

**Honeywell**

# Excel CARE

USER GUIDE

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# Excel CARE

## V 7.01.03

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### USER GUIDE

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# GENERAL

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GETTING STARTED

CARE ENVIRONMENT

BASIC STEPS

PROJECTS DEFINITION AND MANAGEMENT

PLANTS DEFINITION AND MANAGEMENT

EDITORS

DOCUMENTATION



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## REVISION HISTORY

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no changes in comparison to previous version.



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**INTRODUCTION**


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**CARE Features**


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CARE (Excel Computer Aided Regulation Engineering) software provides graphic tools to create downloadable control programs for EXCEL 5000<sup>®</sup> Controllers. The CARE process includes the development of:

- C-bus, LON-bus, and BACnet networks
- Schematics
- Control strategies
- Switching logics
- Point attributes
- Point mapping files (optional)
- Time programs
- Job documentation

**Supported Controllers and Devices**

Excel 10 / 50 / 80 / 100 / 500 / 600  
 Excel Smart Controller  
 Excel Web Controller  
 Smart I/O Modules  
 Distributed I/O Modules  
 Excel Link Controller  
 OLink/OPS Controller  
 Excel IRC  
 Excel Elink  
 M7410G Linear Valve Actuator with LON capabilities  
 3<sup>rd</sup> party LON devices  
 3<sup>rd</sup> party BACnet devices

**Excel 10 Controllers**

Excel 10 applications use an Excel 10 Zone Manager Controller as the interface between the EXCEL 5000 C-bus and an E-Bus with Excel 10 Controllers. In addition to providing point mapping between the C-bus and the E-Bus, the Excel 10 Zone Manager Controller has the functionality of an Excel 100, except that it has no physical points.

Excel 10 applications cover the Q7750A1xxx (1000-series) devices used with VAV 1 (Standard VAV) applications and the 2000-series including the Q7752A2xxx Zone Manager and its corresponding controllers such as VAV 2 and FCU.

CARE 7.01.00 can only be applied to the engineering of 2000-series applications. For these the process is partly done in CARE and completed within the E-Vision software tool.

The complete process is described in the Excel E-Vision User Guide 74-2588. The CARE steps are described in the Excel 10 Applications section in this User Guide.

**Excel Link Controller**

Excel Link applications enable the connection of C-NAP bus controllers to an EXCEL 5000 C-bus. C-NAP bus controllers include Excel MicroCel, Excel MacroCel, Excel W7620, and Excel W7600.

The CARE process for Excel Link applications is similar to that for the Excel 500 controller. There are special considerations as well as additional software requirements for Excel Link applications.

**OLink/OPS Controller**

The OLink controller and its successor the OPS (Open Point Server) controller can be engineered in CARE in the same way as a standard Excel 500 controller. External bus system information such as from M-bus will be integrated by simple point mapping between subsystem points and CARE datapoints.

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## System Requirements

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**Hardware Requirements**

- Minimum Pentium PC 133 MHz (333 MHz highly recommended).
- Graphic board and monitor, which support at least 1024 x 768 pixel (1024 x 768 recommended)-
- Minimum 32 MB RAM (128 MB recommended)
- Minimum\* 100 free space on PC disk drive (200 MB recommended)
- Printers supported by MS-Winword (HP LaserJet recommended)

\* Check for free space while in Windows™. When Windows™ is running, it can use large pieces of disk space, for example, for a temporary swap file. If you check while in DOS, you may think you have enough memory, but you will have less after you start Windows™. For software localization and creation of local language installations, a minimum of 100 MB free disk space is required.

**Software Requirements**

- Microsoft® Windows™ 2000, -XP
- For Enhanced Printout: Word for Windows™ V7.0 or higher.
- For localization of the software components: Visual Localize 2.01.01 or higher.

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## Applicable Literature

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Form No.	Title
74-3556 (US) EN2B-0183 (Europe)	Excel Live CARE User Guide Instructions for using Live CARE software to access controller files on-line and simulate operation
74-5577 (US) EN2B-0184 (Europe)	Excel CARE Control Icons User Guide Descriptions and application examples of control icons used in the CARE control strategy
EN2B-162	RACL Editor User Guide Graphical Editor for creation oft strategy logic programs for Excel 500 controllers.
74-3594 (US) EN2B-185 (Europe)	ASPECD Editor User Guide Provides functions to modify the user interface for Excel Operator Terminals
EN2B-1031GE02	Excel OpenLink Point Server User & Installation Guide
EN3B-1007	Excel OpenLink Point Server Flyer

# CARE CONCEPTS

An HVAC control system is typically composed of controller(s) and plant(s). A controller can be any EXCEL 5000 controller. Plants are specified by their type such as Air conditioning, Chilled water and Hot water.

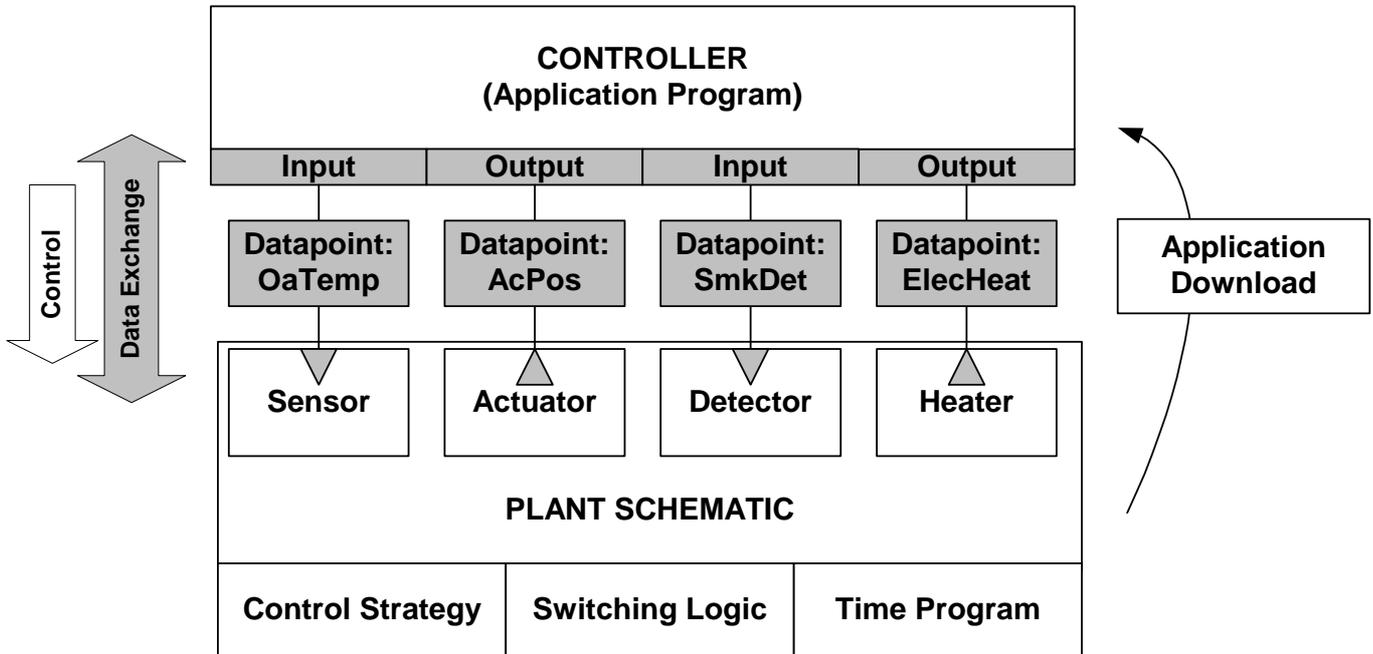
**Physical Control System**

A plant is a controlled mechanical system. For example, a plant can be an air handler, boiler, chiller, or MicroCel Variable Air Volume (VAV) system which is composed for example, of boilers, heaters, pumps, sensors, and other devices. Depending on the technical function, each device has its inputs, respectively its outputs.

The controller and the device are connected via their inputs/outputs. Depending on the used bus system, the devices are connected physically (C-Bus) or logically (LON-Bus, or BACnet-bus) to the controller. The plant is controlled by the application program (control strategy, switching logic, time program) running in the controller. For example, if the sensor gives a changed temperature value, the actuator drives the valve to the appropriate position to compensate the temperature deviation.

**CARE Control System Model**

The physical HVAC control system is realized in CARE by a "Controller - Datapoint - Plant schematic" model.

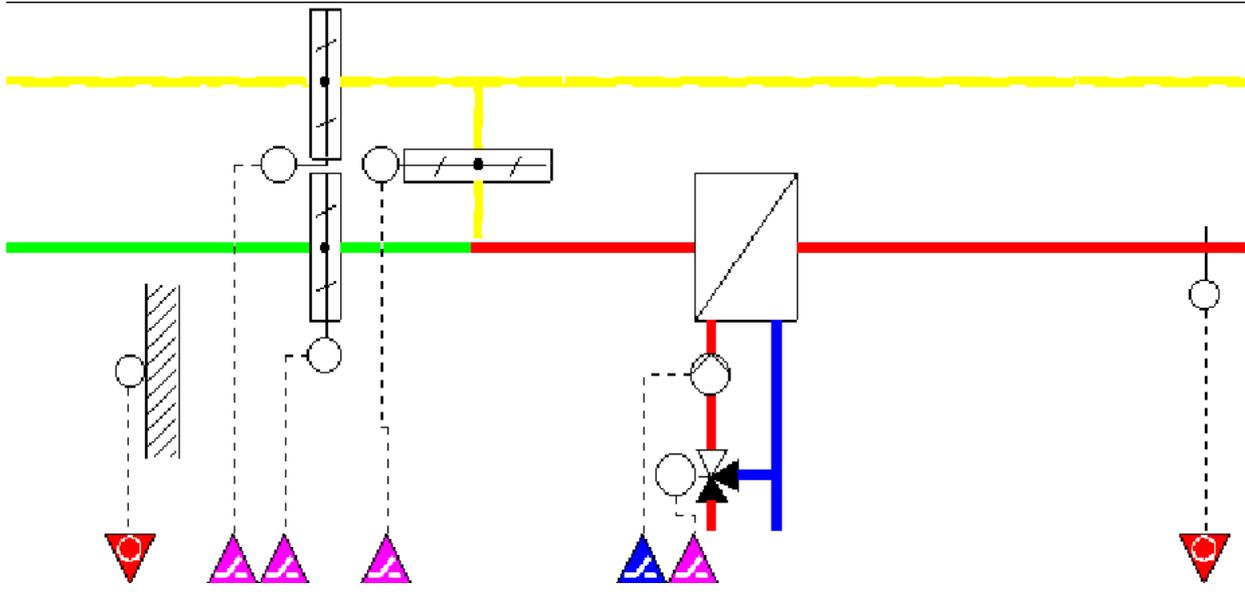


**Controller**

The controller is provided by CARE with its controller specific features such as controller memory and datapoint capacity.

**Plant Schematic**

The physical plant is represented by a schematic, that shows the equipment in the plant and how it is arranged.



**Datapoints**

At the bottom of the schematic, arrowheads represent the inputs/outputs of the equipment as datapoints. They are color-coded, directional (down is input; up is output), and marked with special symbols for additional information:

Color	Direction within triangle	Datapoint Type
Green	downward	Digital input or totalizer
Red	downward	Analog input
Blue	upward	Digital output
Violet	upward	Analog output
Light blue	upward	Flex point

Alternatively a plant schematic can be drawn without the component symbols and just displaying the datapoints as arrows.

CARE distinguishes between physical or hardware points which are related to physical inputs or outputs and software or pseudopoints. Software points can be created for processing calculation results of software programs.

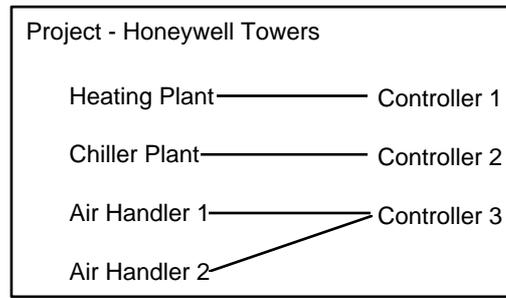
Datapoints are specified by certain properties, such as point type (analog input, digital output etc.), user address (OaTemp=outside air temperature) etc. Datapoints can be identified within the EXCEL 5000 system by their unique user address.

To control the equipment, a control strategy, a switching logic and/or a time program is added to the plant schematic (see also CARE Main Applications section). For the control process through the application program in the controller, the datapoints represent links to provide data exchange between the controller and the plant. Data exchange through datapoints will be performed according to the attached logic functions.

**Project**

All relevant information of controllers and their attached plants are saved in a project.

Example of a project with four plants and three controllers:



In addition, general information such as reference number, client name, and order number are part of the project.

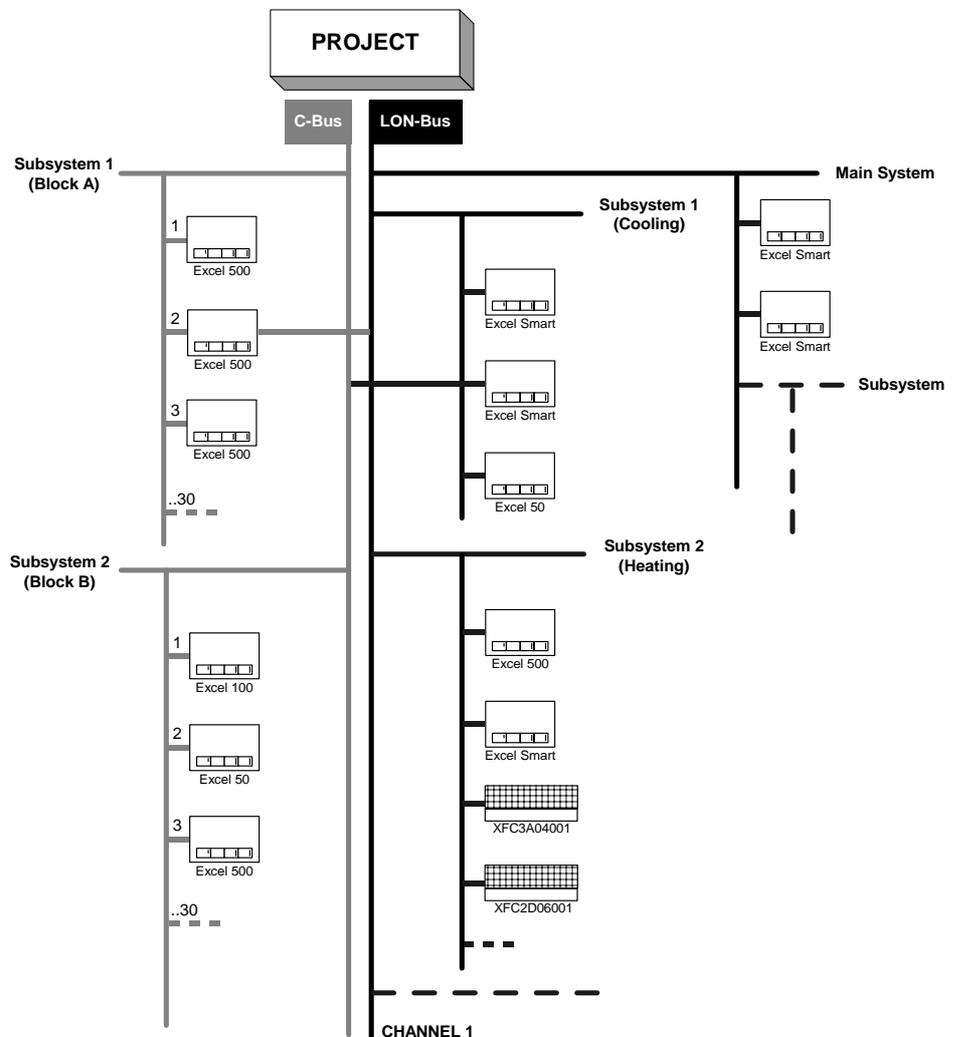
**Bus types**

The controller and plant devices are attached to certain communications media (bus) and communicate with one another using a common communication protocol. CARE supports the proprietary Honeywell C-bus (local LON-bus), the open LON-bus (LonWorks), BACnet-bus and 3<sup>rd</sup> party bus systems such as Meter bus.

**Network Architecture**

In addition to the specified bus type, the physical arrangement of the devices attached to the bus can be represented as network architecture in CARE.

A project can cover multiple of different buses building up a network.



**CARE Main Applications** CARE provides four main applications to create downloadable control programs:

- Plant Schematics
- Control Strategy
- Switching Logic
- Time Programs

**Plant Schematic** The physical plant is represented by a schematic, that show the equipment in the plant and how it is arranged.

**Control Strategy** After the plant schematic has been created, a control strategy may be created that provides the controller with the intelligence to handle the system. Control strategy defines loops for decisions based on conditions, mathematical calculations, and/or time-of-day schedules. Control can depend on analog values, digital values, or both. CARE provides standard control algorithms such as Proportional-Integral-Derivative (PID), minimum value, maximum value, averaging, and sequencing.

**Switching Logic** In addition to adding a control strategy, a switching logic can be added to a schematic for digital control such as switch status.

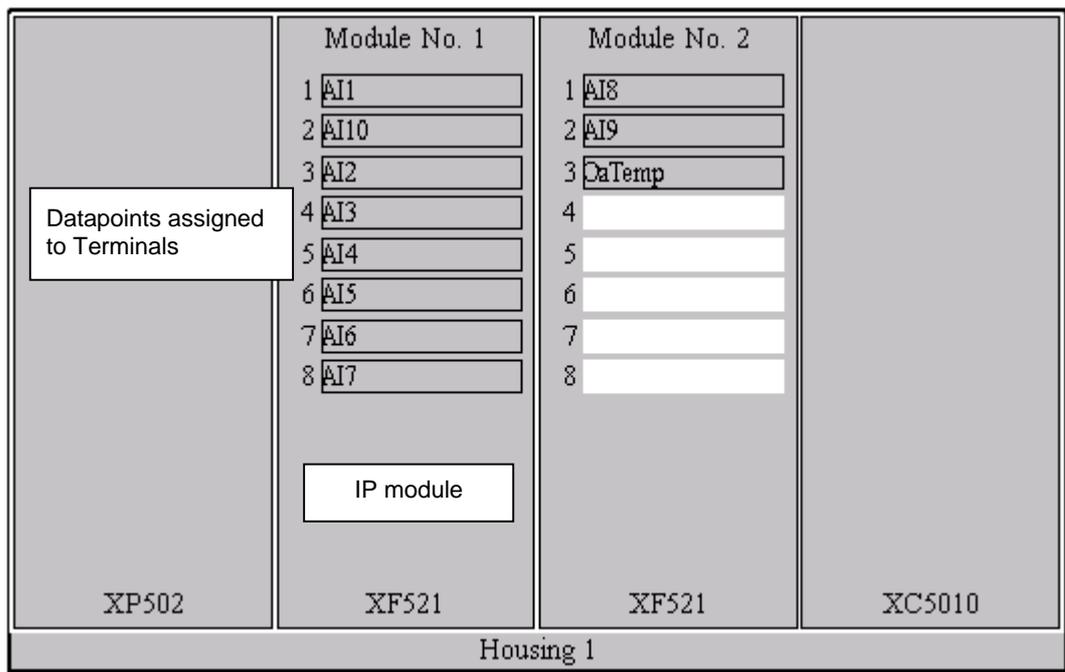
Switching logic is based on logic tables that set up logical ORs, logical ANDs, and exclusive ORs. For example, switching logic can be defined to have the return fan start after a programmed delay from the time that the supply fan was started.

**Time Programs** Time programs can be set up that control equipment on/off times to coincide with occupancy. Daily schedules (for example, weekdays, weekends, holidays) will be defined and assigned to weekly schedules.

**Connecting Inputs/Outputs** Depending on the used hardware and bus type, CARE provides 2 methods to connect inputs/outputs between plant and controller.

**Terminal Assignment (C-Bus)**

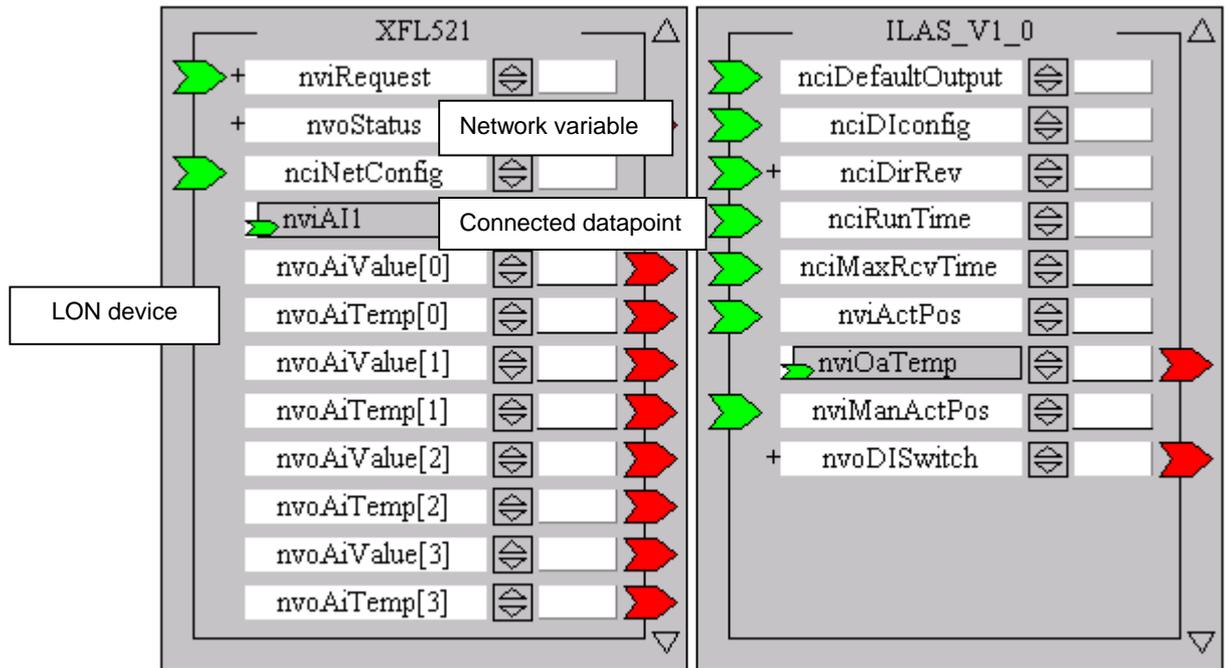
In case of a physical connections between controller and devices on the C-bus, the controller has IP and/or distributed I/O modules. Then, the device inputs/outputs, respectively the corresponding datapoints will be automatically assigned to the controller terminals. The connections can graphically be viewed and re-arranged on the terminal assignment pane.



**Binding (Open LON-bus)**

In case of a logical connection between a LON controller and other (3<sup>rd</sup> party) LON devices on an Open LON-bus, the controller uses neither IP nor distributed I/O modules. Instead, the device inputs/outputs, respectively the corresponding

datapoints are boardless. Then, connections will be made by dragging&dropping boardless controller points to LON device datapoints which are called network variables (NVs). The process of connecting LON devices to each other is called Binding.



**Application Download to Controller**

After a plant has been completed by editing the schematic, control strategy, switching logic and time program, the application files will be translated into a suitable controller format. Then the file will be downloaded and the controller test operation can be started.

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## GETTING STARTED

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This chapter describes how to install, order and register CARE. Additionally it is described how to start and exit CARE, and how to use on-line help.

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### Installation

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#### Several Licenses of CARE 7.01.02 on Same PC?

It is only possible to install one Version of CARE 7.01.00 on the same PC.

#### Different CARE Versions on Same PC

When installing CARE 7.01.02 into a CARE folder where a previous CARE version is installed, all files of the previous CARE installation will be deleted. If you want to keep an old CARE version running on the same PC additionally to CARE 7.01.02, you should install CARE 7.01.02 into a different folder. In this case, CARE provides a copy of the previous CARE.INI file, which can be used for running the old CARE version.

In case of installation of CARE 1.3.X and CARE 7.01.02 on the same PC, CARE 7.01.02 should not be installed into the "CARE"-subdirectory because this is the directory automatically used by the CARE 1.3.X setup procedure. Choose a different name, e.g. C:\CAR7.01.00 instead.

In case the element library of an already installed CARE version is different from the element library of CARE 7.01.00, run an element library backup in your legacy CARE version. This is required only for CARE 1.4.1 and higher. The element library backup could then be merged in the new CARE version via Database/Import/Element Library" as soon as the new CARE version is installed.

#### Installation Path

The DOS path is restricted to 17 characters. This limit can easily be reached when selecting an installation directory consisting of several folder levels of which each level is relatively long. To use long paths to be displayed in the Windows Explorer without exceeding the DOS restriction it is recommended to use no subfolders. The folder name can then be as long as desired:

Example:

C:\CARE701\_LICENSE\_FOR\_MR\_KLEIN\_ßTEST\_30042004

The length of the DOS path affects also the function of the CAREDB.TAF file which CARE uses for its database functions. Your PC may already have an older version of this file that is in use by other RAIMA-type applications. To ensure that CARE finds the correct CAREDB.TAF file, the DOS path to the CARE installation directory should be less than 17 characters.

#### XI584 and CARE

When using XI584 together with CARE, the default directory to find XI584 is C:\XI584 and this path is referenced in the CARE.INI entry:

```
[CareManager] UploadDownload=C:\XI584\XGCMAN.EXE
```

If you install XI584 in a different directory, be sure to also update the path in your CARE.INI file (in your Windows directory) to enable the capability to call XI584 directly from CARE.

In case you want to use an element library from a legacy CARE version, you might now merge this library into the CARE 7.01.00 library. To do so, select "Database/Import/Element Library".

You may want to use UPDEFT to bring the local language default files of your legacy CARE version to the new CARE version. The default files are located in the sub-directories of PCBSTD of your CARE installation directory.

For data file copy instructions and software compatibility refer to the Excel CARE V7.01.02 Software Release Bulletin.

- Procedure**
1. Start Windows™ software, if not already operating.
  2. Check the amount of free disk space that is available on the drive where you want to install CARE.

**IMPORTANT**

*If a CARE directory already exists, first back up the CARE database and Element Library, then copy your specific PIC and XFM files and the default files from the PCBSTD folder to a save location.*

3. Start the SETUP.EXE program in the DISK1 directory of the CARE installation media.

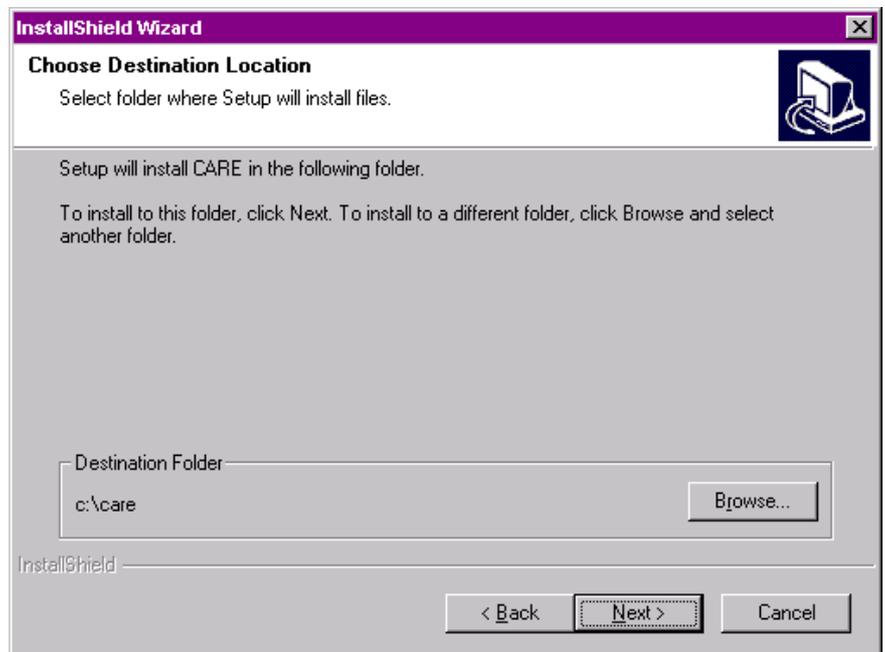
RESULT: A Welcome dialog box displays.

4. Click **Next >** to continue.

RESULT: A dialog box with the license agreement displays.

5. Read the license agreement carefully. Then click **Yes**

RESULT: The Choose Destination Location dialog box displays.



6. Keep default destination folder or click Browse button and choose another folder where you want CARE to be installed.

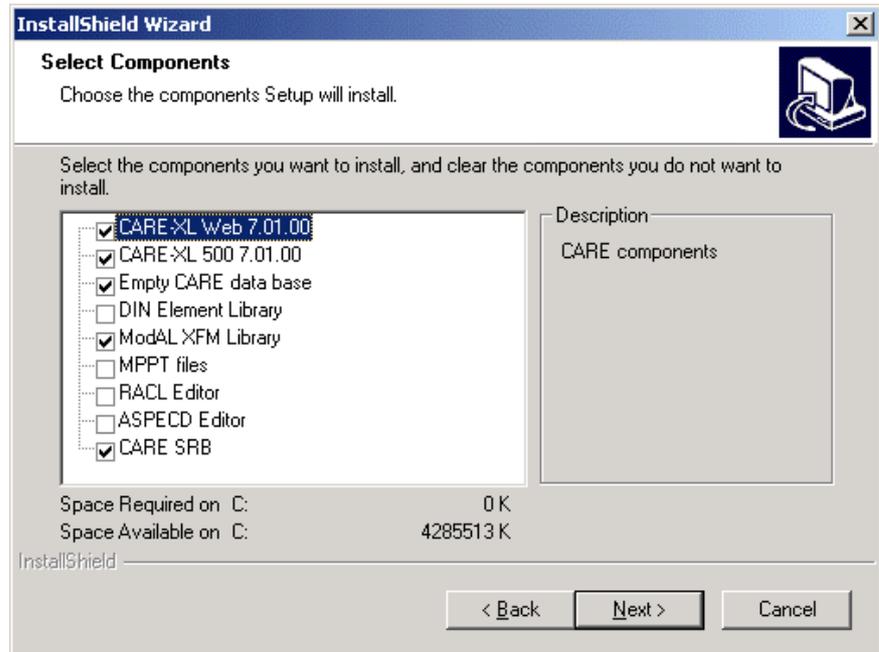
NOTES: The DOS path is restricted to 17 characters. This limit can easily be reached when selecting a destination location consisting of several folder levels of which each level is relatively long. To use long paths to be displayed in the Windows Explorer without exceeding the DOS restriction it is recommended to use no subfolders. The folder name can then be as long as desired:

Example:

C:\CARE701\_LICENSE\_FOR\_MR\_KLEIN\_βTEST\_50082004

7. Click **Next >**.

RESULT: The Select Components dialog box displays.



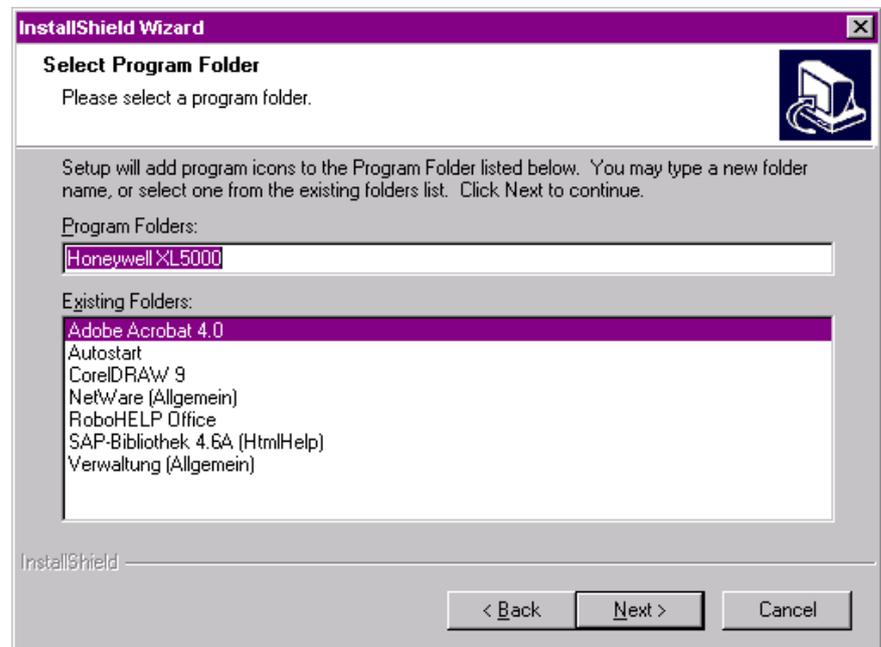
8. Select the CARE components you want to be installed.

NOTES: To use ASPECD Editor and/or RAACL Editor, an additional license has to be ordered.

DIN Element library installs a CARE database without elements, but with DIN pic files and one heating, cooling and air-conditioning element library.

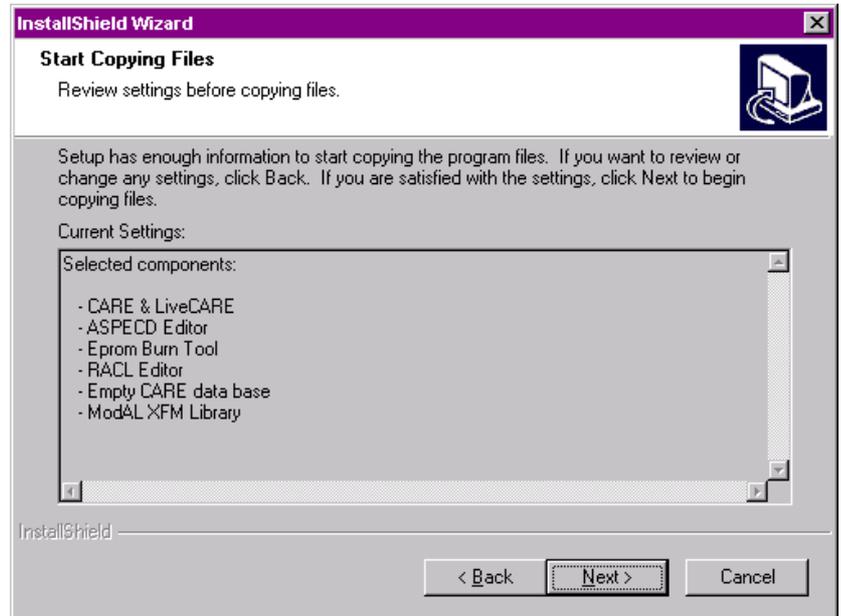
9. Click **Next >** to continue.

RESULT: A Select Program folder dialog box displays.



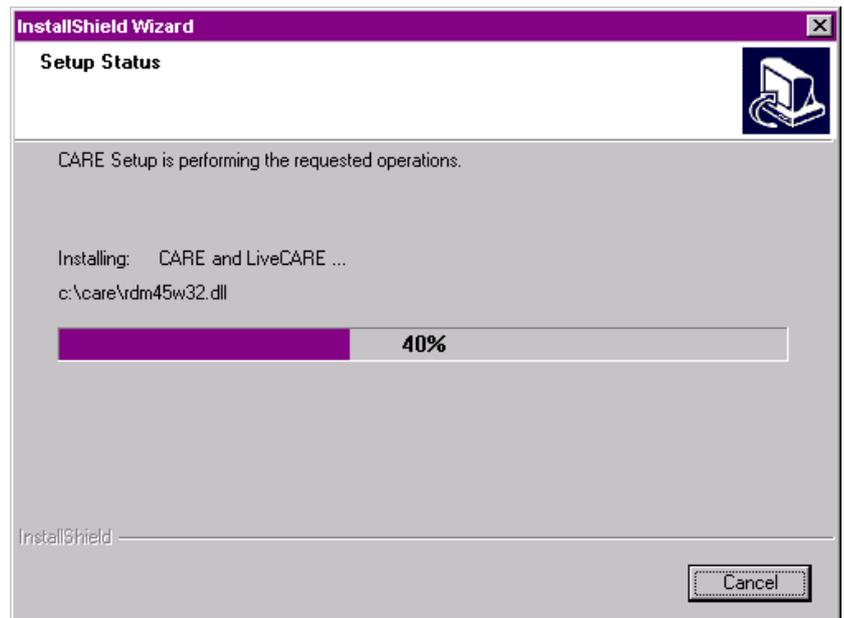
10. Edit program folder name, if desired, or confirm by clicking **Next >**.

11. The Start Copying Files dialog box is displayed showing all selected components.

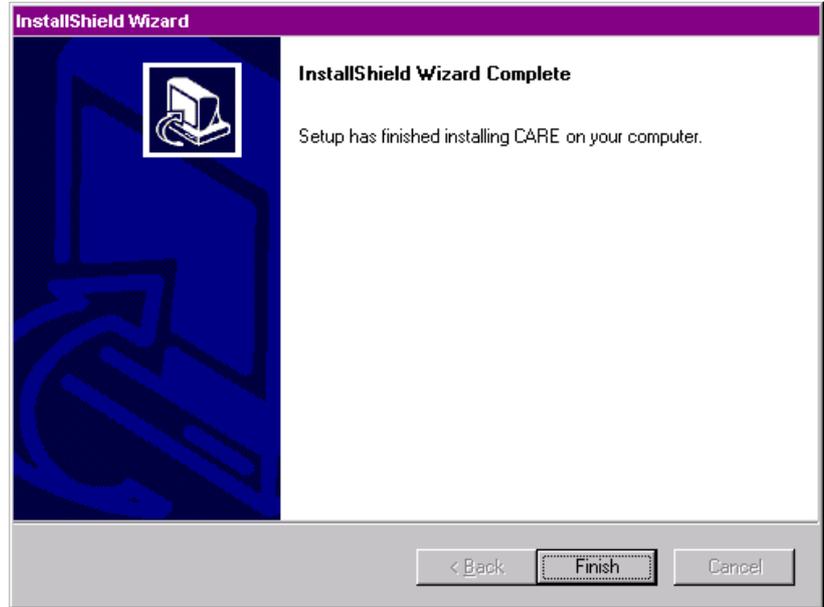


12. Click **Next >** to continue.

**RESULT:** Setup installs the selected components. Setup also creates a copy of the existing CARE.INI file in the Windows and WINNT directory, respectively.



After all files have been copied, the InstallShield Wizard Complete dialog box is displayed



13. Click Finish to close the setup.

## Maintenance of CARE

The CARE Installation procedure is part of the CARE Setup Maintenance program, which includes a Repair and a Remove function in addition.

### Modify

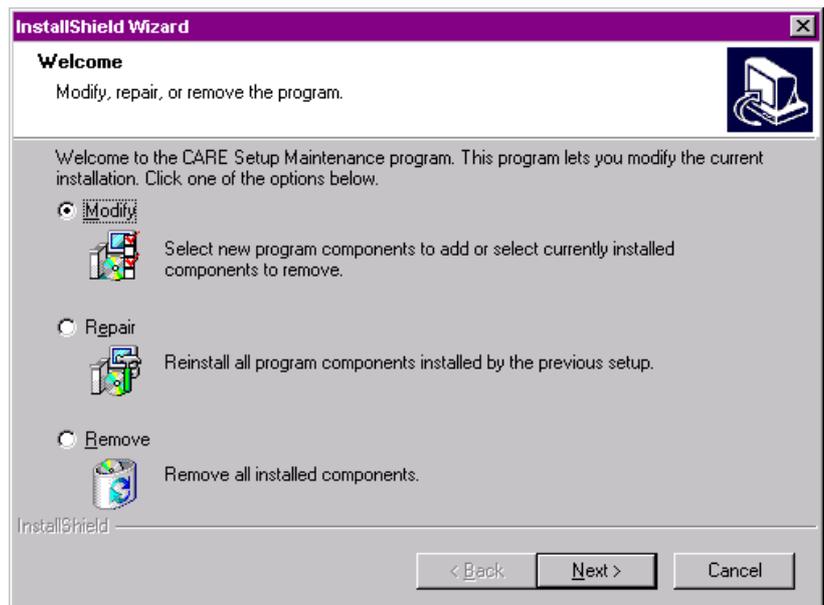
Use the Modify function to install additional components or to remove already installed components.

### Repair

Use the Repair function for restoring files which have been deleted accidentally. The Repair function may corrupt CARE database files when restoring deleted database files.

### Remove

Use the Remove function to completely remove the current CARE version from your PC. Note that all projects and the database will be deleted. Do the respective backups before using this maintenance option.



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## Licensing

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CARE 7.01.00 can be ordered either as CD from the Customer Service Center Schönaich (CSC)/GE51 or by download at:

[http://web.ge51.honeywell.de/dep/mc/HVAC\\_Products/Management/CARE/Software](http://web.ge51.honeywell.de/dep/mc/HVAC_Products/Management/CARE/Software)

These versions are unregistered demo versions with restricted functionality (Evaluation mode).

**IMPORTANT**

*CARE can only be ordered by Honeywell affiliates using the Honeywell ordering system. Thus, external customers must order via their Honeywell representative.*

To continue with the whole functionality, the user needs to get a license key for the CARE demo version.

Depending on the license, the following features are provided:

CARE Feature	Function
Basic Functions	Excel 50/100/Smart/500 Engineering
RACL & ASPECED Editor	Administrator Function for RACL / ASPECED Editor
OPS & Replicate Plant	Open Point Server Support
Smart I/O & Autobinding	LON Engineering
LNS Support	LNS Access and License
XLWeb Translate and Backup	Excel Web Engineering
XLWeb Basic Control Functions	Administrator Function to Use Legacy Functions
XLWeb Edit Basic Macro Library	Administrator Function to Generate System Macros
Excelon	Excelon Functionality

The licensing will be done by using CARE and the Honeywell License Server (<http://license.ge51.honeywell.de>) in parallel. The licensing process is based on three parts:

- Voucher number  
Included and printed on CARE CD label
- Reference key  
Automatically created on the hardware where CARE has been installed
- License key  
Automatically created by the Honeywell License server when performing the procedure described in the "Registering the First Time" section.

In addition to the first license, the user can get a second license for free (e.g. for one Notebook and one Desktop). In case of software enhancements, the user can upgrade an existing license to a version with desired functional content. Once a year a lost license can be replaced by a new one. In addition, the user can also transfer a CARE license from one Computer to another.

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## Registering the First Time

**Assumption** CARE demo version 7.01.02 is installed on your PC.

- Procedure**
1. Start CARE.
  2. Open CARE Registration dialog box by clicking on Help menu, then submenu item Registration.

RESULT: The Registration dialog box shows that the expiration date is unlimited, that the demo version is in Evaluation Mode and that no license is registered yet. A reference code is displayed, which is generated from internal PC data during installation of CARE. This code refers to that particular PC at the time when CARE had been installed.

**CARE Registration**

Registration data

Reference code: y6ynx7c-6r4un3d-e8btwtce

User ID:  Expiration date: Unlimited

Features: Evaluation mode

[To access Honeywell License Server click here!](#)

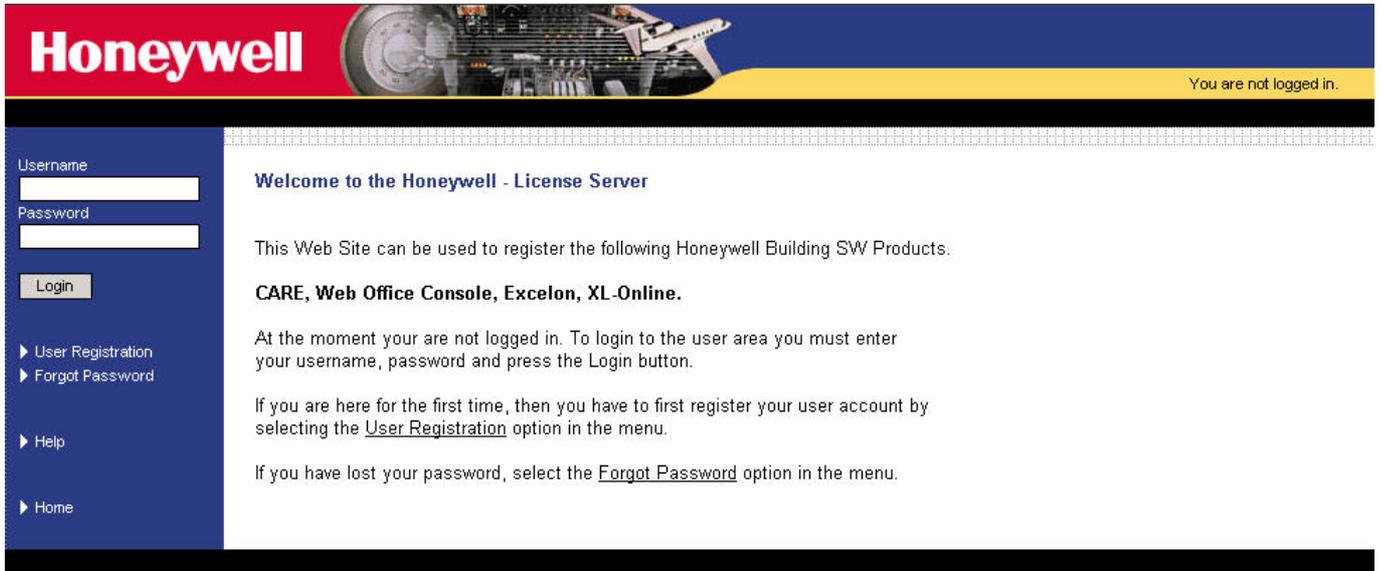
License Key

No License registered.

Termination Voucher

3. Click into the Reference code field and highlight the code.
4. Press CTRL+C key.
5. In the CARE Registration dialog box, click on the link to access the Honeywell License Server or enter the Honeywell License Server URL <http://license.ge51.honeywell.de> into the address field of your Web browser.

RESULT: The Welcome page displays.



**Honeywell** You are not logged in.

Username  
  
 Password

▶ User Registration  
 ▶ Forgot Password

▶ Help

▶ Home

**Welcome to the Honeywell - License Server**

This Web Site can be used to register the following Honeywell Building SW Products.

**CARE, Web Office Console, Excelon, XL-Online.**

At the moment your are not logged in. To login to the user area you must enter your username, password and press the Login button.

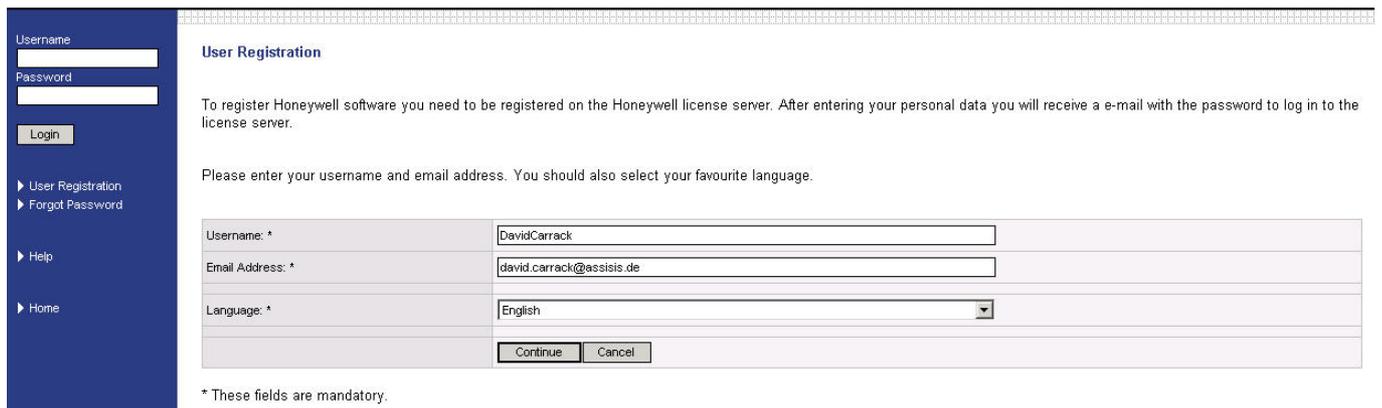
If you are here for the first time, then you have to first register your user account by selecting the [User Registration](#) option in the menu.

If you have lost your password, select the [Forgot Password](#) option in the menu.

Honeywell - License Server 0.21 PAT • [Contact Webmaster](#)  
 Copyright © 2001-2004 Honeywell GmbH - All rights reserved

**6. Click on User Registration.**

**RESULT:** The User Registration page displays.



Username  
  
 Password

▶ User Registration  
 ▶ Forgot Password

▶ Help

▶ Home

**User Registration**

To register Honeywell software you need to be registered on the Honeywell license server. After entering your personal data you will receive a e-mail with the password to log in to the license server.

Please enter your username and email address. You should also select your favourite language.

Username: *	<input type="text" value="DavidCarrack"/>
Email Address: *	<input type="text" value="david.carrack@assisis.de"/>
Language: *	<input type="text" value="English"/>
<input type="button" value="Continue"/> <input type="button" value="Cancel"/>	

\* These fields are mandatory.

**7. Enter your user name and your email address,**

**8. Select the language version of the software.**

**9. Click the Continue button.**

**NOTE:** The Username will be cut to a max. 8-digit user ID. This user ID will be used internally by CARE in the Registration dialog.

**10. In the fields displayed on the following page, enter your personal data and click the Send button.**

Username

Password

- ▶ User Registration
- ▶ Forgot Password
- ▶ Help
- ▶ Home

### User Registration

Please enter your personal data.

Username:	davidcarrack
First Name: *	<input type="text" value="david"/>
Last Name: *	<input type="text" value="carrack"/>
Country: *	<input type="text" value="Germany"/> ▼
Company: *	<input type="text" value="Applied Systems"/>
Honeywell Affiliate:	<input type="text"/>
<input type="button" value="Send"/> <input type="button" value="Cancel"/>	

\* These fields are mandatory.

**RESULT:** You are now registered successfully on the Honeywell License server. You are requested to check you email account, where your login data have been sent to.

Username

Password

- ▶ User Registration
- ▶ Forgot Password
- ▶ Help
- ▶ Home

### User Registration

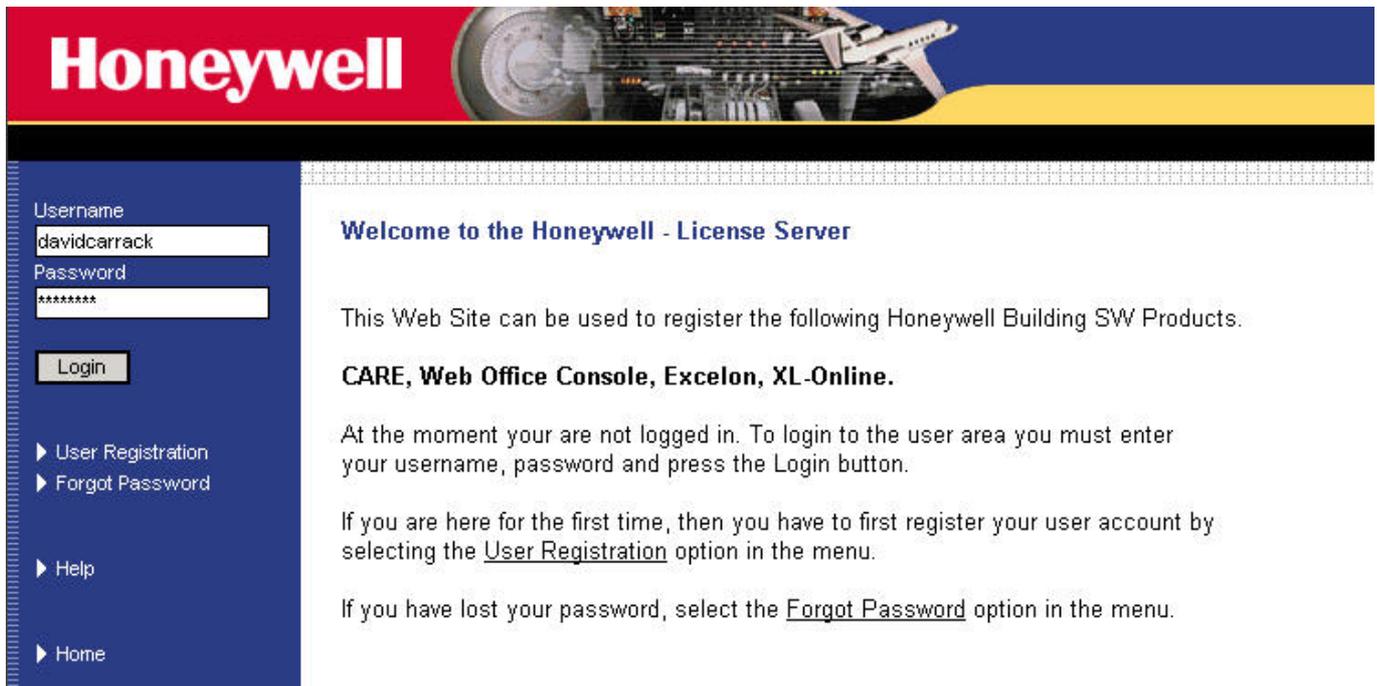
You registered on the License Server successfully.

[Back to overview](#)

Please check your email account for your login data.

**11.** Click on Back to overview.

**RESULT:** The Welcome page redisplay.



**Username**  
davidcarrack

**Password**  
\*\*\*\*\*

Login

- ▶ User Registration
- ▶ Forgot Password
- ▶ Help
- ▶ Home

### Welcome to the Honeywell - License Server

This Web Site can be used to register the following Honeywell Building SW Products.

**CARE, Web Office Console, Excelon, XL-Online.**

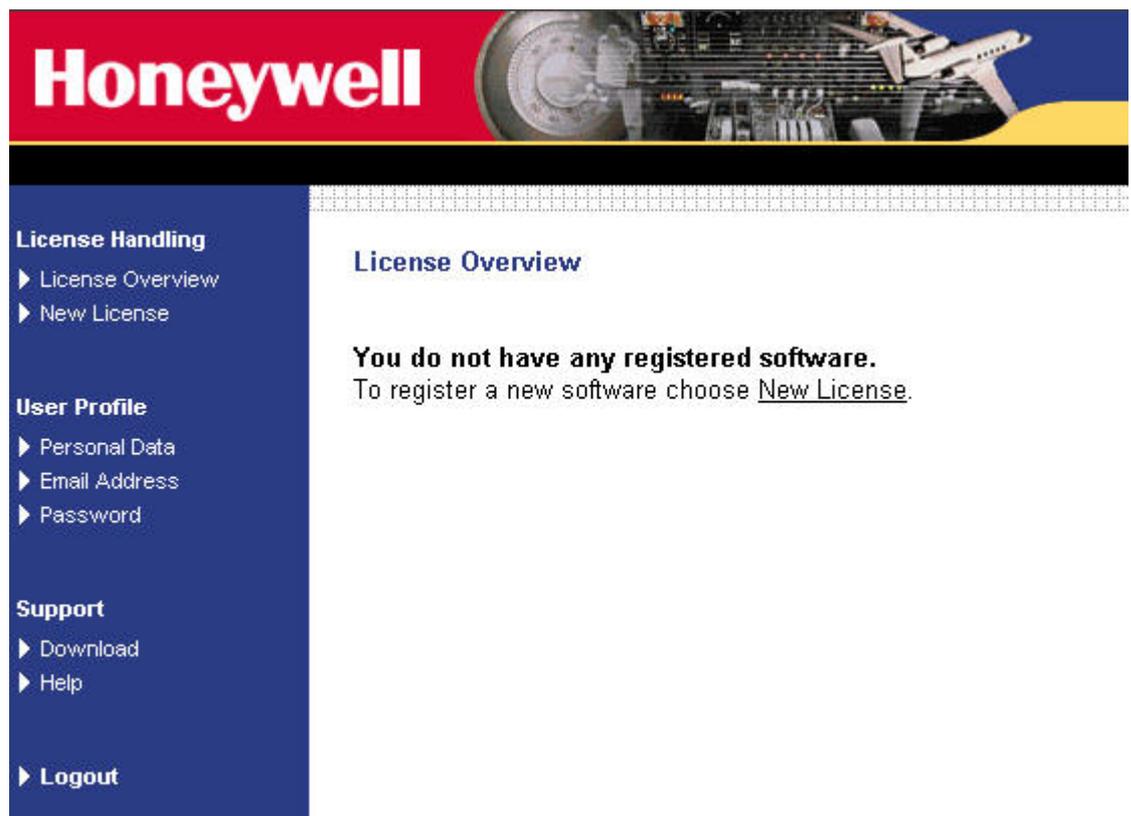
At the moment you are not logged in. To login to the user area you must enter your username, password and press the Login button.

If you are here for the first time, then you have to first register your user account by selecting the [User Registration](#) option in the menu.

If you have lost your password, select the [Forgot Password](#) option in the menu.

12. Check your email for you login data (username and password) and login by entering the username and the password in the fields of the same name.

RESULT: The License Overview page displays.



### License Handling

- ▶ License Overview
- ▶ New License

### User Profile

- ▶ Personal Data
- ▶ Email Address
- ▶ Password

### Support

- ▶ Download
- ▶ Help

▶ Logout

### License Overview

**You do not have any registered software.**  
To register a new software choose [New License](#).

13. Click on New License.

RESULT: The New License page displays.

<b>License Handling</b> ▶ License Overview ▶ New License  <b>User Profile</b> ▶ Personal Data ▶ Email Address ▶ Password  <b>Support</b> ▶ Download ▶ Help  ▶ Logout	<h3>New License</h3> <p>Please enter your Reference Code and Voucher Number. The Reference code can be found in your software in the /help/registration menu. The Voucher Number is printed on the product CD.</p> <p>The field "Free Comment" can be used to remember the license usage.</p> <table border="1"> <tr> <td>Reference Code: *</td> <td><input type="text" value="y6ynx7c-6r4un3d-e8txwtce"/></td> </tr> <tr> <td>Voucher Number: *</td> <td><input type="text" value="faqmd8d-d5wsytd-b47mffe-fgw5pzb-c2b3c2d-8a6trwf-qyynnzb-qpm83nf-qyyx57c-xanbc"/></td> </tr> <tr> <td>Free Comment:</td> <td><input type="text"/></td> </tr> <tr> <td colspan="2" style="text-align: right;"> <input type="button" value="Send"/> <input type="button" value="Cancel"/> </td> </tr> </table> <p>* These fields are mandatory.</p> <p>This function can only be used once for each Voucher Number. For already registered software select <b>Your Licenses</b>.</p>	Reference Code: *	<input type="text" value="y6ynx7c-6r4un3d-e8txwtce"/>	Voucher Number: *	<input type="text" value="faqmd8d-d5wsytd-b47mffe-fgw5pzb-c2b3c2d-8a6trwf-qyynnzb-qpm83nf-qyyx57c-xanbc"/>	Free Comment:	<input type="text"/>	<input type="button" value="Send"/> <input type="button" value="Cancel"/>	
Reference Code: *	<input type="text" value="y6ynx7c-6r4un3d-e8txwtce"/>								
Voucher Number: *	<input type="text" value="faqmd8d-d5wsytd-b47mffe-fgw5pzb-c2b3c2d-8a6trwf-qyynnzb-qpm83nf-qyyx57c-xanbc"/>								
Free Comment:	<input type="text"/>								
<input type="button" value="Send"/> <input type="button" value="Cancel"/>									

14. Click in the Reference Code field and press CTRL+V key to paste the reference code into the field. If the code is not inserted, shift to the CARE Registration dialog box and there, click into the Reference code field. highlight the code, and press CTRL+C key. Shift back to the New License page.

15. Enter the voucher number into the Voucher Number field.

16. Enter a free comment into the Free comment field if desired.

17. Click the Send button.

RESULT: The license agreement is displayed.

18. If you agree, check the **Yes, I agree to these terms and conditions** checkbox at the end of the text and click the Send button.

	<input checked="" type="checkbox"/> <b>Yes, I agree to these terms and conditions.</b> *
<input type="button" value="Send"/> <input type="button" value="Cancel"/>	

\* These fields are mandatory.

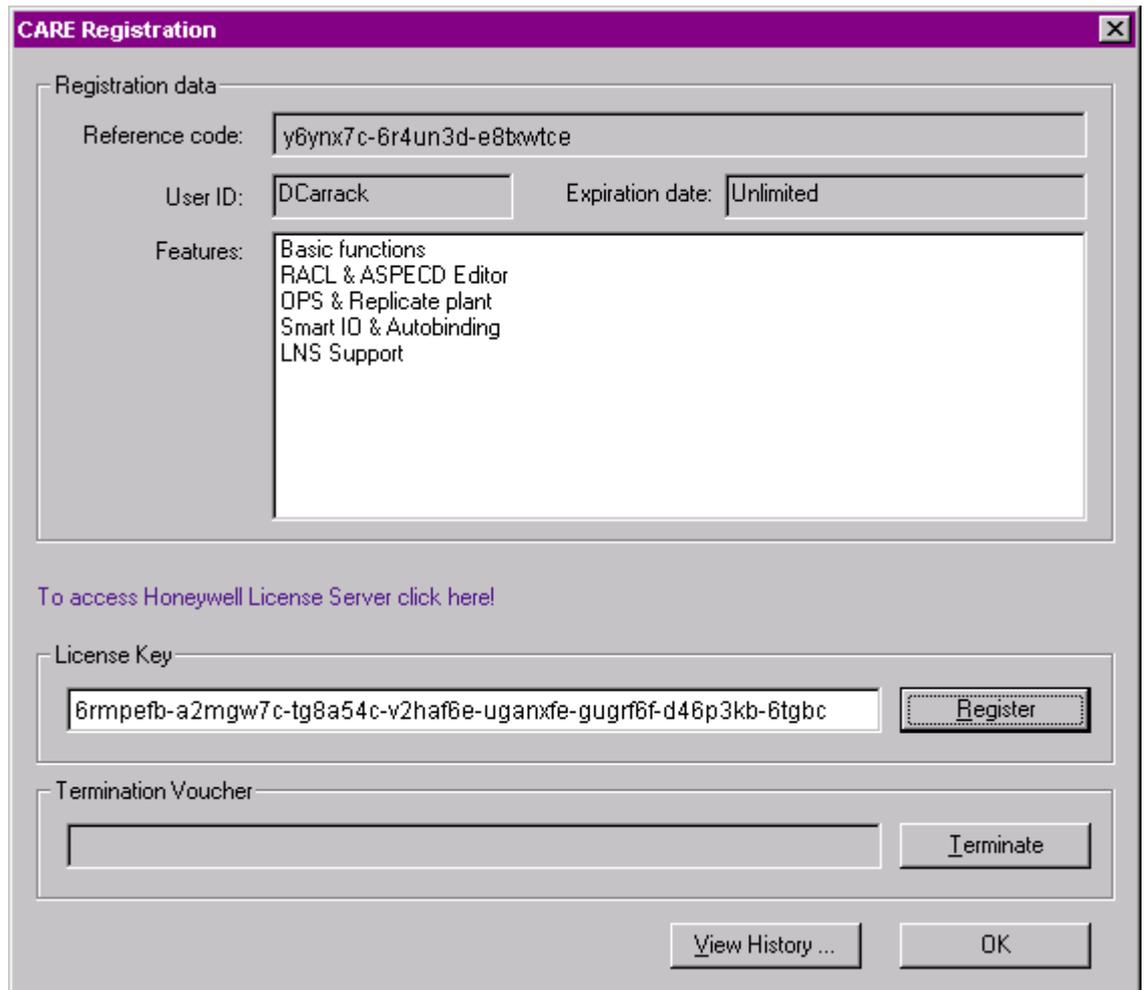
RESULT: The license key is generated and the software product name you want to license, is displayed.

<b>License Handling</b> ▶ License Overview ▶ New License  <b>User Profile</b> ▶ Personal Data ▶ Email Address ▶ Password  <b>Support</b> ▶ Download ▶ Help  ▶ Logout	<h3>New License</h3> <p>Here is your License Key.</p> <table border="1"> <tr> <td>Product:</td> <td>CARE</td> </tr> <tr> <td>Reference Code:</td> <td>y6ynx7c-6r4un3d-e8txwtce</td> </tr> <tr> <td>License Key:</td> <td><input type="text" value="6rmpefb-a2mgw7c-tg8a54c-v2haf6e-uganxfe-gugrf6f-d46p3kb-6tgbc"/></td> </tr> <tr> <td>Free Comment:</td> <td></td> </tr> </table> <p>Now, you can copy and paste the License Key to the registration dialog of the software.</p>	Product:	CARE	Reference Code:	y6ynx7c-6r4un3d-e8txwtce	License Key:	<input type="text" value="6rmpefb-a2mgw7c-tg8a54c-v2haf6e-uganxfe-gugrf6f-d46p3kb-6tgbc"/>	Free Comment:	
Product:	CARE								
Reference Code:	y6ynx7c-6r4un3d-e8txwtce								
License Key:	<input type="text" value="6rmpefb-a2mgw7c-tg8a54c-v2haf6e-uganxfe-gugrf6f-d46p3kb-6tgbc"/>								
Free Comment:									

19. Highlight the license key and press CTRL+C key to copy the key to the clipboard.

20. Delete the entry in the License Key field in the CARE Registration dialog box.

21. Paste the license into the License Key field key by clicking CTRL+V key.



Depending on the license, the following features are provided:

CARE Feature	Function
Basic Functions	Excel 50/100/Smart/500 Engineering
RACL & ASPECD Editor	Administrator Function for RACL / ASPECD Editor
OPS & Replicate Plant	Open Point Server Support
Smart I/O & Autobinding	LON Engineering
LNS Support	LNS Access and License
XLWeb Translate and Backup	Excel Web Engineering
XLWeb Basic Control Functions	Administrator Function to Use Legacy Functions
XLWeb Edit Basic Macro Library	Administrator Function to Generate System Macros
Excelon	Excelon Functionality

22. Click the Register button.

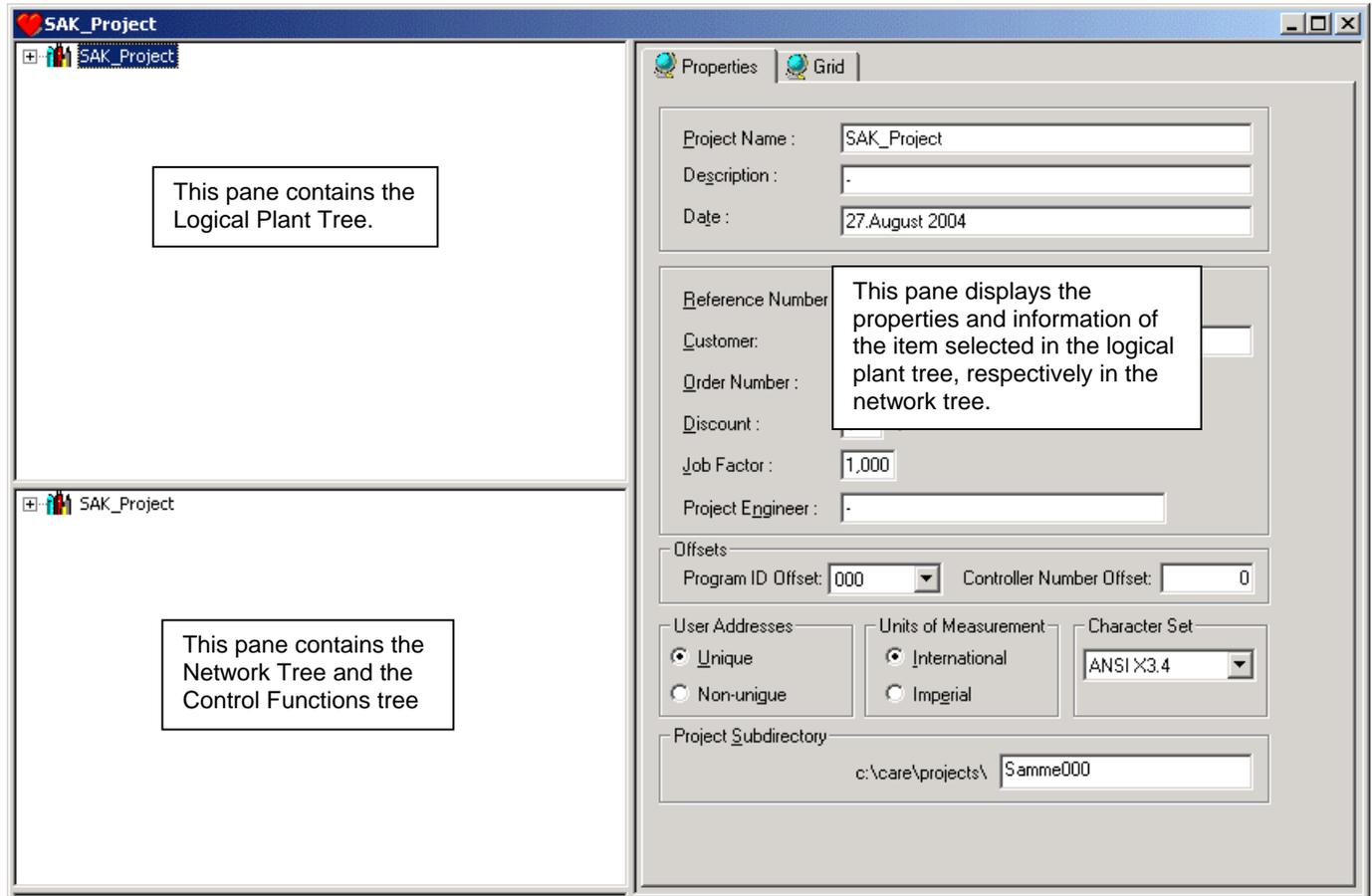
RESULT: A message box displays.



23. In the message box, confirm the registration by clicking OK.
24. Close the Registration dialog box by clicking OK.

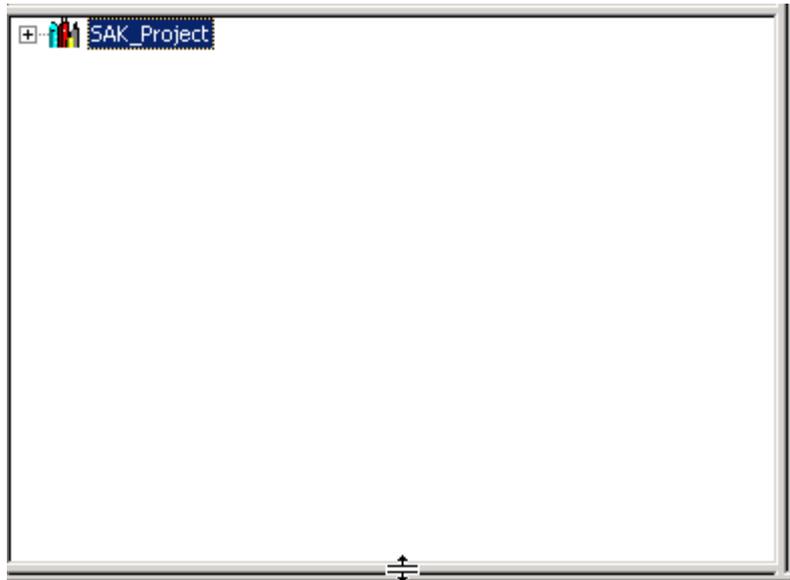
## CARE ENVIRONMENT

When you start CARE, you can see three distinct panes of the CARE environment.

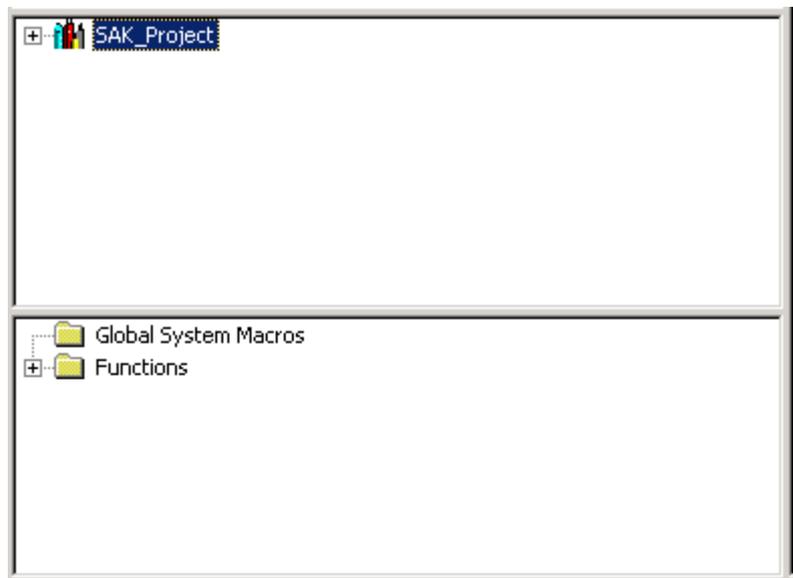


The left bottom pane further can be split. So a fourth pane will be displayed.

The left bottom pane includes two trees, the network tree and the control functions tree. When starting CARE, the control functions tree is not visible. To view the control functions tree, point the cursor on the bottom border till the pointer's image changes to a split pointer.

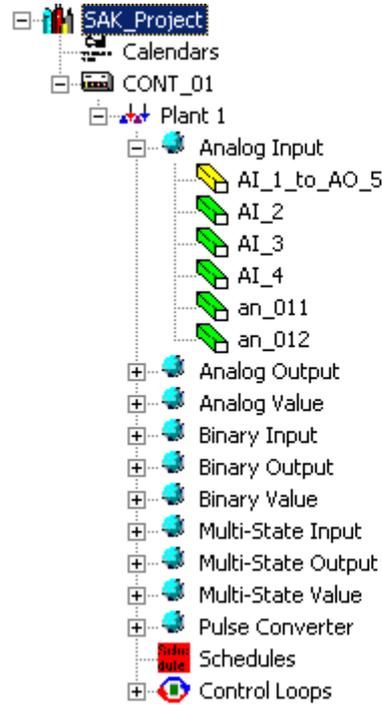


Move the split bar upwards. The control functions tree will be visible in the fourth pane.



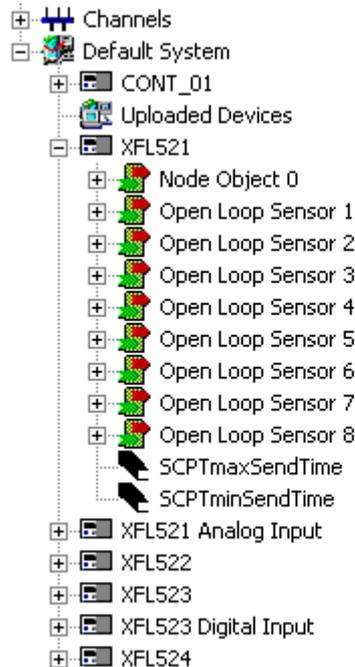
### Logical Plant Tree

The logical plant tree allows to maintain an overall view regarding the logic structure of the project. This helps you to manage and organize the logical components (controllers, plants, datapoints, schedules and control loops) of your project.



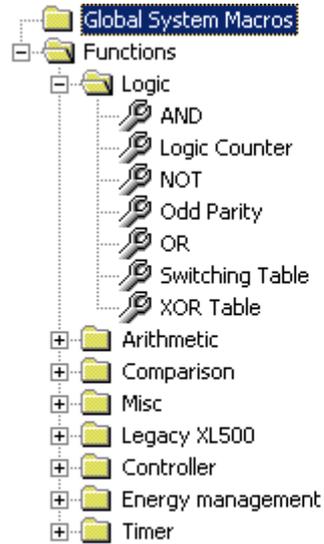
**Network Tree**

The network tree allows to maintain an overall view regarding the bus systems and the network architecture of the project. This helps you to manage and arrange the network components (Controllers, BACnet devices, LON devices, LON-objects, etc.) of your project(s).



**Control Functions Tree**

The control functions tree provides control functions and control macros which will be used in the control editor for creating control loops.



### Sizing the Tree Displays

The size of the tree display can be varied by moving the split pointer/split bar up or downwards.

### Information and Editing Pane

The right pane can look very different depending on the item selected in the logical plant tree, respectively in the network tree. It shows the properties for the selected item. For example, it can show the properties of the project such as name, client, units of measurement etc. or it can show the terminal assignment of a selected controller.

Properties Grid

All information available for the selected item is grouped on tabs.

Project Name : DebisStuttgart  
 Description : -  
 Date : 15.January.2002

Reference Number : 0  
 Client : -  
 Order Number : 0  
 Discount : 1 %  
 Job Factor : 1,000000  
 Project Engineer : -  
 Offset: 000

User Addresses:  Unique  Non-unique  
 Units of Measurement:  International  English

Project Subdirectory: D:\care\projects\ Debis000

Example 1: Project Properties

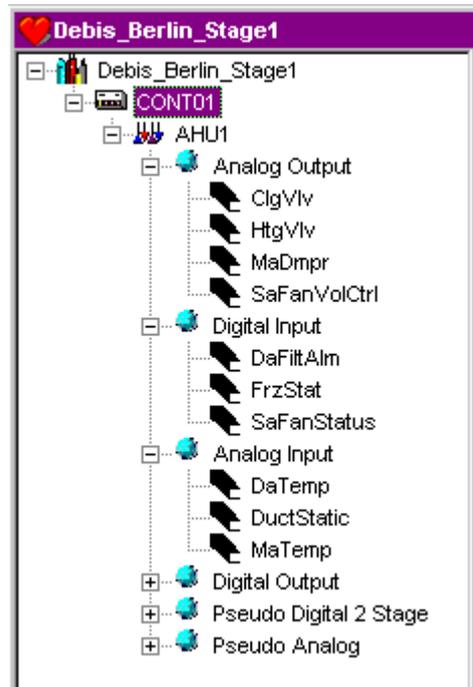
Properties Grid Terminal Assignment for CONT01

	Module No. 1	Module No. 2	
	1 Blr1StrnFlo	1 Blr1TempRst	
	2 Blr1StrnTemp	2	
	3 Blr1WtrTemp	3	
	4	4	
	5	5	
	6	6	
	7	7	
	8	8	
XP502	XF521	XF522	XC5010
Housing 1			

Example 2: Terminal Assignment

## Logical Plant Tree

The logical structure of the project is shown in a hierarchical tree, the logical plant tree. It shows the controllers with their plants (attached or unattached) and the datapoints grouped in types such as Analog Input, Analog Output etc.



The icons in the logical plant tree have the following meaning:

 = Project (max. one)

 = Controller

 = Plant

 = Point Type

 = Single Point

The following information can be displayed and edited on the right pane by clicking on the corresponding tree item:

- Properties of the project, controller, plant and datapoint
- Terminal assignment
- Plant schematic

### Display and Edit Properties

Clicking on the desired item (project, controller, plant, datapoint) in the logical plant tree displays the corresponding properties on the right pane for editing:

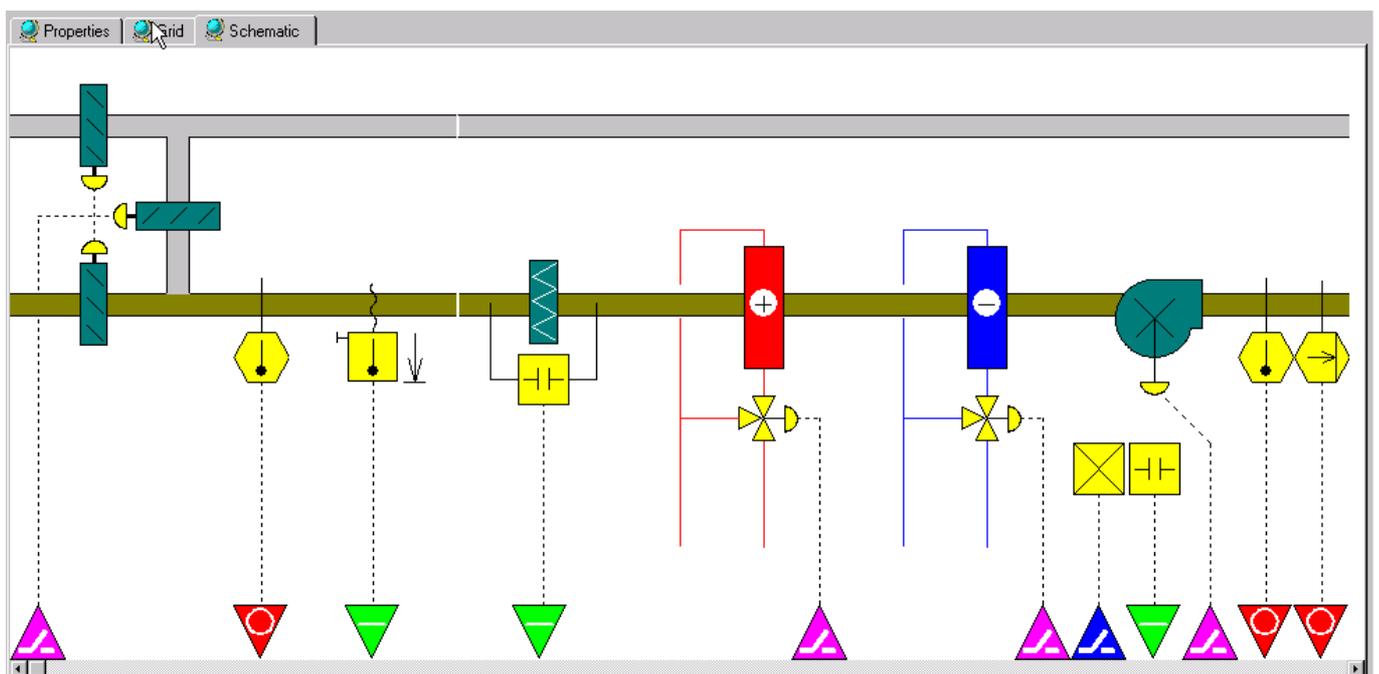
The screenshot displays the 'Properties' tab for a project named 'Debis\_Berlin\_Stage1'. The left-hand pane shows a tree view of the project structure, including 'CONT01' and 'AHU1' with sub-items like 'Analog Output', 'Digital Input', and 'Analog Input'. The right-hand pane contains the following fields:

- Project Name: Debis\_Berlin\_Stage1
- Description: (empty)
- Date: 08.February.2002
- Reference Number: 0
- Client: Debis
- Order Number: 0
- Discount: 1 %
- Job Factor: 1,000000
- Project Engineer: (empty)
- Offset: 000
- User Addresses:  Unique,  Non-unique
- Units of Measurement:  International,  English
- Project Subdirectory: D:\care\projects\ Debis

Example 3: Project Properties

**Display Plant Schematic**

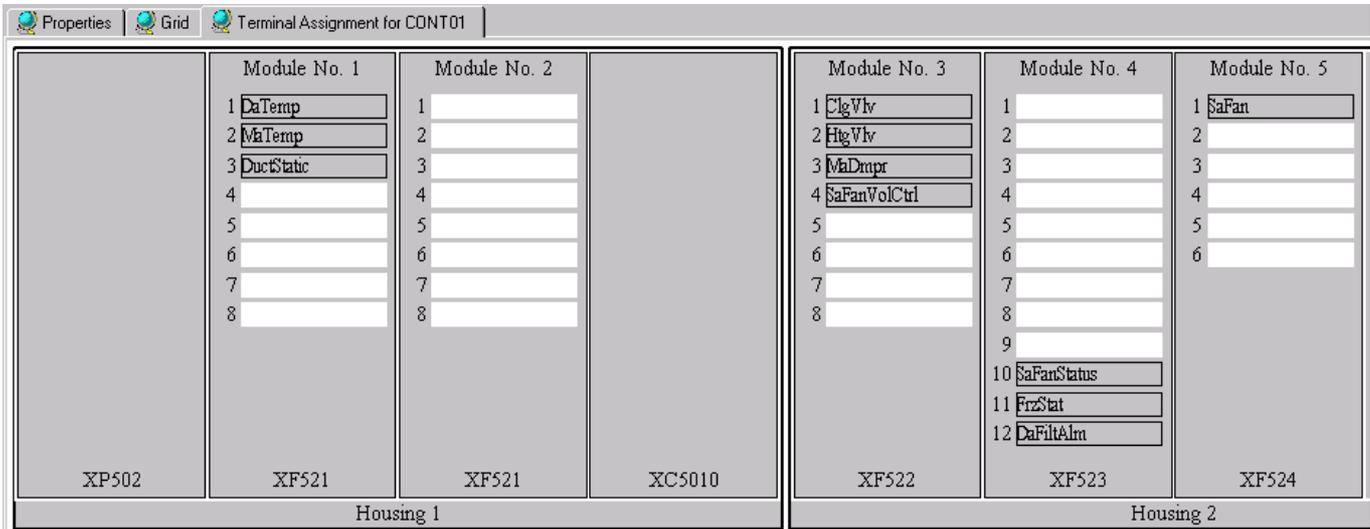
Clicking on the plant in the logical plant tree and then selecting the Schematic tab on the right pane displays the plant schematic (display only). To create and edit a plant schematic, please refer to the Create Plant Schematic section.



**Display Terminal Assignments**

Clicking on the controller in the logical plant tree and then selecting the Terminal Assignment tab on the right pane, displays the terminal assignments of the controller. If LON devices have been added, they will also be displayed.

To assign datapoints to terminals, please refer to the Manually assign Datapoints to Controller section.



**Display Datapoints in Grid**

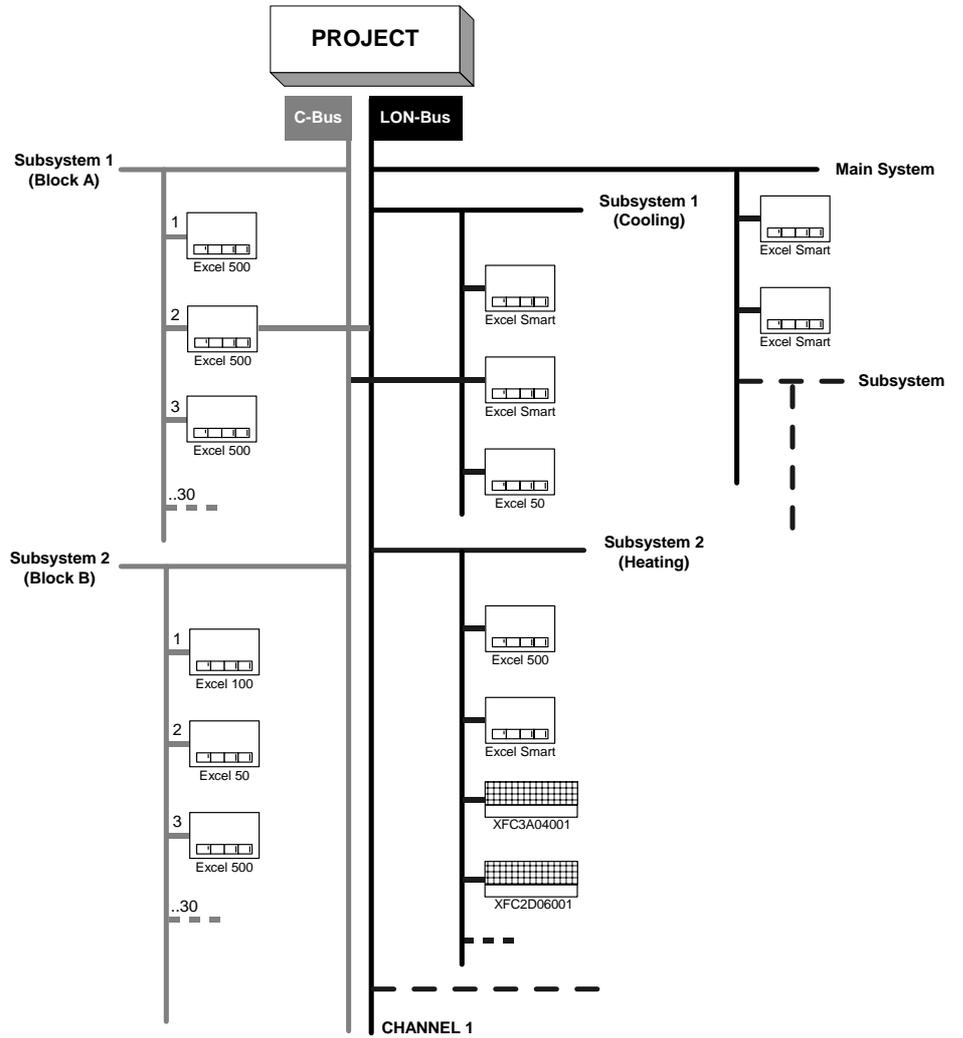
Clicking either on the project, controller or plant in the logical plant tree and then selecting the Grid tab on the right pane, displays all datapoints with their attributes in a grid. To edit datapoints, please refer to the ... section.

Point	User Address	Techn. Address	Sensor Offset	Bus	Characteristic	Engineering Unit	Descriptor	Alarm Text	Active State	Oper. Access Level	Suppr. Alarm	Critical Alarm (Type)	Alarm Point
Filter									*	*			
AO	ClgVlv	01/03/01		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
DI	DaFiltAlm	01/04/12		IP		Normal			0	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AI	DaTemp	01/01/01	0,000000	IP	PT 1000 Type F/I	Deg				3	<input type="checkbox"/>	<input type="checkbox"/>	
AI	DuctStatic	01/01/03	0,000000	IP	Pressure 0-3"	Inw				3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
DI	FrzStat	01/04/11		IP		Normal			0	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AO	HtgVlv	01/03/02		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
AO	MaDmpr	01/03/03		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
AI	MaTemp	01/01/02	0,000000	IP	PT 1000 Type F/I	Deg				3	<input type="checkbox"/>	<input type="checkbox"/>	
BO	SaFan	01/05/01		IP		On			1	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
DI	SaFanStatus	01/04/10		IP		Off			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AO	SaFanVolCtrl	01/03/04		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
PD2	EXECUTING_STOPPED					Normal			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PD2	SHUTDOWN					Normal			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PD2	STARTUP					Normal			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PA	static_setpoint									3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Network Tree

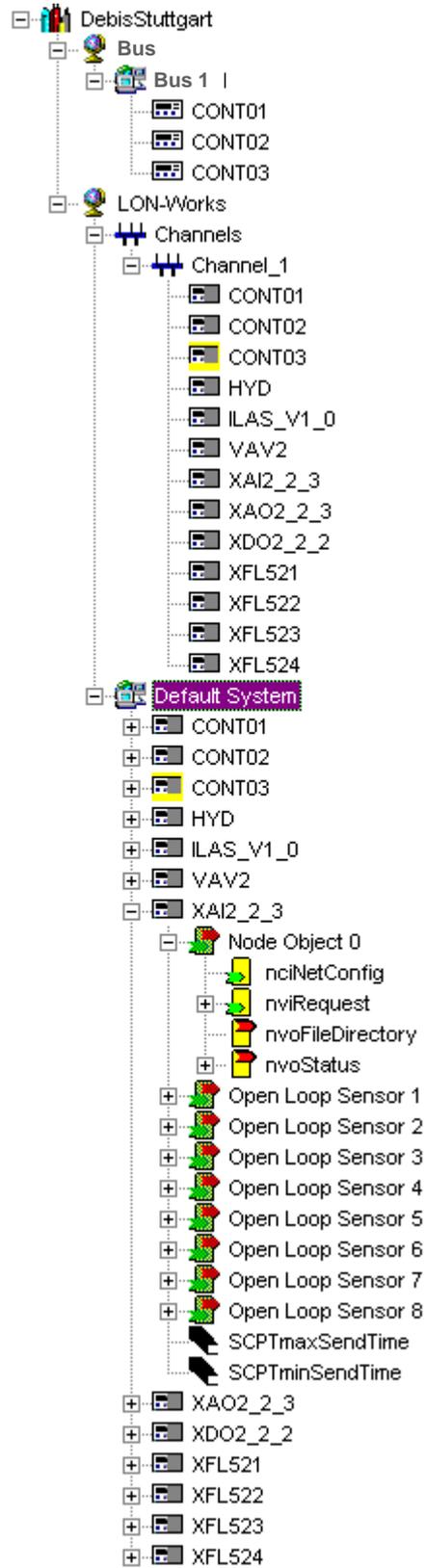
**The Bus types and Network Architecture**

A project can cover multiple of different buses (C-Bus, LON-Bus, BACnet-bus or other) building up the network. The skeletal structure of the network represents the physical and logical conditions in the building.



**Example 4: Project with multiple different buses, in this case (C-Bus and LON-Bus)**

The network is displayed below the logical plant tree in a hierarchical network tree.



The icons in the network tree have the following meaning:

 = Project

 = Bus type

 = LON-channel

 = User defined Default System or Subsystem, or Uploaded Devices

 = LON device (dependent on status different colors)

 = LON object (dependent on status different colors)

 = Input NV (dependent on status different colors)

 = Output NV (dependent on status different colors)

 = Structured Input NV

 = Structured Output NV

 = Standard configuration property type (SCPT) / User-defined configuration property type (UCPT)

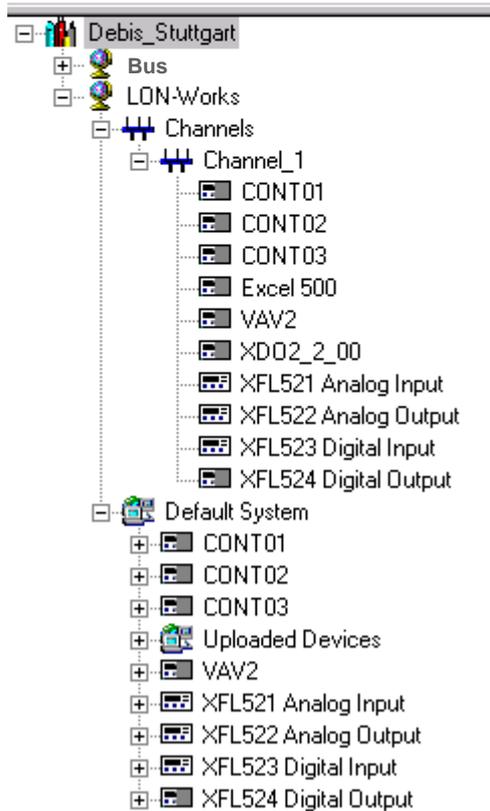
 = Connection between datapoint/NV and NV

 = Router

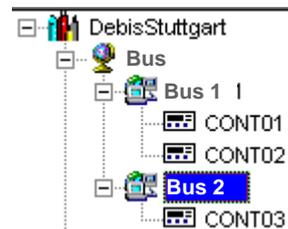
The network tree shows two basic bus types, in this case C-Bus and LON-Works.



Each bus is sub-divided by default to allow an arrangement of the network components according to the physical conditions in the building.



The C-Bus folder contains the C-Bus 1 subfolder by default. Further created subfolders will be numbered continuously. The C-bus subfolders represent the physical C-Bus network structure of the project and contain the C-bus controllers which control that segment of the building.



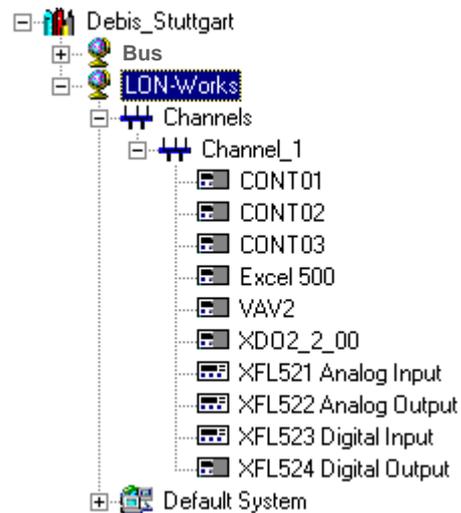
NOTE: The subfolder names are examples and freely editable. For example, the default C-Bus 1 subfolder can be named into Area1 or Block A.

The LON-Works folder represents the network interface of the LON-Bus and is subdivided by default into a physical part, called Channels and a logical part, called Default System.



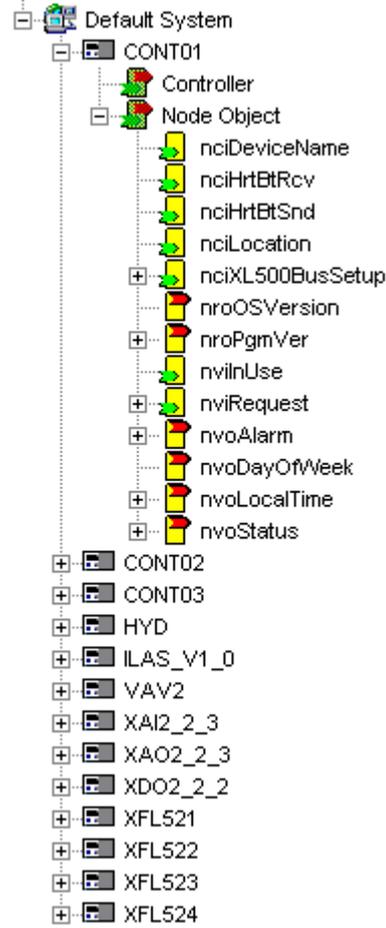
The Channels folder contains the Channel\_1 subfolder by default. Additional channels can be created and their names are freely editable.

A channel arranged in the Channels folder, represents the physical medium, for example twisted-pair cable, and lists all LON devices attached to this cable. Controllers can be shifted between channels to model the physical conditions in the building.



The Default System represents the logical LON-Bus part and provides all software functions necessary to work on LON devices, LON objects, NVs etc. It might contain the following components:

- Subsystems (to be created below the Default System)
- LON devices
- LON objects
- NVs (network variables)
- SCPTs (standard configuration property types)



NOTE: The Default System and subsystems can have further subsystems. Names as "Default System" and "Subsystem" are examples and freely editable.

**Display and Edit Properties**

Clicking on the desired item (project, subsystem, LON device, LON object, NV) in the network tree, displays the corresponding properties on the right pane for editing:

**Example 5: Channel Properties**

The screenshot displays the CARE software interface. On the left, there are two tree views: the Logical Plant Tree and the Network Tree. The Logical Plant Tree shows a hierarchy starting with 'DebisStuttgart\_Stage1', containing folders like 'AC\_01', 'CONT01', 'CONT02', and 'CONT03'. The Network Tree shows a similar hierarchy with 'Bus', 'Bus 1', and 'LON-Works' folders, with 'nviMaDmpr' highlighted in yellow under 'Open Loop Actuator 2'. On the right, the 'Properties' dialog box is open, showing the following details:

**Input NV**

NV: nviMaDmpr  
 NV Type: SNVT\_switch\_XL500  
 Selfdoc string:

**Point Mapping**

DataPoint	Inv.match	Inv.Value	AI.No.
MaDmpr	No	0	0

Additional options in the Properties dialog include 'NV - Booster' (unchecked), 'Enhanced' (unchecked), and 'Value Conversion' (Conversion Table: none, DataPoint:).

Example 6: NV Properties

## Interactivity between Logical Plant Tree and Network Tree

For fast navigation and working during the Engineering process, both the logical plant tree and the network tree are available in parallel, that is, important functions are concurrently activated in both trees.

When creating a controller in the logical plant tree, it will be automatically created in the network tree and available four times in all:

- Once in the logical plant tree
- Once in the C-Bus folder
- Once in the Channels folder
- Once in the Default System folder

Hence, the terminal assignment of a particular controller is automatically available in both trees by simply double-clicking on the controller, either in the logical plant tree or in the network tree. A selected controller is then highlighted in yellow at every location in the tree.

Debis\_Stuttgart\_Stage1

Properties Grid Terminal Assignment for CONT01

At this time the Terminal Assignment tab is selected on the Information and Editing pane.

Module No. 2	Module No. 4
1 A01	1
2 A010	2
3 A02	3
4 A03	4
5 A04	5
6	6
7	7
8	8
	9

4 Cool1 4  
5 Cool2 5  
6 Cool3 6  
7 Cool4 7  
8 Cool5 8

XP502 XF521 XF522 XC501U XF522 XF523

Housing 1 Hous

XFL521 Analog Input

DaTemp

000238839001

The yellow-highlighted controller C01 is selected in the logical plant tree and 4 times available in the trees.

Debis\_Stuttgart\_Stage1

- Debis\_Stuttgart\_Stage1
  - CONT01
- Bus
  - Bus 1
    - CONT01
- LON-Works
  - Channels
    - Channel\_1
      - CONT01
      - Excel 500
      - VAV2
      - XDO2\_2\_00
      - XFL521 Analog Input
      - XFL522 Analog Output
      - XFL523 Digital Input
      - XFL524 Digital Output
  - Default System
    - CONT01
    - Uploaded Devices
    - VAV2
    - XFL521 Analog Input
    - XFL522 Analog Output
    - XFL523 Digital Input
    - XFL524 Digital Output

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## BASIC STEPS

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### Create Project

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**Purpose** Define project name, password, and general information such as reference number, client name, and order number. This information appears in the final documentation for the project, is used in pricing estimates, and controls access to the projects (password).

**Procedure** 1. Click menu item Project, then drop-down item New.

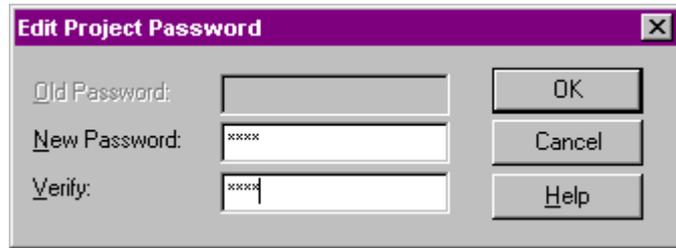
RESULT: The New Project dialog box displays.

2. Enter information in all fields. In some fields defaults are displayed. Do not leave any fields blank. For detailed information on the fields and listbox values, please refer to the PROJECTS DEFINITION AND MANAGEMENT section.

3. When finished with all fields, click **OK** (or press **Enter** key) to close dialog box

RESULT: The Edit Project Password dialog box displays. Every project can have its own password (optional).

NOTE: It is not necessary to enter a password for CARE-XL 500, but it is mandatory to enter a password of at least 5 characters for CARE-XL Web.



4. If desired, type in a password. Maximum 20 characters, any combination of numbers, letters, and special characters like commas.

## CAUTION

*If a password was entered, make a note of the password. No one can work on the project without knowing this password.*

5. In the Edit Project Password dialog box, click **OK**.

**RESULT:** The Project is created and displayed twice, in the logical plant tree and in the network tree. On the right pane, the project properties are displayed.

6. Continue by creating a controller as described under the Create Controller section.

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## Create Controller

---

**Purpose** Create a new controller

- Procedure**
1. If not already highlighted in the logical plant tree, select the project.
  2. Click menu item Controller, then drop-down item New.

Or, click right mouse key and with left mouse key click on Create Controller in the context menu.

**RESULT:** The New Controller dialog box displays.

The screenshot shows the 'New Controller' dialog box with the following settings:

- Controller Name: CONT01
- Bus Name: Bus 1
- Controller Number: 5
- Controller Type: Excel Smart
- Controller OS Version: Version 2.06
- Country Code: GERMANY
- Default File Set: Original Default files for 2.06 XL500 controller & XL50 external MMI. (xl\_2\_06)
- Units of Measurement:  International,  Imperial
- Power Supply:  XP501,  XP502
- Installation Type:  Cabinet Door Installation,  Normal Installation
- LON:  Shared / Open LON,  Local

3. Type a controller name (must be unique within the project). In this example, CONT01.
4. Tab to Bus Name. This field allows to select the subfolders, where the controller should be arranged. By default, software creates a folder named "Bus 1". Click down arrow and select a subfolder. In this example, select Bus 1, since no other subfolders have been created yet.
5. Tab to Controller Number. Click down arrow and select a number from 1 through 30 (must be unique within the project). In this example, 1.
6. Tab to Controller Type. Tab to the next field to keep current type or click down arrow to display and select a different type (Excel 100, Excel 80, Excel 50, Excel 500, Excel 600, Excel Smart, or ELink).
7. Tab to Controller OS Version (the version of OS that will be running in the controller). Tab to the next field to keep the current version or click down arrow to display and select a different version.
8. Tab to Country Code. The operator interface is required to provide the correct language for the selected country. The default depends on the Windows™ version installed. Tab to the next field to keep it or click down arrow to display and select a different country.
9. Tab to Default File Set. Select the appropriate default file for the selected Controller OS Version. A short description for the selected default file set is given below the drop down list box.
10. Tab to Units of Measurement. Select whether the controller should use International (metric) or Imperial units in Control Strategy EMS icons. This selection controls whether inputs are accepted in Celsius or Fahrenheit.

11. Tab to Power Supply. Select desired module type. Power supply applies only to Excel 500 and 600 controllers.
12. Tab to Installation Type. Normal installation is the default selection. If the controller has high-density digital inputs, select Cabinet Door Installation. Installation Type applies only to Excel 500 and 600 controllers.
13. Tab to Wiring type and select desired type (screw terminals or flat strip cabling). Wiring type applies only to Excel 50 controllers.
14. Tab to LON (applies only to Excel 500 controllers OS version 2.04). Select desired configuration:

Shared / Open LON I/O

Allows multiple controllers with its distributed I/O modules residing on one physical LON-bus and/or integration of additional Open LON devices.

NOTE: For this configuration, the controller must contain the 3120E5 LON chip. In Shared configuration only the following distributed I/O modules can be used: XFL521B, XFL522B, XFL523B, XFL524B.

Local

Allows just one controller with its distributed I/O modules residing on one physical LON-bus.

NOTE: For this configuration, controllers containing the 3120E5 LON chip and earlier controller models containing the 3120B1 LON chip can be used. In Local configuration the following distributed I/O modules can be used: XFL521, XFL522A, XFL523, XFL524A. If B-types of distributed I/Os shall be used, the backwards compatibility must be enabled by pressing service while turning hex switch.

For detailed information on the configuration, please refer to the Define LonWorks Network Architecture section.

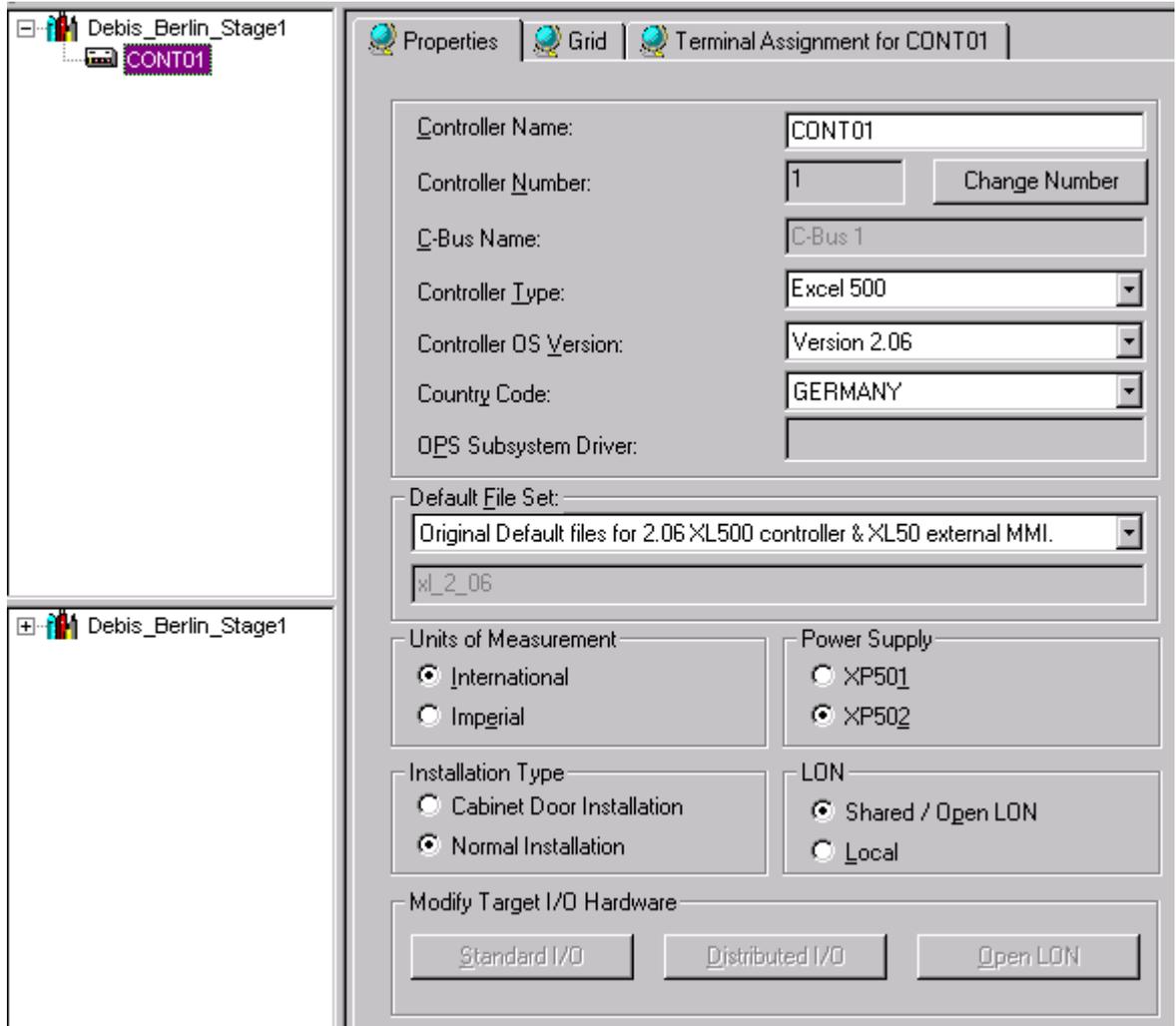
Refer to the Controllers with changeable Hardware Configuration section for a detailed introduction into system configuration. Refer to the Terminal Assignment Tool section for assigning the neuron IDs to the modules.

15. Click **OK**.

RESULT: The new controller is created and displayed four times in all:

- Once in the logical plant tree
- Once in the C-Bus folder
- Once in the Channels folder
- Once in the Default System folder

On the right pane, the controller properties are displayed.



16. Continue by creating plants as described under the Create Plant section.

## Create Plant

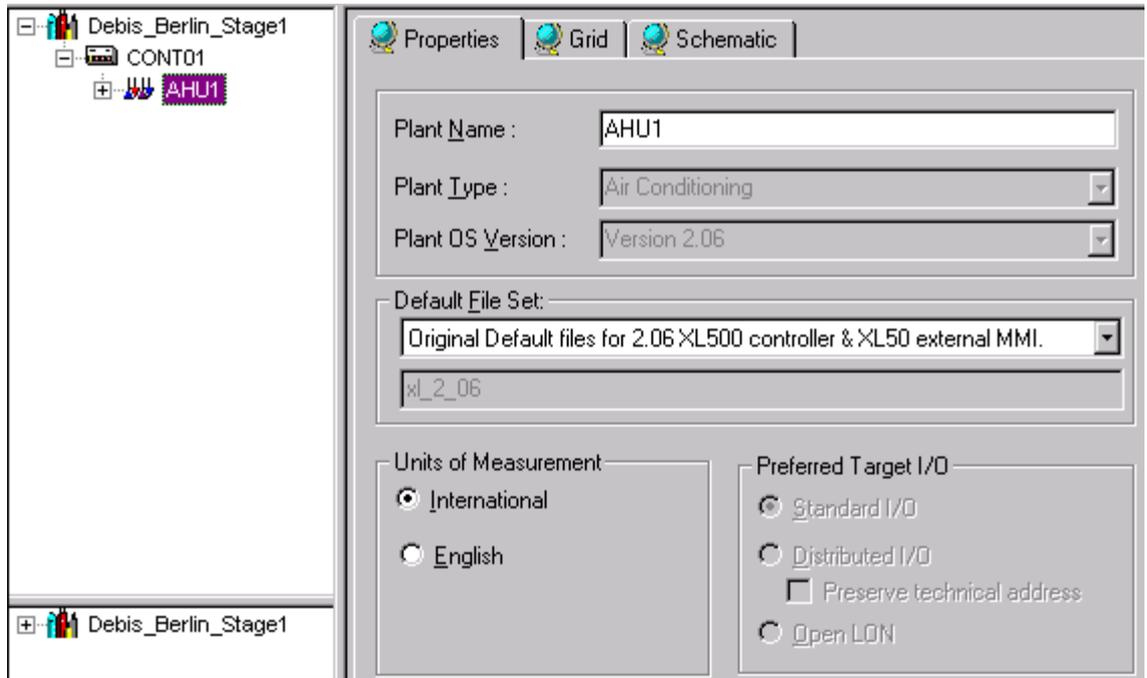
<b>Purpose</b>	Define a plant name, select a plant type and preferred target I/O hardware, and preassign a controller (if desired).
<b>Attached/Unattached Plants</b>	A plant is automatically attached to the selected controller. To create unattached plants in the beginning, the project instead of the controller must be selected. Plants can be detached or re-attached by simply dragging&dropping them to the desired destination (controller, project)
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. If not already highlighted in the logical plant tree, select the controller, you want attach the plant to.</li> <li>2. Click menu item Plant, then drop-down item New.</li> </ol> <p>Or, click right mouse key and with left mouse key, click on Create Plant in the context menu.</p> <p><b>RESULT:</b> The New Plant dialog box displays.</p>

3. Type a plant name in the Name field (the new name cannot match an existing plant name in the project). Maximum 30 alphanumeric characters; no spaces; first character cannot be a number.
4. From the Plant Type drop down listbox, select desired type:
 

Air Conditioning	Air handler or fan system building blocks.
Chilled Water	Cooling tower, condenser water pumps, and chiller building blocks.
Elink	Elements that represent system points for Excel 10 Controllers.
Hot Water	Boilers, converters, and hot water system building blocks.

5. Click **OK**.

**RESULT:** The new plant is created and automatically attached to the controller. It is displayed in the logical plant tree. On the right pane, the plant properties are displayed.



6. If desired, edit plant properties as follows:
7. From the Plant OS Version drop down listbox select desired version. This number is the OS version of the controller where the plant will be downloaded. See Appendix for rules on upgrading/downgrading controller versions.
8. From the Plant Default File Set drop down listbox, select desired plant default file. Plant default files are customized project defaults for use in specific areas or regions generated in the Default Text editor (see Default Text Editor section). A short description for the selected default file set is given below the drop-down list box.
9. Under Units of Measurement, select the desired type for the plant, International (metric) or Imperial. This selection tells the Control Strategy EMS icons which type of inputs to accept, Celsius or Fahrenheit. Units of Measurement applies not to ELink applications.
10. Under Preferred Target I/O Hardware, select desired target I/O hardware (only applies to OS versions 2.0 and higher):
  - Standard I/O  
Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).
  - Distributed I/O  
Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).
  - Open LON  
Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.06)
11. Continue by creating the plant schematic as described under the Create Plant Schematic section.

---

## Create Plant Schematic

---

**Purpose** To provide control over the system operation

To get a good control of the plant a minimum number of datapoints are required. These datapoints are automatically created by drawing a graphical plant schematic or by quickly creating datapoints without graphics. Both procedures can be combined.

**Draw Plant Schematic**

When drawing a plant schematic you define the equipment of the plant and how it works together. A plant schematic is a combination of graphical segments such as boilers, heaters, and pumps. Segments consist of equipment such as sensors, status points, valves, and pumps. Each segment has an associated minimum number of datapoints required for good control.

**Creation of HW/SW Points without Graphic**

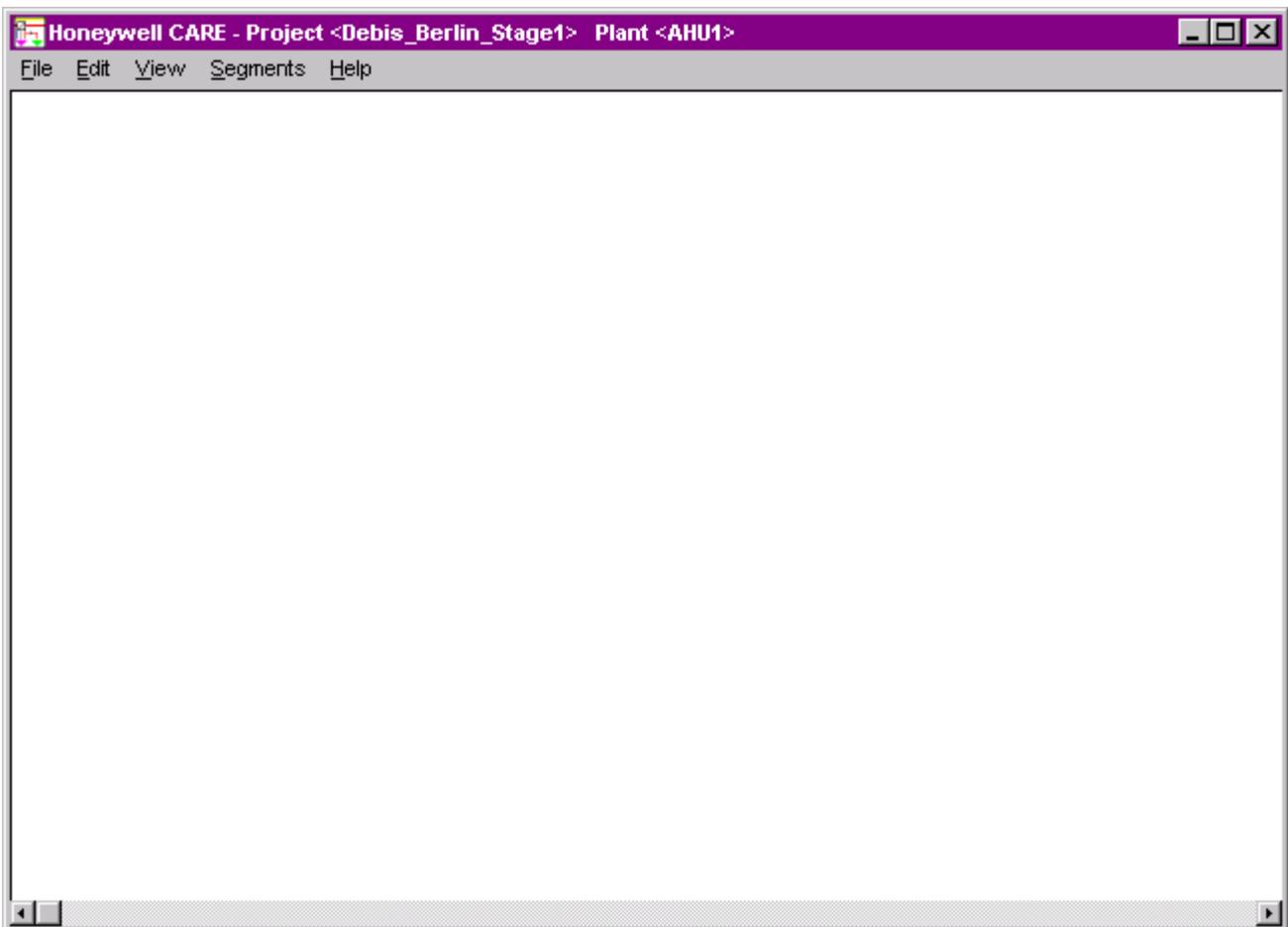
In comparison to drawing a plant schematic, datapoints without graphics can quickly be generated. These quick creation can include hardware as well as software points.

For detailed information on point types, please refer to the PLANT SCHEMATICS section.

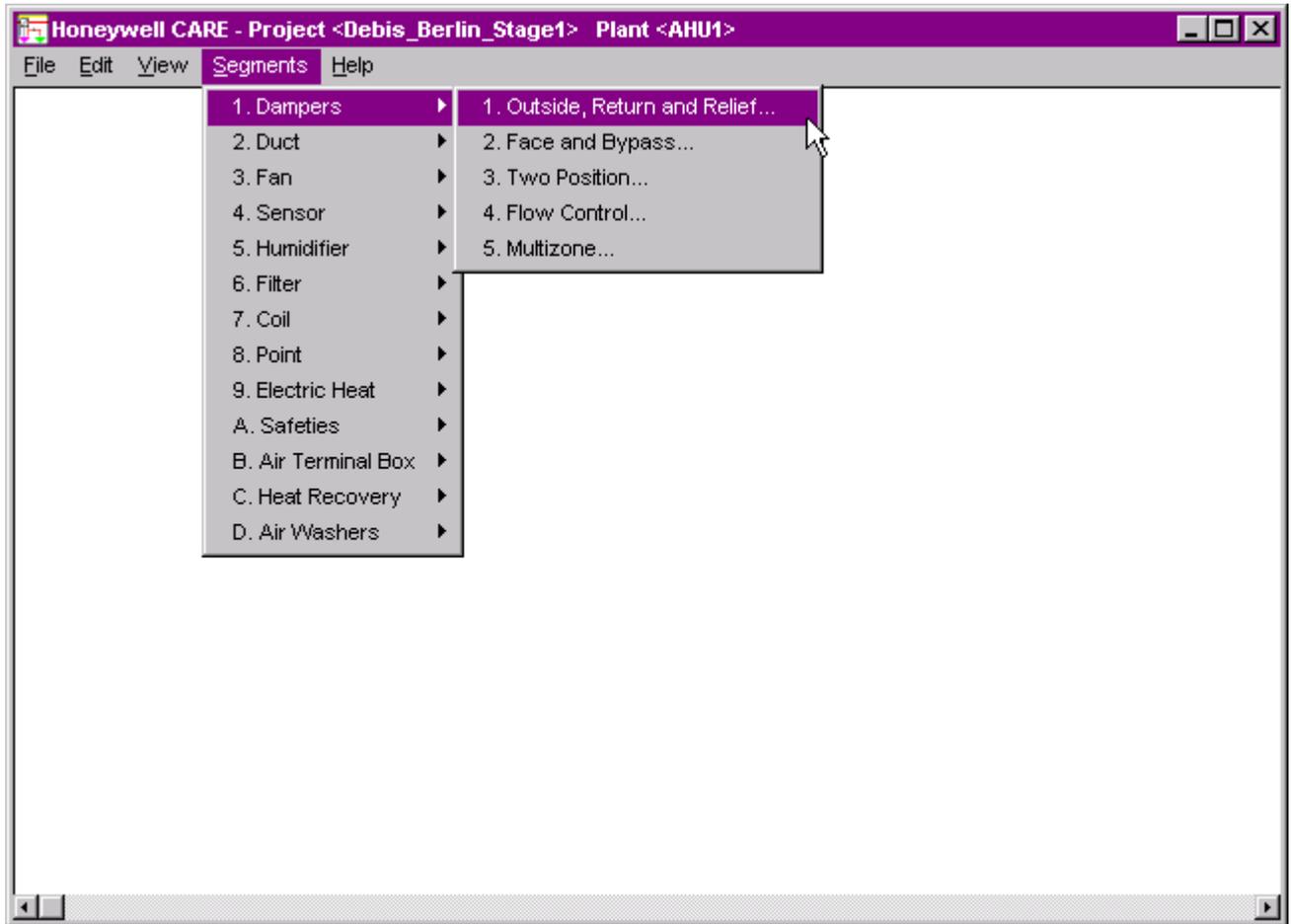
**Procedures****A) Draw Plant Schematic**

1. If not already highlighted in the logical plant tree, select the plant.
2. Click menu item Plant, then drop-down item Schematic.

RESULT: The Schematic Main Window displays.

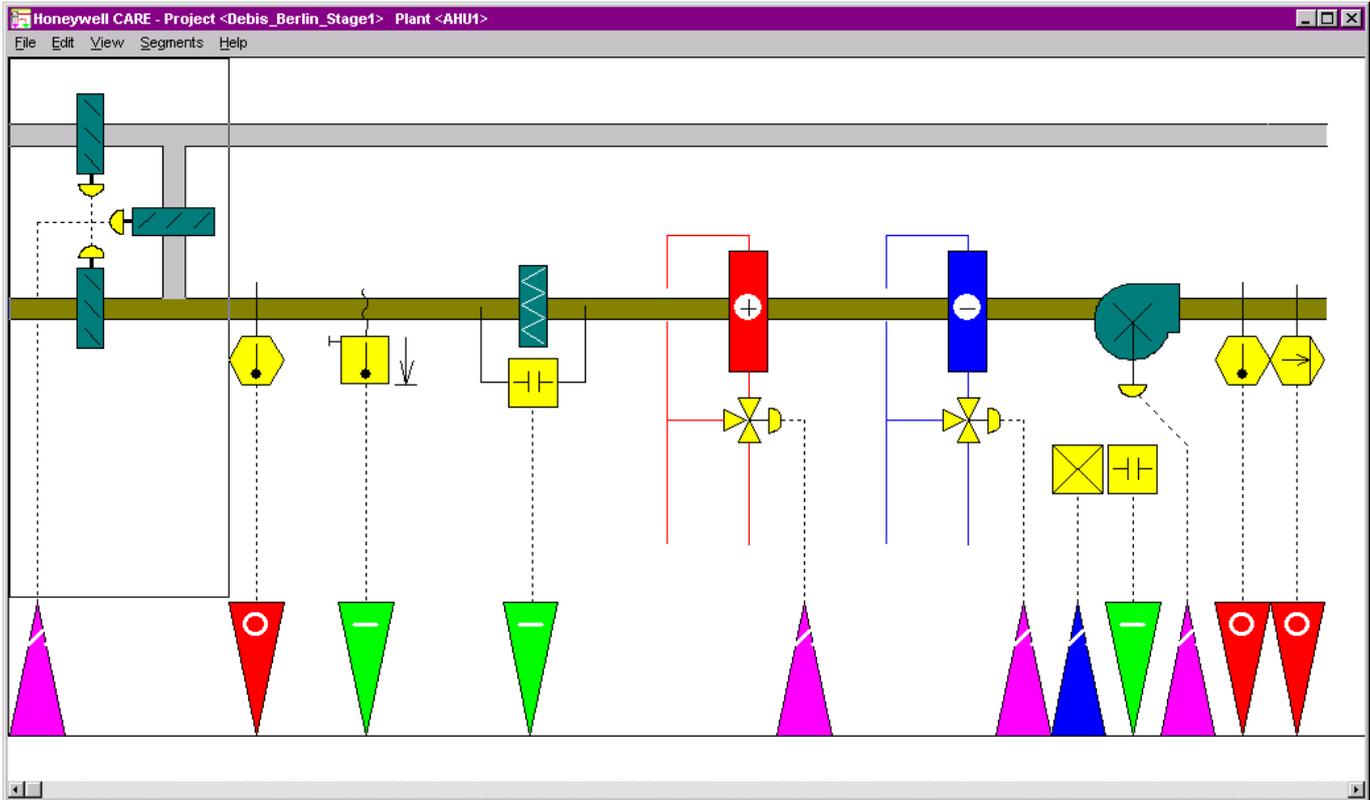


3. Click menu item Segments, then select the desired component to insert it into the plant.



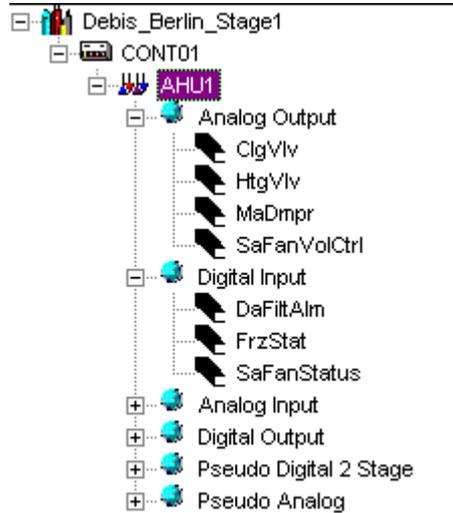
4. Add the following components by selecting the corresponding menu sequences:

- Dampers/Outside, Return and Relief/Mixing Damper/No Minimum Damper
- Sensor/Temperature/Mixed Air
- Safeties/Freeze Status
- Filter/Outside, Mixed or Supply Air Duct/Differential Pressure Status
- Coil/Hot Water Heating Coil/Supply Duct/3-Way Valve/No Pump
- Chilled Water Cooling Coils/Supply Duct/3-Way Valve/No Pump
- Fan/Single Supply Fan/Single Speed with Vane Control/Fan and Vane Control with Status
- Sensor/Temperature/Discharge Air Temp
- Sensor/Pressure/Supply Duct Static



5. When finished the drawing, click menu item File, then submenu item End.

RESULT: In the logical plant tree, the datapoints assigned to the plant components are displayed.



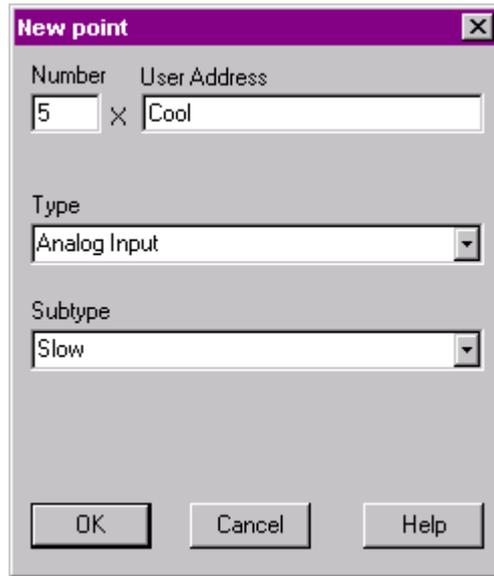
6. If desired, continue with adding HW/SW points without graphic to the schematic as described in the Quick Creation of HW/SW Points without Graphic procedure.

**B) Quick Creation of HW/SW Points without Graphic**

1. If not already highlighted in the logical plant tree, select the plant.
2. Click menu item Plant, then drop-down item Create HW/SW Points.

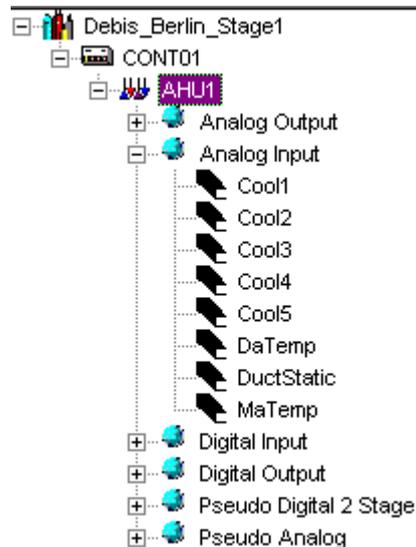
Or, click right mouse key and with left mouse key, click on Create HW/SW Point(s) in the context menu.

RESULT: The New Point dialog box displays.

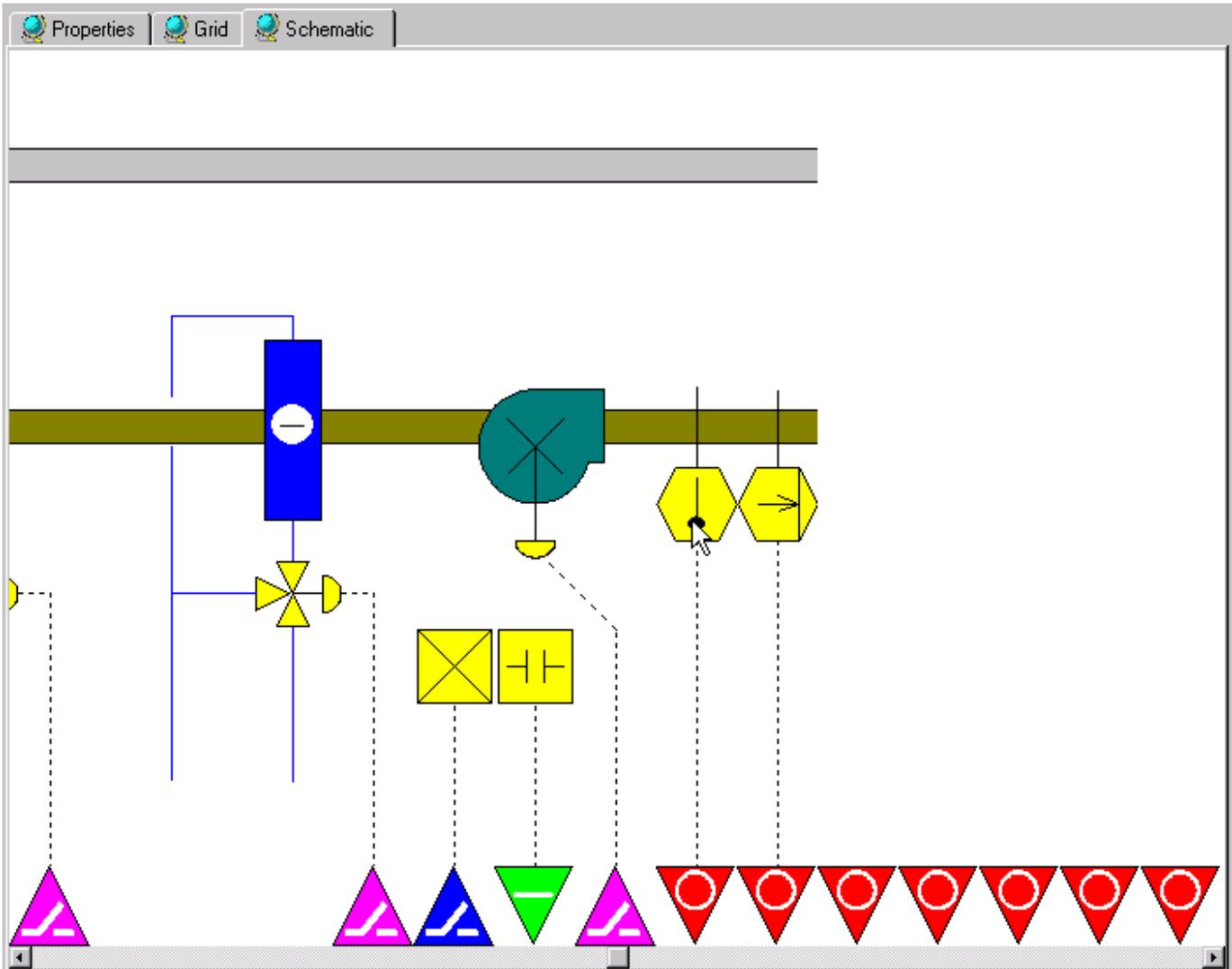


3. In the Number field, select the number of points to be created and in the User Address fields enter the name of the datapoint(s) to be created. If you are adding more than one point, software automatically numbers the corresponding user addresses sequentially to guarantee unique user addresses. For example, if you enter pt and request two points, software creates two points named pt1 and pt 2. Only use alphabetic characters. Do not use blanks.
4. From the Type drop-down listbox, select the datapoint type and, if available, from the Subtype drop-down listbox, select the datapoint subtype.
5. Click **OK**.

RESULT: In the following example, the datapoints are added to the Analog Input type folder in the logical plant tree.



6. To view the plant schematic, click on the plant in the logical plant tree and select the Schematic tab on the right pane.



7. Continue by modifying datapoints as described under the Modify Datapoints section.

## Modify Datapoints

**Purpose** To customize point attributes according to desired system operation.

Points can be modified in two different views, in the itemized display and in the grid display (see Basic Working Techniques section). The itemized display is suited for editing only a few datapoints, the grid display is suited for editing many datapoints in an overall view.

### Procedures A) Modify Datapoints in Itemized Display

1. In the logical plant tree, select the point you want to modify.

**RESULT:** On the right pane, the point attributes are displayed on the Properties tab.

**Properties**

Type

User Address: ClgVlv IP  
 Controller: CONT01  
 Technical Address: 01/03/01 Plant Info: AHU1  
 Point ID:  
 Point Role:  
 Point Subtype: AO Continuous with Switches  
 Lon Point: none  
 NV Type: (Input) none  
 (Output) none

Misc. Editor Functions

Engineering Unit: Pct  
 Descriptor:  
 Characteristic: LINEAR\_GRAPH

Special Values

Operator Access Level: 3

Write Protect Priority: 0

Time to Open: 120,00 sec  
 Time to Close: 120,00 sec

Suppress Alarm  
 Trend Hysteresis: 1,0 Pct  
 Hide Point

2. Modify desired values in the fields and/or select/deselect desired options.
3. Continue with assigning datapoints to the controller as described under the Manually Assign Datapoints to Controller section.

#### **B) Modify Datapoints in Grid Display**

1. In the logical plant tree, select the plant of which datapoints you want to edit and select the Grid tab on the right pane.

RESULT: All datapoints assigned to that plant are displayed in a grid.

Point	User Address	Techn. Address	Sensor Offset	Bus	Characteristic	Engineering Unit	Descriptor	Alarm Text	Active State	Oper. Access Level	Suppr. Alarm	Critical Alarm (Type)	Alarm Point
Filter													
AO	ClgVlv	01/03/01		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
AI	Cool1	01/01/04	0,000000	IP	Linear Input	V				3	<input type="checkbox"/>	<input type="checkbox"/>	
AI	Cool2	01/01/05	0,000000	IP	Linear Input	V				3	<input type="checkbox"/>	<input type="checkbox"/>	
AI	Cool3	01/01/06	0,000000	IP	Linear Input	V				3	<input type="checkbox"/>	<input type="checkbox"/>	
AI	Cool4	01/01/07	0,000000	IP	Linear Input	V				3	<input type="checkbox"/>	<input type="checkbox"/>	
AI	Cool5	01/01/08	0,000000	IP	Linear Input	V				3	<input type="checkbox"/>	<input type="checkbox"/>	
DI	DaFiltAlm	01/04/12		IP		Normal			0	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AI	DaTemp	01/01/01	0,000000	IP	PT 1000 Type F/I	Deg				3	<input type="checkbox"/>	<input type="checkbox"/>	
AI	DuctStatic	01/01/03	0,000000	IP	Pressure 0-3"	Inw				3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
DI	FrzStat	01/04/11		IP		Normal			0	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AO	HtgVlv	01/03/02		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
AO	MaDmpr	01/03/03		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
AI	MaTemp	01/01/02	0,000000	IP	PT 1000 Type F/I	Deg				3	<input type="checkbox"/>	<input type="checkbox"/>	
DO	SaFan	01/05/01		IP		On			1	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
DI	SaFanStatus	01/04/10		IP		Off			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AO	SaFanVolCtrl	01/03/04		IP	LINEAR_GRAPH	Pct				3	<input checked="" type="checkbox"/>		
PD2	EXECUTING_STOPPED					Normal			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PD2	SHUTDOWN					Normal			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PD2	STARTUP					Normal			0	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PA	static_setpoint									3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Modify desired values in the fields and/or select/deselect desired options.
3. Continue by assigning the datapoints to the controller as described under the Assign Datapoints to Controller section.

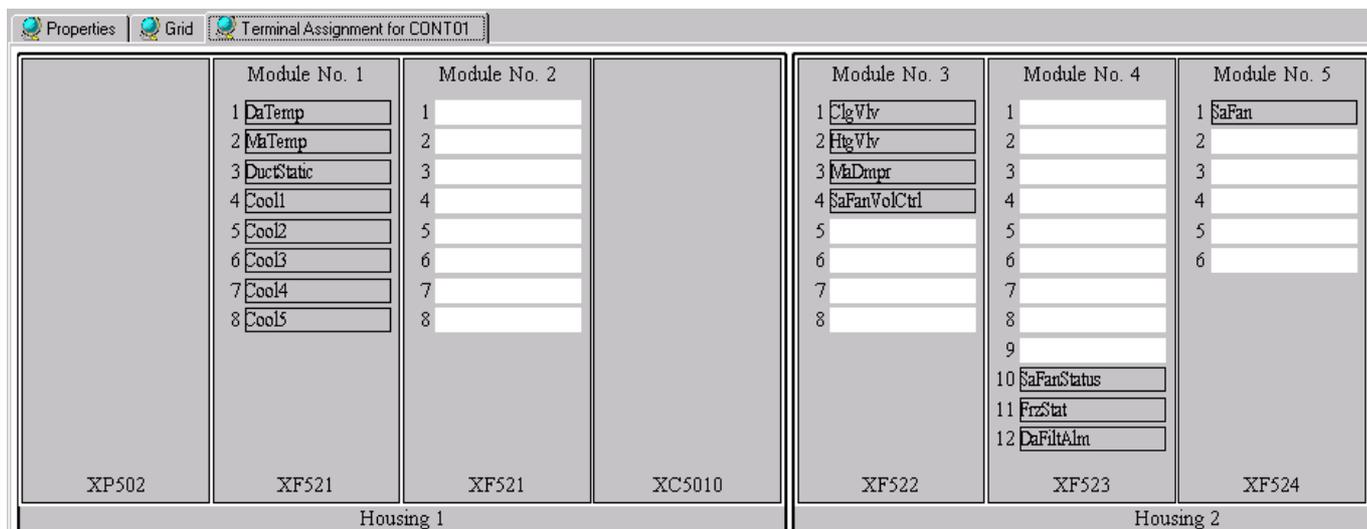
## Manually Assign Datapoints to Controller

**Purpose** To accommodate the terminal assignments in CARE to the physical cabling.

When creating the plant schematic, CARE automatically assigns the datapoints of the plant to the appropriate modules, for example, analog inputs are assigned to the XF521A module, digital outputs are assigned to the XF524A module. But, the order of the datapoints on their module do not necessarily correspond to the physical cabling. Therefore in some cases datapoints need to be moved on their module in CARE. On the other hand it is also possible to accommodate the physical cabling according to the CARE terminal layout.

- Procedure**
1. In the logical plant tree, select the controller.
  2. On the right pane, select the Terminal Assignment tab.

RESULT: The terminal assignments of the controller are displayed.



3. If datapoints need to be relocated, click on the datapoint and with pressed mouse key, move it to the target terminal.

RESULT: The datapoint gets green as you move it over terminals which it matches to.

NOTE: You can move datapoints only to terminals which match to the datapoint type. Over terminals which do not match to the datapoint type, the datapoint gets black and is indicated via a forbidden symbol.



- 4. On the target terminal, release mouse key.
- 5. Continue by developing control strategy for the plant as described under the Develop Control Strategy section.

## Develop Control Strategy

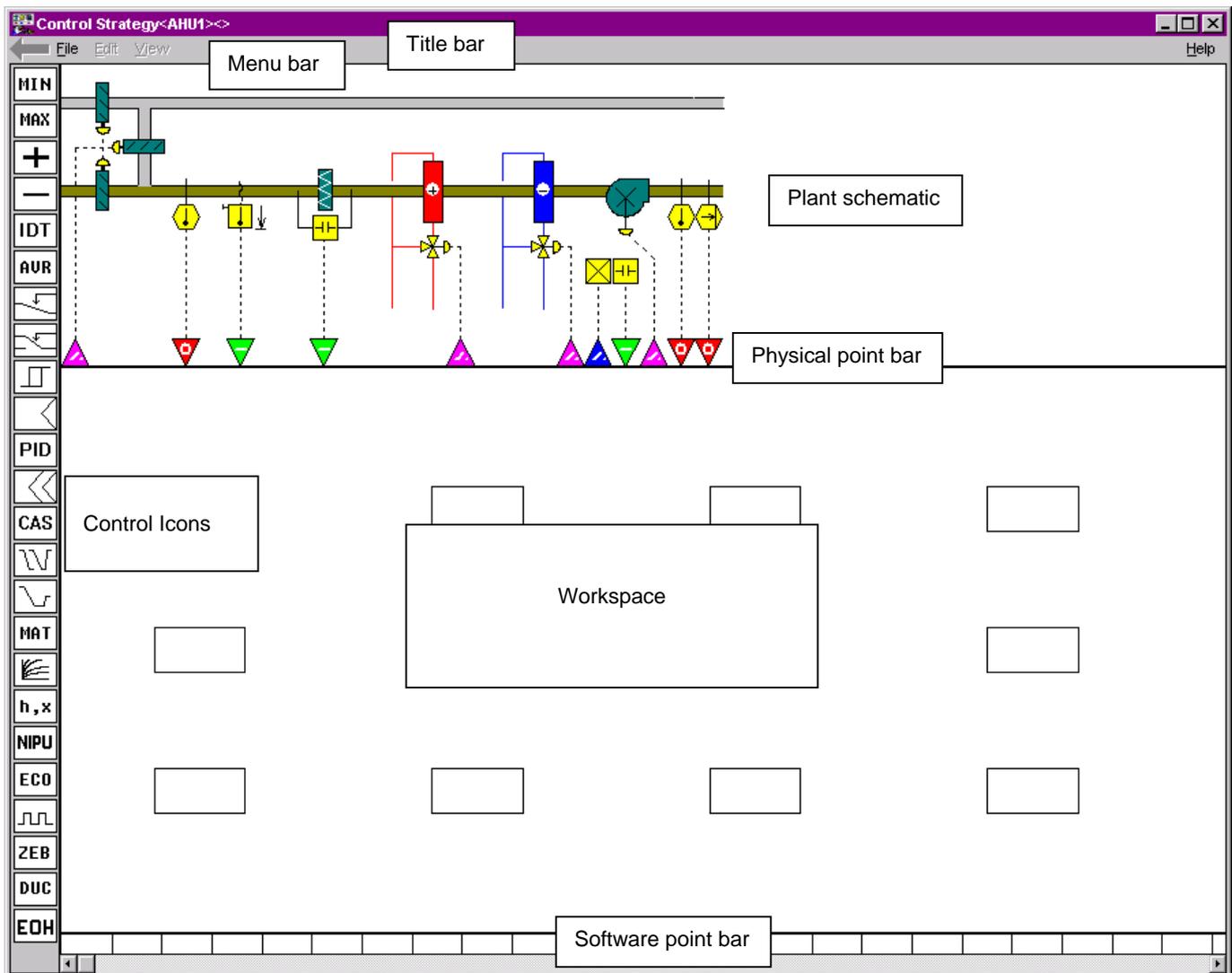
**Purpose** The control strategy for a plant consists of control loops that monitor the environment and adjust equipment operation to maintain comfort levels. For example, a control loop for an air handling system can turn on a return air fan when discharge air temperature in the return air duct is greater than or equal to 68 F(20 °C). Control loops consist of a series of “control icons” that dictate a sequence of events. Control icons provide preprogrammed functions and algorithms to implement sequences of control in a plant schematic. For detailed information on control strategy development, please refer to the Control Strategy section.

Example:

In the following you will add a PID control element to the plant.

- Procedure**
1. In the logical plant tree, select the plant.
  2. Click menu item Plant, then drop-down item Control Strategy.

**RESULT:** The Control Strategy Main Window displays.



**RESULT:** The Control Strategy Main Window is divided in the following areas:

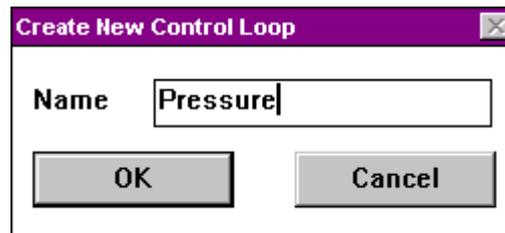
- Title
- Menu bar

- Plant schematic
- Physical point bar
- Software point bar
- Work space
- Control icons

The functions will be described by creating a new control loop in the following steps.

3. The sequence of operation requires control of the duct static pressure.
4. To create a new control strategy, click menu file, then drop-down menu New.

RESULT: The Create New Control Loop dialog box displays.



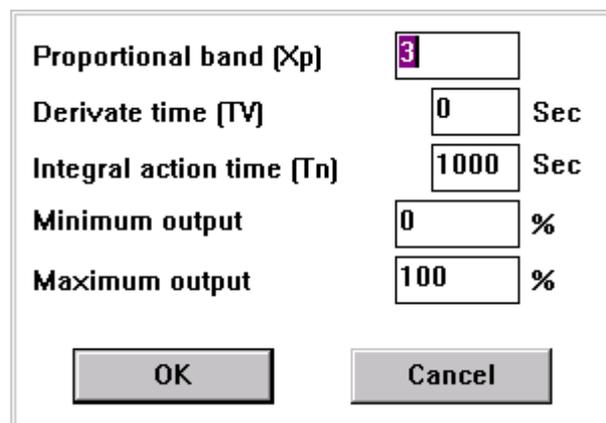
5. Enter a name, e.g. Pressure for the control loop and click **OK**.

RESULT: You can now select the control icons to place them into the workspace.

6. Click the PID control icon.
7. Click a free rectangle in the control strategy work space to place the control icon.

RESULT: Software places the symbol in the rectangle.

Software may then display a dialog box that asks for “internal parameter” information relevant to the control icon. In this case, the PID icon asks for proportional band, derivative time, integral action, minimum output, and maximum output. For this system the default values are fine.

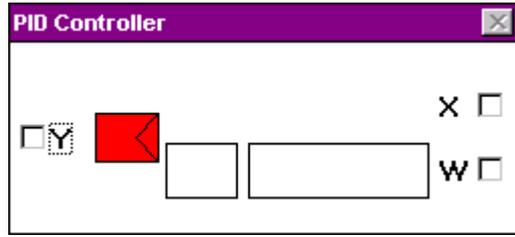


8. Click **OK**.

RESULT: Notice the control icon. The red color indicates that not all inputs and outputs are connected to the schematic.

9. To connect the icon to required inputs and outputs, double-click the icon to display an input/output dialog box that requests required variables.

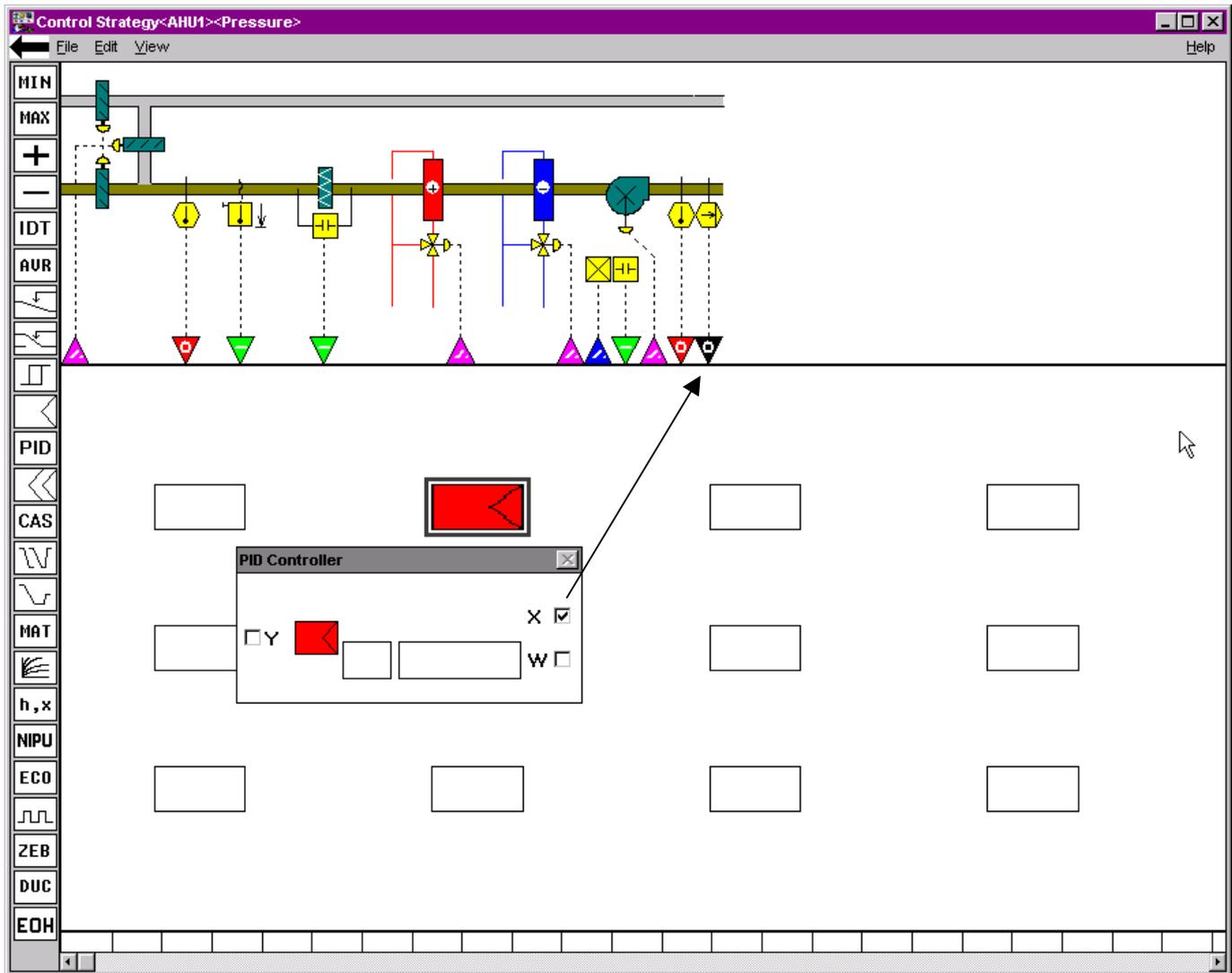
For example, the PID icon displays the following dialog box:



The Y, X, and W variables need connection to either physical points, pseudopoints, and/or other control icons. Variables on the left (Y in this case) are outputs. Variables on the right (X and W in this case) are inputs.

The two blank rectangles in the dialog box are editing fields where you can enter values to replace the physical connections. For example, in the PID dialog box, you can type an engineering unit table reference and value for the W variable, instead of connecting W to a point or control icon. For engineering unit, enter the corresponding index number.

10. To connect the icon, click a W, X, or Y check box, click a physical point at the schematic, then click the control icon in the dialog box.
11. To connect the sensor input, click on the X check box.



12. Select the static pressure sensor physical point by clicking the red arrow head on the far right.

RESULT: The arrow head turns black indicating that it has been selected.

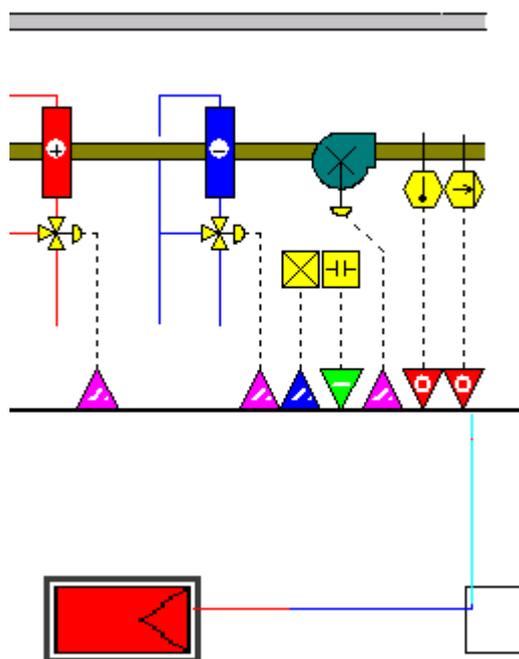
13. Click the control icon symbol in the dialog box.

RESULT:

- The dialog box closes.
- The active control icon changes color to dark blue.
- Software adds a short connecting line leaving the icon from the X location
- Two lines appear in the work space. One line is vertical; one is horizontal. Where they intersect each other is the focus point for mouse clicks. You can move these lines by moving the mouse:
  - When you move the mouse left or right, the vertical line moves left or right.
  - When you move the mouse up or down, the horizontal line moves up or down.

14. Move and click the intersection point to create connecting lines. Move the intersection point over the point arrow head until a cross, +, appears. Click the left mouse key to complete the connection.

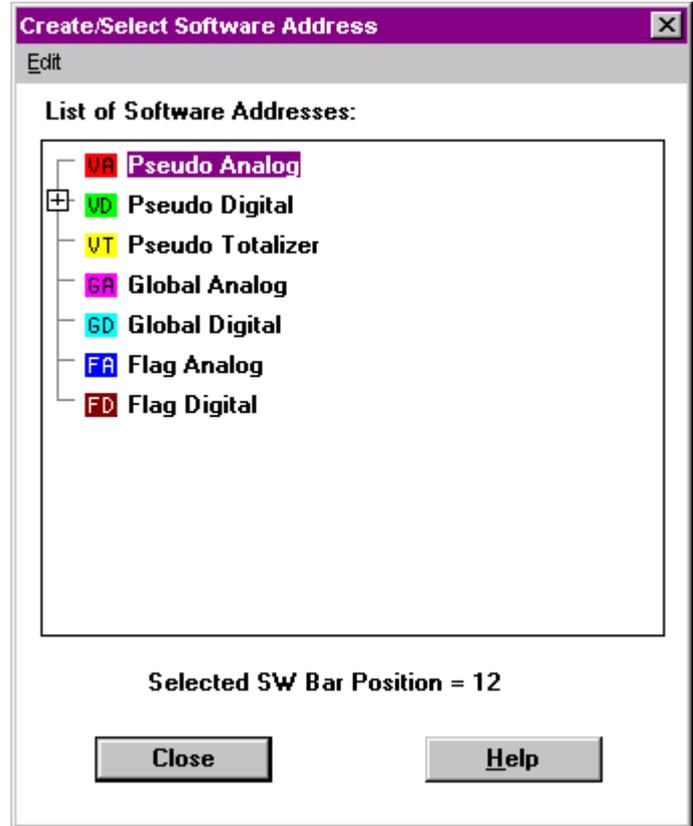
RESULT: Software connects the point and icon.



15. Now connect the W input of the PID control icon to the reference variable - a user definable setpoint. An alternative would be to use the editing fields in the control icon dialog box which would fix the setpoint to the value entered.

16. To create a software point, click on a free position in the software point bar. Locate it near the relevant control icon.

RESULT: The Create/Select Software Address dialog box displays.



The selected software bar position is displayed at the bottom line of the dialog box. The list displays all existing pseudopoints/flags including unassigned, assigned and connected, assigned and unconnected pseudopoints/flags. Unassigned and assigned points/flags can be distinguished by the following symbols:



Assigned points: Pseudopoints/flags that reside on the software bar.



Unassigned pseudopoints/flags or points in switching tables in folder color with point abbreviation.



Unassigned software points mapped to internal datapoints of XFMs.



Unassigned software points mapped to XFM parameters.

Each pseudopoint/flag type has its own colored folder which can be empty or contain already created pseudopoints/flags.

Each pseudopoint/flag type has its own colored folder which can be empty or contain already created pseudopoints/flags.

17. Click the Pseudo Analog folder.

18. Click right mouse button, and with left mouse button click **New** in the context menu,

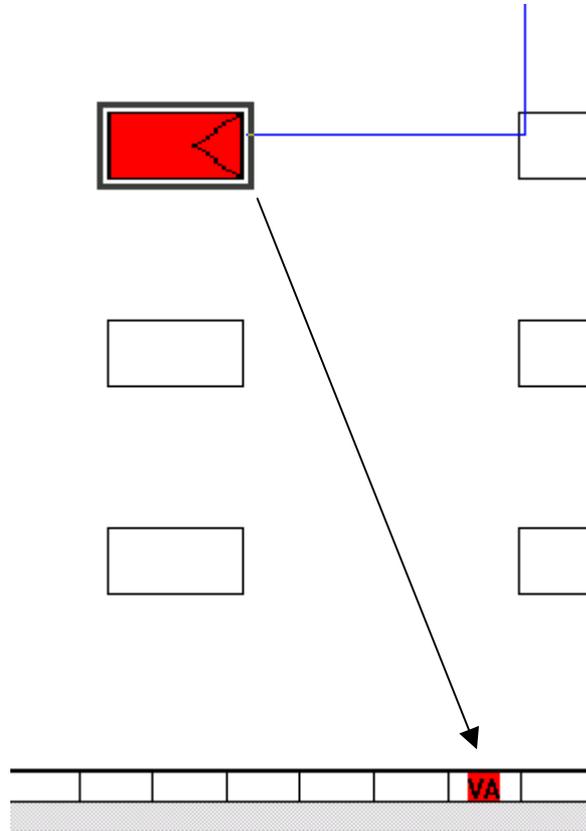
or

click menu item **Edit**, then drop-down item **New**.

RESULT: The New Software Datapoint dialog box displays.

19. Enter "static\_setpoint" in the User Address field.

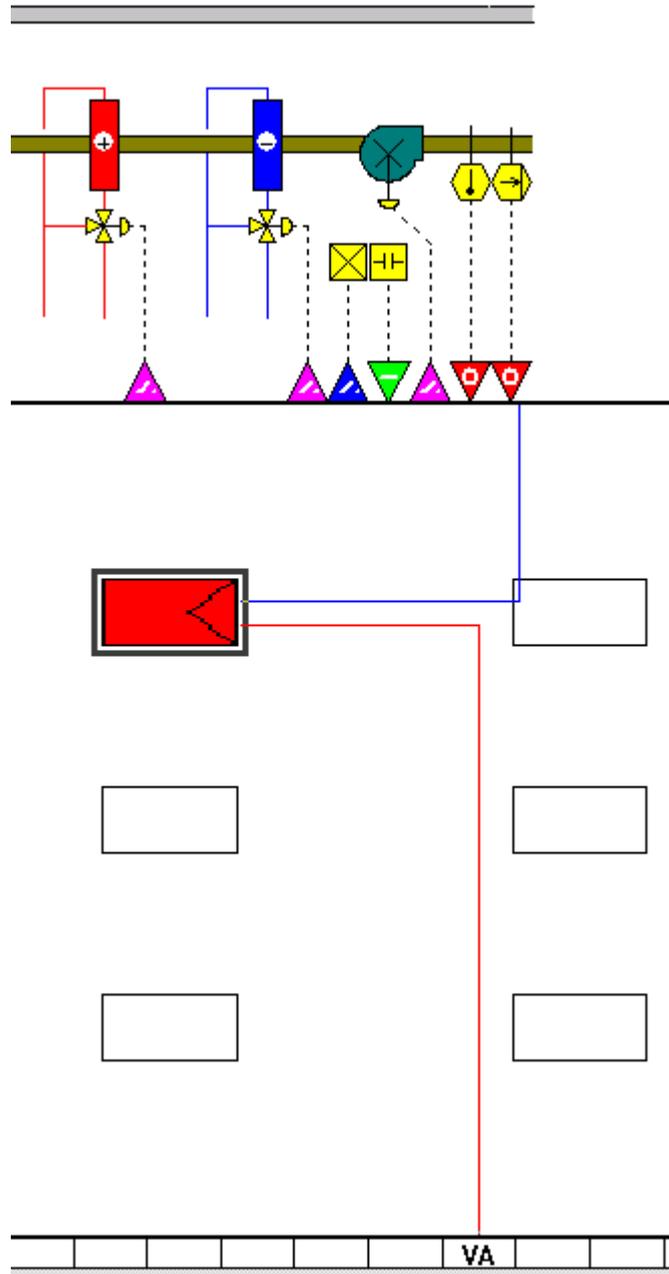
RESULT: In the software point bar, the created software point is indicated by VA (virtual analog).



20. To connect the PID control icon to the software point, double-click the control icon once to open it.
21. Click the W checkbox, then click on the VA software point you have been created.
22. Click the control icon symbol in the control icon dialog box.

RESULT: Notice that there is a red line leaving the control icon from the W location.

23. Complete the connection, by clicking on the software point in the software point bar.

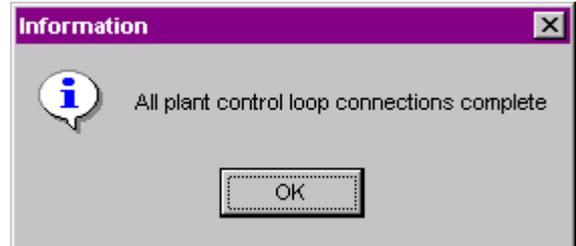


24. To finally connect the PID control icon's output to the dampers on the fan, double-click the control icon once to open it.
25. Click the Y checkbox, then click the violet arrow head beneath the fan.  
 RESULT: The physical point is now black indicating that it has been selected.
26. Click the control icon symbol in the control icon dialog box.  
 RESULT: Notice that there is a red line leaving the control icon from the Y location.
27. Complete the connection, by clicking on the physical point previously selected.  
 RESULT: The PID icon changes color to light blue to let you know that the PID is correctly connected to your system.





30. CARE verifies that all control connections are complete by the following Information dialog box.



31. Confirm the Information dialog box by clicking OK.
32. Continue by developing the switching logic for the plant as described in the Develop Switching Logic section.

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## Develop Switching Logic

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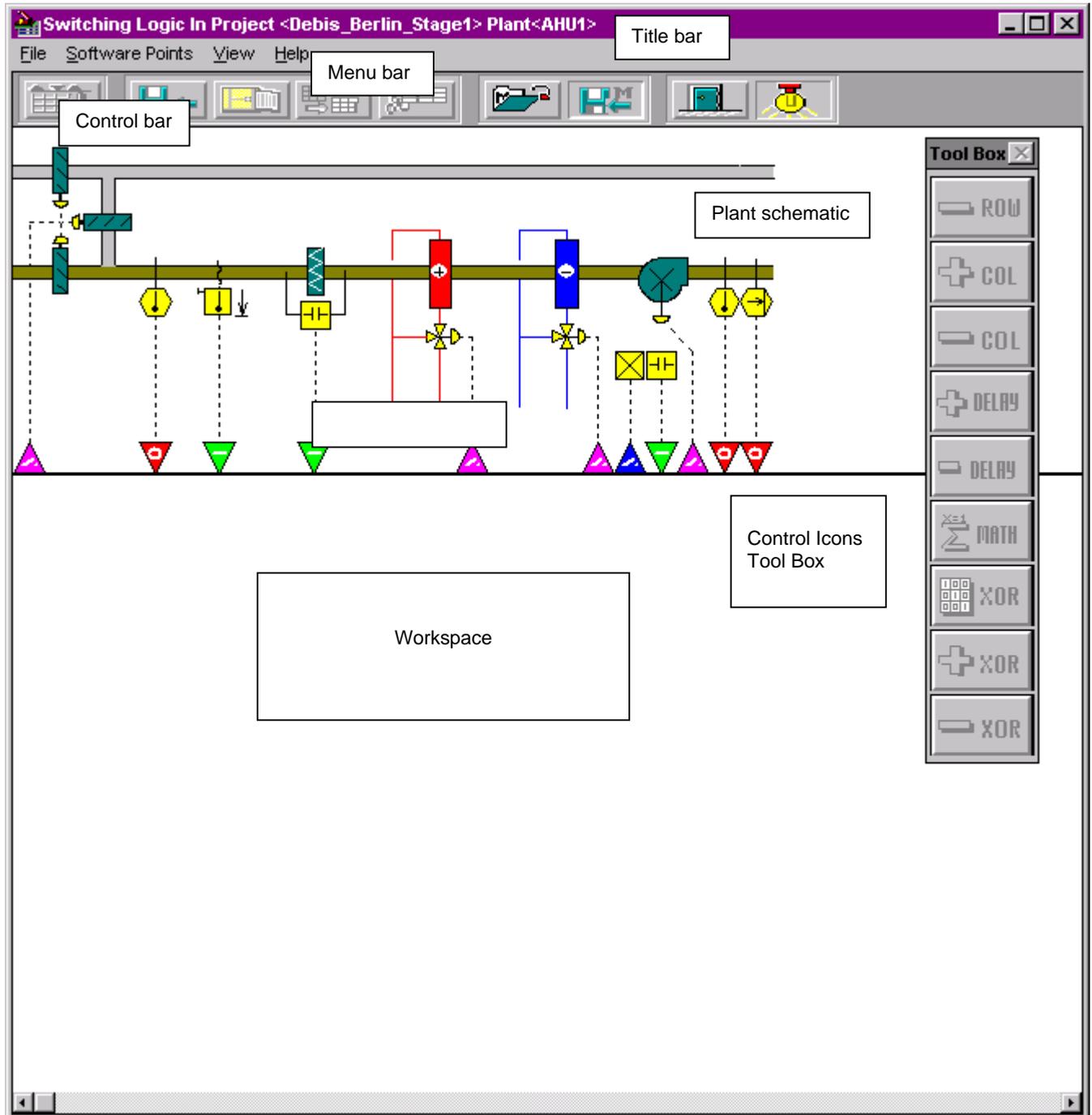
**Purpose** Switching logic provides a convenient means to implement digital (Boolean) logic control of a point. An analog or digital point is commanded to a specific value or state if a certain set of conditions are met. Time delays can also be added. For example, switching logic can start a return air fan 30 seconds after a supply air fan starts. For detailed information on switching logic development, please refer to the Switching Logic section.

Example:

According to the sequence of operation, the dampers of the fan will be placed in minimum position in case of fan failure.

- Procedure**
1. In the logical plant tree, select the plant.
  2. Click menu item Plant, then drop-down item Switching Logic.

RESULT: The Switching Logic Main Window displays.

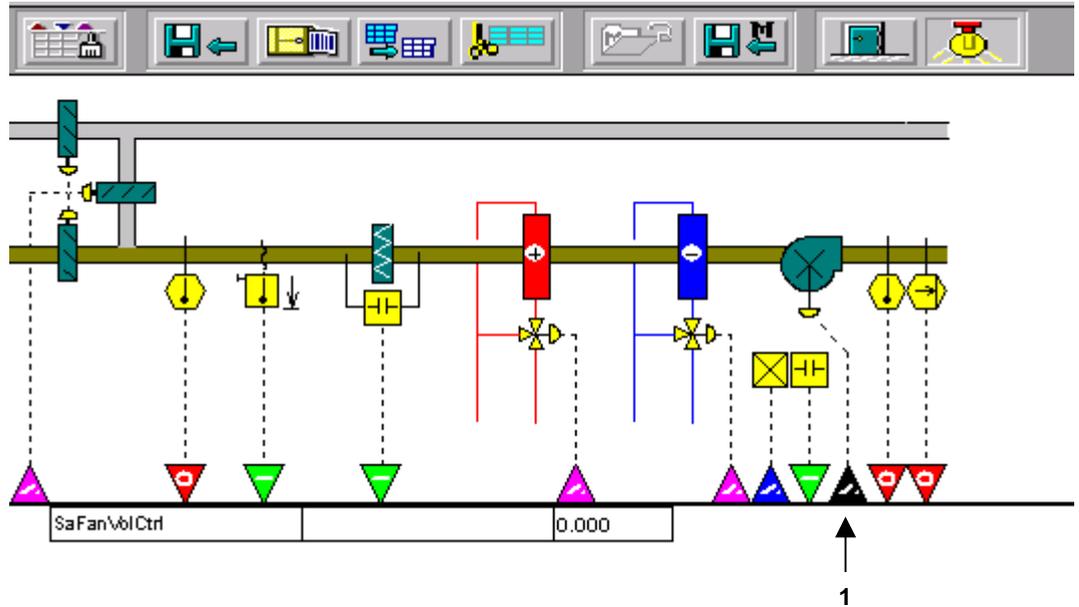


The Switching Logic Main Window is divided into the following areas:

- Title bar
- Menu bar
- Control bar
- Plant schematic
- Switching table (Work space)
- Switching logic icons toolbox

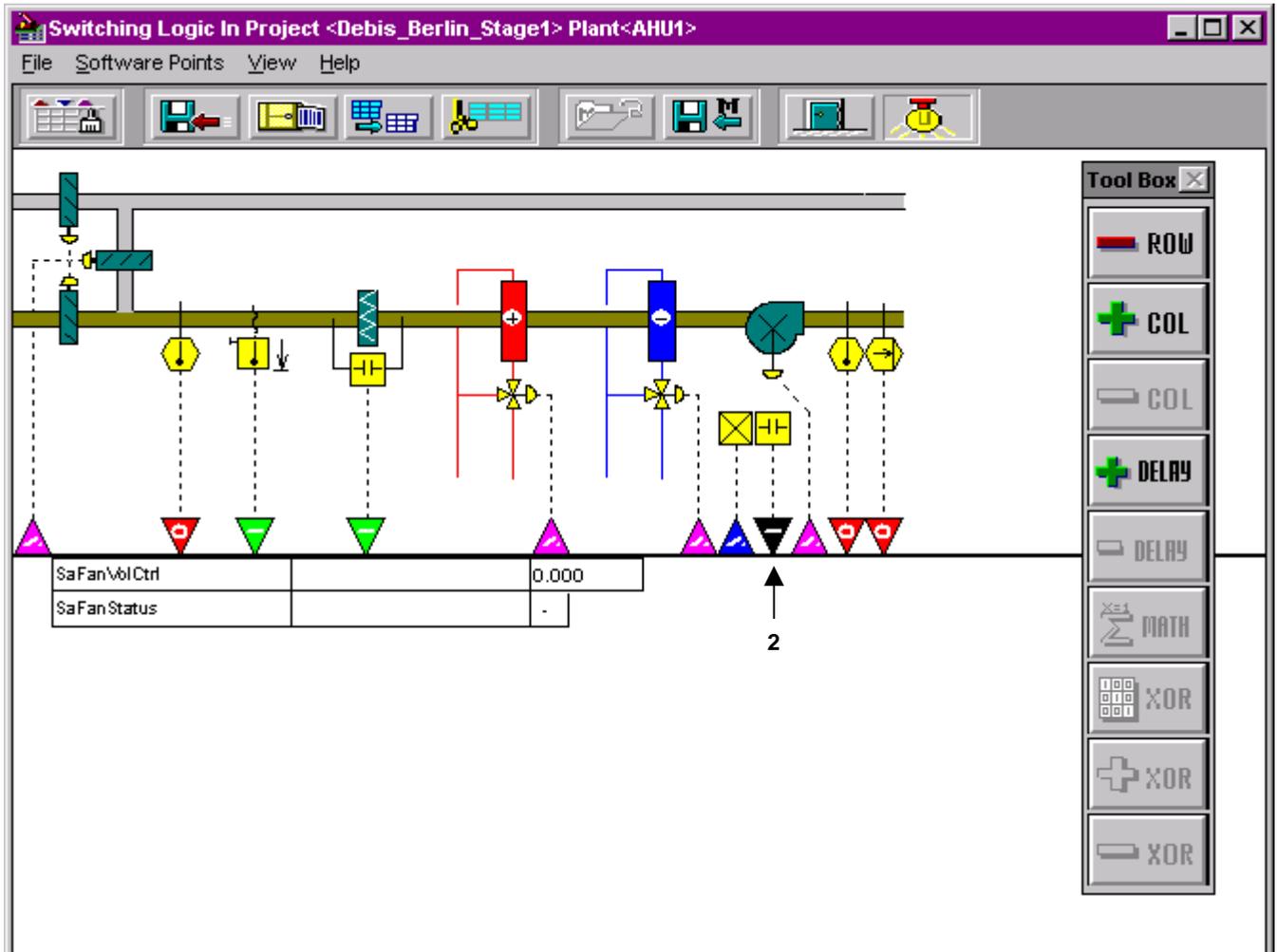
The functions will be described by adding switching logic tables in the following steps.

3. To begin a switching logic for the dampers, click on the fan address point (violet arrow head, 1) that controls the dampers.



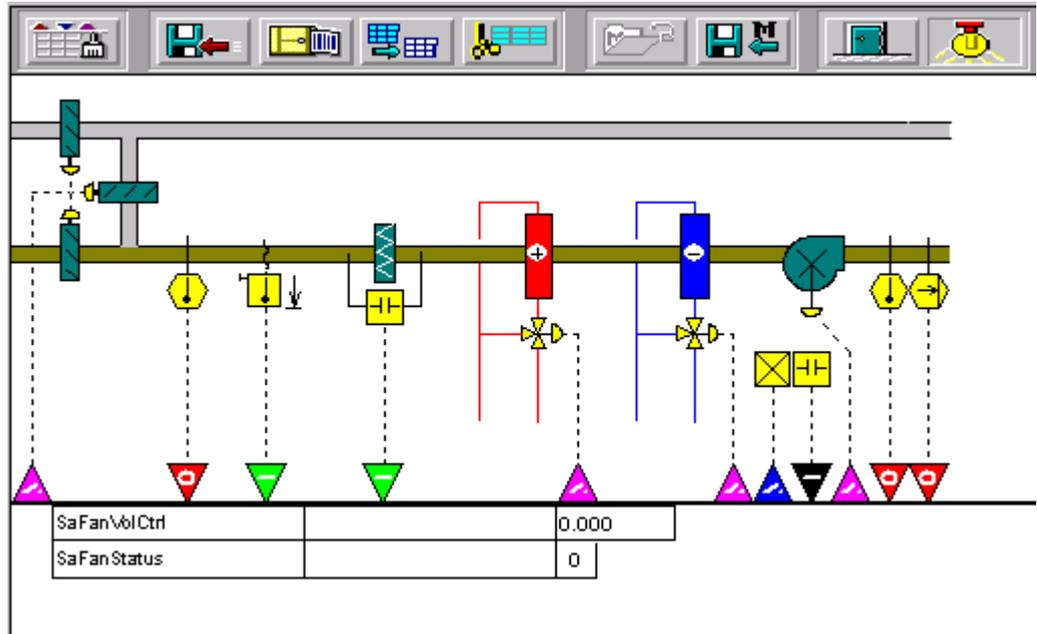
RESULT: The title " SaFanVolCtrl" is the user address for the damper input point on the fan. The default of "0.000" matches the condition required by the sequence of operation. No change is required. We will use the status of the fan to determine when the damper will return to minimum position.

4. Click the green arrow head representing the fan status physical point (2) to add it to the current switching table.



RESULT: According to the sequence of operation, the dampers of the fan will be placed in minimum position in case of fan failure. The field containing the "-" should indicate the status of the fan when you want the damper to be closed.

5. Click the "-" field twice to change it to a "0" (a false or off condition).



RESULT: The switching table is now complete. If the fan status is "0" false or off), the damper will be placed in a minimum position. The system also needs a table to open the heater valve under freeze conditions. The new button from the button bar is used to start a new switching table.

6. Click the  button in the control bar.

RESULT: The following dialog box displays.

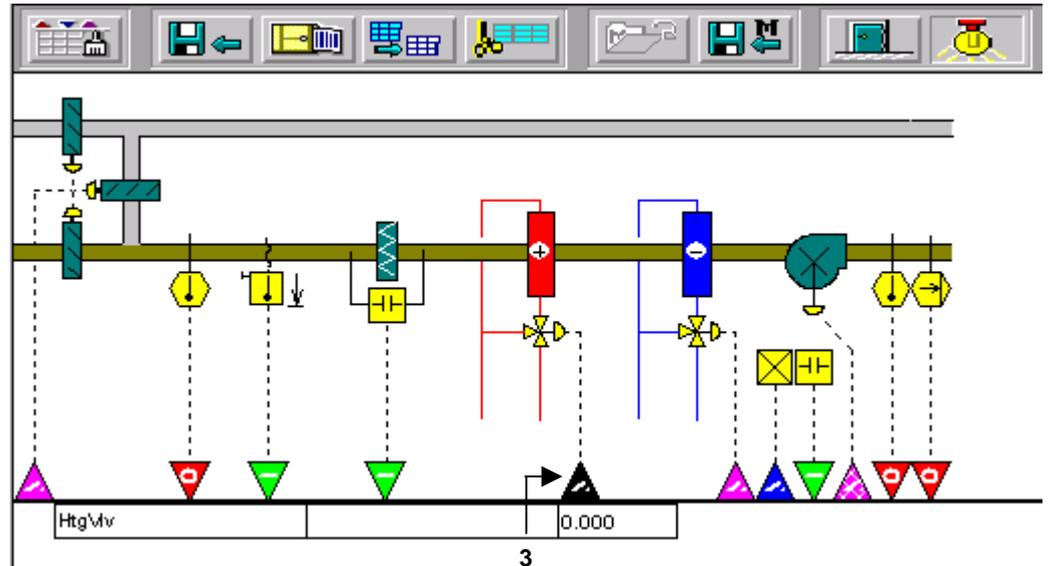


7. Save the switching table by clicking OK.

RESULT: The violet arrow head for the fan dampers is now cross hatched. This indicates that a switching table is assigned to the point.

8. To start a switching table for the heating coil, click on the heating coil control point (second violet arrow head from left, 3).

RESULT: The title "HtgVlv" is the user address for the hot water valve. The default of "0.000" represents a fully closed valve. We need to change the condition to fully open.



9. Click the third column once to change 0.000 to 100.

10. Type 100 and press ENTER key to fully open the heater valve if the switching conditions are met.

RESULT: The heater valve is now set to 100 % open when the switching table conditions are met. Now we will specify those conditions.

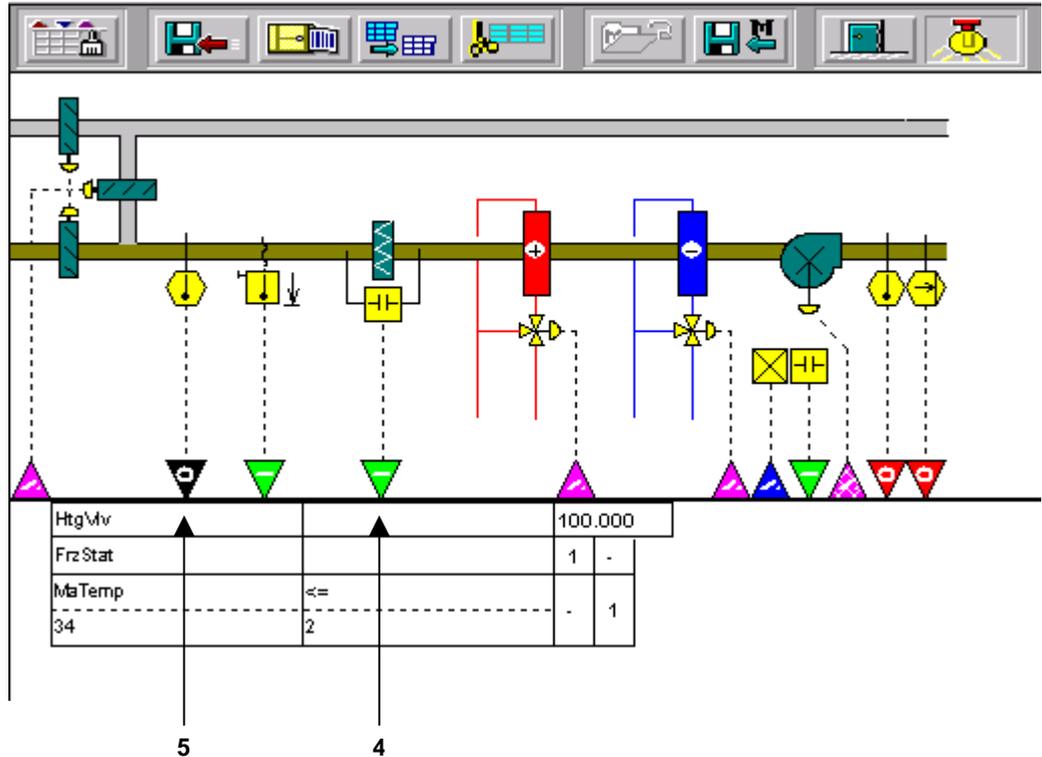
The temperature of the freeze status is one input that should determine the position of the heater valve.

11. Click the green arrow head (left from the heating coil control point, 4) representing the freeze status physical point.

RESULT: The title "Frz Stat" is the user address and the "-" is a true/false or on/off condition. The arrow head representing the physical point turns black to indicate which point is active. Clicking the "-" toggles between "-", "1" and "0".

12. Click the "-" field once to turn it to a "1".

13. For this plant, we want to add an "OR" function with the next step. This is accomplished by adding an additional column.



14. Click the + COL icon on the switching logic icons tool box once.

RESULT: The column is inserted.

15. The heater valve will open to 100 % if the freeze status is active. We also need to open the heater valve if the mixed air temperature is less than 34 degrees Fahrenheit.

16. Click the red arrow head representing the mixed air temperature sensor physical point (second from left, 5).

RESULT: The title "MaTemp" is the user address for the mixed air temperature sensor. The "0" below on the left represents the temperature that activates the condition. The "0" on the right indicates the deadband before the condition is deactivated. The first change needed on this table is to toggle the "=>" to a "<=" sign.

17. Click the "=>" to change it to a "<=" sign.

18. The "0" in the left column represents the temperature that activates the condition. Entering a 34 in the left column indicates you wish to activate the heater valve when the temperature is less that or equal to 34 degrees Fahrenheit.

19. To change the temperature to 34, first click the "0" in the left column.

20. Then type "34" and press ENTER key.

21. The "0" in the second column represents how much the temperature will rise above 34 degrees Fahrenheit before the condition is no longer active. A deadband of 2 degrees is appropriate for this system.

22. Click the "0" field once to enter the deadband.

23. Type 2 and press ENTER key.

24. The field on the far right is where the "or" condition is entered. Clicking the "-" field" cycles through three conditions: "-" which is neutral, "1" which is true, and "0" which is false.
25. Click the "-" field" once to turn it to a "1" (true).
 

RESULT: The table is now complete. When the freeze status is active or the mixed air temperature is equal to or below 34 degrees Fahrenheit, the hot water valve will be opened to 100 %.
26. Click menu File, then drop-down menu Exit.
27. Save the switching table by confirming with OK in the dialog box.
28. Continue by creating a time program as described under the Create Time Program section.

## Create Time Program

**Purpose** Create time sequences for controller operation of devices. For example, set HVAC start and stop times. Time Programs implement these command schedules.

A controller can have a maximum of 20 time programs. Every time program created will be performed by the controller.

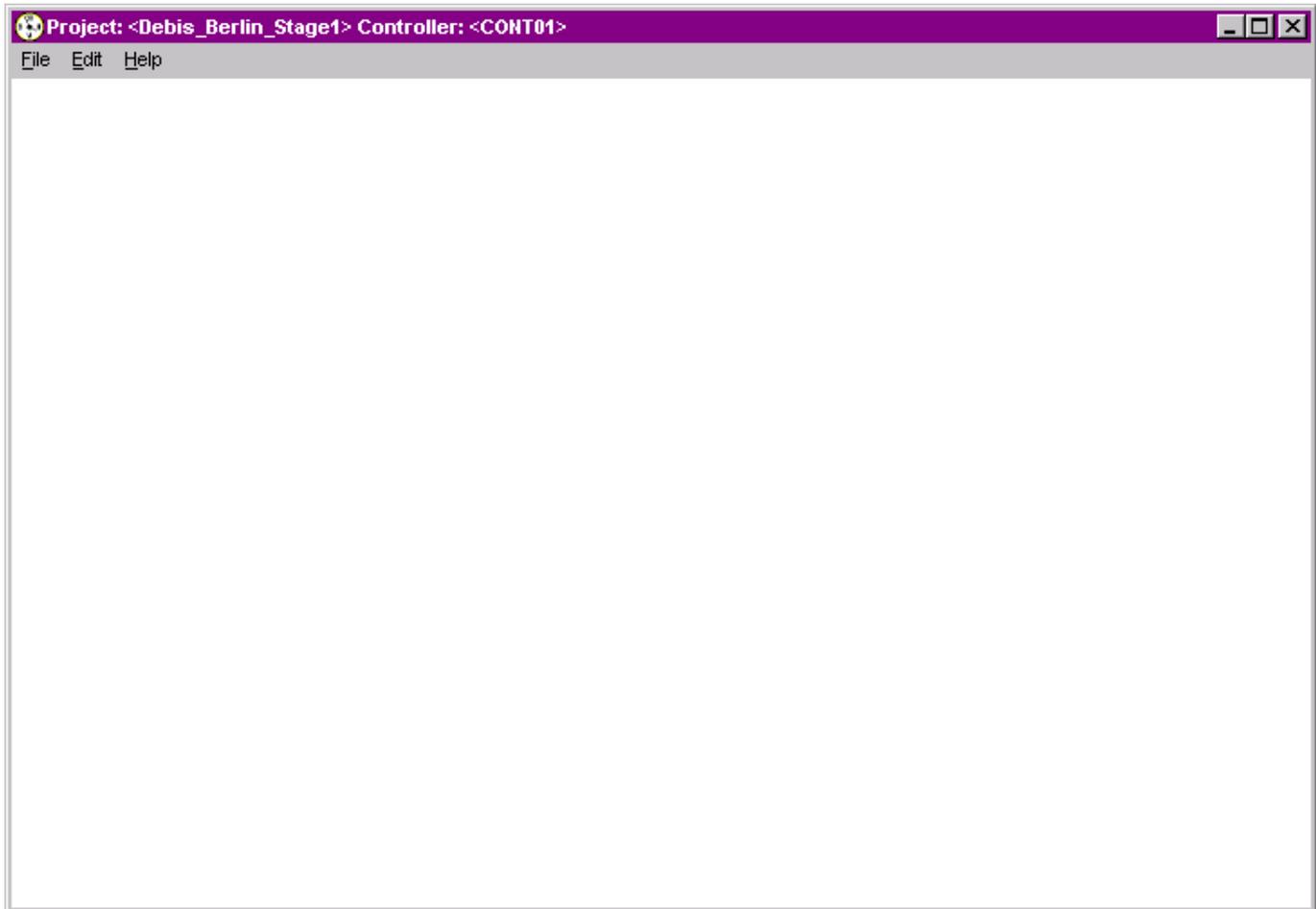
Each Time Program specifies a list of datapoints to command. A Weekly Program defines the normal daily activity of the system by specifying which Daily Programs a controller should use for each day of the week (Sunday through Saturday). The Weekly Program applies for each week of the year. There is only one Weekly Program per Time Program.

Daily Programs list points and point actions and times for the controller to implement.

Holiday programs define special daily programs for holidays such as Christmas and Easter.

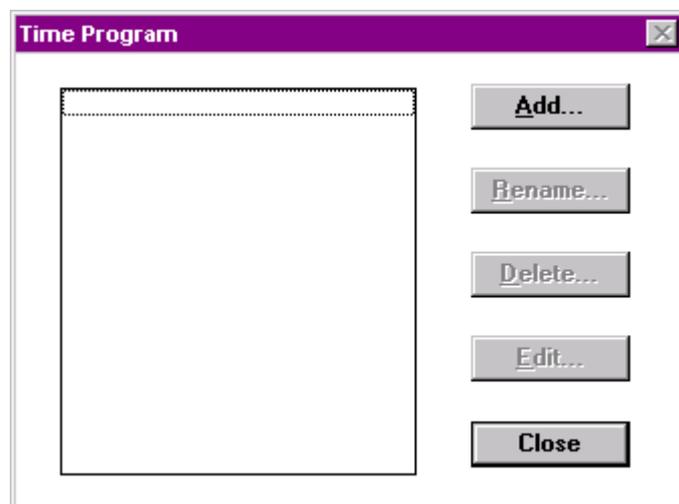
Yearly Programs define time periods with special daily programs. Yearly programs are suited to consider specific local conditions, for example, regional vacation and public /religious festivals. Yearly programs can be defined for more than one year.

- Procedure**
1. In the logical plant tree, select the controller.
  2. Click menu item Controller, then drop-down item Edit and Time Program Editor.
- RESULT: The Time Program Editor displays.



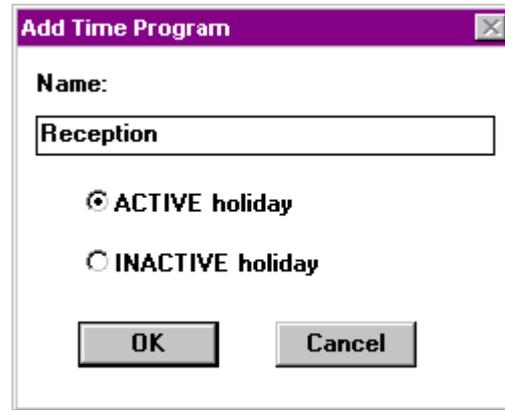
3. Click menu item Edit,

RESULT: The Time Program dialog box displays.



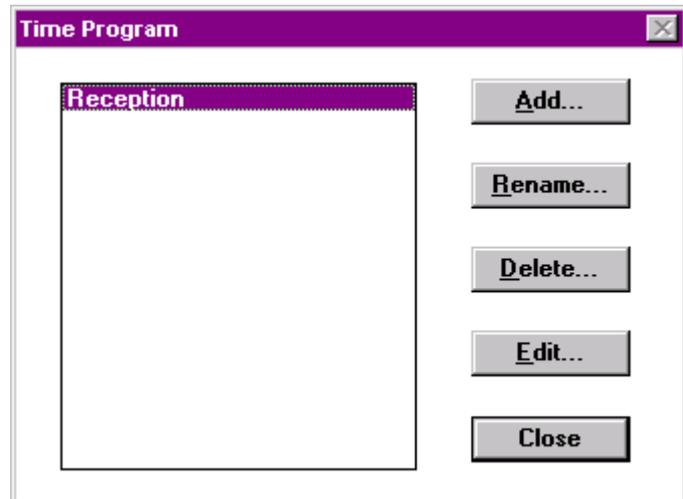
4. Click Add.

RESULT: The Add Time Program dialog box displays.



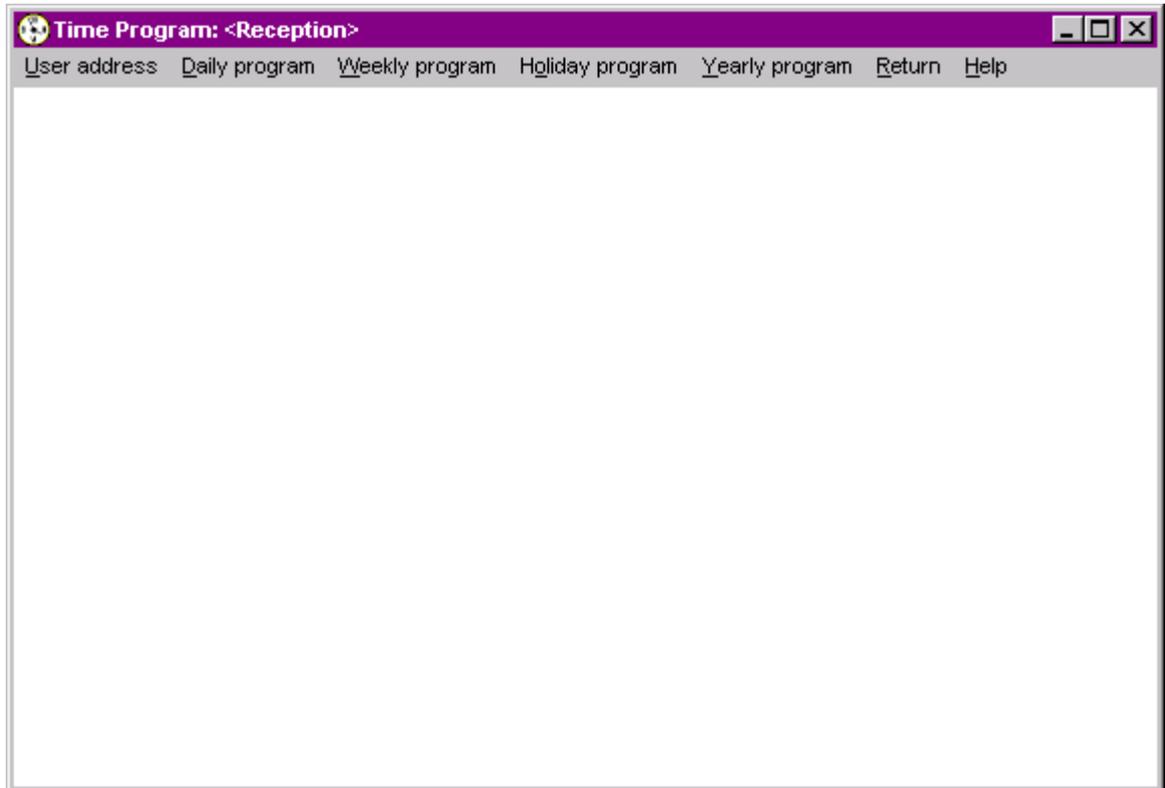
5. Enter name for the time program and click **OK**,
6. The **ACTIVE** holiday radio button enables the Holiday Program. To disable the Holiday Program, click the **INACTIVE** holiday radio button. If holiday is inactive, this Time Program uses the Daily Programs, as set up by the Weekly Program, on holidays.

**RESULT:** The Time Program dialog box redisplay. It shows the name of the overall time program to which then you can add daily, weekly, holiday and yearly programs.



7. Click **Edit**.

**RESULT:** The Time Program: <name of time program> dialog box displays.



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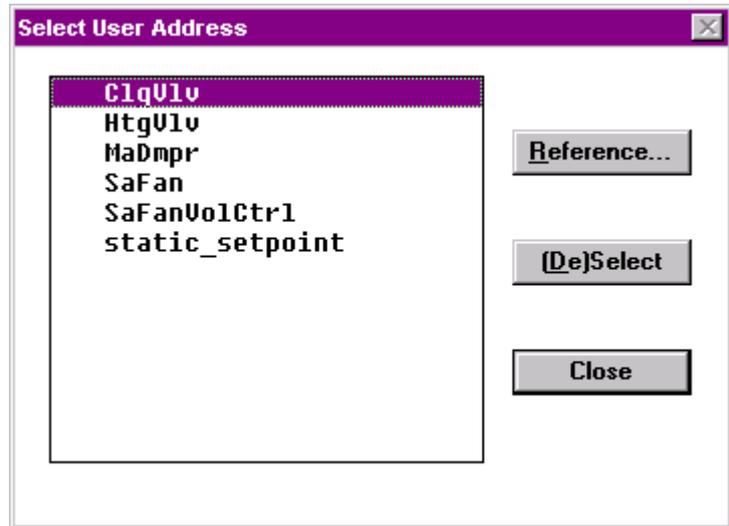
## Create Daily Program

- Purpose** Define Daily Programs and assign point commands and command times to each Daily Program. Each Daily Program covers a 24-hour period
- Daily Programs specify switching times, setpoints, and switching status for selected points.
- Each time program must have a list of assigned datapoints before you can set up Daily Programs....

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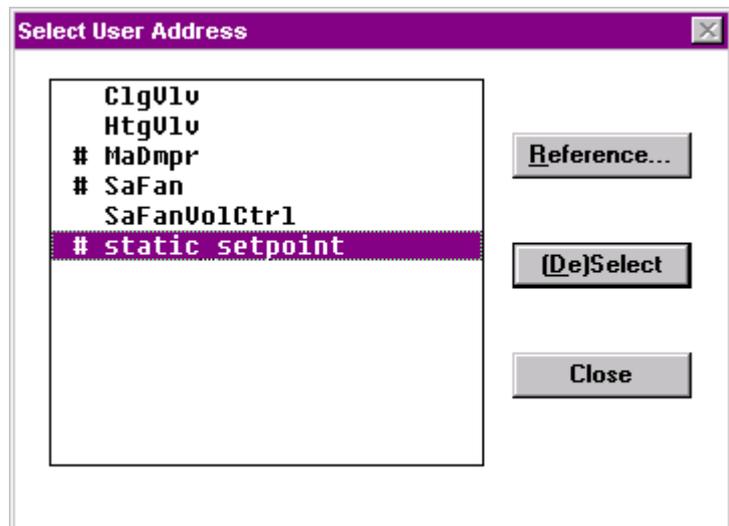
## Assign/Unassign User Addresses

1. In the Time Program: <name of time program> dialog box, click menu item User address.  
**RESULT:** The Select User Address dialog box displays. To set up any daily program, you first must define user addresses which should be controlled by the daily time program. You can assign each user address to only one time program.



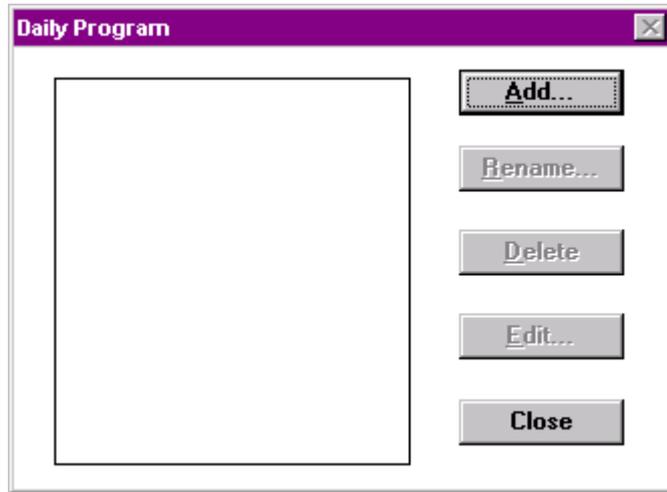
2. Click **Reference** to list already assigned datapoints.
3. Click on datapoint in the list you want to assign and click **(De)Select**.

RESULT: The assigned datapoint will be marked by an #.



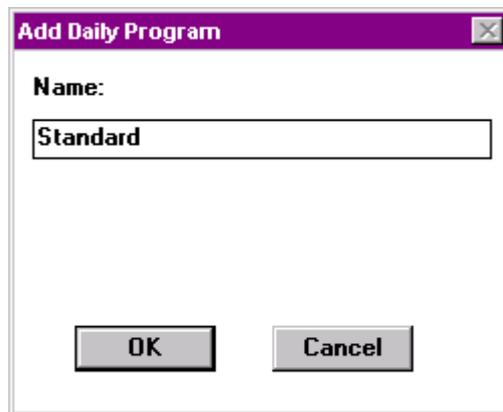
4. Click **Close**.
5. In the Time Program: <name of time program> dialog box , click menu item Daily program.

RESULT: The Daily Program dialog box displays.



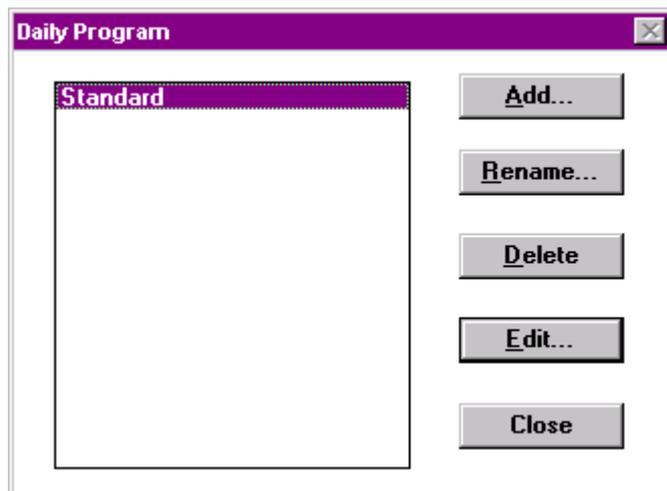
6. Click **Add**.

RESULT: The Add Daily Program dialog box displays.



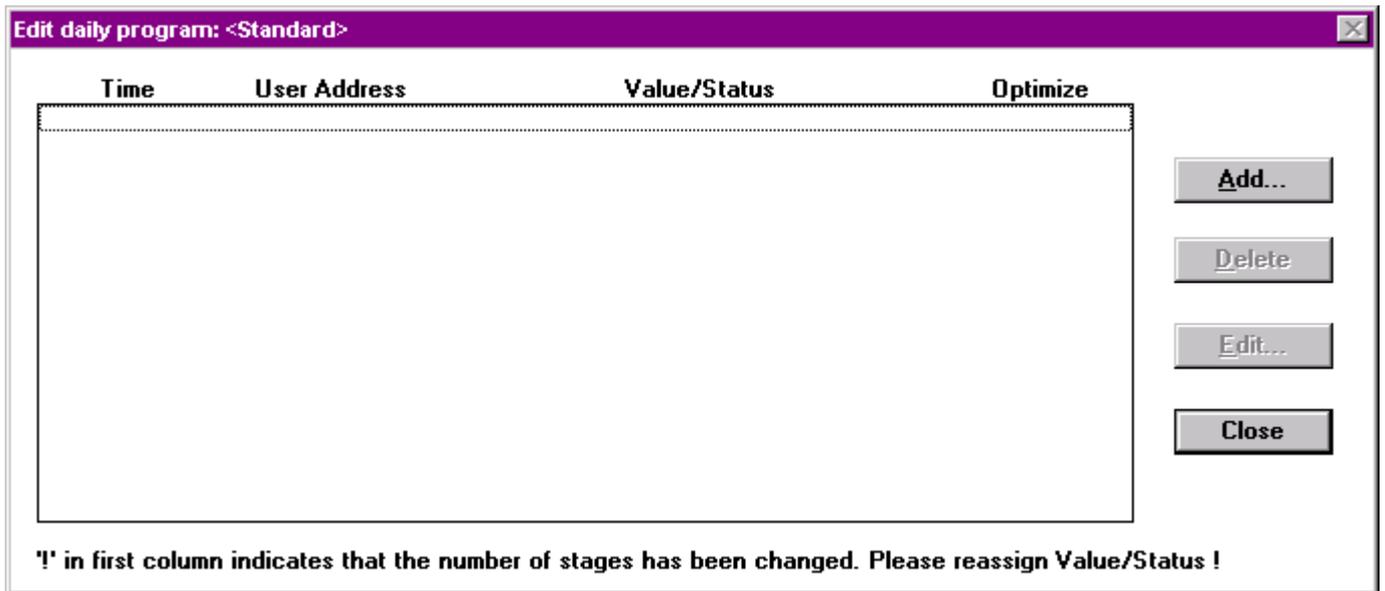
7. Enter the name for the daily program and click **OK**.

RESULT: The Daily Program dialog box redisplay with the new name highlighted.



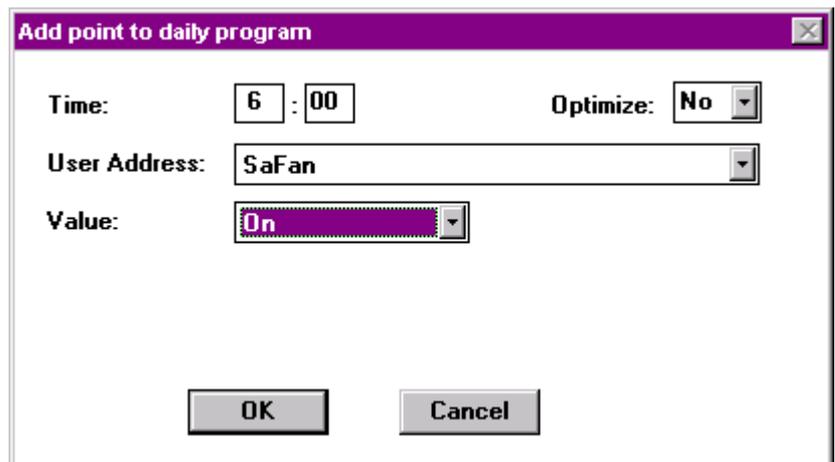
8. Click **Edit**.

RESULT: The Edit Daily Program <name of daily program> dialog box displays in which you assign the datapoints to command the daily program.



9. Click Add.

RESULT: The Add Point to Daily Program dialog box displays.

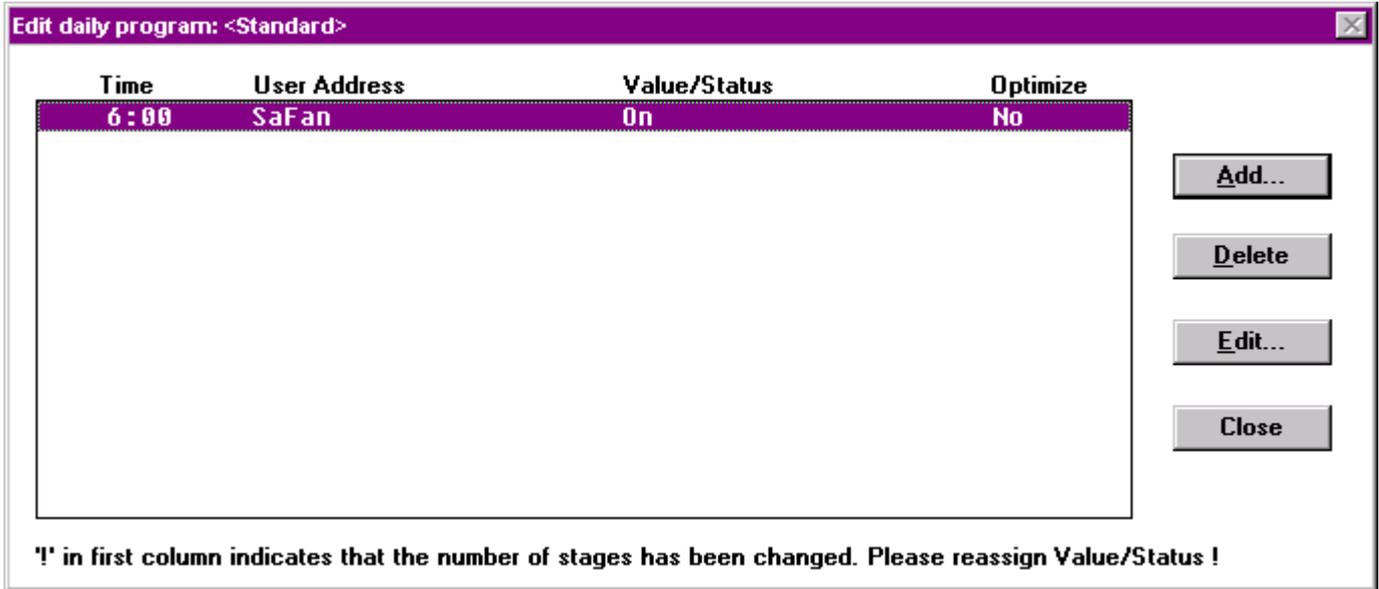


10. From the User Address drop-down listbox, select the user address.

NOTE: The following values and options to be set depend on the type of datapoint selected.

11. In the time fields, enter the time.
12. From the Value drop-down listbox, respectively in the value field, select option, respectively enter the value.
13. For switching points select optimization or not by clicking the corresponding option in the Optimize dropdown list box.
14. Click OK.

RESULT: The Edit Daily Program <name of daily program> dialog box redisplayes for adding further datapoints. Each line in the list represents one command. Each command specifies time, user address, and value or status command.



15. Click **Add** to add further datapoints, etc.
16. Click **Close**.
17. Continue by creating weekly programs as described under the Create Weekly Program section.

For detailed information on creating time programs, please refer to the Time Programs section. In the following you will open an existing switching logic.

## Create Weekly Program

**Purpose** Assign Daily Programs to days of the week.

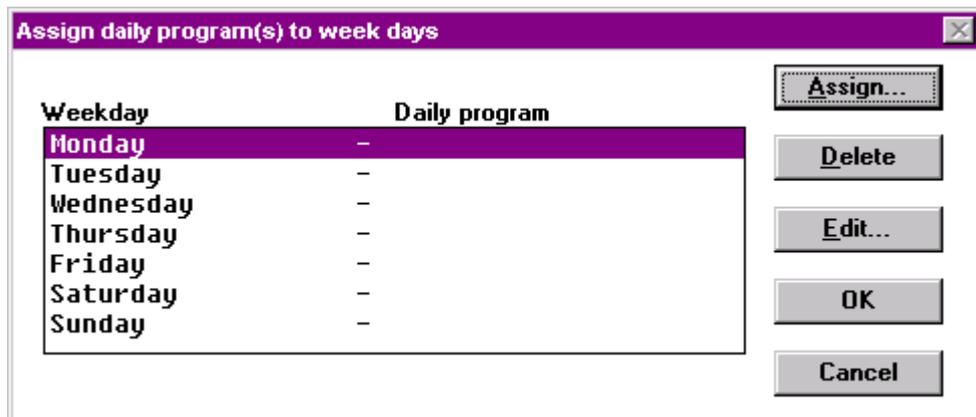
Every Time Program has one Weekly Program that specifies a Daily Program for each day of the week.

Software uses the Weekly Program to generate the annual program. The Annual Program is a repeat of the Weekly Programs for each week of the year.

**Default Daily Program** If you do not assign a Daily Program to a weekday, the Time Program uses the Daily Program for the previous weekday. The default assignments display after you exit the Weekly program function and then reselect it.

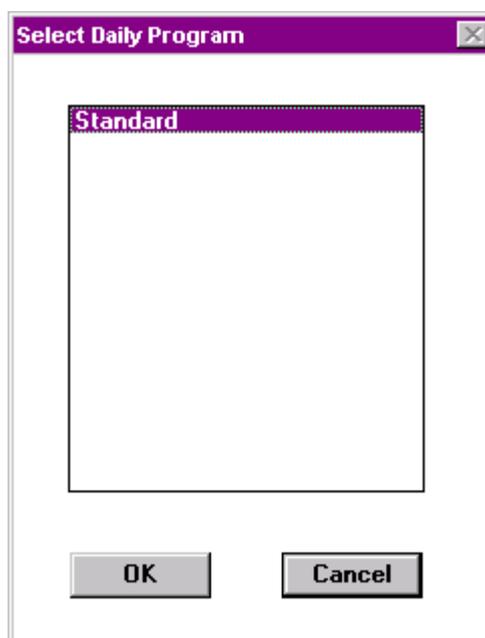
**Procedure** 1. In the Time Program: <name of time program> dialog box , click menu item Weekly programs.

RESULT: The Assign daily program(s) to week days dialog box displays.



- To assign a Daily Program to a weekday, click Daily Program name, then click **Assign**.

RESULT: The Select Daily Program dialog box displays. The existing daily programs for the Time Program display in the list box.

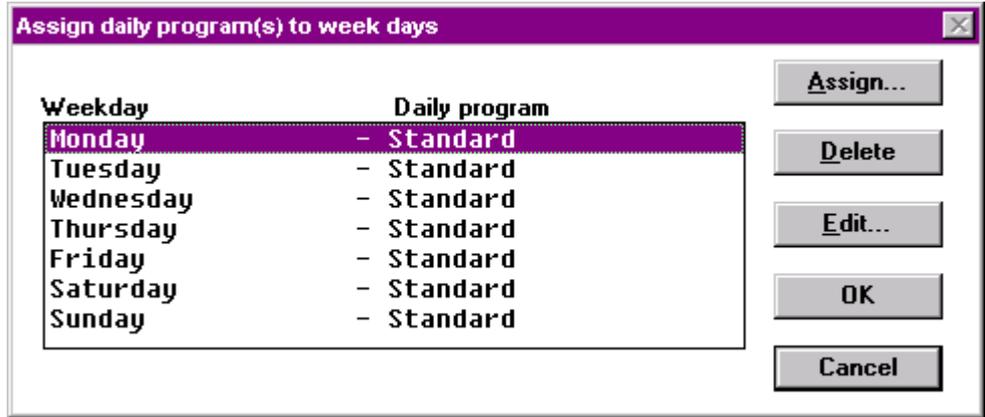


Click desired program name, then click **OK**.

RESULT: The dialog box closes and the Assign daily program(s) to week days dialog box redisplay. The new Daily Program assignment is in the list box.

- When through assigning Daily Programs, click **OK**.

RESULT: The dialog box closes and software assigns the last-assigned Daily Program to the weekdays that were not specified, in this case the daily program "Standard".



Example:

Monday Weekday  
 Tuesday Holiday  
 Wednesday  
 Thursday  
 Friday  
 Saturday  
 Sunday

Software assigns "Holiday" to Wednesday through Sunday because Holiday was the last Daily Program assigned. The Time Program window redisplay.

**Holiday Program and Yearly Programs** To create Holiday and Yearly Programs, please refer to the Holiday Program Function and Yearly Program Function sections.

## Design and Configure C-Bus Network

NOTE: For information on the BACnet-Bus network structure, please refer to the "BACnet Network Structure" section.

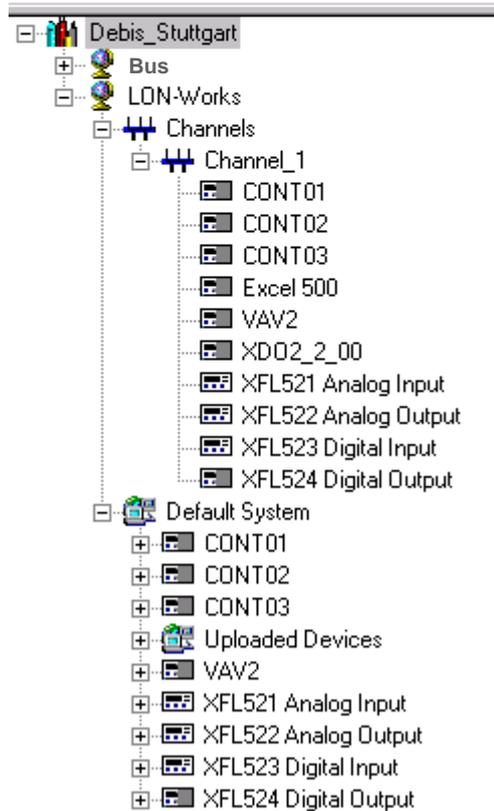
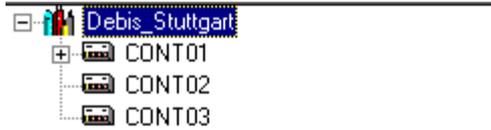
For detailed instructions on LON network engineering, please refer to the LonWorks Network Engineering chapter.

**Purpose** To structure the C-bus according to conditions in the building.

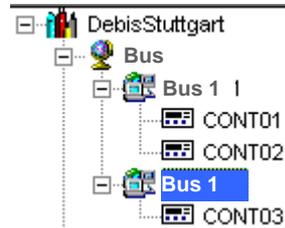
**Default Network Structure** By default, the network tree shows the two basic bus types, Bus (=C-Bus) and LON-Works.



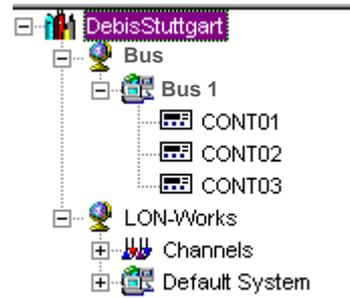
Each bus is sub-divided by default to allow an arrangement of the network components according to the physical conditions in the building.



The Bus folder contains the Bus 1 subfolder by default. Further created subfolders will be numbered continuously. The bus subfolders represent the physical C-Bus network structure of the project and contain the C-bus controllers which control that segment of the building.

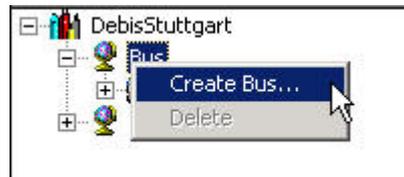


NOTE: The subfolder names are examples and freely editable. For example, the default Bus 1 subfolder can be named into Area1 or Block A.



### Create C-Bus Subsystems

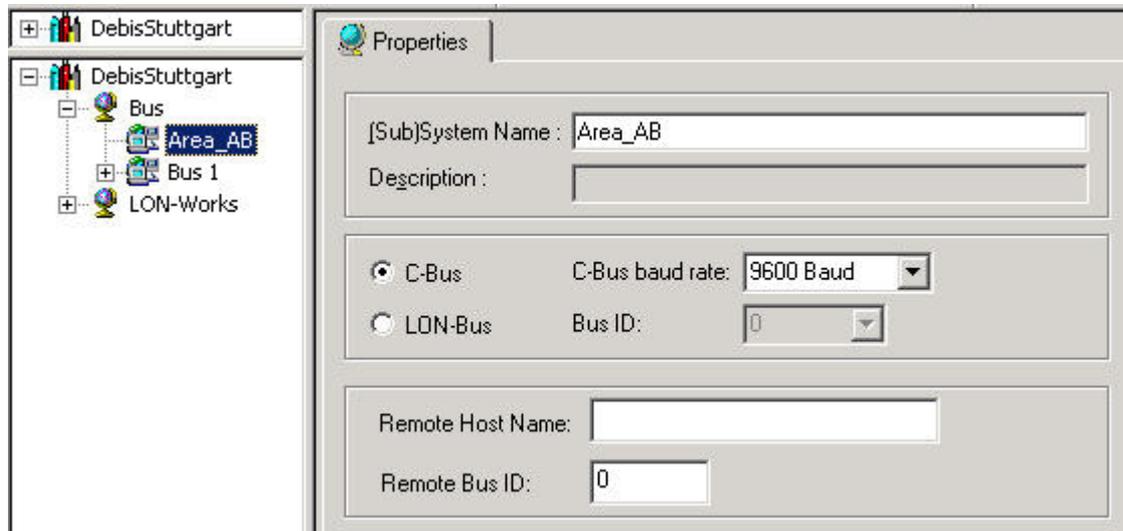
- Procedure**
1. With left mouse key, select the physical Bus folder in the network tree.
  2. Click right mouse key and with left mouse key, click Create Bus in the context menu.



RESULT: The new subsystem folder will be added below the Bus folder.

3. On the Properties tab on the right pane, edit the name in the (Sub)System Name field, if desired, and click on the created subsystem folder below the Bus folder.

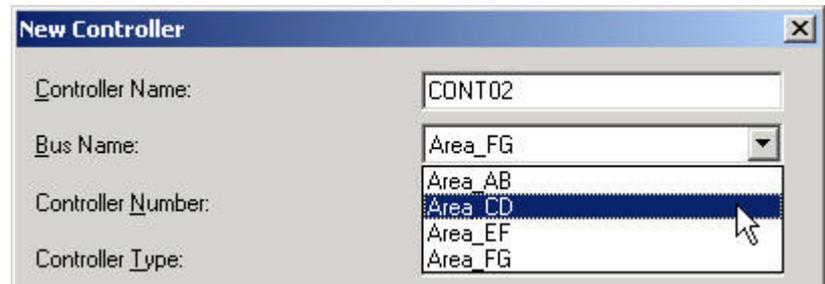
RESULT: The new named subsystem folder displays.



4. For further information on the Subsystem Properties, please refer to the Create C-Bus Subsystems section under LONWORKS NETWORK ENGINEERING.
5. To position controllers in Bus subsystems, please refer to the Create and Place Controller in the Network tree section.

### Create and Place Controller in the Network tree

When creating a controller via the New Controller dialog, the Bus subsystem where the controller should be placed in, can be selected in the Bus Name drop-down listbox.



Controllers can also be moved between different subsystems by Drag&Drop as described in the Move Controllers in the Network Tree by Drag&Drop section.

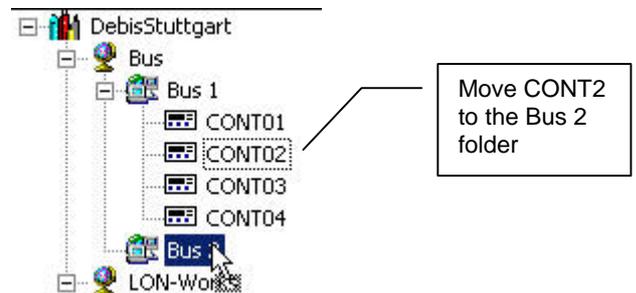
### Move Controllers in the Network Tree by Drag&Drop

In the C-C-Bus part of the network tree, controllers can be moved between different subsystem folders.

#### IMPORTANT

*Do not move controllers which are already bound to other devices. First, move the controller and then do the binding.*

- Procedure**
1. In the source folder, select controller (controller device), drag it to the desired target folder and drop it.



**Example 7: Move C-Bus Controller between Bus Subsystems**

For detailed instructions on LON network engineering, please refer to the LonWorks Network Engineering chapter.

## Commission Controller/LON Device

**Purpose** The commissioning of C-Bus and LON controllers, respectively LON devices include the following steps:

1. Connect to Controller
2. Translation of the controller (C-Bus, LON controllers)
3. Download of the controller via B-port (C-Bus and LON controllers)
4. Commission of the whole LonWorks network or single devices (LON controllers and other LON devices only)

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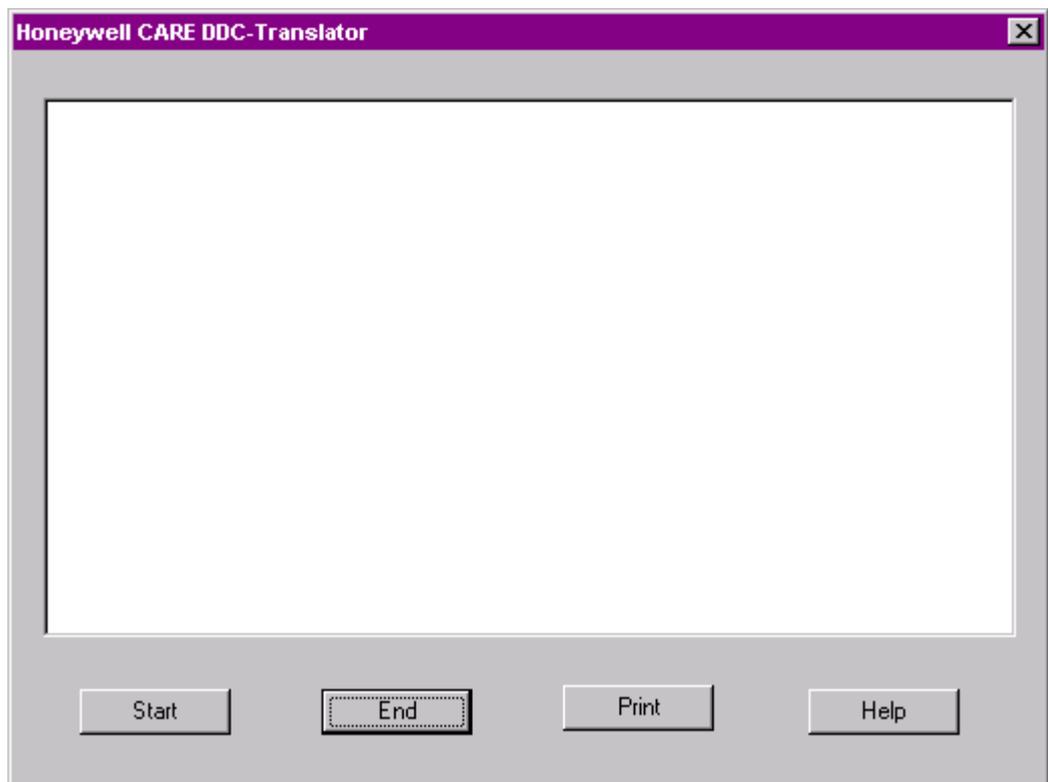
## Physically Connect to Controller

- Purpose** Physically connect controller to Excel CARE Personal Computer (PC) so that CARE can upload or download to the controller database.
- Requirements** The PC must be within 49 ft. (15m) of the controller. At greater distances (up to 3281 ft. [1000m]), you must add a line driver.
- Use a XW585 Connection Cable.
- Procedure**
1. Insert plug on the XW585 connection cable into the socket on the front of the controller computer module.
  2. Insert the other plug on the XW585 connection cable to the serial interface socket on the back of the PC (COM 1 or COM 2).
  3. Power on the PC.
  4. Start XL Online as described in the Start XL Online section.

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## Translate Controller

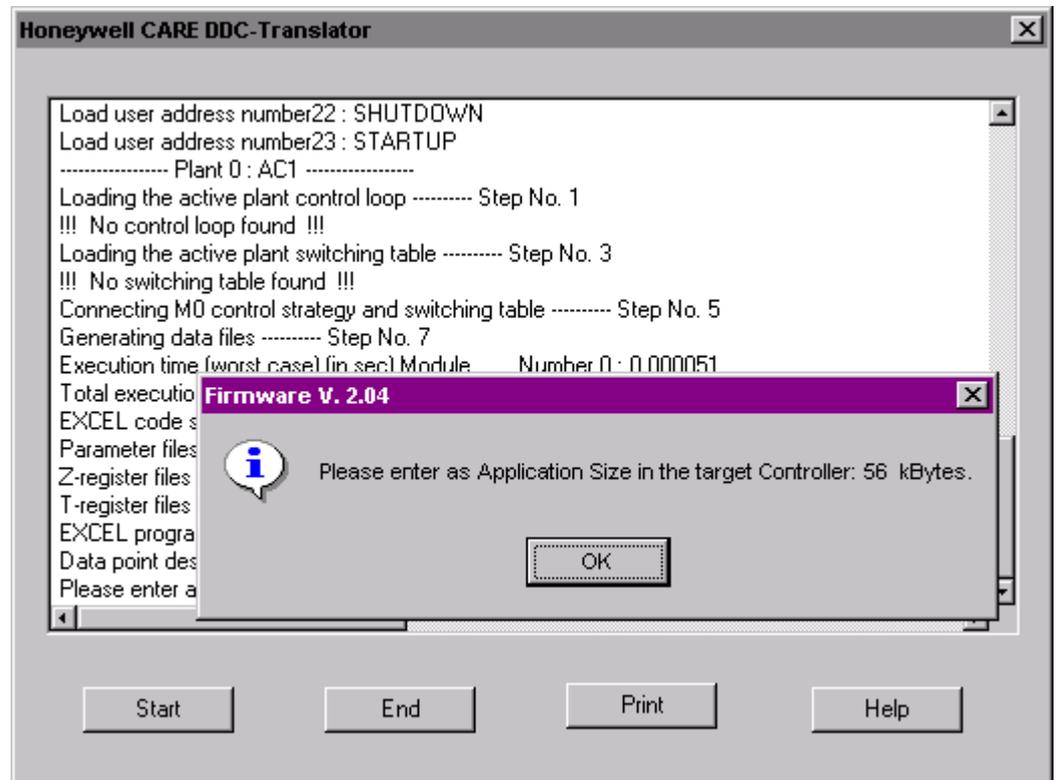
- Purpose** Convert the files for an attached plant to a form suitable for download into a C-Bus controller or LON controller (step 1 of commissioning procedure).
- Procedure**
1. In the logical plant or the physical C-Bus network tree, select controller, you want to translate.
  2. Click menu item Controller, then drop-down item Translate or, click the Translate button in the button bar.
- RESULT: The Honeywell CARE DDC-Translator displays.



3. Click Start button.

**RESULT:** Software begins translation. As it translates, messages and warnings are listed. Warning messages give you the option of clicking **OK** to continue the translation or **Cancel** to terminate the function. If you cancel, translation stops, but the translation window remains so you can view the messages

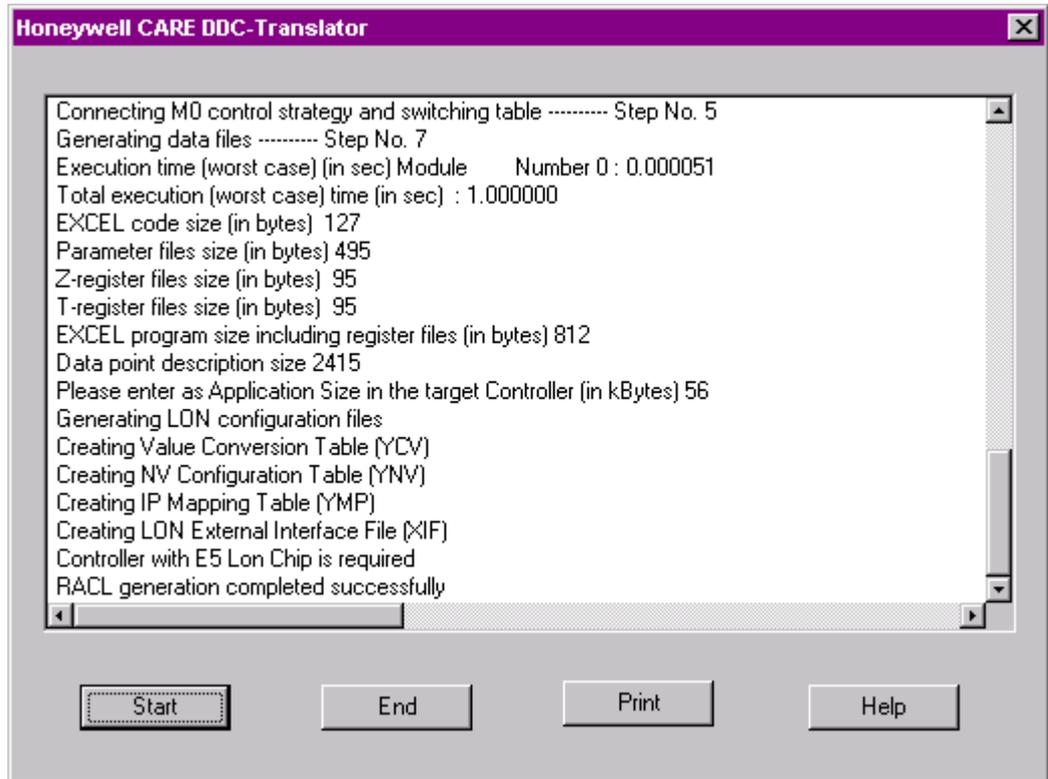
Concurrently a message box informs you about the application size of the translated controller.



4. Confirm the message by clicking OK.

**RESULT:** When the translation is complete, software displays the following message at the end of the list.

RACL generation completed successfully.



5. Click End button to exit the translate function.
6. Click Print button to print the translation result.

## Download Controller

**Purpose** Copy translated files to a C-Bus or LON controller (step 2 of commissioning procedure).

**NOTE:** For copying files into a BACnet controller, please refer to the "Download Application into Excel Web Controller" section.

- Procedure**
1. Physically connect to controller as described in the Connect to Controller section.
  2. Click menu item Controller, then submenu item Tools and XL Online.

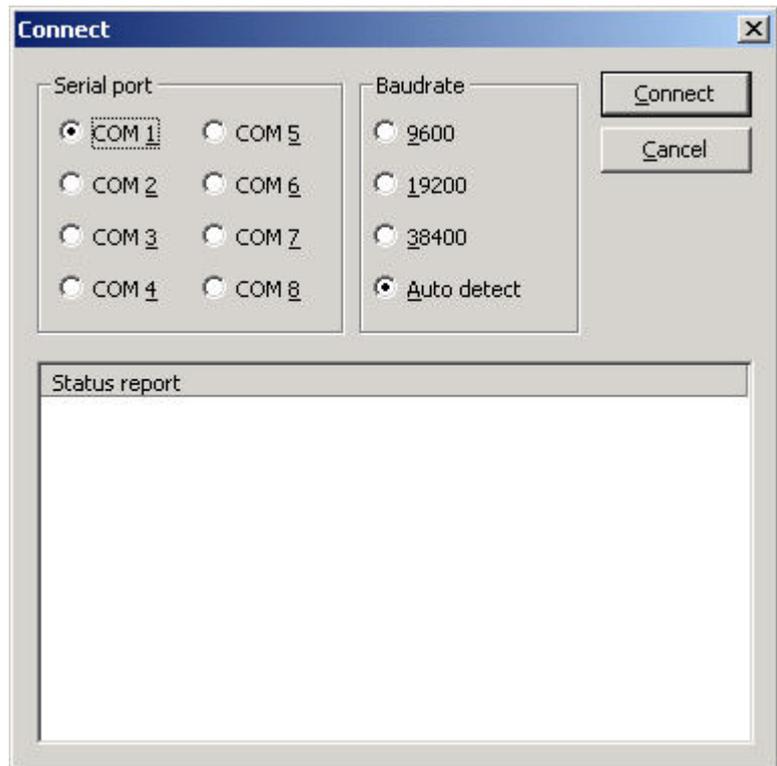
**RESULT:** The XL Online main window displays. Software tries to connect to the port according to the settings defined in the XL Online dialog box (see Define Port Settings section).

If no controller is connected to the port or software cannot connect to the controller due to wrong port settings, the XI 581/2 MMI is gray and the status message No connection is displayed.

If the connection is completed and no application is running, the MMI is blue and blank. If an application is running, the MMI is blue and the initial text is shown.

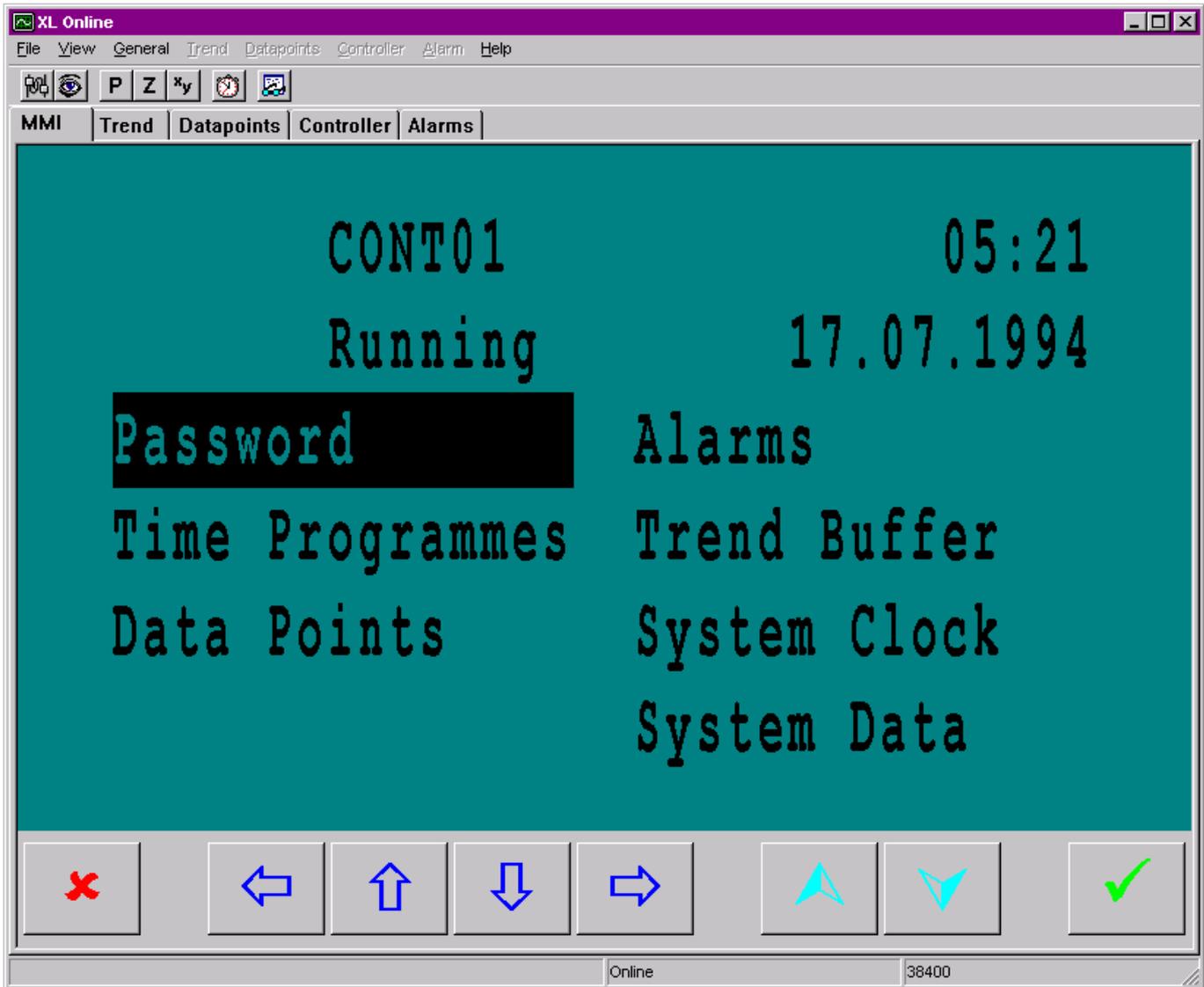
3. If the MMI is gray, connect the controller to the port as follows:
4. Click menu item File, then submenu item Connection.  
Or, click on the Change serial port settings icon  on the button bar.

RESULT: The Connect dialog box displays.



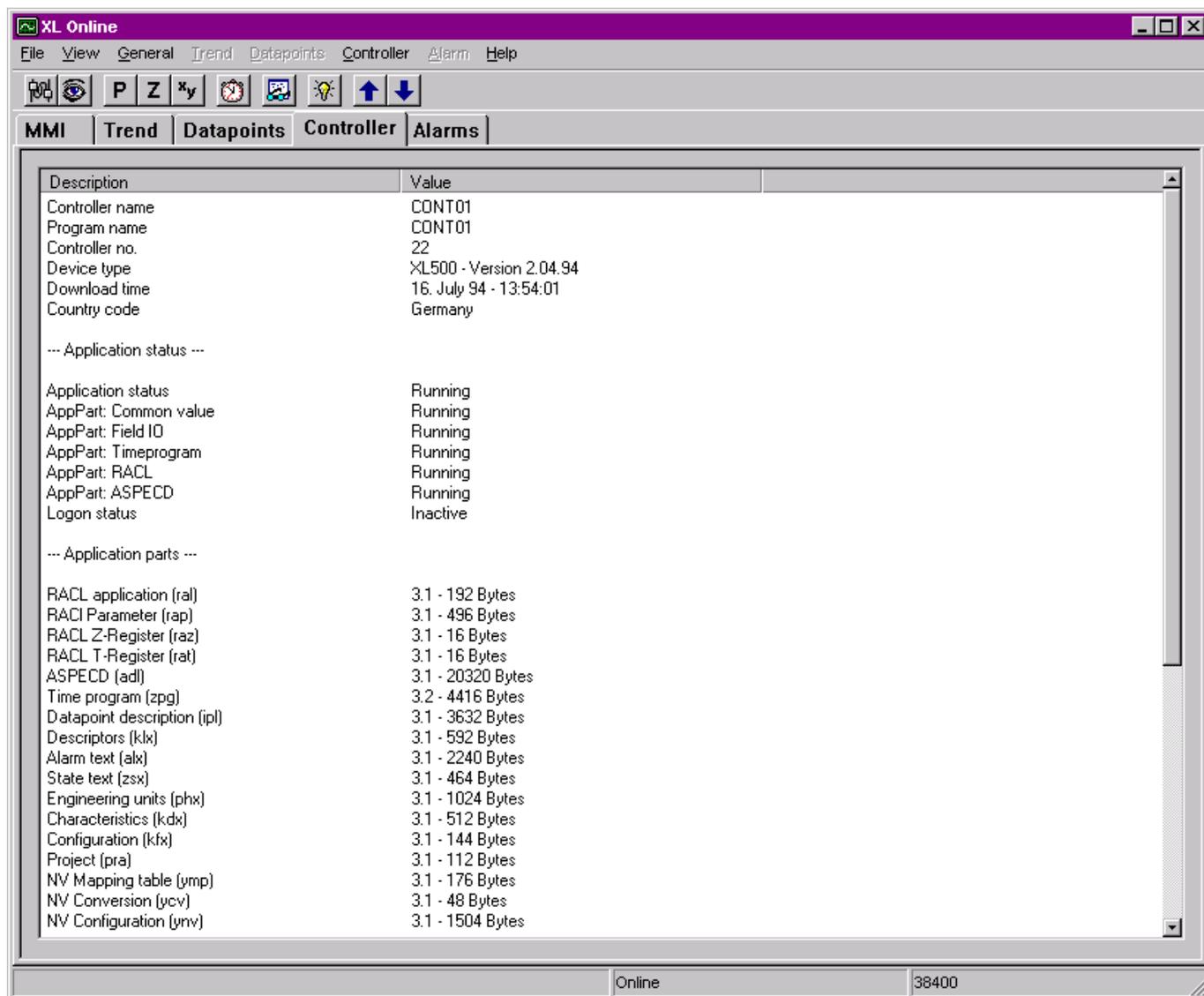
5. Select the serial port and the baudrate by clicking the corresponding radio buttons. Select Auto detect, if you do not know the baudrate (default setting).
6. Click the Connect button.

RESULT: If the connection could not be completed, a status report is displayed with the message that CARE is unable to establish the connection. If the connection could be completed, the MMI is invoked in blue and the initial text is shown, if an application is running. If no application is running the MMI is blank.



7. If no application is running, reset the controller by pressing the Reset button at the controller.
8. Make sure that the controller number in CARE and in the MMI is the same. If they are different, set them equal either in CARE or in the MMI. For operating instructions of the MMI refer to the XI581/2 Operator Terminal Manual.
9. Click the Controller tab.

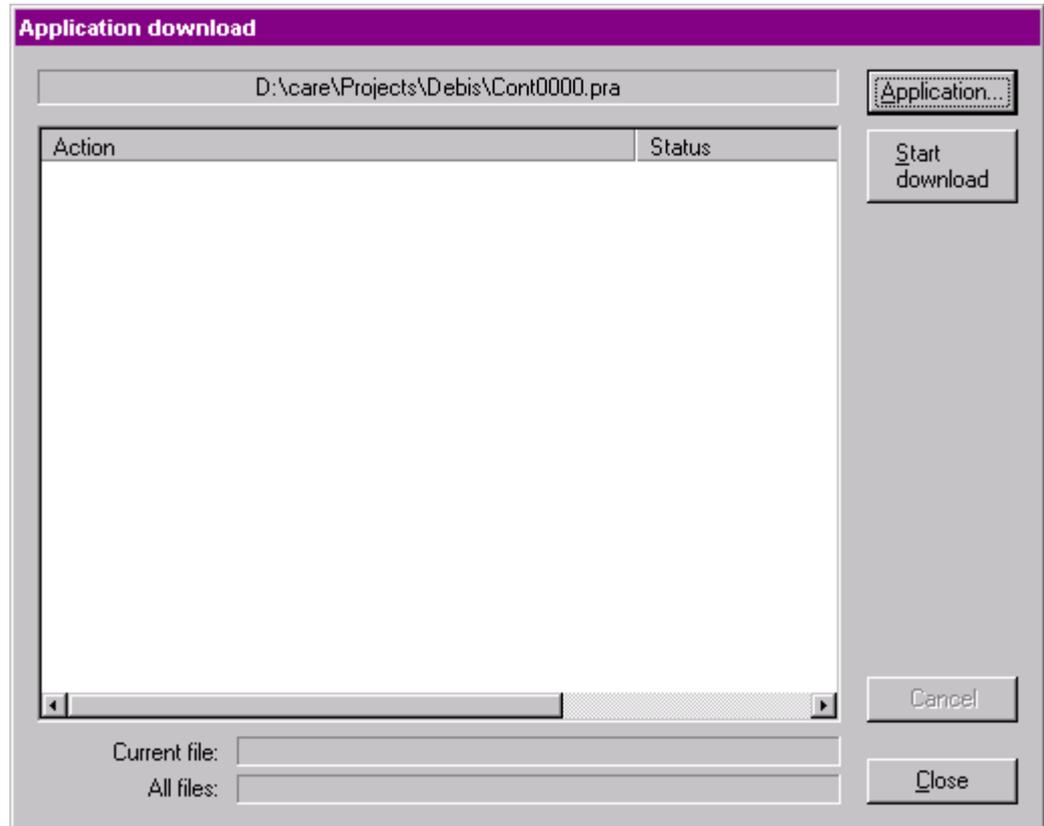
RESULT: Controller status information is listed.



10. Check the information.

11. Click menu item controller, then submenu item Download or,  
click on Download to Controller icon  on the toolbar.

RESULT: The Application download dialog box displays.



RESULT: On the top, the path of the previously downloaded application is displayed.

12. If you want to download a new application, click Application button and select the desired application (.pra file).
13. Click Start download button if you want to download the previously downloaded application or the new application.

RESULT: Depending on the kind of application you want to download, different messages can appear (see What kind of Application to Download section).

The download starts. Action and status messages will be listed while the download proceeds.



RESULT: Eventually alarms are generated as indicated by the flashing alarm icon on the Alarms tab.

15. Click the Alarms tab, check the messages and perform appropriate troubleshooting procedures if necessary.

### Commission LON device / LonWorks Network

NOTE: For detailed instructions on LON engineering, please refer to the LonWorks Network Engineering section.

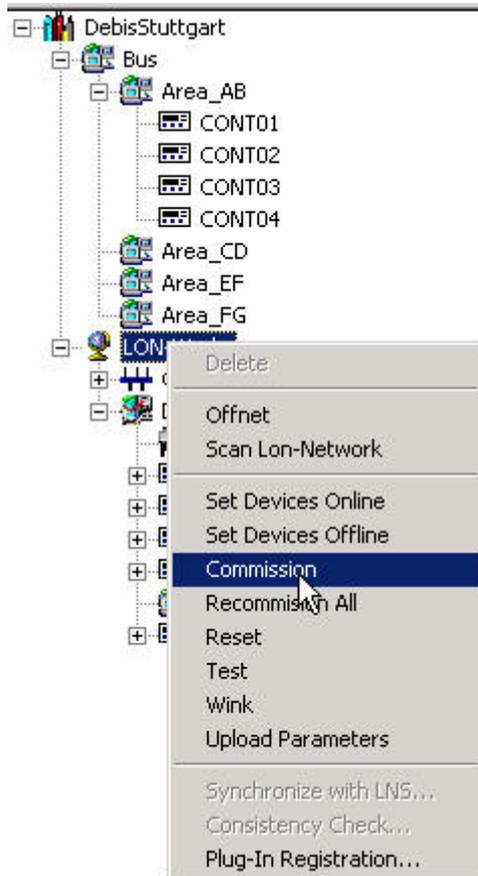
**Purpose** The commissioning process on the LonWorks network is defined by

- Addressing
- Binding (NVs)
- Configuration (devices)

It is possible to commission single devices, all devices of a system (top-level system such as the Default System) or subsystem), or the complete LonWorks network.

When commissioning all devices of a system or the network, only those devices will be commissioned which network interface had been changed in CARE since the latest commissioning, that is, the current state of the device is different to the current state in CARE.

- Procedure**
1. Connect to controller as described in the Connect to Controller section.
  2. In the network tree, click on the desired item (LonWorks folder = complete network, system folder = all devices of the system, or the device) you want to commission.
  3. Click right mouse key and with left mouse key, click Commission.



**RESULT:** For any device which is not addressed yet, the Get Service Pin dialog box displays asking you to press the service pin. Press the service pin and Click OK. After all devices have been addressed, they will be commissioned. Commissioned devices are indicated by the fully colored green display of the devices in the network tree as well as on the device status icon on the devices.



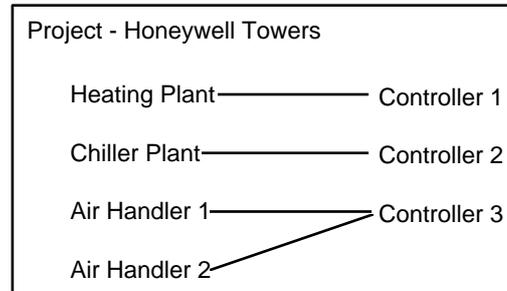
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## PROJECTS DEFINITION AND MANAGEMENT

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- Purpose** This chapter describes how to define and select a project as well as other project management functions in CARE, for example, how to change existing project information.
- Project Definition** A project is a set of controllers with attached plants communicating via bus. A project can cover multiple of different buses (C-Bus, LON-Bus etc.) building up a network.

Example of a project with four plants and three controllers:



You can assign more than one plant to a controller. You cannot assign the same plant to more than one controller.

In addition, general information such as reference number, client name, and order number are part of the project.

CARE organizes plants by project. The first step when you start CARE is to select a project. If none exists, or if you need a new one, you can define a new project.

- Chapter Contents**
- Create New Projects
  - Open Existing Projects
  - Change Project Password
  - Display and/or Modify Project Information
  - Rename Projects
  - Rename User Addresses
  - Delete Projects

**See Also** ⇒ File Management chapter for procedures to delete, back up, and restore projects

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## Create New Project

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- Purpose** Define project name, password, and general information such as reference number, client name, and order number. This information appears in the final documentation for the project, is used in pricing estimates, and controls access to the projects.
- Procedure**
1. Click menu item Project, then drop-down item New.
- RESULT:** The New Project dialog box displays.

The screenshot shows a 'New Project' dialog box with the following fields and values:

- Project Name: TwinTower
- Description: R. Campbell Buildings
- Reference Number: 2243
- Client: Honeywell
- Order Number: 1243
- Discount: 8 %
- Job Factor: 3
- Project Engineer: Don Mac Hucknal
- Date: 10.November.1999
- User Addresses: Unique
- Units of Measurement:  International,  Imperial
- Project Subdirectory: d:\car20298\projects\Twin 000

Buttons at the bottom: OK, Cancel, Help.

2. Enter information in all fields of the box. Do not leave any fields blank. In some fields defaults are displayed, which are defined in the ProjectsDefaults section of the CARE.INI file:

#### Project Name

Name of project, for example, site location. First character must be a letter. There cannot be any spaces; use an underscore, \_, to separate words, if desired. Maximum 32 alphanumeric characters.

NOTE: For LON projects where a synchronization is highly probable to be done, the number of alphanumeric characters of 16 must not be exceeded.

#### Description

Default Text about the project that may help to identify it. Approximate maximum 30 alphanumeric characters. Default display is defined in the CARE.INI file.

#### Reference number

A number that further describes the project. For example, enter branch number. Numeric characters only (0-9). Approximate maximum 9 numeric characters. Default display is defined in the CARE.INI file.

#### Client

Customer name. Approximate maximum 30 alphanumeric characters; Default display is defined in the CARE.INI file .

#### Order number

Number assigned to project order. Approximate maximum 10 numeric characters (0-9). Default display is defined in the CARE.INI file.

#### Discount

Percent of discount from list price. Maximum two numbers (0-99). This value is available to the data export file that can be used in an Excel spreadsheet. Default display (1) is defined in the CARE.INI file.

#### Job Factor

Difficulty factor (0 through 99.99). If you enter a number with more than two decimal places, software truncates the entry to two decimal places after you click **OK**. For example, if you enter 15.045, software saves 15.04. If you enter a number with more than two integer digits, software displays an error message and lets you enter another value. Default display (1) is defined in the CARE.INI file.

When calculating project costs, software multiplies additional services in the estimate with this factor. Job factor can result in an increase or decrease in total costs. This value is available to the data export file that can be used in an Excel spreadsheet.

The screenshot shows the 'New Project' dialog box with the following fields and values:

- Project Name: Volkswagen
- Description: -
- Reference Number: 0
- Client: -
- Order Number: 0
- Discount: 1 %
- Job Factor: 1
- Controller Number Offset: 0
- Project Engineer: -
- Date: 19.Juli 2004
- User Addresses: Unique
- Units of Measurement:  International,  Imperial
- Character Set: ANSI X3.4
- Project Subdirectory: c:\care\projects\ Volkd000

#### Controller Number Offset (BACnet Project only)

Number of the first controller in the project.

#### Project Engineer

Name of responsible project engineer. Approximate maximum 20 alphanumeric characters. Default display is defined in the CARE.INI file.

#### Project Offset

(Only applicable after project is created). The project offset is used for calculating unique program IDs for the network interfaces if more than one

CARE project is used for the same construction project. The offset is only effective for controllers being newly created.

#### **Date**

Date of most recent project modification. Approximate maximum 20 alphanumeric characters.

#### **User Addresses**

Whether you want non-unique or unique user addresses in this project. Unique is the default. You cannot change this assignment after you create a project. The following text explains the implications of the two choices.

It is recommended that you select “unique” addresses. Enabling this feature tells software to check for duplicate nonglobal, uncommon points within the controller and project (a project is a bus) as you create points in the other CARE functions (schematics, control strategy, etc). If software detects duplicate points, software issues a warning message. You cannot attach a controller that has duplicate nonglobal or uncommon points. If a controller is to be used with a central (for example, Excel Building Supervisor [XBS] or Excel Building Supervisor-Integrated [XBS-i]), the addresses must be unique.

*Global points* are points that send their information to receiver pseudopoints in other controllers. The points have the same user addresses. Global points are meant to be duplicated and used by multiple controllers.

*Common points* are used multiple times in the same controller but in different plants. For example, the ahu1 and ahu2 plants in controller 1 can use the same outdoor air temperature sensor in their schematics. The sensor is considered a common point to two plants.

Selecting “unique” also allows you to modify user addresses in the Schematic function when you select an element that is already in a previous plant. When software encounters a repeat element, it displays the following message:

#### **User address already exists, create nevertheless?**

There are two buttons in the message box, **OK** and **Cancel**.

If you click **OK**, software creates the element with the same user address as before. This action is desirable in the case of common points.

If you click **Cancel** and the element is a segment (not a Point Without a Graphic), software creates the element and appends a number to a user address. For example, a user address of OaTemp becomes OaTemp1. If the element is selected again in another plant and you click **Cancel** again, software appends a 2 (that is, OaTemp2). You can also change user addresses later when you use the Editors.

If you click **Cancel** and the element is a Point Without a Graphic, software does not create a point.

#### **Units of Measurement**

Set default for project: International or English. This selection affects the operation of the icons in Control Strategy that perform EMS operations. The values for the inputs and outputs are different depending on the selection of International or English units. See Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) for more information.

#### **Character Set (BACnet Project only)**

The appropriate character set is necessary for unobstructed communication between devices on the BACnet bus. For proper communication between Excel Web controllers and the EBI central, the ANSI character set must be selected.

#### **ProjectSubdirectory**

According to the description entered in the Project field, a subdirectory where the project and the controller files are saved is concurrently set under the CARE\projects directory. The entry can have max. 8 digits. By default the first 5 digits are taken from the Project Name, which can have a maximum of 18 digits. The last 3 digits are numbers starting with 000 and counting forward when

defining new projects, which start their project names with the same first 5 digits than the first project created.

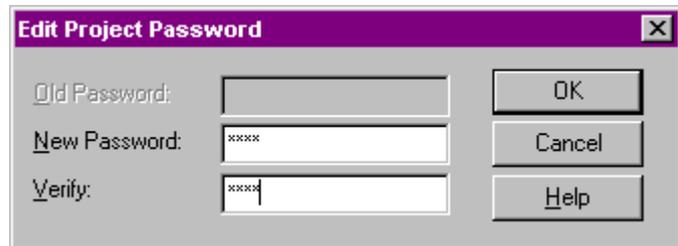
The entry can be changed during creation of a new project to any desired name or on the Project's Properties tab. With this function you can structure related projects by their names and save them under different subdirectories.

Example:

Project Name	Project Subdirectory
AirportTerminalA	Airpo000
AirportTerminalB	Airpo001
AirportTerminalC	Airpo002

- Click **OK** (or press **Enter** key) to close dialog box and create project. All fields must have entries or the **OK** button is inactive.

RESULT: The Edit Project Password dialog box displays. If desired, you can enter a password (optional).



- In the New Password field, type a password. Maximum 20 characters, any combination of numbers, letters, and special characters like commas.

### CAUTION

*Make a note of the password. No one can work on the project without knowing this password.*

- In the Verify field, type the password again. Then click **OK** (or press **Enter** key).

RESULT: If the error message "Incorrect entry" or "Confirm blank" displays, click **OK**. Software redisplayes the Edit Project Password dialog box to start the process over again.

If there are no errors, project definition is complete and the dialog box closes. The project is displayed in the logical plant tree and the network tree. Plants and controllers can be listed by clicking the plus symbols On the Properties tab on the right, project data can be entered/edited.

The screenshot shows the 'Properties' dialog box for a project named 'DebisStuttgart'. The dialog is divided into several sections:

- Project Information:** Project Name: DebisStuttgart, Description: -, Date: 15 January 2002.
- Reference and Client Information:** Reference Number: 0, Client: -, Order Number: 0, Discount: 1 %, Job Factor: 1.000000, Project Engineer: -.
- User Addresses:**  Unique,  Non-unique.
- Units of Measurement:**  International,  English.
- Project Subdirectory:** D:\care\projects\ Debis000.

The status bar at the bottom left shows 'Bereit' and the bottom right shows 'OFFLINE'.

## Change Project Password

**Purpose** Replace the current password for a project.

- Procedure**
1. Open the project and click on any item in the logical plant tree.
  2. Click menu item Project, then drop-down item Change Password.

RESULT: The Edit Project Password dialog box displays.

The 'Edit Project Password' dialog box has a purple title bar and contains the following fields and buttons:

- Old Password:** A text field with masked characters (xxxxxx).
- New Password:** A text field with masked characters (xxxxxxxx).
- Verify:** A text field with masked characters (xxxxxxxx).
- Buttons:** OK, Cancel, and Help.

3. In the Old Password field, type old password. Tab to the New Password field and type a new password (maximum 20 characters). Tab to the Verify field and retype the new password.
4. Click OK to confirm.

## Open Existing Project

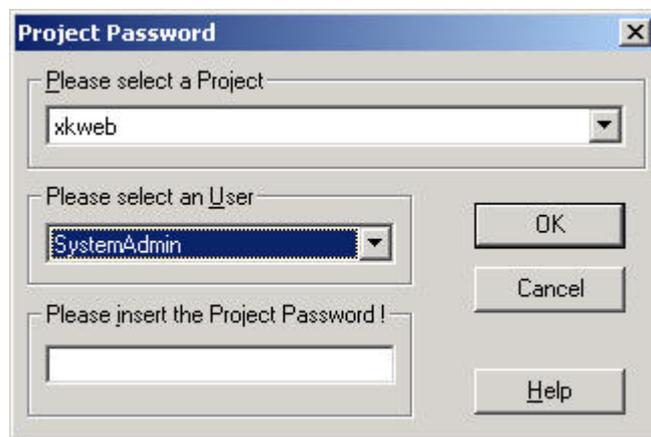
**Purpose** Specify a project, plant, and/or controller to work on.

**Procedure** 1. Click menu item Project, then drop-down item Open.

RESULT: The Project Password dialog box displays.



2. In case of a BACnet project, select an user from the corresponding drop-down listbox.



3. If a password has been issued, enter it in the corresponding field.

RESULT: The project is displayed in the logical plant tree and the network tree. Plants and controllers can be listed by clicking the plus symbols. On the Properties tab on the right, project data can be entered/edited.

The screenshot shows the CARE software interface. On the left, there is a tree view with a folder named 'DebisStuttgart' containing sub-items 'HotWat01', 'CONT01', and 'AC01'. Below this is another instance of the 'DebisStuttgart' folder. The main area on the right is the 'Properties' tab, which contains the following fields and options:

- Project Name: DebisStuttgart
- Description: .
- Date: 15.January.2002
- Reference Number: 0
- Client: .
- Order Number: 0
- Discount: 1 %
- Job Factor: 1,000000
- Project Engineer: .
- Offset: 000
- User Addresses:
  - Unique
  - Non-unique
- Units of Measurement:
  - International
  - English
- Project Subdirectory: D:\care\projects\ Debis000

At the bottom left of the window, the status 'Bereit' is displayed. At the bottom right, there is an 'OFFLINE' button and several other small icons.

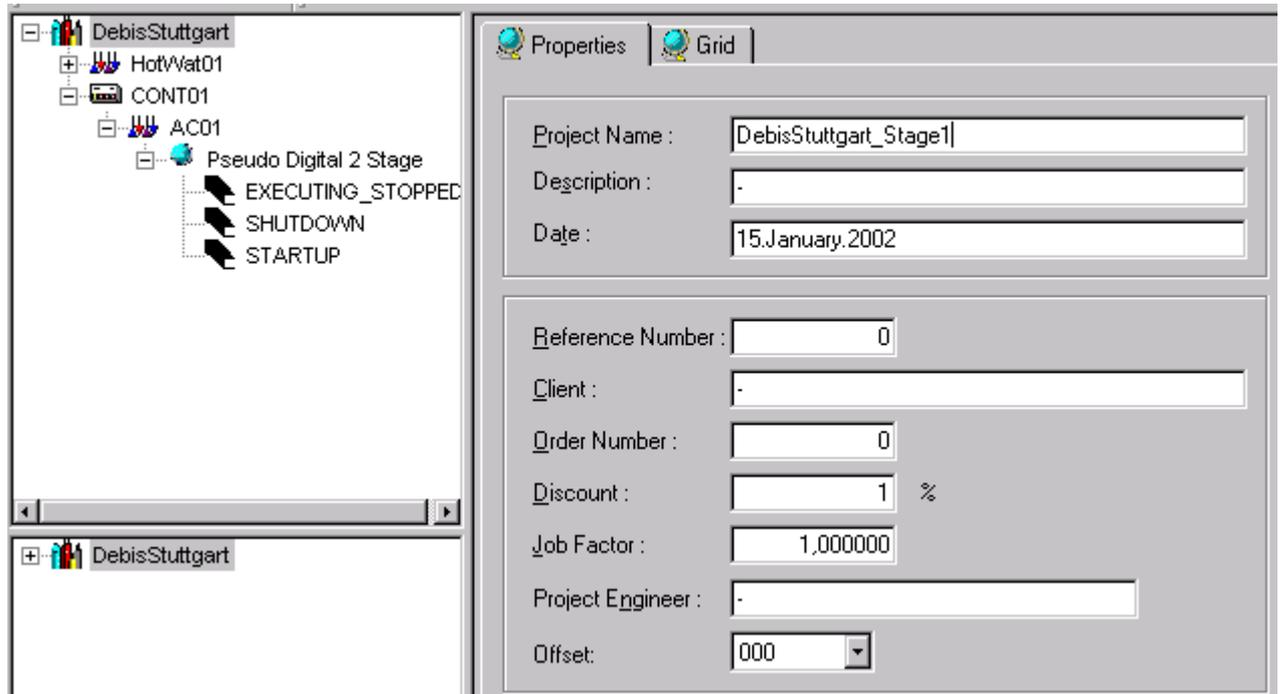
4. On the Properties tab, change project information, if desired. For detailed description of the fields, please refer to the Create New Project section.

---

## Rename Project

---

- Purpose** Rename a project.
- Procedure**
1. In the logical plant tree, click on the project.
  2. On the Properties tab on the right, rename the project in the Project Name field.



3. In the logical plant tree on the left, click on the project.

---

## Delete Project

- Purpose** Delete a project.
- Procedure**
1. With right mouse key, click on the project in the logical plant tree.
  2. With left mouse key, click on Delete in the context menu.
- RESULT: A message box displays.
3. Click Yes to delete the project.

---

## Display/Change Project Information

- Purpose** Display and/or change project information such as reference number, client name, and order number.
- Procedure**
1. In the logical plant tree, click on the project.
  2. On the Properties tab on the right, change desired project data.
- For detailed description of the fields, please refer to the Create New Project section and the Enter Project Offset section.

---

## Enter Project Offset

- Purpose** The project offset is used for calculating unique program IDs for the network interfaces if more than one CARE project is used for the same construction project. The offset is only effective for controllers being newly created.
- Procedure**
1. In the logical plant tree, double-click on project name.

Properties | Grid

Project Name : Debis\_Berlin\_Stage1  
Description :  
Date : 08.February.2002

Reference Number : 0  
Client : Debis  
Order Number : 0  
Discount : 1 %  
Job Factor : 1,000  
Project Engineer :  
Offset: 000

User Addresses  
 Unique  
 Non-unique

Units of Measurement  
 International  
 Imperial

Project Subdirectory  
c:\care\projects\ Debis

000  
000  
001  
002  
003  
004  
005

The screenshot displays the 'Properties' tab of a software application. The interface is organized into several sections:

- Project Information:** Fields for 'Project Name' (Volkswagen), 'Description' (-), and 'Date' (19.Juli 2004).
- Identification:** Fields for 'Reference Number' (0), 'Client' (-), 'Order Number' (0), 'Discount' (1 %), 'Job Factor' (1,000), and 'Project Engineer' (-).
- Offsets:** A section containing 'Program ID Offset' (000) and 'Controller Number Offset' (0).
- User Addresses:** Radio buttons for 'Unique' (selected) and 'Non-unique'.
- Units of Measurement:** Radio buttons for 'International' (selected) and 'Imperial'.
- Character Set:** A dropdown menu set to 'ANSI X3.4'.
- Project Subdirectory:** A text field showing the path 'c:\care\projects\ Volkd000'.

2. From the Offset respectively Program ID Offset (BACnet project) drop-down listbox , select an offset value.

---

## PLANTS DEFINITION AND MANAGEMENT

---

**Purpose** This chapter describes how to define and select plants as well as other plant management functions that CARE provides, for example, plant replication and deletion.

CARE functions such as Schematics, Control Strategy, and Switching Logic pertain to specific plants. The first step when you start CARE is to select a project and then a plant. If no plant exists, or if you need a new one, you can create a new plant.

**Shortcuts** You can copy existing plants and then modify the copies to create new plants more quickly. You can also copy plants to other projects to reuse them.

CARE also provides a library of standard plants that you can use in any project. See Excel 5000™ Control Application Manual 74-3958 for descriptions of the applications. The Copy Applications from the Control Application Library section describes how to load a standard application.

**Maximum Plants** You can define a maximum of 128 plants per controller.

**Chapter Contents**

- Create New Plant
- Display/Change Plant Information
- View Plant Schematic
- Replicate a Plant
- Rename a Plant
- Copy a Plant
- Delete a Plant

**See Also** ⇒ File Management chapter for procedures to back up and restore plants

Appendix Plant and Controller Upgrades and Downgrades for details on changing the OS version for a plant

---

### Create New Plant

---

**Purpose** Define a plant name, select a plant type and preferred target I/O hardware, and assign a controller (if desired).

You can define a maximum of 128 plants per controller.

When creating a plant, you can instantly attach the plant to a controller or create it unattached for later attachment.

**Procedure**

1. In the logical plant tree, click on the controller, to which you want attach the plant.  
Or, if you want to create an unattached plant for later attachment, click on the project.

2. Click menu item Plant, then drop-down item New.

RESULT: The New Plant dialog box displays.

3. Type a plant name in the Name field (the new name cannot match an existing plant name in the project). Maximum 30 alphanumeric characters; no spaces; first character cannot be a number.
4. From the Plant Type drop-down listbox, select desired type:
 

Air Conditioning	Air handler or fan system building blocks.
Chilled Water	Cooling tower, condenser water pumps, and chiller building blocks.
Elink	Elements that represent system points for Excel 10 Controllers.
Hot Water	Boilers, converters, and hot water system building blocks.
5. From the Plant OS Version drop-down listbox select desired version. This number is the OS version of the controller where the plant will be downloaded. See Appendix for rules on upgrading/downgrading controller versions.
6. From the Plant Default File Set drop-down listbox, select desired plant default file. Plant default files are customized project defaults for use in specific areas or regions generated in the Default Text editor (see Default Text Editor chapter). A short description for the selected default file set is given below the drop-down list box.
7. Under Units of Measurement, select the desired type for the plant, International (metric) or Imperial. This selection tells the Control Strategy EMS icons which type of inputs to accept, Celsius or Fahrenheit. Units of Measurement applies not to ELink applications.
8. Under Preferred Target I/O Hardware, select desired target I/O hardware (only applies to OS versions 2.0 and higher):
 

Standard I/O	
Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).	
Distributed I/O	
Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).	
Open LON	

Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.04 and higher)

**9. Click OK.**

**RESULT:** If the new name is acceptable, software closes the dialog box. In the logical plant and network tree, the plant is added below the controller (plant attached) or below the project (plant unattached).

**10.** CARE software performs validation checks for an attached plant while you are creating schematics, control loops, and switching tables for the plant. For example, if you attach the plant to an Excel 80 controller, CARE issues warning messages if you add too many points to the plant schematic.

**Restrictions**

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

- DO Pulsed Digital Output
- FF Flex DO\_Feedback\_DI
- FM Flex Multistage
- FP Flex Pulse2
- GA Global Analog
- GD2 Global Digital 2state
- GDn Global Digital Nstate
- PT Pseudo Totalizer
- TO Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

---

## Create Plant Schematic

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Please refer to the PLANT SCHEMATICS chapter.

---

## Add Control Strategy to Plant

---

Please refer to the CONTROL STRATEGY chapter.

---

## Add Switching Logic to Plant

---

Please refer to the SWITCHING TABLES chapter.

---

## Display/Change Plant Information

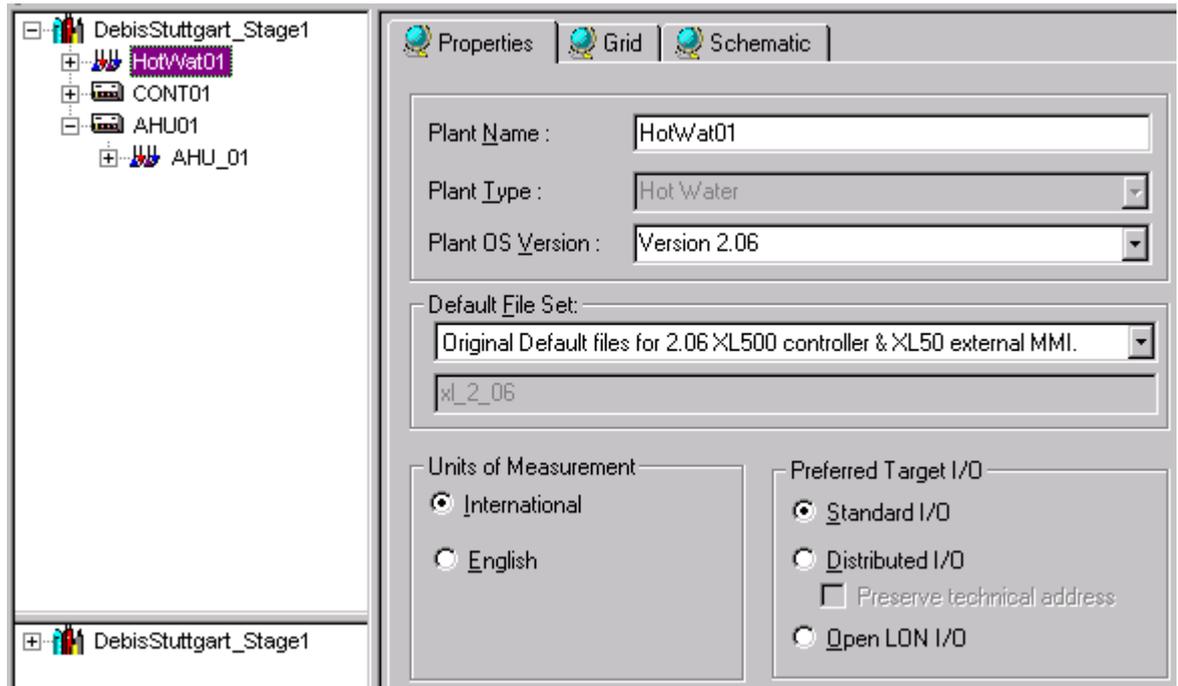
---

**Purpose** Display/Change the Plant Information such as plant name, plant type, OS version with corresponding default file set, engineering unit, and target I/O hardware selection.

**Attached or unattached plant** You cannot change any item of attached plants except the target I/O hardware, if the plant OS version is 2.0 or higher. For unattached plants you can change any item except plant name and plant type.

**Procedure**

1. In the logical plant tree, click on plant you want to display/change plant information for.



2. On the Properties tab on the right, change desired plant data as described in the following.
3. Plant OS Version is the OS version of the controller where the plant will be downloaded. Select desired version from the list. Note that depending on the version number and state of the plant, error messages may occur if you change Plant OS Version. See Appendix Plant and Controller Upgrades and Downgrades for details on changing the OS version for a plant.
4. Plant default files are customized project defaults for use in specific areas or regions generated in the Default Text Editor. Plant Default Files Set includes all plant default files to the corresponding OS version selected under Plant OS Version. To select a different file, click the drop down arrow, and then click the desired file from the list. A short description for the selected default file set is given below the drop-down list box.
5. Units of Measurement selection affects the operation of the icons in Control Strategy that perform EMS operations. The values for the inputs and outputs are different depending on the selection of International (metric) or Imperial units. To change Units of Measurement, click desired type, International or Imperial.
6. Preferred Target I/O displays the module type that the hardware points of the plant are assigned to (only applies to OS Versions 2.0 and higher):

**Standard I/O**

Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).

**Distributed I/O**

Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).

**Open LON**

Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.04 and higher)

If desired, change the target I/O hardware by clicking the corresponding radio button.

Preserve technical address refers to modification of the target hardware via the Standard I/O and Distributed I/O radio buttons, if point changes in the TAF have already been made before (only applies to Excel 500 controller OS Versions 2.0 and higher).

Enabling this checkbox when changing the target hardware results in the following:

Points that are already assigned to that target hardware type, which will be changed to, preserve their technical address on the corresponding module.

Disabling this checkbox when changing the target hardware results in the following:

Points that are already assigned to that target hardware type, which will be changed to, may lead to a change of the technical address on the corresponding module. The Attach process optimizes for best use of modules.

**7. Click **OK** to confirm.**

**RESULT:** An attached plant will be automatically detached, all empty hardware modules will be removed and the plant automatically attached to the selected target hardware.

**Restrictions**

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

**IMPORTANT**

*When an Excel 500 controller is full, that is, the maximum number of modules has been reached, a change in the **plant** target I/O hardware will not be able to create any different module type. Therefore the actual hardware will not change, even if the setting for the plant is changed. In this case you have to do manual changes via the Terminal Assignment or set the Controller to the other target I/O hardware which will affect **all** plants.*

---

## Change Target I/O Hardware for a Plant

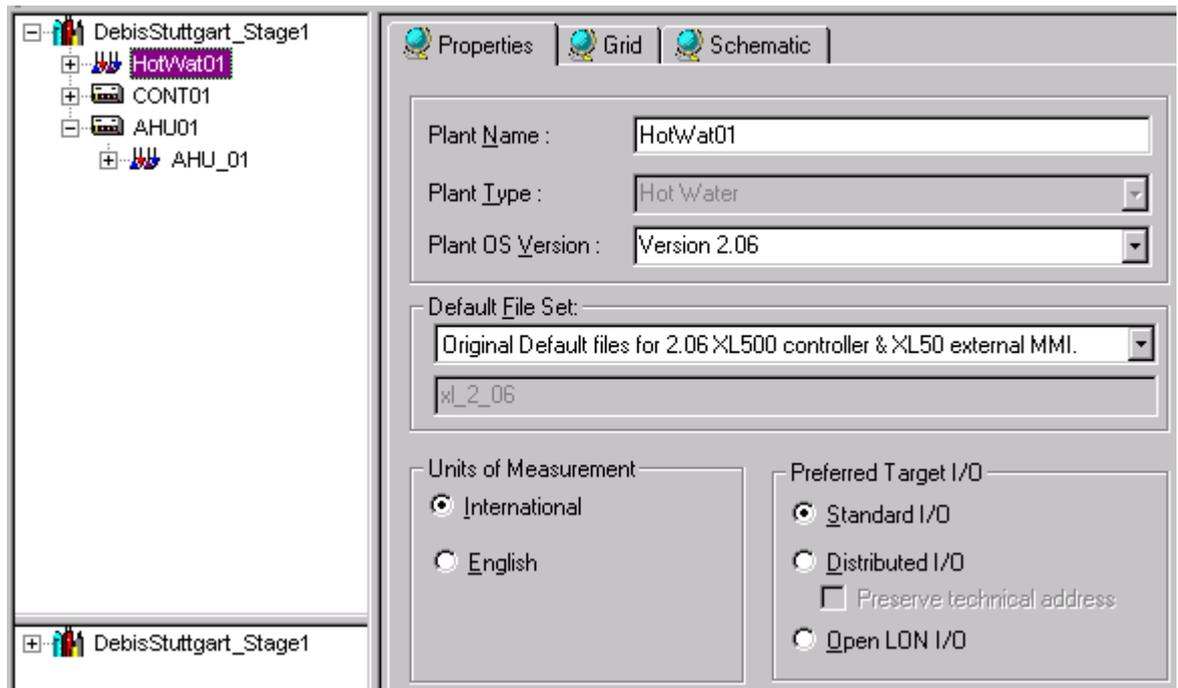
**NOTE:** This function is only applicable to the Excel 500, Smart and 50 controllers with its relevant OS Versions, 2.0 and higher.

**Purpose**

Modify target I/O hardware from standard I/O (IP bus modules) to distributed I/O (LON-bus modules) to Open LON with boardless points and vice versa. All changes are possible. This allows to create a mixed hardware configuration on the same controller. To create a unique hardware configuration refer to the ModifyTarget I/O Hardware for a Complete Controller section.

**Procedure**

1. In the logical plant tree, click on plant you want to change target hardware for, in this case an unattached plant.



2. On the Properties tab on the right, select desired hardware by clicking corresponding radio button under Preferred Target I/O:

#### Standard I/O

Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).

#### Distributed I/O

Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).

#### Open LON

Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.04 and higher)

The Preserve Technical Address checkbox refers to modification of the target hardware, if point changes in the TAF have already been made before.

Enabling this checkbox results in the following:

Points that are already assigned to that target hardware type, which will be changed to, preserve their technical address on the corresponding module.

Disabling this checkbox results in the following:

Points that are already assigned to that target hardware type, which will be changed to, may not necessarily preserve their technical address on the corresponding module. The Attach process optimizes for best use of modules.

3. Click on the plant icon in the logical plant tree.

**RESULT:** An attached plant will be automatically detached, all empty hardware modules will be removed and the plant automatically attached to the selected target hardware.

### Restrictions

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

**IMPORTANT**

*When an Excel 500 controller is full, that is, the maximum number of modules has been reached, a change in the **plant** target I/O hardware will not be able to create any different module type. Therefore the actual hardware will not change, even if the setting for the plant is changed. In this case you have to do manual changes via the Terminal Assignment or set the Controller to the other target I/O hardware which will affect **all** plants.*

---

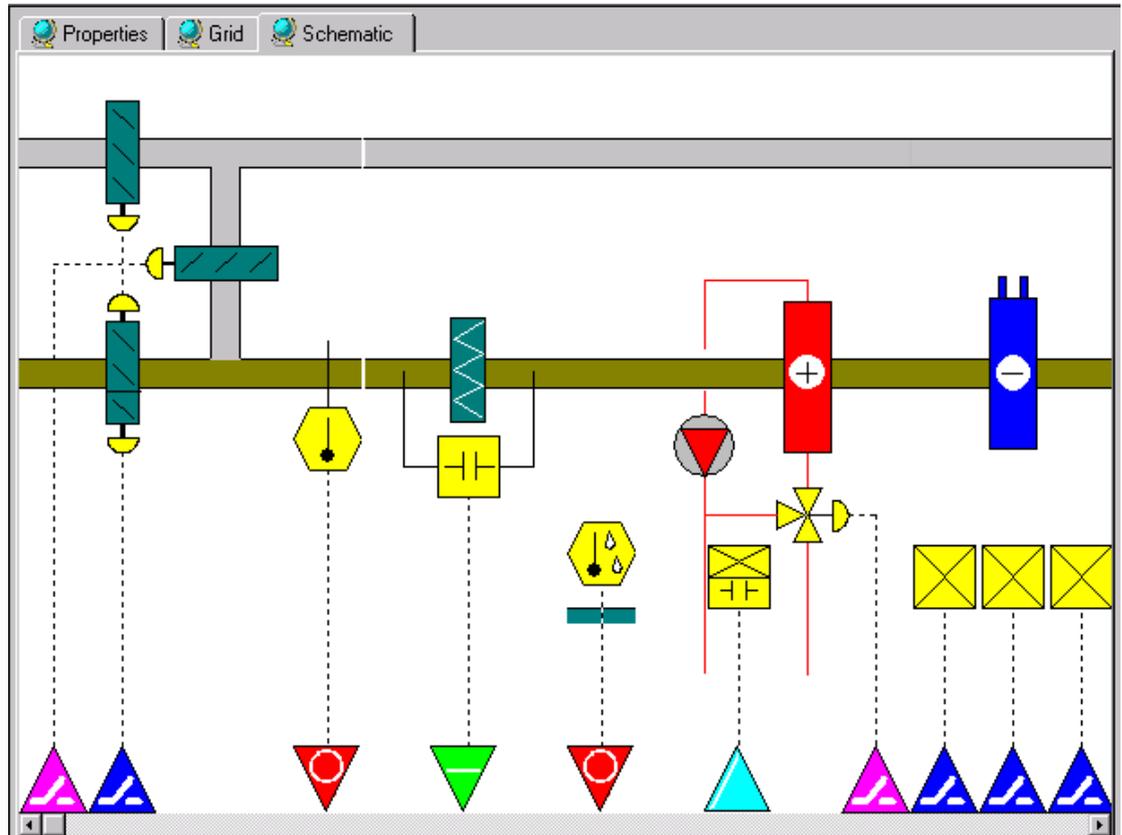
## Display Plant Schematic

---

**Purpose** Quick view of the plant schematic without editing.

- Procedure**
1. In the logical plant tree on the left, click on the plant.
  2. On the right pane, click on the Schematic tab.

**RESULT:** The schematic is displayed without the possibility for editing. For detailed information about editing/creating plant schematics etc., please refer to the PLANT SCHEMATICS chapter.



3. Use the horizontal scroll bar to view the complete schematic.

## Replicate Plant

**Purpose** Create one or more copies of an attached or unattached plant and its information. This function is useful in reducing the amount of time necessary to set up similar plants in a project. When replicating a plant, the following information will be copied and changed during the replication process:

- Plant name
- Datapoint names
- LON object names and NV names (only if LON controller is applied)
- OPS subsystem names and OPS point names (only if OPS controller is applied)
- Mapping information between LON points, respectively OPS points and CARE datapoints

To get the replication well done, the user need to set in advance how the particular information items should be changed. For the new plant, each item to be generated, will be composed of several, partly freely definable, items.

Example: Creation of plant name

The new plant name can be composed of the following items:

- Project name where the plant belongs to
- Controller name where the plant is attached to
- Plant name (current plant name)
- Custom text (freely definable)
- Counter (numerical and/or alphabetical with incremental step)
- Replicate counter (counts the number of replications)

**Rules for Composition** The new name, in this case the plant name **must** be composed of at least **one name** (project, or controller, or plant) **or custom text and one counter**:

**IMPORTANT**

A counter must be used in any case the times to replicate is higher than 1.

Each name or custom text can be used as variable item which means that the full text of the source item is taken for composing the new name or as fixed item which means that the source item is taken with a defined length. The length of the item is defined by Start and Length, e.g.:

Source item **Exhibition** with Start = 1 and length = 4 results in Exhi,  
 Source item **AirportMunich** with Start = 4 and length = 7 results in portMun

Example: Creating new plant name based on source items with variable length

	Project name	Controller name	Current plant name	Number of Replications	New plant names
	AirportMunich	TerminalA	TerminalA	3	
<b>Items selected for composition</b>					
Plant name			x		TerminalA01
Counter (numerical, incremental step = 1, length format = 2)					TerminalA02 TerminalA03
Project name	x				AirportMunich01
Counter (numerical, incremental step = 1, length format = 2)					AirportMunich02 AirportMunich03
Project name	x				AirportMunichTerminalA01
Plant			x		AirportMunichTerminalA02
Counter (numerical, incremental step = 1, length format = 2)					AirportMunichTerminalA03

Example: Creating new plant name based on source items with fixed length

	Project name	Controller name	Current plant name	Number of Replications	New plant names
	AirportMunich	TerminalA	TerminalA	3	
<b>Items selected for composition</b>					
Plant name (Start=1, length=4)			x		Term01
Counter (numerical, incremental step = 1, length format = 2)					Term02 Term03
Project name (Start=1, length=4)	x				AirpA
Counter (alphabetical, incremental step = 1, length format = 1)					AirpB AirpC
Project name (Start=1, length=10)	x				AirportMunichTerm0A
Plant name (Start=1, length=4)			x		AirportMunichTerm0B AirportMunichTerm0C
Counter=alphabetical, incremental step = 1, length format = 2					

The same procedures must be applied in a corresponding fashion for the datapoint names, the LON items and the OPS items.

**Restrictions and Inconsistencies**

Note, that the max. length for datapoint names is 18 characters and for plant names 30 characters. If the new datapoint names are longer than 18 characters, CARE truncates the letters beyond 18. If the plant name used for datapoint names creation is more than 18 characters, all new datapoint names are truncated to the same 18-character name.

The length for NV names is restricted to 21 characters, the length of NV object names is restricted to 16 characters. Names longer than 21, respectively 16 characters will abort the translation of the application and must be reworked.

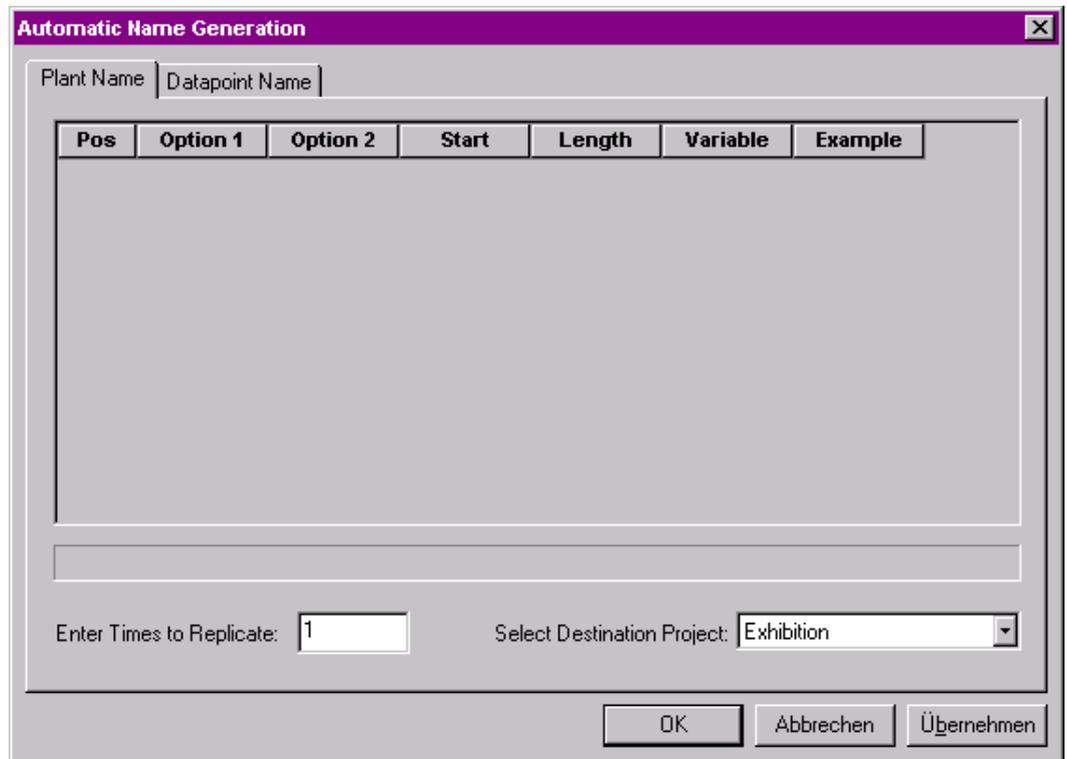
The length for OPS subsystem names and OPS point names is restricted to 32 characters.

Besides long names, CARE will also detect double, non-unique names and the use of invalid characters. They will be displayed in bold in a tree structured dialog for changing. For the OPS controller multiple identical names are allowed.

**General Procedure for any Controllers**

1. In the logical plant tree, click on the plant, you want to replicate.
2. Click menu item Plant, then drop-down item Replicate.

RESULT: The Automatic Name Generation dialog box displays.



The new name of the plant will be composed of several items. For each item, a row have to be inserted where the item will be defined. The new name starts with the first row at position one. Every further row is adding a new item to the previous one building up the new plant name.

**Defining new Plant Name**

3. Click right mouse button and click Add Row.

RESULT: A row is inserted.

Automatic Name Generation

Plant Name | Datapoint Name

Pos	Option 1	Option 2	Start	Length	Variable	Example
1					<input type="checkbox"/>	

Enter Times to Replicate:  Select Destination Project:

OK Abbrechen Übernehmen

4. In the Option 1 column, select item, which the new plant should start with.

The following items are available:

- Project name
- Controller name
- Plant name
- Replicate Counter
- Counter 1..n
- Counter A..Z
- Custom text

5. For example, select Project name. The project name is displayed in the Example column.

6. If you want to use the whole project name for the new plant name, check checkbox in the Variable column.  
If you want to use a part of the project name, uncheck the Variable checkbox and define the part by selecting its start in the Start column and its length in the Length column.

Example: Project name = Exhibition, Start = 1, Length 5  
Result = Exhib

The result is displayed at the bottom of the dialog box.

**Automatic Name Generation** [X]

Plant Name | Datapoint Name

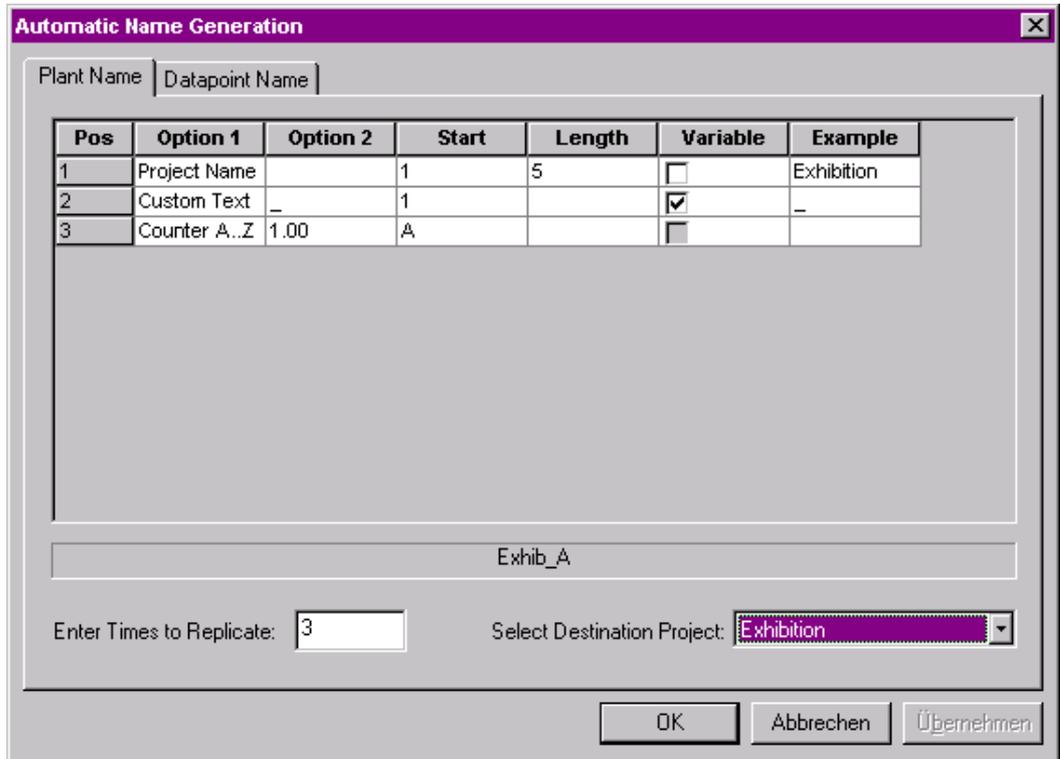
Pos	Option 1	Option 2	Start	Length	Variable	Example
1	Project Name		1	5	<input type="checkbox"/>	Exhibition

Exhib

Enter Times to Replicate:       Select Destination Project:

OK    Abbrechen    Ü**ber**nehmen

7. Add new row(s) for further item(s) to be included into the new plant name by clicking right mouse button and selecting Add Row.
8. Select second component for the new plant name in the Option 1 column of the second row. For example, select Custom text. As described for the first row, where project name was selected, define whether the custom text should be used as variable full text or as name with fixed length. Enter the custom text, for example an underscore.
9. Select third component for the new plant name in the Option 1 column of the third row. For example, select Counter A..Z as alphabetical counter. In the Option 2 column, set the increment for the counter. Define the Start of the counting in the Start column.



Example: Option 1 = Counter A..Z, Option 2 = 1.00 (increment), Start = A

Result: A counter in single-digit format starting with A and incremental step of 1.

**IMPORTANT**

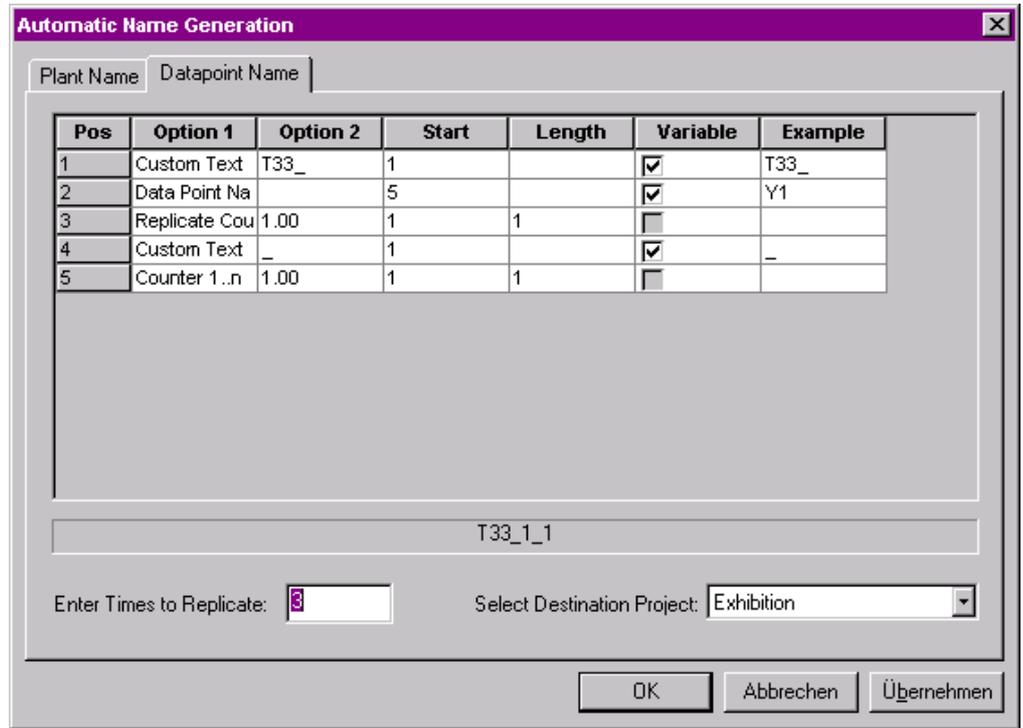
*A counter must be used in any case the times to replicate is higher than 1.*

- 10. Into the Number of Times to Replicate field, enter the number of times for replication.
- 11. From the Select Destination Project drop-down listbox, select the project, which the replicated plants should be assigned to.

**Defining new Datapoint Names**

- 12. Click on Datapoint Name tab.
- 13. Click right mouse button and select Add Row for every desired row you want to insert.
- 14. Compose the new datapoint names in a corresponding fashion by following the rules for composition you applied when composing the new plant names.

For example, apply the options as shown in the following dialog (next page):



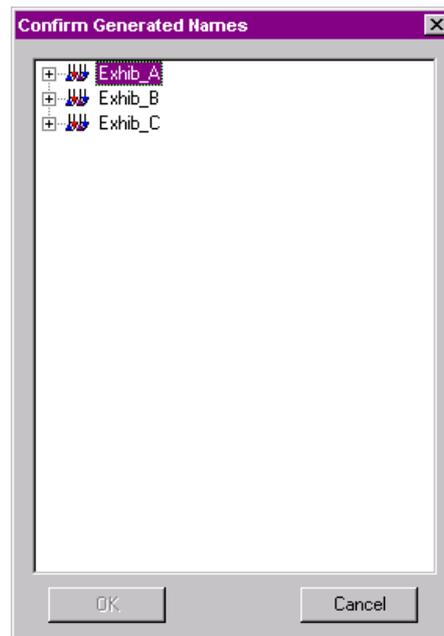
NOTE: When using generated plant name, a replicate counter does not have to be used.

15. Click OK.

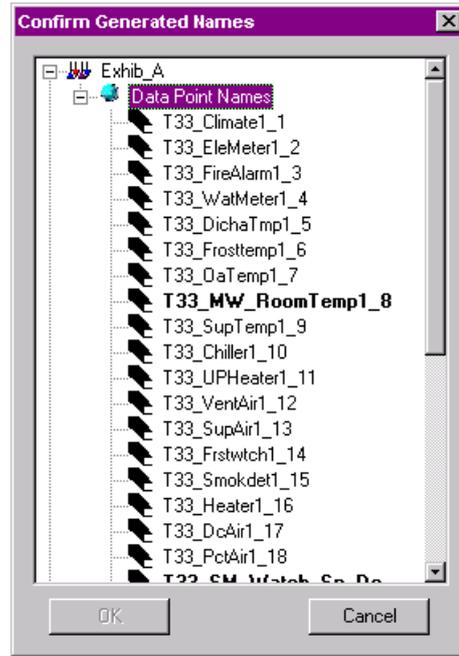
RESULT: In the following cases, messages will be displayed to inform you about inconsistencies in the replicated plants:

- plant and/or datapoint names are too long
- plant and/or datapoint names are not unique
- plant and/or datapoint names include invalid characters, e.g. quotation marks

Nevertheless, the Confirm Generated Names dialog box is displayed showing all generated plants in a tree.



16. If messages about inconsistencies were displayed before, open the tree to check the result. Inconsistent names are displayed in bold.



17. To edit inconsistent names which are too long or non-unique or which include invalid characters, highlight name and click on it.
18. If desired, edit correct names, which you want to edit explicitly.
19. Confirm by clicking OK.

RESULT: The replicated plants are now available for attachment to the controller.

NOTE: When using the Replicate command again, the last generated rules are preset by default.

### Additional Procedure for LON controllers

NOTE: The following LON controller related tabs (next page) are only displayed if the current controller is a LON controller.

#### **IMPORTANT**

*Note that the restriction of the name length is 21 characters for NV names and 16 characters for NV object names. Names longer than 21, respectively 16 characters will abort the translation of the application and must be reworked.*

**Automatic Name Generation**

Plant Name | Data Point Name | LON Object Name | NV Name | System Name

Pos	Option 1	Option 2	Start	Length	Variable	Example
1	Custom Text	Room	1		<input checked="" type="checkbox"/>	Room
2	Replicate Cou	1.00	1	1	<input type="checkbox"/>	

Room1

Number of Times to Replicate:  Select Destination Project:

OK Abbrechen Übernehmen Hilfe

#### Defining new LON Object Names

1. Follow the General Procedure steps 1-19 and in addition...
2. ...Click on LON Object Name tab.
3. Click right mouse button and select Add Row for every desired row you want to insert.
4. Compose the new LON object names in a corresponding fashion by following the composition rules you have applied when composing the new plant names.
5. Continue with step 6 and define new NV names.

#### Defining new NV Names

6. Click on NV Name tab.
7. Click right mouse button and select Add Row for every desired row you want to insert.
8. Compose the new NV names in a corresponding fashion by following the composition rules you have applied when composing the new plant names.
9. Continue with defining new System names as described in the following:

#### Defining new System Names

Note, that LON devices are arranged in the logical LON bus part of the network tree, for example, LON devices controlling a floor may reside in the "Floor" folder. In case you want to replicate, for example, the "Floor" folder with all its devices, the following has to be considered:

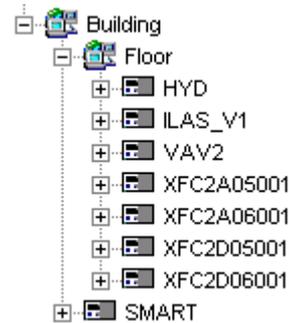
CARE replicates the folder and all devices, bound or unbound, residing in the folder.

#### **IMPORTANT**

*CARE checks all system folders (default and subsystems) for bound devices and takes that folder which hierarchically includes all interconnected devices. Note, that unbound devices residing in the included folders will be replicated too.*

Example:

The "Floor" system should be replicated. Some devices residing in the "Floor" folder are bound to the "SMART" controller. Since the SMART Controller resides in the "Building" system lying one level above, the Building folder will be used as top level folder and replicated too.

**IMPORTANT**

*To avoid undesirable, confusing replication results, move the controller device temporarily to the system folder you want to be replicated, in this case to the Floor folder. After the replication has been finished, move it to the original folder.*

10. Click on System Name tab.
11. Click right mouse button and select Add Row for every desired row you want to insert.
12. Compose the new System names in a corresponding fashion by following the composition rules you have applied when composing the new plant names.
13. Click OK.

RESULT: The Confirm Generated Names dialog box is displayed showing all generated names in a tree structure.

14. If any inconsistent bold names were generated, edit them.
15. Confirm by clicking OK.

NOTE: When using the Replicate command again, the last generated rules are preset by default.

16. Attach the replicated plants to the controller.

---

### Additional Procedure for OPS controllers

NOTE: The following OPS controller related tabs are only displayed if the current controller is an OPS controller.

**IMPORTANT**

*Note that the length for OPS subsystem names and OPS point names is restricted to 32 characters, but multiple identical names are allowed.*

#### Defining new OPS Subsystem Names

1. Follow the General Procedure steps 1-19 and in addition...
2. ...Click on OPS Subsystem Name tab.
3. Click right mouse button and select Add Row for every desired row you want to insert.
4. Compose the new OPS subsystem names in a corresponding fashion by following the composition rules you have applied when composing the new plant names.
5. Continue with step 6 and define new OPS point names.

#### Defining new OPS Point Names

6. Click on OPS Point Name tab.
7. Click right mouse button and select Add Row for every desired row you want to insert.
8. Compose the new OPS point names in a corresponding fashion by following the composition rules you have applied when composing the new plant names.
9. Click OK.
10. If any inconsistent bold names were generated, edit them.
11. Confirm by clicking OK.

**NOTE:** When using the Replicate command again, the last generated rules are preset by default.

---

## Delete a Plant

---

- Purpose** Remove a plant from a project if it is no longer required.
- Procedure**
1. In the logical plant tree, click on the plant, you want to delete.
  2. Click menu item Plant, then drop-down item Delete.  
Or, click right mouse key and with left mouse key click on Delete in the context menu.

**Purpose** CARE includes 6 different Editors to provide the following:

**Miscellaneous Text Editor**

Define and/or edit default and custom texts as:

- Point descriptors
- Alarm texts
- Engineering units
- Characteristics
- Multi-state texts

**Datapoint Editor**

Assign and/or modify attributes to points. Attributes are, for example, texts defined via Miscellaneous Text Editor (descriptors etc.), user address, technical address, delay time, LON attribute etc. They depend on the point type.

NOTE: The Datapoint Editor is only available after a plant has been attached to a controller. The Editors apply to items on a controller basis, not system-wide.

**Network Variables (NV) Editor**

Create/Edit network variables (NVs) for CARE datapoints. Map datapoints to NVs and define value conversion tables for controllers.

**OPS Template Editor**

Create templates for OPS controllers, consisting of subsystem drivers, subsystem controllers, and subsystem points (see OPS Controller chapter).

**Time Program Editor**

Create daily, weekly and yearly time programs.

**Default Text Editor** (see Appendix E)

Customize project defaults for use in a specific area or region.

**Point Definitions**

A point is a variable that contains information about the system and provides control over system operation. There are two types of points, physical and pseudo:

**Physical vs. Pseudo**

*Physical points* refer to controller equipment such as sensors and actuators that sample and modify the environment, for example, space temperature sensors, heating and cooling valves, and dampers. *Pseudopoints* refer to calculation results of software programs.

**Point Types**

Points, called datapoints, can also be input or output as well as analog, digital, or totalizer:

*Input points* represent sensors that measure and report conditions in the environment (for example, temperature, relative humidity, airflow).

*Output points* represent actuators that perform some function in the environment (for example, cooling valves, heating valves, dampers, start/stop relays).

*Analog points* are controller inputs or outputs with a continuous signal characteristic, that is, a range of values. For example, a thermometer can range from below 0 to over 100. An analog point can be physical or pseudo, input or output, and/or global.

*Digital points* are controller inputs or outputs with a discrete signal characteristic, that is, three or four states. For example, a pump can have two states, ON and OFF, and a pulsed transducer can have electrical signals that monitor flow. A digital point can be physical or pseudo, input or output, and/or global.

*Totalizer points* are controller inputs that process pulsed inputs up to 24V dc, for example, metered utility consumption. Totalizer points are always input (not output). A totalizer point can be physical or pseudo. It can also be global.

**Globals** *Global points* are a type of pseudopoint that can be either an input or output. The purpose of global points is to share point information across controllers on a bus. Global inputs *receive* information from a point in another controller. Use a global input when one controller has a point that should be global to many other controllers.

Global outputs *send* information to other points in other controllers. Use a global output when one controller has a point that is global to only one point in another controller. You can also use global outputs for some control icons that only connect to outputs and the output must be global. Global outputs can only be associated with pseudopoints or output points (not input points).

For more details on the operation of global points, see Global Analog Point Editor Dialog Box later in this section.

**Point Addresses** The system tracks points via technical addresses that locate and define the point. Operator's command and display points via user addresses.

**User Address** Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Examples: Rmtempfl1 and FlotempG/fl. This name and the descriptor further define the point. The name, not the descriptor, must be unique within a controller.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

**Technical Address** Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs representing controller number (0-30), module number (1-16), and terminal number (1-12). Example: 010310 meaning Controller 1, Module 3, terminal 10.

---

## Datapoint Editor

---

**Purpose** Define and/or modify attributes for points. Attributes are descriptive information for points and depend on the type of point. For example, analog points specify high and low warning and alarm limits, while digital points specify runtime values.

## Edit Datapoints

The Datapoint Editor is accessible via logical plant tree.

**Procedure**

1. In the logical plant tree, click on desired datapoint, you want to edit

**RESULT:** On the right pane, the Properties tab displays the datapoint attributes.

The screenshot displays the Datapoint Editor interface. On the left, a logical plant tree shows the hierarchy: DebisStuttgart\_Stage1 > CONT02 > AHU\_01 > Digital Input > DaFitAlm. The 'DaFitAlm' datapoint is selected. On the right, the 'Properties' panel is open, showing the following configuration:

- Type:**
  - User Address: DaFitAlm
  - Technical Address: 03/90/00
  - Point Role: (empty)
  - Point Subtype: DI Normally Open
  - Lon Point: Manual Mapping
  - NV Type: (Input) none, (Output) none
- Misc. Editor Functions:**
  - Engineering Unit: Normal / Alarm
  - Descriptor: (empty)
  - Alarm Text: (empty)
- Special Values:**
  - Operator Access Level: 3
  - Service Interval: 0 hrs
  - Write Protect Priority: 0
  - Alarm Delay: 10 sec
  - Critical Alarm Type
  - Suppress Alarm
  - Alarm Point
  - Hide Point
  - Runtime Enabled

2. To get an introduction in datapoint editing, refer to the Basic Working Techniques section. To firstly define/modify texts see the Miscellaneous Text Editor section.

## Basic Working Techniques

## Tree and Information Display

**Hierarchical Tree**

In the logical plant tree, the project is available as hierarchical tree with the following objects:



Project (max. one)



Controller(s)



Plant(s)



Point Types



Single Points

Open and navigate through the tree via common Windows techniques, that is double-clicking on the icon or the + and - symbols at the object icons.

The screenshot displays the CARE software interface. On the left, a hierarchical tree shows the project structure for 'Debis\_Berlin\_Stage1'. The tree is expanded to show 'CONT01' containing 'AHU1', which includes various point types like 'Analog Input', 'Cool1-Cool5', 'DaTemp', 'DuctStatic', 'MaTemp', 'Analog Output', 'Digital Input', 'Digital Output', 'Flex', 'Pseudo Analog', and 'Pseudo Digital 2 Stage'. Below this, a smaller tree shows 'Debis\_Berlin\_Stage1' with 'Bus' and 'LON-Works'.

On the right, the 'Properties' panel is active, showing fields for:
 

- Project Name: Debis\_Berlin\_Stage1
- Description: (empty)
- Date: 08.February.2002
- Reference Number: 0
- Client: Debis
- Order Number: 0
- Discount: 1 %
- Job Factor: 1,000
- Project Engineer: (empty)
- Offsets: Program ID Offset: 000
- User Addresses:  Unique,  Non-unique
- Units of Measurement:  International,  Imperial
- Project Subdirectory: c:\care\projects\ Debis

In the *Standard* toolbar, the filter on/off icon  allows to apply a freely definable filter.

### Information Display

Clicking on the desired object (project, controller, plant, point type, point) in the tree, displays the corresponding information on the corresponding right-sided tab. The information of an object can be displayed differently and depends on the selected display type. You have the following possibilities:

- Itemized Display from within tree
- Grid Display (table)

In the itemized display, you can do the following:

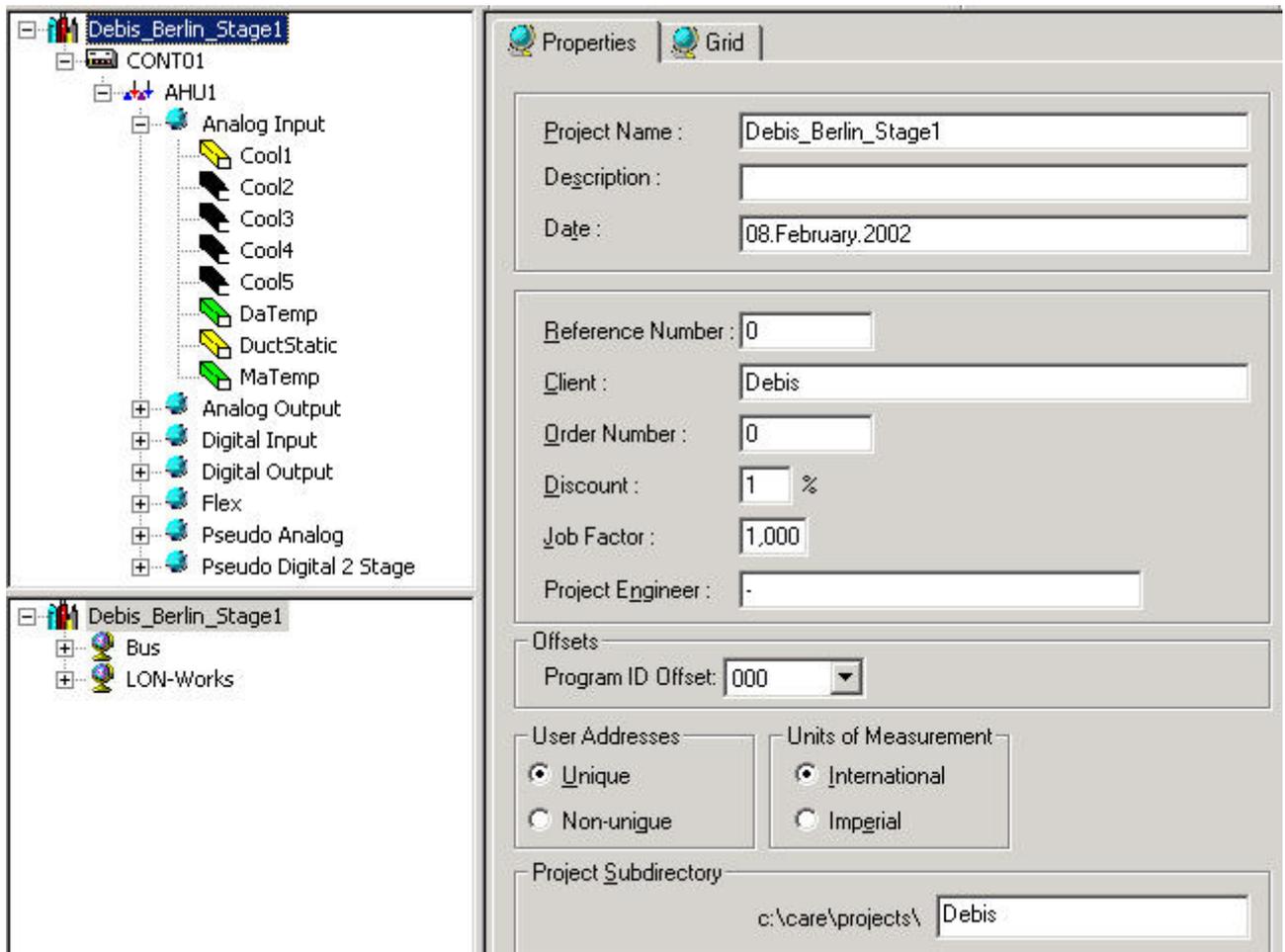
- Display project, controller, and plant information
- Edit attributes of individually selected points
- In addition to the possibility of editing points in itemized display, all points of the same kind can be displayed and edited in grid display when selecting the respective point type icon in the tree.

In the grid display you can do the following:

- Display all points of a project, plant, controller, or point type as grid and edit point attributes in the grid (table).
- Optionally you can display a point in itemized display from within the grid.
- In addition to the possibility of editing all points in grid display, an individual point is always displayed and can be edited in itemized display when selecting it in the tree.

### Examples:

#### Project in Itemized Display (Project Information)



The screenshot displays the CARE software interface. On the left, a tree view shows the project structure for 'Debis\_Berlin\_Stage1'. The tree is expanded to show 'CONT01' and 'AHU1'. Under 'AHU1', there are several point types: Analog Input (with sub-points Cool1-Cool5, DaTemp, DuctStatic, MaTemp), Analog Output, Digital Input, Digital Output, Flex, Pseudo Analog, and Pseudo Digital 2 Stage. Below the tree, a smaller view shows 'Bus' and 'LON-Works'.

On the right, the 'Properties' tab is active, showing the following information:

- Project Name: Debis\_Berlin\_Stage1
- Description: (empty)
- Date: 08.February.2002
- Reference Number: 0
- Client: Debis
- Order Number: 0
- Discount: 1 %
- Job Factor: 1,000
- Project Engineer: -
- Offsets: Program ID Offset: 000
- User Addresses:  Unique,  Non-unique
- Units of Measurement:  International,  Imperial
- Project Subdirectory: c:\care\projects\ Debis



Point in Itemized Display (invoked from within tree)

**Tree View:**

- Debis\_Berlin\_Stage1
  - CONT01
    - AHU1
      - Analog Input
        - Cool1
        - Cool2
        - Cool3
        - Cool4
        - Cool5
        - DaTemp
        - DuctStatic
        - MaTemp
      - Analog Output
      - Digital Input
      - Digital Output
      - Flex
      - Pseudo Analog
      - Pseudo Digital 2 Stage

**Properties Dialog:**

**Type**

User Address: DaTemp IP  
 Technical Address: 01/01/01 Controller: CONT01  
 Plant Info: AHU1  
 Point ID:  
 Point Role:  
 Point Subtype: AI Slow  
 Lon Point: NV - Input  
 NV Type: (Input) SNVT\_temp\_p  
 (Output) none

**Misc. Editor Functions**

Engineering Unit: Deg  
 Descriptor:  
 Alarm Text:  
 Characteristic: PT 1000 Type F1

**Special Values**

Operator Access Level: 3  
 High Alarm Limit: 140.0 Deg  
 High Warning Limit: 130.0 Deg  
 Low Warning Limit: 50.0 Deg  
 Low Alarm Limit: 40.0 Deg  
 Write Protect Priority: 0  
 Sensor Offset: 0.000000  
 Alarm Delay: 10 sec  
 Alarm Hysteresis: 3.0 Deg  
 Trend Hysteresis: 1.0 Deg  
 Critical Alarm Type  
 Suppress Alarm  
 Hide Point

Controller in Grid Display

Debis\_Berlin\_Stage1

- CONT01
  - AHU1
    - Analog Input
      - Cool1
      - Cool2
      - Cool3
      - Cool4
      - Cool5
      - DaTemp
      - DuctStatic
      - MaTemp
    - Analog Output
    - Digital Input
    - Digital Output
    - Flex
    - Pseudo Analog
    - Pseudo Digital 2 Stage

Debis\_Berlin\_Stage1

- Bus
- LON-Works

Properties Grid Terminal Assignment for Controller: CONT01

Point	User Address	Techn. Address	Sensor Offset	Bus	Characteristic	Engineering Unit	Descriptor	Alarm Text	Oper. Access Level	Suppr. Alarm	Critical Alarm (Type)	Alarm Point	Alarm Delay	High Alarm Limit
Filter														
AO	A01	01.02.01		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A010	01.02.02		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A02	01.02.03		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A03	01.02.04		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A04	01.02.05		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A05	01.90.02		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A06	01.06.01		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A07	01.06.02		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A08	01.06.03		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	A09	01.06.04		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	ClgVlv	01.90.03		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AI	Cool1	01.01.04	0,000000	IP	Linear Input	V			3	<input type="checkbox"/>	<input type="checkbox"/>		10	100,0
AI	Cool2	01.01.05	0,000000	IP	Linear Input	V			3	<input type="checkbox"/>	<input type="checkbox"/>		10	100,0
AI	Cool3	01.01.06	0,000000	IP	Linear Input	V			3	<input type="checkbox"/>	<input type="checkbox"/>		10	100,0
AI	Cool4	01.01.07	0,000000	IP	Linear Input	V			3	<input type="checkbox"/>	<input type="checkbox"/>		10	100,0
AI	Cool5	01.01.08	0,000000	IP	Linear Input	V			3	<input type="checkbox"/>	<input type="checkbox"/>		10	100,0
DI	DaFitAlm	01.90.09		IP		Normal			3	<input type="checkbox"/>	<input checked="" type="checkbox"/>		10	
AI	DaTemp	01.01.01	0,000000	IP	PT 1000 Type F.1	Deg			3	<input type="checkbox"/>	<input type="checkbox"/>		10	140,0
FF	Do_Feedback_DI1	DI3				On								
FF	Do_Feedback_DI2	DI3				On								
FF	Do_Feedback_DI3	DI3				On								
AI	DuctStatic	01.90.05	0,000000	IP	Pressure 0.3"	Inw			3	<input type="checkbox"/>	<input checked="" type="checkbox"/>		30	2,00
DI	FrzStat	01.90.10		IP		Normal			3	<input type="checkbox"/>	<input checked="" type="checkbox"/>		10	
AO	HtgVlv	01.03.02		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AO	MaDmpr	01.90.04		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
AI	MaTemp	01.01.02	0,000000	IP	PT 1000 Type F.1	Deg			3	<input type="checkbox"/>	<input type="checkbox"/>		10	90,0
DO	SaFan	01.05.01		IP		On			3	<input checked="" type="checkbox"/>				
DI	SaFanStatus	01.90.00		IP		Off			3	<input type="checkbox"/>	<input type="checkbox"/>		10	
AO	SaFanVolCtrl	01.90.01		IP	LINEAR_GRAPH	Pct			3	<input checked="" type="checkbox"/>				
PD2	EXECUTING_STOPPED					Normal			3	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
PD2	SHUTDOWN					Normal			3	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
PD2	STARTUP					Normal			3	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
PA	static_setpoint					°C	Static setpoi		3	<input checked="" type="checkbox"/>	<input type="checkbox"/>			99999

## Point in Itemized Display (invoked from within Grid Display)

Data Point			
Type			
User Address:	L22_MW_DischarTemp	DIO/LON	
Technical Address:	22/91/01	Controller:	BWMMI_MUKD
Point Role:		Plant Info:	OFFICE_BUILD_VEN
Point Subtype:	AI Slow	Point ID:	
Lon Point:	none		
NV Type: (Input)	none		
(Output)	none		
Misc. Editor Functions			
Engineering Unit:	°C		
Descriptor:	FAX		
Alarm Text:	CHECK SENSOR		
Characteristic:	NTC		
Special Values			
Operator Access Level:	3	High Alarm Limit:	50 °C
		High Warning Limit:	40 °C
		Low Warning Limit:	10 °C
Write Protect Priority:	0	Low Alarm Limit:	5 °C
Sensor Offset:	49,861111	Alarm Delay:	10 sec
<input type="checkbox"/> Critical Alarm Type		Alarm Hysteresis:	0 °C
<input checked="" type="checkbox"/> Suppress Alarm		Trend Hysteresis:	0 °C
<input type="checkbox"/> Hide Point		Trend Cycle:	0 minut.

The display type is set up by the grid configuration function (see Configure Grid section).

## Configure Grid

**Purpose** Configuring the grid includes the following:

- Set up kind of display, itemized or grid display
- Select columns to show in grid and number of frozen columns
- Set up zoom factor and filter line display

**Procedure** 1. Click on menu item Options, then drop-down item Grid Configuration

or,

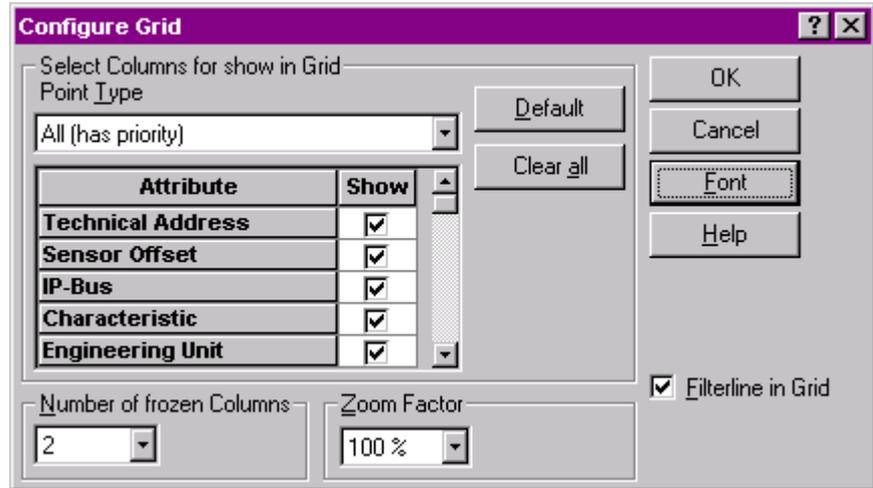
click Configure Grid button  on the toolbar

or,

when in grid display, point cursor over the grid.

Click right mouse button, select Options and click on Grid in the context menu.

RESULT: The Configure Grid dialog box displays.



## 2. Select desired options under:

### Select Columns for Show in Grid

Here you define which attributes for which point types will be displayed in the columns. It is possible to select attributes to be displayed for all points and individually for different point types. This provides the display of single attributes (columns) for all points and to differentiate for which point types the general selected attributes should be displayed or not.

### Point Type

In the drop-down list select the point type for which you want to define the attributes that should be displayed. In the attributes list below check the attributes for the point type in the Show column. Use the default button, if you want to check all attributes. Use the Clear all button, if you want to uncheck all attributes.

In the grid, fields will be grayed and disabled for point types which have not the attribute at all and/or have not checked the attribute for show in the grid.

Options: All (has priority), Analog Input etc.

The settings made for the All (has priority) option are valid for all points and have priority over the settings made for individual point types. But attributes checked for the All (has priority) option will only be displayed as columns, if the same attributes are checked for minimum one point type.

### Example:

If the characteristic is checked for the All (has priority) option and is not checked for the Analog Input point type and Analog Output point type, the Characteristic column will not be displayed. Vice versa the same is true, that is, even if the characteristic is checked for the analog input and output point types, and for All (has priority) the characteristic is not checked, the Characteristic column will not be displayed.

All (has priority) Characteristic checked  
 Analog Input Characteristic checked  
 Analog Output Characteristic checked

All (has priority) Characteristic checked  
 Analog Input Characteristic checked  
 Analog Output Characteristic **not** checked

Point	User Address	Techn. Address	Characteristic
Filter			
AI	L22_MW_DischarTemp	22/01/04	NTC Type F
AI	L22_MW_Frosttemp	22/01/02	Direct Out 0-100%
AI	L22_MW_OaTemp	22/01/01	NTC
AI	L22_MW_RoomTemp	22/01/05	Roomsensor
AI	L22_MW_SupplyTemp	22/01/03	NTC
AO	L22_ST_EH_Valve	22/02/04	LINEAR_GRAPH
AO	L22_ST_KL_DistrAir	22/02/03	0-10 Volt
AO	L22_ST_KL_Mixer	22/02/02	LINEAR_GRAPH
AO	L22_ST_KL_SupplAir	22/02/01	PT 1000 Type C/I
AO	L22_ST_KÜ_Valve	22/02/05	PT 1000 Type F/I
DI	L22_BM_But_Climate	22/03/03	
DI	L22_BM_FireAlarm	22/03/09	
DI	L22_SM_Frostwatch	22/03/07	
DI	L22_SM_Smokedetect	22/03/08	
DI	L22_SM_UP_Heater	22/03/10	
DI	L22_SM_Vent_DcAir	22/03/05	
DI	L22_SM_Vent_SupAir	22/03/04	
DI	L22_SM_Watch_Sp_Dc	22/03/06	
DO	L22_SB_UP_Chiller	22/04/02	
DO	L22_SB_UP_Heater	22/04/01	
DO	L22_SB_Vent_DcAir	22/04/04	
DO	L22_SB_Vent_SupAir	22/04/03	
TO	L22_BM_ElectrMeter	22/03/01	
TO	L22_BM_WaterMeter	22/03/02	
FF	DO_Feedback_DI	DI3	
FM	Multi	DO6	
FP	Pulse2	DO2	
PA	L22Akt_Demand_AC		
PA	L22Akt_SW_Room		
PA	L22VZ_SW_Room		
PD2	EXECUTING_STOPPED		
PD2	SHUTDOWN		
PDn	STARTUP		
PT	PT1		
PT	PT2		
GA	GA1	00/00/00	

Points without the Characteristic attribute

Point	User Address	Techn. Address	Characteristic
Filter			
AI	L22_MW_DischarTemp	22/01/04	NTC Type F
AI	L22_MW_Frosttemp	22/01/02	Direct Out 0-100%
AI	L22_MW_OaTemp	22/01/01	NTC
AI	L22_MW_RoomTemp	22/01/05	Roomsensor
AI	L22_MW_SupplyTemp	22/01/03	NTC
AO	L22_ST_EH_Valve	22/02/04	
AO	L22_ST_KL_DistrAir	22/02/03	
AO	L22_ST_KL_Mixer	22/02/02	
AO	L22_ST_KL_SupplAir	22/02/01	
AO	L22_ST_KÜ_Valve	22/02/05	
DI	L22_BM_But_Climate	22/03/03	
DI	L22_BM_FireAlarm	22/03/09	
DI	L22_SM_Frostwatch	22/03/07	
DI	L22_SM_Smokedetect	22/03/08	
DI	L22_SM_UP_Heater	22/03/10	
DI	L22_SM_Vent_DcAir	22/03/05	
DI	L22_SM_Vent_SupAir	22/03/04	
DI	L22_SM_Watch_Sp_Dc	22/03/06	
DO	L22_SB_UP_Chiller	22/04/02	
DO	L22_SB_UP_Heater	22/04/01	
DO	L22_SB_Vent_DcAir	22/04/04	
DO	L22_SB_Vent_SupAir	22/04/03	
TO	L22_BM_ElectrMeter	22/03/01	
TO	L22_BM_WaterMeter	22/03/02	
FF	DO_Feedback_DI	DI3	
FM	Multi	DO6	
FP	Pulse2	DO2	
PA	L22Akt_Demand_AC		
PA	L22Akt_SW_Room		
PA	L22VZ_SW_Room		
PD2	EXECUTING_STOPPED		
PD2	SHUTDOWN		
PDn	STARTUP		
PT	PT1		
PT	PT2		
GA	GA1	00/00/00	

**Number of frozen Columns**

In the drop-down list, select the number of frozen columns. These columns remain and will always be displayed when you horizontally scroll in the grid. The max. is 4 columns, but you also can select no columns to be frozen.

**Zoom Factor**

Select the zoom factor within the range of 60 through 135 %.

**Default**

To check all attributes for display in the grid, click this button.

**Clear all**

To uncheck all attributes, click this button. No attributes will be displayed in the grid.

**Font**

To select a different font for the grid display, click this button and select desired font in the Fonts dialog box

**Filterline in Grid**

To display the filterline in the grid, check this option. To hide the filterline, uncheck this option (see Use Filterline in Grid chapter).

- Click OK to save settings.
- Click on desired object (project, controller, plant, point type, point) in the tree. The display is updated.

**Edit Points in Grid Display**

The grid displays all points of the project sorted in rows with their attributes ordered in columns.

Point	User Address	Techn. Address	Sensor Offset	Bus	Characteristic	Engineering Unit	Descriptor	Alarm Text
Filter								
AI	L22_MW_DischarTemp	22/01/04	30,	IP	NTC Type F	K	FAX	YOU HAVE CHANGED
AI	L22_MW_FrostTemp	22/01/02	0,0	IP	Direct Out 0-10	°C	FAX	Error
AI	L22_MW_OaTemp	22/01/01	0,0	IP	NTC	°C	VENTILATIONPLANT-OFFICE	CHECK SENSOR
AI	L22_MW_RoomTemp	22/01/05	23,	IP	Roomsensor	°C	VENTILATIONPLANT-OFFICE	YOU HAVE CHANGED
AI	L22_MW_SupplyTemp	22/01/03	0,0	IP	NTC	GPM	FAX	CHECK SENSOR
AO	L22_ST_EH_Valve	22/02/04		IP		°C	text 21	
AO	L22_ST_KL_DistrAir	22/02/03		IP			VENTILATIONPLANT-OFFICE	
AO	L22_ST_KL_Mixer	22/02/02		IP		Inw	VENTILATIONPLANT-OFFICE	
AO	L22_ST_KL_SupplAir	22/02/01		IP		Inw	VENTILATIONPLANT-OFFICE	
AO	L22_ST_KÜ_Valve	22/02/05		IP		Inw	text 45	
DI	L22_BM_But_Climate	22/03/03		IP		ON	VENTILATIONPLANT-OFFICE	YOU HAVE CHANGED
DI	L22_BM_FireAlarm	22/03/09		IP		ON	VENTILATIONPLANT-OFFICE	FIREALARM
DI	L22_SM_Frostwatch	22/03/07		IP		NORMAL	VENTILATIONPLANT-OFFICE	!!! A L A R M !!!
DI	L22_SM_Smokedetect	22/03/08		IP		NORMAL	VENTILATIONPLANT-OFFICE	FIREMESSAGE
DI	L22_SM_UP_Heater	22/03/10		IP		NORMAL	VENTILATIONPLANT-OFFICE	! MALFUNCTION !
DI	L22_SM_Vent_DcAir	22/03/05		IP		NORMAL	VENTILATIONPLANT-OFFICE	! MALFUNCTION !
DI	L22_SM_Vent_SupAir	22/03/04		IP		On	VENTILATIONPLANT-OFFICE	! MALFUNCTION !
DI	L22_SM_Watch_Sp_Dc	22/03/06		IP		NORMAL	VENTILATIONPLANT-OFFICE	FANBELT-DAMAGE
DO	L22_SB_UP_Chiller	22/04/02		IP		ON	COOLING INDEX	
DO	L22_SB_UP_Heater	22/04/01		IP		ON	text 49	
DO	L22_SB_Vent_DcAir	22/04/04		IP		ON		
DO	L22_SB_Vent_SupAir	22/04/03		IP		ON		
TO	L22_BM_ElectrMeter	22/03/01		IP		FPM	ELECTRICITY_METER-OFFICEBUILDING	
TO	L22_BM_WaterMeter	22/03/02		IP		bar	WATERMETER-OFFICEBUILDING	
FF	DO_Feedback_DI	DI3				Manual		
FM	Multi	DO6				AUTO		
FP	Pulse2	DO2				On		
PA	L22Akt_Demand_AC					K	MIXED AIR FLAPS	YOU HAVE CHANGED
PA	L22Akt_SW_Room					°C	VENTILATIONPLANT-OFFICE	
PA	L22VZ_SW_Room					°C	HEATINGPLANT-OFFICE	
PD2	EXECUTING_STOPPED					On	OFFICEBUILDING	
PD2	SHUTDOWN					On	OFFICEBUILDING	
PDn	STARTUP							
PT	PT1							
PT	PT2							
GA	GA1	00/00/00						

On the left point abbreviations bar the points are displayed by the following abbreviations:

AI	Analog Input
AO	Analog Output
DI	Digital Input
DO	Digital Output
FA	Flag Analog
FO	Flag Digital
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Gobal Analog
GD2	Gobal Digital 2state
GDn	Gobal Digital Nstate
PA	Pseudo Analog
PD2	Pseudo Digital 2state

PDn Pseudo Digital Nstate  
 PT Pseudo Totalizer  
 TO Totalizer

**Change rows and column width**

Point cursor between two row/column titles till the cursor turns into the divider symbol. Change size as desired

**Freeze columns**

Click on menu item Options, then drop-down item Grid... to display the Configure Grid dialog box.

Under Number of frozen columns select the number of columns you want always to be displayed while scrolling horizontally within the grid.

Click OK.

**Sort columns**

You can sort certain columns alphabetically in ascending ( A to Z) or descending (Z to A) order.

Double-click the column you want to sort. This affects the order of all other columns.

**Edit fields**

**Formats**

Disabled fields are grayed in all or their text is grayed. Negative values are red-marked. Shared points are blue-marked. The thousand digit is displayed with a dot, the hundred digit with a comma.

**Field types**

There are two different field types you can meet while working in the grid, the simple fields, and the dynamic fields.

**Simple fields**

Simple fields do not show a down arrow. They typically display numeric values. After pointing over the field a few seconds a yellow tool tip displays the range the attribute value in the field can have, and the engineering unit. For example, the tool tip below displays the min. and max. value for the High Warning Limit.

High Warning Limit	Low Warning Limit	Low Alarm Limit
40,0	30,0	5,0
40	20	5
40	30	5
Unit: °C, min : -25,0 max : 112,5		
40,0	30,0	5,0

Locate the point in the point abbreviations bar.

Point a few seconds over the field in the row.

Click into the field and enter the value within the range displayed in the tool tip.

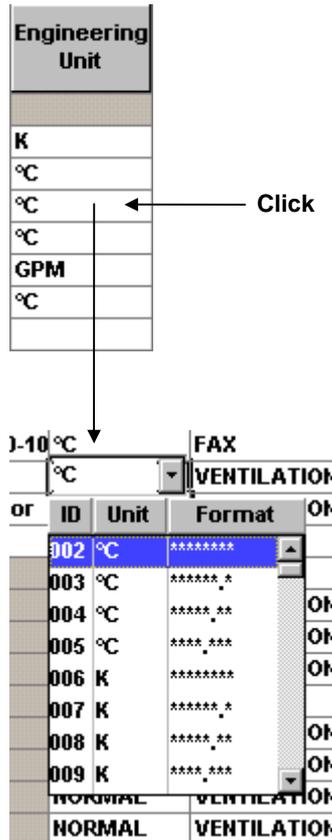
Click outside the field or press ENTER key to confirm.

NOTE: You cannot enter values outside the range.

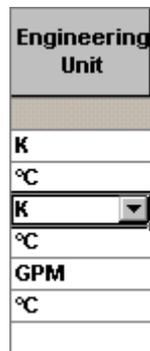
**Dynamic fields**

At first glance dynamic fields look like simple fields.

But after clicking them they get the behavior and look of a drop-down list. That is, they get a down-arrow on the right side to display a drop-down list for selecting an option. The list shows a detailed column wise description of the choices for the attribute (e. g. ID, Unit, Format for the Engineering Unit field).



After selecting an option the down arrow is still displayed.

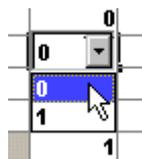


After quitting the field, the down arrow disappears.

**Select Options**

**Drop-down lists**

To select an option from a drop-down list, click on the down arrow at the field and select option from the list.



**Check boxes**

To select an option via check boxes, click on the check box at the desired option.

Point Disab.	Suppr. Alarm
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

**Change of Engineering Units´ Format**

The analog and digital engineering units´ format is displayed in a tool tip when pointing over the field.

In case of changing the format for an engineering unit all corresponding fields (indicated by the engineering unit next to the field) are updated instantly. According to this the decimal places will be cut, if the engineering unit currently selected has less decimal places than the prior selected engineering unit..

**IMPORTANT**

*When changing an engineering unit of the same kind, for example, hrs into min a conversion of the absolute values in the respective fields does not take place. Change the absolute value.*

**Change of Characteristics**

In case of changing a characteristic, either by selecting another characteristic or by changing the reference values via Miscellaneous Text Editor, the high and low alarm and warning limits will be updated due to that change.

**IMPORTANT**

*Change values of the previous, but currently displayed limits, if they are not within the range of the new and updated limits, caused by the change of the characteristics.*

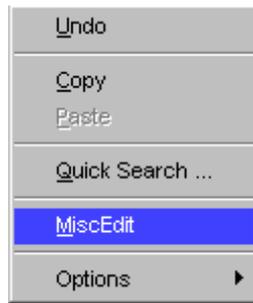
**Define and Edit texts**

Texts are engineering units, descriptors, alarm texts, and characteristics and they can be defined and edited in the Miscellaneous Text Editor.

Select controller in the logical plant tree.

Position mouse cursor over the grid.

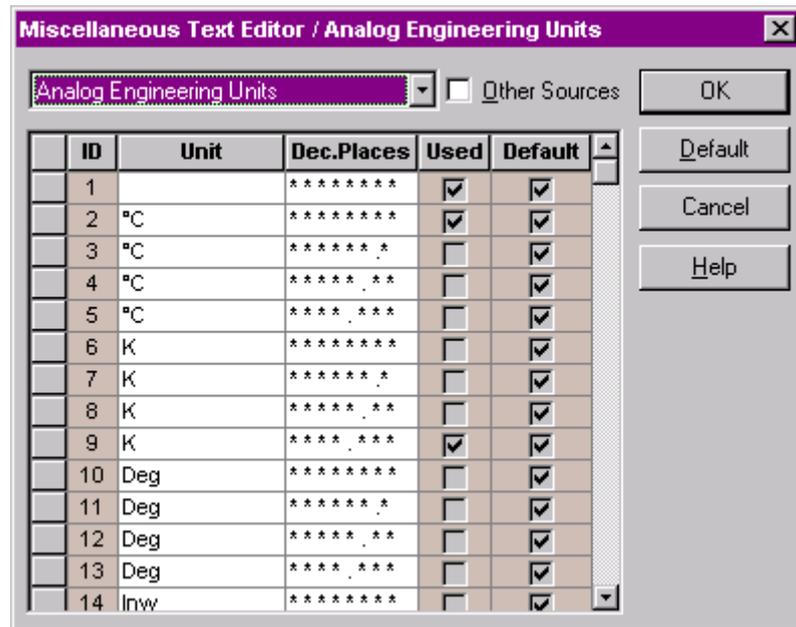
Click right mouse button, and then MiscEdit in the context menu.



or,

click on menu item Options, then drop-down item Edit Text, and desired text (Analog. Eng. Units, etc.)

The Miscellaneous Text Editor dialog box displays.



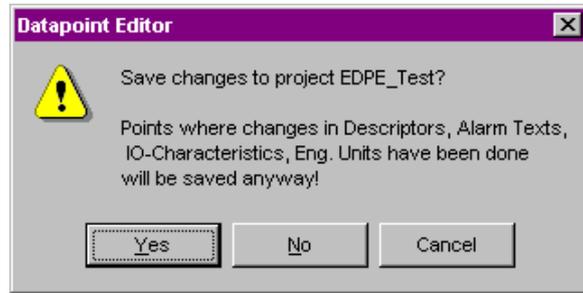
For detailed description of the Miscellaneous Text Editor functions, please refer to the Miscellaneous Text Editor section.

### Save Changes

When working in the grid display, changes you have made, are automatically saved without the need to confirm the changes.

### IMPORTANT

*When closing the project or the Datapoint Editor, software asks if you want to save or discard the last changes that have been done in the **current** grid display. Note that even if you discard changes, points that were changed in descriptors, alarm texts, engineering units, or I/O characteristics will be saved anyway.*



### Edit Points in Itemized Display from within Tree

Click on the point in the tree to display point attributes in itemized display. You exit the dialog by selecting another object in the tree.

<b>Type</b>	
User Address:	L22_MW_DischarTemp
Technical Address:	22/91/01
Point Role:	
Point Subtype:	AI Slow
Lon Point:	none
NV Type: (Input)	none
(Output)	none
DIO/LON Controller: BWMMI_MUKO Plant Info: OFFICE_BUILD_VENTIL Point ID:	
<b>Misc. Editor Functions</b>	
Engineering Unit:	°C
Descriptor:	FAX
Alarm Text:	CHECK SENSOR
Characteristic:	NTC
<b>Special Values</b>	
Operator Access Level:	3
Write Protect Priority:	0
Sensor Offset:	49,861111
<input type="checkbox"/> Critical Alarm Type	
<input checked="" type="checkbox"/> Supress Alarm	
<input type="checkbox"/> Hide Point	
High Alarm Limit:	50 °C
High Warning Limit:	40 °C
Low Warning Limit:	10 °C
Low Alarm Limit:	5 °C
Alarm Delay:	10 sec
Alarm Hysteresis:	0 °C
Trend Hysteresis:	0 °C
Trend Cycle:	0 minut.

### Edit fields

#### Formats

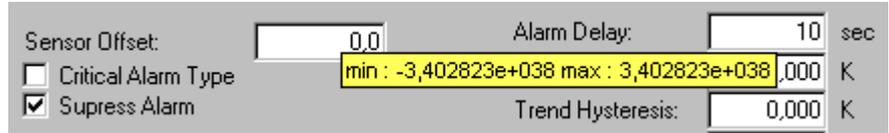
Disabled fields are grayed in all or their text is grayed. Negative values are red-marked. The thousand digit is displayed with a dot, the hundred digit with a comma.

**Field types**

There are two different field types you can meet while working in the itemized display, the simple fields, and the dynamic fields..

**Simple fields**

Simple fields do not show a down arrow. They typically display numeric values. After pointing over the field a few seconds a yellow tool tip displays the range the attribute value in the field can have. For example, the tool tip below displays the min. and max. value for the Sensor Offset. The meaning of +038 is exponent superscript 38.



Locate the point in the point abbreviations bar.  
Point a few seconds over the field in the row.

Click into the field and enter the value within the range displayed in the tool tip.

Click outside the field or press ENTER key to confirm.

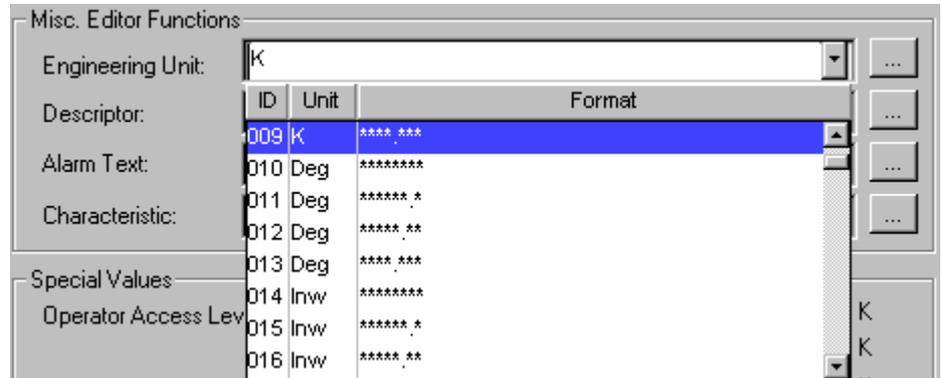
NOTE: You cannot enter values outside the range.

**Dynamic fields**

At first glance dynamic fields look like simple fields.



But after clicking them they get the behavior and look of a drop-down list. That is, they get a down-arrow on the right side to display a drop-down list for selecting an option. The list shows a detailed column wise description of the choices for the attribute (e. g. ID, unit, format for the Engineering Unit field).



After selecting an option the down arrow is still displayed.

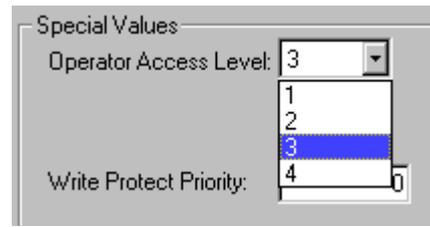


After quitting the field, the down arrow disappears.

**Select Options**

**Drop-down lists**

To select an option from a drop-down list, click on the down arrow at the field and select option from the list.



**Check boxes**

To select an option via check, click on the check box at the desired option.

Point Disab.	Suppr. Alarm
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

**Radio buttons**

To select an option via radio button, click on the radio button at the desired option.

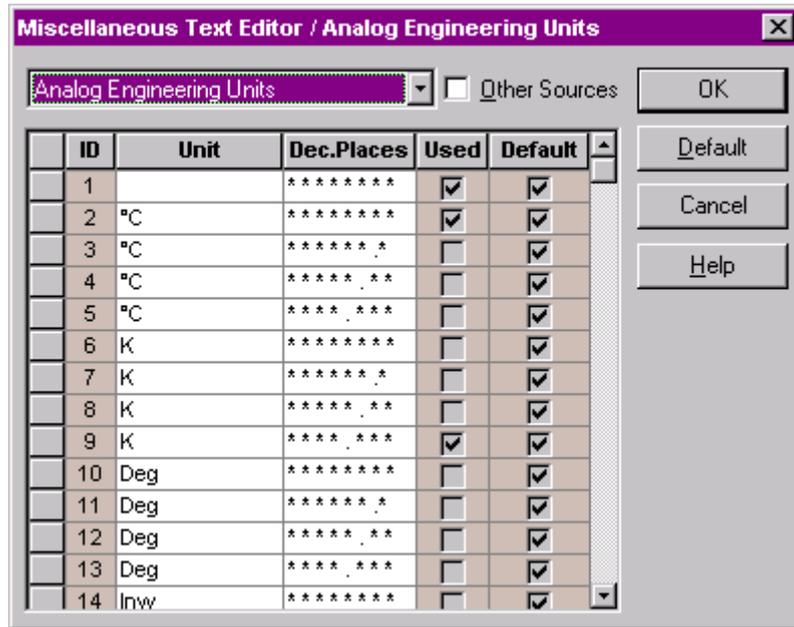


**Define and Edit texts**

Texts are engineering units, descriptors, alarm texts, and characteristics and they can be defined and edited in the Miscellaneous Text Editor.

Click on the datapoint in the tree.

On the Properties tab on the right, click dotted button  in the Misc. Text Editor area to open the Miscellaneous Text Editor dialog box.



For detailed description of the Miscellaneous Text Editor functions, please refer to the Miscellaneous Text Editor section.

### Change of Engineering Units' Format

The analog and digital engineering units' format is displayed in a tool tip when pointing over the field.

In case of changing the format for an engineering unit all corresponding fields (indicated by the engineering unit next to the field) are updated instantly. According to this the decimal places will be cut, if the engineering unit currently selected has less decimal places than the prior selected engineering unit.

#### **IMPORTANT**

*When changing an engineering unit of the same kind, for example, hrs into min a conversion of the absolute values in the respective fields does not take place. Change the absolute value.*

### Change of Characteristics

In case of changing a characteristic, either by selecting another characteristic or by changing the reference values via Miscellaneous Text Editor, the high and low alarm and warning limits will be updated due to that change.

#### **IMPORTANT**

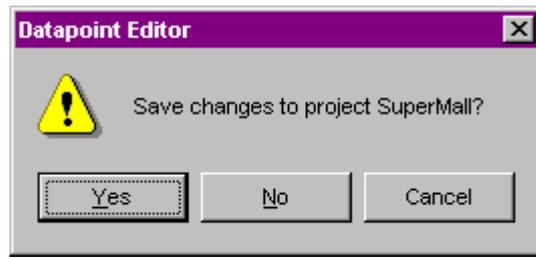
*Change values of the previous, but currently displayed limits, if they are not within the range of the new and updated limits, caused by the change of the characteristics.*

### Save Changes

When working in the itemized display from within the tree, changes you have made are automatically saved without the need to confirm the changes.

#### **IMPORTANT**

*When closing the project or the Datapoint Editor, software asks, if you want to save or discard the **last** changes that have been done to the **current** point displayed. Note that all changes that have been done to points prior to the current point are already saved and cannot be discarded.*



**Edit Points in Itemized Display from within Grid**

**Purpose** Additional feature to edit a point in itemized display, when working in Grid display. .

**Procedure** 1. In the grid, double-click on the point in the point abbreviations bar.

**RESULT:** The corresponding dialog box is displayed showing all attributes like in itemized display. In opposite to the Itemized display, where changes are automatically saved, you must confirm your changes by clicking OK.

Point	User Address	Techn. Address
<b>Filter</b>		
AI	L22_MW_DischarTemp	22/01/04
AI	L22_MW_Frosttemp	22/01/02
AI	L22_MW_OaTemp	22/01/01
AI	L22_MW_RoomTemp	22/01/05
AI	L22_MW_SupplyTemp	22/01/03
AO	L22_ST_EH_Valve	22/02/04

Double-Click →

**Data Point**

Type

User Address: L22\_MW\_OaTemp      DIO/LON  
 Controller: BwMMI\_MUKD  
 Technical Address: 22/91/03      Plant Info: OFFICE\_BUILD\_VEN  
 Point ID:  
 Point Role:      Point ID:  
 Point Subtype: AI Slow  
 Lon Point: none  
 NV Type: (Input) none  
 (Output) none

Misc. Editor Functions

Engineering Unit: °C  
 Descriptor: VENTILATIONPLANT-OFFICE  
 Alarm Text: CHECK SENSOR  
 Characteristic: NTC

Special Values

Operator Access Level: 3  
 High Alarm Limit: 30 °C  
 High Warning Limit: 30 °C  
 Low Warning Limit: -45 °C  
 Low Alarm Limit: -45 °C  
 Write Protect Priority: 0  
 Sensor Offset: 49,861111  
 Alarm Delay: 10 sec  
 Alarm Hysteresis: 0 °C  
 Trend Hysteresis: 0 °C  
 Trend Cycle: 0 minut.

Critical Alarm Type  
 Suppress Alarm  
 Hide Point

OK  
 Cancel  
 Help

2. Edit the values as described in the Edit Point in Itemized Display section.

3. Confirm your actions by clicking OK.

## Expand and Collapse the Tree

**Purpose** Quickly expanding or collapsing the tree.

### Procedure Expanding/collapsing the whole tree

When expanding the whole tree every hierarchical level is displayed. When collapsing the whole tree only the project name is visible.

1. Click any object in the tree (project, controller, etc.)

2. Click menu item Edit, then drop-down item Tree expand all or, click Tree expand all icon  on the toolbar, if you want to see all hierarchical levels of the tree.

or,

click menu item Edit, then drop-down item Tree collapse all or, click Tree collapse all icon  on the toolbar, if you want to see only the project name in the tree.

**Procedure Expanding/collapsing parts of the tree**

When expanding/collapsing parts of the tree every hierarchical level below the object selected in the tree, is displayed/closed.

1. In the tree, click the object (project, controller, etc.), which hierarchical levels below should be displayed/closed (not displayed)
2. Click menu item Edit, then drop-down item Tree expand from here or, click Tree expand from here icon  on the toolbar, if you want to see all hierarchical levels below the object selected in the tree.

or,

Click menu item Edit, then drop-down item Tree collapse from here or, click Tree collapse from here icon  on the toolbar, if you want to close all hierarchical levels below the object selected in the tree.

**Navigate in the Tree**

**Purpose** Navigate in the tree by moving from one object to the next/previous object.

**Procedure** Starting from the current cursor position in the tree, click on the

Next item icon , if you want to move downwards to the next object in the tree.

or,

Previous item icon , if you want to move upwards to the previous object in the tree.

**Arrange Windows**

**Purpose** When more than one project is opened, you can arrange the windows to fit your needs.

**Procedure** Click menu item Window, then desired drop-down item:

**Cascade**, if you want to display the windows in a cascade.

or,

**Tile Horizontally**, if you want to display the windows one below the other.

or,

**Tile Vertically**, if you want to display the windows side by side.

or,

**Arrange Icons**, to order the windows, which were closed before and displayed as icons on the bottom of the screen.

**View/Hide Toolbar**

**Purpose** Display/Hide toolbar and/or status bar. The tool bar provides menu functions as icons. The status bar displays messages of software actions, e.g. creating grid, etc.

**Procedure** Click menu item View, and then check/uncheck desired drop-down item:

**Toolbar**, if you want to display/hide the toolbar under the menu bar

and/or,

**Status bar**, if you want to display/hide the status bar on the bottom.

**RESULT:** Depending on the previous selection of the menu item (checked or unchecked), the bar will be displayed or hidden.

## Point Descriptions

The following describes how to display and modify attributes for the different point types.

## Excel 500 Points

## Analog Input Point

**Purpose** Display and/or modify the attributes for a selected analog input point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

<b>Type</b>	
User Address:	L22_MW_DischarTemp
Technical Address:	22/91/01
Point Role:	
Point Subtype:	AI Slow
Lon Point:	none
NV Type: (Input)	none
(Output)	none
DIO/LON Controller: BWMMI_MUKO Plant Info: OFFICE_BUILD_VENTIL Point ID:	
<b>Misc. Editor Functions</b>	
Engineering Unit:	°C
Descriptor:	FAX
Alarm Text:	CHECK SENSOR
Characteristic:	NTC
<b>Special Values</b>	
Operator Access Level:	3
Write Protect Priority:	0
Sensor Offset:	49,861111
<input type="checkbox"/> Critical Alarm Type	
<input checked="" type="checkbox"/> Suppress Alarm	
<input type="checkbox"/> Hide Point	
High Alarm Limit:	50 °C
High Warning Limit:	40 °C
Low Warning Limit:	10 °C
Low Alarm Limit:	5 °C
Alarm Delay:	10 sec
Alarm Hysteresis:	0 °C
Trend Hysteresis:	0 °C
Trend Cycle:	0 minut.

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Modules** You can assign "slow" analog input points to slow or fast input modules (XF521 and XFL521 or XF526). You can assign "fast" analog input points only to fast input modules (XF526) (see Terminal Assignment Tool chapter).

Attributes description	User Address	Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Examples: Rmtempf11 and FlotempG/fl. The user address and the descriptor further define the point. This name must be unique within a controller. User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a valid user address, but 12 is not.
		<p><b>IMPORTANT</b>  <i>Note that the max. length of the user address for Lon points should not exceed 18 characters (see Lon point attribute).</i></p>
		Behind the user address field the bus type (IP bus or LON-bus) where the point resides, is displayed.
	Technical Address	<p>Internal six-digit number that defines and locates a point in the system. The technical address is composed of three pairs representing controller number (0-30), module number (1-16), and terminal number (1-12). Example: 010310 meaning Controller 1, Module 3, terminal 10. Operators use the User Address to refer to points.</p> <p>For LON points the module number is 90. When the number of LON points (terminals) exceeds 99, the module number will change to 91 and the next LON point gets number 1.</p>
		To change the technical address see the Terminal Assignment Function chapter.
	Controller Name	Name of controller where the point is assigned. Display only. This assignment is done during plant attachment.
	Plant Info	Plant name
	Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
	Point ID	Point ID created via an external tool like Win EDS.
	Point Subtype	Type of point. List of choices depends on input module type where the point is assigned.
	Lon Point	<p>Define whether the datapoint should be a LON point. Select from the list under:</p> <p>NV-Input Creates input NV.</p> <p>NV-Output Creates output NV.</p> <p>NV-Input &amp; Output Creates both, Input and output NV.</p> <p>Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.</p>
	NV Type	Define the NV-type for the LON point. From the Input and/or Output drop-down lists select desired type.

	To edit a LON point, open the NV-Editor by clicking the dotted button on the right or shift to LON view by clicking the Toggles between DPE- and LON – View button (Two Ways to Work on LON chapter).
Engineering Unit	List of choices displays engineering units with ID, unit, and format.  To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter)
Descriptor	Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address “Rmtempf1” can have a descriptor of “Heating circuit, West wing” to help define its location. List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Alarm Text	Alarm text that displays on point alarm.  List of choices displays alarm texts with ID and text. To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Characteristic	Input and output characteristics of the associated sensor. List of choices displays characteristics with ID and text.  To add and change characteristics in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Operator Access Level	Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.
Initial. Value	Value of the point on initial start-up.
Write Protect Priority	Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. Write protection prevents any Level 1 operators from overwriting higher-level operator changes. Default is 0. Valid range is 0 to 255.
Sensor Offset	Sensor offset value. It can be set to 0.  <b>IMPORTANT</b> When controller OS 2.06.00 – 2.06.04 has been chosen, note the following restrictions and malfunctions:  Smart I/O modules The sensor offset value entered here, is not processed by the Smart I/O module. To assure proper working, enter the sensor offset in the network tree for the UCPT.

**Critical Alarm Type** Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display software only writes them to the alarm printer and alarm history file.

**Suppress Alarm** Whether or not software should suppress alarm messages for changes in Fixed Mode and exceeding the alarm and warning limits.

**Hide Point** Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater Ver. 2.0).

**High Alarm Limit**  
**High Warning Limit**  
**Low Warning Limit**  
**Low Alarm Limit**

High (max) and low (min) limits for point value. Limit values must be between the limits for the associated Characteristics. Limit values must also maintain the following relationship:

High Alarm ≥ High Warning > Low Warning ≥ Low Alarm

If you change the Characteristics assignment, the High limits default to the maximum characteristic value (if larger than the new max) and the Low limits default to the minimum characteristic value (if smaller than the new min). The limits change only if they are outside the range of the new characteristic.

**Alarm Delay** How long (0 through 3600 seconds) an alarm condition must exist before software generates an alarm.

**Alarm Hysteresis** Available for controller OS Ver. greater than 1.5. This value is the amount that an analog point must change before software reports an alarm or return-to-normal. Value range is 0 or x to y where x is determined by the engineering unit decimal position and y is determined by the difference of the high warning limit - low warning.

<b>Engineering Unit Decimal Position</b>	<b>Min. Value (x)</b>
0	1.0
1	0.1
2	.01
3	.001

Diff: = high warning limit - low warning.

For example, if the analog point has the following values:

engineering unit = Degrees with one decimal point  
 high alarm limit = 85.0  
 high warning limit = 82.0  
 low warning limit = 68.0  
 low alarm limit = 65.0

Diff = 82.0 - 68.0 = 14.0

Therefore, the valid range is .01 to 14.

Default varies between 1 and 5 depending on schematic element. If the value is zero, fixed hysteresis applies.

#### Trend Hysteresis

Available for controller OS Ver. greater than 1.5. The value that the point must change (negative or positive) before software writes it to the trend buffer. Valid range is 0 or x to 100,000,000 (selected by entering 99999999). The value of x is determined by the engineering unit of the point as follows:

<b>Engineering Unit</b>	
<b>Decimal Position</b>	<b>Min. Value (x)</b>
0	1.0
1	0.1
2	.01
3	.001

If the value is 0, software constantly sends trend data to the trend buffer. Default is 0 for points that are not part of an element. To lessen or turn off the transmission of trend data, assign a high number to this value or assign a value to the Trend Cycle field. The Trend Cycle value takes precedence over the Trend Hysteresis value. Software sends trend data based on either hysteresis value or time, not both.

#### Trend Cycle

Available for controller OS greater than Ver. 2.03. This value is similar to the Trend Hysteresis value, but is based on time. The range is 0 to 65535 minutes. A value of 0 disables time-based trending. Any value greater than 0 enables time-based trending. Time-based trending takes precedence over Trend Hysteresis value. Software sends trend data based on either hysteresis value or time, not both.

**Analog Output Point**

**Purpose** Display and/or modify the attributes for the selected analog output point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab(itemized display).

<b>Type</b>	
User Address:	L22_ST_EH_Valve
Technical Address:	22/91/06
Point Role:	
Point Subtype:	
Lon Point:	none
NV Type: (Input)	none
(Output)	none
<b>Misc. Editor Functions</b>	
Engineering Unit:	Inw
Descriptor:	text 44
Characteristic:	LINEAR_GRAPH
<b>Special Values</b>	
Operator Access Level:	3
Write Protect Priority:	0
Time to Open:	120,00 sec
Time to Close:	120,00 sec
<input checked="" type="checkbox"/> Suppress Alarm	Trend Hysteresis: 0,0 Inw
<input type="checkbox"/> Hide Point	Trend Cycle: 0 minut.

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Modules** You can assign analog output points only to analog output modules. If the point requires a switch, you can assign the point only to a location that has a switch. If the point does not require a switch, you can still assign it to a location with a switch and later move it to a location without a switch.

**Attributes Description** User Address Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Examples: AO1 and MADMPRFL1. This name and the descriptor further define the point. This name must be unique within a controller. User addresses must include one non-digit

character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not. Behind the user address field the bus type (IP bus or LON-bus) where the point resides, is displayed.

**IMPORTANT**

*Note that the max. length of the user address for Lon points should not exceed 18 characters (see Lon point attribute).*

Technical Address	<p>Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs representing controller number (0-30), module number (1-16), and terminal number (1-12).</p> <p>Example: 010310 meaning Controller 1, Module 3, terminal 10. Operators use the User Address to refer to points.</p> <p>For LON points the module number is 90. When the number of LON points (terminals) exceeds 99, the module number will change to 91 and the LON point gets number 1.</p> <p>To change the technical address see the Terminal Assignment Function chapter.</p>
Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
Plant Info	Name of plant.
Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
Point ID	Point ID created via an external tool like Win EDS.
Point Subtype	Type of point. List of choices depends on output module type where the point is assigned.
Lon Point	<p>Define whether the datapoint should be a LON point. Select from the list under:</p> <p>NV-Input Creates input NV.</p> <p>NV-Output Creates output NV.</p> <p>NV-Input &amp; Output Creates both, input and output NV.</p> <p>Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.</p>
NV Type	Define the NV-type for the LON point. From the Input and/or Output drop-down lists select desired type.

	To edit a LON point, open the NV-Editor by clicking the dotted button on the right or shift to LON view by clicking the Toggles between DPE- and LON – View button (see Two Ways to work on LON chapter)
Engineering Unit	<p>List of choices displays engineering units with ID, unit, and format.</p> <p>To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter)</p>
Descriptor	<p>Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address “MADMPRFL1” can have a descriptor of “Mixed air damper, Floor 1” to help define its location.</p> <p>List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Characteristic	<p>Input and output characteristics of the associated sensor. List of choices displays characteristics with ID and text. To add and change characteristics in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Operator Access Level	<p>Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.</p>
Initial. Value	<p>Value of point on initial start-up.</p>
Write Protect Priority	<p>Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level 1 operators from overwriting higher-level operator changes. Default is 0. Valid range is 0 to 255.</p>
Suppress Alarm	<p>Whether or not software should suppress alarm messages for changes in Fixed Mode and exceeding the alarm and warning limits.</p>
Hide Point	<p>Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).</p>
Time to Open	<p>Time (integer, 0 through 999 seconds) required for the actuator of a three-position output to motor from the closed to the open state.</p>

Time to Close	Time (integer, 0 through 999 seconds) required for the actuator of a three-position output to motor from the open to the closed state.										
Trend Hysteresis	<p>Available for controller OS Ver. greater than 1.5. The value that the point must change (negative or positive) before software writes it to the trend buffer. Valid range is 0 or x to 100,000,000 (selected by entering 99999999). The value of x is determined by the engineering unit of the point as follows:</p> <table> <thead> <tr> <th><b>Engineering Unit</b></th> <th><b>Min. Value (x)</b></th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1.0</td> </tr> <tr> <td>1</td> <td>0.1</td> </tr> <tr> <td>2</td> <td>.01</td> </tr> <tr> <td>3</td> <td>.001</td> </tr> </tbody> </table> <p>If the value is 0, software constantly sends trend data to the trend buffer. Default varies between 1 and 5 depending on schematic element.</p> <p>To lessen or turn off the transmission of trend data, assign a high number to this value or assign a value to the Trend Cycle Minutes field. The Trend Cycle value takes precedence over the Trend Hysteresis value. Software sends trend data based on either hysteresis value or time, not both.</p>	<b>Engineering Unit</b>	<b>Min. Value (x)</b>	0	1.0	1	0.1	2	.01	3	.001
<b>Engineering Unit</b>	<b>Min. Value (x)</b>										
0	1.0										
1	0.1										
2	.01										
3	.001										
Trend Cycle	<p>Available for controller OS greater than Ver. 2.03. This value is similar to the Trend Hysteresis value, but is based on time. The range is 0 to 65535 minutes. A value of 0 disables time-based trending. Any value greater than 0 enables time-based trending. Time-based trending takes precedence over Trend hysteresis value. Software sends trend data based on either hysteresis value or time, not both.</p>										

**Digital Input Point**

**Purpose** Display and/or modify the attributes for the selected digital input point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Modules** You can assign digital input points only to digital input modules.

**Attributes description** User Address Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point.  
  
Examples: DI1 and HWTRPUMPST. This name and the descriptor further define the point. This name must be unique within a controller.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

**IMPORTANT**

*Note that the max. length of the user address for Lon points should not exceed 18 characters (see Lon point attribute).*

Behind the user address field the bus type (IP bus or LON-bus) where the point resides, is displayed.

Technical Address	<p>Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs representing controller number (0-30), module number (1-16), and terminal number (1-12). Example: 010310 meaning Controller 1, Module 3, terminal 10. Operators use the User Address to refer to points.</p> <p>For LON points the module number is 90. When the number of LON points (terminals) exceeds 99, the module number will change to 91 and the LON point gets number 1.</p> <p>To change the technical address see the Terminal Assignment Function chapter.</p>
Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
Plant Info	Name of plant.
Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
Point ID	Point ID created via an external tool like Win EDS.
Point Subtype	Type of point. List of choices depends on input module type where the point is assigned.
Lon Point	<p>Define whether the datapoint should be a LON point. Select from the list under:</p> <p>NV-Input Creates input NV.</p> <p>NV-Output Creates output NV.</p> <p>NV-Input &amp; Output Creates both, input and output NV.</p> <p>Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.</p>
NV Type	Define the NV-type for the LON point. From the Input and/or Output drop-down lists select desired type.

	<p>To edit a LON point, open the NV-Editor by clicking the dotted button on the right or shift to LON view by clicking the Toggles between DPE- and LON – View button (see Two Ways to work on LONchapter).</p>
Engineering Unit	<p>List of choices displays ID, number of states, and active and passive state texts for the point, for example, On and Off. Software determines these texts from the assigned engineering unit.</p> <p>To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Descriptor	<p>Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address “HWTRPUMPST” can have a descriptor of “Heating circuit, West wing” to help define its location.</p> <p>List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Alarm Text	<p>Alarm text that displays on point alarm.</p> <p>List of choices displays alarm texts with ID and text. To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Operator Access Level	<p>Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.</p>
Service Interval	<p>Number of log hours after which software generates a maintenance alarm. Enter zero for no alarm message. Runtime Enabled must be enabled (Yes). Note that runtime accumulates only if the point is in the active state.</p>
Write Protect Priority	<p>Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level 1 operators from overwriting higher-level operator changes. Default is 0. Valid range is 0 to 255.</p>
Critical Alarm Type	<p>Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display; software only writes them to the alarm printer and alarm history file</p>
Suppress Alarm	<p>Whether or not software should suppress alarm messages.</p>

- Alarm Point                      Whether or not software should monitor point changes from active to passive.
  
- Hide Point                        Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).
  
- Runtime Enabled                Whether or not to maintain a count of hours run (resolution one hour).
  
- Alarm Delay                      Length of time (integer, 0 through 3600 seconds) an alarm condition must exist before software generates an alarm.
  
- Active State                      State that determines which point state (Logic 0 or 1) is the active ("normal") state. The other state is the passive ("alarm") state.

The following table shows the relationship between active and passive states and statuses as well as between N.O. and N.C.

Hardware Condition	Logical State		Active State Value	
	DI (NC)	DI (NO)	0	1
No voltage at screw terminal. See Note 1.	1	0	Active Text, normal	Passive Text, alarm
Voltage at screw terminal. See Note 2.	0	1	Passive Text, alarm	Active Text, normal

NOTES:

1. On an Excel 500 or 100, this is an open contact. On an Excel 80, this is a closed contact.
2. On an Excel 500 or 100, this is a closed contact. On an Excel 80, this is an open contact.

The active state flag affects the alarm state and engineering units that display for digital inputs. The point type (NO/NC) affects the logical operation of the point.

Note that software monitors point state only if the Alarm Point field is checked.

Active State only applies to controller OS Ver. lower than 2.04 (see Upgrade Controller to OS 2.04 section in Appendix D)

**Digital Output Point**

**Purpose** Display and/or modify the attributes for the selected digital output point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Modules** You can assign digital output points only to digital output modules. If the point requires a switch you can assign the point only to a location that has a switch. If the point does not require a switch, you can still assign it to a location with a switch and later move it to a location without a switch.

**Attributes Description**

User Address	Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Example: DONOSWITCH1. This name and the descriptor further define the point. This name must be unique within a controller.
--------------	--

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

**IMPORTANT**

*Note that the max. length of the user address for Lon points should not exceed 18 characters (see Lon point attribute).*

Behind the user address field the bus type (IP bus or LON-bus) where the point resides, is displayed.

## Technical Address

Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs representing controller number (0-30), module number (1-16), and terminal number (1-12). Example: 010310 meaning Controller 1, Module 3, terminal 10. Operators use the User Address to refer to points.

For LON points the module number is 90. When the number of LON points (terminals) exceeds 99, the module number will change to 91 and the LON point gets number 1.

To change the technical address see the Terminal Assignment Function chapter.

## Controller Name

Name of controller where the point is assigned. This assignment is done during plant attachment.

## Plant Info

Name of plant.

## Point Role

Point Role created via an external tool like Win EDS. The point role can be edited.

## Point ID

Point ID created via an external tool like Win EDS.

## Point Subtype

Type of point. List of choices depends on output module type where the point is assigned.

## Lon Point

Define whether the datapoint should be a LON point. Select from the list under:

NV-Input  
Creates input NV.

NV-Output  
Creates output NV.

NV-Input & Output  
Creates both, input and output NV.

Manual Mapping  
Provides selection of this datapoint for mapping to NVs in the NV-Editor.

## NV Type

Define the NV-type for the LON point. From the Input and/or Output drop-down lists select desired type.

Engineering Unit	<p>List of choices displays ID, number of states, and active and passive state texts for the point, for example, On and Off. Software determines these texts from the assigned engineering unit.</p> <p>To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Descriptor	<p>Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "DONOSWITCH1" can have a descriptor of "Main Floor Mixed Air Damper" to help define its location. List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Operator Access Level	<p>Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.</p>
Service Interval	<p>Number of log hours after which software generates a maintenance alarm. Enter zero for no alarm message. Runtime Enabled must be enabled (Yes). Note that runtime accumulates only if the point is in the active state.</p>
Pulse Duration	<p>Time (sec) of momentary pulse output.).</p>
Critical Alarm Type	<p>Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display; software only writes them to the alarm printer and alarm history file.</p>
Suppress Alarm	<p>Whether or not software should suppress maintenance alarm messages.</p>
Hide Point	<p>Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).</p>
Runtime Enabled	<p>Whether or not to maintain a count of hours run (resolution one hour). Available only for non-pulsed DOs. This item does not display for pulse-type points.</p>
Active State	<p>State that determines which point state (Logic 0 or 1) is the active ("normal") state. The other state is the passive ("alarm") state.</p>

The following table shows the relationship between active and passive states and statuses, as well as between energized and deenergized.

Hardware Condition	Active State Value	
	0	1
Deenergized	Active Text, Logic 1	Passive Text, Logic 0
Energized	Passive Text, Logic 0	Active Text, Logic 1

The active state flag affects the logical operation and engineering units of digital outputs. The point type (NO/NC) only affects the terminal assignment during you attach the plant.

Active State only applies to controller OS Ver. lower than 2.04 (see Upgrade Controller to OS 2.04 section in Appendix D)

**Flex Point**

**Purpose** Display and/or modify the attributes for the selected flex point.

**Procedure** In the tree, click desired flex point, but **not** the associated physical point, which is one level below the flex point. The current values are displayed on the right Properties tab(itemized display).

Attribute	Value
Oper. Access Level	3
Suppr. Alarm	<input type="checkbox"/>
Critical Alarm (Type)	<input type="checkbox"/>
Alarm Delay	0
Runt. Enabl.	<input type="checkbox"/>
Service Interval	0

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display .

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Flex Point Definition** Flex points are pseudopoints that represent one or more physical points. They can command and/or display associated physical points and their values via an operator terminal. Flex point types include Pulse\_2, Multistage, and Point with Feedback.

The Flex Points subsection in the Plant Schematics chapter describes how to create and modify these points.

This section describes the attributes dialog boxes that you can use to modify flex point attributes.

**Common Attributes Description** The following are the common attributes similar to the attributes of other points:

**User Address** Flex point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Examples: Flex1 and MainRF. This name and the descriptor further define the point. This name must be unique within a controller.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
Technical Address	List of addresses for the points associated with the flex point.
Engineering Unit	List of choices displays ID, number of states, the state and its corresponding text. Software determines these texts from the assigned engineering unit.  To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Descriptor	Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "DONOSWITCH1" can have a descriptor of "Main Floor Mixed Air Damper" to help define its location.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Alarm Text	Alarm text that displays on point alarm.  List of choices displays alarm texts with ID and text. Applies only to DO_Feedback_DI points.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
<b>Special Attributes Description</b>	
Point Attribute (Attribute, Value)	List of special point attributes that apply to the flex point. The Value column displays current editable values. Read-only attributes are disabled (same color as Attribute column) and cannot be edited.
Active State	State that determines which point state (Logic 0 or 1) is the active ("normal") state. The other state is the "alarm", or passive, state. Applies to multistage points.
Oper. Access Level	Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.
Suppr. Alarm	Whether or not software should suppress alarm messages for changes in Fixed Mode and exceeding the alarm and warning limits. Click to change from Yes to No and vice versa.
Critical Alarm (Type)	Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display; software only

	writes them to the alarm printer and alarm history file. Click to change from critical to non-critical and vice versa.
Runtime Enabl.	Whether the point is pulsed or non-pulsed. When you assign the point to a schematic, you set this value.
Service Interval	Preset the number of hours that the run-time counter uses.
Hide Point	Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).
Write Protect Priority	Access level (0-255) for operators at operator terminals.
Alarm Delay	Software compares the status of the feedback with the output status after this delay time. Applies only to digital input points that are part of DO_Feedback_DI points.
Pulse Duration	Time of the momentary pulse output. Applies only to pulse_2 and DO_Feedback_DI points.
Delay Switch Up	Waiting period between switching the stages of a staged point. Delay time affects every stage. Applies only to DO_Feedback_DI points.
Delay Switch Down	Waiting period between switching down the stages of a staged point. Delay time affects every stage. Applies only to DO_Feedback_DI points.
Switching Down	Sequence to use when switching down. Applies only to DO_Feedback_DI points. There are two sequences: <3,0,2,0,1,0> or <3,2,1,0>.  The <3,0,2,0,1,0> sequence switches down using the OFF position. Use this setting for systems that have a high inertia (for example, ventilators). When software switches down one stage, it first turns the switch to OFF. The <3,2,1,> sequence switches down to the next lower stage directly. The OFF phase does not exist (for example, electric air heaters).  Each stage is active for the Delay Switch Down, independent of the mode of Switching Down.
Duration Off	Off time value software uses in conjunction with switching point state (down) with a switch to off between states. Applies only to DO_Feedback_DI points.
Feedback Delay Time	Length of time (in seconds) before software checks the input to verify that it follows the associated output. Applies only to DO_Feedback_DI points.
Number Of Stages	Number of stages in this feedback point (1, 2, or 3). Applies only to DO_Feedback_DI points.
Cycle Count-Active State	Value of a counter that represents the number of times a point is commanded to active state. This attribute is read-only.

**Global Points**

**Purpose** Display and/or modify the attributes for the selected global analog point.

**Definition** *Global points* are a type of pseudopoint that can be either an input or output. The purpose of global points is to share point information across controllers on a bus.

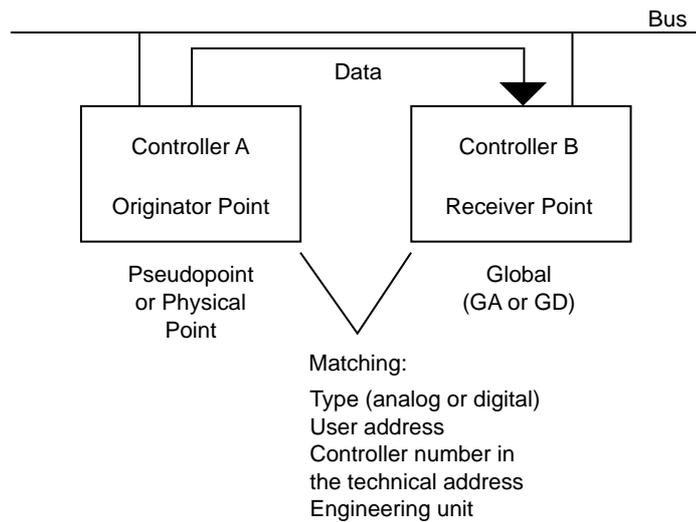
Global inputs *receive* information from a point in another controller. Use a global input when one controller has a point that should be global to many other controllers.

Global outputs *send* information to other points in other controllers. Use a global output when one controller has a point that is global to only one point in another controller. You can also use global outputs for some control icons that only connect to outputs and the output must be global. Global outputs can only be associated with pseudopoints or output points (not input points).

**Centrals Note** Central PCs such as the Excel Building Supervisor (XBS) and Excel Building Supervisor-Integrated (XBS-i) only read global *originator* points. The values of global receiver points are only available via the B port of the controller.

**C-Bus Tunneling Note** From Controller OS 2.06 on, it is strongly recommended to use max. 25 global points per system or project. Instead, NV-binding can be used to get global communication between controllers.

**Global Inputs** Each global input is associated with a pseudopoint or physical point (“originator” point) somewhere on the bus and has the same user address, controller number in the technical address, engineering unit, and type (analog or digital) as the point. The originator point cannot be a global point.



You select the correct type and enter the correct user address when you create the global point. To set the appropriate controller number in the technical address and the engineering unit, use this dialog box.

*Global Input Point Operation*

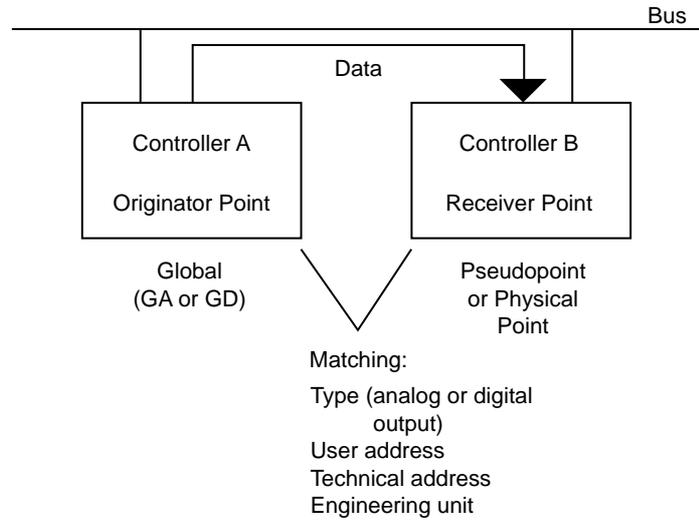
The system updates global inputs every 2 minutes. It also updates global analog inputs when the originator point changes significantly. If point value is greater than 20, the change must be at least 1 percent. If point value is less than or equal to 20, the change must be at least .2 units. For example:

Point Value	Change
100	1
200	2
50	.5
10	.2
5	.2

For global digital points, a change of state triggers an update.

**Global Outputs**

Each global output is associated with a pseudopoint or physical point (“receiver” point) somewhere on the bus and has the same user address, technical address, engineering unit, and type (analog or digital output) as the point.



You select the correct type and enter the correct user address when you create the global point. To set the appropriate technical address, point subtype, and engineering unit, use this dialog box.

*Global Output Point Operation*

The system updates the receiver points when the global analog outputs change significantly. If global value is greater than 20, the change must be at least 1 percent. If global value is less than or equal to 20, the change must be at least .2 units. For example:

Global Value	Change
100	1
200	2
50	.5
10	.2
5	.2

For global digital points, a change of state triggers an update.

There is no automatic 2-minute refresh for global output points.

**Global Analog Point**

**Purpose** Display and/or modify the attributes for the selected global analog point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab(itemized display).

<b>Type</b>	
User Address:	GA_PLT1
Technical Address:	00/00/00
Point Role:	
Point Subtype:	Global Analog Input
Controller: BWMMI_MUKO	
Plant Info: OFFICE_BUILD_VENTIL	
Point ID:	
<b>Misc. Editor Functions</b>	
Engineering Unit:	
Descriptor:	
<b>Special Values</b>	
Operator Access Level:	3
Write Protect Priority:	0
<input type="checkbox"/> Hide Point	
Trend Hysteresis:	1
Trend Cycle:	0 minut.
Broadcast Hyst.:	1

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display .

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Attributes description**

User Address	Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Example: OaTemp. This name and the descriptor further define the point. This name must match the name of the point that is the receiver or originator of information for this global point.
Technical Address	Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs

representing controller number (1-30), module number (1-16), and terminal number (1-12). Example: 010310 meaning Controller 1, Module 3, terminal 10. Operators use the User Address to refer to points.

Select and type over parts of address to change it.

#### **Technical Address**

If it is associated with a physical point, this address must match the associated point. The global definition at the beginning of this section describes addressing rules.

#### **Physical Address**

If it is associated with a pseudo point, only the controller number is issued. The other two fields can be blank, 0 or 99.

Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
Plant Info	Name of plant.
Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
Point ID	Point ID created via an external tool like Win EDS.
Point Subtype	Type of point (input or output).
Engineering Unit	List of choices displays engineering units with ID, unit, and format.  To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter)
Descriptor	Supplemental point information (maximum of 32 characters. Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "OaTemp" can have a descriptor of "outdoor dry bulb temp" to help define its location.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Operator Access Level	Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.
Write Protect Priority	Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level 1 operators from overwriting higher-level operator changes. Default is 0. Valid range is 0 to 255
Hide Point	Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online

wildcard search on a central (only for controller OS greater than Ver. 2.0).

Trend Hysteresis

Available for controller OS Ver. greater than 1.5. The value that the point must change (negative or positive) before software writes it to the trend buffer. Valid range is 0 or x to 100,000,000 where x is determined by the engineering unit of the point as follows:

<b>Engineering Unit</b>	
<b>Decimal Position</b>	<b>Min. Value (x)</b>
0	1.0
1	0.1
2	.01
3	.001

If the value is 0, software constantly sends trend data to the trend buffer. Default is 0.

To lessen or turn off the transmission of trend data, assign a high number to this value or assign a value to the Trend Cycle Minutes field. The Trend Cycle Minutes value takes precedence over the Trend Hysteresis value. Software sends trend data based on either hysteresis value or time, not both.

Trend Cycle

Available for controller OS greater than Ver. 2.03. This value is similar to the Trend Hysteresis value, but is based on time. The range is 0 to 65535 minutes.

A value of 0 disables time-based trending. Any value greater than 0 enables time-based trending. Time-based trending takes precedence over Trend Hysteresis value. Software sends trend data based on either hysteresis value or time, not both.

Broadcast Hyst.

Available for controller OS Ver. 1.5. This value is that amount that a point must change before software broadcasts it to other controllers. Value range is 0 or x to 100,000,000 where x is determined by engineering unit decimal position as follows.

<b>Engineering Unit</b>	
<b>Decimal Position</b>	<b>Min. Value (x)</b>
0	1.0
1	0.1
2	.01
3	.001

If the value is 0, software constantly broadcasts to the controllers. Default is 0. If several global points are assigned to the same physical point, the lowest global point broadcast hysteresis from the assigned global point is used. This value can also be accessed by the RIA and WIA control icons.

To lessen or turn off the frequency of broadcasts, assign a high number to this value.

**Global Digital Point**

**Purpose** Display and/or modify the attributes for the selected global digital point.  
See the Global Points section for a definition of globals and how they operate.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display .

To modify values, edit desired values in the fields, and/or select/deselect desired options.

<b>Attributes Description</b>	User Address	Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Example: global_dig. This name and the descriptor further define the point. This name must match the name of the point that is the receiver or originator of information for this global point..
	Technical Address	Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs

representing controller number (1-30), module number (1-16), and terminal number (1-12). Example: 010310 meaning Controller 1, Module 3, terminal 10. Operators use the User Address to refer to points.

Select and type over parts of address to change it, if desired

#### Technical Address

If it is associated with a physical point, this address must match the associated point. The global definition at the beginning of this section describes addressing rules.

#### Physical Address

If it is associated with a pseudo point, Only the controller number is issued. The other two fields can be blank, 0 or 99.

Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
Plant Info	Name of plant.
Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
Point ID	Point ID created via an external tool like Win EDS.
Point Subtype	Type of point (input or output).
Engineering Unit	List of choices displays ID, number of states, and active and passive state texts for the point, for example, On and Off. Software determines these texts from the assigned engineering unit.  To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Descriptor	Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "global_dig" can have a descriptor of "occupancy / vacancy mode" to help define its location.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Operator Access Level	Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.
Write Protect Priority	Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level

Hide Point

1 operators from overwriting higher-level operator changes. Default is 0. Valid range is 0 to 255  
Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).

**Pseudo Analog Point**

**Purpose** Display and/or modify the attributes for the selected pseudo analog point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display .

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Attributes Description**

User Address

Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Example: Room\_Average.

This name and the descriptor further define the point.  
This name must be unique within a controller.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

**IMPORTANT**

*Note that the max. length of the user address for Lon points should not exceed 18 characters (see Lon point attribute).*

Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
Plant Info	Name of plant.
Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
Point ID	Point ID created via an external tool like Win EDS.
Point Subtype	None.
Lon Point	Define whether the datapoint should be a LON point. Select from the list under:  NV-Input Creates input NV.  NV-Output Creates output NV.  NV-Input & Output Creates both, input and output NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.
NV Type	Define the NV-type for the LON point. From the Input and/or Output drop-down lists select desired type.
Engineering Unit	List of choices displays engineering units with ID, unit, and format.  To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter)

Descriptor	<p>Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "Room_Average" can have a descriptor of "West wing Aug temperature" to help define its location.</p> <p>List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Alarm Text	<p>Alarm text that displays on point alarm.</p> <p>List of choices displays alarm texts with ID and text. To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Operator Access Level	<p>Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.</p>
Initial. Value	<p>Value of the pseudopoint on initial start-up.</p>
Write Protect Priority	<p>Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level 1 operators from overwriting higher-level operator changes. Display only; always defaults to No (0).</p>
Critical Alarm Type	<p>Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display; software only writes them to the alarm printer and alarm history file.</p>
Suppress Alarm	<p>Whether or not software should suppress alarm messages for changes in Fixed Mode and exceeding the alarm and warning limits.</p>
Hide Point	<p>Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).</p>
High Alarm Limit High Warning Limit Low Warning Limit Low Alarm Limit.	<p>High (max) and low (min) limits for point value. Limit values must maintain the following relationship:</p> <p>High Alarm <math>\geq</math> High Warning <math>&gt;</math> Low Warning <math>\geq</math> Low Alarm</p>

Alarm Hysteresis

Available for controller OS Ver. greater than 1.5. This value is the amount that an analog point must change before software reports an alarm or return-to-normal. Value range is 0 or x to y where x is determined by the engineering unit decimal position and y is determined by the difference of the high warning limit - low warning.

Engineering Unit Decimal Position	Min. Value (x)
0	1.0
1	0.1
2	.01
3	.001

Diff: = high warning limit - low warning.

For example, if the analog point has the following values:

engineering unit = Degrees with one decimal point  
 high alarm limit = 85.0  
 high warning limit = 82.0  
 low warning limit = 68.0  
 low alarm limit = 65.0

Diff = 82.0 - 68.0 = 14.0

Therefore, the valid range is .01 to 14. Default varies between 1 and 5 depending on schematic element. If the value is zero, fixed hysteresis applies.

Trend Hysteresis

Available for controller OS Ver. greater than 1.5. The value that the point must change (negative or positive) before software writes it to the trend buffer. Valid range is 0 or x to 100,000,000 (selected by entering 99999999). The value of x is determined by the engineering unit of the point as follows:

Engineering Unit Decimal Position	Min. Value (x)
0	1.0
1	0.1
2	.01
3	.001

If the value is 0, software constantly sends trend data to the trend buffer. Default is 0.

To lessen or turn off the transmission of trend data, assign a high number to this value or assign a value to the Minutes field. The Trend Cycle Minutes value takes precedence over the Trend Hysteresis value. Software sends trend data based on either hysteresis value or time, not both.

Trend Cycle

Available for controller OS greater than Ver. 2.03. This value is similar to the Trend Hysteresis value, but is based on time. The range is 0 to 65535 minutes. A value of 0 disables time-based trending. Any value greater than 0 enables time-based trending. Time-based trending takes precedence over Trend Hysteresis value. Software sends trend data based on either hysteresis value or time, not both.

**Pseudo Digital Point**

**Purpose** Display and/or modify the attributes for the selected pseudo digital point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display .

To modify values, edit desired values in the fields, and/or select/deselect desired options.

**Attributes Description**

User Address

Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Example: pseudo\_dig. This name and the descriptor further define the point. This name must be unique within a controller.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

**IMPORTANT**

*Note that the max. length of the user address for Lon points should not exceed 18 characters (see Lon point attribute).*

Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
Plant Info	Name of plant.
Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
Point ID	Point ID created via an external tool like Win EDS.
Point Subtype	Type of point. PD 2-State or PD-n-State can be selected.
Lon Point	<p>Define whether the datapoint should be a LON point. Select from the list under:</p> <p>NV-Input Creates input NV.</p> <p>NV-Output Creates output NV.</p> <p>NV-Input &amp; Output Creates both, input and output NV.</p> <p>Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.</p>
NV Type	Define the NV-type for the LON point. From the Input and/or Output drop-down lists select desired type.
Engineering Unit	<p>List of choices displays ID, number of states, and active and passive state texts for the point, for example, On and Off. Software determines these texts from the assigned engineering unit.</p> <p>To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Descriptor	<p>Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "pseudo_dig" can have a descriptor of "Hot water pump status" to help define its location.</p> <p>List of choices displays descriptors with ID and text.</p>

	To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Alarm Text	Alarm text that displays on point alarm.  List of choices displays alarm texts with ID and text. To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Operator Access Level	Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.
Initial Value	Value the point should have on initial start-up
Service Interval	Number of log hours after which software generates a maintenance alarm. Enter zero for no alarm message. Runtime Enabled must be enabled.
Write Protect Priority	Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level 1 operators from overwriting higher-level operator changes. Default is 0. Valid range is 0 to 255.
Critical Alarm Type	Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display; software only writes them to the alarm printer and alarm history file.
Suppress Alarm	Whether or not software should suppress alarm messages for changes in Fixed Mode and exceeding the alarm and warning limits.
Alarm Point	Whether or not software should monitor point changes from active to passive.
Hide Point	Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).
Runtime Enabled	Whether or not to maintain a count of hours run (resolution one minute).
Active State	State that determines which point state (Logic 0 or 1) is the active ("normal") state. The other state is the passive ("alarm") state.  The following table shows the relationship between active and passive states and statuses, as well as logical states.

Logical State	Active State Value	
	0	1
0	Active Text, normal	Passive Text, alarm
1	Passive Text, alarm	Active Text, normal

The active state flag affects the engineering units and alarm state that displays for digital pseudopoints.

Active State only applies to controller OS Ver. lower than 2.04 (see Upgrade Controller to OS 2.04 section in Appendix D)

**Pseudo Totalizer Point**

**Purpose** Display and/or modify the attributes for the selected pseudo totalizer input point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

Type	
User Address:	VT1_PLT
Point Role:	
Point Subtype:	
Controller: BWMMI_MUKO	
Plant Info: OFFICE_BUILD_VENTIL	
Point ID:	
Misc. Editor Functions	
Engineering Unit:	
Descriptor:	
Special Values	
Operator Access Level:	3
Write Protect Priority:	0
Scaling Factor:	1
Interval Limit:	0
<input type="checkbox"/> Critical Alarm Type <input checked="" type="checkbox"/> Supress Alarm <input type="checkbox"/> Hide Point	

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display .

To modify values, enter desired values in the fields, and/or select/deselect desired options.

Attributes Description		
	User Address	Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Example: pseudo_tot. This name and the descriptor further define the point. This name must be unique within a controller..
	Controller Name	Name of controller where the point is assigned. This assignment is done during plant attachment.
	Plant Info	Name of plant.
	Point Role	Point Role created via an external tool like Win EDS. The point role can be edited.
	Point ID	Point ID created via an external tool like Win EDS.
	Point Subtype	None.
	Engineering Unit	List of choices displays engineering units with ID, unit, and format.  To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter)
	Descriptor	Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "pseudo_tot" can have a descriptor of "West wing pseudo totalizer" to help define its location.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Operator Access Level	Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.
	Write Protect Priority	Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level 1 operators from overwriting higher-level operator changes. Display only; always defaults to No (0).

Scaling Factor	Amount of measured unit per incoming transition (0 through 9,999,999).
Interval Limit	Number of transitions for software to count (0.0 through 99,999,999.9) before generating an alarm.
Critical Alarm Type	Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display; software only writes them to the alarm printer and alarm history file.
Suppress Alarm	Whether or not software should suppress alarm messages for changes in Fixed Mode and exceeding the alarm and warning limits.
Hide Point	Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).

**Totalizer Point**

**Purpose** Display and/or modify the attributes for the selected totalizer input point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

<b>Type</b>	
User Address:	L22_BM_ElectrMeter
Technical Address:	22/03/01
Point Role:	
Point Subtype:	Totalizer Fast
Lon Point:	none
NV Type: (Input)	none
(Output)	none
DIO/LON Controller: BwMMI_MUKD Plant Info: OFFICE_BUILD_VENTIL Point ID:	
<b>Misc. Editor Functions</b>	
Engineering Unit:	FPM
Descriptor:	ELECTRICITY_METER-OFFICEBUILDING
<b>Special Values</b>	
Operator Access Level:	3
Write Protect Priority:	0
Scaling Factor:	2 FPM
Interval Limit:	10000 FPM
<input type="checkbox"/> Critical Alarm Type <input checked="" type="checkbox"/> Supress Alarm <input type="checkbox"/> Hide Point	

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display .

To modify values, edit desired values in the fields, and/or select/deselect desired options.

Attributes	Description
User Address	<p>Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Example: TOT1. This name and the descriptor further define the point. This name must be unique within a controller.</p> <p>User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a valid user address, but 12 is not.</p> <p><b>IMPORTANT</b>  <i>Note that the max. length of the user address for Lon points should not exceed 18 characters (see Lon point attribute).</i></p> <p>Behind the user address field the bus type (IP bus or LON-bus) where the point resides, is displayed.</p>
Technical Address	<p>Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs representing controller number (0-30), module number (1-16), and terminal number (1-12). Example: 010310 meaning Controller 1, Module 3, terminal 10. Operators use the User Address to refer to points.</p> <p>To change the technical address see the Terminal Assignment Function chapter.</p>
Controller Name	<p>Name of controller where the point is assigned. This assignment is done during plant attachment.</p>
Plant Info	<p>Name of plant.</p>
Point Role	<p>Point Role created via an external tool like Win EDS. The point role can be edited.</p>
Point ID	<p>Point ID created via an external tool like Win EDS.</p>
Point Subtype	<p>Type of point. List of choices depends on module type where the point is assigned.</p>
Lon Point	<p>Define whether the datapoint should be a LON point. Select from the list under:</p> <p>NV-Input Creates input NV.</p> <p>NV-Output Creates output NV.</p> <p>NV-Input &amp; Output Creates both, input and output NV.</p>

	<p>Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.</p>
NV Type	Define the NV-type for the LON point. From the Input and/or Output drop-down lists select desired type.
Engineering Unit	<p>List of choices displays engineering units with ID, unit, and format.</p> <p>To add and change units in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter)</p>
Descriptor	<p>Supplemental point information (maximum of 32 characters). Each Excel Controller has a unique set of descriptors (64 for Ver. 1.2 Controllers; 255 for Ver 1.3 and greater Controllers) that can be assigned to its user addresses to further describe them. Example: user address "TOT1" can have a descriptor of "West Wing totalizer" to help define its location.</p> <p>List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Operator Access Level	Access level (1 through 4) that an operator must have to modify point data via an operator terminal. For example, if a point has an Operator Access Level of 2, only operators with Access Level 2 and higher can change point attributes.
Write Protect Priority	Prevent lower-level operators from changing point attributes that a higher-level operator changed. For example, if a point has an Access attribute of 2 and an operator with Access Level 3 changes an attribute, software restricts future changes to operators with at least Level 3 access. This protection prevents any Level 1 operators from overwriting higher-level operator changes. Default is 0. Valid range is 0 to 255.
Scaling Factor	Amount of measured unit per incoming transition (0.0 through 100,000,000.0; the number of decimal places depends on the selected engineering unit).
Interval Limit	Number of transitions for software to count (0 through 99,999,999) before generating an alarm.
Critical Alarm Type	Whether the point alarm condition is critical or not. Critical alarms display on the central PC when they occur. Noncritical alarms do not display; software only writes them to the alarm printer and alarm history file.
Suppress Alarm	Whether or not software should suppress alarm messages for changes in Fixed Mode and exceeding the alarm and warning limits.
Hide Point	Whether the point is visible or hidden. If a point is hidden, it will not be displayed to the user when performing online wildcard search on a central (only for controller OS greater than Ver. 2.0).

**Analog and Digital Flag Points**

Analog and digital flags cannot and have not to be edited.

**BACnet Points**

**Analog Input Point**

**Purpose** Display and/or modify the attributes of the selected analog output point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

The screenshot shows a 'Properties' dialog box for a BACnet Analog Input Point. The 'Datapoint Name' is 'AI3' and the 'BACnet Object' is 'Analog Input'. The 'Lon Mapping' section includes 'Lon Point', 'Input NV', and 'Output NV', all set to 'none'. The 'Misc. Editor Functions' section includes 'Engineering Unit', 'Descriptor', 'Alarm Text', 'IO', and 'Characteristic', all with empty or 'none' values. The 'Access Rights' section shows 'Read Access' and 'Write Access' both set to 'Guest (0)'. The 'Alarming' section includes 'Notification' (none), 'Notify Type' (Alarm), 'Transition Events' (To-Off Normal, To Fault, Back-To-Normal), 'Alarm Delay' (0 [s]), 'High Limit Enable' (80.00), 'Low Limit Enable' (-15.00), and 'Deadband' (0.50). The 'Values' section shows 'Point Role' and 'Change of Value' (0.00).

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

Attributes Description	Datapoint Name	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Lon Point	Define whether the datapoint should be a LON point or not. List of choices displays:  NV-Input Creates input NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.
	Input NV	Define the NV-type for the LON point.
	Engineering Unit	List of choices displays engineering units with ID and unit.
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	IO Configuration	To configure the connected terminal. List of choices displays NTC, PT100 Type F, etc.  Analog input and output points must be configured prior to their assignment to a particular terminal on a module. By selecting a configuration such as NTC, PT100 Type F, etc., the configuration properties of the datapoint are automatically set.

Configure the datapoint before you assign the datapoint to a terminal on the terminal assignment tab. Otherwise you need to rework the configuration properties manually.

Characteristic	Assign and/or build a characteristic (conversion table) if the datapoint is to be mapped to a NV (see Lon point attribute) and the engineering units of both do not match, for example, the NV has °C and the datapoint has °F. To create a characteristic, open the Characteristics dialogbox by clicking the dotted button on the right (see Create and Assign Characteristic to BACnet Point section).
Read Access Write Access	Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.  All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).
Notification	Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:  - Urgent - High - Low  Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3 <sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)  Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).  This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).
Notify Type	If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.
Transition Events	Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.
Alarm Delay	Defines the time delay with which a 'To-Off-Normal' or To-Normal transition will be set off.
High Limit Enable	If a high limit is exceeded and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off.

	Define whether a high limit exceeding should be considered or not.
Low Limit Enable	If the present value falls below the low limit and this condition remains present for at least the defined alarm delay (time), then an alarm of event type 'To-Off-Normal' is set off. Defines whether a low limit exceeding should be considered or not.
Deadband	Define the value of the deadband in order to set off an alarm of event type 'To-Normal'. For this, the present value must, for at least the defined alarm delay (time), remain within the range: Low limit plus deadband and high limit minus deadband.
Point Role	Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.
Change of Value Increment	Define the change of the value increment (COV). The COV increment specifies the minimum change in present value that causes the controller sending the present value to the Web Interface or other recipients on the BACnet bus (e.g. EBI).

**Analog Output Point**

**Purpose** Display and/or modify the attributes of the selected analog output point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

**Properties**

Datapoint Name:  BACnet Object Type:

---

**Lon Mapping**

Lon Point:  ▾

Input NV:

Output NV:  ...

---

**Misc. Editor Functions**

Engineering Unit:  ...

Descriptor:  ...

Alarm Text:  ...

IO Configuration:  ▾ Characteristic:  ▾ ...

---

**Access Rights**

Read Access Level:  ▾ Write Access Level:  ▾

---

**Alarming**

Notification Class:  ▾ Alarm Delay:  [s]

Notify Type:  ▾  High Limit Enable

Low Limit Enable

Deadband:

**Transition Events**

To-Off Normal

To Fault

Back-To-Normal

---

**Values**

Point Role:

Change of Value Increment:

Relinquish Default:

Continuous with Switch  3 Positions Output

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

Attributes Description	Datapoint Name	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Lon Point	Define whether the datapoint should be a LON point or not. List of choices displays:  NV-Input Creates output NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.
	Output NV	Define the NV-type for the LON point.  Reliability status on the Excel Web HTML Interface:  In order to make sure that the Reliability property for the present value works properly, the service type of the point must be set to Acknowledged (Ackd). With acknowledged service, controller - I/O module disconnections are indicated by the relevant reliability 'No Sensor' or 'No Output'. Note, that if a large number of outputs (e.g. all outputs of multiple I/O modules) are set to acknowledged service, the performance on the LON bus may drastically decrease (see "Change Service Type for Excel Web Datapoints" section).
	Engineering Unit	List of choices displays engineering units with ID and unit.
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.

	To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
IO Configuration	<p>To configure the connected terminal. List of choices displays NTC, PT100 Type F, etc.</p> <p>Analog input and output points must be configured prior to their assignment to a particular terminal on a module. By selecting a configuration such as NTC, PT100 Type F, etc., the configuration properties of the datapoint are automatically set.</p> <p>Configure the datapoint before you assign the datapoint to a terminal on the terminal assignment tab. Otherwise you need to rework the configuration properties manually.</p>
Characteristic	Assign and/or build a characteristic (conversion table) if the datapoint is to be mapped to a NV (see Lon point attribute) and the engineering units of both do not match, for example, the NV has °C and the datapoint has °F. To create a characteristic, open the Characteristics dialogbox by clicking the dotted button on the right (see Create and Assign Characteristic to BACnet Point section).
Read Access Write Access	<p>Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.</p> <p>All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).</p>
Notification	<p>Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:</p> <ul style="list-style-type: none"> <li>- Urgent</li> <li>- High</li> <li>- Low</li> </ul> <p>Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)</p> <p>Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).</p> <p>This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).</p>

Notify Type	If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.
Transition Events	Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.
Alarm Delay	Defines the time delay with which a 'To-Off-Normal' or To-Normal transition will be set off.
High Limit Enable	If a high limit is exceeded and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off. Define whether a high limit exceeding should be considered or not.
Low Limit Enable	If the present value falls below the low limit and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off. Defines whether a low limit exceeding should be considered or not.
Deadband	Define the value of the deadband in order to set off an alarm of event type 'To-Normal'. For this, the present value must, for at least the defined alarm delay (time), remain within the range: Low limit plus deadband and high limit minus deadband.
Point Role	Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.
Continuous with Switch 3 Position Output	Define whether the point transmittes a continous signal and is on a board with switches or if the point is a 3 position output.
Change of Value Increment	Define the change of the value increment (COV). The COV increment specifies the minimum change in present value that causes the controller sending the present value to the Web Interface or other recipients on the BACnet bus (e.g. EBI).
Relinquish Default	Define the value that will be written to present value, if all values in the priority list are invalid.

**Analog Value Point**

**Purpose** Display and/or modify the attributes of the selected analog value point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

The screenshot shows a 'Properties' dialog box for an Analog Value Point. The fields are as follows:

- Datapoint Name:** AV1
- BACnet Object Type:** Analog Value
- Lon Mapping:**
  - Lon Point: none
  - Input NV: none
  - Output NV: none
- Misc. Editor Functions:**
  - Engineering Unit: [empty]
  - Descriptor: [empty]
  - Alarm Text: [empty]
- Access Rights:**
  - Read Access Level: Guest (0)
  - Write Access Level: Guest (0)
- Alarming:**
  - Notification Class: none
  - Notify Type: Alarm
  - Transition Events:
    - To-Off Normal
    - To Fault
    - Back-To-Normal
  - Alarm Delay: 0 [s]
  - High Limit Enable:  80,00
  - Low Limit Enable:  -15,00
  - Deadband: 0,50
- Values:**
  - Point Role: [empty]
  - Change of Value Increment: 0,00
  - Relinquish Default: 0,00
  - Optimisation:

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

<b>Attributes Description</b>	<b>Datapoint Name</b>	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Engineering Unit	List of choices displays engineering units with ID and unit.
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Read Access Write Access	Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.  All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).
	Notification	Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:  - Urgent - High - Low  Those default notification classes are especially designed for the alarming to the EBI central (for information on

notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)

Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).

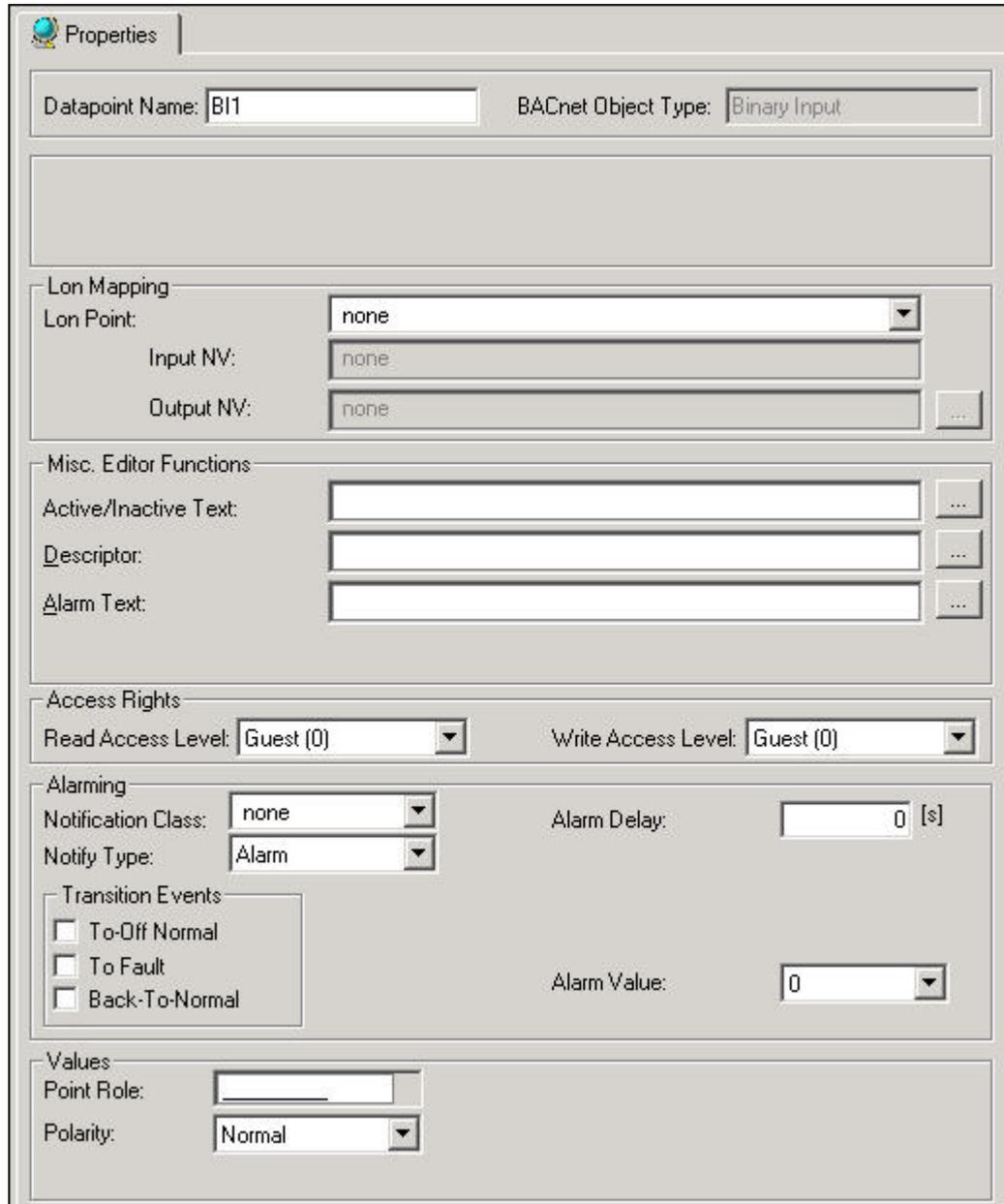
This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).

Notify Type	If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.
Transition Events	Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.
Alarm Delay	Defines the time delay with which a 'To-Off-Normal' or To-Normal transition will be set off.
High Limit Enable	If a high limit is exceeded and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off. Define whether a high limit exceeding should be considered or not.
Low Limit Enable	If the present value falls below the low limit and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off. Defines whether a low limit exceeding should be considered or not.
Deadband	Define the value of the deadband in order to set off an alarm of event type 'To-Normal'. For this, the present value must, for at least the defined alarm delay (time), remain within the range: Low limit plus deadband and high limit minus deadband.
Point Role	Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.
Change of Value Increment	Define the change of the value increment (COV). The COV increment specifies the minimum change in present value that causes the controller sending the present value to the Web Interface or other recipients on the BACnet bus (e.g. EBI).
Relinquish Default	Define the value that will be written to present value, if all values in the priority list are invalid.
Optimization	Check whether the datapoint should be optimized or not, in case the datapoint is used as setpoint for energy optimized heating or ventilation (EOH/EOV).

**Binary Input Point**

**Purpose** Display and/or modify the attributes of the selected binary input point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).



**Properties**

Datapoint Name:  BACnet Object Type:

Lon Mapping

Lon Point:  ▼

Input NV:

Output NV:  ...

Misc. Editor Functions

Active/Inactive Text:  ...

Descriptor:  ...

Alarm Text:  ...

Access Rights

Read Access Level:  ▼ Write Access Level:  ▼

Alarming

Notification Class:  ▼ Alarm Delay:  [s]

Notify Type:  ▼

Transition Events

To-Off Normal

To Fault

Back-To-Normal

Alarm Value:  ▼

Values

Point Role:

Polarity:  ▼

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

Attributes Description	Datapoint Name	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Lon Point	Define whether the datapoint should be a LON point or not. List of choices displays:  NV-Input Creates input NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.
	Input NV	Define the NV-type for the LON point.
	Active/Inactive Text	Assign text which will be displayed for the corresponding active respectively inactive state of the point. List of choices displays active/inactive (passive) texts with ID, and number of states. To add texts to the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see BACnet Miscellaneous Text Editor chapter).
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Read Access Write Access	Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.

All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).

#### Notification

Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:

- Urgent
- High
- Low

Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)

Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).

This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).

#### Notify Type

If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.

#### Transition Events

Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.

#### Alarm Delay

Defines the time delay with which a 'To-Off-Normal' transition will be set off.

#### Alarm Value

To set the status, 0 or 1, when an alarm should be reported, in case the binary input value changes.

#### Point Role

Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.

#### Polarity

Selection of the polarity which indicates the relationship between the physical state of the Input and the logical state represented by the present value. If the polarity is NORMAL, then the ACTIVE state of the present value is also the ACTIVE or ON state of the physical input.

If the polarity is REVERSE, then the ACTIVE state of the present value is the INACTIVE or OFF state of the physical Input.

Present_Value	Polarity	Physical State of Input	Physical State of Device
INACTIVE	NORMAL	OFF or INACTIVE	<u>not</u> running
ACTIVE	NORMAL	ON or ACTIVE	Running
INACTIVE	REVERSE	ON or ACTIVE	<u>not</u> running
ACTIVE	REVERSE	OFF or INACTIVE	running

**Binary Output Point**

**Purpose** Display and/or modify the attributes of the selected binary output point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

Properties

Datapoint Name:  BACnet Object:   
 BACnet Object ID:  BACnet Instance:

Lon Mapping  
 Lon Point:   
 Output NV:

Misc. Editor Functions  
 State Texts:  ...  
 Descriptor:  ...  
 Alarm Text:  ...

Access Rights  
 Read Access Level:  Write Access Level:

Alarming  
 Notification Class:  Alarm Delay:  [s]  
 Notify Type:

Transition Events  
 To-Off Normal  
 To Fault  
 Back-To-Normal

Values  
 Point Role (EDK):   
 Polarity:  Relinquish Default:   
 With Switches

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

Attributes Description	Datapoint Name	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Lon Point	Define whether the datapoint should be a LON point or not. List of choices displays:  NV-Output Creates output NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.
	Output NV	Define the NV-type for the LON point.  Reliability status on the Excel Web HTML Interface:  In order to make sure that the Reliability property for the present value works properly, the service type of the point must be set to Acknowledged (Ackd). With acknowledged service, controller - I/O module disconnections are indicated by the relevant reliability 'No Sensor' or 'No Output'. Note, that if a large number of outputs (e.g. all outputs of multiple I/O modules) are set to acknowledged service, the performance on the LON bus may drastically decrease (see "Change Service Type for Excel Web Datapoints" section).
	Active/Inactive Text	Assign text which will be displayed for the corresponding active respectively inactive state of the point. List of choices displays active/inactive (passive) texts with ID, and number of states. To add texts to the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see BACnet Miscellaneous Text Editor chapter).
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).

Alarm Text	<p>Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.</p> <p>To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).</p>
Read Access Write Access	<p>Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.</p> <p>All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).</p>
Notification	<p>Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:</p> <ul style="list-style-type: none"> <li>- Urgent</li> <li>- High</li> <li>- Low</li> </ul> <p>Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)</p> <p>Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).</p> <p>This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).</p>
Notify Type	<p>If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.</p>
Transition Events	<p>Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.</p>
Alarm Delay	<p>Defines the time delay with which a 'To-Off-Normal' transition will be set off.</p>
Point Role	<p>Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.</p>
Polarity	<p>Selection of the polarity which indicates the relationship between the physical state of the Input and the logical state represented by the present value. If the polarity is NORMAL, then the ACTIVE state of the present value is also the ACTIVE or ON state of the physical input.</p>

If the polarity is REVERSE, then the ACTIVE state of the present value is the INACTIVE or OFF state of the physical Input.

Present_Value	Polarity	Physical State of Input	Physical State of Device
INACTIVE	NORMAL	OFF or INACTIVE	<u>not</u> running
ACTIVE	NORMAL	ON or ACTIVE	Running
INACTIVE	REVERSE	ON or ACTIVE	<u>not</u> running
ACTIVE	REVERSE	OFF or INACTIVE	running

Continuous with Switch

Define whether the point transmits a continuous signal and is on a board with switches or not.

Relinquish Default

Define the value that will be written to present value, if all values in the priority list are invalid.

**Binary Value Point**

**Purpose** Display and/or modify the attributes of the selected binary value point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

**Properties**

Datapoint Name:  BACnet Object Type:

---

**Lon Mapping**

Lon Point:

Input NV:

Output NV:

---

**Misc. Editor Functions**

Active/Inactive Text:

Descriptor:

Alarm Text:

---

**Access Rights**

Read Access Level:   Write Access Level:

---

**Alarming**

Notification Class:   Alarm Delay:  [s]

Notify Type:

**Transition Events**

To-Off Normal

To Fault

Back-To-Normal

Alarm Value:

---

**Values**

Point Role:

Relinquish Default:

Optimisation

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

<b>Attributes Description</b>	<b>Datapoint Name</b>	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	<b>BACnet Object</b>	Displays the BACnet object type.
	<b>Active/Inactive Text</b>	Assign text which will be displayed for the corresponding active respectively inactive state of the point. List of choices displays active/inactive (passive) texts with ID, and number of states. To add texts to the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see BACnet Miscellaneous Text Editor chapter).
	<b>Descriptor</b>	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	<b>Alarm Text</b>	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	<b>Read Access Write Access</b>	Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.  All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).
	<b>Notification</b>	Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:  - Urgent - High

- Low

Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)

Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).

This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).

Notify Type	If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.
Transition Events	Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.
Alarm Delay	Defines the time delay with which a 'To-Off-Normal' transition will be set off.
Alarm Value	To set the status, 0 or 1, when an alarm should be reported, in case the binary input value changes
Point Role	Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.
Relinquish Default	Define the value that will be written to present value, if all values in the priority list are invalid.
Optimization	Check whether the datapoint should be optimized or not, in case the datapoint is used as setpoint for energy optimized heating or ventilation (EOH/EOV).

**Multi-State Input Point**

**Purpose** Display and/or modify the attributes of the selected multi-state input point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

Properties

Datapoint Name: 
 BACnet Object Type:

Lon Mapping  
 Lon Point: 
 Input NV: 
 Output NV:

Misc. Editor Functions  
 State Texts: 
 Descriptor: 
 Alarm Text:

Access Rights  
 Read Access Level: 
 Write Access Level:

Alarming  
 Notification Class: 
 Alarm Delay:  [s]  
 Notify Type:   
 Transition Events  
 To-Off Normal  
 To Fault  
 Back-To-Normal

Values  
 Point Role:

Multi-State Properties
 

States	In Alarm	Fault
1	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

<b>Attributes Description</b>	<b>Datapoint Name</b>	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Lon Point	Define whether the datapoint should be a LON point or not. List of choices displays:  NV-Input Creates input NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.
	Input NV	Define the NV-type for the LON point.
	State Texts	Assign state texts which will be displayed for the corresponding state of the point. List of choices displays the number of states and the first two states of state sequencies which may include mor than two states. Further texts of state sequencies, will be shown by the yellow tooltip. Entries are arranged by ID. To add texts to the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see BACnet Miscellaneous Text Editor chapter).
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Characteristic	Assign a characteristic (conversion table) if the datapoint is to be mapped to a NV (see Lon point attribute). For Multi-State Inputs, the characteristic +1, for Multi-State

	<p>Outputs, the characteristic -1, is provided by CARE by default. These default characteristics must be used if the multi-state points are considered to be mapped to NVs.</p>
<p>Read Access Write Access</p>	<p>Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.</p> <p>All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).</p>
<p>Notification</p>	<p>Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:</p> <ul style="list-style-type: none"> <li>- Urgent</li> <li>- High</li> <li>- Low</li> </ul> <p>Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)</p> <p>Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).</p> <p>This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).</p>
<p>Notify Type</p>	<p>If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.</p>
<p>Transition Events</p>	<p>Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.</p>
<p>Alarm Delay</p>	<p>Defines the time delay with which a 'To-Off-Normal' transition will be set off.</p>
<p>Point Role</p>	<p>Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.</p>
<p>Multi-State Properties</p>	<p>Check in which state the point should be in the Alarm and/or in the Fault condition. If enabled, the alarm text of the corresponding transition events is displayed.(see Alarm text).</p>

**Multi-State Output Point**

**Purpose** Display and/or modify the attributes of the selected multi-state output point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

Properties

Datapoint Name:       BACnet Object Type:

**Lon Mapping**

Lon Point:  ▼

Enable Feedback Value

Output NV:  ...

**Misc. Editor Functions**

State Texts:  ...

Descriptor:  ...

Alarm Text:  ...

**Access Rights**

Read Access Level:  ▼      Write Access Level:  ▼

**Alarming**

Notification Class:  ▼      Alarm Delay:  [s]

Notify Type:  ▼

**Transition Events**

To-Off Normal

To Fault

Back-To-Normal

**Values**

Point Role:

Relinquish Default:

**Multi-State Properties**

States	In Alarm	Fault
1	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

<b>Attributes Description</b>	<b>Datapoint Name</b>	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Lon Point	Define whether the datapoint should be a LON point or not. List of choices displays:  NV-Output Creates output NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.  Reliability status on the Excel Web HTML Interface:  In order to make sure that the Reliability property for the present value works properly, the service type of the point must be set to Acknowledged (Ackd). With acknowledged service, controller - I/O module disconnections are indicated by the relevant reliability 'No Sensor' or 'No Output'. Note, that if a large number of outputs (e.g. all outputs of multiple I/O modules) are set to acknowledged service, the performance on the LON bus may drastically decrease (see "Change Service Type for Excel Web Datapoints" section).
	Output NV	Define the NV-type for the LON point.
	State Texts	Assign state texts which will be displayed for the corresponding state of the point. List of choices displays the number of states and the first two states of state sequences which may include more than two states. Further texts of state sequences, will be shown by the yellow tooltip. Entries are arranged by ID. To add texts to the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see BACnet Miscellaneous Text Editor chapter).
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text.

	To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.
Characteristic	To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter). Assign a characteristic (conversion table) if the datapoint is to be mapped to a NV (see Lon point attribute). For Multi-State Inputs, the characteristic +1, for Multi-State Outputs, the characteristic -1, is provided by CARE by default. These default characteristics must be used if the multi-state points are considered to be mapped to NVs.
Read Access Write Access	Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.  All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).
Notification	Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:  - Urgent - High - Low  Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3 <sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)  Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).  This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).
Notify Type	If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.
Transition Events	Define which transition type (To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.
Alarm Delay	Defines the time delay with which a 'To-Off-Normal' transition will be set off.

Point Role	Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.
Relinquish Default	Define the value that will be written to present value, if all values in the priority list are invalid.
Multi-State Properties	Check in which state the point should be in the Alarm and/or in the Fault condition. If enabled, the alarm text of the corresponding transition events is displayed.(see Alarm text).

**Multi-State Value Point**

**Purpose** Display and/or modify the attributes of the selected multi-state value point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

Properties

Datapoint Name:  BACnet Object Type:

---

Lon Mapping

Lon Point:

Input NV:

Output NV:

---

Misc. Editor Functions

State Texts:

Descriptor:

Alarm Text:

---

Access Rights

Read Access Level:   Write Access Level:

---

Alarming

Notification Class:   Alarm Delay:  [s]

Notify Type:

Transition Events

To-Off Normal

To Fault

Back-To-Normal

---

Values

Point Role:

Relinquish Default:

Optimisation

---

Multi-State Properties

States	In Alarm	Fault
1	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

Attributes Description	Datapoint Name	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	State Texts	Assign state texts which will be displayed for the corresponding state of the point. List of choices displays the number of states and the first two states of state sequencies which may include mor than two states. Further texts of state sequencies, will be shown by the yellow tooltip. Entries are arranged by ID. To add texts to the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see BACnet Miscellaneous Text Editor chapter).
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Read Access Write Access	Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.  All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).
	Notification	Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:

- Urgent
- High
- Low

Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)

Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).

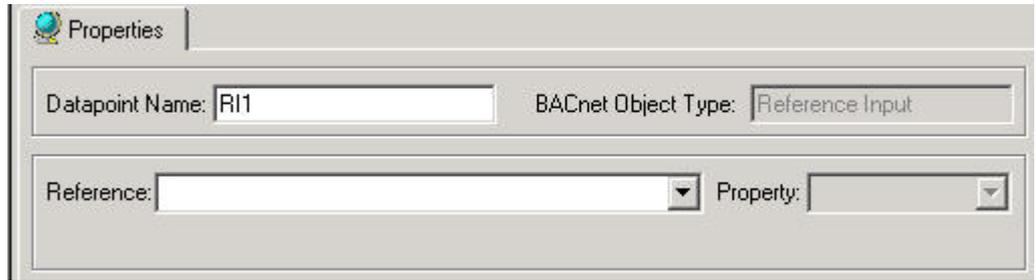
This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).

Notify Type	If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.
Transition Events	Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.
Alarm Delay	Defines the time delay with which a 'To-Off-Normal' transition will be set off.
Point Role	Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.
Optimization	Check whether the datapoint should be optimized or not, in case the datapoint is used as setpoint for energy optimized heating or ventilation (EOH/EOV).
Multi-State Properties	Check in which state the point should be in the Alarm and/or in the Fault condition. If enabled, the alarm text of the corresponding transition events is displayed.(see Alarm text).

**Reference Input Point**

**Purpose** Display and/or modify the attributes of the selected reference input point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).



or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

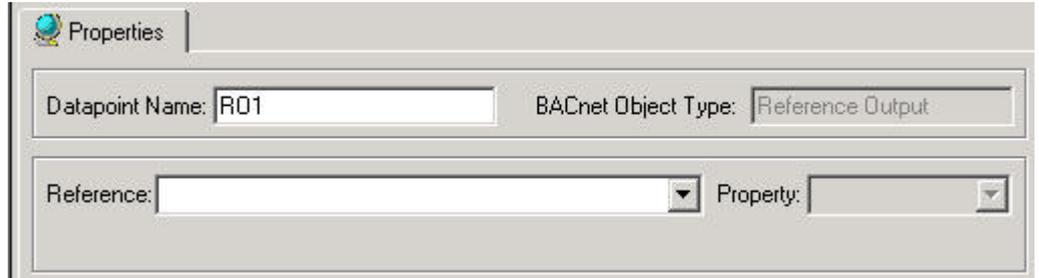
To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

<b>Attributes Description</b>	Datapoint Name	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.  Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.  <b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Reference	Select reference point, the reference input should be assigned to.
	Property	Displays the present value property

**Reference Output Point**

**Purpose** Display and/or modify the attributes of the selected reference output point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).



or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

<b>Attributes Description</b>	Datapoint Name	<p>Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.</p> <p>Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.</p> <p><b>IMPORTANT</b>  <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i></p>
	BACnet Object	Displays the BACnet object type.
	Reference	Select reference point, the reference input should be assigned to.
	Property	Displays the present value property

**Pulse Converter Point**

**Purpose** Display and/or modify the attributes of the selected pulse convertor point.

**Procedure** In the tree, click desired point to display current values on the right Properties tab (itemized display).

The screenshot shows the 'Properties' dialog box for a Pulse Converter Point. The dialog is organized into several sections:

- Datapoint Name:** PC1
- BACnet Object Type:** Pulse Converter
- Lon Mapping:**
  - Lon Point: none
  - Input NV: none
  - Output NV: none
- Misc. Editor Functions:**
  - Engineering Unit: [empty]
  - Descriptor: [empty]
  - Alarm Text: [empty]
  - Scaling Factor: none
- Access Rights:**
  - Read Access Level: Guest (0)
  - Write Access Level: Guest (0)
- Alarming:**
  - Notification Class: none
  - Notify Type: Alarm
  - Alarm Delay: 0 [s]
  - High Limit Enable: 80,00
  - Low Limit Enable: -15,00
  - Transition Events:
    - To-Off Normal
    - To Fault
    - Back-To-Normal
- Values:**
  - Point Role: [empty]
  - Change of Value Increment: 0,00
  - Trigger: Falling Edge

or,

in the tree, click on any object (project, controller, plant) which the point belongs to, and which is in grid display.

To modify values, enter desired values in the fields, and/or select respectively deselect desired options.

Attributes Description	Datapoint Name	Point name (maximum of 40 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. This name must be unique within a controller.
		Point names must include one non-digit character and cannot include Tabs, double quotes, ?, *, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, _, etc). For example, 12A is a datapoint name, but 12 is not.
		<b>IMPORTANT</b> <i>Note that the max. length of the datapoint name for Lon points should not exceed 18 characters (see Lon point attribute).</i>
	BACnet Object	Displays the BACnet object type.
	Lon Point	Define whether the datapoint should be a LON point or not. List of choices displays:  NV-Input Creates input NV.  Manual Mapping Provides selection of this datapoint for mapping to NVs in the NV-Editor.
	Input NV	Define the NV-type for the LON point.
	Engineering Unit	List of choices displays engineering units with ID and unit.
	Descriptor	Supplemental point information. Each project and/or plant has a unique set of descriptors that can be assigned to its datapoint names to further describe them.  List of choices displays descriptors with ID and text. To add and change descriptors in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Alarm Text	Alarm text that displays on point alarm. List of choices displays alarm texts with ID and text.  To add and change alarm texts in the list, open the Miscellaneous Text Editor by clicking the dotted button on the right (see Miscellaneous Text Editor chapter).
	Scaling Factor	Assign and/or create a scaling factor (characteristic), if the datapoint is mapped to a NV (see Lon point attribute). To create a scaling factor, open the Characteristics dialogbox by clicking the dotted button on the right (see Create and Assign Characteristic to BACnet Point section).
	Read Access Write Access	Determine whether the user can read datapoint values respectively write values to the datapoint in the Web Interface.

	<p>All users having a user level equal or higher than the assigned read access respectively write access of the datapoint, will have this access right enabled in the Web Interface, all others will not (for further details, please refer to the User Access Manager section).</p>
Notification	<p>Enable alarming for the datapoint by selecting a notification class with a given priority. By default the following notification classes with descending priority can be selected:</p> <ul style="list-style-type: none"> <li>- Urgent</li> <li>- High</li> <li>- Low</li> </ul> <p>Those default notification classes are especially designed for the alarming to the EBI central (for information on notification classes to be used for 3<sup>rd</sup> party BACnet clients, please refer to the Notification Class Manager section)</p> <p>Each recipient which is assigned to this notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each enabled transition will be propagated with the selected notification. (For further details please refer to the Notification Class Manager section).</p> <p>This connection has not to be mixed up with the transitions selected under Transition Events (see Transition Events description in the following).</p>
Notify Type	<p>If the notification class Urgent, High, or Low has been selected, the notify type Alarm must be used.</p>
Transition Events	<p>Define which transition type ((To-Normal, To-OffNormal, and/or To Fault) will be tracked by timestamping in the Web Interface.</p>
Alarm Delay	<p>Defines the time delay with which a 'To-Off-Normal' or To-Normal transition will be set off.</p>
High Limit Enable	<p>If a high limit is exceeded and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off. Define whether a high limit exceeding should be considered or not.</p>
Low Limit Enable	<p>If the present value falls below the low limit and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off. Defines whether a low limit exceeding should be considered or not.</p>
Point Role	<p>Point Role created via an external tool like XL Toolkit and imported into CARE. The point role is selected from XL Toolkit database.</p>
Change of Value Increment	<p>Define the change of the value increment (COV). The COV increment specifies the minimum change in present value that causes the controller sending the</p>

present value to the Web Interface or other recipients on the BACnet bus (e.g. EBI).

Copy Attribute Values within the Grid

**Purpose** Copy one or a number of attribute values from one or several points to one or more other points. Values can be numeric values, for example delay time, or text, for example, alarm text. The source and target point must be of the same kind, that is, it is possible to copy attributes from analog inputs to analog inputs but you cannot copy attributes from analog inputs to analog outputs, etc. You also cannot copy the same kind of attribute value from different points to another point. That is, you cannot copy the sensor-offset values of two different analog inputs to another analog input.

- Procedure**
1. In the grid, click the attribute you want to copy.
  2. If you want to copy a number of attributes, press STRG key and hold it while clicking further attributes.

Point	User Address	Techn. Address	Alarm Point	Alarm Delay	High Alarm Limit	High Warning Limit	Low Warning Limit	Low Alarm Limit
AI	L22_MW_DischarTemp	22/01/04		10	50,0	40,0	30,0	5,0
AI	L22_MW_Frosttemp	22/01/02		5	50	40	20	5
AI	L22_MW_OaTemp	22/01/01		10	10	10	10	10
AI	L22_MW_RoomTemp	22/01/05		10	10	10	10	10
AI	L22_MW_SupplyTemp	22/01/03		10	10,0	10,0	10,0	10,0

3. Release STRG key.
4. Select menu item Edit, and click Copy  
or,  
with right mouse button, click **outside** the last field you have selected, and then Copy in the context menu.
5. In the point abbreviations bar, click the target point(s) you want the selected attributes copy to.

RESULT: The rows are highlighted.

Point	User Address	Techn. Address	Alarm Point	Alarm Delay	High Alarm Limit	High Warning Limit	Low Warning Limit	Low Alarm Limit
AI	L22_MW_DischarTemp	22/01/04		10	50,0	40,0	30,0	5,0
AI	L22_MW_Frosttemp	22/01/02		5	50	40	20	5
AI	L22_MW_OaTemp	22/01/01		10	10	10	10	10
AI	L22_MW_RoomTemp	22/01/05		10	10	10	10	10
AI	L22_MW_SupplyTemp	22/01/03		10	10,0	10,0	10,0	10,0

6. Click right mouse button and then Paste in the context menu or, select menu item Edit, then drop-down item Paste.

RESULT: In the selected rows, the attributes are pasted into the corresponding fields.

Point	User Address	Techn. Address	Alarm Point	Alarm Delay	High Alarm Limit	High Warning Limit	Low Warning Limit	Low Alarm Limit
AI	L22_MW_DischarTemp	22/01/04		10	50,0	40,0	30,0	5,0
AI	L22_MW_Frosttemp	22/01/02		5	50	40	20	5
AI	L22_MW_OaTemp	22/01/01		5	50	40	30	5
AI	L22_MW_RoomTemp	22/01/05		5	50	40	30	5
AI	L22_MW_SupplyTemp	22/01/03		5	50,0	40,0	30,0	5,0

## Simply Copy Values and Texts without Validity Checking

To simply copy a value or text from one field to another without validity checking you can use the Copy, Cut and Paste icons on the button bar.

### IMPORTANT

*When using the Copy, Cut and Paste icons for copying values/texts, software does not perform validity checking, that is, you have to realize which value/text you are copying to which field.*

- Procedure**
1. In the grid, click the field from which you want to copy (or cut) the value or text .

NOTE: When using the Cut icon, the value/text will be deleted in the field.

2. On the button bar, click copy  (or cut)  icon.
3. In the grid, click the field to which you want to paste the value or text.
4. On the button bar, click Paste  icon.

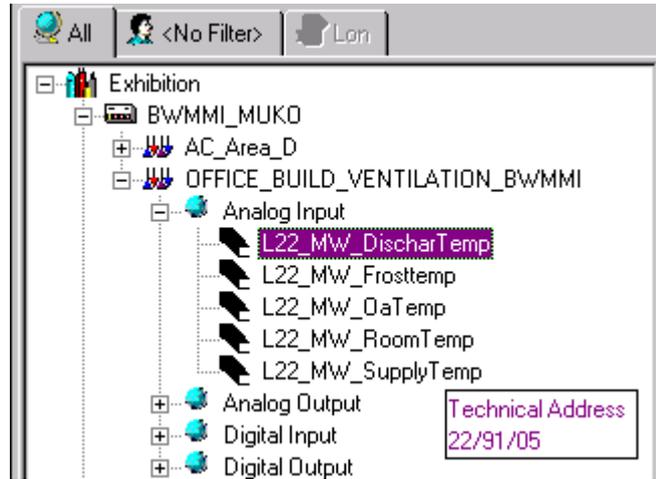
RESULT: The copied and cut value/text respectively is pasted into the field. The current value/text will be overwritten.

5. To copy the same value/text to further fields repeat steps 3 to 4.

## Copy Attribute Values per Drag and Drop within the Tree

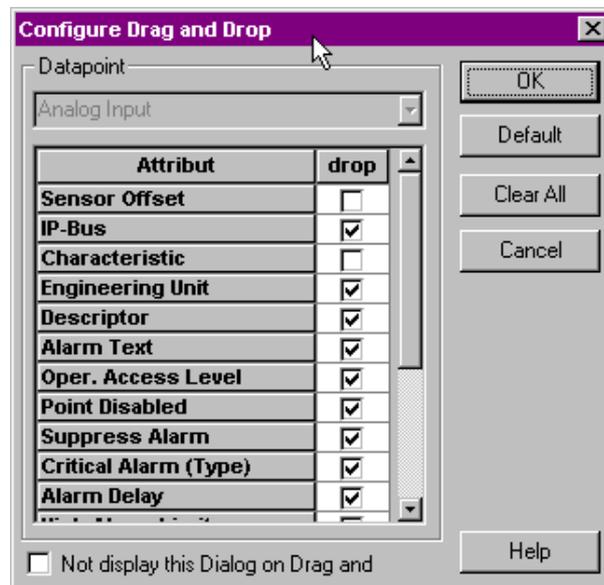
**Purpose** Copy one or max. all attributes values from one point to one or more other points of the same kind. The source and target point(s) must be of the same kind, that is, it is possible to copy attributes from analog inputs to analog inputs but you cannot copy attributes from analog inputs to analog outputs, etc. This function is suitable for quickly copying many (at most all) attributes of one point to another point or a high number of points.

- Procedure**
1. In the tree, select the point, which you want to copy the attributes from.
  2. On the right, check the attribute values and correct some, if desired.
  3. With left mouse button, click already selected point in the tree, and drag it to the desired target point of the same kind. While dragging, a plus symbol is displayed at the cursor indicating that dropping of the attributes on the point where the cursor currently stands, is possible. The current technical addresses are displayed in tool tips. Invalid target points where attributes cannot be dropped on are indicated by the forbidden symbol at the cursor.



- Over the target point, release left mouse button.

RESULT: The Configure Drag and Drop dialog box displays.



- In the list, select the attributes you want to drop on the target point by checking the corresponding check boxes. Use Default button to select all attributes. Use Clear All button to deselect all attributes and reselect desired attributes.

RESULT: The selected attributes are dropped on the target point (cursor position). In grid display, the grid will be concurrently updated.

To generally configure Drag and Drop options for point types, please refer to the Configure Drag and Drop section.

## Search and Replace Attribute Settings

### Purpose

Modify all or selected attribute settings in a controller by searching and replacing. Attribute values can be of very different type, for example: Alarm Text = Firealarm, Alarm Delay = 10 sec, Hide Point = checked, etc. You can search for any type of attribute and replace its setting. For example, you can search for points that have the alarm delay of 10 sec and replace it with 5 sec.

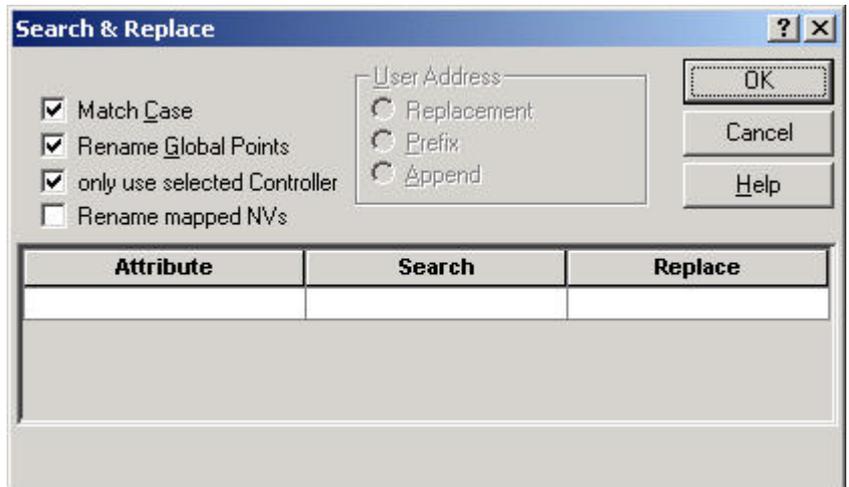
Examples:

Selected Attribute	Search Entry / Selection	Replace Entry
Alarm Text	Firealarm or *F	Phone 733
Alarm Delay	10	5
Hide Point	= checked	=unchecked

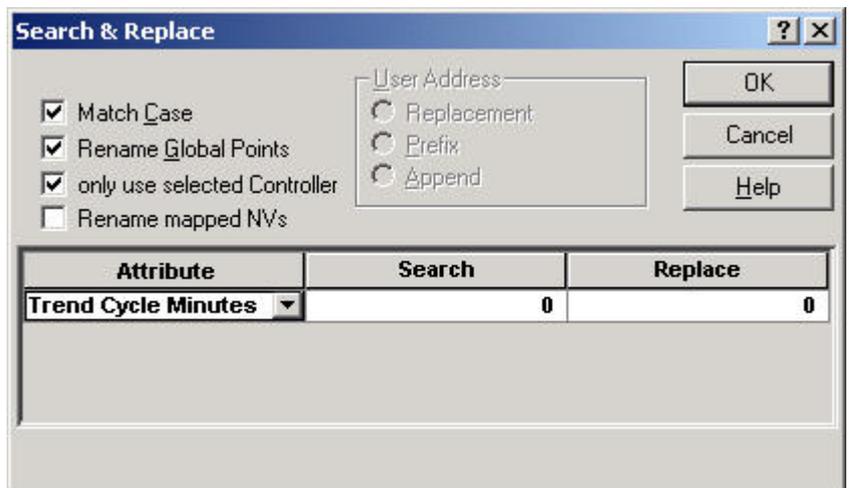
**Procedure**

1. In the logical plant tree, click on desired controller in the tree.
2. Click menu item Edit, then drop-down item Search & Replace...

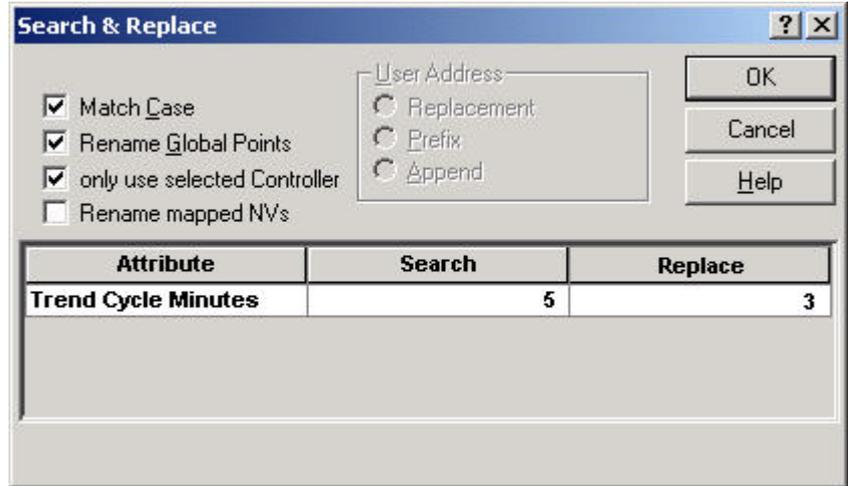
RESULT: The Search & Replace dialog box displays.



3. Click into the Attribute field and select desired attribute, you want to change the settings for.



4. In the Search field, enter the search string (whole term or part of the term) for the attribute setting.
5. In the Replace field, enter/select the setting you want to replace with.



6. Check Match Case, if you want to consider the case (only applicable for user address attribute, see Rename Points and NVs section).
7. Check Rename Global Points, if desired (only applicable for user address attribute, see Rename Points and NVs section).
8. Check only use selected controller if you only want to search in the selected Controller. If this option is unchecked, software searches in the whole tree including all controllers.
9. Check Rename mapped NVs if you want to rename NVs in the same way as the mapped datapoints (only applicable for user address attribute, see Rename Points and NVs section).

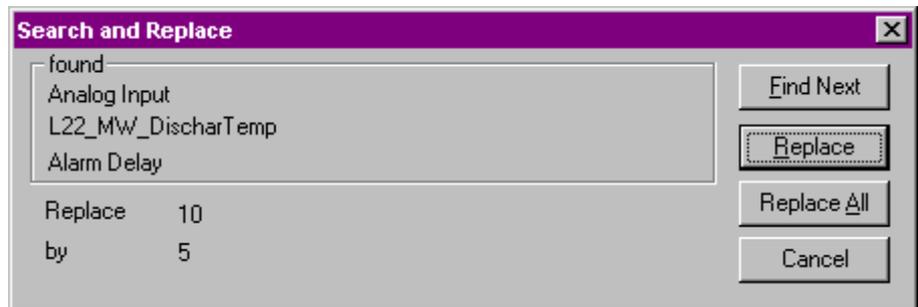
**IMPORTANT**

*When only "use selected Controller" is checked and "Rename Global Points" too, global points may not find the referenced points in the other controller.*

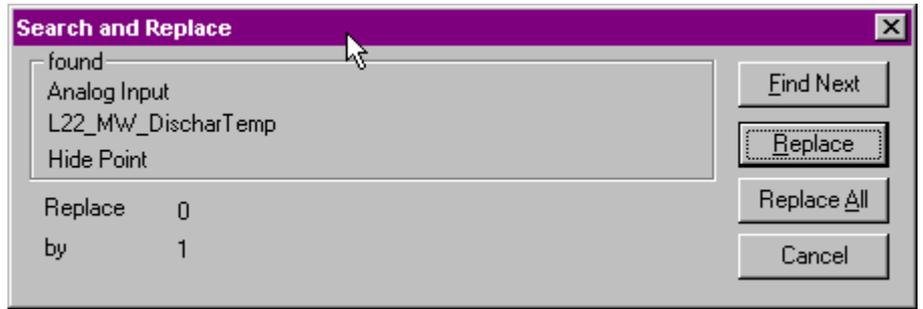
10. Click OK to initiate the first Search.

RESULT: If software does not find any matches, it displays a message to that effect. You can change the search string to initiate other searches. If software finds a matching setting, the Search and Replace dialog box opens showing the point with the setting you have searched for. Depending on the selected attribute the Search & Replace dialog box displays different results:

For attributes with simple values, for example alarm delay, the respective values will be shown.



For attributes which can have two alternative states, for example, checked or unchecked, the state will be shown as 1 for checked and 0 for unchecked.



- To change the setting for the found user address as specified in the Replace string, click Replace.

To find the next user address that matches the criteria, click Find Next.

To change the found user address plus all other addresses that match the criteria, click Replace All.

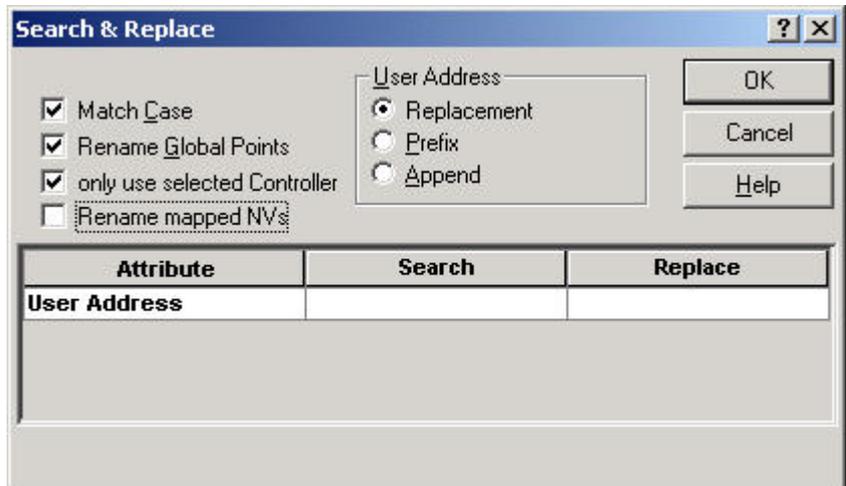
RESULT: Software changes the attribute settings as specified.

## Rename Points and NVs

**Purpose** Modify all or selected user addresses in a controller either by searching for strings (whole user address or alphanumeric items: e.g. L22, RoomTemp, etc.) and replacing them or by adding characters to the beginning or end of user addresses. To directly rename a point, refer to the Edit User Address section.

- Procedure**
- In the logical plant tree, click on desired controller in the tree.
  - Click menu item Edit, then drop-down item Search & Replace...

RESULT: The Search & Replace dialog box displays.



- Check Match Case if character strings should be find that match upper and lower case letters. For example, if you check Match Case and enter a search string of Oa, software does not find OA or oa.
- Check Rename Global Points, if global datapoints should be renamed too.
- Check only use selected Controller if only the names in the currently selected controller should be changed.

### **IMPORTANT**

When "only use selected Controller" is checked and "Rename Global Points" too, global points may not find the referenced points in the other controller.

6. Check Rename mapped NVs if mapped NVs should be changed in the same way as their datapoints.

Example:

User address of datapoint: BaTemp becomes DaTemp  
 NV name of mapped datapoint: nviaBaTemp becomes nviDaTemp

7. Choose whether to search for and replace special strings in user addresses or just add characters to the beginning or to the end of user addresses by using the corresponding option under:

**Replacement**

If this option is selected, the string (characters) of user addresses entered in the Search field will be replaced with the string entered in the Replace field.

Example:

In the Search field, type \*Oa to search for all user addresses that contain the letters Oa. In the Replace field, type the characters you want to substitute when software finds the search string. For example, type Ra to replace the string Oa.

**Prefix**

If this option is selected, the user addresses that match the string (characters) entered in the Search field will be prefixed with the string entered in the Replace field. That is, the string entered in the Replace field will be added to the beginning of user addresses.

Example:

In the Search field, type \*L22, and in the Replace field, type CPU1\_. The item CPU1 is added to the beginning of the user address, that matches the criteria L22, independent where L22 stands within the user address.

**Append**

If this option is selected, the string entered in the Replace field will be appended to the end of the user addresses that match the string (characters) entered in the Search field.

Example:

In the Search field, type \*L22, and in the Replace field, type \_DEMO. The item Demo is added to the end of the user address, that matches the criteria L22, independent where L22 stands within the user address.

8. Click into the Attribute field and select User Address.
9. In the Search field, enter the search string (whole or part of the user address), and in the Replace field, enter the string, which should replace the search string or should be added to the beginning (Prefix) or to the end (Append) of the user address.

**Search String Conventions**

To search successfully, you **must** either enter the whole name of the user address or use the wildcard ? or the joker \* for a string, which is naturally shorter than to enter the whole user address. The joker \* stands for any number of characters, the wildcard ? stands for one character. When using the wildcard ?, the string including the ? must match the exact wording and sequence as it is in the user address. They have to be entered in one of the following ways:

Example:

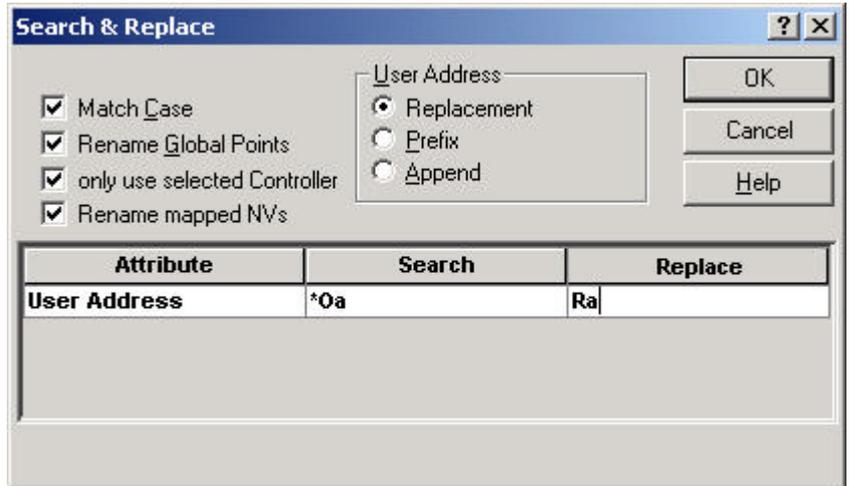
Search (within) the string LMM22:

\*LMM22  
 ?MM22  
 LMM2?  
 ?M?2?

**IMPORTANT**

Although when creating user addresses \* and ? cannot be used, this joker and wildcard has to be used for the **Search** string. Do not use them for the Replace string.

When searching for and replacing user addresses, the search string will be found at any location within the user address (see Valid User Addresses Note at the end of this section). For example, when applying the search criterion "D\*", both, user addresses such as DO\_Feedback where the "D" appears at the beginning and user addresses such as "L08Zone1Dmpr" where the "D" appears in the middle will be found. When using the **Replace All** button then it may result in undesired user addresses.



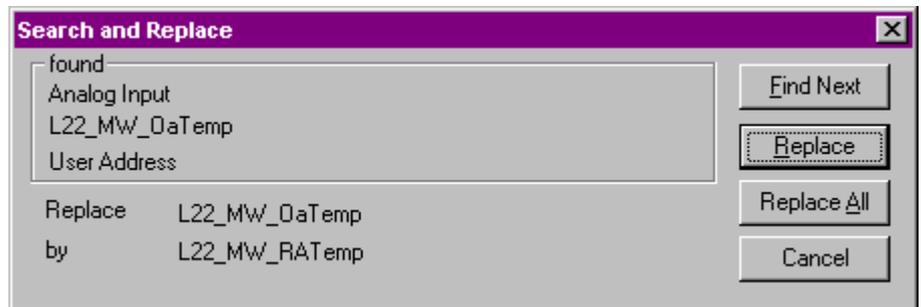
10. Enter desired criteria for renaming the user addresses. Keep in mind the rules for user address name; see the Valid User Addresses note that follows this procedure.
11. Click OK to initiate the first Search.

**RESULT:** If software does not find any matches, it displays a message to that effect. You can change the search string to initiate other searches.

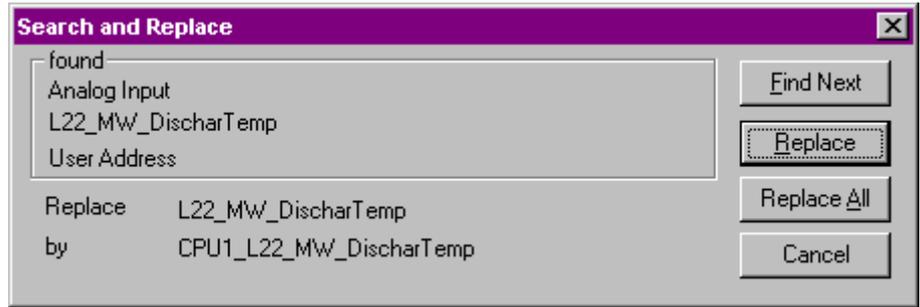
If software finds a matching user address, it displays it in the Search and Replace dialog box. The search results are different depending on the option, which was selected (Replacement, Prefix, Append).

Search result examples:

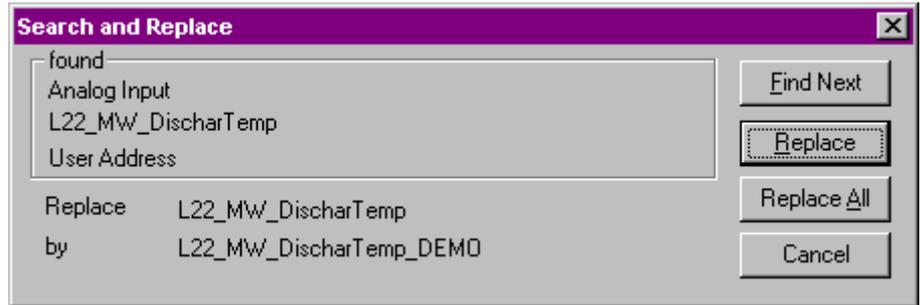
Replacement function



## Prefix function



## Append function



12. To change the found user address as specified in the Replace string, click Replace.

To find the next user address that matches the criteria, click Find Next.

To change the found user address plus all other addresses that match the criteria, click Replace All.

RESULT: Software changes the user addresses as specified.

**Valid User Addresses**

User addresses can be a maximum of 18 characters and must include one non-digit character. They cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

**Quick Search in Tree**

**Purpose** Quickly search in the tree. You can search for user addresses, projects, controllers, plants, names of NVs, CPTs, and program Ids and neuron Ids of devices.

**Procedure** 1. In the logical plant tree or in the network tree, click on desired item (project, controller, etc.) where the search should start.

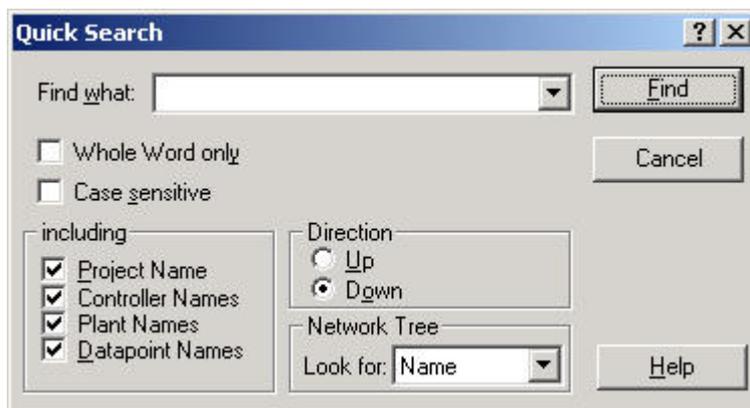
2. Click on menu item Edit, then drop-down item Quick Search

or,

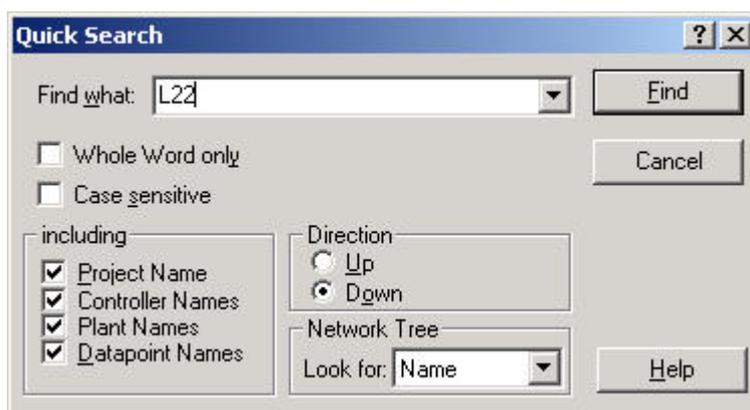
when in grid display, point cursor over the grid.

Click right mouse button and click on Quick Search in the context menu.

RESULT: The Quick Search dialog box displays.



3. In the Find what field, enter the item you want to search for.



4. Select desired options under:

**Whole Word only**

If this option is checked, software searches for occurrences that are whole words, and not part of a larger word. If this option is unchecked, software searches for occurrences of the search item in any word that includes the search item.

**Case sensitive**

If this option is checked, software distinguishes between upper and lower case letters.

**Including**

**Project Name**

If this option is checked, all project names are included in the search.

**Controller Names**

If this option is checked, all controller names are included in the search.

**Plant Names**

If this option is checked, all plant names are included in the search.

**Datapoint Names**

If this option is checked, all datapoints (user addresses) are included in the search.

**Direction**

Check desired direction, Up or Down, by clicking the corresponding radio button. The search starts from the highlighted item in the tree.

**Network Tree**

By selecting one of the options in the Look for drop-down listbox, you can search for items in the network tree, such as names of NVs, CPTs etc., and program Ids and neuron Ids of devices that reside in the network tree.

5. Click Find button.

**NOTE:** Make sure that you have selected the appropriate tree (logical plant tree, network tree) and the desired item in the network tree (e.g. project, controller) to which the software should apply the search.

**RESULT:** In the toolbar, the search item is displayed in the Quick Search field.



The Quick Search field allows to search more quickly later without opening the Quick Search dialog box from the Edit menu. When using this function keep in mind the settings of the Quick Search dialog box.

If the search is successful, the Quick Search dialog box closes, and software highlights the first found item in the tree or grid.

If no text is found, that matches the search item, a corresponding message is displayed. Confirm the message and try again by entering a new search item in the Find what field.

6. To continue a successful search with the same search item, press ENTER key. If more items match the search criteria, the next found item is highlighted, etc.

**Use Filters**

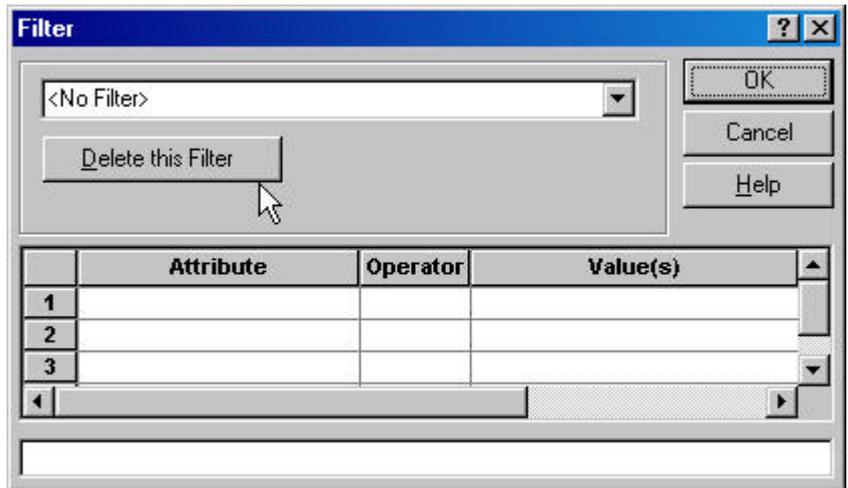
**Purpose** Display points which have equal attribute settings. For example, you can display all hidden points, all points, which reside on module 3, or all points that have a delay time of 10 sec. The filter function can be used in both, the tree and the grid, and they can be used together. The filter function for the tree is more extensive whereas the filter function for the grid can be used quicker. Refer to the following sections for detailed descriptions of the filter functions.

**Apply Filter in Tree**

**Purpose** Display points which have equal attribute settings. For example, you can display all disabled points, or all points that have a delay time of < 10 sec, or a trend hysteresis value of >15 °C, etc. You can also combine filter criteria that is for example, you can display all disabled points, which have a delay time of < 10 sec. In addition to the operator =, the operators <, >, ≤, ≥, not= can be used. In opposite to the filter function in the grid, you can define filters and save them for reuse. Saved filters can be deleted.

- Procedure**
1. In the logical plant tree, click on the project, controller or plant.
  2. Click on menu item Options, then drop-down item Filter Configuration
    - or,
    - click Configure Filter button  on the toolbar
    - or,
    - when in grid display, point cursor over the grid. Click right mouse button, select Options and click on Filter in the context menu.

**RESULT:** The Filter dialog box is displayed.



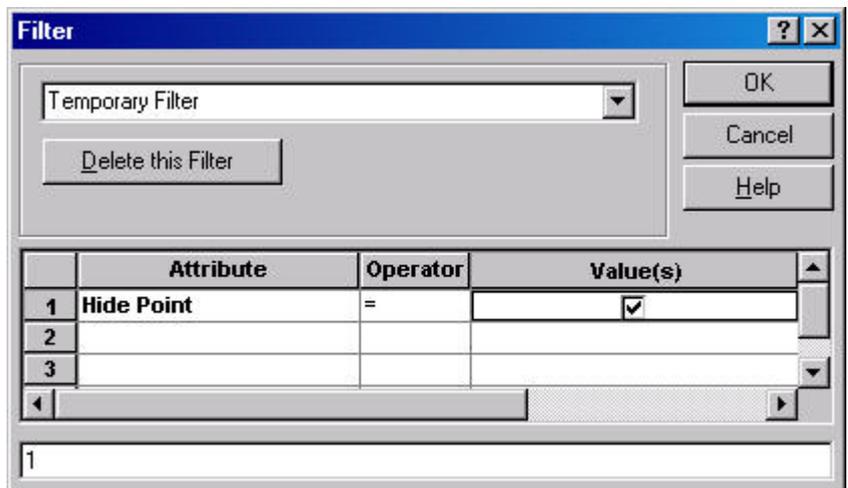
3. In the first line, click in the Attribute field and select desired attribute.

Example:

You want to display all hidden points, that is, all points, which have the attribute 'Hide Point' checked.

Select Hide Point in the Attribute field.

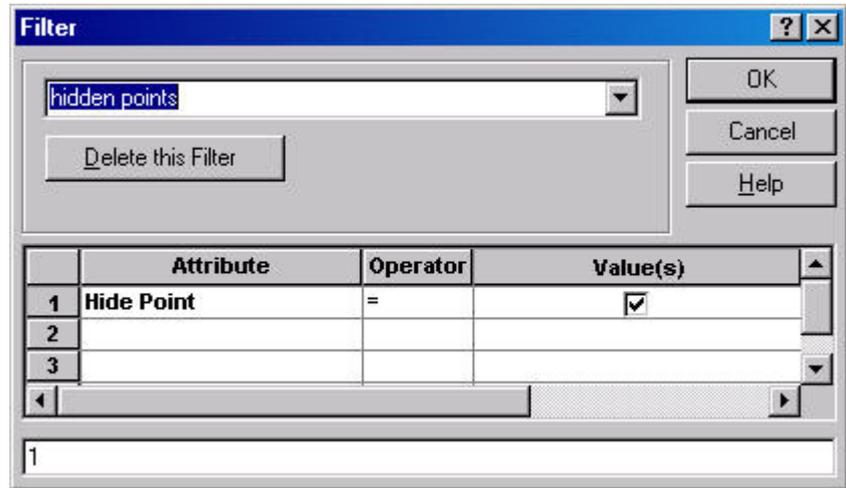
4. In the Operator field, select the operator. Operators are depending on the selected attribute. For the attribute Hide Point the operator = is available.
5. In the Value(s) field, enter/select the value the attribute should have. Values are depending on the selected attribute. To display hidden points in the tree, check the check box in the Value(s) field.



**RESULT:** In the filterline below, the term entered in line one is indicated by its line number (1). When entering additional lines, the terms (lines) will be automatically combined via ANDs and displayed, for example, as follows: 1 and 2 (see AND and OR combination at the end of the section).

The filter is defined as temporary filter. This is shown by the word temporary Filter in the top list box field. A temporary filter will not be saved when closing the dialog box by clicking OK. It must be redefined for the next application.

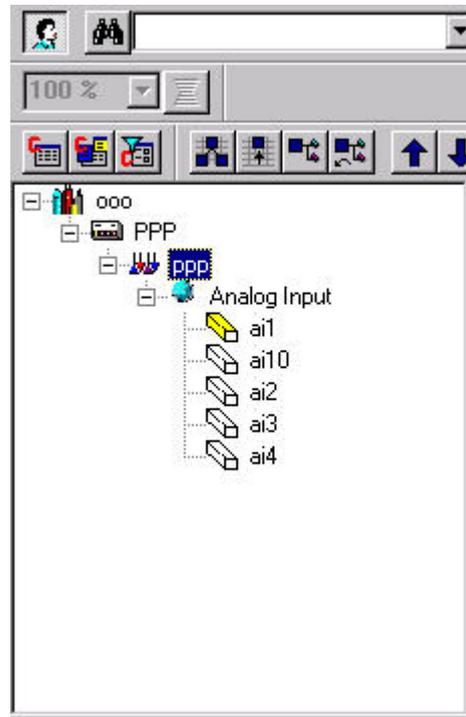
6. To save the filter, click into the top list box field, highlight current entry, press key, and enter the name for the filter you want to define, e.g. hidden points.



7. Confirm by clicking OK.

8. In the *Standard* toolbar, click on the filter on/off icon .

RESULT: All points matching the defined filter, in this case, all hidden points, are displayed in the tree.



#### Delete Filter

Select filter in the drop-down list box and click Delete this Filter.

#### AND and OR combination

When entering more than one line, the lines are automatically combined via ANDs. But, lines can also be combined via ORs. To combine two lines via OR, click into the line, delete “and” and enter “or”. It is recommended to use brackets.

Example:

(1 or 2) and 3

**Apply Filter in Grid**

**Purpose** Display points, which have equal attribute settings. For example, you can display all disabled points, all points that have a delay time of 10 sec, or a trend hysteresis value of 15 °C, etc. In opposite to the filter function in the tree, you cannot define filters and save them for reuse. After quitting the current grid by selecting another object in the tree, the filter will be discharged. You can use the operators <, >, ≤, ≥, and not=.

- Procedure**
1. Select menu item Options, then drop-down item Grid configuration to open the Configure Grid dialog box.
  2. Check Filterline in Grid.
  3. If not already done, display the desired grid by selecting the corresponding object in the tree (see Tree and Information Display section).

RESULT: In the first row of the grid, the Filter line is displayed.

Point	User Address	Techn. Address	Sensor Offset	Bus	Characteristic	Engineering Unit	Descriptor
Filter							
AI	L22_MW_DischarTemp	22/01/04	0,00	IP	PT 1000 Type C.1	K	FAX
AI	L22_MW_Frosttemp	22/01/02	0,00	IP	Direct Out 0-100%	°C	FAX

In the Filter line you can enter the filter criteria into the respective attribute fields. When entering more than one criterion they will be combined to an AND. Grayed fields are disabled.

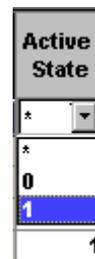
Example:

You want to display all points on module 4, which have active state = 1.

4. In the Filter line, click on the Techn. Address field and replace the two jokers in the middle with 04.

Point	User Address	Techn. Address
Filter		**04**

5. With scroll bar on the bottom, scroll to the Active State column.
6. In the Filter line, click on the Active State field and select 1.



RESULT: Just after leaving the Techn. Address field and while editing the Active State field, all points on module 4 are displayed.

Point	User Address	Techn. Address	Alarm Text	Active State
Filter		**04**		*
DO	L22_SB_UP_Chiller	22/04/02		*
DO	L22_SB_UP_Heater	22/04/01		0
DO	L22_SB_Vent_DcAir	22/04/04		1
DO	L22_SB_Vent_SupAir	22/04/03		1

After leaving the Active State field with desired selection, all points on module 4 with the Active State attribute set to 1, are displayed in the grid.

Point	User Address	Techn. Address	Descriptor	Alarm Text	Active State	Oper. Access Level	Point Disab.
Filter		**04**			1	*	
DO	L22_SB_Vent_DcAir	22/04/04			1	3	<input type="checkbox"/>
DO	L22_SB_Vent_SupAir	22/04/03			1	3	<input type="checkbox"/>

- To discard the filter, enter/select the original settings or, click on any object in the tree.

### Configure Drag and Drop

**Purpose** Define attributes, which should be copied from one, point to one or more other points of the same kind via drag and drop function within the tree.

- Procedure** 1. Click on menu item Options, then drop-down item Drag and Drop...

or,  
click Configure Drag and Drop button  on the toolbar

or,  
when in grid display, point cursor over the grid.

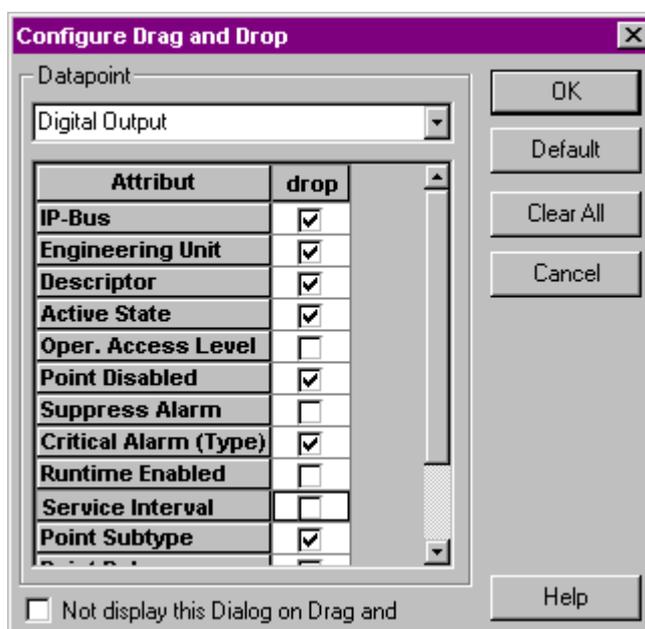
Click right mouse button, select Options and click on Drag and Drop in the context menu.

RESULT: The Configure Drag and Drop dialog box displays.



- In the drop-down list, select the point type.

RESULT: The Attributes for the point type display in a list.



- In the drop column check the attributes, which should be dropped on the target point(s). Use Default button to select all attributes. Use Clear All button to deselect all attributes and reselect desired attributes.
- Check Not display this Dialog on Drag and Drop, if you do not want to display the Configure Drag and Drop dialog box during Dragging and Dropping. In this case keep in mind, which attributes are enabled/disabled for drag and drop.

or,

uncheck Not display this Dialog on Drag and Drop, if you want to display the Configure Drag and Drop dialog box during every Dragging and Dropping. In this case, you can check, which attributes are enabled/disabled before finally dropping the attributes to target point(s). If desired, you can change settings.

- Confirm by clicking OK.

For detailed instructions of the Drag and Drop function, please refer to the Copy Attribute Values per Drag and Drop within the Tree section

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## Print Datapoint Descriptions

To print Datapoint descriptions see Print Documentation chapter.

## Miscellaneous Text Editor (Excel 5000 Controllers)

**Purpose** Provide functions to define, edit, copy, and replace Engineering Units, Point Descriptors, Alarm Texts, and Characteristics. These functions can only be accessed from within the Datapoint Editor in three ways:

- via menu Options, drop-down item Edit Text
- from within the itemized display for a point
- from within the grid via right mouse button

### General Procedure

1. Select the controller in the logical plant tree.
2. Click on menu item Options, then drop-down item Edit Text, and text type (Analog Eng. Units, Descriptors, Characteristics, etc.) you want to edit.

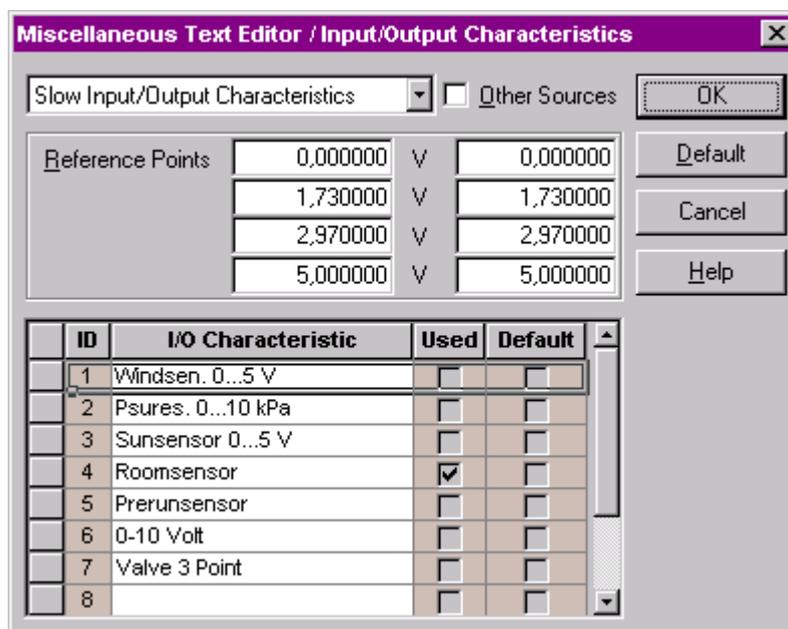
or,

if you are working on a point in itemized display, click corresponding dotted button  in the Misc. Text Editor area.

or,

if you are working in the grid, select corresponding text field (engineering unit, descriptor, etc.), click right mouse button, and then MiscEdit in the context menu.

**RESULT:** The Miscellaneous Text Editor dialog box is displayed. The dialog box title is named according to the text type selected in the Edit Text menu or where the dotted button referred to. The corresponding texts are listed and indicated by their IDs. For characteristics the reference points are displayed additionally. Default texts are displayed with a check mark in the Default column, customized texts do not. Texts, which are already used by at minimum one point are displayed with a check mark in the Used column (only display). Both, used and unused texts can be edited.



### Create new text

3. To create a new text, select an empty line and enter desired text. For engineering units select options in the additional fields (decimal places, number, state). For characteristics enter reference point values.

### Edit text

1. See step 1 General Procedure.

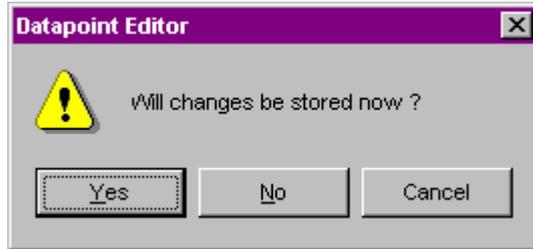
2. See step 2 General Procedure.
3. To edit text, locate line, click into the field and write over text.

and/or,

change options for engineering units in the additional fields (decimal places, number, state). For characteristics change reference point values.

4. To display and edit different texts than currently displayed, click down arrow at the top and select desired text type.

RESULT: A Message is displayed asking for the storage of your changes.



5. Click Yes, if you want to save the changes you did to the previously selected text type.

Click No, if you want to discard the changes you did to the previously selected text type.

RESULT: The Miscellaneous Text Editor dialog box displays the new text type.

#### Replace text

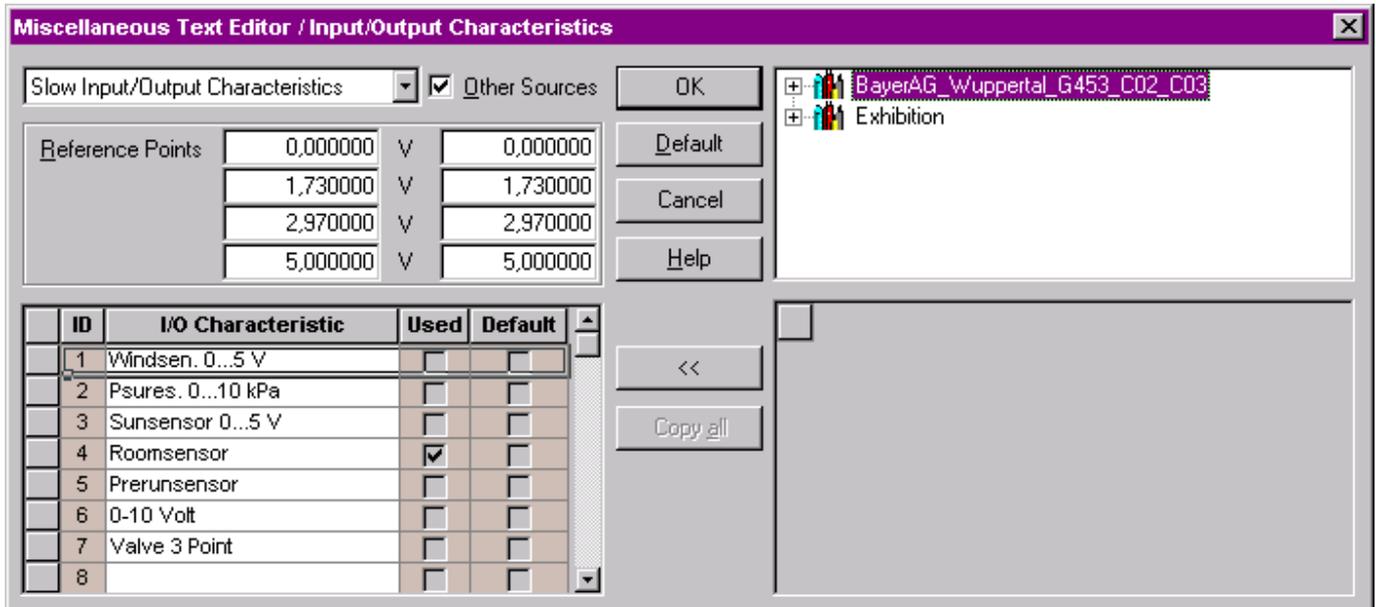
1. See step 1 General Procedure.
2. See step 2 General Procedure.
3. Select text, you want to replace by clicking on the tiled bar on the left.
4. Click Default.
5. Confirm by clicking OK.

NOTE: You cannot remove any of the default texts from the system. You can only replace the default text with custom text. When you select a text and click **Default**, software replaces the custom text with the original default text. This is indicated by the unchecked text in the Default column.

#### Copy texts from other controllers

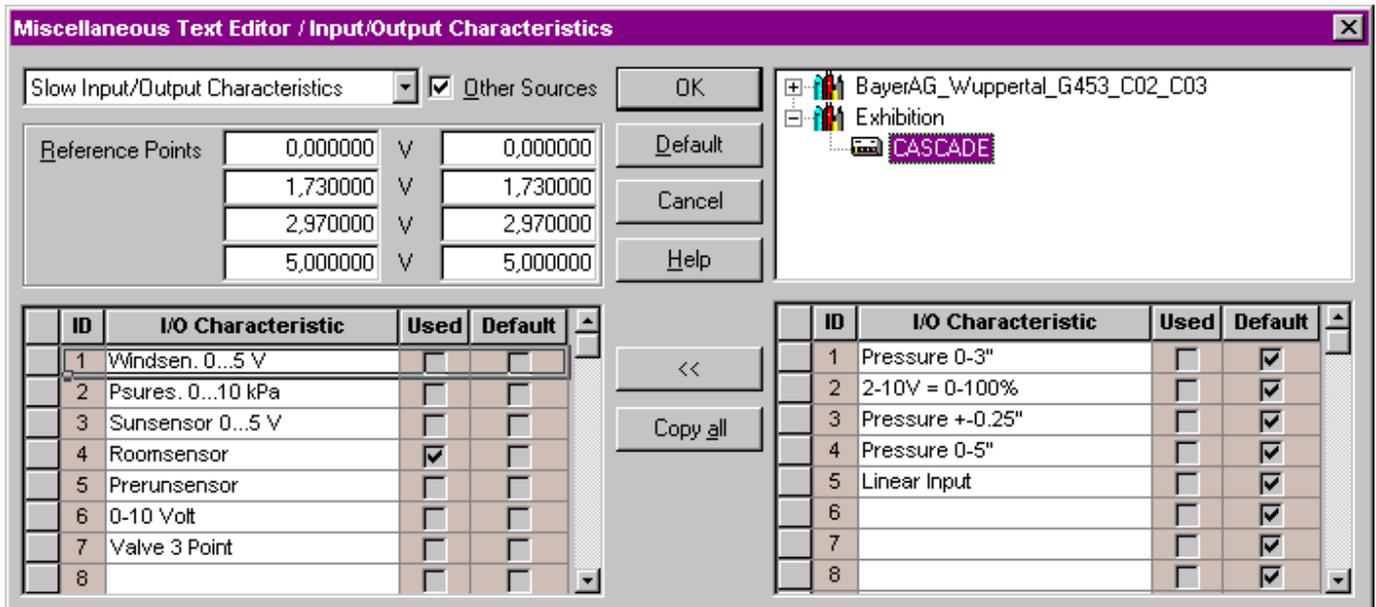
1. See step 1 General Procedure.
2. See step 2 General Procedure.
3. If you want to copy texts from other controllers of the same project or from other projects, check the other Sources check box.

RESULT: The dialog box is expanded and all controllers (projects) are available in a tree on the right side.



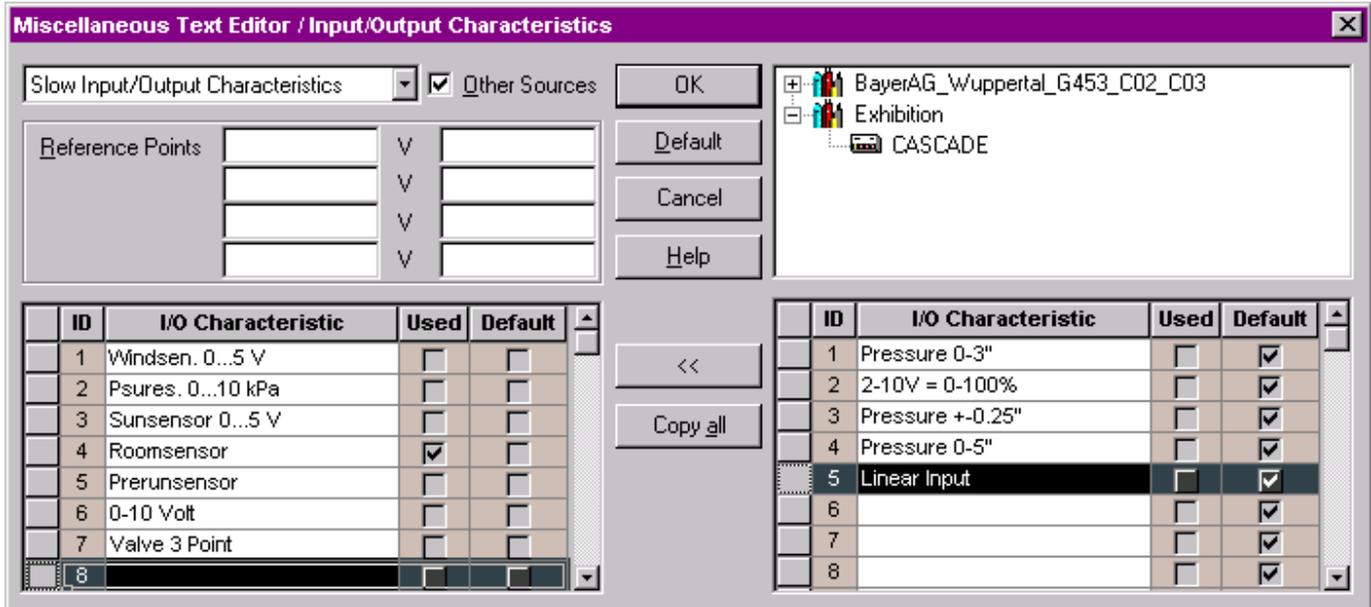
- Open project with desired controller and click on the controller (source).

RESULT: The corresponding texts are displayed below.



- In the list on the right, select the text you want to copy to the controller (target) you currently work with by clicking on the tiled bar. Press SHIFT key, if you want to select more than one text.
- In the list on the left, click the line where the text should be copied to (target). If you have selected more than one text for copying, you must select the same number of lines in the left list.

NOTE: If the lines you selected on the left show already texts, these will be overwritten by the ones from the source controller.

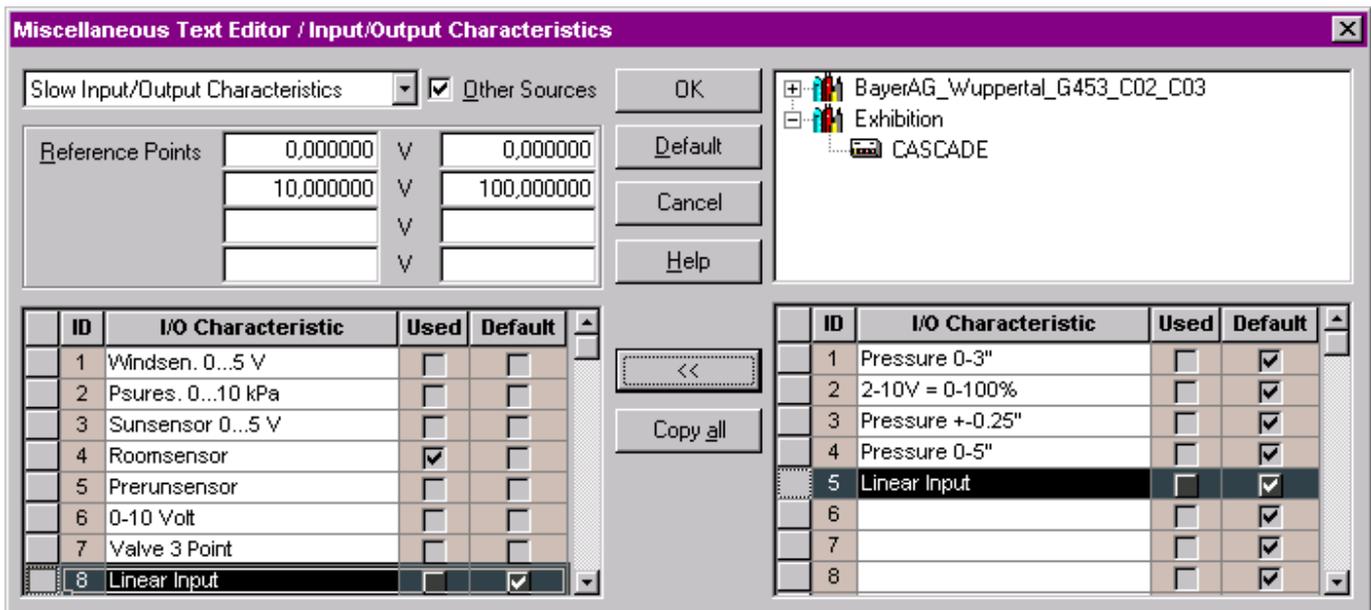


7. Click on the button with the double arrow.

or,

click on the Copy all button, if you want to copy all texts from the source controller to the current target controller.

RESULT: The texts are copied.



8. Click OK to confirm the copying.

For detailed descriptions of creating, editing, and deleting analog and digital engineering units, descriptors, alarm texts, and characteristics, refer to the respective following sections.

## Analog Engineering Units

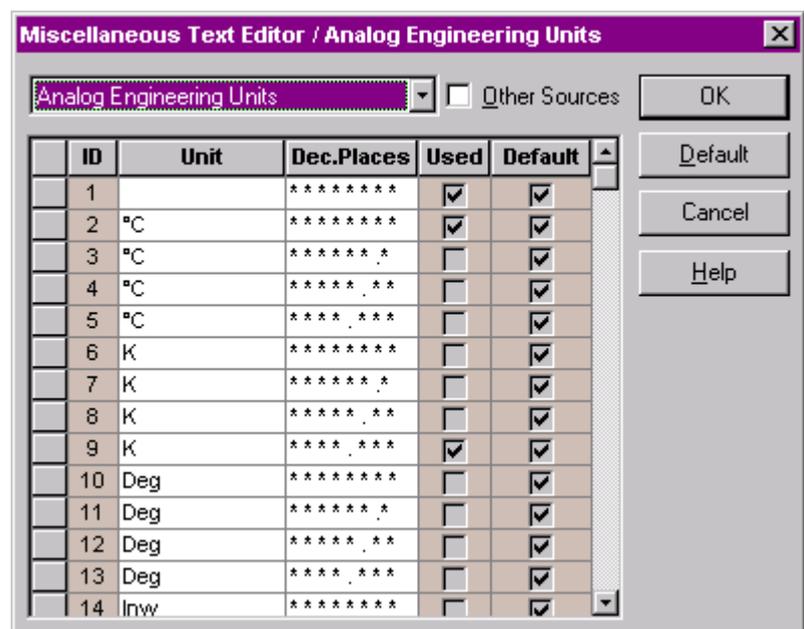
- Create Analog Engineering Units
- Edit Analog Engineering Units
- Copy Analog Engineering Units from Other Controllers
- Replace Analog Engineering Units

**Purpose** Create, edit, copy, and/or replace analog units of measurement. Analog engineering units specify an abbreviation for a unit of measurement (for example, degrees, inches, centimeters) and the number of decimal places allowable for the measurement.

For example, an analog input for a temperature sensor can be in Fahrenheit with an accuracy of two decimal places.

This dialog box defines the text that displays for each engineering unit as well as its decimal places. There are a maximum of 254 analog engineering units.

- Procedure**
- In the logical plant tree, click on the controller. Click menu item Options, then drop-down item Edit Text and Analog Eng. Units.
- RESULT:** The Miscellaneous Text Editor / Analog Engineering Units dialog box is displayed. Default engineering units are displayed with a check mark in the Default column, customized engineering units do not. Engineering units, which are already used by at minimum one point are displayed with a check mark in the Used column (only display). Both, used and unused engineering units can be edited.



- Create new analog engineering unit**
- Select an empty line and enter the text into the Unit field.
  - In the Dec.Places column, click into the field and select the format.
  - Confirm by clicking OK.

- Edit analog engineering unit**
- See step 1 of Procedure.
  - Locate engineering unit, you want to edit.
  - In the Unit column, click into the field and write over the existing text.
  - In the Dec.Places column, click into the field and select another format.
  - Confirm by clicking OK.

**Copy analog engineering units from other controllers**

1. See step 1 of Procedure.
2. If you want to copy analog engineering units from other controllers of the same project or from other projects, check the other Sources check box. For detailed instructions, please refer to Copy texts from other controllers in the General Procedure section.

**Replace analog engineering unit**

1. See step 1 of Procedure.
2. Select engineering unit, you want to replace by clicking on the tiled bar on the left.
3. Click Default.
4. Confirm by clicking OK.

NOTE: You cannot remove any of the default units from the system. You can only replace the default unit with the custom unit. When you select an engineering unit and click **Default**, software replaces the custom unit with the original default unit.

**Digital Engineering Units**

- Create Digital Engineering Units**
- Edit Digital Engineering Units**
- Copy Digital Engineering Units from Other Controllers**
- Replace Digital Engineering Units**

**Purpose**

Create, edit, copy, and/or replace digital units. Digital engineering units identify the switching status of a digital point. A digital point can either be active ("normal") or passive ("alarm"). Active state can be 0 or 1 depending on the Active State attribute for the point.

For example, a digital output connected to a pump can indicate ON when active (normal) and OFF when passive (alarm).

Points can have more than two states. For example, OFF/ON is two states. OFF, ON, POS-1, POS-2, and POS-3 are five states.

This dialog box defines the text that displays for each state. There are 20 default sets of texts (listed in Appendix).

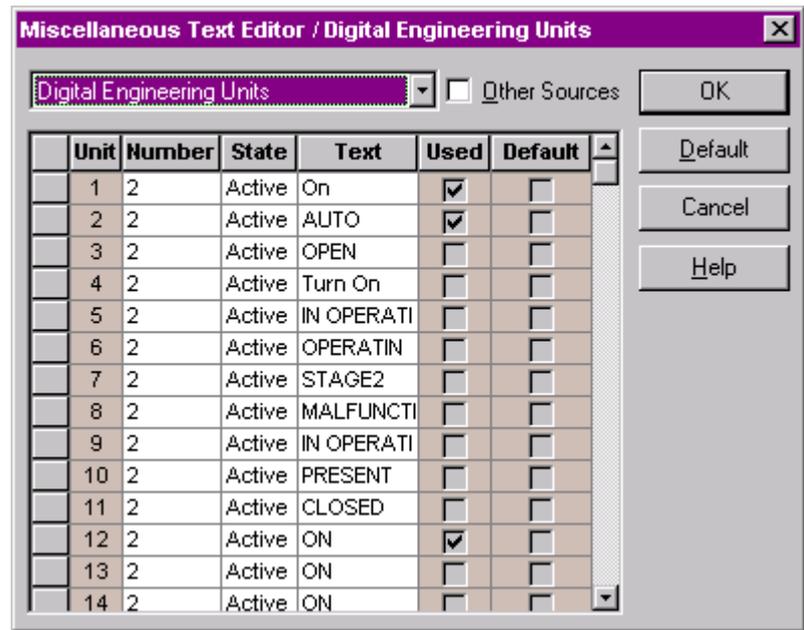
**Maximum Number of Engineering Units**

The range of numbers varies depending on controller version. For Ver. 1.2 Controllers, the range is 1-20. For Ver. 1.3 and greater Controllers, the maximum range is 1-127. The actual range depends on the total number of states assigned to the units. If all units are two-state, then you can assign 127 digital engineering units. If some units are three-state, the number is reduced by the number of extra states used. For example, if engineering units 1 and 2 are three-state units, then the maximum number of units is reduced by two to 125. Software keeps track of the total number of states (maximum 255) and displays a warning message, if you try to assign an engineering unit after the total number of states is reached. The range of numbers always shows 1-127 even though you may have already used all 255 states. After the warning message is displayed, you must delete a line with the **DELETE key**, not with the Default button, which does not necessarily reduce the states.

**Procedure**

1. In the logical plant tree, click on the controller. Click menu item Options, then drop-down item Edit Text and Digital Eng. Units.

RESULT: The Miscellaneous Text Editor / Digital Engineering Units dialog box is displayed. Default engineering units are displayed with a check mark in the Default column, customized engineering units do not. Engineering units, which are already used by at minimum one point are displayed with a check mark in the Used column (only display). Both, used and unused engineering units can be edited.



### Create new digital engineering unit

2. Select an empty line.
3. In the Number column, select the number of states.
4. In the State column, select the first number, and enter the corresponding text in the text field beside.
5. Assign text to all other states analogously as described in step 4.
6. Confirm by clicking OK.

### Edit digital engineering unit

1. See step 1 of Procedure.
2. Locate engineering unit, you want to edit.
3. You can edit a digital engineering unit in one of the following ways:

Change state by selecting another state in the State column.

and/or,

change text for a state by overwriting the existing text.

and/or,

change the number of states in the Number column. In the State column, select the additional numbers one after the other and assign the texts in the Text field beside. Select from the newly created states in the State column.

4. Confirm by clicking OK.

### Copy digital engineering units from other controllers

1. See step 1 of Procedure.
2. If you want to copy digital engineering units from other controllers of the same project or from other projects, check the other Sources check box. For detailed instructions, please refer to Copy texts from other controllers in the General Procedure section.

### Replace digital engineering unit

1. See step 1 of Procedure.
2. Select engineering unit, you want to replace by clicking on the tiled bar on the left.

3. Click Default.
4. Confirm by clicking OK.

NOTE: You cannot reduce the number of default units in the system. There are 20 sets of text for Ver. 1.2 Controllers; 255 sets (range 1-127) for Ver. 1.3 and greater Controllers. You can only replace the default unit with the custom unit and change the number of states a unit can have. When you select a line and click **Default**, software replaces the custom unit with the original default unit.

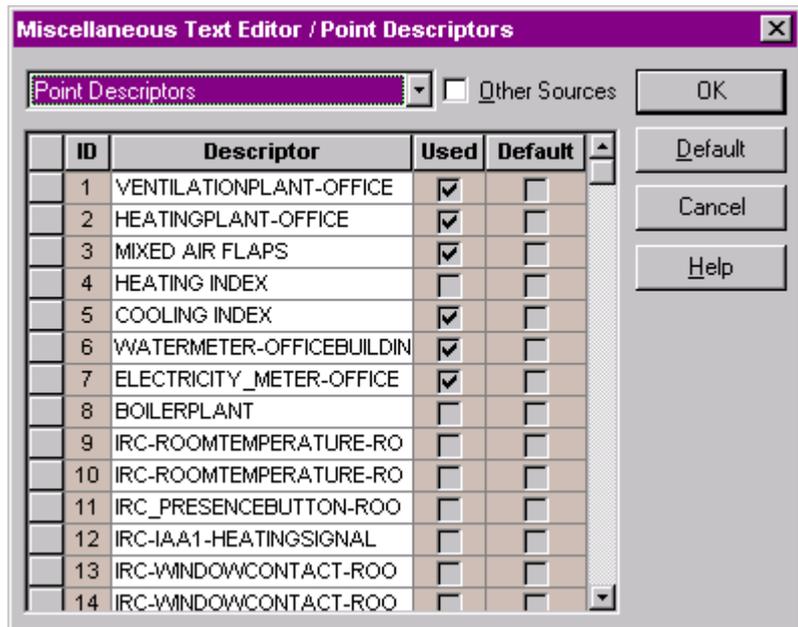
## Point Descriptors

- Create Point descriptors**
- Edit Point descriptors**
- Copy Point descriptors from Other Controllers**
- Replace Point descriptors**

**Purpose** Create, edit, copy, and/or replace point descriptors. Point descriptors are descriptive information that you can add to user addresses. For example, you can assign "CHILLER1" to a point to more fully specify point location.

- Procedure**
1. In the logical plant tree, click on the controller. Click menu item Options, then drop-down item Edit Text and Point Descriptors.

RESULT: The Miscellaneous Text Editor / Point Descriptors dialog box is displayed. Default point descriptors are displayed with a check mark in the Default column, customized point descriptors do not. Point descriptors, which are already used by at minimum one point are displayed with a check mark in the Used column (only display). Both, used and unused point descriptors can be edited.



- Create new point descriptor**
2. Select an empty line and enter the text into the Descriptor field.
  3. Confirm by clicking OK.

- Edit point descriptor**
1. See step 1 of Procedure.
  2. Locate point descriptor, you want to edit.
  3. In the Descriptor column, click into the field and write over the existing text.

**Copy point descriptors from other controllers**

4. Confirm by clicking OK.
1. See step 1 of Procedure.
2. If you want to copy point descriptors from other controllers of the same project or from other projects, check the other Sources check box. For detailed instructions, please refer to Copy text from other controllers in the General Procedure section.

**Replace Point Descriptor**

1. See step 1 of Procedure.
2. Select point descriptor, you want to replace by clicking on the tiled bar on the left.
3. Click Default.
4. Confirm by clicking OK.

**NOTE:** You cannot remove any of the descriptors from the system. There are always 64 descriptors with OS Version 1.2; with Version 1.3 and higher, there are 255 descriptors. You can only replace the default descriptor with the custom descriptor. When you select a descriptor and click **Default**, software replaces the custom descriptor with the original default descriptor.

**Alarm Texts**

- Create Alarm Texts**
- Edit Alarm Texts**
- Copy Alarm Texts from Other Controllers**
- Replace Alarm Texts**

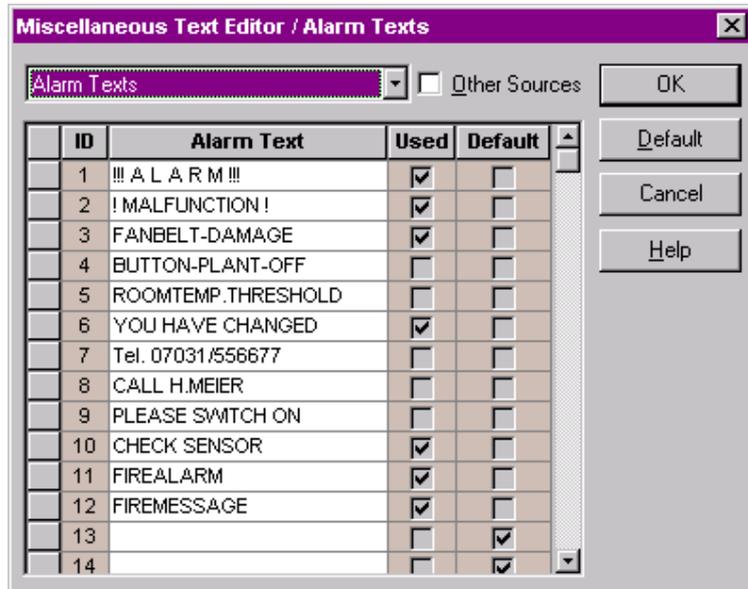
**Purpose**

Create, edit, copy, and/or replace alarm texts. Alarm texts are information for operators to see when alarms occur. These alarms appear on the operator interface connected to the controller (varies according to system). For example, you can specify a phone number to call or a person to contact.

**Procedure**

1. In the logical plant tree, click on the controller. Click menu item Options, then drop-down item Edit Text and Alarm Texts.

**RESULT:** The Miscellaneous Text Editor / Alarm Texts dialog box is displayed. Default alarm texts are displayed with a check mark in the Default column, customized alarm texts do not. Alarm texts, which are already used by at minimum one point are displayed with a check mark in the Used column (only display). Both, used and unused alarm texts can be edited.

**Create new alarm text**

1. See step 1 of Procedure.
2. Select an empty line and enter the text into the Alarm Text field.
3. Confirm by clicking OK.

**Edit new alarm text**

1. See step 1 of Procedure.
2. Locate alarm text, you want to edit.
3. In the Alarm Text column, click into the field and write over the existing text.
4. Confirm by clicking OK.

**Copy alarm texts from other controllers**

1. See step 1 of Procedure.
2. If you want to copy alarm texts from other controllers of the same project or from other projects, check the other Sources check box. For detailed instructions, please refer to Copy text from other controllers in the General Procedure section.

**Replace Alarm Text**

1. See step 1 of Procedure.
2. Select alarm text, you want to replace by clicking on the tiled bar on the left.
3. Click Default.
4. Confirm by clicking OK.

**NOTE:** You cannot remove any of the alarm texts from the system. There are always 128 possible messages in a Ver. 1.2 controller; Ver. 1.3 and greater controllers have 255. You can only replace the default alarm text with the custom alarm text. When you select a alarm text and click **Default**, software replaces the custom alarm text with the original default alarm text.

## Characteristics

Create Characteristics

Edit Characteristics

Copy Characteristics from Other Controllers

Replace Characteristics

**Purpose** Create, edit, copy, and/or replace input/output characteristics. This dialog box allows you to define conversion values for analog points to match the characteristics of their sensors and assign the appropriate characteristics to analog points when required.

**Procedure** 1. In the logical plant tree, click on the controller. Click menu item Options, then drop-down item Edit Text and Input/Output Characteristics.

**RESULT:** The Miscellaneous Text Editor / Input/Output Characteristics dialog box is displayed.

ID	I/O Characteristic	Used	Default
1	Windsen. 0...5 V	<input type="checkbox"/>	<input type="checkbox"/>
2	Psures. 0...10 kPa	<input type="checkbox"/>	<input type="checkbox"/>
3	Sunsensor 0...5 V	<input type="checkbox"/>	<input type="checkbox"/>
4	Roomsensor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Prerunsensor	<input type="checkbox"/>	<input type="checkbox"/>
6	0-10 Volt	<input type="checkbox"/>	<input type="checkbox"/>
7	Valve 3 Point	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>

In the list below, the default characteristics (max. of 10) are listed. Each characteristic has an ID (1 through 10), the name, for example, Sun sensor 0...5 V, and a maximum of four reference points (V=values that determine the characteristic curve). Respective reference points are displayed after selecting the characteristic in the list. A minimum of two reference points can define a linear characteristic. A maximum of four reference points can define a nonlinear characteristic. Default characteristics are displayed with a check mark in the Default column, customized characteristics do not. Characteristics, which are already used by at minimum one point are displayed with a check mark in the Used column (only display). Both, used and unused characteristics can be edited.

**Create new characteristic**

2. Select an empty line and enter the text into the I/O Characteristic field. Type a name that is easy to recall, for example, Pressure 0-3" stands for differential pressure, zero through three inches.
3. In the Reference Points fields, type desired values. Values represent reference points that determine sensor value at various points in its range. Enter sets of values from the smallest to the largest (or largest to smallest). You should enter values in all four sets. If you have only two reference points, enter only two sets, for example, for a linear characteristic of -40 to 100 °C and 0 through 10 V.  
0 V -40  
10 V 100

4. Confirm by clicking OK.

#### Edit new characteristic

1. See step 1 of Procedure.
2. Locate characteristic, you want to edit.
3. In the I/O Characteristic column, click into the field and write over the existing text.  
and/or,  
in the Reference Points fields, change corresponding values.
4. Confirm by clicking OK.

#### Copy characteristics from other controllers

1. See step 1 of Procedure.
2. If you want to copy characteristics from other controllers of the same project or from other projects, check the other Sources check box. For detailed instructions, please refer to Copy text from other controllers in the General Procedure section.

#### Replace characteristic

1. See step 1 of Procedure.
2. Select characteristic, you want to replace by clicking on the tiled bar on the left.
3. Click Default.
4. Confirm by clicking OK.

NOTE: You cannot remove any of the characteristics from the system. There are always 10 characteristics. You can only replace a default characteristic with a custom characteristic. When you select a line and click **Default**, software replaces the custom characteristic with the original default characteristic.

#### Default Characteristics

Default characteristics are delivered with the software, but can they can be edited with the Default Text Editor to meet local requirements. The following shows examples:

1	Pressure 0-3 "	0 to 11.0 V
2	2-10V=0-100 %	0 to 11.0 V
3	Pressure ±0.25 "	0 to 11.0 V
4	Pressure 0-5 "	0 to 11.0 V
5	Linear Input	0 to 10 with 0-10 V
9	Direct Out 0-100 %	0 to 11.0 V
10	Reverse Out 0-100 %	11.0 to 0 V

Note that the voltage ranges are wider than actual device input to account for possible miscalibration of the device. Devices 1 through 4 and 9 range from 2 to 10V. Device 10 ranges from 10 to 2V.

#### Fixed Characteristics

The following fixed characteristics cannot be edited in the Miscellaneous Text Editor. They can only be selected and assigned to points in the Datapoint Editor, and are available under the IDs 10 through 15 for slow subtype points, and under the IDs 10 through 23 for fast subtype points.

Slow Subtype Characteristics		Fast Subtype Characteristics	
NTC Type F	-58.0 to 302.0 F	NTC Type F	-58.0 to 302.0 F
	Negative temperature coefficient degrees F		Negative temperature coefficient degrees F
NTC	-50.0 to 150.0 C	NTC	-50.0 to 150.0 C
	Negative temperature coefficient degrees C		Negative temperature coefficient degrees C
LINEAR_GRAPH	0 to 10 V	LINEAR_GRAPH	0 to 10 V
PT1000 Type F/I	-58.0 to 302.0 F	PT1000 Type F/I	-58.0 to 302.0 F
PT1000 Type C/I	-50.0 to 150.0 C	PT1000 Type C/I	-50.0 to 150.0 C
		PT1000 Type F/II	32 to 752.0 F
		PT1000 Type C/II	0.0 to 400.0 C
		PT100 Type F	-58.0 to 302.0 F
		PT100 Type C	-50.0 to 150.0 C
		PT3000 Type F	-58.0 to 302.0 F
		PT3000 Type C	-50.0 to 150.0 C
		BALCO Type F	-58.0 to 302.0 F
		BALCO Type C	-50.0 to 150.0 C

## Miscellaneous Text Editor (Excel Web Controller)

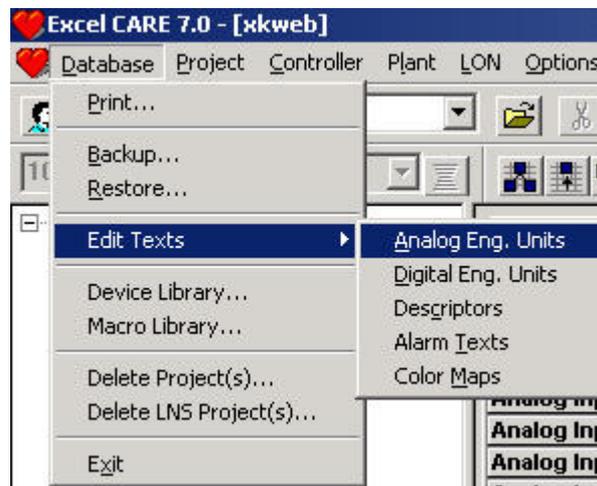
**Purpose** Provide functions to define, edit, copy, and delete descriptors, alarm texts for all points, characteristics for analog points, and state texts for binary points and multi-state points. These functions can be done on project and/or on plant level. Note that analog engineering units can be defined on project level only.

The BACnet Miscellaneous Text Editor can be accessed in three ways:

- via menu Database, drop-down item Edit Texts
- from within the itemized display of a point
- from within the grid via right mouse button

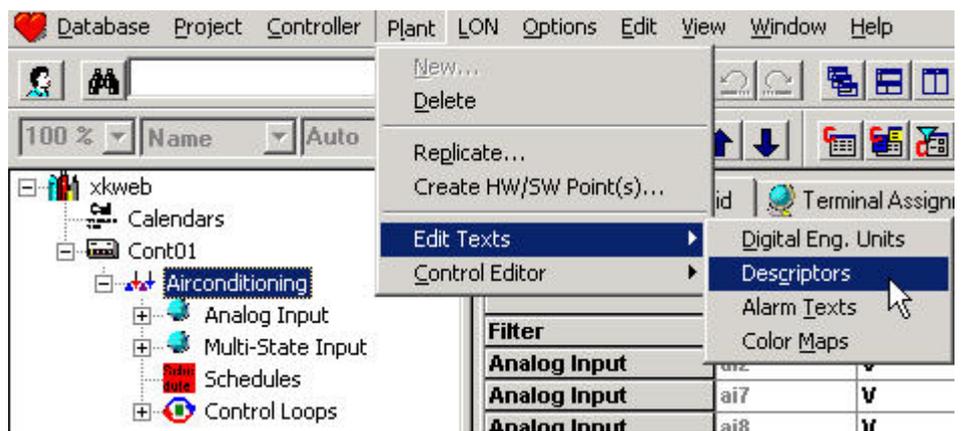
**General Procedure** 1. To define texts on project level, click on menu item Database, then submenu item Edit Texts, and then the text type (Digital Eng. Units or Analog Eng. Units, etc.) you want to edit.

NOTE: Analog engineering units can be defined on project level only whereas all other texts can also be defined for single plants.

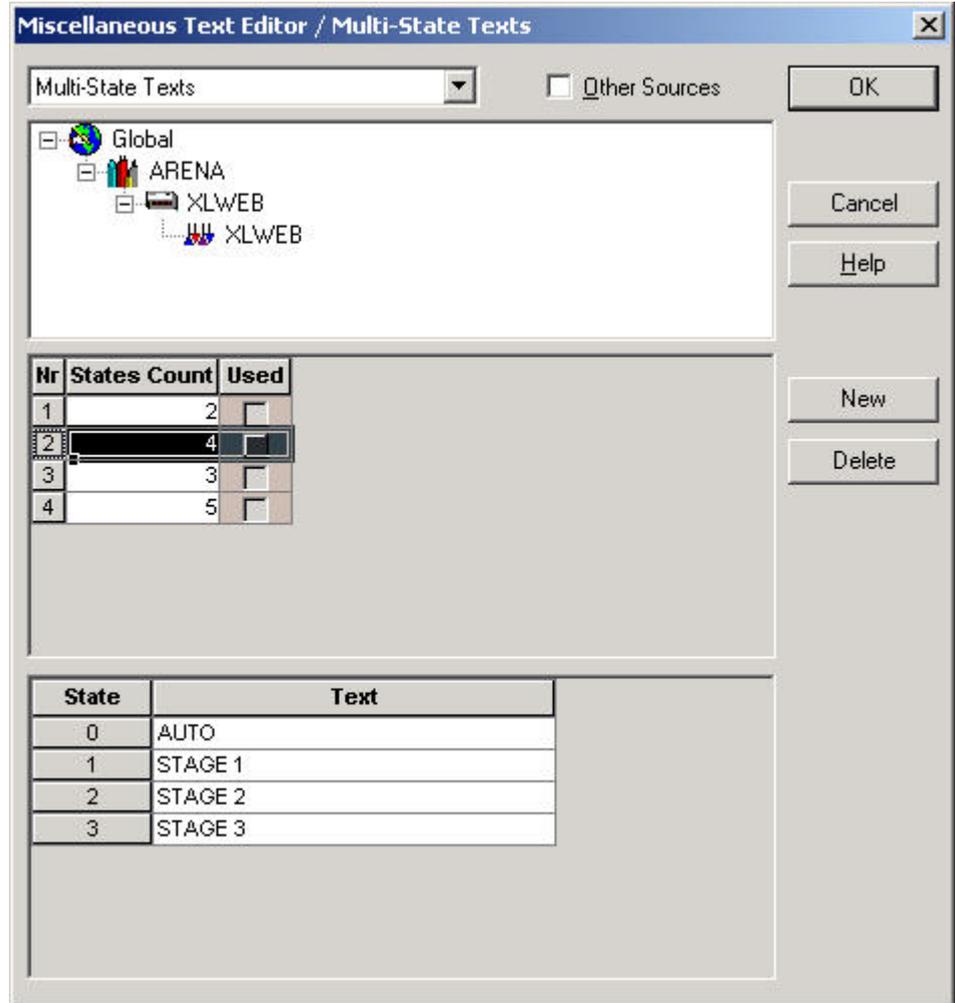


Or,

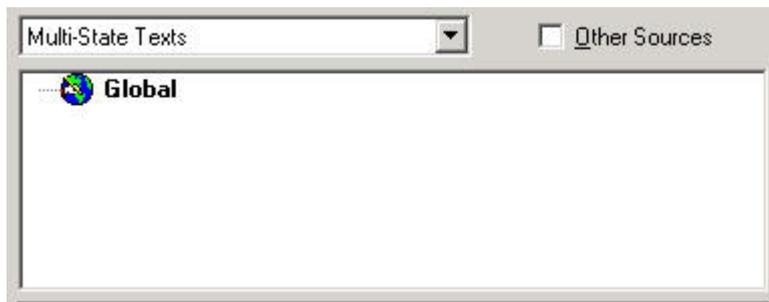
2. To define texts for a single plant, select the plant in the tree, click on menu item Plant, then submenu item Edit Texts, and then the text type (Digital Eng. Units, Descriptors, Alarm Texts, etc.) you want to edit.



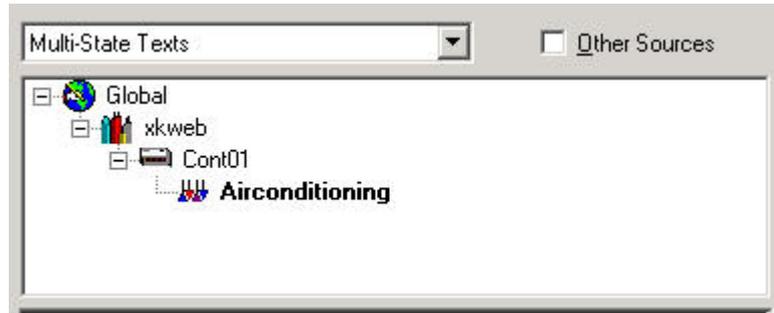
RESULT: The Miscellaneous Text Editor dialog box is displayed. The dialog box title is named according to the text type selected in the Edit Texts menu.



In the example above, Digital. Eng. Units has been selected and the title line and the drop-down listbox on the top shows the corresponding text option, in this case, Multi-State Texts. If desired, another option can be selected. Below the text selection drop-down listbox, the level for which you want to define the texts, is selected by default in the tree structure. If you had chosen to define texts globally on project level as described in step 1, the tree cannot be expanded and all texts will be valid for the whole project.



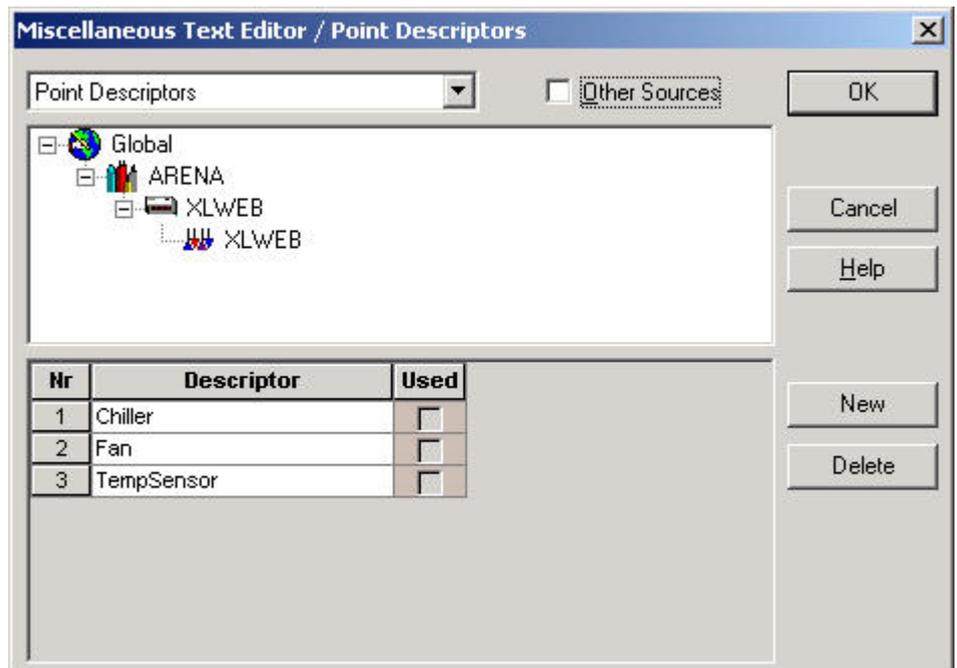
If you had chosen to define texts for a single plant as described in step2, the plant is selected by default in the expandable tree. The texts you will define in the following steps are only valid for the selected tree item

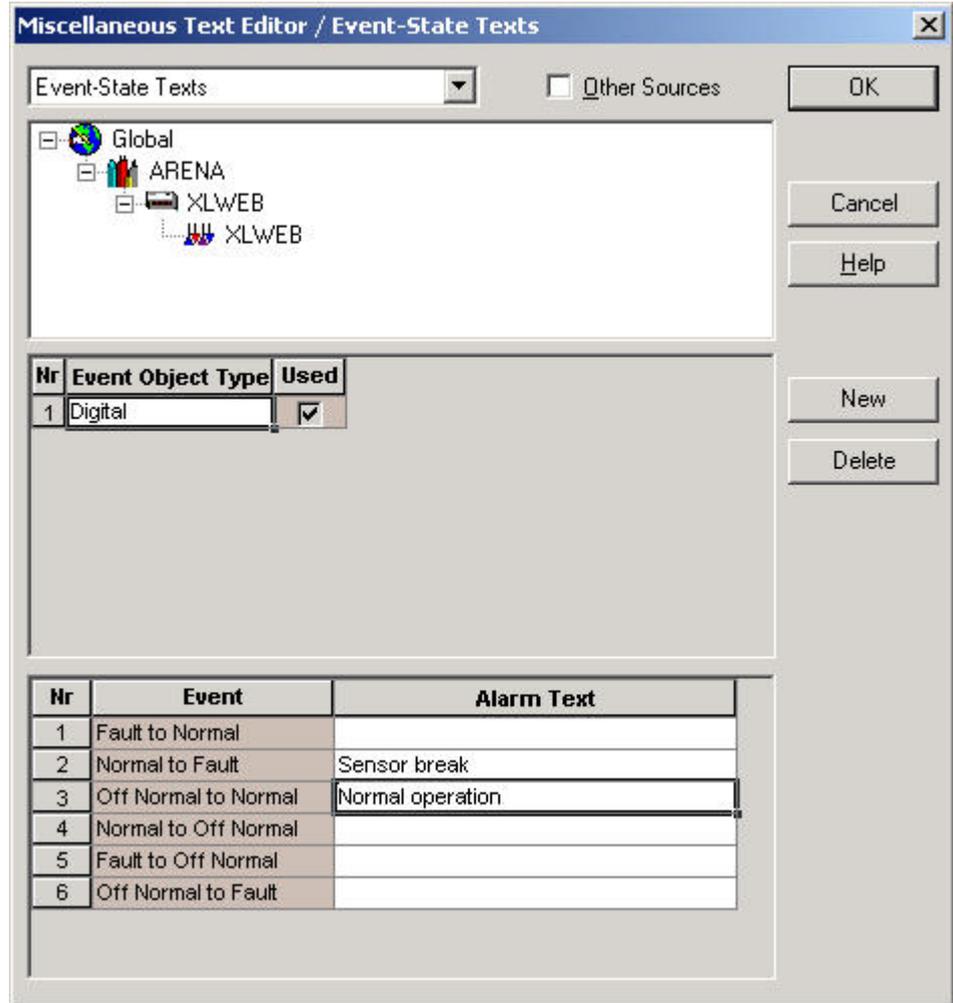


In the middle, the text entry type, e.g. the number of states, 2 ...32, of multi-state texts, or the event object type, digital or analog, of alarm texts is displayed. Point descriptors are displayed directly whereas the proper texts of a selected text entry type are listed below, e.g. AUTO for state 0, STAGE 1 for state 2, etc. in case of a 4-states point (see the following examples below referring to multi-state texts, descriptors and event state texts).

Text entry types, which are already used by at minimum one point are displayed with a check mark in the Used column (only display). Both, used and unused texts can be edited.

For detailed information on characteristics, please refer to the Create and Assign Characteristic to BACnet Point section.



**Create new text**

- To create new texts, click the **New** button. In the middle a new line is inserted. In case of descriptors, the proper text can be directly entered into the line (see figure above).
- In case of multi-state texts, select the number of states from the States Count drop-down listbox. In the table below, assign the texts to states by entering them into the corresponding Text fields (see figure above).
- In case of event-state texts, select the type, analog or digital, form the Event Object Type drop-down listbox. In the table below, enter the texts into the corresponding Alarm Text fields (see figure above).
- Click the **OK** button.

**Edit text**

- Do step 1 or 2 of the General Procedure.
- To edit text, locate the line, click into the field and write over text.
- To display and edit different texts than currently displayed, click drop-down arrow at the top and select desired text type.

RESULT: A Message is displayed asking for the storage of your changes.



4. Click Yes, if you want to save the changes you did to the previously selected text type.

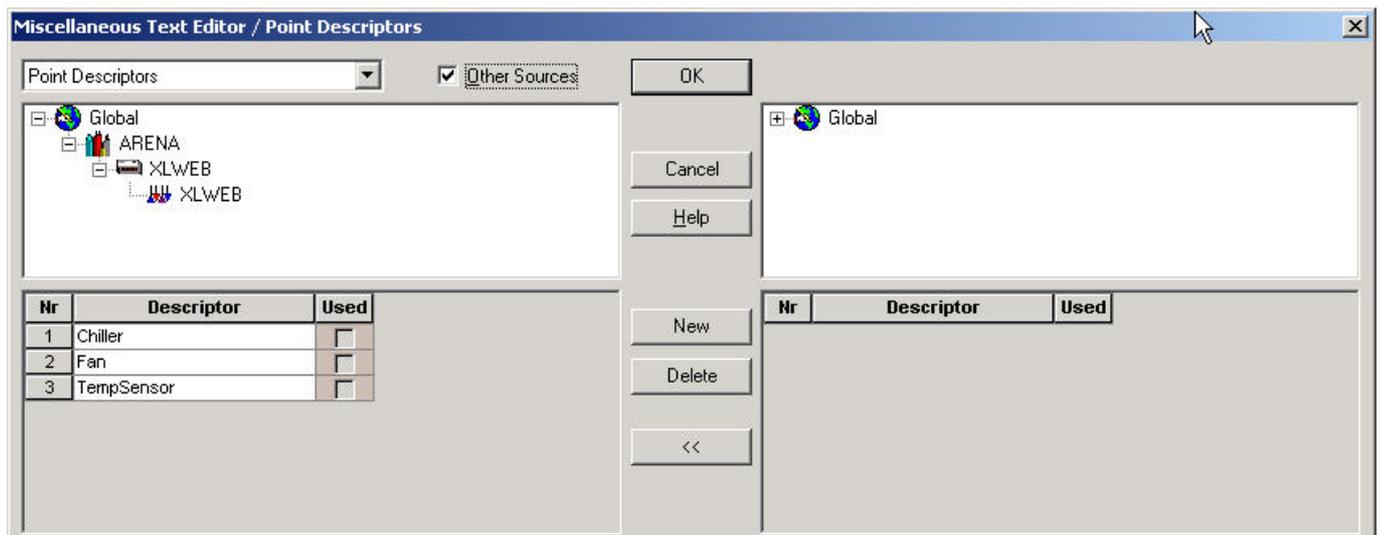
Click No, if you want to discard the changes you did to the previously selected text type.

RESULT: The Miscellaneous Text Editor dialog box displays the new text type.

#### Copy texts from other projects or plants

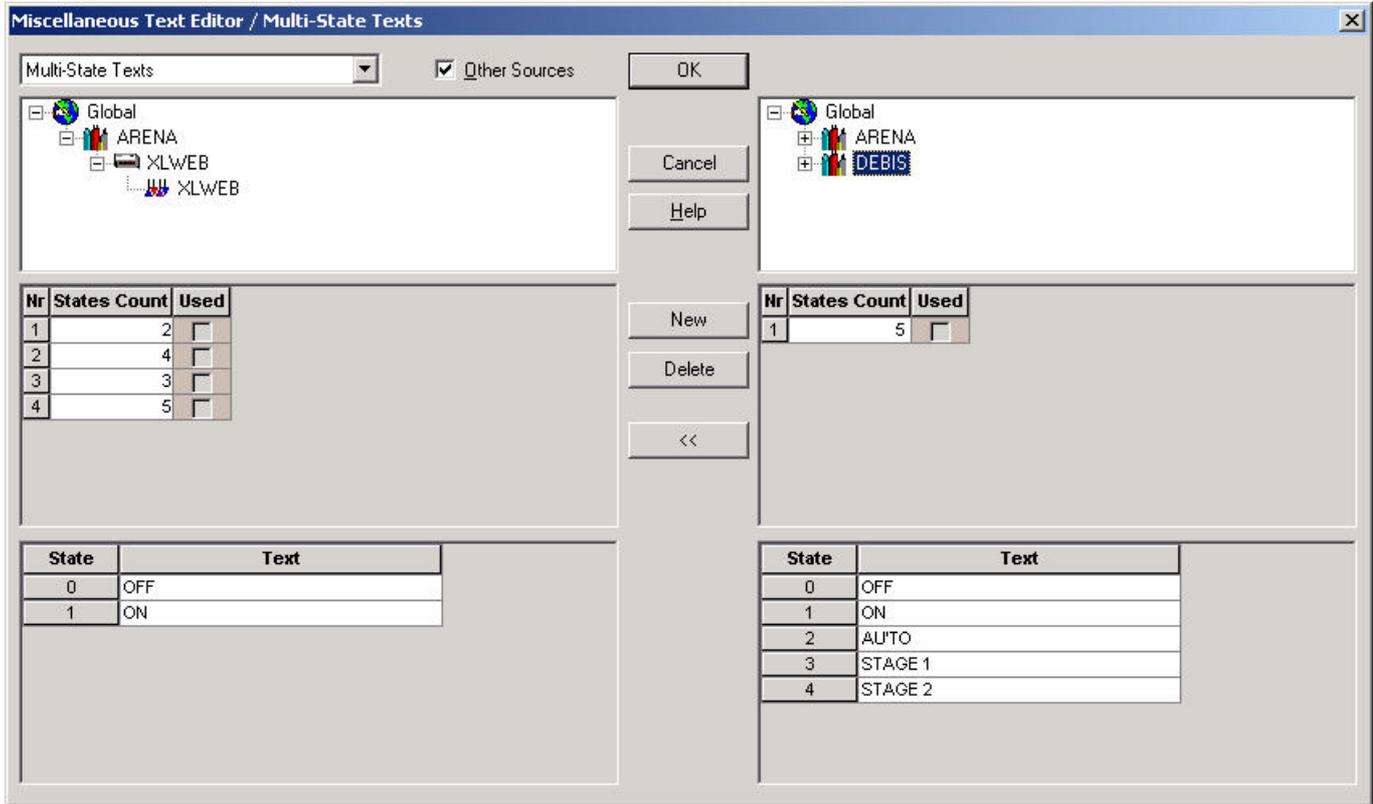
1. Open the source project from which you want to copy the texts.
2. Make the target project to which you want copy the texts the active project.
3. Do step 1 or 2 of the General Procedure.
4. Check the Other Sources check box.

RESULT: The dialog box is expanded and all projects including plants and controllers are available in a tree on the right side.



5. Open the tree and navigate to the project or plant (source).

RESULT: The available texts are displayed on the bottom.

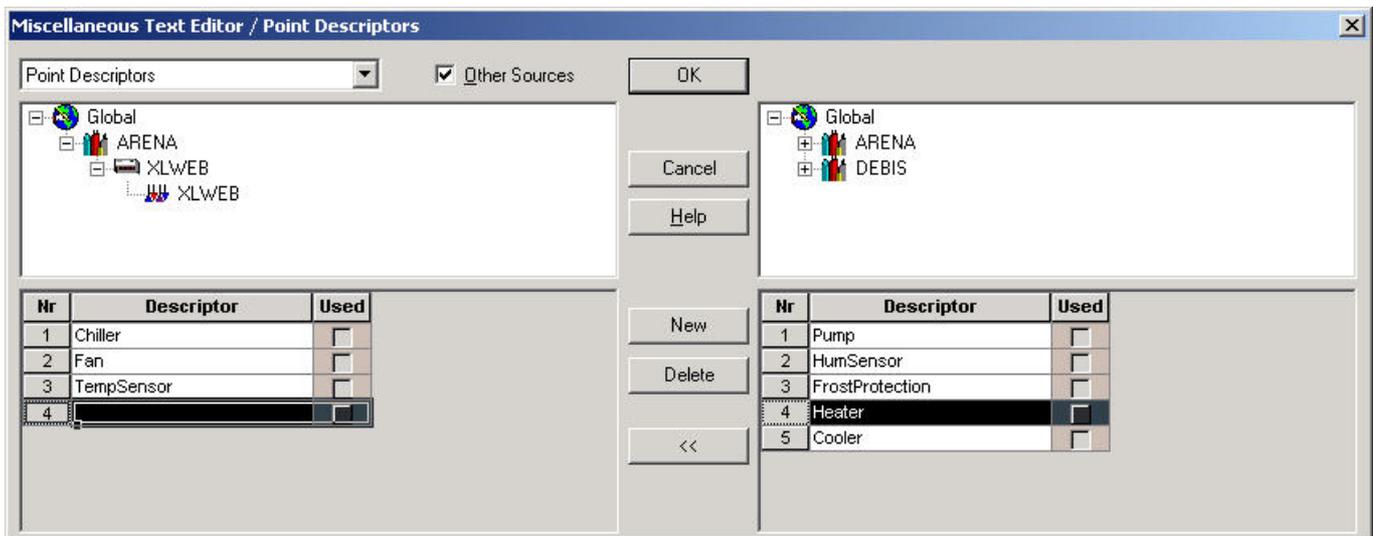


In the table on the bottom on the right, select the text you want to copy to the active project or plant (target) displayed on the left by clicking on the tiled bar.

6. In the list on the left, click the line where the text should be copied to.

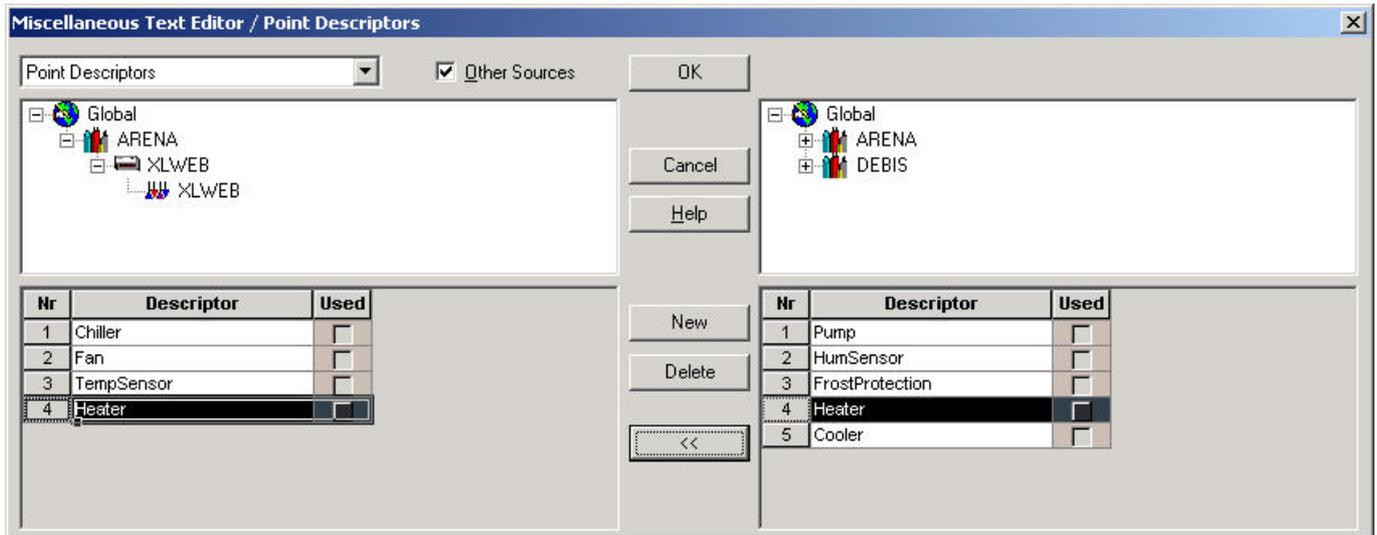
NOTE: If the selected line on the left already shows text, this text will be overwritten by the source text.

7. To avoid overwriting of a source text, click the **New** button to add a new line and click on the new line's tiled bar.



8. Click on the Double arrow button.

RESULT: The text is copied.



8. Click the **OK** button to confirm the copying.

## Configure BACnet Point

**Purpose** Configuration of analog input and analog output points. Analog input and output points must be configured prior to their assignment to a terminal on a hardware module on the terminal assignment tab. By selecting a configuration such as NTC, PT100 Type F, etc., the corresponding configuration properties of the datapoint are automatically set correctly for the terminal.

### **IMPORTANT**

*Configure the datapoint before you assign the datapoint to a terminal on the terminal assignment tab. Otherwise you need to rework the configuration properties manually.*

**Procedure** 1. Select the datapoint in the logical plant tree.

RESULT: On the Properties tab on the right, the properties are displayed.

Properties

Datapoint Name: ANA\_Input01      BACnet Object: Analog Input (0)  
 BACnet Object ID: 0      BACnet Instance: 0

Lon Mapping  
 Lon Point: none  
 Input NV: none  
 Output NV: none

Misc. Editor Functions  
 Engineering Unit:   
 Descriptor:   
 Alarm Text:   
 IO Configuration: 0-10V      Characteristic: none

Access Rights  
 Read Access Level: Guest (0)      Write Access Level: Guest (0)

Alarming  
 Notification Class: none      Alarm Delay: 0 [s]  
 Notify Type: Alarm       High Limit Reporting: 80  
 Low Limit Reporting: -15  
 Deadband: 1  
 Transition Events  
 To-Off Normal  
 To Fault  
 Back-To-Normal

Values  
 Point Role (EDK):   
 Change of Value Increment: 1

- From the I/O Configuration drop-down listbox, select the configuration for the datapoint. Default is 0-10V.

## Create and Assign Characteristic to BACnet Point

### Purpose

If different engineering units are used for the datapoint and its mapped NV, for example, the NV has °C and the datapoint has °F, an appropriate characteristic for conversion must be assigned. If an appropriate characteristic is already available, either provided by CARE or created by the user, it can be selected from the Characteristic drop-down listbox on the Properties pane of the datapoint. If an appropriate characteristic is not available, it must be created. For the multi-state input and output points, please refer to the Multi-State Input/Output Note and for the scaling factor of a pulse convertor point, please refer the Scaling Factor for Pulse Convertors Note at the end of the procedure.

**Example:** In the following case, the Input NV has °C and the datapoint should display the values in °F. From the Characteristics drop-

down listbox, no appropriate characteristic can be selected and assigned. Hence a new characteristic needs to be created as follows:

The screenshot shows the 'Properties' dialog box for a datapoint named 'ANA\_Input01'. The 'BACnet Object' is set to 'Analog Input (0)' and the 'BACnet Instance' is '0'. The 'Lon Mapping' section shows 'Input NV' as 'SNVT\_temp' and 'Output NV' as 'none'. Under 'Misc. Editor Functions', the 'Engineering Unit' is '°C', 'IO Configuration' is '0-10V', and 'Characteristic' is 'none'. 'Access Rights' are set to 'Guest (0)' for both Read and Write. The 'Alarming' section has 'Notification Class' as 'none', 'Alarm Delay' as '0 [s]', and 'Deadband' as '1 [°C]'. 'Values' are set to 'Point Role (EDK)' and 'Change of Value Increment' as '1 [°C]'.

**Procedure** 1. Click the dotted button on the right of the Characteristics drop-down listbox.

**RESULT:** The Characteristics dialog box displays.

**Characteristics**

Name: 2-10V = 0-100%

Direction: Input

Description:

NV Engineering Unit: V DP Engineering Unit: %

Exceed Min/Max Limit

	NV value	DP value
(1)	0,000	- 25,00
(2)	2,000	0,000
(3)	10,0000	100,000
(4)	11,0000	112,500

Buttons: OK, Cancel, New, Delete, EmptyCell, Help

2. Click the **New** button.

RESULT: The New Characteristic dialog box displays.

**New Characteristic**

Name:

Direction: Input

Description:

NV Engineering Unit: DP Engineering Unit:

Reference Points

0,0000	0,0000
0,0000	0,0000

Buttons: OK, Cancel

3. In the Name field, enter a name for the new characteristic.
4. From the Direction drop-down listbox, select Input for inputs respectively input NVs, or Output for outputs respectively output NVs.
5. In the Description field, enter an additional description if desired.
6. From the NV engineering unit drop-down listbox, select the same engineering unit as assigned to the NV via the Input NV respectively Output NV drop-down listbox under Lon Mapping.

7. From the DP engineering unit drop-down listbox, select the same engineering unit as assigned to the datapoint via Engineering Unit field under Misc. Editor Functions.
8. In the Reference Points fields enter the value pairs (left = NV value, right=datapoint value).

NOTE: Negative values will be highlighted in red.

Reference Points	
NV value	DP value
0,0000	32,0000
10,0000	50,0000

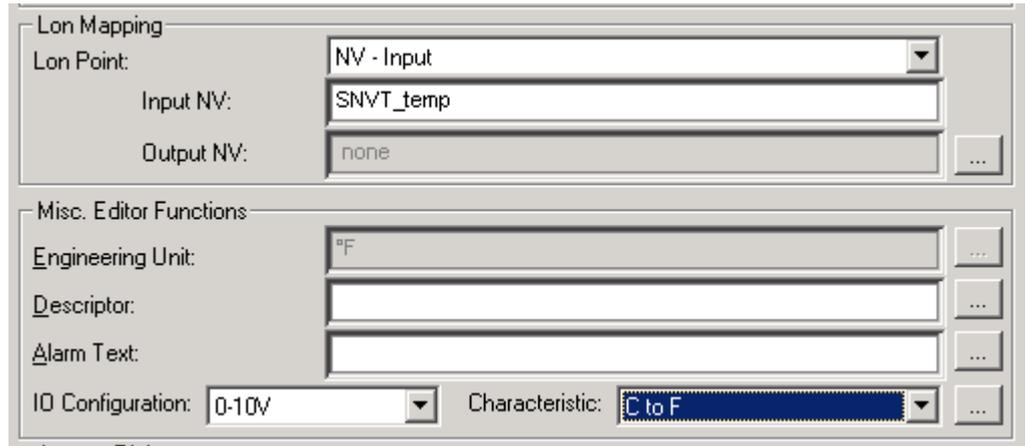
9. Click the **OK** button.

RESULT: The Characteristics dialog box redisplay.

	NV value	DP value
(1)	0,000	32,000
(2)	10,000	50,000
(3)		
(4)		

10. If values outside the minimum and maximum limits as displayed in the table should be considered, check the Exceed Min/Max Limit checkbox and click the **OK** button.

RESULT: The characteristic can now be selected from the Characteristic drop-down listbox.



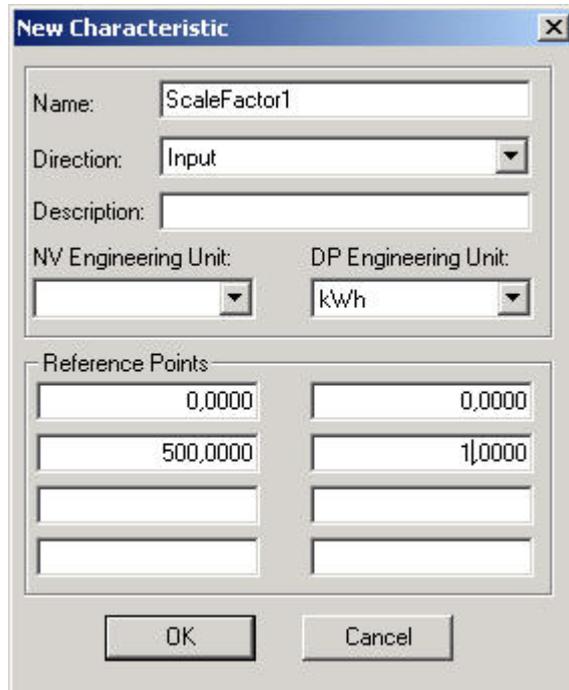
11. Assign the characteristic by selecting it.

RESULT: The corresponding engineering unit is displayed in the Engineering Unit field.

**Scaling Factor for Pulse Converter's Note**

For the definition of the scaling factor for a pulse convertor point, the following must be considered:

- Since the SNVTs of a pulse convertor point do not have an engineering unit, an engineering unit has not to be selected here.
- The DP Engineering Unit must be the same as the one selected on Properties tab of the point.
- The first reference point pair must be 0,0000 – 0,0000
- It is sufficient to enter one second reference point pair to define the scaling factor.



**Multi-State Input/Output Note**

For Multi-State Inputs, the characteristic +1, for Multi-State Outputs, the characteristic -1, is provided by CARE by default. These default characteristics must be used if the multi-state points are considered to be mapped to NVs.

# DOCUMENTATION

**Purpose** Print reports showing system operation and parameters. Also, you can output a variety of file types to supplement job documentation. For example, you can create graphic metafiles (.WMF extension) that are a plant's schematics, control loops, and switching tables. You can also create spreadsheet files that contain information useful for pricing (Data Export function).

**Report Inclusions** The documentation function is available after the selection of a project. You can print reports for a project, one or more plants (whether attached or unattached), and/or one or more controllers. The scope of each report depends on report type and the current selections (project, plant, and/or controller). The following table describes these conditions and their results.

Report Type		Current Selection			
		Project Only	Project and Controller	Project and Unattached Plant	Project, Controller, and Attached Plant
Project	Project Datasheet	always the selected project			
Controller	Controller Summary, Parameter Lists, Termination, Point Data, Plant to Controller	all controllers in selected project	selected controller	all controllers in selected project	selected controller
Plant	Plant Schematic, Control Strategy, Switching Logic, Math Function	all plants in selected project	all plants for selected controller	selected plant	selected plant

**Chapter Contents** Export Graphic Files  
 Print Documentation  
 Technical Information  
 Point Type Abbreviations  
 Frequently Asked Questions

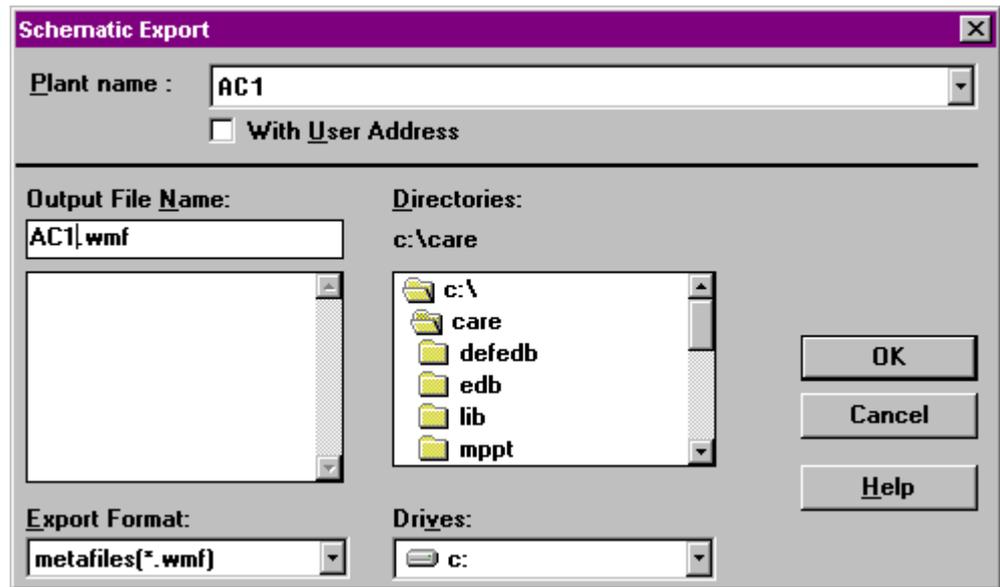
## Export Graphic Files

**Purpose** Create graphic files in a metafile format (.WMF) from a plant's schematic, control strategy loops, and switching tables. These graphic files can be used in a CAD/CAM operation or opened by software such as Micrografx Designer. The files provide a form of documentation in addition to printed reports.

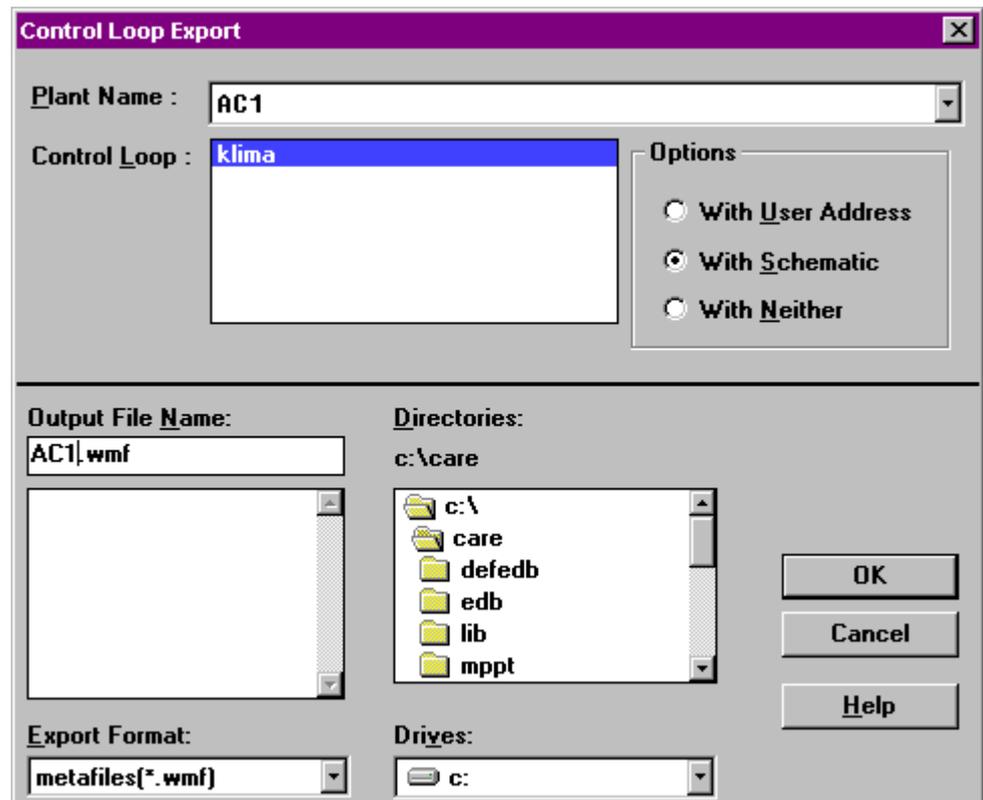
NOTE: If a control loop is multiple pages long, applications such as Designer cannot display the exported graphic file.

- Procedure**
1. Click menu item Database, then dropdown items Export, Graphic.  
 RESULT: A list displays for selection of schematic, control strategy, or switching logic files.
  3. Click desired information type.  
 RESULT: An export dialog box displays that is related to the information type. Following are examples of each type of dialog box. The dialog boxes are very similar. They differ in the print options available to the function. For example, you can export a schematic with or without its user addresses. You can select the control loop to export and also whether or not to export it with its user addresses, schematic, or neither item. You can select the switching table to export and whether or not to export it with its schematic.

## Schematic Export Dialog Box



## Control Loop Export Dialog Box



## Switching Table Export Dialog Box

**Switching Table Export**

Plant name : AC1

User Address	Value

With Schematic

Output File Name: AC1.wmf

Directories: c:\care

- c:\
- care
- defedb
- edb
- lib
- mppt

Export Format: metafiles(\*.wmf)

Drives: c:

OK  
Cancel  
Help

4. Select desired plant name. Click down arrow to display list of available plants.
5. Select desired options for the information type (with/without user addresses, control loop and its options, or switching table and its options).

6. Click Output File Name and type a name for the exported file. The file must have the WMF file extension.

The directory where software will save the file is listed under the word Directories. If it is not the directory you want, use the listbox below it to choose a different directory (and drive, if desired).

The Export Format defaults to metafiles (\*.wmf). You should not change this setting.

7. Click **OK** to begin the export process.

**RESULT:** A Graphic Export message box displays while software creates the file. When done, it displays the message "Export is completed".

8. Click **OK** to close the message box.

**RESULT:** The export dialog box remains on display.

9. Click **Close** to close the export box. Or, select another file to export and repeat the process.

## Print Documentation

**Purpose** CARE provides printing of:

- Complete projects
- Controller(s) with attached plants
- Unattached plants

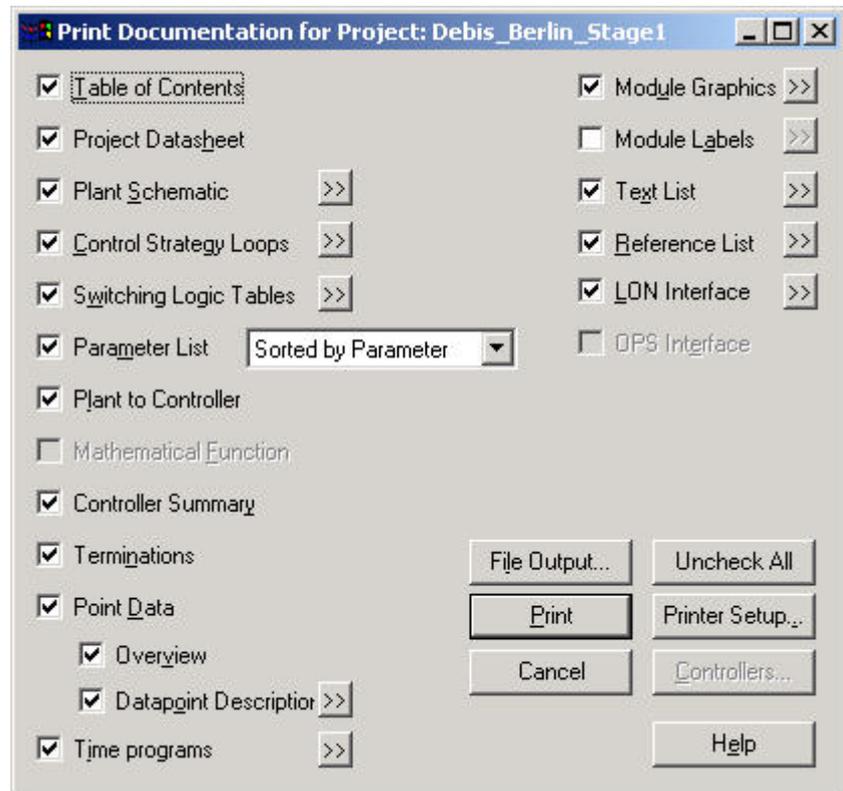
**IMPORTANT**

*Printing complete projects is not recommended because this results in Word documents that exceed 1000 pages and file in excess of 40 Megabytes. These large documents cause Word for Windows™ to become very slow.*

**Procedure**

1. Click menu item **Database**, then submenu item Print.  
Or, in the logical plant tree, right-click on the controller, plant or project and with left mouse key, click on Print in the context menu.

**RESULT:** The printout main dialog box is displayed showing the options for printout. Depending on the application (controller, plant, project) selected, not all options are available and grayed therefore. For example, for plants you can only print table of contents, project data sheet, plant schematic, control strategy loops, switching logic tables and parameter list sorted by usage.



2. Check the options that you wish to print (refer to Select Print Options section for detailed description).
3. Press the **Print** button in order to print directly or alternatively press the **File Output...** button to store the printout in a file that can be edited by Word.

**NOTES:** You may want to have different page breaks or change the layout of tables, etc. To optimize the page breaks and document layout, Microsoft Word for Windows™ can be used to edit the document.

RTF (Rich Text Format) is a text format that can be accessed by Word. This format has been selected for the printout, because it is much more reliable than the DOC format. After loading a file into Word, it might be saved also as DOC or any other Word supported file format (refer to the Word user's manual).

## Select Individual Controllers from a Project

If multiple controllers have been selected for printout (by selecting a project), the **Controllers...** button in the *Print Documentation for Project...* dialog box allows the user to select individual controllers for the printing process.

### Procedure

1. Click **Controllers...** button in the *Print documentation for Project...* dialog box to open the *Controller Selection:...* dialog box.



Selected controller names display in white characters on blue background. Unselected controller names display in black characters on white background.

2. Select an unselected controller by clicking on it with the left mouse button.
3. Deselect a selected controller by clicking on it with the left mouse button.
4. Use the **Tag all/Untag all** button to select/deselect all controllers.
5. Click **OK**.

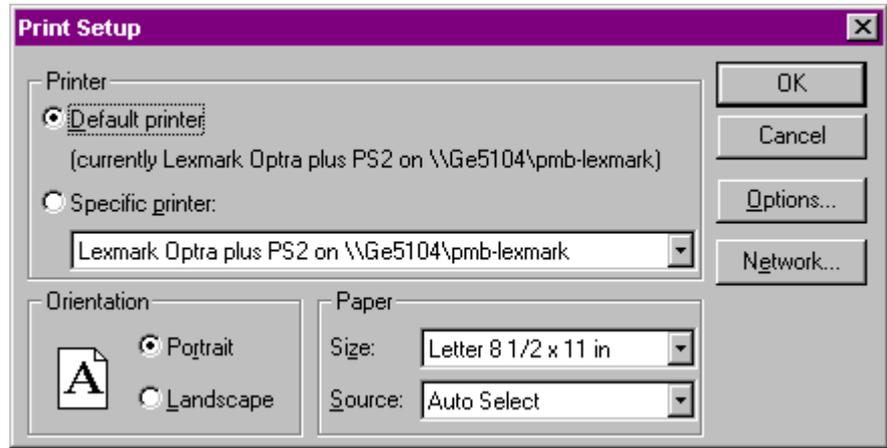
NOTE: The **Controllers...** button is grayed, if only a single controller has been selected before calling the printout.

## Printer Setup

The printer setup button can be used to select a special printer for the CARE printout (other than the default printer) and to set the main printing properties.

### Procedure

1. Click **Printer Setup...** button in the *Print documentation for Project...* dialog box to open the **Printer Setup** dialog box.



NOTE: The Print Setup dialog box is a standard Windows™ feature and always displays in the language of the installed Windows™ version.

## CAUTION

Make sure the **printer driver** you use matches the printer you use or the *Project Datasheet*, *Plant to Controller*, and *Point Data* reports will print with incorrect spacing between the header and field columns. In addition, reports that include graphic items such as a plant schematic, control loop, and/or switching table may have gaps between the schematic and corresponding control loops or switching tables.

2. Select, if the **Default printer** or a **Specific printer** should be used for CARE printouts.
3. Select the printing format (**Portrait** or **Landscape**).

NOTE: Word always prints in landscape format, even if portrait is selected. This is defined by the printout templates and is necessary because of the size of the printout.

4. Select the **Paper size** and the **Source** (tray) to be used. The following paper sizes are supported: DIN A4, Letter and "User defined" paper size. All paper sizes other than DIN A4 and Letter, which are available in the dropdown list box, are seen as User defined. Each of these three paper sizes can be set by default in the caredoc.ini file. When opening the Print Setup dialog box, the caredoc.ini file default setting is displayed. If you now change the size, it will be saved in the caredoc.ini file. When opening the Print Setup dialog box next time, this setting is displayed by default (see the Technical Information/Special Printer section).
5. The **Options...** button may be used to set further printer options.
6. The **Network...** button may be used to connect to a network printer.

NOTE: The selection of the printer type is stored in the caredoc.ini file and recovered when the printout is used the next time.

7. Click **OK** to confirm the settings.

---

## Print to a Printer

If the **Print** button is selected, CARE prints the document on the selected printer. The printing process is described below.

- Procedure**
1. Click the **Print** button in the *Print Documentation for Project...* dialog box.

**RESULT:** CARE generates a temporary file called "PRINTOUT.RTF" in the CARE directory. During file creation, the currently generated application part from CARE is displayed in a status window (for example "Printing Action: Time Programs..."). The percentage of completion is also displayed.

CARE starts Word.

Word prints the document automatically.

Word closes itself and returns to CARE.

**NOTES:**

1. Problems with Word Macro Virus Protection may occur with Word 7.0 or higher.
2. The PRINTOUT.RTF file is not deleted automatically after the document has been printed. However it is overwritten when printing the next time directly to a printer.
3. The default name PRINTOUT.RTF of the temporary RTF file can be changed in the caredoc.ini file. Just change the "OutputFile = PRINTOUT.RTF" to any other valid DOS filename.

## Print to a File

If the **File Output...** button was selected, CARE prints the document to a file that can be accessed by Word. The file output process is described below.

**Procedure**

1. Click the **File Output...** button in the *Print Documentation for Project...* dialog box.
2. In the subsequent dialog box, the user enters a filename or selects an existing file. After the user has made a valid file name selection, CARE starts the printing process.

**RESULT:** CARE generates a file with the user selected name and location (drive and directory). During file creation, the currently generated application part from CARE is displayed in a status window (for example, "Printing Action: Time Programs..."). The percentage of completion is also displayed.

After file generation is completed, the CARE printout main dialog box shows up.

If you load the created RTF file in Word:

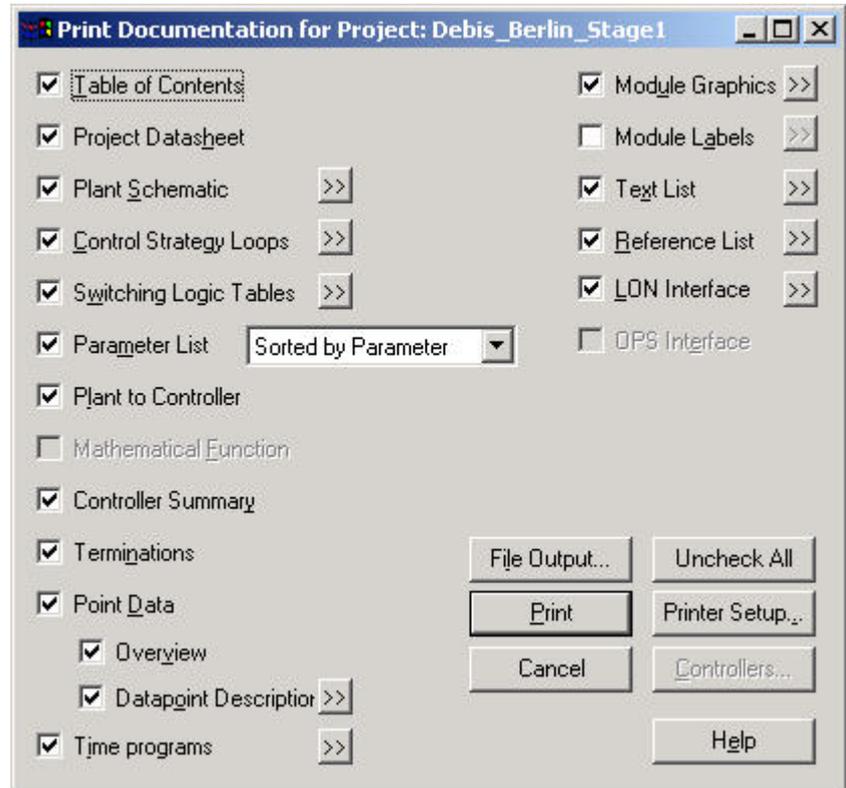
- Word converts the selected RTF file
- Word runs a macro to create a header, footer, and table of contents
- You can edit or print the document

**NOTE:** Problems with Word Macro Virus Protection may occur with Word 7.0 or higher.

## Select Print Options

Before printing the user has to decide which information he wants to print.

After selecting **Database/Print...** the *Print Documentation for Project...* dialog box is displayed with its various selection possibilities.



Each selection checkbox is described in detail in the subsequent sections.

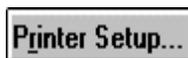
The main printing function buttons are described below.



Clicking the **Uncheck All/Check All... button** (Toggle function) when it reads **Uncheck All**, causes all printing dialog checkboxes to be deactivated. Then single printing dialog checkboxes can be activated by clicking on them.

Clicking the **Uncheck All/Check All... button** when it reads **Check All**, causes all printing dialog checkboxes to be activated, excluding dialog checkbox **Module Labels**.

NOTE: Clicking printing dialog checkbox **Module Labels** deselects all other printing dialog checkboxes automatically. For additional information refer to *Module Labels* section.



Clicking the **Printer Setup... button** opens **Printer Setup...** dialog box to select a specific printer and printing format. For additional information refer to *Printer Setup* section.



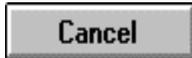
Clicking the **Print** button performs direct printing. For additional information refer to *Printing to a Printer* section.



Clicking the **File Output...** allows the user to store the printout in a file. For additional information refer to *Printing to a File* section.



Clicking the **Controllers...** button allows the user to select specific controllers. For additional information refer to *Selecting Individual Controllers from a Project* section.



Clicking the **Cancel** button returns to the CARE manager without printing.



Clicking the **Help** button provides the user with help support concerning Printing.

**Print Table of Contents**

If this checkbox is marked, a table of contents is printed as the first chapter in the documentation. The table of contents is a Word field and, therefore, it can be automatically updated, if the page breaks change.

NOTE: Through the caredoc.ini file, the printout of the table of contents can be adjusted to be printed without page numbers. To do so, find the section [Table Of Contents] and set **Page Numbers= NO**.

The following Word operations can be used to work with the table of contents (refer to the Word user manual for details).

**Update Table of Contents**

1. Click on the table of contents with the right mouse button
2. From the context menu, select **Update Field**.
3. From the dialog box, determine whether you want to update only the page numbers or whether you want to create a new table of contents.
4. Click **OK** to perform operation.

**Change Layout**

The layout of the table of contents may be changed (for example, to display more/less levels of detail, display or remove page numbers, etc.).

1. Select the table of contents by clicking on it with the left mouse button.
2. Select **Insert/Index and Tables**.
3. In the subsequent dialog box, adjust the layout of the table of contents as you like.
4. Click **OK** to accept your selections.
5. Word asks, if you want to replace the existing table of contents. Click **YES**.

RESULT: The existing table of contents is updated to the new format.

**Project Data sheet**

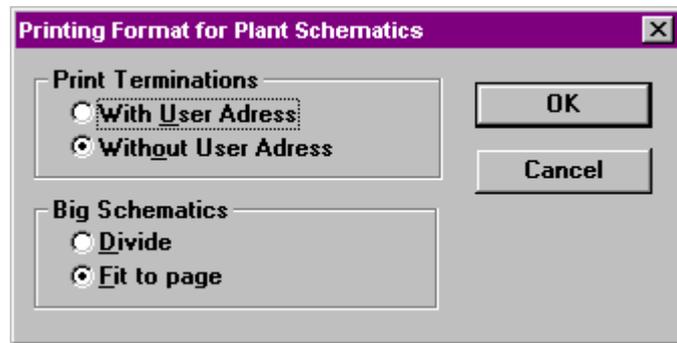
The project data sheet contains general information about the project. This information has been entered in CARE upon creation of the project.

Example:

<b>Project:</b>	<b>PH Exhibition</b>
Project Description:	Air_Handling_Units_Sect5
Project Reference Number:	1273634
Client:	Trade PH
Order Number:	213434534
Percent Discount:	0
Job Factor:	1.5
Project Engineer:	B. McNeal
Date:	03.06.98
Project Default Engineering Unit:	International
Project Subdirectory	PH

If this checkbox is marked, the plant schematics are printed.

The printout of the plant schematics may be adjusted by clicking on the >> button, which opens the **Printing Format for Plant Schematics** dialog box:



### Print Terminations

**With User Address** prints the plant schematic with the user addresses assigned to each hardware point.

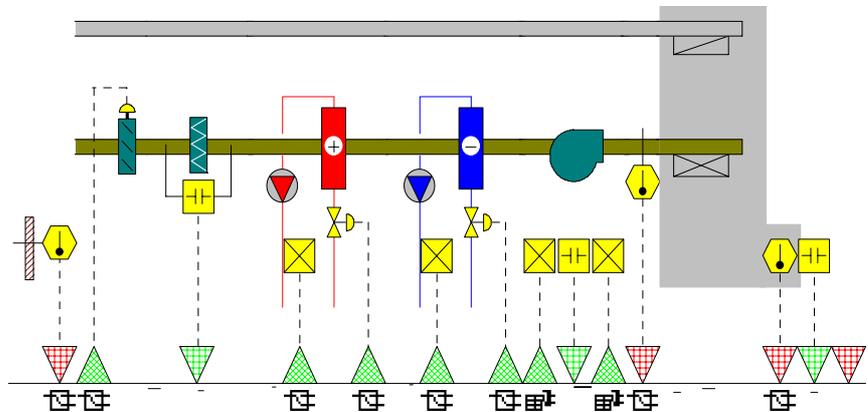
**Without User Address** prints the plant schematic without user addresses.

### Big Schematics

**Divide** automatically splits the schematic across multiple pages.

**Fit to Page** rescales the schematics so that they fit on one page.

The following is an example of a plant schematic printout without user addresses.





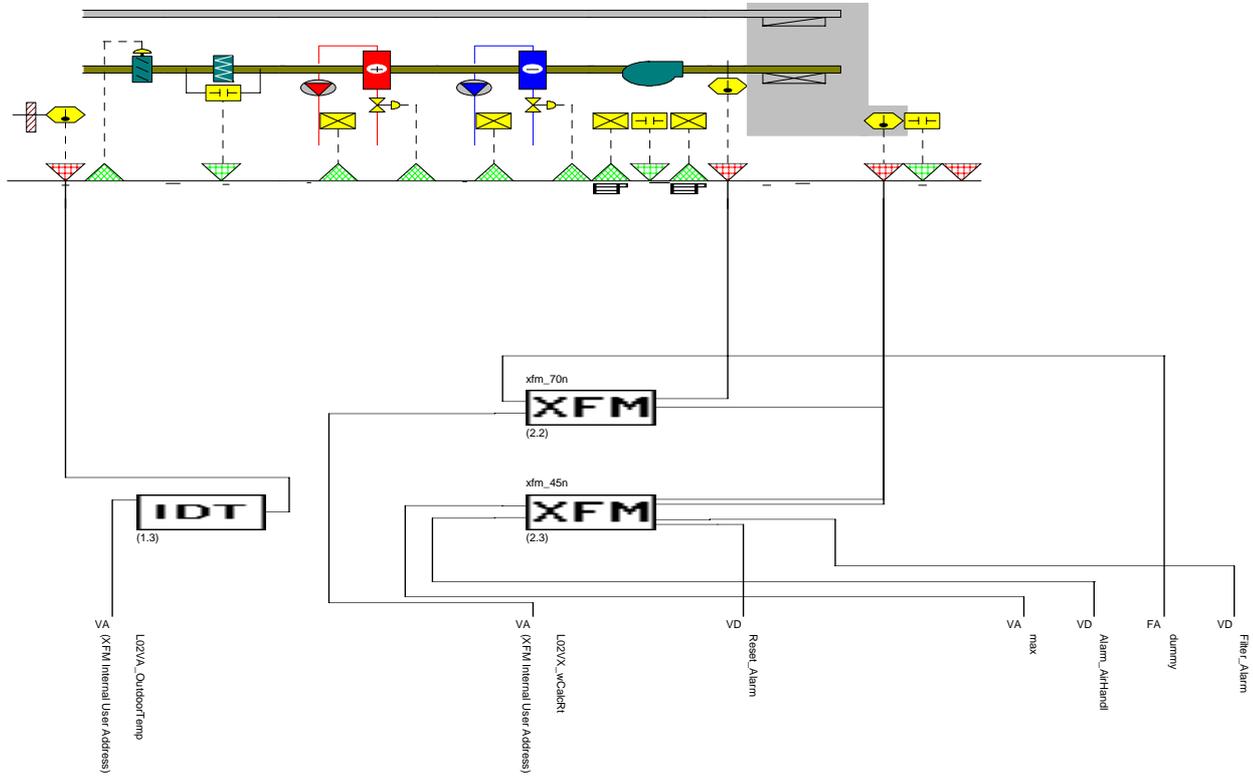
The following is an example of a control strategy printout with schematic. The schematic is printed above the control strategy. User addresses (and their descriptors, if available) are printed only for software points.

HONEYWELL  
PRINTING DATE: 5/13/98  
PRINTING TIME: 4.4 PM6

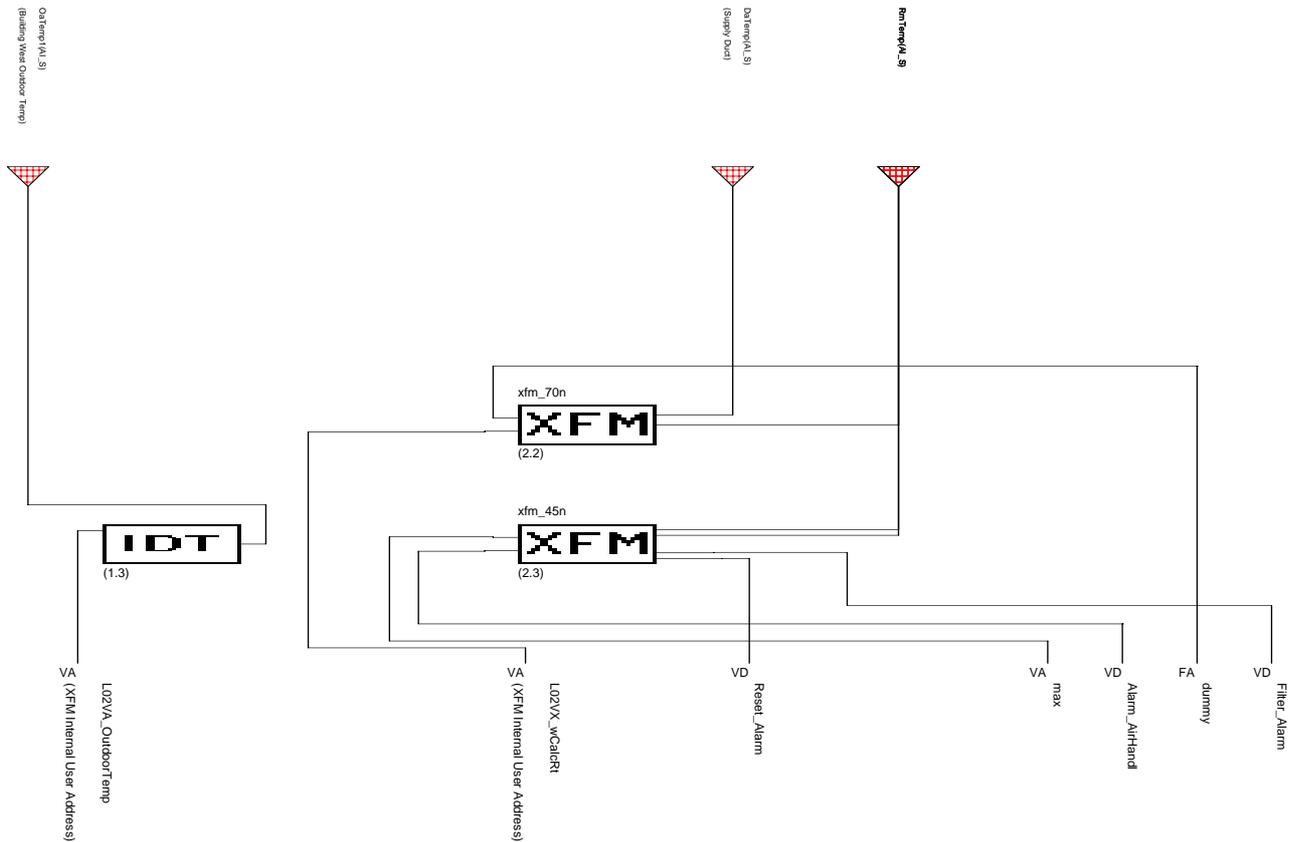
PROJECT PRINTOUT  
CONTROLLERNAME:M C05  
CONTROLLER NO: 5 OS VERSION: 2.0

PROJECT NAME: CARE\_T2

3.8.2.2.2 CONTROL STRATEGY SIMULATION



The following is an example of a plant schematic printout with user addresses and plant schematic. User addresses and type abbreviation (and their descriptors, if available) are printed vertically next to the corresponding hardware or software point.



See the Point Type Abbreviations appendix for point type abbreviations.

**XFMs with Internal User Addresses**

If a control strategy contains XFMs with internal user addresses, a table with the internal user addresses is printed as part of the control strategy loop.

The following table contains: The XFM name, (submodule name), the XFM position, the type of the internal user address, the name of the internal XFM default user address, the name of the connected CARE user address and the CARE descriptor for this user address.

**Example:**

Sub module	Position	Type	XFM Internal User Address	CARE User Address	CARE Descriptor
xfm_70n	2.2	VA	L00VA_Aussentemp	L02VA_OutdoorTemp	XFM Internal User Address
		VA	L00VZ_SwAbTemp	L02VZ_wRt	XFM Internal User Address
		VD	L00VD_BetriebAnl	L02VD_PlantRuns	XFM Internal User Address
		VA	L00VA_XcTemp	L02VA_SeqCntrl	XFM Internal User Address
xfm_45n	2.3	VA	L00VZ_FrgStufen	L02VZ_FanDemand	XFM Internal User Address
		VD	L00VZ_BelegOptim	L02VZ_PlantOn	XFM Internal User Address
		VA	L00VA_Aussentemp	L02VA_OutdoorTemp	XFM Internal User Address
		VA	L00VX_ErrSwRt	L02VX_wCalcRt	XFM Internal User Address
		VD	L00VS_Störung	L02VS_Alarm	XFM Internal User Address
		VD	STARTUP	STARTUP	XFM Internal User Address
		VD	L00VD_BetriebAnl	L02VD_PlantRuns	XFM Internal User Address
		VA	L00VA_AutoAnlage	L02VA_AutoPlant	XFM Internal User Address
		VD	L00VD_FrgMikl	L02VD_EnblDamp	XFM Internal User Address
		VD	L00VD_FrgLh	L02VD_EnblAH	XFM Internal User Address
		VD	L00VD_FrgLkT	L02VD_EnblACT	XFM Internal User Address

**Mathematical Functions**

If a control strategy contains mathematical functions and the printout of mathematical functions is enabled, the functions are printed as part of the control strategy (Refer also to *Mathematical Functions* section).

**Example:**

Average = ("Temp_1"+"Temp_2"+"Temp_3")/3
Smooth = INRT["difference",128,1440m]
difference = "DelayedOutdoorTemp"- "CurrentOutdoorTemp"

**Parameters**

If **Parameters sorted by Usage** is enabled, the parameters of each icon are printed as part of the control strategy. Refer to *Parameters Sorted by Usage* section.

The Parameters of WIA/RIA icons are listed in a separate table as part of the control strategy, if **Parameters sorted by Usage** or **Sorted by Parameter** is enabled.

NOTE: The Math Icon internal parameters are not printed as part of the control strategy.

Parameters are printed with the statement position and type, the description of the parameter, the parameter value and engineering unit, the parameter file number, the parameter index and the user address of the software point, which the parameter is mapped to.

**Example:**

Position	Type	Description	Value	Eng./Unit	User Value	Parameter File	Parameter Index	Point Mapping onto:
2.1	SEQ	Min value sequence 1	10.000			1	3	SW_Point_Test1
2.1	SEQ	Max value sequence 1	100.000			1	5	SW_Point_Test2
2.1	SEQ	Slope sequence 1	0.900			1	4	SW_Point_Test4
2.1	SEQ	y-axis intersection sequence 1	10.000			1	1	SW_Point_Test3
2.1	SEQ	Min value sequence 2	100.000			1	8	SW_Point_Test7
2.1	SEQ	Max value sequence 2	10.000			1	9	SW_Point_Test6
2.1	SEQ	Slope sequence 2	-0.900			1	2	SW_Point_Test5
2.1	SEQ	y-axis intersection sequence 2	100.000			(Not Generated)*		
2.1	SEQ	Min value sequence 3	100.000			(Not Generated)*		
2.1	SEQ	Max value sequence 3	10.000			(Not Generated)*		
2.1	SEQ	Slope sequence 3	-0.900			(Not Generated)*		
2.1	SEQ	y-axis intersection sequence 3	100.000			(Not Generated)*		
2.1	SEQ	Internal Parameter 10/12	100.000			(Not Generated)*		

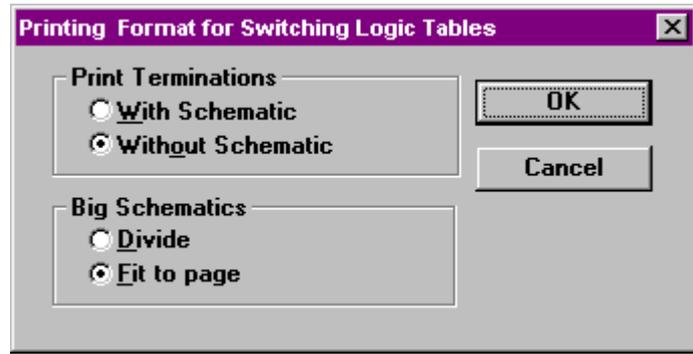
**NOTES:**

- \*If optional parameters exist for a statement (such as for example input parameters), and the user does not use these parameters, the printout shows the entry "Not Generated". The printout of not generated parameters can be suppressed by the caredoc.ini file.
- Engineering units for parameters in the control strategy are only printed for XFMs.

**Switching Logic Tables**

If this checkbox is marked, the switching tables are printed.

The printout may be adjusted by clicking on the >> button, which opens the **Printing Format for Switching Logic Tables** dialog box:



**Print Terminations**

**With Schematic** prints the plant schematic. The points that are controlled by switching tables are marked with the number of the switching table.

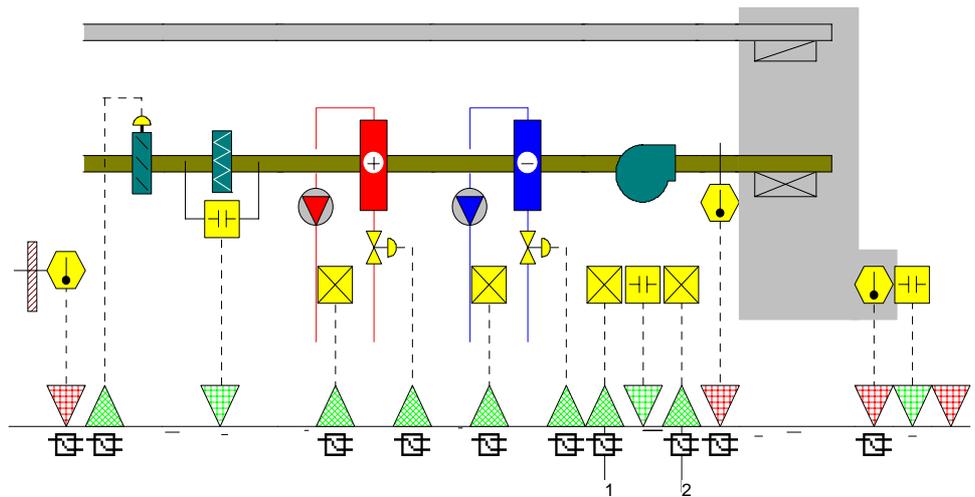
**Without Schematic** does not print the plant schematics, but only the switching tables.

**Big Schematics**

**Divide** automatically splits the control loop across multiple pages.

**Fit to Page** rescales the control loop so that it fits on one page.

The following is an example of a switching table printout with schematic. Each hardware point that is controlled by a switching table is marked with the number of the switching table.



NOTE: The switching tables are headed with  
 — output point user address  
 — output point type abbreviation \*)  
 — output point descriptor  
 — output value

Each user address shows type abbreviation and descriptor (if assigned) in round brackets.

See the Point Type Abbreviations section for point type abbreviations

**Examples:**

Switching Table 1 : SaFanLo (DO\_NO)(Supply Fan) = 1

SaFanLo (DO_NO) (Supply Fan)		1 [9][3]
Filter_Alarm (VD)		0

Switching Table 2 : SaFanHi (DO\_NO)(Supply Fan) = 1

SaFanHi (DO_NO) (Supply Fan)		1 [10][3]
Filter_Alarm (VD)		0

Switching Table 3 : Alarm\_AirHandl (VD) = 1

Alarm_AirHandl (VD)	Te = 10s [11][6]	1 [11][7]
DaTemp (Al_S) (Supply Duct)	>=	1 <sup>*)</sup>
38 [11][5]	hysteresis	

NOTE: The last column of the switching table is smaller for tables with XOR tables than for tables without XOR tables.

### Mathematical Functions

If a switching table contains mathematical functions in a condition row and the printout of mathematical functions is enabled, the functions are printed as part of the switching tables (Refer also to *Mathematical Functions* section).

#### Example:

hysteresis = "DaTemp"*0.1
---------------------------

### Parameters

In switching tables, the parameter file number and index is displayed in square brackets directly behind the corresponding parameter. The first value in brackets represents the file number and the second value in brackets represents the parameter index.

#### Example:

Alarm_AirHandl (VD)	<b>Te = 10s [11][6]</b>	1 [11][7]
DaTemp (Al_S) (Supply Duct)	>=	1
38 [11][5]	hysteresis	

**Te = 10s [11][6]** means that the on delay value of **10** seconds is stored in parameter file **11** in parameter number **6**.

If **Sorted by Parameter** is enabled, the parameters of the complete controller are printed in a separate table with description of the parameter usage.

NOTE: The Math equations internal parameters are not printed as part of the switching tables.

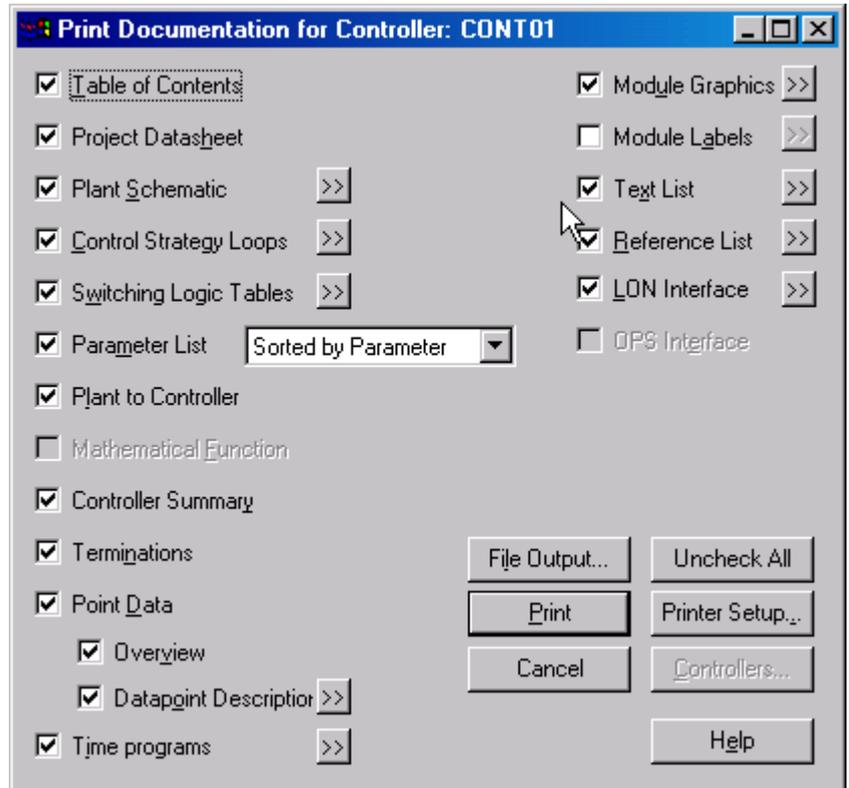
---

### Parameter List

If this checkbox is marked, the application parameters are printed.

NOTE: The Printout function supports the ANSI character set in the parameter list.

Parameter lists can be printed **Sorted by Parameter** and **Sorted by Usage**. The selection can be made from a dropdown list box.



### Sorted by Parameter

If this selection is made, the parameters are printed in a separate chapter and not as part of each control strategy. Only those parameters that are available in the controller are printed.

NOTE: Printout sorted by parameter requires translation of the controller in CARE prior to the printout attempt, because during translation the <controller>.txt file is created which is used as an input file for the parameter printout.

The parameter tables are sorted by parameter file number.

### Examples:

#### Parameter table of the main module.

- The header contains the main module name and the parameter file number 0.
- The column P. No. contains the parameter number.
- The column Description contains the parameter description.
- The column Value + Eng. Unit contains the parameter value and engineering unit (only for XFMs)
- The column Symbol Reference, Plant, Control Strategy contains the position and the input number of the control icon that uses the parameter (for example 4 - 2.3 means this parameter is used for input number 4 of a control statement on the position 2.3 [the second column and the third row of the corresponding control strategy]), the plant reference and the control strategy name.

NOTE: **User Value** is an extra blank column. The startup technician can use it to fill in the values he changes during plant startup.

Main module M0				Parameter file number 0
P.No.	Description	Value + Eng.Unit	User Value	Symbol Reference, Plant, Control Strategy
1	Internal use	0.000		
2	Internal use	1.000		
3	Input 1	1.000		1- 2.2, STARTUP_5, STARTUP
4	Input 3	50.000		3- 2.2, XL20_5, AirConStrategy
5	Input 3	0.000		3- 2.3, XL20_5, AirConStrategy
6	Input 4	0.000		4- 2.3, XL20_5, AirConStrategy
7	Input 2	-50.000		2- 2.2, XL20_5, CoolerFan
8	Input 1	50.000		1- 2.2, XL20_5, HeaterDamper
9	Input 2	50.000		2- 2.2, XL20_5, HeaterDamper
10	Input 1	-50.000		1- 1.1, XL20_5, HeaterDamper
11	Input 3	-50.000		3- 1.1, XL20_5, HeaterDamper

**Parameter table of a control strategy sub module.**

- The header contains the plant name, the sub module name (only for XFMs), the control loop name and the parameter file number.
- The column P. No. contains the parameter number.
- The column Description contains the parameter description.
- The column Value + Eng. Unit contains the parameter value and engineering unit (only for XFMs).
- The column Symbol Reference contains the position and the input number of the control icon that uses the parameter, for example 4 - 2.3 means this parameter is used for input number 4 of a control statement on the position 2.3 (the 2nd column and the 3rd row of the corresponding control strategy).
- The column Mapped SW Point contains the user address name of the software point, which the parameter is mapped to.

NOTE: **User Value** is an extra blank column. The startup technician can use it to fill in the values he changes during plant startup.

Plant STARTUP		Sub module xfm_90.csd	Control loop STARTUP	Parameter file number 1		
P.No.	Description	Value + Eng.Unit	User Value	Symbol Reference	Mapped SW Point	
1	Delay Time	60.000 s		2.2	TestPoint_01	
2	Version	1.000 l		2.2	TestPoint_06	
3	XFM_Number	90.000 l		2.2	TestPoint_11	

**Parameter table of a switching table sub module.**

- The header contains the plant name, the switching table name (name of the switched point) and the parameter file number.
- The column P. No. contains the parameter number.
- The column Description contains the parameter description.
- The column Value + Eng. Unit contains the parameter value and engineering unit (only for XFMs).
- The column Symbol Reference contains the line of the switching table that contains the parameter, where 0 means the table header and 1 means the 1st line.

NOTE: **User Value** is an extra blank column. The startup technician can use it to fill in the values he changes during plant startup.

Plant XL20_3		Switching table Alarm_AirHandl	Parameter file number 11		
P.No.	Description	Value + Eng.Unit	User Value	Symbol Reference	
1	Internal use	0.000			
2	Internal use	1.000			
3	Internal use	48.000		1	
4	Hysteresis (MAT) Line 1 Table 1	0.100		1	
5	Comparison Value 2 Line 1 Table 1	38.000		1	
6	Comp. Value 2 (MAT) Line 2 Table 1	10.000		2	
7	Output On-Delay Table 1	10.000		0	
8	Output Value Table 1	1.000		0	

NOTE: Engineering units for parameters are only printed for XFMs.

**Sorted by Usage**

If this selection is made, the parameters are printed as part of the control strategy to which they belong.

NOTE: **Parameters Sorted by Usage** can only be selected, if control strategy or switching table printout was selected previously.

For switching tables, the parameter file number and index is printed directly behind the corresponding parameter, so that in this case no separate parameter table is required.

Parameters are printed with the statement position and type, the description of the parameter, the parameter value and engineering unit, the parameter file number, the parameter index and the user address of the software point, which the parameter is mapped to.

NOTE: There is an extra column **User Value** that is blank. The startup technician can fill in the values he changes during plant startup.

**Example:**

Position	Type	Description	Value	Eng./Unit	User Value	Parameter File	Parameter Index	Point Mapping onto:
2.1	SEQ	Min value sequence 1	10.000			1	3	SW_Point_Test1
2.1	SEQ	Max value sequence 1	100.000			1	5	SW_Point_Test2
2.1	SEQ	Slope sequence 1	0.900			1	4	SW_Point_Test4
2.1	SEQ	y-axis intersection sequence 1	10.000			1	1	SW_Point_Test3
2.1	SEQ	Min value sequence 2	100.000			1	8	SW_Point_Test7
2.1	SEQ	Max value sequence 2	10.000			1	9	SW_Point_Test6
2.1	SEQ	Slope sequence 2	-0.900			1	2	SW_Point_Test5
2.1	SEQ	y-axis intersection sequence 2	100.000			(Not Generated)*		
2.1	SEQ	Min value sequence 3	100.000			(Not Generated)*		
2.1	SEQ	Max value sequence 3	10.000			(Not Generated)*		
2.1	SEQ	Slope sequence 3	-0.900			(Not Generated)*		
2.1	SEQ	y-axis intersection sequence 3	100.000			(Not Generated)*		
2.1	SEQ	Internal Parameter 10/12	100.000			(Not Generated)*		

**NOTES:**

1. \*If optional parameters exist for a statement (for example input parameters), and the user does not use these parameters, the printout shows the entry "Not Generated".
2. Engineering units for parameters in the control strategy are only printed for XFMs.
3. **Parameters sorted by Usage** does not print the parameters of mathematical functions.

**Parameters of WIA/RIA**

If Control Strategy is enabled, the parameters of WIA/RIA are printed as part of the control strategy loop for each option, sorted by parameters or sorted by usage.

Icon Type	Position	Connected User Address	Type	Descriptor	Attribute
WIA	1.1	L02VD_PlantRuns_5	VD		1: Operational Mode 2: Hide Point 3: No Response
RIA	1.2	L02VA_SeqCntrl_5	VA		1: Operational Mode 2: No Response 3: IO Remote

**Plant to Controller**

If this checkbox is marked, the plants that are assigned to the selected controller are printed as shown below.

The printed table contains:

- All plant names that belong to the specific controller
- The corresponding type (for example, Air Conditioning/Hot Water) for each plant name
- All assigned control strategies for each plant

**Example:**

Plant name	Plant Type	Control Strategy Name
STARTUP	Air Conditioning	STARTUP
XL20_3	Air Conditioning	AirConStrategy
		CoolerFan
		Plant Feedback
		HeaterDamper

**Mathematical Function**

Mathematical functions can be found in control strategies and/or switching tables. If there is not any mathematical function in control strategies and/or switching tables, this checkbox cannot be enabled. In case of existing mathematical functions, they are only printed, if **Control Strategy Loops** and/or **Switching Logic Tables** is enabled.

**Control Strategies**

If a control strategy contains mathematical functions and the printout of mathematical functions and control strategy loops is enabled, the functions are printed as part of the control strategy (Refer also to *Control Strategy Loop* section).

**Example:**

Average = ("Temp_1"+"Temp_2"+"Temp_3")/3
Smooth = INRT["difference",128,1440m]
Difference = "DelayedOutdoorTemp"-"CurrentOutdoorTemp"

**Switching Tables**

If a switching table contains mathematical functions in a condition row and the printout of mathematical functions and of switching tables is enabled, the functions are printed as part of the switching tables (Refer also to *Switching Logic Tables* section).

**Example:**

hysteresis = "DaTemp"*0.1
---------------------------

**Controller Summary**

If this checkbox is marked, a summary for each selected controller is printed. The controller summary shows which module type is plugged into which housing. For each I/O module, the technical address of the module is printed (refer to *Terminal Assignment Function*).

**Example:**

**IP Housing 1**

**IP Housing 2**

XP502	XF521	XF522	XC5010	XF523	XF524	( Empty )	( Empty )
	No : 1	No : 2		No : 3	No : 4		

Note: Number states technical address of module.

**XF528 Housing 2**

XF528(1)	XF528(2)	XF528(3)	XF528(4)	XF528(5)
No : 7	No : 8	No : 9	No : 10	No : 11

Note: Number states technical address of module.

**LON Bus Housing 1**

XFL523	XFL523	XFL523	XFL521	XFL522	XFL523	XFL524
No : 7	No : 8	No : 9	No : 10	No : 11	No : 12	No : 13

→ Slot 7-10  
graphically  
not presented

Note: Number states technical address of module.

**Terminations**

If this checkbox is marked, all terminations of the selected controller(s) are printed.

**Example for standard module terminations:**

Device/ Terminal	Installation	Cable Type	Cable No.	Wire Identification	Housing Number 1 Module Number 5 Module Type XF521
					<input type="radio"/> 01 AC1MaTemp ( 22 / 5 / 1 )
					<input type="radio"/> 02 COM
					<input type="radio"/> 03 AC1OaTemp ( 22 / 5 / 2 )
					<input type="radio"/> 04 COM
					<input type="radio"/> 05 AC1RmTemp ( 22 / 5 / 3 )
					<input type="radio"/> 06 COM
	Coding Pin				<input checked="" type="radio"/> 07
					<input type="radio"/> 08 AC1SolarHeat ( 22 / 5 / 4 )
					<input type="radio"/> 09 COM
					<input type="radio"/> 10
					<input type="radio"/> 11 COM
					<input type="radio"/> 12
					<input type="radio"/> 13 COM
					<input type="radio"/> 14
					<input type="radio"/> 15 COM
					<input type="radio"/> 16
					<input type="radio"/> 17 COM
					<input type="radio"/> 18 10 V

**Example for LON module terminations:**

			Cable Type	Cable No.	Wire Identification	Module Number 1 Module Type XFL521 on XSL513
PE	35					
	36	18				
	37	19		1		L22_MW_DischarTemp ( 22 / 1 / 1 )
	38	20		2		L22_MW_Frosttemp ( 22 / 1 / 2 )
	39	21		3		L22_MW_OaTemp ( 22 / 1 / 3 )
	40	22		4		L22_MW_RoomTemp ( 22 / 1 / 4 )
	41	23		5		L22_MW_SupplyTemp ( 22 / 1 / 5 )
	42	24		6		
	43	25		7		
	44	26		8		
	45	27		9		10 V
<input checked="" type="radio"/>	46	28		10		10 V
	47	<input checked="" type="radio"/> 29		11		10 V
	48	30		12		10 V
	49	31		13		10 V
	50	32		14		10 V
	51	33		15		10 V
	52	<input checked="" type="radio"/> 34		16		10 V
				17		10 V

					System Ground
					Auxiliary Termination Block used for:
					Protection Earth

## Example for Excel 50 terminations (screw terminals):

Port A						
Power	24Vac-	24Vac+				
24VAC	1	2				
Relay outputs	24VAC	24VAC	Datapoint Name	Descriptor	Field Device	
DO1	3	4	do_fb_di_1 ( 2 / 4 / 1 )			
DO2	5	6	do_fb_di_1 ( 2 / 4 / 2 )			
DO3	7	8	do_fb_di_1 ( 2 / 4 / 3 )			
DO4	9	10	do_fb_di_2 ( 2 / 4 / 4 )			
DO5	11	12	do_fb_di_2 ( 2 / 4 / 5 )			
DO6	13	14	do_fb_di_2 ( 2 / 4 / 6 )			
Port B						
Control Outputs	Y	COM	24VAC	Datapoint Name	Descriptor	Field Device
AO1	15	16 & 1	2			
AO2	17	18 & 1	2			
AO3	19	20 & 1	2			
AO4	21	22 & 1	2			
Contacts Input	Y	COM (dry contact)	COM (powered contact)	Datapoint Name	Descriptor	Field Device
DI1	23	32	24	do_fb_di_2 ( 2 / 3 / 1 )		
DI2	25	32	26	do_fb_di_1 ( 2 / 3 / 2 )		
DI3	27	32	28	do_fb_di_1 ( 2 / 3 / 3 )		
DI4	29	32	30	do_fb_di_1 ( 2 / 3 / 4 )		
Universal Inputs	Y	COM	24VAC or URef	Datapoint Name	Descriptor	Field Device
UI1	33	34 & 1*	2* (31**)	do_fb_di_2 ( 2 / 1 / 1 )		
UI2	35	36 & 1*	2* (31**)	do_fb_di_2 ( 2 / 1 / 2 )		
UI3	37	38 & 1*	2* (31**)			
UI4	39	40 & 1*	2* (31**)			
UI5	41	42 & 1*	2* (31**)			
UI6	43	44 & 1*	2* (31**)			
UI7	45	46 & 1*	2* (31**)			
UI8	47	48 & 1*	2* (31**)			

\*Non NTC sensors means active sensor

\*\*for DI on AI board

## Point Data

If this checkbox is enabled, an overview of the point data and the datapoint description for all points are printed.

**Overview** If this checkbox is marked, the quantity of each module and the quantity of the physical datapoints on the corresponding module are printed.

**Example:**

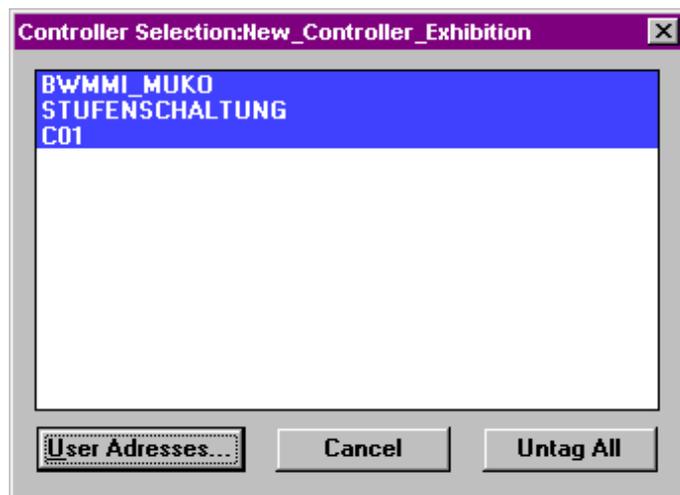
Quantity of Modules		Quantity of Physical Data points	
Quantity DI Modules (XF523)	5	Quantity Digital Inputs	49
Quantity DO Modules (XF524)	4	Quantity Analog Inputs	24
Quantity 3 Position Modules (XF525)	0	Quantity Analog Outputs	20
Quantity AI Modules (XF521)	3	Quantity 3 Position Outputs	0
Quantity AO Modules (XF522)	4	Quantity Totalizers (fast)	0
Quantity Fast AI Modules (XF526)	0	Quantity Totalizers (slow)	0
Quantity AO Modules (w/o switches) (XF527)	0	Quantity Digital Outputs (NO)	0
Quantity DO Modules (w/o switches) (XF529)	0	Quantity Digital Outputs (C/O)	17
Quantity High Density DI Modules (XF528)	0		
<b>Total IP-Bus Modules</b>	<b>16</b>	<b>Total Physical Datapoints</b>	<b>110</b>

Quantity AI LON Modules (XFL521)	0	Quantity Pseudo Analog Points	0
Quantity DI LON Modules (XFL522)	0	Quantity Pseudo Digital Points	3
Quantity AO LON Modules (XFL524)	0	Total Pseudo Data Points	3
Quantity DO LON Modules (XFL523)	0		
Total LON Modules	0	Quantity Global Analog Points	1
		Quantity Global Digital Points	1
<b>Total IO Modules</b>	<b>16</b>	<b>Total Global Points</b>	<b>2</b>

Quantity Control Loops	0	Quantity DO_Feedback_DI Points*	0
Quantity PID Controllers	0	Quantity Multi_Stage_Points*	0
Country Code	GERMANY	Quantity Puls_2 Points*	0
Engineering Units	International	Total Special Points	0
Default File Set	xl_1_5		
Installation	Normal	Quantity Analog Flags	1
Power Supply	XP 502	Quantity Digital Flags	1

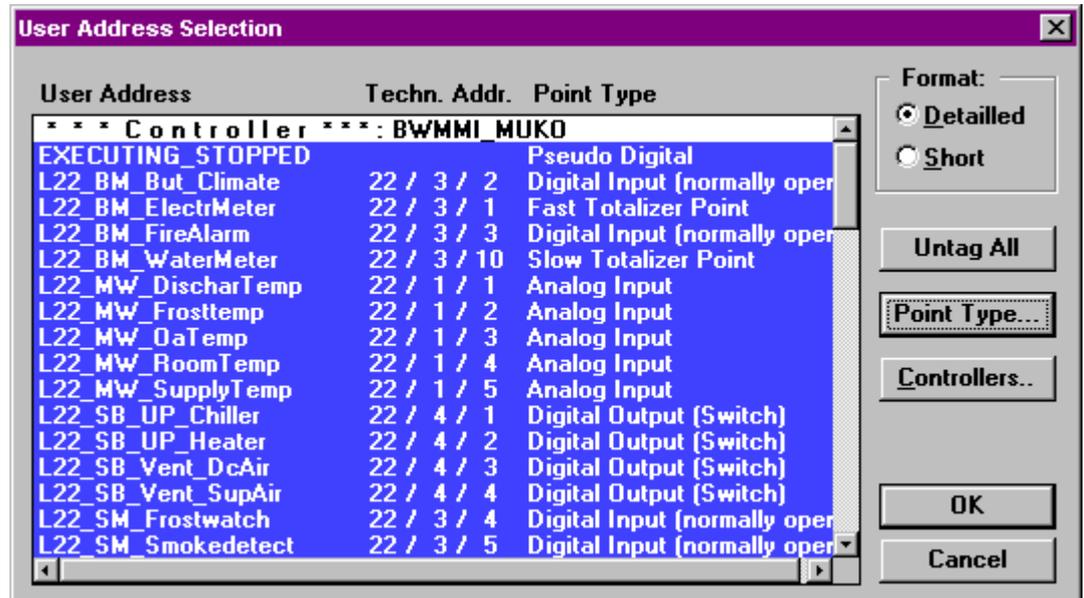
NOTE: The subpoints of these special points are included in the quantity of physical datapoints.

**Datapoint Description** If this checkbox is marked, the datapoint description of the selected controller is printed. The printout may be adjusted by clicking on the >> button. If a project was selected for printout, clicking on the >> button opens the **Controller Selection** dialog box to select controllers for printout.



Highlight desired controller(s) you want to print datapoint description for and click the **User Addresses...** button to open the **User Address Selection** dialog box for the selected controllers.

If a single controller or attached plant was selected for printout, clicking on the >> button opens the **User Address Selection** dialog box directly:



By default all user addresses are highlighted for printing. Deselect addresses you do not want to print by clicking on with left mouse key, or reselect. Use Untag/Tag button for (de)selection of all addresses.

In addition to the **User Address Selection** dialog box, the printing Format, Point Type or Controllers can be selected.

With the **Format** radio buttons, the user can select **Detailed** or **Short** format for the printout:

#### Detailed Format

The detailed format prints a table for each datapoint that contains all its attributes and their values.

The user addresses for each selected point type are printed. Within each point type, the user addresses are sorted by alphabetical order.

If no datapoint exists for a selected type, the corresponding chapter is not printed.

For flags the user address, the z-register file and index numbers are printed. If there is no valid file and index number available, the flag is indicated as "not assigned".

#### Short Format

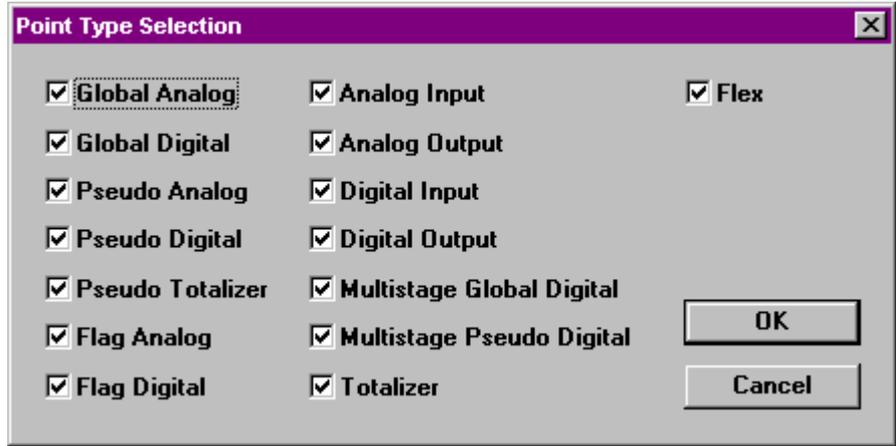
The short format prints no attributes of the datapoints. The printout is sorted by alphabetical order.

#### Controllers...

After clicking on the **Controllers...** button, the user can switch to the **Controller Selection** dialog box (only possible, if a project with multiple controllers has been selected for printout).

#### Point Type...

After clicking on the **Point Type...** button the **Point Type Selection** dialog box is displayed.



In the **Point Type Selection** box, datapoints can be (de)selected by type (for example all AIs, all DIs and/or all Multistage Global Digital points). Only selected point types will be shown in the User Address Selection dialog box.

See Point Type Abbreviations section for a list of point type abbreviations.

Click OK to close the Point Type dialog box.

Clicking OK in the User Address Selection dialog box prints the following:

- User Address
- Descriptor
- Point Type Abbreviation
- Technical Address

#### Example: Datapoint Description (Short Format)

User Address	Descriptor	Point Type	Technical Address
DaTemp	Supply Duct	AI_S	1 / 1 / 1
OaTemp1	Building West Outdoor Temp	AI_S	1 / 1 / 2
RmTemp		AI_S	1 / 1 / 3
CigVlv	Air Cooler	AO	1 / 2 / 1
HtgVlv1	Air Heater	AO	1 / 2 / 2
OaDmpr1	Supply Duct	AO	1 / 2 / 3
L02VA_AutoPlant	XFM Internal User Address	VA	
L02VA_OutdoorTemp	XFM Internal User Address	VA	
L02VA_SeqCntrl	XFM Internal User Address	VA	
L02VA_SuplDemand	XFM Internal User Address	VA	
L02VX_wCalcRt	XFM Internal User Address	VA	
L02VZ_FanDemand	XFM Internal User Address	VA	
L02VZ_wRt	XFM Internal User Address	VA	
GA		GA_I	0 / 0 / 0
DaFiltAlm	Supply Duct	DI_NO	1 / 3 / 12
SaFanStatus2	Supply Fan	DI_NO	1 / 3 / 11
CigPump	Air Cooler	DO_NO	1 / 4 / 1
HtgPump1	Air Heater	DO_NO	1 / 4 / 2
SaFanHi	Supply Fan	DO_NO	1 / 4 / 5
SaFanLo	Supply Fan	DO_NO	1 / 4 / 4
Alarm_AirHandl		VD	
EXECUTING_STOPPED		VD	
Filter_Alarm		VD	
L02VD_EnblACT	XFM Internal User Address	VD	
L02VD_EnblAH	XFM Internal User Address	VD	
L02VD_EnblDamp	XFM Internal User Address	VD	
L02VD_PlantRuns	XFM Internal User Address	VD	
L02VS_Alarm	XFM Internal User Address	VD	

User Address	Descriptor	Point Type	Technical Address
L02VZ_Maintenance	XFM Internal User Address	VD	
L02VZ_PlantOn	XFM Internal User Address	VD	
ManOff		VD	
Reset_Alarm		VD	
SHUTDOWN		VD	
STARTUP		VD	
TotCurrent	Meters in Cellar	TOT_F	1 / 3 / 1
TotWater	Meters in Cellar	TOT_S	
Dummy_yFO		FA	
Dummy_St3		FD	
FD		FD	
ZERO		FD	

**Example: Datapoint Description for Flags**

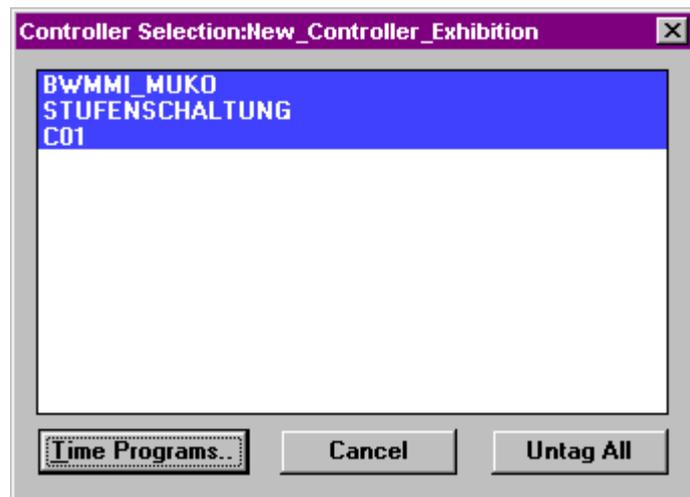
L22FD_Release	(unassigned)
L22FD_Temp	(FileNo.: 5/IndexNo. 8)

**Time Programs**

If this checkbox is marked, the time programs of the selected controllers are printed.

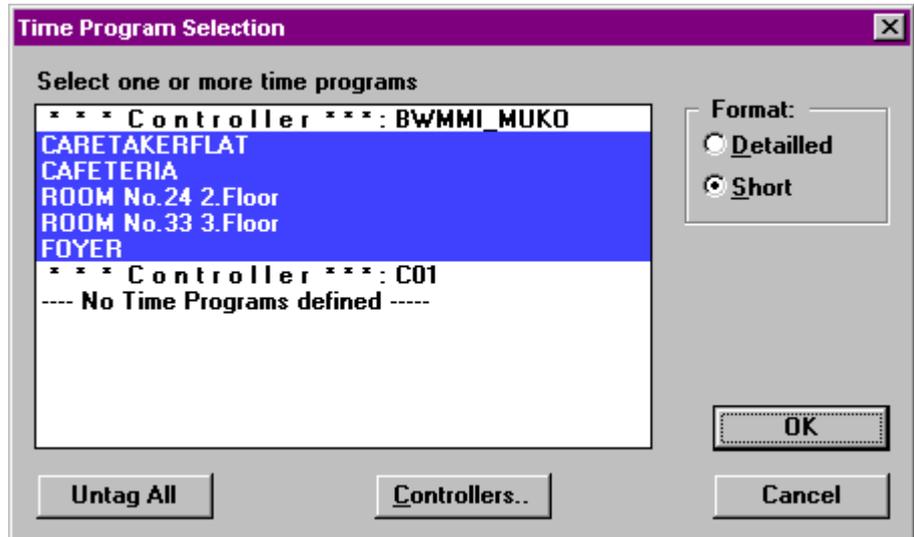
The printout may be adjusted by clicking on >> button.

If a project was selected for printout, clicking on the >> button opens a dialog box to select controllers for printout.



From this dialog box, the **Time Programs** button opens the **Time Program Selection** dialog box for the selected controllers.

If a single controller or attached plant was selected for printout, clicking on the >> button opens the **Time Program Selection** dialog box directly:



In the **Time Program Selection** dialog box, the user can make multiple selections:

- From the list of available time programs, the user can deselect time programs from printing by clicking on already highlighted items with the left mouse button.
- With the Format radio buttons, the user can select Detailed or Short format for the printout (see below).
- With the Controllers... button, the user can switch to the *Controller Selection* dialog box (only possible, if a project with multiple controllers has been selected for printout).

#### Detailed Format

The detailed format prints a table with the following information for each time program:

- A list of all points that are assigned to this time program with
  - user address
  - descriptor
  - type of each point.
- A list of all daily programs that belong to the time program with
  - daily program name
  - switching time
  - user address of the point that is switched
  - descriptor of the point that is switched in round brackets behind the user address
  - value/status to which the point is commanded.
  - optimized status for switching points.
- A list of the weekdays (Monday to Friday) with the corresponding daily programs assigned to them.
- A list of public holidays with the corresponding daily programs assigned to them.

**NOTE:** The holiday program table is only printed, if there is a daily program assigned to one of the holidays.

#### Short Format

The short format prints a table with the following information for each time program:

- A list of all points that are assigned to this time program with
  - user address
  - descriptor
  - type of each point.
- A list of all daily programs that belong to the time program with
  - daily program name
  - switching time
  - user address of the point that is switched
  - descriptor of the point that is switched in round brackets behind the user address

- value/status to which the point is commanded.
- A list of the weekdays (Monday to Friday) with the corresponding daily programs assigned to them and for each daily program:
  - switching time
  - user address of the point that is switched
  - descriptor of the point that is switched in round brackets behind the user address
  - value/status to which the point is commanded.
  - optimized status for switching points.
- A list of public holidays with the corresponding daily programs assigned to them

NOTE: The holiday program table is only printed, if they have a daily program assigned to one of the holidays

**Example (weekly schedule in short format):**

Weekday (Daily program name)	Time	User Address of Switching Point	Value/State	Optim
Monday (everyday)	06:00	L02VZ_PlantOn ( XFM Internal User Address )	Occupied	YES
	22:00	L02VZ_PlantOn ( XFM Internal User Address )	Unoccupied	YES
Tuesday (everyday)	06:00	L02VZ_PlantOn ( XFM Internal User Address )	Occupied	NO
	22:00	L02VZ_PlantOn ( XFM Internal User Address )	Unoccupied	YES
Wednesday (everyday)	06:00	L02VZ_PlantOn ( XFM Internal User Address )	Occupied	YES
	22:00	L02VZ_PlantOn ( XFM Internal User Address )	Unoccupied	YES
Thursday (everyday)	06:00	L02VZ_PlantOn ( XFM Internal User Address )	Occupied	YES
	22:00	L02VZ_PlantOn ( XFM Internal User Address )	Unoccupied	YES
Friday (everyday)	06:00	L02VZ_PlantOn ( XFM Internal User Address )	Occupied	YES
	22:00	L02VZ_PlantOn ( XFM Internal User Address )	Unoccupied	YES
Saturday (weekend)	00:00	L02VZ_PlantOn ( XFM Internal User Address )	Unoccupied	YES
Sunday (weekend)	00:00	L02VZ_PlantOn ( XFM Internal User Address )	Unoccupied	NO

NOTE: It is recommended that the time programs are printed in short format to save paper.

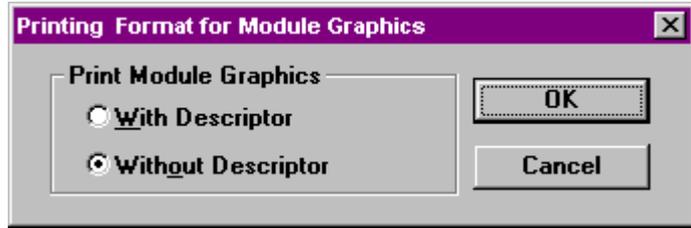
**Controllers...** After clicking on the **Controllers...** button the **Controller Selection** dialog box is displayed to select controllers for which the time programs will be printed.

**Module Graphics**

If this checkbox is enabled, standard and LON modules respectively are printed as a graphic. The graphic shows which user address resides on which switch or lamp, so that the operator can easily find datapoints on the controller. The printout may be put in the cabinet for easy reference to the datapoints. Additionally, the setting of the HEX address switch is displayed.

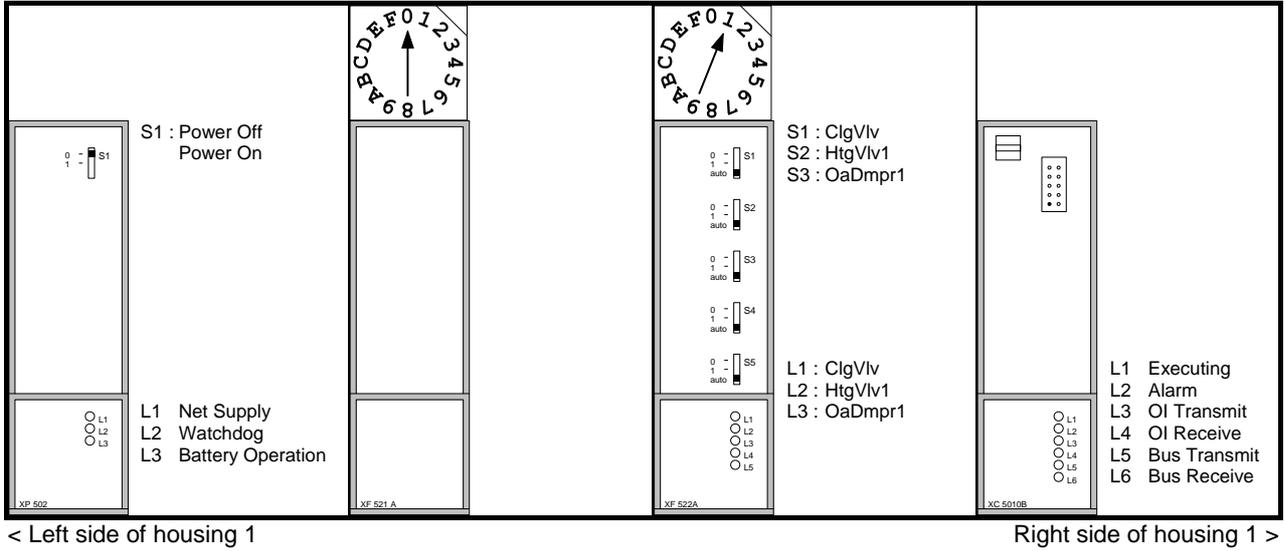
Module graphics can be printed with or without point descriptors. The printout of modules with point descriptors consumes more space and therefore only two modules are printed per page. The printout without point descriptors prints four modules on the same page.

Click the >> button to select the format in the Printing Format for Module Graphics dialog box.



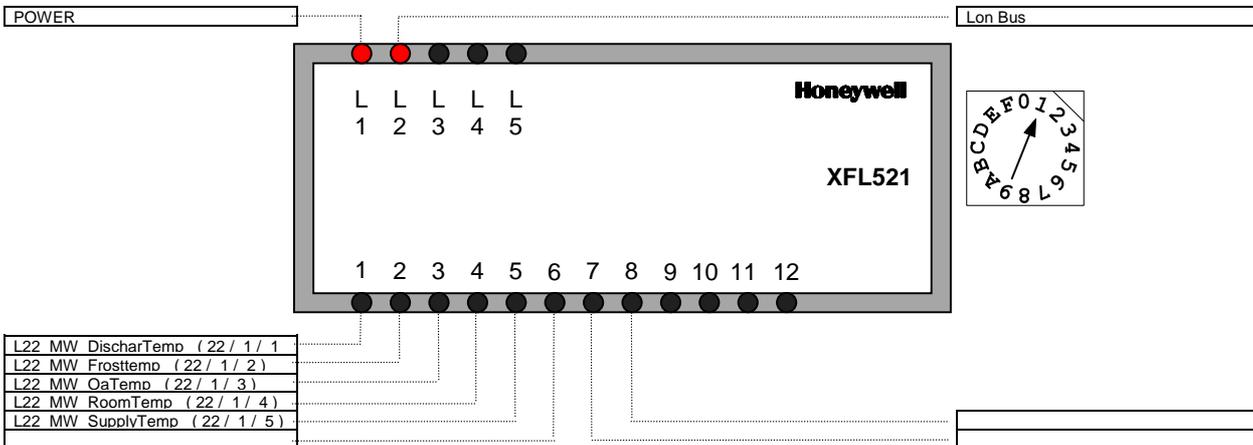
Example (standard module graphics without descriptors):

**Module Graphics for Housing 1**

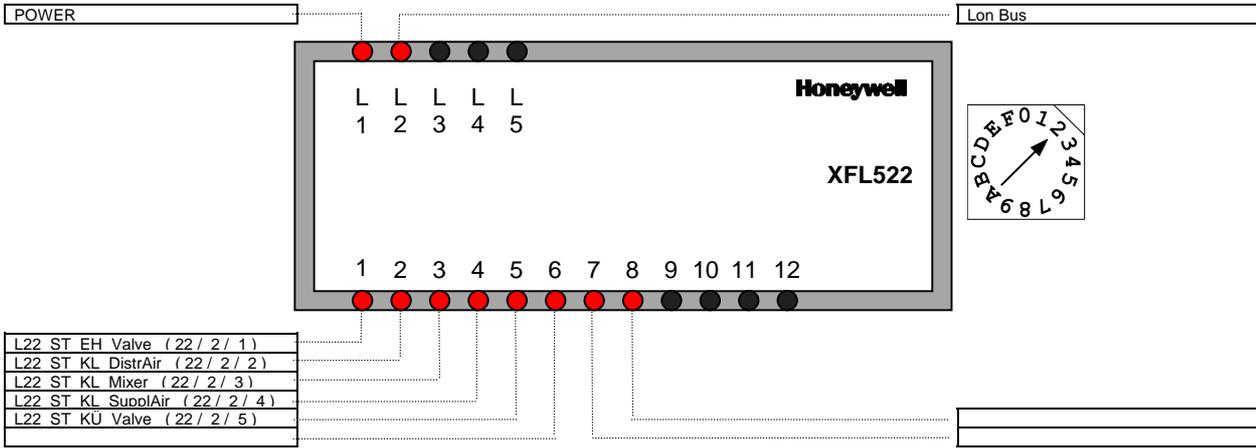


Example (LON module graphics without descriptors):

**Module Graphics for LON module No.: 1**

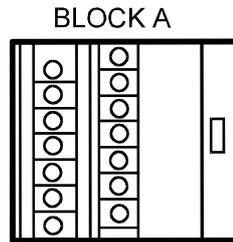


**Module Graphics for LON module No.: 2**



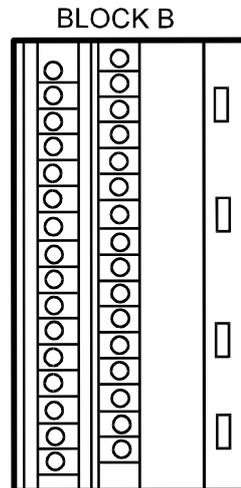
**Example (Excel 50 Screw Terminals):**

2:24 V AC
4:24 V AC
6:24 V AC
8:24 V AC
10:24 V AC
12:24 V AC
14:24 V AC



1:24 V AC (Common)
3:do_fb_di_1 ( 2 / 4 / 1 )
5:do_fb_di_1 ( 2 / 4 / 2 )
7:do_fb_di_1 ( 2 / 4 / 3 )
9:do_fb_di_2 ( 2 / 4 / 4 )
11:do_fb_di_2 ( 2 / 4 / 5 )
13:do_fb_di_2 ( 2 / 4 / 6 )

16:GND
18:GND
20:GND
22:GND
24:GND
26:GND
28:GND
30:GND
32:DI-Power
34:GND
36:GND
38:GND
40:GND
42:GND
44:GND
46:GND
48:GND



15:
17:
19:
21:
23:do_fb_di_2 ( 2 / 3 / 1 )
25:do_fb_di_1 ( 2 / 3 / 2 )
27:do_fb_di_1 ( 2 / 3 / 3 )
29:do_fb_di_1 ( 2 / 3 / 4 )
31:+10V Ref
33:do_fb_di_2 ( 2 / 1 / 1 )
35:do_fb_di_2 ( 2 / 1 / 2 )
37:
39:
41:
43:
45:
47:

**Module Labels**

CARE allows you to print both standard and LON module labels for the module front plates. These labels can be printed on self-adhesive stickers and put on the modules to describe the individual I/Os.

The labels contain the input/output user address for each terminal. For labels with switches, holes are marked. These holes can be cut out using a special cutting tool. Alternatively, the individual user addresses can be cut from the sticker and can be put on the front plate individually.

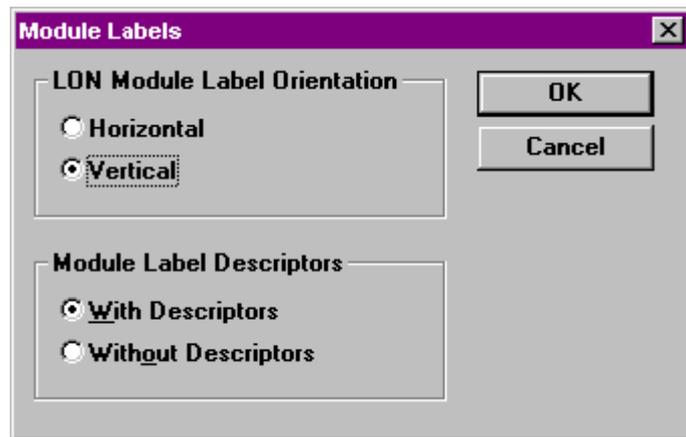
**NOTES:** It is possible that the user addresses are too long for a module label, causing the module label text to look scrambled. In which case, you can edit the printout file that contains the module labels before printing to the self-adhesive stickers. For example, a smaller font can be used or the user address can be abbreviated.

Module label printing for Excel 80/100 controllers is not available

Select the Module Labels checkbox to print module labels.

**RESULT:** All other options from the Print Documentation... dialog box are disabled, because module labels require self-adhesive stickers to be put in the printer.

Click >> button to open the Module Labels dialog box.

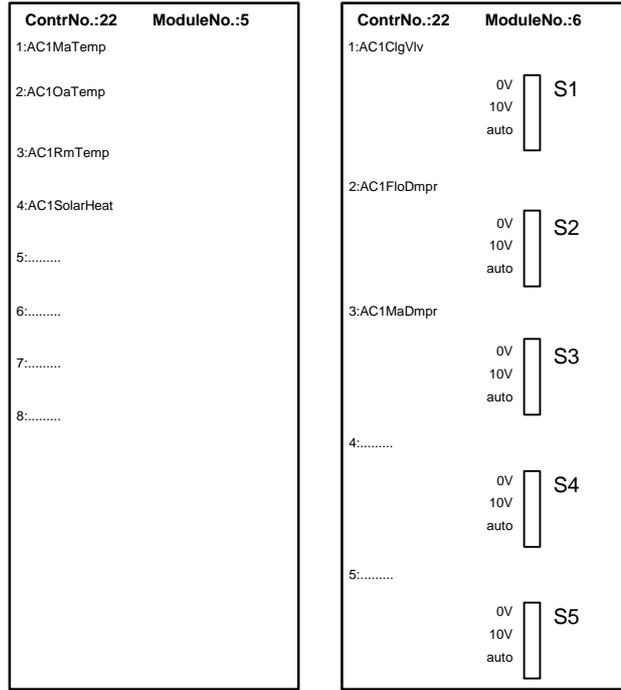


Select the orientation (horizontal or vertical) for LON module labels.

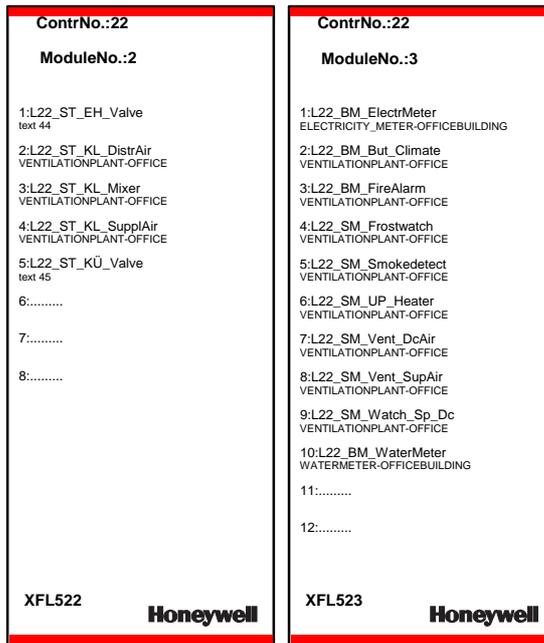
For both labels (standard and LON) select, if you want to print with or without descriptors.

Click **OK** to confirm.

**Example (Vertical standard module labels with descriptors):**



**Example (Vertical LON module labels with descriptors):**

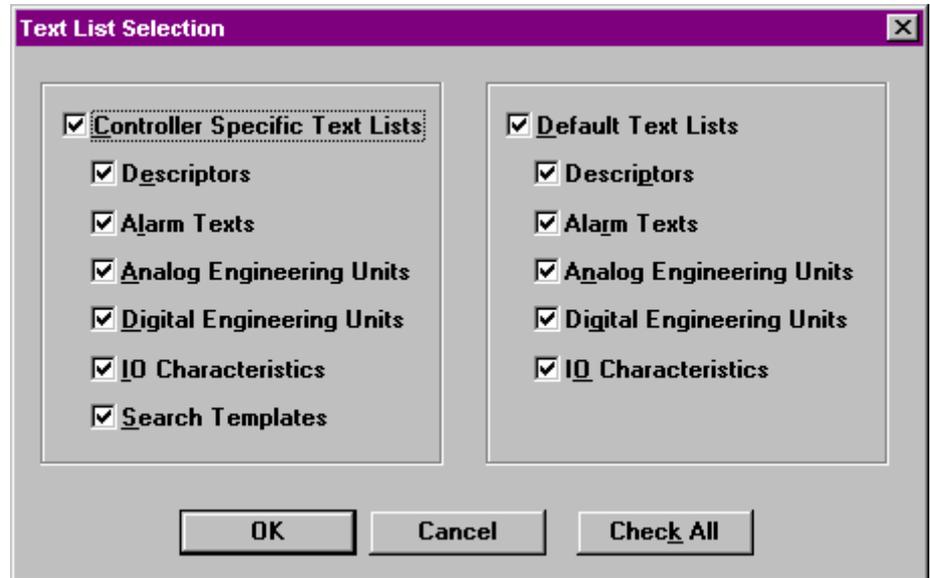


NOTE: First print the module labels to a file, then put the self-adhesive paper for the stickers into the printer and print them one by one.

## Text Lists

If this checkbox is enabled, the text lists of the selected controllers are printed.

The different text lists can be selected in the *Text List Selection* dialog box by clicking on the >> button.



**Controller Specific Text Lists** prints the text as they have been defined in the miscellaneous editor.

**Default Text Lists** prints the texts that are stored in the EXCEL default files in the PCBSTD directory.

For either choice, the following information may be printed:

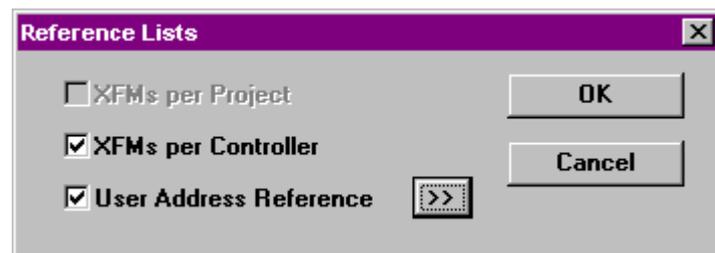
- Descriptors
- Alarm Texts
- Analog Engineering Units
- Digital Engineering Units
- I/O Characteristics
- Search Templates (for controller specific text lists only)

## Reference List

If this checkbox is enabled, reference data of the selected controllers are printed. Reference data include used XFMs per project, per controller and a user address reference table that shows for each point in which plant, control strategy, switching table and time program it is used.

NOTE: Printing a reference list can take time. "Don't worry, be patient or print separately".

Clicking the >> button at the Reference List item opens the Reference Lists dialog box where different reference lists can be selected.



**XFMs per project**

This option is only available, if a project was selected in CARE for printing out. Enabling this check box creates a table showing used XFMs with their names and corresponding paths/filenames for the selected project.

Example:

**XFMs used in this Project**

XFM Name	Path/Filename
ramp	C:/CARE/XFM/ORIGINAL/ramp
enth	C:/CARE/XFM/ORIGINAL/enth
gndda01a	C:/CARE/XFM/ORIGINAL/gndda01a

**XFMs per Controller**

Enabling this check box creates a table showing used XFMs with their names and corresponding paths/filenames for the selected controller(s).

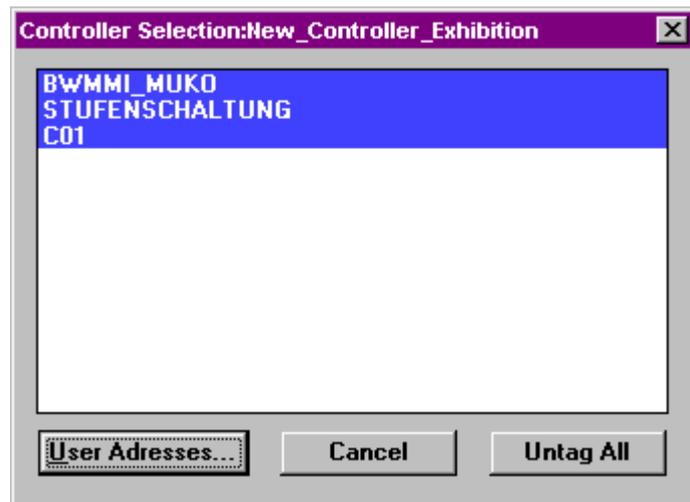
Example:

**XFMs used in Controller BWMMI\_MUKO**

XFM Name	Path/Filename
ramp	C:/CARE/XFM/ORIGINAL/ramp
enth	C:/CARE/XFM/ORIGINAL/enth
gndda01a	C:/CARE/XFM/ORIGINAL/gndda01a

**User Address Reference**

Enabling this check box creates a table showing the locations for each user address in the corresponding plant, switching table, control strategy and time program. If a project was selected for printout, clicking on the >> button opens the **Controller Selection** dialog box to select controllers for printout.



Highlight desired controller(s) you want to print reference lists for and click the **User Adresses...** button to open the **User Address Selection** dialog box for the selected controllers.

If a single controller or attached plant was selected for printout, clicking on the >> button opens the **User Address Selection** dialog box directly:



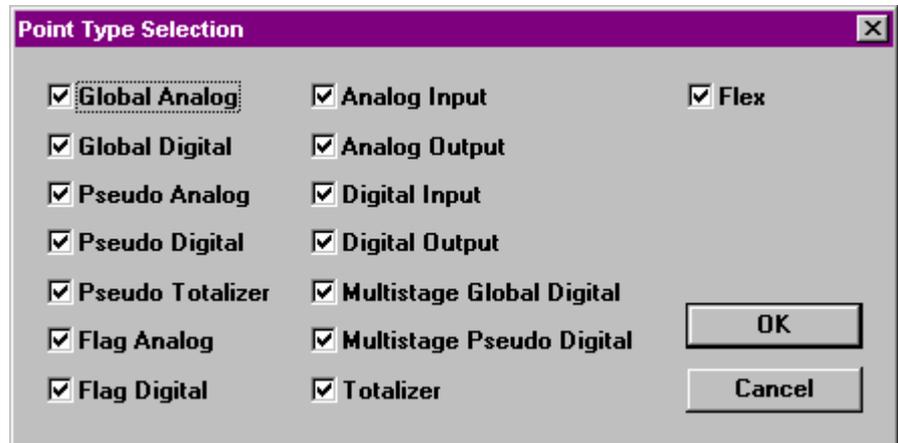
By default all user addresses are highlighted for printing. Deselect addresses you do not want to print by clicking on with left mouse key, or reselect. Use Untag/Tag button for (de)selection of all addresses.

#### Controllers...

After clicking on the **Controllers...** button, the user can switch to the **Controller Selection** dialog box (only possible, if a project with multiple controllers has been selected for printout).

#### Point Type...

After clicking on the **Point Type...** button the **Point Type Selection** dialog box is displayed.



In the **Point Type Selection** box, datapoints can be (de)selected by type (for example all AIs, all DIs and/or all Multistage Global Digital points). Only selected point types will be shown in the User Address Selection dialog box.

See Point Type Abbreviations section for a list of point type abbreviations.

Click OK to close Point Selection dialog box and click OK to close User Address Selection dialog box.

Clicking OK in the Reference Lists dialog box prints the following for each selected user address.

Example:

## User Address ReferenceBWMMI\_MUKO

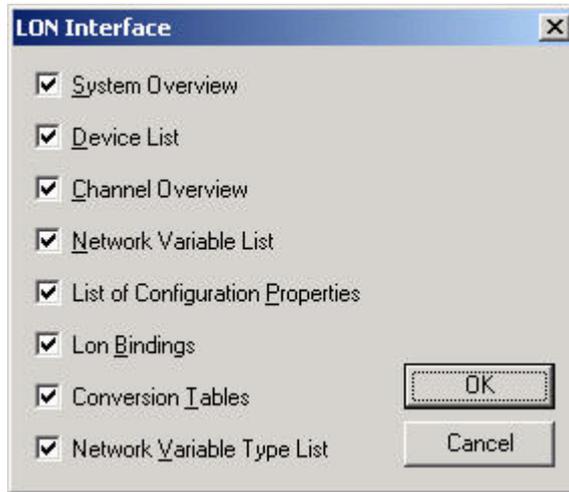
User Address	Plant	Switching Table	Control Strategy	Time Programs (Daily Programs)
<b>Analog Input Points</b>				
AC1MaTemp	AC1		klima	
AC1OaTemp	AC1		klima	
L22_MW_DischarTemp	OFFICE_BUILD_VENTILATSimulation		Simulation	Restaurant (Monday)
L22_MW_Frosttemp	OFFICE_BUILD_VENTILATSimulation		Simulation	Restaurant (Monday)
L22_MW_OaTemp	OFFICE_BUILD_VENTILATSimulation		Simulation	Restaurant (Monday)
L22_MW_RoomTemp	OFFICE_BUILD_VENTILATCascade_Temperature		Caskade_Temperature	Room_01 (workday)
	OFFICE_BUILD_VENTILATL22_ST_EH_Valve	L22_ST_EH_Valve		
	OFFICE_BUILD_VENTILATL22_SB_Vent_SupAir	L22_SB_Vent_SupAir		
L22_MW_SupplyTemp	OFFICE_BUILD_VENTILATSimulation		Simulation	
<b>Analog Output Points</b>				
AC1ClgVlv	AC1		klima	
AC1FloDmpr	AC1		klima	
AC1MaDmpr	AC1		klima	
L22_ST_EH_Valve	OFFICE_BUILD_VENTILATCascade_Temperature		Caskade_Temperature	Room_01 (workday)
	OFFICE_BUILD_VENTILATL22_ST_EH_Valve	L22_ST_EH_Valve		
	OFFICE_BUILD_VENTILATL22_SB_UP_Heater	L22_SB_UP_Heater		
L22_ST_KL_DistrAir	OFFICE_BUILD_VENTILATCascade_Temperature		Caskade_Temperature	Room_01 (workday)
	OFFICE_BUILD_VENTILATL22_ST_KL_DistrAir	L22_ST_KL_DistrAir		
L22_ST_KL_Mixer	OFFICE_BUILD_VENTILATCascade_Temperature		Caskade_Temperature	Room_01 (workday)
	OFFICE_BUILD_VENTILATL22_ST_KL_Mixer	L22_ST_KL_Mixer		
L22_ST_KL_SupplAir	OFFICE_BUILD_VENTILATCascade_Temperature		Caskade_Temperature	Room_01 (workday)
	OFFICE_BUILD_VENTILATL22_ST_KL_SupplAir	L22_ST_KL_SupplAir		
L22_ST_KÜ_Valve	OFFICE_BUILD_VENTILATCascade_Temperature		Caskade_Temperature	Room_01 (workday)
	OFFICE_BUILD_VENTILATL22_ST_KÜ_Valve	L22_ST_KÜ_Valve		
	OFFICE_BUILD_VENTILATL22_SB_UP_Chiller	L22_SB_UP_Chiller		

**LON Interface**

If this checkbox is enabled, the LON interface information of the selected controllers is printed. LON interface data may include

- Overview of the system and the channels
- Lists of network variables, network variables types, devices, and configuration properties
- value conversion tables
- and LON bindings.

Clicking the >> button at the LON interface item opens the LON Interface dialog box where LON Interface data can be selected.

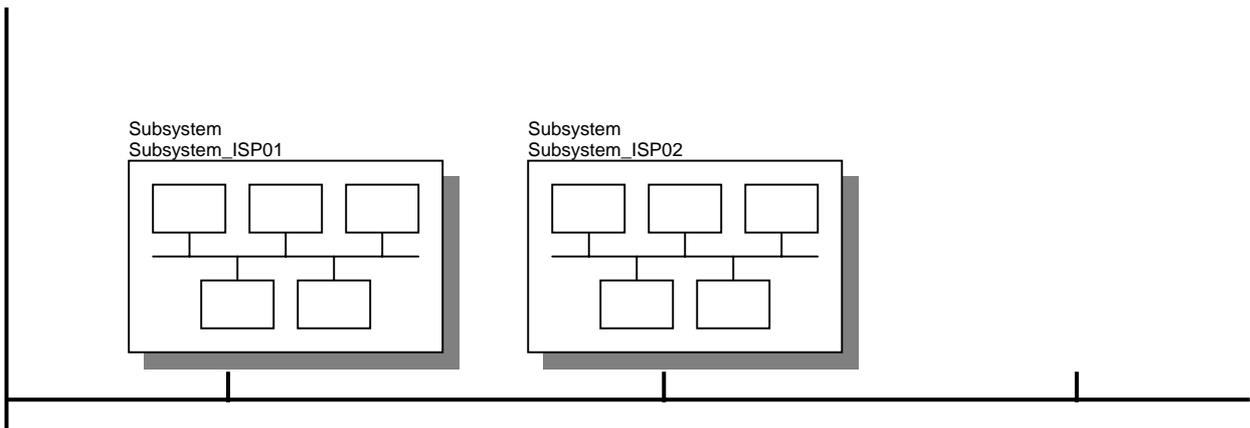


**System Overview**    Enabling this checkbox prints out a system overview of the project

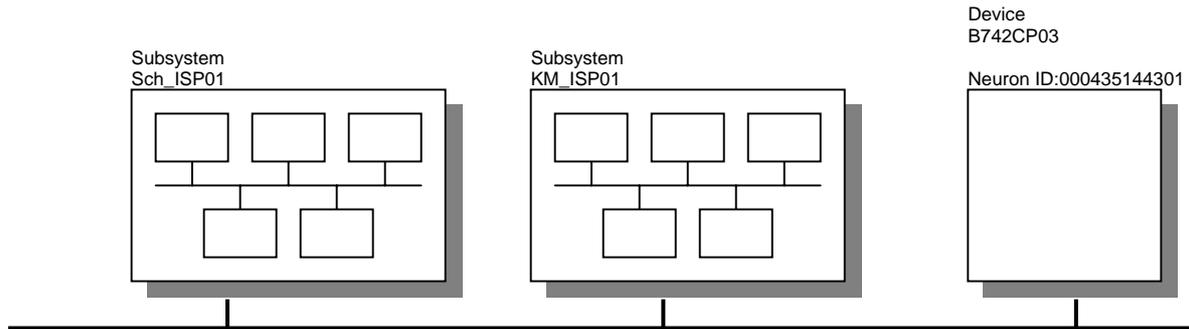
**Subsystem LON-Works**



**Subsystem VW\_H45\_Kälte**



**Subsystem Subsystem\_ISP01**

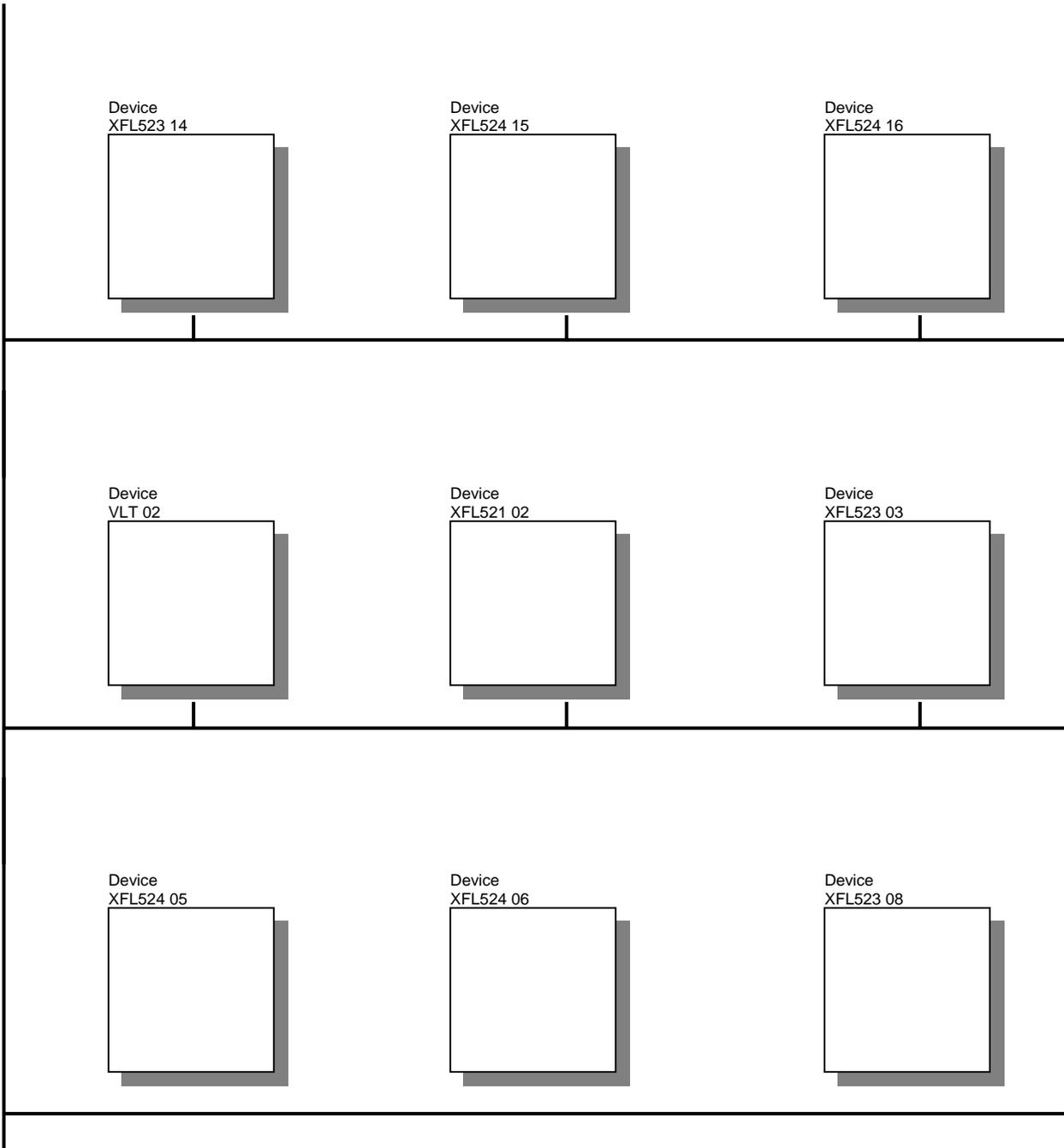


**Device List** Enabling this checkbox prints out a list of all devices of the project.

Device	System Path	Channel	Neuron ID:
B742CP03	LON-Works.VW_H45_Kälte.Subsystem_ISP01	VW_H42	000435144301
XFL521 05	LON-Works.VW_H45_Kälte.Subsystem_ISP01.Sch_ISP01	VW_H42	00A116745501
KM	LON-Works.VW_H45_Kälte.Subsystem_ISP01.KM_ISP01	VW_H42	000867564000
B742CP04	LON-Works.VW_H45_Kälte.Subsystem_ISP02	VW_H42	00A115561301
XFL523 14	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_FU	VW_H42	043B0C8F0100
XFL524 15	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_FU	VW_H42	046194DE0000
XFL524 16	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_FU	VW_H42	04BB9ADE0000
VLT 01	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_FU	VW_H42	046F5BE10000
VLT 02	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_FU	VW_H42	04CBA1D20000
XFL521 02	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	00A122370801
XFL523 03	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	047934F20000
XFL523 04	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	04431DF30000
XFL524 05	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	0445A7D40000
XFL524 06	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	047F3B020100
XFL523 08	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	042ABFAD0100
XFL523 09	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	04F434F20000
XFL524 10	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	04F2BAD30000
XFL524 11	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	044195DE0000
XFL522 13	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	04B8028F0100
XFL521 01	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	00C049353301
XFL521 07	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	000468181201
XFL521 12	LON-Works.VW_H45_Kälte.Subsystem_ISP02.Sch_ISP02_Bestand	VW_H42	000468139901

**Channel Overview**    Enabling this checkbox prints out a graphical channel overview.

**Channel VW\_H42**



**Network Variable List** Enabling this checkbox prints out all network variables of the controller.

<b>NV name:</b>	nviRequest	<b>NV type:</b>	SYS_nviRequest	<b>Direction:</b>	input
<b>Selfdoc String</b>		<b>Config Class:</b> <none>			
failure detec	x	auth_config	x	priority_conf	x
		service_type		offline	polled
				sync	x
				ext_rec	

**List of Configuration Properties** Enabling this checkbox prints out the configuration properties.

**LON Object Open Loop Sensor 1**

<b>CP Name:</b>	UCPTSensorConfig	<b>NV type:</b>	80000C050103040E_UCPT_1
<b>Description</b>			
<b>Selfdoc String</b>	<b>Config Class:</b> <none>		<b>Value</b> 0..10 V with pullup

<b>CP Name:</b>	UCPTSendOnDelta	<b>NV type:</b>	80000C050103040E_UCPT_2
<b>Description</b>			
<b>Selfdoc String</b>	<b>Config Class:</b> <none>		<b>Value</b> 2

<b>CP Name:</b>	UCPTWireOffset	<b>NV type:</b>	80000C050103040E_UCPT_3
<b>Description</b>			
<b>Selfdoc String</b>	<b>Config Class:</b> <none>		<b>Value</b> 0

**Lon bindings** Enabling this checkbox prints out the Lon bindings.

**Controller B742CP03**

**Device XFL521 05**

Data point	Value conversion	NV name:		NV name:	NV type:	LON Object
KW42-01-MW44a		nviKW42_01_MW05b1		nvoAiTemp[1]	SNVT_temp_p	Open Loop Sensor 2
KW42-01-MW03		nviKW42_01_MW03		nvoAiTemp[2]	SNVT_temp_p	Open Loop Sensor 3
KW42-01-MW05		nviKW42_01_MW05		nvoAiTemp[3]	SNVT_temp_p	Open Loop Sensor 4
KW42-01-MW44b		nviKW42_01_MW05b2		nvoAiTemp[4]	SNVT_temp_p	Open Loop Sensor 5
KW42-01-MW44c		nviKW42_01_MW05b3		nvoAiTemp[5]	SNVT_temp_p	Open Loop Sensor 6
KW42-01-MW44d		nviKW42_01_MW05b4		nvoAiTemp[6]	SNVT_temp_p	Open Loop Sensor 7

The subscripts in this table indicate multiple bindings of a data point.

**Conversion Tables** Enabling this checkbox prints out the definition of value conversion tables.

<b>VCT Name:</b>	DI_TEST	<b>Direction:</b>	input	<b>NV type:</b>	SNVT_lev_percent
<b>Description:</b>					
	<b>NV Value:</b>	<b>DP Value:</b>			
=	1.00	1.00			
>=	1.00	1.00			
>=	4.00	8.00			
>=	6.00	12.00			
>=	8.00	24.00			
>=	10.00	40.00			
>=	20.00	80.00			

**Network Variable Type List** Enabling this checkbox prints out a detailed description of the network variable types.

<b>NVT Name::</b>	UNVT_ubyte	<b>Type:</b>	UNVT	<b>Basic Type:</b>	Integer
<b>Detailed Description:</b> Unsigned Short (8 bit)					
<b>Selfdoc NVT Index:</b>	0	<b>Internal NVT Index:</b>	0	<b>Eng. Unit:</b>	
<b>System NVT:</b>	NO	<b>Size:</b>	1	<b>Hidden:</b>	NO
<b>Initial Value:</b>	0	<b>Minimum Value:</b>	0	<b>Maximum Value:</b> 254	

## OPS Interface

**Network Variable Type List** Enabling this checkbox prints out the interface of the OPS controller.

**OPS data for Controller PM500\_EZ**

<b>Subsystem Driver Name:</b> MBUS	<b>OPS Ports Assignment:</b> RS485(DBUSCU)
<b>Initialization Block:</b> 024,E,8,03,000000000,1	

<b>Subcontroller Name:</b> 2WR5_231	<b>Subcontroller Address:</b> 231,1,0,0,0,0,0
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<b>User Address</b>	<b>OPS Point Name:</b> CntPnt_2WR5	<b>Subpoint Address:</b> 0,0,0,0,0
<b>Value Format:</b> Float(65)	<b>Scaling Factor:</b> 1.000000	<b>Scaling Offset:</b> 0.000000
<b>Scan Priority:</b> 1	<b>Access Mode:</b> Readable, Writable	

<b>User Address</b>	<b>OPS Point Name:</b> Energy_St0_T0_____	<b>Subpoint Address:</b> x0C06,0,0,0,2
<b>Value Format:</b> Float(65)	<b>Scaling Factor:</b> 1000.000000	<b>Scaling Offset:</b> 0.000000
<b>Scan Priority:</b> 1	<b>Access Mode:</b> Readable	

<b>User Address</b>	<b>OPS Point Name:</b> Power_____	<b>Subpoint Address:</b> x0B2E,0,0,0,2
<b>Value Format:</b> Float(65)	<b>Scaling Factor:</b> 1.000000	<b>Scaling Offset:</b> 0.000000
<b>Scan Priority:</b> 1	<b>Access Mode:</b> Readable	

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## Technical Information

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**CAREDOC.INI File Settings**

Each user has local or personal preferences regarding the kind of information he wants to print. To satisfy these individual requirements, the CARE printout is configurable via an INI file.

NOTE: The INI file for the printout is called "CAREDOC.INI" and is located in the CARE directory.

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### Default Selections

As each user may require different information for the printout, the caredoc.ini file allows one to specify the default selections, which are made when the printout main dialog box is started. Default selections specify which checkboxes or radio buttons are selected by default.

The default selections are adjustable via the entries in the **[selections]** section.

1. Open the CAREDOC.INI file.
2. Look for the **[selections]** section.
3. Change the items you want to select by default to **YES**. Change the items you want to deselect by default to **NO**.
4. Save the CAREDOC.INI file.

The following checkboxes and radio buttons can be set as defaults:

**[Selections]**

Table of Contents=YES	YES: selects table of contents
Project Datasheet=YES	YES: selects project datasheet
Plant Schematics=YES	YES: selects plant schematic
Control Strategy=YES	YES: selects control strategies
Switching Logic=YES	YES: selects switching logic tables
Parameter List=YES	YES selects parameter list
Plant to Controller=YES	YES: selects plant to controller table
Mathematical Functions=YES	YES: selects mathematical functions
Controller Summary=YES	YES: selects controller summary
Terminations=YES	YES: selects terminations
Point Data=YES	YES: selects point data
Default Datapoint Overview=YES	YES: selects the default point data overview
Default Datapoint Description =YES	YES: selects the default point data Description
Overview=YES	YES: selects the point data overview (only valid, if Point Data is also selected)
Datapoint Description=YES	YES: selects the point datapoint description (only valid, if Point Data is also selected)
Time Programs=YES	YES: selects the time programs
Module Labels=NO	YES: selects module labels.
LON Module Labels Horizontal=NO	YES: selects horizontal orientation No: selects vertical orientation
Module Labels with descriptor=YES	YES: selects module labels with descriptor NO: selects module labels without descriptor
Module Graphics=YES	YES: selects the module graphics
Module Graphics with Descriptor=NO	YES: selects module graphics with descriptor NO: selects module graphics without descriptor
<i>Important</i>	
<i>If module labels are selected, all other items are automatically deselected.</i>	
Text List=YES	YES: selects text lists
XL10 Reports Detailed=YES	YES: Select detailed XL10 reports
XL10 Reports Short=YES	YES: Selects short format XL10 reports

ELink Reports=YES YES: Selects ELink mapping and commissioning reports

*Important*

The following settings are ignored, if **Text List** is not **YES**:

Default Text List=YES YES: Selects default text lists  
 Controller Specific Text List=YES YES: Selects controller specific text lists

*Important*

The following settings are ignored, if the **Default Text List** is not set to **YES**:

Default Descriptors=YES YES: Selects the default descriptors  
 Default Alarms=YES YES: Selects the default alarm texts  
 Default Ana Eng Units=YES YES: Selects the default analog engineering units  
 Default DEU Eng Units=YES YES: Selects the default digital engineering units  
 Default IO Characteristic=YES YES: Selects the default I/O characteristics  
 Search Templates=YES YES: Selects the search templates

*Important*

The following settings are ignored, if the **Controller Specific Text List** is not set to **YES**:

Contr Spec Descriptors=YES YES: Selects the controller specific descriptors  
 Contr Spec Alarms=YES YES: Selects the controller specific alarms  
 Contr Spec Ana Eng Units=YES YES: Selects the controller specific analog engineering units  
 Contr Spec DEU Eng Units=YES YES: Selects the controller specific digital engineering units  
 Contr Spec IO Characteristic=YES YES: Selects the controller specific I/O characteristics

*Important*

The following setting is ignored, if the **Time Programs** entry is not set to **YES**:

Format Time Programs Detailed=YES YES: Selects detailed format for the time program  
 NO: Selects short format for the time program

*Important*

The following setting is ignored, if the **Datapoint Description** entry is not set to **YES**:

Format User Addresses Detailed=YES YES: Selects detailed format for the datapoint description.  
 NO: Selects short format for the datapoint description

*Important*

The following settings are ignored, if the **Plant Schematics** entry is not set to **YES**:

Format Plant Schematic with User Addresses=NO YES: Selects schematic with user addresses  
 NO: Selects schematic with plant graphic  
 Format Plant Schematic Divide=NO YES: Divides big schematics and spreads them over several pages  
 NO: Rescales schematics so that they fit on one page

*Important*

The following settings are ignored, if the **Control Strategy** entry is not set to **YES**:

Format Control Strategy with Schematic=NO	YES: Prints control strategies with schematic NO: Prints control strategies with user addresses
Format Control Strategy Divide=NO	YES: Divides big control strategies and spreads them over several pages NO: Rescales control strategies so that they fit on one page

**Important**

The following settings are ignored, if the **Switching Logic** entry is not set to **YES**:

Format Switching Logic Tables with Schematic=NO	YES: Prints a schematic for the switching tables NO: Prints only the switching tables
Format Switching Logic Tables Divide=NO	YES: Divides big schematics and spreads them over several pages NO: Rescales schematics so that they fit on one page

**Important**

The following settings are ignored, if the **Datapoint Description** entry is not set to **YES**:

Pseudo Totalizers=YES	YES: Prints the pseudo totalizers as part of the datapoint description
Analog Input=YES	YES: Prints the analog inputs as part of the datapoint description
Analog Output=YES	YES: Prints the analog outputs as part of the datapoint description
Digital Input=YES	YES: Prints the digital inputs as part of the datapoint description
Digital Output=YES	YES: Prints the digital outputs as part of the datapoint description
Flag Analog=YES	YES: Prints the analog flags as part of the datapoint description
Flag Digital=YES	YES: Prints the digital flags as part of the datapoint description
Flex=YES	YES: Prints the flexible points as part of the datapoint description
Global Analog=YES	YES: Prints the global analog points as part of the datapoint description
Multistage Global Dig=YES	YES: Prints the multistage global digital points as part of the datapoint description
Global Digital=YES	YES: Prints the global digital points as part of the datapoint description
Pseudo Analog=YES	YES: Prints the pseudo analog points as part of the datapoint description
Pseudo Digital=YES	YES: Prints the pseudo digital points as part of the datapoint description
Multistage Pseudo Dig=YES	YES: Prints the multistage pseudo digital points as part of the datapoint description
Totalizer=YES	YES: Prints the totalizers as part of the datapoint description
Reflist Pseudo Totalizers=YES	YES: Prints the pseudo totalizers as part of the reference list
Reflist Analog Input=YES	YES: Prints the analog inputs as part of the reference list
Reflist Analog Output=YES	YES: Prints the analog outputs as part of the reference list

Reflist Digital Input=YES	YES: Prints the digital inputs as part of the reference list
Reflist Digital Output=YES	YES: Prints the digital outputs as part of the reference list
Reflist Flag Analog=YES	YES: Prints the analog flags as part of the reference list
Reflist Flag Digital=YES	YES: Prints the digital flags as part of the reference list
Reflist Flex=YES	YES: Prints the flexible points as part of the reference list
Reflist Global Analog=YES	YES: Prints the global analog points as part of the reference list
Reflist Multistage Global Dig=YES	YES: Prints the multistage global digital points as part of the reference list
Reflist Global Digital=YES	YES: Prints the global digital points as part of the reference list
Reflist Pseudo Analog=YES	YES: Prints the pseudo analog points as part of the reference list
Reflist Pseudo Digital=YES	YES: Prints the pseudo digital points as part of the reference list
Reflist Multistage Pseudo Dig=YES	YES: Prints the multistage pseudo digital points as part of the reference list
Reflist Totalizer=YES	YES: Prints the totalizers as part of the reference list
Auto Exit CARE Doc=YES	YES: Printout main dialog box is closed automatically after successful printout NO: Printout main dialog box remains open until closed by user

---

## Printing Order

As in most affiliates, customer documentation is provided in a standardized binder with standardized chapters in which the order of specific chapters of the printout can be adjusted individually.

The printing order is adjustable through entries in the "[printing order]" section and other subsequent sections.

A figure defines the location of the corresponding chapter within the document:

- **Datapoint Description=1** means that the datapoint description is the first chapter to be printed after the table of contents.
- **Datapoint Description=4** means that the datapoint description is the fourth chapter to be printed after the table of contents.

NOTE: If **NO** is entered instead of a number, the corresponding chapter is never printed, even though it might be selected.

1. Open the CAREDOC.INI file.
2. Look for the **[printing order]** section or subsequent order sections.
3. Change the printing order by changing the numbers.

NOTE: Make sure that no number is repeated and that no figure is missing in the sequence. Otherwise an error message will occur during printout and the default printing order will be used.

4. Save the CAREDOC.INI file.

### Printing Order ("main chapter")

This section defines the order of the main chapters.

```
[Printing Order]
Controller Summary=1
Point Data Overview=2
Terminations=3
Plant To Controller=4
Time Programs=5
Datapoint Description=6
Module Labels=7
```

Plant Related Data=8  
 Parameter List=9  
 E Link Long=10  
 Text List=11  
 XFMs per Controller=12  
 UAReferenc=13

**Plant Printing Order** This section defines the order within the plant related data.

[Plant Printing Order]  
 Plant Schematic=1  
 Control Strategy=2  
 Switching Logic=3  
 XL10 Short=4 NOTE: This entry has no specific function and is only used to ensure compatibility to older versions  
 XL10 Long=5 NOTE: This entry has no specific function and is only used to ensure compatibility to older versions

**Control Strategy Printing Order** This section defines the order within the control strategy related data.

[Control Strategy Printing Order]  
 Control Strategy=1  
 User Address=2  
 Mathematical Functions=3  
 Parameter List=4  
 WIA RIA=5

**Switching Logic Printing Order** This section defines the order within the switching logic related data.

[Switching Logic Printing Order]  
 Switching Logic=1  
 Mathematical Functions=2  
 Parameter List=3

**Time Program Printing Order** These sections define the order within the time programs' related data. There are separate sections for long and short formats.

[Time Program Short Printing Order]  
 Assigned Points=1  
 Daily Schedule=2  
 Weekly Schedule=3  
 Holiday Programs=4

[Time Program Long Printing Order]  
 Assigned Points=1  
 Daily Schedule=2  
 Weekly Schedule=3  
 Holiday Programs=4

**Datapoint Description  
 Printing Order**

This section defines the order within the datapoint description and is valid for both short and detailed formats.

[Datapoint Description Printing Order]  
 Analog Inputs=1  
 Analog Outputs=2  
 Pseudo Analog=3  
 Global Analog=4  
 Digital Inputs=5  
 Digital Outputs=6  
 Pseudo Digital=7  
 Multistage Pseudo Digital=8  
 Global Digital=9  
 Multistage Pseudo Digital=10  
 Totalizer=11  
 Pseudo Totalizer=12  
 Flex DO Feedback DI=13  
 Flex Pulse 2=14  
 Flex Multistage=15

**Text List Printing Order**

Flag Analog=16

Flag Digital=17

This section defines the order within the text lists for both controller related texts and default texts.

[Text List Printing Order]

Descriptors=1

Alarm Text=2

Analog Engineering Units=3

Digital Engineering Units=4

IO Characteristic=5

Search Templates=6

Default Descriptors=7

Default Alarm Text=8

Default Analog Engineering Units=9

Default Digital Engineering Units=10

Default IO Characteristic=11

**UAREf List Order**

This section defines the order within the reference list.

[UAREf List Order]

Analog Input=1

Analog Output=2

Digital Input Normally Open=3

Digital Input Normally Closed=4

Digital Output Switch=5

Digital Output Change=6

Mot=7

Pseudo Digital=8

Pseudo Analog=9

Global Analog=10

Global Digital=11

Pseudo Totalizer=12

Fast Totalizer=13

Slow Totalizer=14

Flag Analog=15

Flag Digital=16

Flex=17

Multistage Global Digital=18

Multistage Pseudo Digital=19

Pseudo Puls=20

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**Print Table of Contents**

The table of contents can be printed with or without page numbers. This can be adjusted through an CAREDOC.INI file setting.

1. Open the CAREDOC.INI file.
2. Look for the **[Table Of Contents]** section.
3. If you want to print the table with page numbers, set **Page Numbers= YES**. If you want to print the table without page numbers, set **Page Numbers= NO**.
4. Save the CAREDOC.INI file.

---

**Suppress "Not Generated" Parameters**

When printing parameters sorted by usage, usually all parameters of all statements are printed. However, some statements contain optional parameters that may or may not be used by the CARE programmer. Those parameters that are optional and are not used by the CARE programmer are marked with an entry **Not Generated** in the printout (refer to chapter Parameters sorted by usage). These parameters do not show up in the controller.

The INI file allows suppression of the printout of not generated parameters by a special setting to reduce the paper consumption significantly.

1. Open the CAREDOC.INI file.
2. Look for the **[Parameters by Usage]** section.
3. If you want to suppress the **Not Generated** parameters, set **Suppress Not Generated Parameters= YES**.

If you want to print the **Not Generated** parameters, set **Suppress Not Generated Parameters= NO**.

4. Save the CAREDOC.INI file.

---

## Printer Settings

The printer settings in the caredoc.ini file are automatically created and saved according to the settings selected in the Print Setup dialog box. On the other hand, the settings in the ini.file can be edited and these default the settings for the Print Setup dialog box when restarting the printout.

The settings are automatically saved in the following section:

[Special Printer]

Driver=(retrieved from Print Setup or manually entered)

Device=(retrieved from Print Setup or manually entered)

Port=(retrieved from Print Setup or manually entered)

Default Printer= (0=specific printer, 1=default printer)

Paper Format=(DIN A4 or Letter or User defined)

UserDefinedPaperLength=(only valid when Paper format=User defined, value in mm)

UserDefinedPaperWidth=(only valid when Paper format=User defined, value in mm)

---

## Point Type Abbreviations

---

To distinguish point types more exactly, a type abbreviation is included in some parts of the printout:

- In the plant graphics in round brackets behind the user address
- In the switching tables in round brackets behind the user address
- In the datapoint description/short format in the point type field
- In the datapoint description detailed format in the point subtype field

The point type abbreviations are defined as follows:

Abbreviation	Definition
DI_NO	Digital Input (normally open)
DI_NC	Digital Input
DO_NO	Digital Output (NO)
DO_CO	Digital Output (C/O)
AI_S	Analog Input Slow
AI_F	Analog Input Fast
AO	Analog Output
3POS (MOT)	3 Position Output
VD	Pseudo Digital
VA	Pseudo Analog
VT	Analog Input Fast
GD_I	Global Digital Input
GD_O	Global Digital Output
GA_I	Global Analog Input
GA_O	Global Analog Output
FA	Flag Analog
FD	Flag Digital
MS	Multistage
P2	Pulse_2
DO_F_DI	DO_Feedback_DI
TOT_F	Fast Totalizer Point
TOT_S	Slow Totalizer Point
MGD_I	Multistage Global Digital Input
MGD_O	Multistage Global Digital Output
MVD	Multistage Pseudo Digital

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## Frequently Asked Questions

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- Question 1** Sometimes, if I print a project or controller the “Parameter” chapter is not printed, yet the corresponding **Parameter Sorted by...** checkbox has been enabled. Why is this?
- Answer** The parameters can only be printed, if the <CPU name>.txt file exists in the CARE directory. Translate the corresponding controller by selecting **Controller/Translate** in CARE.
- Question 2** The printout of parameters “sorted by usage” sometimes shows “not generated” instead of the parameter filename/index. I do not understand this text. The customer should not see such an entry. Can this be prevented?
- Answer** Some CARE icons provide the capability to enter a parameter value for an input. You can either enter a parameter or connect the input to the output of another icon. When connecting the input to another icon, the parameter is not used and the CARE printout shows “not generated.” The printing of “not generated” parameters can be suppressed by setting **Suppress not generated parameters=Yes** in the caredoc.ini file.
- Question 3** Sometimes when trying to print to a file, an existing destination file is overwritten without warning. Can this be prevented?
- Answer** This happens only, if the filename is longer than 8 characters (an invalid DOS filename). This problem will be solved in an upcoming release.
- Question 4** When printing a reference list, the printing process seems to stop and one could think, CARE seemed to be crashed.
- Answer** Printing reference lists takes a long time.



# CONTROLLERS

EXCEL 500 / 600 / SMART / 100 / 80 / 50

CONTROLLERS DEFINITION, ATTACHMENT, AND MANAGEMENT

PLANT SCHEMATICS

CONTROL STRATEGY

SWITCHING LOGIC

TIME PROGRAMS

TERMINAL ASSIGNMENT FUNCTION

OPERATOR TERMINAL SEARCH TEMPLATES SETUP

PLANT TRANSLATION

FILE MANAGEMENT

CONTROL ICONS

ENGINEERING UNITS

POINT ATTRIBUTES TABLES

PLANT AND CONTROLLER UPGRADES AND DOWNGRADES

DEFAULT TEXT EDITOR

CHECK UTILITY

ERROR MESSAGES

## EXCEL WEB CONTROLLER

### OTHER CONTROLLERS

EXCEL 10 CONTROLLERS

XLINK CONTROLLER

OLINK CONTROLLER

OPS CONTROLLER

## CONTROLLERS DEFINITION, ATTACHMENT, AND MANAGEMENT

<b>Purpose</b>	This chapter describes CARE functions that relate to controllers, for example, defining new controllers and uploading and downloading them.
<b>Chapter Contents</b>	<ul style="list-style-type: none"> <li>Create New Controller</li> <li>Select LonWorks Network Architecture</li> <li>Define/Modify Target I/O Hardware Configuration for Excel 500 Controller</li> <li>Copy a Controller</li> <li>Attach/Detach Plant</li> <li>Rename Controller</li> <li>Delete Controller</li> <li>Display and/or Modify Controller Information</li> </ul>
<b>See Also</b>	Appendix Plant and Controller Upgrades and Downgrades for details on changing the OS version for a controller.

### Create New Controller

<b>Purpose</b>	Create a new controller
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. In the logical plant tree, click on the project.</li> <li>2. Click menu item Controller, then drop-down item New. Or, click right mouse key and with left mouse key, click on Create Controller in the context menu.</li> </ol> <p>RESULT: The New Controller dialog box displays.</p>

3. Type a controller name (must be unique within the project). In this example, CONT02.

Maximum 15 characters. Note that software uses only the first four characters of the controller name followed by a 4-digit number to name the database files for the controller. For example, the name controller\_1 has associated data files named cont0000. The name controller\_2 has associated data files named cont0001. You do not have to be concerned with these naming conventions; software keeps the connections in order.

4. Tab to Bus Name and from the drop-down listbox, select a Bus subsystem, where the controller should be added.
5. Tab to Controller Number. Click down arrow and select a number from 1 through 30. It must be unique within the C-Bus segment, defined under C-Bus name. In this example, 2.
6. Tab to Controller Type. Tab to the next field to keep current type or click down arrow to display and select a different type (Excel 100, Excel 80, Excel 50, Excel 500, Excel 600, Excel Smart, or ELink).
7. Tab to Controller OS Version (the version of OS that will be running in the controller). Note that any plant attached to this controller must abide by the rules of this version or you cannot attach the plant. Tab to the next field to keep the current version or click down arrow to display and select a different version. See Appendix for rules on upgrading/downgrading controller versions.
8. Tab to Country Code. The operator interface is required to provide the correct language for the selected country. The default depends on the Windows™ version installed. Tab to the next field to keep it or click down arrow to display and select a different country.

**NOTE:** For Excel 500 Ver. 1.2 Controllers, the only valid country codes are Germany and United States. Other countries appear in the list box, but United States is always the selection if you select anything other than Germany.

9. Tab to Default File Set. Select the appropriate default file for the selected Controller OS Version. Alternate default files are created via the Default Text Editor. See Appendix for details. A short description for the selected default file set is given below the drop-down list box.
10. Tab to Units of Measurement. Select whether the controller should use International (metric) or Imperial units in Control Strategy EMS icons. This selection controls whether inputs are accepted in Celsius or Fahrenheit. Units of measurement does not apply to Excel 600 and Excel ELink controllers.
11. Tab to Power Supply. Select desired module type. Power supply applies only to Excel 500 and 600 controllers.
12. Tab to Installation Type. Normal installation is the default selection. If the controller has high-density digital inputs, select Cabinet Door Installation. Installation Type applies only to Excel 500 and 600 controllers.
13. Tab to Wiring type and select desired type (screw terminals or flat strip cabling). Wiring type applies only to Excel 50 controllers.
14. Tab to LON (applies only to Excel 500 controllers OS version 2.04). Select desired configuration:

**Shared / Open LON**

Allows multiple controllers with its distributed I/O modules residing on one physical LON-bus and/or integration of additional Open LON devices.

**NOTE:** For this configuration, the controller must contain the 3120E5 LON chip. In Shared configuration only the following distributed I/O modules can be used: XFL521B, XFL522B, XFL523B, XFL524B.

**Local**

Allows just one controller with its distributed I/O modules residing on one physical LON-bus.

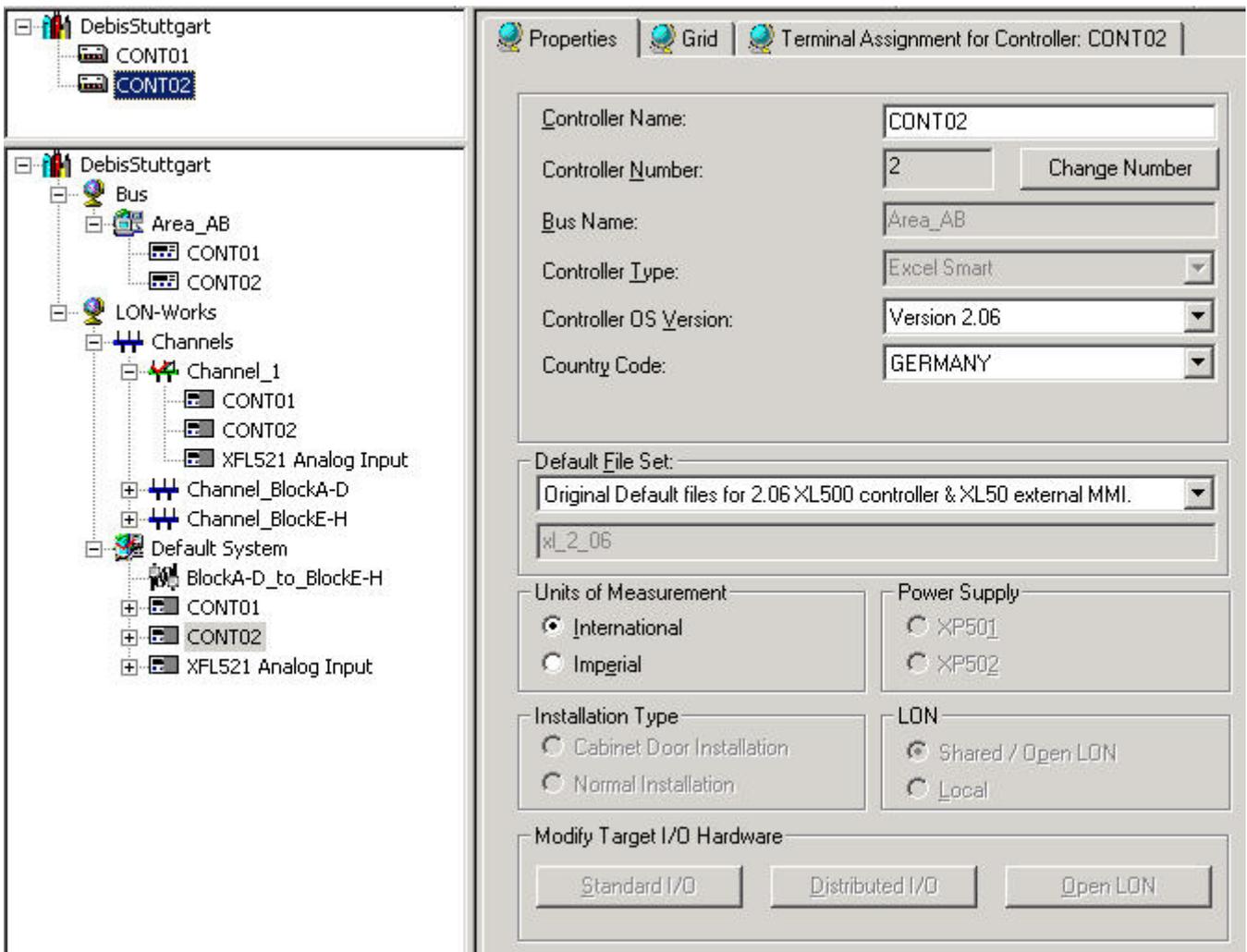
**NOTE:** For this configuration, controllers containing the 3120E5 LON chip and earlier controller models containing the 3120B1 LON chip can be used. In Local configuration the following distributed I/O modules can be used: XFL521, XFL522A, XFL523, XFL524A. If B-types of distributed I/Os shall be used, the backwards compatibility must be enabled by pressing the service pin while turning hex switch.

For detailed information on the configuration, please refer to the Select LonWorks Network Architecture section.

Refer to the Terminal Assignment chapter for assigning the neuron IDs to the modules.

15. Click **OK**. (All fields must have an entry.)

**RESULT:** The dialog box closes and the controller is added once to the logical plant tree and three times to the network tree.



16. Continue with creating new plants or attaching already existing plants.

## Select LonWorks Network Architecture

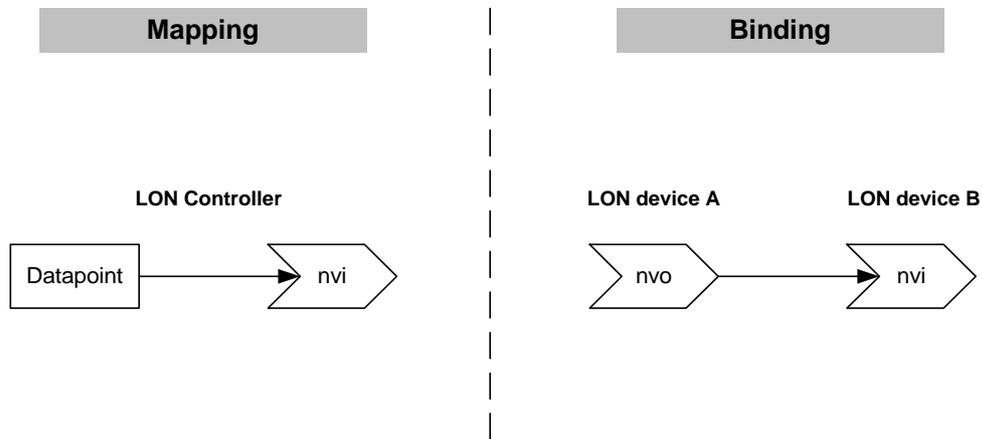
Before engineering a LonWorks network, it is strongly recommended to get familiar with LonWorks technology by reading the Excel 50/500 LonWorks Mechanisms Interface Description, form number EN0B-0270.

### Mapping and Binding

To understand the behavior of different hardware configurations in the LonWorks network architecture, a definition for Mapping and Binding has to be given at this point.

Mapping is the process of assigning a LON network variable (NV) to an Excel 500 or 50 datapoint. This is done in CARE and called Mapping. Mapping allows the use of LonWorks network information in Excel 500 and 50 datapoints.

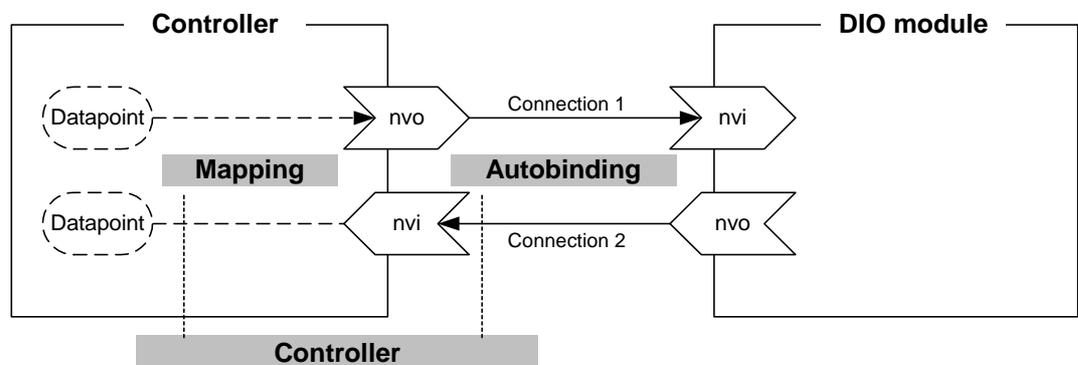
Mapping should not be confused with Binding. Binding is defined as the process of interconnecting NVs (devices) on a LonWorks network. This is a standard functionality provided by CARE and LON tools. Depending on the mechanism, it can distinguished between Manual Binding and Autobinding.



Regarding the use of distributed I/O modules and additional LON devices with Excel 500 and Smart controllers on a LonWorks network, the following binding mechanisms are possible:

#### Controller Autobinding

When using an Excel 500 or Smart controller with its distributed I/O modules residing on one physical LON-bus, the controller generates the NVs for the application itself and assigns them to the respective datapoints. After this, the controller also performs the binding of the NVs automatically (Autobinding). Mapping and Autobinding are proprietary to Honeywell. Due to this controller capability, no mapping needs to be done in CARE and no LON tool for manual binding is necessary.

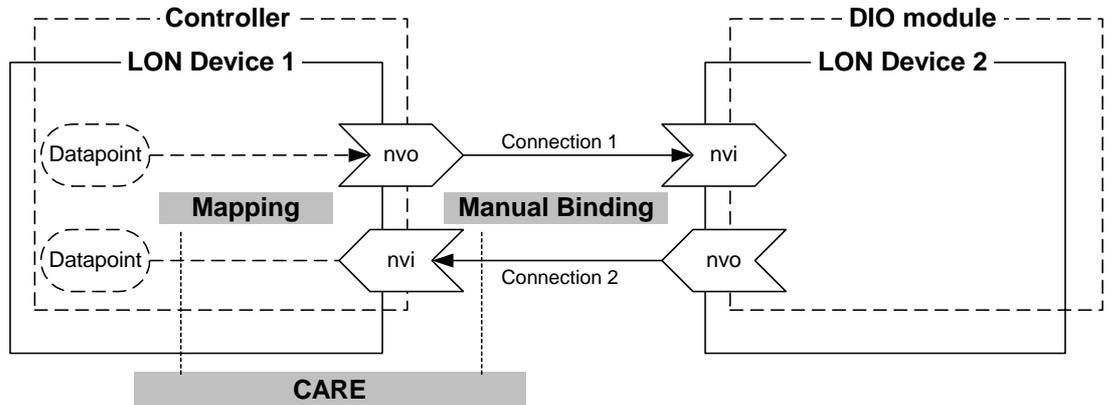


**Manual Binding**

There are several cases in which it is necessary to manually bind the NVs of the Distributed I/O modules to their respective controller(s).

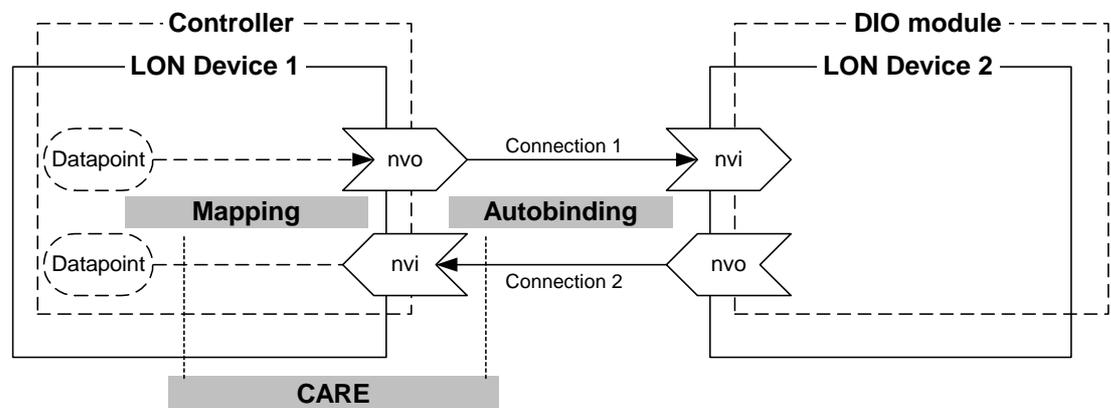
Autobinding can be used to bind the NVs of a maximum of 16 Distributed I/O modules per controller, only. If the application requires more than 16 Distributed I/O modules per controller, you must use CARE to allocate those additional NVs requiring mapping with data points and bind the NVs of the additional modules to the controller.

When the NVs of other devices on the LON bus (other than the host Excel 50/500 controller) require binding to Distributed I/O modules, autobinding cannot be used. A LON tool (e.g. CARE) is required to bind all of the Distributed I/O modules' NVs.



**CARE Autobinding**

In an Open LON configuration, CARE provides the integration of additional Honeywell LON devices other than DIO modules such as the M7410G actuator with LON capabilities and/or 3<sup>rd</sup> party LON devices. In this case, the DIO modules are not assigned to the controller by autobinding. Instead, all datapoints are boardless as a rule and each DIO module must be assigned to the controller by connecting datapoints of the controller to NVs of the LON device (CARE Autobinding). CARE creates the mapped NVs for the datapoints automatically during the Binding procedure. In addition, matching LON devices can be bound to each other by interconnecting their corresponding NVs.



**Network Configurations**

Regarding the use of distributed I/O modules and additional LON devices with Excel 500 and Smart controllers on a LonWorks network, several configurations dependent on the used OS are possible:

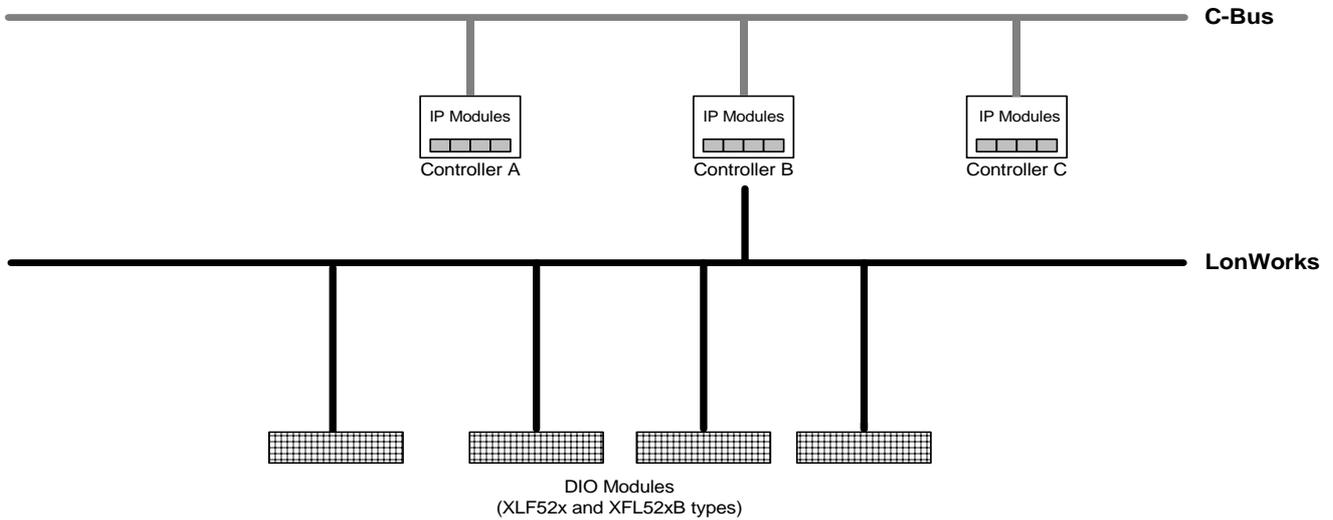
**Local OS 2.0/2.01 - 2.04**

A "Local" configuration allows the attachment of just one Excel 500 or Smart controller to its (max. 16 ) DIO modules on a single LonWorks network. No other devices co-exist on that bus. The DIO modules are assigned to their host Excel 500

or Smart controller automatically, and autobinding is performed. Both, the XFL52x and XFL52xB module types can be used.

NOTE: For OS 2.0/2.1 and OS 2.03, the configuration of the LonWorks network is always "Local" although it cannot be selected explicitly when creating a new controller.

**Local Configuration (OS 2.0/2.01 to 2.04)**



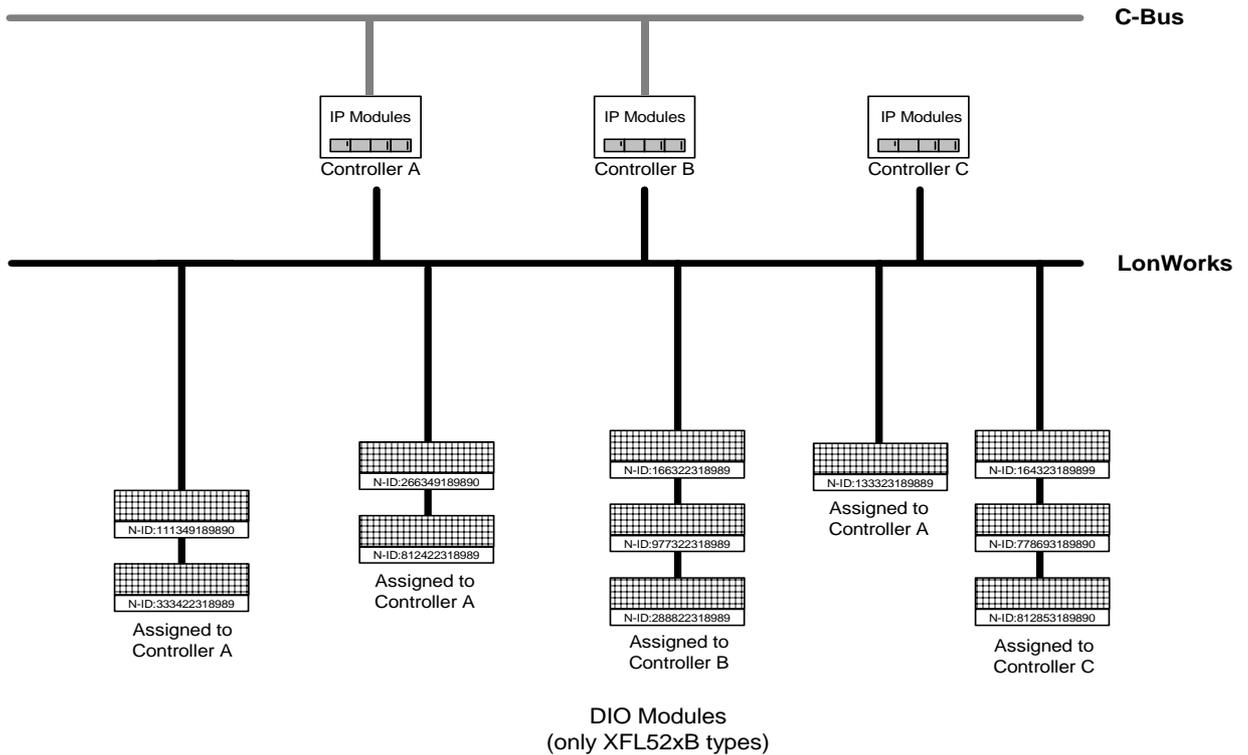
**Shared**

**OS 2.04**

A "Shared" configuration allows the attachment of multiple Excel 500 and Smart controllers to their DIO modules on a single LonWorks network. But, multiple controllers cannot process datapoints on the same DIO module. The Shared configuration does not allow the integration of additional 3<sup>rd</sup> party or other Honeywell LON devices. Autobinding may still be used for the NVs of a maximum of 16 Distributed I/O modules assigned exclusively to the host Excel 500 or Smart controller.

NOTE: It is recommended that you use CARE for assigning the DIO modules to their dedicated Excel 500 or Smart controller by entering the DIO modules' Neuron IDs. The alternative is to assign them using the MMI. Only the XFL52xB module types can be used.

**Shared Configuration (OS 2.04)**



**Open LON**

**OS 2.04**

When using OS 2.04, an "Open LON" configuration refers to an *interoperable* LONWORKS system in which CARE will be used to generate a LONMARK-compliant network interface file capable of providing NVs which can be bound to other devices (which may include other Excel 500 controllers with their own DIO modules, Excel 50 or Excel 10 controllers, or third-party devices). The NVs of the DIO modules exceeding 16 must be bound manually using a LON tool (an LNS-based tool capable of using Honeywell plug-ins is recommended). For OS 2.04, the "Open LON" operating mode is combined with the "Shared" operating mode to allow multiple controllers with DIO modules and further Open LON devices on a single LonWorks bus (see next section).

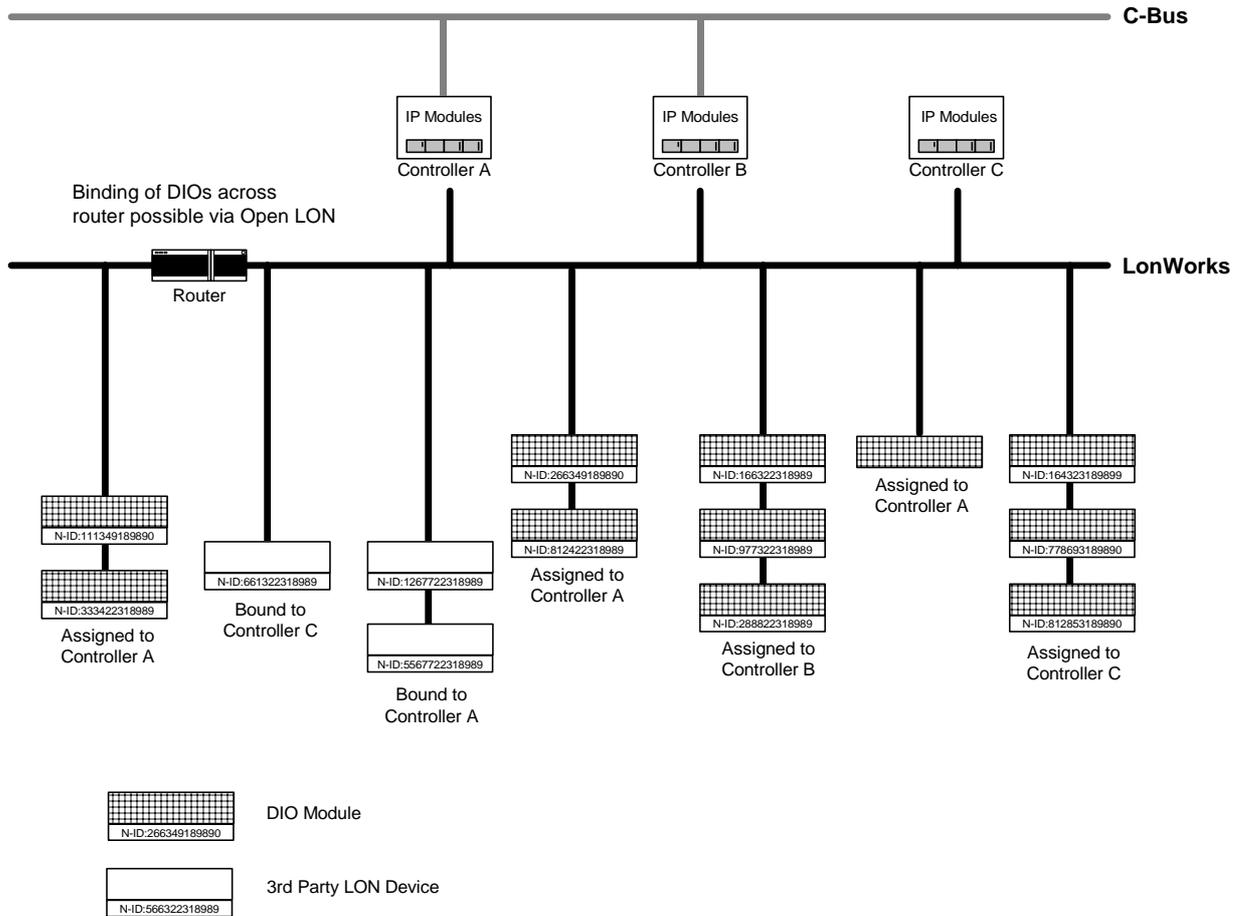
**Shared/Open LON**

**OS 2.04**

When using OS 2.04, the "Shared" and the "Open" operating modes can be in effect simultaneously for the integration of additional 3<sup>rd</sup> party or other Honeywell LON devices. In this case, autobinding is performed for the NVs of a maximum of 16 DIO modules, while the data points of additional DIO modules must be manually mapped with shared NVs and the NVs of the additional DIO modules must be bound manually using an LNS-based tool (Manual Binding).

NOTE: To avoid using a separate software tool for the Binding procedure, it is recommended to integrate Open LON devices by using OS 2.06, since CARE can be used for creating the bindings (CARE Autobinding).

**Shared/Open LON Configuration (OS 2.04)**



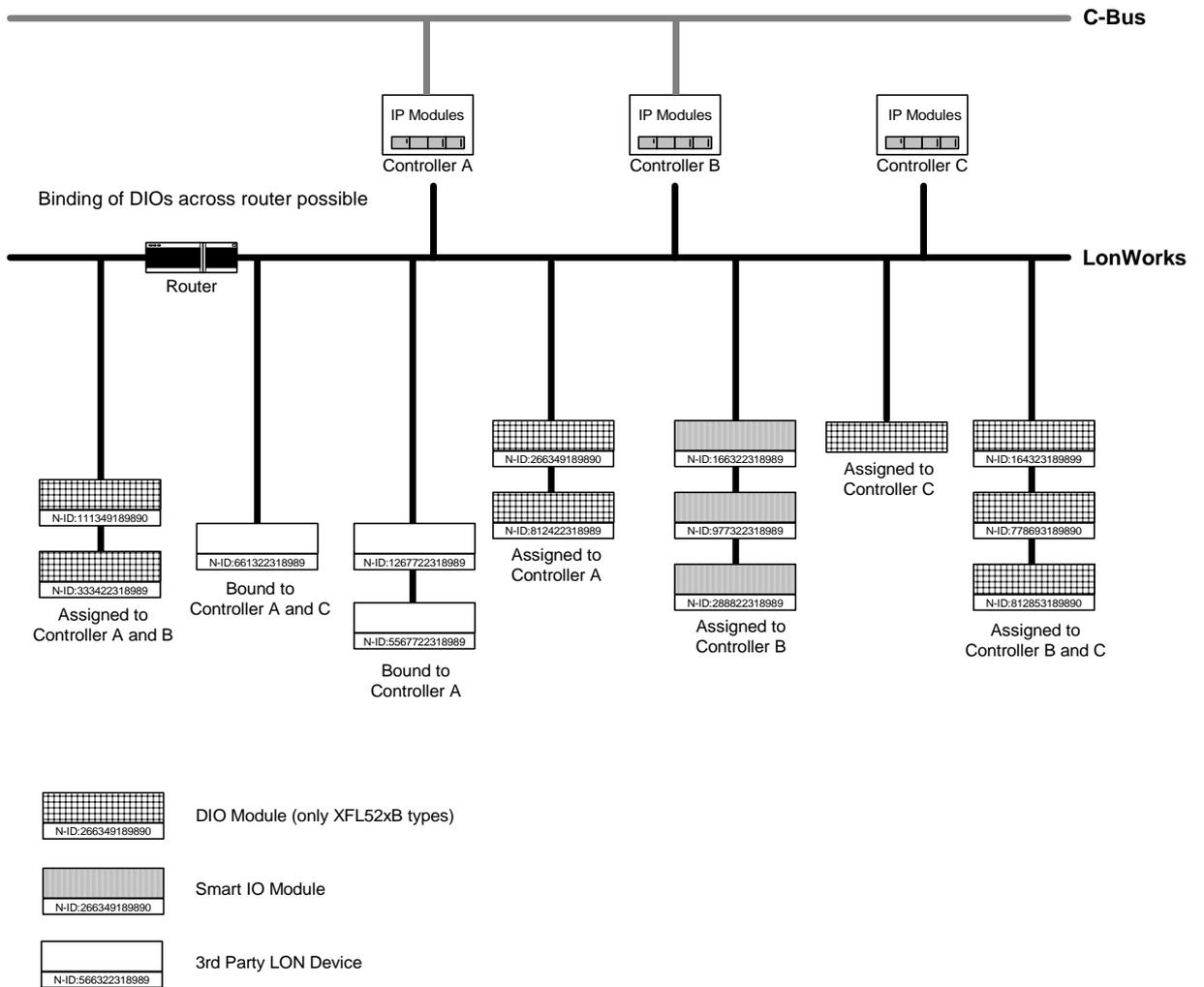
**Open LON OS 2.06**

When using OS 2.06, an "Open LON" configuration allows an interoperable LONWORKS system in which CARE will be used to generate a LONMARK-compliant network interface file for each device, capable of providing NVs which can be bound to other devices. These devices may include Excel 500 controllers with their DIO modules or Smart I/O modules, Excel 50 or Excel 10 controllers, and additional 3<sup>rd</sup> party or other Honeywell LON devices such as the Honeywell actuator with LON capabilities. Multiple controllers can process one and the same datapoint/NV on a DIO, Smart I/O module or any other LON device.

The bindings will be done in CARE (CARE Autobinding). For the integration of Honeywell or 3<sup>rd</sup> party LON devices no separate binding tool such as LonMaker is necessary. The DIO modules will be handled as any other LON device, that is, they must be bound to the controller. Controller Autobinding no longer takes place.

NOTES: For OS 2.06 the DIO modules must be assigned to their Excel 500 controller by entering the Neuron ID in CARE. A later assignment via MMI is not possible.

Open LON Configuration (OS 2.06 only)



Excel 500/Smart Controller with DIO Modules on Local Configuration

NOTE:Applies to OS 2.0/2.02 - 2.04.

**Binding**

When using an Excel 500 or Smart controller with its distributed I/O modules in Local configuration, the controller performs the Mapping and Autobinding. Due to this controller capability, no mapping needs to be done in CARE and no separate LON tool for binding is necessary.

**Physical Assignment**

For proper physical assignment of the DIO modules to the single controller, the module address in CARE must match the hex switch setting.

NOTE: NVs generated by the controller cannot be edited within CARE and are not visible in any LON tool.

---

### Excel 500/Smart Controllers with DIO Modules on Shared/Open LON Configuration (OS 2.04)

NOTE: Applies to OS 2.04.

**Binding** As in Local configuration, the controllers perform Autobinding. To physically assign the corresponding DIO modules to their dedicated controllers, the following steps have to be done:

**Physical Assignment**

- Enter Module address according to hex switch setting.
- Enter Neuron ID in TAF (optional). The Neuron ID can also be selected via XI 581/2 later.

---

### Excel 500, 50, 10, Smart Controllers with DIO Modules and other Honeywell / 3<sup>rd</sup> party LON devices on Shared/Open LON Configuration (OS 2.04)

NOTE: Applies to OS 2.04.

**Binding** To integrate additional LON devices other than distributed I/O modules, the following steps have to be done:

1. In CARE, create LON network interface that fits to the desired Honeywell LON device and 3<sup>rd</sup> party LON device, respectively, by mapping CARE datapoints to NVs.
2. With a LON tool, e.g. CARE, bind the mapped NVs to the corresponding NVs of the Honeywell and 3<sup>rd</sup> party LON device, respectively (Manual Binding)

**IMPORTANT**

*When using OS 2.04, the Integration of additional LON devices is only possible in the Shared/Open LON configuration.*

---

### Excel 500, 50, 10, Smart Controllers with DIO Modules and other Honeywell / 3<sup>rd</sup> party LON devices on Shared/Open LON Configuration (2.06)

NOTE: This applies to OS 2.06 only.

**Logical Assignment** If the system is set to the Open LON configuration, CARE 4.00.00 provides the integration of additional Honeywell LON devices other than DIO modules such as the M7410G actuator with LON capabilities and/or 3<sup>rd</sup> party LON devices. When using Open LON, the DIO modules will be handled as any other LON device. They must be imported from a device library. That is, when using OS 2.06, the DIO modules are not assigned to the controller by controller autobinding. Instead, all datapoints are boardless as a rule and each DIO module must be assigned to the controller by connecting datapoints of the controller to NVs of the LON device (CARE Autobinding). CARE creates the mapped NVs for the datapoints automatically. In addition, matching LON devices can be bound to each other by interconnecting their corresponding NVs.

To bind a LON device to an appropriate Excel controller (Excel 500, 50, 10, Smart) or to another LON device, the following steps have to be done on the Terminal Assignment tab:

3. Import the LON device from the device library.
4. Enter the neuron ID (later assignment via MMI not possible).
5. Depending on the LON device (1) (Excel controller, e.g. DIO module, 3<sup>rd</sup> party LON device), which the imported LON device should be connected to, connect the controller datapoints, respectively the NVs of the other LON device (1) with the matching NVs of the imported LON device (2).

Excel 50 on Shared/Open LON Configuration

NOTE: Applies to OS 2.04.

The Excel 50 freely programmable controller can be used only in Shared/Open LON Configuration. CARE sets this automatically.

Which Target I/O Hardware do you prefer first?

From the CARE point of view, the following table shows the possible Controller - OS – Target I/O hardware combinations for Excel 500 and 50 controllers with LON capabilities:

OS	Possible Target I/O	Controller		
		Excel 500	Excel Smart	Excel 50
2.0/2.01, 2.03	IP	x	-	x
	Distributed I/O	x	x	-
	Open LON *	-	-	-
2.04	IP	x	-	x
	Distributed I/O	x	x	-
	Open LON *	x	x	x
2.06	IP	x	-	x
	Distributed I/O	-	-	-
	Open LON *	x	x	x

\* no physical hardware

As the table shows, the respective controllers can work with a unique hardware configuration of just the same module type or, depending on controller type, with up to three different target hardware types:

- IP modules (Standard)
- Distributed I/O (DIO) modules
- Open LON (boardless points)

**CARE Process**

Regarding the hardware configuration, the following basic steps in CARE have a decisive influence:

**Define controller**

Includes the definition of the system architecture in principle, Shared / Open LON or Local.

**Define plant**

Includes the definition of the preferred target I/O hardware configuration for the plant, IP I/O, Distributed I/O or Open LON (see IMPORTANT hint).

**Attach plant to controller**

When attaching the plant(s) to the controller, CARE assigns the hardware points to the corresponding modules as defined for the plant(s) by the target I/O hardware selection (Preferred Target I/O in New Plant dialog box). This results in a unique hardware configuration if all plants have the same target I/Os or in a mixed hardware configuration if the plants have different target I/Os.

NOTE: The preferred target I/O hardware configuration selected first can be changed afterwards at any time, either for the plants separately (Plant Properties tab) or in a single step for the complete controller, which affects all plants (Modify Target I/O Hardware on the Controller Properties tab).

**IMPORTANT**

*Note, that setting the preferred target I/O hardware means just a pre-definition of the target hardware. The final configuration needs to be done on the Terminal Assignment Tab.*

The following table summarizes the selection of the target I/O hardware and the corresponding assignment on the Terminal Assignment tab.

OS	Physical Target I/O	Preferred Target I/O Modify Target I/O Hardware	Assignment in TAF
2.0/201, 2.03	IP	Standard I/O (IP)	All Points are assigned to IP modules
	Distributed I/O	Distributed I/O	All Points are assigned to distributed I/O modules
2.04	IP	Standard I/O (IP)	All Points are assigned to IP modules
	Distributed I/O	Distributed I/O	All Points are assigned to distributed I/O modules
2.06	IP	Standard I/O (IP)	All Points are assigned to IP modules
	Distributed I/O	Open LON	All* Points are boardless and must be bound manually to distributed I/O modules
	3 <sup>rd</sup> party LON devices and/or other Honeywell LON devices	Open LON	All* Points are boardless and must be bound manually to NVs of the appropriate LON device

**Restrictions\*** Point types which are not supported by Open LON will be assigned to distributed I/O or Standard I/O modules.

Point types not supported by Open LON:

- DO Pulsed Digital Output
- FF Flex DO\_Feedback\_DI
- FM Flex Multistage
- FP Flex Pulse2
- GA Global Analog
- GD2 Global Digital 2state
- GDn Global Digital Nstate
- PT Pseudo Totalizer
- TO Totalizer

**Mapping Scenarios for OS 2.04**

**Assumption** To create a LonWorks network interface for integration of additional LON devices, the following will be assumed:

- OS 2.04 or higher had been selected
- LON configuration was set to Shared/Open LON

Then, NVs can be mapped to:

- Physical hardware points (standard I/O or Distributed I/O)
- Boardless datapoints (Open LON)
- Software points

**Using Standard I/O**

If a datapoint had been mapped to an NV and standard I/O hardware has been selected as target I/O hardware, this datapoint will have a double assignment, to the IP-bus connection via hardware module and to the LonWorks network connection via NV. For value processing of these kinds of mapped datapoints, please refer to the Data Priority of NVs and Datapoints section.

<b>Using Distributed I/O</b>	If a datapoint had been mapped to an NV and distributed I/O hardware has been selected as target I/O hardware, this datapoint will have a double assignment, to the LonWorks network connection via hardware module and to the LonWorks network connection via NV. For value processing of these kinds of mapped datapoints, please refer to the Data Priority of NVs and Datapoints section.
<b>Using Open LON</b>	For integration of additional LON devices, Open LON is recommended as preferred target hardware. This results in creation of boardless points (see restrictions), which do not belong to any board.  Boardless points will have the same behavior as normal hardware points, e.g. Alarming etc.  For value processing of mapped datapoints, please refer to the Data Priority of NVs and Datapoints section.
<b>Software Points</b>	Software points can also be mapped to datapoints, but these points are not visible on the Terminal Assignment tab.
<b>Manual Mapping of Distributed I/O Modules</b>	On a Shared/Open LON architecture, distributed I/O modules can be bound to the Excel 500 or Smart controller like any other LON devices.

**IMPORTANT**

*NVs generated by CARE take precedence over NVs generated by the controller during Autobinding. That is, if DIO modules are bound to the controller via Manual Mapping and Binding, Autobinding does not take place.*

**Data Priority of NVs and Datapoints**

This section describes the priority between the network variables and the datapoints in the application. A valid network input value always has priority over the value from a sensor or switch wired directly to the controller or the values from the internal control algorithm or Time Program.

When a network input variable is not bound and its value is INVALID, then the value is ignored and the value from the local sensor/switch, the control algorithm, or the Time Program is written to the datapoint.

When a network input variable is not bound and has valid data, then the data is written to the mapped datapoint. The datapoint will then work in the Manual mode, and values from the internal algorithm, Time Program, or local sensor/switch are ignored.

When a network input variable is bound and its value is INVALID, then the value is ignored and the value from the local sensor/switch, the control algorithm, or the Time Program is written to the datapoint.

When a network input variable is bound and has valid data, then the data is written to the mapped datapoint. The datapoint will then work in Auto mode, and values from the internal algorithm, Time Program, or local sensor/switch are ignored.

When a network input variable is bound and reports NO RESPONSE (sending device or communication failure), then the latest value from the network is written to the mapped datapoint. The datapoint will then work in Auto mode, and values from the internal algorithm, Time Program, or local sensor/switch are ignored.

**Routers and Repeaters Use**

Autobinding will be performed in the Local as well as in the Shared/Open LON architecture. For both configurations, routers restrict autobinding, since DIO modules have to reside within the same router segment as its dedicated controller.

In contrast to routers, autobinding across repeaters is possible.

Routers can be used in a Shared / Open LON configuration, if distributed I/Os were manually mapped in CARE and manually bound via LON tool.

### Define/Modify Target I/O Hardware Configuration

**Purpose** Define/Modify I/O hardware module type for Excel 500, Smart and Excel 50 controllers. For the Excel 500 controller, target I/O hardware can be changed for OS Versions 2.0 and higher. For the Excel 50 and Excel Smart controllers, hardware can be changed only, if OS 2.04 or higher is applied. The target I/O hardware configuration can be changed according to the following table.

Module Type	Excel 500	Excel Smart	Excel 50
IP I/O	x	-	x
DIO	x	x	-
Open LON* (boardless)	x	x	x

\* no physical hardware

The table shows that for Excel 500, the target hardware can be changed from any type to any type, whereas for Excel Smart, only a change from DIO modules to Open LON and vice versa, and for Excel 50 a change from IP I/Os to Open LON and vice versa is possible.

This provides the creation of unique as well as mixed hardware configurations for the controllers. Creating a **unique hardware configuration** means that all plants will be assigned to the same I/O module type, IP, Distributed I/O, or Open LON. Creating a **mixed hardware configuration** means that IP modules, Distributed I/O modules, and/or boardless points will reside on the same controller.

NOTE: The preferred target I/O hardware configuration selected first can be changed afterwards at any time, either for the plants separately (Plant Properties tab) or in a single step for the complete controller, which affects all plants (Modify Target I/O Hardware on Controller Properties tab).

**IMPORTANT**

*Note that setting the preferred target I/O hardware means just a pre-definition of the target hardware. The final configuration need to be done on the Terminal Assignment tab.*

**Restrictions** Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

- DO Pulsed Digital Output
- FF Flex DO\_Feedback\_DI
- FM Flex Multistage
- FP Flex Pulse2
- GA Global Analog
- GD2 Global Digital 2state
- GDn Global Digital Nstate
- PT Pseudo Totalizer
- TO Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

**IMPORTANT**

*When an Excel 500 controller is full, that is, the maximum number of modules has been reached, a change in the **plant** target I/O hardware will not be able to create any different module type. Therefore the actual hardware will not change, even if the setting for the plant is changed on the*

*Plant Properties tab. In this case you have to do manual changes via the terminal assignment or set the Controller to the other target I/O hardware that will affect **all** plants.*

**Attachment** When attaching a plant, CARE assigns all hardware points of the plant to the target I/O hardware that is selected for the plant. The target hardware can be changed for attached as well as for unattached plants.

### Define Unique Target I/O Hardware Configuration

**Purpose** Define unique target I/O hardware modules (Standard I/O or Distributed I/O, or Open LON) for Excel 500, Smart, or 50 controllers.

**Procedures** This can to be done by selecting the **same** target hardware (Standard I/O or Distributed I/O, or Open LON) for **any** plants when defining the plants.

or

by setting the target hardware for a controller to Standard I/O or Distributed I/O, or Open LON. In this case, the controller has plants with each of two or three module types already attached (see Modify Target I/O Hardware for a Complete Controller section). This affects **all** plants attached to the controller.

#### Define Plants with Unique Target I/Os

1. In the logical plant tree, click on the controller.
2. Click menu item Plant, then drop-down item New.

RESULT: The New Plant dialog box displays.

3. Enter plant name and select plant type.
4. Select OS version. If Distributed I/O modules are used, select OS 2.0 - 2.04. If Open LON is used, select OS 2.06 or higher.
5. Select units of measurement.
6. Under Preferred Target I/O select desired hardware by clicking the corresponding radio button:

Standard I/O

Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).

#### Distributed I/O

Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).

#### Open LON

Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.06 and higher)

7. Click OK.

8. Select the same target I/O hardware for all other plants you want to define and attach the plants.

**RESULT:** All hardware points of the plants are assigned to the appropriate hardware modules of the same kind of target hardware. The points will be attached to existing modules of the selected target hardware first. New modules will be created until the maximum number of I/O modules is reached. If not all points can be attached, the max. number of hardware points has been exceeded.

#### Restrictions

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

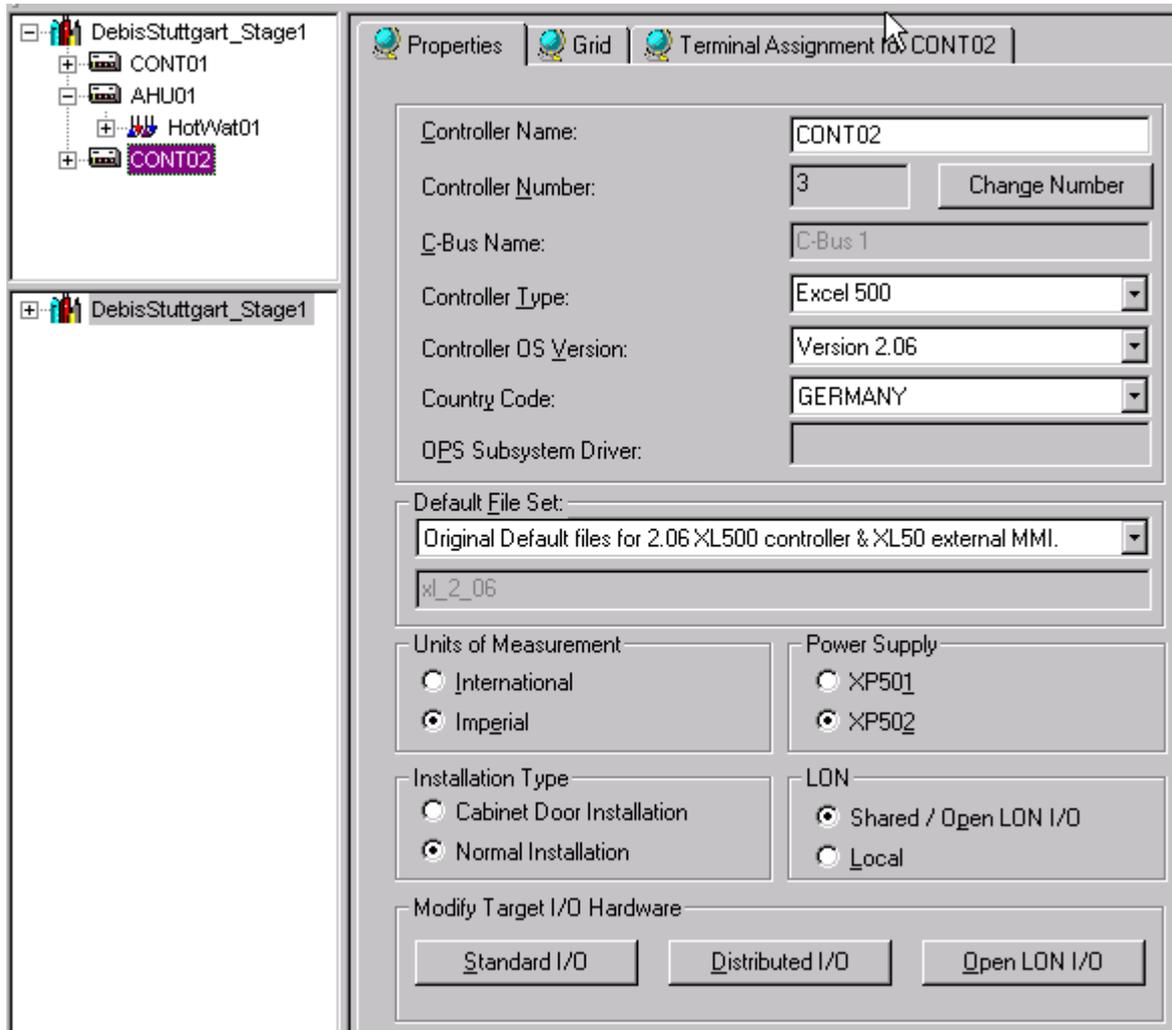
Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

#### Modify Target I/O Hardware for a Complete Controller

1. In the logical plant tree, click on controller.
2. On the right pane, select the Properties tab.



3. Upgrade the controller, if not already done, by changing the Controller OS Version to Version 2.0 or higher. If the controller is already upgraded, continue with step 4.

#### Conditions for Changing Target I/O Hardware

For Excel 50 and Excel Smart, OS version have to be 2.04.

For Excel 500, OS version have to be higher than 2.0. For change to Open LON, the OS have to be 2.06 or higher.

4. When using OS 2.04 for Distributed I/O modules select architecture, Shared/Open LON or Local, by clicking desired radio button.
5. Under Modify Target I/O Hardware click the desired button:

#### Standard I/O

Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).

#### Distributed I/O

Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).

#### Open LON

Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.06)

**RESULT:** All plants will be automatically detached and the plant automatically reattached to the selected target hardware. All datapoint attributes remain unchanged except the technical address.

**Restrictions** Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

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### Define Mixed Target Hardware Configuration

**Purpose** Define mixed target I/O hardware configuration (Standard I/O and/or Distributed I/O, and/or Open LON) for Excel 500, Smart, or 50 controllers. Possible configurations depend on controller type and OS version.

**Procedures** This can to be done by selecting **different** target hardware (Standard I/O, Distributed I/O, or Open LON) for plants when defining the plants

or

by modifying the target hardware of plants already defined and attached

or

by modifying modules to a different type and/or swapping points between different module types by using the terminal assignment function (see TERMINAL ASSIGNMENT chapter).

**Define Plants with Different Target I/Os** 1. In the logical plant tree, click on controller, you want to create the plant for.

2. Click menu item Plant, then drop-down item New.

RESULT: The New Plant dialog box displays.

3. Enter the plant name and select plant type.
4. Select OS version. If Distributed I/O modules are used, select OS 2.0 - 2.04. If Open LON is used, select OS 2.06 or higher.
5. Select units of measurement.
6. Under Preferred Target I/O select desired target I/O hardware by clicking the corresponding radio button:

**Standard I/O**

Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).

**Distributed I/O**

Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).

**Open LON**

Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.06 and higher)

7. Click OK.
8. For further plant(s), select different target I/O hardware and attach the plants.

**RESULT:** The hardware points of the plants will be assigned to existing hardware modules of the selected target hardware. New modules will be created until the maximum number of I/O modules is reached. If this limit is reached, remaining points will be attached to eventually existing free terminals on modules of the different hardware type.

If all points can still not be attached, the max. numbers of hardware modules and points respectively have been exceeded. In this case, reduce the number of hardware points to the maximum number of available hardware points for the particular hardware modules.

**Restrictions**

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported

types will be indicated in red in the logical plant tree and must be put manually on IP boards.

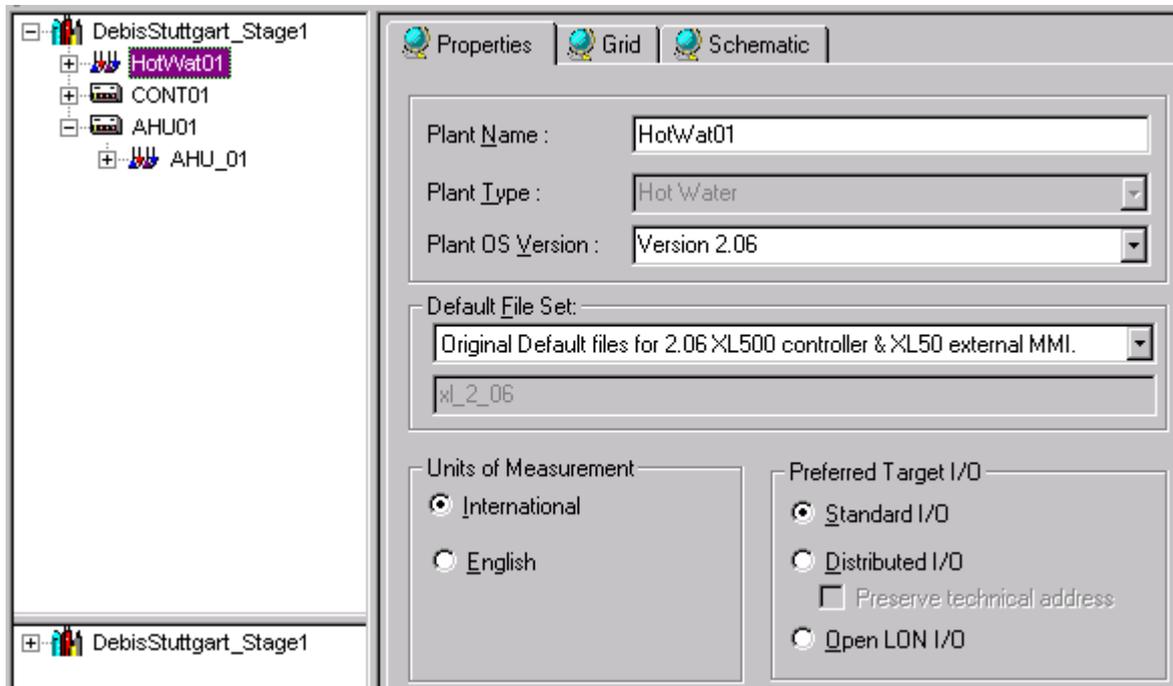
Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

### Modify Target I/O Hardware for a Plant

1. In the logical plant tree, click on the plant.
2. Click on the Properties tab on the right.



3. Under Preferred Target I/O select desired target hardware:

Standard I/O (applicable to Excel 500 and 50)  
Hardware Points of this plant will be assigned to IP bus modules.

Distributed I/O (applicable to Excel 500 and Smart)  
Hardware Points of this plant will be assigned to LON-bus modules

Open LON (applicable to Excel 500, Smart, and 50)  
Hardware points of this plant will be boardless (unassigned). Open LON only applies to OS version 2.06 and higher.

Preserve technical address refers to modification of the target hardware via the standard I/O and distributed I/O radio buttons, if point changes in the TAF have already been made before (only applies to Excel 500 controller OS Versions 2.0 and higher).

Enabling this checkbox when changing the target hardware results in the following:

Points that are already assigned to that target hardware type, which will be changed to, preserve their technical address on the corresponding module.

Disabling this checkbox when changing the target hardware results in the following:

Points that are already assigned to that target hardware type, which will be changed to, may lead to a change of the technical address on the corresponding module. The Attach process optimizes for best use of modules.

5. Click **OK** to confirm.

**RESULT:** An attached plant will be automatically detached and the plant automatically attached to the selected target hardware.

**Restrictions**

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

**IMPORTANT**

*When an Excel 500 controller is full, that is, the maximum number of modules has been reached, a change in the **plant** target I/O hardware will not be able to create any different module type. Therefore the actual hardware will not change, even if the setting for the plant is changed on the Plant Properties tab. In this case you have to do manual changes via the terminal assignment or set the Controller to the other target I/O hardware that will affect **all** plants.*

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## Copy Controller

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**Purpose** Create a new controller by copying the files of an existing controller.

- Procedure**
1. In the logical plant tree, click on controller, you want to copy.
  2. Click menu item Controller, then drop-down item Copy.

Or, click right mouse button and with left mouse button, click on **Copy Controller** in the context menu.

**RESULT:** The Copy Controller dialog box displays with the name of the currently selected project, controller name, and controller number. This information displays in the Source field.

3. Select a project to receive the copy of the selected controller. The Target Project field defaults to the currently selected project. Click the drop-down listbox to display and select a different project.
4. In the New Controller Name field, enter a new name for the controller to be created.
5. From the Bus Name drop-down listbox, select the bus system, in which the controller should be created in the network tree.
6. In the New Controller Number field, enter a number for the controller to be created.

In the Modify Plant Names box, select whether or not you want software to modify the plant names in the new controller. If the controller should be copied in the same project, the plant names must be changed. If so, specify how software should modify them:

Do not modify	Software copies the plant names from the source controller to the new controller as is. This selection results in duplicate plant names in the CARE database.
Prefix Text	Software modifies the plant names from the source controller by prefixing them with the text that you enter in the Text box. The modified names are used in the new controller.
Append Text	Software modifies the plant names from the source controller by appending the text that you enter in the Text field. The modified names are used in the new controller.

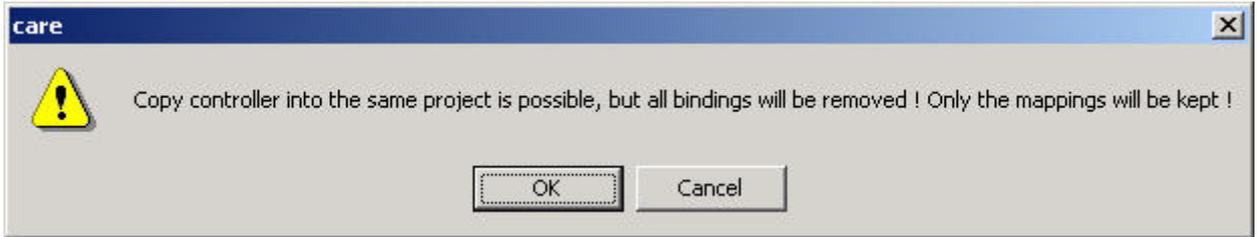
Click **OK** to begin the copy.

**RESULT:** Software displays a message box to remind you to ensure that all user addresses are unique after the copy.



**! CAUTION**

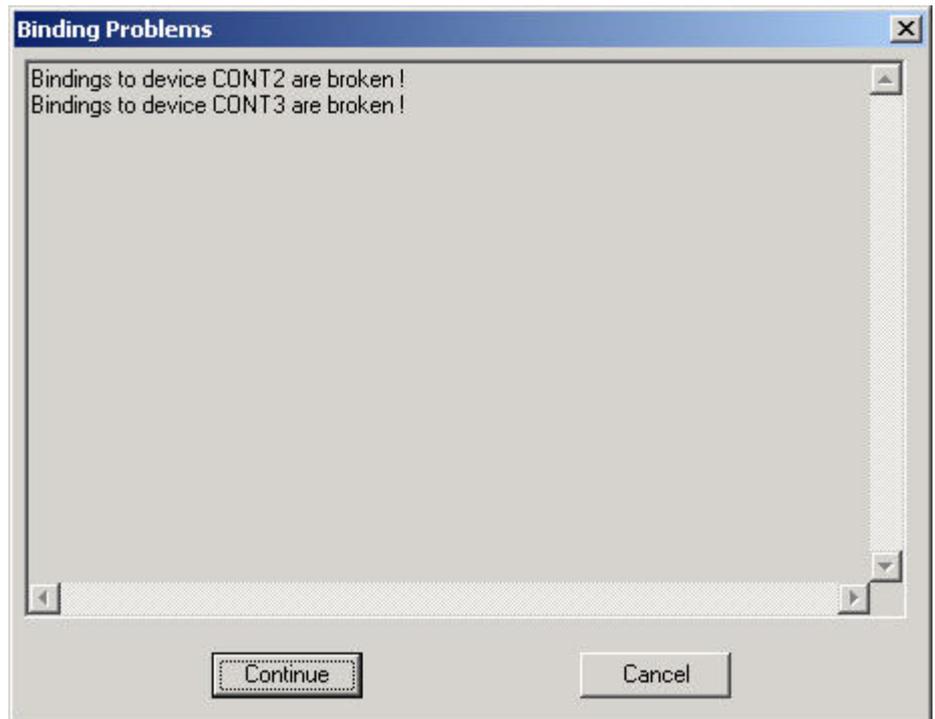
*In case the controller has bindings and is copied within the same project, all bindings will be removed and the mappings will be kept*



7. Click the **OK** button to acknowledge the messages.

**! CAUTION**

*In case bound LON devices of the controller have bindings to other Excel 5000 controllers these bindings will be broken. The Bindings Problems dialog box informs you about that fact.*



8. Click the **Continue** button in the Bindings Problems dialogbox if you want to accept that the bindings will be broken, if not click the **Cancel** button.

**RESULT:** Software copies the source controller files to the selected target project and names and numbers the controller as specified.

For LON controllers, the neuron IDs for the distributed I/O modules of the copied controller are set to 0 by default.

The channel and system/subsystem structures of the network tree will also be copied.

**IMPORTANT**

*Software copies the user addresses without changes. If unique addresses are required, you must manually change the user addresses. See Replicate Plant section.*

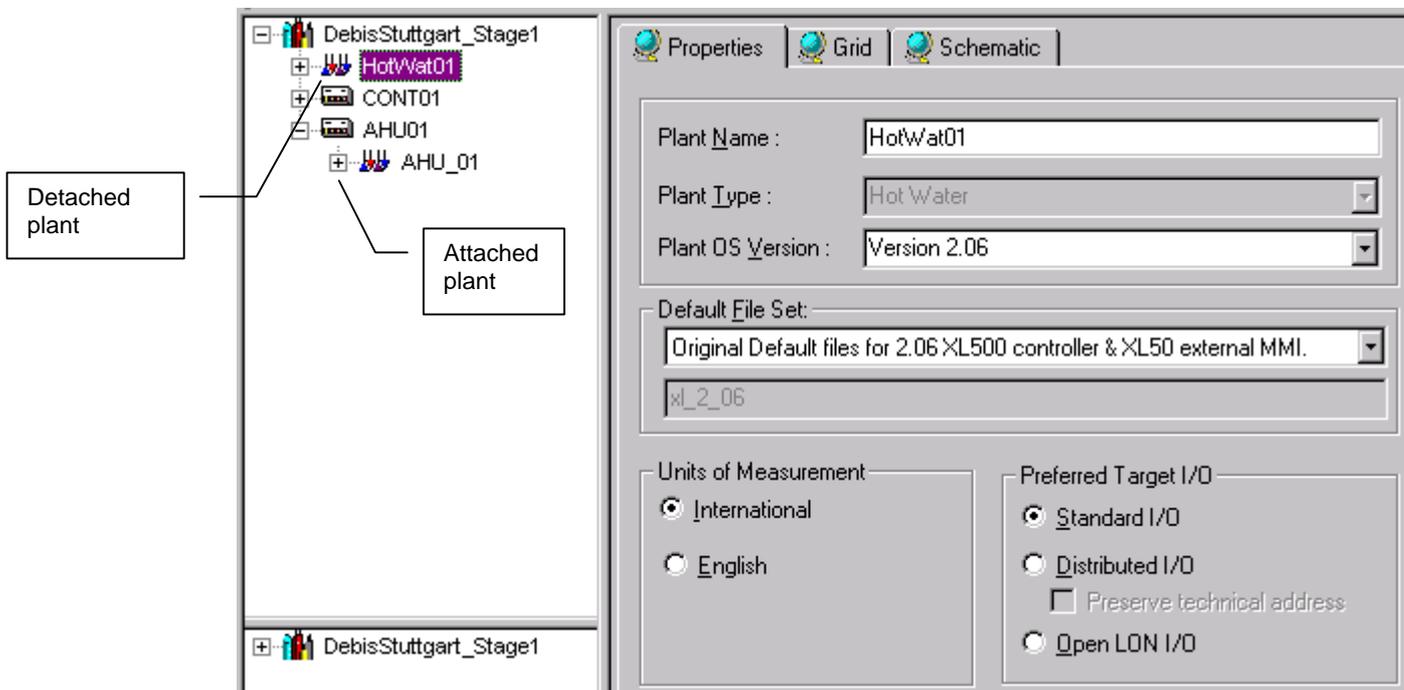
- On the Terminal Assignment tab, set the neuron IDs for the copied controller modules.

## Attach/Detach Plant

When creating a plant, you can instantly attach the plant to a controller or create it unattached for later attachment. Attached plants can be detached from one controller and instantly attached to another controller or can be left detached at the project.

An attached plant is displayed below the controller level in the logical plant tree. An unattached plant is displayed just below the project, respectively the first controller in the logical plant tree.

A plant can easily be attached/detached by drag&drop.



## Attach Plant to Controller

**Purpose** Assign a plant to a controller and determine I/O terminations required in the controller.

**Requirements** The controller and the plant being attached must have the same units of measure (that is, Imperial or International units).

Also, the plant's OS version must be less than or equal to the controller's OS version. For example, if the controller is Ver. 1.3, the plant's OS must be either 1.3 or 1.2.

If either one or both of these rules is violated, the plant can **not** be attached.

**Check Summary**

Before you attach a plant to a controller, you may want to view a summary of controller points to determine whether or not the controller can handle the plant (menu item Controller, drop-down item Summary).

**Plants with unique target hardware (Excel 500, Smart, and Excel 50)**

Hardware points will be assigned first to existing modules of the selected target hardware (IP or Distributed I/O). New modules will be created until the maximum number of I/O modules have been reached. If not all points can be attached, the max. number of hardware modules and points respectively have been exceeded.

**Plants with different target hardware (Excel 500, Smart, and Excel 50)**

Hardware points will be assigned first to existing modules of the selected target hardware (IP, Distributed I/O, or Open LON = boardless points). New modules will be created until the maximum number of I/O modules have been reached. In case this limit is reached, remaining points will be attached to eventually existing free terminals on modules of the other hardware type. If still not all points can be attached, the max. numbers of hardware points have been exceeded.

**NOTE:** If the application for an Excel 500 controller contains a point type, which is not supported by distributed I/O modules such as fast AI points, a standard I/O module will be created, even if Distributed I/O was selected.

**IMPORTANT**

*When an Excel controller is full, that is, the maximum number of modules has been reached, a change in the **plant** target I/O hardware will not be able to create any different module type. Therefore the actual hardware will not change, even if the setting for the plant is changed on the Plant Properties tab. In this case you have to do manual changes via the terminal assignment or set the controller to the other target I/O hardware that will affect **all** plants.*

**Restrictions**

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

**Plant Replication**

You can replicate an attached or unattached plant (menu item Plant, drop-down item Replicate). Replication of attached plants copies the modifications made in the Data Point Editor, for example, alarm limits, etc., as well as control strategies and switching tables. Note that when you detach a plant, you lose any changes you made with the Editors (see Editors chapter). Therefore, after you replicate an unattached plant, you must use the Editors again to make the desired changes to the original plant as well as each of the new plants.

**IMPORTANT**

*LON data of the plant will not be copied when replicating it.*

**Assumption**

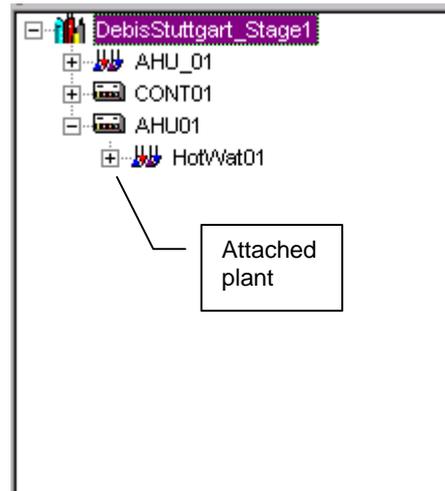
The schematic, control strategy, and switching logic for the plant are done. You must exit these functions before attaching the plant.

**NOTE:** If the plant has control strategy loop(s) that are incomplete, the attach will fail. Return to control strategy to complete them.

**Procedure**

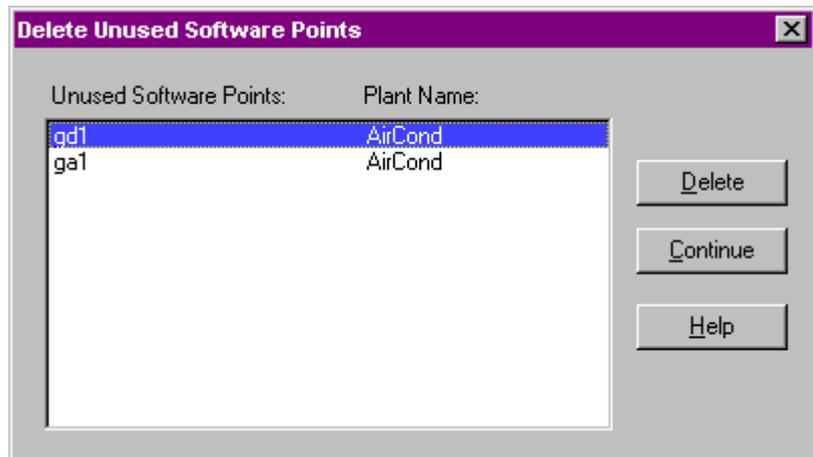
1. In the logical plant tree, click on the unattached plant.
2. Drag the unattached plant to the controller, which you want attach the plant to, and drop it.

RESULT: The Plant will be added one level below the controller in the logical plant tree.



**Unused Software Points**

If there are unused software points in the plant schematic, the unused software points dialog box displays with a list of those points and an option to delete them, if desired. For example:

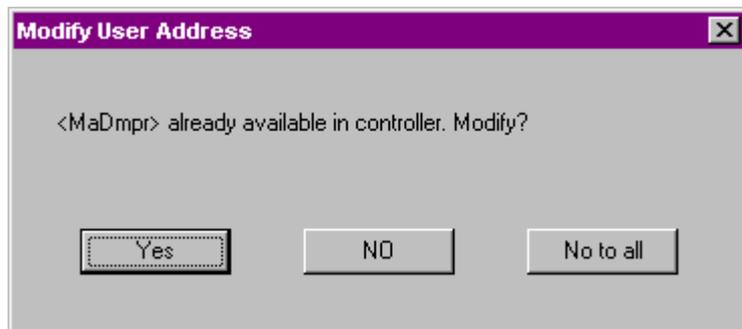


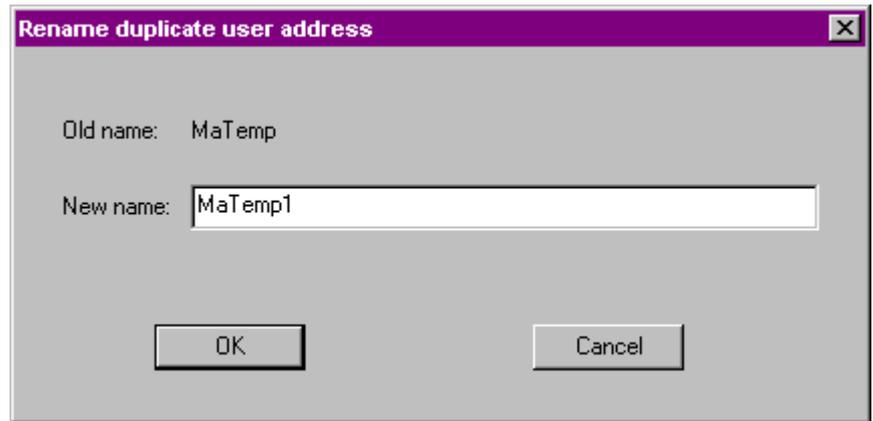
Click the points you want to delete (hold down the **Shift** key while you click to select multiple points). Then click **Delete** for software to delete these unused points. (The **Delete** key is not active until you select at least one point.)

Click **Continue** to close the dialog box. Points that you did not delete remain in the plant.

**Duplicate User Addresses**

If there is a duplicate user address, software displays a message box with the user address in the title and allows you to enter a new address for it. Example:



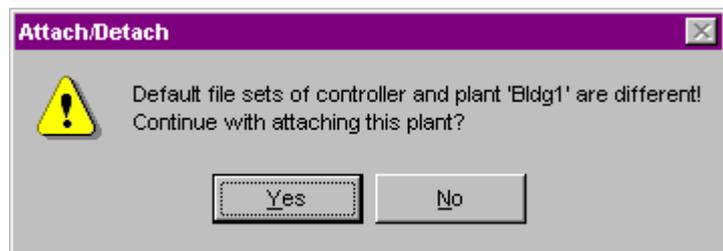


Type a unique address and click **OK** to change user address and close the dialog box. Or, click **Cancel** to keep the user address as is.

If the point is common to all plants in the controller, you should leave the user address as is.

#### Different Default File Sets

If the default file sets of the controller and the plant(s) to be attached are different, the following message displays:



Note, that the default file may be set different (multiple default file sets), although the OS version of the controller and the plant(s) are the same.

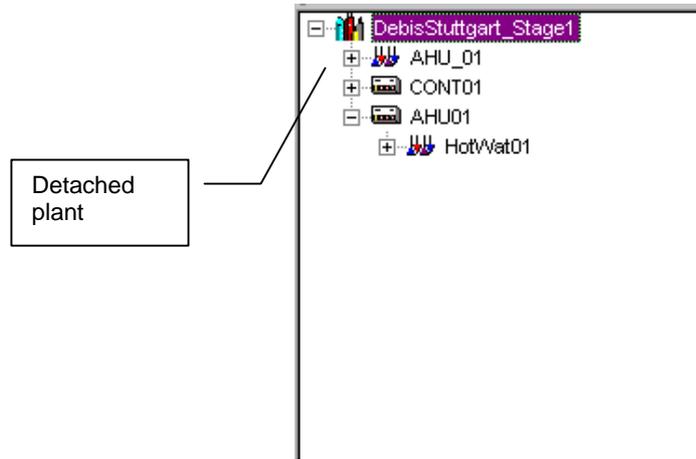
Example:

OS Version 2.0 provides the default file set

xl\_2\_0

## Detach Plant from Controller

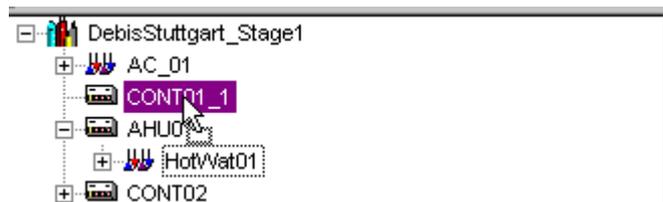
- Purpose** Unassign a plant from a controller and erase its I/O terminations file so that you can assign the plant to a different controller.
- Procedure**
1. In the logical plant tree, click on the attached plant, which you want detach.
  2. Drag the plant to the project and drop it.
- RESULT:** The Plant is added on level below the project in the logical plant tree.



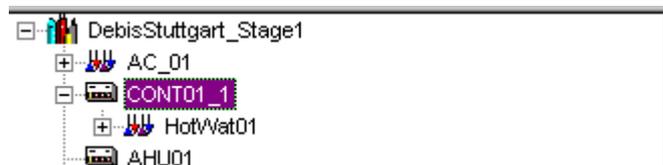
### Detach Plant from one Controller and Attach it to another Controller

**Purpose** Unassign a plant from a controller and assign it concurrently to another controller.

- Procedure**
1. In the logical plant tree, click on the attached plant, which you want detach.
  2. Drag the plant to the target controller and drop it.



**RESULT:** The Plant will be added one level below the target controller in the logical plant tree.



### Rename Controller

**Purpose** Change the name of a controller. Please refer to the Display/Change Controller information section.

### Delete Controller

**Purpose** Erase a controller.

- Procedure**
1. In the logical plant tree, click on the controller, you want to delete.
  2. Click menu item Controller, then drop-down item Delete.  
Or, click right mouse key and with left mouse key click on Delete in the context menu.

**RESULT:** The controller will be deleted.

## Display/Modify Controller Information

**Purpose** View and/or change controller information such as OS Version, power supply, installation type, and target I/O hardware.

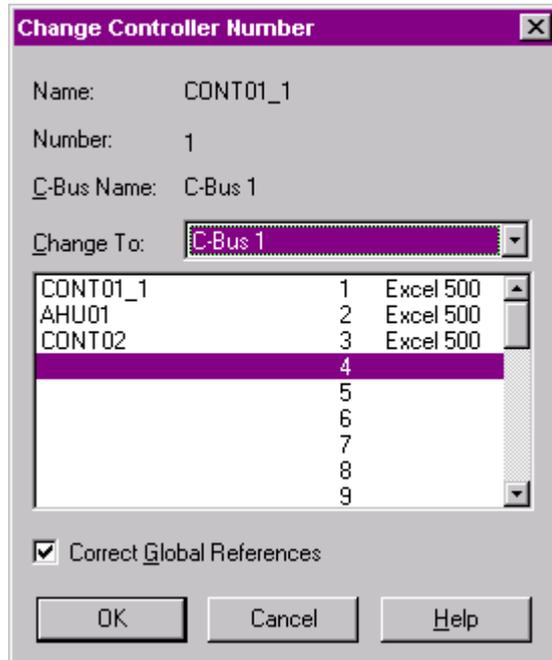
- Procedure**
1. In the logical plant tree, click on the controller.
  2. On the right pane, click on the Properties tab.

The screenshot shows a software interface with three tabs: 'Properties', 'Grid', and 'Terminal Assignment for CONT01'. The 'Properties' tab is active. The main area contains several input fields and dropdown menus:

- Controller Name:** Text box containing 'CONT01\_1'.
- Controller Number:** Text box containing '1' and a 'Change Number' button.
- C-Bus Name:** Text box containing 'C-Bus 1'.
- Controller Type:** Dropdown menu showing 'Excel 500'.
- Controller OS Version:** Dropdown menu showing 'Version 2.06'.
- Country Code:** Dropdown menu showing 'GERMANY'.
- OPS Subsystem Driver:** Empty text box.
- Default File Set:** Dropdown menu showing 'Original Default files for 2.06 XL500 controller & XL50 external MMI.' with a sub-field containing 'xl\_2\_06'.
- Units of Measurement:** Radio buttons for 'International' (selected) and 'Imperial'.
- Power Supply:** Radio buttons for 'XP501' and 'XP502' (selected).
- Installation Type:** Radio buttons for 'Cabinet Door Installation' and 'Normal Installation' (selected).
- LON:** Radio buttons for 'Shared / Open LON I/O' (selected) and 'Local'.
- Modify Target I/O Hardware:** Three buttons: 'Standard I/O', 'Distributed I/O', and 'Open LON I/O'.

3. Change Controller Name, if desired.
4. Change Controller Number by clicking on the Change Number button.

**RESULT:** The Change Controller Number dialog box displays with the name, number and C-Bus location (C-Bus Name) of the selected controller.



- From the Change To drop-down listbox, select a different C-Bus location where the controller should be moved to.
- Decide whether or not you want CARE to correct global references by checking/unchecking the Correct Global References checkbox. The default is to correct the references. If you let CARE correct the references, it changes the controller number in the files for any other controllers that link to this controller via global receptor and originator points.
- In the list, select a number for the controller. To change the currently selected controller number (1 in this example) to an unassigned controller number, click an unassigned number in the Change To list.
- To swap the number of the currently selected controller (1 in this example) with another controller, click that controller's number in the Change To list. For example if 3 was assigned to a controller named CONT02 and you selected it, software would assign CONT01\_1 to number 3 and CONT02 to number 1.
- Click OK.

**RESULT:** A message box displays reminding you that renumbering the controller causes the controller application files to be deleted and requests confirmation that you want to continue.



- Click Yes to continue with the renumbering.

5. Change Controller Type, if desired (Excel 500 or 600 only).
6. Change Controller OS Version (the version of OS that will be running in the controller), if desired. Note that any plant attached to this controller must abide by the rules of this version or you cannot attach the plant. Select desired version.

NOTE: For results on changing OS versions refer to Appendix Plant and Controller Upgrades and Downgrades for details on changing the OS version for a controller.

7. Change Country Code, if desired. The operator interface is required to provide the correct language for the selected country. The default depends on the Windows™ version installed. Tab to the next field to keep it or click down arrow to display and select a different country.

NOTE: For Excel 500 Ver. 1.2 Controllers, the only valid country codes are Germany and United States. Other countries appear in the list box, but United States is always the selection if you select anything other than Germany.

8. Change Default File Set, if desired. Select the appropriate default file for the selected Controller OS Version. Alternate default files are created via the Default Text Editor. See Appendix for details. A short description for the selected default file set is given below the drop-down list box.
9. Change Engineering Units, if desired. Select whether the controller should use International (metric) or Imperial units in Control Strategy EMS icons. This selection controls whether inputs are accepted in Celsius or Fahrenheit.
10. Click new power supply and/or installation type, as desired.

Normal installation is the default selection. If the controller has high-density digital inputs, select Cabinet Door Installation. Installation refers only to Excel 500 and 600 Controllers.

11. Click new wiring type for Excel 50 controller, as desired.
12. Change system configuration, if desired, from Shared /Open LON to Local and vice versa by clicking respective radio button.

**IMPORTANT**

*When changing the system configuration from Shared/Open LON to Local after a network interface had already been created, the network interface will not be downloaded.*

13. Change Target I/O Hardware, if desired (only applies to Excel 500, Smart, and 50 controller with its relevant OS Versions, 2.0 and higher):

NOTE: If not already done, you must set the controller OS version to 2.0 or higher and confirm this by clicking OK, then select the Controller Properties tab again and set the target hardware by clicking the desired button:

Standard I/O

Hardware Points of this plant will be assigned to IP bus modules (applicable to Excel 500 and 50 with OS 2.0 - 2.06).

Distributed I/O

Hardware Points of this plant will be assigned to LON-bus modules (applicable to Excel 500 and Smart with OS 2.0 - 2.04).

Open LON

Hardware points of this plant will be boardless, that is, unassigned (applicable to Excel 500, Smart, and 50 with OS 2.06 and higher)

RESULT: At once **all** plants will be automatically detached, all empty hardware modules will be removed and the plant automatically

reattached to the selected target hardware. All datapoint attributes remain unchanged except the technical address.

14. Click on the controller in the logical plant tree.

RESULT: Software saves the changes and closes the dialog box.

**Restrictions**

Certain point types are not supported by Open LON. When using OS 2.04, non-supported types will be put on IP (Excel 500, 50) or distributed I/O modules (Excel 500, Smart), even if Open LON was selected. When using OS 2.06, non-supported types will be indicated in red in the logical plant tree and must be put manually on IP boards.

Point types not supported by Open LON:

DO	Pulsed Digital Output
FF	Flex DO_Feedback_DI
FM	Flex Multistage
FP	Flex Pulse2
GA	Global Analog
GD2	Global Digital 2state
GDn	Global Digital Nstate
PT	Pseudo Totalizer
TO	Totalizer

When Distributed I/O was selected for an Excel 500 controller and the application contains a point type, which is not supported by distributed I/O modules, these points will be put on standard I/O modules.

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## PLANT SCHEMATICS

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<b>Purpose</b>	This chapter describes how to develop and change plant schematics for a project. A plant schematic defines the equipment in the plant and how it connects together.
	<p><b>IMPORTANT</b></p> <p><i>The Schematics function works differently for Excel 10 (2000series) applications. See Excel 10 Applications chapter.</i></p>
<b>Assumption</b>	This step assumes that you already selected or created a plant.
<b>Chapter Contents</b>	<p>Schematic Window Description</p> <p>Segment Additions/Insertions</p> <p>Segment Deletion</p> <p>Macros (includes saving, loading, and deleting)</p> <p>Physical Point Types (includes analog outputs, digital inputs, digital outputs, totalizers, feedback points, extra user addresses)</p> <p>Flex Points (includes DO_Feedback_DI points, Pulse_2 points, and multistage points)</p> <p>User Address Changes</p> <p>Points Without a Graphic</p> <p>Plant Information Summary (point count, user addresses, segment information, extra text, I/Os)</p> <p>Schematic Redraws</p> <p>Schematic Function Exit</p>
<b>See Also</b> ⇒	<p>Getting Started chapter for procedures to start and exit CARE</p> <p>Plants Definition and Management chapter for procedures to define and select a plant</p> <p>File Management chapter for procedures to back up and restore plant files.</p>

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## Schematic Window Description

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<b>Purpose</b>	Define plant equipment and how it connects together.
<b>Schematic Definition</b>	<p>A plant schematic is a combination of segments such as boilers, headers, and pumps. Segments consist of equipment such as sensors, status points, valves, and pumps. Each segment has an associated minimum number of points required for good control.</p> <p>In the schematic workspace you can add or insert segments, delete segments, and modify some point defaults such as type and user addresses. The CARE library contains predefined segments called macros. You can use macros to more quickly add segments to the schematic. You can also save segments that you create as macros and put them in the library for future use.</p>
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. In the logical plant tree, click on the plant.</li> </ol> <p>A window displays with the plant name in the title.</p>



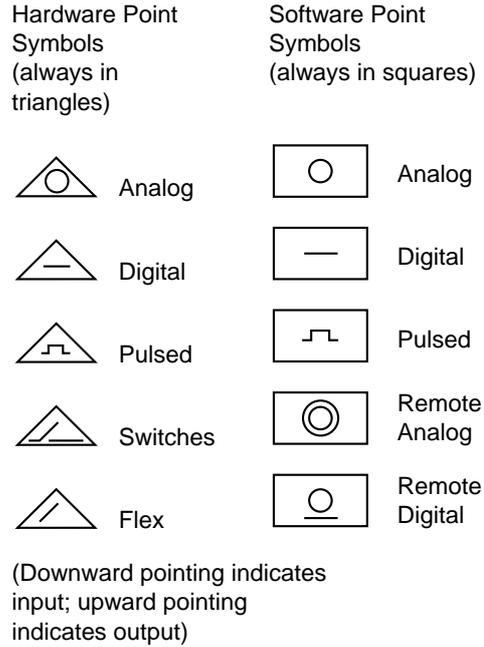
Delete macro	Erase a macro that is no longer useful.
Modify hardware point	Change default attributes for analog outputs, digital inputs, and digital outputs.
Feedback point	Create extra user addresses (digital inputs or outputs).
Modify user address	Change user address for a selected point.
Point without graphic	Add a point to the schematic without selecting a segment.
Redraw schematic	Refresh schematic display.
<b>View</b>	
Point count	Display the Plant summary window with the number of available inputs and outputs as well as the types of inputs and outputs.
User address	Display user addresses below their respective triangles on the schematic.
Segment list	Display segment information related to the selected segment. For example, for a supply fan, display its options such as single speed, no volume control, auxiliary contact.
Extra text	Display extra text that relates to the selected segment. Extra text is usually default values for a sensor or actuator.
<b>Segments</b>	Equipment types that you can select for the selected plant. Different plant types have different segment types.
<b>Help</b>	Display a topics list for the on-line user guide. Click a topic to display related information.

**Schematic Area** The area below the menu bar is where the plant schematic appears as you select segments. Schematic elements represent equipment such as fans, sensors, and dampers. Dotted lines lead from equipment to the bottom of the schematic and end with an arrowhead.

**Arrow Heads** The arrowheads at the bottom of the schematic represent points. They are color-coded, directional (down is input; up is output), and marked with a symbol for additional information:

Color	Direction within triangle	Symbol	Point Type
Green	downward	—	Digital input or totalizer
Red	downward	0	Analog input
Blue	upward	—	Digital output
Violet	upward	0	Analog output
Light blue	upward	/	Flex*

If a digital or analog point has switches, its — or 0 symbol changes to represent a switch, \_/\_ or pulsed. The following diagrams show other symbols that may appear:



\*Flex points represent one or more physical points. They can command and/or display associated physical points and their values via an operator terminal. Flex point types include Pulse\_2, Multistage, and DO\_Feedback\_DI. The Flex Points subsection later in this section describes how to create and modify these points.

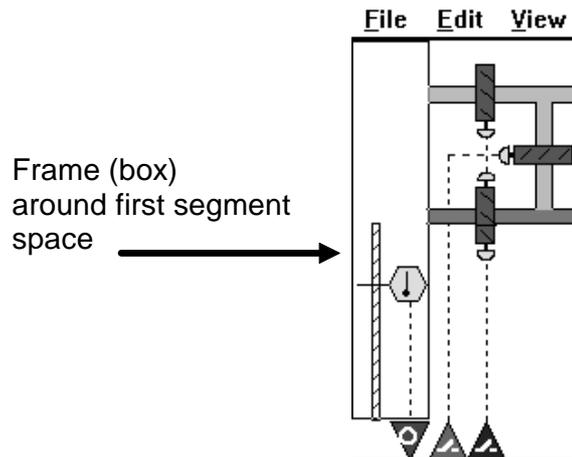
**User Address Display**

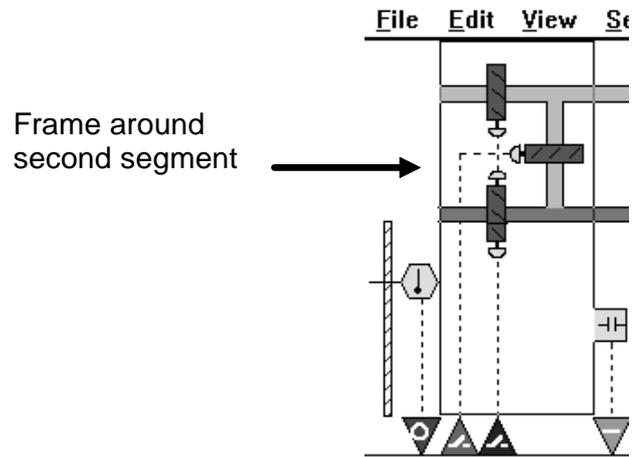
If you move the cursor over a triangle and press and hold the left-hand mouse button down, the user address for the point displays. When you release the mouse button, the display disappears. If the point is used in a control strategy and is connected, the display includes a red block preceding the user address; otherwise, the block is white.

**Frame**

The schematic always includes a rectangle that “frames” the currently selected segment. You can move the frame by clicking a different segment. Typically, you must select a segment before you can perform an operation on it. When you first open a schematic, the frame appears around the first segment.

**Frame Examples**





## Segment Additions and Insertions

**Purpose** Create or modify a plant schematic by adding and inserting segments. As a general rule, pick segments in sequence to flow from left to right. For example, when building a VAV box controller, first pick the inlet arrangement (single duct or dual duct), then the damper actuator, then the fan, then the heating coil, then the space sensor.

**Adding vs. Inserting** When you “add” a segment to a schematic, software places it at the end of the schematic.

When you “insert” a segment in a schematic, software places it just to the left of the currently framed segment.

You control the add and insert functions via the Insert mode on/off option under the Edit menu item:

- If Insert mode on/off is on, there is a check mark next to it. When you select a segment, software *inserts* it. Insert mode remains on until you turn it off.
- If Insert mode on/off is off, there is no check mark next to it. When you select a segment, software *adds* it. Insert mode remains off until you turn it on.

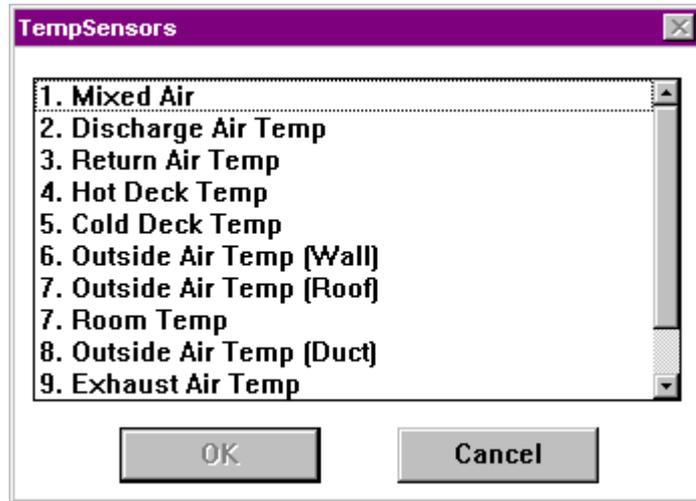
To turn Insert mode on and off, simply click it. If it is on, it turns off. If it is off, it turns on.

- Procedure**
1. Select mode, insert or add, as described in the previous paragraphs.
  2. If you are in insert mode, position segment frame as desired so that the new segment appears where you want it. Software inserts new segments to the left of the framed segment. For example, if you want to insert a new segment between segments 2 and 3, click segment 3 to frame it.
  3. Click menu item Segments.
 

RESULT: A list of segments displays.
  4. Select desired segment by either clicking segment name or typing segment number.
 

RESULT: A list of options displays.
  5. Select desired option by either clicking option name or typing option number.
 

RESULT: Another list may display or a dialog box. For example:



NOTE: To cancel the inclusion of the segment, click **Cancel**.

6. Click item (or type number), then click **OK** to select it. (Or, double-click item as a shortcut).

Depending on the selected segment, additional windows may appear. Select items as required.

RESULT: After you make the last selection, the segment list window closes and the schematic work space reappears with a drawing of the new segment to the left of the previously framed segment. The new segment is framed.

7. You can continue selecting segment menu items and then specific components.

When you are through with a plant schematic, you can end the Schematic function (menu item File, drop-down item End) and create a control strategy for it. See the Control Strategy chapter for details.

**Example** This section shows how to add a Supply Fan segment to an air conditioning plant.

1. Click menu item Segments, then drop-down item Fan.

RESULT: A drop-down list displays with a choice of four types, Single Supply Fan, Single Return Fan, Multiple Supply Fans, and Multiple Return Fans.

2. Click Single Supply Fan.

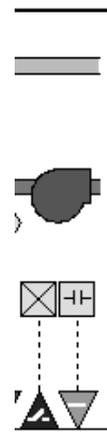
RESULT: The SaFanType segment list window displays with four options, Single Speed, Single Speed with Vane Control, Two Speed, and Variable Speed.

3. Double-click Single Speed.

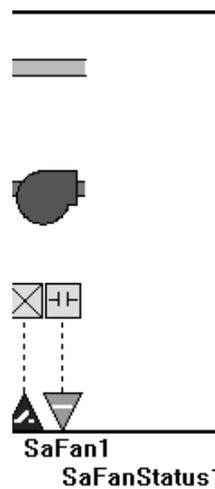
RESULT: The SaFanDev window displays with four choices, Control with Status, Control Only, Status Only, and No Control or Status.

4. Double-click Control with Status.

RESULT: A diagram of the fan displays in the schematic work space. Examples:



The triangles represent points. To see point names, click View, then drop-down item User address. Software displays default names below the triangles:



**Default Point Attributes**

Each point associated with a segment has an associated default file that assigns various types of information to the point. For example, an analog point can have the following defaults:

User Address	sup_fan
CARE type	S
Descriptor number	0
Access attribute	1
Engineering Unit	3
Characteristic number	0
Alarm Text number	0
Low Warning Limit	0
High Warning Limit	100
Low Alarm Limit	0
High Alarm Limit	100
Alarm Delay	360 sec
Suppress Alarm	J
Critical/non-critical alarm	U
Hide Point	No

These default values are accessible via the Data Point Description Editor. This editor provides point dialog boxes that list these default values as well as other values that relate to point operation. The Editors chapter in this manual describes the dialog boxes and how to change the point values.

---

## Segment Deletion

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- Purpose** Modify a plant diagram by deleting equipment segments.
- Procedure**
1. Click segment diagram that you want to delete.  
RESULT: Software frames the segment.
  2. Check whether or not the segment contains points connected to a control loop or switching logic. If there are connected points, first remove the points from the control loop or switching logic. Otherwise, software issues an error message when you try to delete the segment. See Control Strategy or Switching Logic chapter in this manual for procedures.
  3. Click Edit, then drop-down item Delete. Or, press the **Delete** key.  
RESULT: Software displays a message asking for confirmation.
  4. Click **Yes** to continue (or **No** to cancel).  
RESULT: If you clicked **Yes**, software removes the segment from the schematic.
- 

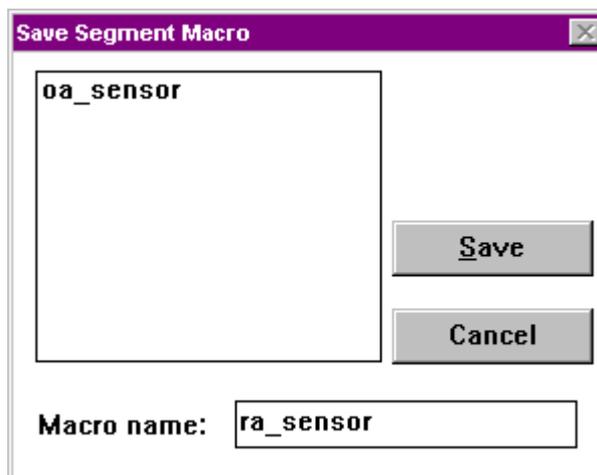
## Macros

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- Purpose** If a segment and its components are used frequently in plant designs, you can save the segment as a macro.
- A macro describes a segment with all specified components, such as sensors, status points, etc. When you use a macro, you do not need to make all the choices that you do when you select a segment from the menu bar. For example, if you add a single-speed supply fan with no volume control and auxiliary contact status to a schematic and then save it as a macro, you can use that macro to quickly add that type of fan to any schematic.
- Each macro is stored under a unique, personalized name. You can recall it repeatedly in multiple plants and projects.
- Stored macros are available independent of selected plant type. For example, you can use segments from a heating plant in air conditioning plants.
- 

### Save a Segment as a Macro

- Procedure**
1. Select the segment to be saved as a macro from the plant schematic.  
RESULT: Software frames the segment.
  2. Click Edit, then drop-down item Save macro. Or, press **F3**.  
RESULT: The Save segment macro dialog box displays.



3. Type a new macro name in the Macro name editing field. The macro name cannot already exist.
4. Click **Save** to save macro and close the dialog box. Or, Click **Cancel** to close the dialog box without saving the macro.

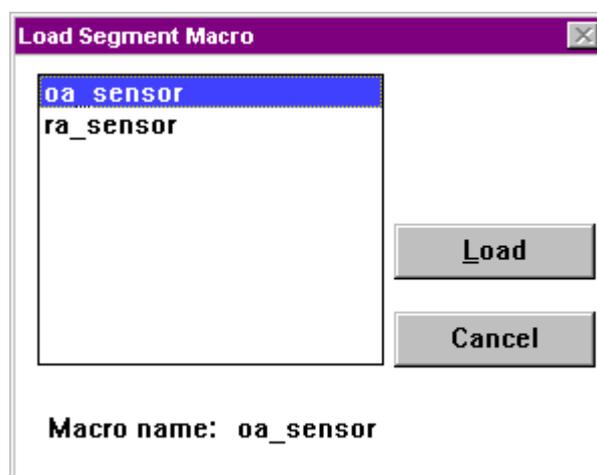
## Load a Macro

You can add or insert a segment, previously stored as a macro, anywhere in a plant schematic.

### Procedure

1. To add the macro segment to the end of the schematic, make sure Insert mode is off (no check mark under Edit menu). To insert the macro segment within the schematic, make sure the Insert mode is on (check mark under Edit menu) and select the segment where you want the macro to appear.
2. Click Edit, then drop-down item Load macro. Or, press **F2**.

RESULT: The Load segment macro dialog box displays.



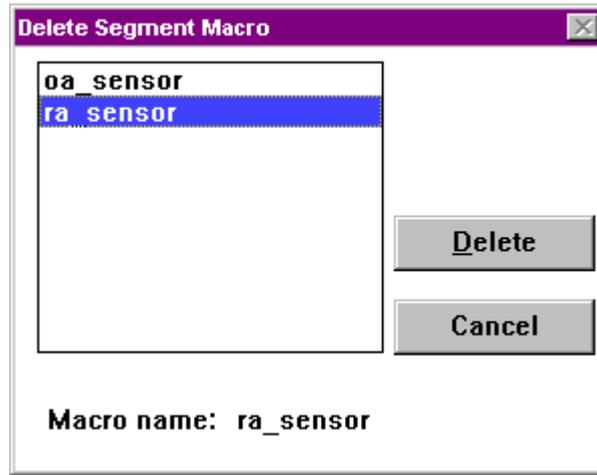
3. Select the desired macro from the existing macros in the list box.
4. Click **Load** to add or insert the segment in the plant schematic and close the dialog box. Or, to close the dialog box without loading the macro, click **Cancel**.

## Delete a Macro From the Library

### Procedure

1. Click Edit, then drop-down item Delete macro. Or, press **F4**.

RESULT: The Delete segment macro dialog box displays.



2. Select the macro to be deleted from the existing macros in the list box.
3. Click **Delete**. Or, click **Cancel** to just close the dialog box without continuing.

RESULT: Software asks whether or not you really want to delete it.

4. Click **OK** to delete the macro and close the dialog box. Or, click **Cancel** to close the dialog box without deleting the macro.

## Physical Point Types

**Definition** Physical points are the plant inputs and outputs from and to controllers.

CARE recognizes various types of physical points. If the type of point preassigned by CARE does not agree with that which exists in the plant, you must modify point type.

In the plant schematic, colored triangles represent the various physical points:

Green	Digital input or totalizer
Red	Analog input
Blue	Digital output (normally open contact)
Violet	Analog output (modulating)

(Light blue triangles represent flex points such as DO\_Feedback\_DI, Pulse\_2, and Multistage. See the Flex Points section for information on creating and modifying these points.)

When you click a triangle to select a point it changes color to black.

If you double-click a triangle, the Datapoint information dialog box displays with point type and user address.

You can modify analog inputs, analog outputs (continuous or three-position output signal), digital inputs, totalizers, and feedback points. The following sections describe the procedure for each type of point.

**Maximums** The maximum number of physical points varies per controller. For example, an Excel 500 can have 128. An Excel 100 can have 36. An Excel 80 can have 24.

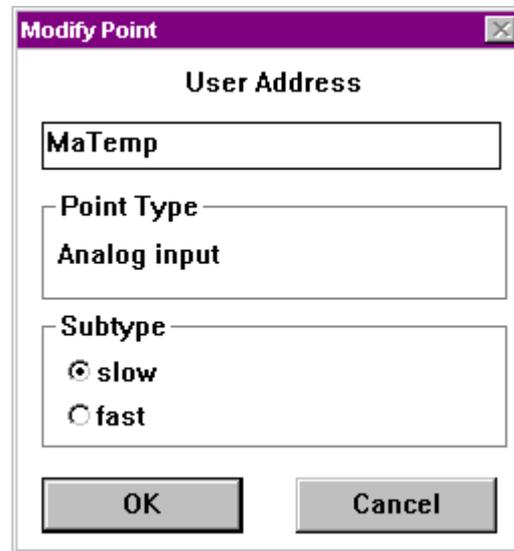
## Analog Inputs

If an analog input must have either Balco 500 or PT3000 sensors, select the fast subtype and, optionally, change the user address.

**Procedure**

1. Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
2. Select the analog input in the plant schematic by clicking on the red arrow pointing down.

**RESULT:** The arrow head turns black. The Modify point dialog box displays with analog input choices.



3. If desired, you can change user address by typing over the address.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

For a point that requires Balco 500 or PT3000 sensors, select Subtype fast.

For other sensor types, select Subtype slow.

See the Analog Input Characteristics note for differences between the slow and fast subtypes.

4. Click **OK** to save changes. Or, to close the dialog box without changing the point, click **Cancel**.

**RESULT:** The arrow head remains black until you select another arrow head.

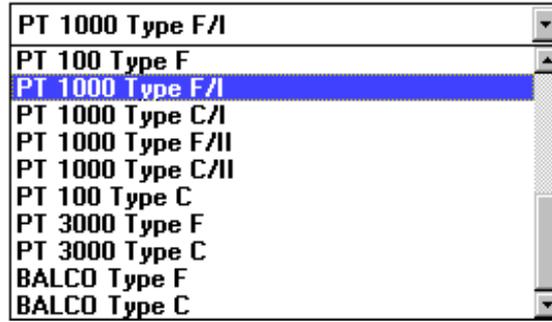
**Board Types**

CARE assigns slow analog inputs to XF521A and XFL521 boards respectively and fast analog inputs to XF526 Boards. Excel 80 and Excel 100 controllers can use only slow analog inputs.

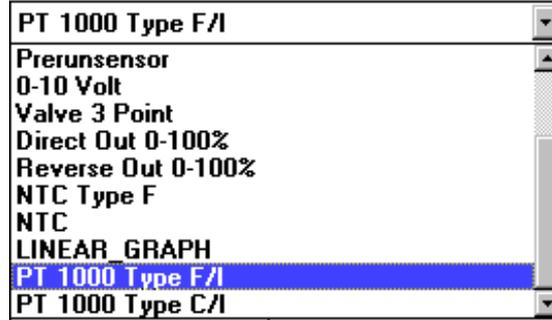
**Analog Input Characteristics**

Each analog input point has an associated set of characteristics. These characteristics describe the action of the associated sensor. When you select a Subtype, software changes the types of characteristics available to the point. You select the characteristics when you use the Data Point Description Editor to modify point attributes (see the Editors chapter).

The fast subtype can have the following types of characteristics:



The slow subtype can have the following types of characteristics:



Descriptions of these characteristics follow.

Pressure 0-3"	0 to 3"	2 to 10V
2-10V=0-100%	0 to 100%	2 to 10V
Pressure ±0.25"	-0.25" to 0.25"	2 to 10V
Pressure 0-5"	0 to 5"	2 to 10V
Linear Input	0 to 100%	0 to 10V
Direct Out 0-100%	0 to 100%	2 to 10V
Reverse Out 0-100%	0 to 100%	10 to 2V
NTC Type F	-58.0 to 302.0F	20k ohm thermistor
	Negative temperature coefficient degrees F	
NTC	-50.0 to 150.0C	20k ohm thermistor
	Negative temperature coefficient degrees C	
LINEAR_GRAPH	0 to 100%	0 to 10V
PT1000 Type F/I	-58.0 to 302.0F	Platinum 1000 ohms
PT1000 Type C/I	-50.0 to 150.0C	Platinum 1000 ohms
PT1000 Type F/II	32 to 752.0F	Platinum 1000 ohms
PT1000 Type C/II	0.0 to 400.0C	Platinum 1000 ohms
PT100 Type F	-58.0 to 302.0F	Platinum 100 ohms
PT100 Type C	-50.0 to 150.0C	Platinum 100 ohms
PT3000 Type F	-58.0 to 302.0F	Platinum 3000 ohms
PT3000 Type C	-50.0 to 150.0C	Platinum 3000 ohms
BALCO Type F	-58.0 to 302.0F	Balco 500 ohms
BALCO Type C	-50.0 to 150.0C	Balco 500 ohms

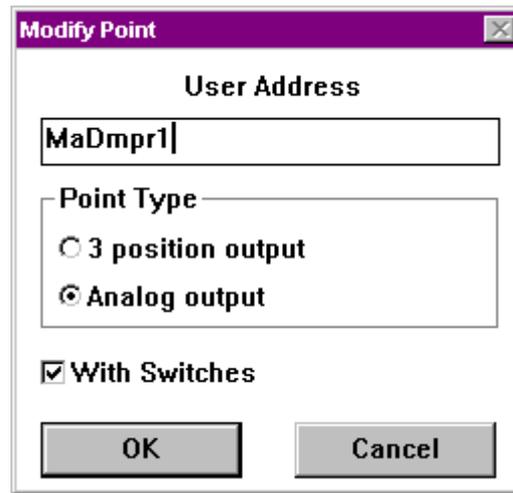
## Analog Outputs

If an analog output is to control an actuator in the plant, determine whether the analog output should be a continuous or three position signal.

### Procedure

1. Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
2. Select the analog output in the plant schematic by clicking on the violet arrow pointing up.

**RESULT:** The arrow head turns black. The Modify point dialog box displays with analog output choices.



3. If desired, you can change user address by typing over the address.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

For a continuous output signal, click Analog output.

For a three-position output signal, click 3 position output.

The With Switches check box indicates whether or not the analog output is on a board with switches:

- If the analog output is on an XF522 with switches, the check box should have a checkmark.
- If the analog output is on an XF527 board without switches, the check box should be empty.

The XF522 board is a multipurpose board that has eight outputs (five with switches and three without). When you select “With Switches”, software specifies an XF522 board. When you disable “With Switches”, software specifies an XF527 board. The XF527 board has eight outputs, all without switches.

An exception to this action is when a combination of with and without switches is required. CARE then uses the XF522 board and places the “with switch” outputs on the first five and the “without switch” outputs on the last three.

When the target hardware for the plant is DIO, CARE assigns any kind of analog output to an XFL522 board with switches.

Excel 80 and Excel 100 Controllers do not support “With Switches”.

Click the check box to change it from checked to blank and vice versa.

4. Click **OK** to save changes.

RESULT: The arrow head remains black until you select another arrow head.

**Excel 20 External 3-Pos Outputs**

During creation of the application it must be assured that the created board addresses of CARE match the Excel 20 hardware. XL20 requires:

Point Type	Board Type	Board Technical Address
AI	XF521A	1
AO *)	XF522A	2
DI	XF523A	3
DO	XF524A	4
external 3-position *)	XF522A	2

\*) If an external 3-position output has to be used, it must reside on the AO board.

CARE creates the following configuration automatically during attach:

Point Type	Board Type	Board Technical Address
AI	XF521A	1
AO	XF522A	2
DI	XF523A	3
DO	XF524A	4
external 3-position	XF525A	5

In case a three-position output is included in your application and therefore the terminations created by the CARE attach do not match the XL20 hardware, use the terminal assignment function.

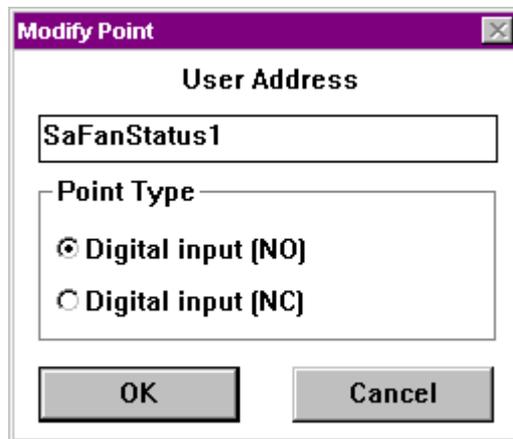
- Procedure**
1. Drag the 3 position user addresses from the XF525 board to any free locations on the XF522 board. It is mandatory that all 3-position points are swapped to the analog board, to empty the XF525 board.
  2. Click on the XF525 board, which is empty now with the right mouse button. Select "Delete" from the context menu in order to delete the module.
  3. Translate the controller.

### Digital Inputs

Digital inputs can be normally open or normally closed. The default is normally open. Use the following procedure to change it.

- Procedure**
1. Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
  2. Select the digital input in the plant schematic by clicking on the green arrow pointing down.

RESULT: The Modify point dialog box displays with digital input choices.



3. If desired, you can change user address by typing over the address.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

If the switch is normally open, click Digital input (NO).

If the switch is normally closed, click Digital input (NC).

- Click **OK** to save changes. Or, to close the dialog box without changing the point, click **Cancel**.

RESULT: The arrowhead remains black until you select another arrowhead.

**Board Types** CARE assigns digital inputs to XF523 and XFL523 boards respectively.

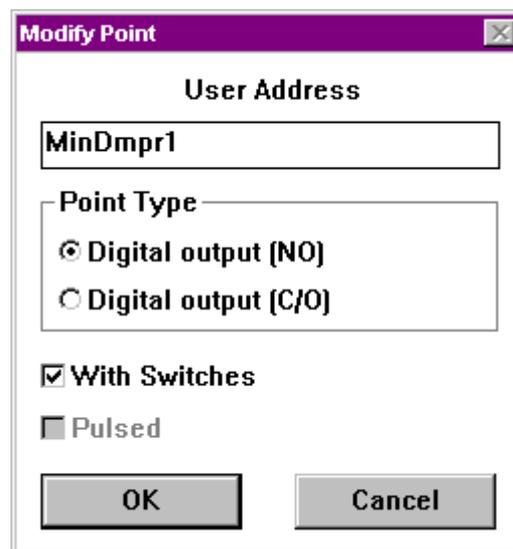
## Digital Outputs

Digital outputs can be normally open or changeover. The default is normally open. Use the following procedure to change it.

### Procedure

- Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
- Select the digital output in the plant schematic by clicking on the blue arrow pointing up.

RESULT: The Modify point dialog box displays with digital output choices.



- If desired, you can change user address by typing over the address.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

If the switch is normally open, click Digital output (NO).

If the switch is changeover, click Digital output (C/O).

The With Switches check box indicates whether or not the digital output is on a board with switches:

- If the digital output is on an XF524 A, the check box is checked.
- If the digital output is on an XF529 board without switches, the check box should be unchecked.

The XF524 board is a multipurpose board that has six outputs (five with switches and one without). When you select "With Switches", software specifies an XF524 board. When you disable "With Switches", software specifies an XF529 board. The XF529 board has six outputs, all without switches.

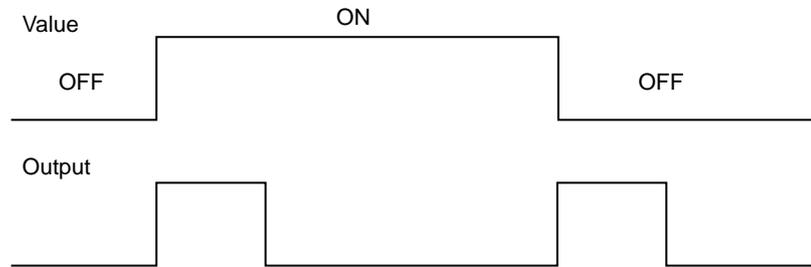
An exception to this action is when a combination of with and without switches is required. CARE then uses the XF524 board and places the "with switch" outputs on the first five and the "without switch" outputs on the last one.

When the target hardware for the plant is DIO, CARE assigns any kind of digital output to an XFL54 board with switches

Excel 80 and Excel 100 Controllers do not support "With Switches".

Click the check box to change it from checked to blank and vice versa.

The Pulsed check box indicates whether or not the output is a momentary output. The duration of the output can be from 1 to 255 seconds. The following diagram illustrates pulse action:



Click the check box to change it from checked to blank and vice versa.

NOTE: Do not select Pulsed if you select With Switches.

You can set the duration of the output later using the Data Point Description Editor described in the Editors chapter.

4. Click **OK** to save changes.

**Plant Attachment**

During plant attachment, CARE software assigns controller I/O terminations according to preset rules. The digital IP output module XF524 has six outputs (five normally closed, one normally open). The five normally closed (C/O) points have five associated override switches. The digital DIO output module XFL524 has six switches on its manual override module XFR524 to independently switch each of the digital outputs OFF (0) or ON (1) or Automatic, which causes the channel to operate normally.

To have a manual override switch on a particular digital output, use this Modify Digital Outputs function to modify the output point from normally open to normally closed.

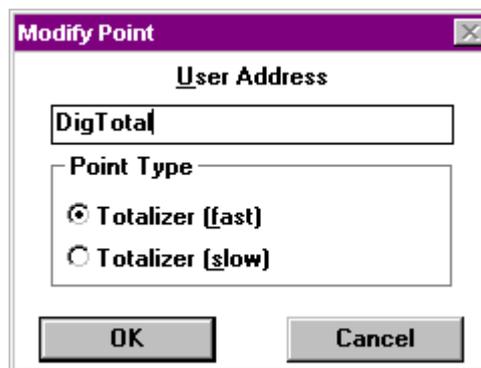
**Totalizers**

Totalizer points can be fast or slow. The default is fast. Use the following procedure to change it.

**Procedure**

1. Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
2. Select the totalizer in the plant schematic by clicking on the green arrow pointing down.

RESULT: The Modify point dialog box displays with totalizer choices.



3. If desired, you can change user address by typing over the address.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

If the totalizer is slow, click Totalizer (slow).

If the totalizer is fast, click Totalizer (fast) (or leave as is).

4. Click **OK** to save changes. Or, to close the dialog box without changing the point, click **Cancel**.

RESULT: The arrowhead remains black until you select another arrowhead.

## Feedback Points

Digital outputs can have feedback points as follows:

- Three extra user addresses via digital inputs
- Two extra user addresses via digital outputs

You can use the digital inputs to define feedback signals such as “Burner 1 switched on”.

You can use the digital outputs to connect alarm devices such as a horn or bell.

### **IMPORTANT**

*There are no physical or software connections to the digital output point, that is, no correlation.*

You need to establish an extra user address for each additional feedback point.

### **Procedure**

1. Click Edit, then drop-down item Feedback point. Or, press **F9**.
2. Select the digital output to be modified from the plant schematic by clicking on the blue arrow pointing up. The point selected must have a graphic.

RESULT: The Create/Edit extra point(s) dialog box displays.

**Create/Edit Extra Point(s)**

User Address : MinDmpr1

Point type : Digital output (NO)

**Digital input**

<input checked="" type="checkbox"/> 1	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 3
<input checked="" type="radio"/> NC	<input checked="" type="radio"/> NC	<input checked="" type="radio"/> NC
<input type="radio"/> NO	<input type="radio"/> NO	<input type="radio"/> NO

**Digital output**

<input type="checkbox"/> 4	<input type="checkbox"/> 5
<input checked="" type="radio"/> N/Open	<input checked="" type="radio"/> N/Open
<input checked="" type="radio"/> C/Over	<input checked="" type="radio"/> C/Over

Extra address 1 : feedback01

Extra address 2 :

Extra address 3 :

Extra address 4 :

Extra address 5 :

OK Cancel

- Click a digital input or output check box to add it as a feedback point.

The Digital Input field allows you to select one, two, or three inputs and indicate the type of contacts through which the feedback point connects, either C/O (normally closed contacts) or NO (normally open contacts).

The Digital Output field allows you to select one or two outputs and indicate the type of contacts through which the feedback point connects, N/Open (normally open contacts) or C/Over (changeover contacts).

**RESULT:** A checkmark appears in the check box for the selected point.

To reset a check box selected in error, click the check box again (to remove the checkmark).

- Click the appropriate switching status for the selected point (C/O, NO, N/Open, or C/Over).
- Click the corresponding Extra address field to select it and type in a user address for the point. Extra address fields are not selectable until you select a digital input or output.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

- Repeat Steps 3 through 5 until you are through selecting all desired inputs and outputs.
- Click **OK** to save changes and close the dialog box.

## Extra User Addresses Display

The extra user addresses do not display on the plant schematic. To view them, double-click the digital output point triangle. The Datapoint information dialog box displays with point type and user address for each point.

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## Flex Points

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**Purpose** Flex points represent one or more physical points. They can command and/or display associated physical points and their values via an operator terminal. Flex point types include Pulse\_2, Multistage, and DO\_Feedback\_DI.

To add flex points to a schematic, use the Point without graphic function under the Edit menu. The Create/View point(s) without graphic dialog box includes the three flex point types. Select desired type(s) and create as many as needed.

In some plant types, there is also a POINTS segment that allows you to create flex point types in the same way as you create schematic segments.

After you add flex points to the schematic, you may want to change the defaults for the points. The following sections describe each type of flex point, lists its defaults, and describes how to change them.

---

### DO\_Feedback\_DI Points

**Purpose** With DO\_Feedback\_DI points, one user address (the DO\_Feedback\_DI point, a pseudopoint) can control up to three digital outputs with up to three digital inputs (all six points are physical points). The digital inputs register the feedback of the outputs 1 through 3 (Stages). The point assignments in CARE are permanent. The digital output points are normally open (N.O.) and are only assigned to boards without switches (for example, XI529).

For example, you can implement a three-stage switch using the following digital outputs:

Status	DO1	DO2	DO3
0	0	0	0
1	1	0	0
2	0	1	0
3	0	0	1

You can define the attributes of these points later using the Data Point Description Editor described in the Editors chapter. The point type for these points in the Editor is "Flex".

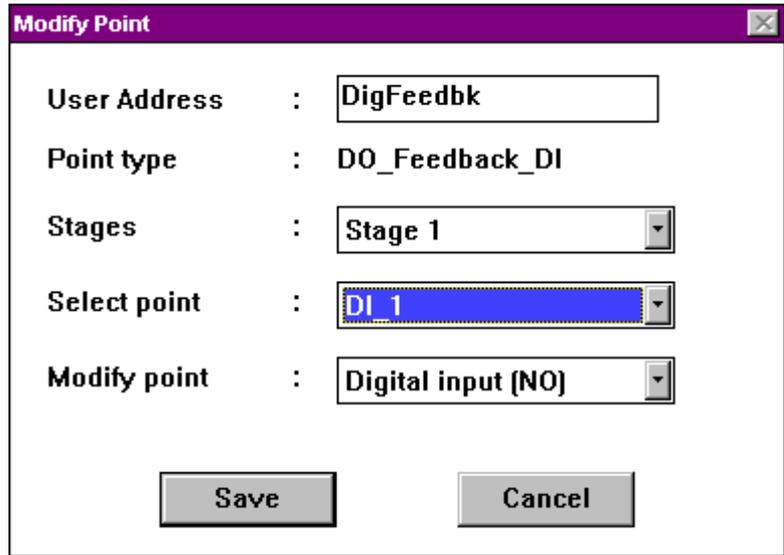
**Deviation** If a deviation occurs between the digital output and its associated digital input, then the controller software will switch down this point type until a "non-alarm" state is reached. In extreme cases and if the flex point has just 1 stage, it may be switched to the off position.

**Defaults** The default for these points is three stages with digital inputs that are normally open. To change the number of stages or the normally open default, use the following procedure.

**Procedure**

1. Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
2. Select the DO\_Feedback\_DI point in the plant schematic by clicking on the light blue arrow pointing up.

RESULT: The Modify point dialog box displays.



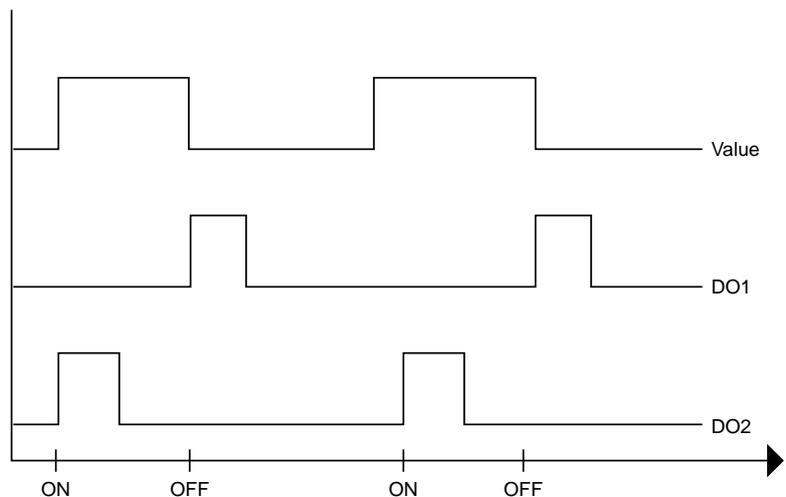
3. Click the down arrow in the Stages box to display the three choices. Click desired number of stages. Software assigns 1, 2, or 3 digital inputs and outputs according to the number of stages you select.
4. To modify a digital input point from normally open to normally closed or vice versa, click the down arrow in the Select point box to display point choices. Click the name of the desired digital input point. Then click the down arrow in the Modify point box to display the normally open/normally closed choices. Click desired choice to select it.

If the Modify point text and box are gray, the Select point box has a digital output point selected. You must select a digital input point to enable the Modify point option.

5. Click **Save** to save changes, then click **Cancel** to close the dialog box. To close the dialog box without changing the point, just click **Cancel**.

### Pulse\_2 Points

**Purpose** Pulse\_2 points use two terminals with one user address (the Pulse\_2 point) that has momentary outputs. The digital output points are normally open (N.O.) and are only assigned to boards without switches (for example, X1529). The following diagram shows output action:



One pulse is generated per point status change (positive edge triggered). A transition of 0 to 1 sets the pulse on DO2. A transition of 1 to 0 sets the pulse on DO1.

A change of state of the value can retrigger all outputs.

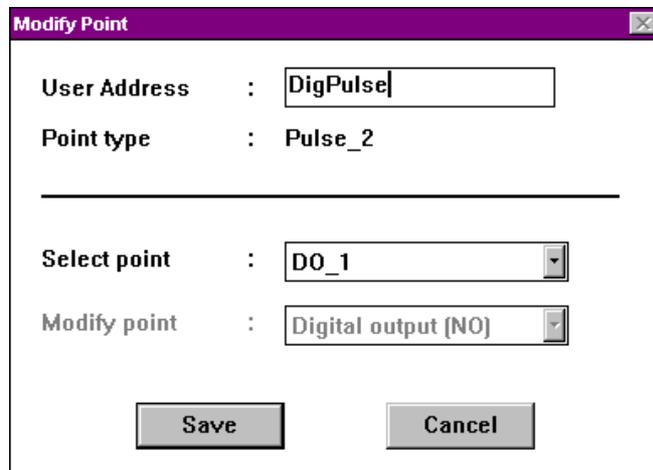
You can define the attributes of these points later using the Data Point Description Editor described in the Editors chapter. The point type for these points in the Editor is "Flex".

**Defaults** The default for these points is two normally open digital outputs. You cannot change this selection. However, to see the user address for these points, you can display the Modify Point dialog box. The following procedure describes how to do that.

The Pulse Duration default is one second. To modify the pulse duration, use the Data Point Description Editor described in the Editors chapter.

- Procedure**
1. Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
  2. Select the Pulse\_2 point in the plant schematic by clicking on the light blue arrow pointing up.

RESULT: The Modify point dialog box displays.



3. Click the down arrow for the Select point drop-down list box to see the user address of the other point..
4. Click **Save** to save changes, then click **Cancel** to close the dialog box. To close the dialog box without changing the point, just click **Cancel**.

## Multistage Points

**Purpose** With Multistage points, one user address (the Multistage point, a pseudopoint) can control up to six outputs (all six points are physical points). CARE positions all physical points on the same hardware module and numbers them sequentially one after the other. Multistage outputs can only be normally open (N.O.) and are only assigned to boards without switches (for example, XI529).

Stage operation is:

Value	Status of Stages					
0	0	0	0	0	0	0
1	1	0	0	0	0	0
2	1	1	0	0	0	0
3	1	1	1	0	0	0
4	1	1	1	1	0	0
5	1	1	1	1	1	0

6 1 1 1 1 1 1

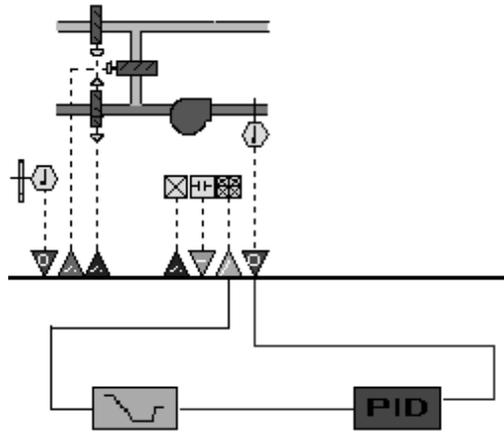
You can define the attributes of these points later using the Data Point Description Editor described in the Editors chapter. The point type for these points in the Editor is "Flex".

**Hysteresis**

For each analog command value of 0.0 through 6.0, there is a hysteresis value of 0.4. The following table lists ranges for each value:

Input Range Switching Up	Displayed Value	Input Range Switching Down
0.00-0.699	0	0-0.299
.7-1.699	1	.3-1.299
1.7-2.699	2	1.3-2.299
2.7-3.699	3	2.3-3.299
3.7-4.699	4	3.3-4.299
4.7-5.699	5	4.3-5.299
5.7-higher	6	5.3-higher

Example:



There is no logic to prohibit the multistaged operator from being driven from one end to the other. You may want to add a Ramp operator during the Control Strategy process to prevent this action.

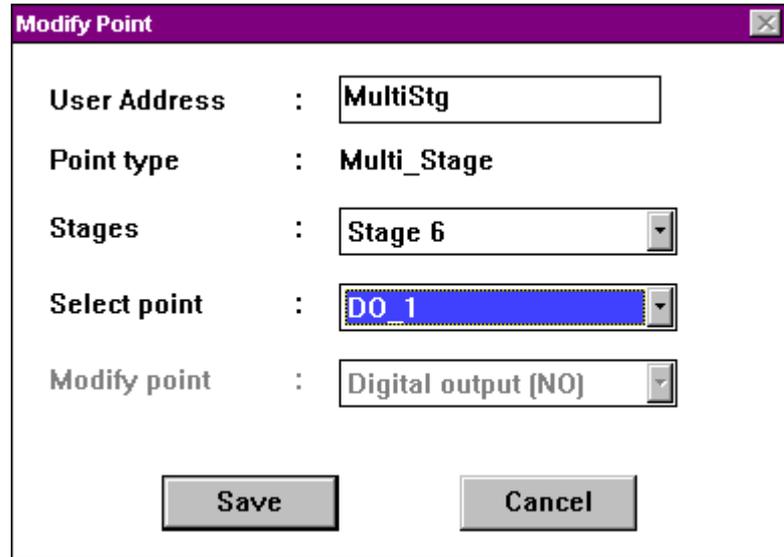
**Defaults**

The default for these points is six output points. To change the number of output points, use the following procedure.

**Procedure**

1. Click Edit, then drop-down item Modify hardware point. Or, press **F5**.
2. Select the Multistage point in the plant schematic by clicking on the light blue arrow pointing up.

RESULT: The Modify point dialog box displays.



3. Click the down arrow in the Stages box to display the six choices. Click desired number of stages. Software assigns the corresponding number of outputs according to the number of stages you select.

4. To display the names of the output points, click the down arrow in the Select point box.

The Modify point text and box are always gray because the Multistage points are always N.O. output points.

5. Click **Save** to save changes, then click **Cancel** to close the dialog box. To close the dialog box without changing the point, just click **Cancel**.

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## User Address Changes

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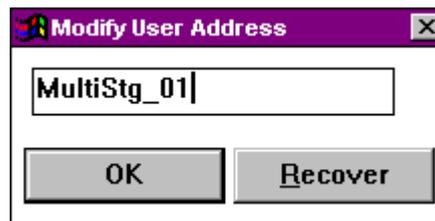
**Definition** CARE preassigns default user addresses to all points. You can change these user addresses, if desired.

You use the user addresses when creating the control strategy and switching logic.

You may want to change user addresses to provide for easier wild card searches at operator terminals such as the Excel Building Supervisor operator terminal. Wild card searches separate upper and lower case letters alphabetically, for example, AHU1 and ahu1 do not sort the same.

- Procedure**
1. Select the point to be modified from the plant schematic.  
**RESULT:** The point triangle changes color to black.
  2. Click Edit, then drop-down item Modify user address. Or, press **F7**.

**RESULT:** The Modify user address dialog box displays showing the current address.



3. To enter a new user address, click the current address and type a new address. To just add to the current address, click behind the current address to place the cursor at the end of the address, and type new letters. To just change part of the current address, highlight that part and type new letters.

To "highlight" letters, click just in front of the first letter you want to highlight, hold down the mouse button, and drag the cursor over all the letters you want to highlight ("select"). Release the mouse button when all the letters are selected.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

4. Click **OK** to save the address.

If you do not click **OK**, the new address is not saved. You can retrieve the original user address by clicking **Recover**.

**RESULT:** The dialog box remains on display so you can continue changing addresses.

5. To change another user address, select the point on the plant schematic and click the editing field in the dialog box.

**RESULT:** The address for the newly selected point appears in the editing field in the dialog box.

6. Enter the new user address and click **OK**. You can continue changing user addresses in this way.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

If you do not click **OK**, the new address is not saved. You can retrieve the original user address by clicking **Recover**.

7. To end modifications to user addresses, double-click the Ventilator icon in the upper left corner of the dialog box.

Or, click Schematic menu item Edit. Note that a check mark is next to Modify user address to indicate that the function is active. Click Modify user address to remove the check mark and stop the function.

#### Deselecting a Point

To deactivate a point selected in error:

- a. Move the mouse pointer to the point level on the plant schematic or to another point.
- b. Click the mouse button once.

**RESULT:** The point returns to its normal color.

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## Points Without a Graphic

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#### Purpose

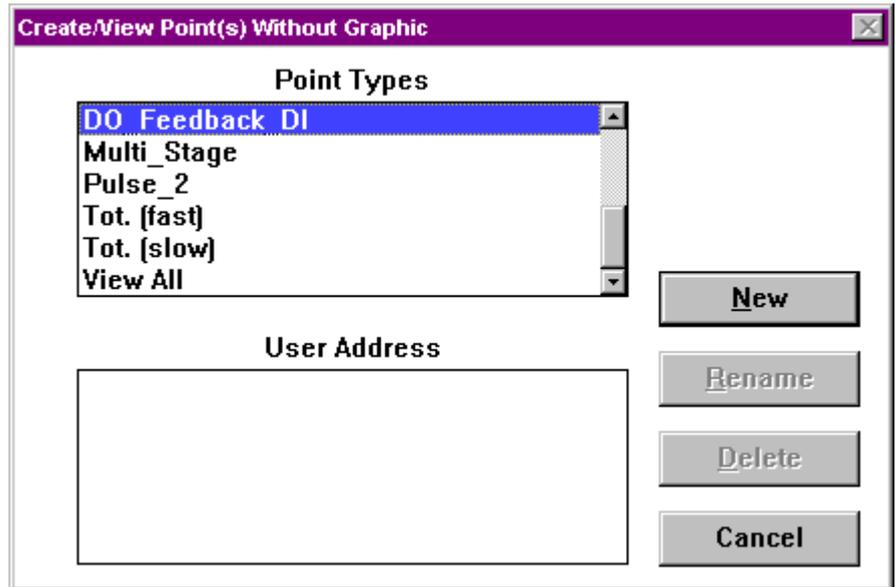
The "Point without graphic" function allows you to add points to a plant schematic even though no segment exists for the point.

A point without a graphic can be an input such as an occupancy sensor or a window switch.

#### Procedure

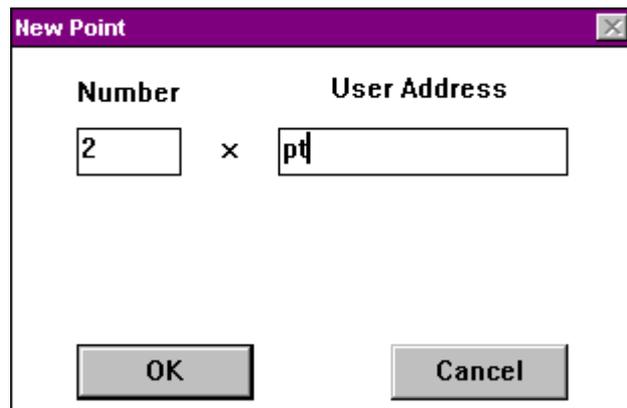
1. Click Edit, then drop-down item Point without graphic. Or, press **F8**.

RESULT: The Create/View point(s) without graphic dialog box displays.



2. Select point type. Click **New**.

RESULT: The New Point dialog box displays.



This dialog box always contains the Number and User Address fields, but it may also display other fields depending on the type of point selected.

3. Enter the number of data points of this type to be established as a "Point without graphic" in the Number editing field. Tab to User address field.
4. Type a user address in the User address editing field. If you are adding more than one point, software automatically numbers the corresponding user addresses sequentially to guarantee unique user addresses. For example, if you enter pt and request two points, software creates two points named pt1 and pt 2. Only use alphabetic characters. Do not use blanks. The user address can be a maximum of 15 characters. Software adds an increment number to the end of the user address you enter. If it creates an address greater than 18 characters, software truncates enough characters at the end of the name to reduce it to 15. For example, if you entered Room\_one\_space\_tmp (18 characters) and wanted to make 20 points, software would create 20 points named Room\_one\_space\_1 (15 characters plus the increment number) through Room\_one\_space\_20.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

If the dialog box contains With Switches and/or Pulsed check boxes, check appropriate choices as described in the following text.

The *With Switches check box* indicates whether or not the digital output is on a board with switches:

- If the digital output is on an XF524 board with hand/off/auto switches, the check box should have a checkmark.
- Otherwise, the check box should be empty.

Click the check box to change it from checked to blank and vice versa.

The *Pulsed check box* indicates whether or not the output is a momentary output. The duration of the output can be from 1 to 255 seconds. The following diagram illustrates pulse action:



Click the check box to change it from checked to blank and vice versa.

NOTE: Do not select Pulsed if you select With Switches.

You can set the duration of the output later using the Data Point Description Editor described in the Editors chapter.

5. Click **OK** to add the point(s) to the end of the plant schematic. Software always adds the points to the end.
6. Click **Cancel** to close the dialog box and return to the schematic.

**Alternative Points** Some plant types have a segment called POINTS that is simply a point. Selecting a POINTS segment allows you to place a point without a graphic anywhere in the schematic, rather than just at the end of the graphic as the Point without graphic function does.

**Point Modification** To change some default values for the points, use the Modify functions available under the Edit menu item. See the Physical Point Types and/or the Flex Points sections for more information about the types of modifications you can make.

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## Plant Information

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**Purpose** Display and check plant information in case you need to make changes before continuing with the next CARE step.

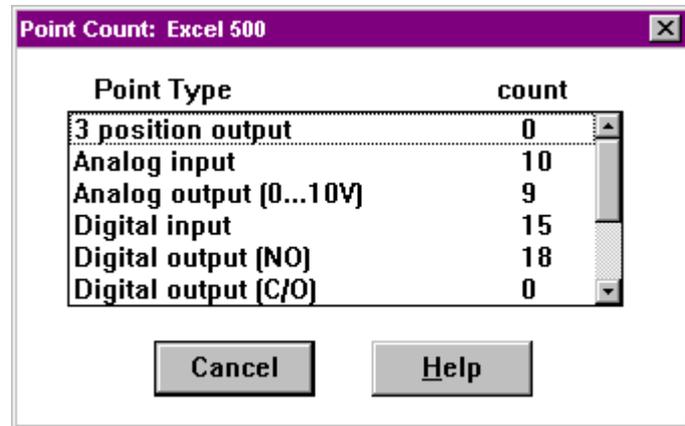
You can generate a point count for the controller, display assigned user addresses, list segment blocks, view additional text, and display controller input/output information.

**Assumption** This step assumes that you have already selected or created a plant and the CARE window has project name, plant name, and plant type as well as a menu bar with the Schematic menu item. See the Plants Definition and Management chapter for procedure.

## Point Count

- Procedure** 1. Click View, then drop-down item Point count.

RESULT: The Point Count window displays with the type of controller in the title, the number of available inputs and outputs as well as the types of inputs and outputs. Example:



2. To close the Point Count window, click **Cancel**.

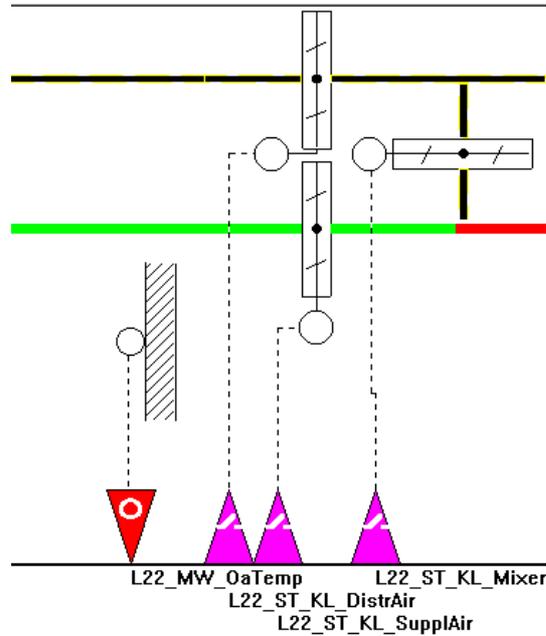
Or, click View again. Note that a check mark appears next to the Point count function to indicate that it is active. Click Point count to remove the check mark and stop the function.

RESULT: The Point Count window closes.

## User Addresses

- Procedure** 1. Click View, then drop-down item User address.

RESULT: The user addresses of the selected plant display under the plant schematic.



The first letter of every user address is just below the plant schematic symbol for the input/output triangle to which the user address belongs.

2. To end this function, click View again. Note that a check mark appears next to the User address function to indicate that it is active. Click User address to remove the check mark and stop the function.

RESULT: The user addresses disappear from the screen.

**Single User Address Display**

If you move the cursor over a triangle and press and hold the left-hand mouse button down, the user address for the point displays. When you release the mouse button, the display disappears.

**Segment Information**

**Purpose** Display the list of components in a selected segment.

- Procedure**
1. Select the required segment from the plant schematic.

RESULT: Software frames the segment.

2. Click View, then drop-down item Segment list.

RESULT: The Segment list dialog box displays below the schematic.



3. To view the list of components for another segment, select the segment in the plant schematic.

4. To end this function, double-click the Ventilator icon in the upper left corner of the window.

Or, click View again. Note that a check mark appears next to the Segment list function to indicate that it is active. Click Segment list to remove the check mark and stop the function.

RESULT: The Segment list dialog box disappears from the screen.

## Extra Text

- Purpose** Display additional information about a selected segment.
- Procedure**
1. Select the required segment from the plant schematic.

RESULT: Software frames the segment.

2. Click View, then drop-down item Extra text.

RESULT: The Extra text dialog box displays below the schematic. For example, in the following dialog box, the extra text specifies the default sensor type.



3. To view additional information for another segment, select the segment in the plant schematic.
4. To end this function, double-click the Ventilator icon in the upper left corner of the window.

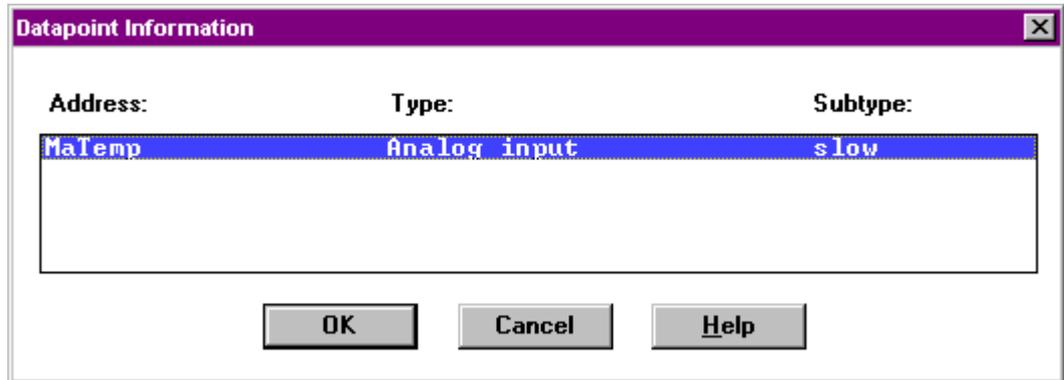
Or, click View again. Note that a check mark appears next to the Extra text function to indicate that it is active. Click Extra text to remove the check mark and stop the function.

RESULT: The extra text disappears from the screen.

## Controller Input/Output Information

- Purpose** Display information about controller inputs and outputs.
- The type of input or output you select displays. All user addresses assigned to these inputs or outputs display.
- Procedure**
1. Double-click desired input or output on the plant schematic.

RESULT: The Datapoint information dialog box displays.



2. Click **OK** or **Cancel** to close the dialog box.

**NOTE:** Later when you set up control strategy and switching logic for the plant, you use this dialog box to specify which user address to tie to a function. The extra addresses for feedback points do not appear on the schematic, so you need this dialog box to find and select them.

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## Schematic Redraws

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**Purpose** Redisplay the plant schematic on the screen so all recent changes appear.

**Procedure** Click Edit, then drop-down item Redraw Schematic. Or, press **F6**.

**RESULT:** Software redraws the plant schematic .

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## Print Plant Schematic

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To print a plant schematic see Print Documentation chapter.

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## Schematic Function Exit

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**Purpose** Close the Schematic function and return to the CARE main window.

**Procedure** Click File, then drop-down item End.

**RESULT:** The main CARE window displays.

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## CONTROL STRATEGY

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<b>Purpose</b>	<p>The control strategy for a plant consists of control loops that monitor the environment and adjust equipment operation to maintain comfort levels. For example, a control loop for an air handling system can turn on a return air fan when discharge air temperature in the return air duct is greater than or equal to 68F (20 °C).</p> <p>Control loops consist of a series of “control icons” that dictate a sequence of events. Control icons provide preprogrammed functions and algorithms to implement sequences of control in a plant schematic. Examples of control icons include a Proportional-Integral-Derivative (PID) function and a Maximize function. Appendix A lists the available control icons. Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) provides complete descriptions and application examples for each control icon.</p>
<b>Control Strategy Capacities</b>	<ul style="list-style-type: none"> <li>• Each plant can have more than one control loop.</li> <li>• Each controller can have a maximum of 128 control icons for all plants attached to the controller. In other words, if there are three plants, the total of control icons used by all three plants cannot exceed 128.</li> <li>• Each controller can have a maximum of 40 PID control icons for all plants attached to the controller. In other words, if there are three plants, the total of PID control icons used by all three plants cannot exceed 40.</li> </ul>
<b>Incomplete Loop Warning</b>	<p>If you exit the Control Strategy function with incomplete control loops, you cannot attach or translate the plant.</p>
<b>Chapter Contents</b>	<p>Control Strategy Window</p> <p>Control Loop Selection (New Control Loops or Existing Control Loops)</p> <p>Control Loop Functions, including:</p> <ul style="list-style-type: none"> <li>• Select and Place a Control Icon</li> <li>• Connect Control Icons to Plant</li> <li>• Connect Two Control Icons</li> <li>• Examples</li> <li>• Delete a Control Icon and Its Connections</li> <li>• Delete a Completed Connection</li> <li>• Delete an Incomplete Connection</li> </ul> <p>Pseudopoints and Flags, including:</p> <ul style="list-style-type: none"> <li>• Create/Assign New Pseudopoints and Flags</li> <li>• Load/Assign Pseudopoints and Flags</li> <li>• Search for Pseudopoints and Flags via Keyboard</li> <li>• Modify Pseudopoint and Flag User Address</li> <li>• Delete Pseudopoints and Flags</li> <li>• Connect a Pseudopoint or Flag to a Control Loop</li> <li>• Change a Pseudopoint or Flag User Address</li> </ul> <p>XFMs, including:</p> <ul style="list-style-type: none"> <li>• Map Software Point to XFM Parameter</li> <li>• Map Software Point to an XFM Internal Datapoint</li> <li>• Create User Address of the Same Name and Map to XFM Internal Datapoint</li> <li>• Unmap Mapped Software Point from an XFM Parameter</li> <li>• Modify XFM Parameter</li> </ul> <p>Plant Information Displays</p> <p>Loop Management Functions, including:</p> <ul style="list-style-type: none"> <li>• Copy a Control Loop</li> <li>• Delete a Control Loop</li> <li>• Check a Control Loop</li> <li>• Print a Control Loop</li> <li>• Control Strategy Exit</li> </ul>

- See Also** ⇒ Getting Started chapter for procedures to start and exit CARE  
Plant Schematics chapter for procedures to create and/or modify a plant schematic  
File Management chapter for procedures to back up and restore plant files

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## Control Strategy Window

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- Purpose** Provide standard control functions for analog points in the plant schematic.
- Assumption** The plant schematic is done.
- Procedure**
1. In the logical plant tree, click on the plant..
  2. Click menu item Plant, then drop-down item Control Strategy. Or click the Control Strategy button in the button bar below the menu bar.
- RESULT:** The control strategy workspace displays. The following example shows the workspace with a control loop that has two PID operators and a Sequence operator connected to physical points and a pseudopoint.



- Title Bar** Plant name (in this case, ahu1) displays in the window title bar. To the right is a pair of brackets where the control loop name appears. The brackets are empty until you select or define a loop (menu item File, drop-down item New or Open).

<b>Menu Bar</b>	<p>The left arrow and View menu items are only available after you define or select a control loop.</p> <p>Left arrow                      Change control icon column to show other control choices.</p> <p>File</p> <p>    New...     Create a new control loop.</p> <p>    Load...     Add an existing control loop to the plant.</p> <p>    Copy...     Copy selected control loop and give it a new name.</p> <p>    Delete...     Delete unnecessary loop.</p> <p>    Check loop...     Verify control loop operation.</p> <p>    Print with Schematic     Output a print of the current control loop with schematic</p> <p>    Print with User Address     Output a print of the current control loop with user addresses.</p> <p>    Exit     Stop control strategy function and return to main window.</p> <p>    Information...     Copyright and program authors.</p> <p>Edit</p> <p>    Modify Pseudo User Address     Change the user address for a selected pseudopoint.</p> <p>    Delete Symbol     Erase the currently selected control icon and all its connections.</p> <p>    Connect Symbol...     Display the icon dialog box for the currently selected symbol.</p> <p>    Symbol Parameters...     Display the parameters dialog box for the currently selected symbol.</p> <p>    Load Software Points...     If pseudopoints are defined in the switching logic chapter for inclusion in the plant control strategy, you must load them into the control strategy. The pseudopoints and Flags section explains how to use this function.</p> <p>    Delete Unused SW Points...     Display the unused software points window for a list of unused software points. You can delete one or more, if desired. See the Unused Software Points note for details.</p> <p>View</p> <p>    Display physical user addresses or pseudopoint user addresses.</p> <p>Help</p> <p>    Display topic list for on-line user guide. The Getting Started chapter describes the help function.</p>
<b>Plant Schematic</b>	This area displays the schematic created via the Schematic function.

**Physical Point Bar** This area displays the physical points required for the schematic.

If you move the cursor over a triangle and press and hold the left-hand mouse button down, the user address for the point displays with either a red exclamation symbol or a green check mark symbol. When you release the mouse button, the display disappears. The red exclamation symbol appears for:

- hardware points with one allowable connection that are used in an XFM
- digital outputs that are connected to a symbol
- flex points that are connected to a symbol
- software points that are connected to an output pin of a symbol.

Once you display a physical address, you must “clear” the display mode before you can display an address in the other point bar. To clear display mode, click the triangle again, but this time with the right-hand mouse button.

If you double-click a triangle, the Datapoint information window displays for the point.

**Work Space** This area is where you place control icons after you select them. You can assign a control icon to each rectangle. You can connect the rectangles to each other, to physical points, and to pseudomonas.

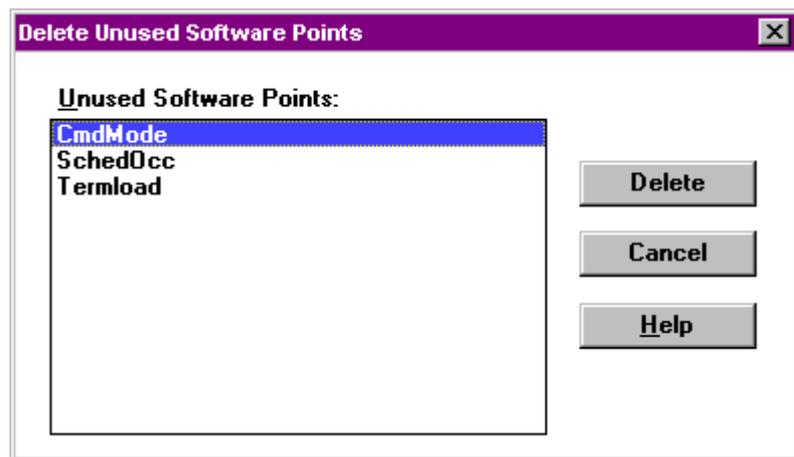
**Softwarepoint Bar** Display abbreviations for pseudopoints related to the control loop. These abbreviations appear after you add a pseudopoint to the control loop.

If you move the cursor over an abbreviation and press and hold the left-hand mouse button down, the user address for the point displays with either a red exclamation symbol or a green check mark symbol. When you release the mouse button, the display disappears.

The red exclamation symbol appears for software points that are connected to an output pin of a symbol.

**Control Icons** Standard control functions available for assignment to the plant schematic. Appendix A lists the available control icons. Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) provides complete descriptions and application examples for each control icon. This section describes how to place and connect them.

**Unused Software Points** To delete unused software points, in other words, points which are not connected to a control strategy symbol in the plant schematic, select menu item Edit, then drop-down item Delete Unused SW Points.. The Delete Unused Software Points dialog box displays with a list of those points and an option to delete them, if desired. For example:



Click the points you want to delete (hold down the **Shift** key while you click to select multiple points). Then click **Delete** for software to delete these unused points. (The **Delete** key is not active until you select at least one point.)

Click **Continue** to close the dialog box. Points that you did not delete remain in the plant. Points assigned to the software bar but not connected become unassigned.

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## Control Loop Selection

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**Purpose** Name a control loop. You must define a name for a loop or select an existing loop before you can select any control icons.

There are two ways to name a loop. You can name a new loop and begin from scratch. Or, you can load an existing control loop and modify as required.

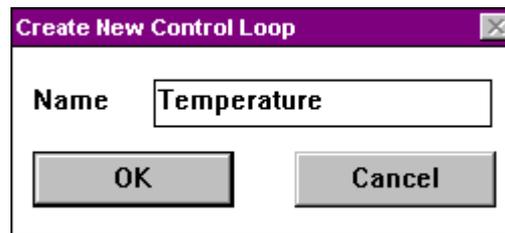
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### New Control Loops

**Purpose** Name a new control sequence for the selected plant.

**Procedure**

1. Click File, then drop-down item New.  
RESULT: The Create new control loop dialog box displays.



2. Type a new control loop name in the Name editing field.
3. Click **OK**.  
Or, to close the dialog box without creating a loop, click **Cancel**.

RESULT: The control loop name displays, in brackets, next to the plant name on the window title. You can now select the control icons down the left hand window border. The Control Loops section provides procedures.

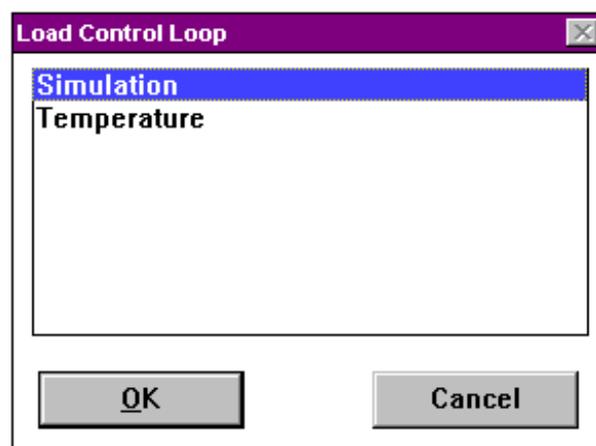
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### Existing Control Loops

**Purpose** Use an existing control loop to speed creation of control functions for a plant.

**Procedure**

1. Click File, then drop-down item Load.  
RESULT: The Load control loop dialog box displays.



2. Select the control loop to be modified from the list of existing control loops.

**3. Click OK.**

Or, to not load the loop, click **Cancel**.

**RESULT:** The control loop name displays to the right of the plant name on the window title bar. The loop icons display in the work space. You can now modify the control loop as required. The next section, Control Loop Functions, provides procedures.

## Control Loop Functions

**Purpose** Build or modify a control loop by adding and deleting control icons and connecting them together and with physical points and pseudopoints.

This section contains the following procedures:

- Select and Place a Control Icon
- Connect Control Icons to the Plant
- Connect Two Control Icons
- Examples (sample control loops with clear and confusing connections)
- Delete a Control Icon and its Connections
- Delete a Completed Connection
- Delete an Incomplete Connection

### Select and Place a Control Icon

**Procedure** 1. Click a control icon symbol in the icon column.

**RESULT:** The mouse cursor assumes the shape of the control icon.

**Tip** ⇒ If you do not see the required control icon in the icon column, click the left arrow, ←, in the menu bar. The column changes to show other available icons.

2. Click a free rectangle in the control strategy work space to place the control icon in the rectangle. See the Examples section for guidelines.

**RESULT:** Software places the symbol in the rectangle and changes its color to red. It also places a thick gray bar around it to indicate it is the currently selected icon.

Software may then display a dialog box that asks for “internal parameter” information relevant to the control icon. For example, the PID icon asks for proportional band, derivative time, integral action, minimum output, and maximum output.

**Tip** ⇒ To cancel selection of an icon that you have not yet placed, click the right-hand mouse button.

3. If an internal parameters dialog box displays, type or select information as required. Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) provides complete descriptions and application examples for each control icon.

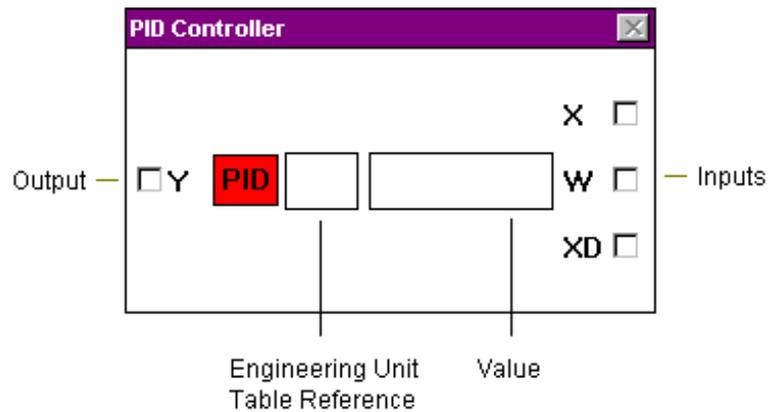
Click **OK** to save the information and close the dialog box.

Or, click **Cancel** to close the dialog box without saving the information.

**Tip** ⇒ To redisplay an internal parameters dialog box, click the right-hand mouse button when the cursor is over the desired icon. Or, click menu item Edit, drop-down item Symbol parameters. The parameters dialog box displays for the currently selected icon (a gray box surrounds a selected icon).

4. Connect the icon to required inputs and outputs. Double-click the icon (left-hand mouse button) to display an input/output dialog box that requests required variables. The dialog box always shows output variables on the left, the control icon in red, and input variables on the right.

For example, the PID icon displays the following dialog box:



The Y, X, and W variables need connection to either physical points, pseudopoints, and/or other control icons. Variables on the left (Y in this case) are outputs. Variables on the right (X and W in this case) are inputs. The PID description in Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) defines the type of connection that is valid for each variable.

The two blank rectangles in the dialog box are editing fields where you can enter values to replace the physical connections. For example, in the PID dialog box, you can type an engineering unit table reference and value for the W variable, instead of connecting W to a point or control icon. For engineering unit, enter the corresponding index number. Appendix B lists engineering units and their index numbers.

If a variable does not have editing fields next to it, you cannot type values for a connection; you must connect to another icon or a point.

The following sections describe how to connect the variables.

## Connect Control Icons to Plant

**Purpose** Make connections between control icons and the plant.

You can connect control icons to:

- Physical points (each physical output point can connect to only one icon)
- Pseudopoints
- Flags
- Other control icons

See the Pseudopoints and Flags section for procedures to create and load pseudopoints and flags. The section also defines these items.

**Procedure** The steps required depend on the type of control icon you select. Each type has a different set of inputs and outputs. Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) describes the requirements for each icon.

The following steps summarize typical operations that connect an icon to a plant via points.

1. Select and place desired control icons in the control strategy work space. See the previous section, Select and Place Control Icons, for procedure and tips.

RESULT: Icon symbols in the work space are red to indicate that they do not yet have connections to required inputs and outputs. A thick gray box surrounds the currently selected icon.

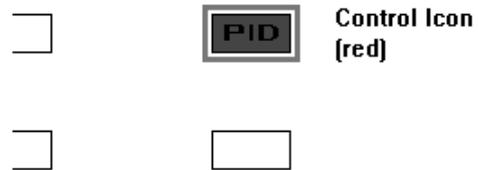
- Click the arrow head of a point that is either an input to or output from one of the control icons.

NOTE: Each physical output point can connect to only one icon.

**Feedback Points**

If the schematic has feedback points that you want to connect to control icons, *double-click* the digital output point to access these hidden points and their user addresses.

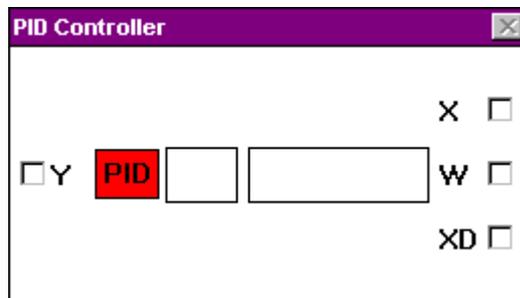
RESULT: The arrow head turns black.



- Double-click the desired control icon in the work space. Or, if the desired control icon is the currently selected icon (a gray box surrounds it), click menu item Edit, then drop-down item Connect symbol.

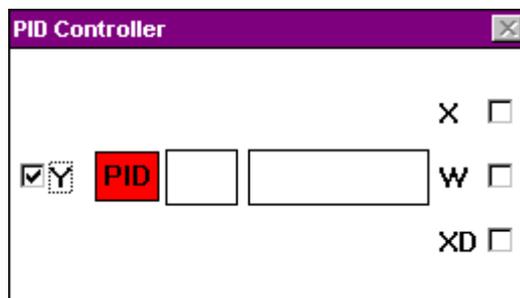
RESULT: The control icon input/output dialog box that lists requirements for inputs and outputs displays.

For example, the PID dialog box prompts for Y, X, and W:



- Click the input/output type that corresponds to the point you selected.

RESULT: A check mark appears in the check box to indicate its selection. For example, if you click the Y variable in the PID dialog box:

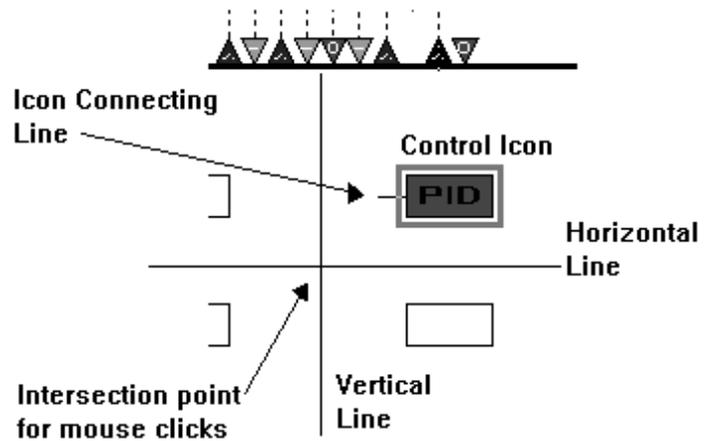


**No checkmark** If a checkmark does not appear, you do not have the appropriate point type for the variable. Close the dialog box and select a different point.

**Tip** ⇒ To close the dialog box without selecting a variable, click the icon symbol in the dialog box.

5. Click the control icon symbol *in the dialog box*.

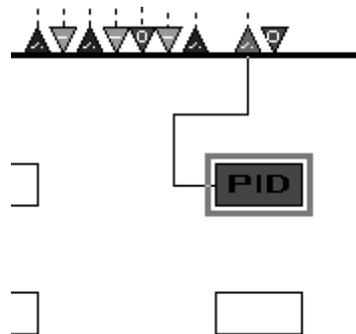
- RESULT:
- a. The dialog box closes.
  - b. The active control icon changes color to dark blue.
  - c. Software adds a short connecting line next to the icon on the left (outputs are always on the left).
  - d. Two lines appear in the work space. One line is vertical; one is horizontal. Where they intersect each other is the focus point for mouse clicks. You can move these lines by moving the mouse:
    - When you move the mouse left or right, the vertical line moves left or right.
    - When you move the mouse up or down, the horizontal line moves up or down.



If these actions do not occur, the point you selected was not appropriate for the variable you selected in the icon dialog box. Select a different point arrow head or double-click the icon again and select a different variable.

6. Move and click the intersection point to create connecting lines. See the Routing Connecting Lines note for details. Move the intersection point over the point arrow head until a cross, +, appears. Click the left-hand mouse button to complete the connection.

RESULT: Software connects the point and icon. (If it doesn't, see the No Connection note following this procedure.)



- Routing Connecting Lines**
7. Repeat this sequence with the other inputs and outputs the control icon requires.
- RESULT:** After all connections are done, the control icon changes color to light blue to indicate that the loop is completely connected.
- Connecting lines sometimes pass through other control icons or cross other connecting lines. This may make the control strategy confusing.
- To route connecting lines around icons:
- Move the intersection point to just before an icon and click.
- RESULT:** Software creates a line just that long.
- Move the intersection down below the icon and click again.
- RESULT:** Software creates another connecting line.
- Move the intersection point past the icon and click again to create another short line.
- Every time you click, software creates a line. By moving the intersection point around other icons and clicking at the angles, you can avoid crossing other icons and lines.
- Also see the Examples section for more tips on creating connections.
- No Connection**
- If you click new points before software has a chance to create a connecting line, software may not be able to make the final connection when you reach the point arrow head. To prevent this, wait after you click until a gray-colored line appears. Then, move the intersection point to another point and click.
- Also, make sure you line up the intersecting line and the last red line before you click again. Otherwise, software cannot create the next line.
- If you are in a situation where software is not making the final connection, delete all lines that you made for this connection and start over again.
- No Diagonals**
- Connections can only run vertically or horizontally. They cannot run diagonally.

---

## Connect Two Control Icons

- Purpose** Connect several control icons together so that the output from one icon is an input to the second.
- Procedure**
- Select the first control icon and place it in the work space.
  - Select a second control icon and place it in the work space.
  - Double-click each icon, in turn, from left to right, to display their input/output dialog boxes.
  - Select a variable from each box. One variable should be an output; the other, an input.
  - Click the icon symbol *in the dialog box* on the left to close both dialog boxes.
- RESULT:** The icon on the left displays with a short connecting line. The intersection lines display.
- Move the intersection point over the left edge of the icon on the right.
  - Click to make the connection.
- Example**
- To connect the output of an Add icon with one of the PID controller inputs:
- Place the PID controller icon in the work space.

2. Place the Add icon in the work space to the right of the PID controller icon.

3. Double-click the PID controller icon.

RESULT: The PID controller icon input/output dialog box displays.

4. Double-click the Add icon.

RESULT: The Add icon dialog box displays.

5. Click the Y check box in the Add icon dialog box.

RESULT: A check mark appears in the check box.

6. Click the X check box in the PID controller dialog box.

RESULT: A check mark appears in the check box.

7. Click the red PID controller icon in the PID controller dialog box.

RESULT: Both dialog boxes close. Both icons in the work space turn dark blue. A short connecting line appears on the right side of the PID icon. The intersection lines appear in the work space.

8. Place the intersection point on the Add icon. Move the mouse so the horizontal line overlaps the short connecting line from the PID icon.

9. Click to complete the connection.

RESULT: Both control icons turn red and a line connects the two icons.

#### Dialog Box Closing

In general, dialog boxes close when you select the icon symbol *in the dialog box* on the left.

#### Multiple Inputs

An output from a control icon can connect to many inputs of other control icons. For example, continually click the YD check box of the digital output until it turns gray. Make the connection as described in this procedure.

## Examples

#### Placement Tips

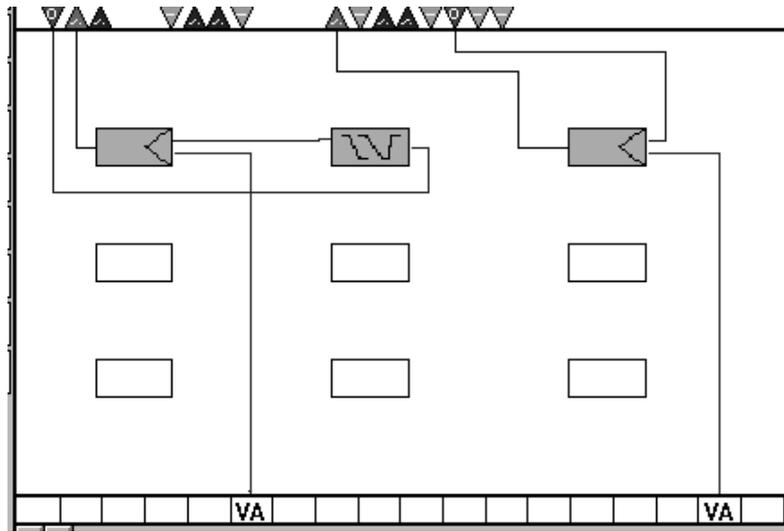
Plan the placement of control icons and pseudopoints so you can make necessary connections clearly. This section presents examples of good connections and confusing connections.

Position control icons just below their related equipment. It helps if output points or icons are to the left of the control icon and input points or icons are to the right of the control icon.

Make connections to physical and pseudopoints as you place control icons. If you place all the icons first, and then try to make connections, you may need to reposition some icons to make less confusing connections.

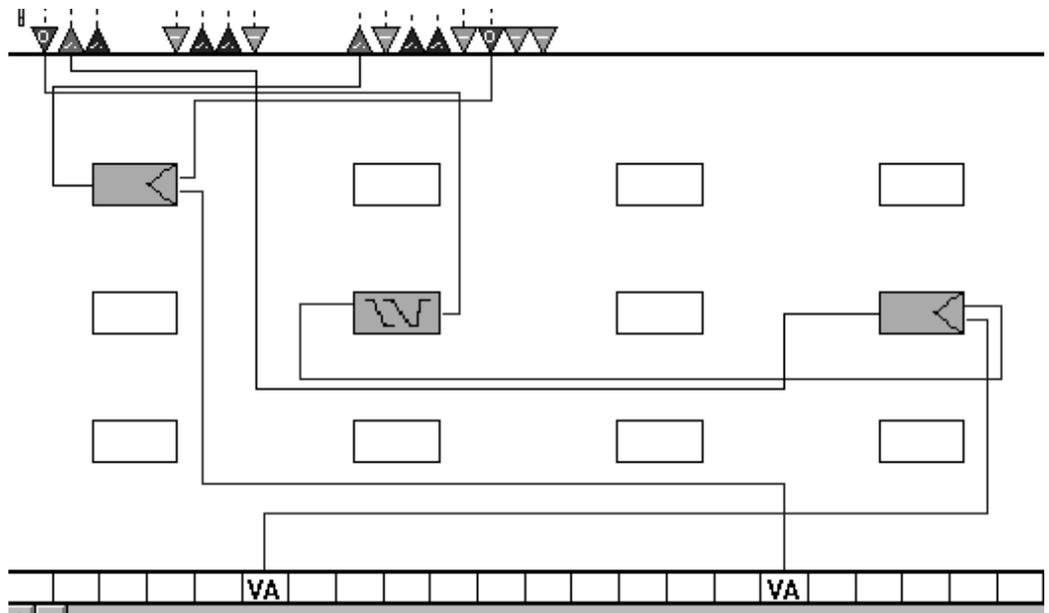
#### Example with Clear Connections

The following diagram includes three control icons with connections to physical points, pseudopoints, and each other. Note that the connection lines cross a minimum amount of times so that the control strategy is easy to read.



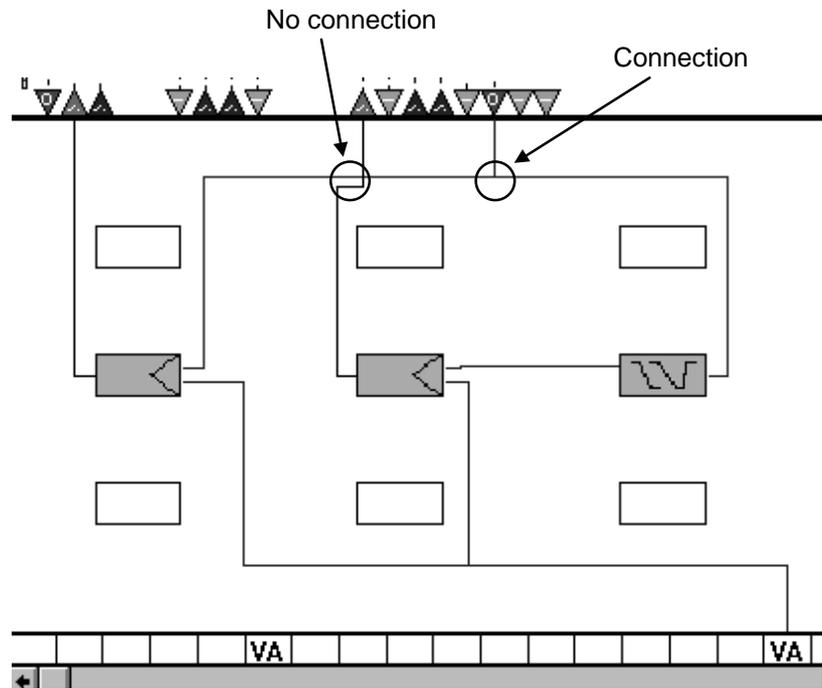
**Example with Confusing Connections**

The following diagram has the same three icons and points as the previous example, but because of the placement of the icons and connections, it is very confusing.



**How to Cross Lines**

The following example presents a method of crossing lines that do not connect so that it is obvious that they do not connect. The idea is to draw lines next to each other for a short distance instead of directly crossing the lines.



### Delete a Control Icon and its Connections

#### Procedure

1. Click the icon you want to delete to select it (if not already selected).

RESULT: a gray box surrounds the currently selected icon.

2. Click Edit, then drop-down item Delete symbol.  
Or, hold down **Ctrl** key and press **Delete** key.

RESULT: A Question dialog box displays that asks "Delete Symbol: Are you sure?"

3. Click **Yes** to delete, or **No** to cancel the operation.

RESULT: If you click **Yes**, software deletes the control icon with all its connections.

### Delete a Completed Connection

#### Procedure

1. Double-click the control icon in the work space that has the connection to be deleted.  
Or, if the icon is the currently selected icon (a gray box surrounds it), click menu item Edit, drop-down item Connect symbol.

RESULT: The related input/output dialog box displays.

2. Click the check box to which the connection was made until the check mark disappears and the box is white.
3. Click the red control icon in the control icon dialog box.

RESULT: Software deletes the connection and closes the dialog box.

### Delete an Incomplete Connection

1. Place the intersection point on the end point of a connection that is not yet complete.

2. Click the right-hand mouse button once.

RESULT: Software deletes the connection.

Each time you click the right-hand mouse button, software deletes a further connection. You do not have to move the mouse.

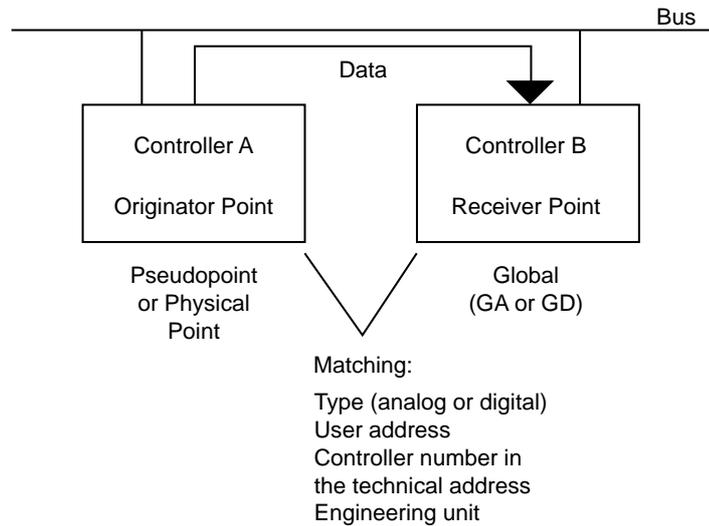
The control icon turns red.

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## Pseudopoints and Flags

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<b>Definition</b>	Pseudopoints and flags have no physical basis and, therefore, no technical address. CARE calculates the value of a pseudopoint. You assign a user address to a pseudopoint to be able to use and display them like physical points. The difference between physical points and pseudopoints is that pseudopoints do not have a technical address.
<b>Example</b>	The calculated flow temperature setpoint of a heating plant is a pseudopoint.
<b>Types</b>	<p>There are seven types of pseudopoints and flags:</p> <p>VA for Pseudo analog            VD for Pseudo digital            VT for Pseudo totalizer            GA for Global analog            GD for Global digital            FA for Flag analog            FD for Flag digital</p> <p>Pseudopoints can be analog, digital, or totalizer. They represent calculated values within the controller. Flags can be analog or digital and represent z-registers within the RACL application program.</p>
<b>Limitations</b>	<p>Each controller can have a maximum of 256 pseudopoints. Three digital pseudopoints are reserved (STARTUP, SHUTDOWN, and EXECUTING_STOPPED), leaving 253 free for user assignment. The max limits changed for controller OS &gt; 2.03 to 253 + 3 internal.</p> <p>There is no maximum number for flags.</p>
<b>Globals</b>	<p>Global points are a type of pseudopoint (GA or GD) that can be either an input or output. The purpose of global points is to share point information across controllers on a bus.</p> <p>Global inputs receive information from a point in another controller. Use a global input when one controller has a point that should be global to many other controllers.</p> <p>Global outputs send information to other points in other controllers. Use a global output when one controller has a point that is global to only one point in another controller. You can also use global outputs for some control icons that only connect to outputs and the output must be global. Global outputs can only be associated with pseudopoints or output points (not input points).</p>
<b>Centrals Note</b>	Central PCs such as the Excel Building Supervisor (XBS) and Excel Building Supervisor-Integrated (XBS-i) only read global originator points. The values of global receiver points are only available via the B port of the controller.
<b>Global Inputs</b>	Each global input is associated with a pseudopoint or physical point (originator point) somewhere on the bus and has the same user address, controller number in the technical address, engineering unit, and type (analog or digital) as the point. The originator point cannot be a global point. The technical address for a pseudopoint is 99.99.



You select the correct type and enter the correct user address when you create the global point. To set the appropriate controller number in the technical address and the engineering unit, use the Data Point Description Editor described in the Editors chapter in this manual. You can edit point data after you attach the plant.

*Global Input Point Operation*

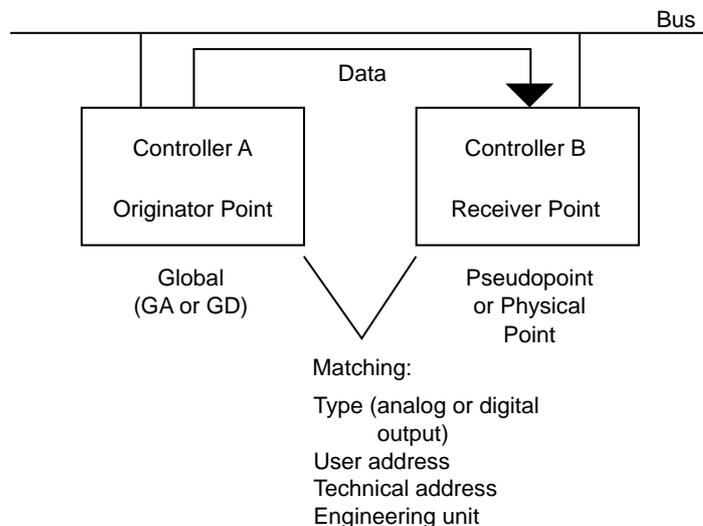
The system updates global inputs every 2 minutes. It also updates global analog inputs when the originator point changes significantly. If the point value is greater than 20, the change must be at least 1 percent. If the point value is less than or equal to 20, the change must be at least .2 units. For example:

Point Value	Change
100	1
200	2
50	.5
10	.2
5	.2

For global digital points, a change of state triggers an update.

**Global Outputs**

Each global output is associated with a pseudopoint or physical point ("receiver" point) somewhere on the bus and has the same user address, technical address, engineering unit, and type (analog or digital output) as the point. The technical address for a pseudopoint is 99.99.



You select the correct type and enter the correct user address when you create the global point (next section, New Pseudopoints and Flags). To set the appropriate technical address, output type, and engineering unit, use the Data Point Description Editor described in the Editors chapter in this manual. You can edit point data after you attach the plant.

To use a physical point as the originator, use the IDT icon to convert the physical point value to a global point (GA or GD).

#### *Global Output Point Operation*

The system updates the receiver points when the global analog outputs change significantly. If global value is greater than 20, the change must be at least 1 percent. If global value is less than or equal to 20, the change must be at least .2 units. For example:

Global Value	Change
100	1
200	2
50	.5
10	.2
5	.2

For global digital points, a change of state triggers an update. There is no automatic 2-minute refresh for global output points.

**Flags** *Flags* are pseudopoints that only appear in the CARE work space. They are not accessible later through the Datapoint Editor and any other operator terminal but through Live CARE.

**Deletions** Software displays a message that it will delete pseudopoints and flags that are not required when the plant is assigned to a controller (Attach Controller function). You can accept or reject the deletion. In addition, you can use the Delete unused software points function under the Edit menu item in Control Strategy to delete flags.

**Special Pseudopoints** There are three special pseudopoints, STARTUP, SHUTDOWN, and EXECUTING\_STOPPED, that CARE automatically attaches to each EXCEL 5000 controller. Each point has an engineering unit of Normal/Alarm. Following is a description of each point. You can use the Data Point Editor to enhance these points. For example, by making the STARTUP point an alarm point and changing the active/passive flag, the point will go into alarm, if the application program stops.

NOTE: The following descriptions assume the controller application is both the time schedules and the RACL code.

STARTUP has a value of 1 (alarm) when the controller application is running and a value of 0 (normal) when the application is not running. When a database is downloaded to the controller, the application attempts to start. If there are fatal CPU errors, the application does not run. If there is a power failure and the battery maintains the application in memory, the application again attempts to restart. You can use the Stop Application function in XBS or XI584 to set this point to a zero value. You can use the Start Application function in XBS or XI584 to attempt to restart the application.

SHUTDOWN has a value of 0 (normal) when the controller application is running and a value of 1 (alarm) when the controller application is not running. The only way to get this point set to 1 (other than manually fixing it) is to use the Stop Application function in XBS or XI584. If RACL software stops this point, the point remains set to zero.

EXECUTING\_STOPPED has a value of 0 (normal) when the RACL program in the controller is running and a value of 1 (alarm) when RACL has stopped. If the controller detects an error condition that will cause RACL to halt (such as a disabled point), software sets the point to a value of 1. If you manually fix this point to a value of 1, RACL execution halts and all outputs are frozen at their last value. You cannot restart RACL by fixing this point back to zero or by putting it in the automatic mode. You can only restart RACL with a power reset or by using the Start Application function in XBS or XI584.

A typical application of the STARTUP point is to stage loads when the controller application program first starts. For example, if the RACL program in the controller calls for three large chiller plants to be on after the first cycle when the controller starts, you can use the STARTUP point in a switching table to delay the outputs with different times to keep from starting all three chillers at exactly the same time.

### Section Contents

This section includes:

- General Steps
- Create New Pseudopoints and Flags
- Load/Assign Pseudopoints and Flags
- Search for Pseudopoints and Flags via Keyboard
- Modify Pseudopoint and Flag User Address
- Delete Pseudopoints and Flags
- Connect a Pseudopoint or Flag to a Control Loop
- Change a Pseudopoint or Flag User Address

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## General Steps

Working with pseudopoints and flags generally includes the following actions:

- Create a new pseudopoint/flag or load pseudopoints/flags
- Assign the created pseudopoint/flag to the software bar
- Connect the pseudopoint/flag to a control strategy symbol

Refer to the following sections for detailed descriptions.

### Software Points Behavior on Software Bar

Existing pseudopoints/flags can be unassigned or assigned to the software point bar. Assigned pseudopoints/flags appear with their point type abbreviations on the software bar. Unassigned points can be accessed from a list (see following sections). Assigned pseudopoints/flags should be connected to control strategy symbols. Only assigned pseudopoints/flags can be connected to control strategy symbols. After connection they are “used”.

Points are used when they are:

- connected to control icons
- used as internal points of XFMs
- mapped to XFM parameters
- contained in switching tables
- referenced in time programs

Unassigned pseudopoints/flags that are not used in the application are “unused” software points. Unused software points can be deleted, used points cannot.

CARE automatically updates the software bar. It removes all points from the software bar that are not connected to a control strategy symbol.

**NOTE:** The points are not deleted. They can still be accessed from a list via the Edit/Load Software Points command.

The software bar will be automatically updated when:

- creating a control loop
- loading a control loop
- deleting a control loop
- deleting a control strategy symbol
- opening and closing the Delete Unused Software Points dialog box even if no software point was deleted.

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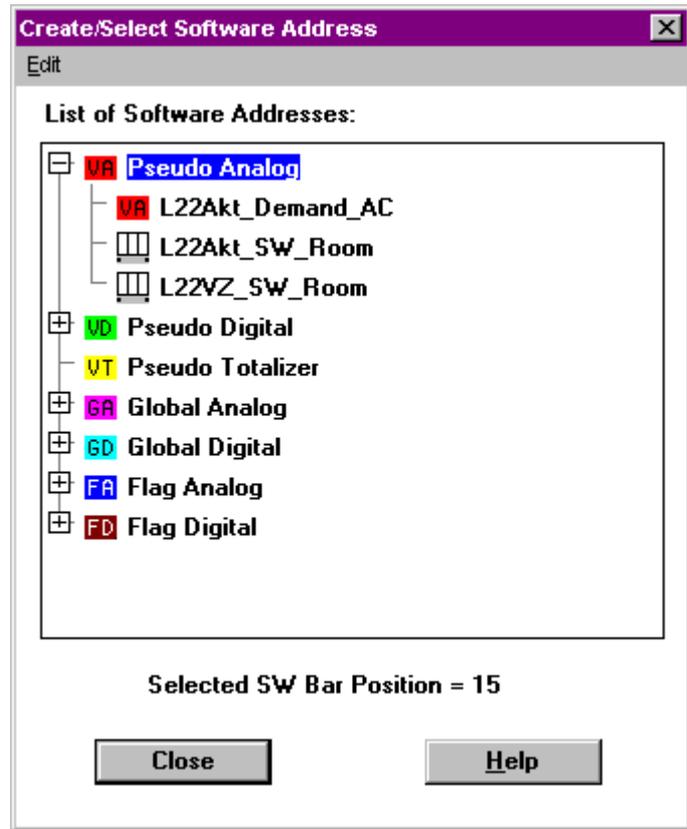
## Create/Assign New Pseudopoints and Flags

### Purpose

Create a new pseudopoint/flag and assign it to the software bar.

- Procedure**
1. Click on a free position in the software point bar where you want to place the new pseudopoint/flag. Locate it near the relevant control icon(s).

RESULT: The Create/Select Software Address dialog box displays.



The selected software bar position is displayed at the bottom line of the dialog box. The list displays all existing pseudopoints/flags including unassigned, assigned and connected, assigned and unconnected pseudopoints/flags. Unassigned and assigned points/flags can be distinguished by the following symbols:



Assigned points: Pseudopoints/flags that reside on the software bar.



Unassigned pseudopoints/flags or points in switching tables in folder color with point abbreviation.



Unassigned software points mapped to internal datapoints of XFM.

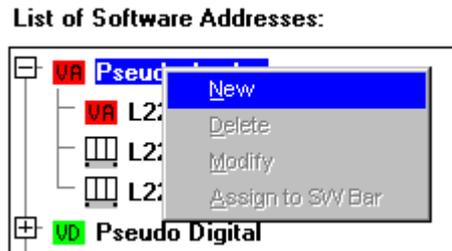


Unassigned software points mapped to XFM parameters.

Each pseudopoint/flag type has its own colored folder, which can be empty or contain already created pseudopoints/flags. Folders can be opened by clicking on the + symbol.

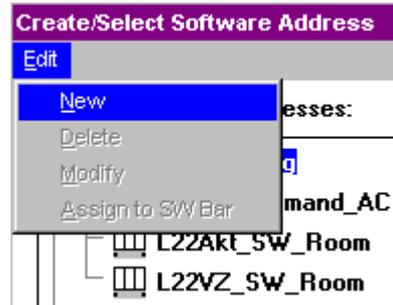
2. Click the desired pseudopoint/flag folder or any existing pseudopoint/flag in the open folder.

- Click right mouse button, and with left mouse button click **New** in the context menu,

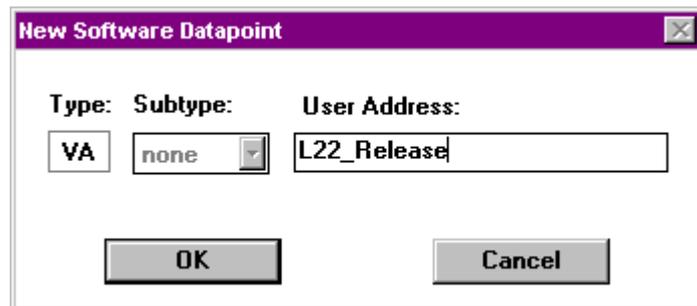


or

click menu item **Edit**, then drop-down item **New**.



RESULT: The New Software Datapoint dialog box displays.



- Select a point subtype in the Subtype drop-down list box (if available and desired).
- Enter a user address in the User Address field.

User addresses must include one non-digit character and cannot include tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

If you are creating a global point, enter a user address that matches the pseudopoint or physical point that you want to associate with the global. Also, select the type (analog [GA] or digital [GD]) that matches.

- Click **OK**.

RESULT: The pseudopoint/flag is automatically assigned to the software point bar and is shown with its abbreviation as follows:

VA for Pseudo analog  
 VD for Pseudo digital  
 VT for Pseudo totalizer  
 GA for Global analog  
 GD for Global digital

FA for Flag analog  
FD for Flag digital

7. To connect a pseudopoint/flag to a control strategy symbol, see Connect a Pseudopoint or Flag to a Control Loop section.

NOTE: Assigned pseudopoints/flags that are not connected to any control strategy symbol become unassigned points when one of the following is done:

- creating a control loop
- loading a control loop
- deleting a control loop
- deleting a control strategy symbol
- opening and closing the Delete Unused Software Points dialog box even if no software point was deleted.

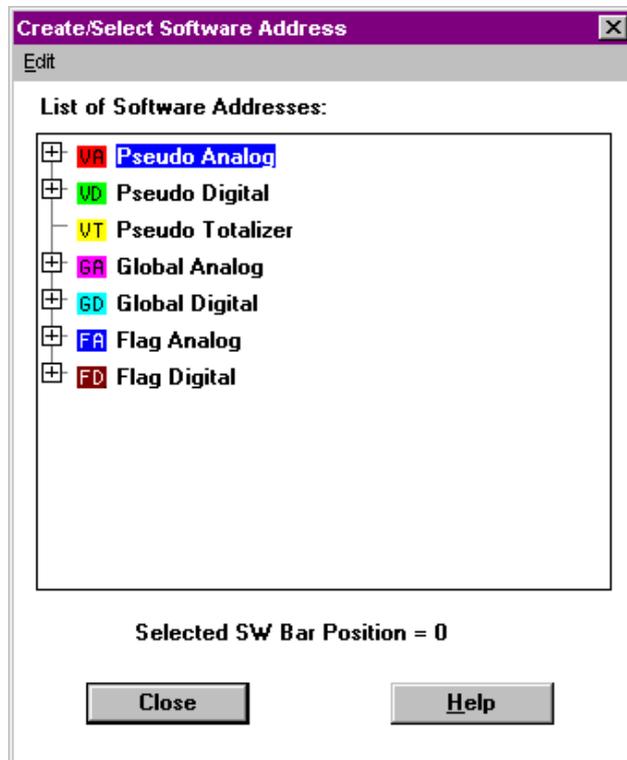
8. For creating further pseudopoints/flags, click on the desired position in the software bar where the next point is to be created and repeat steps 2 through 6.

NOTE: If you do not select a software point bar position, the pseudopoint/flag is created as unassigned pseudopoint/flag and has to be assigned to the software point bar using the **Assign to SW Bar** command separately (see Load/Assign Pseudopoints and Flags section).

## Load/Assign Pseudopoints and Flags

**Purpose** Load existing pseudopoints or flags created via the switching logic function or from other plants, and assign them to the software bar.

- Procedure**
1. Load a control loop (menu item **File**, drop-down item **Load**).
  2. Open the Create/Select Software Address dialog box by clicking either on the position in the software point bar where you want to place the pseudopoint/flag or by selecting menu item **Edit**, then drop-down item **Load Software Points**.



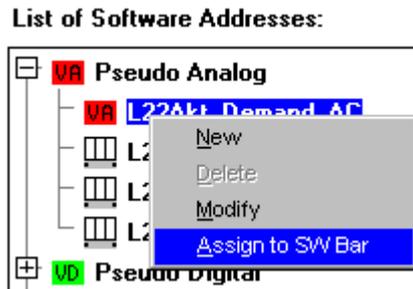
- Open the pseudopoint/flag folder, and click the pseudopoint/flag you want to assign to the software bar.

- Select a position on the software bar by clicking left mouse button.

RESULT: The selected software bar position is shown at the bottom line of the dialog box.

NOTE: If you do not select a position on the software bar before assigning the point, CARE will ask you to select a position after step 5.

- Click right mouse button, and with left mouse button click **Assign to SW Bar** in the context menu, or



click menu item **Edit**, then drop-down item **Assign to SW Bar**.

RESULT: The pseudopoint/flag is assigned to the software bar and its abbreviation appears as follows:

VA for Pseudo analog  
 VD for Pseudo digital  
 VT for Pseudo totalizer  
 GA for Global analog  
 GD for Global digital  
 FA for Flag analog  
 FD for Flag digital

In the Create/Select Software Address dialog box the pseudopoint/flag gets the assigned symbol at the user address name.



- To connect a pseudopoint/flag to a control strategy symbol, see Connect a Pseudopoint or Flag to a Control Loop section.

NOTE: Assigned pseudopoints/flags, which are not connected to any control strategy symbol, become unassigned points when one of the following is done:

- creating a control loop
- loading a control loop
- deleting a control loop
- deleting a control strategy symbol
- opening and closing the Delete Unused Software Points dialog box even if no software point was deleted.

- For assigning further pseudopoints/flags, click on the desired position on the software point bar where the next point is to be created and repeat steps 4 through 5.

## Search for Pseudopoints and Flags via Keyboard

- Assumption** The Create/Select Software Address dialog box is open.
- Procedure**
1. Type the complete name or single characters (search entry) of the name you want to find.
 

**RESULT:** CARE automatically finds the first name that matches the search entry. CARE searches from the VA through the FD folder and finds matched datapoint names in closed folders too.

If a datapoint name you search for is not found, CARE continues searching with the next search entry you enter. CARE does not distinguish between upper-case and lower-case letters except on vowel mutations or country specific characters.
  2. To find the next name that matches the same search entry, click the asterisk (\*).
 

Example:

The following datapoints are available in the Create/Select Software Address dialog box:

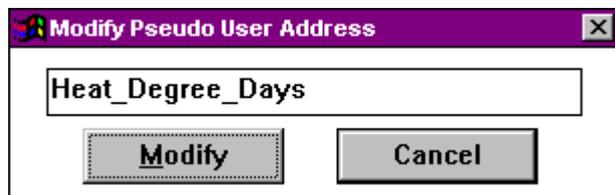
L22\_VA\_Release (VA-folder)  
L22\_GA\_Setpoint (GA-folder)

The search entry "L22" is entered.

CARE first finds the L22\_VA\_Release datapoint name. After entering the asterisk (use SHIFT key) the L22\_GA\_Setpoint datapoint name is found.
  3. To find a different datapoint name, enter the new search entry.

## Modify Pseudopoint and Flag User Address

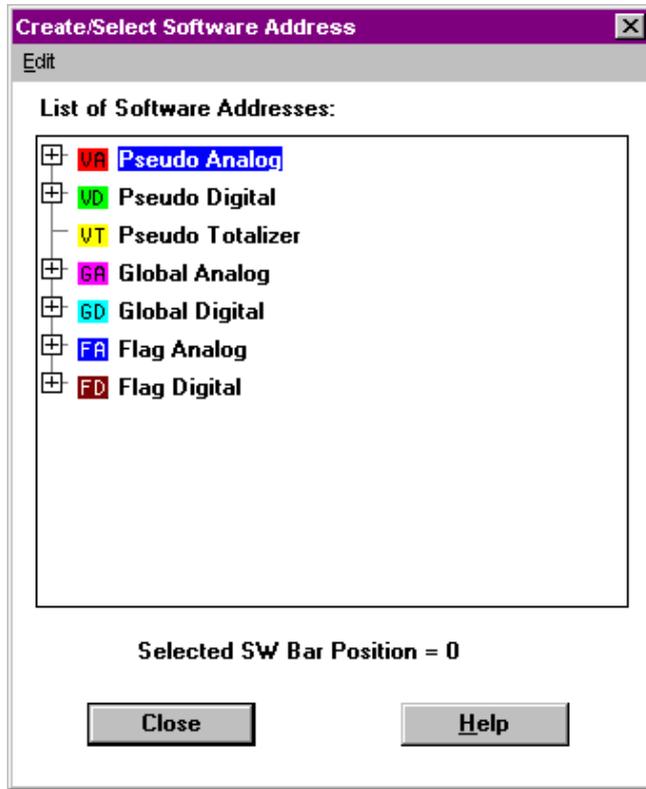
- Purpose** Modify pseudopoint or flag user address.
- Procedures** There are two ways to modify a pseudopoint/flag user address:
- A. By selecting the pseudopoint/flag on the software bar.
  - B. By selecting the pseudopoint/flag in the Create/Select Software Address dialog box.
- A.**
1. Select the pseudopoint or flag to be modified from the software point bar.
  2. Click menu item **Edit**, then drop-down item **Modify Pseudo User Address**, or press **F5**.
- RESULT:** The Modify Pseudo User Address dialog box displays.



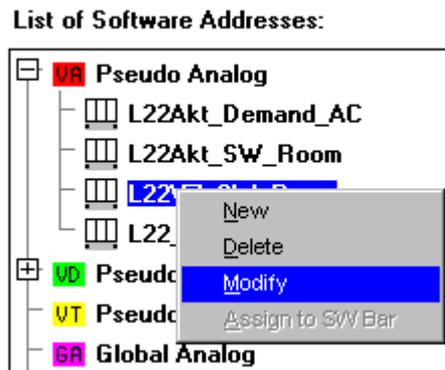
3. Type to change the address in the editing field.

User addresses must include one non-digit character and cannot include tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

4. Click **Modify** to save changes. The dialog box remains open so that you can select other pseudopoints or flags to modify.
  5. Click **Cancel** or press **F5** to end the Modify function.
- B. 1. Open the Create/Select Software Address dialog box by clicking on a blank position on the software point bar or by selecting menu item **Edit**, then drop-down item **Load Software Points**.

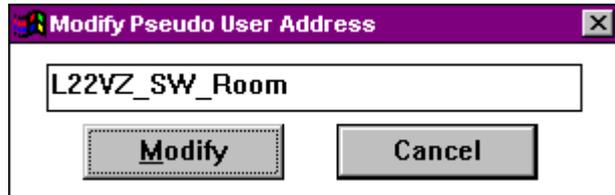


2. Open the pseudopoint/flag folder, and click the pseudopoint/flag you want to modify.
3. Click right mouse button, and with left mouse button click **Modify** in the context menu, or



click menu item **Edit**, then drop-down item **Modify**.

RESULT: The Modify Pseudo User Address dialog box displays.



4. Type to change the address in the editing field.

User addresses must include one non-digit character and cannot include tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

5. Click **Modify** to save changes.
6. To modify further points/flags, repeat steps 2 through 5.

## Delete Pseudopoints and Flags

**Purpose** Delete pseudopoint or flag.

NOTE: Used pseudopoints/flags cannot be deleted.

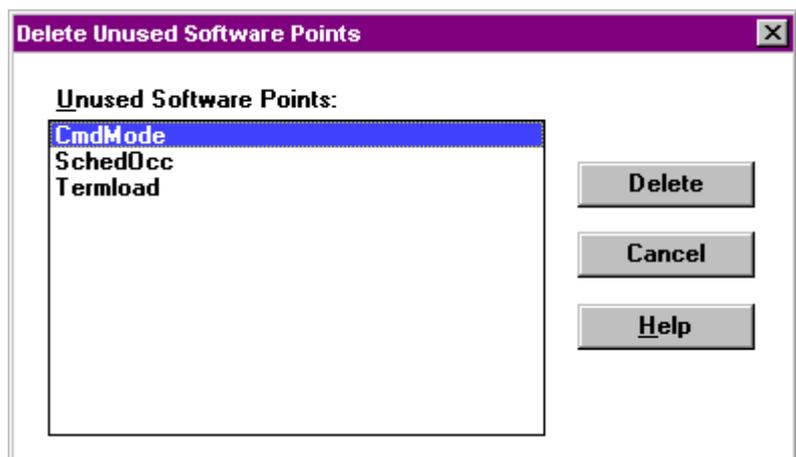
Points are used when they are:

- connected to control icons
- used as internal points of XFM's
- mapped to XFM parameters
- contained in switching tables
- referenced in time programs

**Procedures** There are two ways to delete pseudopoints/flags:

- A. Via the **Edit/Delete Unused Software Points** command, you can delete one or several pseudopoints/flags.
  - B. Via the **Edit/Load Software Points** command or by clicking on the software bar, you can delete one pseudopoint/flag after another individually.
- A. 1. Click menu item **Edit**, then drop-down item **Delete Unused SW Points**.

RESULT: The Delete Unused Software Points dialog box displays.



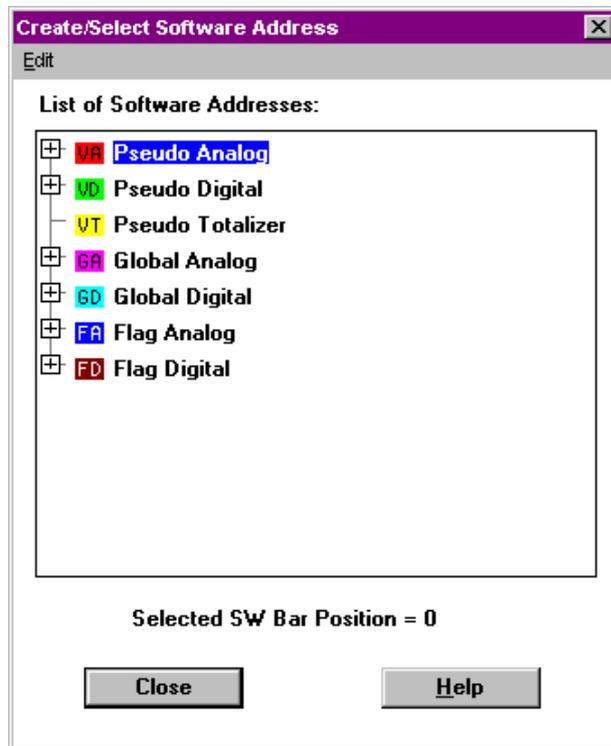
2. Click the points you want to delete (hold down SHIFT key while you click to select multiple points).
3. Click **Delete**.

RESULT: All selected software points are deleted. The deleted points are no longer available on the software points bar.

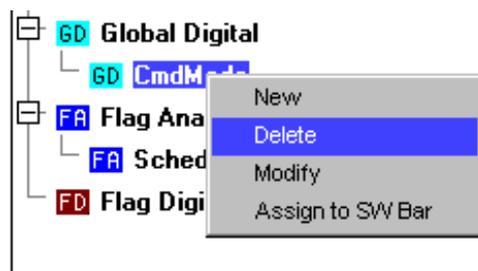
4. Click **Cancel** to close the dialog box.

RESULT: Points that you did not delete remain in the plant

- B. 1. Open the Create/Select Software Address dialog box by clicking on a blank position on the software point bar or by selecting menu item **Edit**, then drop-down item **Load Software Points**.



2. Open the pseudopoint/flag folder, and click the pseudopoint/flag you want to delete.
3. Click right mouse button, and with left mouse button click **Delete** in the context menu, or



click menu item **Edit**, then drop-down item **Delete**.

RESULT: The selected pseudopoint/flag is deleted. The deleted pseudopoint/flag is no longer available on the software points bar.

## Connect a Pseudopoint or Flag to a Control Loop

NOTE: The control icon must already be selected and placed in the work space.

- Procedure**
1. Click the desired pseudopoint on the software point bar.  
 If you select a physical point on the physical data point bar, you cannot select a pseudopoint.  
 When creating the connections, pseudopoint type and the control icon's inputs or outputs must match.  
 RESULT: The box turns red.
  2. Double-click the control icon in the work space to which the pseudopoint should connect.  
 Or, if the control icon is the currently selected icon (a gray box surrounds it), click menu item Edit, then drop-down item Connect symbol.  
 RESULT: The input/output dialog box for the control icon displays.
  3. Click the check box of the input or output to which the pseudopoint should connect.
  4. Click the red control icon in the input/output dialog box.  
 RESULT: The dialog box closes. The control icon turns dark blue. The intersection lines appear.
  5. Move the intersection point and click to connect the pseudopoint with the control icon (same procedure as in the Connect Two Control Icons section).

## XFM's

- Section Contents** This section includes:
- Map Software Point to XFM Parameter
  - Map Software Point to an XFM Internal Datapoint
  - Create User Addresses of the Same Name and Map to XFM Internal Datapoint
  - Unmap Mapped Software Point from an XFM Parameter
  - Modify XFM Parameter

### Map Software Point to XFM Parameter

**Purpose** Assign (map) a software point to an XFM parameter. The following point types can be mapped to an XFM parameter

- Pseudo analog (VA)
- Pseudo digital (VD)
- Pseudo totalizer (VT)

These points can be preassigned to the software point bar or unassigned. They can already be mapped to an internal XFM datapoint.

Hardware points, global points and flags cannot be mapped to XFM parameters.

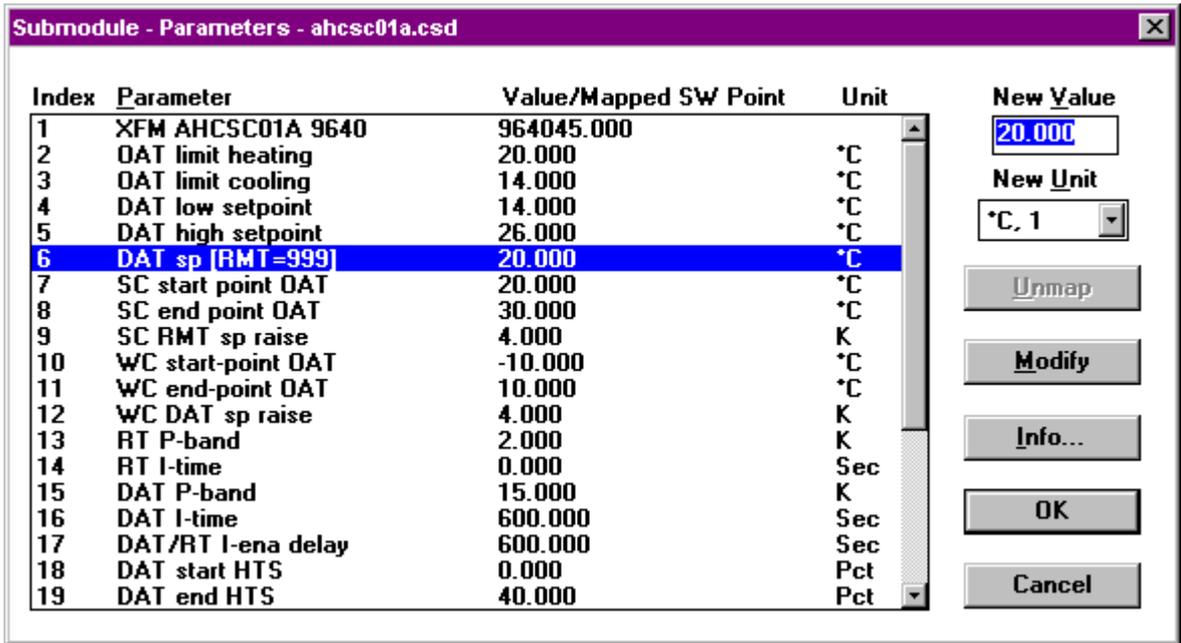
**NOTE:** Mapped parameters can be displayed and modified in XBS central graphics. Graphics for a Central will be created with an appropriate graphic software program, for example Designer. The user addresses that reference a parameter will be placed in the graphics.

**Procedures** There are two ways to map a software point to an XFM parameter.

- A. From the software points bar
- B. From the Create/Select Software Address dialog box

**Common Steps** 1. With right mouse button, click on the XFM control strategy icon.

RESULT: The Submodule - Parameters <XFM name> dialog box displays.

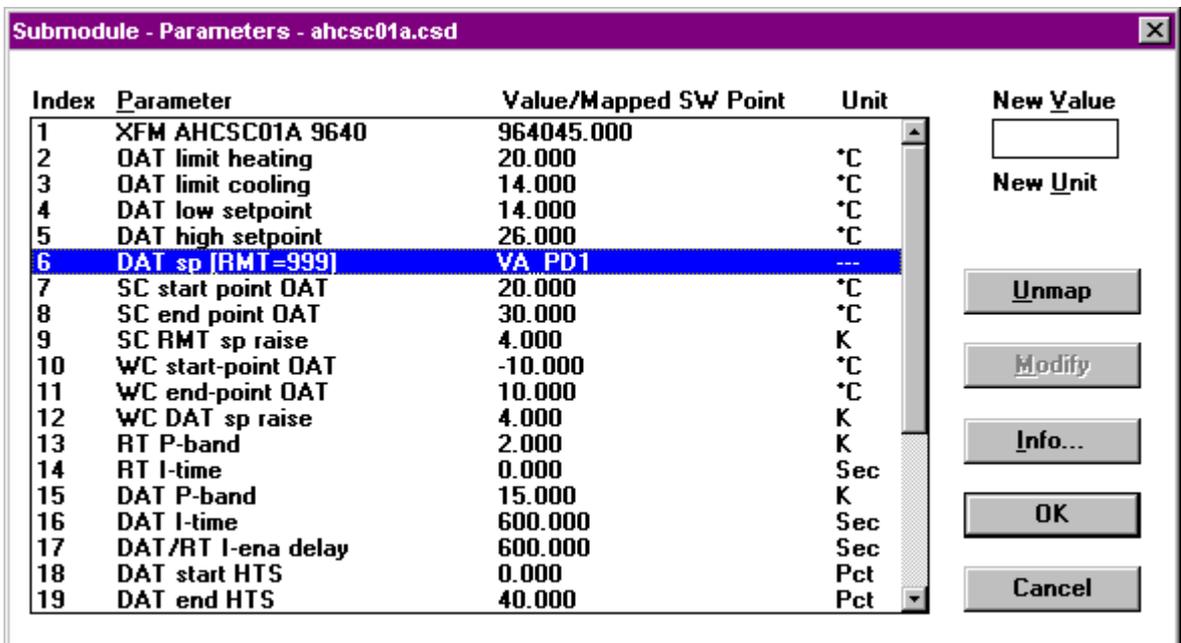


2. In the list, click desired parameter to which you want to map the software point.

**Software Points from the Software Points Bar**

1. On the software points bar click the software point you want to map to the XFM parameter.

RESULT: For the parameter (highlighted) in the Submodule - Parameters <XFM name> dialog box the software point selected is shown in the Value/Mapped SW Point column. The previous unit of the parameter is invalid indicated by three dashes (---).

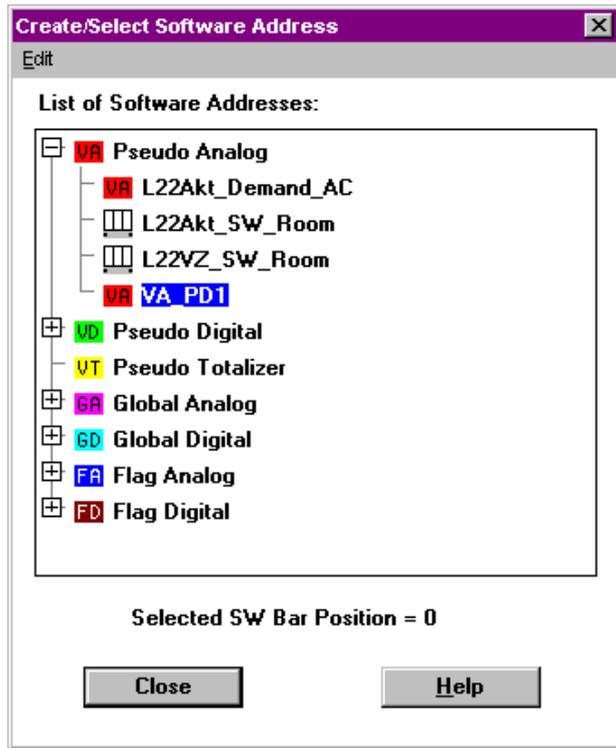


2. Click OK in the Submodule - Parameters <XFM name> dialog box .

RESULT: The software point is mapped to the parameter.

**From the Create/Select Software Address Dialog Box**

1. Open the Select User Address dialog box by clicking on the software points bar or by the selecting menu item Edit, then drop-down item Load Software Points.



2. Click the software address (software point) you want to map to the XFM parameter selected in step 2 (Common Steps). Software points can already be assigned to the software point bar or unassigned indicated by the following icons at the address:



Assigned point on the software bar. This icon has priority over the others meaning if e. g. a point is an XFM internal datapoint but at the same time assigned to the software bar, this icon will display.



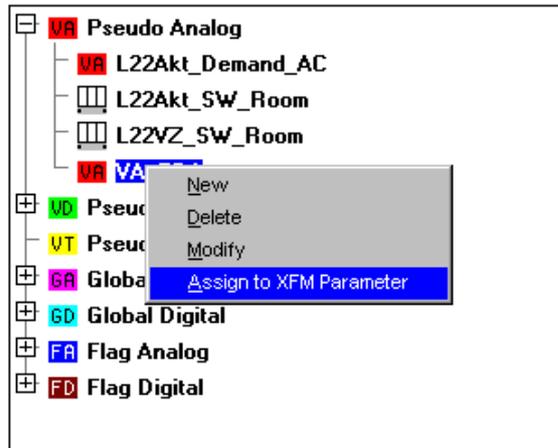
Unassigned software point in folder color with point abbreviation.



Unassigned software point mapped to an XFM internal datapoint.

3. For an assigned point finish with step 5. For an unassigned point continue with step 4.
4. Click right mouse button and with left mouse button click Assign to XFM Parameter in the context menu.

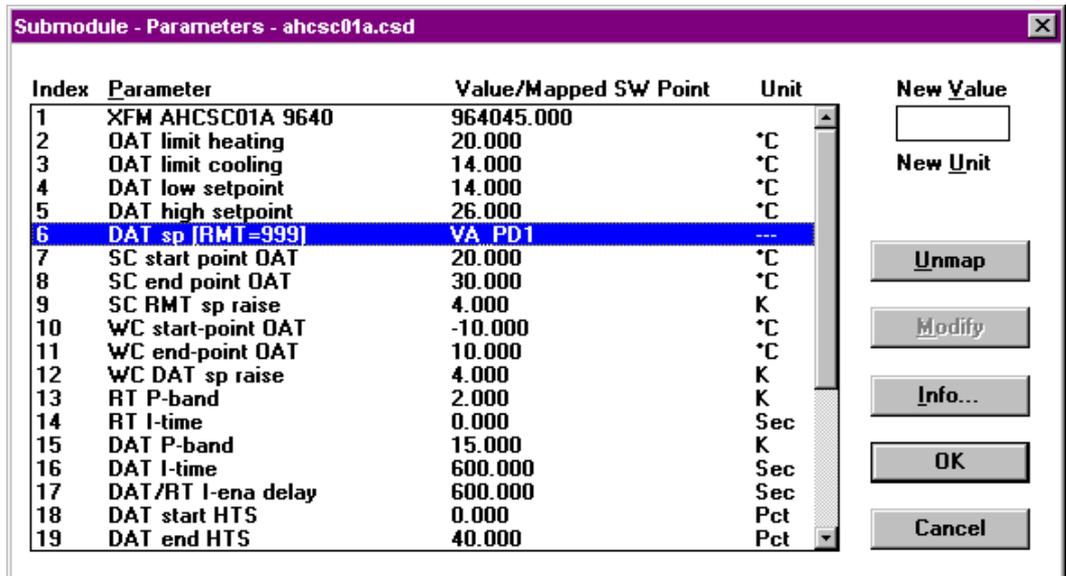
List of Software Addresses:



or

click menu item Edit, then drop-down item Assign to XFM Parameter.

RESULT: For the parameter (highlighted) in the Submodule - Parameters <XFM name> dialog box the software point selected is shown in the Value/Mapped SW Point column. The previous unit of the parameter is invalid indicated by three dashes (---).



5. Click OK in the Submodule - Parameters <XFM name> dialog box .

RESULT: The software point is mapped to the parameter. In the Create/Select Software Address dialog box it is indicated by the icon at the address name changing to the following shape:



This icon change concerns only software points, which are not assigned to the software point bar. Assigned software points are indicated with the following icon and keep this shape after they are mapped to an XFM parameter.



## Map Software Point to an XFM Internal Datapoint

**Purpose** Assign (map) software point to an XFM internal datapoint of the same type. Software points can only be mapped to an XFM internal datapoint of the same type, in other words, pseudo analog to pseudo analog or global analog, pseudo digital to pseudodigital or global digital etc. Compatibility is checked by CARE.

The following point types can be mapped to an XFM internal datapoint, if the point type matches:

- Hardware points
- Global analog (GA)
- Global digital (GD)
- Pseudo analog (VA)
- Pseudo digital (VD)
- Pseudo totalizer (VT)

These points can be preassigned to the software point bar or unassigned.

Flags cannot be mapped to XFM internal datapoints.

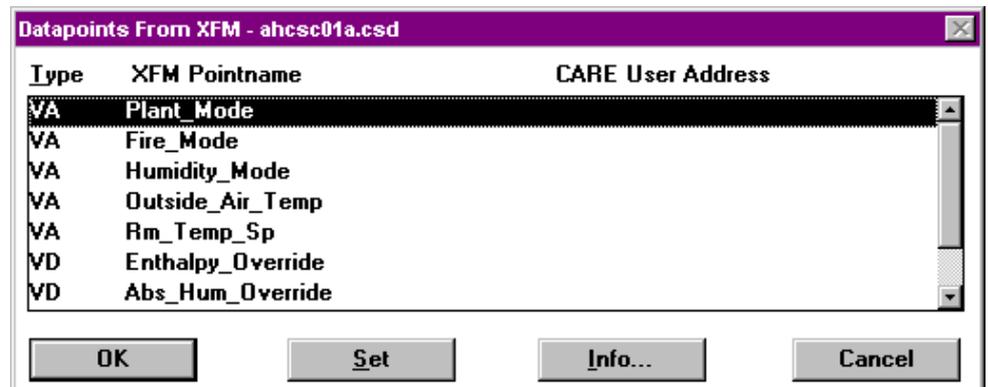
**Procedures** There are three ways to map a software point to an XFM internal datapoint.

1. From the software points bar
2. From the Create/Select Software Address dialog box
3. By creating and connecting user addresses of the same name to XFM internal datapoints

### User Addresses from the Software Points Bar

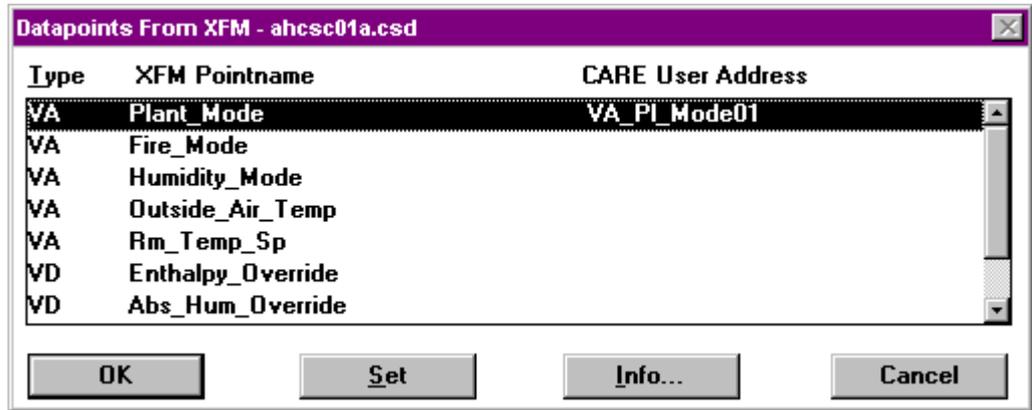
1. Double-click the XFM icon and select the Datapoints button in the XFM I/O dialog box.

**RESULT:** The Datapoints From XFM <XFM name> dialog box displays showing the internal datapoints.



2. Click the datapoint to which you want to map a software point (CARE point = CARE user address).
3. On the software point bar click the desired software point (CARE point) you want to map to the internal datapoint, or click on a hardware point.

**RESULT:** The CARE point is located next to the internal datapoint (CARE User Address column).



- Click OK to confirm.

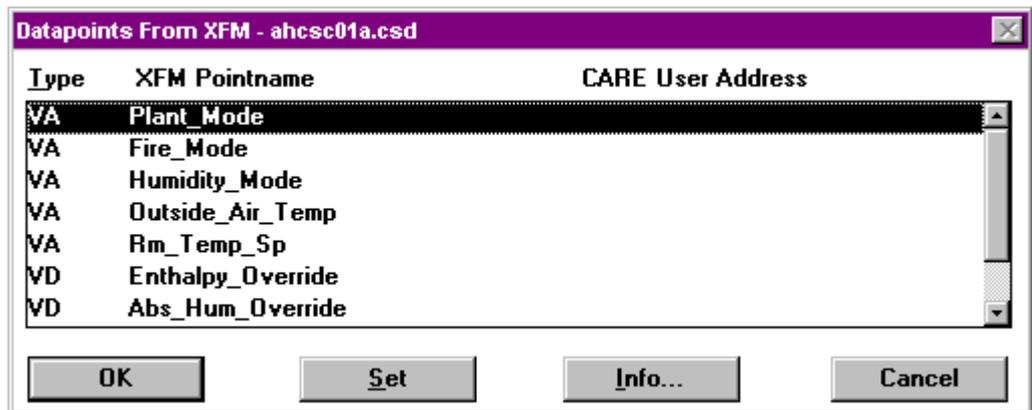
RESULT: The CARE point is mapped.

NOTE: You can change the mapped point by mapping any other compatible point to the XFM datapoint.

#### From the Select Software Address Dialog Box

- Double-click the XFM icon and select the Datapoints button in the XFM I/O dialog box.

RESULT: The Datapoints From XFM <XFM name> dialog box displays showing the internal datapoints.



- Open the Create/Select Software Address dialog box by clicking on the software points bar or by selecting menu item Edit, then drop-down item Load Software Points.

- Click on the software address (CARE point of the same type!) you want to map to the XFM internal datapoint.

Software addresses can already be assigned to the software point bar or unassigned indicated by the following icons at the user address:



Assigned points: Pseudopoints/flags that reside on the software bar.



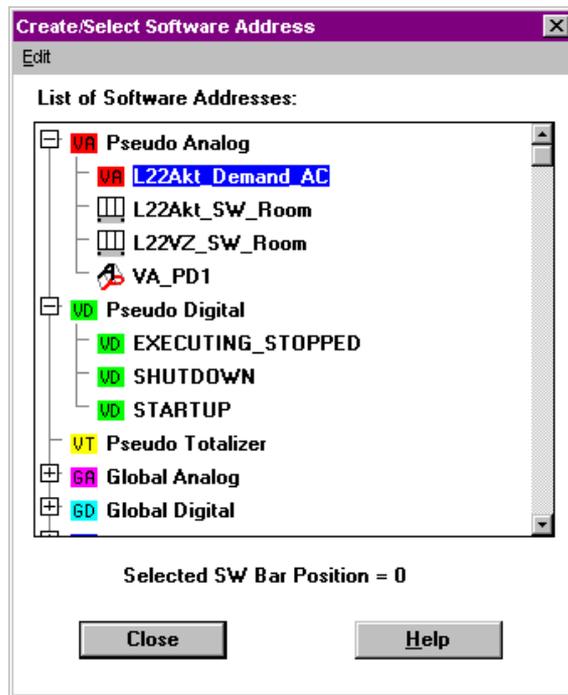
Unassigned software point in folder color with point abbreviation.



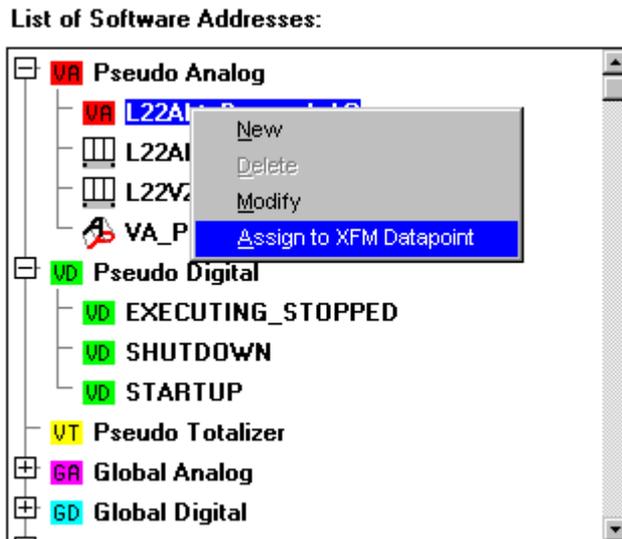
Unassigned software point mapped to an XFM internal user address.



Unassigned software point mapped to an XFM parameter.



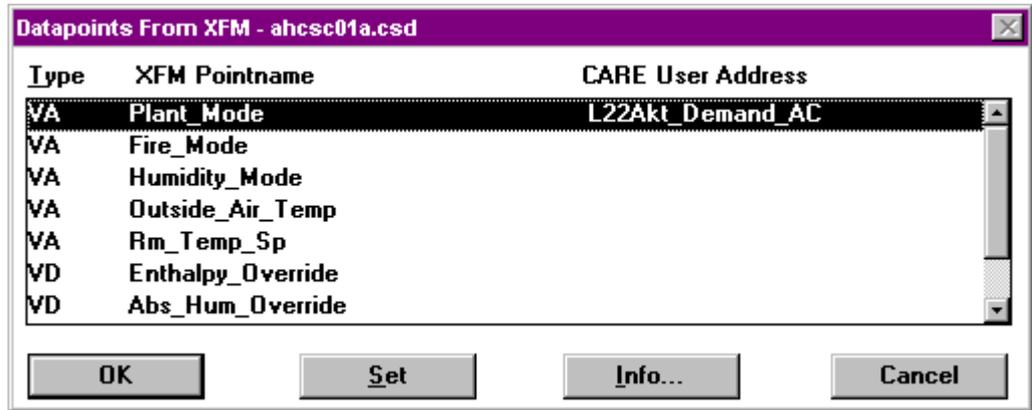
- Click right mouse button and click on Assign to XFM Datapoint in the context menu.



or

click menu item Edit, then drop-down item Assign to XFM Datapoint.

RESULT: The CARE point is located next to the internal datapoint (CARE User Address column).



5. Click OK to confirm.

RESULT: The software point is mapped to the XFM internal datapoint. In the Create/Select Software Address dialog box it is indicated by the icon at the address name changing to the following shape:



This icon change concerns only software addresses, which are not assigned to the software point bar. Assigned software addresses are indicated with the following icon and keep this shape after they are mapped to an XFM internal datapoint.

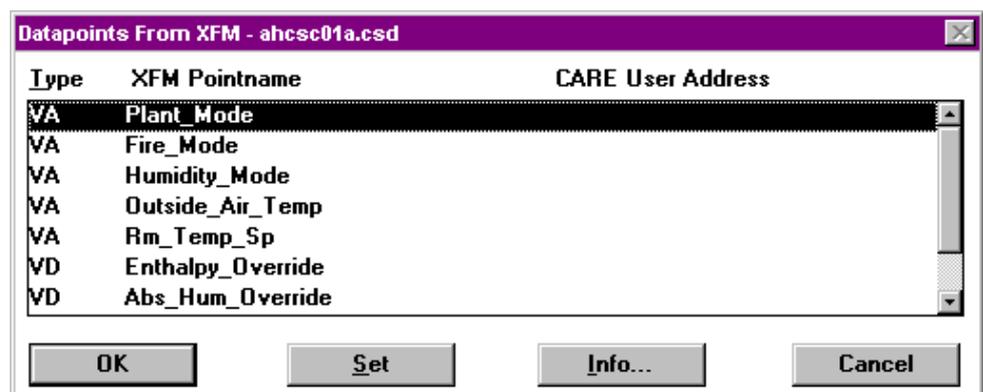


NOTE: You can change the mapped point by mapping any other compatible point to the XFM datapoint.

## Automatically Create User Addresses of the Same Name and Map to XFM Internal Datapoint

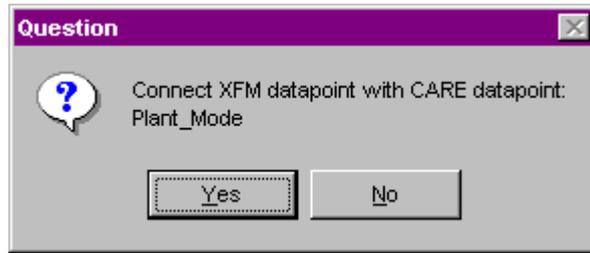
**Purpose** Create XFM internal user address of the same name and map it to XFM internal datapoint. Using this function, it is possible to automatically create points for exchange of information between XFMs.

**Procedure** 1. To open the Datapoints From XFM <XFM name> dialog box, double-click the XFM icon and click the Datapoints button.



2. Click the Set button.

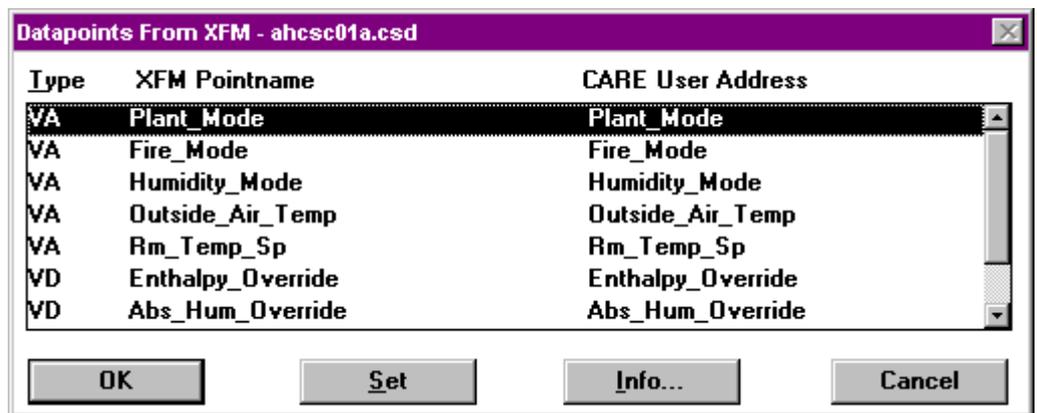
RESULT: The Question dialog box displays asking you for confirmation of each XFM datapoint you want to connect to the CARE datapoint of the same name.



NOTE: This dialog is only displayed, if a corresponding datapoint already exists. If not, a point is automatically created without any question.

3. Click Yes, if you want to connect the XFM datapoint displayed with the existing CARE point of the same name.
4. Click No, if you want to skip this datapoint for connection.

RESULT: The connections between XFM points and CARE datapoints are established.



5. Click OK to confirm.

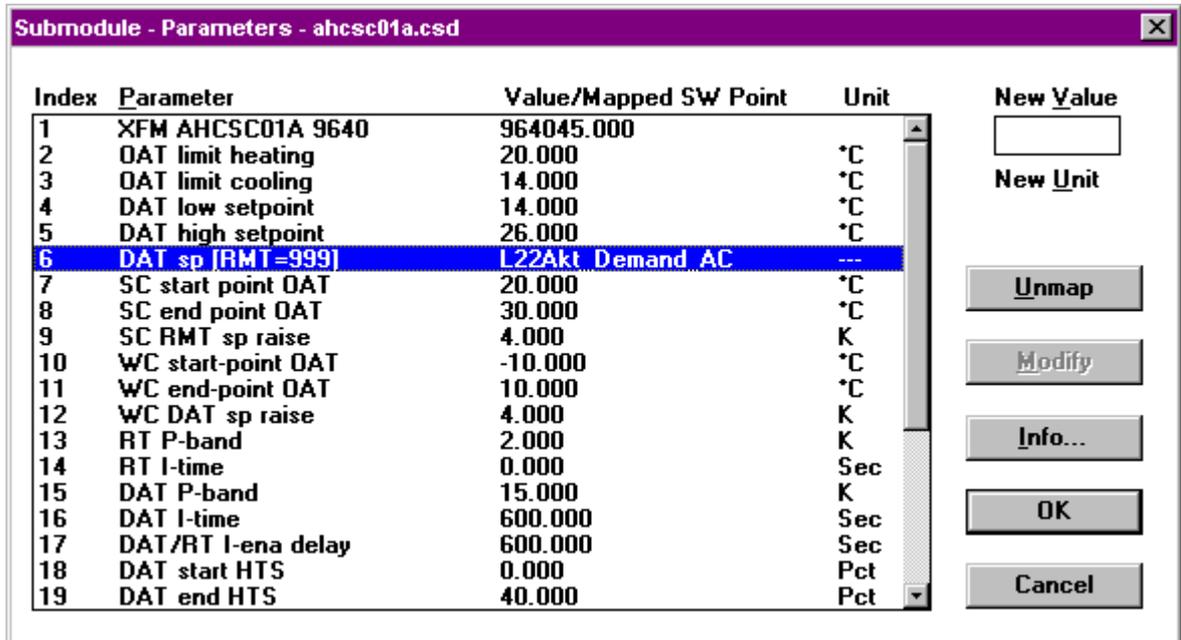
RESULT: The CARE user addresses are mapped to their XFM internal datapoints.

### Unmap Mapped Software Point from an XFM Parameter

**Purpose** Unassign (unmap) a mapped software point from an XFM parameter.

- Procedure**
1. With right mouse button click on the XFM control strategy icon.

RESULT: The Submodule - Parameters <XFM name> dialog box displays.



2. In the list, click desired parameter, from which you want to unmap the software point.

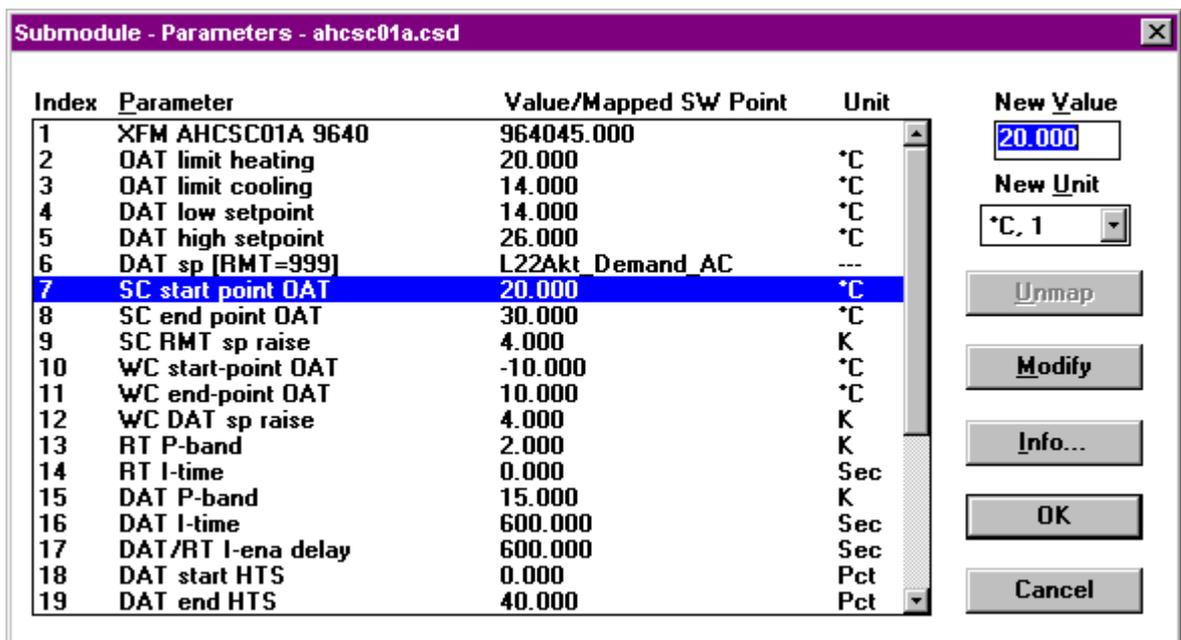
3. Click the Unmap button.

**RESULT** The mapped software point will be moved from the parameter and the parameter gets his value and unit back. In the Create/Select Software Address dialog box the "mapped" icon at the user address disappears.

## Modify XFM Parameter

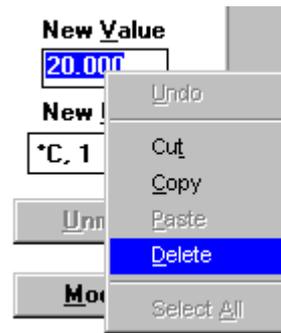
**Procedure** 1. With right mouse button click on the XFM control strategy icon.

**RESULT:** The Submodule - Parameters <XFM name> dialog box displays.



2. In the list box click on the parameter you want to modify.

3. Edit the parameter in the New Value field. You can use the Cut, Copy, Delete, Paste and Undo functions from the context menu by clicking right mouse button when the field is highlighted.



4. Change the engineering unit of the parameter in the New Unit field, if desired.
5. Click Modify to confirm the modified parameter.
6. Click OK to confirm the modification.

---

## Plant Information Displays

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You can display the following information:

- Physical points
- Physical point user addresses
- Pseudopoint user addresses

---

### Physical Point Information

- Procedure**
1. *Double* click (left-hand mouse button) the arrow head for the physical data point.  
**RESULT:** The Datapoint information window displays with user address and point type.
  2. Click **OK** to close window when done viewing the information.

---

### User Addresses

- Procedure**
1. Click View, then drop-down item Physical user address for physical points or Pseudo user address for pseudopoints.  
**RESULT:** The user addresses for the selected type display under the plant schematic. The first letter of every user address is directly beneath the triangle to which the user address belongs. Software places a check mark next to the Physical (or Pseudo) user address function to indicate that it is on.
  2. To end the function, click View, then drop-down item Physical (or Pseudo) user address again.  
**RESULT:** The check mark disappears and the user addresses disappear from the screen.

**Keyboard Commands** You can hold down the **Ctrl** key and press **p** to display physical addresses or **s** to display pseudopoint addresses. Repeat action to remove the address display.

**Physical and Pseudo  
Point Displays**

You cannot display physical point user addresses at the same time as pseudopoint user addresses.

**Single Address Display**

If you move the cursor over a triangle or pseudopoint abbreviation and press and hold the left-hand mouse button down, the user address for the point displays with either a red exclamation symbol or a green check mark symbol. When you release the mouse button, the display disappears.

The red exclamation symbol appears for:

- hardware points (with one allowable connection) that are used in an XFM
- digital outputs that are connected to a symbol
- flex points that are connected to a symbol
- software points that are connected to an output pin of a symbol.

You cannot display a single address if the View Physical (or Pseudo) user address function is on.

## Loop Management

There are several functions that you can use to copy, check, delete, and print loops:

- Copy a Control Loop to reuse it with modifications (or as is).
- Delete a Control Loop if it is no longer necessary.
- Check the Control Loop to make sure all connections are complete.
- Print a Control Loop for documentation purposes.

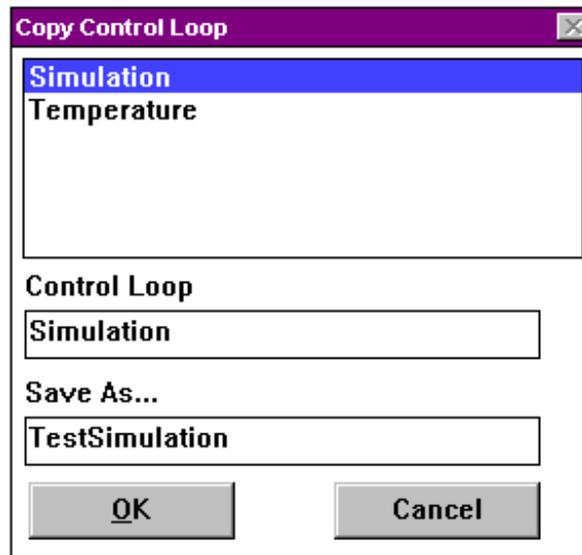
This section provides procedures for these functions.

### Copy a Control Loop

**Purpose** Make a copy of an existing control loop and save it under another name.

**Procedure** 1. Click File, then drop-down item Copy.

RESULT: The Copy control loop dialog box displays.



2. Select the control loop name to be copied from the list of existing control loops.

RESULT: The selected control loop name displays in the Control loop editing field.

3. Click the Save as through editing field

RESULT: The cursor appears in the editing field.

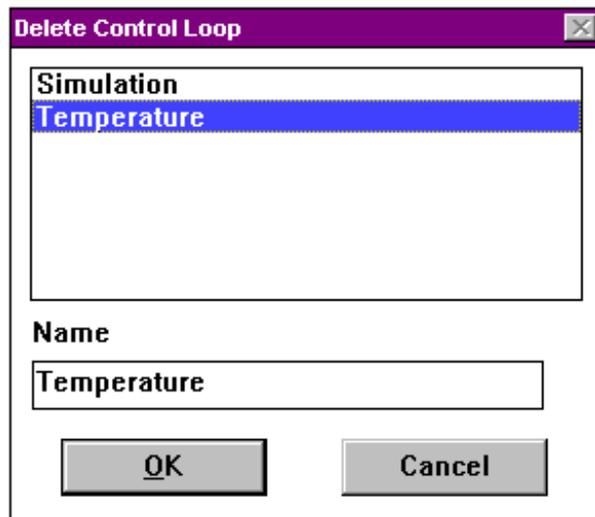
4. Enter the new control loop name in the editing field. The new control loop name cannot already exist.
5. Click **OK** to copy and then close the dialog box.

## Delete a Control Loop

**Purpose** Erase a control loop is no longer necessary.

- Procedure**
1. Click File, then drop-down item Delete.

RESULT: The Delete control loop dialog box displays.



2. Select the control loop to be deleted from the list of existing control loops.

RESULT: The control loop name to be deleted displays in the Name editing field.

3. Click **OK** to delete the loop and close the dialog box.

## Check a Control Loop

**Purpose** Verify control loop operation. Software asks whether or not to run this function when you exit the control loop function.

- Procedure**
1. Click File, then drop-down item Check loop.

RESULT: The Information dialog box displays with a message that the loop is complete or incomplete.

2. Click **OK**.

RESULT: A dialog box displays the number of PID controllers per system.

3. Click **OK** to close dialog box.

## Print a Control Loop

For printing a control loop see Print Documentation chapter.

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## Control Strategy Exit

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**Procedure**

1. Click File, then drop-down item Exit.

RESULT: The End control strategy dialog box displays and asks whether or not you want to check the control loop.

2. Click **Yes** to initiate a software check of the loop.  
Or, click **No** to skip the check and exit the control strategy function.

RESULT: If **Yes**, software checks the control loops and displays the Information dialog box with loop statistics or an error message about the loop. Click **OK** close the message boxes, exit the control strategy function, and display the CARE main window. Click **Cancel** to remain in the function.

If **No**, software exits the control strategy function and displays the CARE main window.

**Incomplete Loop Warning**

If you exit the Control Strategy function with incomplete control loops, you cannot attach the plant.

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## SWITCHING LOGIC

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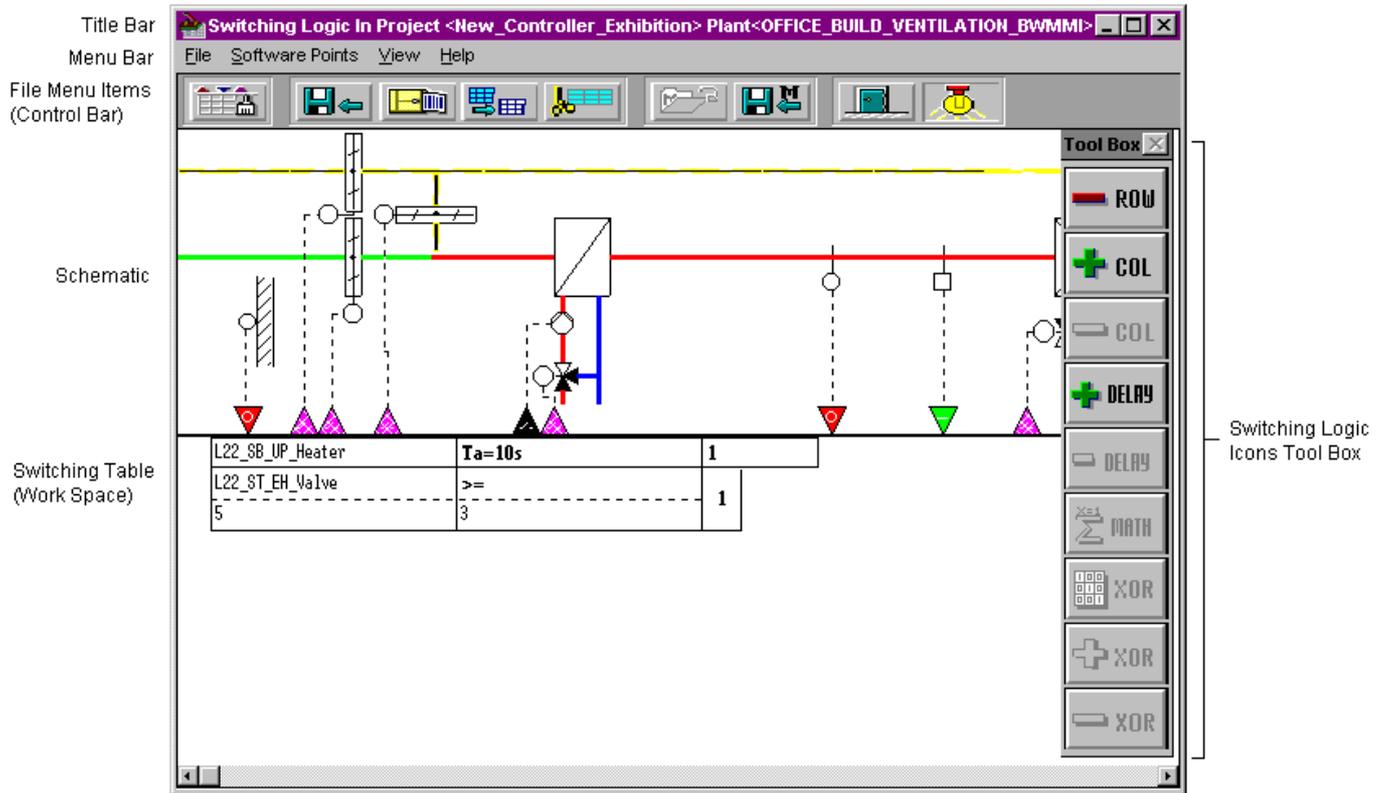
<b>Purpose</b>	Switching logic provides a convenient means to implement digital (Boolean) logic control of a point. An analog or digital point is commanded to a specific value or state if a certain set of conditions are met. Time delays can also be added. For example, switching logic can start a return air fan 30 seconds after a supply air fan starts.
<b>Assumption</b>	The plant schematic is done.
<b>Priority</b>	Switching logic has a higher priority than the control strategy. Control strategy cannot operate on a point when switching logic has control. When switching logic releases the point, control strategy can then command the point.
<b>Chapter Contents</b>	<p>Switching Logic Window (areas and functions)</p> <p>Switching Table Description (rows, AND logic, OR logic, and time delays)</p> <p>Switching Table Creation (including multiple tables for a point, row deletion)</p> <p>Result Row (definition and modifications)</p> <p>Digital Condition Rows (definition and modifications)</p> <p>Analog Condition Rows (definition and modifications, hysteresis)</p> <p>MATH Rows (definition and modifications, hysteresis)</p> <p>Delays for a Logical AND (Column Delay)</p> <p>OR Columns and Exclusive OR Table (COL and XOR functions)</p> <p>Pseudopoints</p> <p>Switching Logic File Management (including saving, loading, deleting, restoring)</p> <p>Macros (including saving and loading)</p> <p>Plant Information Displays</p> <p>Print Switching Tables</p> <p>Switching Logic Function Exit</p>
<b>See Also</b> ⇒	<p>Getting Started chapter for procedures to start and exit CARE</p> <p>File Management chapter for procedures to back up and restore plant files</p>

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## Switching Logic Window

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<b>Purpose</b>	Provide logical switching actions for digital points in the plant schematic.
<b>Assumption</b>	The plant schematic is done.
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. In the logical plant tree, click on the plant.</li> <li>2. Click menu item Plant, then drop-down item Switching Logic. Or click the Switching Logic button in the button bar below the menu bar.</li> </ol> <p><b>RESULT:</b> The Switching logic window displays with menu items File, Software points, View, and Help as well as a sidebar with logic icons. Example:</p>



- Title Bar** Project and plant names display in the window title bar.
- Menu Bar** The File, Software points, View, and Help menu items provide the following functions (you can also select these functions via the icons below the menu bar):
  - FILE**
    - Delete Erase the displayed switching table.
    - Copy Copy the table to another point (physical or pseudo).
    - Save macro Save the current switching table to the macro library.
    - Save Store the currently displayed switching table. Software names it with the output result (for example, 0, 1, or 100.0)
    - Load macro Recall a saved macro from the macro library.
    - Restore Cancel changes made to the current switching table since the last save.
    - New/Clear End work on current switching table and start another table. Software prompts whether or not to save the current table.
    - Exit Stop switching logic function and return to main window.
    - Print Output a copy of a switching table.
  - SOF POINTS** List of pseudopoint, global, and flag types. Select a type to create a new one.

Also, an option to Delete Unused SW Points. See the Unused Software Points note for more details.

## VIEW

Physical user  
address

Display user addresses for physical points in the schematic.

Show Control  
Bar

Display the File menu item icons below the menu bar.

Show Tool  
Box

Display the switching logic icons down the right-hand side of the window.

## HELP

Display the on-line user guide topic list. See Getting Started, On-Line Help chapter, for details on using the help function.

About

Copyright and program authors.

**File Menu Items Line  
(Control Bar)**

These symbols allow you to select File functions without clicking File and then selecting a drop-down item. The symbols (from left to right) correspond to the following File functions:



New/Clear



Save



Restore



Copy



Delete



Load macro



Save macro



End



Remove the control bar from the window.

**Plant Schematic**

This area displays the schematic created via the Schematic function. Outputs for which a switching table exists have white cross-hatching on the input/output triangles.

**Physical Point Bar**

This area displays the physical points required for the schematic. If an arrowhead is white and cross-hatched, the point has a switching table. Click the arrow head to display the switching table for the point.

If you move the cursor over a triangle and press and hold the left-hand mouse button down, the user address for the point displays with either a red exclamation symbol or a green check mark symbol. The red exclamation symbol appears for inputs. The green check mark displays for outputs. When you release the mouse button, the display disappears.

**Work Space**

Switching logic tables appear in this area.

**Switching Logic Icons  
(Tool Box)**

Standard logic functions available for assignment:

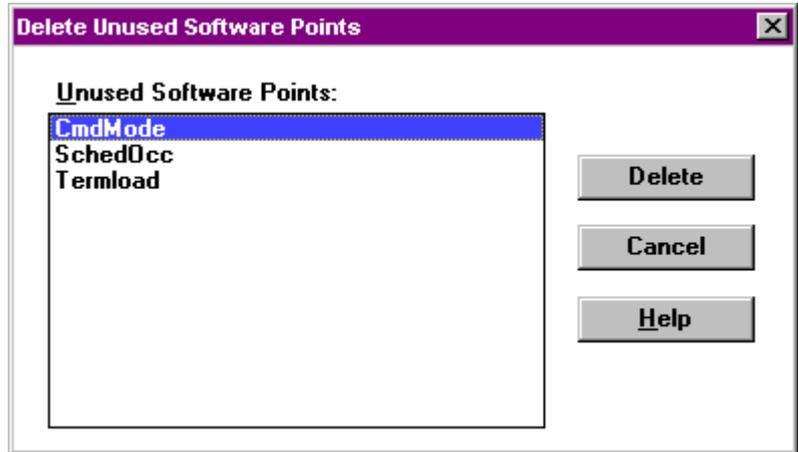
-ROW	Delete a row from the switching table. You cannot delete the first row. Use the File, Delete function to completely delete a table.
+COL	Add a column to the right-hand side of the switching table.
-COL	Delete a column from the switching table.
+DELAY	Add a delay time value to the output of a switching table.
-DELAY	Remove the delay time value row from a switching table.
MATH	Enter a formula for the determination of a value.
XOR	Change multiple OR columns in a switching table to Exclusive OR columns, that is, only one column can be

true to produce a true condition for the output. In a non-exclusive OR table, as long as just one column is true, software produces a true condition for the output.

- +XOR Add a new line to an Exclusive OR table.
- XOR Delete a line from an Exclusive OR table.

**Unused Software Points**

To delete unused software points in the plant schematic, select menu item Software points, then drop-down item Delete Unused SW Points. The Delete Unused Software Points dialog box displays with a list of those points and an option to delete them, if desired. For example:



Click the points you want to delete (hold down the **Shift** or **Ctrl** key while you click to select multiple points). Then click **Delete** for software to delete these unused points. (The **Delete** key is not active until you select at least one point.)

Click **Cancel** to close the dialog box. Points that you did not delete remain in the plant.

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## Switching Table Description

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**Description** Switching tables consist of rows and columns. Each row represents a point or output condition and contains user addresses, values, and switching statuses.

**First (or Result) Row** The first row in a table always specifies the desired output result.

<i>Result Row</i>	Output point user address	Minimum delay time	On or Off
-------------------	------------------------------	-----------------------	-----------

For example, the following line says to turn the Supply\_Fan point on after a minimum delay of 30 seconds:

<i>Result Row</i>	Supply_Fan	Te=30s	1
-------------------	------------	--------	---

The point must be an output point, pseudopoint, or flag. For digital outputs, the desired result can be either zero or one. For analog outputs, the result is a value. For example, the following line says to open a damper to 100 percent:

<i>Result Row</i>	Bld1_dmpr		100.0
-------------------	-----------	--	-------

You create the first row in a table by clicking the arrow head for an output point or selecting the Software points menu item and then the desired pseudopoint or flag. Or, if there are existing logic tables that were saved as macros, you can use the Load macro function (under menu item File) to assign them to the plant.

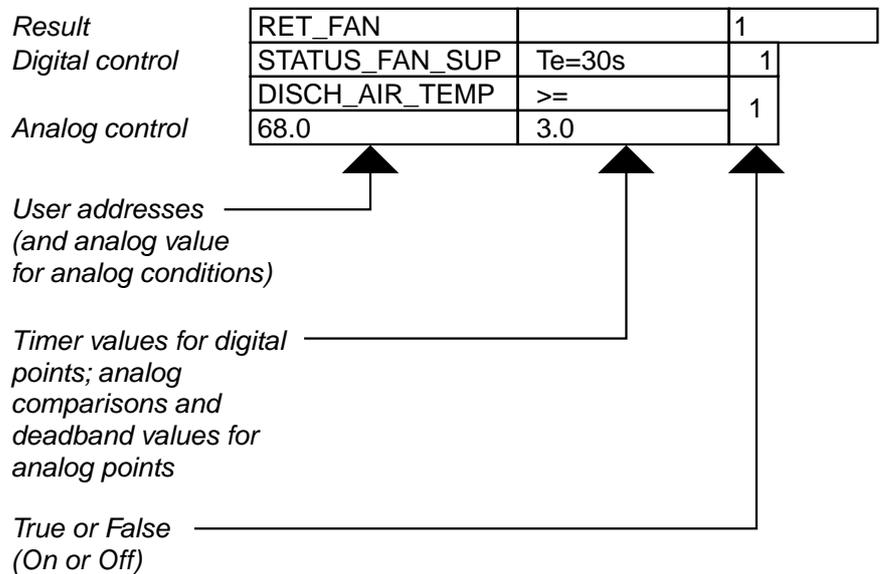
**Subsequent Rows**

Subsequent rows in a table specify the required conditions to implement the desired output result. All row conditions must be met ("AND" logic) for software to initiate the point change.

**"AND" Logic**

Software determines whether or not to implement the command in the result row by using AND logic on the rows below the result row. In other words, all conditions in those rows must be true for software to issue the command in the result row.

For example, the following table says to turn on the return air fan if the supply fan has been on for 30 seconds AND the discharge air temperature is greater than or equal to 68F (20C):



The 3.0 value in the last row, second column, creates a deadband of 3 degrees with the 68.0 value to keep the return fan from short cycling due to small changes in temperature. In other words, the temperature has to fall at least to 65 (68 minus 3) to invalidate the condition.

You create subsequent rows in a table by clicking the arrow heads for input or output points, or selecting the Software points menu item and then the desired pseudopoints or flags.

The 1's and 0's in the True or False columns have specific meanings. For analogs, a 1 is true; a 0 is false. For digitals, a 1 is closed for a digital input and powered (energized) for a digital output, no matter what the engineering unit says. A 0 for a digital input means open. A 0 for a digital output means deenergized (not powered).

**Digital vs. Analog Rows**

A digital point occupies one row, while an analog point occupies two rows.

The first row for an analog point specifies user address and comparison type (for example, greater than or equal to). The second row specifies test value and deadband differential. Switching status is in the last column and applies to both rows.

**Limits** One switching table can contain a maximum of 11 digital or 5 analog control conditions. Switching tables can only extend as far as the lower window border.

Switching tables can contain a mixture of digital and analog control conditions.

**See Also** ⇒ Result Row, Digital Condition Rows, Analog Condition Rows, and MATH Rows sections for additional details

### “OR” Logic

Tables can also include “OR” logic in additional columns. OR logic tells software to initiate the desired result if just ONE condition is true.

For example, the following table says to turn on the return air fan if the supply fan has been on for 30 seconds OR if the discharge air temperature is greater than or equal to 68F (20C) with a 3.0-degree deadband:

<i>Result</i>	RET_FAN		1
<i>Digital control</i>	STATUS_FAN_SUP	Te=30s	1 -
	DISCH_AIR_TEMP	>=	- 1
<i>Analog control</i>	68.0	3.0	

OR columns  
 (- means the condition does not matter)

**Limit** You can define a maximum of 10 OR columns for one point.

**See Also** ⇒ OR Columns and Exclusive OR Table section for additional details

### Time Delays

**Purpose** Delay commands and set minimum times for conditions to exist before software acts. Options include:

- Delay for a row condition  
For example, a supply fan must be on for at least 30 seconds before software can change its status to true.
- Delay for a logical AND (column delay)  
For example, software must wait another 30 seconds after all conditions are met in a column before issuing a command.
- Delay command to the output point of the switching table  
For example, software must wait 2 minutes before issuing an OFF command to a fan.

**Example** The following switching table shows all three timer options:

Cooler_pump	Te=2m	1
Air_cool._t_status	Te=10s	1
Air_cool._t_sen34	>=	1
60	2	
		Te 15s

Delay command to the output point  
 Delay for a row condition  
 Delay for a logical AND (column delay)

The Air\_cool.\_t\_status point must be on for at least 10 seconds before software changes its status to true.

The AND conditions in this column must be true for at least 15 seconds before software can decide to issue the ON command to the Cooler\_pump.

Software must then wait an additional 2 minutes to send the ON command to the Cooler\_pump.

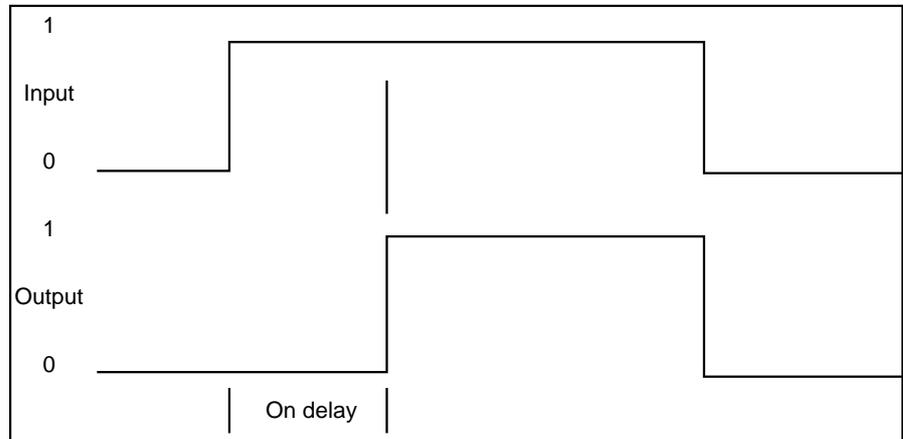
**Procedures** You add delays in the second box of result and digital rows by clicking the box and selecting delay type and time in the Select time period dialog box that displays. See the Result Row section and/or the Digital Condition Rows section for procedure details.

You add the additional delay in the bottom row by using the +DELAY function. See the Delay for a Logical AND (Column Delay) section for procedures.

**Restriction** You cannot add delay time to analog rows.

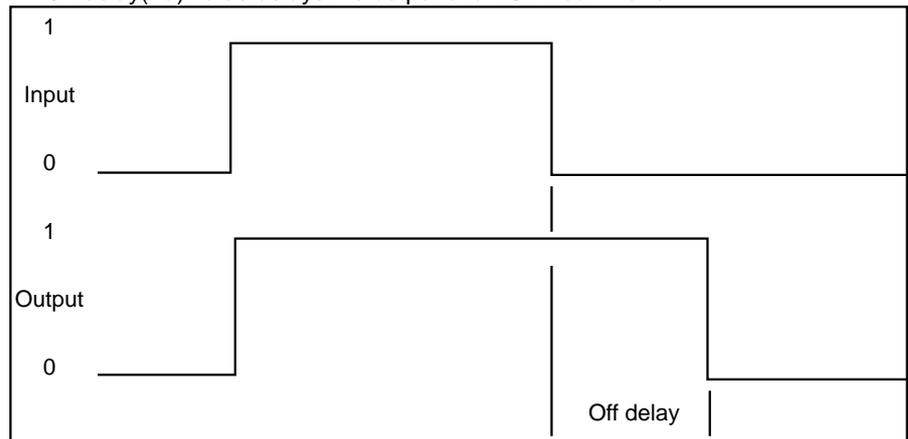
**Delay Types** When you select a delay time, you also select a delay type. Delay types include On, Off, and Cycle.

An On delay (Te) value delays the output of an ON command.



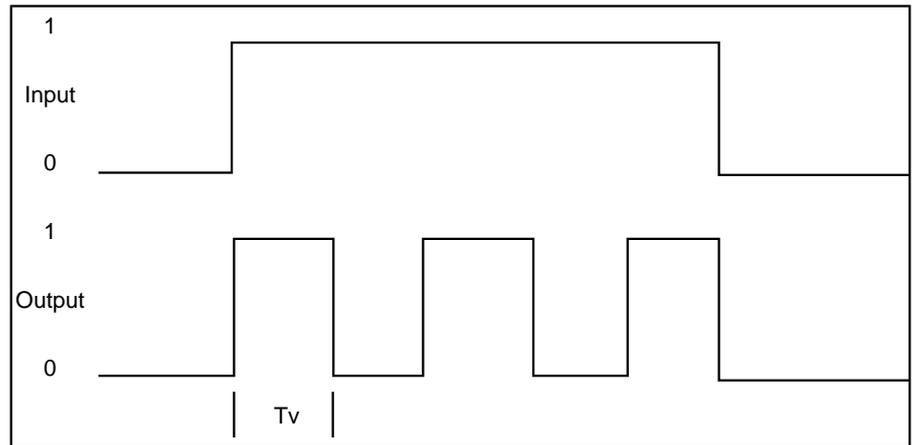
**On Delay Operation Diagram**

An Off delay (Ta) value delays the output of an OFF command.



**Off Delay Operation Diagram**

A Cycle delay (Tv) value cycles the ON and OFF times.



Cycle Delay Operation Diagram

**On Delay Example**

Extract_fan_cmd	Te=30s	1	
Supply_fan_cmd	Te=20s	1	-
Analog_condition	>=	1	-
0	0		
Supply_fan_status	Te=10s	1	-
Manual_override		-	1
		Te	
		15s	

The Supply\_fan\_cmd must be on for a continuous minimum period of 20 seconds before its 1 appears in the table AND the Analog\_condition must be true (delays cannot be assigned to analog conditions) for its 1 to appear in the table AND the Supply\_fan\_status must be made for a continuous period of 10 seconds before its 1 appears in the table.

All ANDs must be true (1) for a continuous minimum period of 15 seconds before the Extract\_fan\_cmd receives the ON command. But, the Extract\_fan\_cmd is delayed for a further 30 seconds before actually starting up.

OR, the Manual\_override can start the extract fan with a delay of 30 seconds.

**Off Delay Example**

Extract_fan_cmd		1
Supply_fan_status	Ta=10s	1

Supply\_fan\_status remains ON in the table unless its contact goes OFF for a continuous minimum period of 10 seconds. Software then picks up the OFF signal and switches the Extract fan off.

**Cycle Delay Example**

Cycle a filter cleaner ON for 60 seconds and OFF for 60 seconds if the supply fan command is ON AND the return fan command is ON.

Filter_cleaner	Tv=60s	1
Supply_fan_cmd		1
Return_fan_cmd		1

**Antibounce Example**

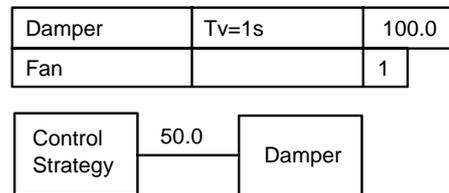
Extract_fan_cmd		1	
Supply_fan_cmd		1	-
Supply_fan_status	Ta=15s	1	-
Time_program		1	-
Manual_override		-	1

When the supply fan first starts, air flow can be intermittently strong and weak causing the supply fan status contact to “bounce” on and off. The Off delay of 15 seconds for the Supply\_fan\_status causes software to wait for a positive indication of constant air flow.

### Control Strategy and Switching Logic Interaction

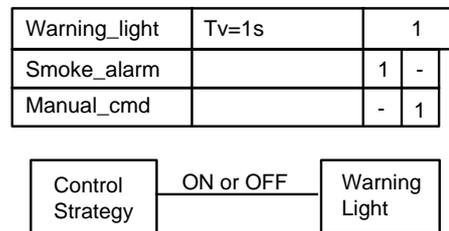
If a switching table and a control strategy are both commanding the same point, the switching table has priority.

Example 1:



In this example, the damper has a value of 100.0 as long as fan equals 1. When fan is not 1, switching logic releases the damper and the control strategy commands damper value to 50.0.

Example 2:



If both the smoke alarm and the manual command are false (0), the control strategy determines whether the warning light is ON or OFF. When the smoke alarm, for example, goes true, the warning light is alternately commanded ON (by the switching table) and commanded to the control strategy output state. So, if the control strategy is outputting the OFF state, the warning light cycles ON for 1 second and OFF for 1 second. But, if control strategy output is ON, the light stays ON continuously.

---

## Switching Table Creation

---

**Purpose** Select output points and specify conditions that software should check to determine whether or not to initiate a change to the output point.

This section presents a general procedure that explains how to set up a logic table and then presents examples of specific tables to clarify the procedure.

**Tip** ⇒ This section explains how to set up a new table. To use an existing table that was saved as a macro, see the Load Macro section.

**General Procedure** 1. Select the device to be controlled. The device can be a physical output point, pseudopoint, or flag:

To select a physical output point, click the point arrow head on the physical point bar. Output points have an upward-pointing arrow head.

To select an existing\* pseudopoint or flag, click menu item Software points, then click desired type. A dialog box displays with a list of available points. Select the desired point/flag from the list. Click **OK** to select the point. Click **Cancel** to close the dialog box.

**RESULT:** The result row for the new switching table displays in the space below the schematic. The row shows the user address for the

selected point, a blank column for a delay value, and the desired status/value column with a default status/value for the point. Analog points always have a default value of 0.

\*To create a new pseudopoint or flag, use the procedure in the Pseudopoints section, then you can select it.

2. Select other points to create rows in the switching table. You can select any physical points, pseudopoints, or flags.

RESULT: New rows appear below the result row:

- Each digital point has one row that shows the user address for the selected point, a blank column, and a status column with a default status of -.
- Each analog point has two rows that show the user address for the selected point, a default comparison symbol (>=), a status column with a default status of -, and a second row with zeroes.

3. Customize the switching table by setting up time delays, changing defaults, adding OR columns, and/or adding mathematical formulas. Each row operates a little differently. See the row sections for procedures (Result Row, Digital Condition Rows, Analog Condition Rows, MATH Rows).

### Multiple Tables for a Point

**Purpose** Allow an output point to be driven to multiple states or various logical conditions.

For example, a damper must be open when a fan is ON, but closed when there is a fire. To ensure this, set up multiple switching tables for the damper point.

**Digital Tables Tip** Complementary digital switching tables should not be used unless a control strategy also controls the digital point. Switching tables that command the point to the one state automatically toggle the point to the zero state or to the control strategy output when its conditions become false. When a control strategy controls a digital point, a zero switching table is the only way to drive the point to the zero state.

Example 1

Dig_out		1
Condition		1

Example 2

Dig_out		1
Condition		0

In Example 1, if condition goes to 0, the table sets Dig\_out to 0 automatically. In Example 2, if condition goes to 1, the table sets Dig\_out to 0 automatically.

Zero digital switching tables DO NOT have this same feature.

Example 1

Dig_out		0
Condition		1

Example 2

Dig_out		0
Condition		0

In Example 1, if condition goes to 0, Dig\_out remains 0. In Example 2, if condition goes to 1, Dig\_out remains 0.

This feature is useful in an application where toggling is not desired, for example, in the case of freeze alarms. If a freeze stat alarm causes a condition and the return-to-normal of the freeze stat causes a condition, you would not want the command result to toggle. Instead, you would require a manual override.

**Table Identifiers**

Each switching table for a point has a different result command. The result command is how software distinguishes the tables. For a digital command table, there can only be two tables, 0 and 1. Analog command tables can have multiple tables depending on the point's range of values.

**Procedure**

1. Set up the first switching table for the point and save it via menu item File, drop-down item Save.

RESULT: Software saves the table with the value of the output result (the table is also associated with the output point). For example, if the output result is 1, table name is 1.

2. To create another table for the same output point, change the result command. For example, the following table commands a damper to 100 percent open:

Damper		100.0
Fan		1

To create another table for the damper point, click 100.0. Software turns the background light blue. Type a new value, for example, 0.0.

Damper		0.0
Fan		1

Make other changes to the table as desired. For example, change Fan status or add other conditions.

3. Use menu item File, drop-down item Save, to save the new table when done with modifications.

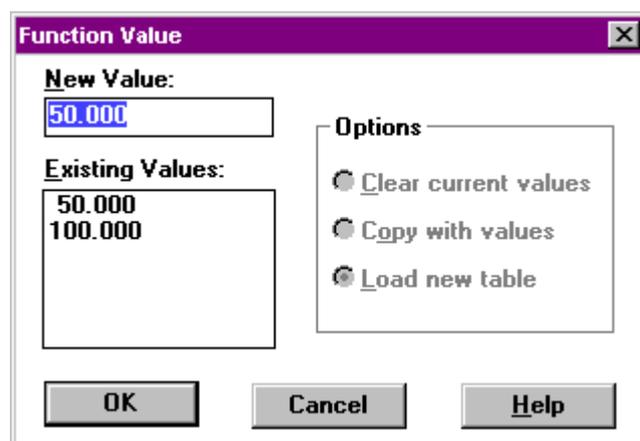
RESULT: There are now two tables for the damper point.

**To Recall a Table**

To display a specific table for a point with multiple tables:

1. Clear the window (menu item File, drop-down item New/Clear).
2. Click the arrow head for the point.

RESULT: Software displays the Function Value dialog box that lists the available tables.



3. Select desired table by clicking a value in the Existing values list. Then click OK.

You can also select a value by clicking the down arrow next to the New Value box and selecting the desired value.

**RESULT:** The Function value dialog box closes and the selected table displays in the switching logic work space.

There are other options in the Function value dialog box that allow you to create new tables for a point and display a different table. These options are not available unless there is a table on display.

To redisplay the Function value dialog box from a table, click the value in the result row. You may want to move the dialog box to see the table better. Click on the title bar and hold down the mouse button as you move the dialog box to a different position.

The types of actions that you can perform include:

- Erase all parameters in the current table (Clear current values).
- Copy the current table to another table with or without its parameter values (Copy with values or Clear current values).
- Close current table and open another table that already exists (Load new table).

Procedures for each of these actions follow.

**Erase all parameters in the current table**

- Do not change the table selection in the New Value field
- Select Clear current values, then click **OK**.

**RESULT:** Software asks first whether or not you really want to clear values. If you click **OK**, software erases all parameters from all rows. For example, if the following table was on display:

Extract_fan_cmd	Te=30s	1	
Supply_fan_cmd	Te=20s	1	0
Analog_condition	>=	0	1
68.0	3.0		

And you selected Clear current values, the dialog box closes and the table redisplay as follows:

Extract_fan_cmd		1	
Supply_fan_cmd		-	-
Analog_condition	>=	-	-
0	0		

**NOTE:** If you do not change the table selection, the Copy with values and Load new table options just close the dialog box and redisplay the current table.

**Copy the current table to another table**

- To copy a table to another table, display the table you want to copy.
- Click the result row value to display the Function value dialog box.
- Select the table that you want to receive a copy of the displayed table.

Select Clear current values to copy the current table **WITHOUT** its values. Select Copy with values to copy the current table **WITH** its values. (If you select Load new table, software simply closes the current table and displays the selected table.)

- Click **OK**.

**RESULT:** Software first asks whether you want to clear or replace, as appropriate. If you click **OK**, software copies as directed and displays the changed table.

For example, if there were two tables representing values 100.0 and 50.0 (as follows):

Extract_fan_dmpr	Te=30s	100.0	
Supply_fan_cmd	Te=20s	1	0
Analog_condition	>=	0	1
68.0	3.0		

Extract_fan_dmpr	Te=30s	50.0	
Supply_fan_cmd	Te=20s	0	1
Analog_condition	>=	1	0
85.0	5.0		

And you decided to copy the 100.0 table over the 50.0 table and keep the values from the 100.0 table, the following table would display:

Extract_fan_dmpr	Te=30s	50.0	
Supply_fan_cmd	Te=20s	1	0
Analog_condition	>=	0	1
68.0	3.0		

If you decided to copy over the 50.0 table WITHOUT the values in the 100.0 table, the following table would display:

Extract_fan_dmpr		50.0	
Supply_fan_cmd		-	-
Analog_condition	>=	-	-
0	0		

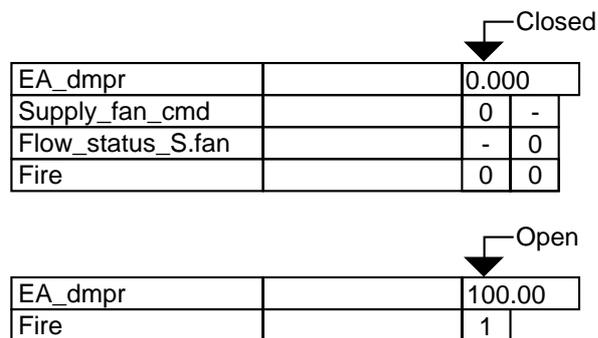
**Close current table and open another table that already exists**

- Select a table number in the Existing values box.
- Select Load new table.
- Click **OK**.

RESULT: Software closes the current table and displays the selected table. If you made changes to the current table, software asks first whether or not it should save the changes before it closes it.

**Damper/Fire Example**

The following example controls a damper with multiple tables (opposite states in each table) to ensure action for a priority situation such as a fire.



**OFF and ON Tables**

If there are two tables for a point, one OFF and one ON, but no control strategy, the ON table has priority and turns the point both ON and OFF. Therefore the OFF table is unnecessary.

If there is a control strategy but no ON table (only an OFF table), the control strategy operates the point unless the OFF table is triggered. Then, switching logic turns the point off. Switching logic always takes precedence.

If there is only an OFF table (no ON table or control strategy), there is nothing to turn the point back on after the OFF table turns it off.

### Row Deletion

- Purpose** Eliminate an unnecessary row (other than the result row).
- Procedure**
  1. Click the -ROW icon in the list down the right-hand side of the window.  
 RESULT: The switching table function turns red.
  2. Select the input condition (row) to be deleted from the switching table.  
 RESULT: Software removes the input condition from the switching table. For a digital input condition, the switching table becomes one row shorter. For an analog input condition, it becomes two rows shorter.
- To Cancel Without Deleting** To cancel without deleting the row, click the -ROW icon with the right-hand mouse button.
- Restriction** You cannot delete the result row with this function. Use menu item File, drop-down item Delete, to erase the entire switching table.

### Result Row

**Purpose** The result row specifies the output that software should command when table conditions are true. It can also specify a time delay for a digital commands. The result row is always the first row in a table.

<i>Result Row</i>	Output point user address	Minimum delay time	Digital or Analog value
-------------------	---------------------------	--------------------	-------------------------

**Example** For example, the following line says to turn the Supply\_Fan point on after a minimum delay of 30 seconds:

<i>Result Row</i>	Supply_Fan	Te=30s	1
-------------------	------------	--------	---

**Point Type** The point must be an output point, pseudopoint, or flag. For digital outputs, the desired result can be either zero or one. For analog outputs, the result is a value. For example, the following line says to open a damper to 100 percent:

<i>Result Row</i>	Bld1_dmpr		100.0
-------------------	-----------	--	-------

**Row Changes** The following sections explain how to change the output command for the point (digital or analog value) and how to set delay time.

### Command Changes

- Purpose** Modify the resulting command software sends to the selected point.
- Digital Points** Click the command in the row to change its value.

For example, the 1 in the following row is the click area to change the command output for the table:

Supply_Fan	Te=30s	1
------------	--------	---

Click area 

Whenever you click a command, it changes. For example, a two-position point changes between 1 and 0. A multi-stage point can have seven states, so the command can change from 0 to 1 to 2 to 3 to 4 to 5 to 6.

The command numbers (0, 1, etc) refer to the digital engineering unit table (see Appendix B: Engineering Units, Digital section). For example, the first digital engineering unit table entry assigns ON to 1 and OFF to 0. Therefore, a switching table command to 1 in this example is an ON command and a command to 0 is an OFF command.

This action assumes the Active State flag for the point is enabled. See the Editors chapter, Point Attributes Dialog Boxes, for more details on the Active State attribute.

### Analog Points

1. Click the command value.

Bld1_dmpr		100.00
-----------	--	--------

Click area 

RESULT: The background in the value box turns blue.

2. Type a new value.

RESULT: The new value displays in the box.

### Analog Command Tip

Actual analog output commands depend on point characteristics. The following example illustrates this function.

Ana_out_1		50.0
Condition		1

Ana\_out\_1 I/O characteristics are:

2V = 0 percent  
10V = 100 percent

If no other controls are acting on the Ana\_out\_1 point (for example, control strategy or other switching logic), the following actions occur:

- If the condition is true, software commands Ana\_out\_1 to 50.0 (actual command 6V).
- If the condition is false, software commands Ana\_out\_1 to the lower value of the point's engineering unit range, 0 (2V).

If the point's I/O characteristic were reversed:

2V = 100 percent  
10V = 0 percent

Software would still command the point to 0 when the condition is false, but the actual command would be 10V.

As a further example, if the point's I/O characteristic were 20 to 80 percent (4V to 7V), software would command the point to 20 (4V) when the condition is false.

Delay Command to a Digital Output Point

**Purpose** Add a delay for a digital command result in a switching table. For example, if a switching table commands a supply fan on when conditions are met, you can add a delay of 30 seconds before software actually issues the command.

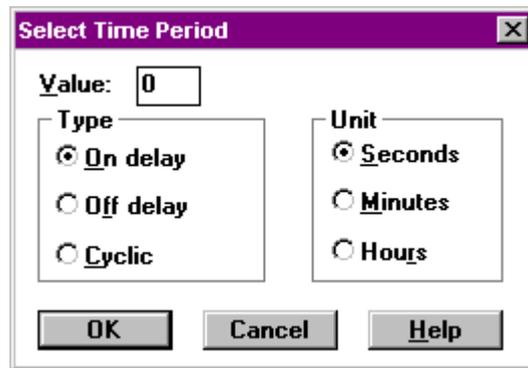
This function only applies to digital outputs.

**Procedure** 1. Click the rectangle in the second column of the result row in the switching table (top row). For example:

Click area 

Supply_fan_cmd		1
----------------	--	---

RESULT: The Select Time Period dialog box displays.



2. Type a number for the desired period of time in the Value box. Press **Tab** to go to the Type box.
3. Click desired type of delay:  
*On delay*—Minimum time (Te in table) that software should add a delay to a start command.  
*Off delay*—Minimum time (Ta in table) that software should add a delay to a stop command.  
*Cyclic*—Cycle time (Tv in table) tells software to alternate ON and OFF times.
4. Press **Tab** to go to the Unit box. Click desired unit of time (Seconds, Minutes, or Hours).
5. Click **OK** to save changes and close dialog box. Or, to close the dialog box without saving changes, click **Cancel**.

RESULT: The selected timer value with its value and unit displays. For example, if you selected 30-second On delay:

Supply_fan_cmd	Te=30s	1
----------------	--------	---

Time delay 

**To Delete Timer Value**

1. Click the timer value to be deleted (in this example, Te=30s).

RESULT: The Select Time Period dialog box displays.

2. Enter 0 (zero) in the Value field.
3. Click **OK**.

RESULT: Software deletes the selected timer value from the row.

**See Also** ⇒ Digital Condition Rows, Delay for a Row Condition subsection, for procedure to add timer delays to digital conditions

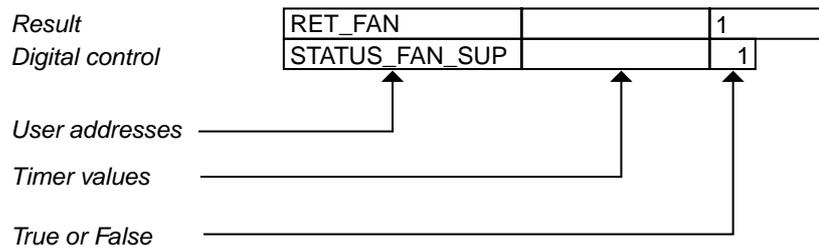
Delay for a Logical AND (Column Delay) section for a procedure to add a delay time to an AND Column

Switching Table Description, Time Delays subsection, for a summary of optional delay actions.

## Digital Condition Rows

**Purpose** Specify required digital conditions to implement the desired output result.

For example, the following table says to turn on the return air fan if the supply air fan is on:

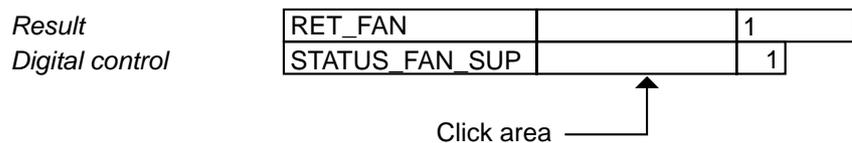


**Row Changes** The following sections explain how to set delay time and how to change the True or False status for the row.

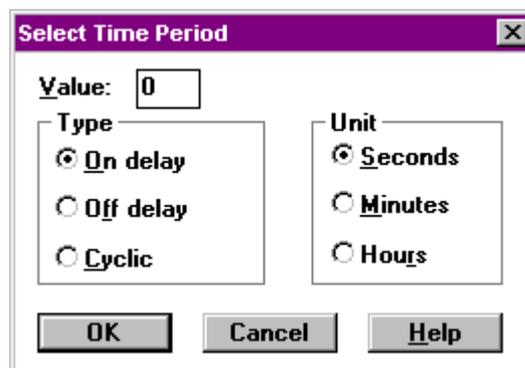
## Delay for a Row Condition

**Purpose** Require a condition to be true for a minimum amount of time before software changes its status to true. For example, a supply fan must be on for at least 30 seconds before software can change its status to true.

**Procedure** 1. Click the rectangle in the second column of the input condition. For example:



RESULT: The Select Time Period dialog box displays..



2. Type a number for the desired period of time in the Value box. Press **Tab** to go to the Type box.

3. Click desired type of delay:

*On delay*—Minimum time (Te in table) that a condition must be on before software should change its status to true.

*Off delay*—Minimum time (Ta in table) that a condition must be off before software should change its status to true.

*Cyclic*—Cycle time (Tv in table) tells software to alternate ON and OFF times.

4. Press **Tab** to go to the Unit box. Click desired unit of time (Seconds, Minutes, or Hours).

5. Click **OK** to save changes and close dialog box. Or, to close the dialog box without saving changes, click **Cancel**.

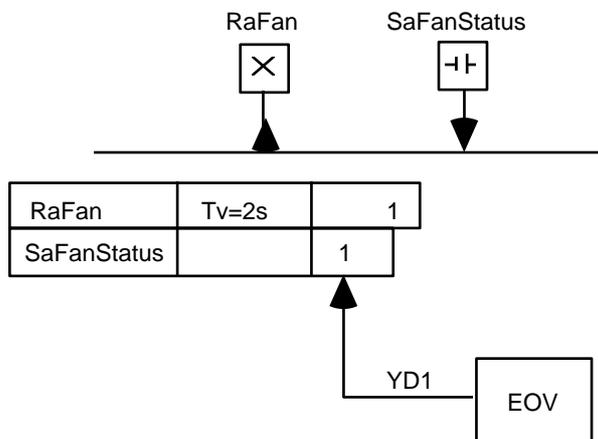
RESULT: The selected timer value with its value and unit displays in the selected field. For example, if you added a 20-second On delay:

**Multiple Row Conditions**

If a switching table has more than one digital condition and you assign delays to each condition, the lowest delays may be irrelevant. For example, if digital 1 has a delay of 10 seconds and digital 2 has a delay of 15 seconds, software cannot mark the column as true for at least 15 seconds (the longest time) since all conditions must be true (AND logic) for software to mark the column as true. If a switching table has more than one digital condition plus OR columns, multiple delay times may still be useful since an OR column needs only one condition to be true.

**Cycle Timer**

Cyclic timers have priority over Control Strategy loops only during the active condition of their cycle. For example, the following figure shows a digital output point, RaFan, being commanded by a switching table that is controlled by the status of a digital input called SaFanStatus. The RaFan point is also controlled by an EOV operator in a Control Strategy loop.



*Scenario 1: SaFanStatus is true; EOV output is false.*

RaFan turns on for 2 sec and then releases priority. This action has the effect of turning the point off (standard switching table logic).

*Scenario 2: SaFanStatus is true; EOV output is true.*

RaFan stays on continuously because switching logic turns the output on for 2 sec and then releases priority to the EOV, which wants the point on. Therefore, it looks like the output is no longer cycling.

**To Delete Timer Value**

1. Click the timer value to be deleted in the switching table. In the previous example, Te=20s.

RESULT: The Select Time Period dialog box displays.

2. Enter 0 (zero) in the Value field.

3. Click **OK**.

RESULT: Software deletes the selected timer value.

**True or False Changes****Purpose**

Modify the required status for the point. This status determines how software ANDs the rows.

For example, in the following table, if the supply fan status point (STATUS\_FAN\_SUP) is on (1) AND the supply fan command point (SUP\_FAN\_CMD) is on (1), software calculates a True value for the table. If either point is off, software calculates a False value for the table.

RET_FAN		1
STATUS_FAN_SUP		1
SUP_FAN_CMD		1

If you change the required status for one of the points, software calculates the True/False value differently. For example:

RET_FAN		1
STATUS_FAN_SUP		0
SUP_FAN_CMD		1

Now software calculates a True value only if the supply fan status point is off and the supply fan command point is on.

**Procedure**

Click the status in the row to change it to another value. True is 1; False is 0; Not applicable is -.

For example, if the following row were in a table and you clicked 1, the command would change to 0. If you clicked again, it would change to -. Each time you clicked it, it would change.

Supply_Fan	Te=30s	1
------------	--------	---

Click area 

**Analog Condition Rows****Purpose**

Specify required analog conditions to implement the desired output result.

**Description**

Each analog condition requires two rows. The first row specifies user address and comparison type (for example, greater than or equal to). The second row specifies comparison value and deadband differential. Switching status is in the last column and applies to both rows.

For example, the following table says to turn on the return air fan if the supply fan has been on for 30 seconds AND the discharge air temperature is greater than or equal to 68F (20C). The DISCH\_AIR\_TEMP row is the analog condition:

<i>Result</i>	RET_FAN		1
<i>Digital control</i>	STATUS_FAN_SUP	Te=30s	1
<i>Analog control</i>	DISCH_AIR_TEMP	>=	1
	68.0	3.0	

*User addresses (and analog value for analog conditions)* ———>  
*Timer values for digital points; analog comparisons and deadband values for analog points* ———>  
*True or False (On or Off)* ———>

The 3.0 value in the last row, second column, creates a deadband of 3 degrees with the 68.0 value to keep the return fan from short cycling due to small changes in temperature. In other words, the temperature has to fall at least to 65 (68 minus 3) to invalidate the condition.

**Row Changes**

The following sections explain how to set comparison type (>=), comparison value, and deadband value, and how to change the True or False status for the row.

**Comparison Type**

**Purpose** Select a less than or greater than comparison for the analog point.

**Procedure** Click the comparison symbol to change it to the other symbol. Only two are available, >= (greater than or equal to) and <= (less than or equal to).

<i>Result</i>	RET_FAN		1
<i>Digital control</i>	STATUS_FAN_SUP	Te=30s	1
<i>Analog control</i>	DISCH_AIR_TEMP	>=	1
	68.0	3.0	

Click area ———>

**RESULT:** The symbol changes to the other symbol. Each click changes the symbol back and forth.

**Comparison Value**

**Purpose** Select a point or enter a value for software to compare with the analog control point.

**Procedure** 1. Click the comparison value box. Initially, the box always shows 0. For example:

<i>Result</i>	RET_FAN		1
<i>Digital control</i>	STATUS_FAN_SUP	Te=30s	1
<i>Analog control</i>	DISCH_AIR_TEMP	>=	1
	0		

Click area ———>

**RESULT:** The background in the box turns light blue.

2. Select a physical analog point or a pseudopoint, or enter a value, or enter a mathematical formula using one of the following methods:

- To enter a value (for example, 68.0), type the value.

The value appears in the box and the blue disappears.

- To select a physical analog point, click the point arrow head on the physical point bar.

The user address for the point appears in the box and the blue disappears.

NOTE: If you select an incompatible point (for example, a digital), nothing happens.

- To select an existing\* pseudopoint or flag, click menu item Software points, then click desired type. A dialog box displays with a list of available points. Select the desired point/flag from the list. Click **OK** to close the dialog box.

\*To create a new pseudopoint or flag, use the procedure in the Pseudopoints section, then you can select it.

The user address for the point appears in the box and the blue disappears.

- To use a mathematical formula for multiple analog points, select the MATH icon. The Mathematical Editor window displays. Enter the required formula. See Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) for details on MATH operation. The formula name displays in the comparison value field.

### Deadband (or Hysteresis) Value

**Purpose** Enter a value that creates a range for the comparison value.

For example, in the following table, discharge air temperature is compared to the value 68.0. There is also a deadband (or hysteresis) of 3.0. The deadband value tells software to mark this condition as true as long as discharge air temperature is between 65 and 68. If discharge air temperature falls below 65, software invalidates the condition. Using a deadband prevents frequent command changes.

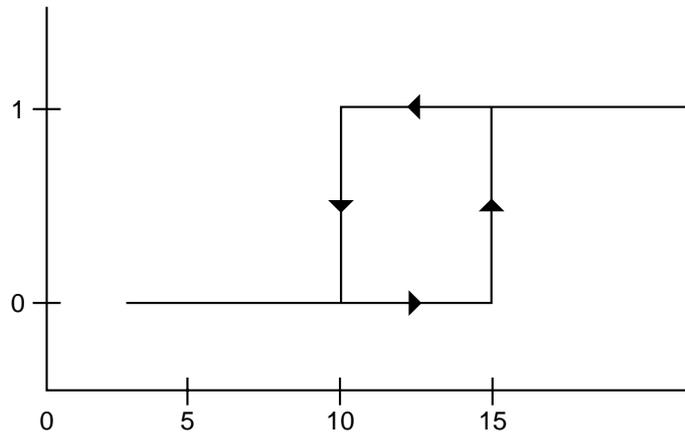
<i>Result</i>	RET_FAN		1
<i>Digital control</i>	STATUS_FAN_SUP	Te=30s	1
<i>Analog control</i>	DISCH_AIR_TEMP	>=	1
	68.0	3.0	

Deadband value 

As another example, you can control a fan based on a temperature as follows:

FAN		1
TEMP_1	>=	1
15	5	

The following operation occurs:

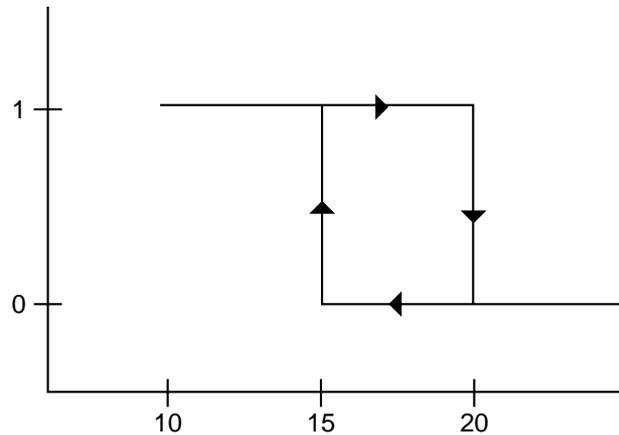


(15-5)

If you reverse the TEMP\_1 >= sign to <=:

FAN		1
TEMP_1	<=	1
15	5	

The following operation occurs:



(15+5)

**Procedure**

1. Click the deadband box.

RESULT: The background in the box turns light blue.

2. Select a physical analog point or a pseudopoint, or enter a value, or enter a mathematical formula using one of the following methods:

- To enter a value (for example, 3.0), type the value.

The value appears in the box and the blue disappears.

- To select a physical analog point, click the point arrow head on the physical point bar.

The user address for the point appears in the box and the blue disappears.

NOTE: If you select an incompatible point (for example, a digital), nothing happens.

- To select an existing\* pseudopoint or flag, click menu item Software points, then click desired type. A dialog box displays with a list of

available points. Select the desired point/flag from the list. Click **OK** to close the dialog box.

\*To create a new pseudopoint or flag, use the procedure in the Pseudopoints section, then you can select it.

The user address for the point appears in the box and the blue disappears.

- To use a mathematical formula for multiple analog points, select the MATH icon. The Mathematical Editor window displays. Enter the required formula. See Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) for details on MATH operation. The formula name displays in the deadband field.

### True or False Changes

**Purpose** Modify the required status for the point. This status determines how software ANDs the rows.

For example, in the following table, if the supply fan status point (STATUS\_FAN\_SUP) is on (1) AND discharge air temperature (DISCH\_AIR\_TEMP) is greater than or equal to 65 (1), software calculates a True value for the table. If the status point is off or discharge air temperature is below 65, software calculates a False value for the table.

<i>Result</i>	RET_FAN		1
<i>Digital control</i>	STATUS_FAN_SUP	Te=30s	1
<i>Analog control</i>	DISCH_AIR_TEMP	>=	1
	68.0	3.0	

If you change the required status for one of the points, software calculates the True/False value differently. For example:

<i>Result</i>	RET_FAN		1
<i>Digital control</i>	STATUS_FAN_SUP	Te=30s	0
<i>Analog control</i>	DISCH_AIR_TEMP	>=	1
	68.0	3.0	

Now software calculates a True value only if the supply fan status point is off and discharge air temperature is greater than or equal to 65.

**Procedure** Click the status in the row to change it to another value. True is 1; False is 0; Not applicable is -.

For example, if the following row were in a table and you clicked 1, the command would change to 0:

Supply_Fan	Te=30s	1
------------	--------	---

Click area 

If you clicked again, it would change to -. Each time you clicked it, it would change.

### MATH Rows

**Purpose** Create a calculated value to replace a variable in a switching table.

**Procedure** 1. To replace an existing variable in a switching table, click the variable name/value to highlight it. Then, click the MATH icon in the Tool Bar to display the Math Editor window.

To create an analog row in a switching table so that you have a variable to replace with a calculated value, either create an analog pseudopoint or flag (via the Software points menu item) or click a physical point in the schematic.

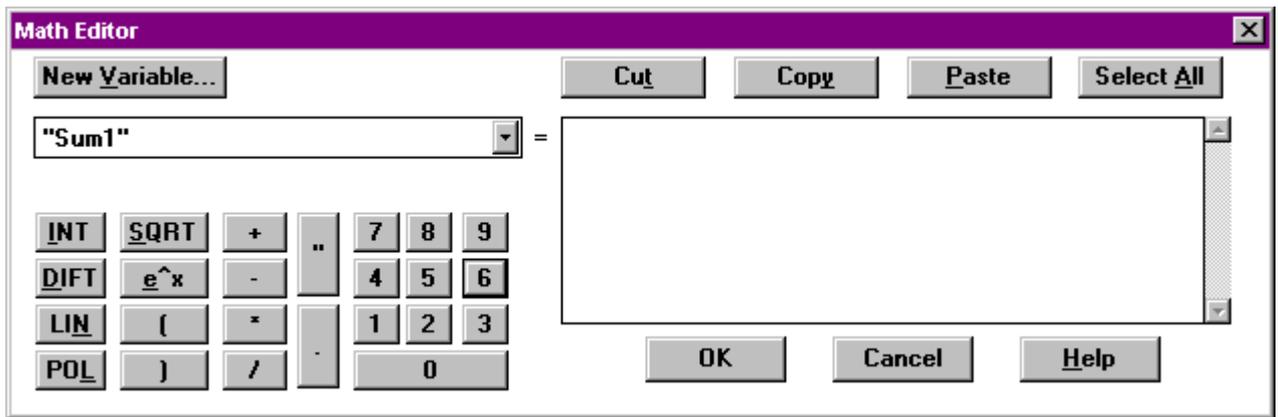
NOTE: After you create a math calculation for a variable, software replaces the point/pseudopoint name with the name of the math variable. Therefore, if you used a pseudopoint/flag, you can delete it during the attach process since it is no longer needed. If you used a physical point, no further action is required.

For example, the following switching table shows three variables, t1, 0, and 0. The t1 variable can be a physical point or an analog pseudopoint or flag defined via the Software points menu item. The zero values automatically display when you create a pseudopoint/flag or click a physical point in a schematic. You can highlight the zero values and click the MATH icon to create calculated values for them, also.

do		1
t1	>=	1
0	0	

RESULT: The Math Editor dialog box displays.

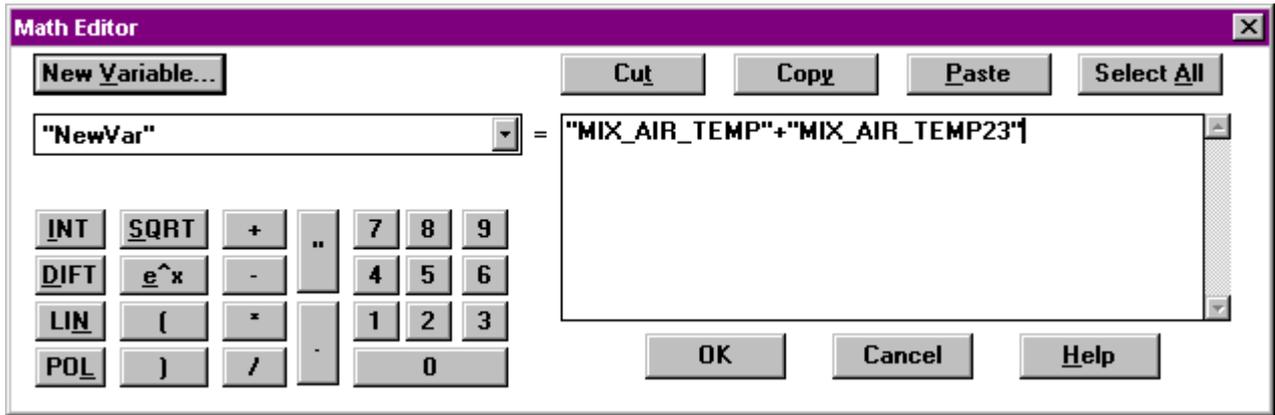
TIP: You can also display the Math Editor dialog box by double-clicking a formula.



2. Click New Variable to enter a new formula name or select an existing formula from the box below New Variable. Click the down arrow in the box to display a list of available variable names. Click one to select it. Its formula displays in the box next to it.

You can now start selecting points from the hardware point triangles or Software points menu, and mathematical functions or values from the calculator pad. See Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) for MATH Control Icon details.

Example:



3. Click **OK**.

**RESULT:** The window closes and the switching table redisplay with the math variable name instead of the original variable name (for example, t1 or zero).

## Delay for a Logical AND (Column Delay)

**Purpose** Add a delay for a column in a switching table. For example, if a switching table commands a supply fan on when conditions are met, you can add a delay of 30 seconds before software actually issues the command.

**Procedure** 1. Click the +DELAY icon from the icon list in the right-hand column.

**RESULT:** Software adds a row for the timer value to the bottom of the switching table.

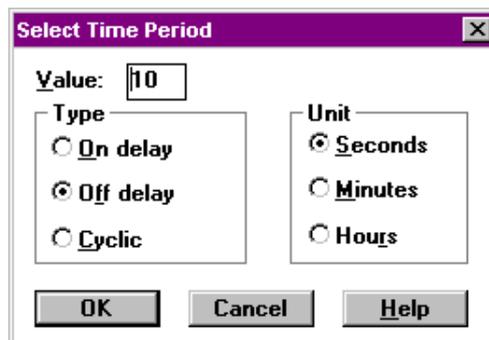
**NOTE:** If you insert more entries into the switching table later, software adds them above the timer value entry.

2. Click the box below the column where you want to add a delay. For example:

Cooler_pump		1
Air_cool._t_status		1
Air_cool._t_sen34	>=	1
60	2	

Click area

**RESULT:** The Select time period dialog displays.



3. Type a number for the desired period of time in the Value box. Press **Tab** to go to the Type box.
4. Click desired type of delay:
  - On delay*—Minimum time (Te in table) that all column conditions must be true before software should add the delay time to the switching table output ON command.
  - Off delay*—Minimum time (Ta in table) that all column conditions must be true before software should add the delay time to the switching table output OFF command.
  - Cyclic*—Cycle time (Tv in table) tells software to alternate ON and OFF times.
5. Press **Tab** to go to the Unit box. Click desired unit of time (Seconds, Minutes, or Hours).
6. Click **OK** to save changes and close dialog box. Or, to close the dialog box without saving changes, click **Cancel**.

RESULT: The selected timer value with its value and unit displays in the selected field.

**To Delete Result Delay**

The -DELAY function is available only after you define a delay via the +DELAY function.

- > Click the -DELAY icon from the list down the right-hand window column.

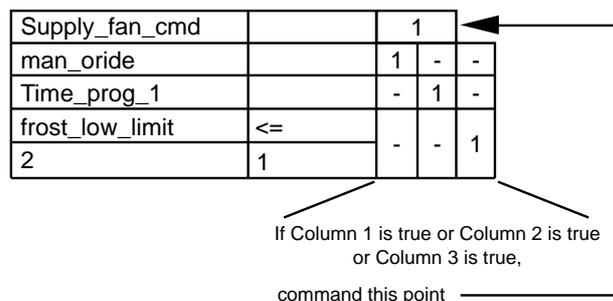
Software removes the last row containing delay time.

## OR Columns and Exclusive OR Columns

**Purpose**

The OR function tells software to command a point when at least one of the conditions in the switching table is true.

For example, the following table says to command the supply fan on if there is a manual override command (for example, from an operator), or Time program 1 commands it on, or the low limit sensor for frost is less than or equal to 2 (with a deadband of 1):



**Limits**

Each table can have a maximum of 10 OR columns and a maximum of eight rows.

**Procedure**

1. Click the +COL icon in the list down the right-hand window border.

RESULT: Software adds a new OR column to the right-hand edge of the switching table.

2. Click the statuses in the columns to create the appropriate true (1), false (0), and not applicable (-) statuses. Each click changes the status (0 to 1 to - and back to 0).

**To Remove a Column**

1. Click the -COL icon in the list down the right-hand window border.

RESULT: The switching table function turns red.

- Click the OR column that you want to delete.

RESULT: Software removes the column from the switching table.

**Tip** ⇒ To cancel a deletion, click the -COL icon again with the *left-hand* mouse button.

## Exclusive OR Tables

**Purpose** An Exclusive OR table only allows one true condition in a switching table with OR columns.

A switching table must already have OR columns before you can define an Exclusive OR table.

For example, if you have a switching table with the following OR columns:

Dig_out		1		
Condition 1		1	-	-
Condition 2		-	1	-
Condition 3		-	-	1

You can click XOR to create the following table:

Dig_out		1		
	1	0	0	
	0	1	0	
	0	0	1	

This table tells software to turn Dig\_out on if ONLY ONE of the three conditions is true. If any two are true, the table is false.

**Limits** Each table can have a maximum of 10 XOR columns.

- Procedure**
- Click the XOR icon in the list down the right-hand window border.

RESULT: The normal switching table disappears and the Exclusive OR table appears.

- You can modify the table:

- To change the True/False values, click any of the 0's and 1's. Each click changes it to the opposite (0 to 1, 1 to 0).
- To insert a line in the table, click the +XOR icon in the list in the right-hand window border.

Software adds the new line to the end of the Exclusive Or table. All entries are preassigned as zero.

- To delete a line from the table, click the -XOR icon in the right-hand window border. The icon turns red.

Click the line to be deleted in the Exclusive Or table. Software deletes the line.

To cancel deletion, click the -XOR icon again using the *left-hand* mouse button.

**Restriction** You cannot delete the Exclusive Or table header (first row).

### +XOR and -XOR Functions

To use these functions after you establish an Exclusive OR table, redisplay the table by clicking XOR. You can then select a function.

**XOR Table Changes**

There is no indication in a switching table if there is an XOR table assigned to it. The only way to know is to click the XOR button to see if a table appears.

If you change a switching table that has an Exclusive OR table assigned to it, the resulting table action may not be acceptable. Always check whether there is a table and then adjust the table to achieve the desired result.

For example, you can make changes to the following switching table and even though it has an Exclusive OR table assigned, software does not warn you.

pd_2		1	
di_1		1	0
di_2		0	1

XOR table:

pd_2		1	
		1	0
		0	1

If you added an analog line as follows:

pd_2		1	
di_1		1	0
di_2		0	1
ai_1	>=	1	-
5.0	0.5		

Software will AND the analog condition with the di\_1 condition before doing the Exclusive or.

---

## Pseudopoints

---

**Definition** A pseudopoint is a calculated value; it has no physical basis in the system. It contains a process or control variable required by the switching logic or control strategy. The controller calculates the value while the program is running.

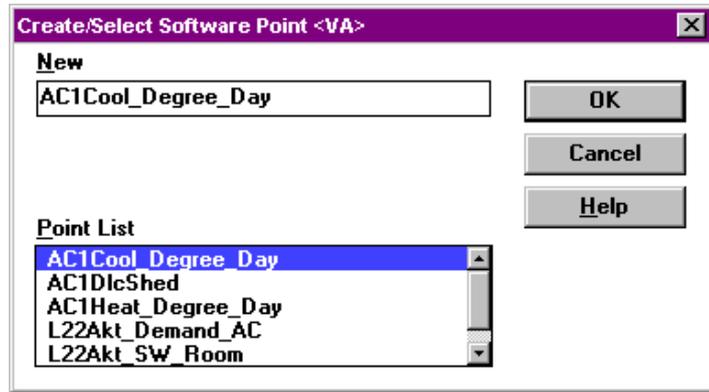
**Procedure** 1. Click menu item Software points.

RESULT: The pseudopoint types list displays. Types include:

- Pseudo analog (VA)
- Pseudo digital (VD)
- Pseudo totalizer (VT)
- Global analog (GA)—see Globals note.
- Global digital (GD)—see Globals note.
- Flag analog (FA)
- Flag digital (FD)

2. Click required pseudopoint type.

RESULT: The Create/Select Software Point dialog box displays.



3. To create a new pseudopoint, type a new name in the New editing field. New names cannot already exist. Click **OK**.

RESULT: The name of the newly created pseudopoint appears in the list box.

4. To select an existing pseudopoint (or your new one) for inclusion into the currently displayed table, double-click its name. (Or, single-click the name and then click **OK**.)

RESULT: Row(s) for the pseudopoint appear at the bottom of the switching table. One row appears for digitals; two rows for analogs.

5. To end the pseudopoint function and close the dialog box, click **Cancel**.

**NState** Pseudo digital (VD) points have two subtype choices, 2State and NState. Select the NState if the point has more than two states, for example, OFF, ON, Open, Close, etc.

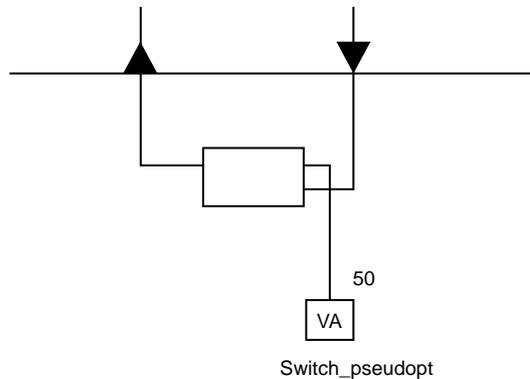
**Globals** When you create a global, you must match user address and type (analog or digital) with the associated pseudopoint or physical point. The Pseudopoints and Flags subsection in the Control Strategy chapter of this manual describes global points in detail.

**Control Strategy Tip** If you save the switching table to a pseudopoint, you can also use the pseudopoint in the Control strategy for the plant. For example, if you set up a switching table for an analog pseudopoint so that software commands it to 50 under certain conditions, you can then use the pseudopoint in the control strategy as an input to a function for switching purposes.

Switching table:

Switch_pseudopt		50
condition 1		1
condition 2		1

Control strategy:



Switch\_pseudopt acts as an input switch to the control icon.

---

## Switching Logic File Management

---

**Purpose** Save, load, delete, and restore switching tables. The File menu item provides drop-down items for these functions:

Save a Switching Table  
 Copy a Switching Table to Another Point  
 Load a Switching Table  
 Delete a Switching Table  
 Restore a Switching Table  
 Start a New Switching Table

---

### Save a Switching Table

**Purpose** Save the currently displayed switching table.

**Procedure** 1. Click File, then drop-down item Save.

RESULT: The Acknowledge dialog box displays.

2. Click **OK**.

RESULT: The arrow head associated with the output point is cross-hatched in white.

**Macro Option** You can also save switching tables in the Macro library for later use in other systems. See the Macros section for details.

---

### Copy a Switching Table to Another Point

**Purpose** Copy the switching table and assign it to another point (physical or pseudo).

NOTE: The type of point (analog or digital, input or output) you select for reassignment must be compatible with the type of point for which the switching table was created.

**Procedure to save to a pseudopoint**

1. Click File, then drop-down item Copy.

RESULT: Software highlights the switching table.

2. Click menu item Software points.

RESULT: The list of pseudopoint types displays.

3. Select the required pseudopoint type .

NOTE: The type of point to which the switching table is assigned must be compatible with the type of point for which the switching table was created.

RESULT: The Software points dialog box displays.

4. Select an existing pseudopoint or create a new one.

NOTE: If you create a new point, you must also assign it a place on the software bar in the Control strategy. See Control Strategy, Pseudopoints and Flags section, for procedure. You can assign the point after you complete the switching logic.

5. Click **OK** to assign the point.

**RESULT:** The Acknowledge dialog box displays, confirming the switching table has been successfully saved. The switching table is no longer highlighted.

**NOTE:** If the switching table is still highlighted, you selected an incompatible point type. Select a compatible point.

6. Click **OK**.

7. Click **Cancel**.

**Tip** ⇒ To cancel the storage of the switching table before you finish, click **Cancel** instead of **OK** in Step D. After the dialog box closes, click the right-hand mouse button once. Software removes the highlighting from the table.

#### Procedure to save to a physical point

1. Click File, then drop-down item Copy.

**RESULT:** Software highlights the switching table.

2. Select the desired physical point from the plant schematic .

**NOTE:** The type of point you select must be compatible with the type of point for which the switching table was created.

**RESULT:** The Acknowledge dialog box displays confirming successful storage.

3. Click **OK**.

**RESULT:** Software removes the highlighting from the switching table. The physical point symbol is cross-hatched in white.

#### Control Strategy Tip

If you save the switching table to a pseudopoint, it is available in the Control strategy for the plant.

---

### Load a Switching Table

**Purpose** Redisplay a previously saved switching table to modify or view it. The outputs for switching tables that already exist are recognizable by the white cross-hatching on the physical point bar.

**Procedure** Click the desired output arrow head in the plant schematic.

If there is only one switching table for the point, it displays.

If there is more than one table for the point, software displays a dialog box that lists the names of the tables. Click desired table name, then click **OK**. Software displays the selected table.

---

### Delete a Switching Table

**Purpose** Remove an unnecessary switching table.

**Procedure** When the unnecessary table is on display in the window, click File, then drop-down item Delete.

Software deletes the switching table.

See the Load a Switching Table section if you do not know how to display a desired table.

---

## Restore a Switching Table

- Purpose** Cancel modifications made to currently displayed switching table since it was last saved.
- Procedure** Click File, then drop-down item Restore.
- The stored version of the switching table displays.

---

## Start a New Switching Table

- Purpose** End the processing of the current switching table and start a new one.
- Procedure**
1. Click File, then drop-down item New/Clear.
- RESULT: The Note dialog box displays.
2. Click **OK** to save the current switching table and remove it from display. Or, to remove it without saving, click **Cancel**.
  3. Select a point to start a new table.

---

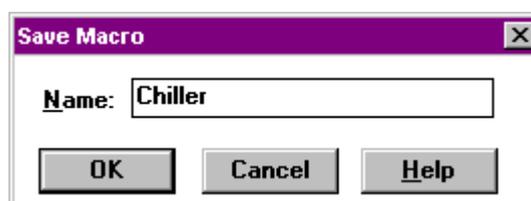
## Macros

- Purpose** Save switching tables in a Macro library with descriptive names for reuse throughout the system. All macros are available for all plant types.

---

## Save the Switching Table as a Macro

- Procedure**
1. Click File, then drop-down item Save macro.
- RESULT: The Macro name dialog box displays



2. Click the Name editing field.
3. Enter the name of the macro in the Name editing field.

NOTE: The name may not already exist.

4. Click **OK**.

RESULT: The Acknowledge dialog box confirms the macro has been saved.

5. Click **OK** to close the dialog box.

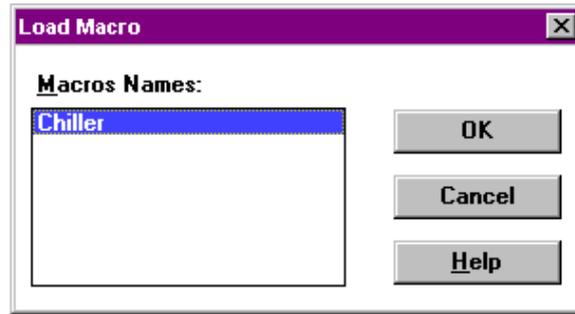
---

## Load a Macro

NOTE: You can only load a macro if no other switching table is currently in the window. Use menu item File, drop-down item New/Clear to clear the window.

- Procedure**
1. Click File, then drop-down item Load Macro.

RESULT: The Load Macro dialog box displays.



2. Select the macro to be copied from the list of existing macros.

3. Click **OK**.

RESULT: The switching table defined in the macro displays without a point name in the result row.

4. Click menu item File, then drop-down item Copy.

RESULT: Software highlights the switching table.

5. Click the arrow head for the point you want in the result row, that is, the point the switching table should control.

RESULT: The Acknowledge dialog box displays with a message that software copied the switching table.

6. Click **OK** to close the dialog box.

RESULT: The switching table remains as is on the screen (no point in the result row). To see the table with the point in the result row, clear the screen (File, drop-down item New/Clear), then click the arrow head of the point to display the new table.

7. If you use a macro that was created for a different plant, you must change the user addresses stored in the macro to match the new plant. Select the user address to be modified in the switching table.

NOTE: The user addresses included in the macro can be physical as well as pseudopoints. You can only replace user addresses with compatible point types. CARE does not accept incompatible types.

RESULT: The selected field turns light blue.

8. Change the address in the same way you would if you were creating a new switching table. For example:

- To assign a physical point, click the arrow head for the point in the physical point bar.
- To assign a pseudopoint, click menu item Software points. The pseudopoint types list displays. Select the required pseudopoint type. The Software points dialog box displays. Select the required pseudopoint. Click **OK**, then click **Cancel**.
- To assign or modify a mathematical relationship between analog user addresses, click the MATH icon. The Mathematical Editor window displays. Enter (or change) the formula. Click **OK**.

RESULT: The selected point user address displays in the selected field.

9. Make any other changes, as desired. Then, save the switching table as usual (menu item File, drop-down item Save).

---

## Plant Information Displays

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### Physical Point Information

- Procedure**
1. Double-click the physical point about which more information is required.  
**RESULT:** The Data Point Information window displays.
  2. Click **OK** to close dialog box after you finish viewing the information.  
**RESULT:** The dialog box disappears from the screen.

---

### User Addresses

- Procedure**
1. Click View, then drop-down item Physical user address.  
**RESULT:** The user addresses display under the plant schematic. The initial letter of the user address is located vertically below the physical point to which it belongs.
  2. To remove user addresses display, click View, then drop-down item Physical user address again.  
**RESULT:** The user addresses disappear from the screen.

**Restriction** You cannot select any switching logic functions while the user addresses are on display.

- Single Address Display** If you move the cursor over a triangle and press and hold the left-hand mouse button down, the user address for the point displays with either a red exclamation symbol or a green check mark symbol. When you release the mouse button, the display disappears.  
 The red exclamation symbol appears for:
- hardware points with one allowable connection that are used in an XFM
  - digital outputs that are connected to a symbol
  - flex points that are connected to a symbol
  - software points that are connected to an output pin of a symbol.

---

## Print Switching Tables

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For printing switching tables see Print Documentation chapter.

---

## Switching Logic Function Exit

---

- Purpose** Return to the main CARE screen.
- Procedure**
1. Click File, then drop-down item Exit.  
**RESULT:** The Note dialog box displays.
  2. Click **OK** to save the switching table and exit.  
 Or, to exit without saving, click **No**.  
 Or, to remain in the Switching Logic function, click **Cancel**.  
**RESULT:** The main CARE menu displays.



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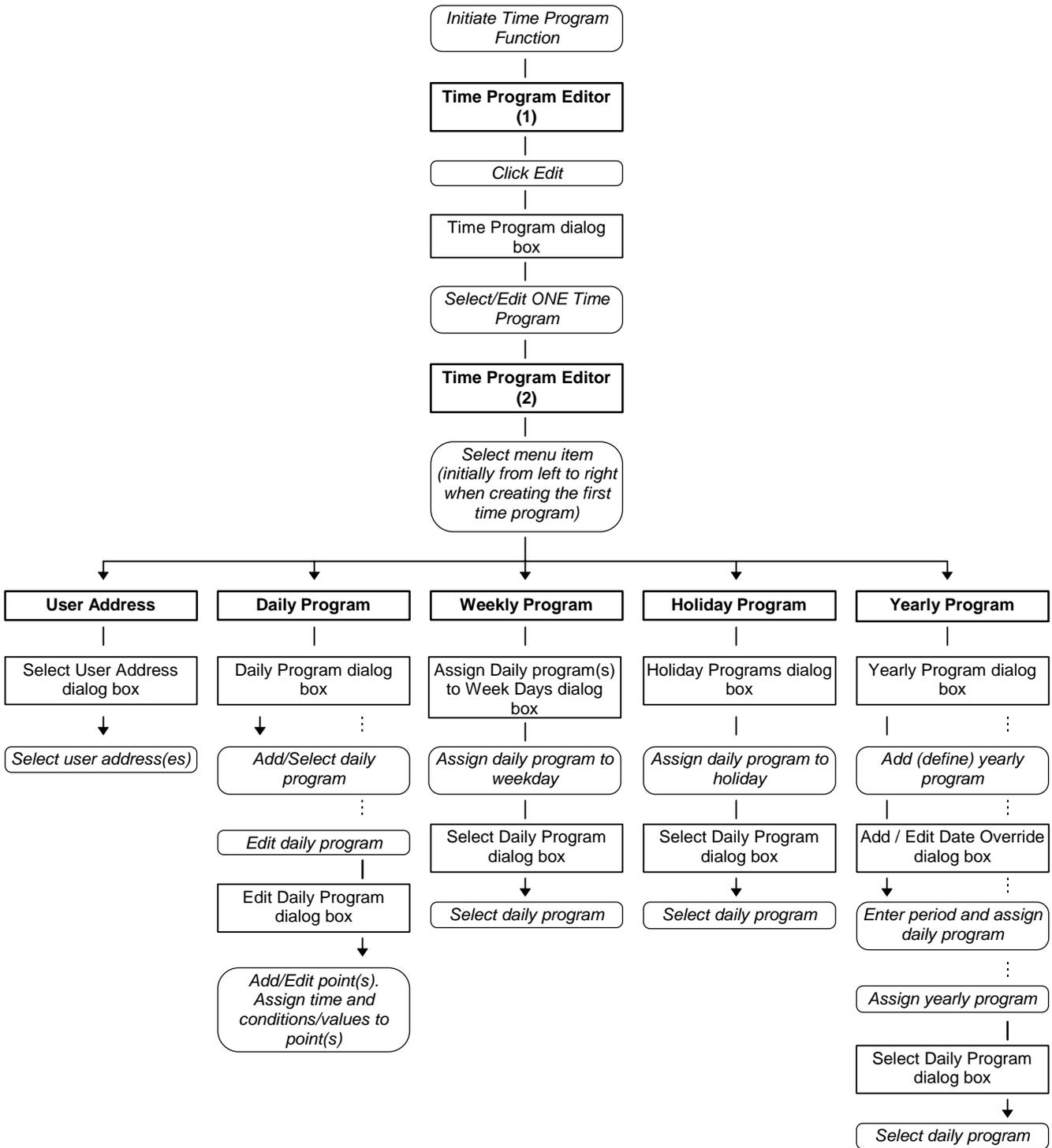
## TIME PROGRAMS

---

- Purpose** Create time sequences for controller operation of devices. For example, set HVAC start and stop times.
- Time Programs* implement these command schedules. A controller can have a maximum of 20 Time Programs.
- Each Time Program specifies a list of points to command and a *Weekly Program*. This Weekly Program defines the normal daily activity of the system by specifying which Daily Programs a controller should use for each day of the week (Sunday through Saturday). The Weekly Program applies for each week of the year. There is only one Weekly Program per Time Program.
- Daily Programs* list points and point actions and times for the controller to implement.
- Yearly Programs* define time periods with special daily programs. Yearly programs are suited to consider specific local conditions, for example, regional vacation and public /religious festivals. Yearly programs can be defined for more than one year.
- Required Steps** Use the Editors (see Editors chapter) to establish required point types before setting up Time Programs.
- ⇒ The Editors (Time Program Editor included) are only available after a plant has been attached to a controller.
- Example** Controller 1  
 Time Program 1  
*Point Assignments*  
 hvac\_ctrl  
 min\_hvac
- | <i>Weekly Program</i> | <i>Daily Program Name</i> |
|-----------------------|---------------------------|
| Monday                | <b>normal_daily</b>       |
| Tuesday               | <b>normal_daily</b>       |
| Wednesday             | <b>normal_daily</b>       |
| Thursday              | <b>normal_daily</b>       |
| Friday                | <b>normal_daily</b>       |
| Saturday              | <b>Weekend</b>            |
| Sunday                | <b>Weekend</b>            |
- Where the **normal\_daily** Daily Program includes the following items (time, user address, command):
- |       |           |     |
|-------|-----------|-----|
| 06:00 | hvac_ctrl | on  |
| 18:00 | hvac_ctrl | off |
- And the **Weekend** Daily Program includes the following items (time, user address, command):
- |       |          |     |
|-------|----------|-----|
| 12:01 | min_hvac | on  |
| 23:59 | min_hvac | off |
- You can also assign Time Programs 2 through 20 to the controller. For each Time Program, you assign a set of points and a set of Daily Programs for its Weekly Program.
- Holidays** Each Time Program can also specify a list of holidays and which Daily Program each holiday should use.
- If a holiday occurs that is not in the Time Program holiday list, the system uses the normal Daily Program for the day of the week the holiday falls on.
- Point Restriction** Time programs cannot include analog input, digital input, or totalizer points.

**Daily Programs** Daily programs can only specify points assigned to the controller.

**Flowchart** The following flowchart summarizes the menu structure and procedure for the Time Program function.



**Examples** Time Program Editor functions:

Edit	Time Programs List Example	Daily Program	Daily Program Example
	ADMIN BLOCK RESTAURANT ANNEX		07:20 S_FAN            ON 17:00 S_FAN            OFF 07:20 SETPOINT        20.0 12:00 SETPOINT        18.0 16:00 SETPOINT        20.0 17:00 SETPOINT        15.0
User address	Point List Example	Weekly Program	Weekly Program Example
	# S_FAN # SETPOINT R_FAN OA_SENSOR DA_SENSOR		Monday        NORMAL_DAILY Tuesday        NORMAL_DAILY Wednesday    NORMAL_DAILY Thursday        NORMAL_DAILY Friday            NORMAL_DAILY Saturday        WEEKEND Sunday            WEEKEND
Daily Program	Daily Programs List Example	Holiday Program	Holiday Schedule Example
	NORMAL_DAILY EARLY_OFF WEEKEND HOLIDAY		New Year Christmas            HOLIDAY Christmas Eve Labor Day Easter                HOLIDAY Good Friday            HOLIDAY

---

## Initiate Time Program Function

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- Purpose**        Begin Time Program functions such as adding, changing, and deleting Time Programs, point assignments, and schedules.
- Assumption**    The currently selected plant is attached to a controller and translated. You cannot use the Time Programs function on a plant that is not already attached to a controller and translated. After a plant is attached, the Schematic, Control Strategy, and Switching Logic functions are not available.
- Procedure**
1. In the logical plant tree, select the controller:
  2. Click menu item Controller, then submenu items Edit, Time Program Editor.
- Or, click the Time Program Editor button in the button bar below the menu bar.
- RESULT:**    The Time Program window displays with two menu items:

- File**  
Display the following dropdown items:
- |               |  |
|---------------|--|
| Print to File | Output selected Time Program(s) to an ASCII text file. |
| Print to      |  |

- Printer      Print selected Time Program(s).
- Change  
Printer      Select a different printer.
- Exit          Close the Time Program function and return to  
the CARE window.

**Edit**

Create, modify, and delete Time Programs. The Time Program dialog box displays to select, create, rename, edit, or delete a Time Program. The next section describes these procedures.

**Help**

Display the following dropdown items:

- About      Display the About dialog box.
- Help        Display the help topic for Time Programs.

Select a Time Program

Create Time Programs

Rename Time Programs

Modify Time Programs

Delete Time Programs

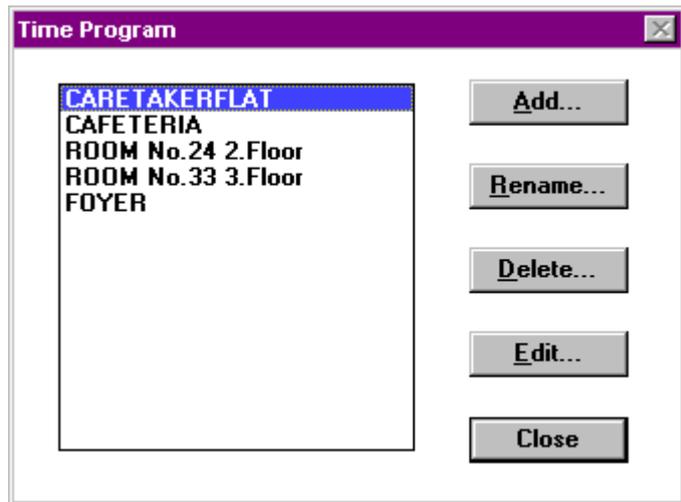
**Purpose** Select, create, rename, modify, and/or delete Time Programs.

**Subsections** This section also contains the following procedures that are available after you select a Time Program:

- Assign/Unassign User Addresses (User Address function)
- Define and/or Modify Daily Programs (Daily program function)
- Define and/or Modify Weekly Program (Weekly program function)
- Assign/Unassign Holidays (Holiday program function)
- Define and/or Modify Yearly Program (Weekly program function)
- Exit Time Program Editor (Return function)

**Procedure** 1. In the Time Program window, click menu item Edit. (See Initiate the Time Program Function procedure to display the window, if not already done.)

RESULT: The Time Program dialog box displays with a list of existing Time programs. If there are none, the list box is empty.



2. To create a new Time Program:

- a. Click **Add**.  
The Add Time Program dialog box displays.



- b. Type a descriptive name for the new Time Program, for example, weekend or weekday.

The **ACTIVE holiday** button enables the Holiday Program. To disable the Holiday Program, click the **INACTIVE holiday** button. If holiday is inactive, this Time Program uses the Daily Programs, as set up by the Weekly Program, on holidays.

Click **OK** to add the Time Program. (Or, click **Cancel** to close the dialog box without saving the new Time Program name.)

If you click **OK**, the Time Program dialog box redisplay with the new Time Program name highlighted.

- c. Click **Edit** to begin the process of assigning schedules to the Time Program.  
The Time Program Editor window displays with the User Address, Daily program, Weekly program, Holiday program, Yearly program, and Return menu items. See the following sections for procedures.

*To rename an existing Time Program:*

- a. Click Time Program name in the list box to select it. Then, click **Rename**.  
The Rename Time Program dialog box displays with the old name and a box to enter a new name.

- b. Type a new name. Click **OK**.  
Or, click **Cancel** to close the dialog box without saving the new Time Program name.  
If you click **OK**, the Time Program dialog box redisplay with the new Time Program name highlighted.
- c. Click **Edit** to modify the Time Program, if desired.  
The Time Program Editor window displays with the User Address, Day, Week, Holiday, and Return menu items. See the following sections for procedures.  
Or, click **Close** to close this dialog box and return to the main Time Program window.

*To delete a Time Program:*

- a. Click a Time Program name in the list box to select it. Then, click **Delete**.  
A confirmation dialog box displays to check whether or not you really want to erase the Time Program.
- b. Click Yes to erase, No to cancel.  
If you click Yes, the Time Program dialog box redisplay without the deleted Time Program. If you click No, the Time Program dialog box redisplay and still has the selected Time Program.

*To modify a Time Program or assign schedules to a new Time Program:*

Click Time Program name to select it. Then, click **Edit**. (Or, double-click Time Program name.)

The Time Program Editor window displays with the User Address, Daily program, Weekly program, Holiday program, Yearly Program and Return menu items:

User address	Assign points to the selected Time Program.
Daily program	Create and/or modify Daily Programs that specify points, times, and commands.
Weekly program	Assign Daily Programs to the Weekly Schedule for the controller.
Holiday program	Assign Daily Programs to system holidays. Holidays are preset. You cannot change them with CARE.
Yearly program	Define time periods with special daily programs for local and national needs (vacation, festivals).
Return	Exit the Edit function.

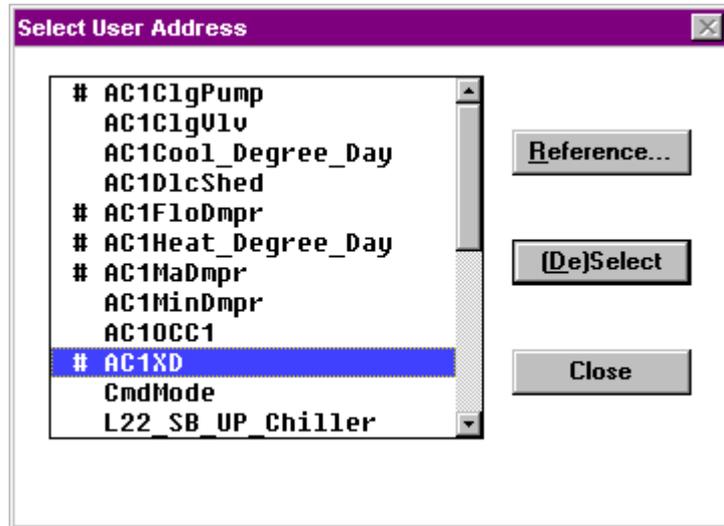
The following sections describe these functions.

3. To close this dialog box and return to the main Time Program window, click **Close**.

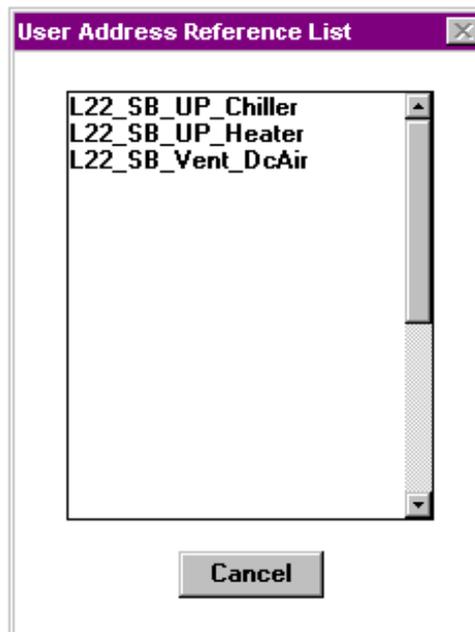
## User Address Function

### Assign/Unassign User Addresses

<b>Purpose</b>	Assign and unassign points to and from a time Program. Each time program must have a list of assigned points before you can set up Daily Programs....
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. Select desired Time Program (see Select a Time Program section for procedure).                       RESULT: The Time Program Editor window displays with the User Address menu item.</li> <li>2. Click User Address.                       RESULT: The Select User Address dialog box displays with a list of existing user addresses. The user addresses were previously specified using the data point editor (see the Editors chapter for procedure).                       User Addresses marked with a pound sign, are already assigned to the selected Time Program.</li> </ol>



You can assign each user address to only one Time Program. Click **Reference** to display user addresses that are already assigned (User Address Reference List dialog box)



Click **Cancel** to close the dialog box when through checking the point assignments..

3. To assign an unassigned address (no pound sign, #), click user address name. Then click **(De)Select**. The (De)Select button acts as a **Select** when you click unassigned addresses.

**Tip** ⇒ Double-clicking an address selects and deselects it.

**RESULT:** Software assigns the user address to the Time Program and adds a pound sign, #, next to the selected user address to mark it as assigned.

4. To unassign assigned user addresses, click user address name and then click **(De)Select**. The (De)Select button acts as a **Deselect** when you click assigned addresses.

**Tip** ⇒ Double-clicking an address selects and deselects it.

RESULT: Software unassigns the user address from the Time Program and removes the pound sign, #, next to it. Software does not delete the user address from the point description file.

5. Click **Close** to end the function.

RESULT: Software closes the dialog box. The Time Program Editor window redisplay. You can now select the Daily program function to define Daily Programs.

## Daily Program Function

**Create Daily Program**

**Rename Daily Programs**

**Delete Daily Programs**

**Copy Daily Programs**

**Modify Daily Programs**

**Purpose** Define, rename, delete, copy, and/or modify Daily Programs and assign point commands and command times to each Daily Program. Each Daily Program covers a 24-hour period.

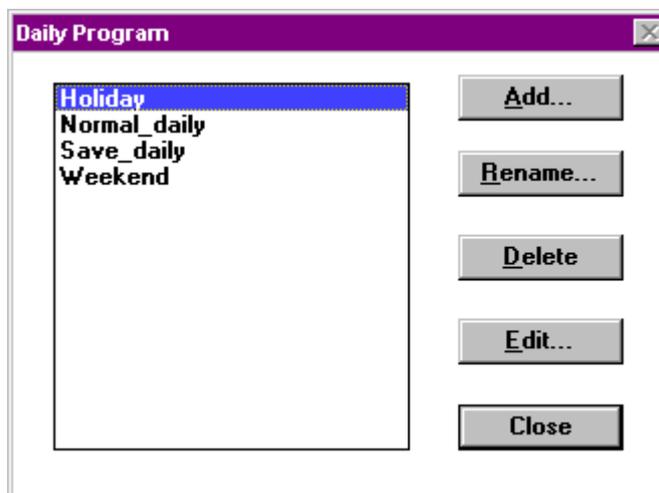
Daily Programs specify switching times, setpoints, and switching status for selected points.

- Procedure**
1. Select desired Time Program (see Select a Time Program section for procedure).

RESULT: The Time Program Editor window displays with the Day menu item.

2. Click Daily program.

RESULT: The Daily Program dialog box displays.



3. To create a new Daily Program:

- a. Click **Add**.  
The Add Time Program dialog box displays.
- b. Type a descriptive name for the new program, for example, Saturday or Sunday. Then, click **OK**.  
The dialog box closes and the Daily Program dialog box redisplay with the new name highlighted.

- c. To begin defining times, setpoints, and statuses for the new Daily Program, go to Step d and just click **Edit** (the Daily Program is already selected).

*To rename a Daily Program:*

- a. Click its name to select it. Then, click **Rename**. The Rename dialog box displays.
- b. Type a new name. Name can be a maximum of 18 characters and must be unique to the selected Time Program.
- c. Click **OK** to save the new name. The dialog box closes and the Daily Program dialog box redisplay with the new name highlighted.
- d. To modify times, setpoints, and statuses for the Daily Program, go to Step d and just click **Edit** (the Daily Program is already selected).

Or, Click **Close** to close this dialog box and return to the Time Program main window.

*To delete a Daily Program:*

- a. Click its name, then click **Delete**. Software asks whether or not you really want to delete the entry. Click **Yes** to delete; **No** to cancel. The name disappears from the list box. When software deletes a program, it deletes all its data.
- b. Click **Close** to close this dialog box and return to the Time Programs main window. Or, continue with other Time Program modifications.

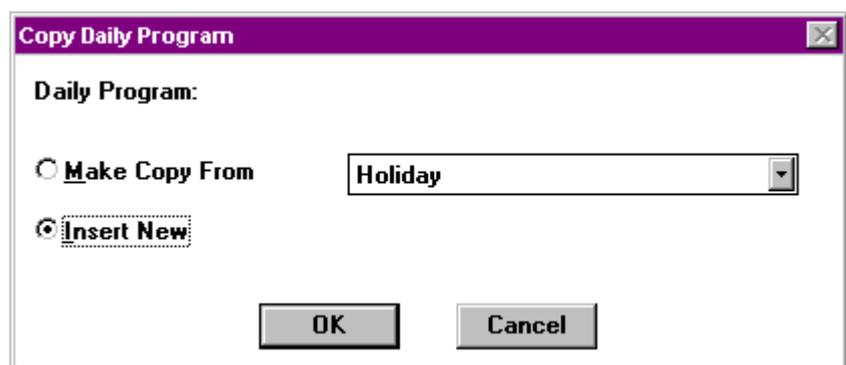
#### 4. *To select and modify a Daily Program:*

Click its name and then click **Edit**. (Or, double-click name.)

**Tip** ⇒ To select a name, type the first letter of the name, then the second letter, and so on, until software highlights the desired name.

The Edit Daily Program dialog box displays with the current list of times, points, and commands assigned to the selected Daily Program.

If there are no time, points, and commands assigned to the Daily Program, the Copy Daily Program dialog box displays (unless there are no other Daily Programs):



#### 5. If the Copy Daily Program dialog box displays, select one of the following actions:

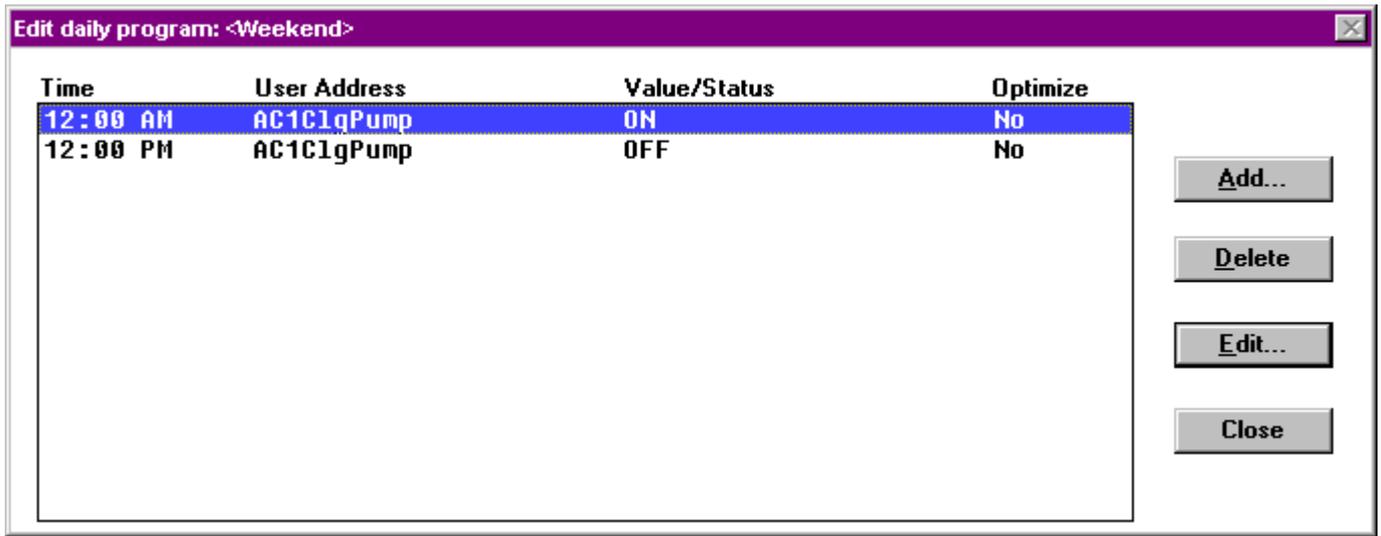
- Click **Insert New**, then **OK** to close the dialog box and return to the Edit Daily Program dialog box to assign all new items.
- Click **Make Copy From**, then click the down arrow in the box to the right to display a list of Daily Programs.

- Click desired program name. Click scroll bars and/or arrows to display other Daily Program names if the name you want is not in the list box. Click **OK**. (Or, click **Cancel** to close the dialog box without selecting a program.)

The dialog box closes and the Edit Daily Program dialog box redisplay with the copied entries from the selected Daily Program. You can change the entries as desired.

- Click **Cancel** to just close the dialog box and return to the Edit Daily Program dialog box.

**RESULT:** The Edit Daily Program dialog box displays. If you copied a Daily Program, its commands display in the list box. Each line in the list box represents one command. Each command specifies time, user address, and value or status command.

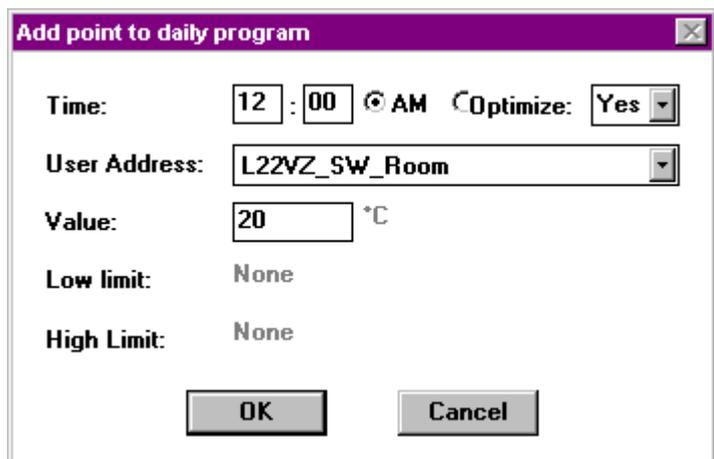


- Delete existing entries by clicking the line you want to delete and then clicking **Delete**.

All command data in the Daily Program for the point is gone. The dialog box remains so you can continue adding, changing, and deleting other entries.

Create new entries by clicking **Add**.

**RESULT:** The Add point to daily program dialog box displays.



- Select user address in the User Address dropdown list box and enter value in the Value field.
- Enter time in the Time field and select appropriate radio button AM or PM.
- For switching points select optimization or not by clicking the corresponding item in the dropdown list box Optimized.

Change existing entries by clicking **Edit**.

RESULT: The Edit point in daily program dialog box displays.

7. Type a time value, for example, 06:30. Time format can be in 12- or 24-hour format (Windows™ Control Panel setting). Hours and minutes must be two digits, not one. For example, 06, not 6. Time can only include hours and minutes (no seconds).

Press **Tab** to go to the User Address box. Click the down arrow to display the list of user addresses assign to this Time Program (see User Address function). Click desired address to select it.

Press **Tab** to go to the Value box. Type a status if the point is digital (for example, ON or OFF). Type a value if the point is analog (for example, 3).

The Low limit and High limit values display only for analog points. The characteristic for the point determines limits. If there is no characteristic, there are no limits.

8. Click **OK** to save your entries.  
Or, **Cancel** to close the dialog box without saving.

RESULT: Software saves the entry. See Engineering Unit note.

The Edit Daily Program dialog box redisplay for entry and/or modification of other points and commands.

9. Click **OK** to save the new Daily Program with the currently displayed entries and close the dialog box.  
Or, click **Cancel** to close the dialog box without saving the changes.

RESULT: The Daily Program dialog box redisplay.

### Engineering Unit Default

If no engineering unit is assigned to the point, software assigns spaces and three decimal places to analog points and the strings "State text 0", "State text 1", etc, to digital points.

Weekly Program Function

Define Weekly Program

Modify Weekly Program

**Purpose** Assign and unassign Daily Programs to days of the week.

Every Time Program has one Weekly Program that specifies a Daily Program for each day of the week.

Software uses the Weekly Program to generate the annual program. The Annual Program is a repeat of the Weekly Programs for each week of the year.

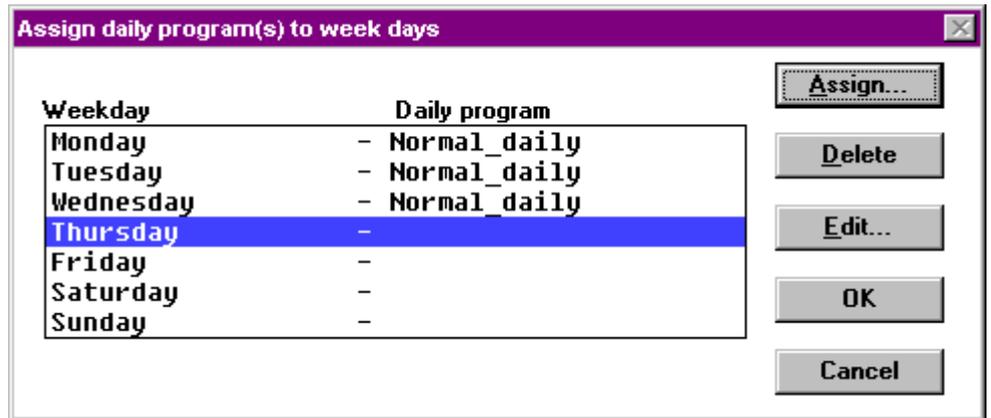
**Default Daily Program** If you do not assign a Daily Program to a weekday, the Time Program uses the Daily Program for the previous weekday. The default assignments display after you exit the Weekly program function and then reselect it.

**Procedure** 1. Select desired Time Program (see Select a Time Program section for procedure).

RESULT: The secondary Time Programs window displays with the Weekly program menu item.

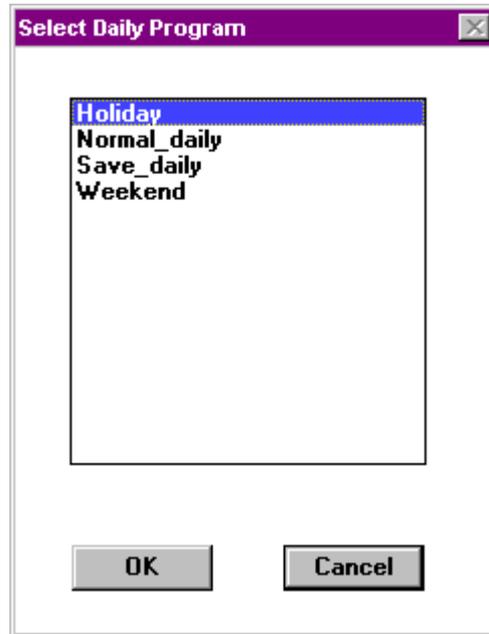
2. Click Weekly program.

RESULT: The Assign daily program(s) to weekdays dialog box displays. The existing daily programs assigned to the weekdays for the selected Time Program display in the list box. For a new Weekly Program, there are no daily program assignments.



3. To assign a Daily Program to a weekday , click Daily Program name, then click **Assign**. (Or, double-click Daily Program name.)

RESULT: The Select Daily Program dialog box displays. The existing daily programs for the Time Program display in the list box.



Click desired program name, then click **OK** to complete the selection. Click scroll bars and/or arrows to display other Daily Program names if the name you want is not in the list box. (Or, click **Cancel** to close the dialog box without selecting a program.)

**RESULT:** The dialog box closes and the Assign daily program(s) to weekdays dialog box redisplay. The new Daily Program assignment is in the list box.

4. *To delete an assignment*, click Weekday item in the list box. Then click **Delete**.

**RESULT:** Software unassigns the Daily Program. After you finish assigning Daily Programs and close the dialog box, software replaces all default assignments with the Daily Program for the previous day.

5. *To make changes to a Daily Program without exiting this function and going to the Day function*, click the desired Daily Program name in the list box and then click **Edit**.

**RESULT:** The Edit daily program dialog box displays. Modify Daily Program as desired. See Daily Program Function section for procedure. When you exit, the Assign daily program(s) to weekdays dialog box redisplay.

6. When through assigning Daily Programs, click **OK**.

**RESULT:** The dialog box closes and software assigns the last-assigned Daily Program to the weekdays that were not specified. For example:

```
Monday   Weekday
Tuesday  Holiday
Wednesday
Thursday
Friday
Saturday
Sunday
```

Software assigns "Holiday" to Wednesday through Sunday because Holiday was the last Daily Program assigned.

The Time Program window redisplay. To see what all the weekday assignments are, reselect the Weekly program function.

**Holiday Program Function**

**Define Holiday Program**

**Modify Holiday Program**

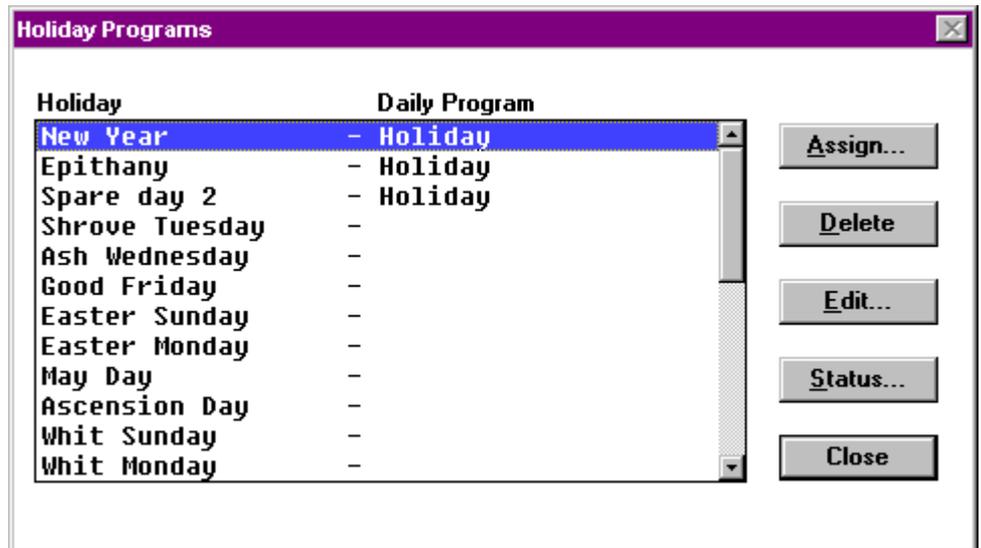
**Inactivate Holiday Program**

**Purpose** Assign and unassign Daily Programs to holidays such as Christmas and Easter. Since holidays usually do not require occupancy-type schedules, software uses Holiday Program assignments for holidays instead of the Weekly Program schedules. The daily program will then apply on a holiday every year.

NOTE: "Spare day" holidays are NOT available for programming specific holidays.

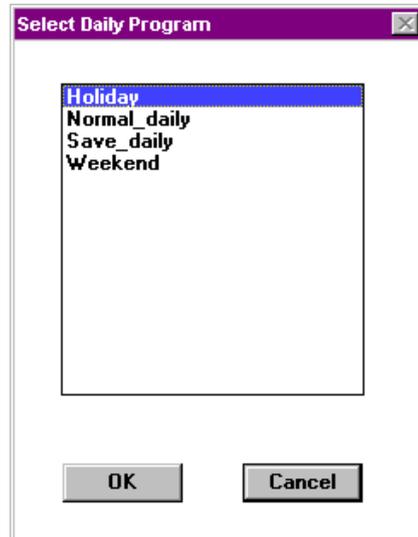
**Default Daily Program** If you do not assign a Daily Program to a holiday, the Weekly Program uses the Daily Program for that weekday.

- Procedure**
1. Select desired Time Program (see Select a Time Program section for procedure).  
  
RESULT: The secondary Time Programs window displays with the Week menu item.
  2. Click Holiday program.  
  
RESULT: The Holiday Programs dialog box displays. The existing daily programs assigned to the holidays for the selected Time Program display in the list box. If you do not assign a Daily Program to a holiday, the Weekly Program uses the Daily Program for that weekday. ).



3. To assign a Daily Program to a holiday , click Daily Program name, then click **Assign**. (Or, double-click Daily Program name.)

RESULT: The Select Daily Program dialog box displays. The existing daily programs for the Time Program display in the list box.



Click desired program name, then click **OK** to complete the selection. Click scroll bars and/or arrows to display other Daily Program names if the name you want is not in the list box. (Or, click **Cancel** to close the dialog box without selecting a program.)

RESULT: The dialog box closes and the Holiday Programs dialog box redisplay. The new Daily Program assignment is in the list box.

4. To delete an assignment, click Holiday item in the list box. Then click **Delete**.

RESULT: Software unassigns the Daily Program.

5. To make the Holiday Program inactive for this Time Program, click **Status**.

RESULT: The Holiday Program Status dialog box displays.



The Active button enables the Holiday Program.

The Inactive button disables the Holiday Program so that this Time Program uses the Daily Programs as set up by the Weekly Program.

Click desired status button.  
Then, click **OK** to save change and exit.  
Or, click **Cancel** to exit without saving change.

6. To make changes to a Daily Program without exiting this function and going to the Daily program function, click the desired Daily Program name in the list box and then click **Edit**. (Or, double-click Daily Program name.)

RESULT: The Edit Daily Program dialog box displays. Modify Daily Program as desired. See Daily Program Function section for procedure. When you exit, the Holiday Programs dialog box redisplay.

7. When through assigning Daily Programs, click **Close**.

RESULT: The dialog box closes and the Time Program window redisplay.

Yearly Program Function

Define Yearly Program

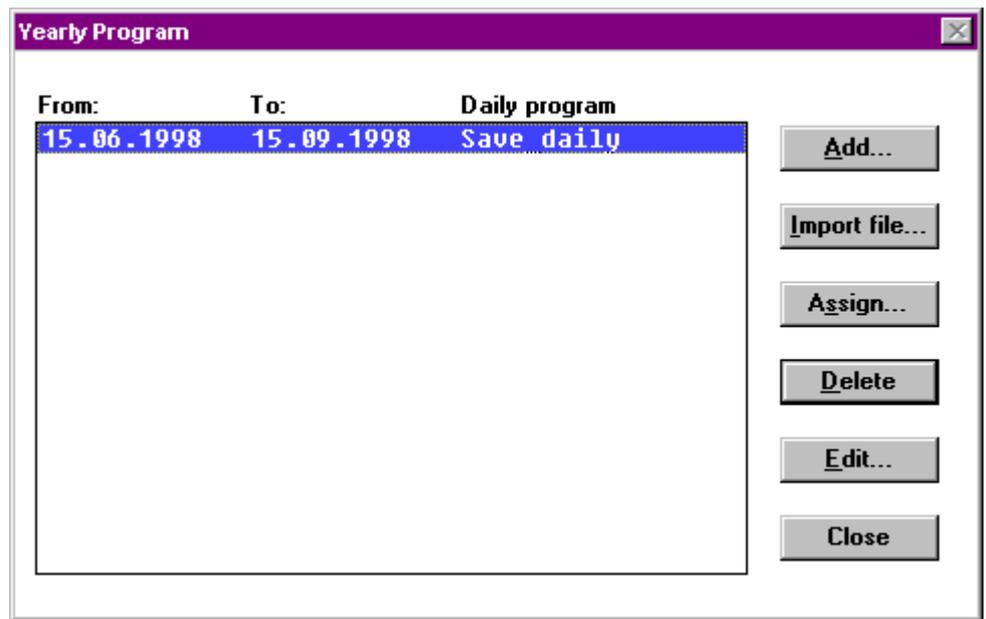
Modify Yearly Program

Delete Yearly Program

Import File

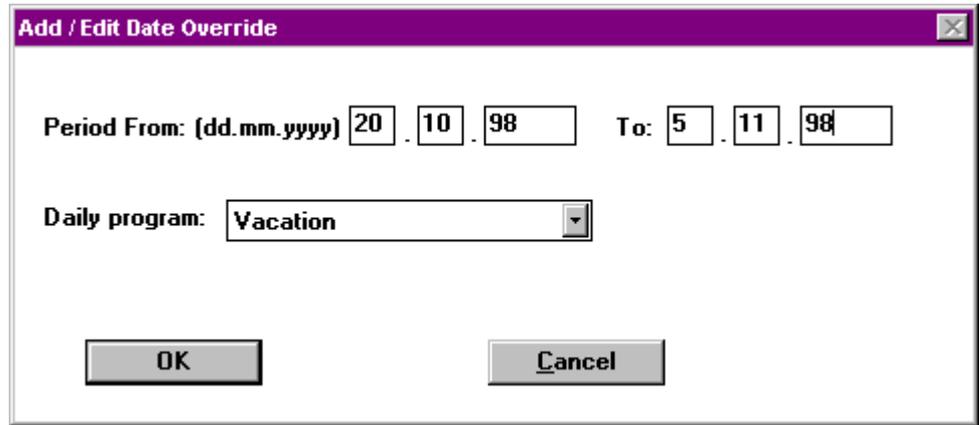
**Purpose** Define time periods with special daily programs. Yearly programs are suited to consider specific local conditions, for example, regional vacation and public /religious festivals. Yearly programs can be defined for more than one year. It is therefore not necessary to define a yearly program every new year as you have to do with the holiday program function. Yearly programs have higher priority than the weekly program, which is used to generate the annual program.

- Procedure**
1. Select desired Time Program (see Select a Time Program section for procedure).  
**RESULT:** The secondary Time Programs window displays with the Yearly Program menu item.
  2. Click Yearly program.  
**RESULT:** The Yearly Program dialog box displays. The existing yearly programs with their assigned daily program are summarized.



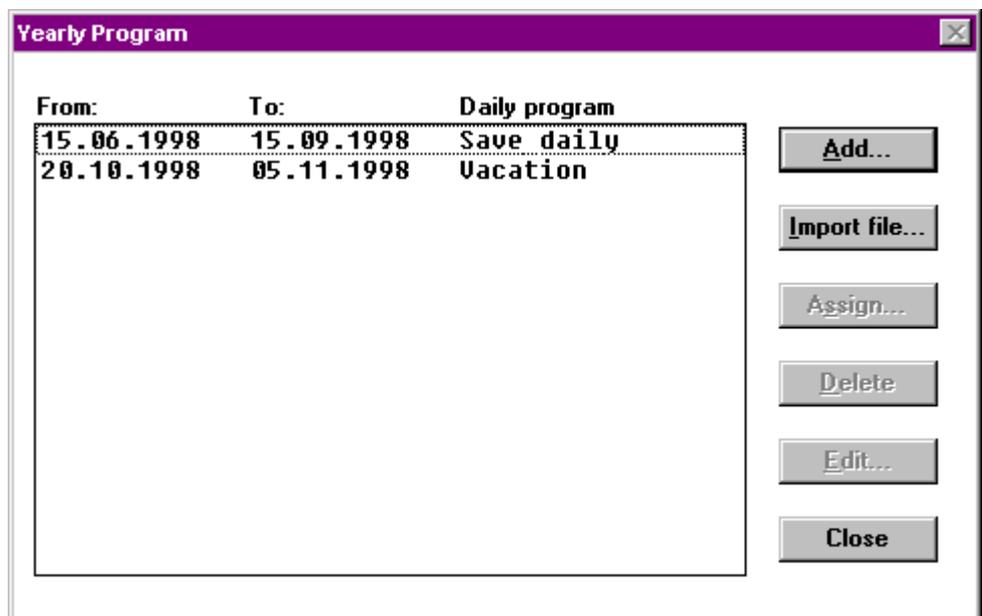
3. To define a new Yearly Program and assign a daily program to it , click **Add**.

**RESULT:** The Add/Edit Date Override dialog box displays.



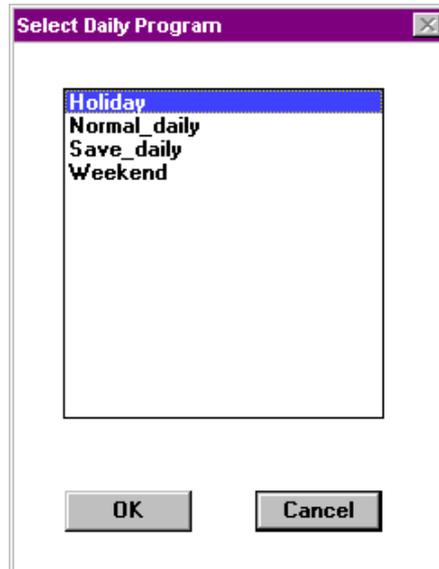
Enter the time range into the Period From and To fields. Select the desired daily program from the Daily program dropdown list box, then click **OK**.

**RESULT:** The dialog box closes and the Yearly Program dialog box redisplay. The new Yearly Program is in the list box.



3. To assign another Daily Program to an existing Yearly program , click Yearly Program name, then click **Assign**.

**RESULT:** The Select Daily Program dialog box displays. The existing daily programs for the Time Program display in the list box.



4. Click desired daily program and click OK.

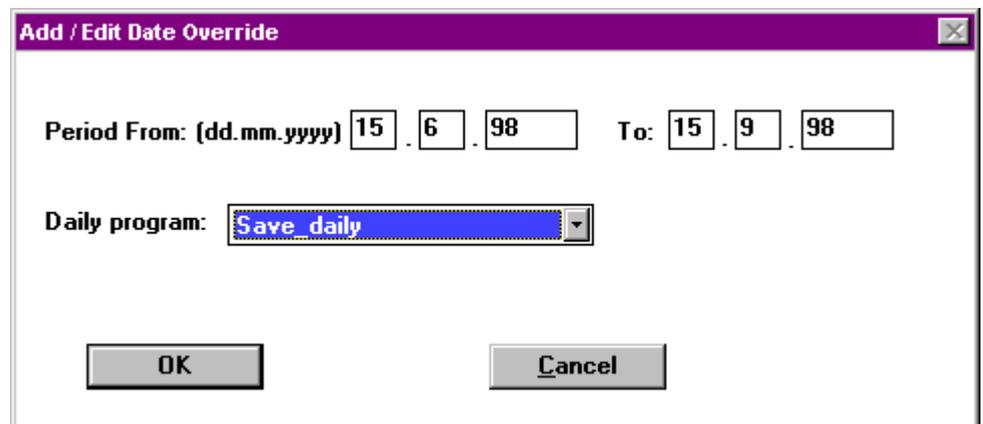
RESULT: Software assigns the selected Daily Program to the Yearly Program.

5. To delete an Yearly Program, click program item in the list box. Then click **Delete**.

RESULT: Software deletes the Yearly Program.

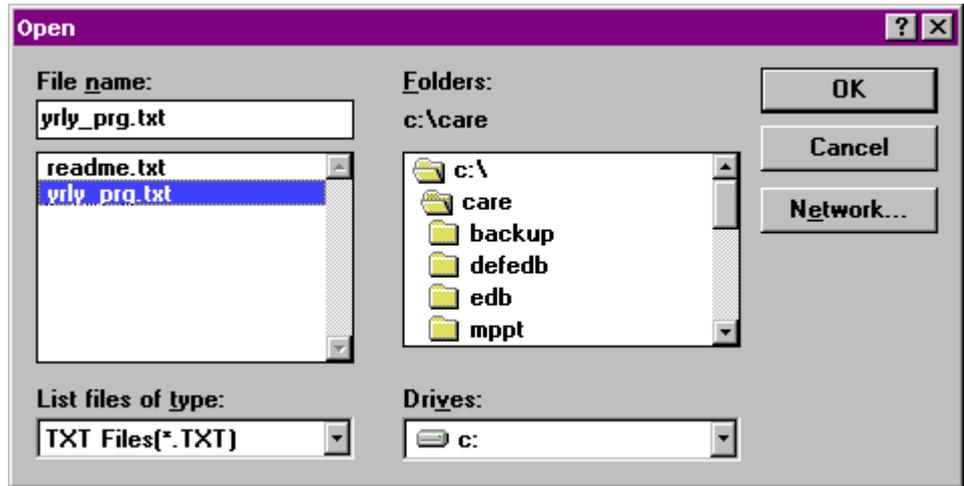
6. To make changes to a Yearly Program without exiting this function, click the desired Yearly Program in the list box and then click **Edit**.

RESULT: The Add / Edit Date Override dialog box displays. Modify the Yearly Program as desired.



Click OK to return to the Yearly Program dialog box.

7. To use yearly programs through a range of several years, click the Import file... button and open the predefined text file, for example, yrly\_prgr.txt.



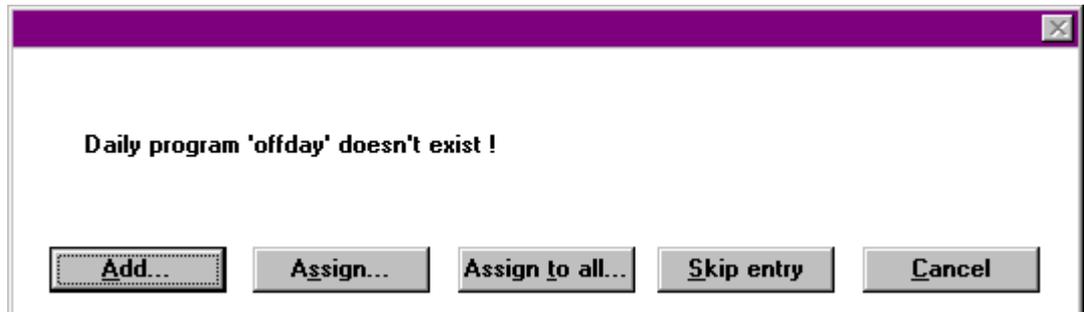
To define a text file for import see Imported File example at the end of this section.

After opening the \*.txt file you will get the following message, if you have already defined yearly programs:



Click OK.

RESULT: If a daily program defined for a yearly program in the \*.txt file does not still exist in the time program, the following message dialog box displays.



Clicking the Add... button opens the Daily Program dialog box to add the missing daily program to the time program. After adding the daily program you can assign this or a different, existing daily program to the yearly program defined in the txt.file.

Clicking the Assign... button opens the Select Daily Program dialog box to assign a daily program to the yearly program that corresponds to the daily program displayed in the message dialog box. Only daily programs other than the one displayed can be assigned to the corresponding yearly program because the daily program displayed is not yet added. Use Add... button to add the appropriate daily program.

Clicking the Assign to all... button opens the Select Daily Program dialog box to assign one daily program to all yearly programs defined in the \*.txt file.

NOTE: The daily program is only assigned to yearly programs, which do not yet have daily programs, assigned to them.

Clicking the Skip entry button ignores the entry indicated with the daily program in the message dialog box and continues with the next entry.

Clicking the Cancel button returns to the Yearly Program dialog box. All the yearly programs will be inserted into the list to which daily programs were assigned (as defined in the txt.file or different ones).

8. When through defining Yearly Programs, click **OK**.

**Imported File example**

To define repeatedly yearly programs that may last over a period of several years, you create a txt.file with a text editor like Notepad. See the following description included in the text file example for creating yearly program entries.

```
*****
;
*****
```

; YRLY\_PRG.txt Example Definition File for Yearly Time Program

```
*****
;
*****
```

```
; This txt file is an example import file for the yearly time program.
; Each date override entry with its fields from, to and daily program have to list in one
line.
; The fields are separated with spaces or tabs. The order is from, to, daily_program
name.
; Syntax: From_Date To_Date [Daily_Prog_Name]
; The daily program name is optional. If the daily program name is omitted or
; if the given name does not yet exist upon definition file import, the time program
editor
; asks for resolution of the conflict.
; The date format is dd/mm/[yyyy]
; If the year is omitted, the date override is repeated for the next 5 years.
; The timeframe for repetition of date overrides can be adjusted by changing the
"RepeatCounter" setting.
; A comment-line starts with ';'.
```

; Examples:

```
RepeatCounter=5
;The above line specifies that a date override is repeated for the next 5 years,
;in case the year is omitted in the data specification
```

```
19.5.1997 19.5.1997      offday
; the above line shows how to insert a date override on May/19th/1997 with daily
program offday
```

```
1.5          1.5          may1
; a date override on May, 1st. for the next five years with daily program may1
```

```
2.5.1997 6.5.1997 holiday
; date override from May/2nd/1997 to May/6th/1997 with daily program holiday
```

```
7.2          11.2
; date override from Feb/7th to Feb/11th for the next five years,
; Import will ask for user interaction to assign/create daily program
```

---

**Return Function****Exit Edit**

**Purpose** Save Time Program changes and exit the Time Program function.

**Procedure** 1. Click menu item Return.

RESULT: The Time Program editor window displays.

2. Click File, dropdown item Exit to close the Time Program Editor and return to the main CARE window.

Or, click File and one of the Print dropdown items to print selected Time Program(s). See the next section for procedures.

---

**Print Time Programs**

---

To print time programs see Print Documentation chapter.

# TERMINAL ASSIGNMENT

The Terminal Assignment Function (TAF) is a graphical tool that may be used to display and modify existing controller target I/O hardware configurations.

TAF supports Excel 50, 80, 100, 500, 600, and Excel Smart controllers as well as Honeywell and 3<sup>rd</sup> party LON devices.

The Terminal Assignment Function supports Excel 50, 80, 100, 500, 600, and Excel Smart controllers as well as Honeywell and 3<sup>rd</sup> party LON devices and allows:

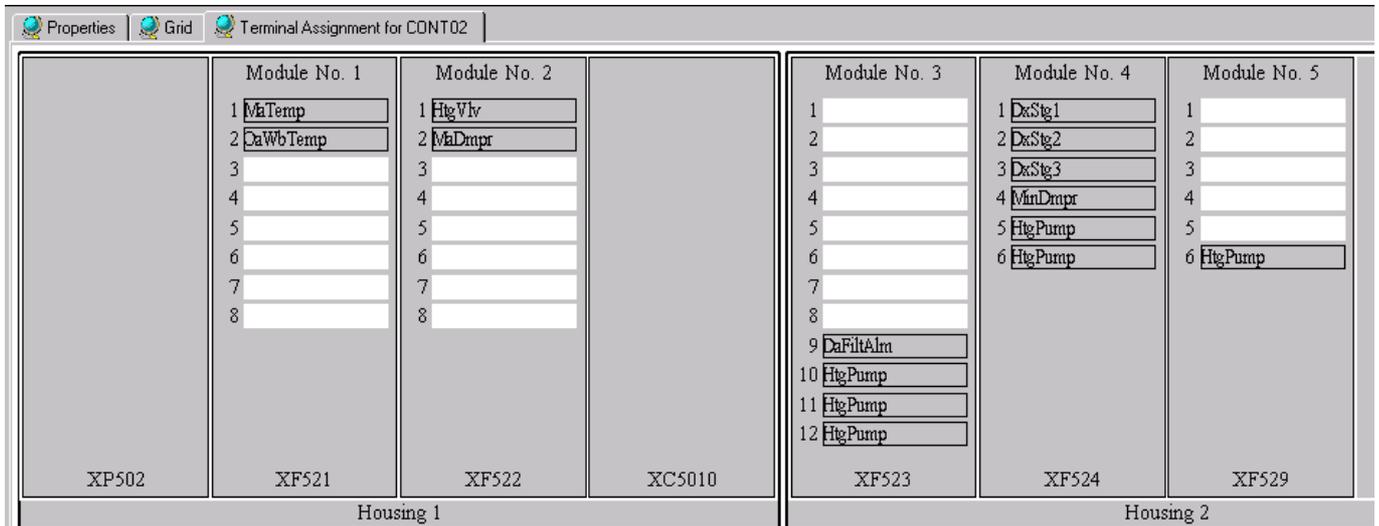
- Adding controller housings
- Inserting modules into housings
- Adding and connecting LON devices
- Copying LON devices
- Changing the position and the types of Excel 500/600 modules (for example, DO with switches by DO without switches)
- Setting/Changing neuron IDs of distributed I/O modules
- Assigning points to modules or shifting points between modules
- Mapping datapoints/NVs to NVs

Module types in Excel 50, 80, and Excel 100 controllers are fixed and, therefore, not changeable.

## Invoke TAF

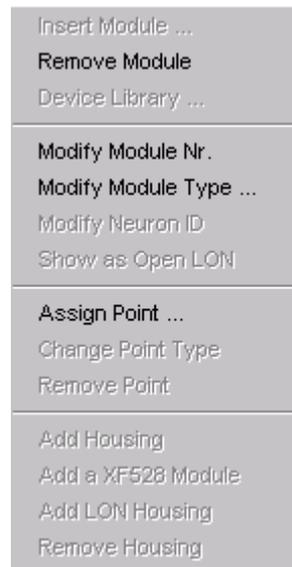
- Procedure**
1. In the logical plant tree, click on the controller
  2. On the right pane, click on the Terminal Assignment tab.

**RESULT:** The current terminal Assignment of the selected controller is displayed.



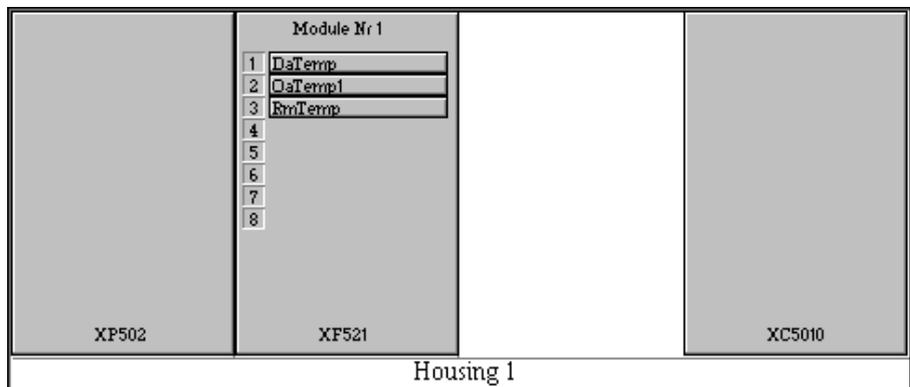
## Using the Context Menu

The important functions you need for working within the TAF are quickly available via context menu, which is displayed by clicking the right mouse key at the appropriate position on the terminal assignment tab.



## Working With Housings

A controller contains at least one housing, a basic housing with a power supply (PS), a central processing unit (CPU), and at least one module.



In order to take in further modules, the following housing types can be added to the existing basic housing:

- Standard housings for max. 4 IP modules (XF521 etc)
- LON housings for max. 10 DIO modules (XFL521 etc)
- XF528 housings for max. 5 high-density I/O modules (XF528)

A maximum of 16 modules (IP, DIO, and/or high density modules) can be inserted into the appropriate housings in total.

Housings can be removed as well. Before removing the housing, the existing modules of the housing to be removed have to be moved to another housing, otherwise the assigned points will automatically get boardless.

NOTE: The basic housing can never be removed.

---

## Add Housing

- Purpose** Add housing. Each housing to be added is an empty housing, except the XF528 housing, and can take in the maximum module number of the corresponding module types.
- Procedure**
1. Click right mouse key on the terminal assignment tab, then click desired **Add** command in the context menu, or  
  
click **Add Housing** button on the button bar, then click desired **Add** command in the context menu.
- RESULTS:
- Add Housing** adds a standard housing with 4 empty slots to insert up to 4 IP modules.
- Add a XF528 Module** adds a XF528 housing with one XF528 high-density module already inserted and 4 empty slots. Up to 4 further XF528 modules can be inserted.
- Important**  
*An empty slot in a XF528 housing means that the corresponding DIP-switches of this module have to be switched off.*
- Add LON Housing** adds a LON housing with 10 empty slots to insert up to 10 DIO modules.

---

## Remove Housing

- Purpose** Remove housing. Both, empty as well as filled housings can be removed. When removing a filled housing, all points will get boardless.
- NOTE: When exiting TAF, all empty housings will be removed automatically.
- Procedure**
1. If you want to empty the housing before removing it, move any inserted modules to another housing.
  2. Position the cursor on the housing you want to remove, click right mouse key, then click **Remove Housing**, or  
  
click **Remove Housing** button on the button bar, then click the housing you want to remove. The housings are displayed with their names and numbers.
- RESULT: TAF removes the housing.
- For moving or removing modules, refer to Working With Modules section.

---

## Working With Modules

Modules can be inserted in housings, moved in or between housings, or removed from housings. TAF supports standard modules like XF521, XF522, LON modules like XFL521, XF522, and the special XF528 module.

---

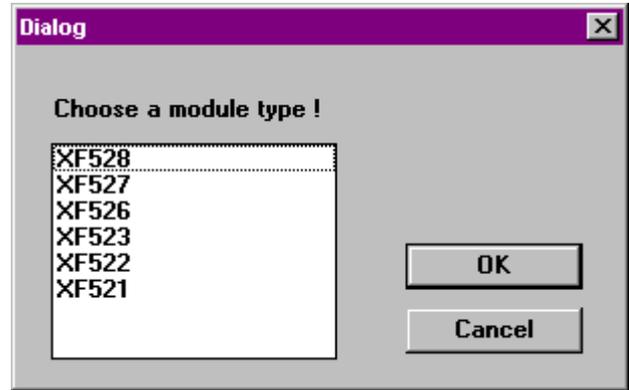
## Insert Standard Module

- Purpose** Insert standard module. Standard modules are modules of the type XF521, XF522 etc. Standard modules can be inserted into empty slots of a standard and the basic housing.
- Procedure**
1. Click right mouse key in appropriate housing slot, then click **Insert Module** (highlighted).

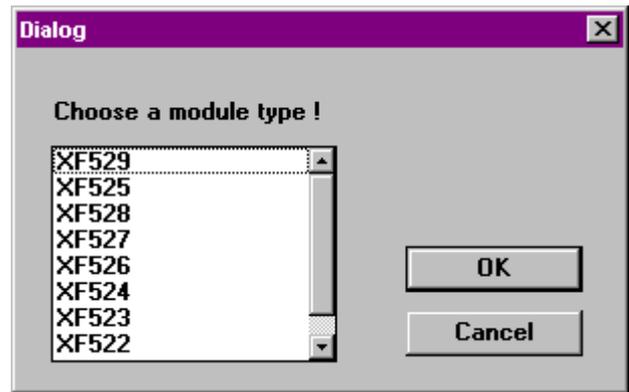
**NOTE:** The basic housing provides only two slots in which default modules can be inserted, because it always contains a power supply and a central processing unit.

**RESULT:** TAF displays a module type dialog box to select a valid module type for the currently selected slot. When inserting modules into basic housings, the dialog box displays different module types than when inserting modules into an empty standard housing.

Module type dialog box for basic housings:



Module type dialog box for standard housings:



2. Select appropriate module type and click **OK**.

**RESULT:** TAF inserts the selected module into the housing and assigns a module number to the inserted module automatically.

For changing module number, refer to Modify Module Number section.

For changing module type, refer to Modify Module Type section.

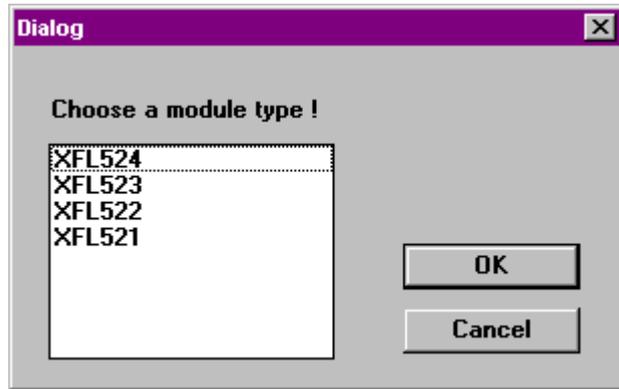
For assigning points to the inserted module, refer to Working with Points section.

## Insert LON Module

**Purpose** Insert LON module into empty slots of a LON housing. LON modules are modules of the type XFL521, XFL522 etc.

**Procedure** 1. Click right mouse key in appropriate housing slot, then click **Insert Module** (highlighted).

**RESULT:** TAF displays a module type dialog box to select a valid module type for the currently selected slot.



2. Select appropriate module type and click **OK**.

**RESULT:** TAF inserts the selected module into the housing and assigns a module number to the inserted module automatically.

For changing module number, refer to Modify Module Number section.

For changing module type, refer to Modify Module Type section.

For assigning points to the inserted module, refer to Assign Point section.

### Insert XF528 Module

**Purpose** Insert XF528 module. The XF528 module is a special module providing five modules of the type XF523 each in a single slot in the XF528 housing.

- Procedure**
1. Click right mouse key in appropriate housing slot, then click **Insert Module** (highlighted).

**RESULT:** TAF inserts a XF528 (XF523) module into the housing and assigns a module number to the inserted module automatically.

For changing module number, refer to Modify Module Number section.

For changing module type, refer to Modify Module Type section.

For assigning points to the inserted module, refer to Assign Point section.

### Modify Module Type

**Purpose** Modify module type. Standard and LON modules can be changed to modules of the same or different family.

To change a module type to a module of the same family, in other words, Standard to Standard or LON to LON, the modules have to be free from points, except the XF521 module, which can be changed directly to the XF526 module even if there are points assigned to it.

To change a module type to a module of a different family, in other words, Standard to LON or vice versa, the modules do not have to be free from points.

Module type XF521 with assigned points can only be changed to module type XF526.

Module type XF529 can be changed to module type XF524 if no pulsed point is assigned to it.

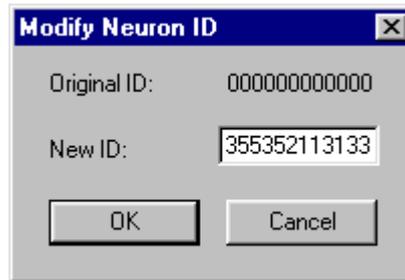
For further information, refer to Combine Point and Module section.

### Set/Modify Neuron ID for DIO Module

In a shared system architecture every distributed I/O module must have its unique twelve-digit neuron ID. The neuron ID is displayed at the bottom of the module. By default the neuron ID is set to 0, in other words, to a 12-digit number of 0. The neuron ID can be changed and will be kept even when changing the target I/O hardware from DIO to Standard I/O.

- Procedure**
1. Point on LON module, then click right mouse key.
  2. Click **Modify Neuron ID**.

RESULT: TAF displays the Modify Neuron ID dialog box.



3. In the New ID field, enter the desired neuron ID for the module, then click **OK**.

NOTE: The neuron ID must have twelve digits.

RESULT: TAF displays the modified Neuron ID at the bottom of the module.

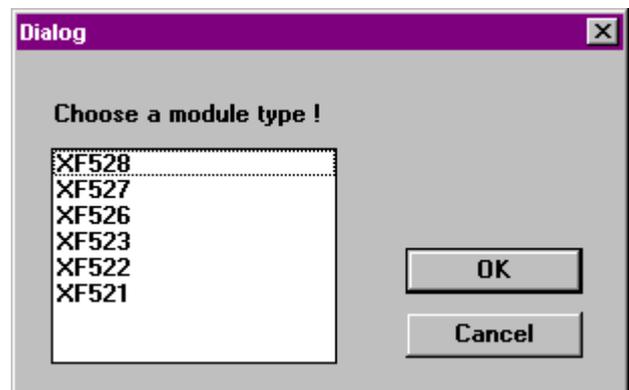
### Modify Module Type to Same Family of Module

**Purpose** Modify standard module type to any other standard module type, e.g. XF522 to XF527 and modify LON module type to any other LON module type, e.g. XFL522 to XFL524.

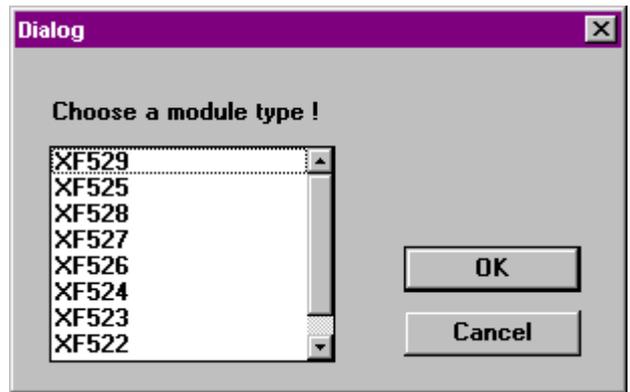
- Procedure**
1. Free module from points (see Move Point section; not necessary for XF521 and XF529 modules).
  2. Click right mouse key on the module to be modified, then click **Modify Module Type** (highlighted).

RESULT: TAF displays a module type dialog box showing all module types to which the selected module can be changed.

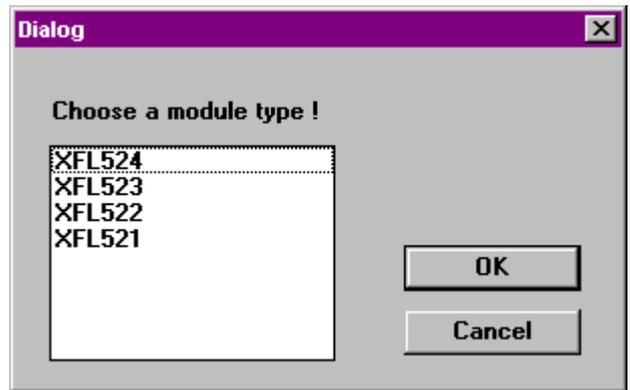
Module type dialog box for basic housings:



Module type dialog box for standard housings:



Module Type dialog box for LON housings:



3. Select the appropriate module type and click **OK**.

RESULT: TAF replaces the module type with the selected new module type.

After changing the module type, points have to be assigned to the module (refer to Assign Point section).

**Modify Module Type to Different Family of Module**

**Purpose** Modify standard module type to equivalent LON module type, e.g. XF522 to XFL522 or vice versa, by moving the module into a different housing type (standard housing and LON housing respectively).

The following list shows the movement possibilities:

Standard		XF528		LON
XF523	↔	XF528	↔	XFL523
XF521	↔	↔	↔	XFL521
XF522	↔	↔	↔	XFL522
XF523	↔	↔	↔	XFL523
XF524	↔	↔	↔	XFL524
XF526	→	→	→	XFL521
XF527	→	→	→	XFL522
XF529	→	→	→	XFL524

- Procedure**
1. Click left mouse key on the module (e.g. standard) to be modified, drag it to an empty slot of the different housing type (LON), and then drop it.

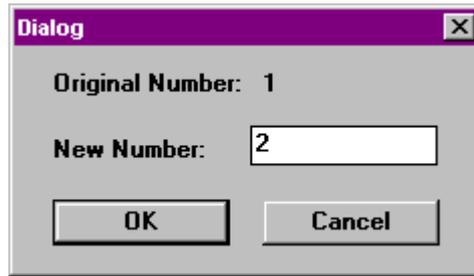
RESULT: TAF changes the module type and all points remain on their original terminations as far as possible. If modifying a module results in any invalid point assignments, the corresponding points will automatically get boardless as indicated in the logical plant tree.

### Modify Module Number

**Purpose** Modify module number.

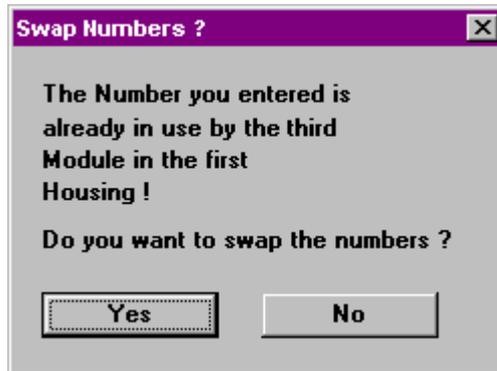
**Procedure** 1. Click right mouse key on the module for which the module number has to be modified, then click **Modify Module Type** (highlighted).

RESULT: TAF displays the module number dialog box to select the new module number.



2. Select appropriate module number and click **OK**.

RESULT: TAF modifies the module number of the selected module. If the module number already exists, TAF opens the Swap Numbers ? dialog box.



3. Select **YES** if numbers should be swapped, or select **NO** and choose another number not used before.

NOTE: TAF explains where the selected module number has been defined before to allow swapping of the numbers.

RESULT: TAF swaps the module numbers of the appropriate modules.

### Move Module

**Purpose** Move a module from one slot of a housing to any other empty slot of the same or another housing by Drag&Drop.

You can move standard modules from their housings to LON housings or XF528 module housings, and vice versa.

The following list shows the movement possibilities:

Standard		XF528		LON
XF523	↔	XF528	↔	XFL523
XF521	↔	↔	↔	XFL521
XF522	↔	↔	↔	XFL522
XF523	↔	↔	↔	XFL523
XF524	↔	↔	↔	XFL524
XF526	→	→	→	XFL521
XF527	→	→	→	XFL522
XF529	→	→	→	XFL524

Moving modules between LON and standard housings results in the following:

TAF changes the module type and all points remain on their original terminations as far as possible. In case module modifying results in any invalid point assignment, the corresponding points will automatically get boardless as indicated in the logical plant tree.

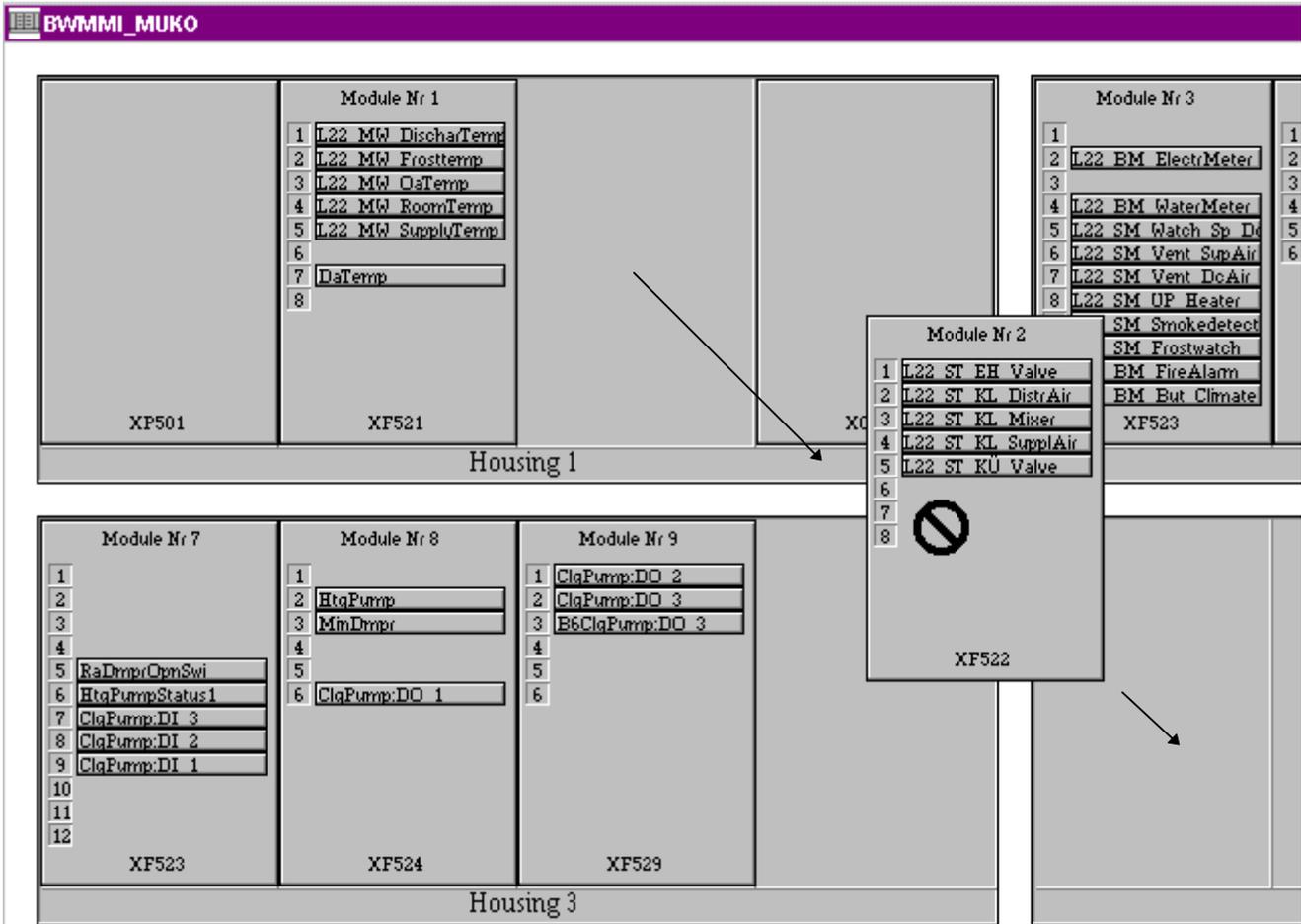
**Procedure**

1. Drag module by clicking and holding the left mouse key on the appropriate module. Drag the module to the target slot, then drop it by releasing the mouse key.

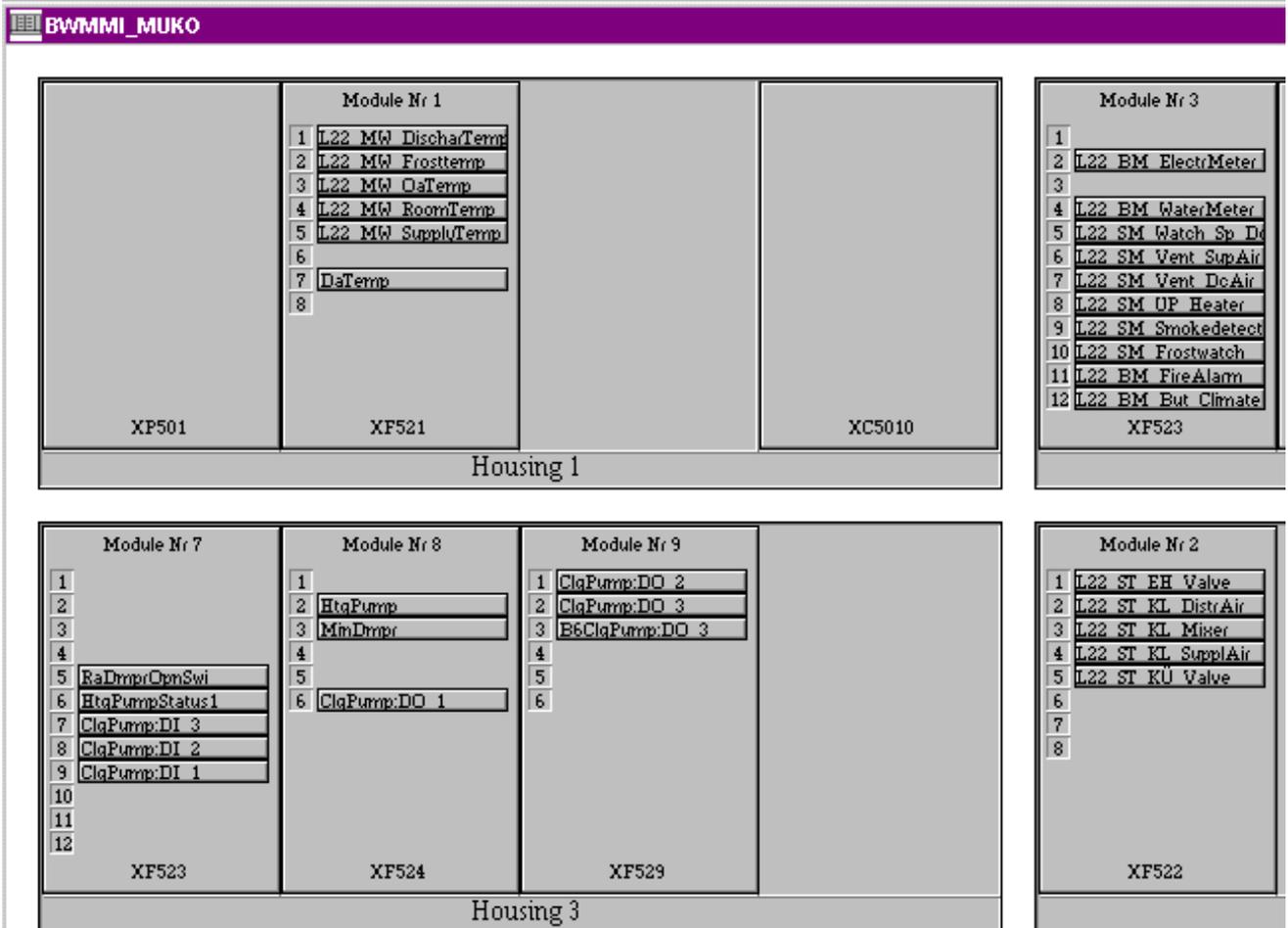


**NOTE:** A module cannot be inserted into an occupied slot or outside a housing.

The cursor will change to "Prohibited" to indicate that dropping is not possible.



RESULT: TAF inserts the selected module with its points in the target slot.



Remove Module

**Purpose** Remove module. When removing a module where datapoints are still assigned to, they will be removed.

The necessary re-assignment may be avoided by assigning the points to another module before removing the module.

**Procedure** 1. Click right mouse key on the module to be removed, then click **Remove Module** (highlighted).

**RESULT:** If points are still remaining on the module, they will be concurrently removed with the module and indicated in the logical plant tree as follows:

	On board	black
	Boardless	white
	On board and mapped	yellow
	Boardless and mapped	yellow
Boardless Flexpoint	red	

Working With LON Devices

In addition to the physical assignment of CARE datapoints to IP or distributed I/O modules, the logical assignment of LON devices will be performed on the terminal assignment tab.

Configure Display

**Purpose** To configure the display of LON devices on the terminal assignment tab.

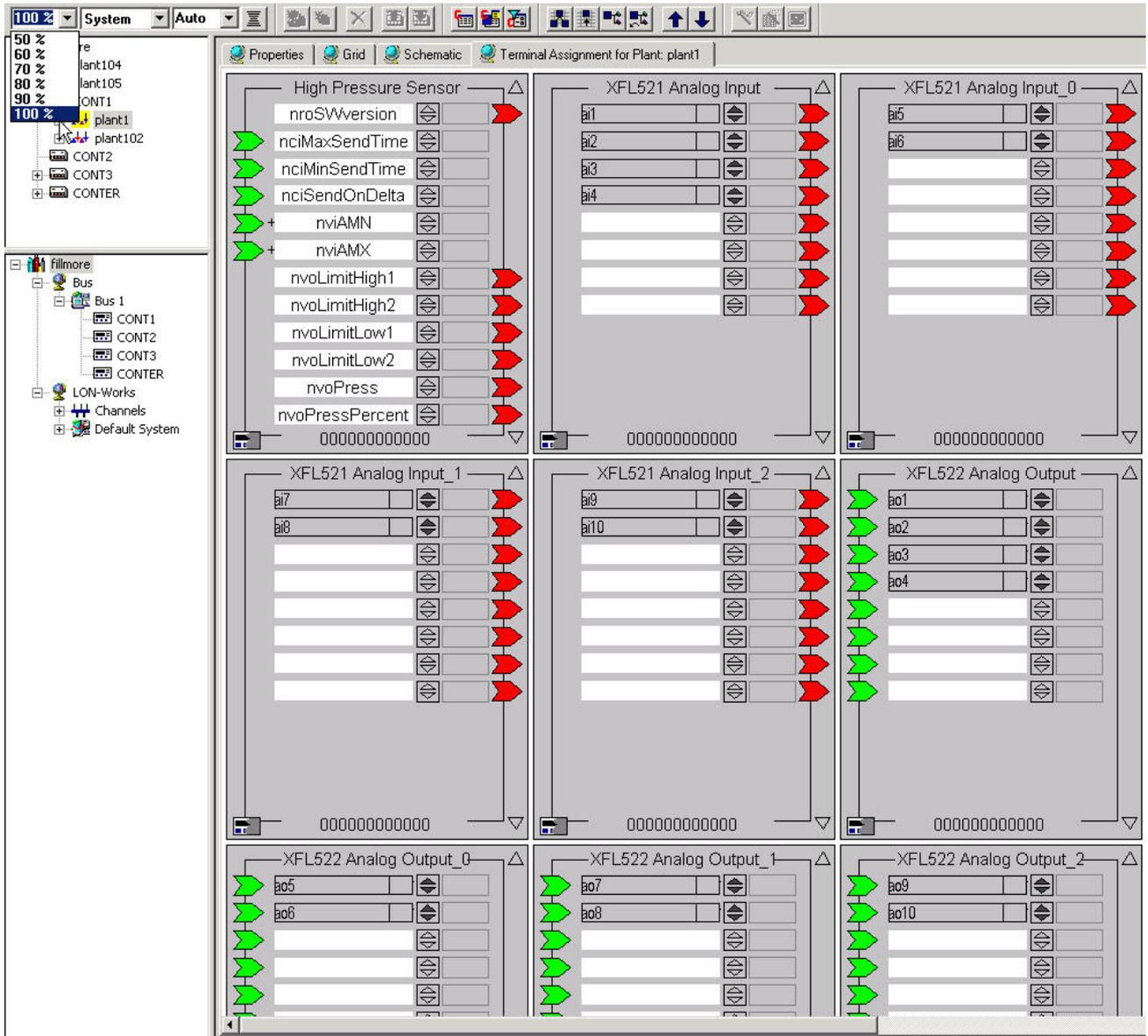
The display configuration can be varied by the following concurrently applicable means:

- Zoom, to reduce or enlarge the display with a magnification between 50 and 100 percent
- Column configuration to define the number of devices per row
- Sort order of devices by name, channel and system

**NOTE:** Zoom also applies to the variable display of LON housings with DIO modules.

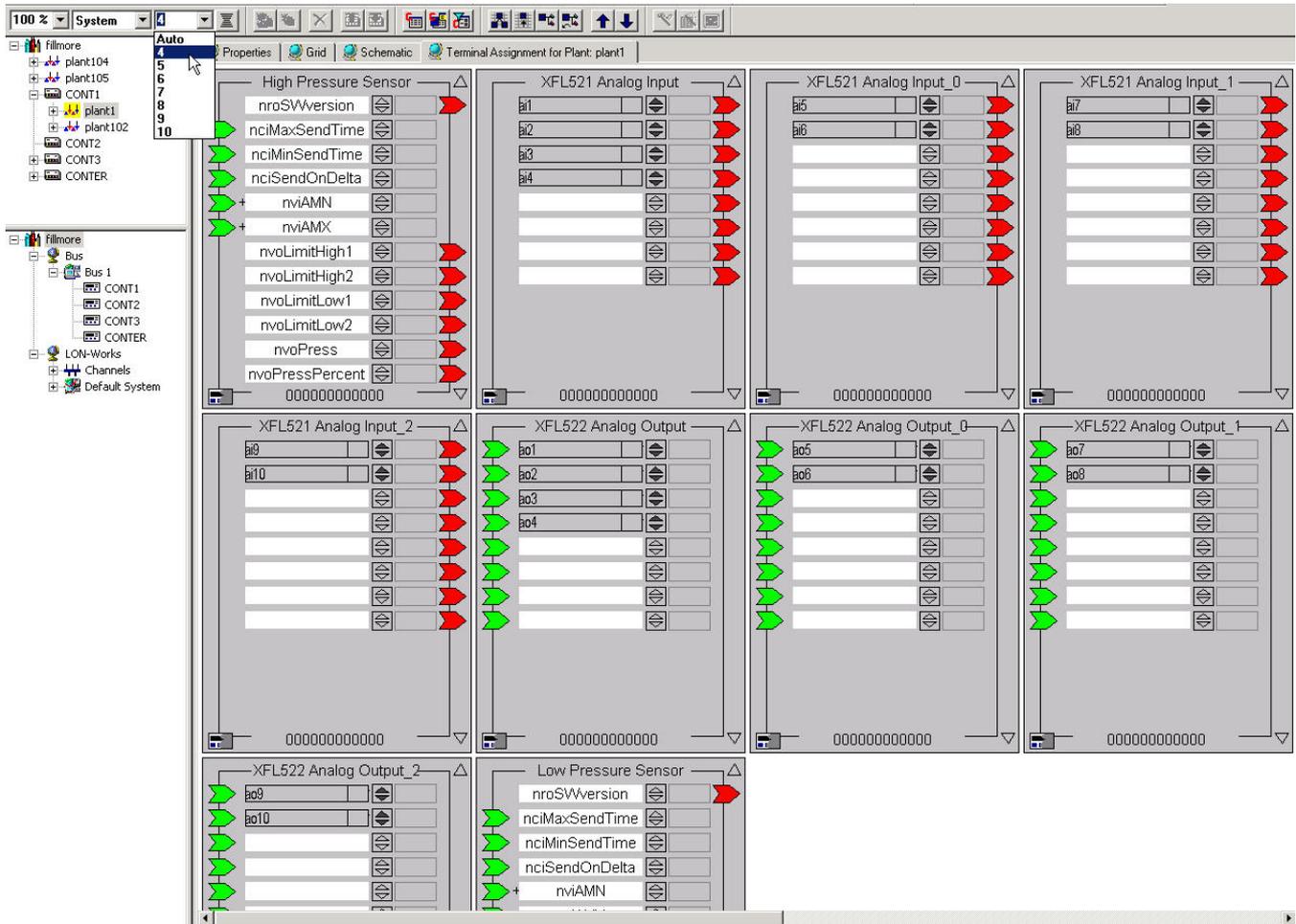
**Procedures** 1. To determine the zoom, select the magnification from the Zoom drop-down listbox in the toolbar. When the magnification once has been selected in the drop-down listbox you can use the mouse wheel for continuously adjusting the magnification.

**RESULT:** The devices will be displayed according to the selected magnification and to the configured number of columns. In case Auto has been selected for the column configuration, CARE optimizes the column number so that no device will be cut vertically from display. You might scroll vertically to view further devices. In case a certain number of columns (4 to 10 by default, a user-defined number can be entered) has been selected, CARE always displays the devices in that defined column number independent from the magnification.



- To determine the column number, select the number from the Column Number drop-down listbox in the toolbar. When the column number once has been selected in the drop-down listbox you can use the mouse wheel for continuously selecting the column number.

**RESULT:** The devices will be displayed according to the selected column number and magnification. In case Auto has been selected for the column configuration, CARE optimizes the column number so that no device will be cut vertically from display. In case a certain number of columns (4 to 10) has been selected, CARE always displays the devices in that defined column number independent from the magnification.



- To determine the sort order, select desired option from the Sort Order drop-down listbox in the toolbar:

**Name**

All bound devices of the controller will be sorted by name

**Channel**

All bound devices of the controller will be sorted by their channel assignment.

**System**

All bound devices of the controller will be sorted by their system assignment

When the sort order once has been selected in the drop-down listbox you can use the mouse-wheel for continuously changing the sort order.

**RESULT:** The devices will be displayed according to the selected sort order option whereas the magnification and the column configuration applies concurrently.

The devices are sorted by System as follows;  
Default System  
Subsystem\_A

### Assign LON devices (Binding)

The assignment of LON devices will be performed on the Terminal Assignment tab by interaction between the logical plant tree and the logical LON-bus part of the network tree.

Click on Terminal Assignment tab to display assigned devices

From logical plant tree, these two CARE datapoints are connected (bound) by Drag&Drop to appropriate NVs on the below LON devices

In logical LON bus part of network tree, double-click on (controller) device (CONT01), to display assigned devices

These two LON devices are assigned to CONT01

The assignment of LON devices includes two main steps:

1. Add LON device to the network
2. Connect CARE datapoints, respectively NVs to NVs (Binding)

### Add LON Device to the Network

To add LON devices to the network, they will be imported out of a device library.

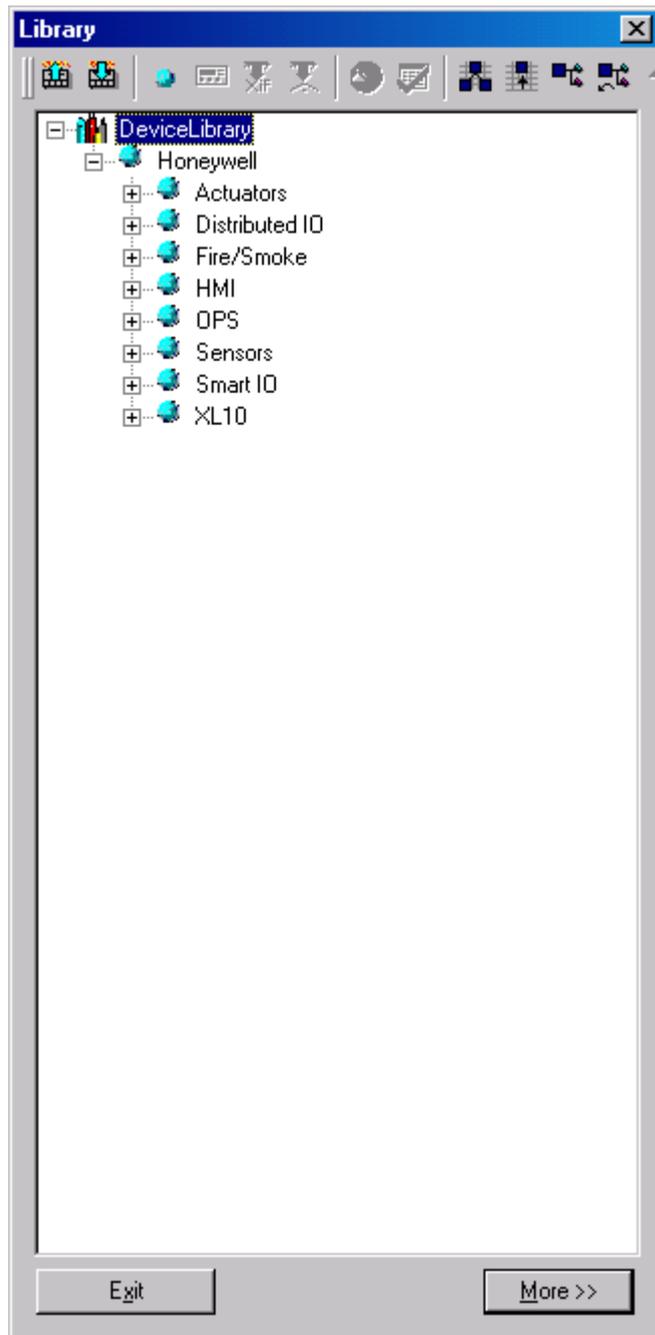
- Procedure**
1. In the logical LON-Bus part of the network tree, **double-click** on the LON device, e.g. controller device, you want to assign a LON device to.



RESULT: The controller is highlighted in yellow.

2. On the right pane, select the Terminal Assignment tab.
3. On the Terminal Assignment pane, click right mouse key, then click Device Library in the context menu.

RESULT: The Library dialog box displays.



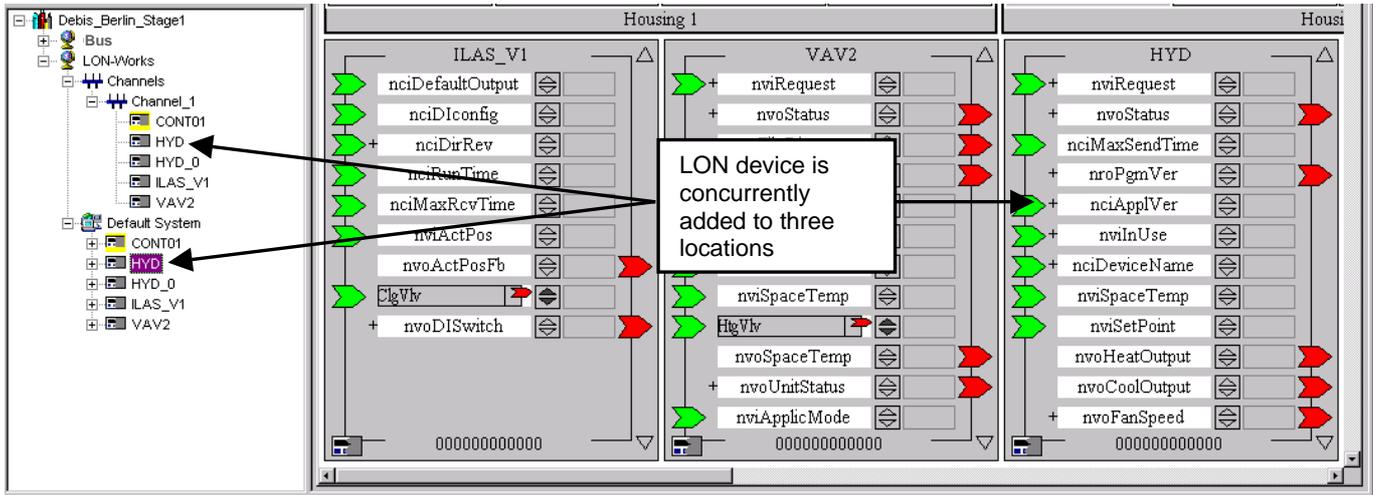
4. Expand the DeviceLibrary tree, to display the available devices.

NOTE: The tree can be structured by creating, deleting and renaming folders.

5. Select the device in the DeviceLibrary tree, drag it to a blank spot on the Terminal Assignment tab and drop it there.

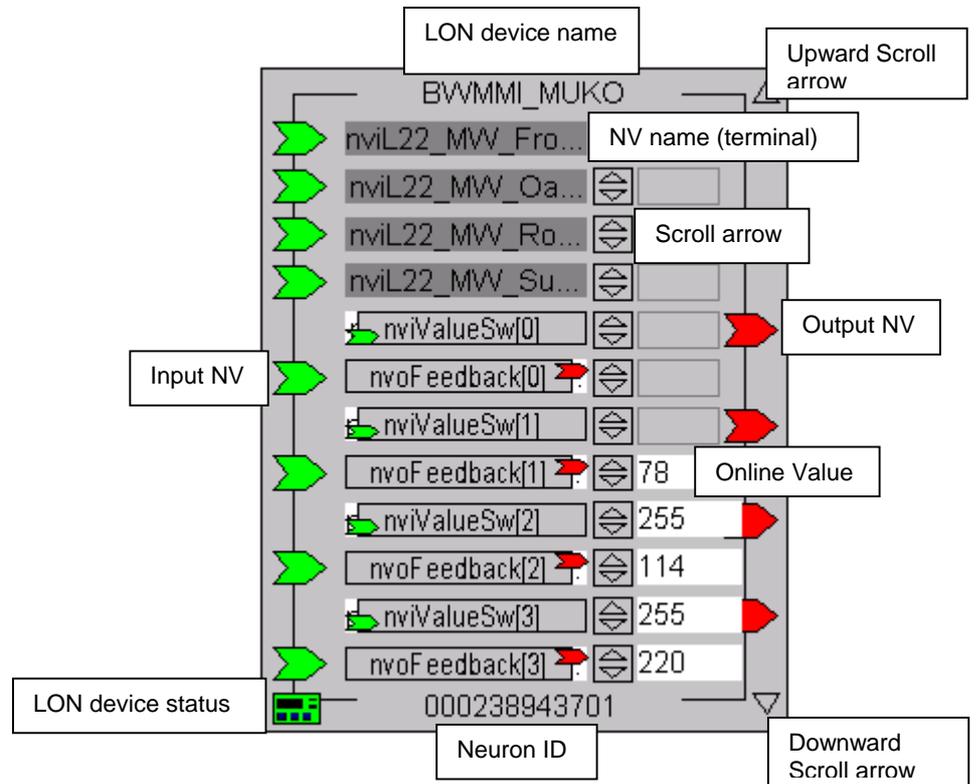
RESULT: The LON device is concurrently added to three locations:

- to the terminal assignment tab
- to the channel where the selected LON device resides
- in the logical LON-Bus part of the network tree, to the subsystem where the selected LON device resides



- To assign the device, continue by interconnecting the devices as described under the Connect CARE Datapoints/NVs to NVs section.

On the top of the LON device the name is displayed. The terminals display the NV name. Input-NVs are indicated on the left as green arrows, Output-NVs are indicated on the right as red arrows. Upward- and downward scroll arrows on the right top and at the bottom allow to scroll through all available NVs of the device. Scrolling is also possible when dragging a datapoint/NV onto a terminal by positioning the datapoint/NV over the upward or downward scroll arrow. Right to the terminal a combined upward-downward arrow allows to display bound NV/datapoint names. Right to the upward-downward arrow, a field allows to display the current online value of the NV. When setting the terminal online, the field is white. When setting the terminal offline, the field is gray. A plus symbol at an NV indicates components of a structured NV. In the middle at the bottom, the neuron ID is displayed. On the left at the bottom the color of the LON device status icon indicates the current status of the device (white = unknown-not initialized, green = application is running, red = not available-application stopped). Fully-colored means that the current status in CARE and the device status is the same. Half-colored means "Updates pending". Certain devices such as distributed I/O modules and Smart I/O modules can be displayed in two different modes (see Show LON device as Open LON section). Terminals which have bound datapoints to another LON controller as the selected controller are indicated "anonymously", that is without the datapoint name, by a dark gray bar (see Indicate bound Datapoint on LON Device / Show Bound LON Device of Datapoint section).



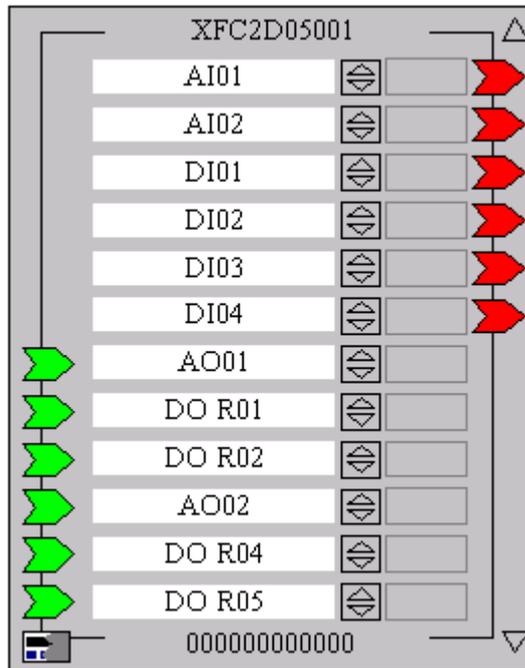
To display assigned devices for one particular device, please refer to the Display Connected Devices section.

**Show LON Device as Open LON**

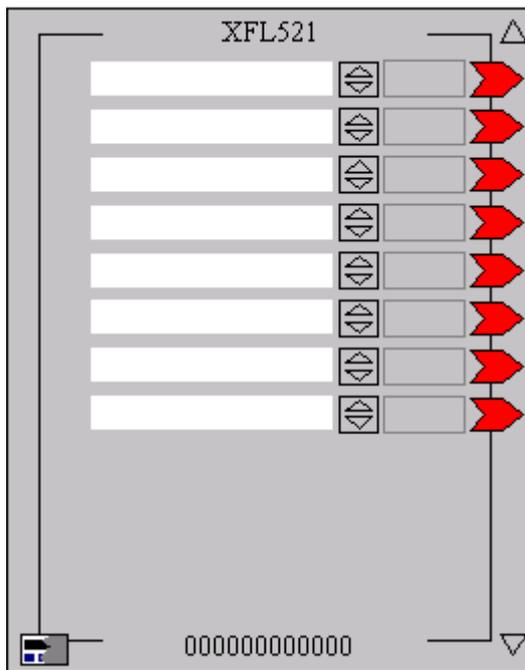
Some devices such as Smart I/O modules or distributed I/O modules of type XFL ... B with the 3120E5 neuron chip can be displayed in two different modes, as:

- Standard mode
- Open LON mode

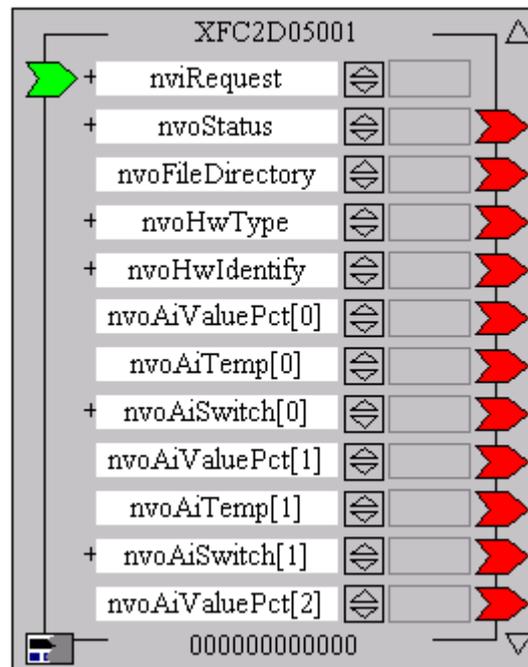
A Smart I/O module such as XFC2D05001 shows the terminals in standard mode as follows:



A distributed I/O module such as XFL 521 of B-type shows the terminals in standard mode as follows:



As Open LON, the NVs residing on the device terminals are shown:

**IMPORTANT**

When connecting CARE datapoints to a distributed I/O or Smart I/O module in the standard mode, that is no NVs are shown, CARE automatically creates the proper connections through the CARE Autobinding mechanism. Hence, the standard mode is recommended for the binding of distributed I/O or Smart I/O modules to an Excel 500 controller. Do not display distributed I/O or Smart I/O modules as Open LON when binding them to an Excel 500 controller. The Open LON display mode is recommended if NVs from Open LON devices should be connected to a distributed I/O or Smart I/O module.

**Procedure**

1. To toggle between the Standard and the Open LON mode, do the following:
2. Move cursor over the device.
3. Click right mouse key and with left mouse key, click on Show as Open LON to check/uncheck the option.

RESULT: The device is displayed in Open LON mode (Show as Open LON checked), respectively standard mode (Show as Open LON unchecked).

**Connect CARE Datapoints/NVs to NVs**

Assigning LON devices to others will be done by connecting the appropriate NVs of the two devices. If one LON device is an Excel 50 or 500 controller, assignment will simply be done by connecting the CARE datapoints to the appropriate NVs of the LON device (CARE Autobinding). When connecting datapoints to NVs, CARE internally creates the corresponding NVs of the same name (Mapping). In case of the assignment of two LON devices, the NVs of the corresponding devices will be directly connected. In case the output and input NV resides on the same device, a turnaround binding will be executed.

**Procedure**

1. Make sure that the LON device to which you want assign another device or on which you want to create a turnaround binding, has been selected by double-clicking in the network tree (highlighted in yellow) and the Terminal Assignment tab has been selected on the right pane.

RESULT: On the terminal assignment tab, previously added LON devices are displayed

2. If the LON device you want to assign is not available, add desired device to the network by Drag&Drop of the LON device from either the logical LON-Bus part of the network tree or the device library (see Add LON device to the Network section). In case of turnaround binding creation, it is the same device.
3. In the logical plant tree, click on the datapoint.

Or, if the datapoint is also assigned to a module, click on the terminal on the terminal assignment tab on the right.

Or, when assigning two Open LON devices to each other, click on the NV in the logical LON-Bus part of the network tree, you want to connect to the LON device displayed on the terminal assignment tab.

Or, when creating a turnaround binding on one and the same device, click on the NV in the logical LON-Bus part of the network tree.

4. Drag it to the desired terminal on the LON device and drop it.

**RESULT:** When moving the datapoint/NV over the LON device, CARE shows any NV type in green that matches to the datapoint/NV. In the status line at the bottom, the corresponding NV name, NV type and the LON object, which the NV belongs to, is displayed.

In logical LON bus part of network tree, double-click on destination device (CONT01), to display assigned source devices

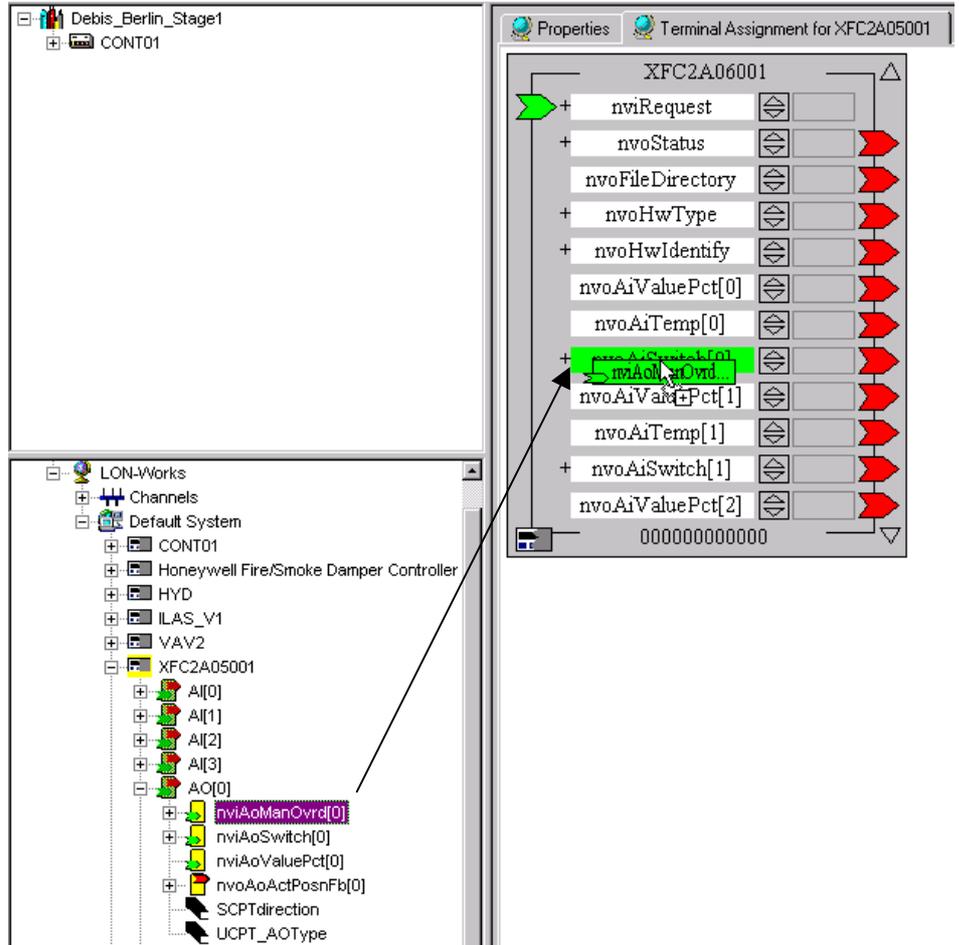
Datapoint "MaDmpr" can be dragged from both locations alternatively

Module No.	Terminal
1	DaTemp
2	MaTemp
3	DucStatic
4	Cool1
5	Cool2
6	Cool3
7	Cool4
8	Cool5

Module No.	Terminal
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	SaFanStatus
11	FrzStat
12	DaFiltAlrn

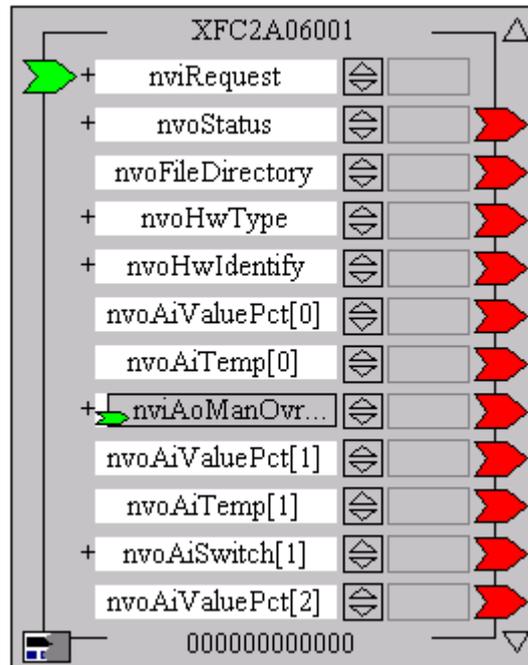
Device	Terminal	Status
ILAS_V1	nciDefaultOutput	
	nciDIconfig	
	nciDirRev	
	nciRunTime	
	nciMaxRcvTime	
	nviActPos	
	nvoActPosFb	
	ClgVlv	
	nvoDISwitch	
VAV2	nviRequest	
	nvoStatus	
	nroFileDirectory	
	nroPgmVer	
	nciDeviceName	
	nciAppIVer	
	nviInUse	
	nviSpaceTemp	
	HtgVlv	
	nvoSpaceTemp	
nvoUnitStatus		
nviApplicMode		
HYD	nviRequest	
	nvoStatus	
	nciMaxSendTime	
	nroPgmVer	
	nciAppIVer	
	nviInUse	
	nciDeviceName	
	MaDmpr	
	nviSetPLght	
	nvoHeatOutput	
nvoCoolOutput		
nvoFanSpeed		

**Example 1: Connection of CARE Datapoint to NV of an Open LON Device (Excel 500 to Excel 10 Hydronic controller)**



**Example 2: Connection of NVs of two Open LON Devices**

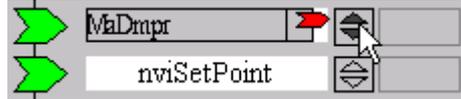
RESULT: The connection is indicated as follows:



When a CARE datapoint is connected, CARE automatically creates a NV of the same name, in the previous case (see figure,

respectively Example 1) nvoMaDmpr for the datapoint MaDmpr. On the device in the terminal assignment tab, the connected datapoint with the newly created NV name is shown as "terminal" covering the NV where the datapoint has been dropped. The NV type, input or output NV, is indicated by a small green, respectively red arrow.

You can toggle between the display of the datapoint name and the created NV name MaDmpr ↔ nvoMaDmpr by clicking the dark upward-downward arrows  right at the terminal.

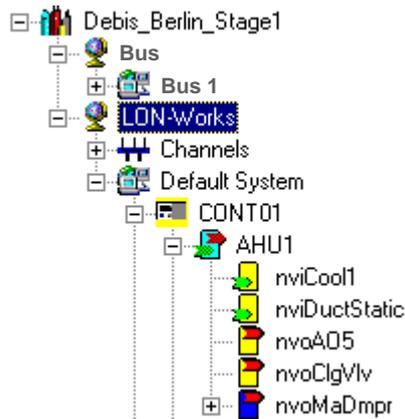


If multiple datapoints or NVs have been dropped onto the same terminal, you can scroll with the dark upward-downward arrows and all of them will be displayed with their datapoint name and NV name.

If (only) two NVs are mapped to each other, see figure, respectively Example 2, toggling is not possible.



In the LON-Bus part of the network tree, any bound NV is indicated by its blue background, which previously was yellow in the unbound state.



For a connection between two NVs, in the status line at the bottom, the NV name and NV type of the moved NV (left side), the NV name, NV type and the LON object where the NV has been dropped (right side), is displayed.

NV Name: nviAoManOvr[0]	NV Type: SNVT_switch	NV Name: nvoAiSwitch[0]	NV Type: SNVT_switch	LON Object: AI[0]
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**Example 3: Status display of two connected NVs**

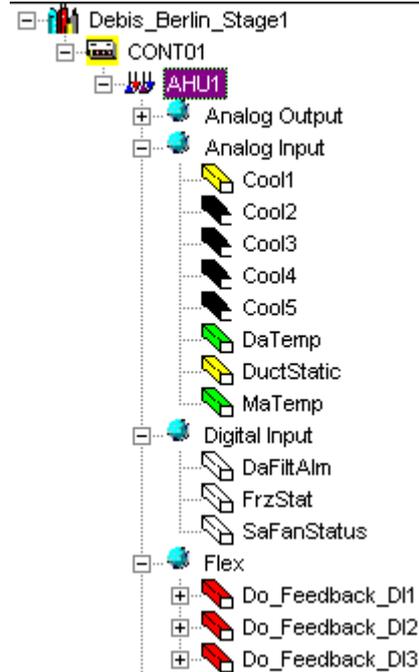
For a connection between CARE datapoint and NV, in the status line at the bottom, the datapoint type and subtype (left side), the NV name, NV type and the LON object, where the datapoint has been dropped (right side) is displayed.

Point Type: AI	Subtype: SLOW	NV Name: nvoAiValuePct[0]	NV Type: SNVT_lev_percent	LON Object: AI[0]
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**Example 4: Status display of connected CARE Datapoint and NV**

**Datapoint Display** Depending on their status/type, datapoints are displayed in different colors in the logical plant tree:

Point Status/Type	Color
On board	black
Boardless	white
On board and mapped	yellow
Boardless and mapped	yellow
On board, mapped and bound	green
Boardless, mapped and bound	green
Boardless Flexpoint	red



**NV and LON Object Display**

Depending on their status, NVs and LON objects are displayed in different colors in the LON-bus part of the network tree:

Tree Item	Status	Color
NV	Unbound	Yellow background with green left-handed arrow (inputs) and red right-handed arrow (outputs)
	Bound	Dark blue background with green left-handed arrow (inputs) and red right-handed arrow (outputs)
LON Object	No bound NVs included	Green background with green left-handed arrow and red right-handed arrow
	At least one bound NV included	Bright blue background with green left-handed arrow and red right-handed arrow

NOTE: How connections are displayed in the logical LON part of the network tree, please refer to the Show Connections of Devices section.

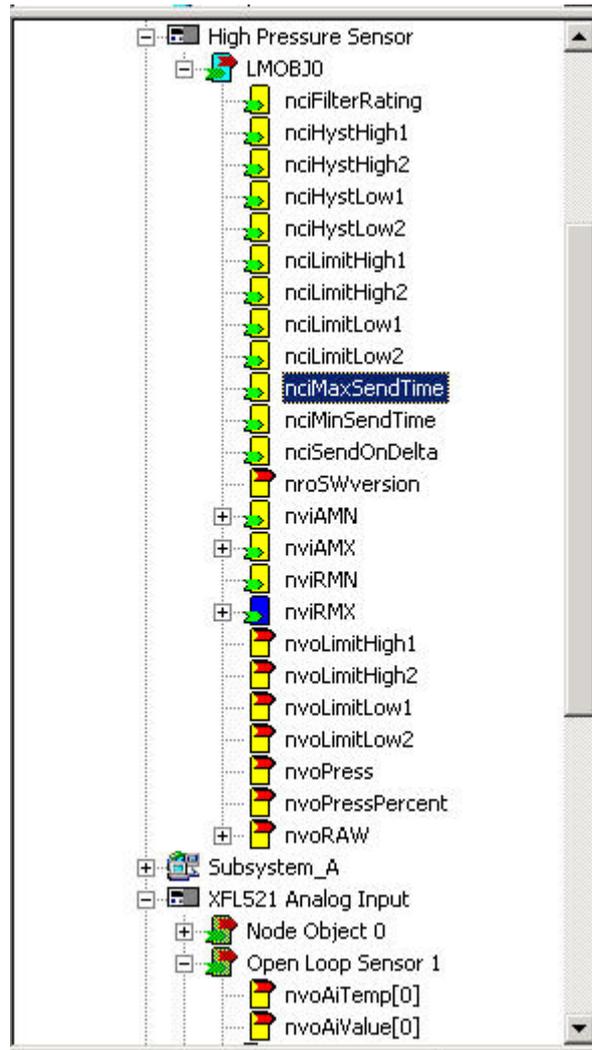
**Create Turnaround Binding**

**Purpose** To create a turnaround binding, that is, to bind an input NV to an output NV or vice versa of the same device. For the procedure, please refer to the Connect CARE Datapoints/NVs to NVs section and connect the two NVs on the same device.

**Create Multiple Bindings**

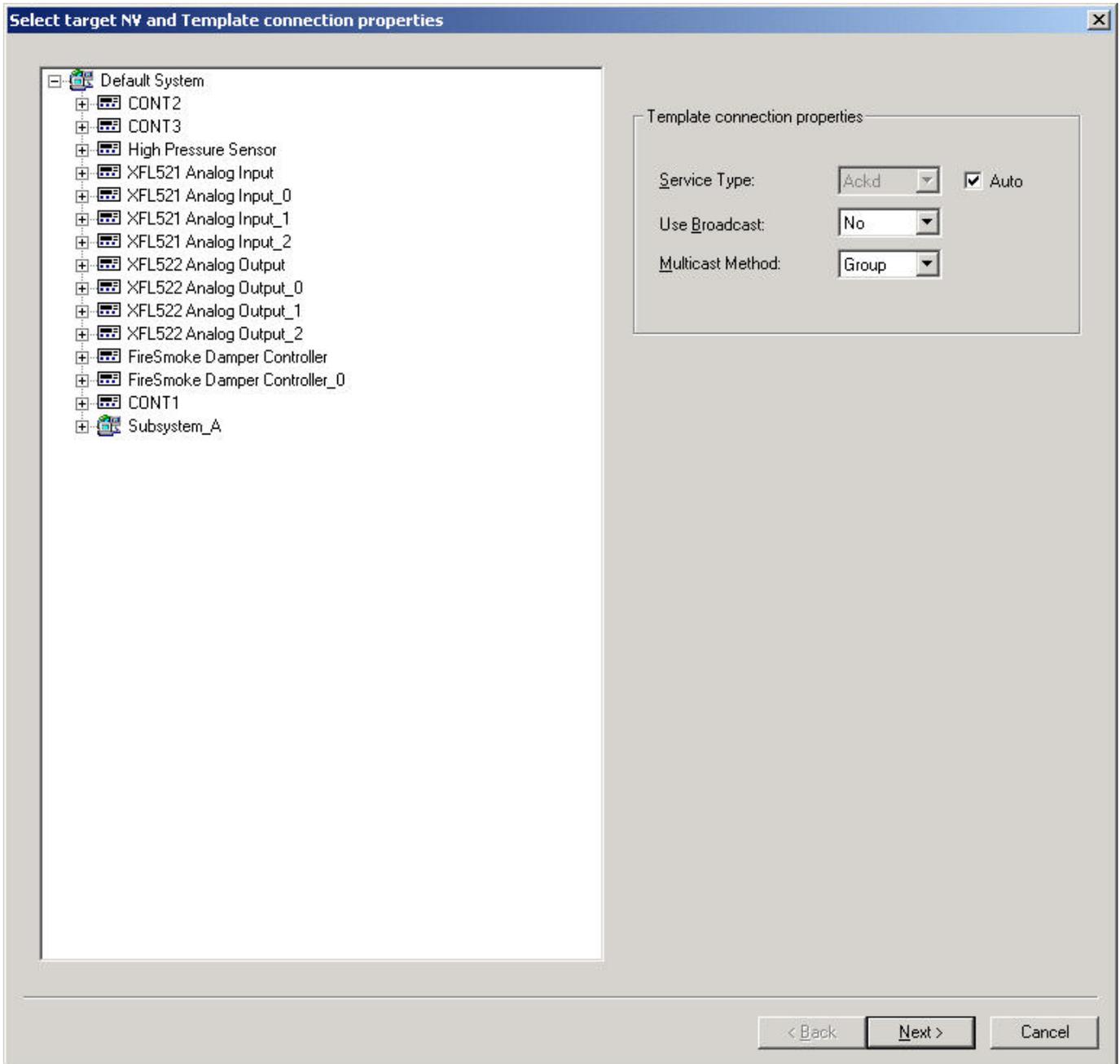
**Purpose** To create multiple bindings between one particular NV of a source device and NVs of the same type in multiple target devices.

**Procedure** 1. In the network tree, navigate to the source device and select the NV you want to create the multiple bindings for.

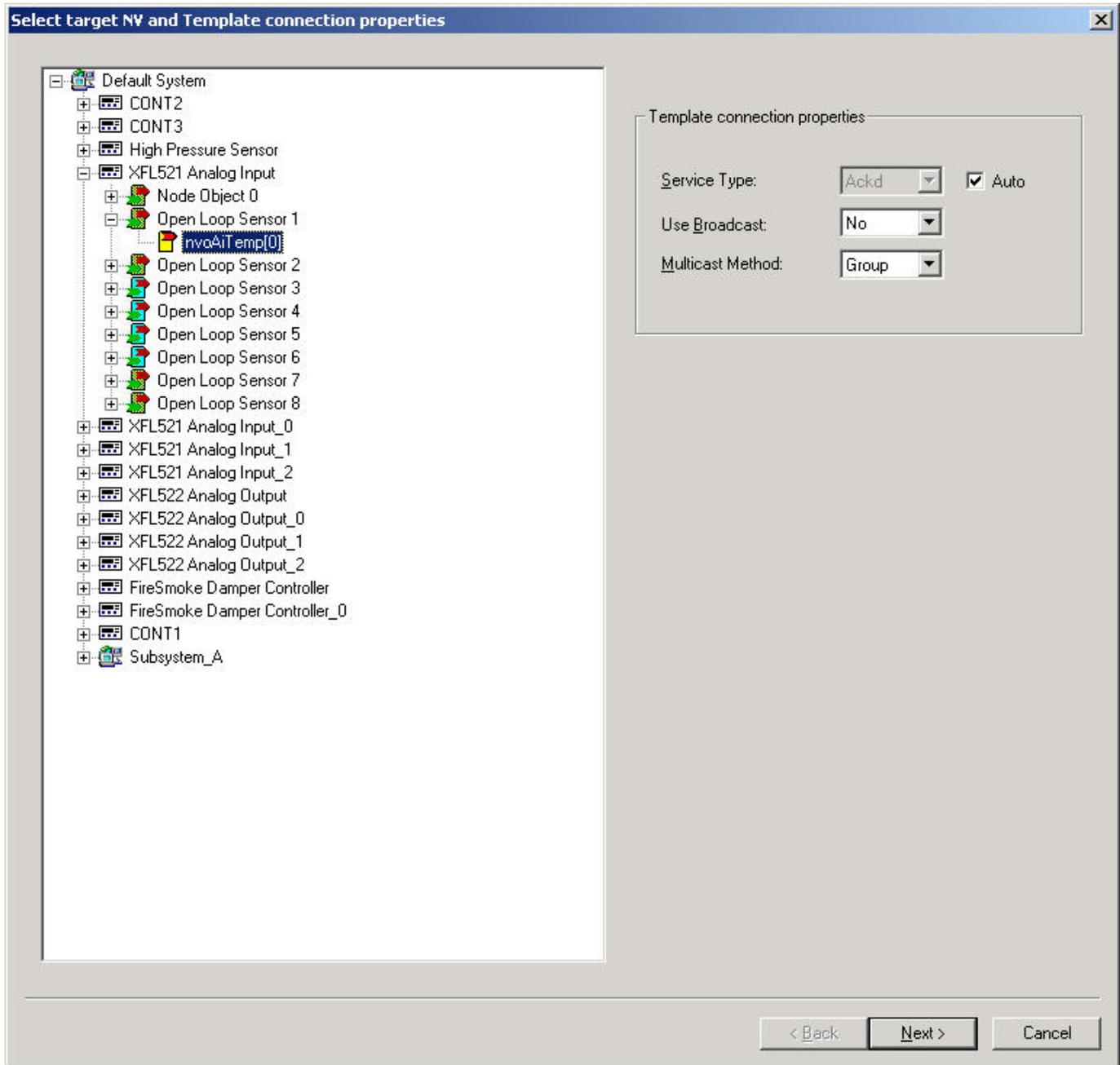


2. Click right mouse button and with left mouse button, click on Multiple Binding in the context menu.

**RESULT:** The Select target NV and template connection properties dialogbox displays.

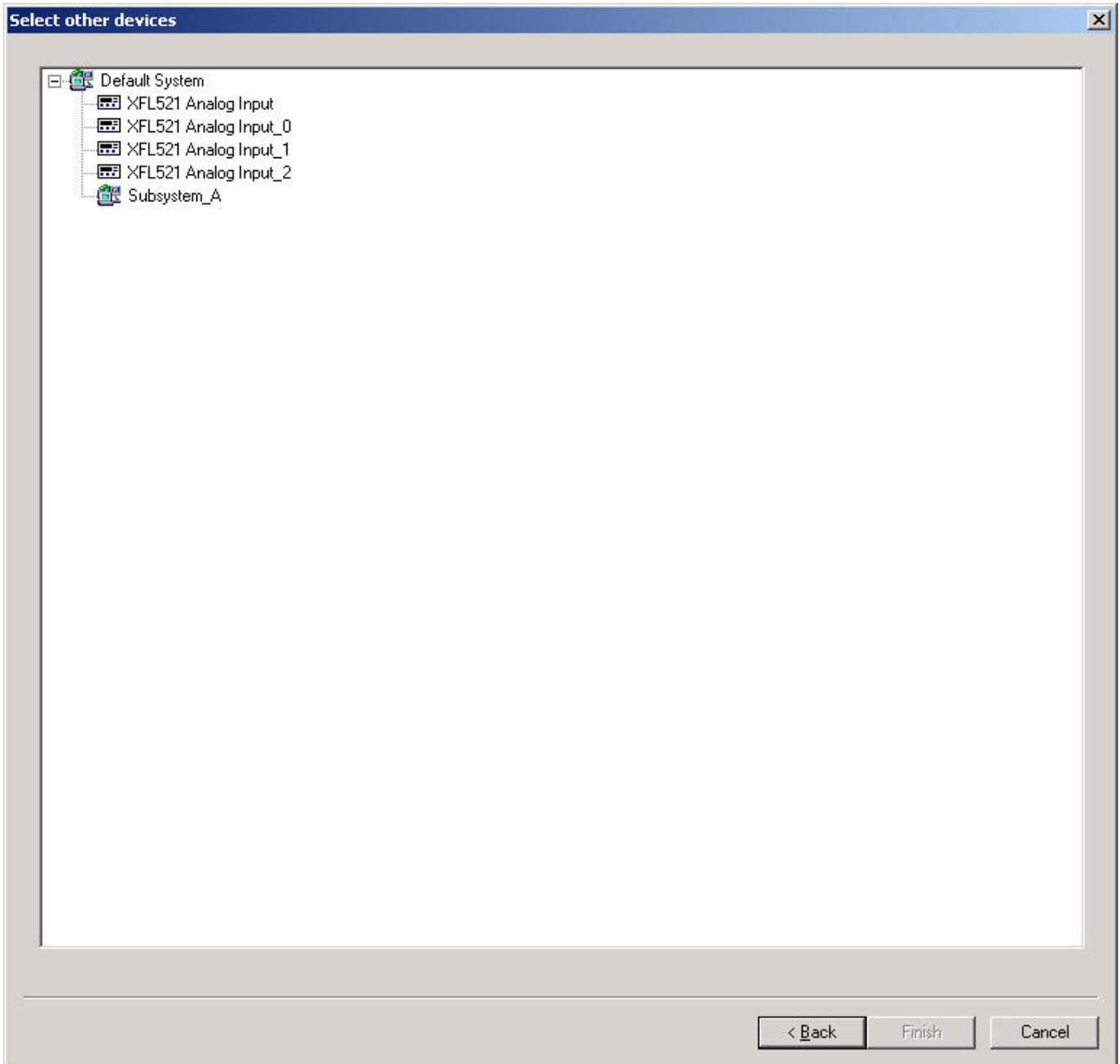


3. Expand the tree and navigate to the target NV. Non-compatible devices respectively NVs cannot be selected as target.



4. To alter the default NV connection properties, change the Template connection properties on the right. Refer to the relevant Echelon documentation for details on these settings.
5. Click the **Next** button.

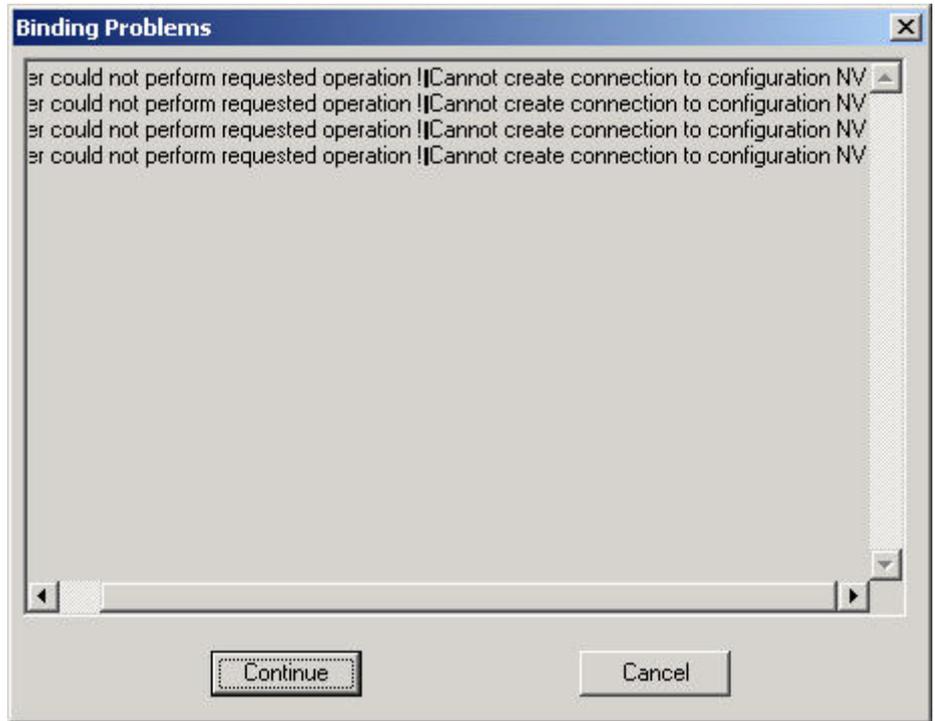
RESULT: All compatible target devices are displayed.



6. Select devices by clicking on them. Use CTRL key for multi-selection.

7. Click the **Finish** button.

RESULT: In case the bindings cannot be created properly the Binding problems dialogbox displays.



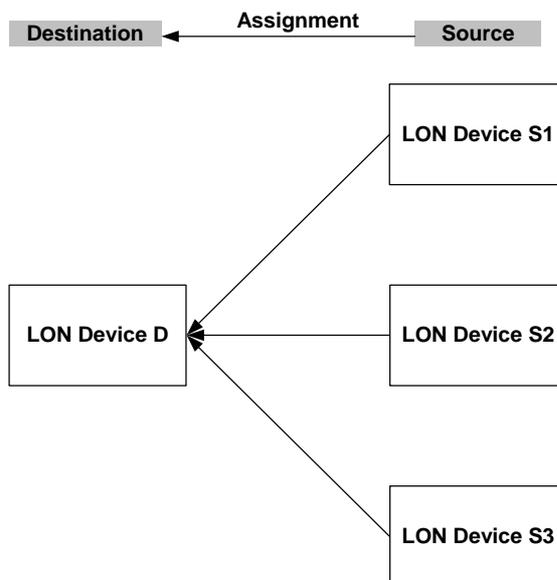
8. Click the **Continue** button, if you want CARE to create the bindings anyway.

RESULT: In case there were binding problems, CARE will perform all steps that are possible in creating multiple bindings.

9. Click the **Cancel** button, if you want CARE to cancel the multiple binding procedure.

### Display Connected Devices

When interconnecting LON devices, you will select a destination device to which you can assign up to multiple source devices.

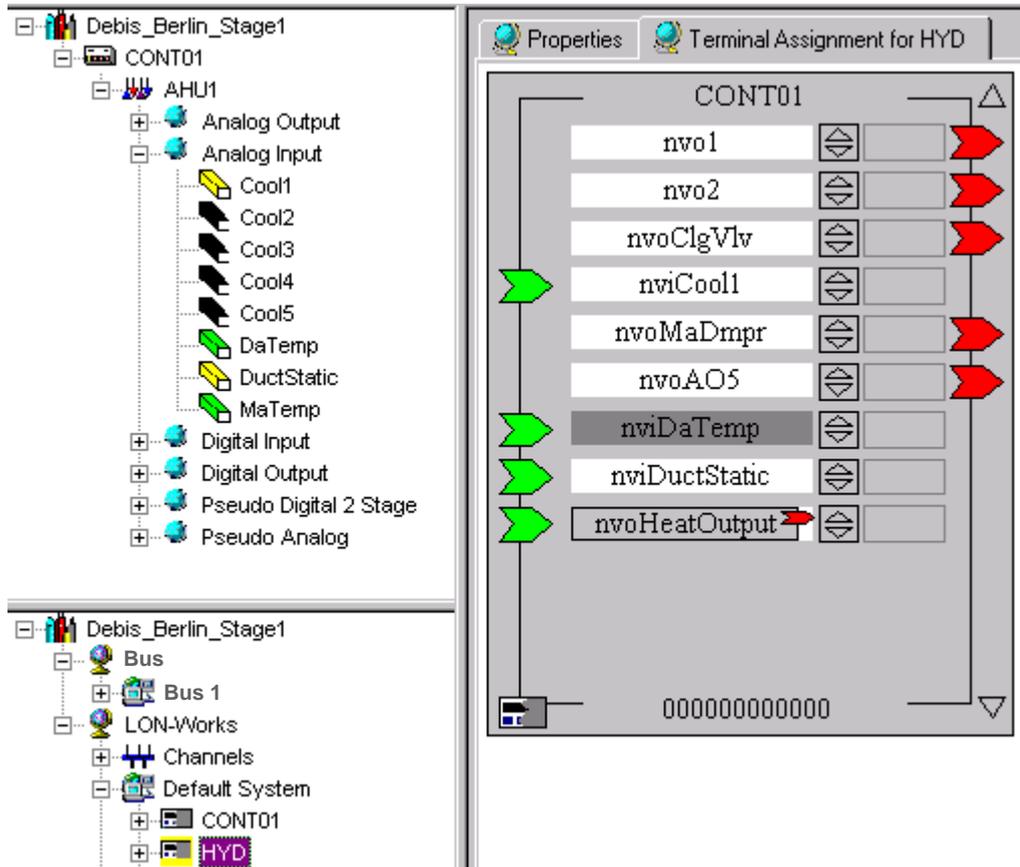


To display all assigned devices of one particular device, either destination or source device, you simply double-click on it in the logical LON-Bus part of the network tree and then select the Terminal Assignment tab.

The screenshot displays the 'Terminal Assignment for CONT01' window. On the left, a network tree shows the hierarchy: Debis\_Berlin\_Stage1 > CONT01 > AHU1 > Analog Output > ClgVlv, HtgVlv, MaDmpr, SaFanVolCtrl; Analog Input > Cool1-Cool5, DaTemp, DuctStatic, MaTemp; Digital Input, Digital Output, Pseudo Digital 2 Stage, Pseudo Analog. The main window is divided into four modules: XP502, XF521, XF522, and XF5010. A callout box with an arrow points to the 'Terminal Assignment for CONT01' tab, with the text 'Click on Terminal Assignment tab to display assigned devices'. Below the modules, a detailed view shows assigned devices for ILAS\_V1 and VAV2. A callout box with an arrow points to these devices, with the text 'These two source devices are assigned to CONT01'. The detailed view shows various terminals like nciDefaultOutput, nciRunTime, nciMaxRcvTime, nviActPos, nvoActPosFb, ClgVlv, nvoDISwitch, nviRequest, nroPgmVer, nciDeviceName, nciApplVer, nviInUse, nviSpaceTemp, HtgVlv, nvoSpaceTemp, nvoUnitStatus, and nviApplicMode. Some terminals are highlighted in dark gray, indicating they are assigned to CONT01.

**Example 5: Display of assigned devices**

If a device is connected to multiple devices, the connected datapoints/NVs are shown in dark gray. In the following example, the controller CONT01 is connected to the Hydronic controller currently which is selected in the network tree. This is indicated by the nvoHeatOutput terminal. In addition CONT01 is connected to another device, which is indicated by the dark gray nviDaTemp terminal.



Example 6: Display of a multiple connected device

Permanent and Temporary Display of Devices

The assignment of LON devices includes two main steps:

1. Add LON device to the network
2. Connect CARE datapoints, respectively NVs to NVs (Binding)

When adding the device to the network in step 1, the device is **permanently** inserted and displayed into the **network tree**, but **temporarily** added and displayed on the **terminal assignment tab**.

**IMPORTANT**

*If the destination device in the network tree will be de-selected, **before** the source device has been bound in step 2, the temporary device will be removed from the terminal assignment tab. The temporary source device on the terminal assignment tab will only be displayed permanently after step 2 has been done.*

*Once the device has been imported from the device library, it is still available in the network tree. Do not import the device twice from the device library. Instead, drag&drop it from the network tree to the terminal assignment tab.*

### Indicate bound Datapoint on LON Device / Show Bound LON Device of Datapoint

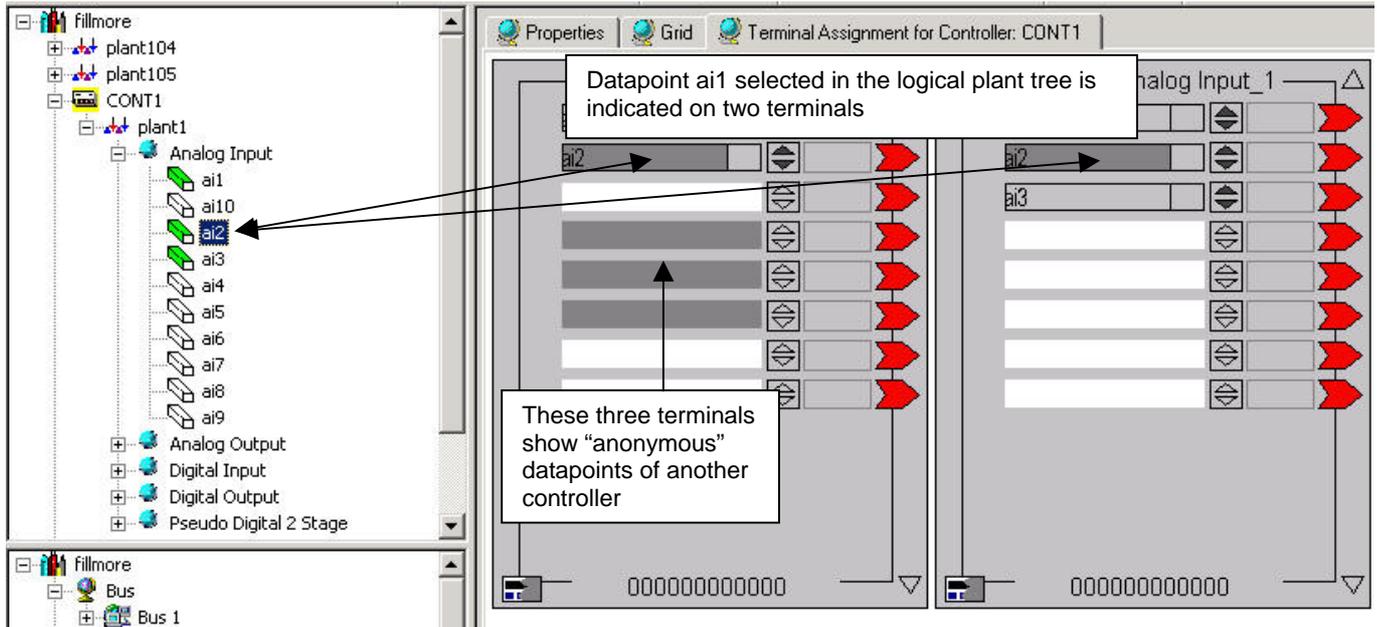
Datapoints which are bound to a LON device are automatically indicated on the LON device in dark gray when the datapoint is selected in the logical plant tree.

Hence, all bound LON devices can automatically be seen by simply selecting the datapoint.

**Procedure**

1. In the logical plant tree, click on the bound datapoint of which bound LON devices you want to see.

**RESULT:** On the terminal assignment tab, the bound datapoint is indicated in dark gray on the corresponding terminal. Terminals which have bound datapoints to another LON controller are indicated "anonymously" without the datapoint name by a dark gray bar.



### View Bound LON Devices on Plant Level

**Purpose**

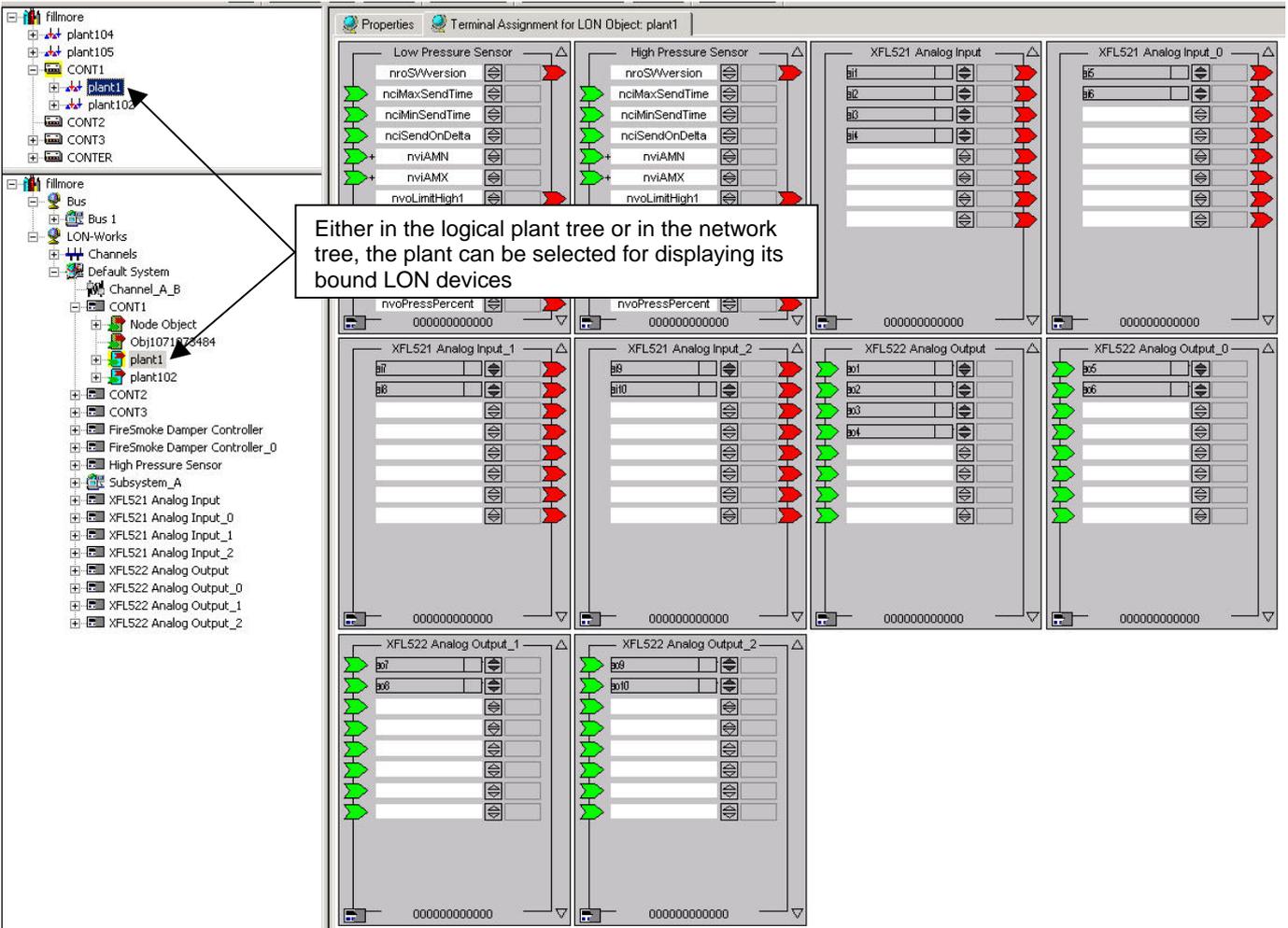
To view all bound LON devices of a plant. LON devices of a plant can be displayed in two ways, either in the logical plant tree or in the network tree on LON object level

**Procedure**

1. In the logical plant tree, click on the plant and select the Terminal Assignment tab.

Or, navigate to the corresponding LON object of the plant in the network tree and double-click on it.

**RESULT:** All bound LON devices are displayed.



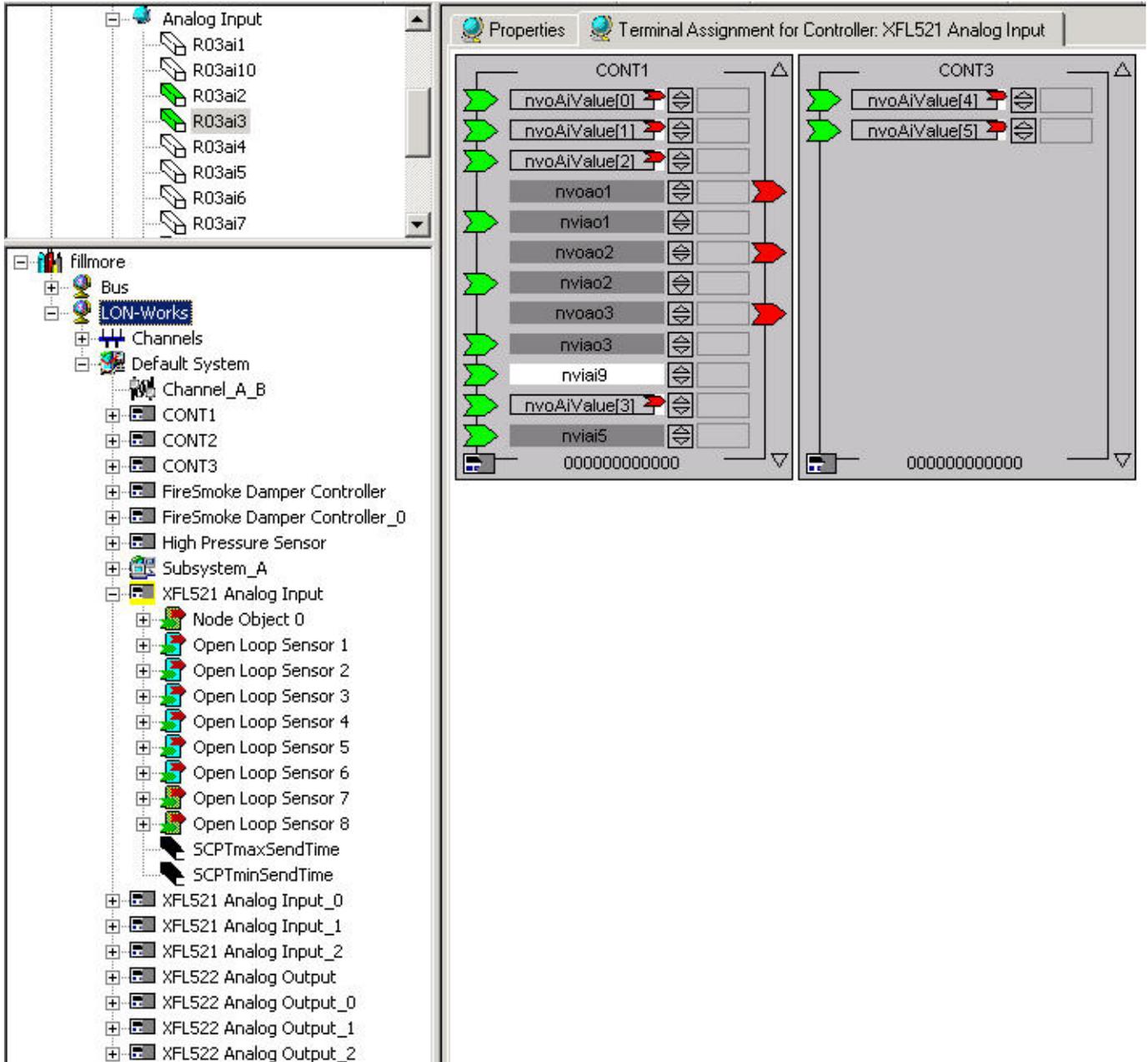
View Bound LON Devices on LON Object Level

**Purpose** To view on LON object level which other LON device is bound to the LON device. When viewing assigned LON devices of a particular device in the network tree by double-clicking on its device icon  all LON devices bound to it are displayed on the terminal assignment tab. When double-clicking on a particular LON object of a device, only the corresponding LON device, which is connected to that LON object, is displayed on the terminal assignment tab.

**Example:** An XFL521 Analog input module is assigned to two controllers, Cont1 and Cont3. Compare the displays as described in the following procedure.

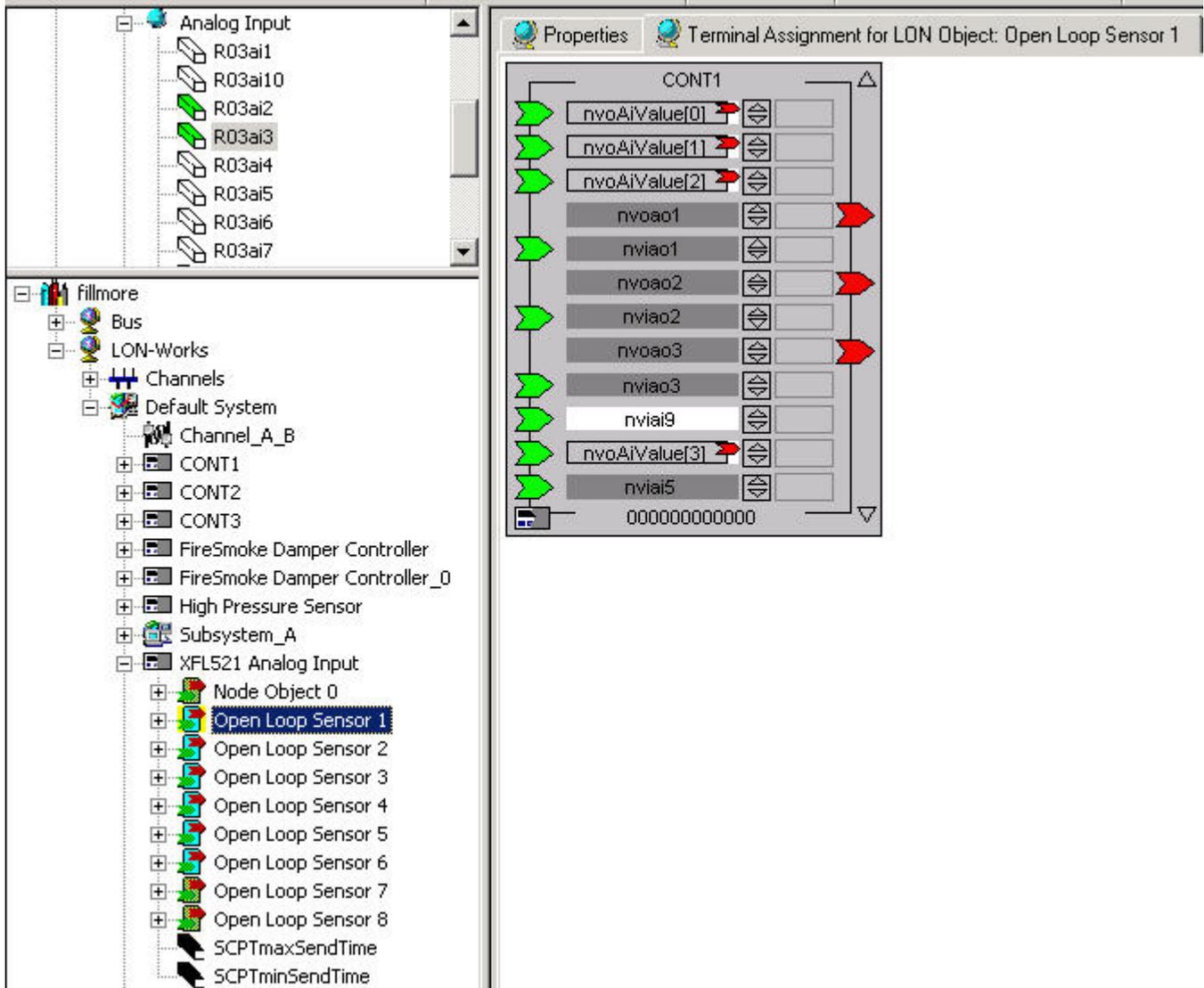
**Procedure** 1. Double-click on the LON device  in the network tree and select the Terminal assignment tab.

**RESULT:** Both controllers, Cont1 and Cont3, which are bound to the XFL521 Analog input module, are displayed.

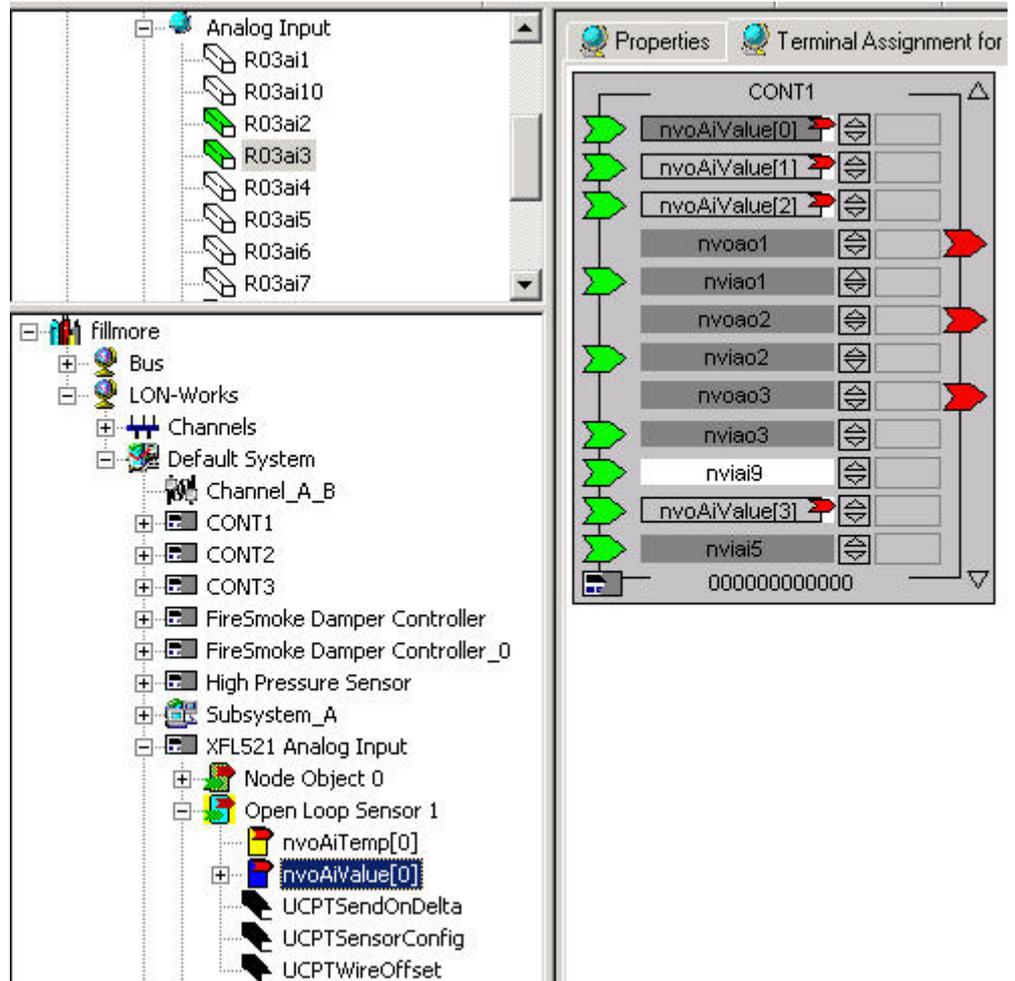


2. In the network tree, double-click on the Open Loop Sensor 1 LON object of the LON device.

**RESULT:** In this case, only CONT1 is shown on the terminal assignment tab, that is CONT1 is bound via the Open Loop Sensor 1 object to the XFL521 Analog input module.



3. To view details on which NV is used for the connection, open the Open Loop Sensor 1 object by clicking on the plus symbol.



RESULT: The used NV, in this case nvoAiValue(0) is indicated in dark blue.

- Click on the nvoAiValue(0) NV.

RESULT: On the terminal assignment tab the corresponding terminal highlighted in dark grey.

- In this example the CONT1 is additionally bound via the Open Loop Sensor 2, 3 and 4 objects. CONT3 is bound via the Open Loop Sensor 5 and 6 objects. To view details about those bindings repeat steps 2 to 4.

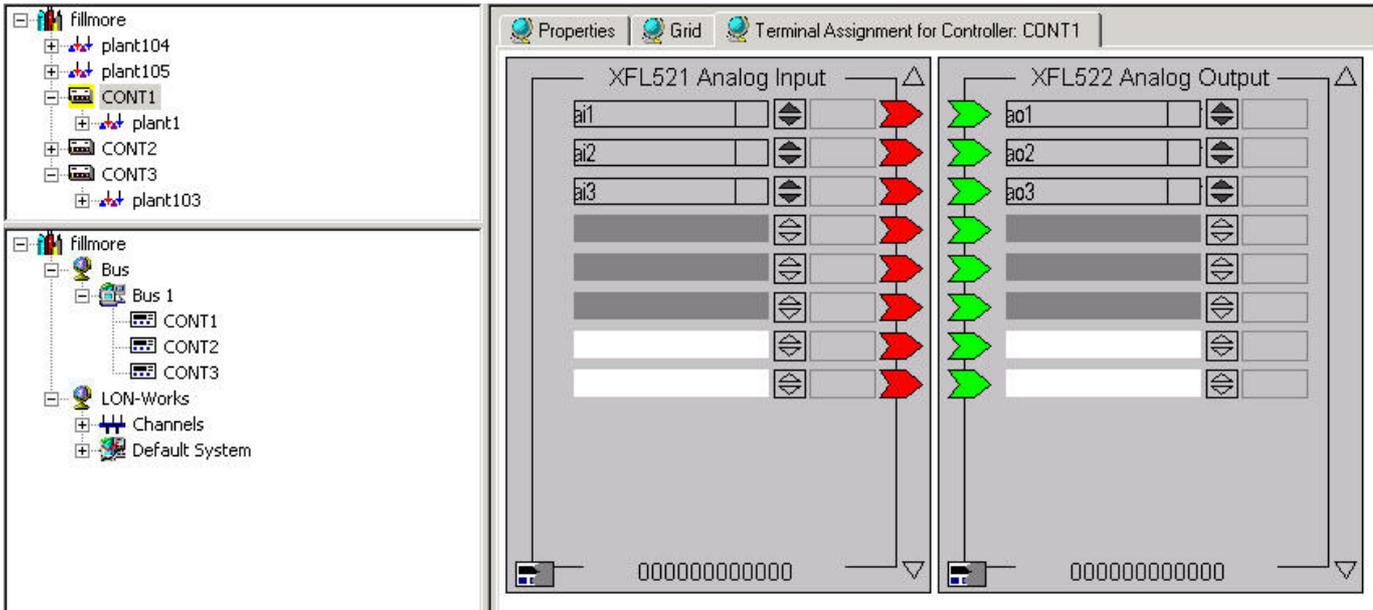
## Copy LON Devices

**Purpose** To copy a LON device (Honeywell LON device or 3<sup>rd</sup> party LON device) including its bindings to a LON controller.

**NOTE:** LON devices can only be copied in the same terminal assignment view, that is, LON devices cannot be copied between different LON controllers. LON controllers cannot be copied in the TAT. To copy LON controllers, please refer to the Copy Controller section under CONTROLLERS DEFINITION, ATTACHMENT, AND MANAGEMENT.

- Procedure**
- On the Terminal Assignment tab, display the device you want to copy by double-clicking on the bound LON controller in the logical plant tree or in the network tree.
  - On the right pane, select the Terminal Assignment tab.

RESULT: All bound LON devices are displayed.



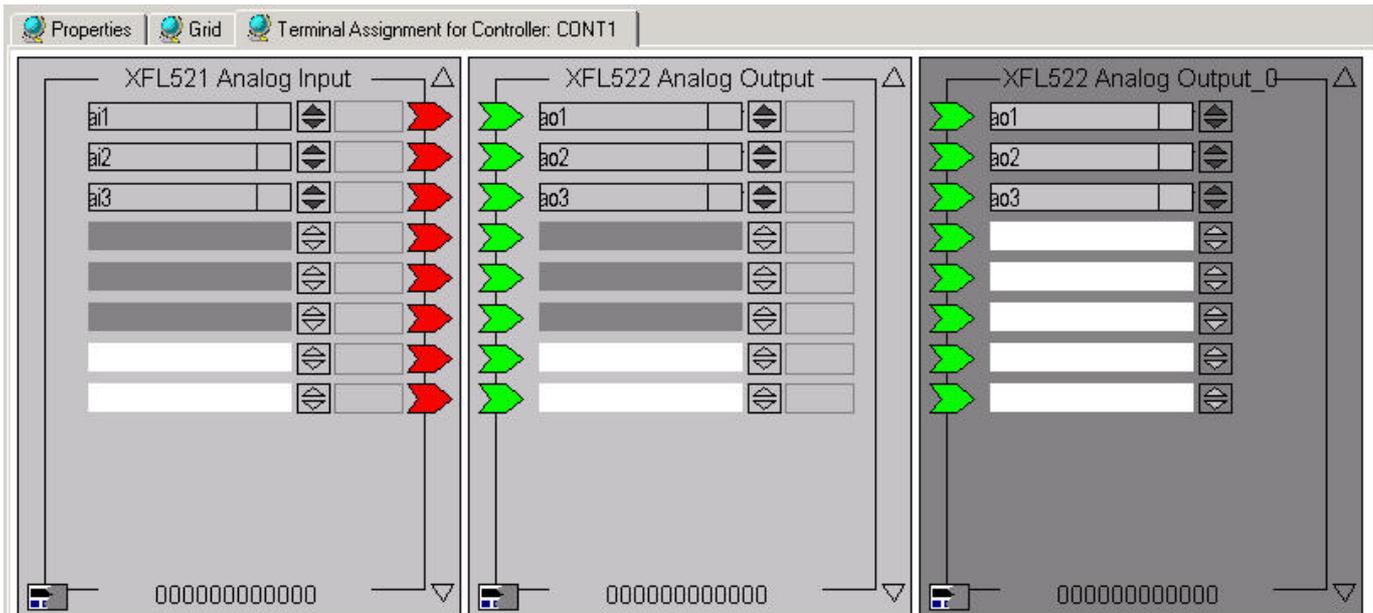
3. Click on the LON device you want to copy.

RESULT: The device is marked in dark-gray.

4. Click right mouse button and with left mouse button click on **Copy** in the context menu or press CTRL+C keys.

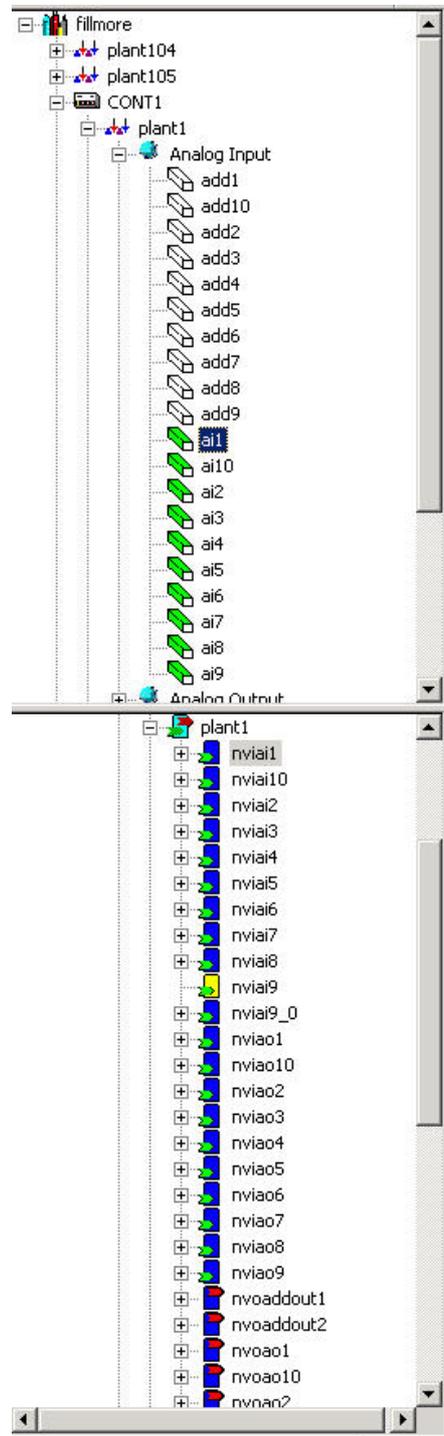
5. On any position in the terminal assignment tab, click right mouse button and with left mouse button click on **Paste** in the context menu or press CTRL+V keys.

RESULT: The LON device is copied and placed in the terminal assignment tab. Every copied device is consecutively numbered as **\_0, \_1, \_2** etc. In the network tree, the copied device is added to the same LON channel respectively to the same system/subsystem. The bindings of the copied device are copied as multicast to the existing NVs of the source device and they have the same binding properties as the source bindings.



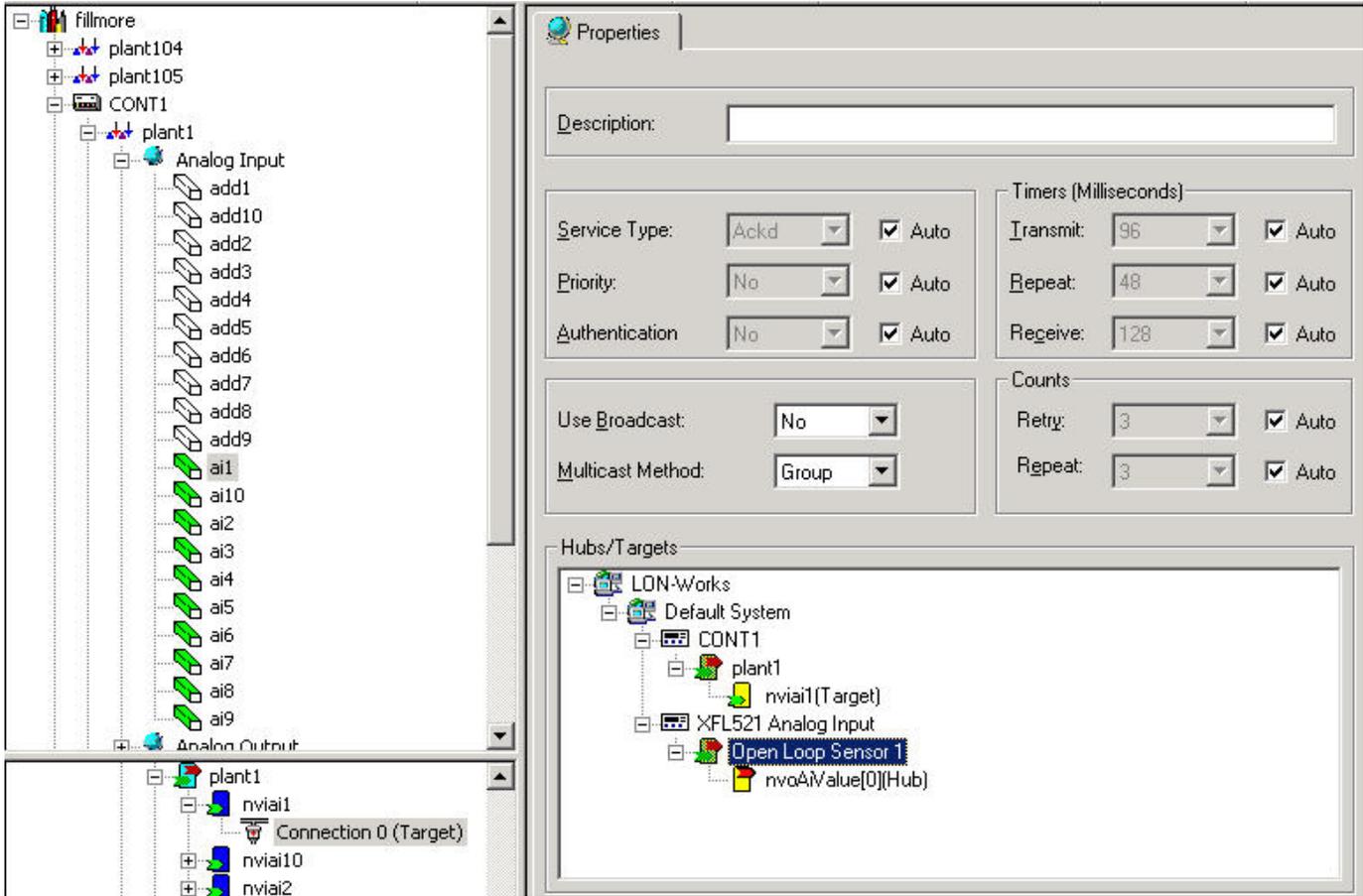
## Show associated NV of Bound Datapoint

- Purpose** To show the associated NV of a bound datapoint.
- Procedure**
1. In the logical plant tree, click on the datapoint.
  2. Click right mouse button and with left mouse button click Go to NV in the context menu.
- RESULT:** The network tree will be expanded and the associated NV will be marked.



3. Click on the plus symbol at the associated NV and click on the connection icon.
4. On the right pane, select the Properties tab.

RESULT: Under Hub/Target you can view the corresponding destination NVs that has caused the binding.

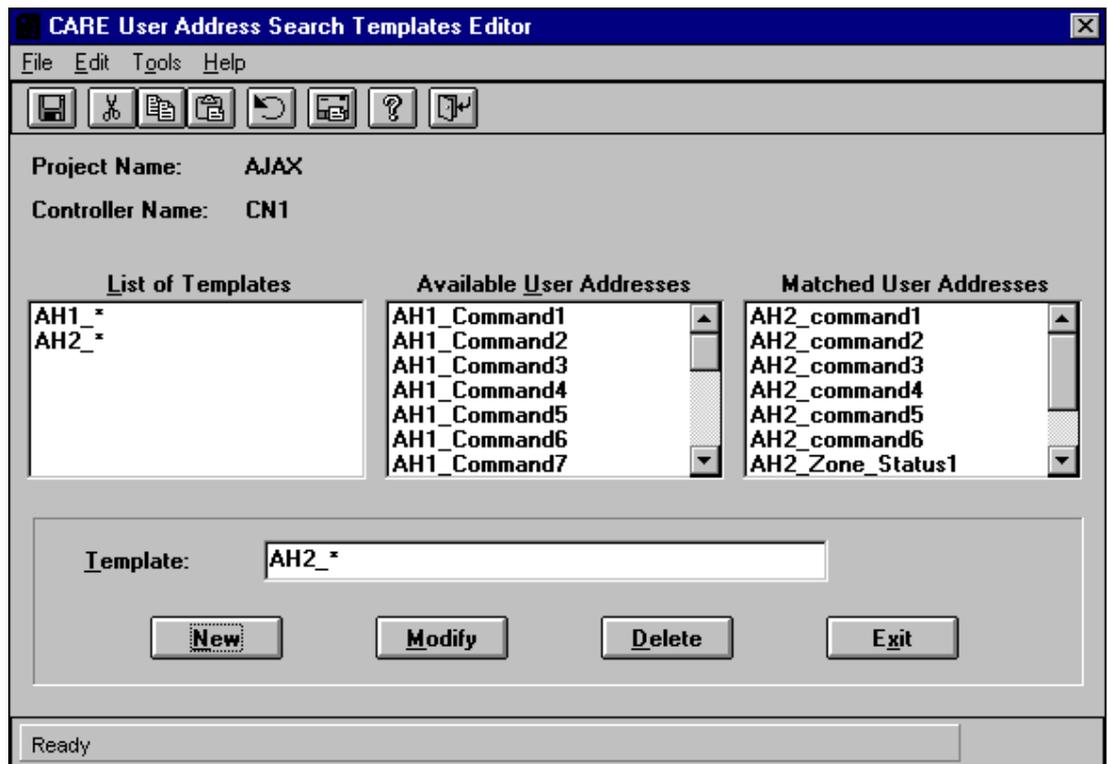


## OPERATOR TERMINAL SEARCH TEMPLATES SETUP

**Purpose** Define general search templates to enable operators using XI581/XI582 Bus-Wide Operator Interface Terminals to quickly search for a set of user addresses. See XI581AH/XI582AH Operator Terminals Operator Manual 74-3554 for details on using search templates.

- Procedure**
1. In the logical plant tree, click on the controller.
  2. Click menu Controller, then drop-down item Edit/Search Templates.

**RESULT:** The CARE User Address Search Templates Editor window displays. Example:



Initially, the List of Templates is blank. In this example, there are two entries, AH1\_\* and AH2\_\*, to show what templates look like. The selected controller, CN1, has two fan systems (plants), AH1 and AH2. User addresses have the plant name as a prefix (AH1\_, AH2\_). All user addresses in the controller display in the Available User Addresses column.

In this case, the AH2\_\* template tells the operator terminal to find all user addresses that begin with "AH2\_". The Matched User Addresses column shows what addresses fit the template.

In general, to define templates:

- a. Click a suitable address in the Available User Addresses column. The address appears in the Template box below the column.
- b. Edit the selected address so that it applies to a group of points. An asterisk, \*, is a wild card that represents any number of characters. You can also use a question mark, ?, to represent just one character. For example, the template AH?\_C\* selects all AH1 and AH2 command addresses.
- c. When the template is complete, click **New**. The new template appears in the List of Templates column.

- d. Highlight a template to display the user addresses that match it in the Matched User Addresses column. If the matched addresses are not what you want, click **Modify** to change the template until it produces the correct list.
- e. Save the template(s) by clicking the Save icon in the button bar (first icon), or clicking File, Save.

The following text describes the window in detail.

### Menu Bar

The menu bar provides the following additional functions.

File Display two drop-down menu items:

**Save** saves the newly defined templates.

**Exit** closes this windows and returns to CARE.

Edit Provide editing functions (Undo, Cut, Copy, and Paste) in the Template box to aid in editing new template names. For example, you can copy part of a template name and paste it back in the template name if you need a name with duplicate parts such as AH2\_AH2\_.

Tools Provide a Copy From Controller function to copy existing templates from another controller to this one. This function is a convenient shortcut.

Help Display two drop-down menu items:

**Contents** displays the on-line help file for this window.

**About** displays the About box for this software. The About box shows software version.

### Button Bar

The button bar provides clickable buttons for the menu bar and window functions in the following order:

Save (templates)  
 Cut (text in Template box)  
 Copy (text in Template box)  
 Paste (text in Template box)  
 Undo (text changes in Template box)  
 Copy templates from another controller  
 Display About box  
 Exit window

### Work Area

The window's work area contains the following information and fields.

Project and Controller The names of the selected Project and Controller. The templates you create are unique to these selections.

List of Templates List of all templates for the selected controller.

Available User Addresses All user addresses in the selected controller.

Matched User Addresses List of user addresses in the controller that match the highlighted template in the List of Templates.

Template Edit box for the entry of a new template name and editing.

### Command Buttons

Command buttons for the following functions:

- New Add template from the Template box to the List of Templates.
- Modify Copy selected template from the List of Templates to the Template box to edit it.
- Delete Erase the template selected in the List of Templates.
- Exit Close the window and return to CARE.

**Status Line** The status line displays messages as you move the cursor over the window and as software performs functions.

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## PLANT TRANSLATION

---

**Purpose** Convert the files for an attached plant to a form suitable for download into a controller.

**Assumptions** The schematic, control strategy, and switching logic for the plant are done. You have exited those functions and the main CARE window is on display.

Plant attachment is done.

**IMPORTANT**

*Integrated modem communication for CARE versions 1.5 and higher is only possible for total application sizes of max. 100kBytes.*

**Procedure**

1. In the logical plant tree, click on the controller.
2. Click menu item Controller, then drop-down item Translate. Or, click the Translate button.

RESULT: Software begins translation. As it translates, messages and warnings display in the dialog box.

When the translation is complete, software displays the following message at the bottom of the dialog box:

RACL generation completed successfully.

3. Check messages to verify proper translation.
4. If desired, click Start button to re-start the translation.
5. If desired, click Print button to print the translation result. The CARE Translator stores its messages in a printable file. Software names the file using the last four letters of the controller name and appending four numbers. For example, if the name of the controller is AHUCPU1, the name of the print file will be CPU10001.LST.
6. Click End button to exit the translate function.

### Translation Message Examples

The following messages are examples for the type of information the translator displays for a plant.

- 1 Loadable files
- 2 Point numbers and names (physical points, global points, pseudopoints, flex points). There can be a maximum of 383 points in a controller (128 physical and 253 pseudo + EXECUTING\_STOPPED, SHUTDOWN, STARTUP). Pseudopoints and Flags in the Control Strategy chapter describes the permissible number of pseudopoints.
- 3 Flags and formula names (from the mathematical editor). Formula names and flags are not included in the 381 + 3 internal point maximum per controller.
- 4 Control loops
- 5 Switching tables
- 6 Calculated execution times, including modules, control loops, switching tables, and total execution time.

NOTE: CARE sets execution time depending on controller type and analog input card type. If the controller is an Excel 600 and all analog input cards are "fast", CARE calculates the optimum cycle time. However, all analog input points must be defined as "fast". If any points are defined as "slow", CARE calculates cycle time as if the controller is an Excel 500. This cycle time could be six to eight times slower.

- 7 Excel code size (in bytes)
- 8 File sizes (parameter, Z-register, and T-register)
- 9 Excel program size
- 10 Total application size
- 11 Data point description size

<b>Controller Download</b>	See the Upload/Download procedures in the File Management chapter of this manual for details.
<b>Switching Tables Warning</b>	The warning "Several switching tables for user address" may appear during a plant translation. It means that more than one switching table commands the same point. This situation is very common with analog points and sometimes with digital points. It could be a problem if you have inadvertently created two switching tables commanding the same point to do opposite actions. You may want to check your tables.
<b>Integrated Modem Communication Warning</b>	<p>When the total application size is bigger than 100 Kbytes, integrated modem communication is not possible, which is shown by a message of the same name:</p> <p>This concerns the CARE version 1.5 and higher ones.</p>
<b>NV Warning and Translation Abortion</b>	Due to restrictions in LNS, CARE can only handle NVs of which names do not exceed 21 characters. Any NV of which name exceeds 21 characters will abort the translation. All such NVs are listed and must be reworked in the NV Editor to allow the translation of the LON application.

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## FILE MANAGEMENT

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**Chapter Contents** This chapter includes the following procedures.

### Back Up Functions

CARE Database (including projects, plants and device library)  
Projects (including plants)

### Restore Functions

CARE Database (including plants and device library)  
Projects (including plants)

### Import/Export the Element Library

### Controller Loading

Upload/Download Controllers  
Program EPROM

### Delete Projects, Plants, and/or Controllers

### Import Controller Files (to copy operator changes made to controller files)

## Backups / Restores

The CARE database contains files that pertain to all projects and plants as well as files that pertain to individual projects and plants.

When you back up the CARE database, software copies all necessary files for current projects and plants in CARE and creates a single file named CARExxxx.DB where xxxx is a sequencing number to allow more than one database backup to exist in a directory.

When you back up a project, software copies all the files relevant to just that project and creates a backup file with an extension of .PJT.

**NOTE:** It is recommended to backup the database, or at least the project after any CARE session to avoid the loss of work.

For backups and restores in CARE the following files can be purposefully included/excluded from the backup and restore process

- Pic files (segment graphics in the plant schematics)
- Default files
- Controller files
- XFMs
- Element library

By default the files necessary for the respective backup will be included. By default all files which were backed up will be automatically included in the respective restore.

## Restoring old Backups

When backing up databases, projects, or plants in CARE versions lower than 3.01.00, the above-mentioned files were not backed up automatically.

If any of these files are missing or different to the corresponding files of CARE 3.01.00 it may become necessary to copy it separately into the respective folders under the CARE directory to complete the restore process and get the desired results.

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## Back Up the CARE Database

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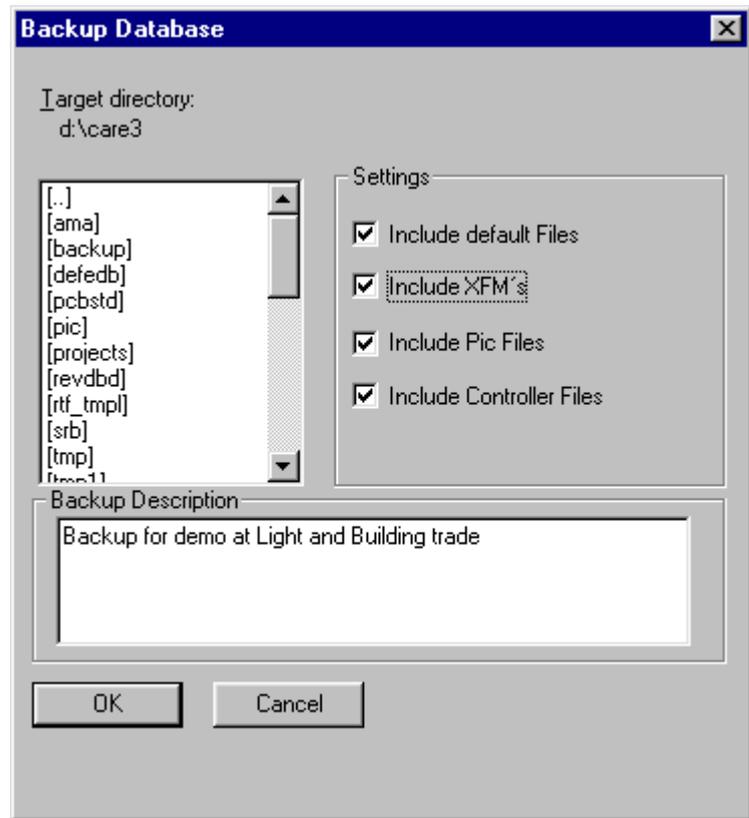
### Purpose

Copy CARE database files in case they are needed to replace corrupted database files. When you back up the CARE database, software copies all necessary files for current projects and plants in CARE and creates a single file named CARExxxx.DB

where xxxx is a sequencing number to allow more than one database backup to exist in a directory.

- Procedure** 1. Click menu item Database, then drop-down item Backup.

**RESULT:** The Backup Database dialog box displays. The Target directory is the drive and directory that will receive copies of the files.



2. To select a different directory, use Windows™ techniques.

**RESULT:** The Target directory shows the desired drive and directory name.

3. Under Settings, by default all files to be included in the database backup are checked. If desired, uncheck files you want to be excluded from the database backup.

**NOTE:** It is recommended to include all files.

4. Under Backup Description, enter additional information about the database you want to backup, if desired.

5. Click **OK** to initiate backup.

**RESULT:** A Backup window displays with percentage (or number of records) completed as well as an **Abort** button in case you want to stop the process. When the backup is complete, the message box disappears and the main CARE window redisplay.

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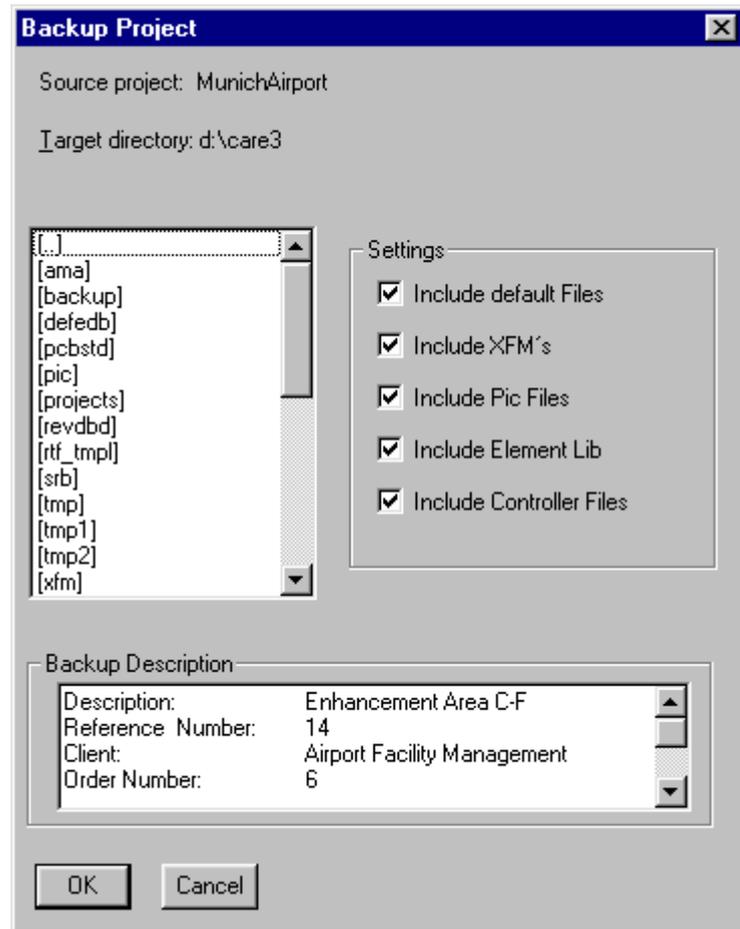
## Back Up a Project

---

**Purpose** Copy project files to a backup directory or diskette. Keeping a "good" copy of project files is useful if the project is changed incorrectly or if the files become corrupt. Use the Restore a Project procedure to retrieve these files when required.

- Procedure** 1. Click menu item Project, then drop-down item Backup.

RESULT: The Backup Project dialog box displays with the name of the currently selected project (Source project). The Target directory is the drive and directory that will receive copies of the files.



- To select a different directory, use Windows™ techniques.

RESULT: The Target directory shows the desired drive and directory name.

- Under Settings, by default all files to be included in the project backup are checked. If desired, uncheck files you want to be excluded from the project backup.

NOTE: It is recommended to include all files.

- Under Backup Description, the project information is shown. If desired, enter additional information about the project you want to backup.
- Click **OK** to initiate backup.

RESULT: A Backup window displays with percentage (or number of records) completed as well as an **Abort** button in case you want to stop the process. When the backup is complete, the message box disappears and the main CARE window redisplay.

### Naming Convention

Backup software uses the project name to create a file name with the first five characters of the project name, a sequencing number, and an extension of PJT. Examples:

Project Name	Backup File Name
STD1	STD1001.PJT
HONEYWELL	HONEY003.PJT

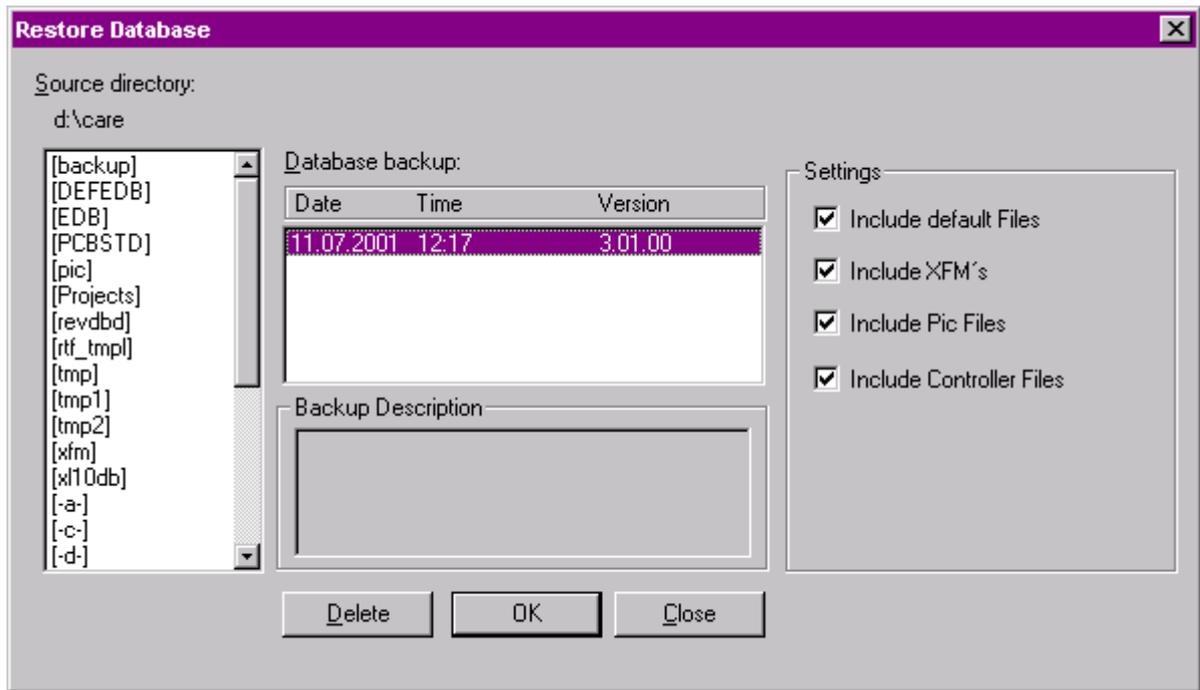
Each time you back up a project, software increments the numbers in the file name, for example, the first backup for the STD1 project is STD1001.PJT; the next backup is STD1002.PJT; the next, STD1003.PJT, etc. Each file is a different version of the same project.

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## Restore the CARE Database

---

<b>Purpose</b>	Replace CARE database files with the backup copies made with the Back Up the CARE Database procedure.										
<b>Restoring old Backups</b>	<p>If you restore a CARE database that was backed up with CARE software prior to Version 1.4.1, CARE first does a complete database backup before the restore operation is attempted. This action is done so that in case of a restore failure or user abort, the database can be restored to its state before the restore was attempted.</p> <p>If there is a restore failure or user abort, restore software initiates a new restore from the automatic backup. A message displays that a restore of the backup file is occurring.</p> <p>If there is a catastrophic failure (PC is turned off or an application generates a General Protection Fault error and only Windows™ or DOS is active), the restore will not have time to retrieve the backup. In that case, restart CARE and first do a restore of the backup since the CARE database may be corrupt. To restore the backup, use the standard restore procedure described in this section and navigate to the CARE\TEMP directory. That directory holds the automatic backup that restore originally did.</p> <p>Restores of backups done with software Version 1.4.1. or later are also protected but with a different, more efficient mechanism.</p> <p>When backing up databases in CARE versions lower than 3.01.00, the following files were not backed up automatically:</p> <ul style="list-style-type: none"> <li>• Element library</li> <li>• Pic files (segment graphics in the plant schematics)</li> <li>• Default files</li> <li>• Controller files</li> <li>• XFMs</li> </ul> <p>If any of these files are missing or different to the corresponding files of the CARE version 3.01.00 or higher it may become necessary to copy it separately into the respective folders under the CARE directory to complete the restore process and get the desired results.</p> <p><b>Directories</b></p> <table border="0" style="margin-left: 20px;"> <tr> <td>Pic files</td> <td>&lt;drive:&gt;\care\pic</td> </tr> <tr> <td>Default files</td> <td>&lt;drive:&gt;\care\pcbstd</td> </tr> <tr> <td>Xfms</td> <td>&lt;drive:&gt;\care\xfm\original</td> </tr> <tr> <td>Controller files</td> <td>&lt;drive:&gt;\care\&lt;project name&gt;</td> </tr> <tr> <td>Element library</td> <td>If the import of an element library of previous version is necessary it must be done via the Import Element library menu item. Please refer to the Import Element Library section.</td> </tr> </table>	Pic files	<drive:>\care\pic	Default files	<drive:>\care\pcbstd	Xfms	<drive:>\care\xfm\original	Controller files	<drive:>\care\<project name>	Element library	If the import of an element library of previous version is necessary it must be done via the Import Element library menu item. Please refer to the Import Element Library section.
Pic files	<drive:>\care\pic										
Default files	<drive:>\care\pcbstd										
Xfms	<drive:>\care\xfm\original										
Controller files	<drive:>\care\<project name>										
Element library	If the import of an element library of previous version is necessary it must be done via the Import Element library menu item. Please refer to the Import Element Library section.										
<b>Restoring CARE Backups of Ver. 3.01.00 and higher</b>	Since CARE Ver. 3.01.00 it is up to you to include/exclude certain files such as the element library, pic files (segment graphics in the plant schematics), default files, XFMs, and controller files for the backup process. Any file that was backed up will be automatically restored unless you exclude it.										
<b>Procedure</b>	<p>1. Click menu item Database, then drop-down item Restore.</p> <p><b>RESULT:</b> The Restore Database dialog box displays with a default Source directory (where the backup CARE database files are) and a list of available backup files (date, time, version number) in the source directory.</p>										



- To select a different Source directory (to access other backup files), use Windows™ techniques.

RESULT: The Source directory shows the desired drive and directory name. The Database backup field shows the date, time, and version of the backup files you want.

- Click the date, time, and version line of the backup that you want to copy.
- Under Settings, all files which were backed up are checked by default. If desired, uncheck files you want to be excluded from the database restore (not applicable for old backups done in CARE versions lower than 3.01.00).

NOTE: It is recommended to include all files.

- Click **OK** to initiate restore.

RESULT: A Restore window displays with percentage (or number of records) completed as well as an **Abort** button. The Abort button is gray (disabled) because once the database restore begins, no recovery to the original database contents is possible (unless the original database was backed up before the restore was attempted).

When the restore is complete, the message box disappears and the main CARE window redisplay.

**Delete Button** You can also delete a backup file by selecting it and clicking the **Delete** button.

---

## Restore a Project

**Purpose** Retrieve a copy of a project to place it in the PC. This procedure is useful if the PC files are corrupt or if changes were made that need to be erased.

**Cannot Replace Current Project Files**

Software does not restore a project to a directory if there are already project files with the same name in the directory. Either delete the project that already exists or, to get another copy of that project, change the name of the Target project in the Restore Project dialog box (see Procedure).

**Restoring old Backups**

If you restore a project that was backed up with CARE software prior to Version 1.4.1, CARE first does a complete database backup before the restore operation is attempted. This action is done so that in case of a restore failure or user abort, the database can be restored to its state before the restore was attempted.

If there is a restore failure or user abort, restore software initiates a new restore from the automatic backup. A message displays that a restore of the backup file is occurring.

If there is a catastrophic failure (PC is turned off or an application generates a General Protection Fault error and only Windows™ or DOS is active), the restore will not have time to retrieve the backup. In that case, restart CARE and first do a restore of the backup since the CARE database may be corrupt. To restore the backup, use the standard restore procedure described in this section and navigate to the CARE\TEMP directory. That directory holds the automatic backup that restore originally did.

Restores of backups done with software Version 1.4.1. or later are also protected but with a different, more efficient mechanism.

When backing up projects in CARE versions lower than 3.01.00, the following files were not backed up automatically:

- Element library
- Pic files (segment graphics in the plant schematics)
- Default files
- Controller files
- XFMs

If any of these files are missing or different to the corresponding files of CARE version 3.01.00 or higher it may become necessary to copy it separately into the respective folders under the CARE directory to complete the restore process and get the desired results.

**Directories**

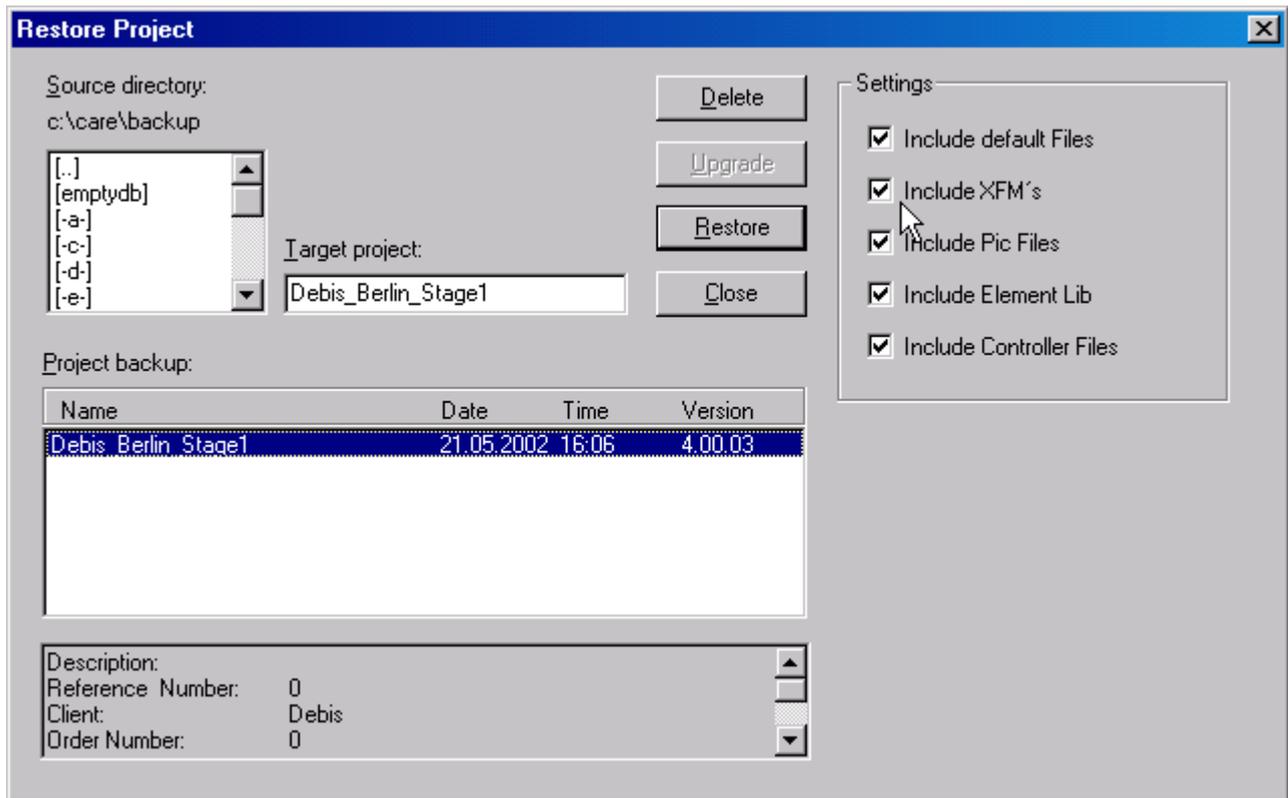
Pic files	<drive:>\care\pic
Default files	<drive:>\care\pcbstd
Xfms	<drive:>\care\xfm\original
Controller files	<drive:>\care\<project name>
Element library	If the import of an element library of previous version is necessary it must be done via the Import Element library menu

**Procedure**

1. Click menu item Project, then drop-down item Restore.

**RESULT:** The Restore Project dialog box displays with a default Source directory and a list of project backup files in that directory.

## Project backed up in CARE 4.00.03



- To select a different Source directory (to access different project backup files), use Windows™ techniques.

RESULT: The Source directory shows the desired drive and directory name. The Project backup field shows the date, time, and version of the backup files you want.

- Click name of project that you wish to use as source.

RESULT: Software writes the name in the Target project field.

- To change the name of the resulting project, type a new name in the Target project field.

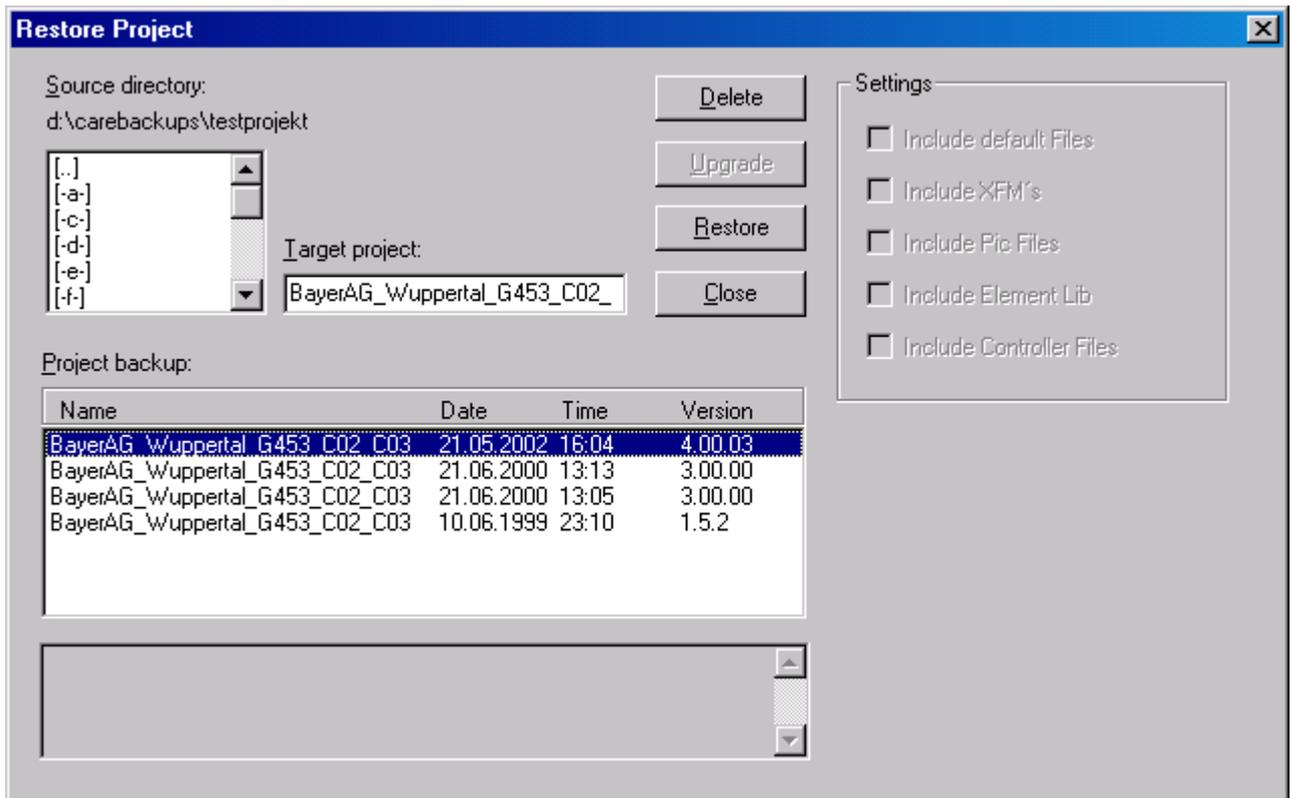
- Select the desired project backup file.

RESULT: If the backup file is Version 3.01 or lower the **Upgrade** button becomes active and the **Restore** button becomes inactive.

- If the **Upgrade** button is active, click it to convert the lower version file to the current CARE version, in this example to version 4.00.03.

RESULT: Software adds a converted backup file of version 4.00.03 to the list in the Project backup field.

## Old Project backed up in CARE 1.5.2 and upgraded to 4.00.03



- Under Settings, all files which were backed up are checked by default. If desired, uncheck files you want to be excluded from the project restore (not applicable for old backups done in previous CARE versions).

NOTE: It is recommended to include all files.

- Click **Restore** to initiate restore.

RESULT: A Restore window displays with percentage (or number of records) completed as well as an **Abort** button in case you want to stop the process. When the restore is complete, the dialog box redisplay in case you want to do more restores.

If a message displays that there is missing element information and the restore fails, you need to import the missing elements from the CARE database where the project originated. See the Import the Element Library section for details.

NOTE: If the project is already in the directory, software displays a message that it already exists. Click **OK** to close the message box and return to the Project restore dialog box.

- Click **Close** to remove the Project restore dialog box and return to the CARE main window.

## Export the Element Library

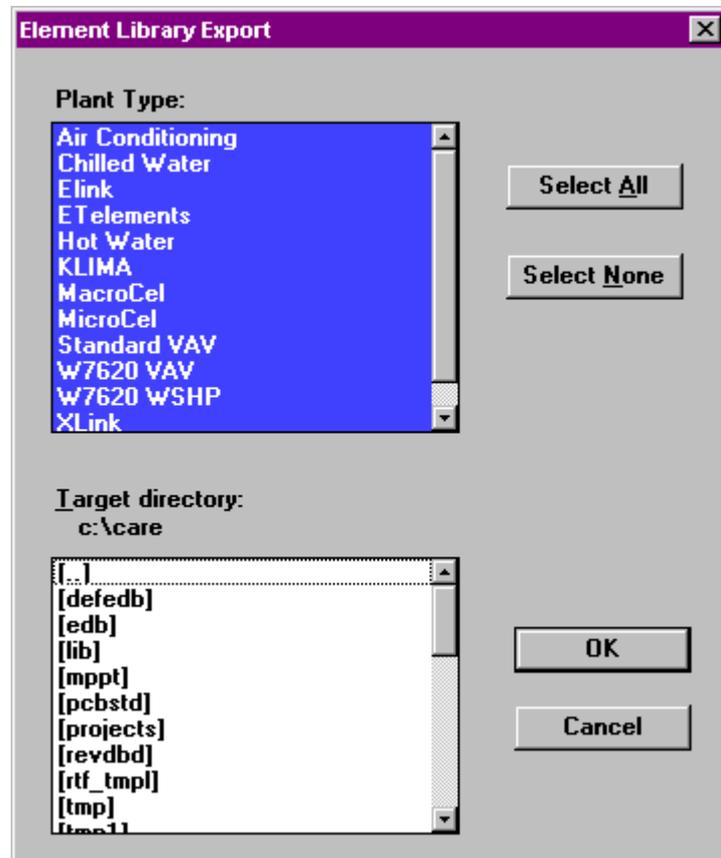
**Purpose** Output element records from the CARE database for use in other CARE databases.

"Elements" are source records for the segments that are available for each type of plant. For example, an air conditioning plant can have fan, sensor, and damper segments. The fan segment can include return and supply air fans in single and multiple configurations.

CARE Element Editor software (a separate software package) provides functions to modify elements and/or create new elements. You use this Export function to create a backup file of element records that can be copied to other CARE databases. See the Import the Element Library section for details.

- Procedure** 1. Click menu item Database, then drop-down items Export, Element Library.

**RESULT:** The Element Library Export dialog box displays. The Target directory is the drive and directory that will receive copies of the files. The dialog box example shows c:\care.



2. In the Plant Type list all plant types are selected. Click on plant types you do not want to export. Use Select All and Select None buttons to select/deselect desired plant types.
3. Typically, you export to a diskette so you can transport the elements to another CARE database on another PC. To select a different drive and directory, use Windows™ techniques.

**RESULT:** The Target directory shows the desired drive and directory name.

4. Click **OK** to initiate export.

**RESULT:** An Export window displays with percentage (or number of records) completed as well as an **Abort** button in case you want to stop the process. When the export is complete, the message box disappears and the main CARE window redisplay.

---

## Import the Element Library

- Purpose** Read an Element Library file that was exported from a CARE database to obtain new element records and place them in another CARE database for use in the Schematic function..

"Elements" are source records for the segments that are available for each type of plant. For example, an air conditioning plant can have fan, sensor, and damper segments. The fan segment can include return and supply air fans in single and multiple configurations.

CARE Element Editor software (a separate software package) provides functions to modify elements and/or create new elements. If you want to copy the new elements you create to other CARE databases, you can use this Import function to merge new elements from the modified CARE database with element records in another CARE database.

### Import Process

The Import process only copies backup elements that are new to the target database. It does not copy backup elements that are already in the target database, but are changed in the backup. The rules for considering an element "new" to a database are:

1. If any of the following fields in a backup element are different from those for any element in the target database:
  - a. Plant type
  - b. Main group name or group name
  - c. Element name
  - d. PIC file name
  - e. Width of element
  - f. Text that displays in the segment menu
  - g. Next-group name (that is, the drop-down if the element has one)
  - h. CARE type and user address for each default point in the element
2. If plant type is missing, software assumes it to be a new plant type and creates it in the target database.
3. If main group name or group name is missing (within a plant type), software assumes the group to be new and creates it in the target database.
4. If element name is missing (within a group and plant type), software assumes it to be a new element and creates it in the target database along with all its default point information.

If plant type, group name, and element name match but any of the other criteria fail to match, software creates a new element under the same plant type and group. Software assigns a new name to this element by prefixing the old name with an x\_. The new element includes the same default point information as the backup element.

If the above criteria match exactly, software does NOT write the element to the target database.

For example, if a backup element only has a different engineering unit from a target database element, software will NOT overwrite the target database element.

### Restore Failures

CARE project and plant restores can fail because the backup file may not contain all the necessary element information. CARE project and plant backups only contain element information to restore element connection at restore time. If you try to restore a project or plant to a CARE database that does not contain the appropriate elements, the restore fails. This situation may occur if you were trying to share a project or plant backup with another user who does not have an up-to-date Element Library.

To enable a successful restore, perform the following steps:

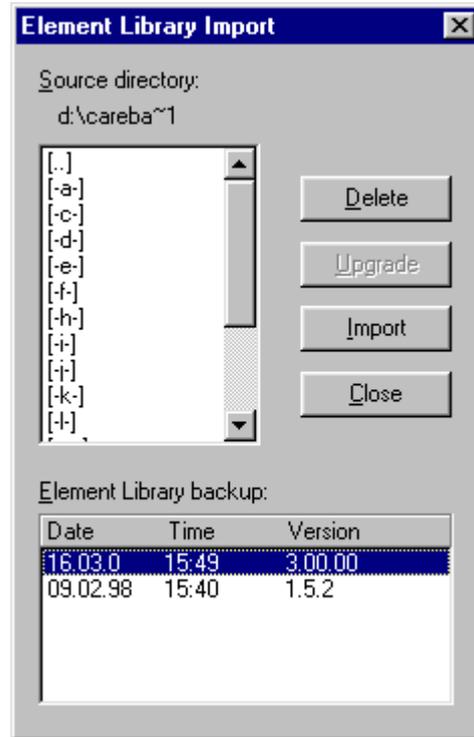
1. Export the Element Library from the CARE database where the original project or plant resided. Export to a diskette. The next section, Export the Element Library, explains this process.
2. Import the Element Library to the target database from the export diskette generated in Step 1. Use the following procedure.

### Procedure

1. Insert the diskette that contains the exported Element Library into a PC drive.

- Click menu item Database, then drop-down items Import, Element Library.

RESULT: The Element Library Import dialog box displays with a default Source directory (usually, the CARE directory) and a list of available backup files (date, time, version number) in the Source directory.



- To select a different Source directory, in this case, the diskette, click the drive name where you inserted the diskette. Use other Windows™ techniques as necessary to display the appropriate Source directory and Element Library backup data.

RESULT: The Source directory shows the desired drive and directory name. The Database backup box shows the date, time, and version of the backup files you want.

- If the source files were created with CARE 2.02 or a lower version, click **Upgrade** to convert the files to the current CARE version, in this case to version 3.00.00.

RESULT: Two backup sets display in the dialog box, one for the lower CARE version and one for 3.00.00.

- Click the date, time, and version line of the backup that you want to copy.

- Click **Import** to initiate import.

RESULT: An Import window displays with percentage (or number of records) completed as well as an **Abort** button in case you want to stop the process. Software first decompresses the backup files (0-100%), then does the restore (0-100%). When the import is complete, the message box disappears and the main CARE window redisplay.

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## Upload/Download Controllers

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**Purpose** Copy files to and from controllers.

In case there are problems with a download, you should first back up the CARE database, or at least the relevant projects and plants, so you can restore them if necessary.

**Requirements** Plant translation must be done.

If you are updating controller files in the CARE database based on uploaded files from a controller, see the Import Controller Files procedure later in this section.

---

## Physically Connect to Controller

**Purpose** Physically connect controller to Personal Computer (PC).

**Requirements** The PC must be within 49 ft. (15m) of the controller. At greater distances (up to 3281 ft. [1000m]), you must add a line driver.

Use a XW585 Connection Cable.

- Procedure**
1. Insert plug on the XW585 connection cable into the socket on the front of the controller computer module.
  2. Insert the other plug on the XW585 connection cable to the serial interface socket on the back of the PC (COM 1 or COM 2).
  3. Power on the PC.
  4. Start CARE as described in the Start CARE section.

---

## Download Controller

**NOTE:** Make sure that the controller number in CARE and in the MMI is the same. If they are different, set them equal either in CARE or in the MMI or by "Set controller no." command (see Set Controller Number section). For operating instructions of the MMI refer to the XI581/2 Operator Terminal Manual.

**Purpose** Copy translated files to a C-Bus or LON controller (step 2 of commissioning procedure).

- Procedure**
1. Physically connect to controller as described in the Connect to Controller section.
  2. Click menu item Controller, then drop-down item Tools and XL Online.

**RESULT:** The XL Online main window displays. Software tries to connect to the port according to the settings defined in the XL Online dialog box (see Define Port Settings section).

If no controller is connected to the port or software cannot connect to the controller due to wrong port settings, the XI 581/2 MMI is gray and the status message No connection is displayed.

If the connection is completed and no application is running, the MMI is blue and blank. If an application is running, the MMI is blue and the initial text is shown.

3. If "no connection" is displayed in the status line, connect the controller to the port as follows:

- Click menu item File, then drop-down item Connection.

Or, click on the Change serial port settings icon  on the button bar.

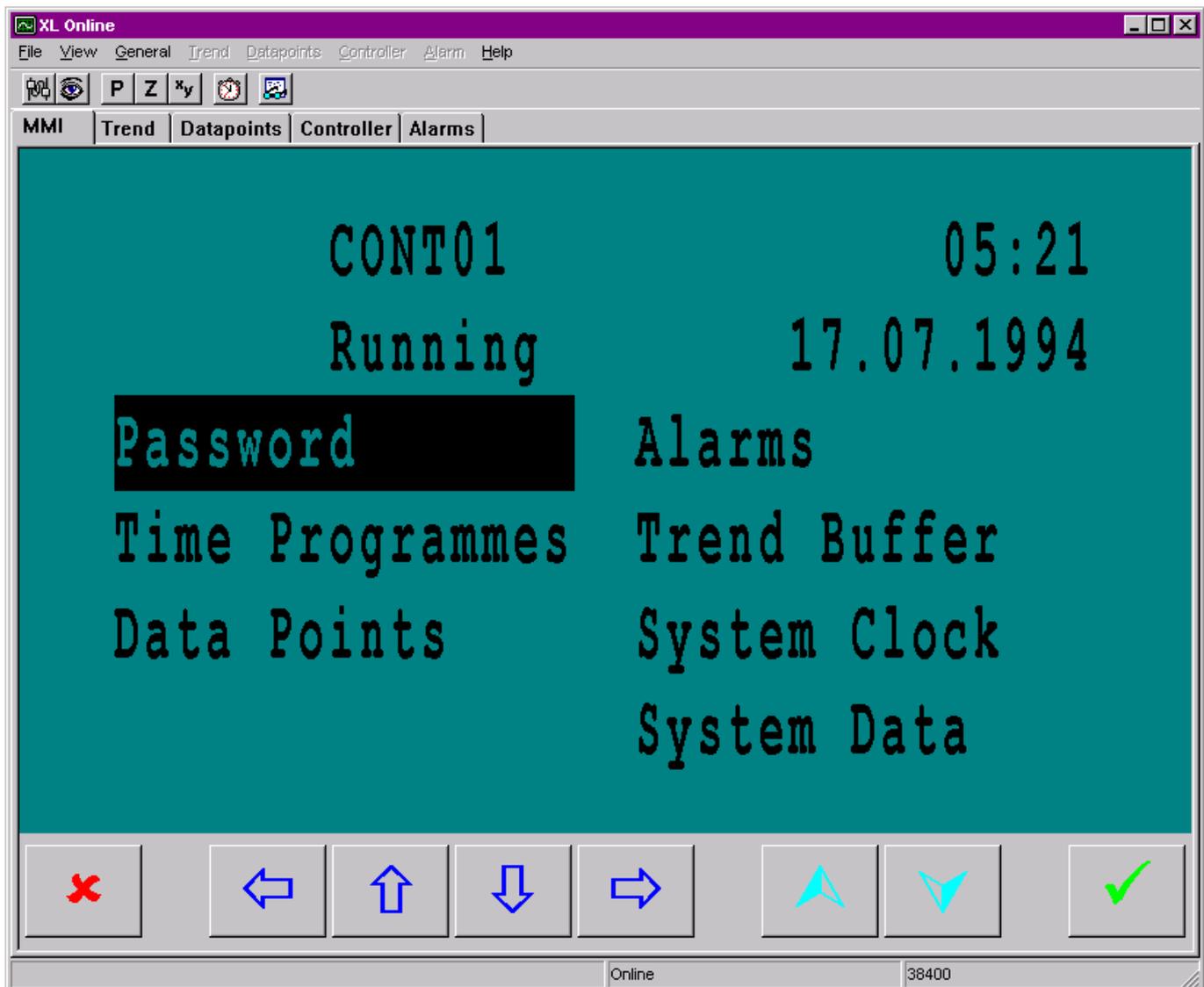
RESULT: The Connect dialog box displays.

- Select the serial port and the baudrate by clicking the corresponding radio buttons. Select Auto detect, if you do not know the baudrate (default setting).

- Click the Connect button.

RESULT: If the connection could not be completed, the status report is displayed with the message that CARE is unable to establish the connection.

If the connection could be completed, the MMI is invoked in blue and the initial text is shown, if an application is running. If no application is running the MMI is blank.

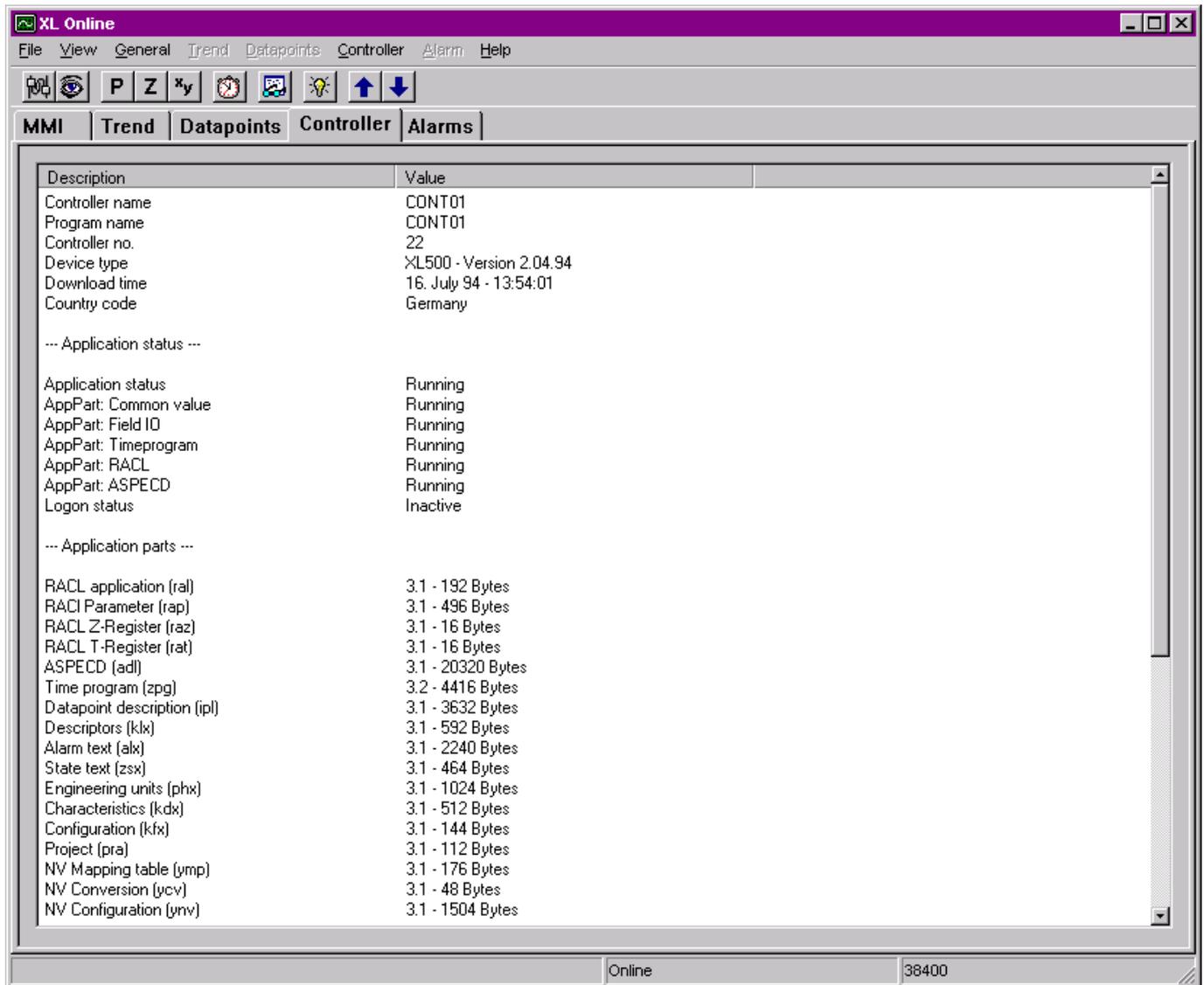


- If no application is running, reset the controller by pressing the Reset button at the controller.

- Make sure that the controller number in CARE and in the MMI is the same. If they are different, set them equal either in CARE or in the MMI. For operating instructions of the MMI refer to the XI581/2 Operator Terminal Manual.

9. Click the Controller tab.

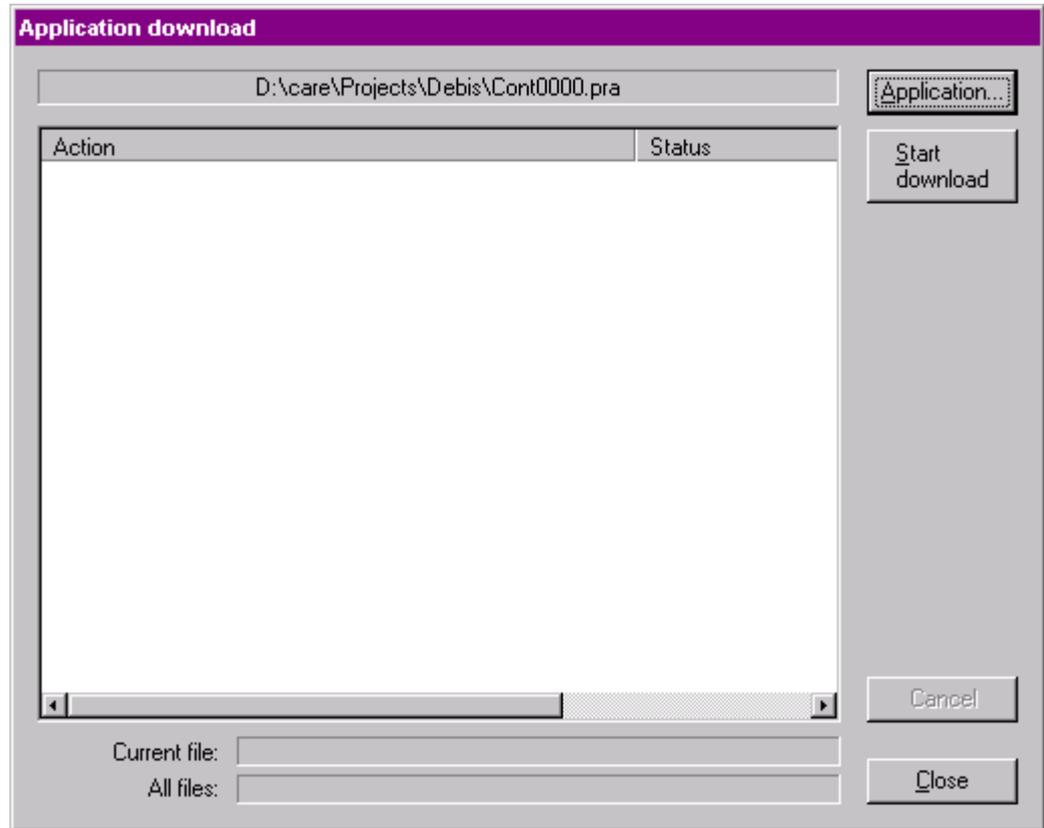
RESULT: Controller status information is listed.



10. Check the information.

11. Click menu item controller, then drop-down item Download or, click on Download to Controller icon  on the toolbar.

RESULT: The Application download dialog box displays.

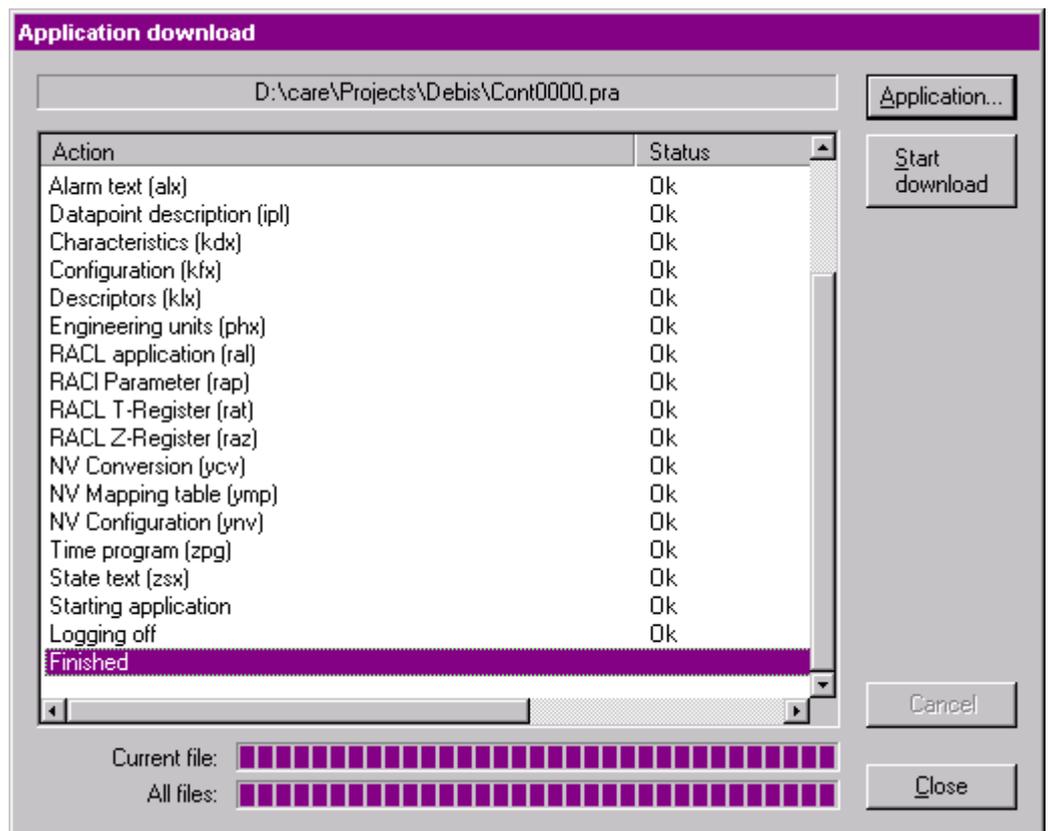
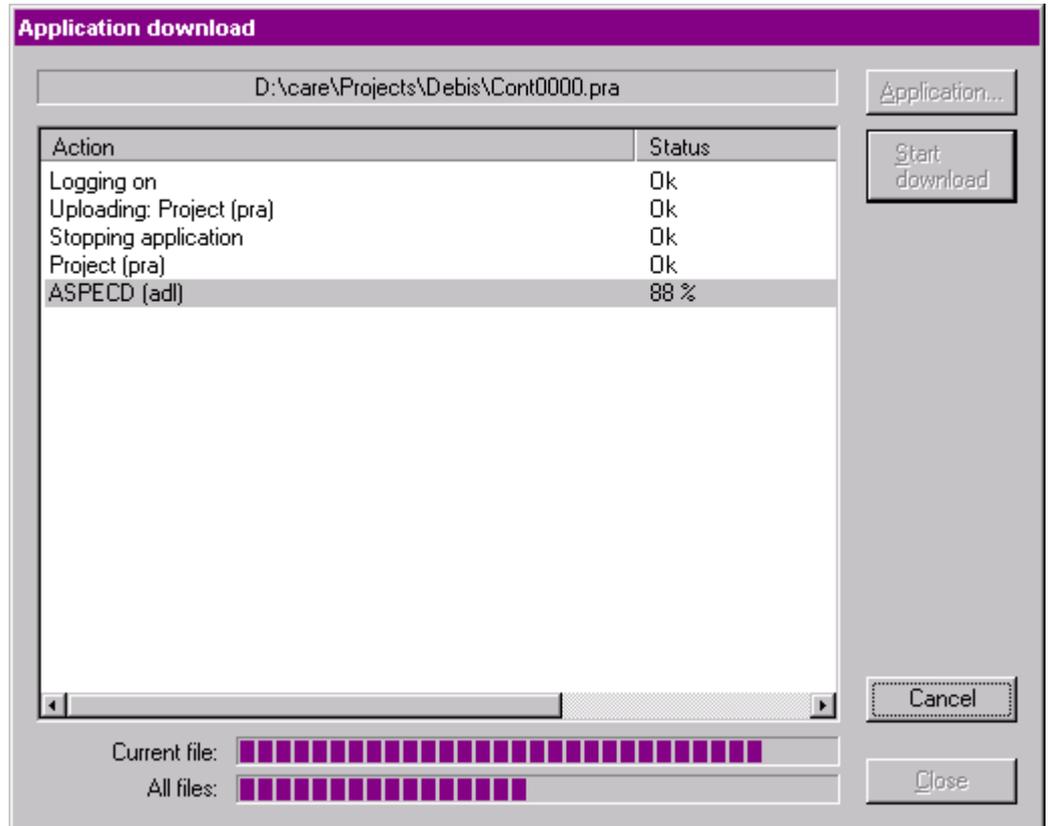


**RESULT:** On the top, the path of the previously downloaded application is displayed.

12. If you want to download a new application, click Application button and select the desired application (.pra file).
13. Click Start download button if you want to download the previously downloaded application or the new application.

**RESULT:** Depending on the kind of application you want to download, different messages can appear (see What kind of Application to Download section).

The download starts. Action and status messages will be listed while the download proceeds.



14. Click the Close button when the download is finished.

RESULT: Eventually alarms are generated as indicated by the flashing alarm icon on the Alarms tab.

15. Click the Alarms tab, check the messages and perform appropriate troubleshooting procedures if necessary.

### What Kind of Application to Download?

When using controller OS 2.06 for binding LON devices, the bindings will be kept when downloading an application with a changed LON network interface.

When using controller OS lower than 2.06 in combination with a separate LON tool for creating the bindings, different messages will occur when downloading a changed interface. In the XL Online tool, it is possible to enable/disable the display of the corresponding warning messages generally.

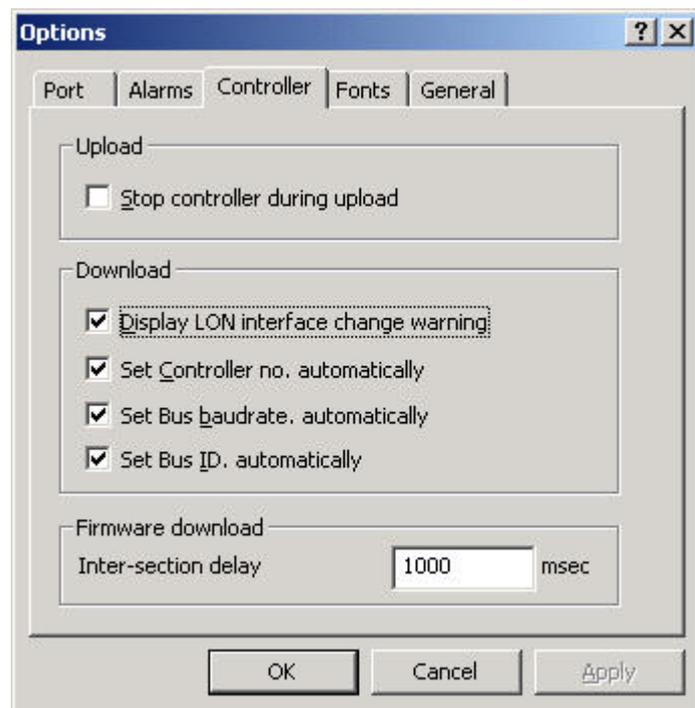
#### Enable/Disable LON Interface Change Warning

In the XL Online Tool, click menu item File, then drop-down item Options to open the XL Online Options dialog box

Click Controller tab.

Check the Display LON interface change warning check box if you want to get the warning messages in case a changed LON network interface will be downloaded. Enabling the option is recommended when using controller OS lower than 2.06 and bindings might be deleted.

Uncheck the Display LON interface change warning check box if warning messages should not be displayed when downloading a changed LON network interface. Disabling the option is recommended when using controller OS 2.06 where any bindings will be kept even if the LON interface has been changed.



**LON Interface Change Warning Enabled** As CARE allows the creation of LON applications, it has to be considered, whether the application you want to download is a LON application having a LON network interface or whether it is a “normal” application without a LON network interface. CARE allows the partial download of a LON application, where changes had been made to the CARE application itself, with keeping an unchanged LON network interface.

**IMPORTANT**

*It is of high importance to know what kind of application you want to download and what kind of application is currently running in the controller, since CARE allows the choice of keeping or eliminating the bindings.*

*Although CARE compares the controller application and the application to be downloaded regarding the LON network interface, you should also know, whether the LON network interface and/or the CARE application had been changed or not.*

The following table summarizes the different possibilities when downloading normal applications and LON applications:

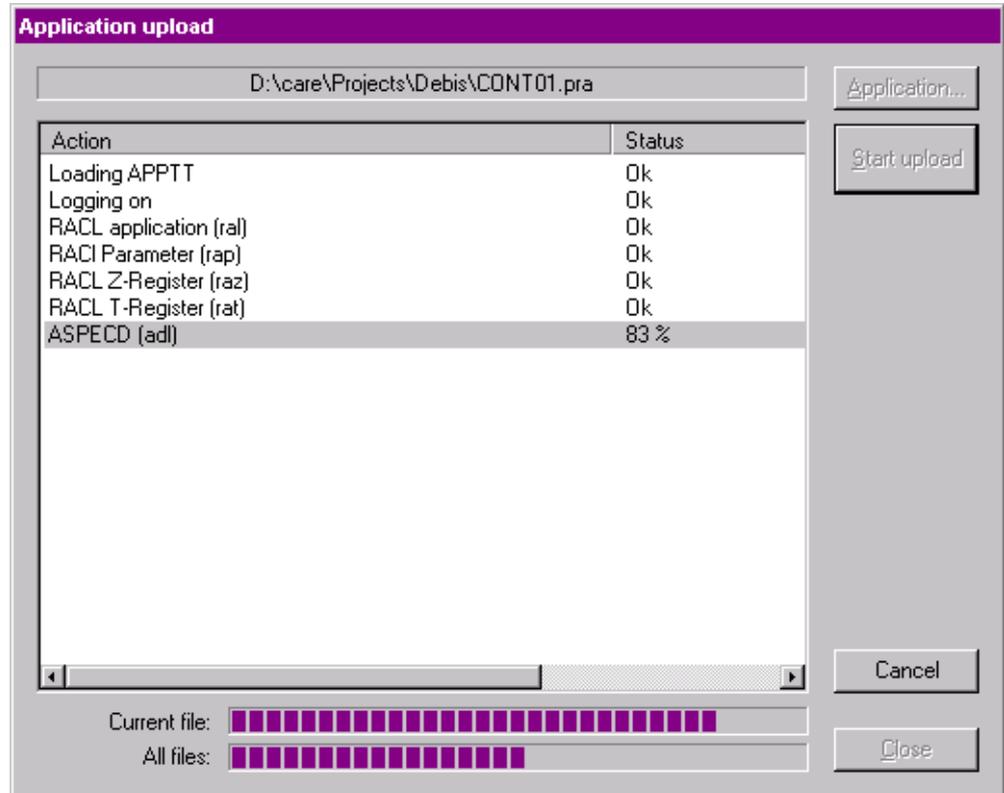
Download of Normal Application without LON Network Interface	
Controller	CARE
No application in controller	Download without response
Normal application in controller	Download without response
LON application in controller	Download with response asking: <i>The LON interface of this application has changed. If you download now, your existing bindings will get lost.</i> When confirming with OK, the bindings will get lost and need to be re-done with a LON tool. The (modified) CARE application will be downloaded. When canceling the download, the bindings will be kept and the CARE application will not be downloaded.
Download of LON Application	
Controller	CARE
No application in controller	Download without response
Normal application in controller	Download without response
LON application in controller	Download with response. Message depends on, whether the network interface was changed or not. <b>If Network interface had been changed:</b> <i>The LON interface of this application has changed. If you download now, your existing bindings will get lost.</i> When confirming with OK, the bindings will get lost. The (modified) CARE application will be downloaded. When canceling the download the bindings will be kept. The CARE application will not be downloaded. <b>If LON interface had not been changed:</b> <i>Do you want to keep existing NV bindings. If you select NO, then all bindings will get lost.</i> When confirming with OK, the bindings will be kept. The (modified) CARE application will be downloaded (partial download). When confirming with NO, the bindings will get lost and need to be re-done with a LON tool. The (modified) CARE application will be downloaded. When canceling the download the bindings will be kept. The CARE application will not be downloaded.

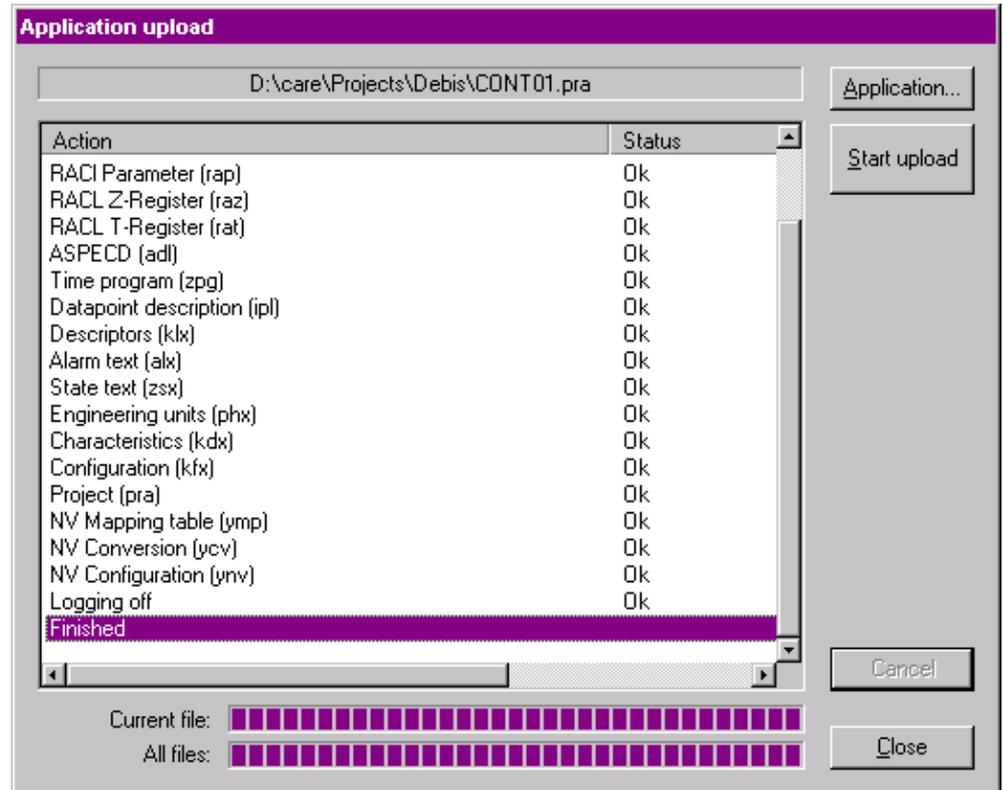
**Upload Controller**

1. If not already connected to the controller, follow steps 1 to 10 of the Download Controller procedure.

2. Click menu item controller, then drop-down item Upload or,  
click on Upload from Controller icon  on the toolbar.

RESULT: The upload starts. Action and status messages will be listed while the upload proceeds.





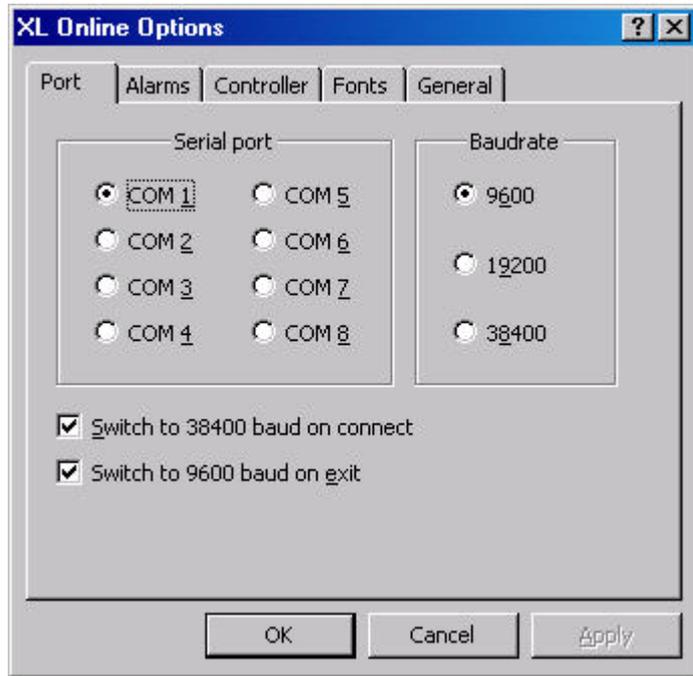
3. Click the Close button to finish the Upload.

### Define Port Settings

**Purpose** Define default settings for the port and baudrate the XL Online tool should use when starting it. After the start, XL Online searches automatically for the port and the baudrate defined in this dialog box. If the port configuration matches, the MMI displays. If the port configuration is different, the MMI remains gray and displays the status "No connection" in the status line.

**Procedure** 1. Click menu item File, then drop-down item Options.

**RESULT:** The XL Online Options dialog box is displayed.



2. Under Serial port and Baudrate, select desired port respectively baudrate which software should use as default connection settings.
3. To increase the download/upload speed after the connection has been completed, check the Switch to 38400 baud on connect check box, to increase the baudrate to 38400 baud.

NOTE: For a correct data transmission at higher baudrates than 9600 baud, the controller OS must be 2.04 or higher.

4. Check the Switch to 9600 baud on exit check box, to reset the baudrate to 9600 baud if the baudrate had been set to higher values, either under the Baudrate area and/or by the Switch to 38400 baud on connect option.

NOTE: If the controller supports a baudrate of 38400 baud, it is recommended to check both, the Switch to 38400 baud on connect and the Switch to 9600 baud on exit option.

5. Click OK to confirm settings.

NOTE: If the a correct data transmission at higher baudrates than 9600 baud, the controller OS must be 2.04 or higher.

**Detect Baudrate**

**Purpose** Scan for baudrate of the port where the controller is connected to. This function can be used if the connection to the controller is completed after XL Online has been started, but the baudrate does not match.

**Procedure** 1. Click menu item File, then drop-down item Detect Baudrate.

or,

click on Detect Baudrate for current serial port icon  on the toolbar.

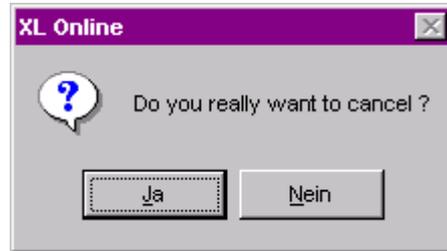
**RESULT:** Software scans for baudrates and autodetects the baudrate that matches to the baudrate of the controller.

Cancel Up- / Download

**Purpose** To correctly finish the up- or download, if for example, the communication was interrupted during the process or, if you want to definitely cancel the up- or download.

**Procedure** 1. In the Download application or Upload application dialog box, click the Cancel button.

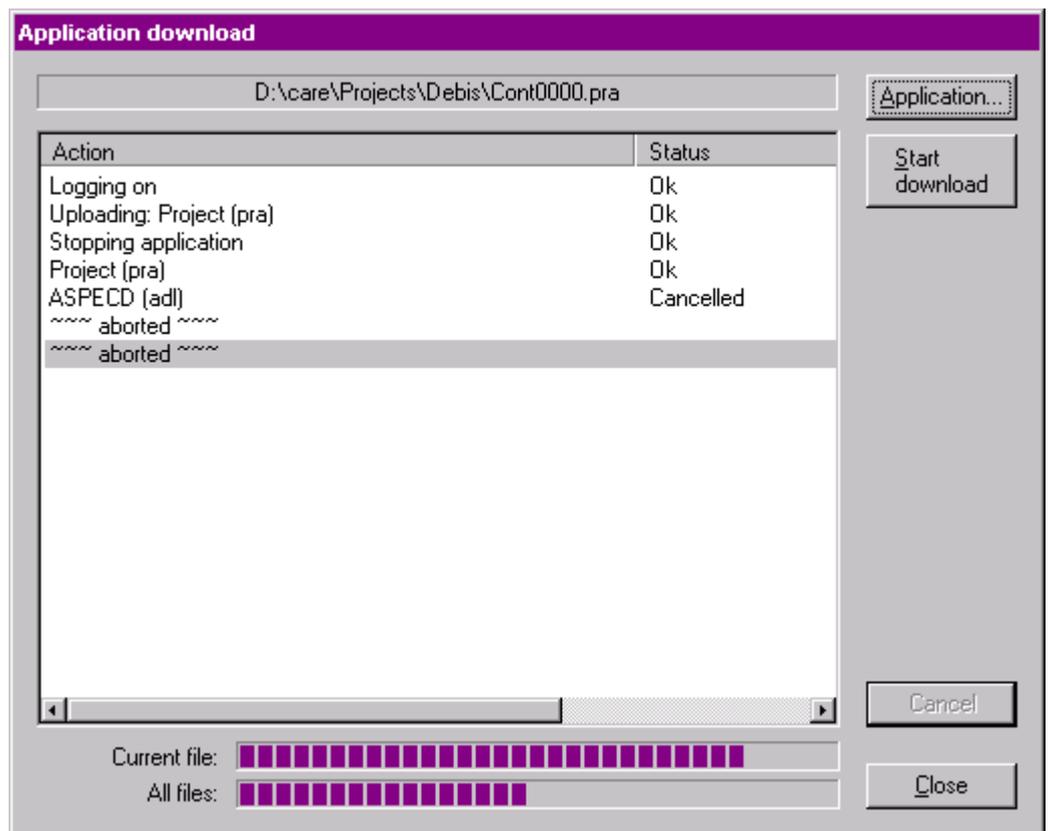
**RESULT:** A message is displayed asking, if you really want to cancel the up- or download.



**RESULT:** The current up- or download process is cancelled.

2. Click Yes to cancel.

**RESULT:** The current up- or download process is cancelled.



Exit XL Online

**Procedure** 1. Click menu item File then drop-down item Exit, or click on default Windows Close icon on the top right corner.

**RESULT:** XL Online is closed.

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## Program EPROM

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<b>Purpose</b>	Burn Excel 20 Controller files into EPROM chips.
<b>Procedure</b>	Refer to Excel 20 System Engineering 74-2060 for EPROM burning details.

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## Import Controller Files

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**Purpose** Update controller files in the CARE database based on uploaded files from a controller. Or, you can just create a report of the differences between the controller files and the CARE database files for the controller. Operators on Excel Building Supervisor (XBS) operator terminals can change point, parameter, and Time Program data in controller data files. You can use this Import function to copy those changes into the original CARE database for the controller. If you subsequently need to reload the controller from CARE, the reload will include the operator changes. See Appendix: Point Attributes Tables for information about the types of point information that are available to the import function.

**Parameter Mismatches** Parameter mismatches occur if outdated controller files are imported. If the controller files in the CARE database have been changed and/or retranslated but not downloaded to the controller, a mismatch of parameters could occur after an import of the uploaded, out-of-date controller files. The Translation procedure can change the file number and index number of a plant parameter, so that CARE would no longer have the correct mapping of parameters to switching tables and control loops and could put the parameters in the wrong place.

Verify that the controller files are the current translation of the CARE controller files before uploading and importing them.

**RACL Parameter Imports** CARE 7.01 imports all editable (on-line and off-line) point attributes and Time Programs. It can also import the Recursive Algorithmic Control Language ("RACL") parameters in certain circumstances. RACL parameters are used to generate the RACL control programs that run in a controller. The RACL parameters are NOT imported if the control strategies and switching tables for the controller are not available in the target CARE database, for example, if the controller was originally engineered in or restored from a different CARE database from where you are currently importing it. Details follow.

**CARE can import** the RACL parameters if you are importing controllers (Ver. 1.1 and 1.2 OS) that were engineered with CARE 1.3.x or 1.4.x into the same CARE database (upgraded to 7.01) where they were engineered or restored.

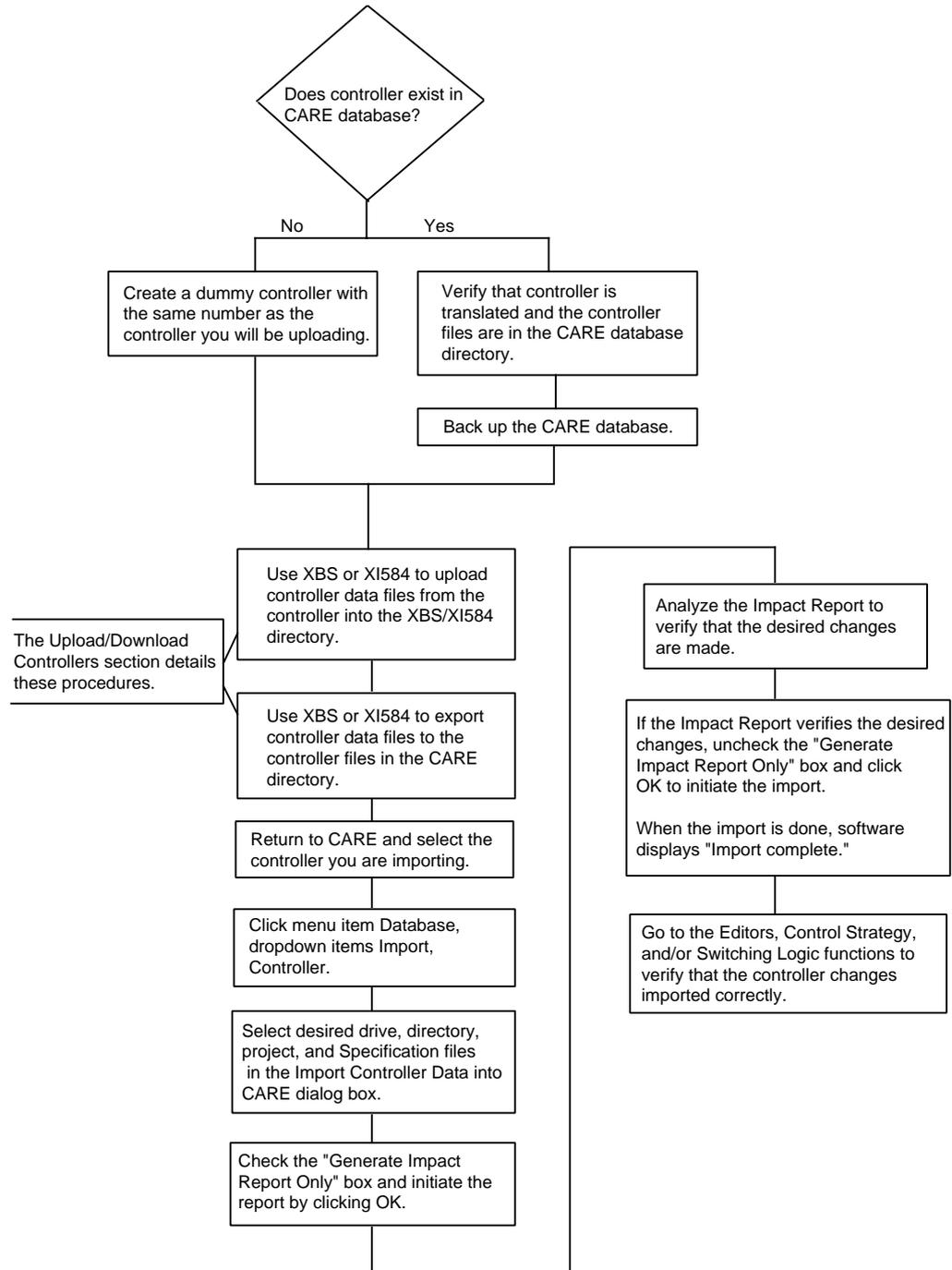
After the import, when you translate the imported controllers, CARE creates Ver. 1.2 OS controllers just as it does for non-imported controllers. CARE supports upward compatibility (Ver. 1.1 controllers become Ver 1.2) but not downward compatibility (cannot create Ver. 1.1 controllers).

Note that CARE does not "reverse engineer" control strategies and switching tables from generated RACL programs (equivalent to trying to generate source code from compiled C code). Reverse engineering is not necessary as long as the control strategies and switching tables are still in the database. All CARE functions are available for controllers imported to their original database.

**CARE cannot import** the RACL parameters if you are importing controllers into a different CARE database from the one where they were engineered or restored. To be able to import RACL parameters, CARE must have the control strategies and switching tables from which they are generated. Since the controllers were originated elsewhere, the control strategies and switching tables are not available in the database.

The only CARE functions available for this kind of imported controller are the Editors, Documentation, and Translation only of the point files (IPL generation The Schematic, Control Strategy, Switching Table, and Translation of RACL parameters (RACL generation) functions are not possible.

**Procedure Flowchart**

**Procedure**

1. If you are importing a controller that does NOT exist in the CARE database, use the New Controller dialog box to create a dummy controller in the CARE database before uploading (in the next step). The dummy controller must have the same number as the controller you are uploading. This dummy controller is the one that will receive the imported files. If you create a dummy controller *after* uploading, CARE will delete and overwrite the uploaded controller application files when it creates the dummy controller.

If you are importing a controller that DOES exist in the CARE database, make sure that you have translated the controller and that the controller files for the controller that you want to import are in the CARE directory. As a precaution, back up the CARE database (see Back Up the CARE Database section).

2. Use XBS to upload controller data files from the controller into the XBS directory. See the CARE Upload/Download Controllers procedure (earlier in this section) for procedure details for this step and the next step.

RESULT: Application files for the uploaded controller are available in the drive and directory you selected.

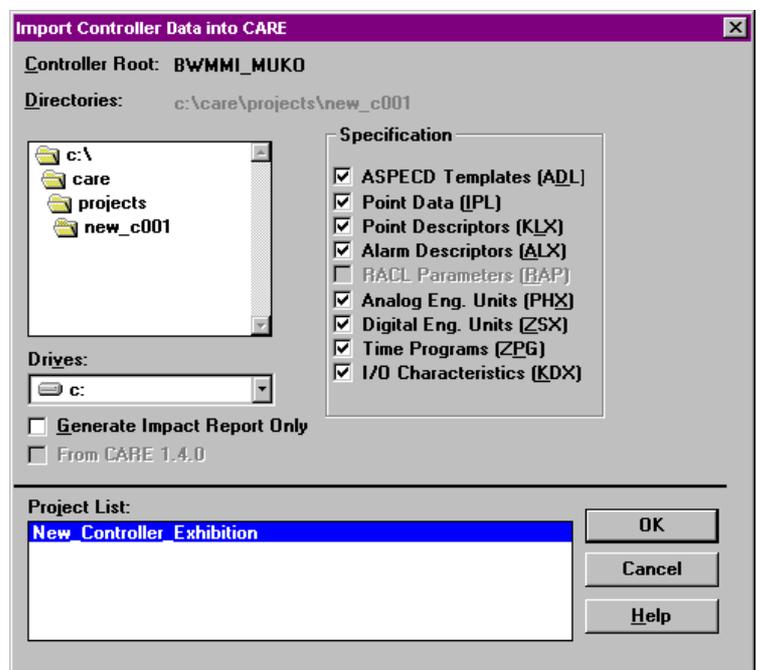
3. Use XBS to export controller data files to the controller files in the CARE directory. When the CARE Export dialog box is on the screen and the path is set to the CARE directory, your project should be listed in the Sites box. Select the desired project and controller and click **Export**.
4. Return to CARE. Select the controller you are importing:
  - a. Click menu item Database, then drop-down item Select to display the Select dialog box. Or, click the Select button in the button bar below the menu bar.
  - b. Click desired controller name (or controller icon), then click **OK**.

RESULT: The Enter Project Password dialog box displays. Enter password and click **OK**.

A window displays with controller name in the title.

5. Click menu item Database, then drop-down items Import, Controller.

RESULT: The Import Controller Data into CARE dialog box displays.



The Controller Root that displays is the name of the currently selected controller (Step B). This name should be the destination controller. The Project List box should include the associated project name.

6. Select the directory and drive that have the desired uploaded controller files. The directory defaults to the CARE database directory, usually, c:\care (specified in the CARE.INI file).

To select a different directory, use one of the following techniques:

- Click a drive letter, for example, [-a-], to show the directories in that drive. Click desired directory. If you want a subdirectory that is within a directory, double-click directory name. For example, if the [care] directory has a subdirectory called [backup], double-click the word [care]. Then click [backup] directory to select it.

- Click a directory name, for example, **[care]**. If you want a subdirectory that is within a directory, double-click directory name. For example, if the **[care]** directory has a subdirectory called **[backup]**, double-click the word **[care]**. Then click **[backup]** directory to select it.

If you want to display a previous list of directories and drives, use the scroll bar to find an item that is just two periods, **[..]**. Double-click the periods. The list now shows the next level up of directories.

7. In the Specification box, click the types of files that you want to copy/check.
8. If you want to only create an impact report and NOT copy the files, click the check box next to Generate Impact Report Only. The Impact Report summarizes the differences between the CARE database files and the uploaded controller files. See the Impact Report Example note for sample reports.

YOU SHOULD ALWAYS RUN AND ANALYZE AN IMPACT REPORT BEFORE DOING AN IMPORT.

9. Click **OK** to initiate comparison and copy (or impact report only, if checked).

RESULT: Software copies the files and generates an impact report, or just generates the impact report, as selected. The impact report is a text file (extension is .RPT).

When the import is done, an information box displays stating "Import complete".

10. Click **OK** to close the message box. Then, click **Close** to close the Import Controller dialog box.

Go to the Editors, Control Strategy, and/or Switching Logic functions to verify that the changes in the controller were imported correctly into the CARE database.

Impact Report Examples

Import Controller Impact Report

Date: 7-7-98  
 Project: Honeywell Center  
 Controller: Third\_Floor  
 Imported Controller File: CNTRL03

Point Data (.IPL) Report

Point Name: Outside Air Temperature  
 Technical Address: 1-3-1  
 Point Type : Analog Input

<u>Data Field</u>	<u>Originally</u>	<u>Updated to</u>
Descriptor	Room 301 point 10	Room 302 point 10
Engineering Units	Degree F	Percent
Operating Mode	Manual	Automatic
Suppress Alarm	Enabled	Disabled
Alarm Text	Shut Down System	Call For Help
Alarm Delay	1	2
High Alarm Limit	100	90
High Warning Limit	95	85
Low Warning Limit	40	50
Low Alarm Limit	30	40

User Address: Damper Setpoint  
 Technical Address: 1-4-1  
 Point Type : Analog Output

<u>Data Field</u>	<u>Originally</u>	<u>Updated to</u>
Descriptor	Room 101 point 10	Room 102 point 10
Engineering Units	Degree F	Percent
Operating Mode	Manual	Automatic
Suppress Alarm	Enabled	Disabled
Close to Open Time	0700	0600
Open to Close Time	1700	1800

Point Name: Calculated BTU  
 Technical Address: 30,1,1,11,1  
 Point Type : Pseudo Analog

<u>Data Field</u>	<u>Originally</u>	<u>Updated to</u>
Descriptor	Total Energy Used	Electrical Consumption
Engineering Units	KB btu * 1000	BTU
Operating Mode	Manual	Automatic
Suppress Alarm	Enabled	Disabled
Alarm Text	Adjust Chiller	Call For Supervisor
High Alarm Limit	100.0	90.1
High Warning Limit	95.0	85.2
Low Warning Limit	40.0	50.3
Low Alarm Limit	30.0	40.4

Point Descriptor (.KLX) Report

Index: 5

Imported Controller: Room 301 point 10

Care Database: Room 302 point 10

Index: 9

Imported Controller: Room 301 point 40

Care Database: Room 301 point 30

Index: 22

Imported Controller: Penthouse AHU

Care Database: Floor 3 AHU

Time Program (.ZPG) Report

Time Program: Morning Start\_Up.....deleted

Time Program: Night Shut Down.....added

Time Program: Penthouse Weekly program changed

Time Program: First Floor Daily Program: Weekday.....deleted

Time Program: Second Floor Daily Program: Saturday.....added

Time Program: Third Floor Daily Program: Sunday.....changed

RACL Parameter (.TXT) Report

**Project** Honeywell Inc. Arlington  
 Heights  
**Plant** Tech Center  
**Control Strategy Loop** test

Location	Symbol Type	Parameter Description	Value Controller (.RAP)	Parameter File	Parameter Index
1,1	PID	Input Parameter 2 ( W )	50.000	1	3
		Proportional band ( Xp )	3.000	1	4
		Integral action time ( Tn )	1000.000	1	5
		Minimum output	0.000	1	6
		Maximum output	100.000	1	7

**Project** Honeywell Inc. Arlington  
 Heights  
**Plant** Tech Center  
**Switching Logic Tables** RaFanLo

Description	User Address	Value Controller (.RAP)	Parameter File	Parameter Index
Command Value		1.000	2	7
Command Delay		720.000	2	6
User Address Value	ZnDmpr1	12.000	2	3
User Address Value	DaRh	12.000	2	4
Internal Use		0.000	2	5

**Project** Honeywell Inc. Arlington  
 Heights  
**Plant** Tech Center  
**Switching Logic Tables** HumidLvl1

Description	User Address	Value Controller (.RAP)	Parameter File	Parameter Index
Command Value		0.000	3	31
User Address Value	DaRh	0.000	3	3
Command Value		10.000	3	30
User Address Value	DaRh	0.000	3	4
User Address Value	RhtVlv	0.000	3	5
Command Value		20.000	3	29
Command Delay		12.000	3	13
User Address Value	HxEaTemp	10.000	3	7
User Address Hysteresis	HxEaTemp	2.000	3	6
User Address Value	HxOaBypDmpr	10.000	3	9
User Address Hysteresis	HxOaBypDmpr	1.000	3	8
User Address Value	HrVlv	0.000	3	11
User Address Hysteresis	HrVlv	121.000	3	10
User Address Value	ElecHeat	2.000	3	12
Command Value		30.000	3	28
Column 1 Delay		30.000	3	14
User Address Value	HxEaTemp	0.000	3	16
User Address Value	HumidVlv2	22.000	3	18
User Address Hysteresis	HumidVlv2	1.000	3	17
User Address Value	DaRh	23.000	3	20
User Address Hysteresis	DaRh	2.000	3	19
User Address Value	CigVlv	44.000	3	21
User Address Delay	HiTempLim	12.000	3	22
Command Value		40.000	3	27
User Address Value	HumidVlv1	0.000	3	23
User Address Value	RhtVlv	0.000	3	24
User Address Value	HxEaTemp	0.000	3	25
User Address Value	HotDkStatic	0.000	3	26
Internal Use		30.000	3	15

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## APPENDIX A: CONTROL ICONS

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<b>Purpose</b>	Control icons provide preprogrammed functions and algorithms to implement sequences of control in a plant schematic. Control icon symbols list in the left-hand column of the control strategy window.
<b>Celsius vs. Fahrenheit</b>	Some control icons use metric units, for example, Celsius instead of Fahrenheit for temperatures. If you want to use English units, you must convert any English inputs to metric units before input to a control icon or switching logic. Use the MAT editor to perform the conversion.  If the icons in a control loop use consistent engineering units for all inputs and outputs, it is not necessary to perform a conversion.
<b>Control Icon Manual</b>	For a complete description of each control icon as well as application examples, see Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe).
<b>Table Organization</b>	The following table alphabetically summarizes the icons included in this chapter with their function names, symbols, and short descriptions. Function name is usually the same as the icon name. One exception is 2PT, which is functionally Digital Switch.

## APPENDIX B: ENGINEERING UNITS

**Purpose** This chapter lists engineering units available in the system for points and pseudopoints. There are two types: analog and digital.

## Analog

Index Number	Eng. Unit	Decimal Places	Example Dec. Pl.	Description
1		0	x	BLANK
2	° C	0	x	Celsius (no decimal)
3	° C	1	x.x	Celsius (one decimal)
4	° C	2	x.xx	Celsius (two decimal)
5	° C	3	x.xxx	Celsius (three decimal)
6	K	0	x	Kelvin (no decimal)
7	K	1	x.x	Kelvin (one decimal)
8	K	2	x.xx	Kelvin (two decimal)
9	K	3	x.xxx	Kelvin (three decimal)
10	Deg	0	x	degrees Fahrenheit (no decimal)
11	Deg	1	x.x	degrees Fahrenheit (one decimal)
12	Deg	2	x.xx	degrees Fahrenheit (two decimal)
13	Deg	3	x.xxx	degrees Fahrenheit (three decimal)
14	Inw	0	x	inches of water column (no decimal)
15	Inw	1	x.x	inches of water column (one decimal)
16	Inw	2	x.xx	inches of water column (two decimal)
17	Inw	3	x.xxx	inches of water column (three decimal)
18	GPM	0	x	Gallons per minute (no decimal)
19	GPM	1	x.x	Gallons per minute (one decimal)
20	CFM	0	x	Cubic feet per minute (no decimal)
21	CFM	1	x.x	Cubic feet per minute (one decimal)
22	KFM	0	x	1000 cubic feet per minute (no decimal)
23	KFM	1	x.x	1000 cubic feet per minute (one decimal)
24	KFM	2	x.xx	1000 cubic feet per minute (two decimal)
25	FPM	0	x	Feet per minute (no decimal)
26	FPM	1	x.x	Feet per minute (one decimal)
27	Hr	0	x	Hours (no decimal)
28	Hr	1	x.x	Hours (one decimal)
29	Min	0	x	Minutes (no decimal)
30	Min	1	x.x	Minutes (one decimal)
31	Sec	0	x	Seconds (no decimal)

32	Day	0	x	Day (no decimal)
33	Day	1	x.x	Day (one decimal)
34	Cnt	0	x	Count (no decimal)
35	kW	0	x	Kilowatt (no decimal)
36	kW	1	x.x	Kilowatt (one decimal)
37	kW	2	x.xx	Kilowatt (two decimal)
38	kW	3	x.xxx	Kilowatt (three decimal)
39	MW	0	x	Megawatts (no decimal)
40	MW	1	x.x	Megawatts (one decimal)
41	MW	2	x.xx	Megawatts (two decimal)
42	MW	3	x.xxx	Megawatts (three decimal)
43	kWH	0	x	Kilowatt hours (no decimal)
44	kWH	1	x.x	Kilowatt hours (one decimal)
45	kWH	2	x.xx	Kilowatt hours (two decimal)
46	kWH	3	x.xxx	Kilowatt hours (three decimal)
47	MWH	0	x	Megawatts per hour (no decimal)
48	MWH	1	x.x	Megawatts per hour (one decimal)
49	MWH	2	x.xx	Megawatts per hour (two decimal)
50	MWH	3	x.xxx	Megawatts per hour (three decimal)
51	Pos	0	x	Position (no decimal)
52	Pos	1	x.x	Position (one decimal)
53	Pos	2	x.xx	Position (two decimal)
54	Pct	0	x	Percent (no decimal)
55	Pct	1	x.x	Percent (one decimal)
56	Pct	2	x.xx	Percent (two decimal)
57	Val	0	x	Value (no decimal)
58	Tot	0	x	Totalizer (no decimal)
59	PSI	0	x	Pounds per square inch (no decimal)
60	PSI	1	x.x	Pounds per square inch (one decimal)
61	PSI	2	x.xx	Pounds per square inch (two decimal)
62	V	0	x	Volts (no decimal)
63	V	1	x.x	Volts (one decimal)
64	V	2	x.xx	Volts (two decimal)
65	mA	0	x	Milliamperes (no decimal)
66	mA	1	x.x	Milliamperes (no decimal)
67	A	0	x	Amperes (no decimal)
68	A	1	x.x	Amperes (one decimal)
69	A	2	x.xx	Amperes (two decimal)
70	BTU	0	x	British Thermal Unit (no decimal)
71	BTU	1	x.x	British Thermal Unit (one decimal)
72	W	0	x	Watts (no decimal)
73	RH	0	x	Relative humidity (no decimal)
74	RH	1	x.x	Relative humidity (one decimal)
75	Hz	0	x	Hertz (no decimal)

76	WBF	0	x	Wet-bulb fahrenheit (no decimal)
77	WBF	1	x.x	Wet-bulb fahrenheit (one decimal)
78	Ton	0	x	Tons (no decimal)
79	Ton	1	x.x	Tons (one decimal)
80	TnH	0	x	Tons per hour (no decimal)
81	TnH	1	x.x	Tons per hour (one decimal)
82	DPT	0	x	Dew-point temperature (no decimal)
83	BPH	0	x	BTU per hour (no decimal)
84	MBH	0	x	1000 BTU per hour (no decimal)
85	PPH	0	x	Parts per hour (no decimal)
86	m/K	0	x	Meters per Kelvin
87	m/K	1	x.x	Meters per Kelvin
88	%/K	0	x	Percent per Kelvin
89	%/K	1	x.x	Percent per Kelvin
90	gkg	0	x	Gram per kilogram
91	gkg	1	x.x	Gram per kilogram
92	gkg	2	x.xx	Gram per kilogram
93	gkg	3	x.xxx	Gram per kilogram
94	Wm <sup>2</sup>	0	x	Watts per square meter
95	h_m	2	x.xx	hours and minutes
96	m_s	2	x.xx	minutes and seconds
97	GWh	0	x	Gigawatthours
98	GWh	1	x.x	Gigawatthours
99	GWh	2	x.xx	Gigawatthours
100	GWh	3	x.xxx	Gigawatthours
101	GW	0	x	Gigawatts
102	GW	1	x.x	Gigawatts
103	GW	2	x.xx	Gigawatts
104	GW	3	x.xxx	Gigawatts
105	W	0	x	Watts
106	W	1	x.x	Watts
107	W	2	x.xx	Watts
108	W	3	x.xxx	Watts
109	J	0	x	Joules
110	J	1	x.x	Joules
111	J	2	x.xx	Joules
112	J	3	x.xxx	Joules
113	KJ	0	x	Kilojoules
114	KJ	1	x.x	Kilojoules
115	KJ	2	x.xx	Kilojoules
116	KJ	3	x.xxx	Kilojoules
117	MJ	0	x	Megajoules
118	MJ	1	x.x	Megajoules
119	MJ	2	x.xx	Megajoules
120	MJ	3	x.xxx	Megajoules
121	GJ	0	x	Gigajoules
122	GJ	1	x.x	Gigajoules
123	GJ	2	x.xx	Gigajoules
124	GJ	3	x.xxx	Gigajoules

125	TJ	0	x	Terajoules
126	TJ	1	x.x	Terajoules
127	TJ	2	x.xx	Terajoules
128	TJ	3	x.xxx	Terajoules
129		0	x	
130	Pa	0	x	Pascals
131	Pa	1	x.x	Pascals
132	Pa	2	x.xx	Pascals
133	Pa	3	x.xxx	Pascals
134	kPa	0	x	KiloPascals
135	kPa	1	x.x	KiloPascals
136	kPa	2	x.xx	KiloPascals
137	kPa	3	x.xxx	KiloPascals
138	bar	0	x	Bar
139	bar	1	x.x	Bar
140	bar	2	x.xx	Bar
141	bar	3	x.xxx	Bar
142	N/m	0	x	Newtons per meter
143	N/m	1	x.x	Newtons per meter
144	N/m	2	x.xx	Newtons per meter
145	N/m	3	x.xxx	Newtons per meter
146	p	0	x	Pound
147	p	1	x.x	Pound
148	p	2	x.xx	Pound
149	p	3	x.xxx	Pound
150	kp	0	x	Kilopound
151	kp	1	x.x	Kilopound
152	kp	2	x.xx	Kilopound
153	kp	3	x.xxx	Kilopound
154	Mp	0	x	Megapound
155	Mp	1	x.x	Megapound
156	Mp	2	x.xx	Megapound
157	Mp	3	x.xxx	Megapound
158	N	1	x.x	Newtons
159	N	2	x.xx	Newtons
160	N	3	x.xxx	Newtons
161	g	0	x	Grams
162	g	1	x.x	Grams
163	g	2	x.xx	Grams
164	g	3	x.xxx	Grams
165	Kg	0	x	Kilograms
166	Kg	1	x.x	Kilograms
167	Kg	2	x.xx	Kilograms
168	Kg	3	x.xxx	Kilograms
169	t	0	x	Metric ton
170	t	1	x.x	Metric ton
171	t	2	x.xx	Metric ton
172	t	3	x.xxx	Metric ton
173	mm	0	x	Millimeters
174	cm	0	x	Centimeters
175	m	1	x.x	Meters
176	m	2	x.xx	Meters
177	m	3	x.xxx	Meters

178	km	0	x	Kilometers
179	km	1	x.x	Kilometers
180	km	2	x.xx	Kilometers
181	km	3	x.xxx	Kilometers
182	m/s	0	x	Meters per second
183	m/s	1	x.x	Meters per second
184	kmh	0	x	Kilometers per hour
185	kmh	1	x.x	Kilometers per hour
186	spG	3	x.xxx	Specific weight
187	Ent	1	x.x	Enthalpy
188	Ent	2	x.xx	Enthalpy
189	Ent	3	x.xxx	Enthalpy
190	SpW	2	x.xx	Specific heat
191	W1z	3	x.xxx	Heat number
192	m <sup>2</sup>	3	x.xxx	Square meters
193	m <sup>3</sup>	0	x	Cubic meters
194	m <sup>3</sup>	1	x.x	Cubic meters
195	m <sup>3</sup> h	0	x	Cubic meters per hour
196	m <sup>3</sup> h	1	x.x	Cubic meters per hour
197	m <sup>3</sup> s	0	x	Cubic meters per second
198	m <sup>3</sup> s	1	x.x	Cubic meters per second
199		0	x	Blank
!200	Hr	0	x	Hours (no decimal)
!201	Min	0	x	Minutes (no decimal)
!202	Sec	0	x	Seconds (no decimal)
!203	Pct	0	x	Percent (no decimal)
!204	K/K	1	x.x	Kelvin per Kelvin
!205	K/K	2	x.xx	Kelvin per Kelvin
!206	K/K	3	x.xxx	Kelvin per Kelvin
!207	kHz	1	x.x	Kilohertz
!208	kHz	2	x.xx	Kilohertz
!209	kHz	3	x.xxx	Kilohertz
210	kVa	1	x.x	Kilo Voltamperes
211	kVa	2	x.xx	Kilo Voltamperes
212	kVa	3	x.xxx	Kilo Voltamperes
213	VA	0	x	Voltamperes
214	VA	1	x.x	Voltamperes
215	VAR	0	x	
216	VAR	1	x.x	
217	kV	0	x	Kilovolts
218	kV	1	x.x	Kilovolts
219		0	x	
220	con	0	x	Constant
221	con	1	x.x	Constant
222	con	2	x.xx	Constant
223	con	3	x.xxx	Constant

224		0	x	
225	I/O	0	x	Input/Output
226	klx	0	x	Kilolux
227	klx	1	x.x	Kilolux
228	k/h	0	x	Kelvin per hour
229	k/h	1	x.x	Kelvin per hour
230	l	0	x	Blank
231	l	1	x.x	Blank
232	l	2	x.xx	Blank
233	l	3	x.xxx	Blank
234	l	0	x	Blank

<b>Index Number</b>	<b>Active Status Text</b>	<b>Passive Status Text</b>
1	Normal	Alarm
2	Night	Day
3	Disable	Enable
4	Heating	Cooling
5	Local	Remote
6	Manual	Auto
7	Unoccupied	Occupied
8	Off	On
9	Open	Close
10	Winter	Summer
11	Slow	Fast
12	Low	High
13	On	Off
14	Alarm	Normal
15	Close	Open
16	Enable	Disable
17	Occupied	Unoccupied
18	on	off
19	on	off
20	on	off

---

## APPENDIX C: POINT ATTRIBUTES TABLES

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Each point in a controller has associated attributes such as user address, technical address, and descriptor. The Data Point Editor described in the Editors chapter of this manual provides dialog boxes that specify attributes (fields and values) for each point type in a controller.

Point attributes in the CARE database may not be available for editing in an off-line editor such as the Excel Building Supervisor (“XBS”) operator terminal or the XI518/XI582 operator terminals. Likewise, some attributes may be in controller files, but not available for import from the controller into the CARE database.

This chapter contains tables for each point type. The tables list point attributes and presents the following information for each:

- **Field description** specifies either the attribute name in the related point editor dialog box or the use of the field in CARE.
- **Field range** specifies the possible values of the field.
- **In CARE Database** specifies whether or not it is stored in CARE databases that are Version 1.5.1 or later. Previous database versions do not necessarily store the same fields.
- Whether or not the attribute is available for **off-line editing**. “Off-line” editing refers to changes made to database values while the controller is not active in the system. In other words, when you are using CARE to change copies of controller files, not the files in the actual controller.
- Whether or not the attribute is available for **on-line editing**. “On-line” editing refers to changes made to controller files while the controller is active. For example, if you are using an XBS operator terminal to change field values in a controller while it is operating.
- Whether or not the attribute can be imported via the **Import Controller** function (menu item Database, dropdown items Import, Controller). Import Controller Files in the File Management chapter describes the import procedure.

This information is useful when you are importing controller files or setting initial values for attributes that can be changed in an on-line editor.

### Table Definitions

User address and technical address are attributes that apply to every point. Following are definitions and ranges for each field.

#### User

##### Address

Point name (maximum of 18 alphanumeric characters) assigned to a point for operator use in locating and commanding the point. Examples: Room temp floor 1 and Flow temp G/floor. This name and the descriptor further define the point. This name must be unique within a controller.

User addresses must include one non-digit character and cannot include Tabs, double quotes, ?, \*, or space characters. All other ASCII characters are allowable (A-Z, 0-9, +, -, \_, etc). For example, 12A is a valid user address, but 12 is not.

#### Technical

##### Address

Internal six-digit number that defines and locates a point in the system. The number is composed of three pairs representing controller number (0-30), module number (1-16), and I/O number (1-12). Example: 010310 meaning Controller 1, Module 3, I/O 10.

## Analog Input Point Type

## Datapoint Editor Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Technical Address of point (controller, board, point)	6 digits	yes	yes, with Technical Address dialog box	no	yes (for nonexistent only)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3	yes	no	no	yes
Engineering Unit (index into table of analog engineering units)	0 to 235	yes	yes	no	yes
Characteristic (index into table of linearization tables)	0 to 255	yes	yes	no	yes
Alarm Text (index into table of alarm text strings)	0 to 128	yes	yes	XBS	yes
Low Alarm Limit (lower alarm limit)		yes (as float)	yes (as float)	XBS (as float)	yes
Low Warning Limit (lower warning limit)		yes (as float)	yes (as float)	XBS (as float)	yes
High Warning Limit (upper warning limit)		yes (as float)	yes (as float)	XBS (as float)	yes
High Alarm Limit (upper alarm limit)		yes (as float)	yes (as float)	XBS (as float)	yes
Alarm Delay (time in seconds)	0 to 65535	yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1] or enabled [0])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Point Subtype	0 to 255	yes	no	no	yes (for nonexistent only)
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes
Trend cycle (time in minutes)	0-65535	yes	yes	yes	yes

## Other Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
number of technical addresses (future)	0 to 255	yes	no	no	yes
manual point value	0 to 4095	yes (initial value stored as a float)	no	XBS	yes
current point value	0 to 4095	yes	no	no	yes
last modification date		yes	no	no	yes
indicates negative slope for linearization table	0 or 1	yes	no	no	no
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if point is in alarm (1)	0 or 1	yes	no	no	yes
indicates if trend is enabled (1)	0 or 1	yes	no	581	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	XBS (trending)	no
A/D offset* for ai point	-32767 to 32768	yes (as float)	yes	XBS (as float)	yes
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0])	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no

\* A/D offset must be imported with current value because the offset is stored in the controller as a number of counts that is relative to the "current" value.

## Analog Output Point Type

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Technical Address of point (controller, board, point)	3 digits	yes	yes, with Technical Address dialog box	no	yes (for nonexistent only)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	XBS	yes
Engineering Unit (index into table of analog engineering units)	0 to 235	yes	yes	no	yes
Characteristic (index into table of linearization tables)	0 to 255	yes	yes	no	yes
Point Subtype	0 to 255	yes	no	no	yes (for nonexistent only)
Time to Close (in seconds)		yes	yes	XBS	yes
Time to Open (in seconds)		yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes
Trend cycle (time in minutes)	0-65535	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
number of technical addresses	0 to 255	yes	no	no	yes
manual point value	0 to 4095	yes (initial value stored as float)	no	XBS	yes
current point value	0 to 4095	yes	no	no	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	XBS (trending)	no
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0])	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no

## Pseudo Analog Point Type

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters*	yes	yes	no	no
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	XBS	yes
Initialization Value (manual point value)		yes (initial value stored as float)	yes	XBS	yes
Engineering Unit (index into table of analog engineering units)	0 to 235	yes	yes	no	yes
Alarm Text (index into table of alarm text strings)	0 to 128	yes	yes	XBS	yes
Low Alarm Limit (lower alarm limit)		yes	yes	XBS	yes
Low Warning Limit (lower warning limit)		yes	yes	XBS	yes
High Warning Limit (upper warning limit)		yes	yes	XBS	yes
High Alarm Limit (upper alarm limit)		yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical [0])	0 or 1	yes	yes	XBS	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes
Trend cycle (time in minutes)	0-65535	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
Technical address of point (controller, board, point)	5 digits	yes	no	no	yes (for nonexistent only)
current point value		yes	no	no	yes
date of last modification		yes	no	no	yes
point subtype	0 to 255	yes	no	no	yes (for nonexistent only)
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if point in alarm (1)	0 or 1	yes	no	no	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	XBS (trending)	no

## Digital Input Point Type

## Datapoint Editor Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Technical Address of point (controller, board, point)	6 digits	yes	yes, with Technical Address dialog box	no	yes (for nonexistent only)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	XBS	yes
Alarm Text (index into table of alarm text strings)	0 to 128	yes	yes	XBS	yes
Engineering Unit (index into table of digital engineering units)	0 to 20	yes	yes	no	yes
Alarm Delay (time in seconds)	0 to 65535	yes	yes	XBS	yes
Service Interval (for runtime hours)	0 to 65535	yes	yes	XBS	yes
Point Subtype	0 to 255	yes	no	no	yes (for nonexistent only)
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Runtime Enabled (indicates if runtime is enabled [1])	0 or 1	yes	yes	XBS	yes
Active State of point (0 or 1)	0 or 1	yes	yes	no	yes
Alarm Status (enable alarm checking upon change of point value)	0 or 1	yes	no	XBS	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

## Other Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
number of technical addresses (future)	0 to 255	yes	no	no	yes
manual point value	0 to 255	yes (initial value)	no	XBS	yes
current point value	0 to 255	yes	no	no	yes
highest value for n-state point	0 to 255	yes	no	no	yes
runtime in minutes(accumulated)		yes	no	XBS	yes
last modification date		yes	no	no	yes
counter of runtime between service intervals (mins)		yes	no	XBS	yes
cycle count to active state		yes	no	no	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if point is in alarm (1)	0 or 1	yes	no	no	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	XBS (trending)	no
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0])	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no

## Digital Output Point Type

## Datapoint Editor Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no
Technical Address of point (controller, board, point)	6 digits	yes	yes, with Technical Address dialog box	no	yes (for nonexistent only)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	XBS	yes
Engineering Unit (index into table of digital engineering units)	0 to 235	yes	yes	no	yes
Service Interval for runtime hours	0 to 65535	yes	yes	XBS	yes
Point Subtype	0 to 255	yes	no	no	yes (for nonexistent only)
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical [0])	0 or 1	yes	yes	XBS	yes
Runtime Enabled (indicates if runtime is enabled [1])	0 or 1	yes	yes	XBS	yes
Active State	0 or 1	yes	yes	no	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

## Other Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
number of tech addr (future)	0 to 255	yes	no	no	yes
manual point value		yes (initial value)	no	XBS	yes
current point value		yes	no	no	yes
highest value for n-state pt	0 to 255	yes	no	no	yes
runtime in minutes		yes	no	XBS	yes
date of last modification		yes	no	no	yes
counter of runtime between service intervals (mins)		yes	no	XBS	yes
cycle count to active state		yes	no	no	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
switching down has an OFF phase (0)	0 or 1	yes	no	no	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	no	no
delay time for OFF phase (secs)	0 to 255	yes	yes	XBS	yes
delay time switching up (secs)	0 to 255	yes	no	no	yes
delay time switching down (secs)	0 to 255	yes	no	no	yes
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0])	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no

## Pseudo Digital Point Type

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	XBS	yes
Initial value (manual point value)	0 to 255	yes (initial value)	yes	XBS	yes
Engineering Unit (index into table of digital engineering units)	0 to 20	yes	yes	no	yes
Alarm Text (index into table of alarm text strings)	0 to 128	yes	yes	XBS	yes
Service Interval for runtime hours	0 to 65535	yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Runtime Enabled (indicates if runtime is enabled [1])	0 or 1	yes	yes	XBS	yes
Active State of point (0 or 1)	0 or 1	yes	yes	no	yes
Alarm Status (enable alarm checking upon change of point value)	0 or 1	yes	no	XBS	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
technical address		yes	no	no	yes (for nonexistent only)
current point value	0 to 255	yes	no	no	yes
highest value for n-state point	0 to 255	yes	no	no	yes
runtime in minutes		yes	no	XBS	yes
last modification date		yes	no	no	yes
counter of runtime between service intervals (mins)		yes	no	XBS	yes
cycle count to active state		yes	no	no	yes
point subtype	0 to 255	yes	no	no	yes (for nonexistent only)
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if point is in alarm (1)	0 or 1	yes	no	no	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	XBS (trending)	no

## Totalizer Point Type

## Datapoint Editor Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Technical Address of point (controller, board, point)	6 digits	yes	yes, with Technical Address dialog box	no	yes (for nonexistent only)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	XBS	yes
Engineering Unit (index into table of analog engineering units)	0 to 20	yes	yes	no	yes
Interval Limit to report a message		yes	yes	no	yes
Scaling Factor for number of pulses		yes	yes	XBS	yes
Totalizer type	0 to 255	yes	no	no	yes (for nonexistent only)
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

## Other Attributes

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
number of technical addresses	0 to 255	yes	no	no	yes
manual point value		yes (initial value)	no	XBS	yes
current point value		yes	no	no	yes
last value of HW counter	0 to 255	yes	no	no	yes
last value of slow HW counter	0 to 255	yes	no	no	yes
last reported refresh value	0 to 255	yes	no	no	yes
interval counter for pulses specified in attrib "interval"		yes	no	no	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	no	no
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0])	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no

## Pseudo Totalizer Point Type

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	no	yes
Engineering Unit (index into table of analog engineering units)	0 to 20	yes	yes	no	yes
Interval Limit to report a message		yes	yes	no	yes
Scaling Factor for number of pulses		yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
technical address of point (controller, board, point)	6 digits	yes	no	no	yes (for nonexistent only)
manual point value		yes (initial value)	no	XBS	yes
current point value		yes	no	no	yes
last reported refresh value	0 to 255	yes	no	no	yes
interval counter for pulses specified in attrib "interval"		yes	no	XBS	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	XBS (trending)	no

## Global Analog and Digital Point Types

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
Point Subtype (input or output)		yes	yes	no	yes (for nonexistent only)
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Technical Address	6 digits	yes	yes	no	yes (for nonexistent only)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	no	XBS	yes
Engineering Unit (index into table of engineering units)	0 to 20 (digital) 0 to 235 (analog)	yes	yes	no	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes
Trend cycle (time in minutes)	0-65535	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
manual value		yes (initial value)	no	XBS	yes
current point value		yes	no	no	yes
1 if controller is down	0 or 1	yes	no	no	no
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
1 if controller is slave	0 or 1	yes	no	no	yes
active state (for digital points only)	0 or 1	yes	yes	no	yes
indicates if point should be refreshed (1) (for analog pts only)	0 or 1	yes	no	XBS (trending)	no

## DO Feedback DI Point Type

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Alarm Text (index into table of alarm text strings)	0 to 128	yes	yes	XBS	yes
Engineering Unit (index into table of digital engineering units)	0 to 20	yes	yes	no	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	yes	XBS	yes
Cycle Count to active state		yes	no	no	yes
Duration Off phase (secs)	0 to 255	yes	yes	no	yes
Delay Switch Up (secs)	0 to 255	yes	yes	no	yes
Delay Switch Down	0 to 255	yes	yes	no	yes
Feedback Delay (time) for signal	0 to 255	yes	yes	no	yes
Service Interval (user specified maintenance interval in hours)	0 to 65535	yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Runtime Enabled	0 or 1	yes	yes	XBS	yes
Switching Down (OFF phase when value is 1)	0 or 1	yes	yes	no	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
subtype of assigned points (DO)	0 to 255	yes	no	no	yes ( for nonexistent only)
subtype of feedback points (DI)	0 to 255	yes	no	no	yes (for nonexistent only)
manual point value	0 to 255	yes	no	XBS	yes
current point value	0 to 255	yes	no	no	yes
max for manual/current point values	0 to 255	yes	no	no	yes
accumulated runtime (mins)		yes	no	XBS	yes
time within a maintenance interval (time since last service)		yes	no	XBS	yes
last modification date		yes	no	no	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if point is in alarm (1)	0 or 1	yes	no	no	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
enable runtime accumulation	0 or 1	yes	yes	XBS	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	no	no
technical address of DO point	6 digits	yes	no	no	yes
technical address of DI point	6 digits	yes	no	no	yes
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0])	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no

## Pulse 2 Point Type

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no (create)
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Engineering unit (index into table of digital engineering units)	0 to 20	yes	yes	no	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	yes	XBS	yes
Cycle Count to active state		yes	yes	no	yes
Pulse Duration (secs)	0 to 255	yes	yes	XBS	yes
Service Interval (user-specified maintenance interval in hours)	0 to 65535	yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Runtime Enabled	0 or 1	yes	yes	XBS	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
point subtype	0 to 255	yes	no	no	yes (for nonexistent only)
technical address of first point		yes	no	no	yes
manual point value	0 to 255	yes	no	XBS	yes
current point value	0 to 255	yes	no	no	yes
accumulated runtime (mins)		yes	no	XBS	yes
time within a maintenance interval (time since last service)		yes	no	XBS	yes
last modification date		yes	no	no	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	no	no
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0]), for OS 2.0 only	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no

## Multistage Point Type

**Datapoint Editor Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
User Address	18 alphanumeric characters	yes	yes	no	no
Descriptor (index into table of point descriptors)	0 to 64	yes	yes	XBS	yes
Engineering Unit (index into table of digital engineering units)	0 to 20	yes	yes	no	yes
Technical address of first point	6 digits	yes	no	no	yes
Operator Access Level	1 to 4	yes	yes	no	yes
Write Protect Priority	0 to 3 (1-255)	yes	yes	XBS	yes
Cycle Count to active state		yes	no	no	yes
Service Interval (user-specified maintenance interval in hours)	0 to 65535	yes	yes	XBS	yes
Suppress Alarm (indicates alarm disabled [1])	0 or 1	yes	yes	XBS	yes
Alarm Type (indicates critical [1] or non-critical)	0 or 1	yes	yes	XBS	yes
Runtime Enabled	0 or 1	yes	yes	XBS	yes
Active State (1)	0 or 1	yes	yes	no	yes
Hide Point (indicates, if point is visible=no [0] or hidden=yes [1])	0 or 1	yes	yes	yes	yes

**Other Attributes**

Field Description	Field Range	In CARE Database	Off-line Editing?	On-line Editing?	Imported?
point subtype	0 to 255	yes	no	no	yes (for nonexistent only)
manual point value	0 to 255	yes	no	XBS	yes
current point value	0 to 255	yes	no	no	yes
max value of point	0 to 255	yes	no	no	yes
accumulated runtime (mins)		yes	no	XBS	yes
time within a maintenance interval (time since last service)		yes	no	XBS	yes
last modification date		yes	no	no	yes
indicates manual mode (1)	0 or 1	yes	no	XBS	yes
indicates if trend is enabled (1)	0 or 1	yes	no	XI581/XI582	yes
indicates if point should be refreshed (1)	0 or 1	yes	no	no	no
No Response (indicates, if communication between controller and DIO module is interrupted, yes [1], no [0])	0 or 1	no	no	no	no
DIO Remote (indicates, if point is in manual override by a DIO module, yes [1], no [0])	0 or 1	no	no	no	no



# APPENDIX D: PLANT AND CONTROLLER UPGRADES AND DOWNGRADES

## Multiple Operating System Handling

**Purpose** Multiple Operating System Handling is a feature of CARE allowing to upgrade/downgrade operating system versions for Excel 5000 controllers. CARE supports the operating system versions:

- OS 1.1(Europe and Latin America only)
- OS 1.2
- OS 1.3/1.4
- OS XLIRC (Europe and Latin America only)
- OS 1.5
- OS 2.0
- OS 2.03
- OS 2.04
- OS 2.06

CARE capabilities vary for each version as shown in the following table.

Feature	Ver. 1.1/1.2	Ver. 1.3/1.4/XLIRC	Ver 1.5	Ver 2.0 / 2.03 / 2.04 /2.06
Point descriptors	64	255	255	255
Alarm messages	128	255	255	255
Analog engineering units	234	234	254	254
Digital engineering units	20	127*	127*	127
Global digital points	2-state	2-state and multi-state	2-state and multi-state	2-state and multi-state
Global analog update	fixed**	fixed**	programmable	programmable
Trend hysteresis	fixed**	fixed**	programmable	programmable
Alarm hysteresis	fixed	fixed	programmable	programmable
LON points				Via point mapping to NVs
NVs				Excel 50: max. 46
				Excel 500: max. 512
Hardware points	128			
Software points of one type	128 (253 + 3 internal if OS > 2.03)			
Software points of all types	256			
Global points	128			
Maximum number of points: (Hardware-, software, internal- and global points)	384			

NOTE: \*There is a limit of 255 states, therefore, 127 implies that each point has two states (pairs). If a point has more than two states, the total number is reduced.

\*\*If global value is greater than 20, the change must be at least 1 percent. If the value is less than 20, the change must be at least .2 units.

Upgrading is possible from a current version to any higher version without intermediate steps, for example you can upgrade from OS Version 1.3/1.4 to OS-Version 2.06 without upgrading to OS-Version 1.5 as intermediate step. Analogously the same is valid for downgrading.

**Restrictions** Upgrading from older OS versions uses all restrictions required for the older OS version. Downgrading to an older OS version will be allowed as long as the application remains within the restrictions of the target OS. If downgrading of a controller is not possible because of controller or plant restrictions, CARE displays the appropriate error message and does not change the OS version.

**Procedures** Upgrading or downgrading a controller applies to the controller and its **attached** plants only. When replacing its OS all attached plants are upgraded/downgraded automatically.

**NOTE:** The OS number of one single **attached** plant cannot be changed. The OS number of an unattached plant can be changed. When attaching a plant with a different OS version number than the controller, the OS version number of the plant gets the OS version number of the controller.

### Change Controller OS Version

1. In the logical plant tree, click on the controller.
2. On the right pane, click on the Properties tab.

**NOTES:** All plants attached to the controller will be upgraded/downgraded by upgrading/downgrading the controller.

If downgrading of a controller is not possible because of controller or plant restrictions, CARE displays the appropriate error message and does not change the OS version.

3. Click the down arrow next to Controller OS Version list box and select desired version.
4. If messages occur, follow the instructions and correct the conditions displayed.

### Change Plant OS Version

1. In the logical plant tree, click on the **unattached** plant.

**NOTE:** Attached plants cannot be upgraded/downgraded.

2. On the right pane, click on the Properties tab.

Properties | Grid | Schematic

Plant Name : AC\_01

Plant Type : Air Conditioning

Plant OS Version : Version 2.03

Default File Set:

Original Default files for 2.03 XL500 controller & XL50 external MMI.

xl\_2\_03

Units of Measurement

International

English

Preferred Target I/O

Standard I/O

Distributed I/O

Preserve technical address

Open LON I/O

3. Click the down arrow next to Plant OS Version list box and select desired version.

The Preserve Technical Address checkbox refers to modification of the target hardware, if point changes in the TAF have already been made before.

Enabling this checkbox results in the following:

Points that are already assigned to that target hardware type, which will be changed to, preserve their technical address on the corresponding module.

Disabling this checkbox results in the following:

Points that are already assigned to that target hardware type, which will be changed to, may not necessarily preserve their technical address on the corresponding module.

4. If messages occur, follow the instructions and correct the conditions displayed.

#### Disposition of Templates

If you enter search templates for a Ver. 1.3 or 1.5 controller and then downgrade the controller to Ver. 1.2, there is no warning message during the downgrade pertaining to the templates. The templates remain in the database in case the controller is upgraded to Ver. 1.3. or 1.5. When the database is translated to the Ver. 1.2 controller with the "hidden" templates, the templates are not translated into the controller files.

Upgrade controller to OS 2.04 and higher

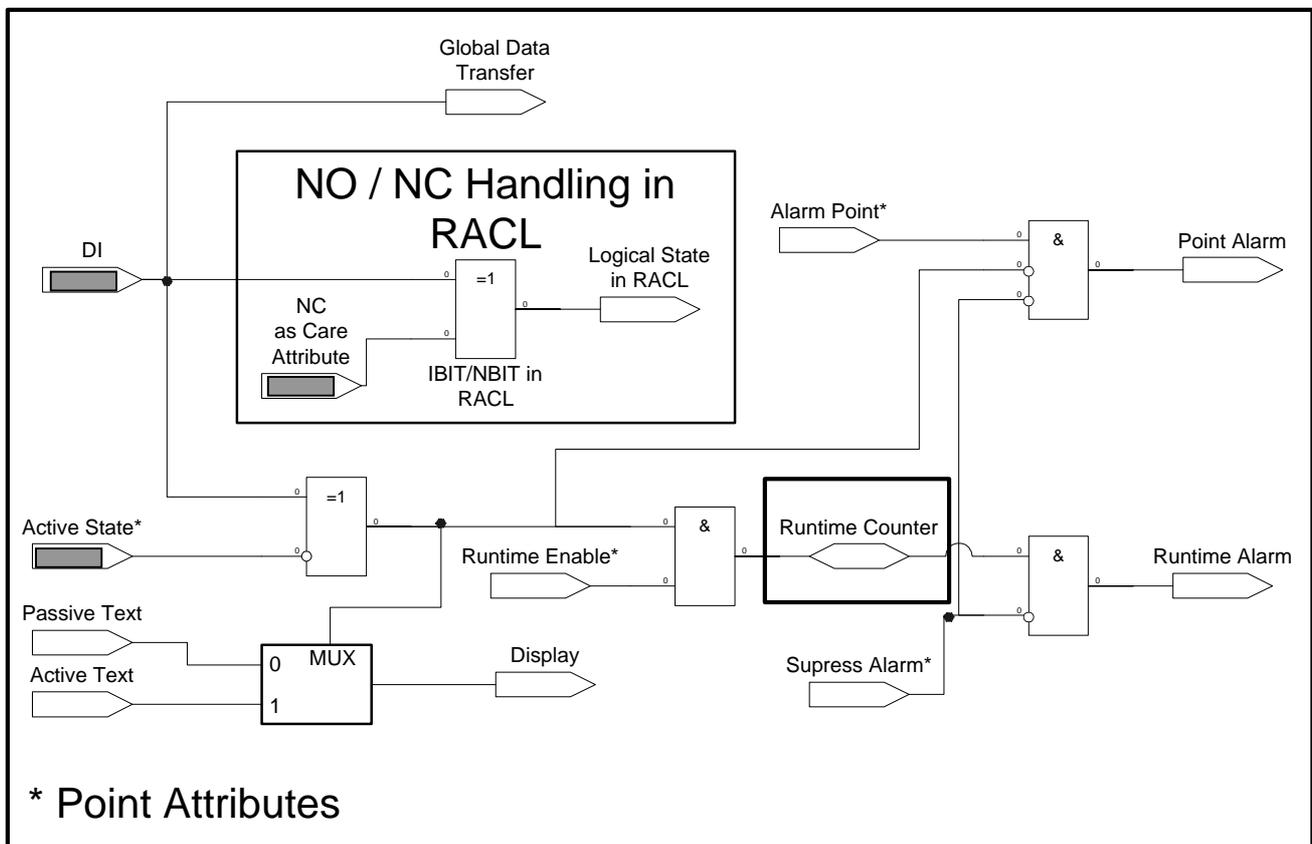
NO/NC Processing

For OS 2.04 and higher the NO/NC\* handling is completely reworked. When using previous projects CARE performs an automatic upgrade for datapoints regarding the NO/NC behavior. The upgrade result may show points which have to be reworked either in the control strategy or to be defined as status or alarm point. To understand what to do in the upgrade dialog, the old NO/NC handling (OS version lower than 2.04) and the new NO/NC handling for OS 2.04 and higher will be compared for digital points in the following sections.

\*NO/NC means Normally Open/Normally close.

Old NO/NC Mechanism

For OS lower than 2.04 the NO/NC mechanism is as follows:



■ Have decisive influence on results of logical processing

The logical behavior provides several interactive spots. The following table shows the dependence.

DI Voltage	NO/NC as CARE attribute in schematic	Logical State in Control Strategy (RACL)	Logical state for Global Transfer	Active State	Text Displayed	Alarm	Runtime Enable	Hours run accumulation
<2,5V	NC	1	0	0	Active	RTN		
>5V	NC	0	1	0	Passive	ALM		
<2.5V	NC	1	0	1	Passive	ALM		
>5V	NC	0	1	1	Active	RTN		
<2.5V	NO	0	0	0	Active	RTN		
>5V	NO	1	1	0	Passive	ALM		
<2.5V	NO	0	0	1	Passive	ALM		
>5V	NO	1	1	1	Active	RTN		

Alarm direction: ALM = Alarm, RTN = Alarm Return to Normal

DI Voltage: Terminal logic state (open < 2.5 V = 0, closed > 5 V = 1)

NO/NC as CARE attribute: NO = 0, NC = 1

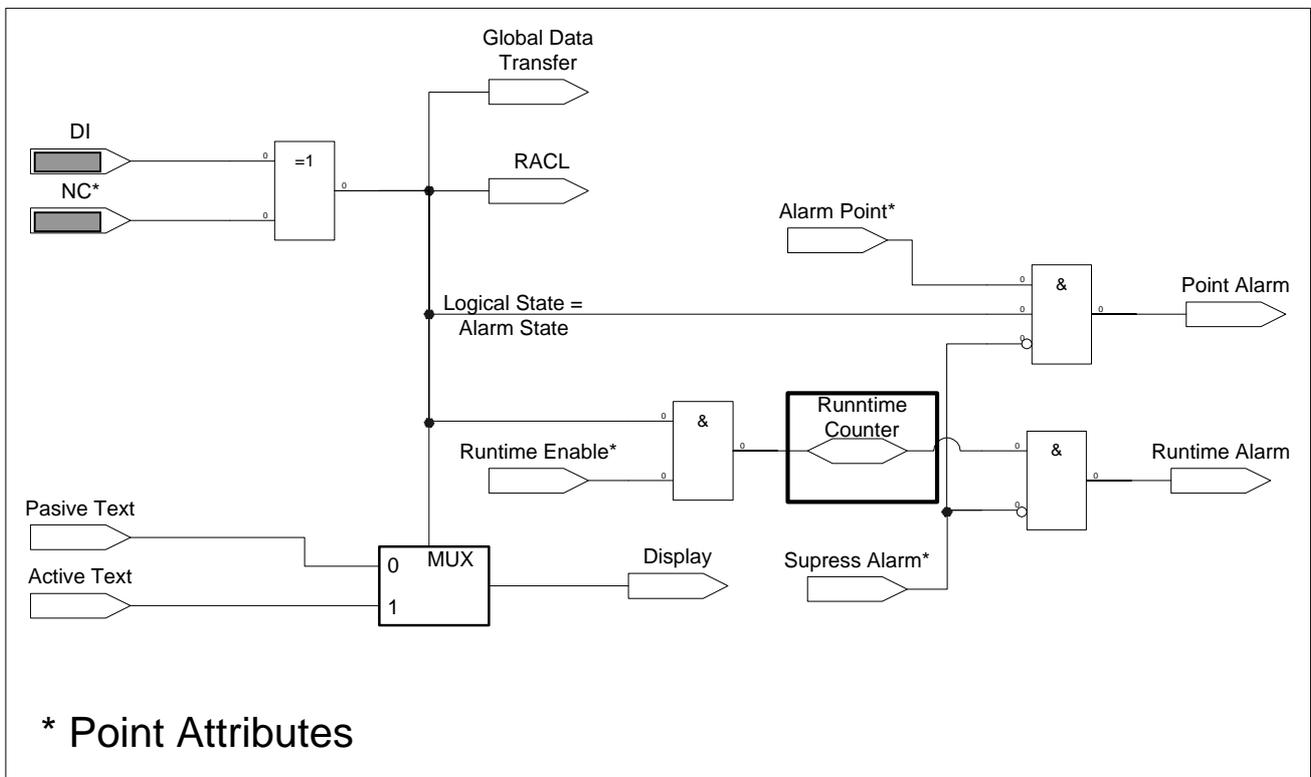
Active State: DI is active at 0 or 1

The results are the following:

- Via Active State attribute it is possible to invert the alarm direction, the corresponding active/passive text pair, and the runtime counter.
- The logical state of global points provided for global data transfer can be different to the logical state in the control strategy (RACL) if NO was chosen for the point. In addition when NC and Active State = 0 or NO and Active State = 1 was chosen, the active-passive text pairs were inverted.
- In general negative logic could lead to problems.

**New NO/NC Mechanism**

For OS 2.04 and higher the NO/NC mechanism is as follows:



 Have decisive influence on results of logical processing

DI Voltage: Terminal logic state (open < 2.5 V = 0, closed > 5 V = 1)  
 NO/NC as CARE attribute: NO = 0, NC = 1

**Assumption:** positive logic and relay contact model

Digital Input NO			Digital Input NC		
Contact position	Voltage at Input	Logical Status	Contact position	Voltage at Input	Logical Status
Open	<2.5V	0	Open	<2.5V	1
Closed	>5V	1	Closed	>5V	0

The new NO/NC handling for OS 2.04 or higher provides the following:

The NO/NC attribute will firstly be set in the schematic as before, but can be changed in the Datapoint Editor offline as well as online via XI 581AH/582AH. The Active State attribute is no longer available. There will be no possibility to invert this logic. Results are shown in the following tables:

Logical state in control strategy	Unit Text displayed	Text Display	Value change	Generated alarm
0	passive	OFF	0->1	Return to normal (RTN)
1	active	ON	1->0	Alarm coming (ALM)

The logical state of a DI point (0 or 1 in control strategy) depends only on the setting of the normally open/normally closed attribute set in the Datapoint Editor. The alarm state, the state for the runtime counter and for the global point transfer follows the logical state in the control strategy.

The hours run are always counted when the control strategy logical state is 1. As outlined above, this depends only on the setting on the NO/NC attribute. Hours run in general are only counted if the Runtime Enabled attribute is set to yes.

DI Voltage	NO/NC as CARE attribute in schematic	Logical state in control strategy	Logical state for Global Transfer	Text Displayed	Alarm	Runtime Enable	Hours run accumulation
<2.5V	NO	0	0	Passive	RTN	Yes	No
>5V	NO	1	1	Active	ALM	Yes	Yes
<2.5V	NC	1	1	Active	ALM	Yes	Yes
>5V	NC	0	0	Passive	RTN	Yes	No
<2.5V	NO	0	0	Passive	RTN	No	No
>5V	NO	1	1	Active	ALM	No	No
<2.5V	NC	1	1	Active	ALM	No	No
>5V	NC	0	0	Passive	RTN	No	No

Alarm direction: ALM = Alarm, RTN = Alarm Return to Normal

**Upgrading to OS 2.04 and higher / Status point or Alarm point**

When upgrading from a previous OS to OS 2.04 or higher CARE is checking each digital, pseudo digital, and global digital point, whether it can be upgraded without losing the correct logical behavior. To keep the logical behavior means that both the logical value for Data processing and the logical value for Alarming will be the same as before. If this is the case the point will be automatically upgraded.

For some reasons certain points cannot be upgraded automatically. If e.g. the Active State attribute was inverted in the application to be upgraded, points cannot keep both the correct Data processing value and the correct Alarming value. In this case the user has to decide whether the point should be a Status point for which the data processing value of the control strategy will be considered and the alarming will be wrong, or if the point should be an Alarm Point for which the Alarming value will be considered and the data processing will be wrong. This can be done in the NO/NC Upgrade dialog box.

In general status points are set to NO, alarm points are set to NC. Global points have to be reworked completely in the control strategy and/or switching logic and certain pseudopoints need to be corrected regarding the alarming direction in any case.

For each point to be upgraded manually, a description is displayed in the NO/NC Upgrade dialog box, which indicates what to do.

**IMPORTANT**

*The Upgrade to OS 2.04 and higher cannot be done without losing compatibility in some cases*

Upgrading is done by the rules listed in the following table:

Attributes				OS < 2.04				OS 2.04		
Point	NO / NC	Contact	Relay	Active	Logical	Alarm	Unit text	Logical	Alarm	Unit text
Types:	Attributes:	position:	On/Off:	State	status <sup>3</sup>		displayed:	status: <sup>1,3</sup>		displayed:
DI	NO	Open (<2.5V)		0	0	RTN	Active	0	RTN	Passive
DI	NO	Closed (>5V)		0	1	ALM	Passive	1	ALM	Active
DI	NO	Open (<2.5V)		1	0	ALM	Passive	0	RTN	Passive
DI	NO	Closed (>5V)		1	1	RTN	Active	1	ALM	Active
DI	NC	Open (<2.5V)		0	1	RTN	Active	1	ALM	Active
DI	NC	Closed (>5V)		0	0	ALM	Passive	0	RTN	Passive
DI	NC	Open (<2.5V)		1	1	ALM	Passive	1	ALM	Active
DI	NC	Closed (>5V)		1	0	RTN	Active	0	RTN	Passive
AI>DI <sup>2</sup>	NO	Open (<2.5V)		0	0	RTN	Active	0	RTN	Passive
AI>DI <sup>2</sup>	NO	Closed (>5V)		0	1	ALM	Passive	1	ALM	Active
AI>DI <sup>2</sup>	NO	Open (<2.5V)		1	0	ALM	Passive	0	RTN	Passive
AI>DI <sup>2</sup>	NO	Closed (>5V)		1	1	RTN	Active	1	ALM	Active
AI>DI <sup>2</sup>	NC	Open (<2.5V)		0	1	RTN	Active	1	ALM	Active
AI>DI <sup>2</sup>	NC	Closed (>5V)		0	0	ALM	Passive	0	RTN	Passive
AI>DI <sup>2</sup>	NC	Open (<2.5V)		1	1	ALM	Passive	1	ALM	Active
AI>DI <sup>2</sup>	NC	Closed (>5V)		1	0	RTN	Active	0	RTN	Passive
DO	NO		On	1	1		Active	1		Active
DO	NO		Off	1	0		Passive	0		Passive
DO	NC		On	0	0		Active	0		Passive
DO	NC		Off	0	1		Passive	1		Active
PD_2	n/a			0	0	RTN	Active	0	RTN	Passive
PD_2	n/a			0	1	ALM	Passive	1	ALM	Active
PD_2	n/a			1	0	ALM	Passive	0	RTN	Passive
PD_2	n/a			1	1	RTN	Active	1	ALM	Active
PD_n	n/a							X (0,1,2...)		StateX
GD_2	n/a							0	RTN	Passive
GD_2	n/a							1	ALM	Active
GD_n	n/a							X (0,1,2...)		StateX

<sup>1</sup> Runtime follows the Logical status (Logical Status = 1 means runtime logging)

<sup>2</sup> At DI Subtype AI the pull up resistor will be switched off as default for new HW Points only for OS 2.04

<sup>3</sup> State in Control Strategy (RACL)

**Procedure**

**IMPORTANT**

*Note, that the Upgrade cannot be performed explicitly. The upgrade will be done automatically when upgrading a controller OS lower than 2.04 to 2.04. Nevertheless after once the upgrade was performed the points that need to be reworked/defined as status or alarm points can be edited in the NO/NC Upgrade dialog box in as many sessions as you like.*

1. Open Controller Information dialog box by clicking menu item Controller, then submenu item Information.
2. From the controller OS Version drop-down listbox, select OS 2.04 or higher.
3. Click OK.

RESULT: Observe the following message and click OK if you really want to upgrade to OS 2.04 or higher.



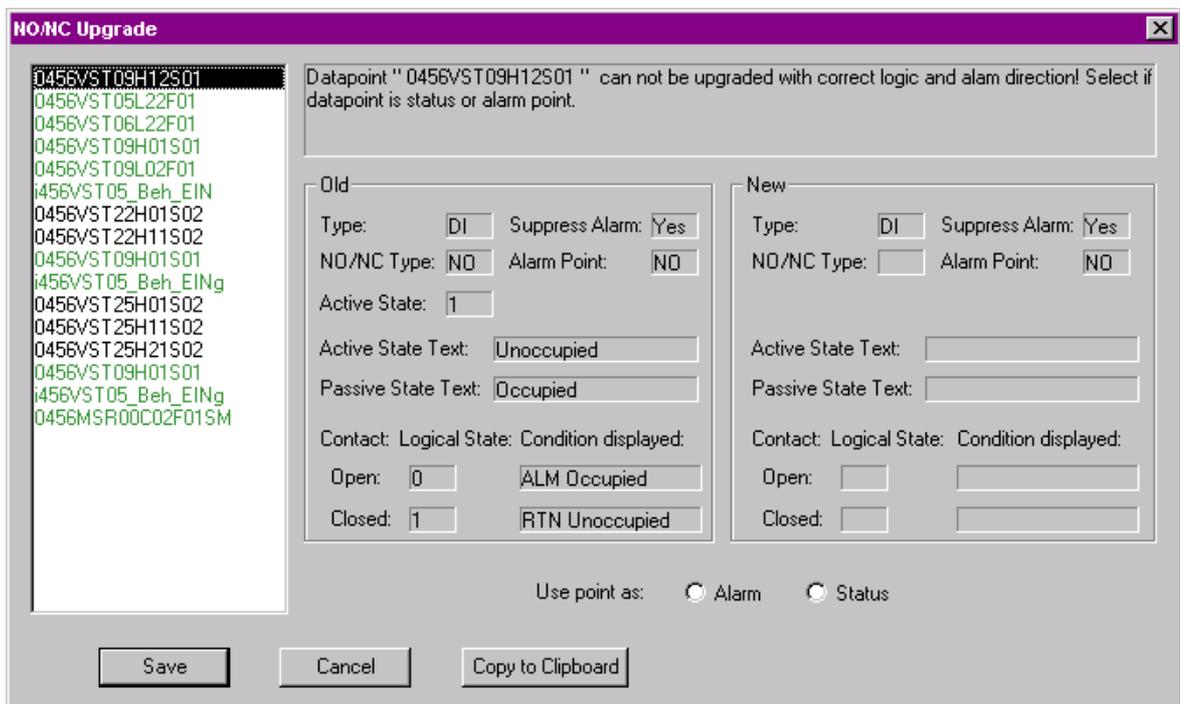
4. Confirm next message box.



5. Confirm next message box. It is recommended to print the problem points report.



RESULT: The NO/NC Upgrade dialog box is displayed.



On the left, all points, which were not automatically upgraded are shown. When selecting a point, note the point description on the right. Points, which can be defined as status or alarm point, are

displayed in black. Global points and pseudopoints, which have wrong alarm direction, will displayed green when selecting them.

6. Copy the points to the clipboard and paste them into a word processing program. Print out the list. Do this every time before you close the dialog box to keep the result of the points edited.
7. Select a point displayed in black and define if it should be a status point (NO) or an alarm point (NC) by selecting respective radio button. Note the results in the field under New on the right.

RESULT: The point gets green in the list.

8. Continue with next point(s).
9. Before closing the dialog box, copy the points to the clipboard and paste them into a word processing program for printing your result.
10. Click Save button.

RESULT: All points defined as status or alarm point are now upgraded. When opening the NO/NC Upgrade dialog box next time, they will not be displayed anymore. Go for reworking global points and pseudopoints.

---

## Upgrade Controller to OS 2.06 when using Multistage or DO\_Feedback\_DI Points on DIO

### **IMPORTANT**

*When using Multistage DO or DO\_Feedback\_DI Points (Flex points) that reside on distributed I/O modules, the points must be shifted to IP modules before upgrading the controller to OS 2.06 in order to avoid damage of the controlled equipment. As long as the controller OS is lower than 2.06, for example 2.04, the application need not to be changed even if the controller unit supports OS 2.06.*

## Controller OS 2.06 usage and functionality in CARE 4 and CARE- XL500 7.01.02

The behavior of the controller OS 2.06 in CARE 4 and CARE-XL500 7.01.02 differ strongly regarding the following functions:

- Sensor Offset
- NO/NC
- Characteristics
- Actuator runtime

The following table shows the relationship between controller hardware OS, controller OS in CARE, and the CARE version.

Controller OS Version (Hardware)	Controller OS Version (CARE)	CARE Version
2.06.00 – 2.06.04	2.06.	Version 4
2.06.00 – 2.06.04 2.06.05	2.06	Version XL500 7.01.02

For the usage of open LON I/O modules (Smart I/O modules and Distributed I/O modules), the hardware controller OS 2.6.05 includes the following enhancements:

- Sensor offset applicable for all characteristic types
- Normally open / Normally Closed attribute active in controller
- Default characteristics enabled and calculated by the controller
- Actuator run time handling optimized for open LON I/O modules

When upgrading a CARE 4 project to a CARE-XL500 7.01.02 project using controller OS 2.06, the CARE version dependent behavior of each of these functions have to be clearly understood as described in the following.

### Sensor Offset Handling

The sensor offset compensates value deviations caused, for example, by voltage drop on the cable. The following example shows how the sensor offset is calculated:

Example:

<b>Displayed Original Value</b>	20 K
<b>Entered Sensor Offset Value</b>	- 2 K
<b>Displayed New Value</b>	18 K

#### CARE 4 and OS 2.06.00 – 2.06.04

- Sensor offset handling is done in the open LON I/O module:  
Sensor offset value entered in the datapoint (Datapoint Editor) is ignored and has to be set via UCPT in the LON-Works part of the network tree, or the module has to be configured via plug-in.
- Sensor offset is supported for PT1000 only.
- Sensor offset is handled differently for Distributed I/O modules and Smart I/O modules:  
For Distributed I/O modules, sensor offset is entered as value in Ohm to be calculated according to the characteristic of the sensor  
For Smart I/O modules, sensor offset is entered as direct value without the need of referring to the characteristic
- Online Sensor offset changes via MMI or Excel Online are ignored

**CARE-XL500 7.01.02 and OS 2.06.05 and higher**

- Sensor offset handling is done in the controller:  
Sensor offset value entered in the datapoint (Datapoint Editor) will be valid and executed
- Sensor offset is entered as a real value (+ or -) for both module types and other relevant Honeywell devices such as Excel 10
- Sensor offset is applicable to all characteristics (NTC, PT1000, PT100, 0-10 V input) in combination with open LON devices.
- Sensor offset input can still be done as in CARE 4.
- The sensor offset should be done only in one place, either in the datapoint of the controller (Datapoint Editor) or in the UCPT of the open LON module (LON-Works part of the network tree)
- Online sensor offset changes via MMI or Excel Online are executed.
- Plug-in for configuration is no longer needed

**CARE 4 / CARE-XL500 7.01.02 Upgrade and OS 2.06.05 and higher**

When upgrading a CARE 4 project in CARE-XL500 7.01.02, sensor offset values set in the open LON I/O module and in the controller will be added.

Example:

Real Value (Sensor)	Sensor Offset 1 (I/O Module)	Sensor Offset 2 (Controller)	Value Display (MMI)
22 K	2 K	2 K	26 K

**Work around**

Check the sensor offset value of the datapoint and set the value to 0.

**CARE 4 / CARE-XL500 7.01.02 Upgrade and OS 2.06.00 - 06.04**

When still using OS 2.06.00 - 2.06.04 in an upgraded project in CARE-XL500 7.01.02, the sensor offset handling is the same as in CARE 4.

**NO/ NC Attribute Handling**

**CARE 4 and OS 2.06.00 – 2.06.04**

- NO/NC handling is done in the open LON I/O modules
- NO/NC handling of digital Smart I/O and Distributed I/O modules are different via plug-in access in CARE
- Changing NO/NC status in CARE requests new bindings
- Online changes of NO/NC status for digital Smart I/O and Distributed I/O modules can be entered, but are ignored.
- Online changes of NO/NC status for internal digital I/O modules (XF-modules) can be entered and are executed.

**CARE-XL500 7.01.02 and OS 2.06.05**

- NO/NC handling for digital Smart I/O and Distributed I/O modules is shifted into the controller:  
Contact state is converted inside the controller, not in the module
- NO/NC handling for digital Smart I/O and Distributed I/O modules is the same.
- NO/NC status can be edited in the datapoint Attribute 'Point Subtype' (Datapoint Editor)
- When changing NO/NC status, re-binding or module re-configuration is no longer required in CARE
- Online changes of NO/NC status are blocked for digital Smart I/O and Distributed I/O modules. MMI shows \*\*\*\*\*
- Online changes of NO/NC status for internal digital I/O modules can be entered and are executed

**CARE 4 / CARE-XL500 7.01.02 Upgrade and OS 2.06.05 and higher**

When upgrading a CARE 4 project in CARE-XL500 7.01.02, take care of the following:

Check if value conversation tables have been used for Distributed I/O modules. If yes, remove any of them.

Check digital inputs which are configured as NC in the Smart I/O module (in CARE 4, digital inputs of a Smart I/O module are automatically set to NC if a datapoint of subtype NC is bound to the Smart I/O terminal).

Reset all NC states of the Smart I/O module to NO states with the plug-in.

**Characteristics Handling**

CARE supports the following characteristic types:

**Default Characteristics**

Default characteristics are delivered with CARE and they can be edited with the Default Text Editor to meet local requirements. The following shows examples:

	Default Characteristic	Range of Open LON I/O Module
1	Pressure 0-3 "	0 to 11.0 V
2	2-10V=0-100 %	0 to 11.0 V
3	Pressure ±0.25 "	0 to 11.0 V
4	Pressure 0-5 "	0 to 11.0 V
5	Linear Input	0 to 10 with 0-10 V
9	Direct Out 0-100 %	0 to 11.0 V
10	Reverse Out 0-100 %	11.0 to 0 V

Note that the voltage ranges are wider than actual open LON I/O module input to account for possible miscalibration of the module. Modules 1 through 4 and 9 range from 2 to 10V. Device 10 ranges from 10 to 2V.

**Fixed Characteristics**

Fixed characteristics are delivered with CARE, but cannot be edited in the Miscellaneous Text Editor. They can only be selected and assigned to points in the Datapoint Editor, and are available under the IDs 10 through 15 for slow subtype points, and under the IDs 10 through 23 for fast subtype points.

		Slow Subtype Characteristics		Fast Subtype Characteristics	
11	NTC	-50.0 to 150.0 C Negative temperature coefficient degrees C	NTC	-50.0 to 150.0 C Negative temperature coefficient degrees C	
12	LINEAR_GRAPH	0 to 10 V	LINEAR_GRAPH	0 to 10 V	
13	PT1000 Type F/I	-58.0 to 302.0 F	BALCO Type F	-58.0 to 302.0 F	
14	PT1000 Type C/I	-50.0 to 150.0 C	BALCO Type C	-50.0 to 150.0 C	
15	NTC Type F	-58.0 to 302.0 F Negative temperature coefficient degrees F	PT3000 Type F	-58.0 to 302.0 F	
16			PT3000 Type C	-50.0 to 150.0 C	
17			PT1000 Type F/II	32 to 752.0 F	
18			PT1000 Type C/II	0.0 to 400.0 C	
19			PT1000 Type F/I	-58.0 to 302.0 F	
20			PT1000 Type C/I	-50.0 to 150.0 C	
21			PT100 Type F	-58.0 to 302.0 F	
22			PT100 Type C	-50.0 to 150.0 C	
23			NTC Type F	-58.0 to 302.0 F Negative temperature coefficient degrees F	

Characteristics can either be calculated in the open LON I/O module or in the controller. Depending on the controller OS and the CARE version, the handling of characteristics is as follows:

#### **CARE 4 and OS 2.06.00 - 2.06.04**

- Fixed characteristics such as PT1000 are calculated inside the open LON I/O module.
- Default characteristics such as Pressure 0-3 " cannot be calculated by the open LON I/O module and are ignored by the controller too, although they are selectable in CARE.
- In case a fixed characteristic has been selected, the input NV value delivered by the open LON I/O module is properly displayed as datapoint value.
- In case a default characteristic has been selected, the datapoint in most cases shows a value in the range of 0 - 10 based on the default characteristic input range of 0 - 10 V. To correct that wrong display and assure right input NV-to-datapoint value conversion, a conversion table has to be allocated to the controller.
- Default characteristics can be changed, deleted and newly created ("user-definable default characteristics").

#### **CARE-XL500 7.01.02 and OS 2.06.05 and higher**

- Fixed characteristics such as PT1000 are calculated inside the open LON I/O module.
- Default characteristics such as Pressure 0-3 " are enabled in CARE and calculated by the controller.
- In case a fixed characteristic is selected, the NVi value delivered by the open LON I/O module is properly displayed as datapoint value.
- In case a default characteristic is selected, the datapoint value is displayed properly as datapoint value. No additional conversion table is required.
- Default characteristics can be changed, deleted and newly created ("user-definable default characteristics").

#### **Benefit and Limitation of "User-Definable Default Characteristics" in CARE 4 and XL500 7.01.02**

##### **Benefit**

Allows the creation of non-linear characteristics by definition of up to four reference points.

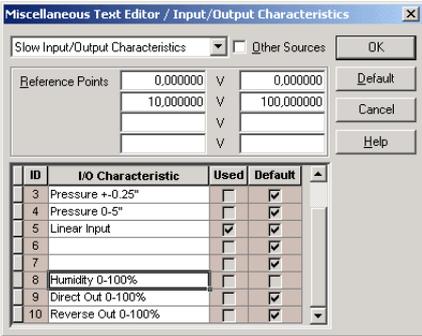
##### **Limitation**

Controller characteristic input allows max. input values of 0-11.

##### **Work around**

Add a value conversion table that fits the NV input value to the max. input range of 0 - 11.

Example: Smart I/O module with 0 – 10 V humidity sensor connected

Inputsignal (Sensor)	NVO – Value (I/O Module)	Value Conversion Table (Controller NV)	Characteristic (Datapoint)	Value Display (Datapoint on MMI)									
0 – 10 V	SNVT_lev_percent: 0 – 100 %	<table border="1"> <thead> <tr> <th></th> <th>NV value</th> <th>DP value</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>0</td> <td>0,00000</td> </tr> <tr> <td>(2)</td> <td>100</td> <td>10,00000</td> </tr> </tbody> </table>		NV value	DP value	(1)	0	0,00000	(2)	100	10,00000		0 – 100 %
	NV value	DP value											
(1)	0	0,00000											
(2)	100	10,00000											

**CARE 4 / CARE-XL500 7.01.02 Upgrade and OS 2.06.05 and higher**

When upgrading a CARE 4 project in CARE-XL500 7.01.02, previously ignored default characteristics become active and are calculated by the controller. If, as in most cases, a conversion table had been assigned additionally, the datapoint shows wrong values.

**Workaround**

Check if a conversion table is allocated to the controller. If yes, delete it. Check the values (reference points) of the characteristic in order to assure a correct datapoint value display.

**Actuator Run Time Handling**

The actuator runtime handling is still located in the LON I/O modules but is optimized as the following comparison shows:

**CARE 4 and OS 2.06.00 - 2.06.04**

- Changing the actuator runtime in CARE deletes existing bindings and requests a re-binding
- Online changes of the actuator runtime for internal I/O modules can be entered and are executed
- Online changes of the actuator runtime for open LON I/O modules can be entered, but are ignored

**CARE-XL500 7.01.02 and OS 2.06.05**

- Change of the actuator runtime datapoint attribute in CARE is written into the UCPT without deleting the binding
- Online changes of the actuator runtime for internal I/O modules can be entered and are executed
- \*Online changes of the actuator runtime for open LON I/O modules are blocked. MMI displays \*\*\*\*\*

\*Also supported for open LON applications using OS 2.06.05 in CARE 4.

**OS XLIRC Support**

A feature of CARE 3.0.00 is the support of mapping IRC controller configurations on Excel 500 controllers (OS XLIRC), which provides basically the same functionality as Excel OS 1.3 except active bus wide MMI tool functionality (BMMI).

CARE offers the ability to map a defined set of IRC Multicontroller fixed application registers to Excel 5000 system user addresses that are accessible via an XBS central or local user interfaces. If defined, room specific time programs can be downloaded to an IRC Multicontroller.

The new features are added to the CARE *Default Text Editor* and to the *Miscellaneous Text Editor*.

## Default Text Editor

CARE provides sets of default files available for each new controller, which can be edited or created by the *Default (Text) Editor* (DEFT). Creating of new default files is only possible by copying an existing file set and then editing this copy.

This Editor of menu bar item *Database* is enhanced by two additional features for editing *Register Class Names* and the *Engineering Units Mapping Table* in an OS XLIRC default .ADL file.

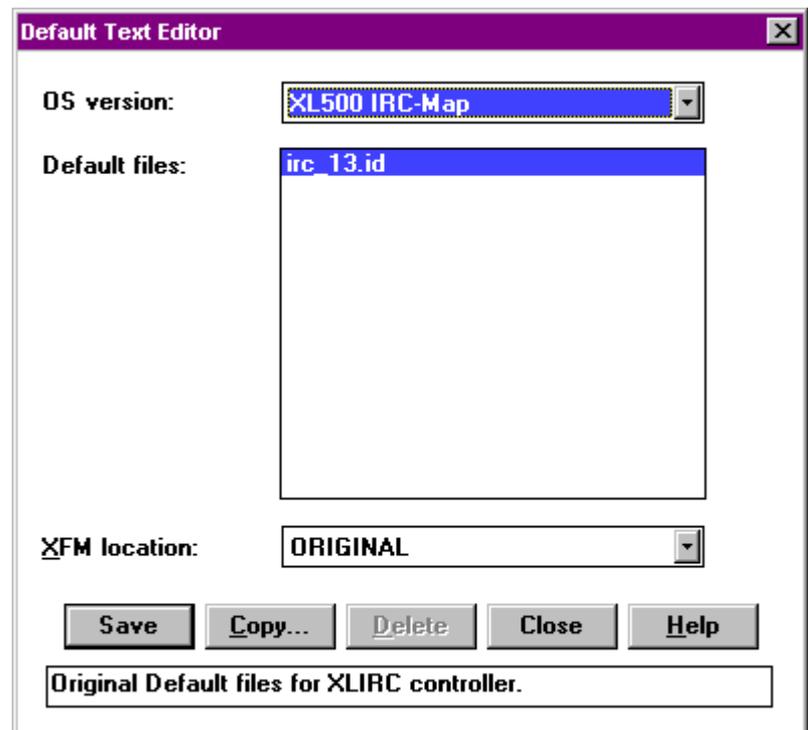
When the selected default file set has OS version *OS XLIRC*, the new item *OS XLIRC* of DEFT menu bar item *Edit* opens with a sub menu containing the two items *Register Class Names* and *Engineering Units Mapping Table*.

For default text editing refer to Appendix: Default Text Editor.

**Purpose** Select default file of IRC Multicontroller configuration

**Procedure** 1. Dropdown menu bar item *Database* and select *Default Editor*.

CARE opens *Default Text Editor* box.



2. Pull down *OS version* window and select *XL500 IRC-Map*.

CARE displays all the default files available for OS version *XL500 IRC-Map* (*OS XLIRC*).

3. Select specific default file, confirm with **Save** and select **Close**.

**RESULT:** CARE provides with specific IRC multicontroller default file to be edited.

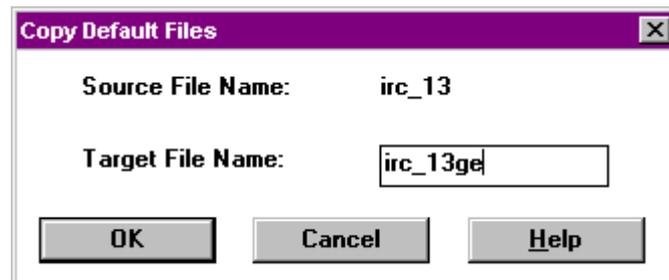
To edit the specific XLIRC features refer to *IRC Register Class Names (DEFT)* or *IRC Engineering Units (DEFT)* to edit other default features refer to the main body of this manual.

Default files can be edited or copied to create a new file, default file set(s) can be deleted.

**Purpose** Create new default file for IRC Multicontroller configuration

- Procedure**
1. Dropdown menu bar item *Database* and select *Default Editor*.
  2. Pull down *OS version* window and select *XL500 IRC-Map*.
  3. Select specific default file and click **Copy**.

CARE displays the *Copy Default Files* box with the selected file name as Source File Name and the same name for Target File Name.



4. Enter new target file name and confirm with **OK**.

CARE returns to *Default Text Editor* box.

5. Pull down *OS version* window and select *XL500 IRC-Map* again.

CARE displays all the default files including the new file available for OS version *XL500 IRC-Map (OS XLIRC)*.

6. Select new default file in the *Default Text Editor* box, confirm with **Save** and select **Close**.

**RESULT:** CARE returns to *Default Text Editor* for editing the selected new file.

In order to edit the specific XLIRC features refer to *IRC Register Class Names* or *IRC Engineering Units*, to edit other default features refer to the main body of this manual.

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## IRC Register Class Names (DEFT)

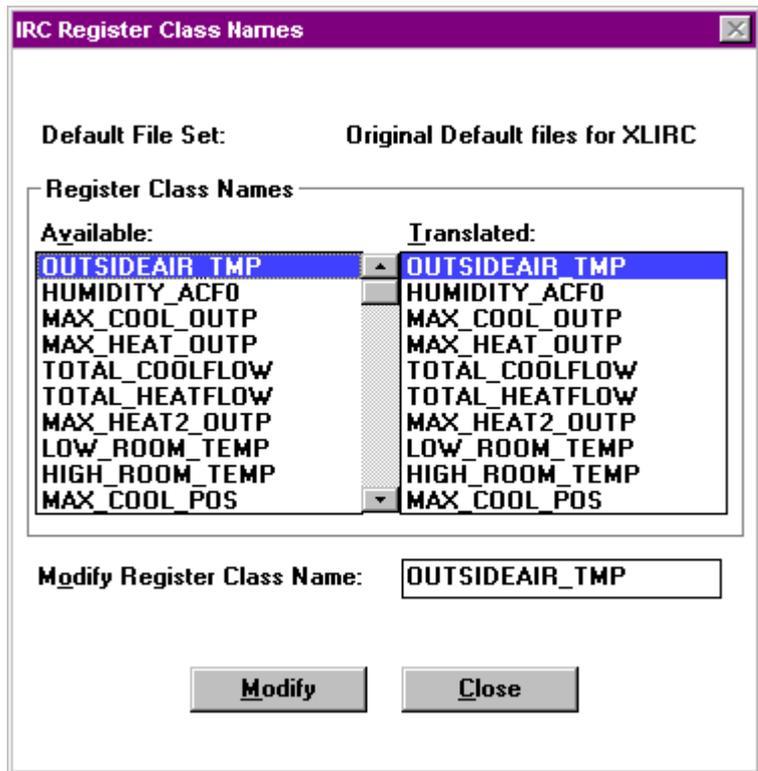
After selecting an IRC multicontroller default file, the class names of the IRC registers can be modified.

**Purpose** Modify IRC register class name

- Procedure**
1. Pull down menu bar item *Edit* of CARE Default Editor and select *Register Class Names* of item *OS XLIRC*.

**NOTE:** Item *OS XLIRC* only occurs if default file is of version XLIRC.

CARE Default Editor displays the *IRC Register Class Names* box.



2. Select the register class name to be modified.

CARE Default Editor displays selected register class name in the *Modify Register Class Name* window.

3. Edit register class name and click **Modify** to confirm the modification.
4. Select another register class name to be modified or click **Close** to close the box.

RESULT: The default file contains modified register class names, which are available for each new controller.

NOTE: Opening the *IRC Register Class Names* box at another time, the new IRC register class names occur in the *Register Class Names* windows *Available* and *Translated*.

## IRC Engineering Units (DEFT)

After selecting an IRC multicontroller default file, the texts of the IRC engineering units can be mapped to another number.

**Purpose** Modify mapping of IRC engineering unit

- Procedure**
1. Pull down menu bar item *Edit* of the CARE Default Editor and select *Engineering Units Mapping Table* of item *OS XLIRC*.

NOTE: Item *OS XLIRC* only occurs if default file is of version *XLIRC*.

CARE Default Editor displays the *Engineering Units Mapping Table* box.

2. Select the IRC engineering unit in the *IRC Engineering Unit* window.

CARE Default Editor marks the selected IRC engineering unit and the CARE engineering unit opposite, and displays the appropriate unit texts.

3. Select a CARE engineering unit of the same type with another number in the *CARE Engineering Unit* window and click **Modify** to confirm the modification.
4. Select another IRC engineering unit to be remapped or click **Close** to close the box.

RESULT: The IRC engineering unit is mapped on another CARE engineering unit.

### IRC Register Class Names (MISC)

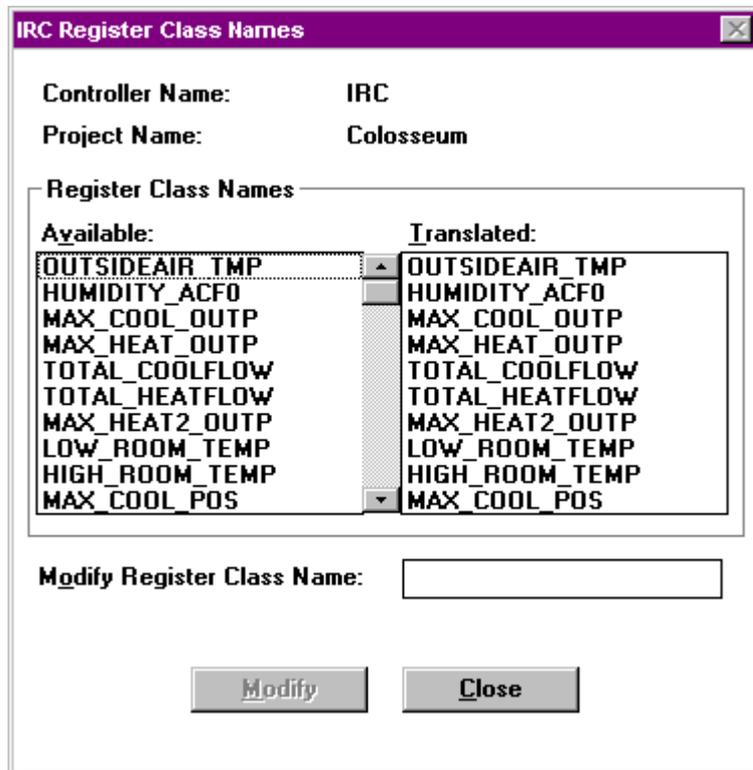
After selecting a current IRC multicontroller, the class names of the IRC registers can be modified.

**Purpose** Modify IRC register class name

- Procedure**
1. Pull down menu bar item *Edit* of CARE Miscellaneous Text Editor and select *Register Class Names* of item *OS XLIRC*.

NOTE: Item *OS XLIRC* only occurs when the selected controller is of version XLIRC.

CARE Miscellaneous Text Editor displays the *IRC Register Class Names* box for the selected controller.



2. Select the register class name to be modified.

CARE Miscellaneous Text Editor displays selected register class name in the *Modify Register Class Name* window

3. Edit register class name and click **Modify** to confirm the modification.
4. Select another register class name to be modified or click **Close** to close the box.

RESULT: The controller files now contain modified register class names, which are available for the selected controller.

NOTE: Opening the *IRC Register Class Names* box at another time, the new IRC register class names occur in the *Register Class Names* windows *Available* and *Translated*.

### IRC Engineering Units (MISC)

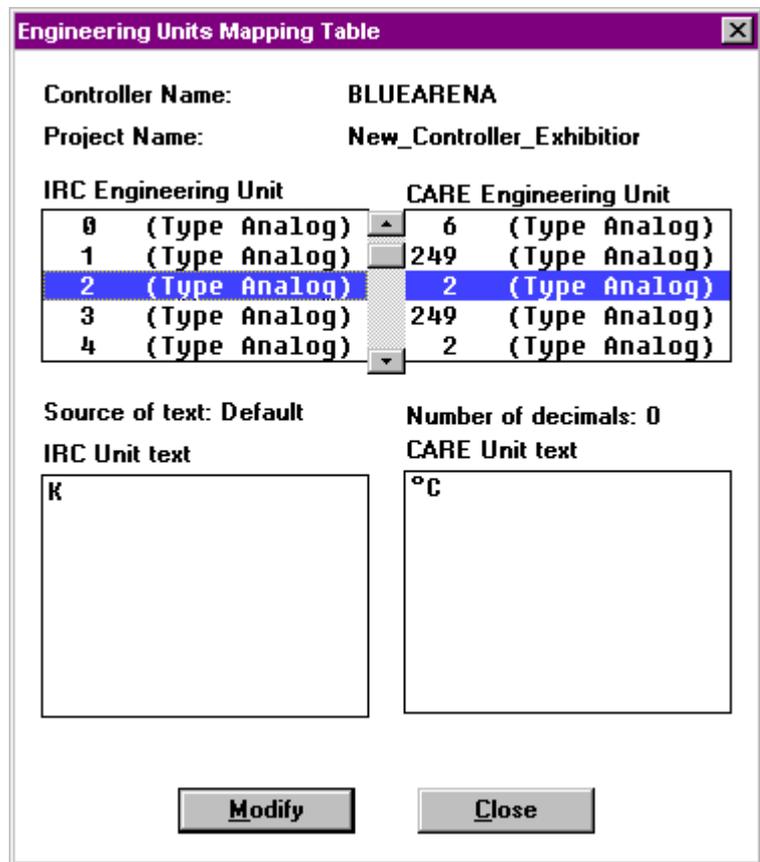
After selecting a current IRC multicontroller, the IRC engineering units can be mapped to another number.

**Purpose** Modify mapping of IRC engineering unit

**Procedure** 1. Pull down menu bar item *Edit* of the CARE Miscellaneous Text Editor and select *Engineering Units Mapping Table* of item *OS XLIRC*.

NOTE: Item *OS XLIRC* only occurs when the selected controller is of version XLIRC.

CARE Miscellaneous Text Editor displays the *Engineering Units Mapping Table* box.



2. Select the IRC engineering unit in the *IRC Engineering Unit* window.  
CARE Miscellaneous Text Editor marks the selected IRC engineering unit and the CARE engineering unit opposite, and displays the appropriate unit texts.
3. Select a CARE engineering unit of the same type with another number in the *CARE Engineering Unit* window and click **Modify** to confirm the modification.
4. Select another IRC engineering unit to be remapped or click **Close** to close the box.

RESULT: The IRC engineering unit is mapped on another CARE engineering unit.

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## OS 1.1/1.1.30 Support

A feature of CARE 7.01.02 is the support of downgrading controller configurations to *OS version 1.1* and creating controllers and plants with *OS version 1.1.30*.

CARE offers the ability to downgrade controller configurations as long as the engineered controller allows you to do so. If there are controller or plant restrictions, which do not allow to downgrade, CARE displays the appropriate error message and does not change the OS version.

Refer to the introduction of this appendix:

- For all other processes corresponding to downgrading a controller configuration.
- To create controllers and plants with OS version 1.1.30.
- For information about general restrictions for creating and downgrading of controllers and plants with this version.

Special restrictions for plants with this OS version include no support of:

- Flexible Multistage Points
- Flexible DO\_Feedback\_DI Points
- Flexible Pulse\_2 Points
- Fast AI Points
- Fast Analog Input Points
- Pulsed Digital Output Points

NOTE: Unattached plants containing those points cannot be attached to a controller with OS version 1.1.30.

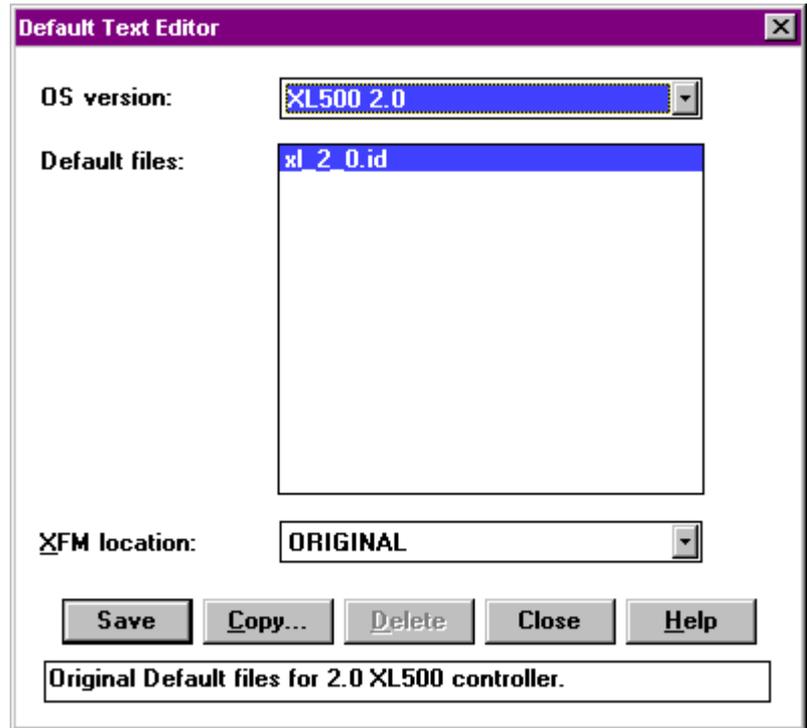
## APPENDIX E: DEFAULT TEXT EDITOR

**Purpose** Customize project defaults for use in a specific area or region. After you create a modified file, you can use it for any project created by that CARE PC.

Default files have a file extension of ID. Default files correspond to different versions of controllers. For example, the default file for Excel 500 Controllers, OS Version 1.2, is called xl\_1\_2.id. For OS Version 1.3, the file is called xl\_1\_3.id.

**Procedure** 1. Click menu item Database, then submenu item Default Editor.

RESULT: The Default Text Editor window displays. Example:



OS version List of OS versions that you can choose (down arrow):

Controller	OS										
	1.0	1.01	1.1	1.2	1.3/1.4	IRC-Map	1.5	2.0/2.1	2.03	2.04	2.06
XL50								x	x	x	x
XL80			x	x	x	x	x				
XL100			x	x	x	x	x	x	x	x	x
XL500			x	x	x	x	x	x	x	x	x
XL600				x	x						
XL Smart								x	x	x	x
ELINK	x	x									

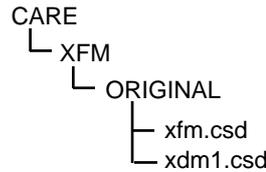
Default files

List of default files available for the selected OS Version. The xl\_1\_2.id file is the standard default file for Excel 500 OS version 1.2. You can change this list by selecting a different OS version (previous field).

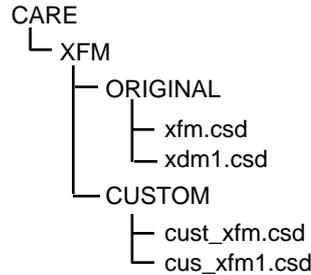
XFM location

XFMs are installed in subdirectories under the CARE directory. This field shows the location (subdirectory) where the XFMs are located.

For example, the standard location is named ORIGINAL:

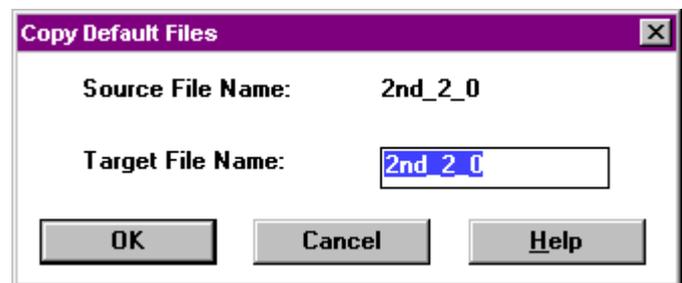


You can create additional subdirectories under CARE\XFM if a different subset of XFMs is required, but they must be located in the CARE\XFM\ directory. Example with a new subdirectory called CUSTOM:



The CUSTOM subdirectory displays in the XFM location field. You can have a custom set of XFMs for each default file, if required.

- Save Use the currently selected default file and open the Default Text Editor main window after selecting Close. You can now edit the selected file.
- Copy Create a new default file by copying the selected default file. You can then name and edit the new file to have different defaults. The Copy Default Files window displays. Example:



Enter a name for the new file in the highlighted Target File Name box. Click **OK** to save and then open the main Default Text Editor window.

- Delete Erase the currently selected default file.
- Close Close this window.
- Help Display the on-line help topic for this window.
- Original... Information line about the currently selected default file.

**2. Select a default file, click **Save** and **Close**. Or, **Copy** a default file.**

**RESULT:** The main CARE Default Editor window displays so you can edit the selected/new file. File name displays in the title bar. Example:

File	<p>Two drop-down items display:</p> <p><b>Select</b> redisplay the first Default Text Editor window so you can choose a different default file.</p> <p><b>Exit</b> closes the Default Text Editor and returns to CARE.</p>
Edit	<p>The following dropdown items display so you can edit the default text values for the selected file.</p> <p><b>Engineering Unit (analog and digital)</b> <b>I/O Characteristics</b> <b>Point Descriptors</b> <b>Alarm text</b> <b>System Alarm</b> <b>*XL10 Alarms</b></p> <p>The edit windows that display are the same as the ones described in the Editors chapter of this manual. See that chapter for details.</p> <p><b>*XL10 Alarms</b> only applies when ELINK 1.01 was selected. This item allows for changes to the standard alarm messages that are part of the new VAV2 Controllers programmed by the E-Vision tool. This item allows you to change the text in the alarm messages to a different language, if required.</p>
Help	<p>Two dropdown items display:</p> <p><b>Help</b> displays the on-line help topic for this window.</p> <p><b>About</b> displays the About dialog box that shows software version number and available memory.</p>

3. Select each Edit item and modify as desired. When through, click File, Exit to close this window and return to CARE.

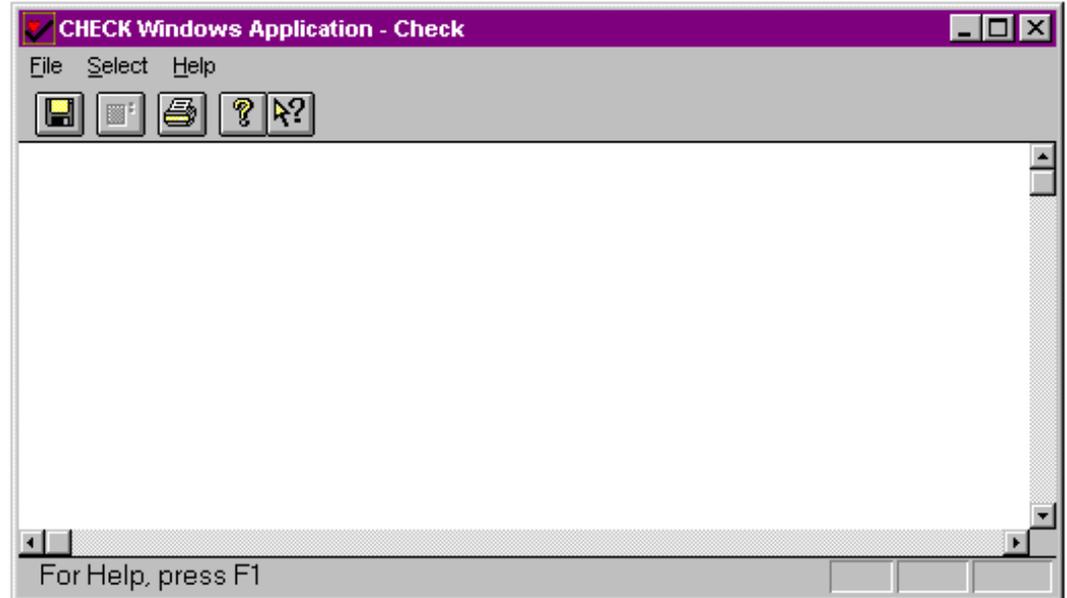


## APPENDIX F: CHECK UTILITY

**Purpose** This chapter describes the check utility that looks at multiple selected projects to find non-unique user addresses and controller names.

**Procedure** 1. Click menu item Project, then submenu item Check User Addresses.

**RESULT:** The CHECK Windows Application Check window displays.  
Example:



The Menu Bar Description note following this procedure describes menu bar and button bar options.

2. Click menu bar item Select, then dropdown item Projects. Or, click the select project button in the button bar (second button from the left).



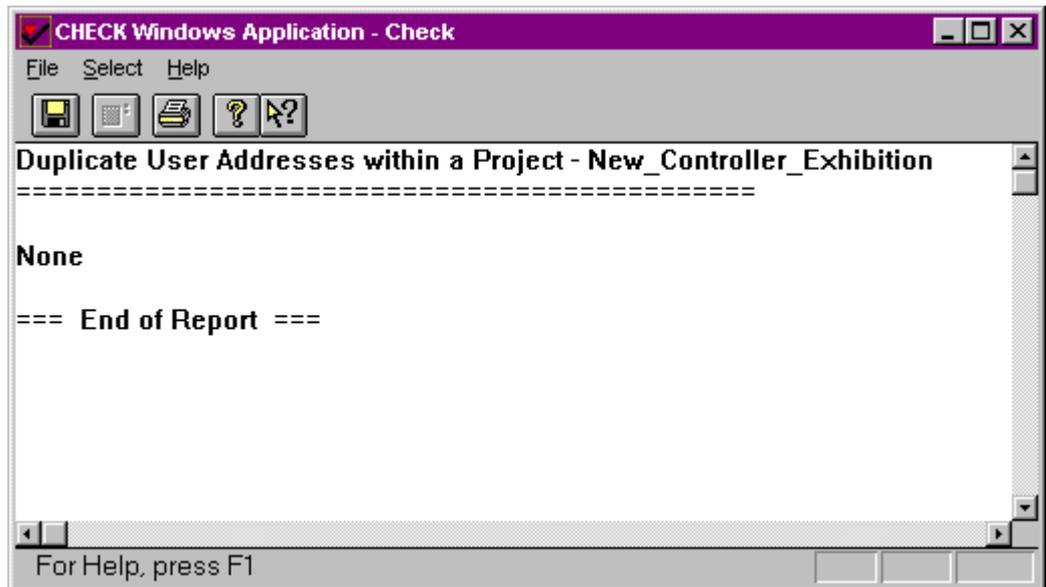
**RESULT:** The Project Selection dialog box displays with a list of all projects in the CARE database.

3. Click one or more project names to select them to be checked. Click **OK** to begin the check process.

**NOTE:** After you click **OK**, you cannot return to this selection dialog box and select other projects. You must exit the check utility and restart it to check other projects.

To deselect a project, click it again. To exit without selecting any projects, click **Cancel**.

**RESULT:** When the check utility is through, the results display in the check window. Example:



The first section of the display lists controller names that were found in more than one project. In this example, the name CPU1 was found in a project named AnothProject and also in a project named TwinTowers.

The next section of the display lists user addresses found in more than one project. In this example, user address MaDmpr was found in both the AnothProject and the TwinTowers project.

The end of the display is labeled with the words COMPARISON COMPLETE.

4. You can print the results, save them to a file, and/or exit the utility.



To print the results, click menu bar item File, then dropdown item Print. Or, click the print button in the button bar (third from the left). The Print dialog box displays so you can select print options.



To save the results to a file, click menu bar item File, then dropdown item Save As. Or, click the save as button in the button bar (first one on the left). The Save As dialog box displays so you can enter a file name and location where software should save the file.

To exit the utility, click menu bar item File, then dropdown item Exit. Or, double-click the Ventilator icon in the upper left-hand corner of the window.

**Menu Bar Description**

The menu bar contains three items, File, Select, and Help. The button bar contains buttons that provide a shortcut to selecting the menu bar items. The following text describes each menu bar item and shows its associated button, if one exists.

File The File menu bar item provides the following dropdown items:



Save As Display the Save As dialog box to specify a file name and location where software should save the check results.



- Print** Display the Print dialog box to select print options (range of pages to print, number of copies, etc) and print the check results. Shortcut keys: **Ctrl P**.
- Print Preview** Display the check results in a preview window as they would appear if printed. The print preview window replaces the check window and allows you to view either one or two pages at a time; move through the document; zoom in and out of pages; and initiate a print.
- Print Setup** Display the Print Setup dialog box to specify a printer and other print options. You can also display this dialog box from the Print dialog box (Print dropdown item).
- Exit** Close the check utility function. You can also double-click the Ventilator icon in the upper left-hand corner of the window to end the check session. Or, use the shortcut keys (**Alt F4**).



- Select** The Select menu bar item provides one dropdown item, Projects. This item displays the Project Selection dialog box that lists all current CARE projects. You use this dialog box to specify which projects you want the check utility to search. See Step C in the previous procedure for more details and a dialog box example.
- Help** The Help menu bar item provides three dropdown items:
- Index** Display the Table of Contents topic in the on-line help file for the check utility. See On-Line Help in the Getting Started chapter of this manual for details on help files.
- Using Help** Display the Table of Contents topic in the on-line help file for the check utility. See On-Line Help in the Getting Started chapter of this manual for details on help files.



- About CHECK** Display the About dialog box to view the version number of the check utility.

### Context-Sensitive Help



The button bar provides a context-sensitive button that changes the cursor to a help question mark. Move the help cursor to the area of the window where you want more information and click the mouse button. The help topic related to that area of the window displays.

- Troubleshooting** The following text lists problems that may occur and suggests actions you can take.

- Incomplete Reports** A report may not display in its entirety because software generated more data than can fit in the window buffer. You can view the entire report by printing it or saving the results to a file and then printing or viewing the file. Or, you can run the check utility again but with fewer projects selected. Edit the projects in CARE to remove duplications and run the check utility again.
- Memory Exceeded Message** Software generated more data than can fit in available memory. Run the check utility again but with fewer projects selected. Edit the projects in CARE to remove duplications and run the check utility again.
- No Data Base** The check utility executable file (CHECK.EXE) must reside in the same directory as the CARE database. If it is not, copy CHECK.EXE into the same directory as CAREMAN.EXE.
- No Projects Found in Data Base** Software found a CARE database, but it does not contain any projects. Verify that the check utility is in the correct directory (CHECK.EXE must be in the same directory as CAREMAN.EXE) and that the correct version of the CARE database is also there.



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**APPENDIX G: ERROR MESSAGES**


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**Purpose** This chapter lists error messages that can appear during various CARE functions (alphabetically arranged) and a list of error messages that can occur during RACL generation.

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**General Errors**


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Message	Description
Alarm Message	An Alarm message dialog box may display after a controller download. The box displays date and time, user address and value/status (if relevant), and an alarm message. This Appendix lists some of the alarm messages that can display.
Communication problems	<p>When you exit CARE, the serial port used for communication with controllers may remain in use and thus be unavailable to other software applications.</p> <p>You can use the Control Panel 386 Enhanced function to issue a warning message whenever two applications attempt to control the same COM port. The 386 Enhanced function dialog box lists available COM ports in the Device Contention box. Select the COM port CARE uses and enable the Always Warn option.</p> <p>When the warning message occurs, reset the serial port. The Windows™ Terminal function can usually release the serial port and make it available for the next application. Start the Terminal function. The Terminal window displays with a menu bar that includes a Settings item. Select Settings, then the Communications dropdown item. When the Communications dialog box displays, select the COM port in question, click <b>OK</b>, and then exit the Terminal function.</p> <p>Try running the new application. If the application will not communicate (for example, no data is available), close the application, reboot the PC, and restart the application.</p>
Controller already exists	While establishing a new controller, you entered the name and number of an existing controller. Change the name and number.
Control loop is incomplete or Control strategy is incomplete	The control loop created is not completely connected. Check out the control loop.
Duplicate math output name. Names must be unique.	If you enter a new formula name in the New Variable Name dialog box and another formula already exists with that name, this message displays. All formula names must be unique within a controller. The New Variable Name dialog box displays from the Math Editor dialog box. See Switching Logic, MATH Rows section for an example of the Math Editor dialog box.
Error establishing data	Internal database error. This error cannot be eliminated.
Hardware point cannot be modified	The physical point type selected cannot be modified.
HW Config. failure	This message may display in an Alarm Message dialog box after a download to a controller. The message means that there are not enough hardware modules or enough of the right type of hardware modules to support the database. For example, there may be digital output points in the database but no digital output modules in the controller.

HW Conf. too large	This message may display in an Alarm Message dialog box after a download to a controller. The message means that the database requires less hardware than the controller physically has. For example, an Excel 500 controller may have two analog input boards, but the database requires only one. This alarm always appears when loading an Excel 80A or 100A controller if the points required are less than or equal to one Excel 500 module. For example, an Excel 100A can have 12 analog inputs but if the database has 8 or less inputs (the size of an XF521 or XF526 board), the alarm displays.
Illegal character in math expression Illegal character in User Address	These messages display after entry of a math formula in the Math Editor dialog box. See Switching Logic, MATH Rows section for an example of the Math Editor dialog box. See Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) for rules for formula entry.
Insufficient hard disk capacity to print	The Windows™ print spooler could not establish the spooler file on the PC disk. As a result, the printing operation will take longer. Delete unnecessary files from the PC disk.
Insufficient memory or Insufficient memory space	There is insufficient memory available for the selected function. Divide the action into several steps and repeat.
Insufficient memory to print	The main computer memory is inadequate to print. Increase the main computer memory.
Invalid entry	The entry made in the mathematical editor is incorrect. Correct the mathematical formula.
Invalid password	The password entered is incorrect. Repeat password entry.
Invalid user address	The user address entered is incorrect. Only letters and numbers may be used.
Macro cannot be deleted	The selected macro cannot be deleted.
Macro name already exists	An attempt has been made to overwrite an existing macro. Select another name, one that does not exist, in order to save the macro.
Macro name does not exist	The macro name given does not exist in the database.
Mathematical function could not be saved	The formula in the mathematical editor could not be saved. Try to save again.
Maximum number of hardware points reached in controller or Maximum number of hardware points reached in plant	The maximum number of physical points for a controller has been exceeded. A maximum of 128 different physical points may be specified.
Maximum number of modules exceeded or Maximum number of modules reached in the controller	The maximum number of modules for a controller has been exceeded. One EXCEL 500 Controller can contain a maximum of 16 input/output modules.
Maximum number of PID controllers per plant has been reached or Maximum number of PID controllers exceeded	The maximum number of controllers in the plant have been exceeded. Maximum number of controllers per plant is 20.
Maximum number of software points exceeded	The maximum number of pseudopoints for the controller has been exceeded. A maximum of 256 different pseudopoints may be defined.
Minimum value > maximum value	While entering internal parameters, the lower limit has been set above the upper limit.

Missing double quote	This message can display after entry of a math formula in the Math Editor dialog box. All user addresses in a formula must be surrounded by double quotes. See Switching Logic, MATH Rows section for an example of the Math Editor dialog box. See Excel CARE Control Icons User Guide 74-5577 (US) / EN2B-0184 (Europe) for rules for formula entry.
More than 128 T-registers in module	The maximum number of T-registers (time registers) has been exceeded. Maximum number of T-Registers is 128.
More than 128 X or Y-Registers in module	The maximum number of X-registers or Y-registers has been exceeded. Maximum number of X or Y-registers is 128.
Name/Number/Type conflict	The name or the number of the new controller created already exists.
No controller assignment for project	The selected controller has not been used in the selected project.
No controller in database	CARE cannot find the controller in the database.
No controller in the project	A controller has not been established for this project.
No control loop found	No control loop has been created for the plant selected.
No control loop symbol found	CARE cannot find the control loop icon. Exit from the control strategy. Recall the control strategy again.
No element information	CARE cannot find any information about the elements of the selected segment.
No memory for polynomial	There are too many pivot points. Reduce the number of pivot points.
No more memory available	CARE has exceeded the memory. Increase the memory size of the computer.
No plant for the controller	No plant has been assigned to the selected controller.
No plant in database	CARE cannot find a plant in the database belonging to the project.
No plant type in database or No plant type exists	CARE cannot find a plant type in the database for the plant selected.
No printer found in WIN.INI	No printer has been entered in the WIN.INI file. Please install the printer and then recall the function again.
No software point exists	A pseudopoint has not been created for the plant selected.
No software point has been selected	A pseudopoint box has not been selected on the pseudopoint bar. Select a box on the pseudopoint bar to eliminate the error.
No switching table exists or No switching table found	No switching table has been created for the plant selected.
No text selected	If you click a Copy or Cut button and you have not highlighted any text to copy or cut, this message displays. For example, the Math Editor dialog box has Cut, Copy, and Paste functions that would generate this error. See Switching Logic, MATH Rows section for an example of the Math Editor dialog box.
Now removing controller application files due to changes in database. Please retranslate this controller.	This notice means that the controller has been translated but changes have been made to its files. These changes were made with one of the editors (Miscellaneous Text, Data Point Description, or Time Program). This notice appears when you exit an editor. You should retranslate the controller.
Number of columns > 128 in one module	The maximum number of columns has been exceeded. Maximum number of columns is 128.
Number of parameter registers in Module > 128	The maximum number of parameter registers has been exceeded. Maximum number of parameter registers is 128.
Number of submodules > 127	The maximum number of submodules (subprograms) has been exceeded. Maximum number of submodules is 128.
Number of Z-registers in module > 128	The maximum number of Z-registers (dynamic registers) has been exceeded. Maximum number of Z-registers is 128.
Paste buffer is empty	If you click a Paste button and you have not copied or cut any text, this message displays. For example, the Math Editor dialog box has Cut, Copy, and Paste functions that would generate this error. See Switching Logic, MATH Rows section for an example of the Math Editor dialog box.

Plant already exists	The newly created plant has been given the name of a plant that already exists. Select a new name that does not already exist.
Plant could not be assigned to controller <Controller Name>	The desired controller could not be assigned to the plant. Assign another controller to the plant.
Plant segment cannot be added	The maximum number of plant segments has been reached.
Price data not available	The calculation routine in CARE cannot find the price data. Copy the price data file (CAREKALK.DAT) from the diskette into the CARE directory on your PC disk.
Printer set for portrait format. Do you want landscape format?	If portrait format is preselected, this question displays before printing the plant graphics. Landscape format can then be reset.
Project already exists	An attempt has been made to assign an existing project name to a new project. Please choose another name that does not already exist.
Project <Name> does not exist	The selected project does not exist.
Segment cannot be deleted. It is still connected	The segment to be deleted from the plant is still in use elsewhere in the plant. This segment can only be deleted once it has been removed from all relevant control loops or switching tables.
Several switching tables for user address	This warning may appear during a plant translation. It means that more than one switching table commands the same point. This situation is very common with analog points and sometimes with digital points. It could be a problem if you have inadvertently created two switching tables commanding the same point to do opposite actions. You may want to check your tables.
Software address already exists	A new pseudopoint user address already exists. Please select a new user address.
Software point could not be established	The pseudopoint cannot be generated because an existing user address has been used. Modify the user address.
Switching table not included in macro library	The switching table cannot be included in the macro database. Repeat the save as a macro.
Switching table not saved due to missing user address	The user address for the control device has been omitted from the switching table being loaded as a macro.
This user address already exists or User address already exists in controller. Modify?	Two plants have been assigned to one controller. In both plants, at least one user address is identical so the controller does not know which plant to associate with it. Take care to ensure that identical user addresses are not used when a controller controls more than one plant.
Translate function gray	If the Translate item is gray (unavailable) under the Controller menu, one or more of the control strategies for the current plant may be incomplete.
Unknown point type	CARE does not recognize the selected plant type. Perhaps a blank space has been included in the new name during renaming or copying? Currently, only the heating and air conditioning plant types exist.
WIN.INI error. Change printer	There is an error in the WIN.INI file. Call up the "Change..." function in the printer menu.

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## RACL Generation Errors

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RACL generation errors are usually a result of insufficient memory or wrong data from the database. Suggestions:

- Check the following list of messages.
- Try closing other open applications and/or rebooting the PC.
- For database problems, try retranslating the controller and/or detaching and attaching the controller.

If an internal error displays, the real cause may stem from other software applications in Windows™ or DOS rather than from RACL. Again, rebooting may help.

Message	Description
!!! No control loop found !!!	No control loop has been defined in CARE. This is a warning.
No control loop icon found	An empty control loop has been found. Loading does not make sense.
Insufficient memory	More memory is required.
Memory lock error	A memory block could not be locked. This error should not occur in Windows™ 3.1
Error in data base function	A database function returned an error code.
Nullpointer in parameter list	A local memory handler function in RACLGEN got a null pointer. This error should never occur in a final version.
Invalid parameter list handler	This text is wrong. It should be "Invalid handle in parameter". It says that a memory block handle passed to a RACLGEN memory handler function is null.
Memory reallocate error	Error in memory handler.
Inconsistency in CARE database	The data from the CARE database is not plausible. Possible causes: - an empty input connection in a control loop. - unknown delay type in a switching table
Parameter error in function	This message is no longer in use.
Array overload error	This message is no longer in use.
!!! No switching table found !!!	No switching table has been defined in CARE. This is a warning.
Specified memory size > 64K	A memory block greater than 64 has been requested. Possible causes:  --a large application in CARE - wrong database connection information which leads to an open connection in RACL.
Module: more than 128 T-registers More than 128 X or Y-registers in modules Number of module parameter registers > 128 Number of module Z-registers > 128	Too many registers of the specified type required for the application.
Trying to connect outside of a symbol	Attempt to connect two RACL symbols where the requested input/output is above the existing connectors.
Trying to connect two data points without I/O statement	Internal RACL error that should never occur.

Internal memory inconsistent	<p>A plausibility check of RACLGEN's internal database detected an error. Possible causes:</p> <ul style="list-style-type: none"> <li>- any input connection at a MAT symbol.</li> <li>- an undefined input type in the internal RACL chart.</li> <li>- an undefined output type in the internal RACL chart.</li> <li>- attempt to connect two RACL symbols, which do not have the appropriate number of inputs and outputs.</li> <li>- an unknown point type when loading the .IPL file.</li> </ul> <p>For example, if you use a Math statement that includes a flag in a control loop that also uses an XFM, software generates incorrect code during plant translation. See the Control Strategy chapter, Pseudopoints and Flags, for details.</p>
Switching table overflow (too many rows, columns or XOR's)	A switching table has too many rows, columns, or XORs.
User address or address type not found	A point name has been referenced that cannot be found in the data read from the .IPL file. In many cases, this error is a result of a reversed notation in a MAT function.
Invalid type for input data point	Attempt to access input in a way that is only allowed for outputs. This error does not normally display. If it does, there may be an error in the database data.
Invalid type for output data point	Attempt to access output in a way that is only allowed for inputs. This error does not normally display. If it does, there may be an error in the database data.
Mathematical function stack underflow	Internal MAT function stack underflow. This error should never occur.
Error interpreting the mathematical function row	Usually, this error means there is wrong data in the database.
Error: Recursion in mathematical function row	Another MAT function is referenced in a MAT function.
Invalid type of CARE symbol conversion	An unknown symbol has been read from a control loop.
Function not supported	This message is no longer in use.
Type of data point used in this location not permitted	The type connected to the symbol must be a point.
No plant for the active controller available	No plant found in the database. This error does not usually occur.
Program stack overflow	Too many recursions have been made to convert a MAT function.
Number of submodules > 127 Number of columns in a module > 128	Excessive number of submodules or columns in a module.
RACL opcode not supported	An internal error in RACLGEN that should not occur.
Too few internal parameter in CARE symbol	Too few parameters for a control loop symbol from the CARE database.
Too few X-registers in symbol	An internal error in RACLGEN that should not occur.
No columns in switching table No rows in switching table XOR tables with only one column or row forbidden Multiple columns with only one row forbidden	Invalid switching table read from the database.
Inputs must be continuously connected	Inputs of a control loop symbol have not been continuously connected.
No more space for message	Message listbox overflow.
Switching table function values buffer overflow	Too many switching tables defined for one point.
The index definitions for standard files missing	This text is wrong. It displays when the directory for the XI584 standard files is not defined in the CARE.INI file.
The index definitions for XI583 missing	This text is wrong. It displays when the directory for the XI584 and CARE.EXE files is not defined in the CARE.INI file.
The standard files name definitions missing	The name for the standard files is missing in the CARE.INI file.

Warning. Application is too big	The sum of all application parts exceeds the maximum defined in RGWRFILE.C. The algorithm is also in RGWRFILE.C
Error opening or reading XL100, XL80 intermediate file Data point description file not found	These messages are no longer in use.
Error opening temporary switching table file Error generating temporary switching table file Error reading temporary switching table file Error writing to temporary switching table file Error deleting temporary switching table file Error writing to temporary control loop file Error reading the temporary control loop file Error deleting the temporary control loop file	RACLGEN creates a temporary file for each switching table and control loop. These messages indicate file I/O errors.
Error generating the loadable T-register file Error generating the loadable Z-register file Error generating the loadable P-register file Error generating the loadable EXCEL code file Error generating the loadable EXCEL code or P-register file Error generating the loadable EXCEL code file	File I/O error in the last pass in RGWRFILE.C
Error copying the XI583 standard files Error opening the project file Error reading the project file	These messages are no longer in use.
Error generating the reference file	The function for writing the reference file is in RGWRFIL1.C, but the error is in RGWRFILE.C based on the return code.
Error whilst loading engineering units	The function for reading engineering units is in RGINIT.C, but the error is in RGWRFILE.C based on the return code.
User address (or value of operand) >127	A plausibility check message in RGWRFILE.C while creating the RACL code file. It always indicates an internal error where the real cause may stem from other software applications in Windows™ or DOS rather than from RACL. Rebooting may help.
Error in submodule file	An error while loading and linking an XFM in RGWRFILE.C.
Error in Input assignment! Error in Output assignment!	An illegal connection between control symbols was found in RGSETSYM.C. The problem is usually wrong data from the database.
Error in internal XFM-Symbol parameters!	An empty file name or wrong version of an XFM was found in the database.
Datapoint for XFM->CSD assignment not found!	An XFM references a point that cannot be found in the point list of RACLGEN, normally the contents of the .IPL file plus CARE flags and mathematical function names.
Different version of XFM symbol and .CSD file!	The version of an XFM in the database and the referenced file does not match.
File is not a .CSD file for Honeywell-CARE!	Illegal file header found in a .CSD file.
Too much datapoints in .CSD File!	The number of points in a .CSD file exceeds 255.
Error in Command Line	Syntax error in run-time command line of RACLGEN.
Illegal project name!	No project name passed via run-time command line.
Illegal target controller name!	No target controller passed via run-time command line.
Error opening data point description (.IPL) Error opening data point text description (.KFX)	Open error in RGPCB_IN.C.
Maximum number of software points exceeded	More than 128 software points found in RGPCB_IN.C.
There was an error accessing the Environment Record There was an error creating the Alarm Text File There was an error creating the Analog Eng Units File There was an error creating the Digital Eng Units File There was an error creating the Point Descriptor File There was an error creating the Time Program File There was an error creating the Characteristics File	Database and file I/O errors in RGMKFILE.C.

Illegal or duplicate datapoint access!	Writing access to one point has been attempted: <ul style="list-style-type: none"><li>- from more than one symbol in one or more control loops</li><li>- from an internal XFM reference and from anywhere outside</li><li>- from more than one switching table.</li></ul>
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## BACNET

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**NOTE:** Before engineering a BACnet network, it is strongly recommended to get familiar with BACnet technology.

For BACnet network engineering, some steps are common with the CARE standard steps such as:

- Creating projects
- Creating Excel Web controllers
- Creating plants
- Creating datapoints
- Assigning LON devices to Excel Web controllers

The following steps will be performed differently when engineering an HVAC application running on the BACnet bus.

- Creating schedules and calendars
- Creating control strategy and switching logic
- Defining general BACnet-bus properties
- Creating a skeletal structure consisting of subsystems and subnets
- Defining IP address ranges for Excel Web controllers
- Creating BACnet 3<sup>rd</sup> party devices
- Modeling the network structure by creating or deleting subsystems, subnets and 3rd party BACnet devices
- Moving BACnet devices between subnets
- Setting up Excel Web controllers
- Adapting the alarming to the EBI central and 3<sup>rd</sup> party BACnet clients by creating notification classes.
- Defining user access rights

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### Create Excel Web Project

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Please refer to the PROJECTS DEFINITION AND MANAGEMENT chapter.

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### Create Excel Web Controller

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**Purpose** To create an Excel Web Controller. The BACnet-Bus subnet, into which the controller should be placed, must have been already created. The presetting for the default subnet is IP-Subnet 1.

***IMPORTANT***

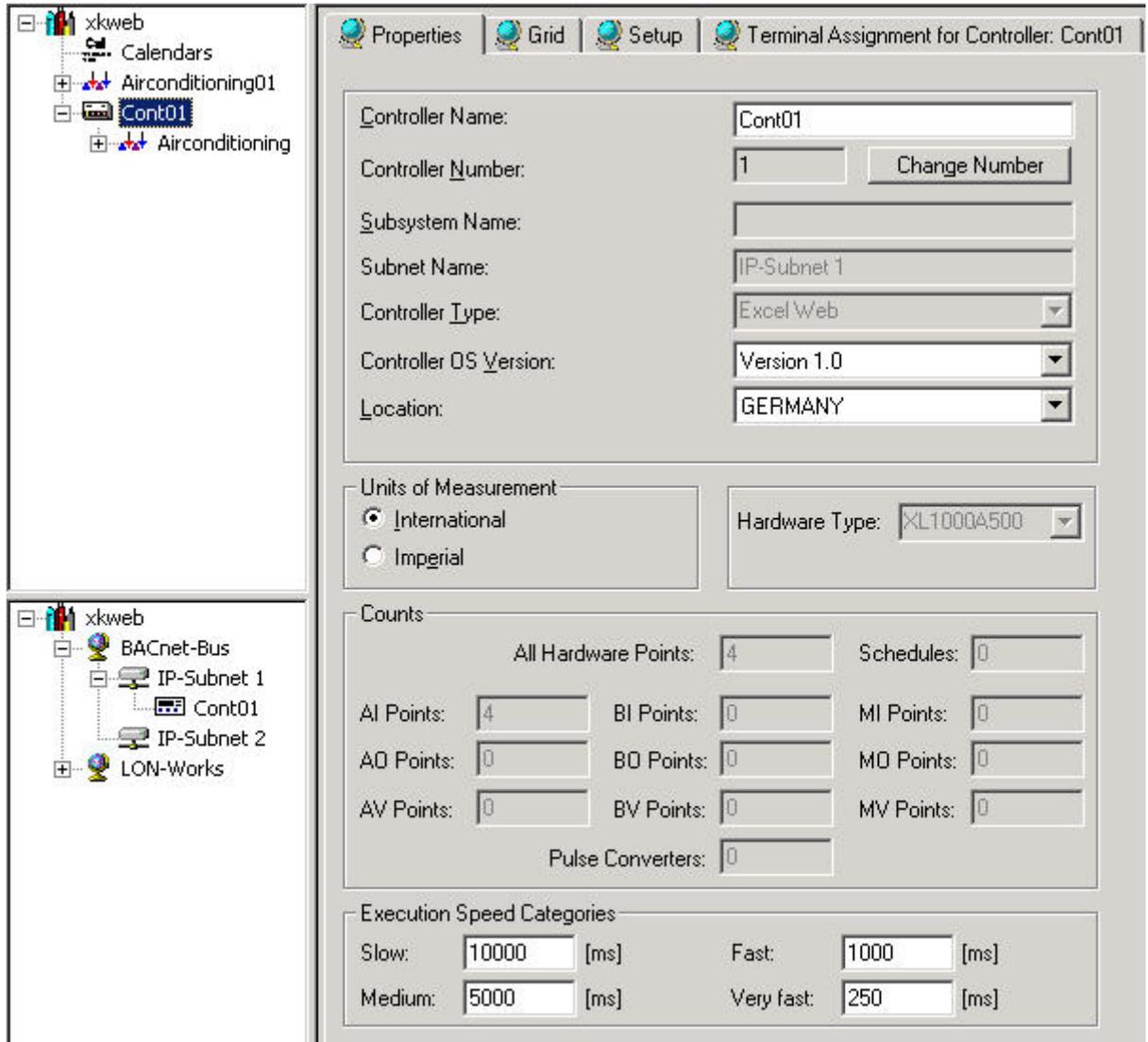
*It is recommended to define the subsystems/subnet before creating Excel Web controllers.*

**Procedure** 1. Click menu item Controller, then submenu item New.

Result: The New Controller dialog box displays.

2. In the Controller Name field, enter the controller name.
3. From the Subsystem/Subnet drop-down list box, select the desired subnet. By default IP-Subnet 1 is selected.
4. From the Controller Number drop-down list box, select the controller number.
5. From the Controller Type drop-down list box, select the controller type.
6. From the Controller OS Version drop-down list box, select the OS Version of the controller.
7. From the Country Code drop-down list box, select the country code.
8. Under Units of Measurement, select the measurement units under International and Imperial by selecting the corresponding radio button.
9. From the Hardware Type drop-down list box, select the controller hardware type.
10. Complete controller creation by clicking the **OK** button.

**RESULT:** On the Properties tab on the right, the properties of the controller are displayed. To modify properties, please refer to the Display/Modify Excel Web Controller Properties section.



## Display/Modify Excel Web Controller Properties

**Purpose** View and/or change controller information such as name, OS Version, execution speed categories.

- Procedure**
1. In the logical plant tree, click on the controller.
  2. On the right pane, click on the Properties tab.

**RESULT:** On the Properties tab on the right, the following properties of the controller are displayed:

The screenshot shows the CARE software interface. On the left is a project tree with the following structure:

- DEMO
  - Calendars
  - CONT\_01
    - Plant 1
    - Plant 2

Below the tree are two folders: 'Global System Macros' and 'Functions'. On the right is a 'Properties' dialog box with the following fields and options:

- Project Name:** DEMO
- Description:** -
- Date:** 27 August 2004
- Reference Number:** 0
- Customer:** -
- Order Number:** 0
- Discount:** 1 %
- Job Factor:** 1,000
- Project Engineer:** -
- Offsets:**
  - Program ID Offset: 000
  - Controller Number Offset: 0
- User Addresses:**
  - Unique
  - Non-unique
- Units of Measurement:**
  - International
  - Imperial
- Character Set:** ANSI X3.4
- Project Subdirectory:** c:\care\projects\ Samme000

**Controller Name**  
Change the name if desired.

**Controller Number**  
To change the controller number, click the Change Number button and change the number in the Change Controller Number dialog box (see Display/Modify Controller Information section).

**Subsystem Name**  
Displays the name of the subsystem.

**Subnet name**  
Displays the name of the subnet.

**Controller Type**  
Displays the controller type.

**Controller OS Version**  
To change the OS version, select desired controller version from the drop-down listbox.

**Country Code**  
To change the country code, select desired country code from the drop-down listbox.

**Units of Measurement**  
To change the measurement units, select desired radio button.

**Hardware Type**  
Displays selected controller hardware type.

**Counts**

Displays the counts of datapoint types such as AIs, BIs etc, the number of hardware points and the number of schedules.

**Execution Speed Categories**

Displays the speed categories in ms. An execution speed category (target cycle time) defines how often the loop will be automatically executed by the controller. Execution speed categories are grouped in the following categories: Slow, Medium, Fast, Very Fast. Each control loop is assigned to one of these categories.

**NOTE:**

The execution speed category should not be exceeded during control loop execution. Any changes will affect all control loops assigned to the corresponding category.

If a category's actual execution time displayed in the Excel Web HTML Interface is permanently greater than the corresponding execution speed category, the controller is overloaded and the execution speed category should be changed by increasing it to higher values than the actual execution time.

To change a speed category, enter the desired value. Note that the default values can only be increased but not decreased.

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## Create New Plant

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**Purpose** Define a plant name, select a plant OS version and the units of measurement.

When creating a plant, you can instantly attach the plant to a controller or create it unattached for later attachment.

**Procedure**

1. In the logical plant tree, click on the controller, to which you want attach the plant.  
Or, if you want to create an unattached plant for later attachment, click on the project.

**NOTE:** If the plant is created on controller level, it is not possible to select the plant OS version and the units of measurement. Those plant properties can only be selected if the plant is created on project level (not attached to any controller).

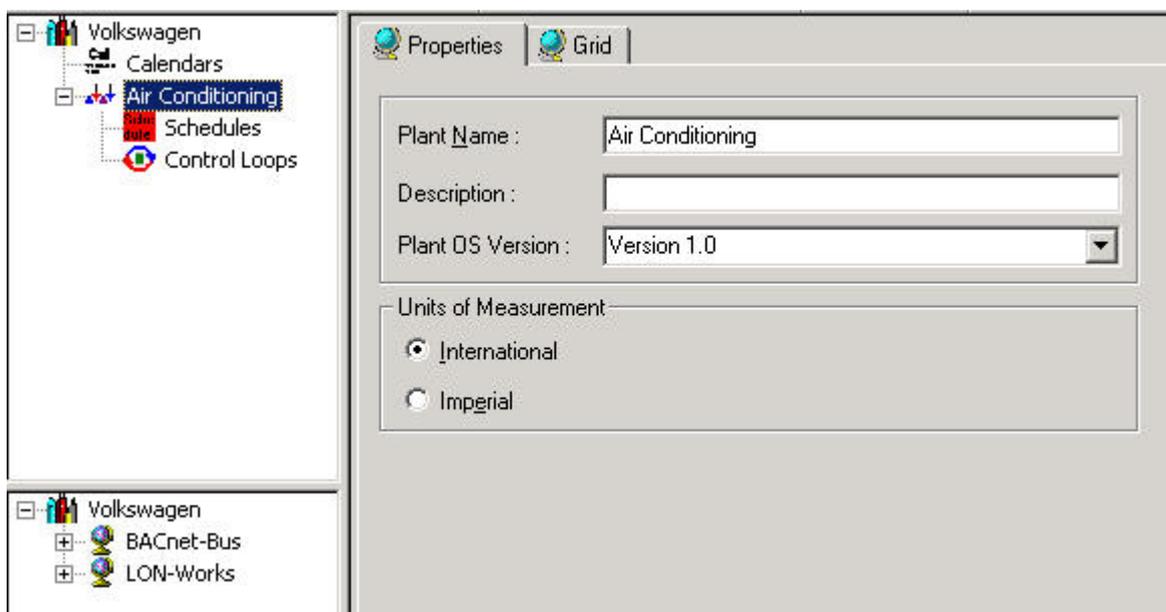
2. Click menu item Plant, then drop-down item New.

**RESULT:** The New Plant dialog box displays.



3. Type a plant name in the Name field (the new name cannot match an existing plant name in the project).
4. Type a description in the Description field if desired.
5. From the Plant OS Version drop-down listbox, select desired version.
6. Under Units of Measurement, select the desired type for the plant, International (metric) or Imperial. This selection tells the Control Strategy functions which type of inputs to accept, Celsius or Fahrenheit.
7. Click **OK**.

**RESULT:** If the new name is acceptable, software closes the dialog box. In the logical plant and network tree, the plant is added below the controller (plant attached) or below the project (plant unattached). Below the plant level, the Schedules and Control Loops folders are automatically created. For applying these functions please refer to the Schedules and Calendars and the Control Loops sections.



## Create Datapoints

- Procedure**
1. If not already highlighted in the logical plant tree, select the plant.
  2. Click menu item Plant, then drop-down item Create HW/SW Points.

Or, click right mouse key and with left mouse key, click on Create HW/SW Point(s) in the context menu.

RESULT: The New Point dialog box displays.

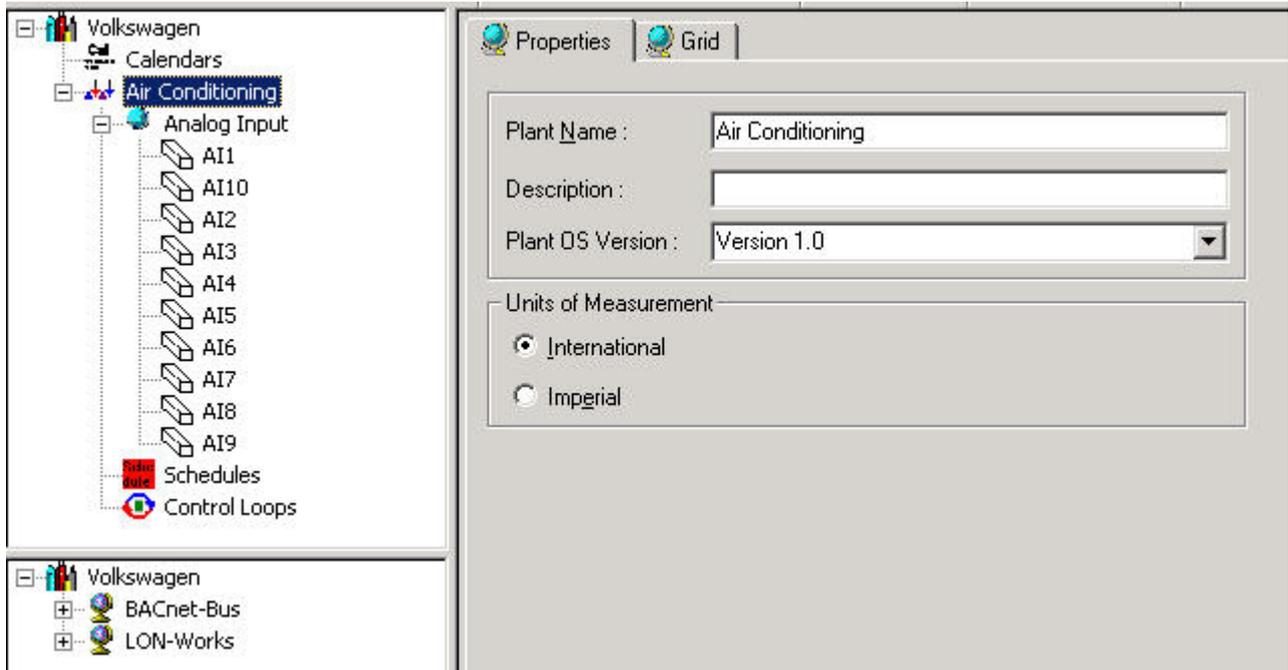


The image shows a 'New point' dialog box with the following fields and controls:

- Type:** A dropdown menu currently showing 'Analog Input'.
- Subtype:** An empty dropdown menu.
- Number:** A text input field containing the value '10'.
- User Address:** A text input field containing the value 'A1'.
- Buttons:** 'OK', 'Cancel', and 'Help' buttons are located at the bottom of the dialog.

3. From the Type drop-down listbox, select the datapoint type.
4. In the Number field, enter the number of points to be created and in the User Address fields enter the name of the datapoint(s) to be created. If you are adding more than one point, software automatically numbers the corresponding user addresses sequentially to guarantee unique user addresses. For example, if you enter pt and request two points, software creates two points named pt1 and pt 2. Only use alphabetic characters. Do not use blanks.
5. Click **OK**.

RESULT: In the following example, the datapoints are added to the Analog Input type folder in the logical plant tree.



6. Continue by mapping datapoints to NVs of appropriate devices as described under Assign LON devices (Binding) section.

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## Add Control Strategy / Switching Logic to Plant

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Please refer to the CONTROL LOOPS section.

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## Network Engineering

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### The BACnet Network Structure

By default, after creation of the first Excel Web controller of the project, the network tree shows the two basic bus types necessary for BACnet engineering, the BACnet-bus and LON-Works.



To create an Excel Web Controller, please refer to the Create Excel Web Controller section.

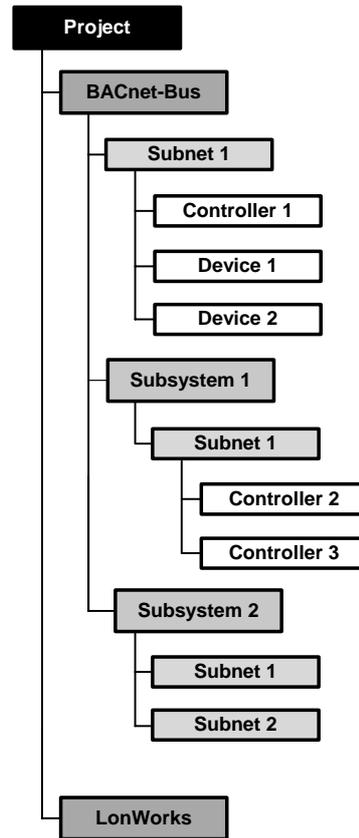
#### LonWorks

For detailed information on basics of the LonWorks network structure and LonWorks Engineering, please refer to the LonWorks Network Engineering chapter firstly.

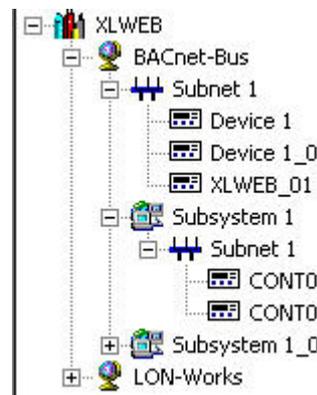
#### BACnet-Bus

The BACnet network as part of a project can be hierarchically arranged in the following components:

- Subsystems
- Subnets
- Controllers/Devices



Subnets represent the LAN infrastructure of the building and contain the BACnet controllers/devices that control that segment of the building. Subsystems are a logical hierarchical level for grouping multiple subnets to a system requiring communication between the different subnets. BACnet controllers and devices can be placed in subnets only. Subnets can be created below subsystems or directly on the BACnet-Bus level.



By default, the BACnet-Bus folder contains the 'Subnet 1' folder and no Subsystem folder. Further created folders will be numbered continuously, for example 'Subnet 1\_0', 'Subnet 1\_1', 'Subsystem 1\_0', etc. The same applies to the BACnet devices.

NOTE: The default subsystems, subnets and device names are freely editable.

## Design and Configure BACnet Network

**Purpose** To structure the BACnet network according to conditions in the building.

This includes:

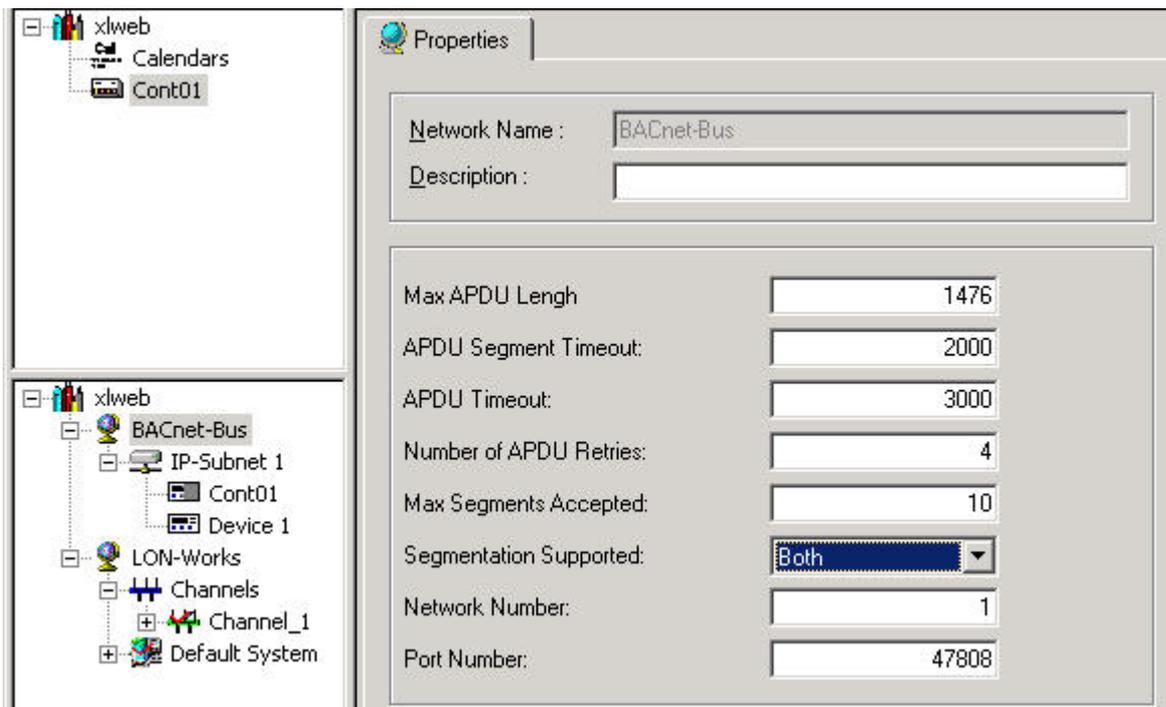
- Definition of general BACnet-bus properties
- Creation of subsystems (optional)
- Creation of subnets and definition of IP address ranges for Excel Web controllers
- Creation of Excel Web controllers
- Creation of BACnet 3<sup>rd</sup> party devices
- Arrangement of Excel Web Controllers and BACnet 3<sup>rd</sup> party devices in this structure

### Define BACnet-Bus Properties

**Purpose** To define the BACnet-Bus settings (e.g., I-Am Information, segmentation of the APDU data streams) for the Excel Web controller and 3<sup>rd</sup> party BACnet devices.

**Procedure** 1. With left mouse button, select the BACnet-Bus folder in the network tree.

RESULT: The BACnet-bus properties are displayed on the right pane.



2. To define the BACnet-Bus properties, enter text and values as follows:

#### Description

Additional descriptive text for the BACnet-Bus

#### MaxAPDU Length

The max. size of data in one packet. With BACnet/IP, the maximum is 1476. It may be necessary to reduce the size if packets are transmitted over routers or tunnelling

#### APDU Segment Timeout

The timeout in msec for one single packet (of a segmented) message.

#### APDU Timeout

The timeout in msec for the whole message (all packets). For proper communication with EBI, the value must be set to 5800 msec.

#### Number of APDU Retries

Number of retries sent by Excel Web to another device if this device does not answer. Too many retries will slow down communication.

**Max. Segments Accepted**

The maximum number of packets for a segmented message. The product of Max Segments Accepted \* Max APDU Length shall not exceed a limit of 16000 bytes (current maximum for Excel Web 0.00.92).

**Segmentation Supported**

Specifies if Excel Web supports messages with more than one packet:

- Both = segmentation in both directions
- Transmit = Excel Web cannot receive segmented messages
- Receive = Excel Web can receive but not send segmented messages
- None = Excel Web can neither receive nor send segmented messages

**Network Number:**

Any number between 1 and 65534 for the local BACnet network to which Excel Web belongs. To have separate BACnet networks within one LAN it is not enough to specify different numbers. You should also use different UDP Port numbers.

The BACnet network number must be unique in a project. In multi-vendor systems, all partners should agree upon the network numbers and UDP-Port settings.

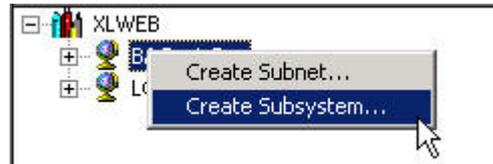
**Port Nr.**

The UDP-Port number. Default for BACnet is 47808. Never use standard port numbers (like 21 for ftp or 80 for http). If you want to separate virtual BACnet networks on the same LAN, use 47808, 47809, 47810, etc. If you do not use 47808, please ask your network administrator first.

**Create BACnet Subsystem**

**Purpose** To create subsystems for structuring the network logically, e.g. to provide a hierarchy level for the integration of multiple subnets in case communication between subnets occurs.

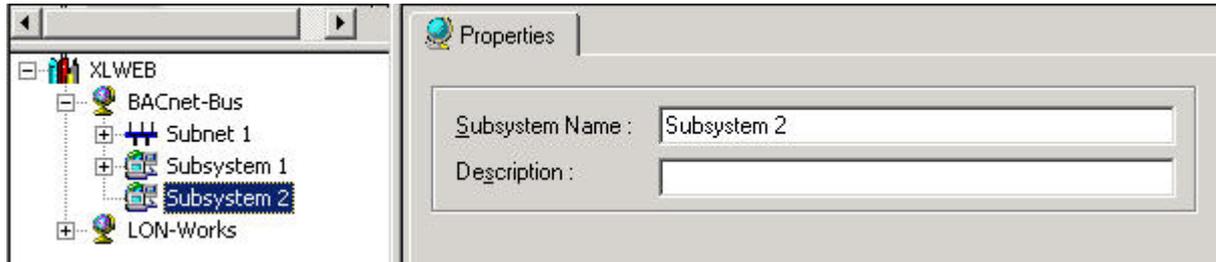
- Procedure**
1. With left mouse button, select the physical BACnet-Bus folder in the network tree.
  2. Click right mouse button and with left mouse button, click Create Subsystem in the context menu.



RESULT: The new subsystem folder will be inserted into the tree.

3. On the Properties tab on the right pane, edit the name in the Subsystem Name field, if desired.
4. If desired, enter an additional description in the Description field. and click on the created subsystem folder in the tree.
5. Click on the created subsystem folder in the tree.

RESULT: The newly named subsystem folder displays.



6. To create subnets for the BACnet-bus, please refer to the Create BACnet-Bus Subnet section.

### Create BACnet Subnet / Allocate IP Addresses to Controllers

**Purpose** To create subnets for representing the physical network of the building and to allocate IP addresses to the controllers located in the subnet.

**IMPORTANT:**

*Contact the network administrator to get the network address(es), the subnet mask(s) and the gateway address(es) for the subnet(s).*

You can either define IP address ranges and CARE automatically allocates IP addresses to the controllers while the controllers will be created, or you manually allocate particular IP addresses to controllers. A combination of these two ways is possible.

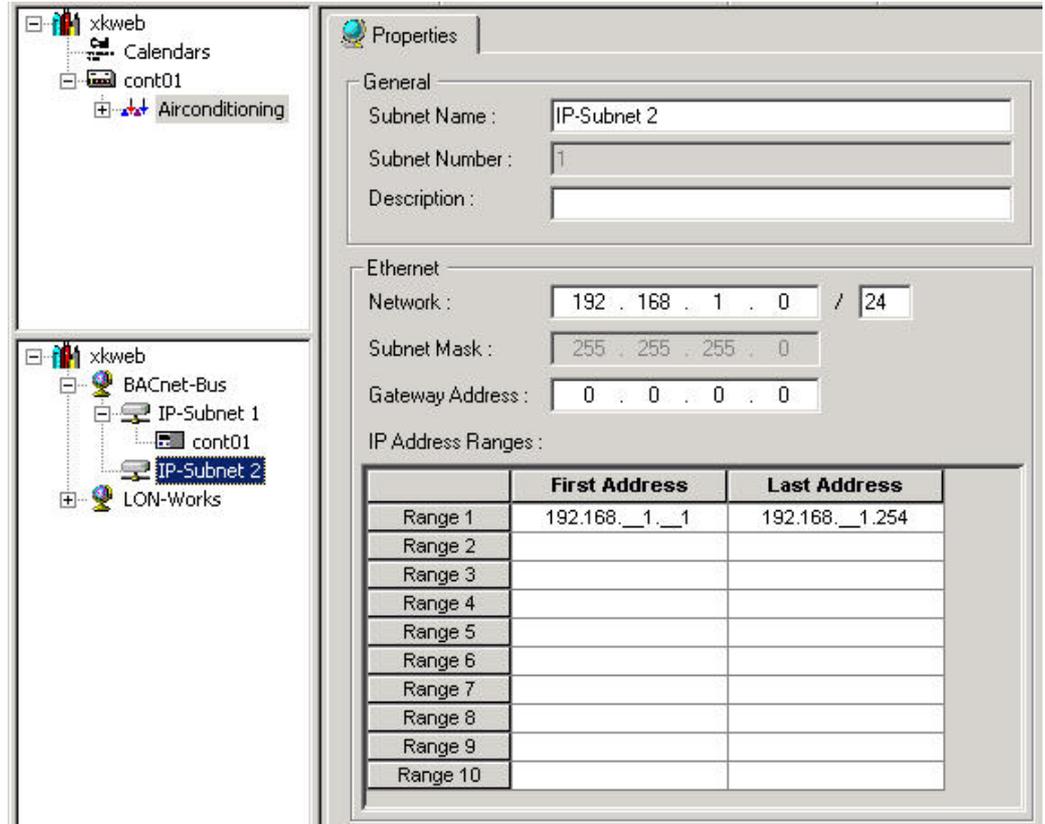
**NOTE:** At that time, an IP address has not yet been allocated to the physical controller. The physical controller does not get the IP address until the controller has been setup.

The IP addresses must match the real IP addresses, which you have obtained from the network administrator.

- Procedure**
1. Depending on where you want to place the subnet, below the BACnet-Bus main folder or below a subsystem, select the BACnet-Bus main folder respectively the corresponding subsystem folder with the left mouse button.
  2. Click right mouse button and with left mouse button, click Create Subnet in the context menu.

**RESULT:** The new subnet folder will be inserted into the tree and on the right pane, the Properties tab shows the properties to be defined for the subnet are displayed.

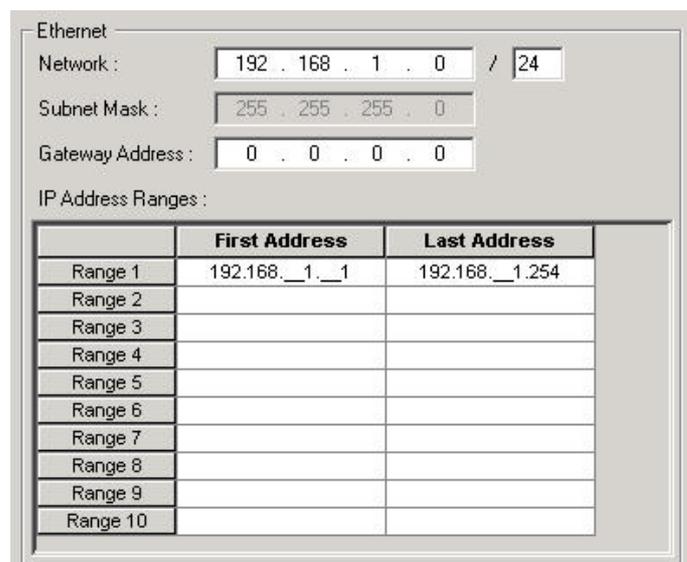
3. On the Properties tab, define the properties for the subnet as follows:



4. Under General, edit subnet name and enter an additional description if desired.
5. Under Ethernet, you will ensure the proper allocation of IP addresses to the controllers. While creating a controller, CARE automatically allocates an IP address to each controller that is located in the subnet. The IP addresses will be consecutively issued according to the defined ranges.

Example:

By default CARE defines the network address to "192.168.1.0 / 24" and the gateway address to "0.0.0.0". Under IP Address Ranges, the first range is inserted accordingly. The range can be further divided into sub ranges.



**One Range** In the default example, the network ID "192.168.1.0 / 24" defines the following IP address range and subnet mask:

IP address range (Range 1):  
 192.168.1.001 (First Address) to 192.168.001.254 (Last Address)  
 There are 254 IP addresses. The IP addresses will be consecutively issued when creating the controllers as follows:

192.168.1.001  
 192.168.1.002  
 192.168.1.003  
 etc.

A particular IP address of a controller can be changed as long as it is within the IP address range.

Subnet mask:  
 255.255.255.0.

The number 24 corresponds to a 3-byte subnet ID, and a one-byte host ID. This is the widely-used subnet mask of class-C networks, which the Excel Web Controller typically uses. A class-C network allows up to 254 BACnet devices per system.

**Sub ranges** If you want to factor out particular ranges, you can divide range 1 into sub ranges. For example (see screenshot):

The screenshot shows an 'Ethernet' configuration window. It includes fields for Network (192.168.1.0 / 24), Subnet Mask (255.255.255.0), and Gateway Address (0.0.0.0). Below these is a table titled 'IP Address Ranges' with columns for 'First Address' and 'Last Address'. The table lists Range 1 (192.168.1.1 to 192.168.1.40), Range 2 (192.168.1.81 to 192.168.1.120), and Range 3 (192.168.1.160 to 192.168.1.254). Ranges 4 through 10 are empty.

	First Address	Last Address
Range 1	192.168.1.1	192.168.1.40
Range 2	192.168.1.81	192.168.1.120
Range 3	192.168.1.160	192.168.1.254
Range 4		
Range 5		
Range 6		
Range 7		
Range 8		
Range 9		
Range 10		

In the above example, IP addresses, which are within the IP address ranges, will be consecutively issued beyond all ranges when creating the controllers:

192.168.1.001  
 ...  
 192.168.1.040  
  
 192.168.1.081  
 ...  
 192.168.1.120  
  
 192.168.1.161  
 ...  
 192.168.1.240

The following IP addresses cannot be assigned to controllers:

192.168.001.**041** to 192.168.001.**080**

192.168.001.121 to 192.168.001.159

NOTE To divide a range into sub ranges, the complete range (automatically defined by the network ID) must become part of the sub ranges and hence it must be edited first in the Range 1 line.

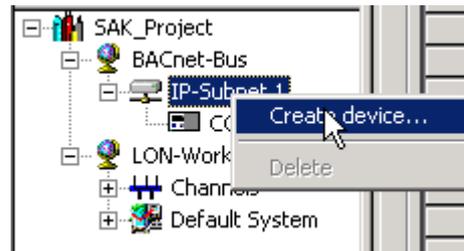
6. To continue with setting up a controller, please refer to the Setup Excel Web Controller section.

---

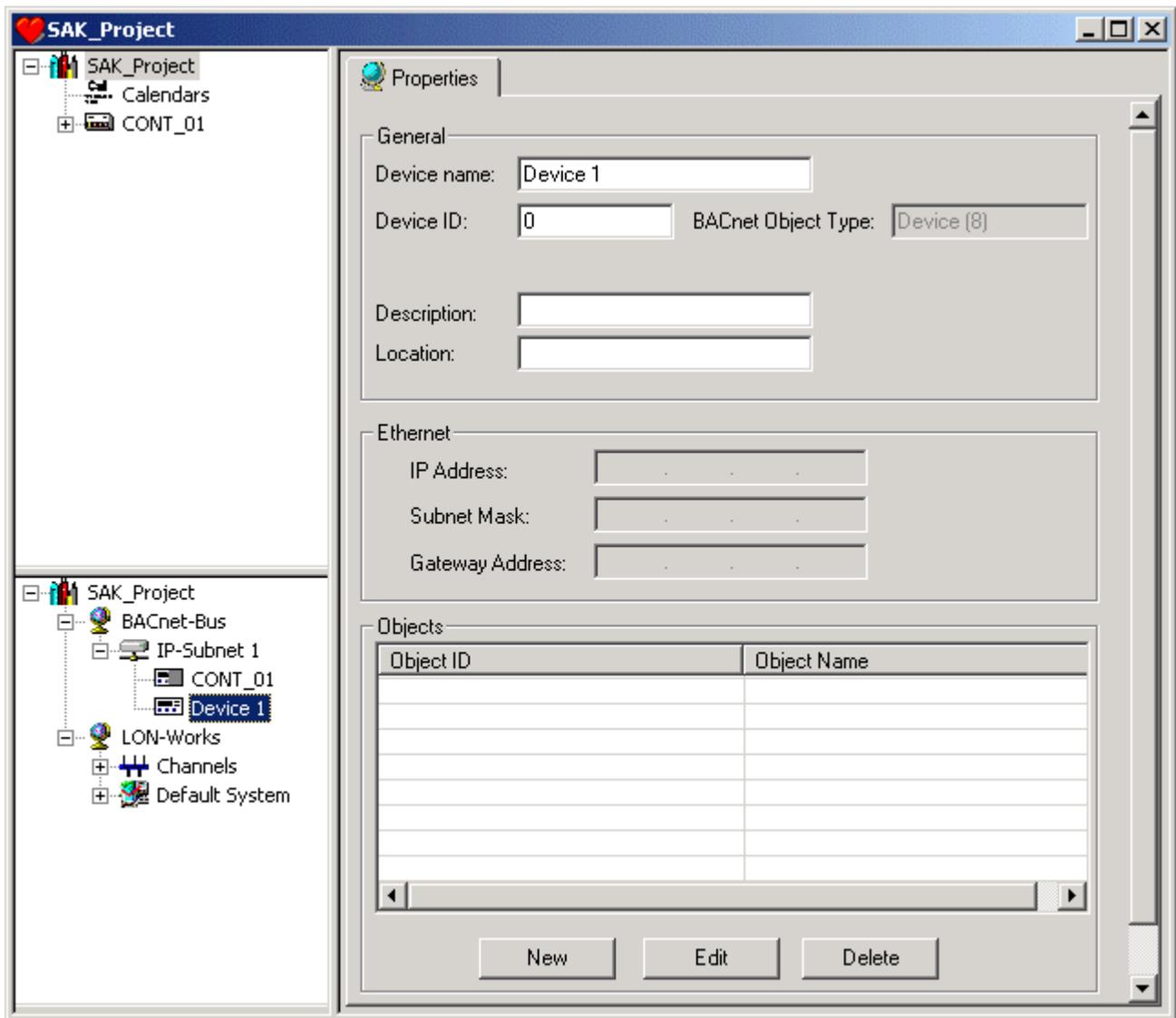
### Create BACnet 3<sup>rd</sup> Party Device

**Purpose** To create a BACnet 3<sup>rd</sup> party device and define its general network specific settings such as Ethernet (LAN) parameters.

- Procedure**
1. With left mouse button, select the BACnet-Bus subnet in the network tree.
  2. Click right mouse button and with left mouse button, click Create Device in the context menu.



RESULT: The new device will be inserted into the tree.



3. Under General, enter/view information such as:

**Device name**

Default name can be edited

**Device ID**

Object identifier of the BACnet device object. This is a unique ID for any device on the BACnet bus. If the BACnet device is an Excel Web controller, the device ID is the same as the controller number.

**NOTE:**

When integrating 3<sup>rd</sup> party BACnet devices, it must be ensured that no identical device IDs exist in the whole BACnet system. For that reason, an offset can be defined. Adding this offset to the controller number generates the device ID.

**BACnet Object Type**

Name of the BACnet object type according to BACnet convention.

**Description**

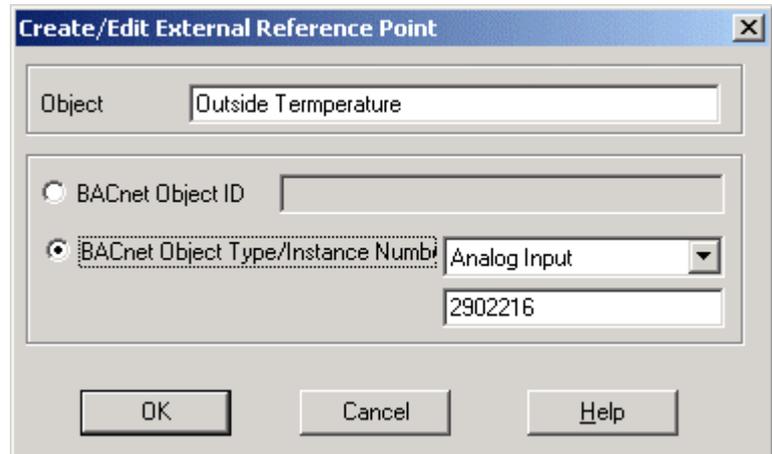
Additional descriptive Text for the device

**Location**

Additional Text for the device, which indicates the location of the device, e.g. Floor 4, Section Nord.

4. Under Objects, you can define external reference points, which can be used to share point information across Excel Web controllers on the BACnet-bus.
5. Click the **New** button.

RESULT: The Create/Edit External Reference Point dialog box displays.



6. In the Object field, enter the object name.
7. Each of the following two options can be used for addressing the device in the BACnet network:
  - BACnet Object ID or
  - BACnet Object Type and its Instance Number

The settings must be provided by or to the project engineer/vendor who is responsible for the 3<sup>rd</sup> party BACnet device to be added to the CARE project.

The BACnet object ID is a unique ID within a BACnet device and within a CARE project. It is calculated within CARE by the following Standard BACnet formula:

$$\text{BACnet object ID} = \text{BACnet object type} \times 2^{22} + \text{Object Instance number}$$

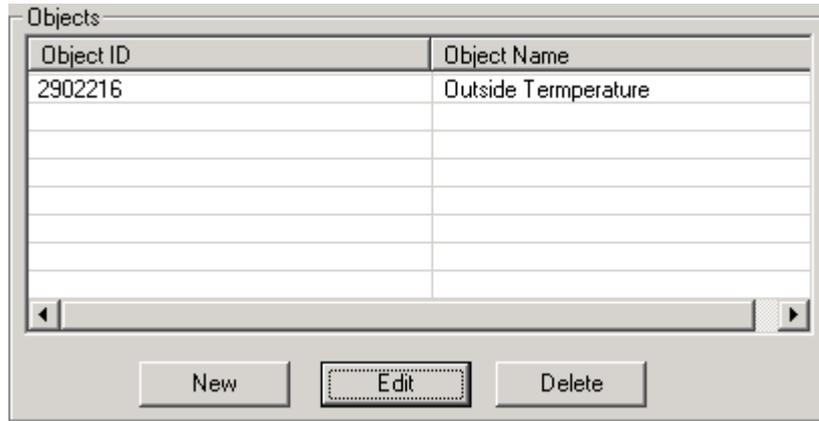
Hence, if the BACnet object ID is not known, you can use the BACnet Object Type and its Instance Number. CARE calculates the BACnet Object ID using these data.

Select the BACnet Object ID radio button and enter the BACnet Object ID into the field.

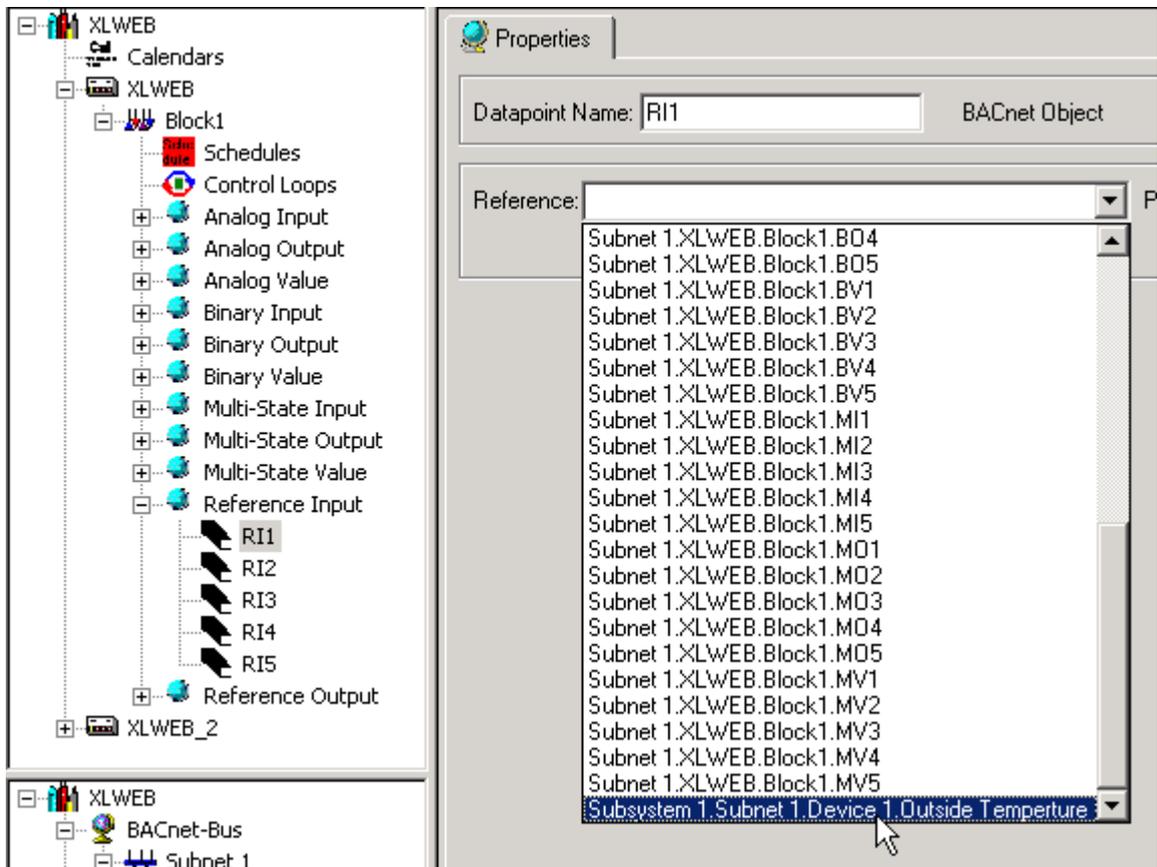
Or, select the BACnet Object Type/Instance Number radio button. From the drop-down listbox, select the BACnet object type and enter the instance number into the field below.

8. Click the **OK** button.

RESULT: The object is inserted into the list. To edit an object, select the object in the list and click the **Edit** button. To delete an object, select the object in the list and click the **Delete** button.



9. The created object can now be selected under the Reference Input and Reference Output point types of any BACnet controller of the project.
10. To assign an object to a BACnet controller, navigate to a reference input, respectively reference output point in the logical plant tree and select the object from the Reference drop-down list box of the point.



**RESULT:** The reference point will now use the value that the object passes.

**NOTE:** Objects are available for any reference input point of any BACnet controller of the project.

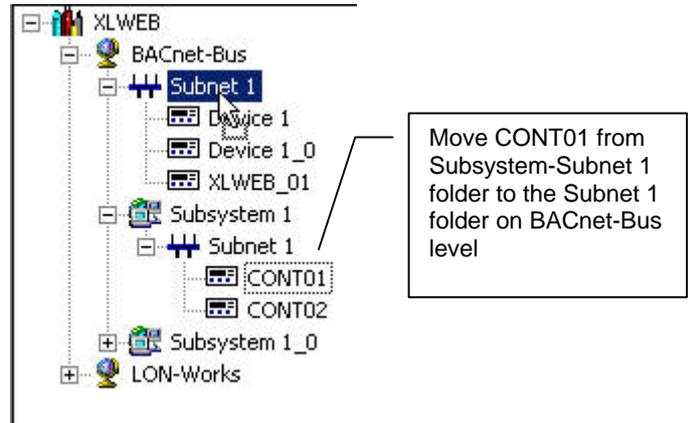
**Move BACnet Devices in the Network Tree by Drag&Drop**

**IMPORTANT**

*Do not move BACnet devices which are already bound to the Excel Web Controller. First, move the controller and then do the binding.*

In the BACnet-Bus part of the network tree, controllers and devices can be moved between different subsystem folders.

- Procedure**
1. In the source folder, select the item (Excel Web Controller or device), drag it to the desired target folder and drop it.



#### Delete BACnet Subsystem, Subnet, or Device.

To delete a subsystem or a subnet, it must first be emptied before. That is, to delete a subnet, delete all devices of the subnet. To delete a subsystem, delete all subnets of the subsystem.

- Procedure**
1. In the BACnet network tree, select the item (subsystem, subnet, or device), you want to delete.
  2. Click right mouse button and with left mouse button click on **Delete** in the context menu.

## Setup Excel Web Controller

Setting up an Excel Web controller includes the following initial steps:

- Establish physical connection to Excel Web controller
- Connect to the Excel Web controller
- Download settings
- Download application

The following steps may be necessary during or after initial setup:

- Stop/start controller
- Upload application
- Download (upgrade firmware)
- Download settings

## Establish Physical Connection to Excel Web Controller

**NOTE:** For interface descriptions and cable specifications described in the following, please refer to the Excel Web Installation Instructions EN1B-0256GE51 / 7157 683

For application and firmware downloads, the Excel Web controller must be connected to the CARE PC in one of the following ways:

- **LAN** (remote access)  
The Excel Web controller can be accessed remotely via LAN by allocating a valid IP address to the controller, which is reachable within the LAN.

The LAN connection type is recommended and mandatory when using a platform hosting EBI for e.g. viewing and editing time programs, trending values, etc. of the other devices of the BACnet/IP network.

Procedure: see Establish Remote LAN Connection section.

- **Crossover cable** (local access)

To locally connect to the Excel Web controller via Ethernet, a crossover cable can be used.

The crossover cable connection type has the highest transfer rate (100 Mbit/s), but when applied, the IP address settings of the CARE PC need to be changed. Hence it has temporarily no connection to any other network and the Excel Web controller is not reachable in the network.

Procedure: see Establish Local Ethernet Connection via Crossover Cable section.

- **USB** (local access)

To locally connect to the Excel Web controller via USB interface, an USB cable can be used.

The USB connection type is recommended for the initial setup of an Excel Web controller due to a reasonable transfer rate (2 Mbit/s) and because no IP address changes are necessary after installation. In addition, the LAN connection can be used further on.

Procedure: see Establish Local Connection via USB Cable section.

## IP Address Allocation

To establish any of the provided connections, IP addresses must be allocated to the relevant network components such as CARE PC, Excel Web controller(s) and USB adapter.

### **IMPORTANT**

*Ask the network administrator for the dedicated IP addresses (IP address ranges) that are allowed for the network components.*

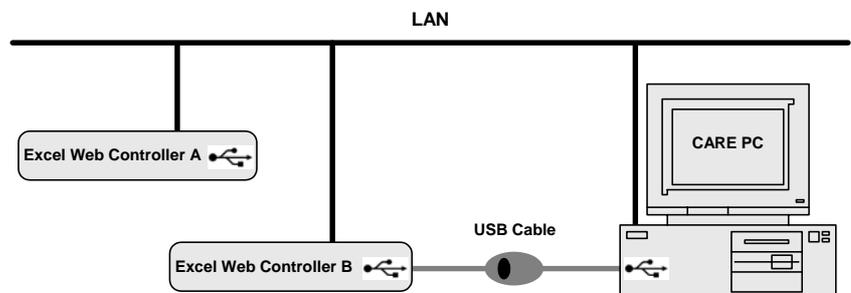
During engineering, the typical procedure to connect to an Excel Web controller is as follows:

- Initial access to the controller by connecting via USB cable  
When delivering the Excel Web controller has no IP address allocated by default. So, in this state, it cannot be accessed via LAN.
- Allocating the dedicated IP address to the controller by downloading the settings into the controller. Now the controller has a valid IP address and it can be reached within the LAN.
- Continual access to the engineered controller by connecting via LAN.

## Establish Local Connection via USB Cable

### Procedure

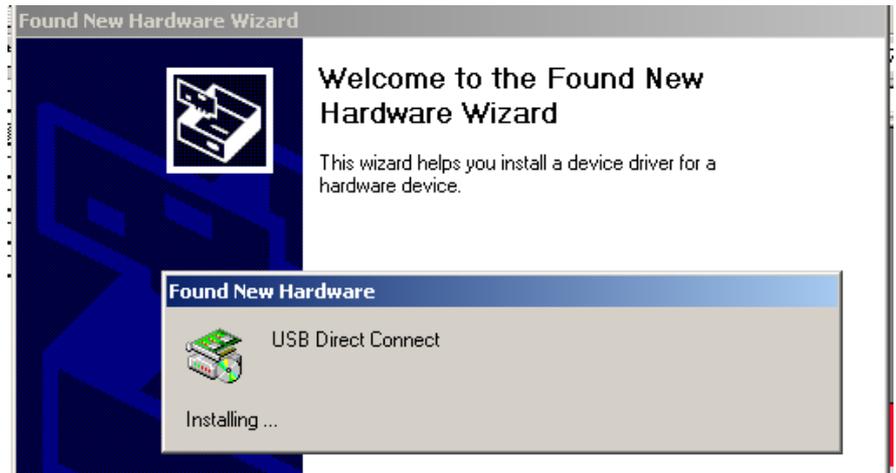
1. Take the USB cable and connect CARE PC and Excel Web controller via USB interface jacks  as shown in the following figure:



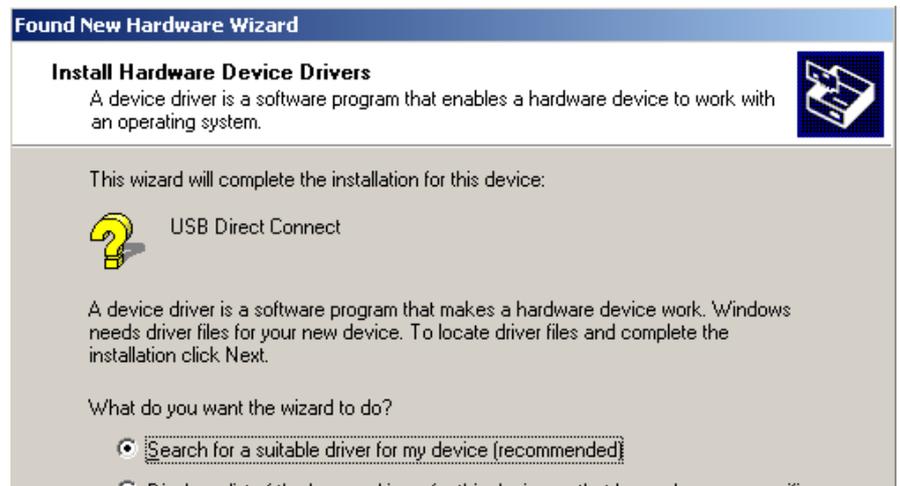
2. Install the approved USB driver (BELKIN Direct Connect) as follows:

3. Insert the Belkin drivers CD delivered with the cable.

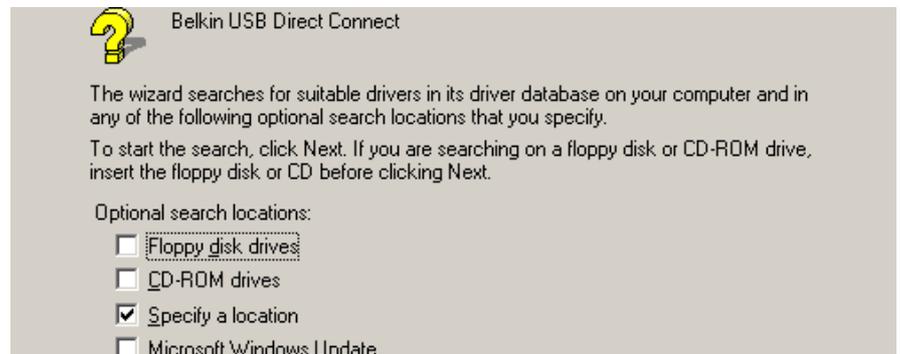
RESULT: The Found New Hardware window respectively the Found New Hardware Wizard displays.



4. Click the Next button.



5. Select the Search for a suitable driver for my device (recommended) radio button and click the Next button.



6. Check the Specify a location checkbox.

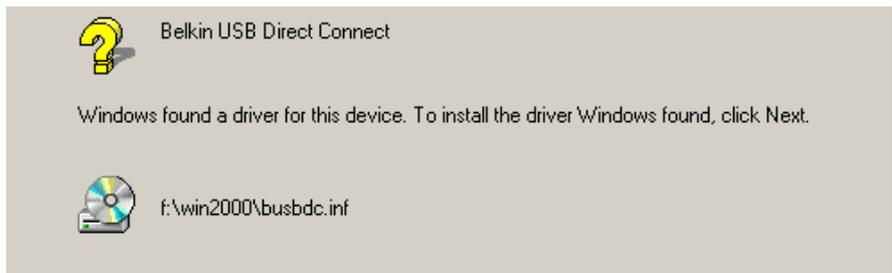
7. Click the Next button.

RESULT: The Locate File dialog box displays.



8. Navigate to the corresponding operating system folder on the Belkin drivers CD and select the *busbdc.inf* file.
9. Click the Open button.

RESULT: The Found New Hardware Wizard dialog box re-displays.



10. Click the Next button.

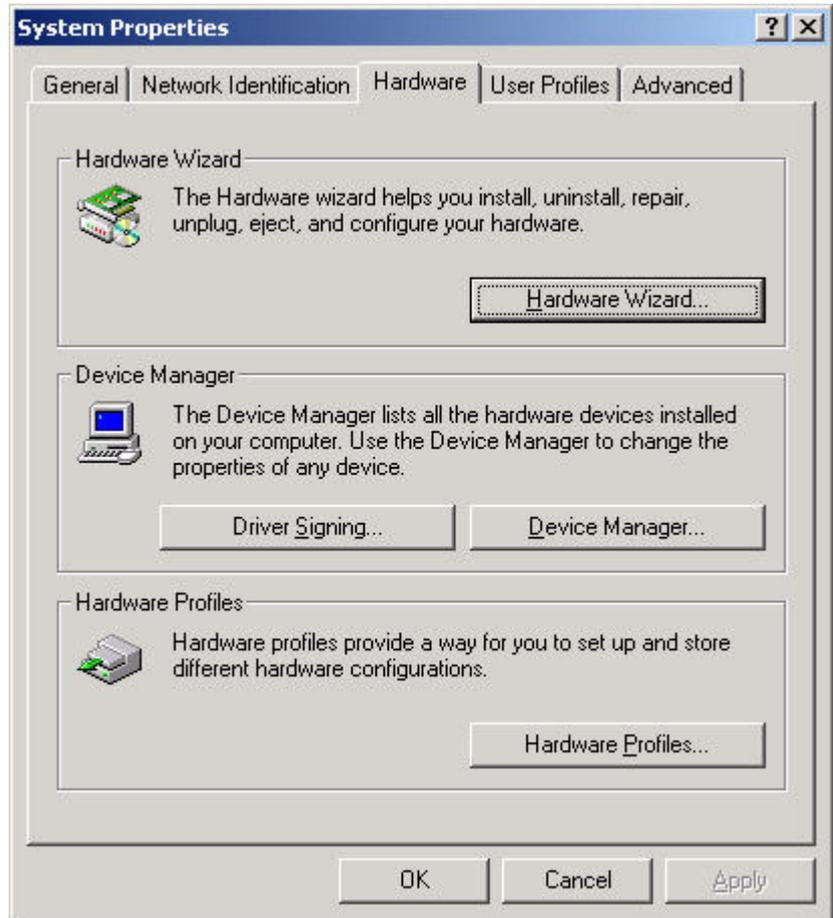


11. Click the Finish button.

RESULT: The Belkin hardware driver has been installed.

12. Continue with the installation of the network adapter as follows:
13. Start the Control Panel by clicking Windows Start menu, then submenu item Settings.
14. In the Control Panel window, double-click on the System icon.

RESULT: The System Properties dialog box displays.

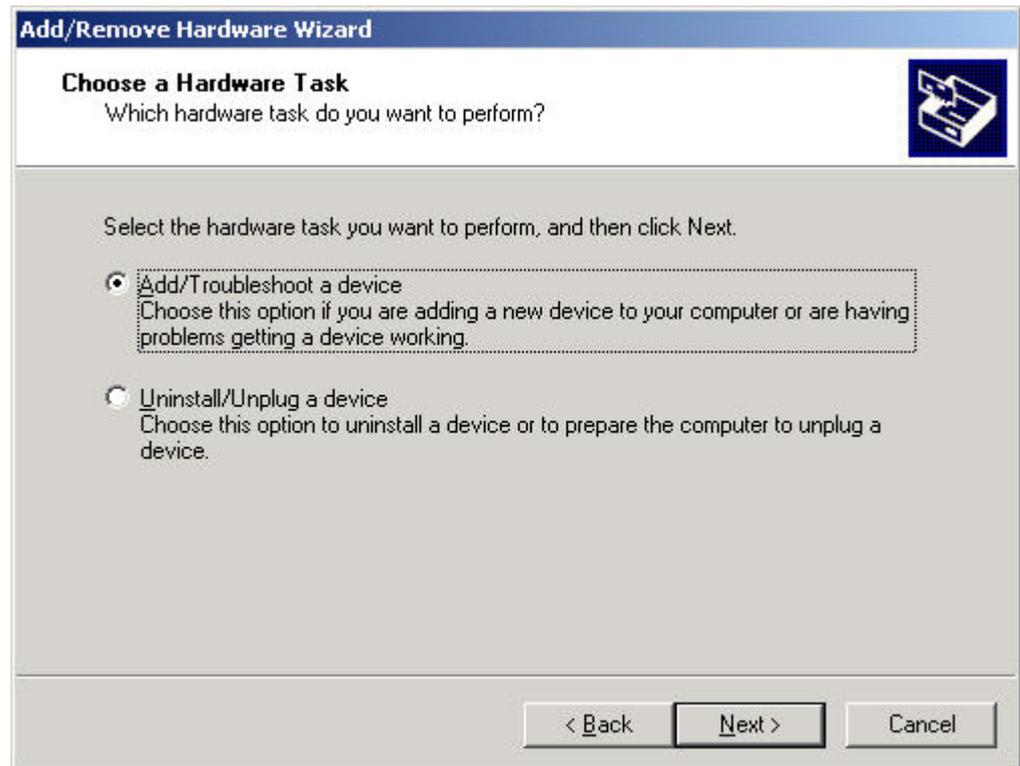


15. Select the Hardware tab and click the Hardware Wizard button.

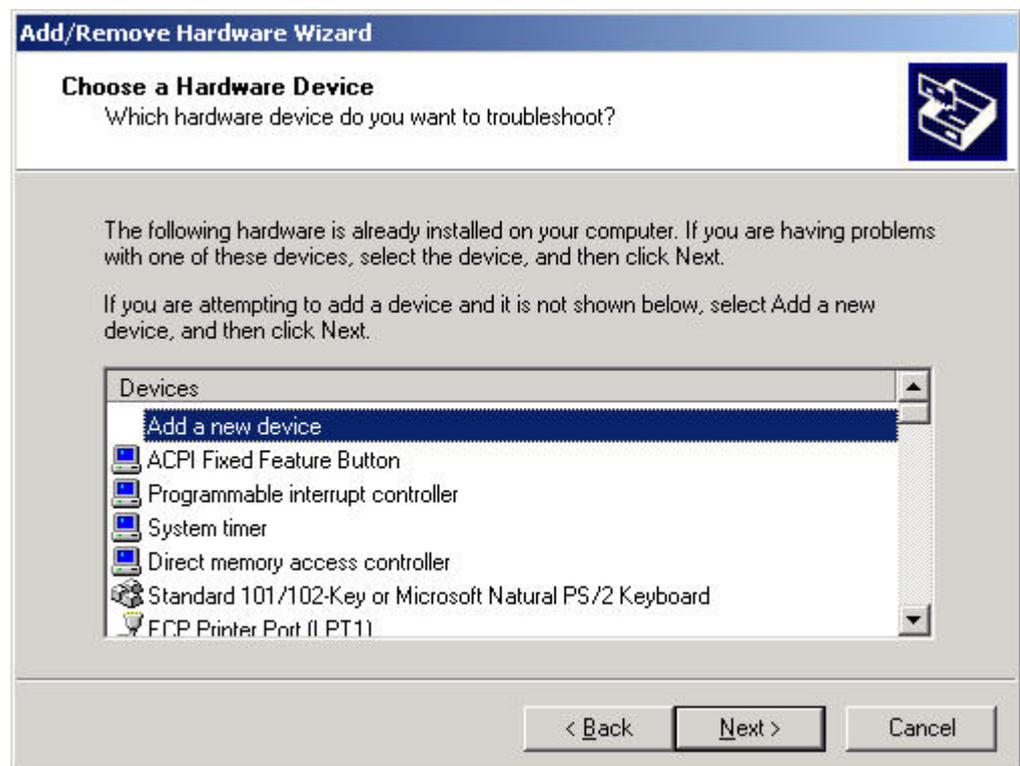
RESULT: The Add/Remove Hardware Wizard displays.



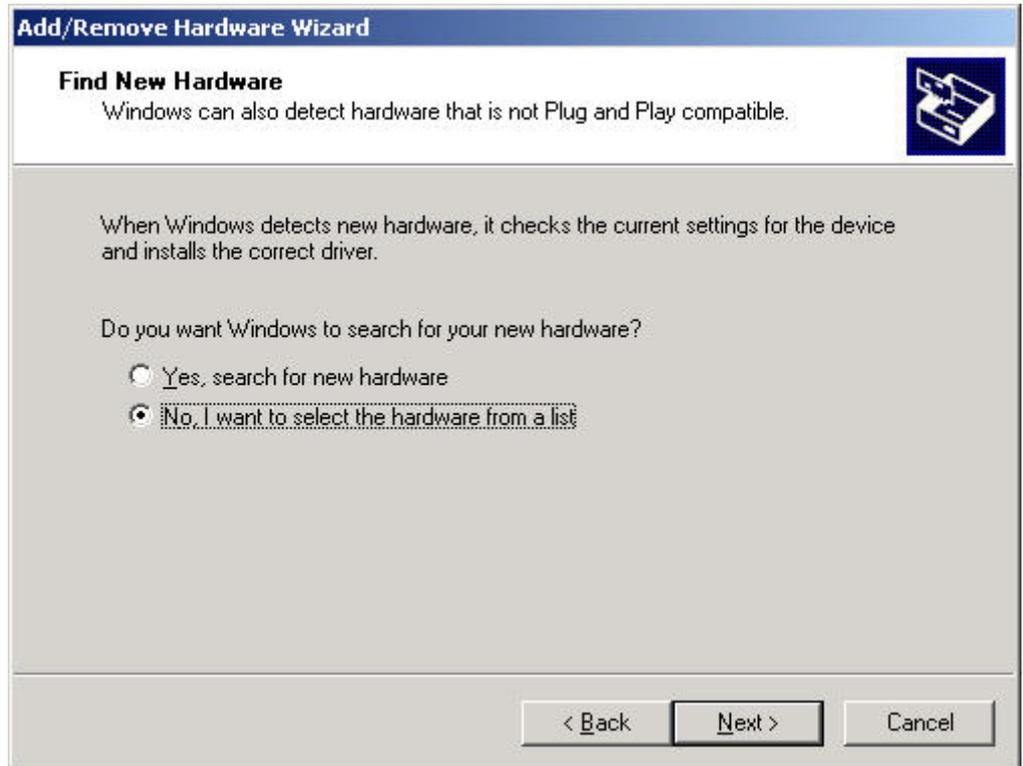
16. Click the Next button.



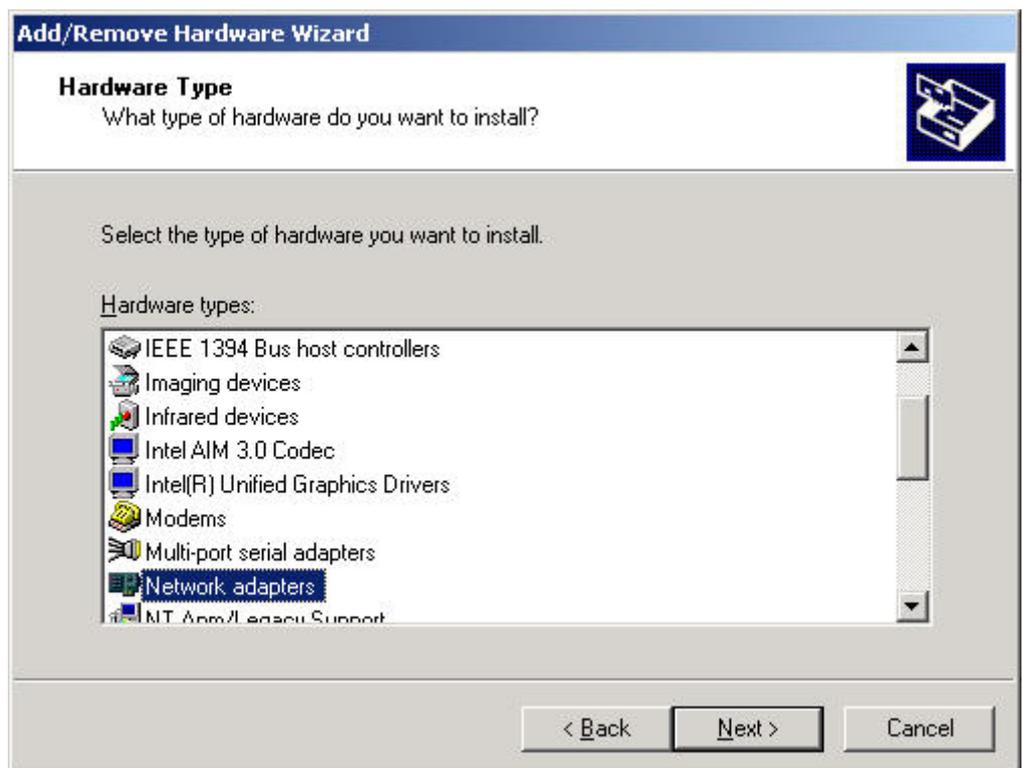
17. Select the Add/Troubleshoot a device radio button.



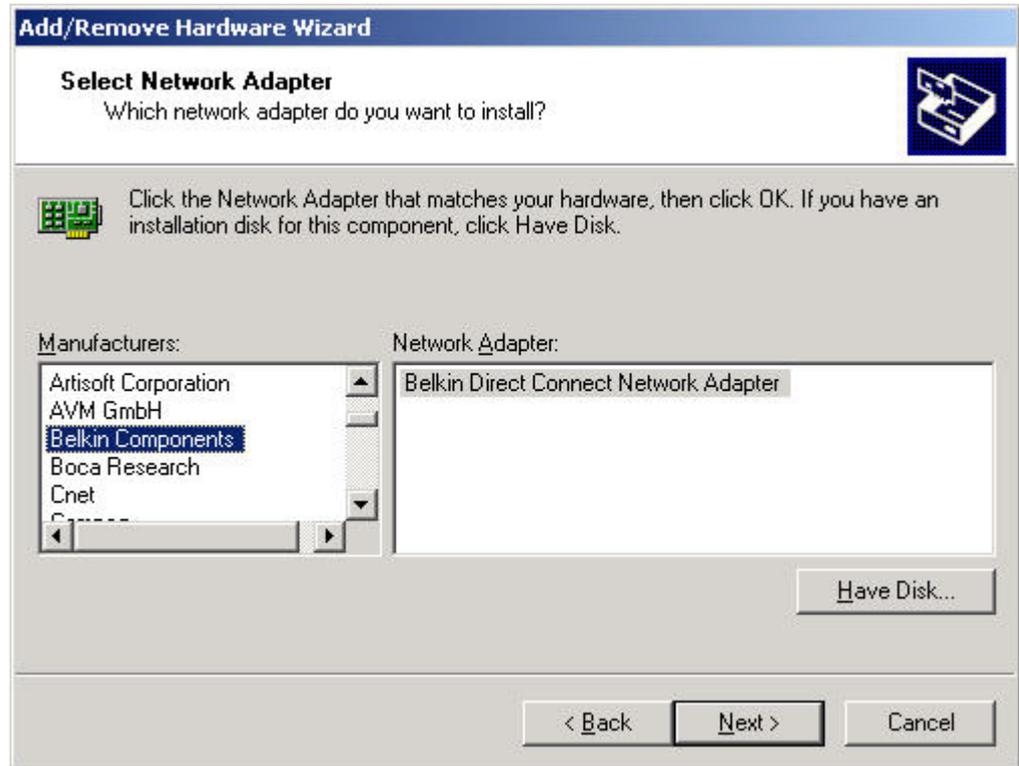
18. Select Add a new device and click the Next button.



19. Select the No, I want to select the hardware from a list radio button.

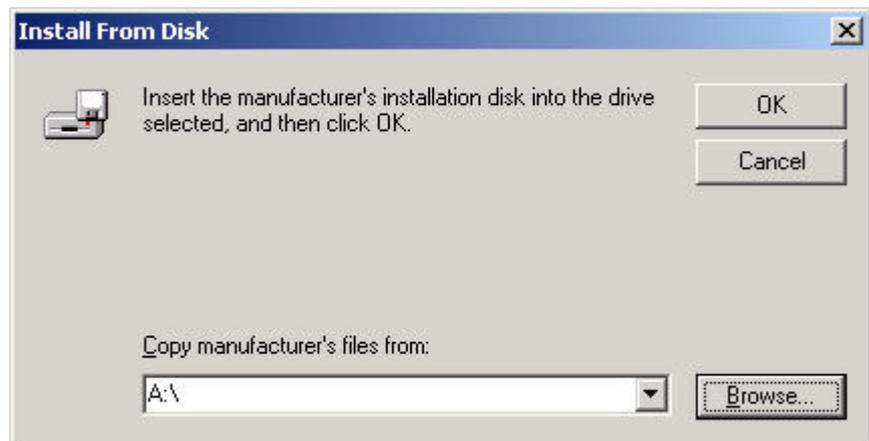


20. Select Network adapters and click the Next button.



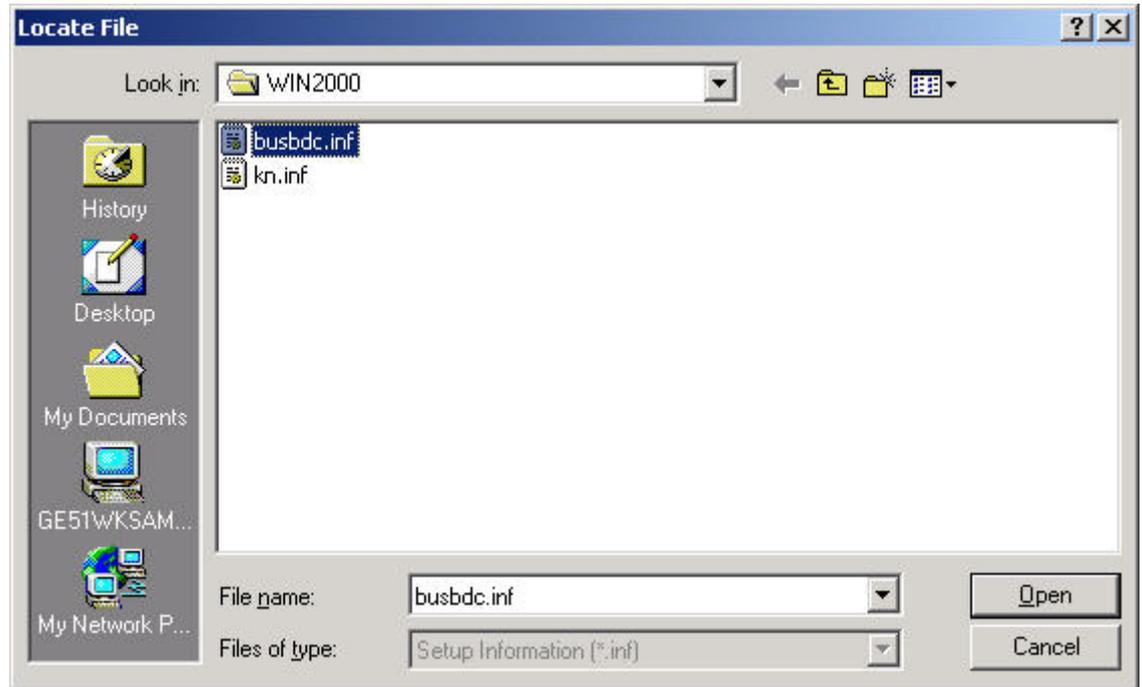
21. Under Manufacturers, select Belkin Components and click the Have Disk button.

RESULT: The Install From Disk dialog box displays.

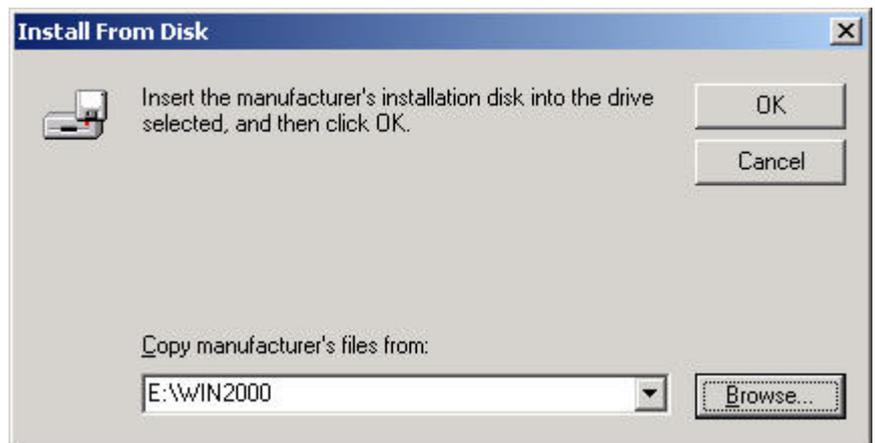


22. Select CD-Rom drive and corresponding operating system folder by using the Browse button.

RESULT: The Locate File dialog box displays.

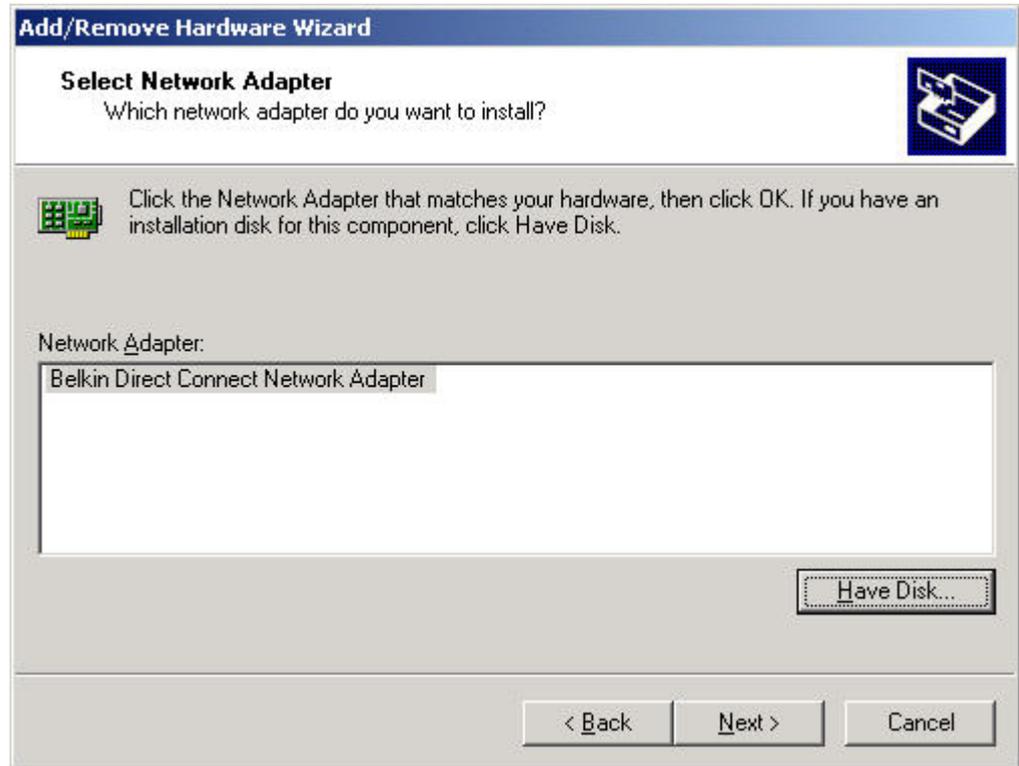


23. Select the *busbdc.inf* file and click the Open button.

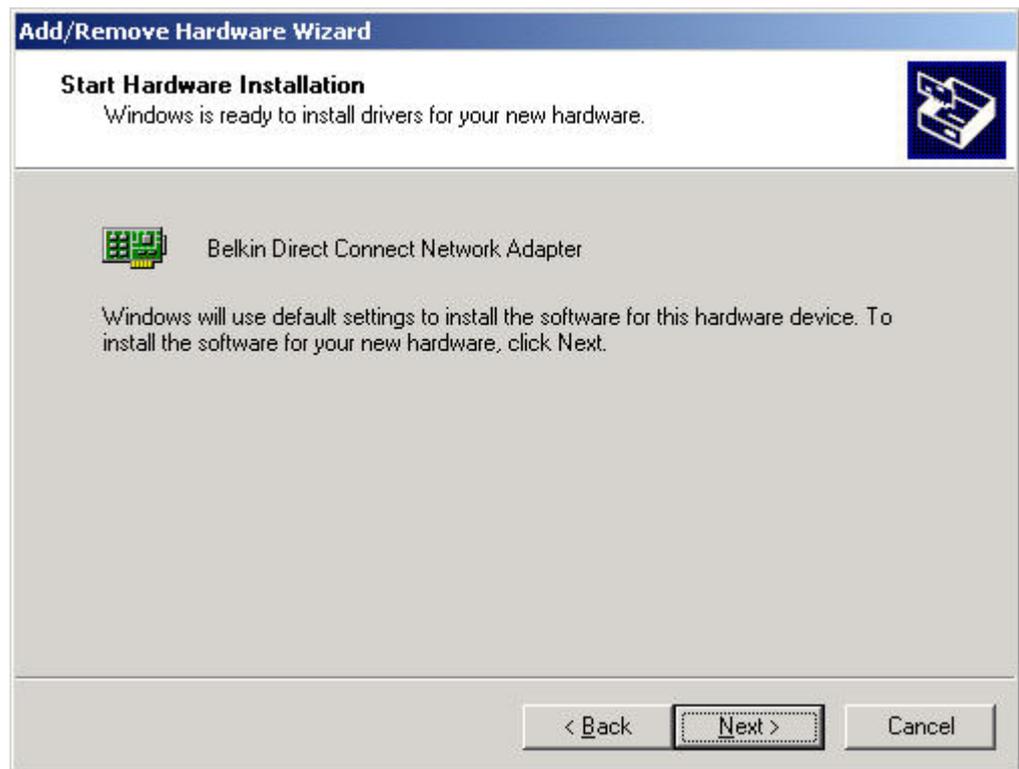


24. Click the OK button.

RESULT: The Add/Remove Hardware Wizard re-displays.



25. Click the Next button.



26. Click the Next button.



27. Click the Finish button.

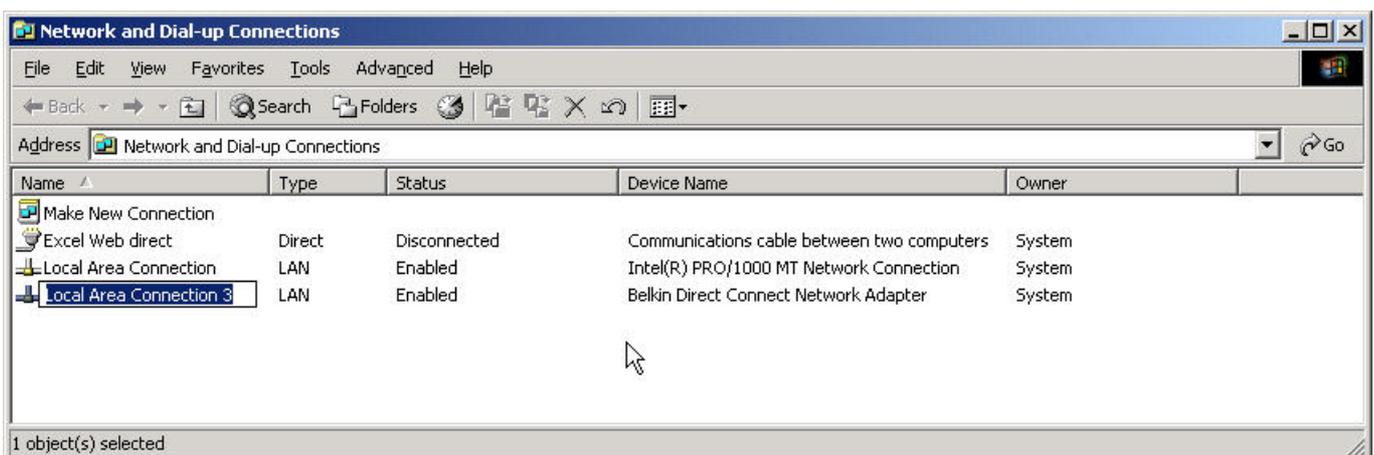
RESULT: The network adapter has been installed.

28. Continue with the configuration of the network adapter as follows:

29. Start the Control Panel by clicking Windows Start menu, then submenu item Settings.

30. In the Control Panel window, double-click on the Network and Dial-up Connections icon.

RESULT: The Network and Dial-up Connections window displays.



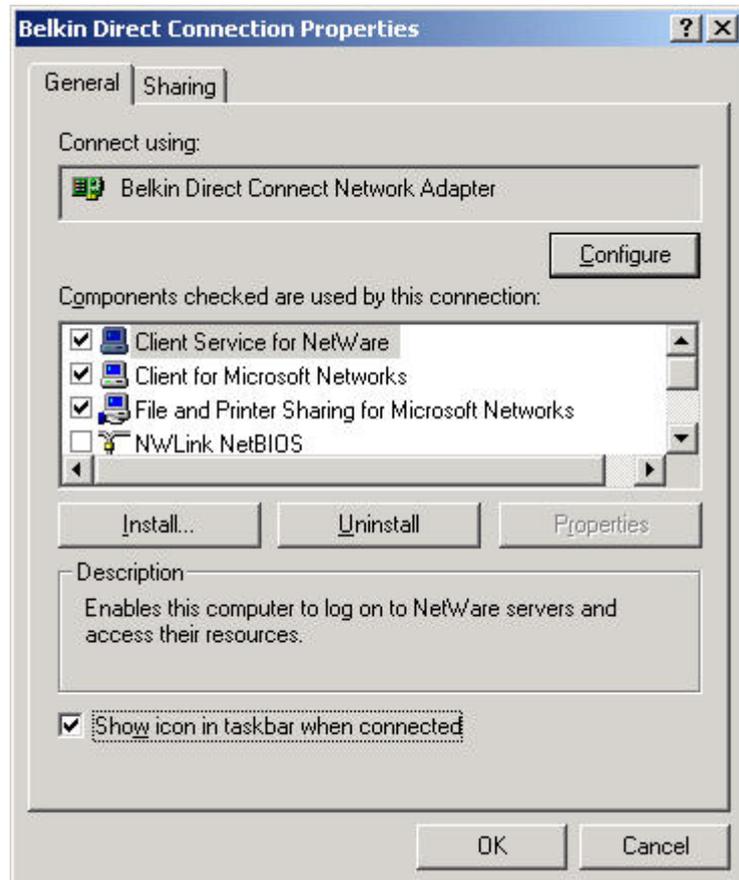
31. In the Name column, right-click on the network adapter, which is named as local area connection, in this case local area connection 3.

32. With left mouse button, click Rename in the context menu and rename it to e.g. Belkin Direct Connection.

Name	Type	Status	Device Name	Owner
Make New Connection				
Excel Web direct	Direct	Disconnected	Communications cable between two computers	System
Local Area Connection	LAN	Enabled	Intel(R) PRO/1000 MT Network Connection	System
Belkin Direct Connection	LAN	Enabled	Belkin Direct Connect Network Adapter	System

33. Right-click on the name of the Belkin network adapter and with left mouse button, click on Properties.

RESULT: The Belkin Direct Connection Properties dialog box displays.



34. Check the Show icon in taskbar when connected checkbox.

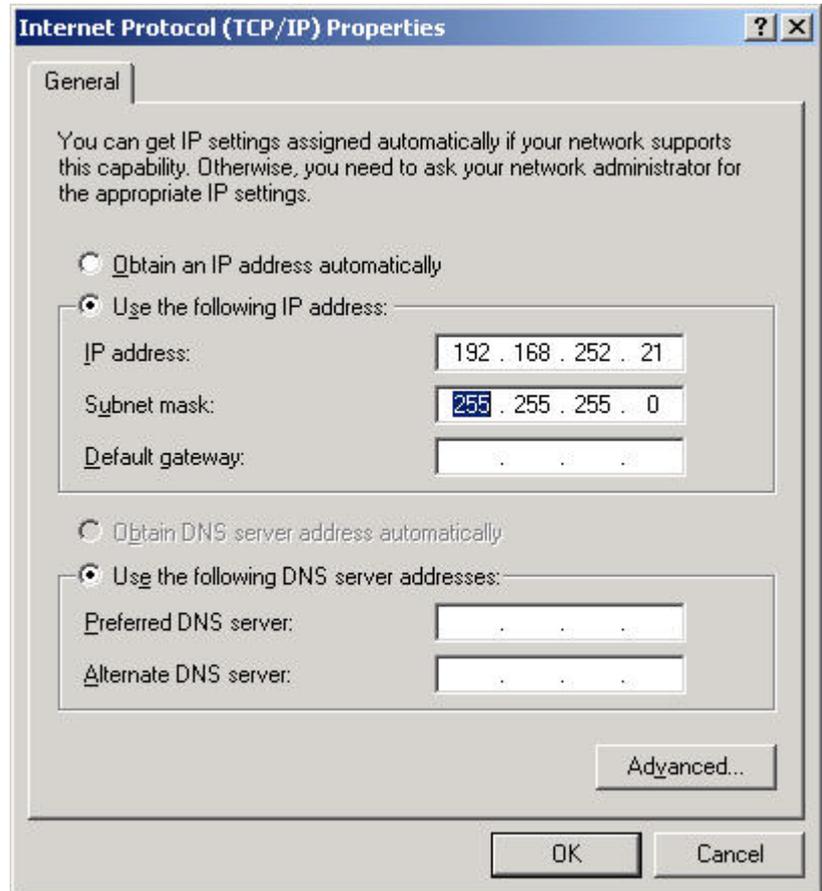
35. In the list, select Internet Protocol (TCP/IP).

**IMPORTANT**

*Do not uncheck protocols that are not needed for Belkin, doing so affects settings of other network interface cards.*

36. Click right mouse button, and with left mouse button, click on Properties.

RESULT: The Internet Protocol (TCP/IP) Properties dialog box displays.



37. Select the Use the following IP address radio button and enter the following:

IP address: **192.168.252.21**  
 Subnet mask: **255.255.255.0**

NOTE: The IP address of the Excel Web controller part of the USB connection need not be defined, because this IP address is provided for the controller in delivery state and CARE reads this IP address from the controller when connecting via the USB network adapter.

38. Click the OK button.
39. The Belkin Direct Connection Properties dialog box re-displays.
40. Click the OK button.
41. Close the Network and Dial-up Connections dialog box and the Control Panel.

### Test USB Communication

#### Procedure

1. To test the communication via USB, start the Command Prompt on the CARE PC as follows:

Click on Run in the Windows Start menu, enter 'cmd' into the Open field and click the OK button in the *Run* dialog box.

2. Enter ping <IP address of Belkin network adapter> and press ENTER key.

Example: ping 192.168.252.21

```

C:\> Command Prompt

C:\> C:\USER\e671782>ping 192.168.252.21

Pinging 192.168.252.21 with 32 bytes of data:

Reply from 192.168.252.21: bytes=32 time<10ms TTL=128

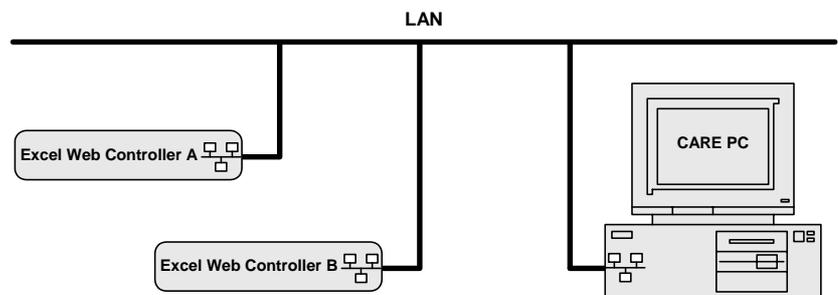
Ping statistics for 192.168.252.21:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

```

3. Check the result.  
If there is no timeout, the USB connection is working properly

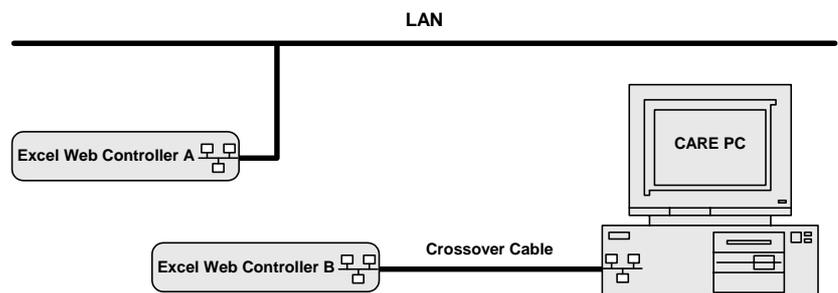
### Establish Remote LAN Connection

To establish a LAN connection, an IP address must be assigned to the Excel Web controller. For detailed instructions on how to assign an IP address to an Excel controller, please refer to the Create BACnet Bus Subnet section.



### Establish Local Ethernet Connection via Crossover Cable

- Procedure**
1. Take the crossover cable and connect CARE PC and Excel Web controller via Ethernet interface jacks as shown in the following figure:

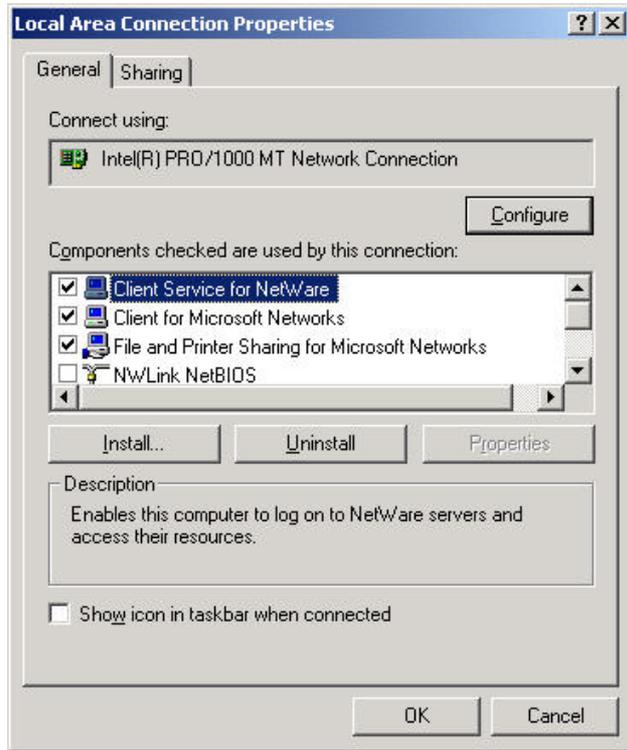


2. On the CARE PC, start the Control Panel by clicking Start menu, then submenu item Settings.
3. In the Control Panel window, double-click on the Network and Dial-up connections icon.

**RESULT:** The Network and Dial-up Connections window displays.

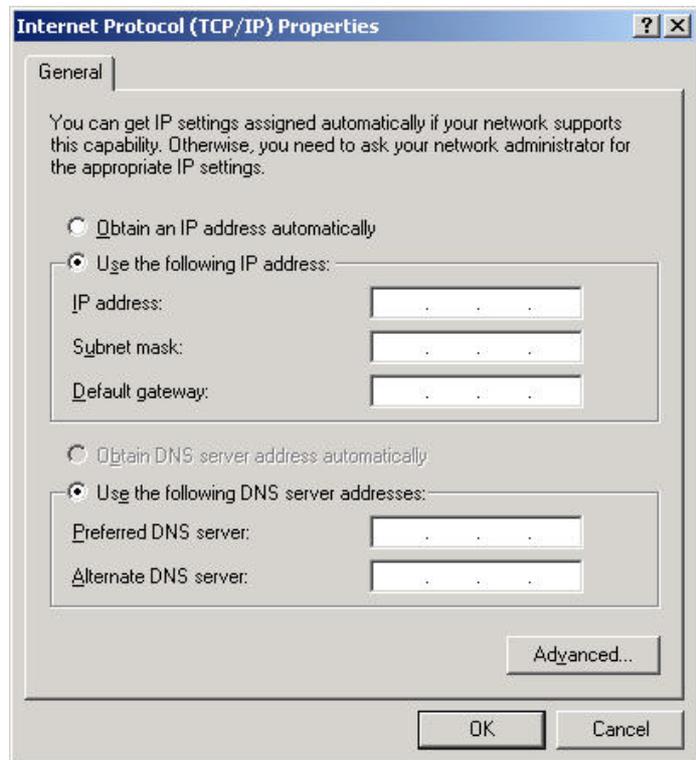
4. In the Network and Dial-up Connections window, right-click on the LAN connection of the CARE PC and with left mouse button, click on Properties.

RESULT: The Local Area Connection Properties dialog box displays.



5. In the list, select Internet Protocol (TCP/IP).
6. Click right mouse button, and with left mouse button, click on Properties.

RESULT: The Internet Protocol (TCP/IP) Properties dialog box displays.



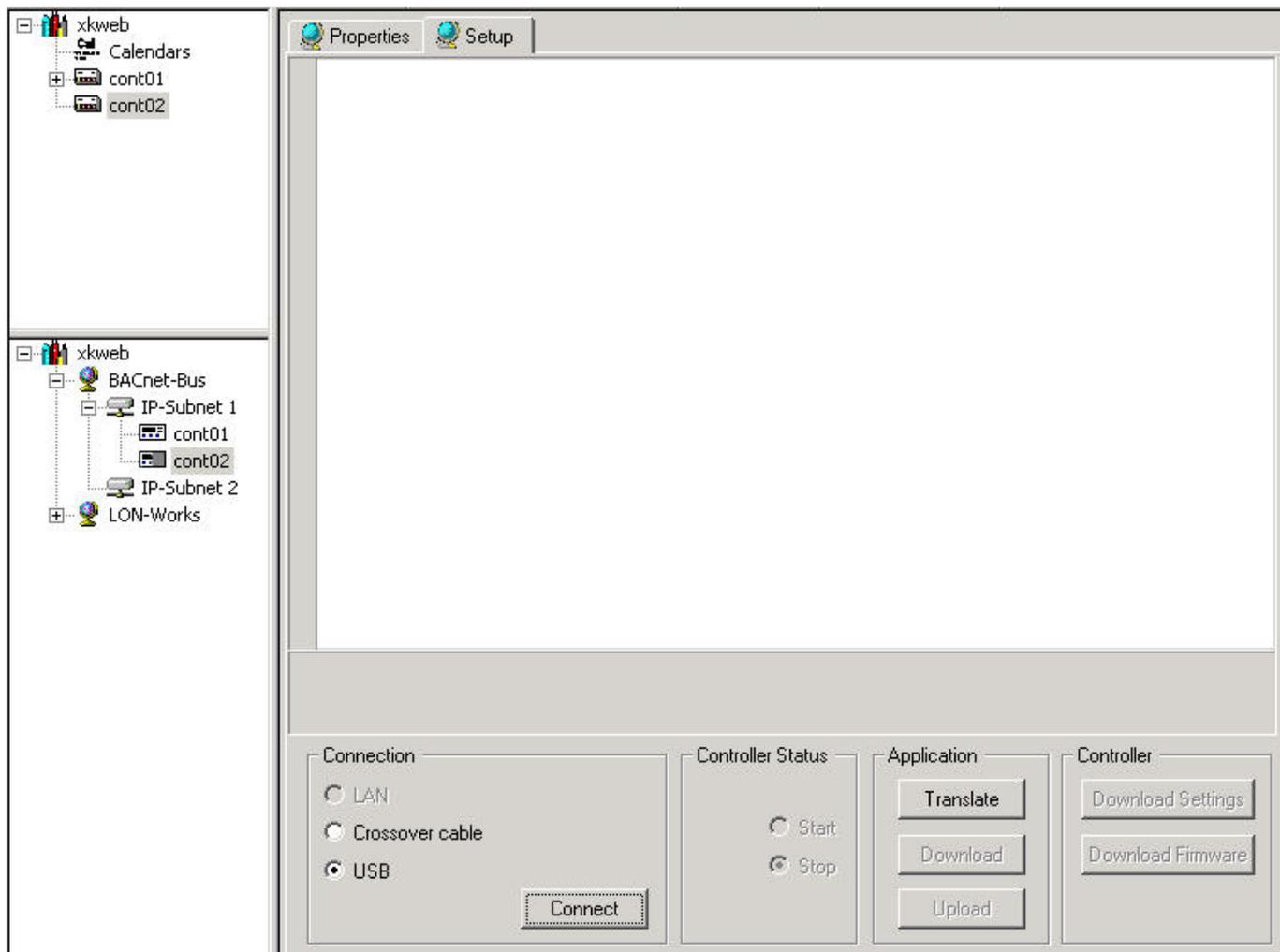
7. Select the Use the following IP address radio button and enter the following IP address: **192.168.253.21**.
8. Click the OK button.
9. The Local Area Connection Properties dialog box re-displays.
10. Click the OK button.

**RESULT:** The CARE PC now cannot connect to the Internet or to another network. After connecting to the Excel Web controller with CARE and completing the required actions, you will have to change the configuration back to the previous settings in order to (subsequently) operate on the office LAN network (again).

---

## Connect to Excel Web Controller

<b>Purpose</b>	To connect to the controller in order to setup or update the controller by performing the appropriate function such as download settings, download application, or download controller firmware.
<b>Prerequisites</b>	To connect to the controller, the controller should be translated and must be physically connected to the CARE PC (see Establish Physical Connection to Excel Web Controller section).
<b>Procedure</b>	<ol style="list-style-type: none"><li>1. In the BACnet-Bus part of the network tree, navigate to the subsystem/subnet and click on the Excel Web controller to which you want to connect.</li><li>2. On the right pane, select the Setup tab.</li></ol>



According to your needs, you have the choice to connect to the controller in one of the following ways:

- LAN**  
 Allows continual remote access to the controller once the controller has been accessed via USB or crossover cable connection and has gotten its dedicated IP address by the download of the controller settings. Next time when accessing the Setup pane, the controller's IP address is displayed at the LAN radio button.



If you need to remotely connect to a setup controller with a valid IP address in a running system or test environment in order to do changes to the controller, or if the IP address of a controller has been changed by the network administrator, you can do that by entering the dedicated IP address of the controller on the Properties pane and clicking the Confirm button. This displays the IP address at the LAN radio button.

Note that by default an Excel Web controller has no IP address allocated in delivery state. Therefore, it cannot be accessed via LAN and the LAN option is disabled.

- Crossover cable  
Allows initial setup of the controller by local access like with USB cable, but with higher speed and temporary disconnection to the network.
- USB  
For initial access to the controller, you must connect via USB cable.

3. Select the connection type, USB (local access recommended for initial setup), crossover cable (local access for initial setup), or LAN (continual remote access), and click the Connect button.

RESULT: CARE connects to the controller. If the connection is successful, the following information is displayed:

- Communication Settings
- Clock Settings
- Version Information

Settings displayed in black can be changed, settings displayed in gray cannot be changed.

**IMPORTANT**

*The shown data is the data of the selected controller in CARE, not the data of the physical controller. Although CARE reads the data from the physical controller, it does not import the data into CARE but compares it with the data of the controller selected in CARE you want to do the setup for.*

<b>Communication Settings</b>	
Serial Interfaces	Serial communication interfaces of XLWeb
Modem Setup	Modem Settings
TCP	TCP/IP settings of XLWeb
Web Interface	Settings for the Web User Interface
BACnet	Settings for BACnet communication
LonWorks	Settings for the LON network
<b>Clock Settings</b>	
Local Time	15:51:06
Local Date	Dienstag, 29. Juni 2004
Time Zone	GMT+12
GMT (UTC) Offset [h] *	-12
Has Daylight Savings	<input type="checkbox"/> No
<b>Version Information</b>	
XL-Web	Version Info for this XL-Web controller

<p>Connection</p> <p><input type="radio"/> LAN</p> <p><input type="radio"/> Crossover cable</p> <p><input checked="" type="radio"/> USB</p> <p>Disconnect</p>	<p>Controller Status</p> <p> <input checked="" type="radio"/> Start</p> <p><input type="radio"/> Stop</p>	<p>Application</p> <p>Translate</p> <p>Download</p> <p>Upload</p>	<p>Controller</p> <p>Download Settings</p> <p>Download Firmware</p>
---	--	---	---

Any data variations in the selected controller in comparison to the physically connected controller are indicated by an asterisk (\*).

Properties Setup	
<b>Communication Settings *</b>	
+ Serial Interfaces	Serial communication interfaces of XLWeb
+ Modem Setup	Modem Settings
+ TCP *	TCP/IP settings of XLWeb

- To view sub items, expand the tree by clicking the plus icon at the item.
- To change settings (non-changeable settings are displayed in gray), click in the corresponding item line in the right column.

**Example:** Expand the Serial Interfaces item and Port 3 subitem, then click in the right column of the Baudrate line and select the desired baudrate.

NOTE: Any changes will be indicated by an asterisk (\*).

<b>Communication Settings</b>	
- Serial Interfaces	Serial communication interfaces of XLWeb
- Port 3	Serial interface for direct(2) or modem(3) connection
Baudrate	115200
- Port 2	9600
Baudrate	19200
Baudrate	38400
Baudrate	115200
+ Modem Setup	Modem Settings
+ TCP	TCP/IP settings of XLWeb
+ Web Interface	Settings for the Web User Interface
+ BACnet	Settings for BACnet communication
+ LonWorks	Settings for the LON network
<b>Clock Settings *</b>	
<b>Version Information</b>	
+ XL-Web	Version Info for this XL-Web controller

**Communication Settings**

Serial Interfaces, Port 2, 3, Baudrate

Defines the baudrate for direct connection of CARE (port 2) and modem connection (port 3).

Modem Setup, Dialout

Defines the dialout settings such as wait for dial tone, dial method, idle time, command string and speaker.

TCP

Displays TCP/IP settings such as IP address, subnet mask, gateway address, and host name.

Web Interface

Defines logout time, which sets the time after which you will be automatically logged out if no action has been taken in the meantime.

Web Interface  
Defines logout time.

BACnet  
Displays the UDP number which will be used for communication and the network number (see BACnet-Bus Properties).

LonWorks  
Displays the neuron ID of the controller.

#### Clock Settings

Defines the values for local time, local date and time zone and displays

GMT (UTC) Offset (h), Has daylight savings  
Displays the offset of the Greenwich Mean Time (Universal Time Conversion) and whether the controller has daylight savings or not.

#### Version Information

XL-Web  
Displays the version of the operating system Linux and the Excel Web firmware.

6. For further information and/or functions, look at the bottom of the Setup tab. Under Controller Status, the current application status is displayed. When CARE has successfully connected to the controller, the application is automatically started as displayed by the permanent icon indication WALK in green color and the selected Start radio button. If for any reason, the application cannot be started, the radio button switches to Stop and the icon displays DON'T WALK in red color. You can stop or start the application manually by clicking the corresponding radio button.



7. Under Application you can translate, download or upload the application (see Translate Controller, Download Application into Excel Web Controller and Upload Controller Application from Excel Web Controller sections). Under Controller you can download the actual displayed communication and clock settings into the controller and download the controller firmware (see Download Settings into Excel Web Controller and Download Excel Web Controller Firmware sections).
8. Continue by downloading the settings into the controller as described in the Download Settings into Excel Web Controller section.

### Remotely Connect to Particular Excel Web Controller

**Purpose** To **remotely** connect to a setup controller that is reachable in a running system or test environment in order to:

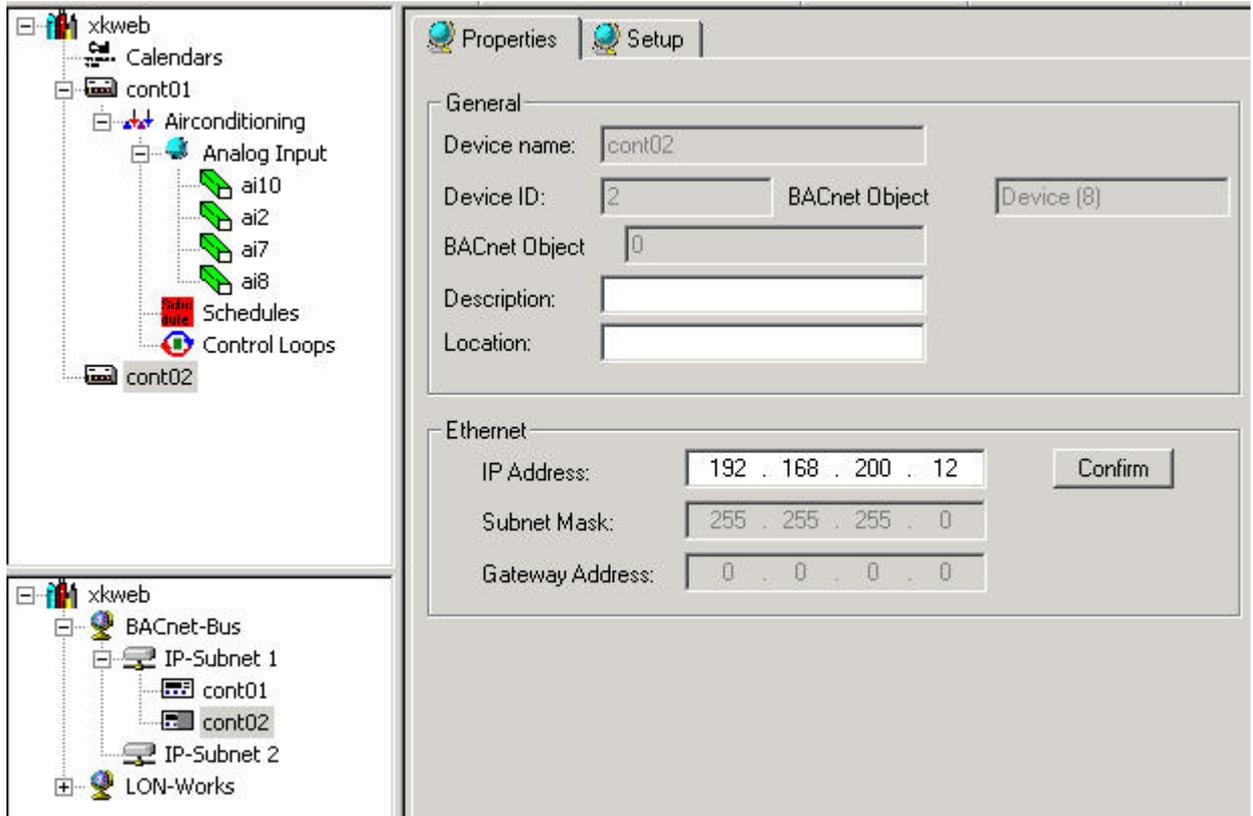
- do remote changes to a particular setup controller of which IP address you know
- remotely connect to a controller whose IP address has been changed e.g. by the network administrator

Note that the IP address must be in the IP address range as defined by the network address.

This procedure makes the local connection via USB unnecessary.

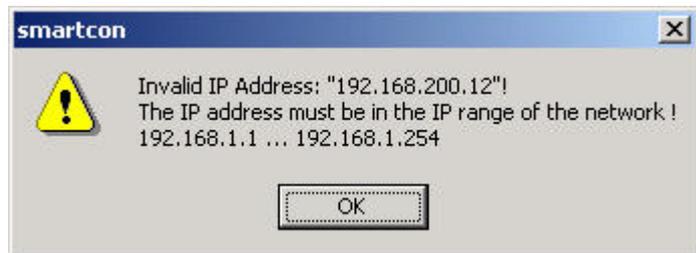
1. In the BACnet-Bus network tree, click on the controller.

- In the IP Address field on the Properties tab, enter the IP address of the controller to which you want to connect.



- Click the Confirm button.

RESULT: One of the following message boxes displays:



If this message box displays, check if the gateway address is correct in order to reach the controller via this IP address, or contact the network administrator for a valid IP address.



If this message box displays, the controller has already been setup and been reached once at a valid IP address. Make sure

that the controller can be reached via the IP address you have issued. If you are sure, then click the OK button.



If this message box displays, make sure that the controller can be reached via the IP address you have issued. If you are sure, then click the OK button and continue by setting up the controller.

4. To setup the controller, please refer to the Setup Excel Web Controller section.

### Download Settings into Excel Web Controller

**Purpose** To download the actual communication and clock settings as displayed on the Setup tab into the physical controller. This function must be performed to continue the initial setup of an Excel Web controller, and it can be used for updating the controller in case of changes in the communication or clock settings since the latest download of the settings. After the download, the controller has gotten its dedicated IP address, which allows the continual remote access to the controller. Next time when accessing the Setup pane, the controller's IP address is displayed at the LAN radio button.

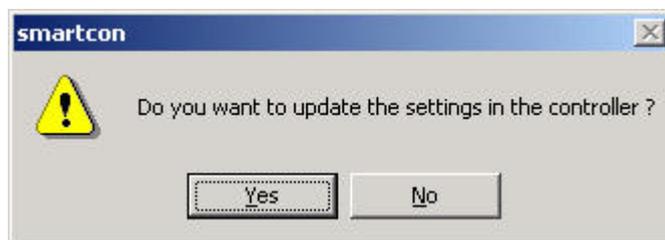
**Prerequisites** The controller must be physically connected to the CARE PC.

- Procedure**
1. If not already done, connect to the controller as described under the Connect to Excel Web Controller section.



2. Click the Download Settings button.

RESULT: The following message box displays.



3. Click the Yes button.

RESULT: The settings are downloaded into the controller.

## Download Application into Excel Web Controller

**Purpose** To copy the application files of the selected controller into the physical controller.  
**Prerequisites** The controller must be physically connected to the CARE PC and the controller must be translated. The controller must have sufficient Flash memory.

All data of an Excel Web project are exportable. Data may include:

- Plant graphics
- Alarm limits, parameters, and schedules
- etc.

The following data is not part of the application:

- Trend objects will be recovered from the Flash card after export
- All controller runtime data (e.g. present value of a datapoint, last execution time of a control loop object. Those data are re-initialized after export.
- Elapsed active time will be recovered by the battery buffered RAM.

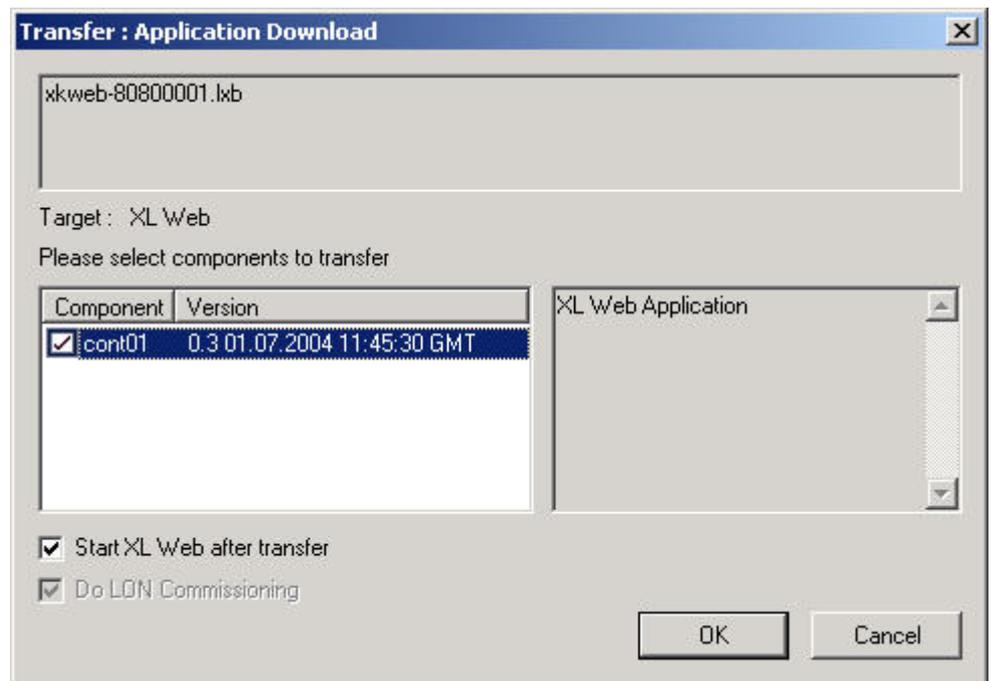
A controller application can only be exported in whole. Parts of an application cannot be exported separately.

- Procedure**
1. Connect to the controller as described under the Connect to Excel Web Controller section.



2. Under Application, click the Download button.

**RESULT:** The Transfer: Application Download dialog box displays showing information such as file name, target, name and version of the components.



3. Select whether the application should be started after the export or not by checking/unchecking the Start XL Web after transfer checkbox.
4. Select whether the network should be commissioned after download or not by checking/unchecking the Do LON Commissioning checkbox. This option is only enabled for selection, when being Onnet with CARE.
5. Click the OK button.

**RESULT:** The controller is stopped and the application will be exported. Status of the export is displayed in the process window.

## Upload Controller Application from Excel Web Controller

**Purpose** To update the CARE database with the application files currently loaded in the controller.

A controller application can only be imported in whole. Parts of an application cannot be imported separately.

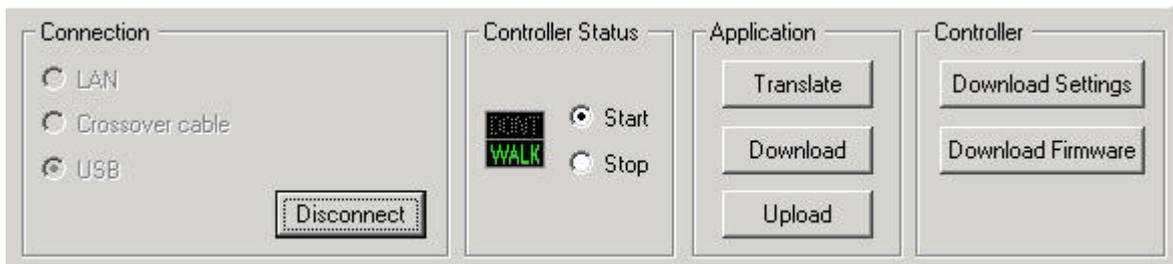
### **▲ WARNING**

*When uploading an application, all changes, except newly added datapoints, done to the application in the meantime in CARE will be lost.*

**Prerequisites** The controller must be physically connected to the CARE PC and the application must be downloaded once.

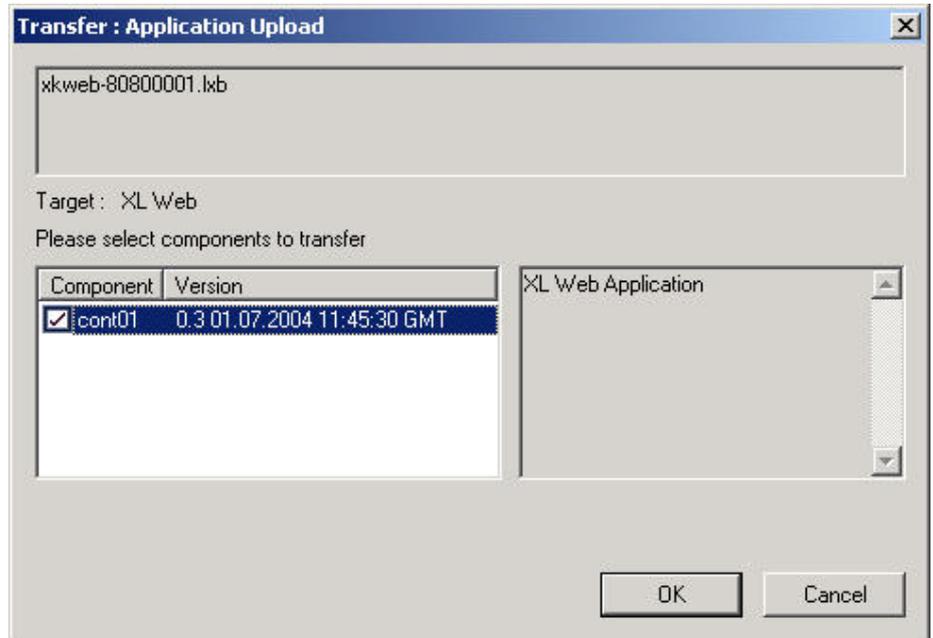
**Procedure**

1. Connect to the controller as described under the Connect to Excel Web Controller section.



2. Under Application, click the Upload button.

**RESULT:** The Transfer: Application Upload dialog box displays showing information such as file name, target, name and version of the components.



3. Click the OK button.

**RESULT:** The application will be imported into CARE. Status of the import is displayed in the process window.

## Stop/Start Application

- Purpose** To stop or start the application in the controller.
- Prerequisites** The controller must be physically connected to the CARE PC.
- Procedure**
1. Connect to the controller as described under the Connect to Excel Web Controller section.



2. To stop the application in the controller, click the Stop radio button.

**RESULT:** The icon displays DON'T WALK in red color.



3. To start the application in the controller, click the Start radio button.



RESULT: The icon displays WALK in green.

## Download Excel Web Controller Firmware (Upgrade)

**Purpose** To download updated firmware in the controller.

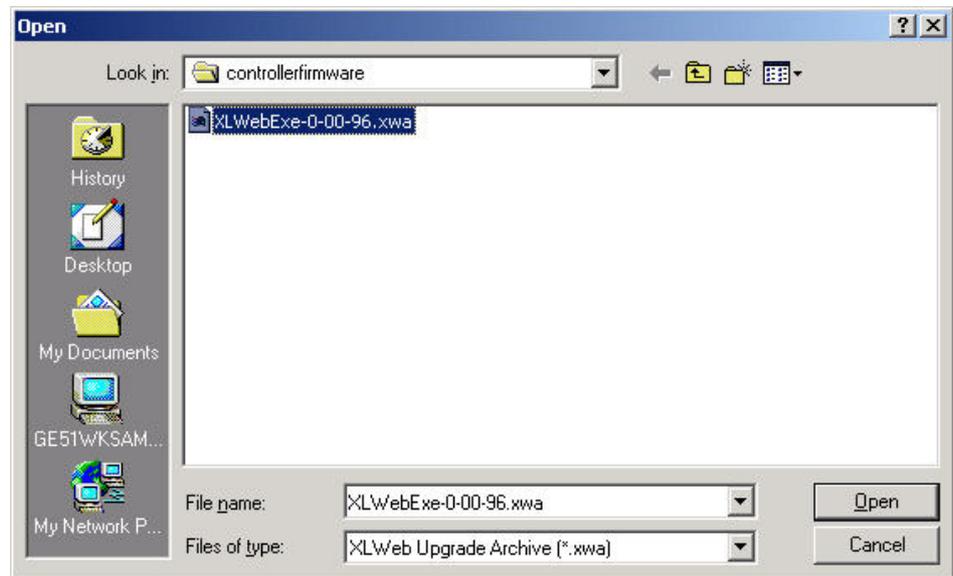
**Prerequisites** The controller must be physically connected to the CARE PC.

**Procedure** 1. Connect to the controller as described under the Connect to Excel Web Controller section.



2. Click the Download Firmware button.

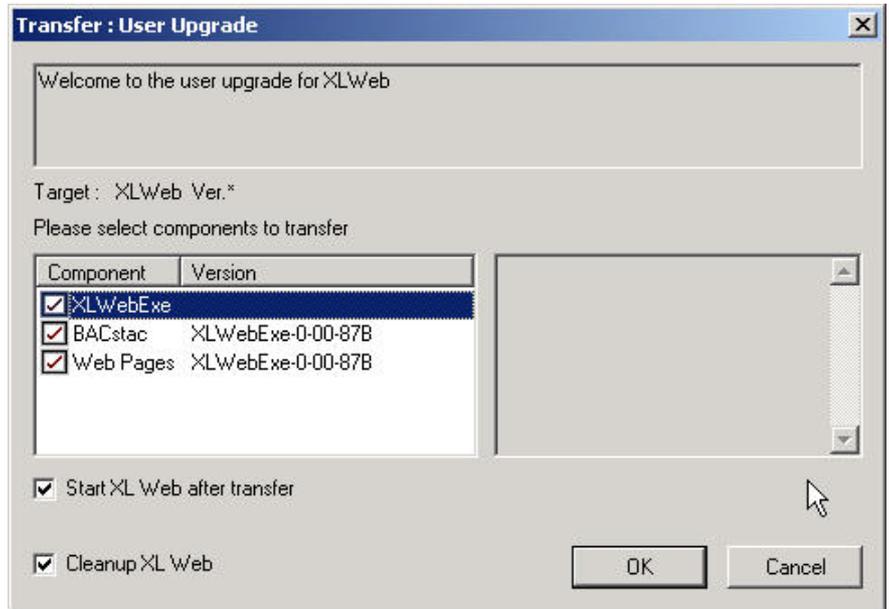
RESULT: The Open dialog box displays.



3. Navigate to the folder where the firmware file (.xwa) resides and select it.

4. Click the Open button.

RESULT: The Transfer: User Upgrade dialog box displays showing information such as target, name and version of the components.



3. Select whether the application should be started after the upgrade or not by checking/unchecking the Start XL Web after transfer checkbox.
4. Select whether the controller should be cleaned up or not by checking/unchecking the Cleanup XL Web checkbox. When cleaning the controller, all applications other than the application to be downloaded will be deleted from the flash memory. It is recommended to check the option to save flash memory.
5. Click the OK button.

**RESULT:** The controller is stopped and the controller firmware will be downloaded. Status of the export is displayed in the process window.

## Engineering, Downloading, and Commissioning (Procedure)

- |                  |   |
|------------------|---|
| <b>Purpose</b>   | In the following, the typical engineering procedure of an Excel Web application is described.   |
| <b>Procedure</b> | <ol style="list-style-type: none"> <li>1. With CARE 7.01.02 (in the following simply named CARE), provide the application data by translating the Excel Web controller.</li> <li>2. Download the application data into the Excel Web controller (initially via the USB interface).</li> <li>3. Use CARE for testing and debugging in a simulated environment, i.e. the Excel Web is connected to a test board.</li> <li>4. Install the Excel Web controller physically in the wall, wiring cabinet, etc. In the course of doing this, the Excel Web controller's terminal blocks are wired and the corresponding RJ45 jacks are inserted into its LONWORKS interface and the Ethernet interface; the Ethernet interface is thus now occupied and henceforth unavailable for performing e.g. step 5. If desired (i.e. if the Excel Web controller is to later communicate by modem, too), the corresponding jack can be inserted into the corresponding RS232C interface (namely: Port 3).</li> <li>5. Using CARE on a (portable) Windows-compatible platform, you then start up and parameterize (via the USB interface) the Excel Web controller.</li> <li>6. Commission the Excel Web controller and the field devices to which it is connected via LonWorks (i.e. their NV's must be bound and configured). This is</li> </ol> |

performed with the same platform hosting CARE as in step 5, via any LonWorks access (e.g. terminals 5+6 and 11+12 or via the RJ45 LONWORKS jack).

7. Typically, you test and debug the Excel Web controller again; this time in its actual working environment. Testing and debugging is again performed using the same platform hosting CARE as in steps 5 and 6, and via the same interface (namely: the USB port). The tester/debugger performs audio-visual checking to see if the field devices are responding as predicted/desired.
8. Engineering, installation, commissioning are now complete. The corresponding jack can now be removed from the USB port. The Excel Web controller begins operation.

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## Control Loops

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- Purpose** The data processing of the controller is programmed in control loops. They are defined by authorized users, using the CARE-software. CARE comes with basic functions; you may order more extensive macros from Honeywell. A control loop receives the input values from sensors and other hardware components. The controller calculates with these values and determines if a regulation is necessary. In such a case, the controller initiates the predefined reaction by switching the connected hardware on.
- Types** There are three types of functions:
- **Functions**  
Functions are basic logic elements with which you can build macros. They cannot be created, edited or removed.
  - **Macros in plant**  
Macros are software modules programmed from functions. Macros in a plant are available in a single plant. It is in the user's hand to create, edit or remove such macros.
  - **System Macros**  
System Macros are provided by Honeywell. They are available for all projects of the Database. These macros are protected against editing and removing.

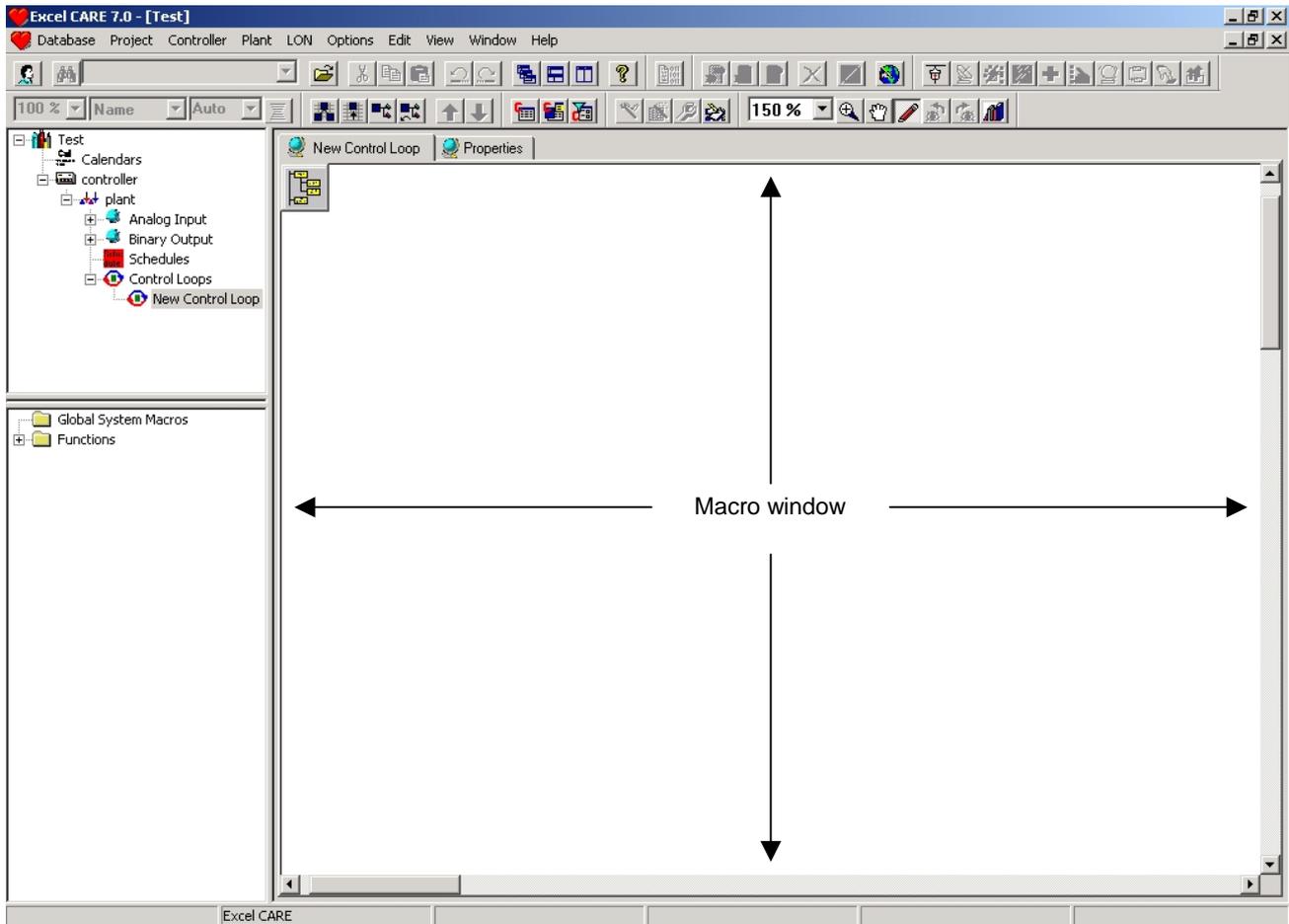
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## Mouse and Function Keys

- Purpose** Additional navigation tools to the standard window functions are available for more comfortable handling of the macros.
- Prerequisites** 1. The user is logged in.
- Procedure** 1. Enter any Macro window:
- Macro window of a control loop.
  - Macro window of a macro.
  - Macro window of a global macro.

- Click once into the free space of the Macro window.

RESULT: The Macro window is selected.



- Use the following function keys as needed.

Denotation of the function keys:

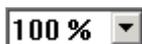
- F1  
Opens the online-help window conform.
- F2  
Displays the area around the mouse-cursor in the middle. E.g. If the mouse cursor is on the left side, the view will be moved to the right side.
- F3  
Zooms out to display the whole window so all used icons are visible.
- F4  
Switches the zoom mode on and off.
- F5  
Opens the Loop Properties or Macro Properties dialog box.
- F7  
Creates a new macro, including all present selected functions and macros.
- F8  
Opens the Edit Flags dialog box.
- F9  
Sets execution order of control icons manually.
- CTRL + A  
Selects all control icons.
- CTRL + F  
Opens the Find dialog box.
- CTRL + L  
Aligns all selected icons to the left
- CTRL + T  
Aligns all selected icons to the top
- CTRL + R

Autoroutes selected lines

Mouse functions:

- **Shift + mouse wheel**  
Hold the Shift key pressed and then scroll with the mouse wheel the view to the left and to the right.
- **Ctrl + mouse wheel**  
Hold the Ctrl key pressed and then use the mouse wheel to zoom the view in and out the middle area in the window.
- **Shift + Ctrl + mouse wheel**  
Hold the Shift and the Ctrl key pressed and then use the mouse to zoom with wheel the view in and out the area around the mouse cursor.
- **Shift + left mouse key**  
Hold the Shift key pressed and then click on icons you want to select.

## Toolbar Buttons



Displayd and changed the numerous zoom factor in percent of the whole view, centered by the opened window.



Enables Zoom mode, in which you can zoom the selected items and zooms in the workspace/selected area.



Enables the Move mode, in which you can move the view of the macro window.



Enables the Select/Edit mode, in which you can select and move elements in the Macro window, draw connections between outputs and inputs and insert text into the Macro window.



Switches to the previous view. The last change of the view is reverted.



Switches to the next view. The last undo of the view is reverted.



Opens the global macro library.

## General Functions

### Insert Text

You may insert text in all the editor views. To insert text, right-click to open the context menu and select "insert text". A dialog opens in which you can type the text and select text attributes.

### Mirrored

Control icons can be mirrored. Right-click the context menu and select "mirrored". To insert all icons by default mirrored, select in the main menu "Plant > Control Editor > Add new icons mirrored."

### Background

The background is divided into squares. Each square represents the area of one page in the project documentation.

**Execution Order**

The numbers in brackets, e.g. [15], underneath the icons show the priority of the execution order. The priorities are generated on saving and leaving the control editor. The priorities can be changed

**Datapoints**

Datapoints can be dragged directly from the project tree and dropped into the control editor. If the datapoint is output or variable the context menu of the datapoint icon allows the toggle between read or write.

**IDT Function**

The IDT icon has two kinds of views. Regularly the IDT icon has an input and an output. If you set input or output on connection, and the other not, the view of the icon changes to a special view without the title bar (as used for datapoints dropped from the project tree).

**Grid Lines**

Grid lines can be shown or blanked.  
Select in the main menu "Plant > Control Editor > Show grid lines" to toggle between the grid line display mode.

**Autrouting Connection Lines**

By default, connection lines between control icons are autorouted when they are created and when control icons are moved, that is, they will be optimized for display (short, space consuming). Selected connection lines can be autorouted explicitly, if desired. To autoroute one particular connection line, select the connection line, click right button and click on Autoroute in the context menu, or, to autoroute multiple connection lines, select them and press CTRL + R keys.

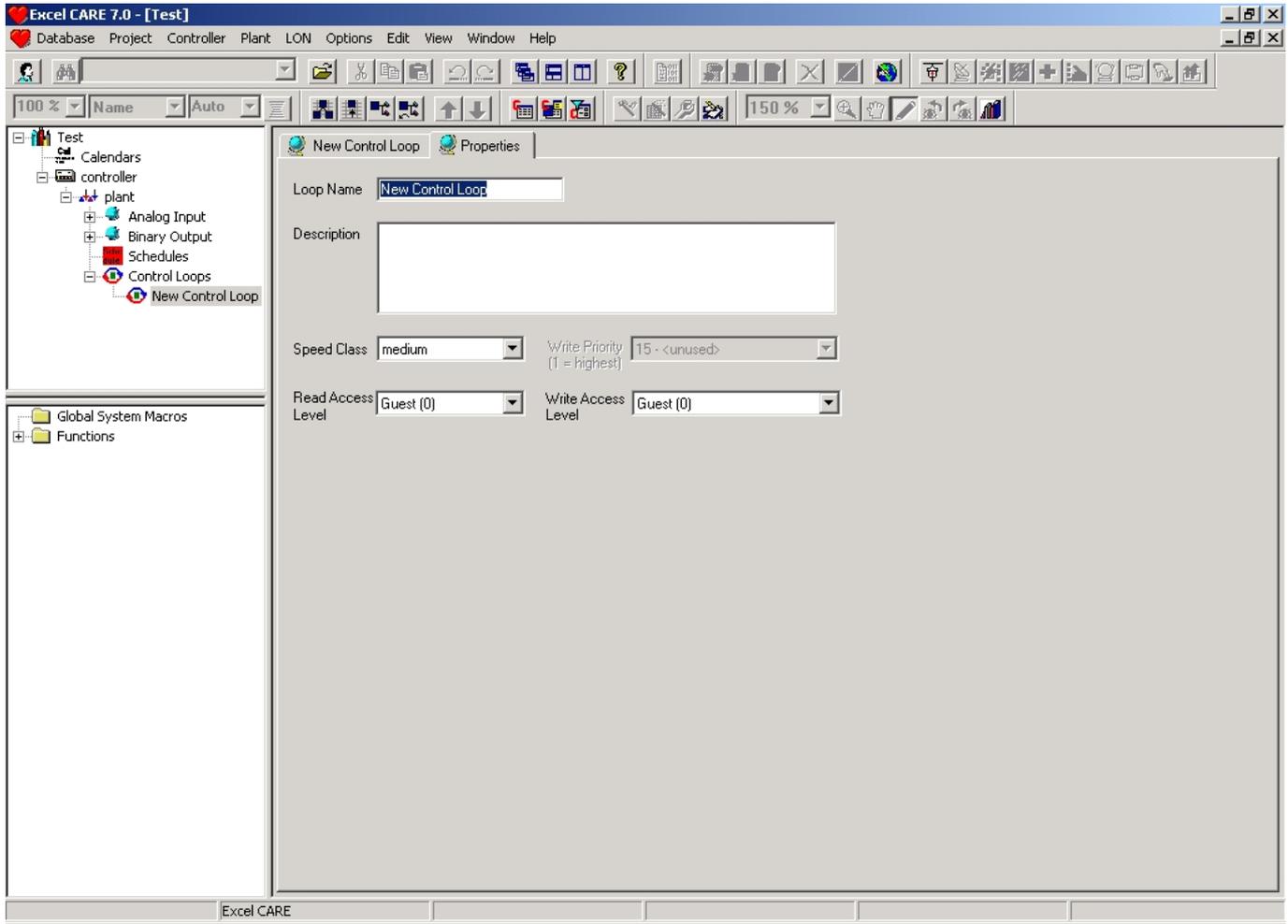
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**Create Control Loop****Prerequisites**

1. The user is logged in.
2. A project is open.
3. The open project has at least one controller and one plant.

**Procedure**

1. Expand the view of the plant, you want assign a control loop to.
2. Click with the right mouse button on the "Control Loops"-icon.  
RESULT: The context menu to create a control loop opens.
3. Click on it with the left mouse button.  
RESULT: A new icon "New Control Loop" opens on the left pane.
4. Double-click on the icon of the new control loop.  
RESULT: The macros window of the control loop opens on the right pane.
5. Click on the tab "New Control Loop".  
RESULT: The Properties window of the control loop opens on the right pane.



Fill in the fields according to your requirements:

- **Loop Name**  
Unique name of the loop. The name should consist of up to 40 characters and/or digits and/or ASCII special characters.
- **Description**  
Description of the loop, e.g. what's the function of the loop or which special functions are used within this loop.
- **Speed Class**  
Defines how often the loop will be automatically executed by the controller. The time slice of the speed class is defined in the property sheet of the controller.
- **Write Priority** (only displayed)  
Datapoints for data transfer include a "Write Priority". In case some components write to the same data point, only the value, unequal to zero, with the highest priority will be written to the output. All other values will be stored, but they have no influence for regulation.
- **Read Access Level**  
Someone with these, or higher access rights can view this loop (via web-interface).
- **Write Access Level**  
Someone with these, or higher access rights can edit this loop (via web-interface).

Fill the input fields according to your requirements.

RESULT: All Inputs are automatically saved.

Now can you define the logic of the new control loop.

## Edit Control Loop Properties

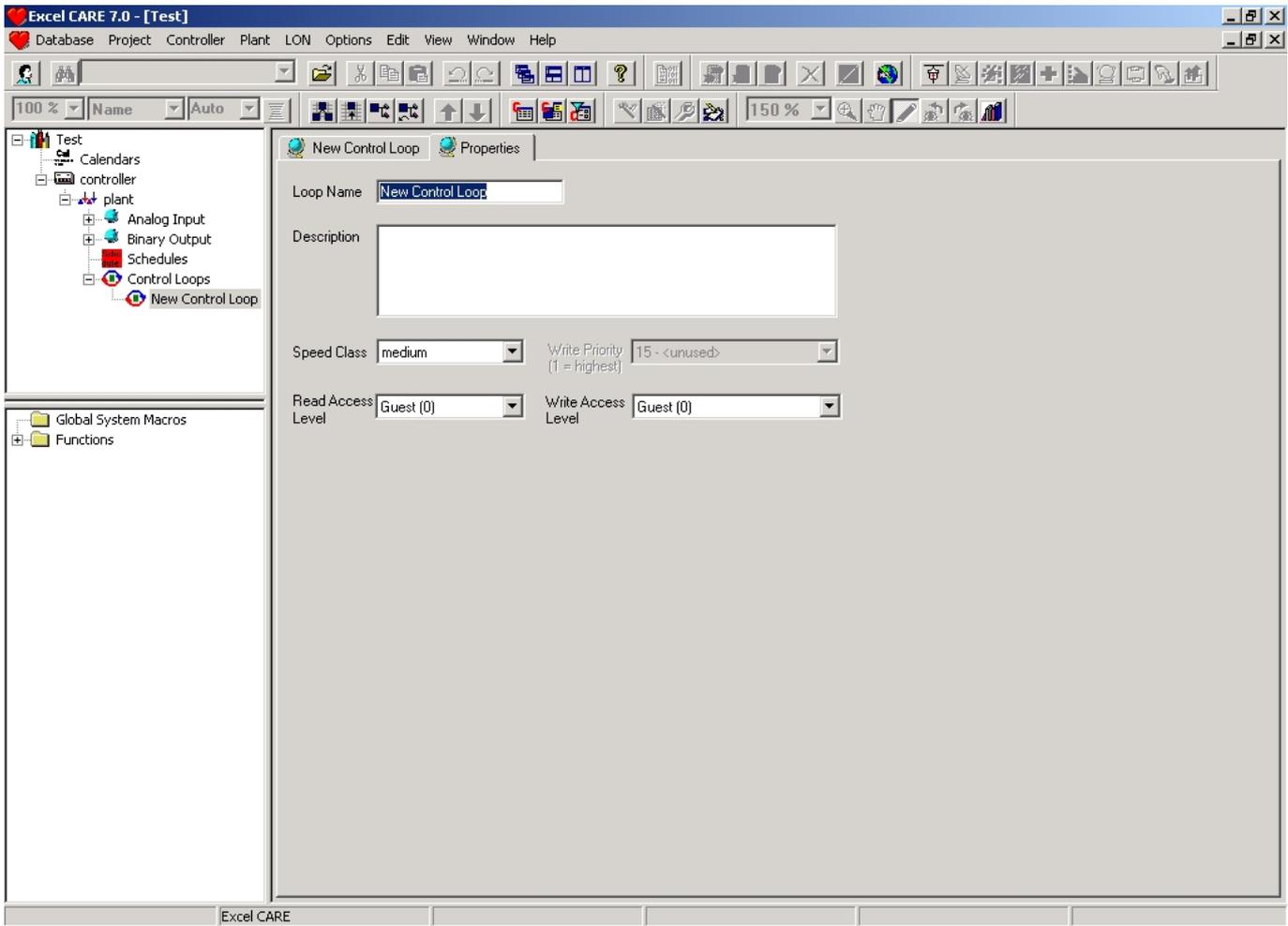
- Prerequisites**
1. The user is logged in.
  2. A project is open.
  3. The open project has at least one controller, one plant and one control loop.

- Procedure**
1. Expand the tree view of the control loops of the plant, the control loop is assigned to.
  2. Double-click on the icon of the control loop you want to edit.

RESULT: The macros window of the control loop opens in the right pane.

3. Click on tab "<name of the control loop>".

RESULT: The properties of the control loop are open in the right pane.



Change the entries in the following input fields according to your requirements:

- **Loop Name**  
Unique name of the loop. The name should consist of up to 40 characters and/or digits and/or ASCII special characters.
- **Description**  
Description of the loop, e.g. what's the function of the loop or which special functions are used within this loop.

- **Speed Class**  
Defines how often the loop will be automatically executed by the controller. The time slice of the speed class is defined in the property sheet of the controller.
- **Write Priority** (only displayed)  
Datapoints for data transfer include a "Write Priority". In case some components write to the same data point, only the value, unequal to zero, with the highest priority will be written to the output. All other values will be stored, but have no influence on the regulation.
- **Read Access Level**  
Someone with these, or higher access rights can view this loop (via web-interface).
- **Write Access Level**  
Someone with these, or higher access rights can edit this loop (via web-interface).

RESULT: All Inputs are automatically saved.

## Create and Edit control Loop Logic

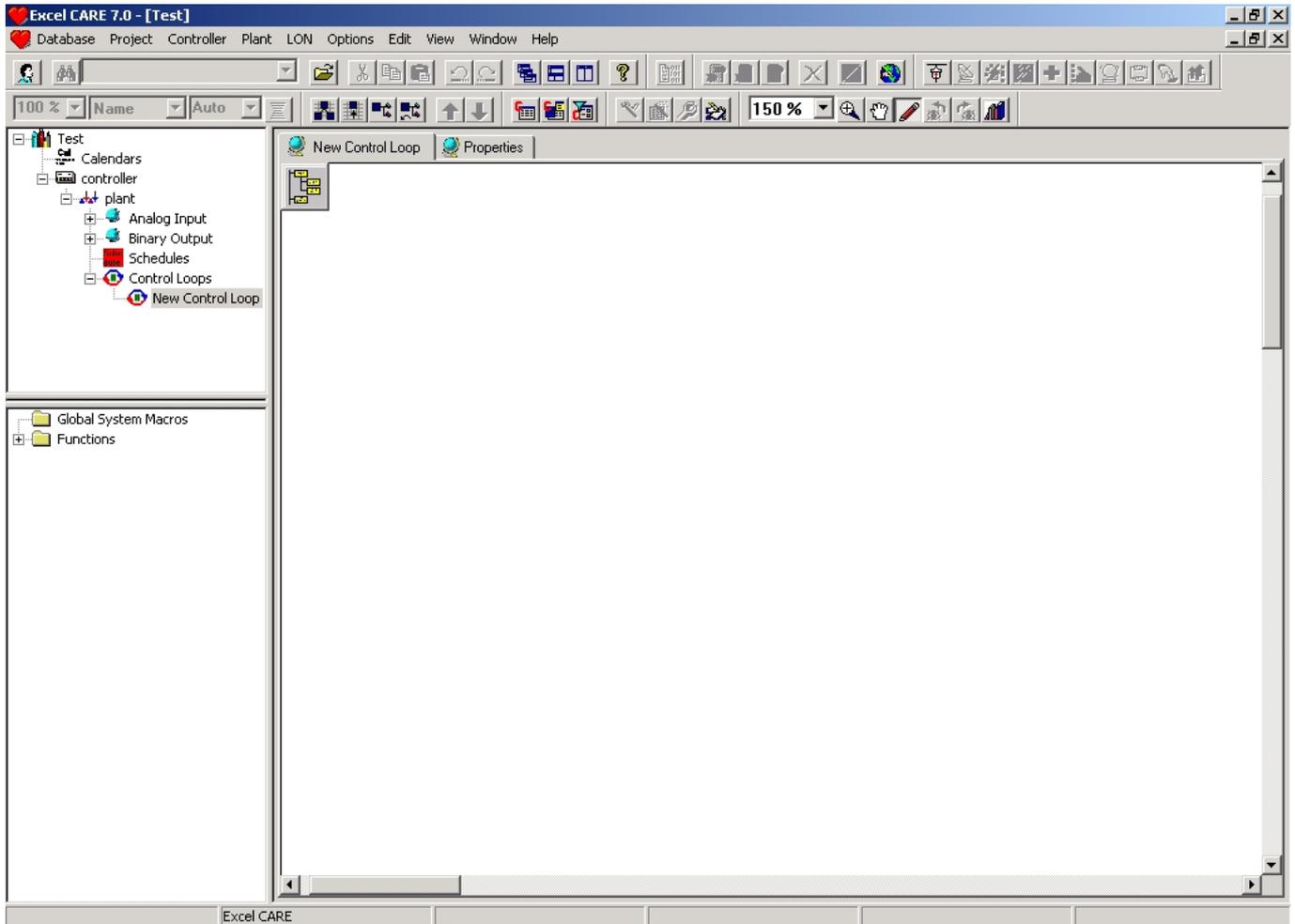
**Prerequisites**

1. The user is logged in.
2. A project is open.
3. The open project has at least one controller and one plant and one control loop.

**Procedure**

1. Expand the tree view of the plant for which you want create or edit a control loop.
2. Double-click on the icon of the control loop you want to edit.

RESULT: The Macro window of the control loop opens in the right pane.



3. Define the content of the loop as desired. Assign functions or hardware/software points to the loop by using the window known function of drag & drop:
  - Click once on the desired icon and hold the left mouse-button pressed.
  - Move the cursor into the Macro window. The cursor becomes a “No Parking”-sign if it is moved in areas, you can not drop the component into.
  - Release the left mouse button.

You are able to transfer elements from the following windows into the Macro window:

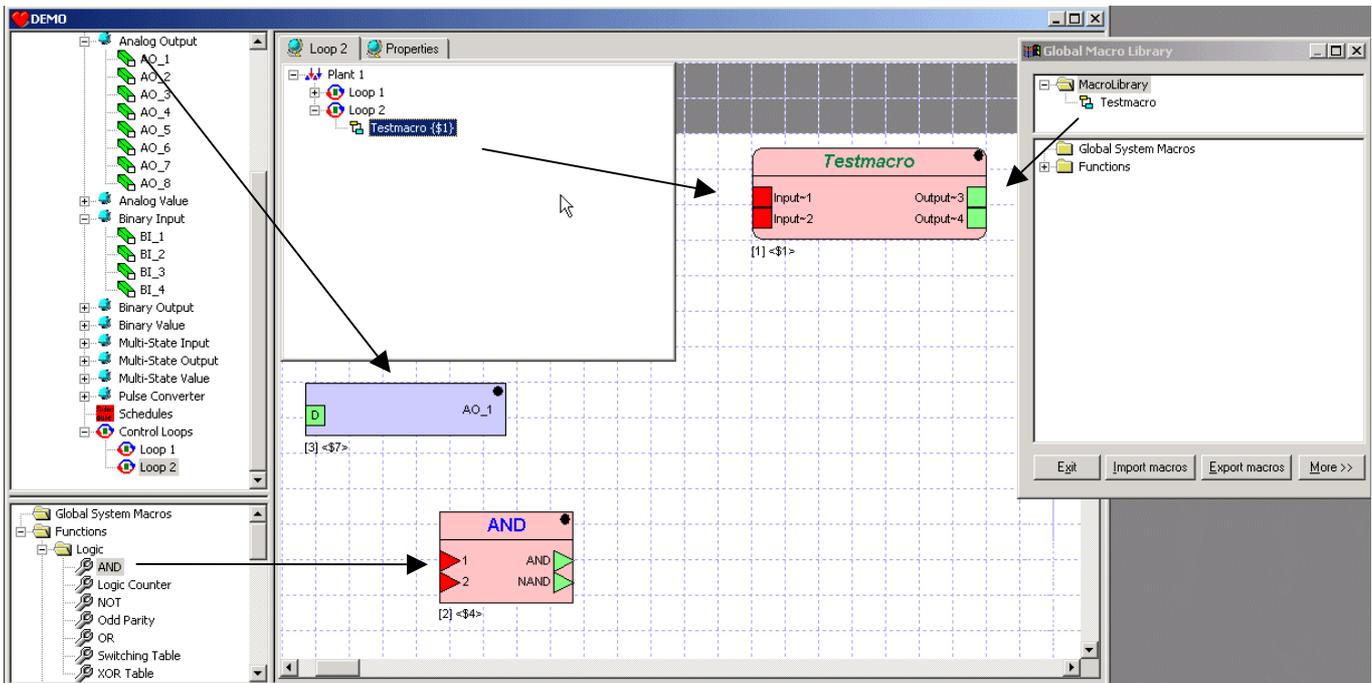
- From the controllers view (upper left from the macro window).
- From the functions view (down left from the macro window).
- From the Macros in plant view. To open the Macros in plant view, move the mouse cursor on the sensitive field in the upper left corner of the macro window:



- From the Global Macro Library. To open the Global Macro library, click menu item Database, then submenu item Macro Library... , or click on button:



RESULT: The function or component displays in the Macro window.



Meaning of the colours:

- **red**  
The setup of the icon is incomplete. All inputs must get a value, e.g. by connecting it to an output or by defining it as a constant.
- **blue**  
The icon is selected.
- **none colored (light grey)**  
The setup of the icon is accomplished, no errors are expected.

For setting up a connection between input and output, see step 8.

4. Apply the procedure written above with all components and functions you want to combine in this loop.

- All icons in the Macro window can be moved via drag & drop.
- You can use the windows known short keys, e.g. "Ctrl + A" for selecting all elements in the active window.
- To enter the menu Plant, make sure, the Macro window is still selected: Click once with the left mouse button in the Macro window.

RESULT: The following buttons and drop-down list in the taskbar are activated (from left to the right):

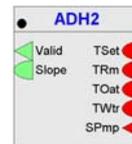


- Zoom: Display and change the numerous zoom factor of the whole view, centered by the opened window.
- Zoom: Use this button(s) to zoom in a selected area.
- Move all: The cursor becomes changed to a hand and you can move the view of the Macro window.
- Select and edit: The cursor becomes changed to standard and you can select elements in the Macro window, draw connections between outputs and inputs and insert text into the Macro window.
- Last view: The last change of the view is reverted.
- Next view: The last undo of the view is reverted.

The elements in the Macro window are displayed in the following manner:  
Hardware/software point, in most cases a real input or output of the controller.



Function, indicated by the separated header and input and output ports. The name of the function is displayed in this header.



You can always connect an analog and digital port. The input port translates the input signal into his own format (analog or binary) some information may be lost. A warning informs you about a data mismatch, if you set up a connection between analog and digital ports that have different signal formats.



Digital port. Can have two values: TRUE (1) or FALSE (0).



Any port, this port is not predefined as an analog or digital input. The type of data depends on the further processing.



Some types of I/O connections are shown with one or two letters in the connector box. The meanings of these letters are described in the following table:

Letters	Meaning
"P"	Parameter
"I"	Macro input
"O"	Macro output
"C"	Constant
"D"	Datapoint property
"Pr"	Point role
"S"	System data
"pr"	Function p register
"ur"	Function u register
"F"	Flag point

The black point in the header indicates the side of the output ports.



A line at the bottom of the icon indicates hidden (invisible) ports. You can make them visible using the Properties window of these ports.

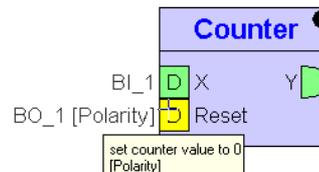
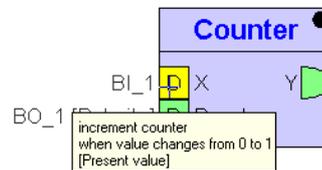
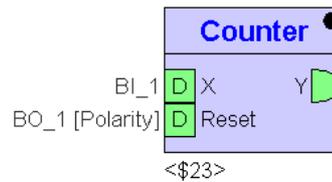


Input ports are red colored, if they are not connected, if they do not get any input. The color green indicates the accurate connection of the port. Pointroles are not a valid connection and must be changed for translation. Thus pointroles are also red.



The configuration of inputs is indicated as follows:

If an input port is configured as datapoint attribute, the default datapoint property "Present Value" is displayed in the tooltip of the port. If any other property is selected as datapoint attribute, e.g. Polarity, this is shown in the tooltip and additionally in brackets at the port.



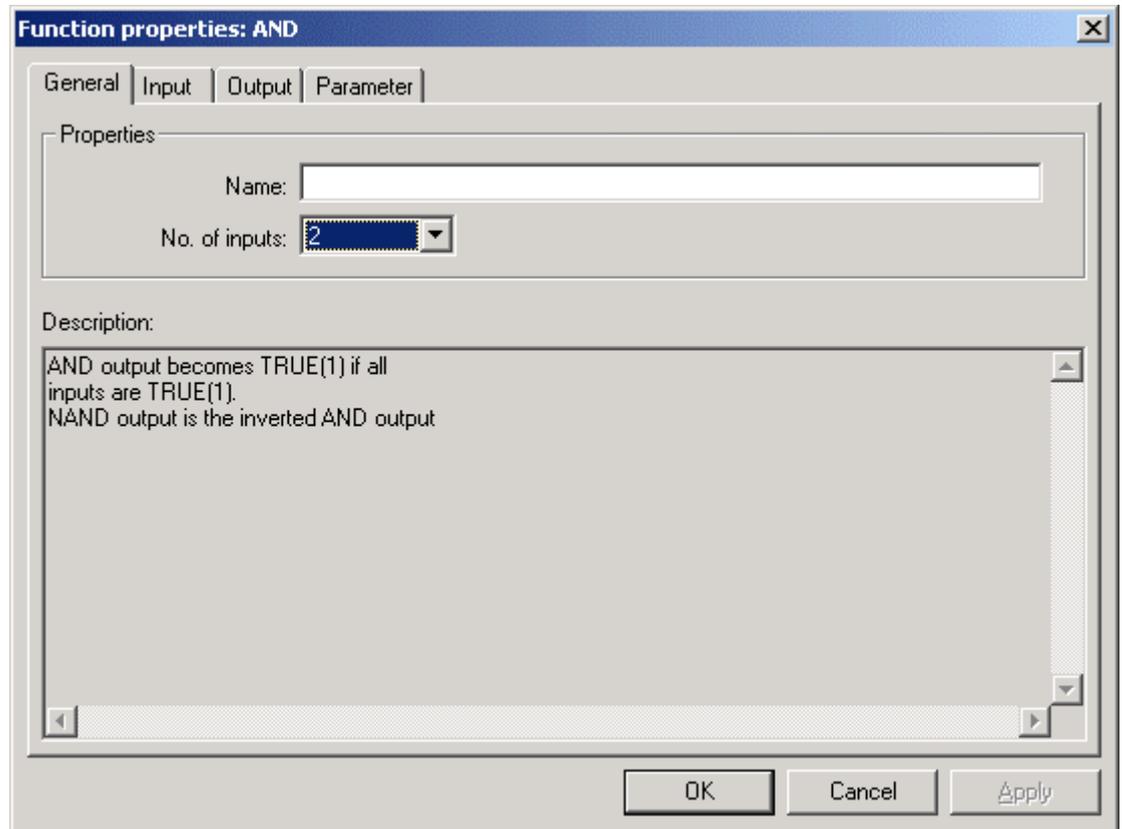
5. Setup the properties of the functions and hardware/software points as follows:

- Click with right mouse button on the element, you want to set up.

RESULT: The context menu of the element displays.

- Click on **Properties**.

RESULT: The Function properties:<name> dialog box of the element opens.



In tab **General** are the following input fields:

- **Name**

Alias of this element. The alias can consist of up to 32 characters and/or digits. This alias is displayed in the tab Internal Parameter of parent macros (only if the alias-element includes parameters).

- **No. of inputs**

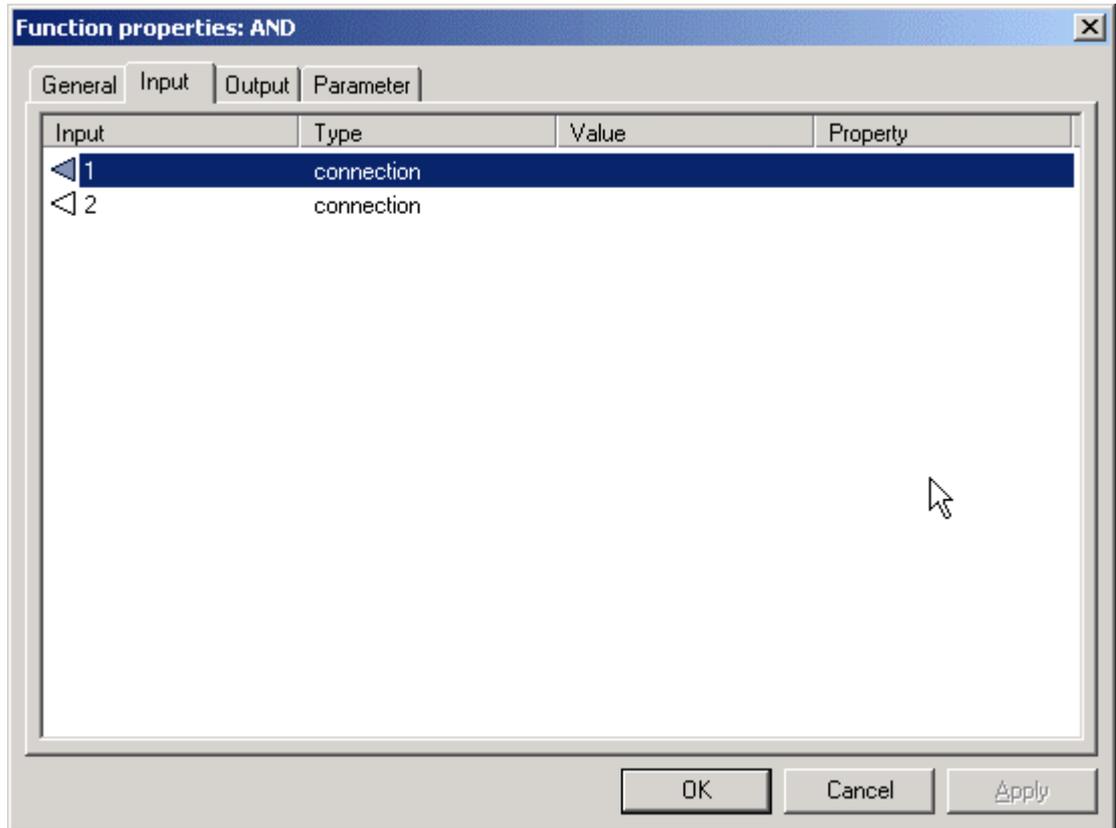
Number of input (in some cases output) connections of the element.

You have to apply changes of the input/output count before you can view the changed number in the input/output tab.

An input always must be filled with a value. The value could be e.g. a connection (to the output of another element) or a data point or system data. It is possible to hide an input/output if it is not a connection.

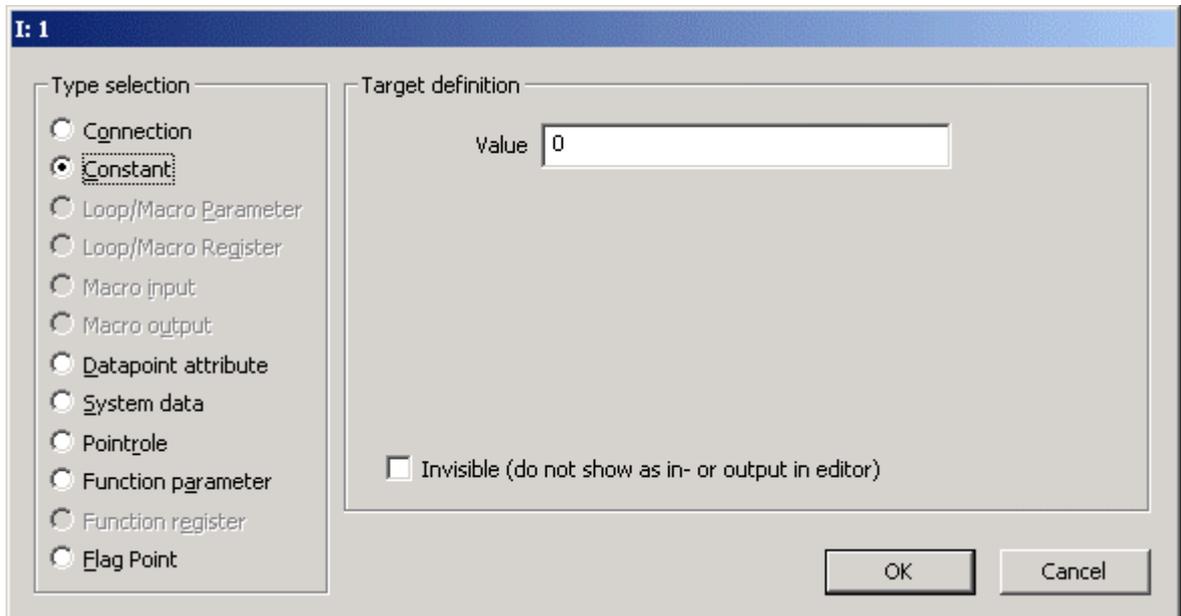
The available input connections are displayed in the tab **Input**.

Select the tab.



Select the properties of the input by double-clicking into the desired row of the table.

RESULT: The configuration dialog box for selecting type and target for the input opens.



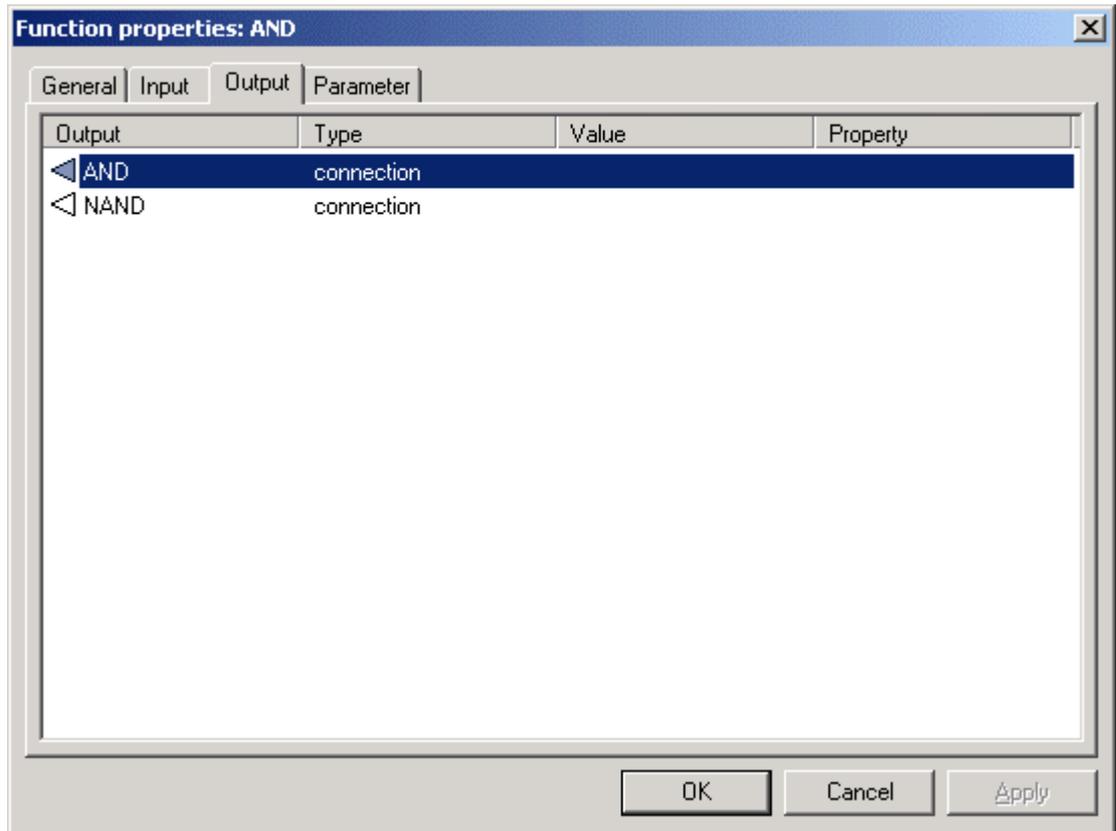
**- Connection**

The input is defined as a connection to one output of another element of this loop. This input will be always displayed in the Macro window.

- **Constant**  
The input is always set up to this value. It is possible to hide this input in the Macro window.
- **Loop/Macro Parameter (not available while editing control loop)**  
A parameter can be used by all functions and macros of this loop/macro without being connected. So it is possible to simplify the displayed connections. The input becomes this value.  
It is possible to hide this input in the Macro window.
- **Macro input (not available while editing control loop)**
- **Macro output (not available while editing control loop)**
- **Data point attribute**  
The input becomes a value of a data point attribute. Datapoints are hardware/software points, e.g. sensors. The list of available attributes depends on the type of the datapoint and if this attribute is used for an input or output.  
It is possible to hide this input in the Macro window.
- **System data**  
The input becomes the value of the system function, such as clock. The following system values are stored:
  - Day and month (actual date, =100\*month+day)
  - Day of week (actual day of the week, monday(1)...saturday(7))
  - Hours and minutes (actual time, =100\*hours+minutes)
  - Minutes since midnight (number of minutes after midnight)
  - Startup flag (indicates, if the system has been restarted)
 It is possible to hide this input in the Macro window.
- **Pointrole**  
Datapoints can be combined in so called pointroles. It is easier to sort the datapoints by their main properties. Select a data point from the pointrole.  
It is possible to hide this input in the Macro window.
- **Function parameter**  
The input changes to the value of a parameter of one function/macro (which includes parameters) included in this control loop. Only functions with parameters are listed. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is also displayed below the symbol as long as no name is set.  
It is possible to hide this input in the Macro window.
- **Function register**  
The output sets the hidden stored value of one function/macro included in this macro. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is displayed below the symbol as long as no name is set.
- **Flag Point**  
Flags are points for transferring data between loops of one plant. The input is always set up to this value.  
It is possible to hide this input in the Macro window.
- **Invisible (do not show as in - or output in editor)**  
Hides the input or output of the control icon for all types other than "Connection". A line at the bottom of the icon indicates invisible ports.

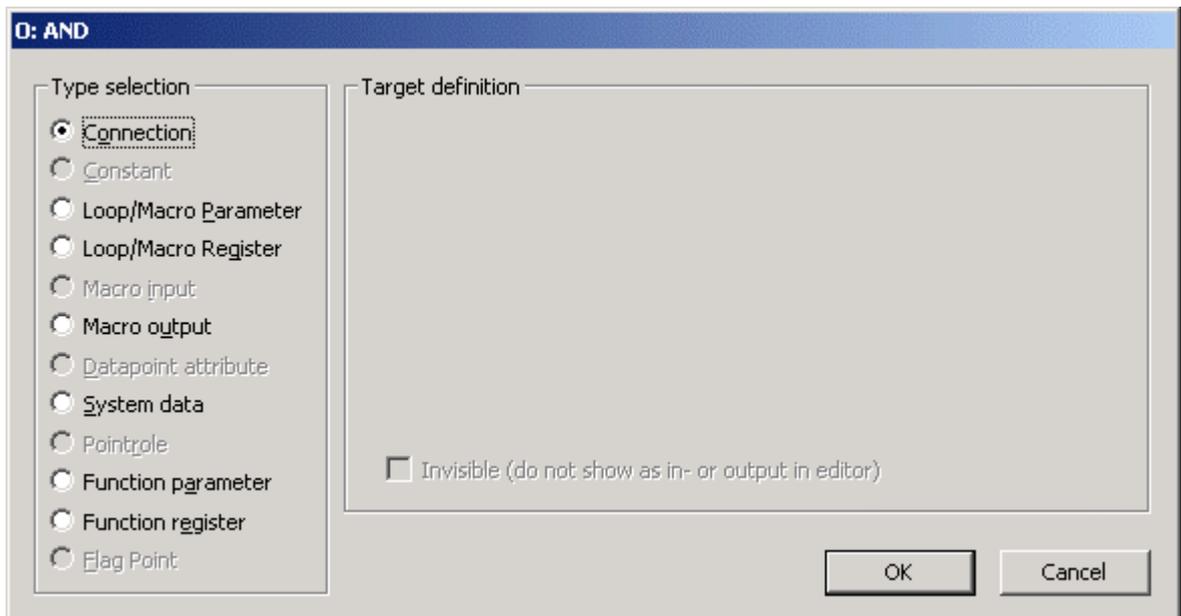
The available output connections are opened in the tab **Output**.

Select the tab.



Select the properties of the output by double-click into the desired rows of the table:

RESULT: The configuration dialog box for selecting type and target for the output opens.

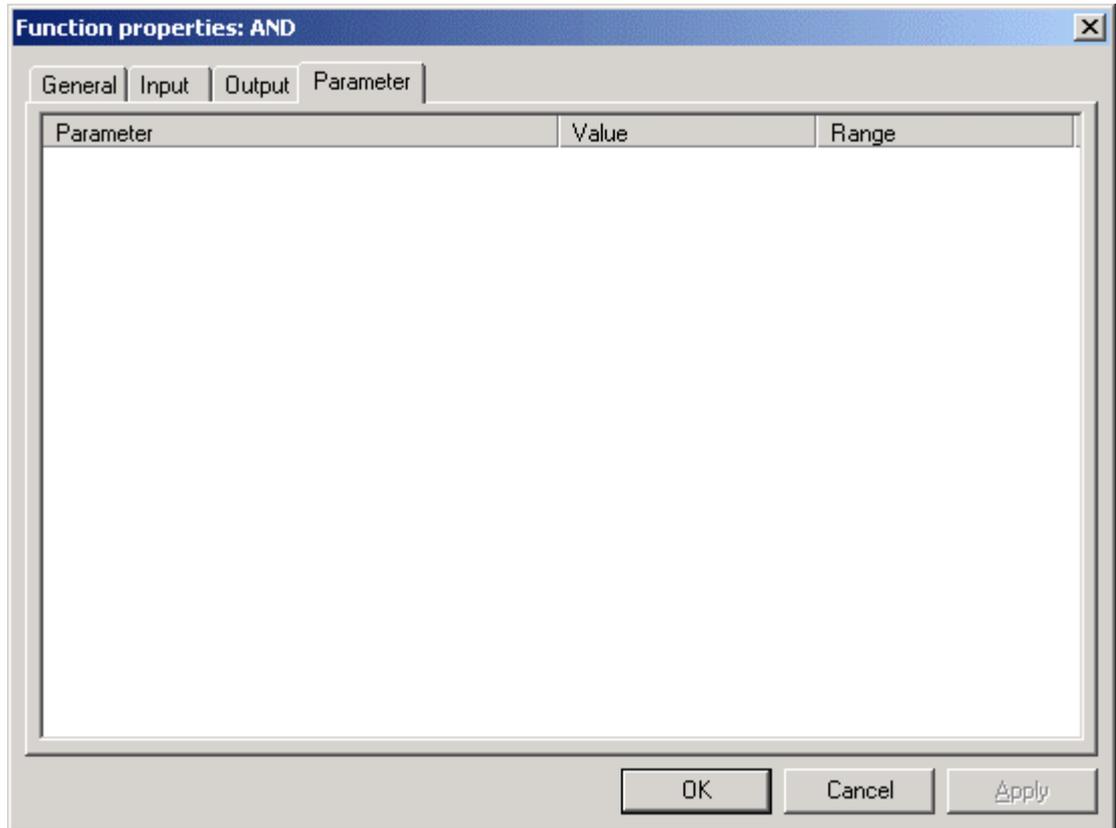


- Connection

The output is defined as a connection to one or more inputs of another element of this loop. This output will be always opened in the Macro window.

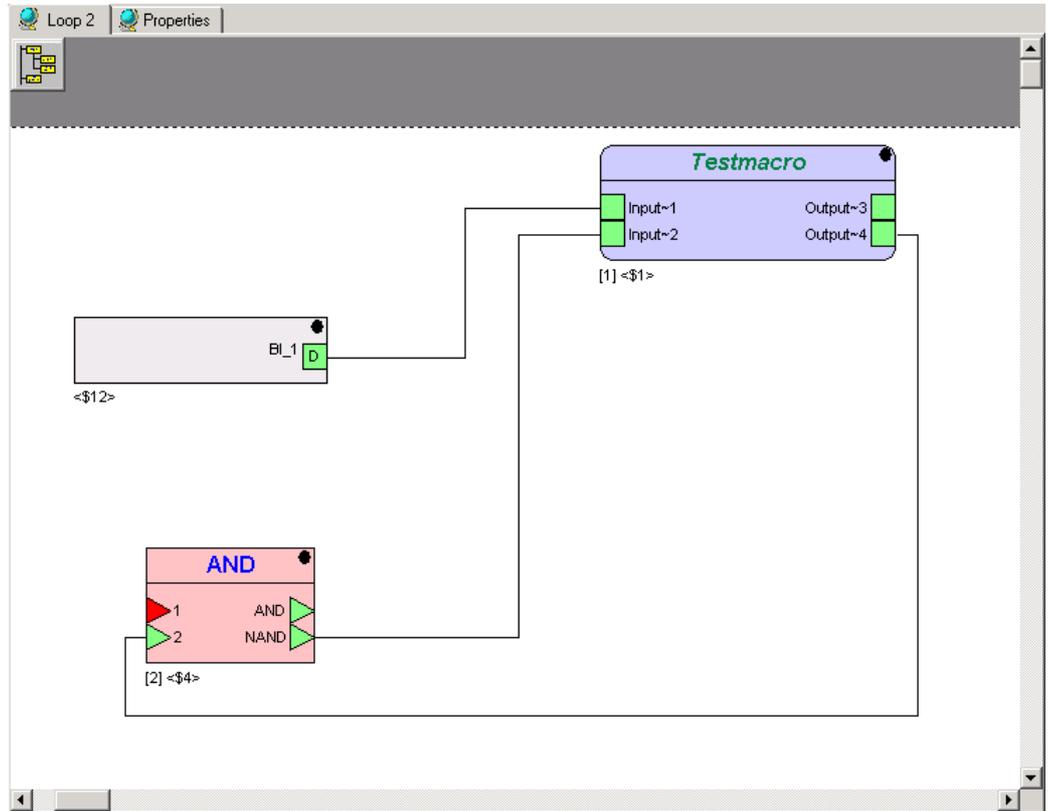
- **Constant**  
The output always sets up this value. It is possible to hide this output in the Macro window.
- **Loop/Macro Parameter**  
A parameter can be used by all functions and macros of this loop/macro without being connected. It is possible to simplify the displayed connections. The output sets this value.  
It is possible to hide this output in the Macro window.
- **Data point attribute**  
The input becomes a value of a data point attribute. Datapoints are hardware/software points, e.g. sensors. The list of available attributes depends on the type of the datapoint and if this attribute is used for an input or output.  
It is possible to hide this input in the Macro window.
- **System data**  
The output sets a system data. The only possible data is the Startup flag. All other system data is read only. It is possible to hide this output in the Macro window.
- **Pointrole**  
Datapoints can be combined in so called pointroles. It is easier to sort the datapoints by their main properties. Select a data point from the pointrole.  
It is possible to hide this output in the Macro window.
- **Function parameter**  
The output sets the value of a parameter of one function/macro (which includes parameters) included in this control loop. Only functions with parameters are listed. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is also displayed below the symbol as long as no name is set.  
It is possible to hide this output in the Macro window.
- **Function register**  
The output sets the hidden stored value of one function/macro included in this macro. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is displayed below the symbol as long as no name is set.
- **Flag Point**  
Flags are points for transferring data between loops of one plant. The output always sets up this value.  
It is possible to hide this output in the Macro window.
- **Invisible (do not show as in - or output in editor)**  
Hides the input or output of the control icon for all types other than "Connection". A line at the bottom of the icon indicates invisible ports.

For some elements it is possible to set up **Parameters** in the so named tab. Select the tab and then double-click on the value field of the parameter table to edit them.

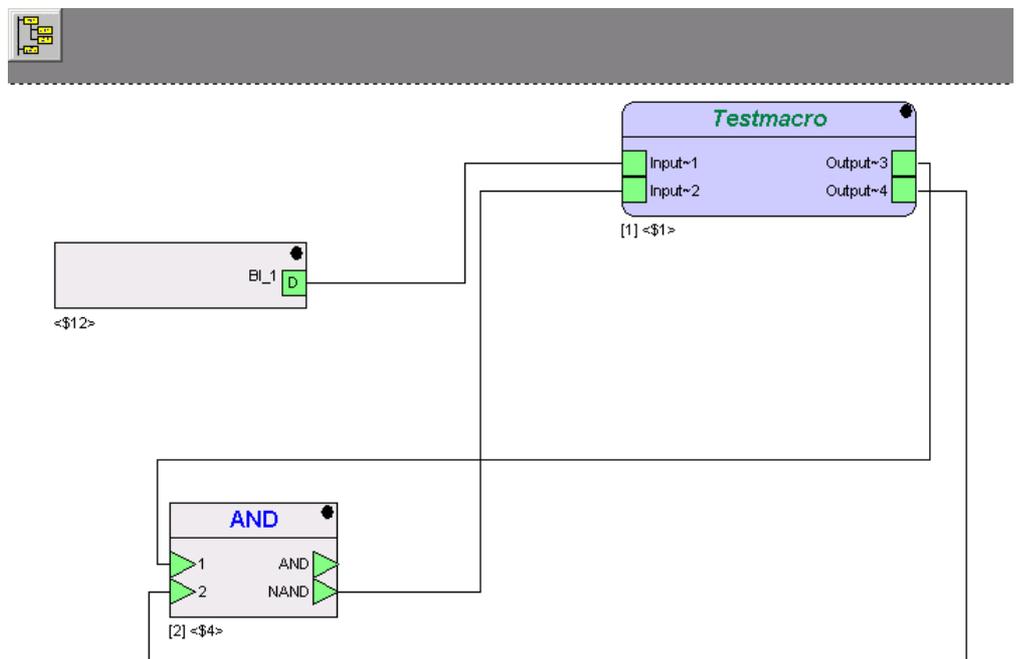


**6. Now connect the input and output ports:**

- Click once on the first port, you want to connect.
- Move the cursor to the second port and click on it.
- A line will connect the two ports (only in case they are corresponding). One output port can be connected to many input ports. But one input port can always be connected to only one output port.
- Customize the connecting line. While creating the connection you can click the left mouse button into free space and the line becomes a corner there. Clicking the right mouse button removes the last corner.
- After creating you can click the right mouse button at the line and the context menu to split (adding one corner) and to delete segments displays. After selecting the line via clicking on it, each single segment (between two corners) can be moved by clicking on it.



7. Make sure, you have connected all inputs and outputs. Unconnected points are red coloured; all points have to be coloured green.

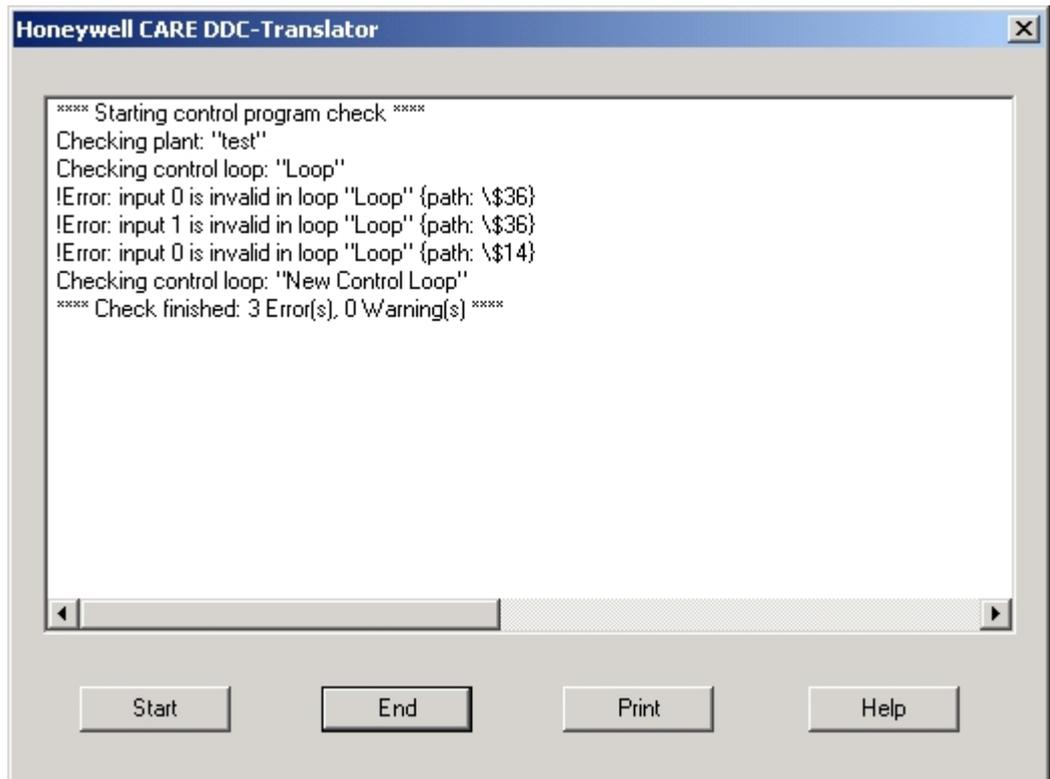


8. Now translate the loop so it can be executed by the controller:

- Select the controller by double-click on it.
- Click on menu item Controller.

- Click on submenu item Translate.

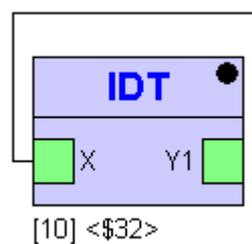
RESULT: The Honeywell CARE DDC-Translator window opens.



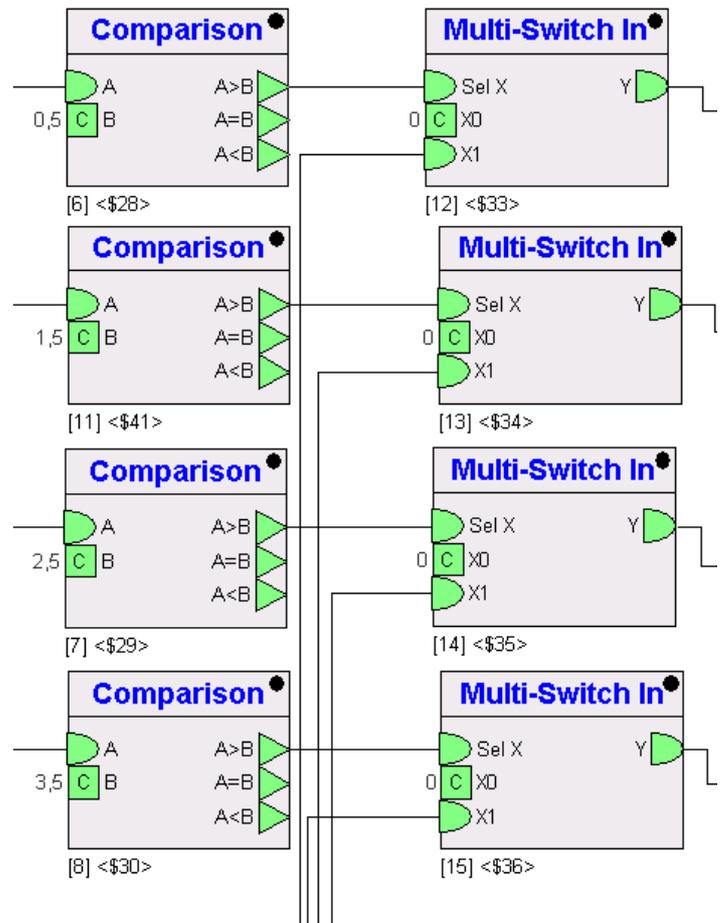
- You receive a log with the result of the translation.
- If the translation failed, use the log in the translation window to identify the mistake(s). Correct them and start the translation again.
- Transfer the software to the controller if the translation was successful.

## Set Execution Order of Control Loop Logic

CARE software calculates the execution order of all functions of the control loop in order to optimize the execution time of the complete control loop. The execution order of the control functions and macros are indicated as number in brackets below each icon. For example, the following icon has the execution number 10 which means, that 9 other functions will be calculated before:

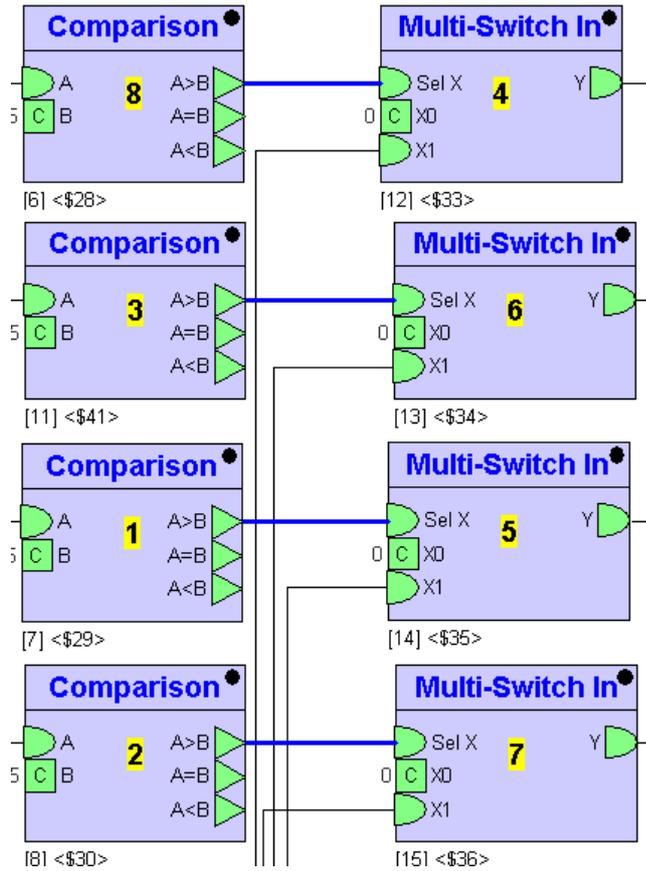


The following picture shows the execution order numbers of multiple functions of a control loop section.



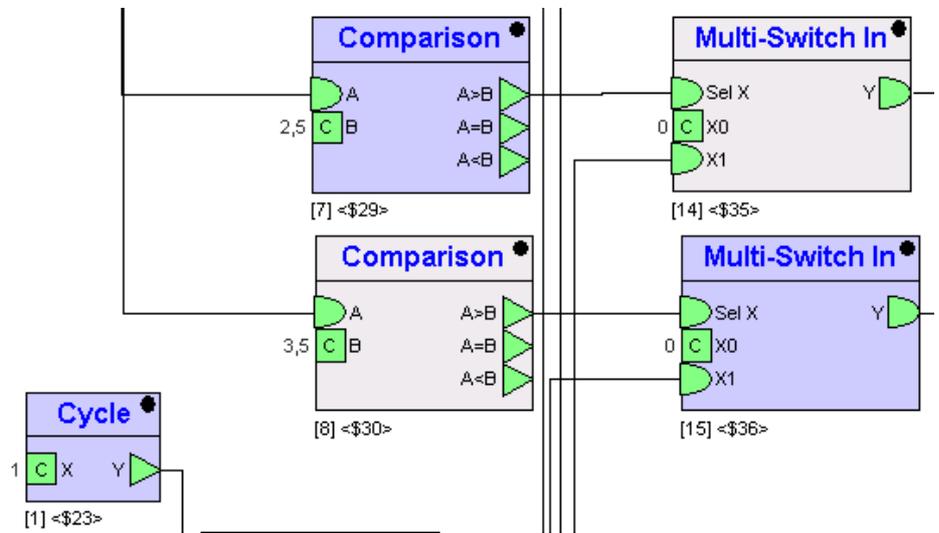
Besides the automatic calculation and optimization of the control loop execution, CARE software allows manually setting the execution order of particular control functions.

**Example:** The following control functions will be executed according to their manual order which is indicated by the yellow highlighted numbers. The order is relative, since between each two steps other functions which are not selected manually, are executed due to the optimization by the software. But, the order between two following steps is absolute.



**Procedure** 1. Select the control functions you want to order manually.

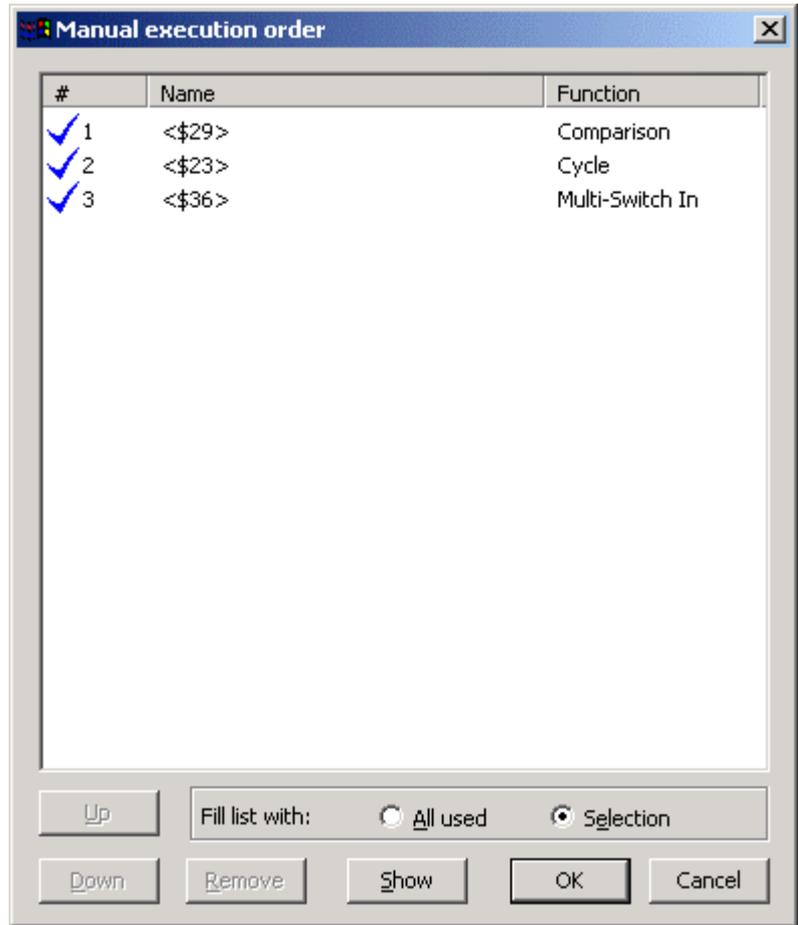
RESULT: The selected control functions are highlighted in blue.



The original order is Cycle = 1, Comparison = 7, and Multi-Switch In = 15.

2. Click on Plant>Control Editor>Manual Execution Order>Set Order, or press F9 key.

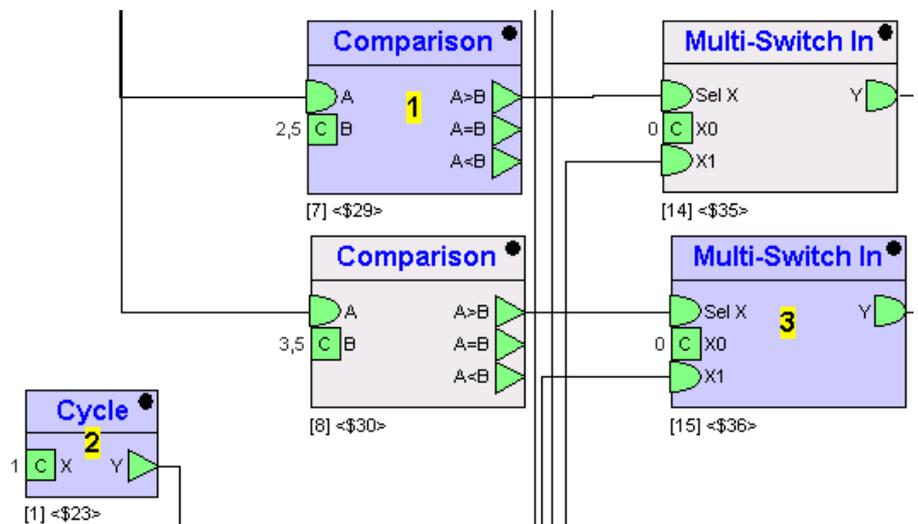
RESULT: The Manual execution order dialog box displays.



The list shows the optimized order for the selected functions.

- By default, only the current selected functions (option "Selection" is checked), will be manually ordered and labeled accordingly in the macro logic. To include icons into the ordering, which have been previously but are not currently selected, click the All used radio button.
- To preview the order of the functions in the control logic, click on the Show button.

RESULT: The functions in the list (selected or all used) are labeled in the control logic.



5. To change the order, select the function in the list and click the Up or Down button. Multiselection by using SHIFT or CTRL keys and left mouse button is possible.
6. To remove a function from manual ordering, select the function in the list and click the Remove button. Multiselection by using SHIFT or CTRL keys and left mouse button is possible.
7. If changes have been done in the list, preview the new order of the functions in the control logic by clicking the Show button again.

RESULT: The functions in the list (selected or all used) are labeled in the control logic.

8. To confirm the previewed order, click the OK button.

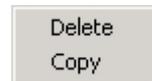
RESULT: The control loop will be executed according to the defined order.

## Delete Control Loop

- Prerequisites**
1. The user is logged in.
  2. A project is open.
  3. The opened project has at least one controller, one plant and one control loop.

- Procedure**
1. Expand the tree view of the control loops of the plant, the control loop is assigned to.
  2. Click with the right mouse button on the icon of the control loop you want to delete.

RESULT: The context menu displays.



3. Click on Delete with the left mouse button.

RESULT: The icon of the selected control loop will be removed.

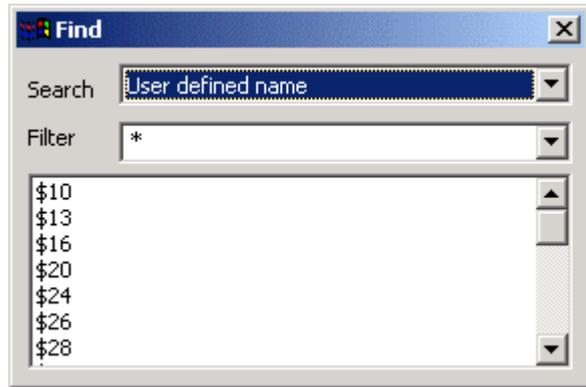
NOTE: The control loop will be removed finally. You can not use the submenu undo.

## Find Element in Control Loop

- Prerequisites**
1. The user is logged in.
  2. A project is open.
  3. The opened project has at least one controller, one plant and one control loop.

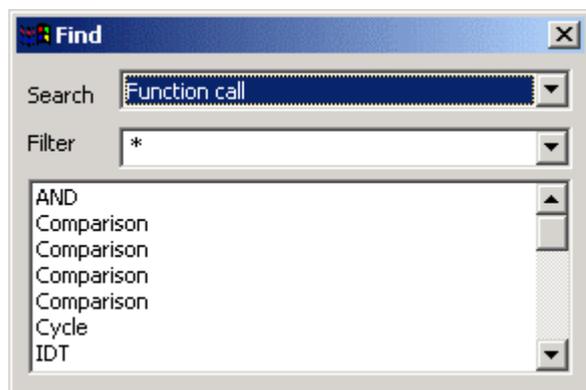
- Procedure**
1. Click main menu Plant, then submenu Control Editor, then submenu item Find, or press CTRL + F keys.

RESULT: The Find dialog box displays.



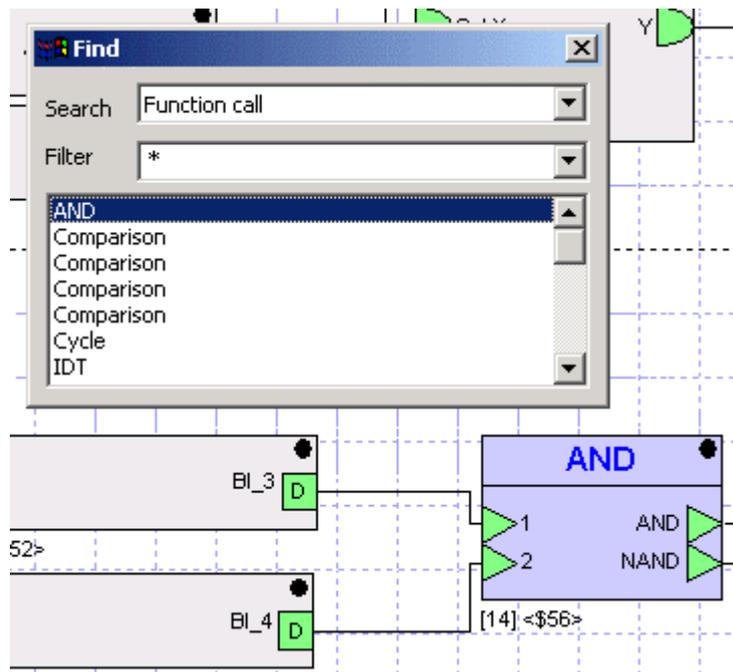
- From the Search drop-down listbox, select the item you want to find in the control loop displayed.

RESULT: In the list below, all available elements of the selected search item are displayed.



- To apply a filter to the search result of the list, enter a string in the Filter drop down listbox. By default all elements of the control loop are displayed as indicated by an asterisk \*.

- To find a particular element in the control loop, click on in the list.



RESULT: The found element will be highlighted. In this case, an AND Function call has been selected in the list and is highlighted in the control loop.

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## Macros

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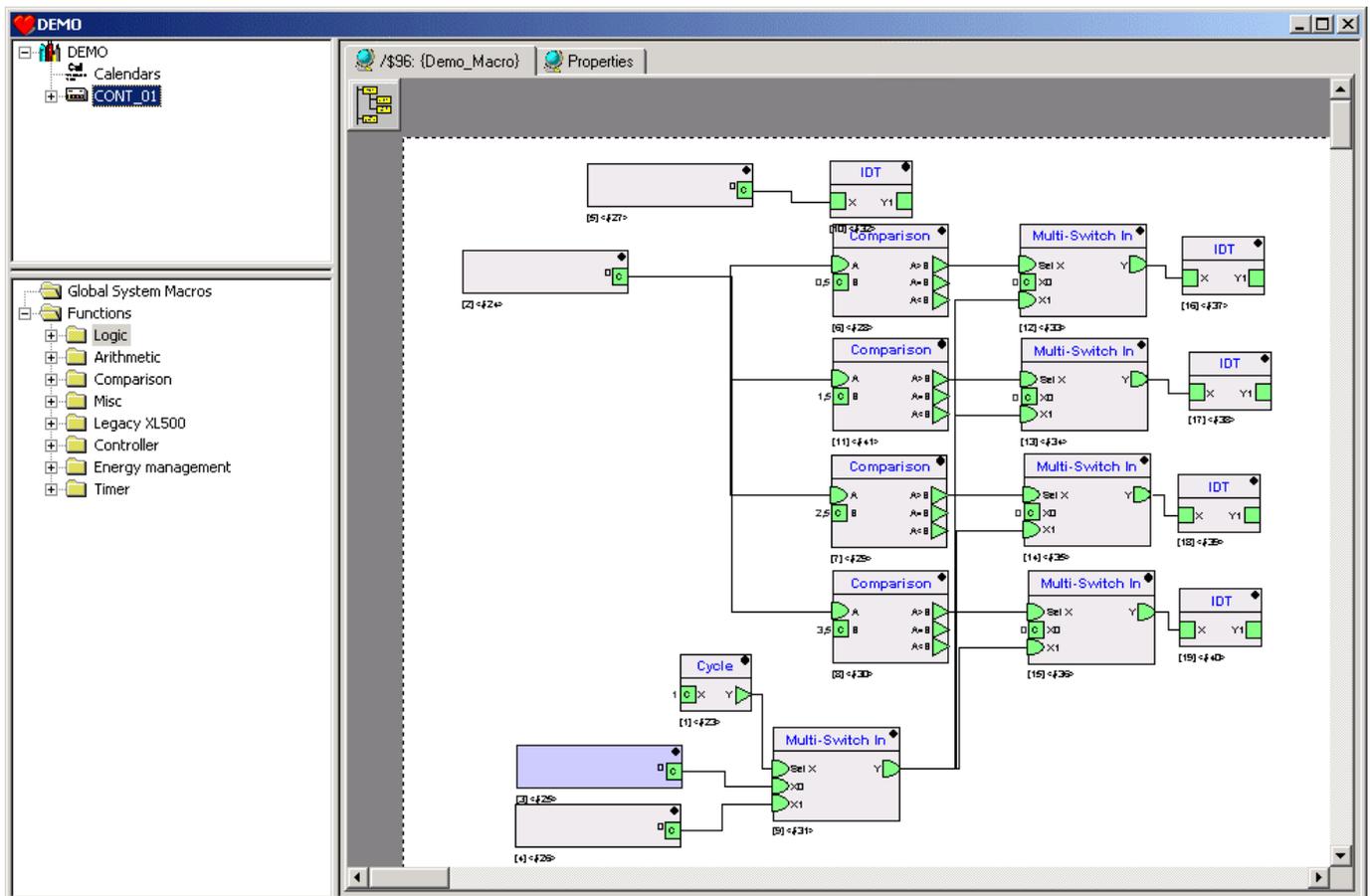
- Purpose** Macros are functions, built from other functions by the CARE-user (like a loop within a loop).  
Macros can be used to carry out recommended special functions, e.g. freeze protection (not included in CARE software basic version). The macros can be built and used like a control loop, and can be assigned to a single plant, to a whole project or to the all projects of the data base. Macros are stored in the global macro library, to ensure the transfer between data bases.
- Types** There are three types of macros:
- **Macros in plant**  
Macros that are software modules programmed from functions.  
Macros in plant that are only available in a single plant. It is in the user's hand to create, edit or remove such macros. You can copy the macros of a plant into the global macro library.
  - **System Macros**  
System Macros are mostly provided by Honeywell.  
They are available for all projects of a database. Only authorized users have access to these macros.
  - **Global Macros**  
Global Macros are stored in the global macro library.  
They are available for all projects of the database. Use the macro library to create, edit, remove and organize these macros.

## Create Macro

- Prerequisites**
1. The user is logged in.
  2. A project is open.
  3. The opened project has at least one controller, one plant and one control loop.

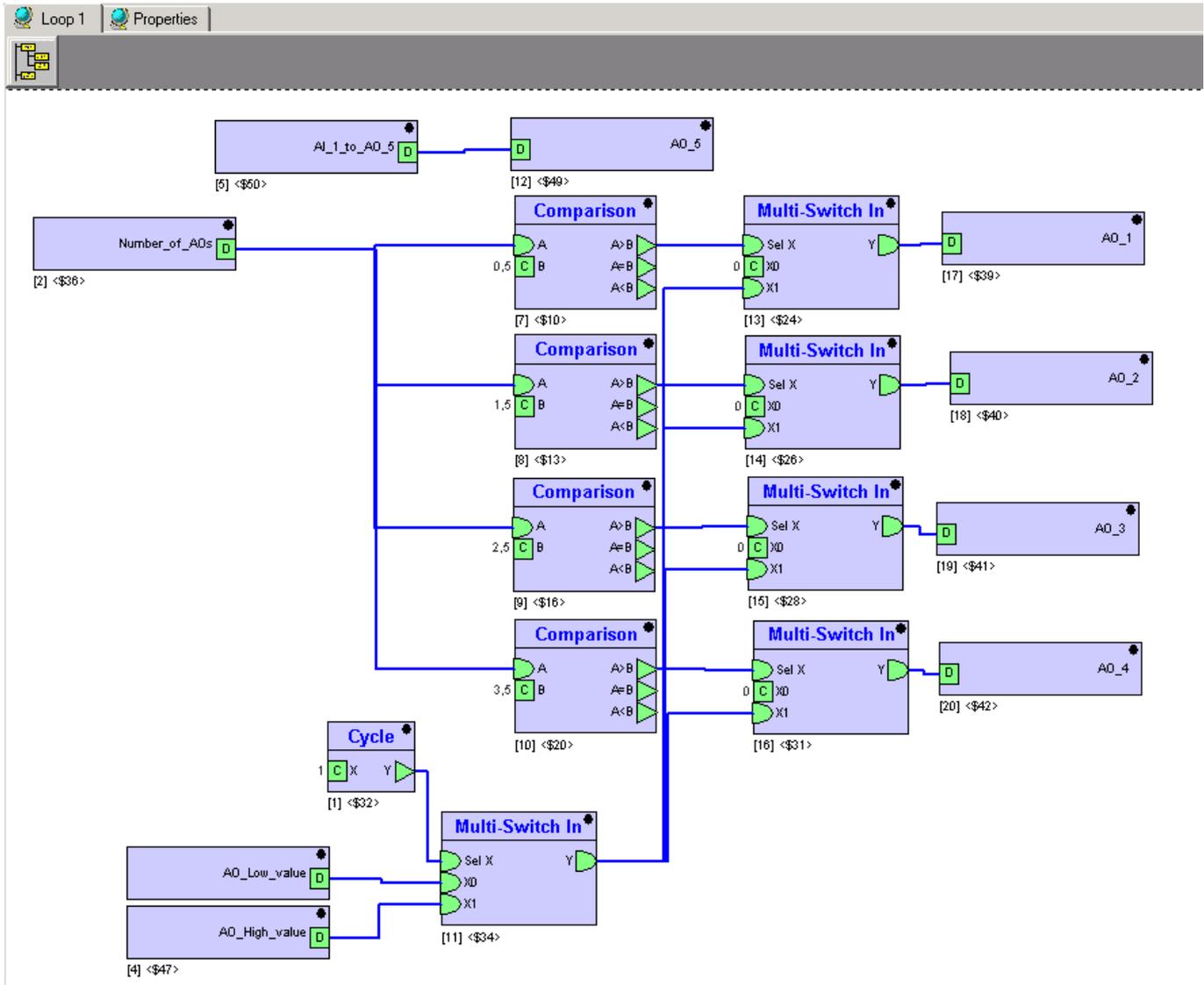
- Procedure**
1. Expand the tree view of the control loops of the plant, the control loop is assigned to.
  2. Double-click on the icon of the control loop for which you want to create a macro.

**RESULT:** The Macro window of the control loop opens in the right pane.



3. Select the functions, you want to move into a macro:
  - Select a single function by clicking on it.
  - Select some single functions by clicking on them and hold the Shift-key pressed.
  - Select a couple of functions by holding the left mouse button pressed and drawing a rectangle, covering the functions.
  - If nothing is selected, the macro stays empty.

RESULT: The selected functions are colored blue.



- Click menu item Plant, then submenu item Control Editor and then submenu Create new macro... (or press F7)

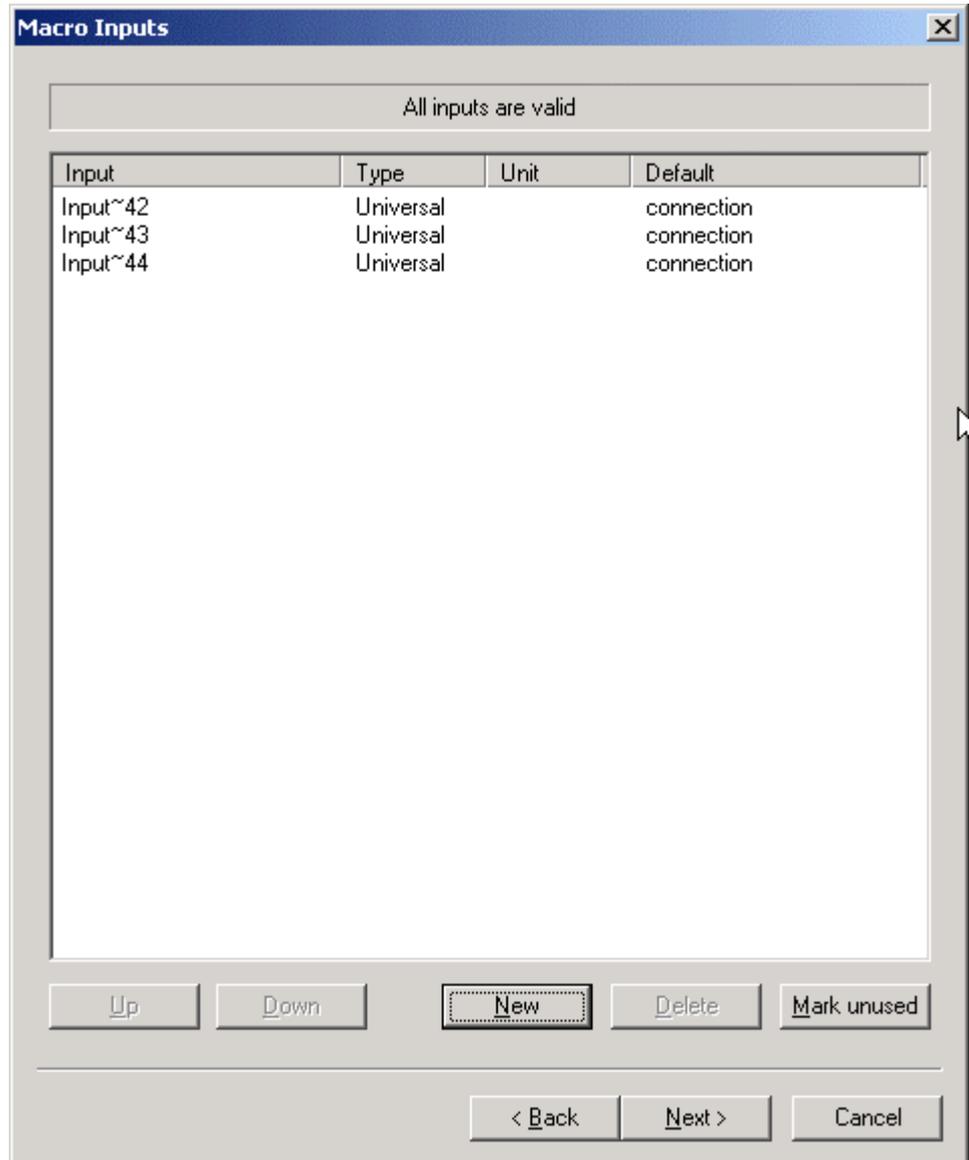
RESULT: The Macro overview dialog box of the macro opens.

Fill out the fields according to your requirements:

- **Please enter a name:**  
Unique name of the macro.
- **Description**  
Description of the macro, e.g. what's the function of it or which special input/output or parameters are used in this macro.
- **Tooltip**  
Descriptive information that will be displayed in the yellow tooltip which displays when moving the cursor over the macro icon.
- **System macro**  
Select the checkbox if the macro should be included in the folder "Global System Macros". The macros of this folder are usable for all control loops of this database. Only authorized users can create or access System macros.
- **Version info (read only, set automatically)**  
Some information about the macro, similar to file information known from MS-window.

5. Click the **Next** button.

**RESULT:** The Macro Inputs dialog box of the macro opens. The inputs of the selected functions are predefined as inputs of the macro.



6. Set up the properties of the inputs of the macro by clicking twice into the desired fields of the table:

Meaning of the columns:

- **Input**  
Name of the input(s). Click twice into the row of the desired input to change its name.
- **Type**  
Type of the input(s). Click twice into the row of the desired input to get the choice between the three input types (analog, binary or universal).
- **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).

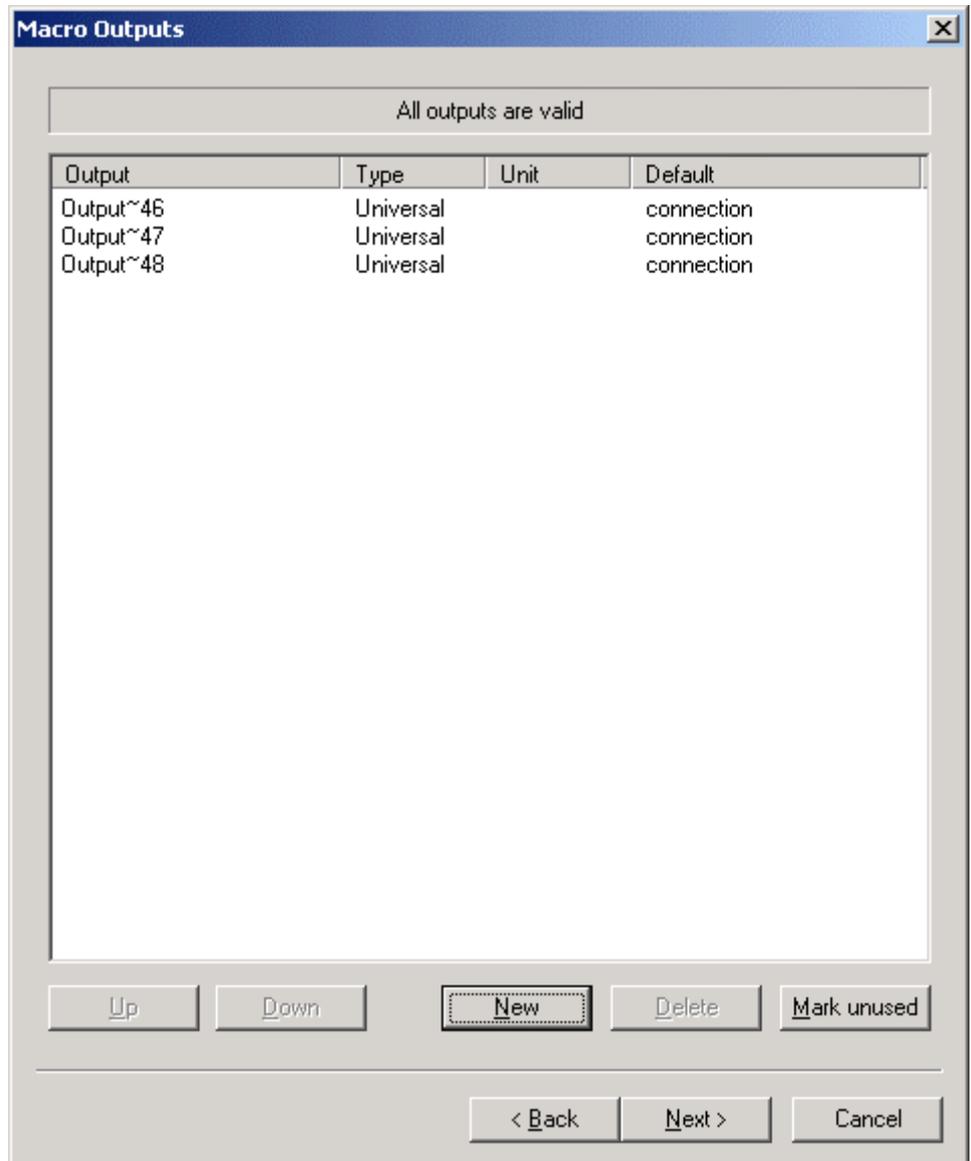
Meaning of the buttons:

- **Up**  
Use this button to place the selected input one step up.
- **Down**  
Use this button to place the selected input one step down.
- **New**  
Use this button to create a new input of the macro.
- **Delete**  
The selected input will be removed. Pay attention, only unused inputs can be removed and no undo is possible.

- **Mark unused**  
All entries are selected (to delete them).

7. Click the **Next** button.

RESULT: The Macro Outputs dialog box of the macro opens. The outputs of the selected functions are predefined as outputs of the macro.



8. Set up the properties of the outputs of the macro by clicking twice into the desired rows of the table:

Meaning of the columns:

- **Output**  
Name of the output(s). Click twice into the row of the desired output to change its name.
- **Type**  
Type of the output(s). Click twice into the row of the desired output to get the choice between the three output types (analog, binary or universal).
- **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).

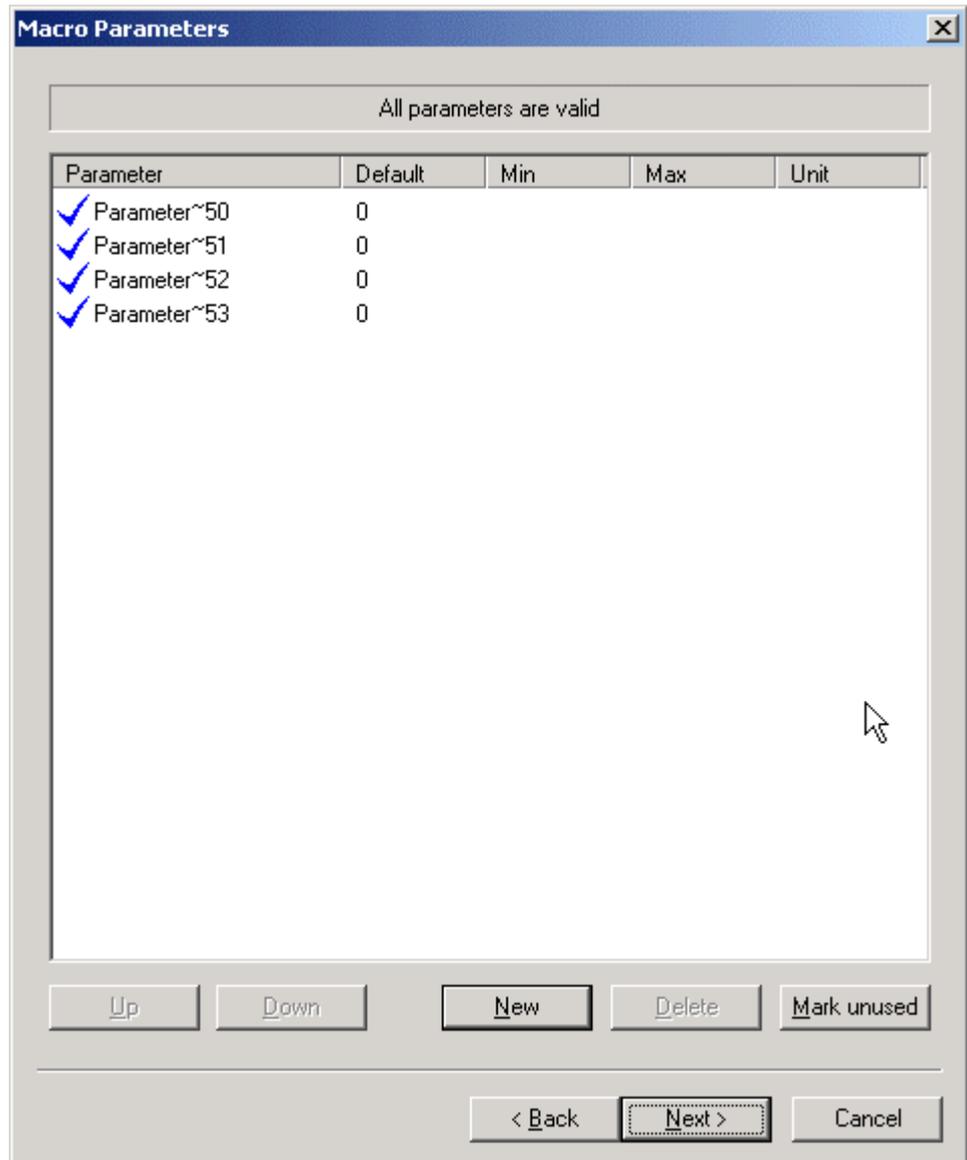
Meaning of the buttons:

- **Up**  
Use this button to place the selected output one step up.

- **Down**  
Use this button to place the selected output one step down.
- **New**  
Use this button to create a new output of the macro.
- **Delete**  
The selected output will be removed. Pay attention, only unused outputs can be removed and no undo is possible.
- **Mark unused**  
All entries become selected (to delete them).

9. Click the **Next** button.

RESULT: The Macro Parameters dialog box of the macro opens.



10. Set up the properties of the parameters of the macro by clicking twice into the desired rows of the table:

Meaning of the columns:

- **Parameter**  
Name of the parameter(s). Click twice into the row of the desired parameter to change its name.
- **Default**  
Default value of the parameter(s).

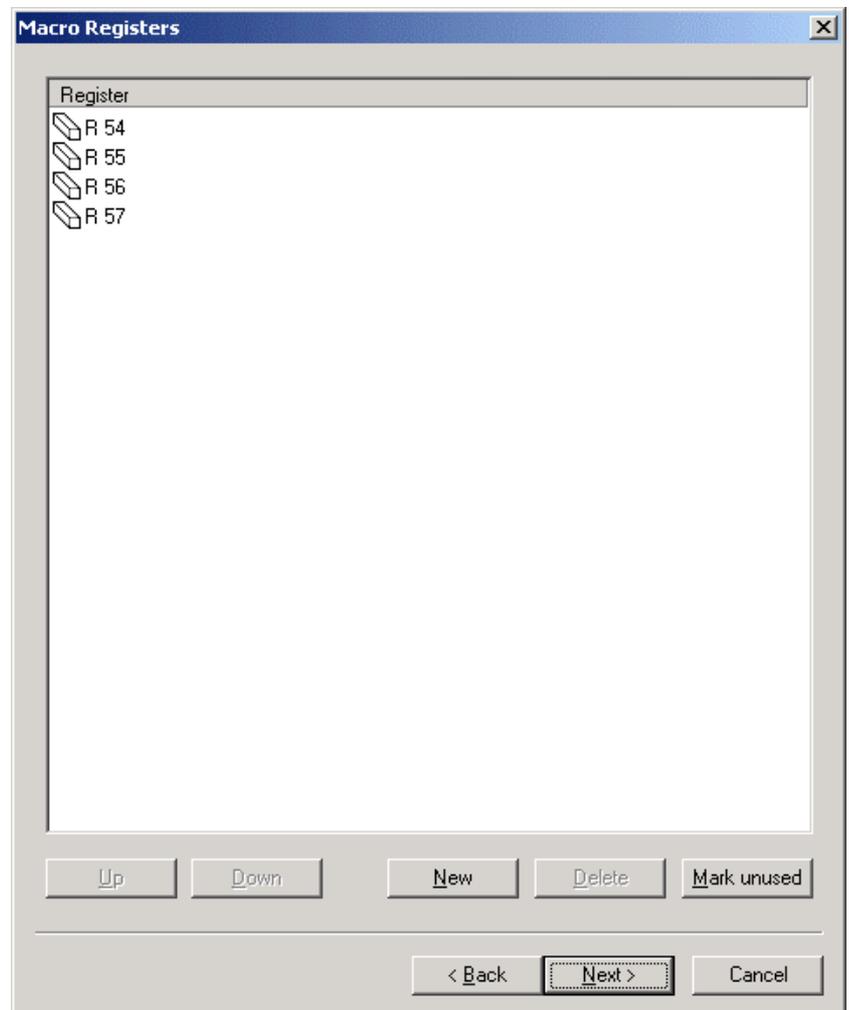
- **Min**  
Minimum value of the parameter(s).
- **Max**  
Maximum value of the parameter(s).
- **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).

Denotation of the buttons:

- **Up**  
Use this button to place the selected parameter one step up.
- **Down**  
Use this button to place the selected parameter one step down.
- **New**  
Use this button to create a new parameter of the macro.
- **Delete**  
The selected parameter will be removed. Pay attention, only unused parameters can be removed and no undo is possible.
- **Mark unused**  
All entries become selected (to delete them).

11. Click the **Next** button.

RESULT: The Macro Registers dialog box opens.



12. Set up the properties of the registers of the macro by clicking twice into the desired rows of the table:

Meaning of the columns:

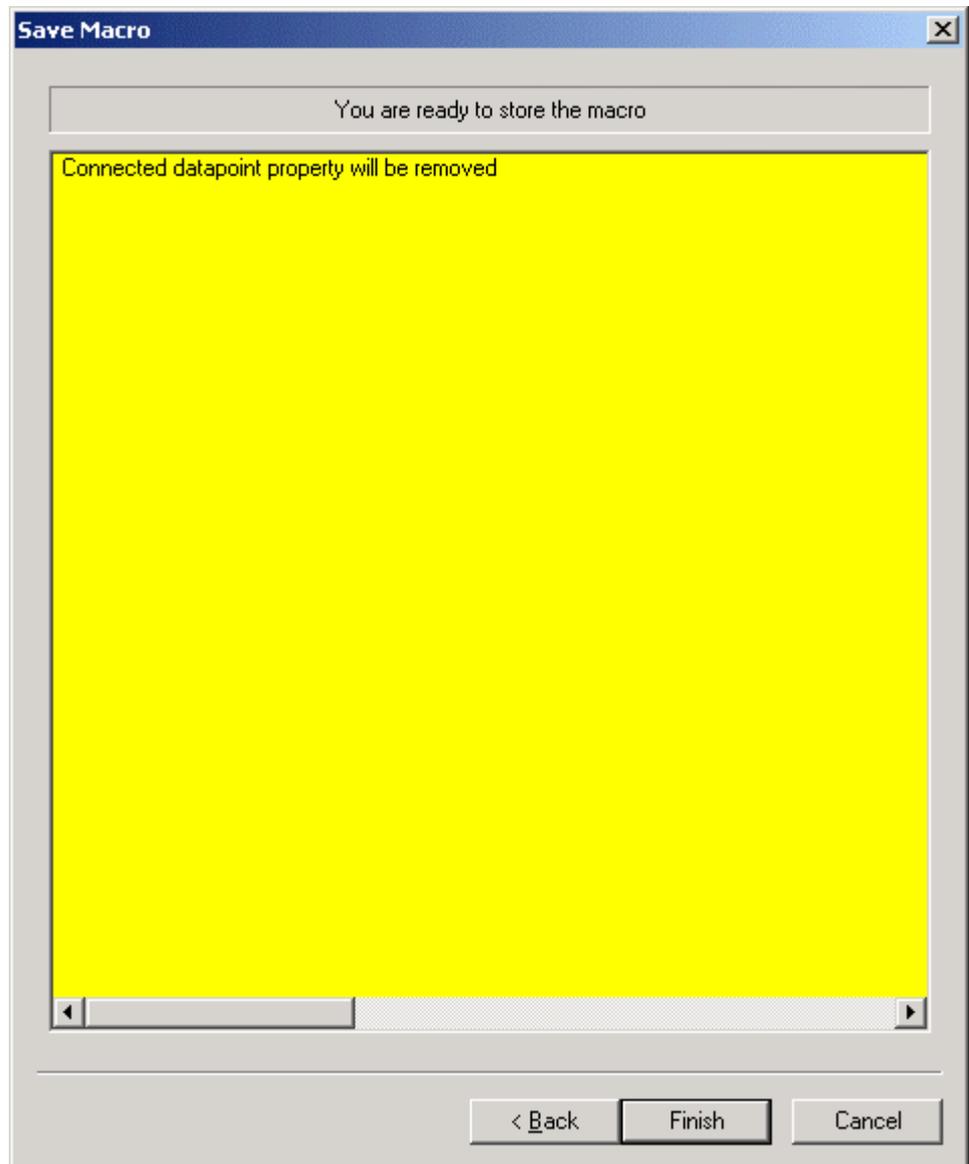
- **Register**  
Name of the register(s). Click twice into the row of the desired register to change its name.

Denotation of the buttons:

- **Up**  
Use this button to place the selected register one step up.
- **Down**  
Use this button to place the selected register one step down.
- **New**  
Use this button to create a new register of the macro.
- **Delete**  
The selected register will be removed. Pay attention, only unused registers can be removed and no undo is possible.
- **Mark unused**  
All entries become selected (to delete them).

13. Click the **Next** button.

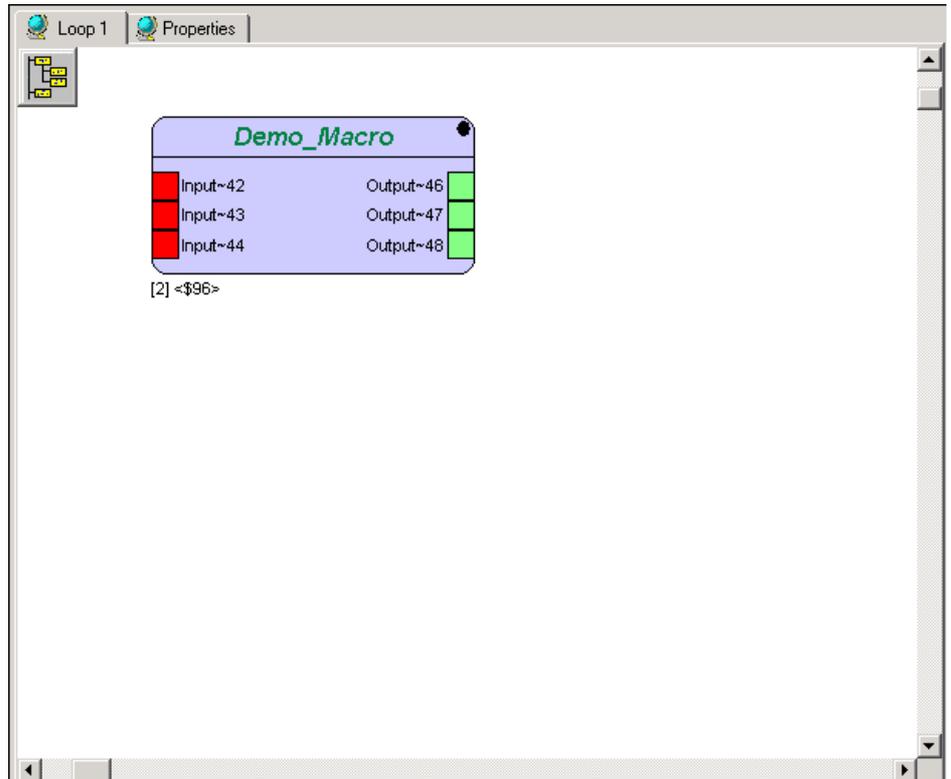
RESULT: The Save Macro dialog box of the macro opens.



NOTE: Please note the information, that connected datapoint properties will be removed.

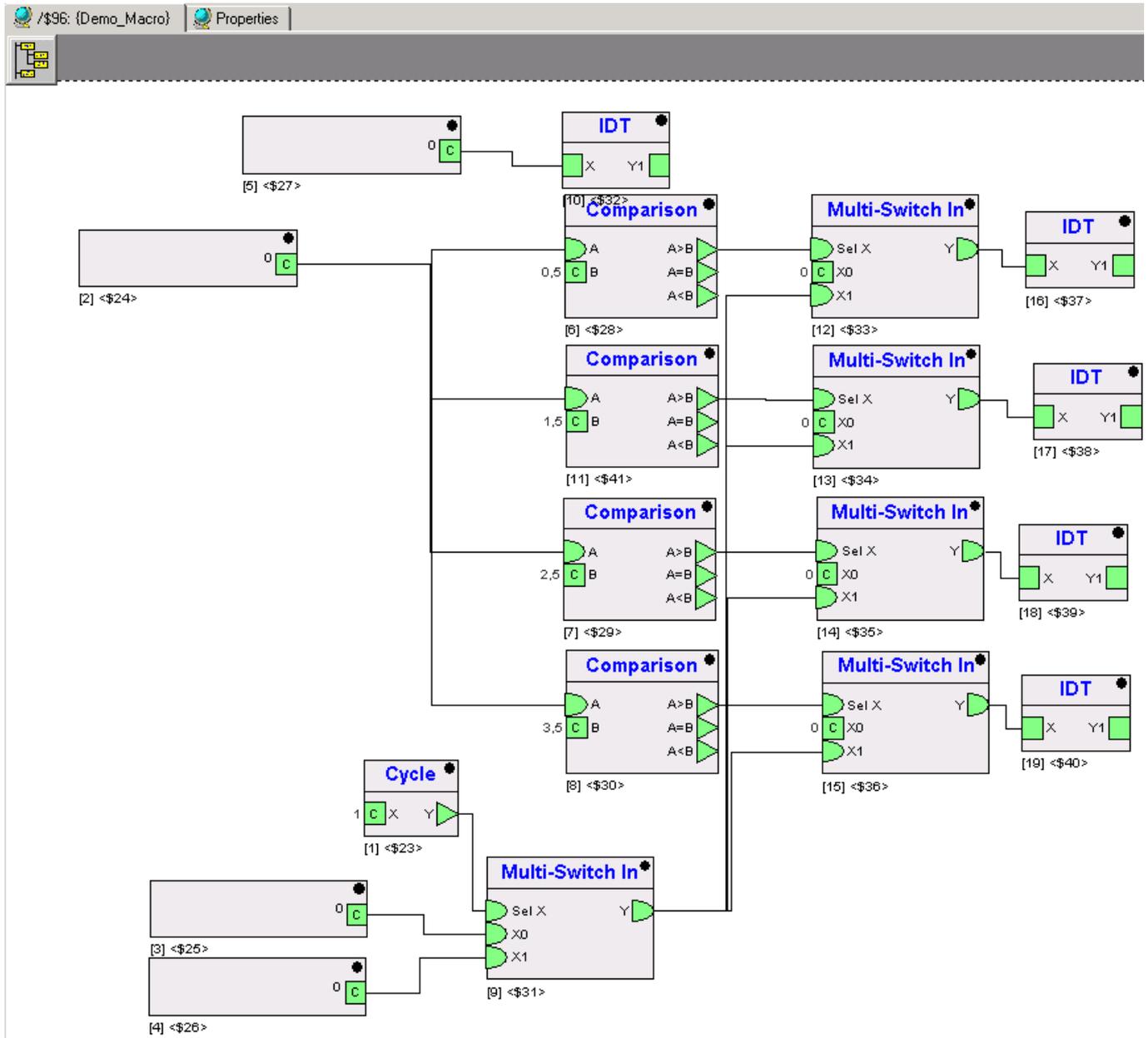
- Click the **Finish** button.

RESULT: The macro is placed into the macro window.



- To view the macro logic, select it, click right mouse button and click on **open macro in editor** in the context menu.

RESULT: The macro logic is shown in the macro window. Note that in the following picture, the removed datapoint property has already been reworked by selection of another connection type, e.g. "Constant".



## Edit Macro Properties

- Prerequisites**
1. The user is logged in.
  2. A project is open.
  3. The opened project has at least one controller and one plant, one loop and one macro.
- Procedure**
1. Expand the tree view of the control loops of the plant, the macro is assigned to.
  2. Double-click on one of the icons of the control loop, the macro is assigned to.  
RESULT: The macro window of the control loop opens in the right pane. The icon of the macro is displayed in this macro window.
  3. Right-click on the macro icon in the right pane.  
RESULT: The context menu of the macro opens.
  4. Click on **Properties**.  
RESULT: The properties box of the macro opens.

Macro properties: Demo\_Macro

General | Input | Output | Parameter | Internal Parameter

Properties:

Name:

No. of inputs:

Conditional call

Description:

Macro version: 2 {14.03.2005}

Here you can enter additional information

OK Cancel Apply

Fill in the fields according to your requirements:

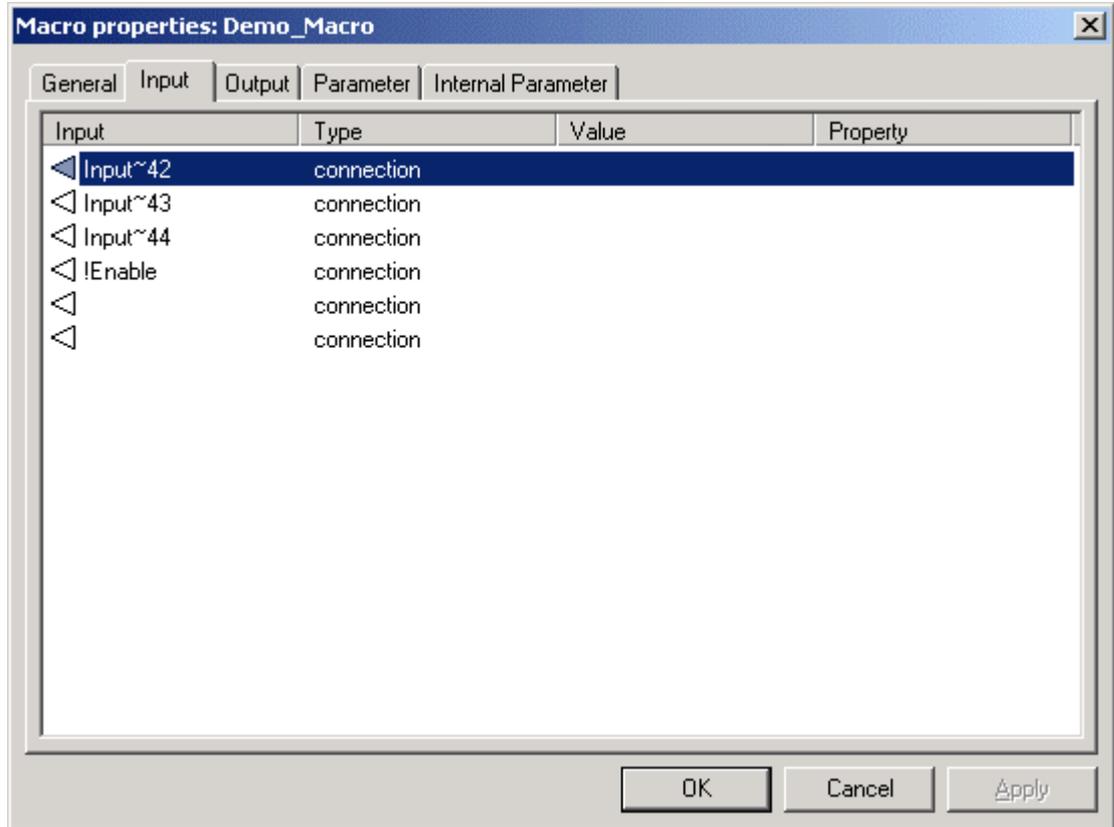
- **Name:**  
Alias of this element. The alias can consist of up to 32 characters and/or digits. This alias will be displayed on the tab Internal Parameter of the parent macros (only if the alias-element includes parameters).
- **No. of inputs (read only)**  
Number of input connections of the macro.
- **Conditional Call**  
Select the checkbox if the condition "macro switch able" should be activated. If selected, the macro will be extended by a further input called !Enable. The macro will not be executed, if !Enable equals FALSE(0). It is not possible to use !Enable as an input of functions inside the macro.

- **Description (read only)**

Description of the macro, e.g. what's the function of it or which special input/output or parameters are used in this macro.

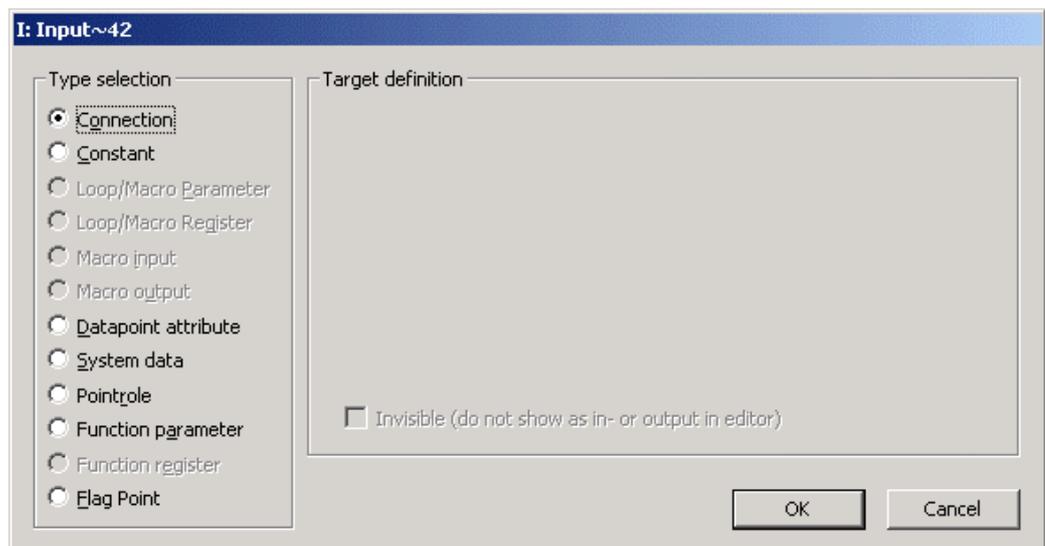
An Input always must be filled with a value. The value could be e.g. a connection (to the output of another element), a data point or system data. It is possible to hide an input/output if it is not a connection.

5. The available input connections are displayed in the tab **Input**. Select the tab.

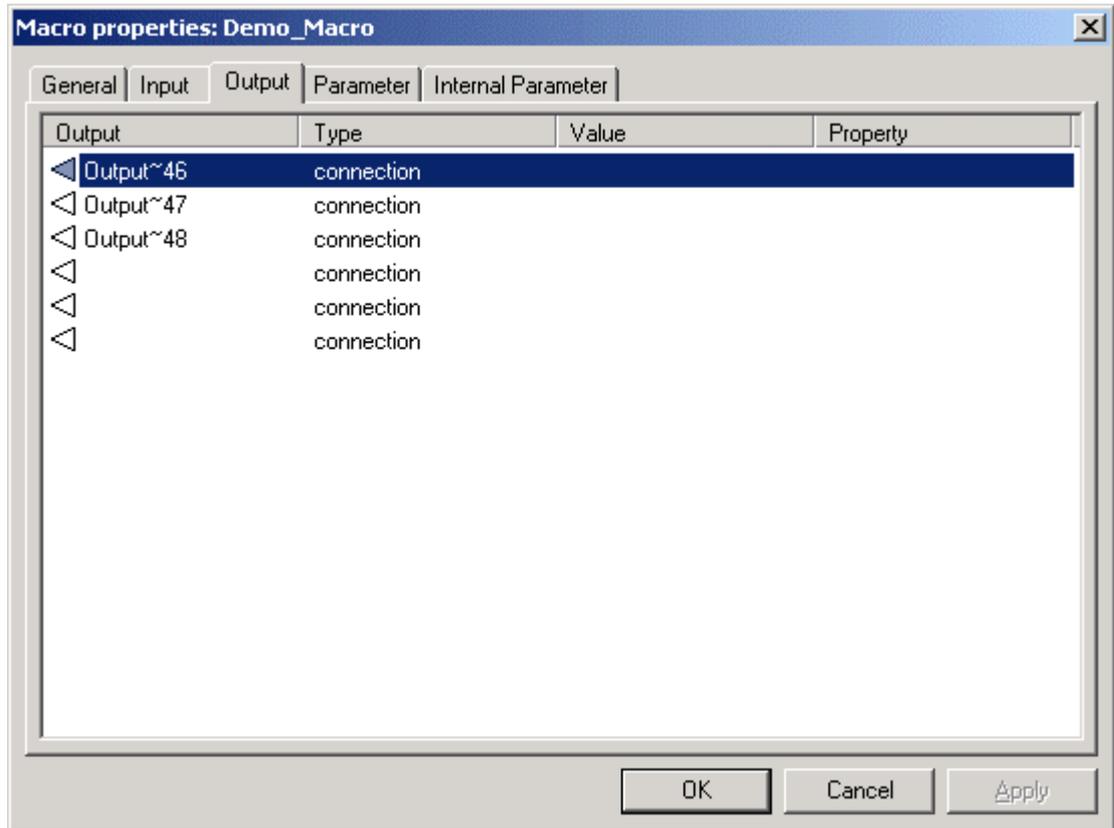


6. Double-click into the desired rows of the table to set up the properties of the inputs of the macro.

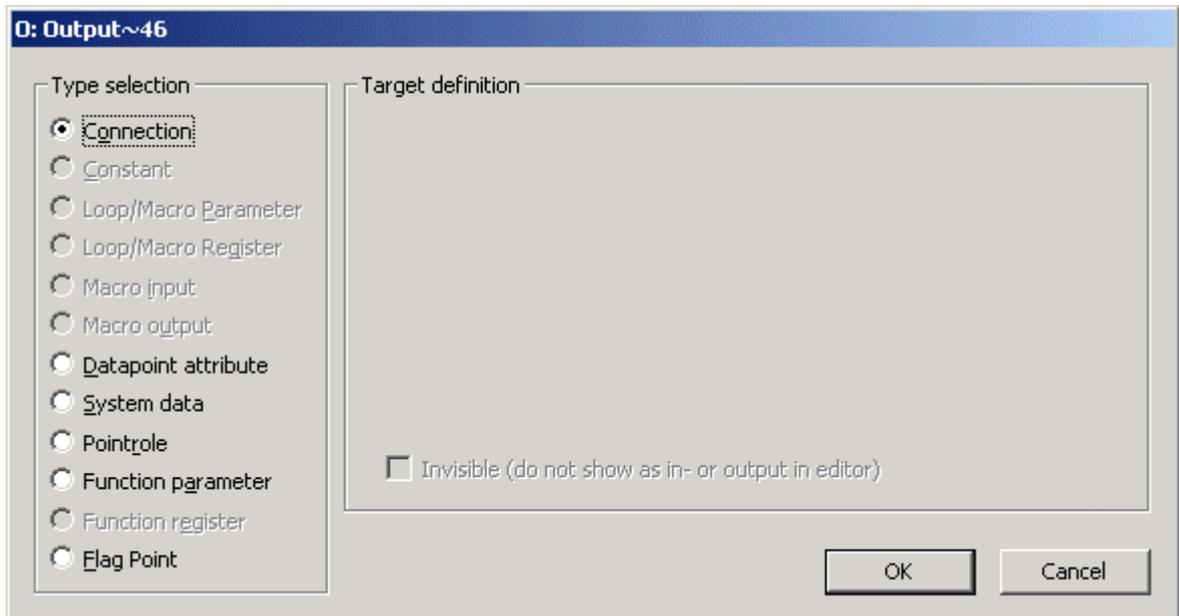
RESULT: The configuration dialog box for selecting type and target for the input opens.



- **Connection**  
A connection is defined as the connection from an input to one output of another element of the loop. This input will be always displayed in the macro window.
  - **Constant**  
The input is always set up to this value. It is possible to hide this input in the Macro window.
  - **Loop/Macro Parameter**  
The input reads from a parameter of a control loop. If you select the option Loop/Macro Parameter you can select from the existing parameters.
  - **Macro input)**  
To select this option, you have to be in the macro view. If you select this option you can select from the existing inputs.
  - **Macro output**  
To select this option, you have to be in the macro view. If you select this option you can select from the existing outputs.
  - **Datapoint attribute**  
The input becomes a value of a data point attribute. Datapoints are hardware/software points, e.g. sensors. The list of available attributes depends on the type of the datapoint and if this attribute is used for an input or output.  
It is possible to hide this input in the Macro window.
  - **System data**  
The input becomes the value of the system function, such as clock. The following system values are stored:
    - Day and month (actual date, =100\*month+day)
    - Day of week (actual day of the week, monday(1)...saturday(7))
    - Hours and minutes (actual time, =100\*hours+minutes)
    - Minutes since midnight (number of minutes after midnight)
    - Startup flag (indicates, if the system has been restarted)
 It is possible to hide this input in the Macro window.
  - **Pointrole**  
Datapoints can be combined in so called pointroles. So it is easier to arrange the datapoints by their main properties. Select a data point from the pointrole.  
It is possible to hide this input in the Macro window.
  - **Function parameter**  
The input becomes the value of a parameter of one function/macro (which includes parameters) included in this control loop. Only functions with parameters are listed. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is also displayed below the symbol as long as no name is set.  
It is possible to hide this input in the Macro window.
  - **Function register**  
The output sets the hidden stored value of one function/macro included in this macro. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is displayed below the symbol as long as no name is set.  
It is possible to hide this output in the Macro window.
  - **Flag Point**  
Flags are points for transferring data between loops of one plant. The input is always set up to this value.  
It is possible to hide this input in the Macro window.
  - **Invisible (do not show as in - or output in editor)**  
Hides the input or output of the control icon for all types other than "Connection". A line at the bottom of the icon indicates invisible ports.
7. Click the **OK** button to leave the window with saving the settings or click the **Cancel** button to leave the window without saving the settings.
  8. The available output connections are displayed in the tab **Output**. Select the tab.



9. Set up the properties of the outputs of the macro by double-clicking into the desired fields of the table:  
 RESULT: The configuration dialog box for selecting type and target for the output opens.

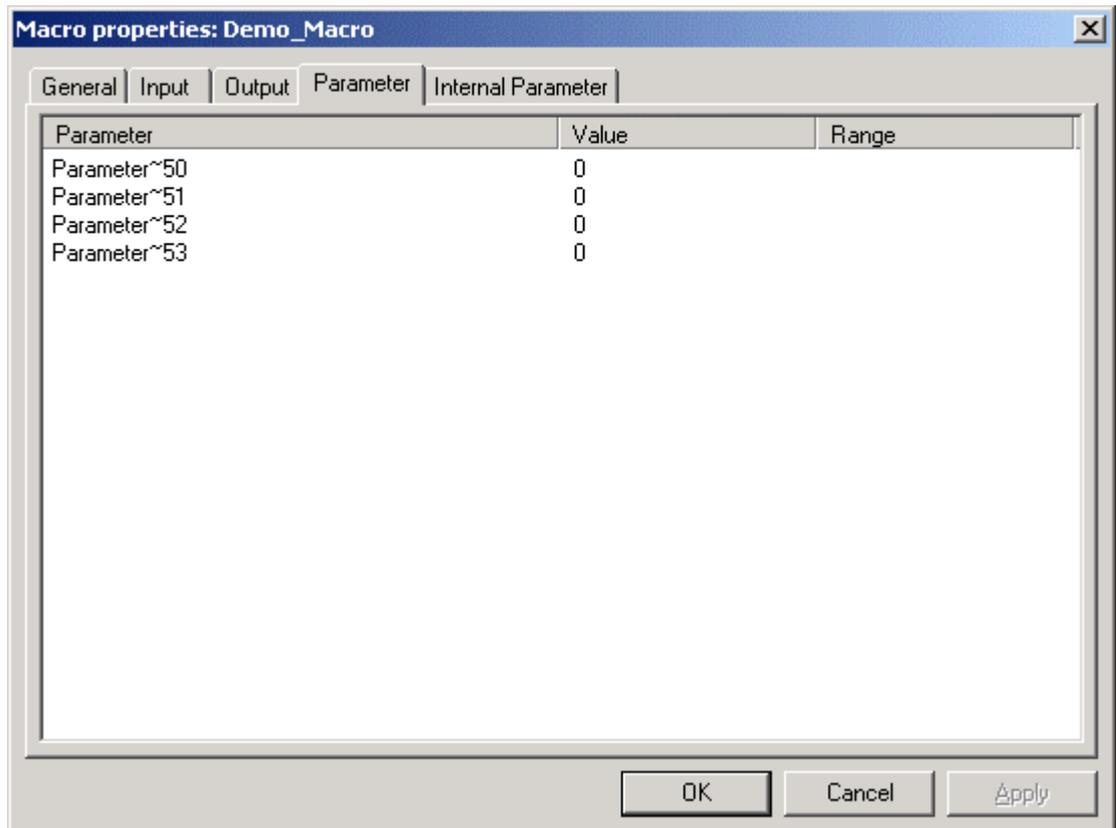


- **Connection**  
The output is defined as a connection to one input of another element of this loop. This output will be always displayed in the Macro window.
- **Constant**  
The output is always set up to this value. It is possible to hide this output in the Macro window.
- **Loop/Macro Parameter**

The input reads from a parameter of a control loop. If you select the option Loop/Macro Parameter you can select from the existing parameters.

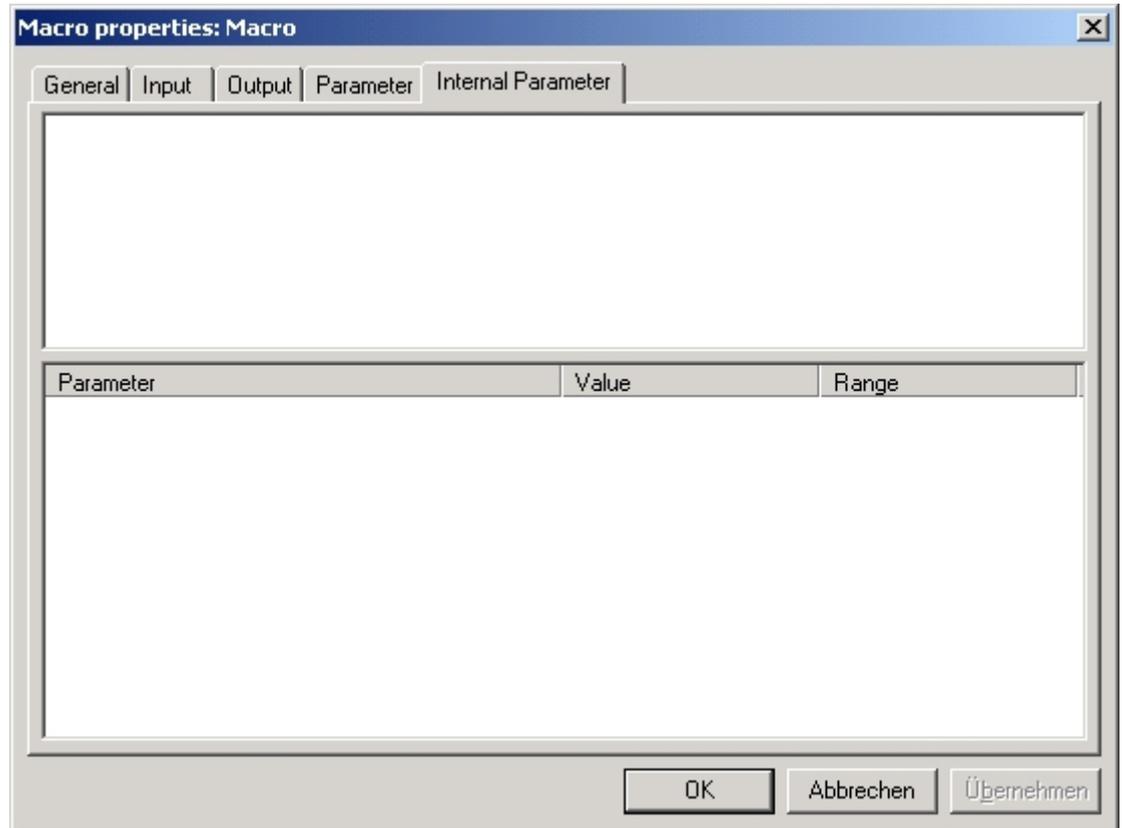
- **Macro input)**  
To select this option, you have to be in the macro view. If you select this option you can select from the existing inputs. This option is not available if you are in the tab output.
- **Macro output**  
To select this option, you have to be in the macro view. If you select this option you can select from the existing outputs.
- **Datapoint attribute**  
The input becomes a value of a data point attribute. Datapoints are hardware/software points, e.g. sensors. The list of available attributes depends on the type of the datapoint and if this attribute is used for an input or output.  
It is possible to hide this input in the Macro window.
- **System data**  
The output sets a system data. The only possible data is the Startup flag. All other system data is read only. It is possible to hide this output in the Macro window. It is possible to hide this output in the Macro window.
- **Pointrole**  
Datapoints can be combined in pointroles. This makes it easier to arrange the datapoints by their main properties. Select a data point from the pointrole.  
It is possible to hide this output in the Macro window.
- **Function parameter**  
The output is a value of a parameter of one function/macro included in this control loop. Only functions with parameters are listed. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is displayed below the symbol as long as no name is set.  
It is possible to hide this output in the Macro window.

- **Function register**  
The output sets the hidden stored value of one function/macro included in this macro. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is displayed below the symbol as long as no name is set.  
It is possible to hide this output in the Macro window.
  - **Flag Point**  
Flags are points for transferring data between loops of one plant. The output is always set to this value.  
It is possible to hide this output in the Macro window.
  - **Invisible (do not show as in - or output in editor)**  
Hides the input or output of the control icon for all types other than "Connection". A line at the bottom of the icon indicates invisible ports.
10. Click the button **OK** to leave the window with saving the settings or click the button **Cancel** to leave the window without saving the settings.
11. The available parameters are displayed in the tab **Parameter**. First select the tab and then double-click on the parameter to edit its properties.



RESULT: The value can be changed.

13. The available internal parameters are displayed in the tab **Internal Parameter**. Select the tab.



In this view the parameters of named macros and functions of the macro are displayed. It is possible to hide parameters which should not be changed. Named functions/macros without parameters will not be displayed.

14. Double-click on the value field of the parameter table to set up the properties of the internal parameters of the macro.

RESULT: The value can be changed.

15. Click the button **OK** to leave the window with saving the settings. Click the button **Cancel** to leave the window without saving the settings. Click the button **Apply** to save the settings, or click on any other tab to edit further properties of the macro.

## Edit the Properties of Inputs/Outputs/Parameters/Registers of a Macro

### Prerequisites

1. The user is logged in.
2. A project is open.
3. The opened project has at least one controller and one plant, one loop and one macro.

### Procedure

1. Expand the tree view of the control loops of the plant, the macro is assigned to.
2. Double-click on one of the icons of the control loops, the macro is assigned to.

RESULT: The Macro window of the control loop opens in the right pane. The icon of the macro is displayed in the Macro window.

3. Right-click on the macros icon in the right pane.

RESULT: The context menu of the macro opens.

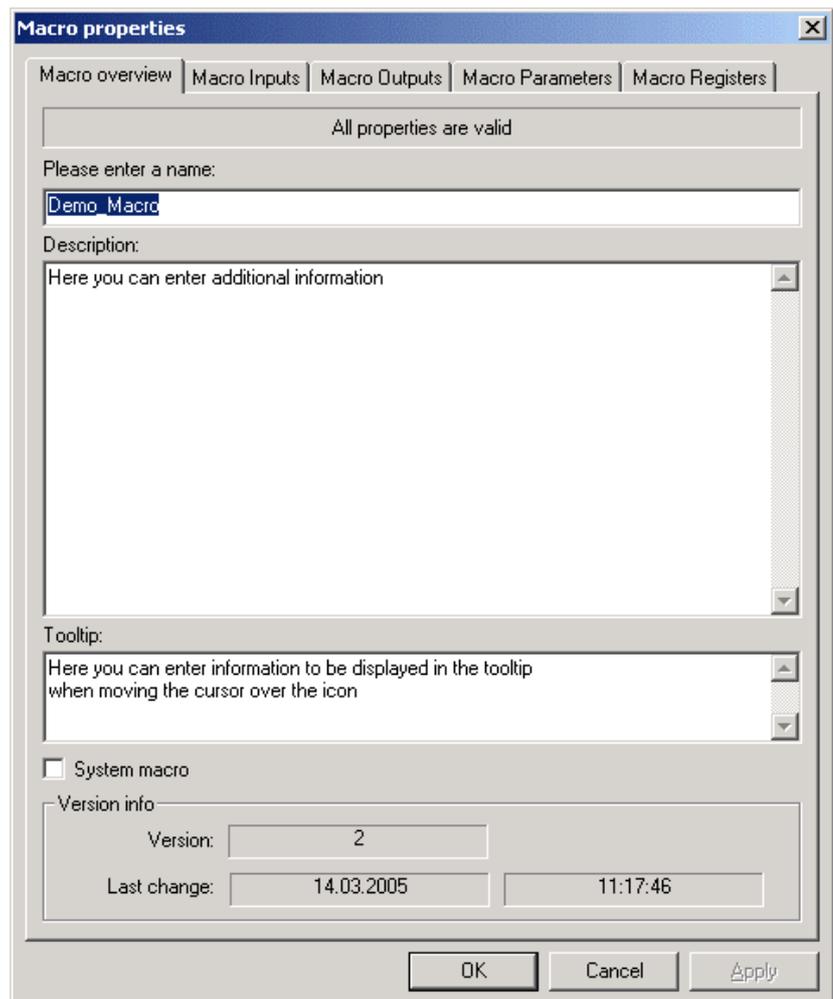
4. Click on **Open macro in editor**.

RESULT: The Macro window switches from control loop-view to macro-view.

NOTE: The always displayed Properties tab does not change to macro-view. Here the properties of the control loop are displayed.

5. Click menu item Plant > Control Editor > Macro Properties....

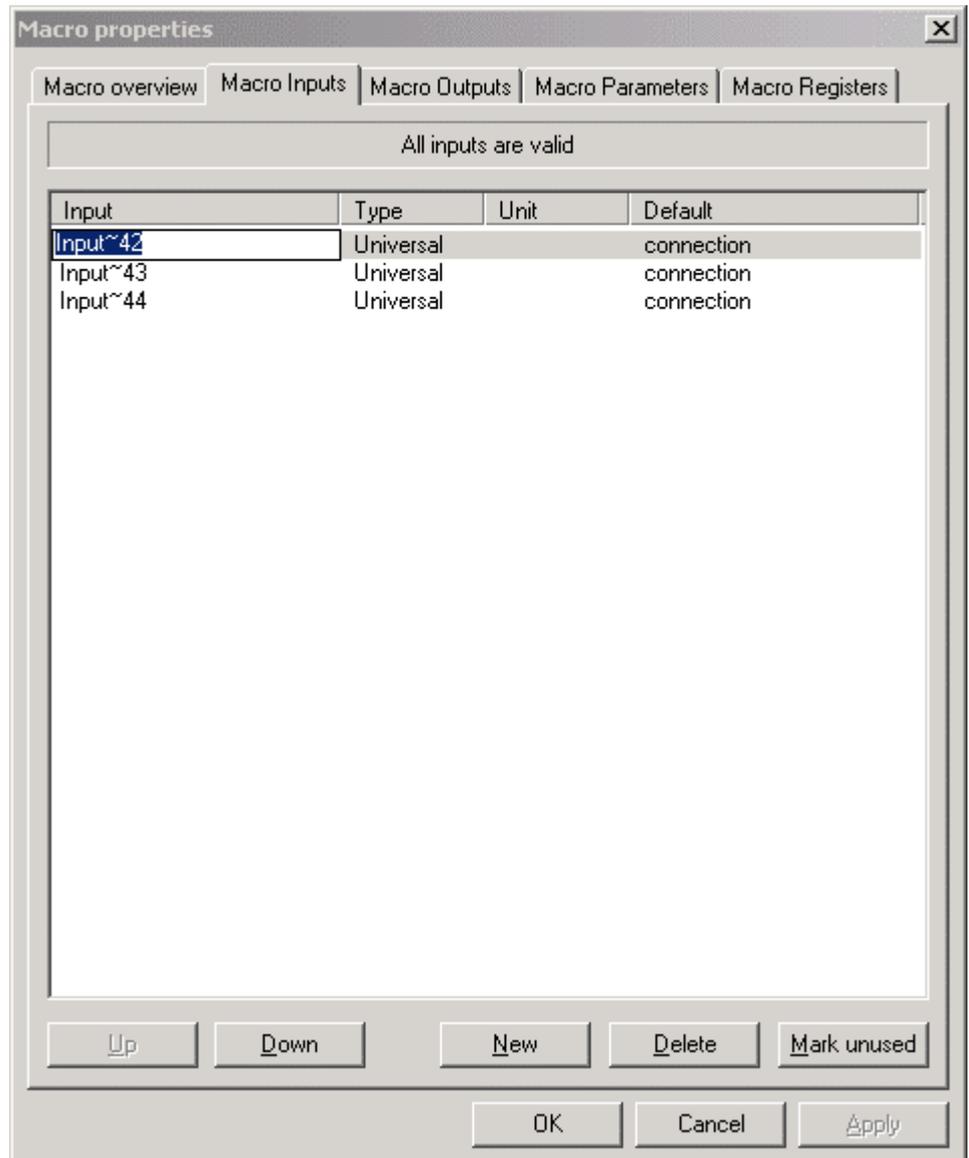
RESULT: Tab Macro overview of the Macro properties dialog box of the macro opens.



Fill in the fields according to your requirements:

- **Please enter a name:**  
Unique name of the macro.
- **Description**  
Description of the macro, e.g. what's the function of it or which special input/output or parameters are used in this macro.
- **Tooltip**  
Descriptive information that will be displayed in the yellow tooltip which displays when moving the cursor over the macro icon.
- **System macro**  
Select the checkbox if the macro should be included in the folder "Global System Macros". You can use the macros of this folder for all control loops of the database. Only authorized users can access System macros.
- **Version info (read only)**  
Information about the macro, similar to the file information known from MS-windows.

6. The available inputs are displayed in the tab **Macro Inputs**. Select the tab.



7. Click twice into the rows of the table to set up the properties of the input datapoints of the macro:

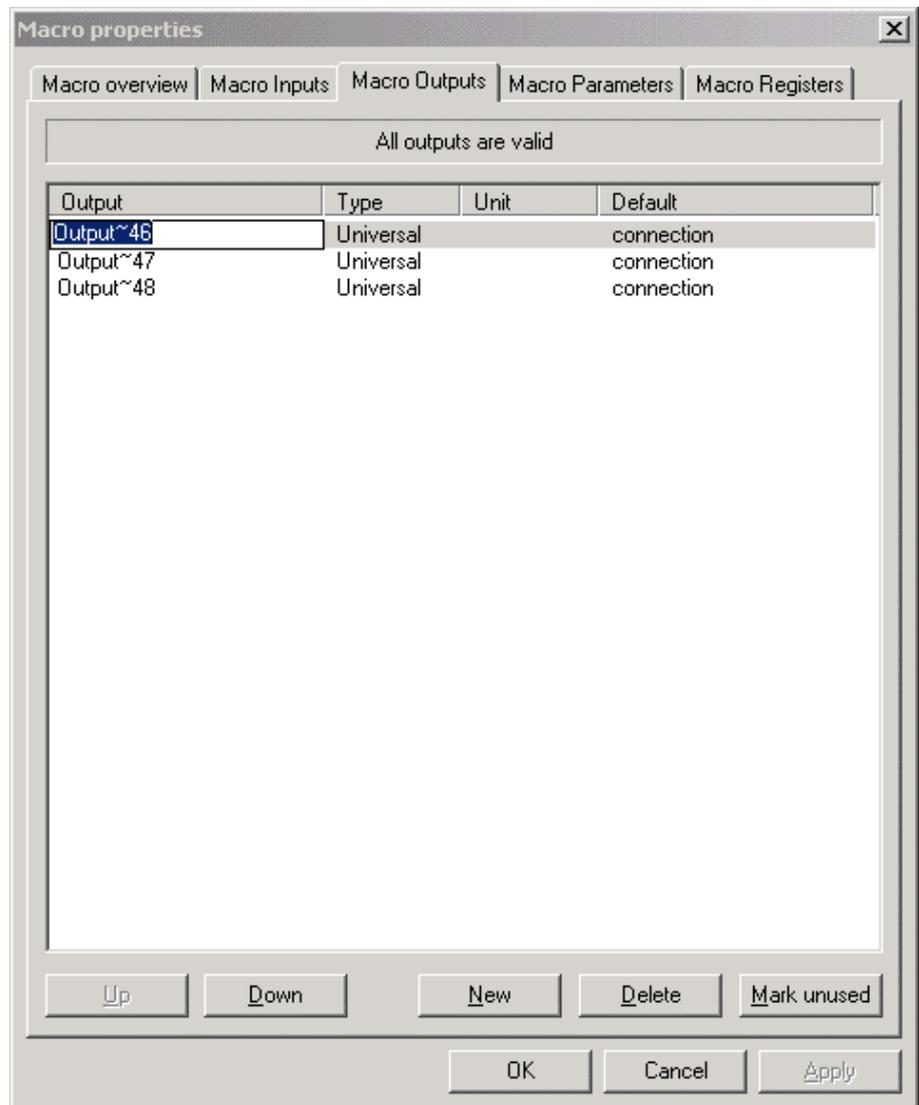
Denotation of the columns:

- **Input**  
Name of the input(s). Click twice into the row of an input to change its name.
  - **Type**  
Type of the input(s). Click twice into the row of an input to choose between the three input types (analog, binary or universal).
  - **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).
- Default column**  
Type of connection default when dropped in the editor.

Denotation of the buttons:

- **Up**  
Use this button to place the selected input one step up.
- **Down**  
Use this button to place the selected input one step down.
- **New**  
Use this button to create a new input of the macro.
- **Delete**  
The selected input will be removed. Please note, only unused inputs can be removed and no undo is possible.
- **Mark unused**  
All entries that are not used in the control strategy of this macro are selected (to delete them).

8. The available outputs are displayed in the tab **Macro Outputs**. Select the tab.



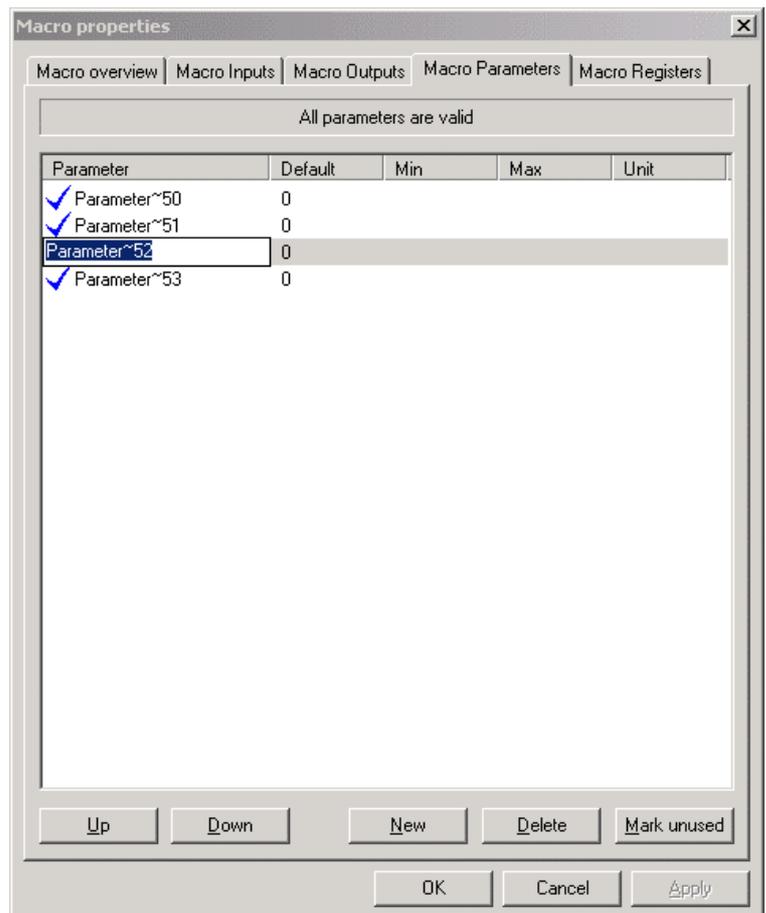
9. Click twice into the rows of the table to set up the properties of the output datapoints of the macro:

Denotation of the columns:

- **Output**  
Name of the output(s). Click twice into the row of an output to change its name.
- **Type**  
Type of the output(s). Click twice into the row of an output to choose between the three output types (analog, binary or universal).
- **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).
- **Default column**  
Type of connection default when dropped in the editor.

Denotation of the buttons:

- **Up**  
Use this button to place the selected output one step up.
  - **Down**  
Use this button to place the selected output one step down.
  - **New**  
Use this button to create a new output of the macro.
  - **Delete**  
The selected output will be removed. Please note, only unused outputs can be removed and no undo is possible.
  - **Mark unused**  
All entries that are not used in the control strategy of this macro are selected (to delete them).
10. The available parameters are displayed in the tab **Macro Parameters**. Select the tab.



11. Click twice into the rows of the table to set up the properties of the parameters of the macro:

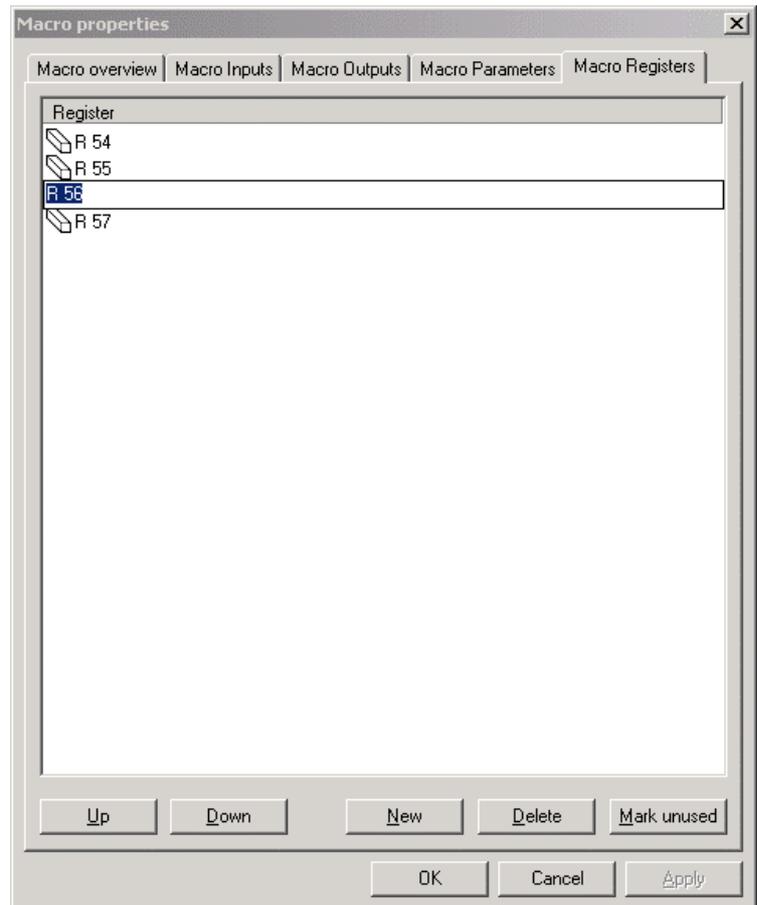
Denotation of the columns:

- **Parameter**  
Name of the parameter(s). Click twice into the row of a parameter to change its name.
- **Default**  
Default value of the parameter(s).
- **Min**  
Minimum value of the parameter(s).
- **Max**  
Maximum value of the parameter(s).
- **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).

Denotation of the buttons:

- **Up**  
Use this button to place the selected parameter one step up.
- **Down**  
Use this button to place the selected parameter one step down.
- **New**  
Use this button to create a new parameter of the macro.
- **Delete**  
The selected parameter will be removed. Please note, only unused parameters can be removed and no undo is possible.
- **Mark unused**  
All entries that are not used in the control strategy of this macro are selected (to delete them).

12. The available registers are displayed in the tab **Macro Registers**. Select the tab.



13. Click twice into the rows of the table to set up the properties of the registers of the macro:

Denotation of the columns:

- **Register**  
Name of the register (s). Click twice into the row of a register to change its name.

Denotation of the buttons:

- **Up**  
Use this button to place the selected register one step up.
  - **Down**  
Use this button to place the selected register one step down.
  - **New**  
Use this button to create a new register of the macro.
  - **Delete**  
The selected register will be removed. Please note, only unused registers can be removed and no undo is possible.
  - **Mark unused**  
All entries that are not used in the control strategy of this macro are selected (to delete them).
14. Click the button **OK** to leave the window with saving the settings. Click the button **Cancel** to leave the window without saving the settings. Click the button **Apply** to save the settings, or click on any other tab to edit further properties of the macro.

RESULT: The Macro window of the macro opens if you click on button **OK** or **Cancel**.

15. To leave the macro-view and return to the control loop-view, click the right mouse button.

RESULT: The context menu of the macro opens.

16. Click on **Open parent macro**.

RESULT: The Macro window changes from macro- to control loop-view or the macro above. (An indefinite number of macro levels is possible).

Double-click on any other element to change the view to it.

## Create and Edit Macro Logic

**Prerequisites**

1. The user is logged in.
2. A project is open.
3. The opened project has at least one controller, one plant, one loop and one macro.

**Procedure**

1. Expand the tree view of the control loop of the plant, the macro is assigned to.
2. Double-click on one of the icons of the control loops, the macro is assigned to.

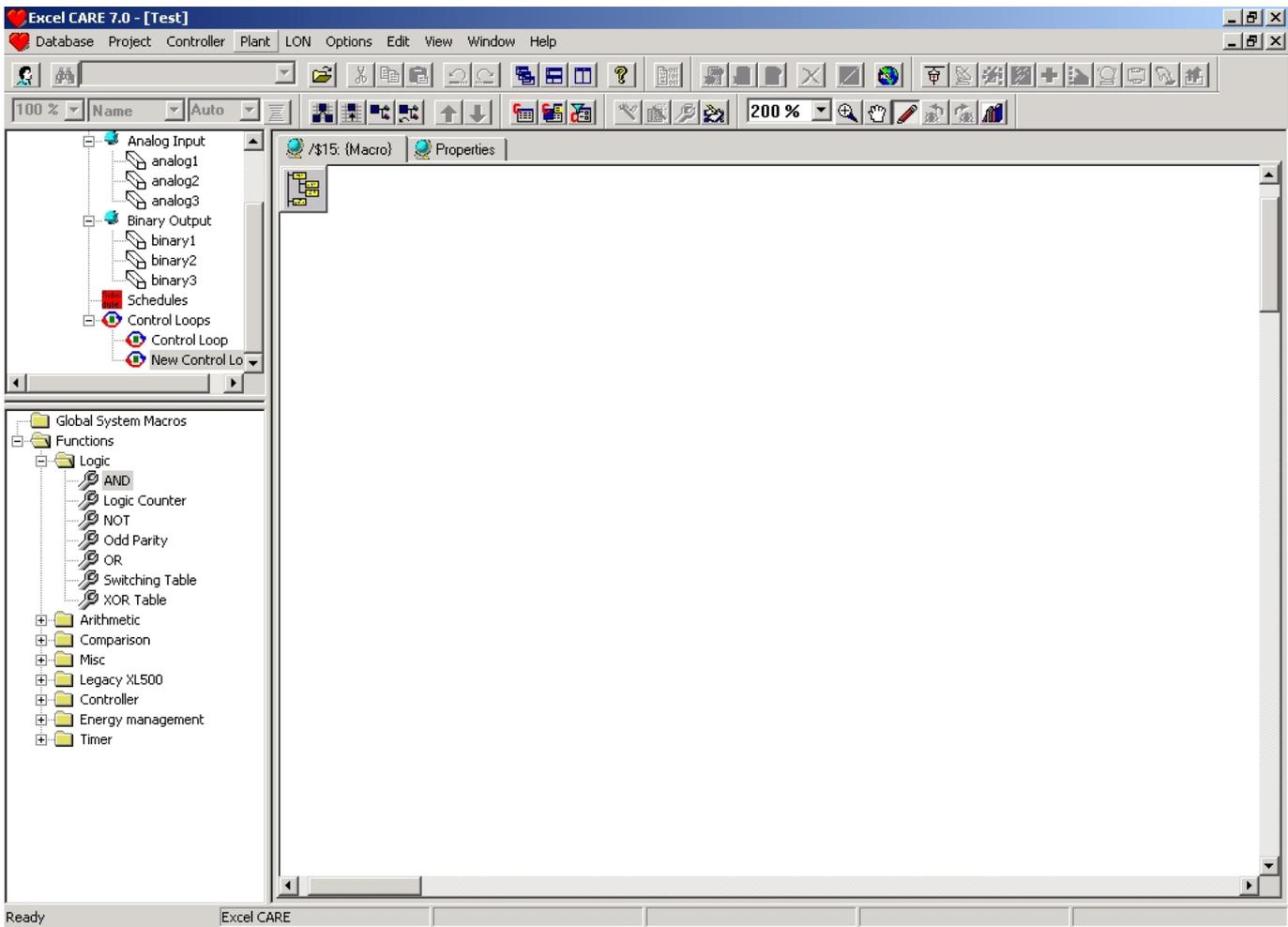
RESULT: The Macro window of the control loop opens in the right pane. The icon of the macro is displayed in this Macro window.

3. Right-click on the macros icon in the right pane.

RESULT: The context menu of the macro opens.

4. Click on **Open macro in editor**.

RESULT: The Macro window changes from control loop-view to macro-view.

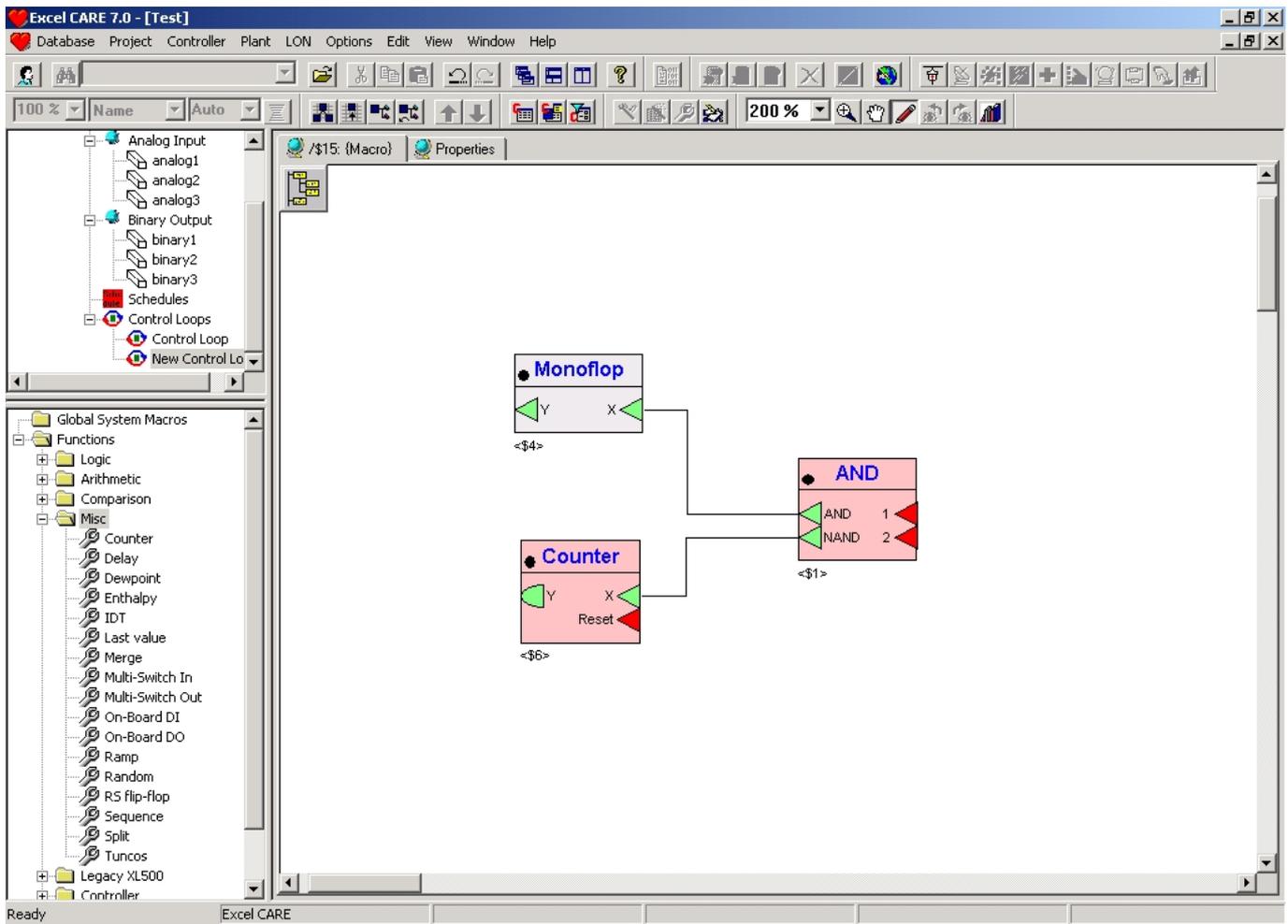


NOTE: The always displayed Properties tab does not change to macro-view. Here the properties of the control loop are displayed.

5. Define the content of the macro as desired (similar to the creation of a loop logic). Assign functions or hardware/software points to the macro by using drag & drop:
6. Click once on the icon and hold the left mouse-button pressed.

7. Move the cursor into the Macro window. The cursor changes to a “No Parking”-sign if it is moved in areas, you cannot drop the component into.
8. Release the left mouse button.

RESULT: The function or component is displayed in the Macro window.



Denotation of the colours:

- **red**  
The setup of the icon is incomplete. All inputs must have a value, e.g. by connecting it to an output or by defining it as a constant.
- **blue**  
The icon is selected.
- **none colored (light grey)**  
The setup of the icon is accomplished, no errors expected.

For setting up a connection between input and output, see step 8.

9. Apply the described procedure written above with all components and functions you want to combine in this macro.
  - All icons in the Macro window can be moved via drag & drop.
  - You can use the windows known short keys, e.g. “Ctrl + A” for selecting all elements in an active window.
  - To enter the menu Plant, make sure, the Macro window is still selected: Click once with the left mouse button in the Macro window.

RESULT: The following button and drop-down list in the taskbar (from left to the right) are activated:

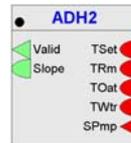


- Zoom per %:  
Display and change the numerous zoom factor of the whole view, centered by the displayed window.
- Zoom +:  
Use this button(s) to zoom in a selected area.
- Move all:  
The cursor changes to a hand and you can move the view of the Macro window.
- Select and edit:  
The cursor changes to standard and you can select elements in the Macro window, draw connections between outputs and inputs and insert text into the Macro window.
- Last view  
The view reverts prior to the last change.
- Next view  
The last undo of the view is reverted.

The elements in the Macro window are displayed in the following manner:  
Hardware/software point, in most cases a real input or output of the controller.



Function, indicated by the separated header and input and output ports. The name of the function is displayed in this header.



Analog port, it is possible to connect analog and binary ports. The input port translates the input signal into his own format (analog or binary) information may be lost. If you set up a connection between analog and binary ports, an error message informs you about a data mismatch.



The binary port has two values: TRUE (1) or FALSE (0).



Any port, this port is not predefined as an analog or binary input. The type of data depends on further processing.



The black point in the header indicates the side of the output ports.



A line under the ports indicates hidden (invisible) ports. You can make them visible using the Properties window of these ports.

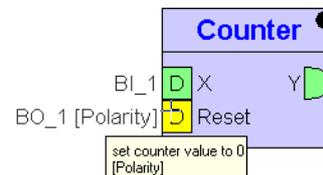
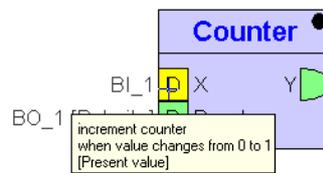
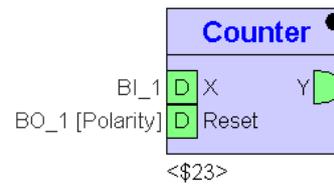


Input ports are red coloured, if they are not connected. The color green indicates the accurate connection of the port.



The configuration of inputs is indicated as follows:

If an input port is configured as datapoint attribute, the default datapoint property "Present Value" is displayed in the tooltip of the port. If any other property is selected as datapoint attribute, e.g. Polarity, this is shown in the tooltip and additionally in brackets at the port.



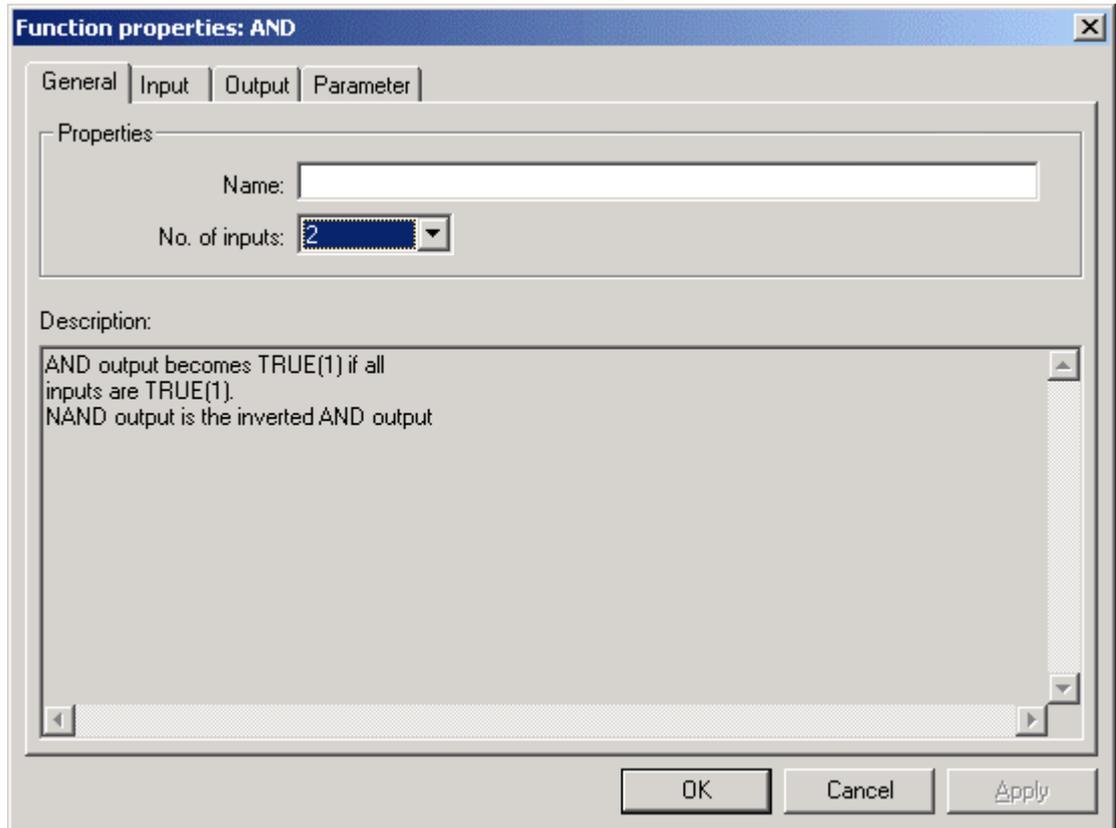
**10.** Setup the properties of the functions and hardware/software points as follows:

- Right-click on the element you want to setup.

RESULT: The context menu of the element opens.

- Click on **Properties**.

RESULT: The Function properties:<name> dialog box of the element opens.



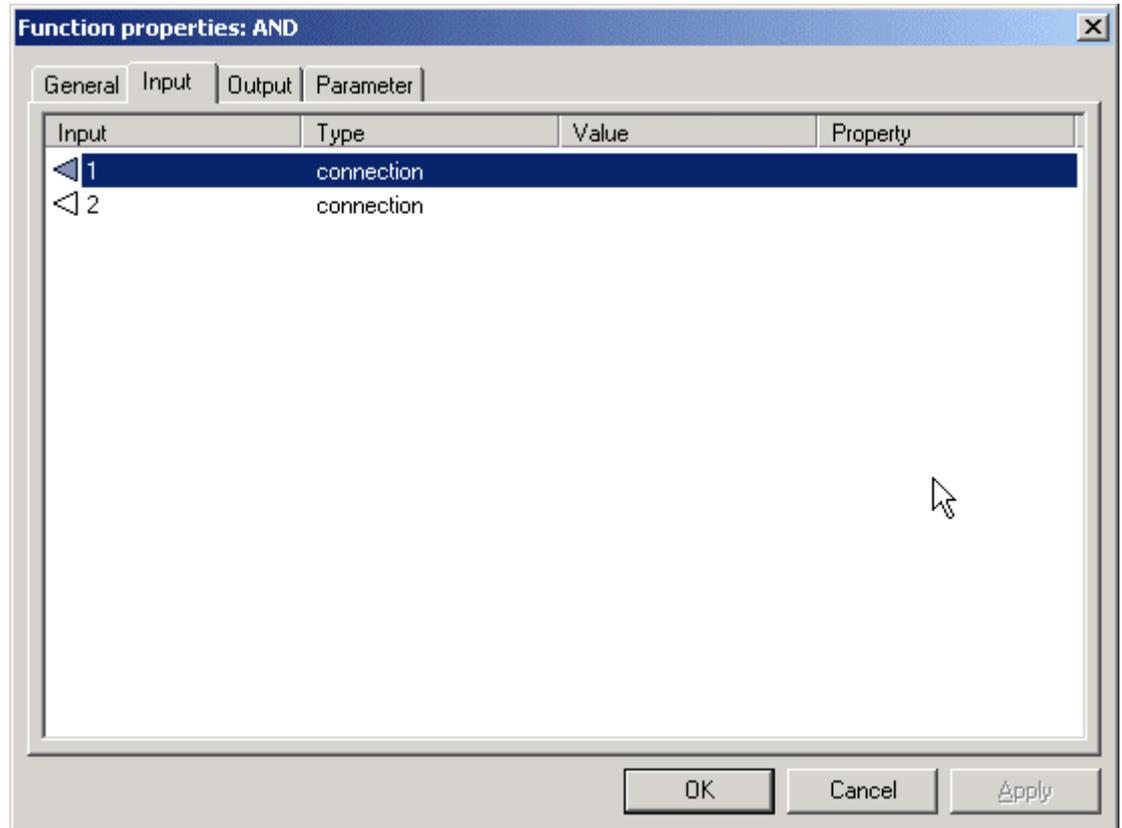
In tab **General** are the following input fields:

- **Name**  
Alias of this element. The alias can consist up to 32 characters and/or digits. This alias will be displayed on the tab Internal Parameter of the parent macros (only if the alias-element includes parameters).
- **No. of inputs**  
Number of input (in some cases output) connections of the element.

You have to apply changes of the input/output count before you can see the changed number in the input/output tab.

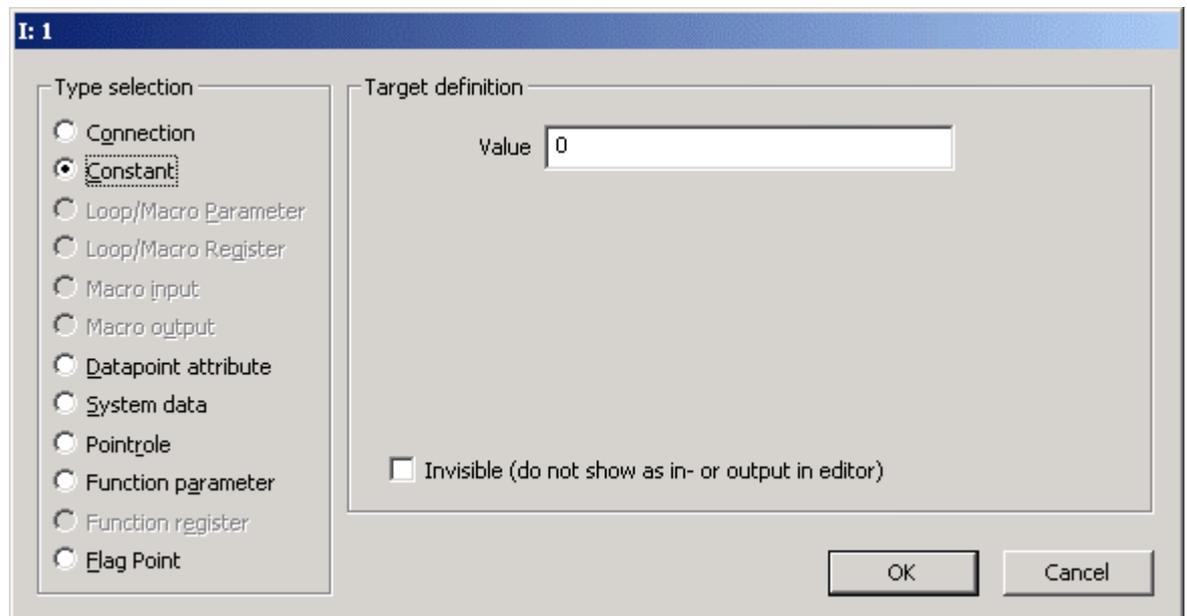
An Input must be always filled with a value. The value could be e.g. a connection (to the output of another element), a data point, or system data. It is possible to hide an input/output if it is not a connection.

The available input connections are displayed in the tab **Input**. Select the tab,



Select the properties of the input by double-clicking on the rows of the table.

RESULT: The configuration dialog box for selecting type and target for the input opens.



**- Connection**

The input is defined as a connection to one output of another element of this loop. This input will be displayed in the Macro window.

**- Constant**

The input is set to this value. It is possible to hide this input in the Macro window.

**- Loop/Macro Parameter**

A parameter can be used by all functions and macros of the loop/macro without being connected. So it is possible to simplify the displayed connections. The input turns to this value. It is possible to hide this input in the Macro window.

**- Macro input**

The input is the value of a macro's input. It is possible to hide this input in the Macro window.

**- Macro output**

The input is the value of a macro's output. In this case, the output of the macro is used as a data point.

**- System data**

The input is a system function, e.g. clock. The following system values are stored:

- Day and month (actual date, =100\*month+day)
- Day of week (actual day of the week, monday(1)...saturday(7))
- Hours and minutes (actual time, =100\*hours+minutes)
- Minutes since midnight (number of minutes after midnight)
- Startup flag (indicates, if the system has been restarted)

It is possible to hide this input in the Macro window.

**- Function parameter**

The input is the value of a parameter of one function/macro included in this control loop. Only functions with parameters are listed. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is also displayed below the symbol as long as no name is set.

It is possible to hide this input in the Macro window.

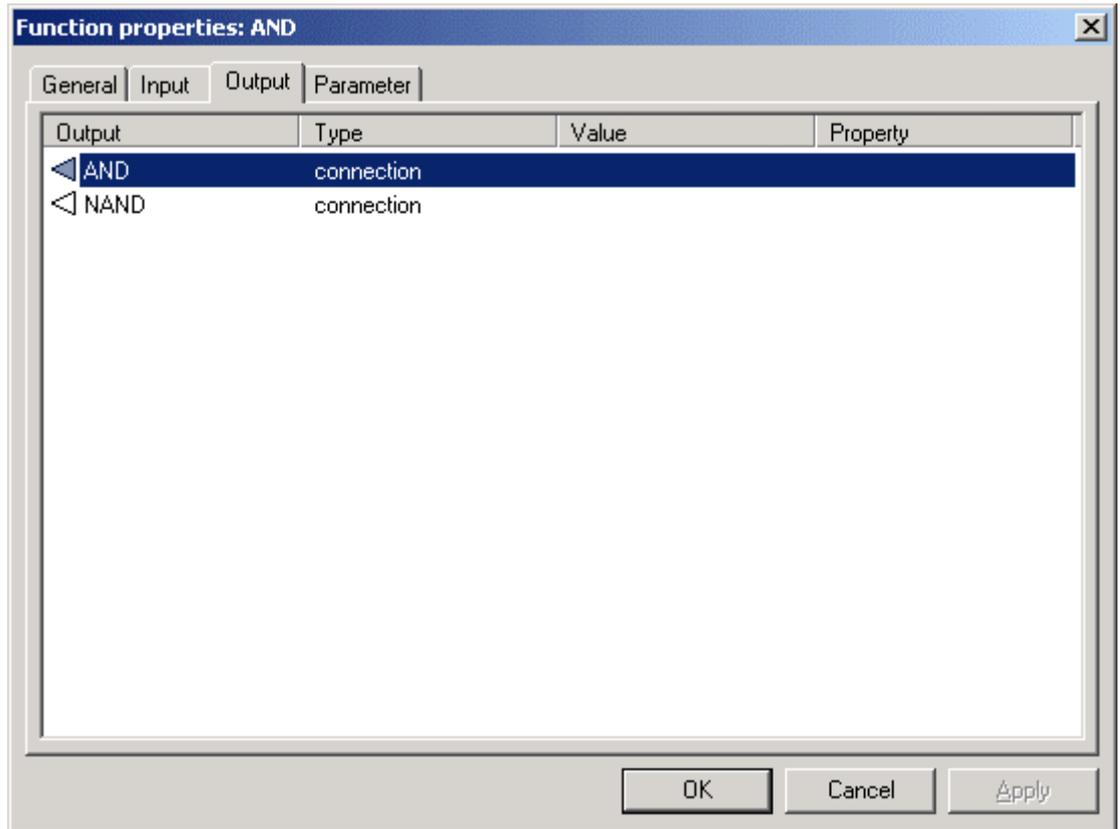
**- Function register**

The output sets the hidden stored value of one function/macro included in this macro. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is displayed below the symbol as long as no name is set. It is possible to hide this output in the Macro window. It is possible to hide this input in the Macro window.

**- Invisible (do not show as in - or output in editor)**

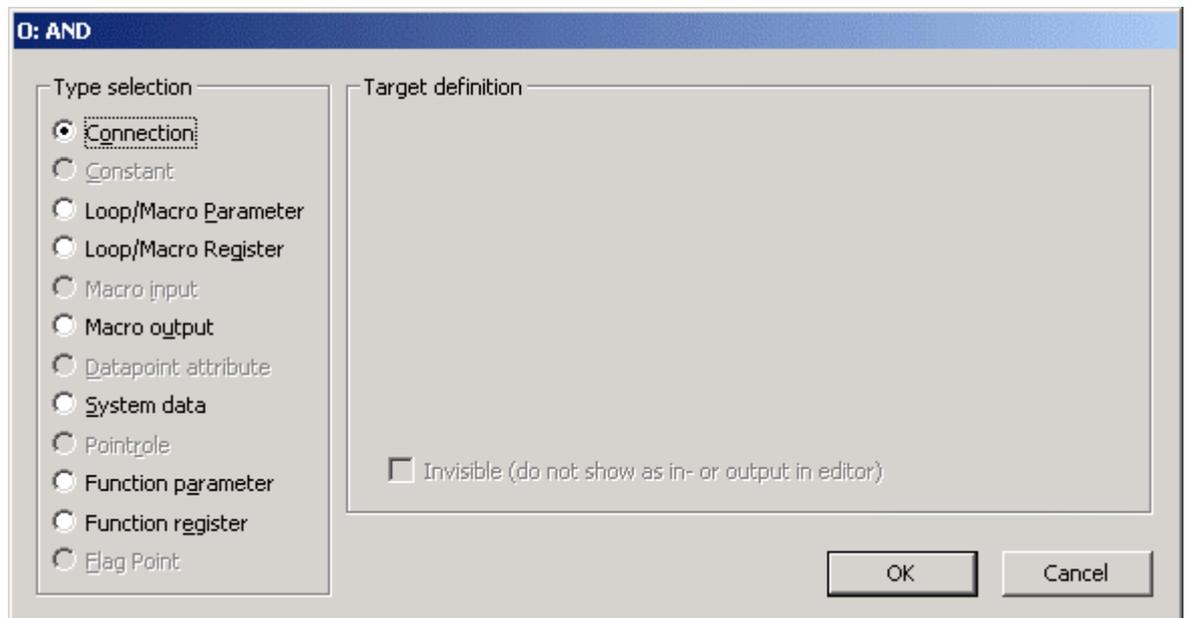
Hides the input or output of the control icon for all types other than "Connection". A line at the bottom of the icon indicates invisible ports.

Note: Datapoint attributes, Point roles and Flags are not available within macros.  
 The available output connections are displayed in the tab **Output**. Select the tab.



Double-click into the rows of the table.

RESULT: The configuration dialog box for selecting type and target for the output opens.



**- Connection**

The output is defined as a connection to one or more inputs of another element of this loop. This output will be displayed in the Macro window.

**- Constant**

The output sets up this value. It is possible to hide this output in the Macro window.

**- Loop/Macro Parameter**

A parameter can be used by all functions and macros of this loop/macro without being connected. So it is possible to simplify the displayed connections. The output sets this value.

It is possible to hide this output in the Macro window.

**- Macro output**

The input is the value of a macro's output. In this case, the output of the macro is used as a data point.

**- System data**

The output sets a Startup flag. It is possible to hide this output in the Macro window.

**- Function parameter**

The output sets the value of a parameter of one function/macro included in this control loop. Only functions with parameters are listed. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is also displayed below the symbol as long as no name is set.

It is possible to hide this output in the Macro window.

**- Function register**

The output sets the hidden stored values (default the previous values of input, output and parameters) of an input, output or parameter of one function/macro included in this macro.

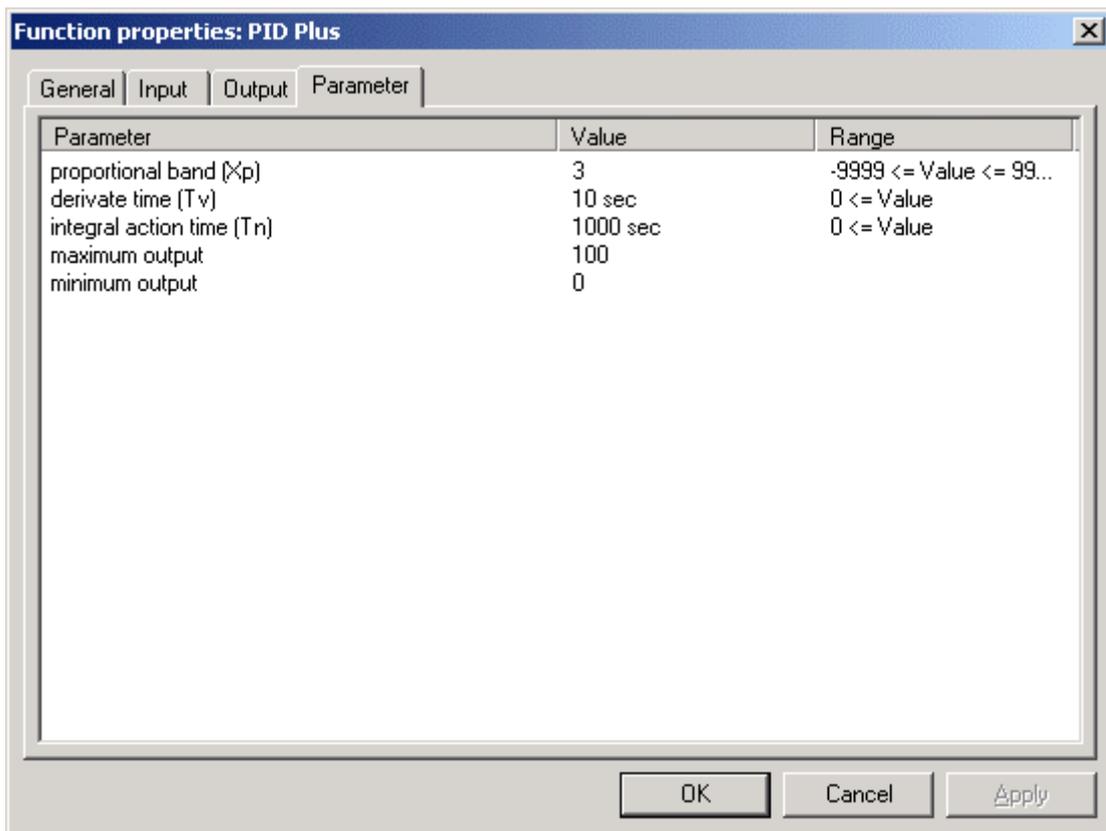
It is possible to hide this output in the Macro window. Only functions with parameters are listed. If a function has no (alias) name, an identifier ('\$' followed by a unique number) is assigned. This identifier is also displayed below the symbol as long as no name is set.

**- Invisible (do not show as in - or output in editor)**

Hides the input or output of the control icon for all types other than "Connection". A line at the bottom of the icon indicates invisible ports.

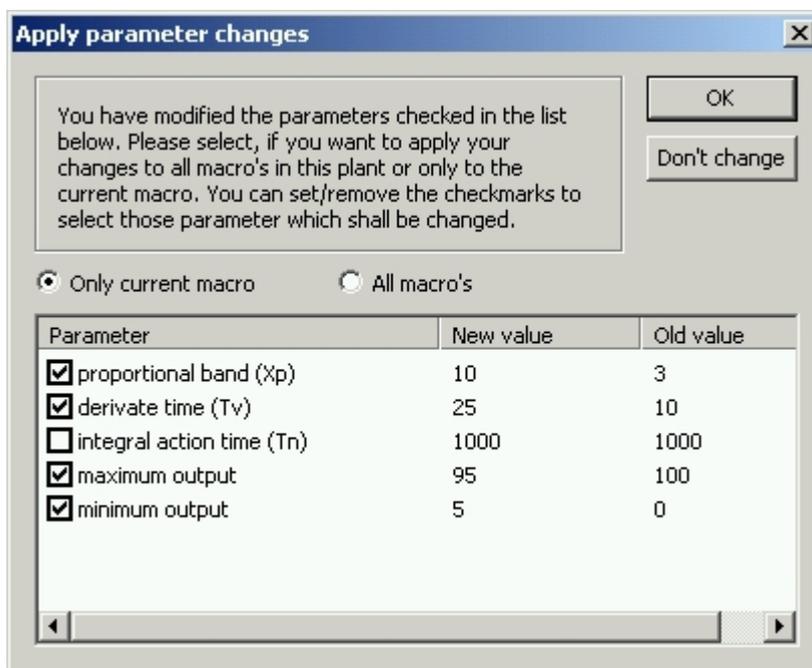
NOTE: Datapoint attributes, Point roles and Flags are not available within macros.

For some elements it is possible to set up **Parameters** in the so named tab. Select the tab.



**Parameter update**

If you change the parameter of an icon in a macro, the dialog "Apply parameter changes" opens.



You can select in the check boxes for which parameter the change should apply. The option "Only current macro" applies your changes only to the current macro. The option "All macros" applies the changes to all calls of this macro. With the

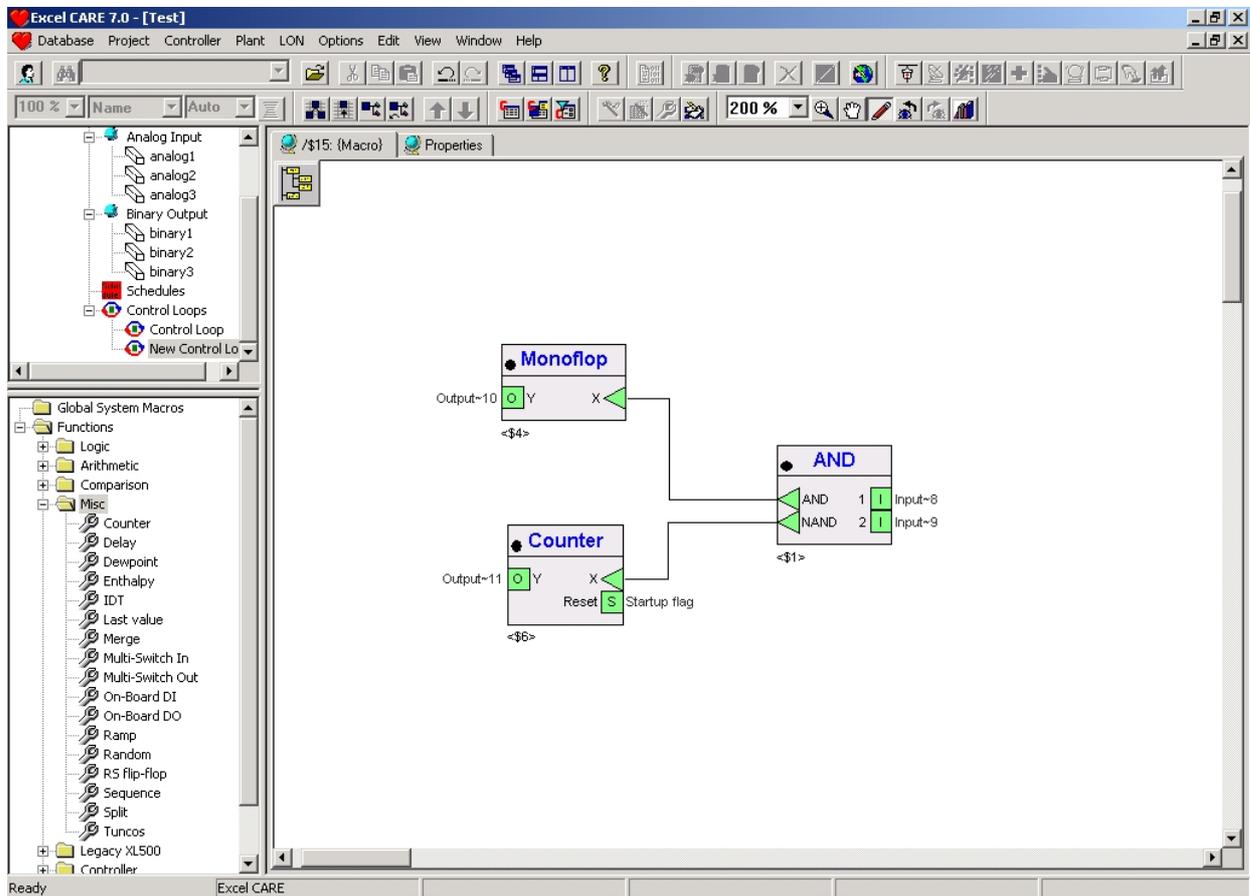
button “OK” you confirm the made changes. With the button “Don’t change” your changes are deleted.

11. Now connect the input and output ports:

- Click once on the first port, you want to connect.
- Move the cursor to the second port and click on it.
- A line will connect the two ports (only in case they are corresponding). One output port can be connected to many input ports. But one input port can be connected to only one output port.
- Customize the connecting line. While creating you can click the left mouse button into free space and the line becomes a corner there. Clicking the right mouse button removes the last corner and cancels line editing when the start point will be removed. Hitting the Space bar toggles the routing direction.
- After creating you can click the right mouse button at the line and the context menu to split (adding one corner) and to delete segments displays. After selecting the line via clicking on it, each single segment (between two corners), except the first and last one, can be moved by clicking on them.

12. Make sure, you have connected all inputs and outputs. Unconnected points are red coloured; all points have to be coloured green.

NOTE: Please note the definition of the macros inputs and outputs. As they are not displayed they easily could be left undefined.



13. To leave the macro-view and return to the control loop-view, click the right mouse button.

RESULT: The context menu of the macro displays.

14. Click on **Open parent macro**.

RESULT: The Macro window changes from macro- to control loop-view.

Double-click on any other element to change the view of it.

---

**Delete Macro**

**Procedure**

Macros will be automatically removed, if they are no longer used in any control loop.

# Flags

**Purpose** Flags are independent memory addresses defined for one plant. Each element (hardware/software point, function or macro) of any control loop of this plant is able to setup the value of such a flag with an output or setup the value of an own input with the value of such a flag. So it is possible to transmit data between the control loops of one plant without using a hardware/software point.

NOTE: It is not possible to use flags if the element is included in a macro.

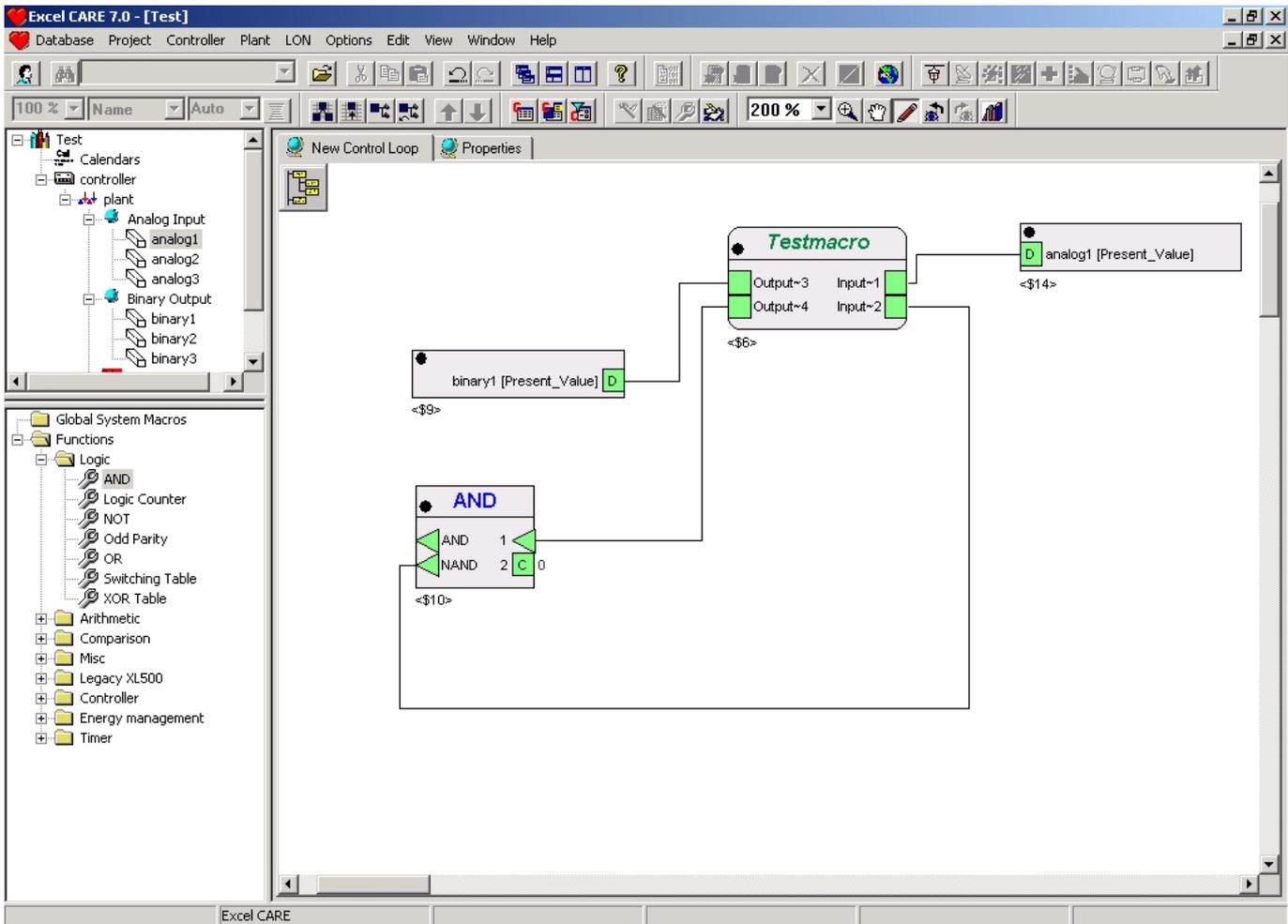
## Create and Edit Flags

**Purpose** Use Flags for easy data transfer between elements (hardware/software point, function or macro) of a single control loop.

- Prerequisites**
1. The user is logged in.
  2. A project is open.
  3. The opened project has at least one controller, one plant and one control loop.

- Procedure**
1. Expand the tree view of the control loops of the plant, the control loop is assigned to.
  2. Double-click on the icon of the control loop you want to setup Flags for.

RESULT: The Macro window of the control loop opens in the right pane.



3. Click once into the free space of the Macro window.

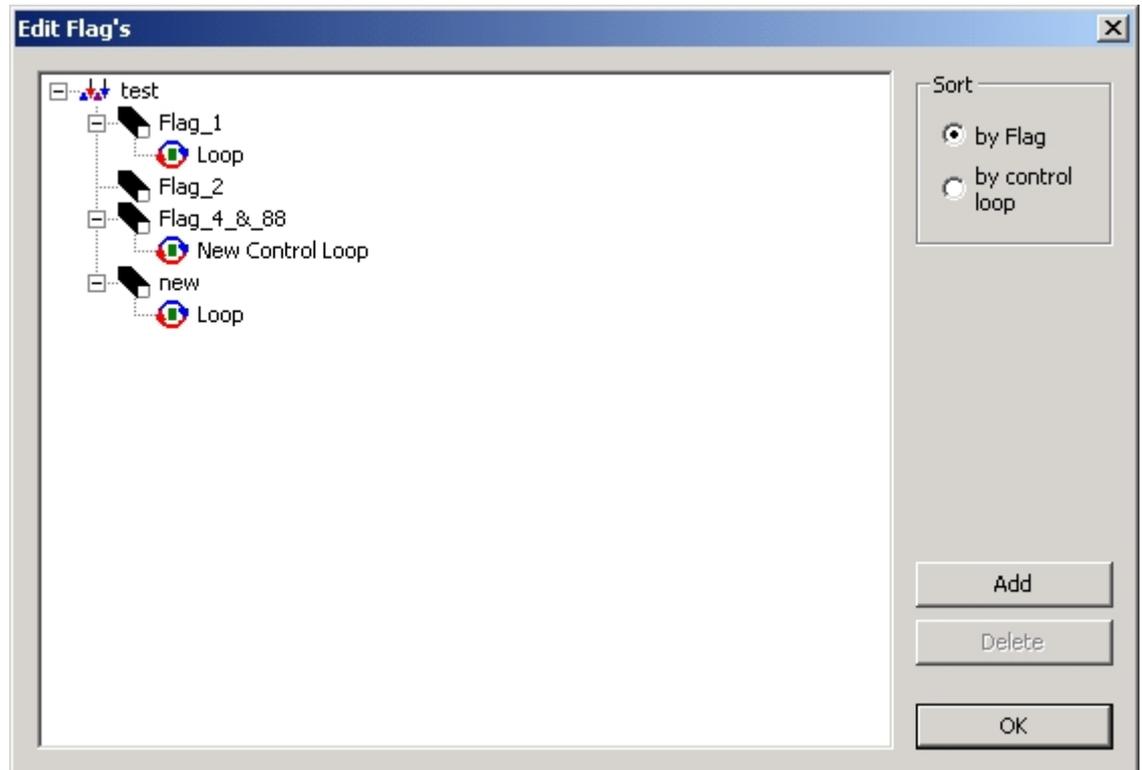
RESULT: The Macro window of the control loop is selected.

4. Click menu item Plant > Control Editor, > Flags...

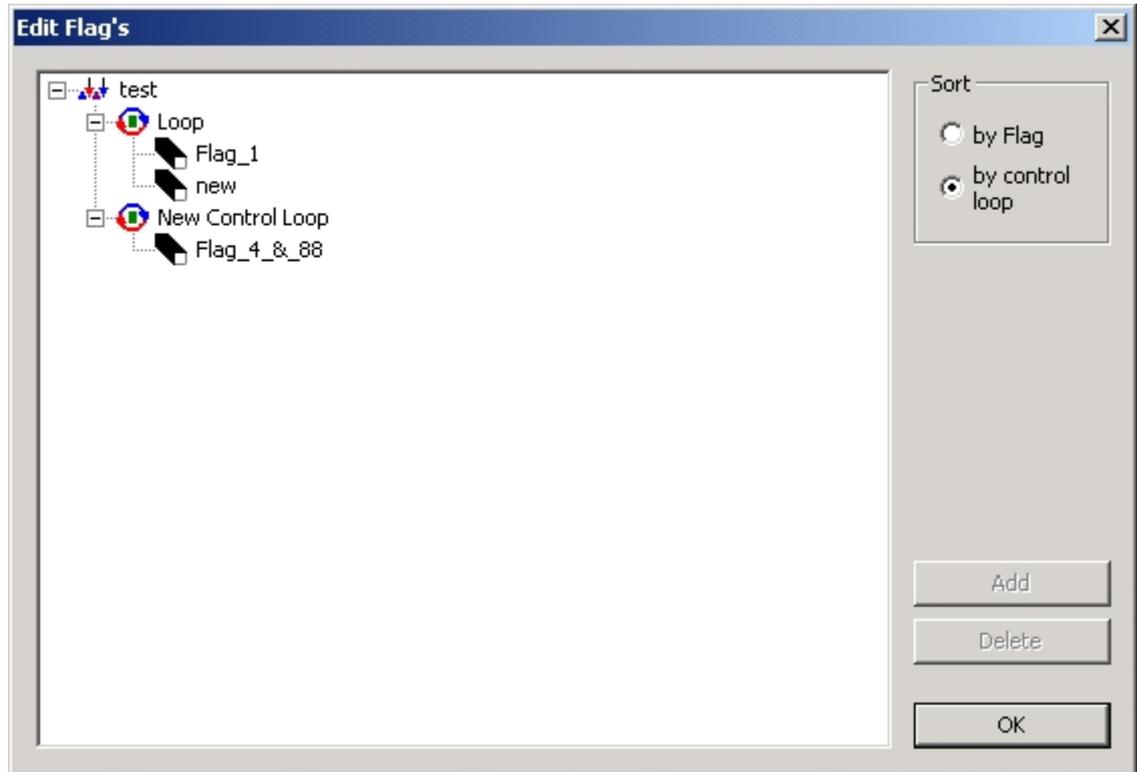
RESULT: The Edit Flag's dialog box opens.

5. Sort flags by clicking on the radio buttons, by Flag or by control loop, on the right.

RESULT: If sorted by flag, all Flags and the control loops, which include these flags, are displayed.



RESULT: If sorted by control loop, all control loops with their connected flags are displayed.

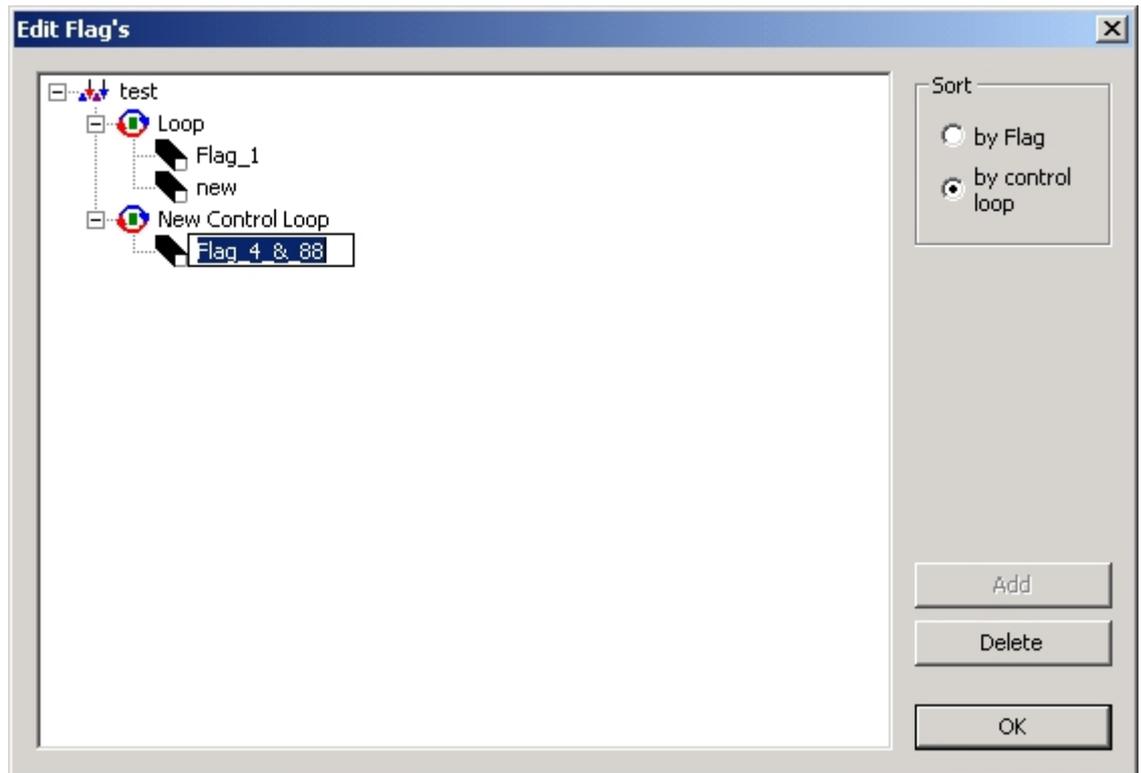


Denotation of the buttons:

- **Add**  
Click on Add to create a new flag.  
It is not possible to create Flags if the view of the Flags is sorted "by control loop".  
The name of the flag must consist of at least one letter. For the name of the flag do not use special characters like " /, ?, \* and blank.
- **Delete**  
Click on Delete to remove the selected flag.  
Only unused (not assigned to a control loop) flags can be removed.
- **OK**  
Click on OK to leave the window.

Click twice on the name of a flag to rename it.

RESULT: The name becomes highlighted and changeable.



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## Global Macro Library

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**Purpose** The Global Macro Library enables you to transfer macros between projects.

You can transfer macros:

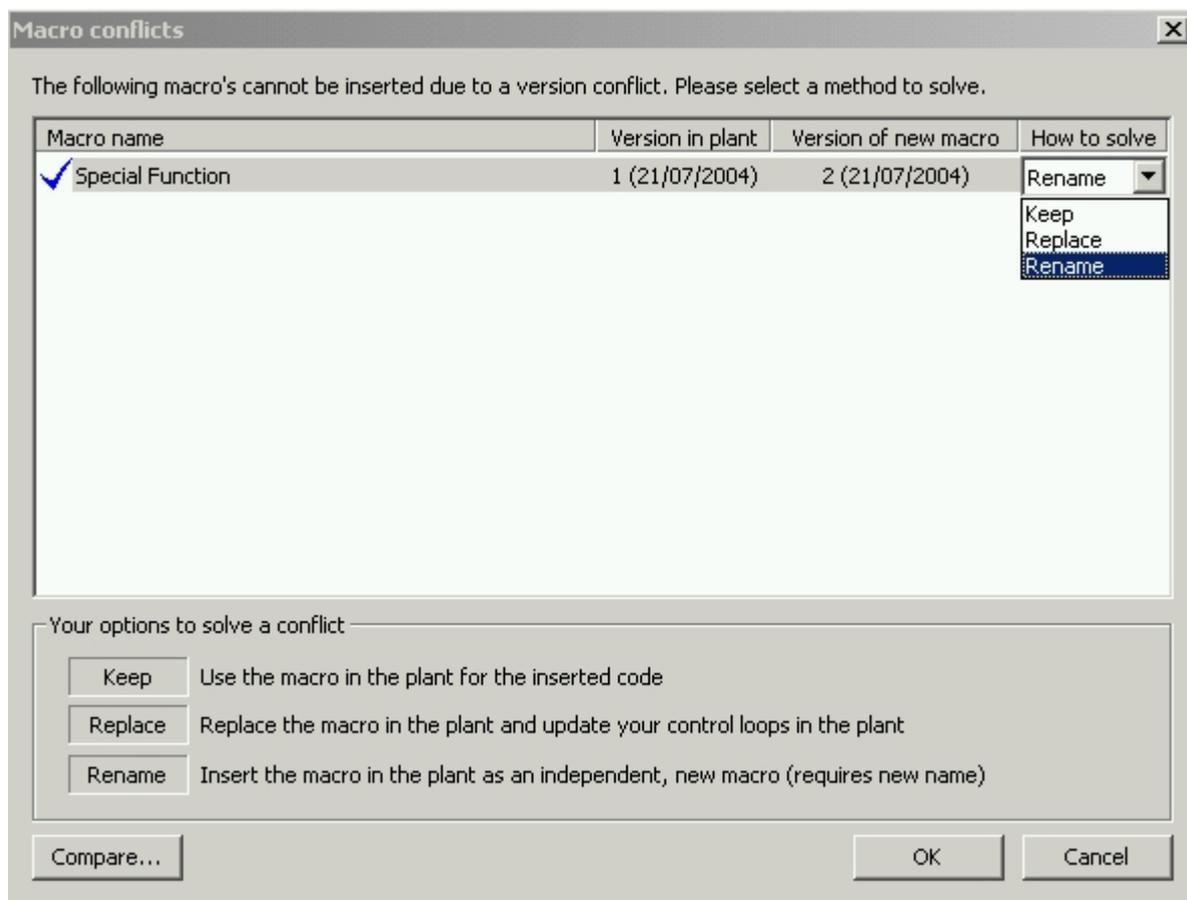
- from the library to the folder “Global System Macros” of your project
- like files between databases
- using drag & drop between the library and a macro window

The macros can be used independently from any project or control loop.

---

### Macro Conflict

Whenever the contents or properties of a macro are changed, the version and the date of the macro are modified. This may lead to a conflict. The conflict arises when you drop a macro in an editor where the same macro with a different version or date is already in use. The dialog macro conflict opens.



More than one macro may be shown in the dialog, because of the macro dependencies.

You have three options to resolve the conflict as described in the dialog. Double-click on one of the listed conflicts to mark it. Select your solution in the drop-down list “How to solve”. As long as not all macro conflicts are resolved, the button “OK” stays inactive.

Double-click on one of the listed conflicts and then on the button “Compare” to see the differences between the conflicting macros.

## Global Macro Library Window

- Purpose** In the Global Macro Library window you can handle global macros.
- Prerequisites** 1. The user is logged in.
- Procedure** 1. Click menu item Database > Macro Library... , or click on button .
- RESULT: The Global Macro Library window opens.



This window is organized as a file manager. Move macros between the folders by using drag & drop.

NOTE: It is only possible to move macros in the upper part (macro library) or from the Global Macro Library to a macro window.

2. Move the mouse cursor above the icons and click the right mouse button.

RESULT: Further menus will be displayed.

Denotation of the buttons on the base of the window:

- **Exit**  
Closes the window.
- **Import macros**  
A new window appears, where you can search for backed up data of macros or macro libraries.
- **Export macros**  
A new window appears, where you can store backup data of macros or macro libraries.
- **More**  
The Global Macro Library window expands by a Macro window. Double-click a macro of the Global Macro Library to display and edit it in this Macro window.

## Create and Edit Global Macro

**Prerequisites** 1. The user is logged in.

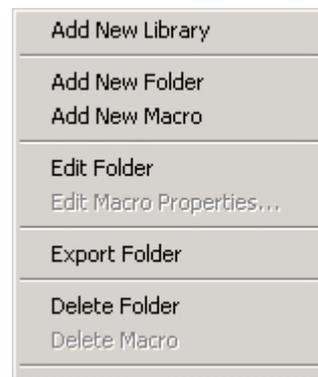
**Procedure** 1. Click menu item Database > Macro Library... , or click on button .

RESULT: The Global Macro Library window opens.



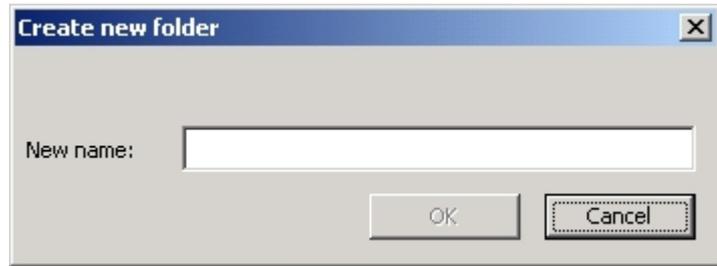
2. Right-click on the folder Macro Library (or each other folder).

RESULT: The context menu of the folder opens.



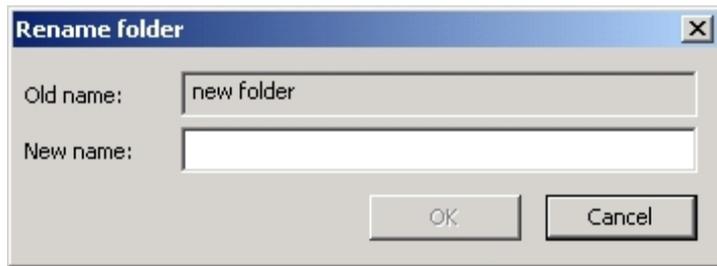
3. Click with the left mouse button on:

- **Add New Library**  
A new folder named "MacroLibrary\_1" is added to the folder level of folder Macro Library.
- **Add New Folder**  
The Create new folder dialog box opens.



Enter the desired name of the folder into New name field.  
Click on the button OK to create a new folder.

- **Add New Macro**  
The wizard for setting up a new macro starts.
- **Edit Folder**  
The Rename folder dialog box opens.



Enter the desired name of the folder into New name field.  
Click on the button OK to apply the new name to the folder.  
Click on the button Cancel to leave the dialog box without saving.

- **Delete Folder**  
The selected folder and all macros in this folder will be removed.

NOTE: Other than handling of macros in the control loops view, unused and used macros will be deleted. The used ones are available in the control loop, but no longer stored in the macro library.

4. To create a new macro, click on **Add New Macro**.
5. To edit an existing macro, right-click on the desired macro, the context menu opens, select Edit Macro Properties... .

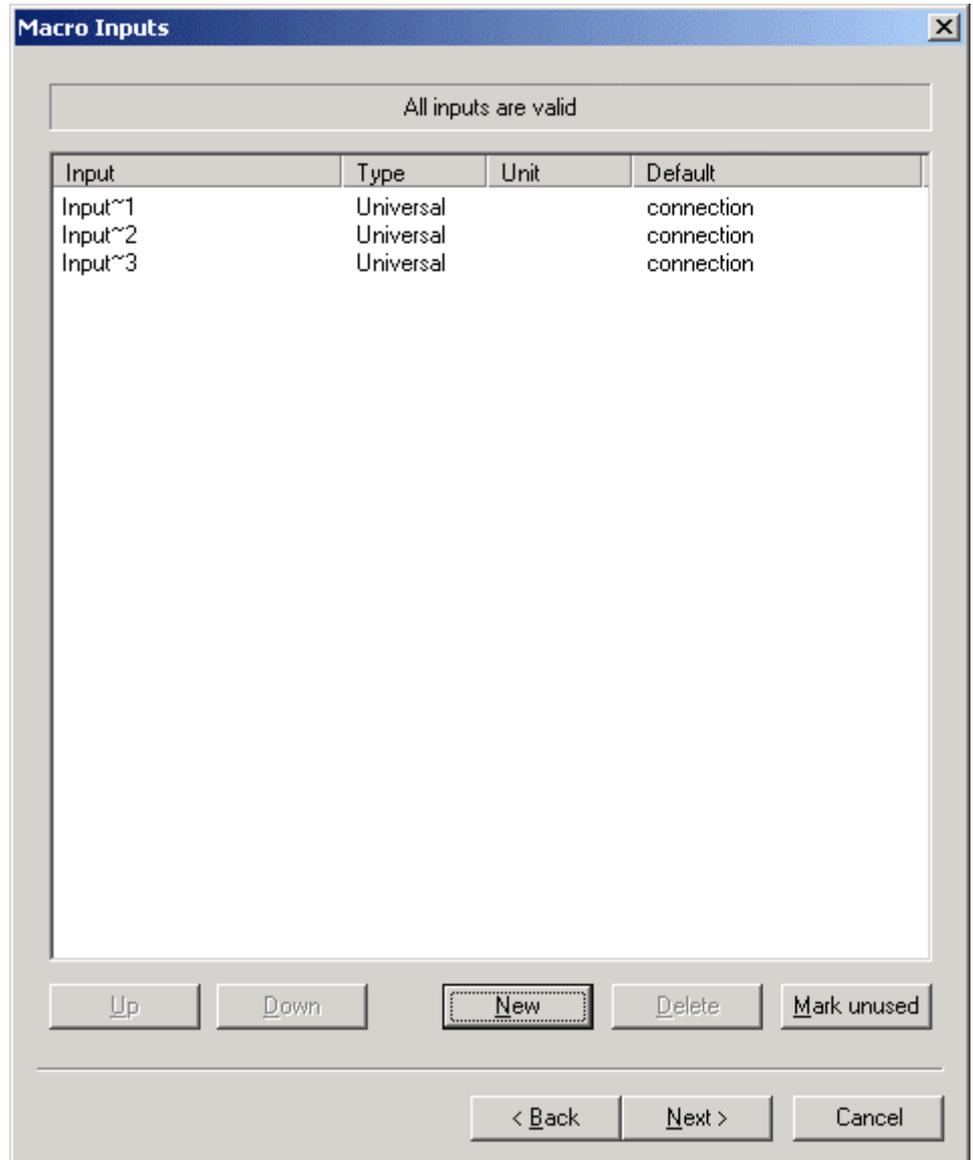
RESULT: The Macro overview dialog box of the macro opens.

Fill in the fields according to your requirements:

- **Please enter a name:**  
Unique name of the macro.
- **Description**  
Description of the macro, e.g. what's the function of it or which special input/output or parameters are used in this macro.
- **Tooltip**  
Descriptive information that will be displayed in the yellow tooltip which displays when moving the cursor over the macro icon.
- **System macro**  
Select the checkbox if the macro should be included in the folder "Global System Macros". The macros of this folder can be used for all control loops of the database. Only authorized users can access System macros.
- **Version info (read only, managed automatically)**  
Information about the macro, similar to file information known from MS-windows.

6. Click the button **Next**.

RESULT: The Macro Inputs dialog box of the macro opens.



7. Click twice into the desired fields of the table to set up the properties of the input datapoints of the macro:

Denotation of the columns:

- **Input**  
Name of the input(s). Double-click into the row of the desired input to change its name.
- **Type**  
Type of the input(s). Double-click into the row of the input to choose between the three input types (analog, binary or universal).
- **Unit**  
Property dialog box of the connections unit of the value (e.g. liters, volt, minutes, ...).

- **Default**

In the default column you can select the type of connection, which will be used when you drop the macro from the Global Library into your editor. If the type pointrole is used, and exactly one datapoint is found with the same pointrole, it is automatically replaced. Otherwise the pointrole type stays the same and should be changed manually.

For default types only one of the following options can be selected:

- Connection
- Constant
- System Data
- Pointrole
- Flagpoint

All options other than "Connection" may be invisible too.

Denotation of the buttons:

- **Up**

Use this button to place the selected input one step up.

- **Down**

Use this button to place the selected input one step down.

- **New**

Use this button to create a new input of the macro.

- **Delete**

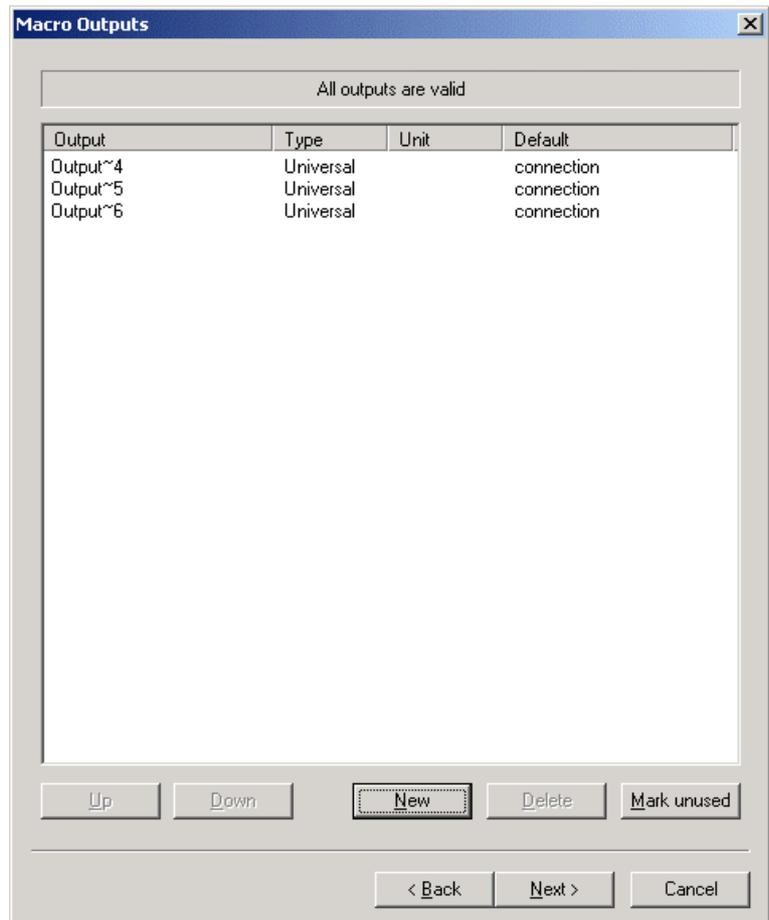
The selected input will be removed. Please note, only unused inputs can be removed and no undo is possible.

- **Mark unused**

All entries not used by the control strategy of the macro are selected (to delete them).

8. Click the button **Next**.

RESULT: The Macro Outputs dialog box of the macro opens.



9. Click twice into the rows of the table to set up the properties of the output datapoints of the macro:

Denotation of the columns:

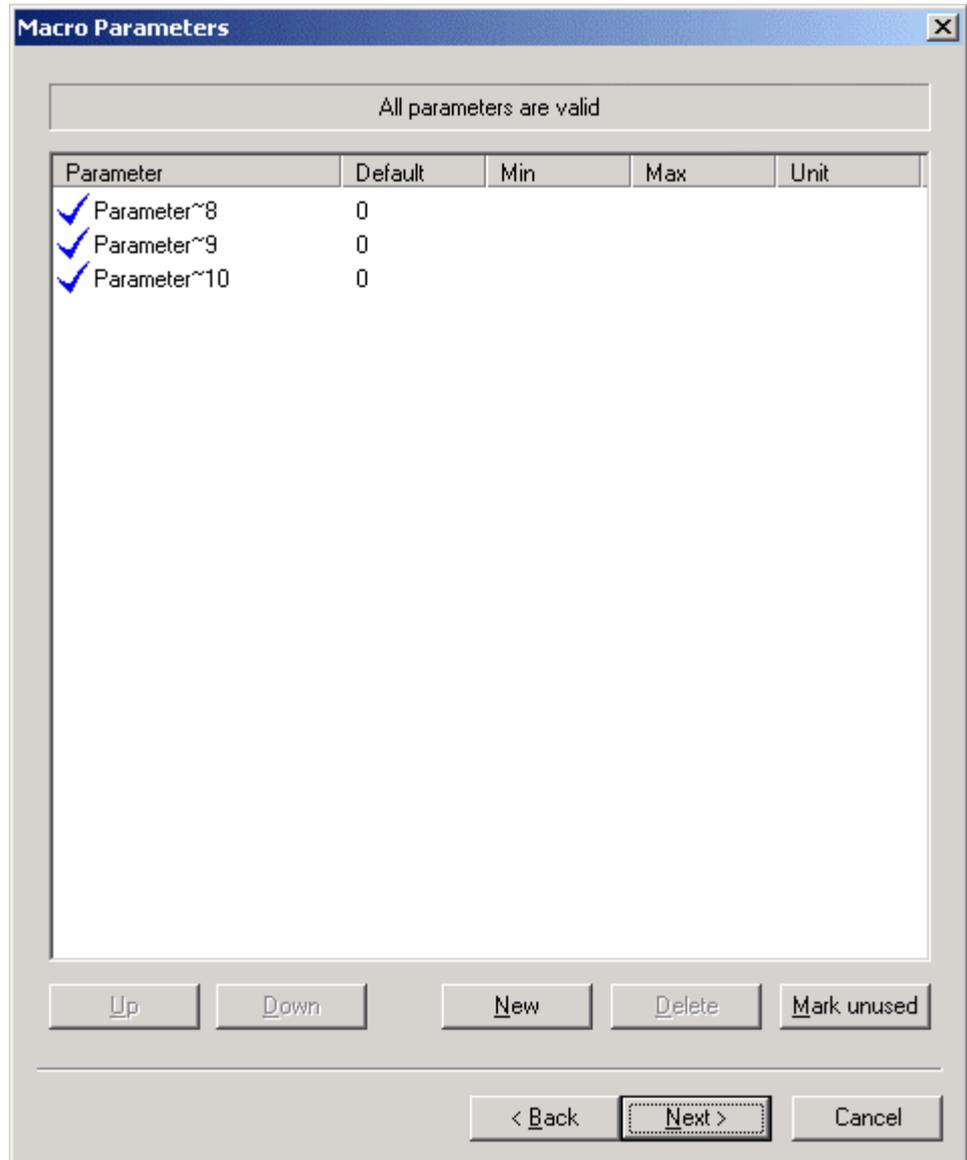
- **Input**  
Name of the output(s). Double-click into the row of the desired output to change this name.
- **Type**  
Type of the output(s). Double-click into the row of the desired output to choose between the three output types (analog, binary or universal).
- **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).
- **Default**  
In the default column you can select the type of connection, which will be used when you drop the macro from the Global Library into your editor. If the type pointrole is used, and exactly one datapoint is found with the same pointrole, it is automatically replaced. Otherwise the pointrole type stays the same and should be changed manually.  
For default types only one of the following options can be selected:
  - Connection
  - Constant
  - System Data
  - Pointrole
  - Flagpoint

All options other than connection may be invisible too.

Denotation of the buttons:

- **Up**  
Use this button to place the selected output one step up.
  - **Down**  
Use this button to place the selected output one step down.
  - **New**  
Use this button to create a new output of the macro.
  - **Delete**  
The selected output will be removed. Please note, only unused outputs can be removed and an undo is not possible.
  - **Mark unused**  
All entries not used by the control strategy of the macro are selected (to delete them).
10. Click the button **Next**.

RESULT: The Macro Parameters dialog box of the macro opens.



11. Click twice into the desired fields of the table to set up the properties of the parameters of the macro:

Meaning of the columns:

- **Parameter**  
Name of the parameter(s). Double-click into the row of the desired parameter to change its name.
- **Default**  
Default value of the parameter(s).
- **Min**  
Minimum value of the parameter(s).
- **Max**  
Maximum value of the parameter(s).
- **Unit**  
Unit of the value (e.g. liters, volt, minutes, ...).

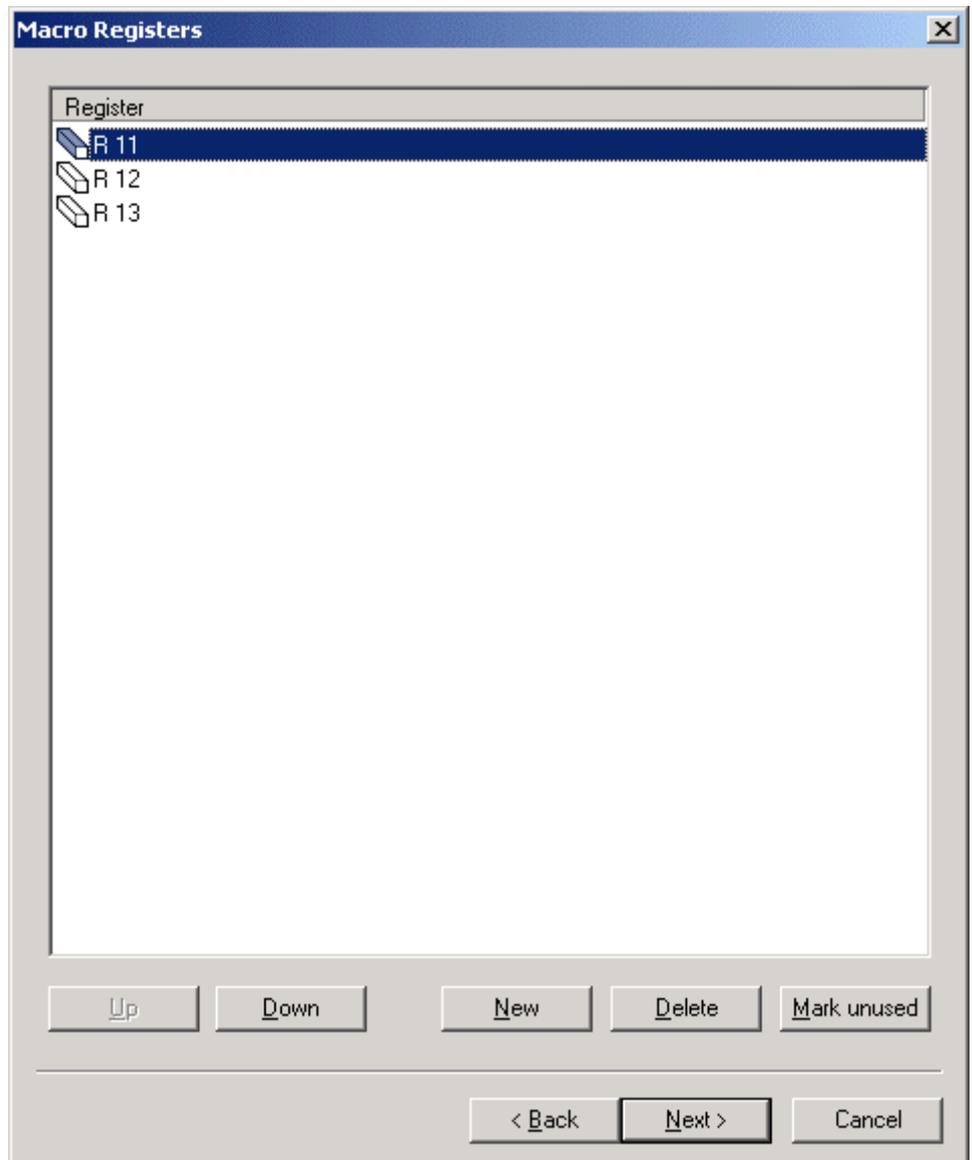
Denotation of the buttons:

- **Up**  
Use this button to place the selected parameter one step up.
- **Down**  
Use this button to place the selected parameter one step down.
- **New**  
Use this button to create a new parameter of the macro.

- **Delete**  
The selected parameter will be removed. Please note, only unused parameters can be removed and an undo is not possible.
- **Mark unused**  
All entries not used by the control strategy of the macro are selected (to delete them).

12. Click the button **Next**.

RESULT: The Macro Registers dialog box of the macro opens.



13. Click twice into the desired fields of the table to set up the properties of the registers of the macro:

Meaning of the columns:

- **Register**  
Name of the register(s). Click twice into the row of the desired register to change its name.

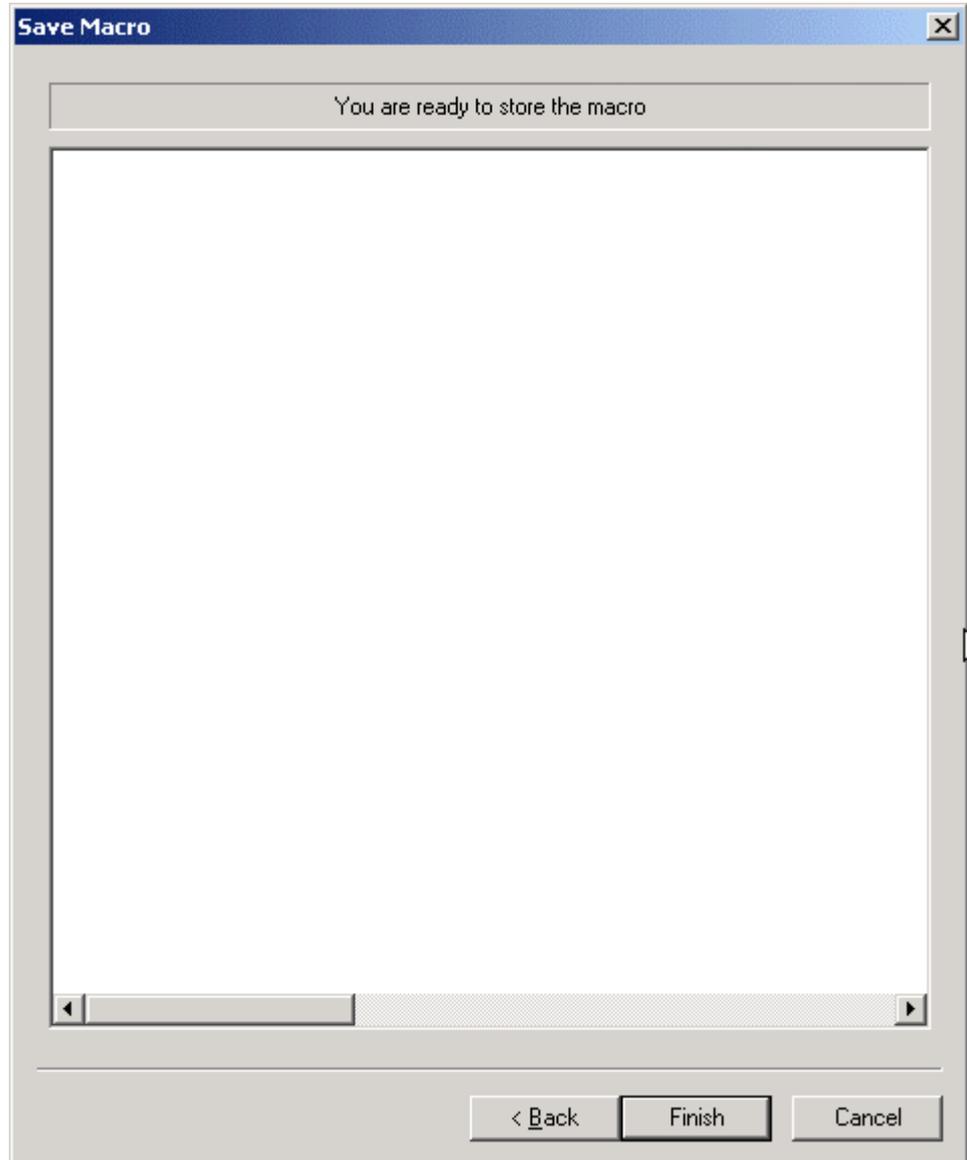
Denotation of the buttons:

- **Up**  
Use this button to place the selected register one step up.
- **Down**  
Use this button to place the selected register one step down.

- **New**  
Use this button to create a new register of the macro.
- **Delete**  
The selected register will be removed. Please note, only unused register can be removed and an undo is not possible.
- **Mark unused**  
All entries not used by the control strategy of the macro are selected (to delete them).

14. Click the button **Next**.

RESULT: The Save Macro dialog box of the macro opens.



13. Click on the **Finish/OK** button.

RESULT: The macro is displayed like a function in the Global macro Library window.



14. Create the macros logic.
15. From now on, the macro is stored in the global macro library and can be transferred into any project, database and is available for any control loop.

### Create and Edit Global Macro Logic

Several macros have the attribute System Macro. To see if your macro is defined as a System Macro, open the Macro properties dialog and check if the option "System Macro" is active. System Macros cannot be edited, deleted or moved within the Global Macro Library. A special license is required to create System Macros.

#### Prerequisites

1. The user is logged in.

#### Procedure

1. Click menu item Database > Macro Library..., or click on button .

RESULT: The Global Macro Library window opens.



2. Expand the tree view of the folder, the macro is assigned to.

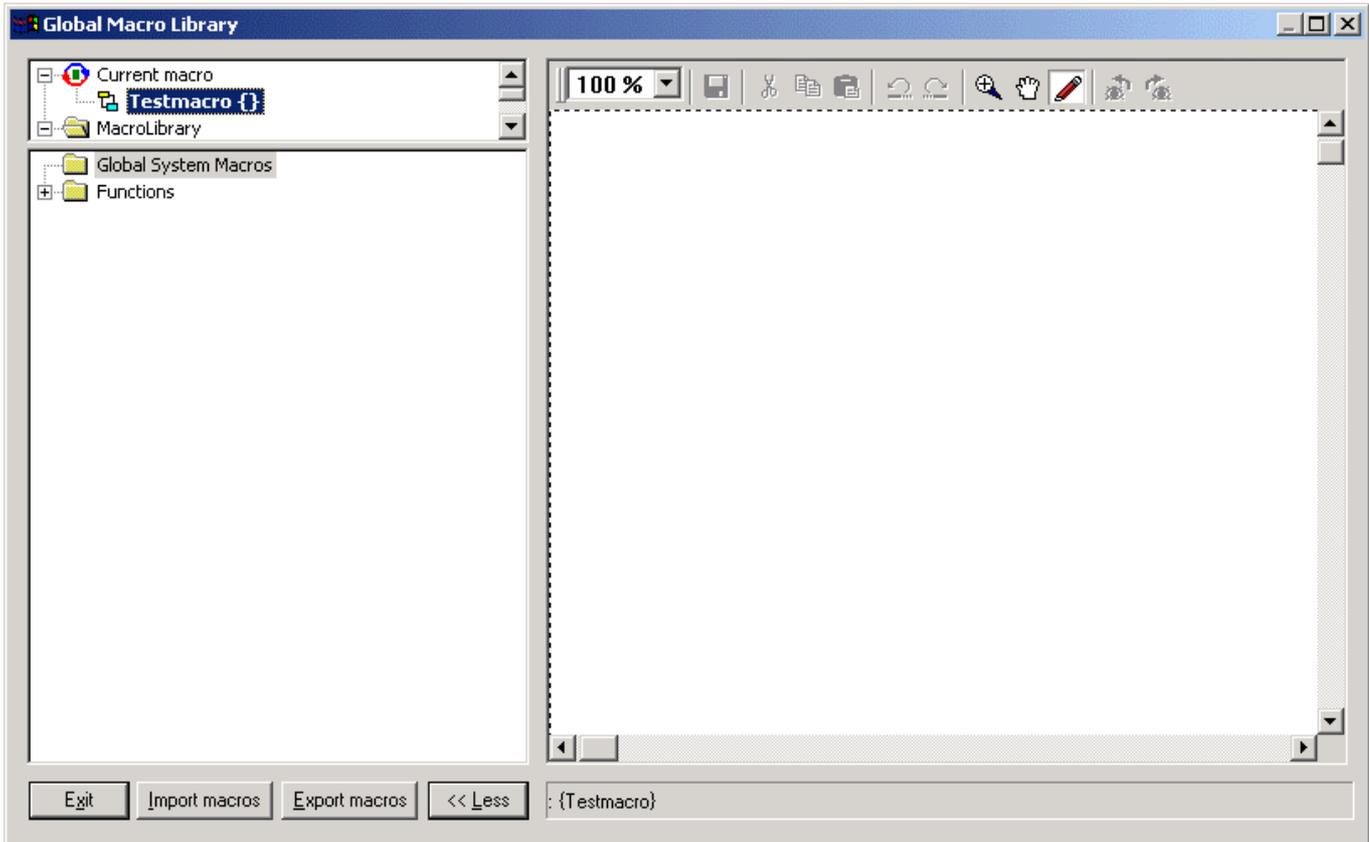
3. Click on button More>>.

RESULT: The Macro window of the folder opens in the right pane.

4. Double-click on the macro.

RESULT: The logic of the macro opens in the Macro window.

NOTE: The editor pane will be displayed automatically if not already visible.



5. Define the content of the macro and connect the input and output ports as described in the previous sections.

6. Make sure, you have connected all inputs and outputs. Unconnected points are red coloured; all points have to be coloured green.

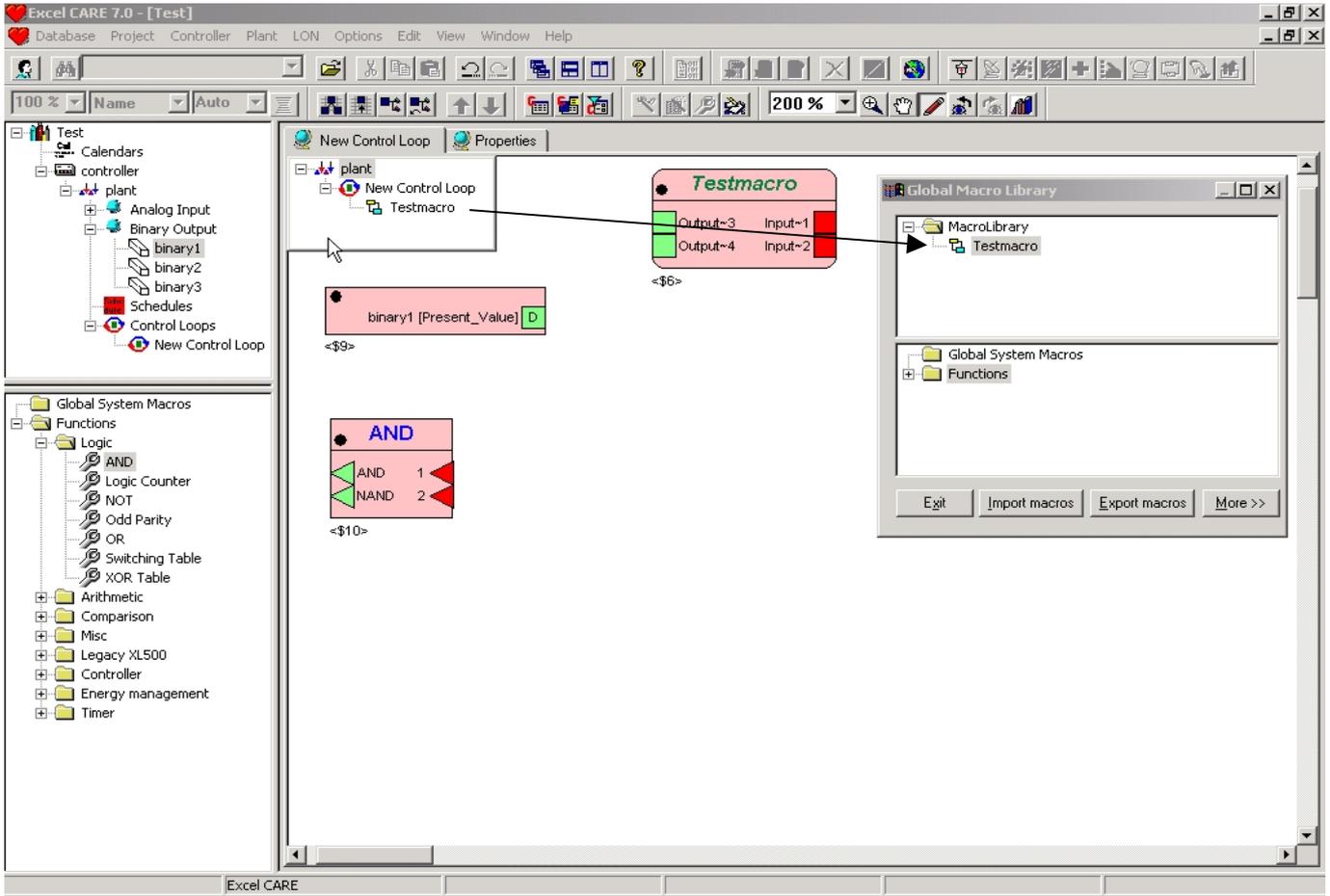
NOTE: Please note to the definition of the macro's inputs and outputs. As they are not displayed they easily could be left undefined.

The button "More >>" changed to "<< Less". Use the Save key in the toolbar to save the changes. Leave the edit mode by clicking on "<< Less" or double-clicking another macro to apply changes. Otherwise old settings are copied when you use drag & drop.

## Add a Macro of a Control Loop to the Global Macro Library

- Prerequisites**
1. The user is logged in.
  2. A project is open.
  3. The opened project has at least one controller, one plant, one loop and one macro.
- Procedure**
1. Expand the tree view of the control loop of the plant, the macro is assigned to.
  2. Double-click on one of the icons of the ccontrol loops, the macro is assigned to.  
 RESULT: The Macro window of the control loop opens in the right pane. The icon of the macro is displayed in this Macro window.
  3. Open the Global Macro library:
    - Click menu item Database,
    - Then submenu item Macro Library... ,
    - Or click on button:
 RESULT: The Global Macro Library window opens.
  4. Transfer the desired macro to the Global Macro Library, by using the window function drag & drop:
    - Move the mouse cursor above the sensitive field in the upper left corner of the macro window:
 RESULT: The view expands by the macros in the loop.
    - Click once on the desired macro and hold the left mouse-button pressed.
    - Move the cursor into the Global Macro Library window. The cursor changes to a "No Parking"-sign if it is moved in areas, you can not drop the macro into.
    - Release the left mouse button.
 Drag & drop is only **possible** between folders. The library must not contain any system macros, except you have the proper license,

RESULT: The macro is dropped into the Global Macro Library.



## Delete Global Macro

**Prerequisites**

1. The user is logged in.
2. There must be at least one global macro.

**Procedure**

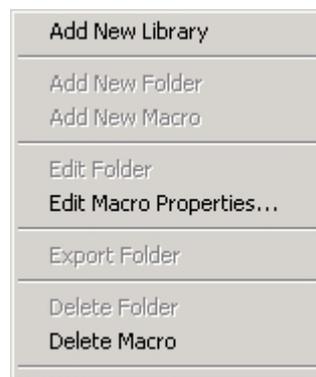
1. Click menu item Database > Macro Library... , or click on button .

RESULT: The Global Macro Library window opens.



2. Right-click on the name of the macro you want to delete.

RESULT: The context menu of the macro opens.



3. Click with the left mouse button on:
  - **Delete Macro**  
The selected macro will be removed.

NOTE: Other than the handling of macros in the control loops view, unused and used macros will be deleted. The used ones are available in the control loop, but no longer stored in the macro library.

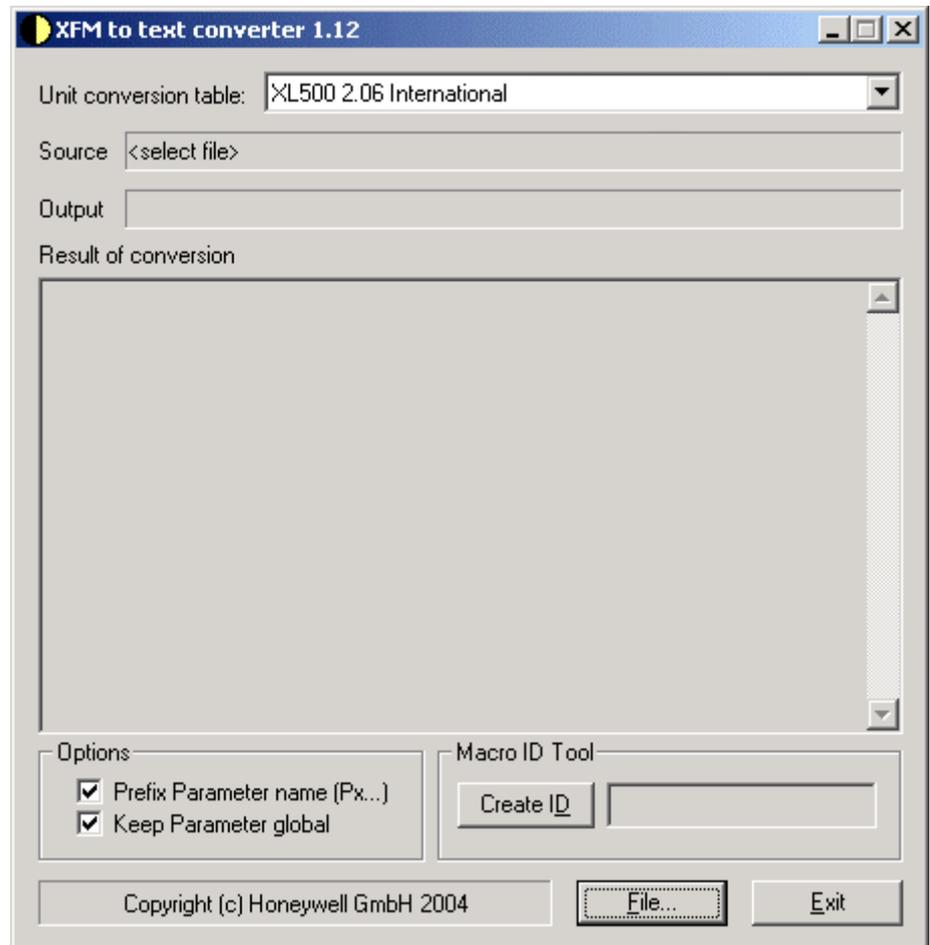
## Import Text Macro (XFM)

XMFs can be reused in the Excel Web controller by importing them into the Global Macro Library. Note, that this function is restricted to users that have administrator rights. Before importing an XFM in CARE, it must be converted into a text file by using the XFM to Text Converter.

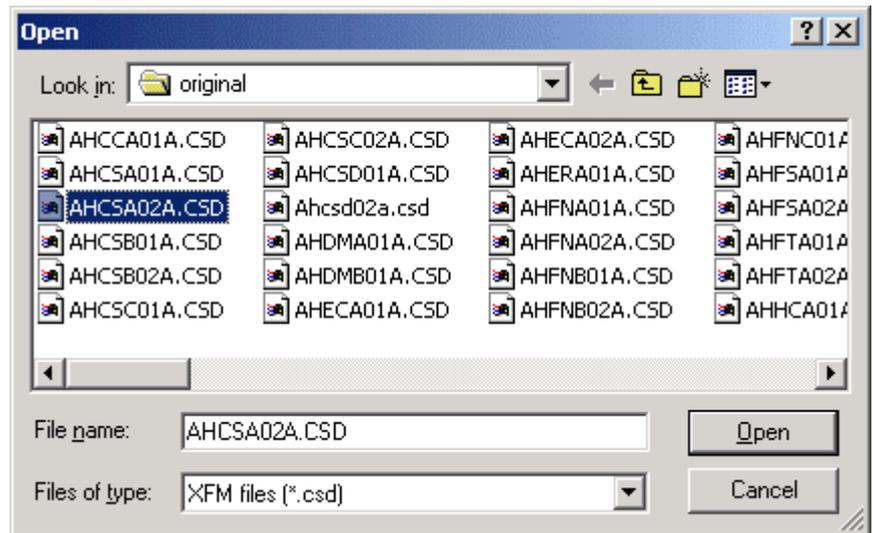
### Procedure

1. In the CARE folder, navigate to the folder 'csd2txt' and double-click on *csd2txt.exe*.

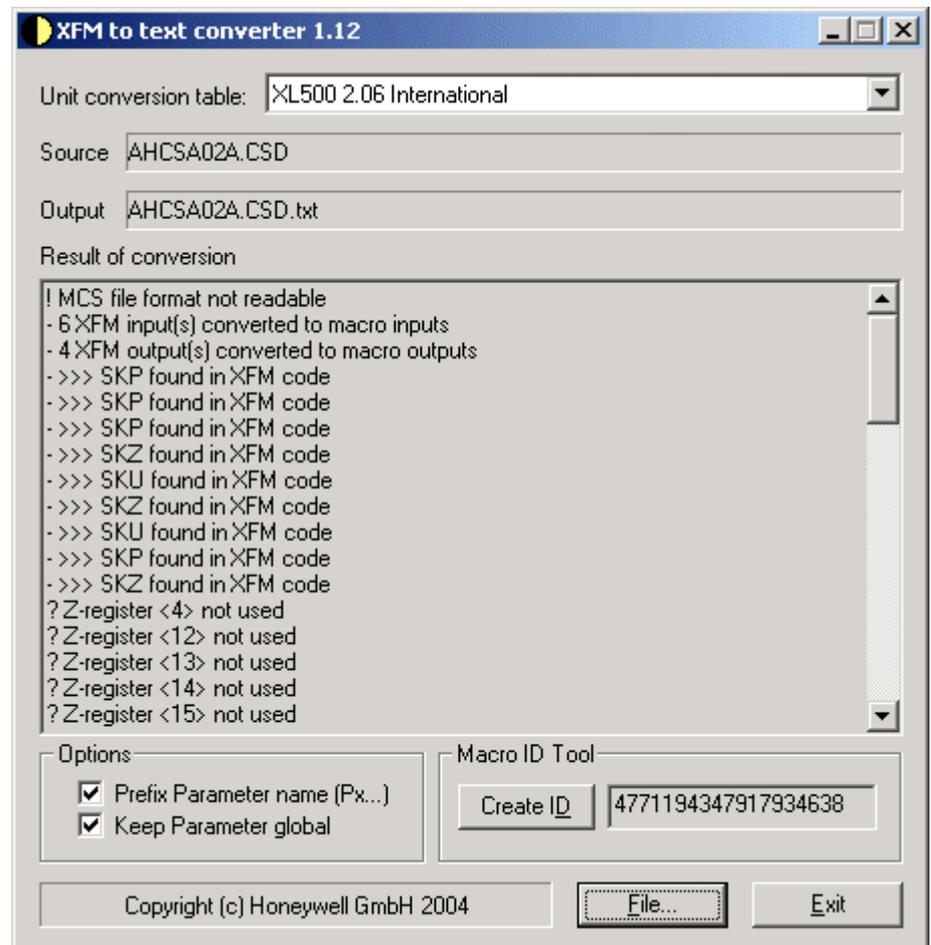
RESULT: The XFM to text convert dialog box displays.



2. From the **Unit Conversion table** drop-down listbox, select the unit conversion table. The list shows all table names which were found in the UNITCONV.INI. It may be necessary to create or change this table in the UNITCONV.INI file before starting the application
3. Check **Prefix Parameter name (Px...)** if a prefix "Px" should be added to all parameters in the text file, with 'x' replaced by the parameter index.
4. Check **Keep Parameter global** if all XFM parameter will be kept as global macro parameters, even if they would become local function parameters.
5. Click the **Create ID** button if you want to create a new macro id, which will be shown in the text field right to the button.
6. Click **File...** button, select the XFM (*csd* file) you want to convert to a *txt* file in the *Open* dialog box and click the **OK** button. It is recommended to have the RACL Editor source file of the selected XFM (same name, but extension *MCS*) stored in the same directory. Then the XFM to text converter is able to read the statement comments from the source file and add them to the text output.



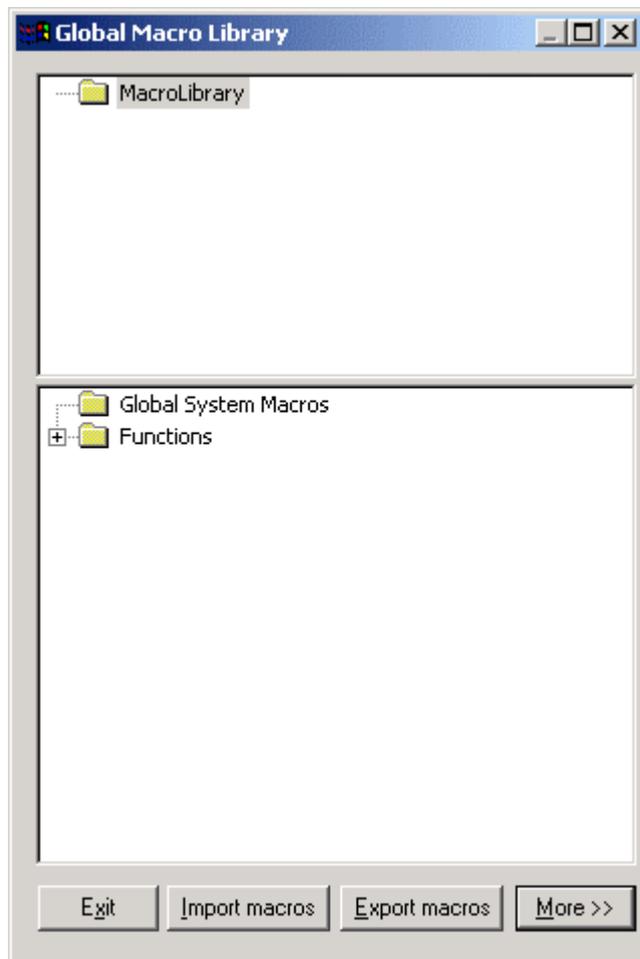
RESULT: In the XFM to text converter dialog box, the selected csd file name is displayed in the **Source** field. In the **Output** field, the converted txt file name is displayed. The result of the conversion is displayed under **Result of conversion**.



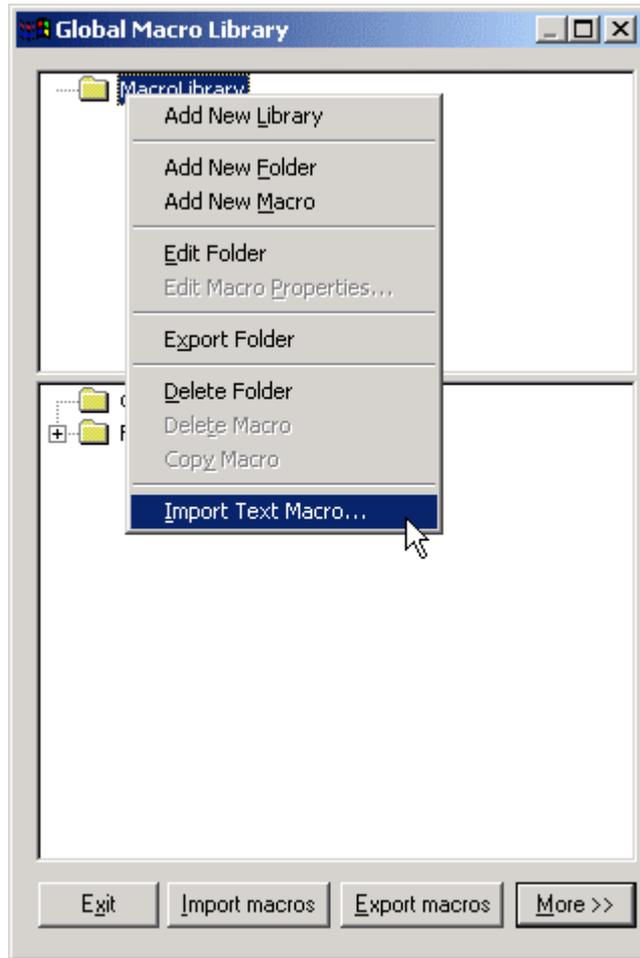
7. Check the conversion result for errors. If successful, the created text file would be saved in the same directory where the XFM was loaded from, with the same name but an additional extension *TXT*, for example, the XFM "AHCSA02A.CSD" will be saved to "AHCSA02A.CSD.txt".

8. Click the **Exit** button.
9. Start CARE and open the project.
10. Open the control loop.
11. Open the Global Macro Library by clicking the Global Macro Library icon .

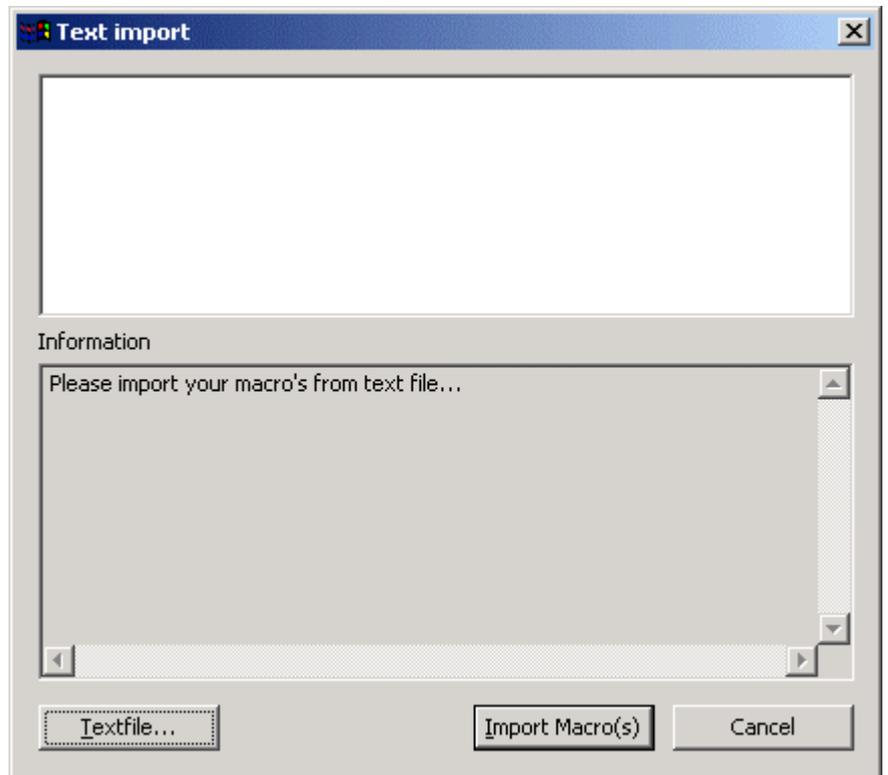
RESULT: The *Global Macro Library* window displays.



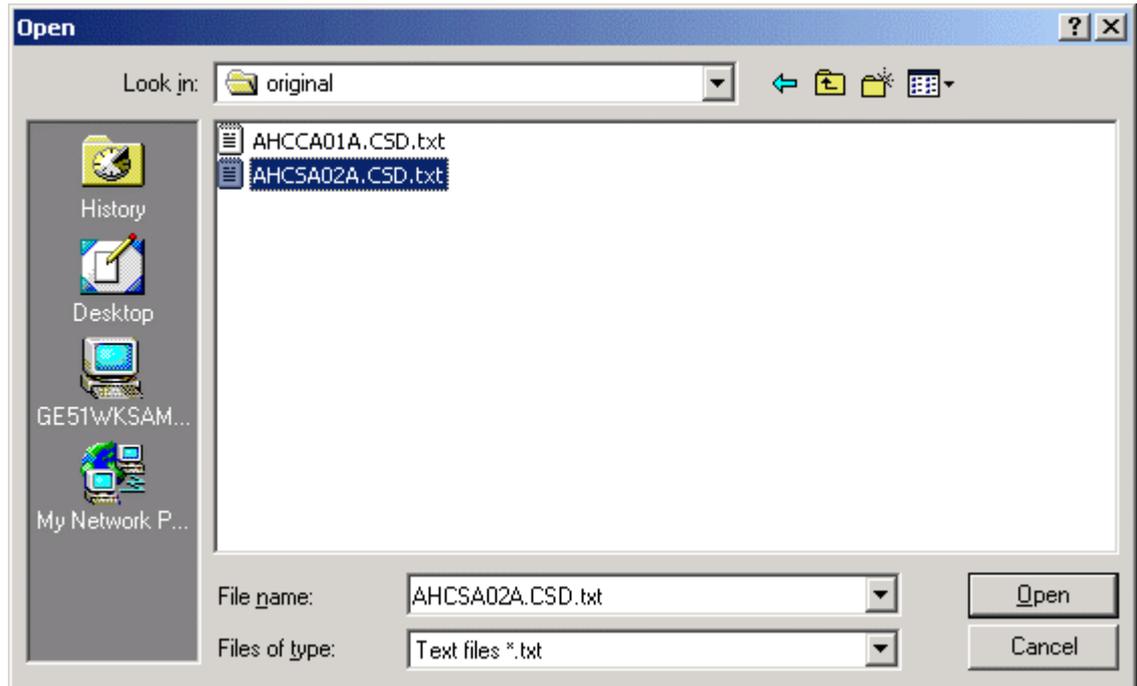
12. In the upper area, click on a folder to which the macro should be imported.
13. Click right mouse button and click on **Import Text Macro** in the context menu.



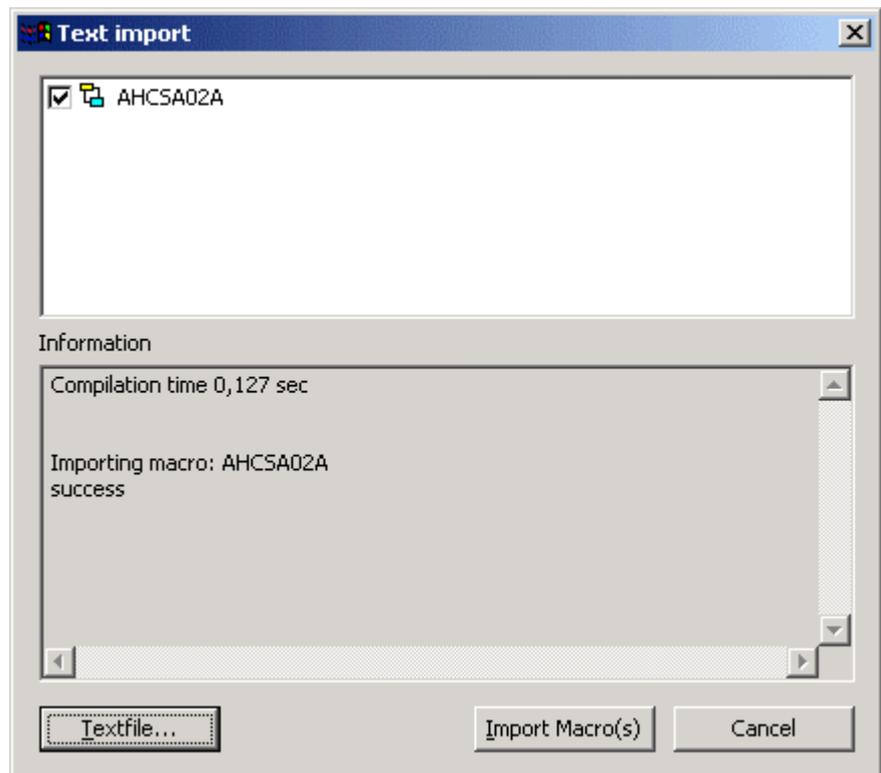
RESULT: The *Text import* dialog box displays.



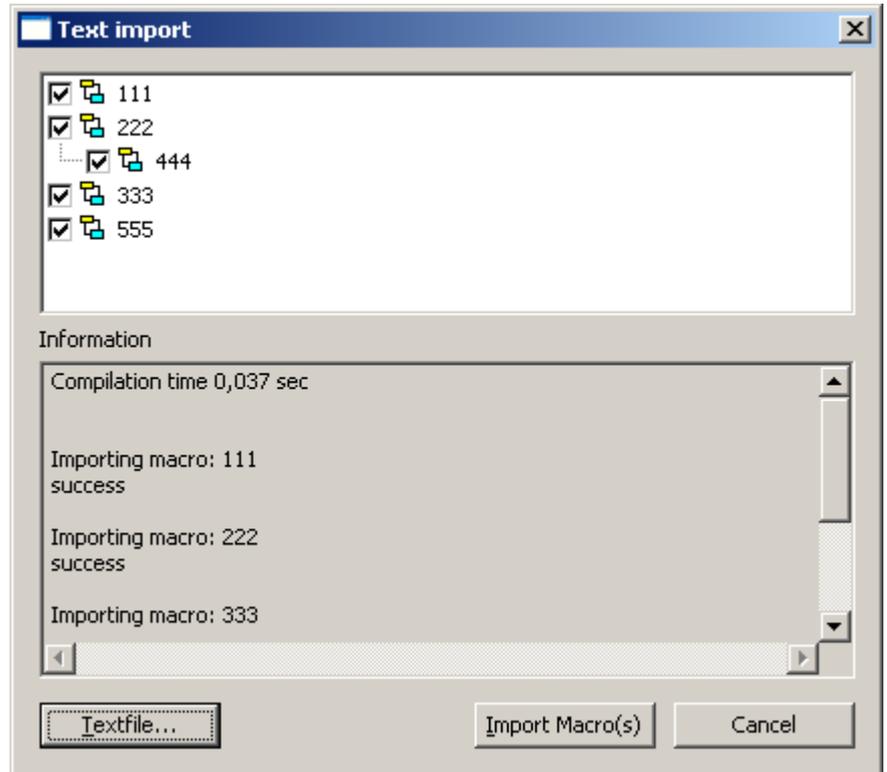
14. Click **Textfile...** button, select the XFM (csd file) you want to import in the *Open* dialog box and click the **OK** button.



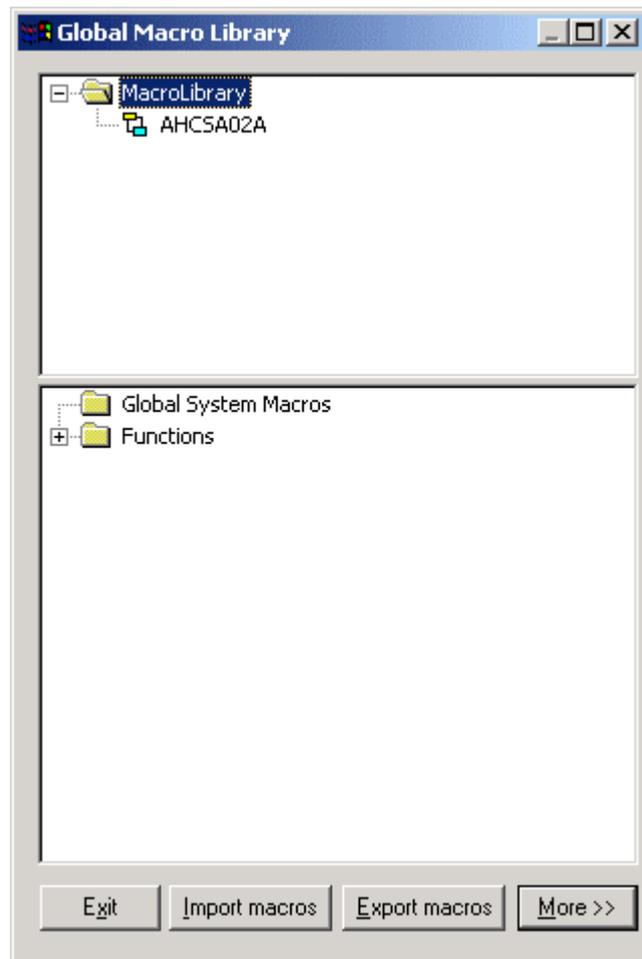
**RESULT:** After the file has been read short information of the read procedure is displayed and in the upper area are all macros are listed that could be read from the file.



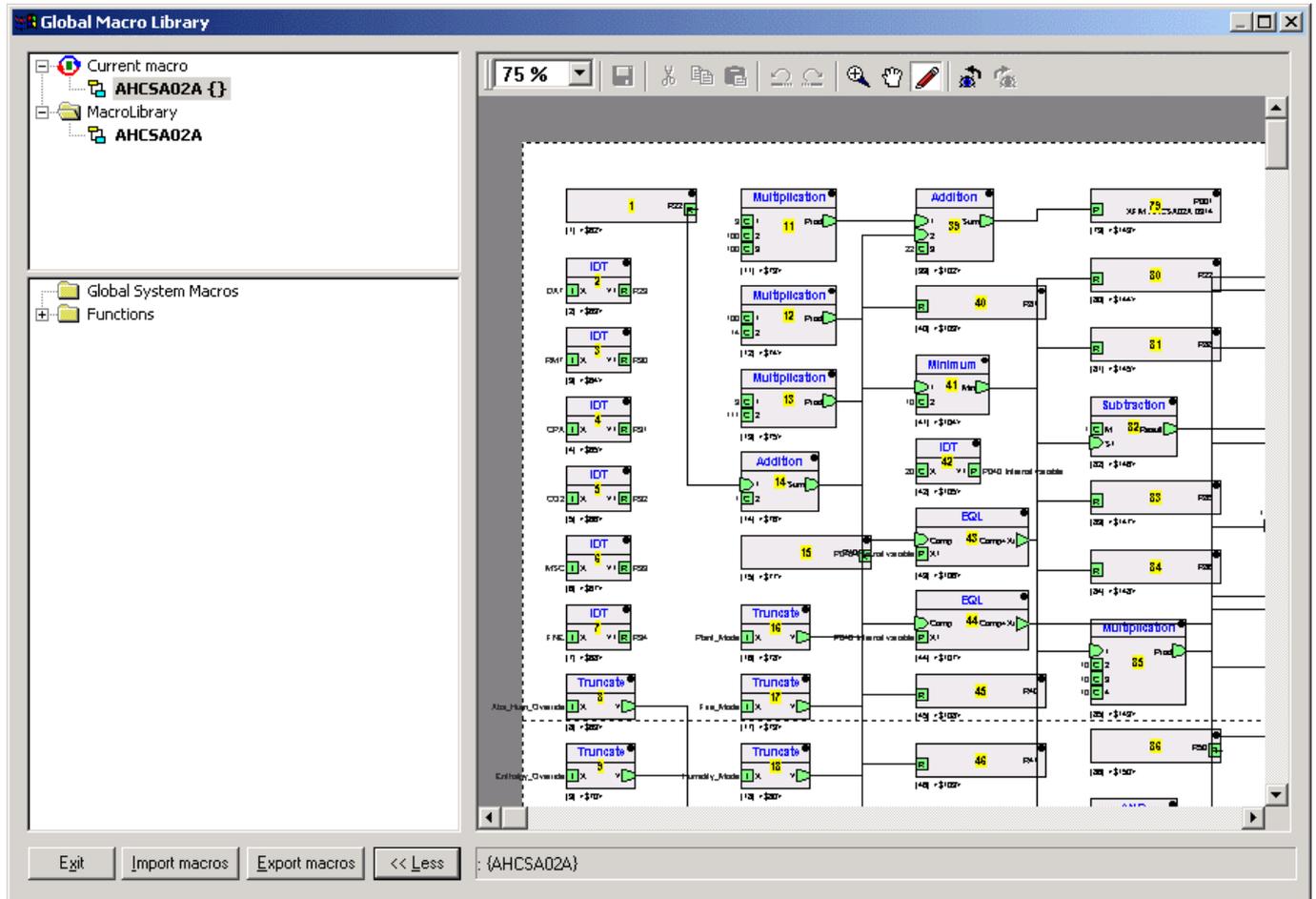
If multiple macros have been imported (see next graphic), the tree structure represents the macro dependencies.



15. Check the macros you want to import. Some macros may be checked automatically if they were needed for other macros you want to import. All macros you want to import must not already exist in the selected macro library. Otherwise and error message will occur and the import fails. If there are errors in the text file, the information text will display a brief description of the error and where it was found in the text.
16. If the text import has been executed properly, click the **Import Macro(s)** button.  
**RESULT:** The macro (XFM) is imported and displayed in the tree in the *Global Macro Library* window.



17. Click the More>> button and double-click on the macro icon in the upper tree for viewing the macro logic on the right pane.



18. If desired, edit the macro logic on the right pane.

19. Click the **Exit** button.



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## User Access Manager

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**Purpose** To define user rights according to the required functions. This will be done by creating the users and issuing the functions they should have permission for in the Web Interface (user access scheme). In addition to define the language and decimal places of values to display in the Web Interface for each user.

NOTE: All users can operate all controllers of a project.

**Access Rights List** An access rights list for a complete project will be created by assigning predefined access levels to all executable functions (access rights) of the Web Interface. An access rights list may look as follows:

Access Right	Access level
Change Communication Settings	System Admin
Create and Delete Schedules	Building Engineer
Create and Delete Trends	Building Engineer
Display Diagnostics	Tenant
etc.	etc.

The predefined access levels are arranged hierarchically and the sequence with descending priority is as follows:

- System Admin (128)
- Project Admin (115)
- Building Engineer (96)
- Operator (64)
- Tenant (32)
- Guest (0)

Example:

When assigning 'Operator' to 'Create & Delete Calendars', a user having an access level below 'Operator', for example 'Tenant' or 'Guest', is not able to create and delete calendars. A user having a user access level equal to or higher than 'Operator', for example 'Building Engineer' or 'Project Admin' is able to create and delete calendars.

NOTE: When creating a project, the System Admin level is automatically assigned to the user who has created the project. Only the user who has System Admin access level can create new users, edit, or delete existing users.

**User Profile** For each user within a project, a user profile with the following properties will be created:

- User name
- Access level
- Language
- Decimal places
- Password
- Access rights

A user is identified by its user name. One of the predefined access levels will be appropriately assigned to the user (name).

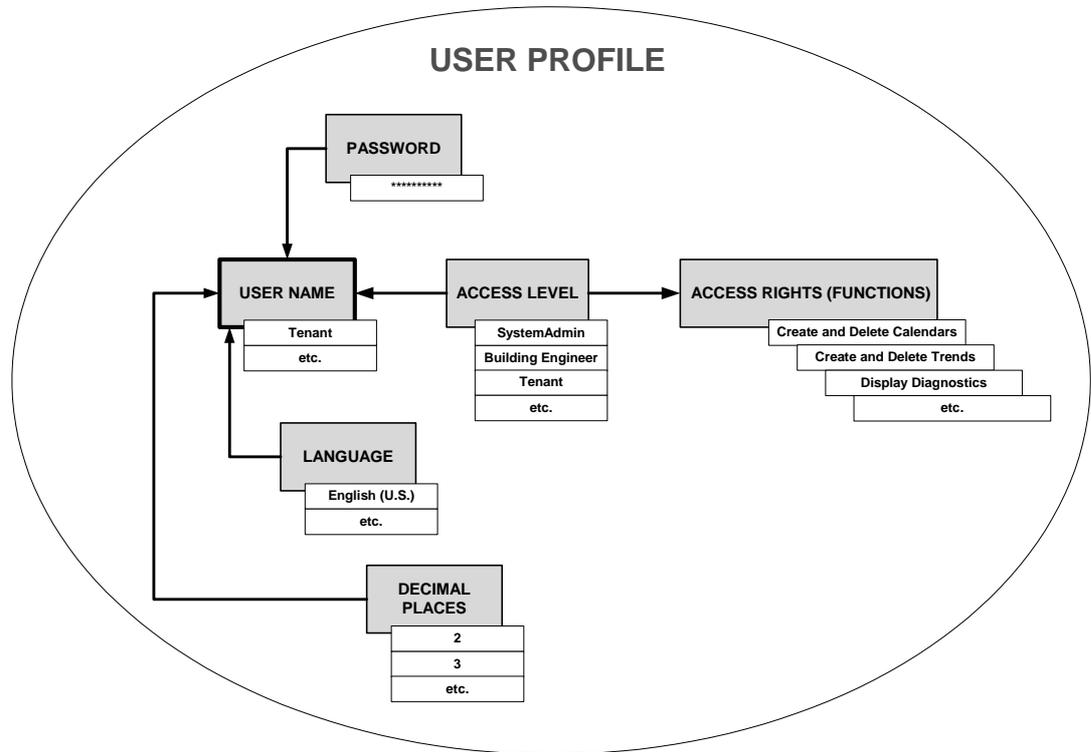
Due to the access rights list definitions, this assignment automatically determines the set of access rights which the user is allowed to execute in the Web Interface.

All users having an access level higher than or equal to the assigned access level will have this access right enabled in the Web Interface, all others will not.

NOTE: A user can carry out his/her assigned access rights in all controllers of the project.

In addition, the user profile includes the settings of the language in which the Web Interface is displayed and the number of decimal places of values to be displayed in the Web Interface.

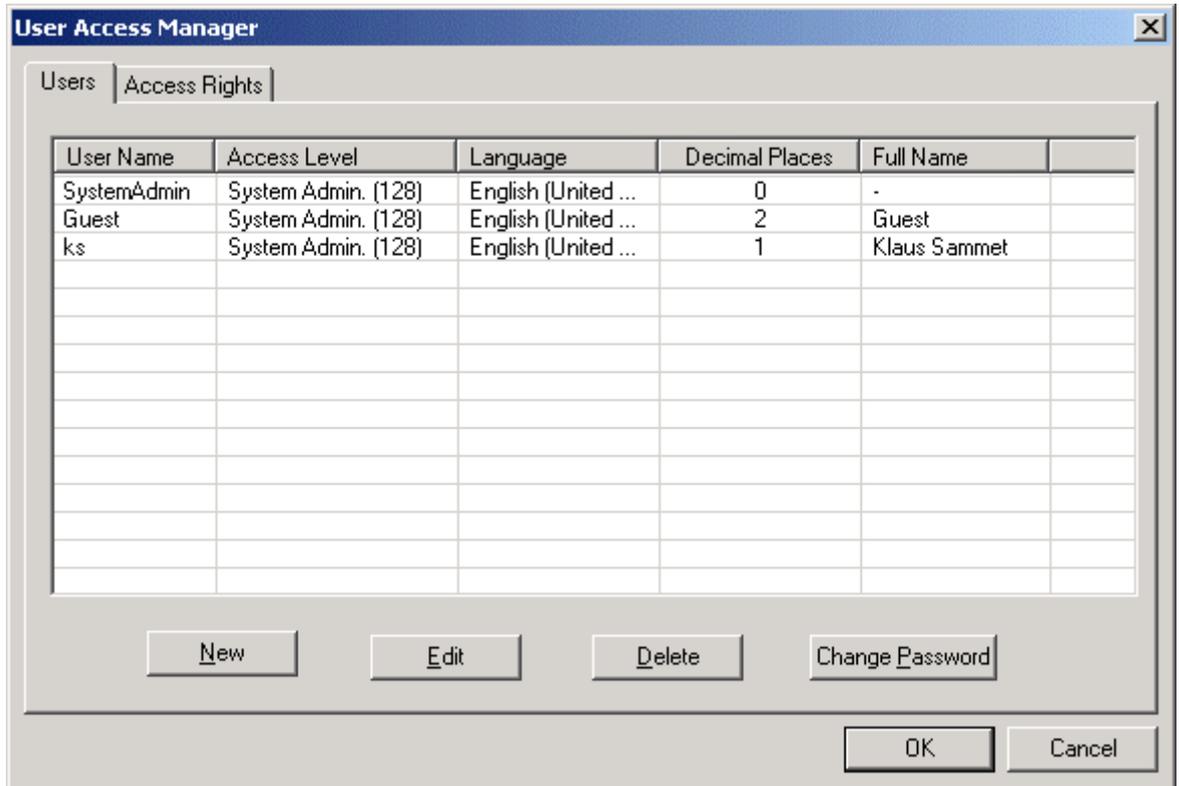
Finally, a password for each user must be issued for secure operation of the Web Interface.



## Start User Access Manager

- Procedure**    1. Click menu item Project, then submenu item User/Access Manager.

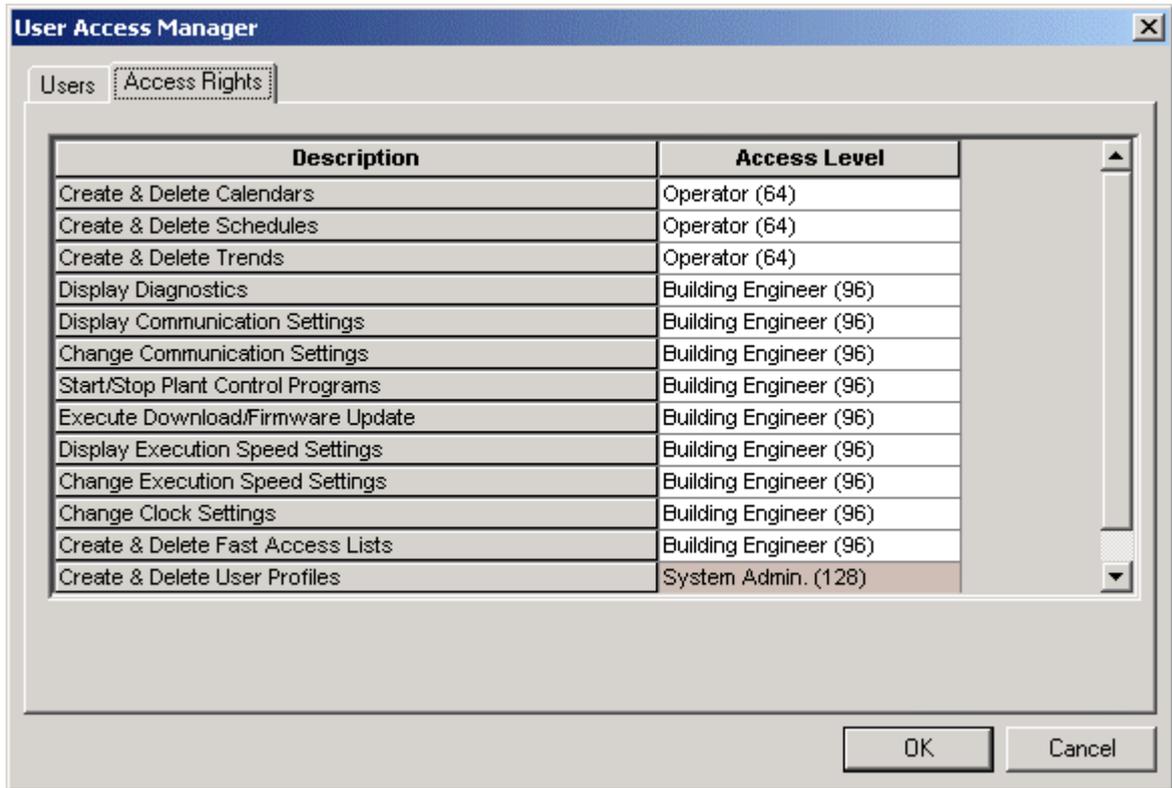
**RESULT:**    The User Access Manager dialog box displays.



On the Users tab, users can be newly created, edited and deleted. In addition, the user's password can be changed. By default the SystemAdmin and the Guest users are already available. For each user, the following properties are shown:

- User Name
- Full Name
- Access Level
- Language
- Decimal Places

On the Access Rights tab, the access rights for all users will be defined by assigning the predefined access levels to the executable functions (see Create Access Rights section).

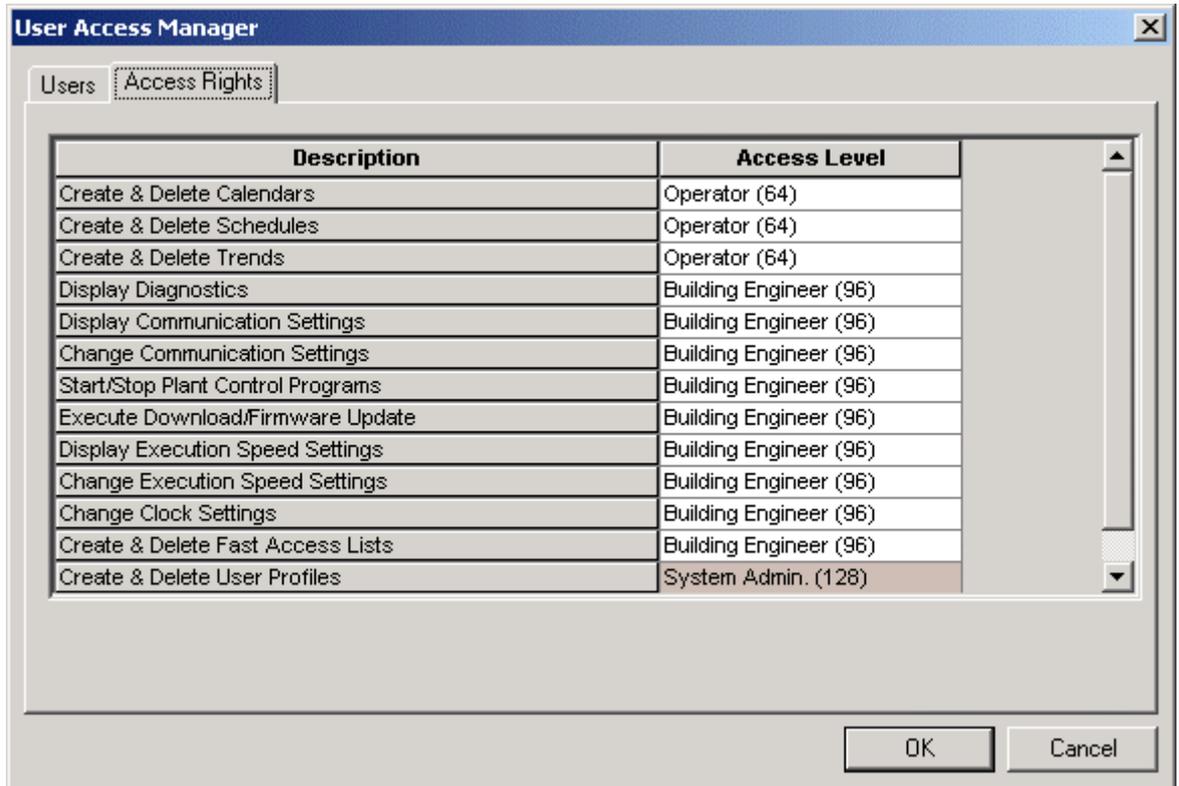


### Create Access Rights List

**Purpose** To assign predefined access levels to all functions to be executed in the Web Interface (access rights).

**NOTE:** Only the user who has System Admin or Project Admin access level can create or edit access rights.

**Procedure** 1. In the User Access Manager dialog box, select the Access Rights tab.



- To each function as described in the Description column, assign the appropriate access level by selecting it in the corresponding line in the Access level column.

Note that the access levels are arranged hierarchically with the following sequence of descending priority:

- System Admin (128)
- Project Admin (115)
- Building Engineer (96)
- Operator (64)
- Tenant (32)
- Guest (0)

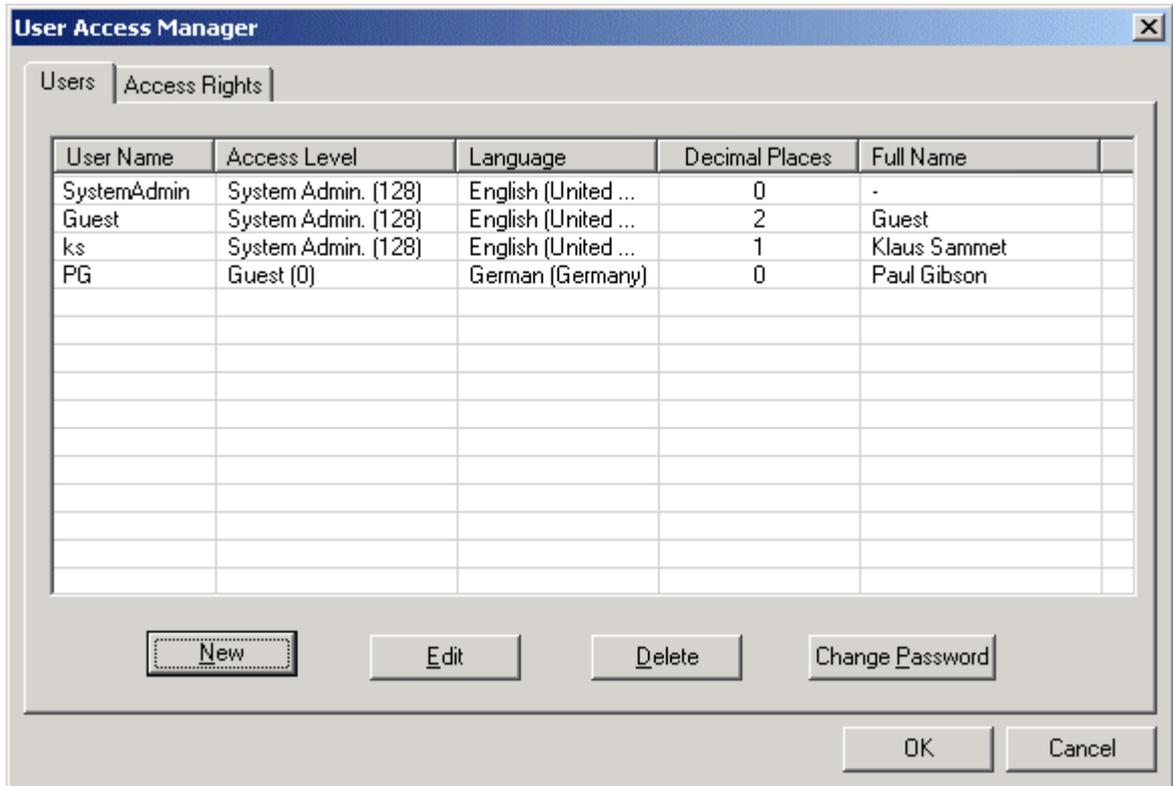
- Click **OK** button to save settings.
- To create a new user, continue as described under the Create New User section.

### Create New User

**Purpose** To create a new user.

**NOTE:** Only the user who has System Admin access level can create new users, edit, or delete existing users.

**Procedure** 1. In the User Access Manager dialog box, select the Users tab.



- Click the **New** button.

RESULT: The Create/Edit User dialog box displays.



- In the User Name field, enter the short form of the user name.
- In the Full Name field, enter the full user name.
- In the Password field, enter the password for the user.
- In the Confirm Password field, confirm the new password by entering the password again.

7. From the Access Level drop-down list box, select the access level.

Note that the access levels are arranged hierarchically with the following sequence of descending priority:

- System Admin (128)
- Project Admin (115)
- Building Engineer (96)
- Operator (64)
- Tenant (32)
- Guest (0)

Due to the access rights list definitions (see Create Access Rights section), this assignment automatically determines the set of access rights which the user is allowed to execute in the Web Interface.

8. From the Language drop-down list box, select the language in which the Web Interface should be displayed for the user.

**Date Format**

Displays the date format. It may be either dd.mm.yyyy or mm/dd/yyyy. The controller stores the date format along with the language setting.

**Time Format**

Displays the time format. The controller stores the time format along with the language setting.

9. From the Decimal drop-down list box, select the number of decimal places for the display of values.
10. Click **OK** button to save settings.
11. In the User Access Manager dialog box, click the **OK** button to save changes.

---

**Edit User**

- Purpose** To edit user name, access level and corresponding access rights, language, or decimal places for a user.  
NOTE: Only the user who has System Admin access level can create new users, edit, or delete existing users.
- Procedure**
1. In the User Access Manager dialog box, select the Users tab.



- System Admin (128)
- Project Admin (115)
- Building Engineer (96)
- Operator (64)
- Tenant (32)
- Guest (0)

If the access level has been changed, you should note the current access rights definitions on the Access Rights tab in the User Access Manager dialog box.

5. If desired, change the language in which the Web Interface should be displayed for the user by selecting another language from the Language drop-down list box

**Date Format**

Displays the date format. It may be either dd.mm.yyyy or mm/dd/yyyy. The controller stores the date format along with the language setting.

**Time Format**

Displays the time format. The controller stores the time format along with the language setting.

6. If desired, change the number of decimal places for the display of values in the Web Interface by selecting another value from the Decimal drop-down list box.
7. Click the **OK** button to save settings.
8. In the User Access Manager dialog box, click the **OK** button to save changes.

**Delete User**

<b>Purpose</b>	To delete a user.
	NOTE: Only the user who has System Admin access level can create new users, edit, or delete existing users.
<b>Procedure</b>	1. In the User Access Manager dialog box, select the Users tab.



---

## Notification Class Manager

---

**Purpose** To adapt alarming to the EBI central and 3<sup>rd</sup> party BACnet clients according to the requirements.

This will be done by creating, editing and deleting notification class objects. Notification class objects will be assigned to datapoints in order to enable alarming for datapoints.

**About the Notification Class Object Types**

Notification class objects represent and contain information required for the distribution of event notifications within a BACnet system. Notification Classes are useful for event-initiating objects that have identical needs in terms of how their notifications should be handled, what the recipient(s) for their notifications should be, and how they should be acknowledged.

A notification class defines how event notifications shall be prioritized in their handling according to TO-OFFNORMAL, TO-FAULT, and TO-NORMAL events; whether these categories of events require acknowledgment (nearly always by a human operator); and what recipient devices (e.g. Excel Web Interface, EBI) or processes should receive notifications.

The purpose of prioritization is to provide a means to ensure that alarms or event notifications with critical time considerations are not unnecessarily delayed. The possible range of priorities is 0 - 255. A lower number indicates a higher priority. Priorities may be assigned to TO-OFFNORMAL, TO-FAULT, and TO-NORMAL events individually within a notification class.

The purpose of acknowledgment is to provide assurance that a notification has been acted upon by some other agent, rather than simply having been received correctly by another device. In most cases, acknowledgments come from human operators.

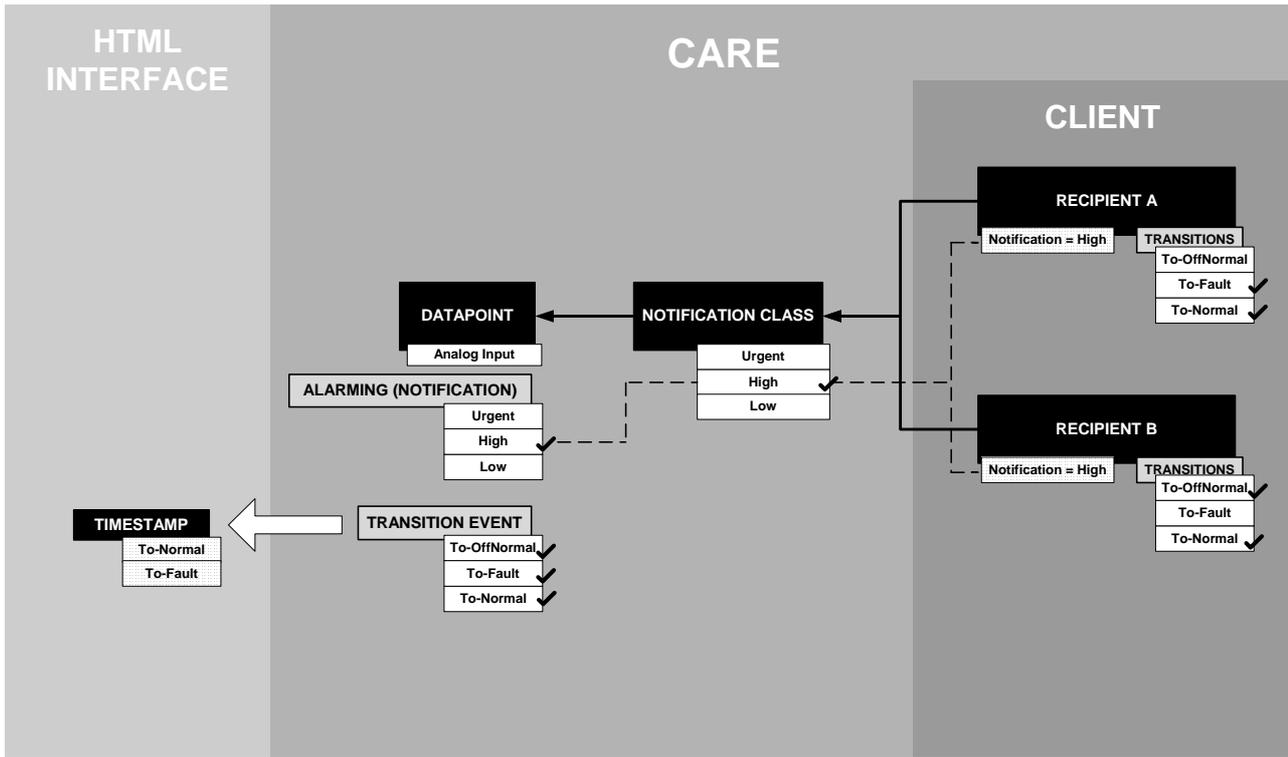
TO-OFFNORMAL, TO-FAULT, and TO-NORMAL events may, or may not, require individual acknowledgment within a notification class.

It is often necessary for event notifications to be sent to multiple recipients or to different recipients based on the time of day or day of week. Notification Classes may specify a list of recipients, each of which is qualified by time, day of week, and type of handling. A recipient is specified by a set of days of the week (Monday through Sunday) during which the recipient is considered viable by the Notification Class object. In addition, each recipient has a FromTime and ToTime, which specify a window, on those days of the week, during which the recipient is viable. If an event that uses a Notification Class object occurs and the day is one of the days of the week that is valid for a given recipient and the time is within the window specified for the recipient, then the recipient shall be sent a notification. Recipients may be further qualified, as applicable, by any combination of the three event transitions TO-OFFNORMAL, TO-FAULT, or TO-NORMAL.

The recipient also defines the device to receive the notification and a process within the device. Processes are identified by numeric handles that are only meaningful to the recipient device. The administration of these handles is a local matter. The recipient device may be specified by either its unique Device Object Identifier or its BACnetAddress. In the latter case, a specific node address, a multicast address, or a broadcast address may be used. The recipient further specifies whether the notification shall be sent using a confirmed or unconfirmed event notification.

How the notification class assignment is handled in CARE: please see the following graphic.

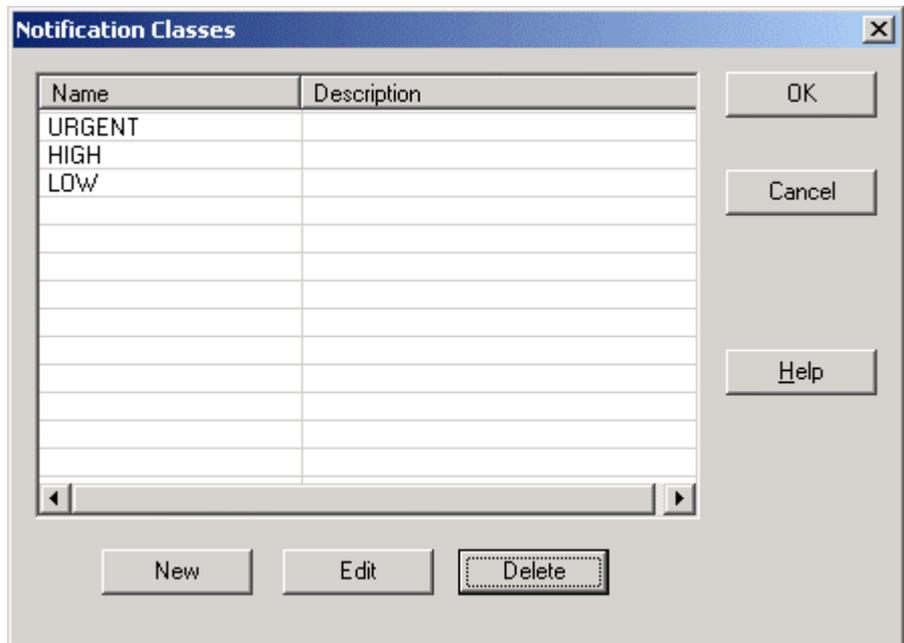
NOTIFICATION CLASSES AND EVENT HANDLING



Start Notification Class Manager

- Procedure** 1. Click menu item Project, then submenu item Notification Class Manager.

RESULT: The Notification Classes dialog box displays.



In the Notification Classes dialog box, the Urgent, High, and Low notification classes are available by default.

**NOTE:** The default notification classes "urgent", "high", and "low" are especially designed for the alarming to the EBI central. In this case, priorities must not be changed. For 3<sup>rd</sup> party BACnet clients, new notification classes should be created if the default notification classes do not meet exactly the requirements.

You can create new notification class objects, edit and delete notification class objects (see respective sections in the following).

### Notification Class JOURNAL Usage

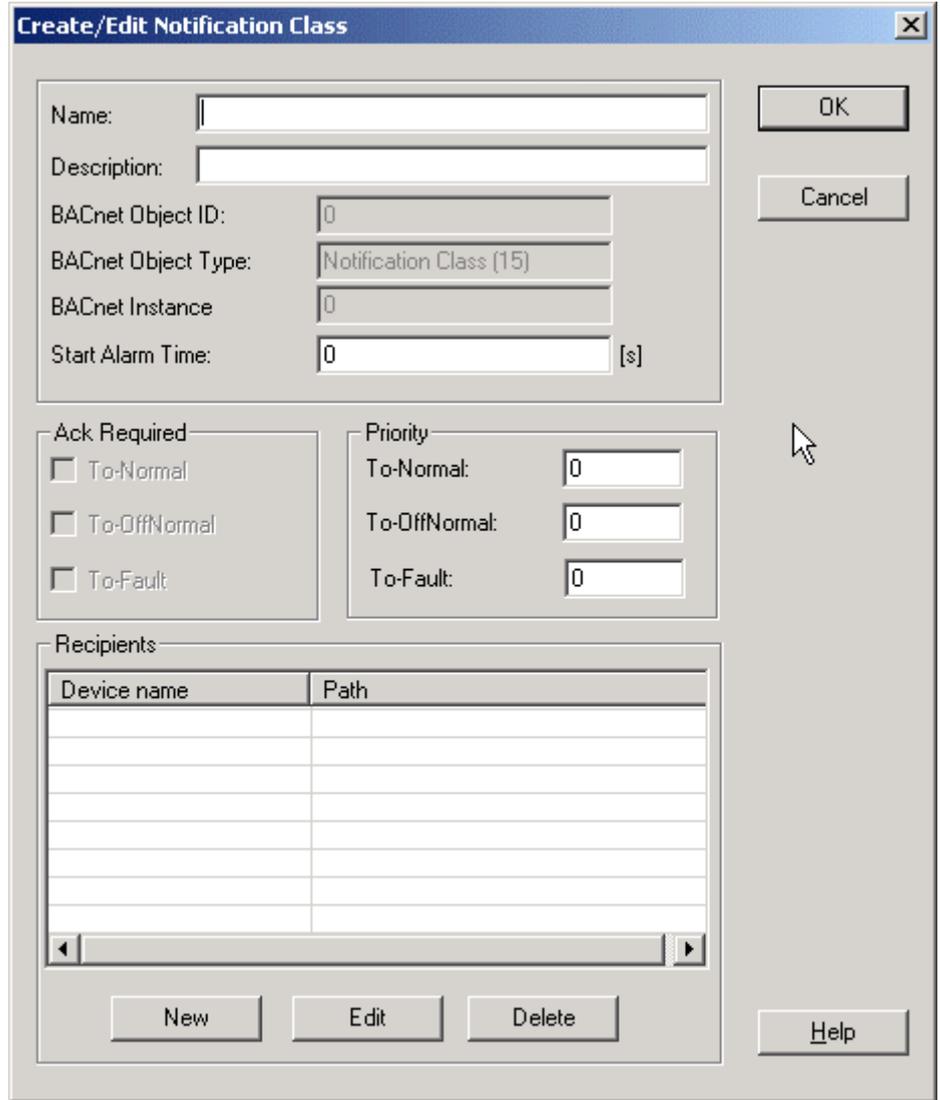
#### **IMPORTANT**

*Any application that has been engineered by using the notification class JOURNAL will not lose it. After application upload into CARE, all notification classes which have been previously defined will be available in CARE for further engineering and download.*

---

### Create New Notification Class Object

- Purpose** To create a new notification class in order to adapt the alarming to a 3<sup>rd</sup> party BACnet client. The default notification classes "urgent", "high", and "low" are especially designed for the alarming to the EBI central.
- Procedure**
1. To create a new notification class object, click the **New** button in the Notification Classes dialog box.
- RESULT:** The Create/Edit Notification Class dialog box displays.



2. In the Name field, enter the name for the notification class object.
3. In the Description field, enter a description if desired.
4. In the Start Alarm time field, enter a time during which the notification of alarms is suppressed. The start alarm time will become effective upon every start/restart of the Excel Web controller, e.g. power-on, application start, etc. Entering a start alarm time is requested to prevent alarm shower at start/restart of the controller.
5. Under Priority, enter the priority for the transitions. The following table may be helpful for prioritizing:

Event (Alarm) Category	Transitions		
	To Normal	To Off-Normal	To Fault
Urgent (range 0...84)	83	0	42
High (range 85...169)	168	86	127
Low (range 170...250)	250	171	210

6. Under Recipients, the destination devices that should receive the notification will be created and can be edited and deleted.
7. To create a new recipient, click the **New** button.

RESULT: The Create/Edit Recipient dialog box displays.

8. From the Recipient drop-down list box, select the recipient. The recipient is shown by its path and device name, for example Subnet1 XLWeb. Herewith Subnet 1 is the path and XLWeb the device name as shown in the network tree.
9. Under Valid Days, check the days on which the notification should be sent by clicking the corresponding checkboxes.
10. Under Window of Time, check the time period, during which the notification should be sent. Select All day to send the notification all day long. Enter the time in the From Time and Time fields, if the notification should be sent during a time period shorter than the whole day.
11. Under Transitions, check the transitions that should be sent by selecting the corresponding checkboxes at:
  - To Off-Normal  
The alarm reaches off-normal state, that is, the datapoint value exceeds the high limit, respectively remains under the low limit.
  - To Fault  
The alarm originates in a fault such as sensor break, etc.
  - To-Normal  
The alarm is going to normal state, that is, the value of the datapoint remains under the high limit, respectively exceeds the low limit.
12. Click the **OK** button to save settings.

RESULT: The Create/Edit Notification Class dialog box redisplay.

**Create/Edit Notification Class**

Name:

Description:

BACnet Object ID:

BACnet Object Type:

BACnet Instance:

Start Alarm Time:  [s]

Ack Required  
 To-Normal  
 To-OffNormal  
 To-Fault

Priority  
 To-Normal:   
 To-OffNormal:   
 To-Fault:

Recipients

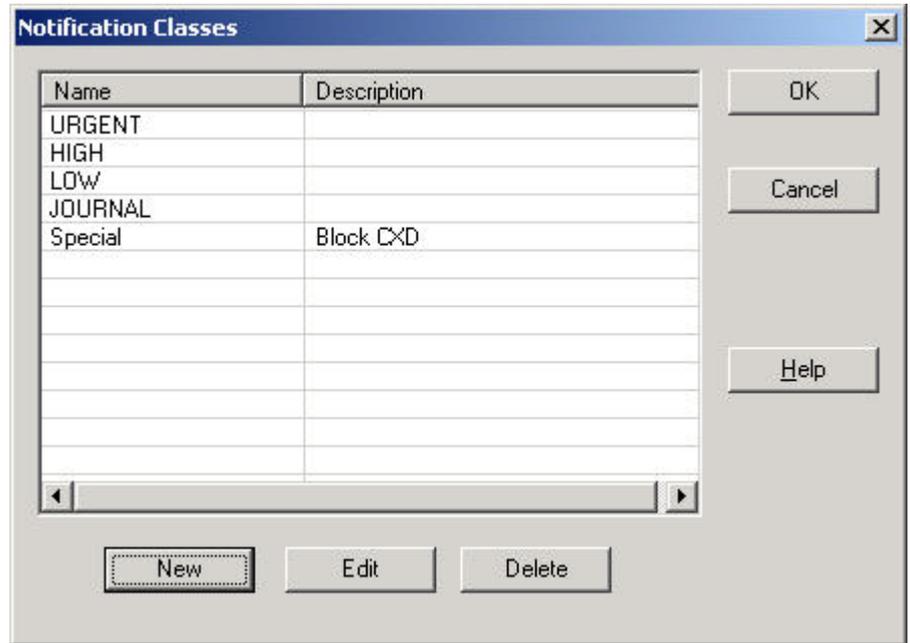
Device name	Path
Device 1	IP-Subnet 1

OK  
Cancel

Under Recipients, the device is inserted.

- Click the **OK** button to save settings.

RESULT: The Notification Classes dialog box redisplay.



In the list, the currently available notification class objects are shown by name and description

- Click the **OK** button to save settings.

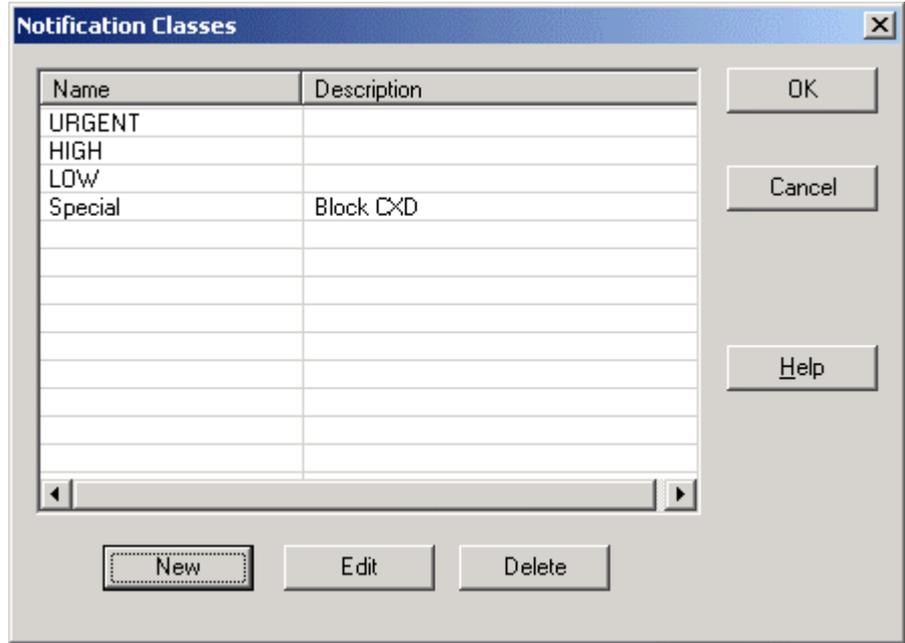
**RESULT:** The Notification classes are now available for assignment to datapoints.

### Edit Notification Class Object

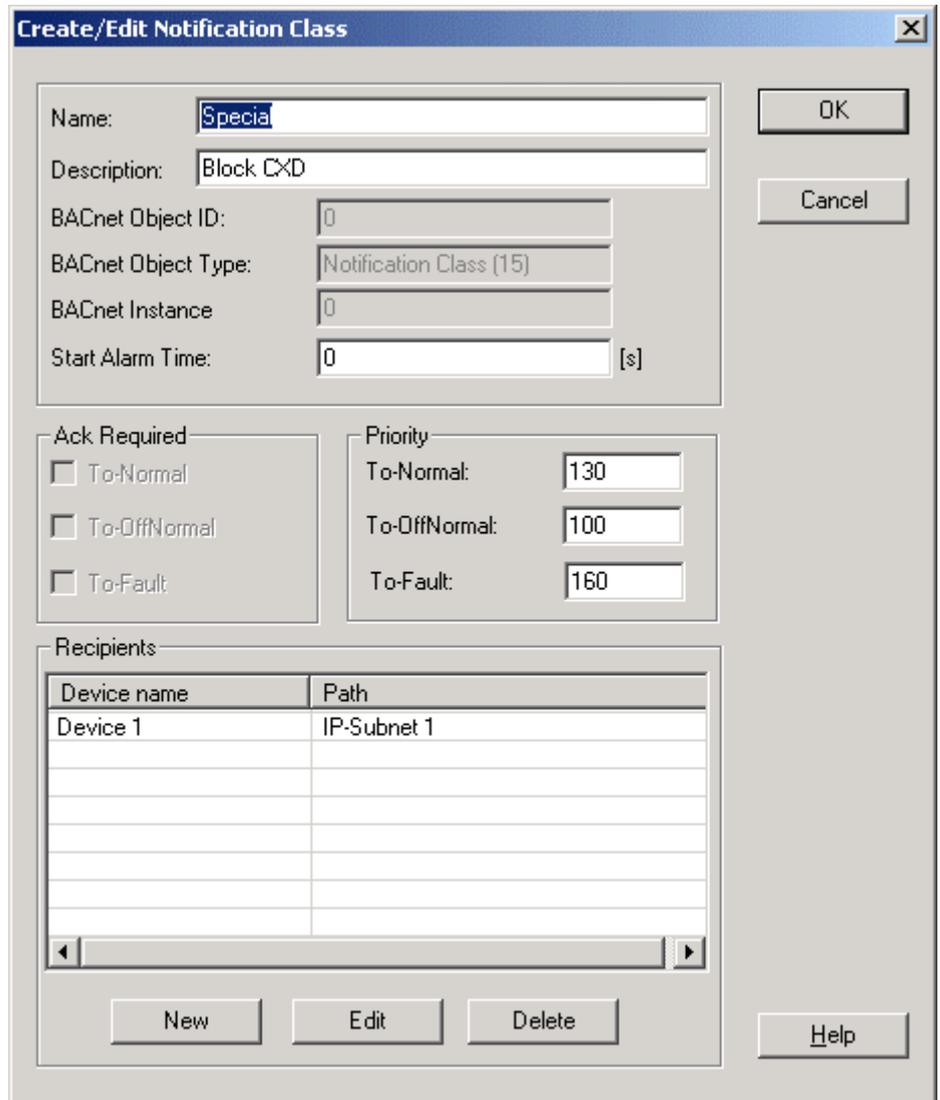
**Purpose** To edit a notification class object in order to adapt the alarming to a 3<sup>rd</sup> party BACnet client.

**NOTE:** The default notification classes "urgent", "high", and "low" are especially designed for the alarming to the EBI central and must not be changed.

- Procedure**
- In the Notification Classes dialog box, select the notification class object in the list and click the **Edit** button.



RESULT: The Create/Edit Notification Class dialog box displays.



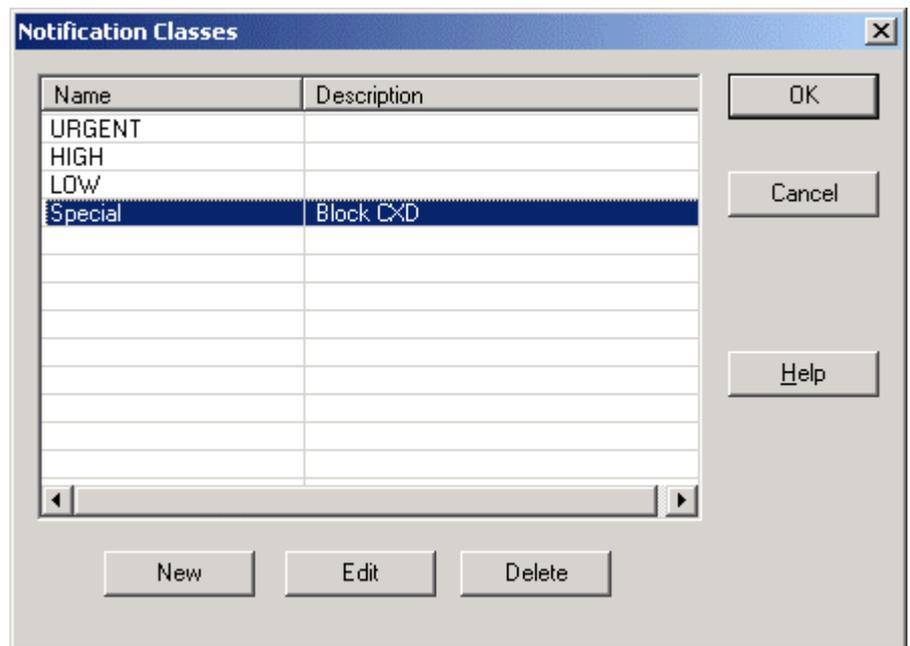
2. Change the desired options and/or values such as Name or Priority. Edit the recipients list by changing recipients data or deleting recipients from the list (for detailed description of the items see Create New Notification Class Object section).

---

### Delete Notification Class Object

**Purpose** To delete a notification class object.

- Procedure**
1. In the Notification Classes dialog box, select the notification class object in the list and click the **Delete** button.



**RESULT:** The notification class object is deleted from the list.

2. Click the **OK** button to save settings.

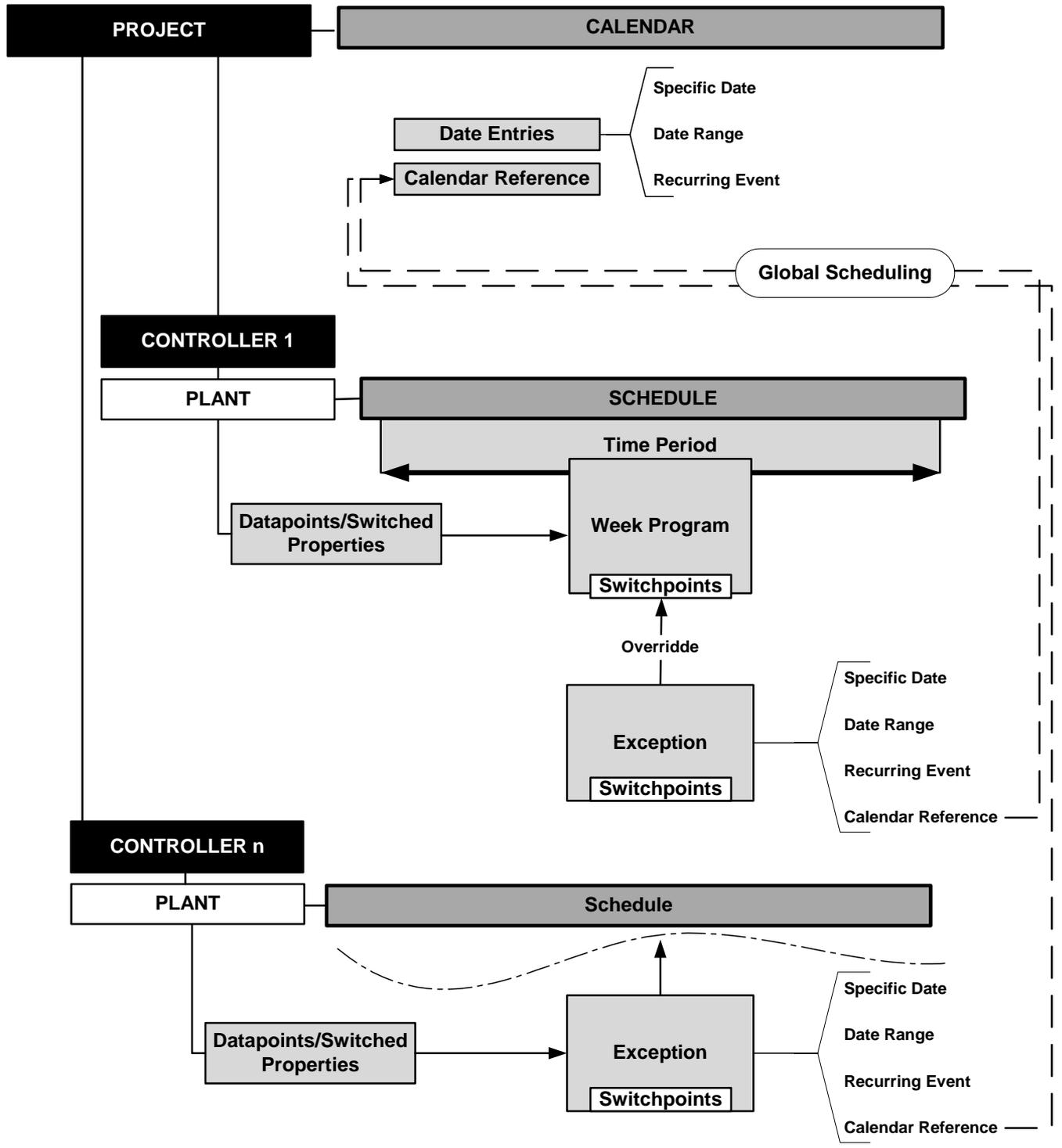


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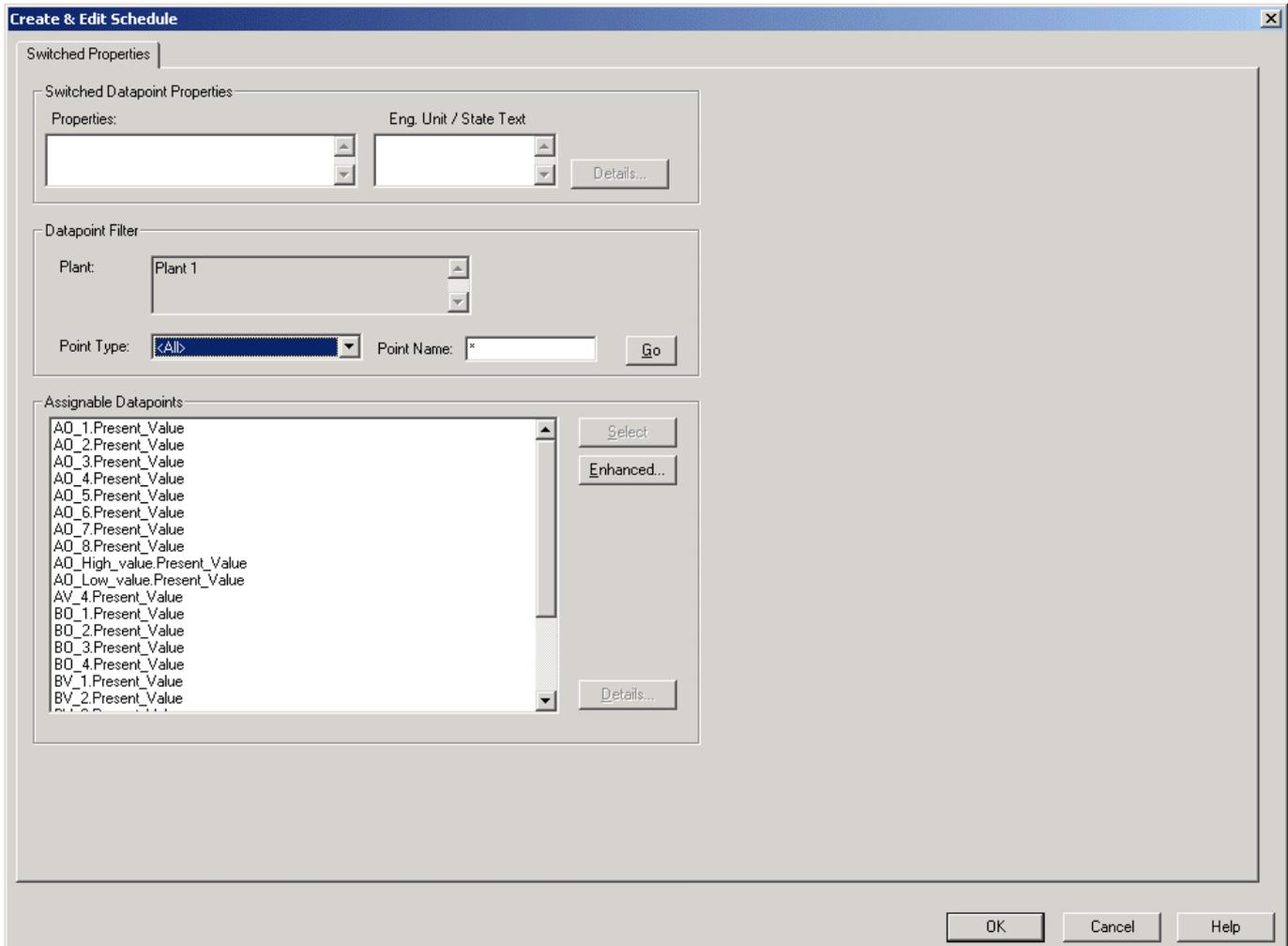
## Schedules and Calendars

---

<b>Purpose</b>	To create time sequences for controller operation of devices. For example, set HVAC start and stop times.
<b>Schedules</b>	<p>Schedules are assigned to plants and implement these command programs. Each plant of a controller can have multiple schedules assigned and each schedule can command devices of other controllers.</p> <p>Each schedule specifies a list of datapoint properties to command (switchpoints) on a weekly basis. The week program defines the normal daily activity of the system by specifying which switchpoints are to be commanded each day of the week. The week program applies to a definable time period. There is only one week program per schedule.</p> <p>Besides the week program, specific programs called exceptions can be created. Exceptions have higher priority than the week program and will overwrite the week program for a definable time period. Exceptions can have four different time periods:</p> <ul style="list-style-type: none"><li>• Specific Date e.g. Christmas Eve or 5.5., the whole of May, or the whole year of 2004</li><li>• Date Range e.g. Summer holidays from 29.7-7.9.2004</li><li>• Recurring Event e.g. every last Friday of every month</li><li>• Calendar Reference A project-wide calendar provides dates, e.g. regional holidays and public/religious festivals or any other particular date. The time period can be a specific date, a date range or a recurring event.</li></ul>
<b>Calendars</b>	<p>Via exceptions which reference to a project-wide calendar, CARE provides global scheduling because calendar dates are executed in each controller of the project which references to the calendar. Changes in multiple particular controller schedules can be quickly made by simply changing the referenced calendar.</p> <p>The schedule-calendar reference provides specific scheduling of a plant by parallel access to the project-wide calendar data.</p>







On the Switched Properties tab, the switched properties will be selected.

Datapoints can be switched in two ways:

#### Standard

Just a single datapoint with its present value property can be switched. By default, a datapoint has the present value property assigned.

#### Enhanced

Multiple datapoints and/or other properties than the present value can be switched.

Under Datapoint Filter, a filter for listing certain datapoints to be switched can be defined. The filtered datapoints will be listed on the bottom for selection. By default, all datapoints of the originator plant are available in the list. Once selected, the datapoint will be inserted in the Properties field under Switched Properties. Under Eng. Unit / State text, its engineering unit respectively the state text is displayed.

By clicking the corresponding **Details** button, the datapoint's details can be viewed/edited, either of the filtered datapoint/property or the selected datapoint/switched property.

#### Select Datapoints/Switched Properties 2. To filter certain datapoints, do one of following:

From the Point Type drop-down list box, select the point type to be filtered.

NOTE: Inputs cannot be switched.

and/or

In the Point Name field, enter a search text to display specific datapoint names. Wildcards can be used. By default, all datapoints will be displayed as indicated by an asterisk (\*). A blank field is interpreted as \*. The filter function is not case sensitive.

3. Click the **Go** button to apply the filter. All datapoints matching the filter criteria will be displayed in the list.
4. Select the datapoint you want to be switched and click the **Select** button.

RESULT: The datapoint will be inserted in the **Properties** field under **Switched Properties**.

The screenshot shows the 'Create & Edit Schedule' dialog box with the following details:

- Switched Properties** tab is selected.
- Switched Datapoint Properties:**
  - Properties: AO\_1.Present\_Value
  - Eng. Unit / State Text: %
  - Details... button
- Datapoint Filter:**
  - Plant: Plant 1
  - Point Type: <All>
  - Point Name: \*
  - Go button
- Assignable Datapoints:**
  - List of datapoints: AO\_1.Present\_Value, AO\_2.Present\_Value, AO\_3.Present\_Value, AO\_4.Present\_Value, AO\_5.Present\_Value, AO\_6.Present\_Value, AO\_7.Present\_Value, AO\_8.Present\_Value, AO\_High\_value.Present\_Value, AO\_Low\_value.Present\_Value, AV\_4.Present\_Value, BO\_1.Present\_Value, BO\_2.Present\_Value, BO\_3.Present\_Value, BO\_4.Present\_Value, BV\_1.Present\_Value, BV\_2.Present\_Value.
  - AO\_1.Present\_Value is selected.
  - Buttons: Select, Enhanced..., Details...

5. To edit details of a datapoint that is selected in the list, click the **Details** button.

NOTE: By using the **Select** button, only one datapoint can be switched (Standard Mode). To switch multiple datapoints and/or other properties than the present value, click the **Enhanced** button (Enhanced Mode).

6. If you want to use the Enhanced mode, continue with step 8.

or



10. Click the **Go** button to apply the filter. All datapoints/properties matching the filter criteria will be displayed in the Datapoints list under Select Properties to Switch. Datapoints/properties can be put into switching status and vice versa by moving them between the Datapoints and the Switched Properties list.
11. To move datapoints/properties between the two lists lists, that is, to make them to be switched or not, do one of the following:

To move certain datapoints/properties:

- highlight the datapoints/properties to be moved in the Datapoints list respectively in the Switched Properties list. Multiselection by using the CTRL, respectively the SHIFT key is possible.
- Click the **Single Arrow** button with desired direction.

Or,

To move all datapoints in one step:

- Click the **Double Arrow** button with desired direction.

NOTE:

Software performs consistency checking for datapoint type, property and engineering unit for the datapoints that have been selected and moved into the switching status.

Consistency checking assures that the same schedule does not switch datapoints:

- of different types, e.g. AO and BO
- with different properties, e.g. present value and low alarm limit
- of which engineering unit does not correspond to the property to be switched

If one of these items do not match, the inconsistency is indicated in red with the corresponding comment number in the OK column of the point name.

Switched properties:		
OK	Point Name	Property
✓	A01	Present_Value
✓	A02	Present_Value
✓	A03	Present_Value
✓	A04	Present_Value
✓	A05	Present_Value
✓	A06	Present_Value
*2	MV1	Present_Value
*2	MV2	Present_Value

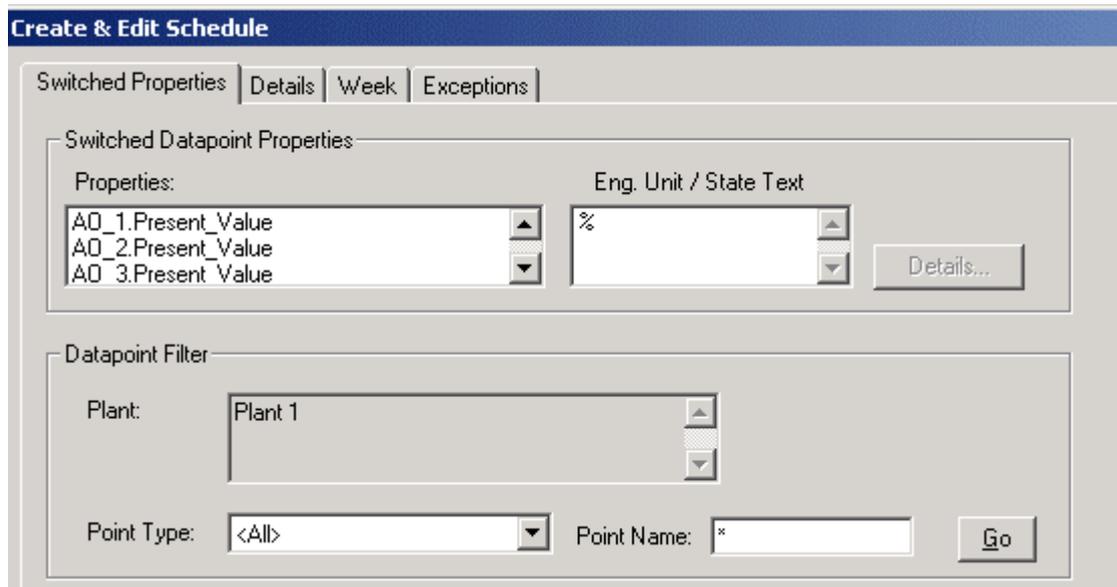
\*1 - Inconsistent Property  
 \*2 - Inconsistent Point Type  
 \*3 - Inconsistent Eng. Unit  
 \*4 - Inconsistent Numbers of States

In addition, a warning displays in case you want to continue by clicking the **OK** button.



12. Confirm the message by clicking the **OK** button.
13. Remove inconsistent properties from the Switched Properties list (see step 14).
14. Click the **OK** button in the Enhanced Property Selection dialog box.

**RESULT:** In the Create & Edit Schedule, the properties will be inserted in the Properties list under Switched Properties. The Details, Week and Exceptions tabs are now available for completing the schedule.



- Define Details**    15. Click the Details tab.

The screenshot shows a software window with four tabs: 'Switched Properties', 'Details', 'Week', and 'Exceptions'. The 'Details' tab is active. The form contains the following fields:

- Schedule Name:** A text box containing 'Schedule\_AO\_1'.
- Description:** A large empty text area.
- Valid from:** A checked checkbox followed by a date dropdown menu showing '07.12.2004'.
- Valid until:** A checked checkbox followed by a date dropdown menu showing '07.12.2005'.
- Priority for writing:** A dropdown menu showing '15 - <unused>'.
- Access Rights:** A section containing two dropdown menus: 'Read Access Level' and 'Write Access Level', both set to 'Operator (64)'.
- BACnet Object Information:** A section containing three text boxes: 'Object Type' (set to 'Schedule Object (17)'), 'Instance ID' (set to '0'), and 'Object ID' (set to '0').

Here you can enter the following details of the schedule:

- Name
- Description
- Valid period
- Priority for writing
- Access rights

16. In the Schedule Name field, enter the name for the schedule.
17. In the Description field, enter an additional description if desired.
18. The valid period for the schedule will be defined by selecting the start and end date under Valid from and Valid until. By default, the schedule is valid one year from the current date on.

To define the valid period of the schedule, do the following:

Click the Valid From checkbox and select the start date from the drop-down list box.

**NOTE:** If the checkbox is unchecked, no start date can be selected. This means that the schedule is valid on any date up to and including the end date.

Click the Valid Until checkbox and select the end date from the drop-down list box.

NOTE: If the checkbox is unchecked, no end date can be selected. This means that the schedule is valid on any date from the start date on.

NOTE: If both checkboxes are disabled, the schedule is always valid.

19. From the Priority for Writing drop-down list box, select the priority between 9 and 16 (lowest). The priority defines which priority the schedule will have in the BACnet command priority level.

20. From the Read Access level drop-down list box, select the user level that should have read access for the schedule.

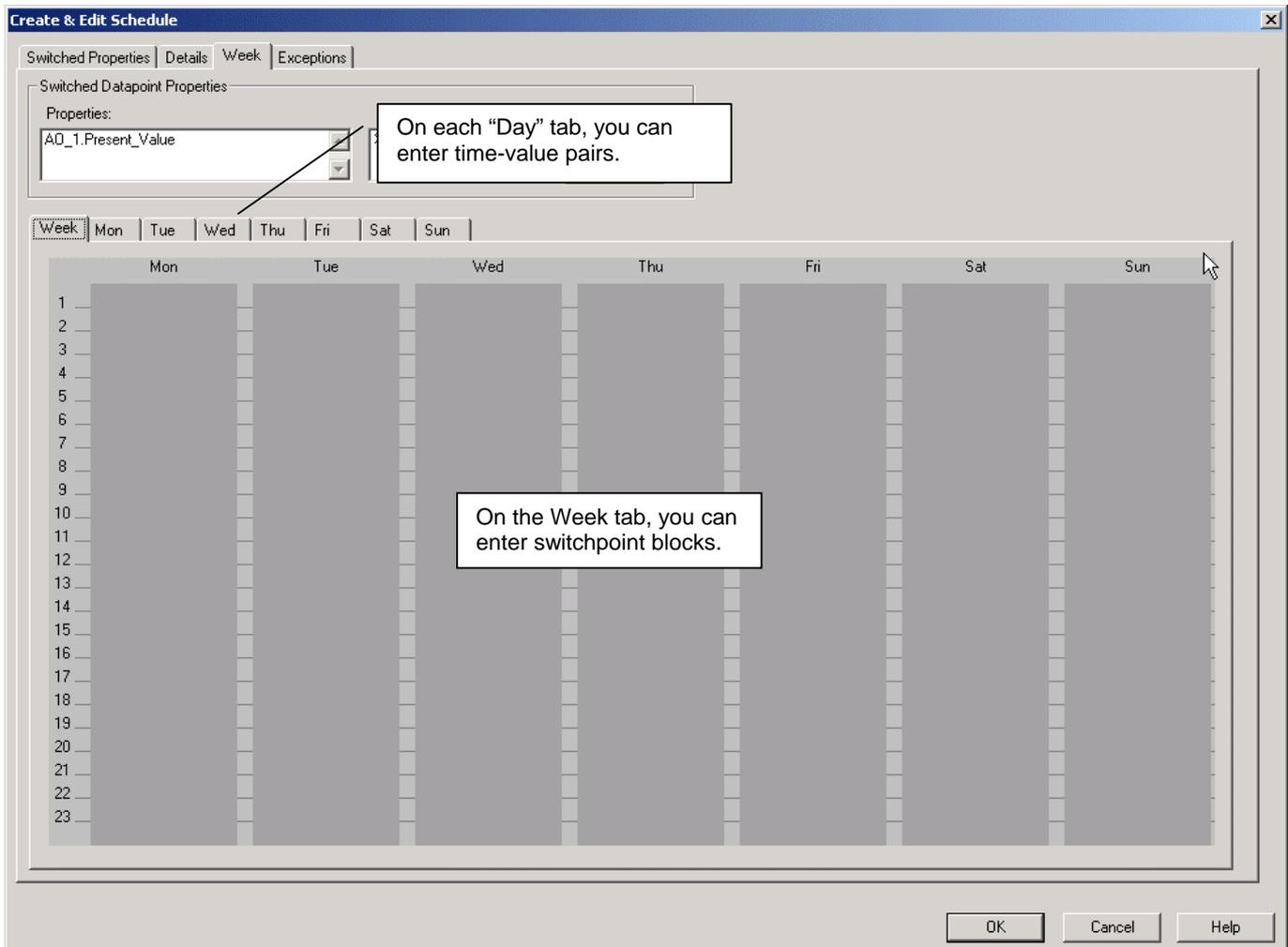
Schedules will only be displayed in the Excel Web Interface if the read access level of the user is equal to or higher than the read access level of the schedule.

21. From the Write Access level drop-down list box, select the user level that should have write access for the schedule.

Creating, editing, deleting and copying of schedules in the Excel Web Interface is only possible if the user's write access level is equal or higher than the write access level of the schedule.

**Create Week Program**

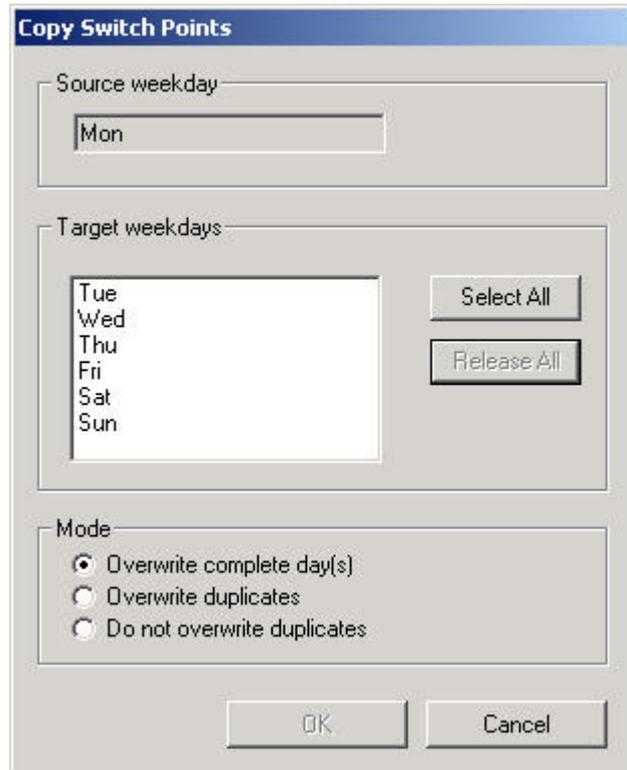
22. Proceed the creation of the schedule by clicking the Week tab.



RESULT: On the Week tab, you create the weekly program that should be performed during the schedule period (see Details tab).







Under Source weekday, the currently selected day is displayed.

28. Under Target weekdays, click on the day(s) you want the source day to be copied to. Click the **Select All** button to select all target weekdays. Click on single days to deselect them, or click the **Release All** button to deselect all target weekdays.
29. Under Mode, define the copy mode by selecting the desired option under:

**Overwrite complete day(s)**

All switchpoints (time-value pairs) of the target days will be deleted and overwritten with the source day's switchpoints.

**Overwrite duplicates**

Switchpoints of the target day(s) which are at the same time (duplicates) as the source switchpoint will be overwritten with the source switchpoint values. New switchpoints of the source day will be copied to the target days.

**Do not overwrite duplicates**

Switchpoints of the target day(s) which are at the same time as the source switchpoint will not be overwritten with the source switchpoint values. New switchpoints of the source day will be copied to the target days.

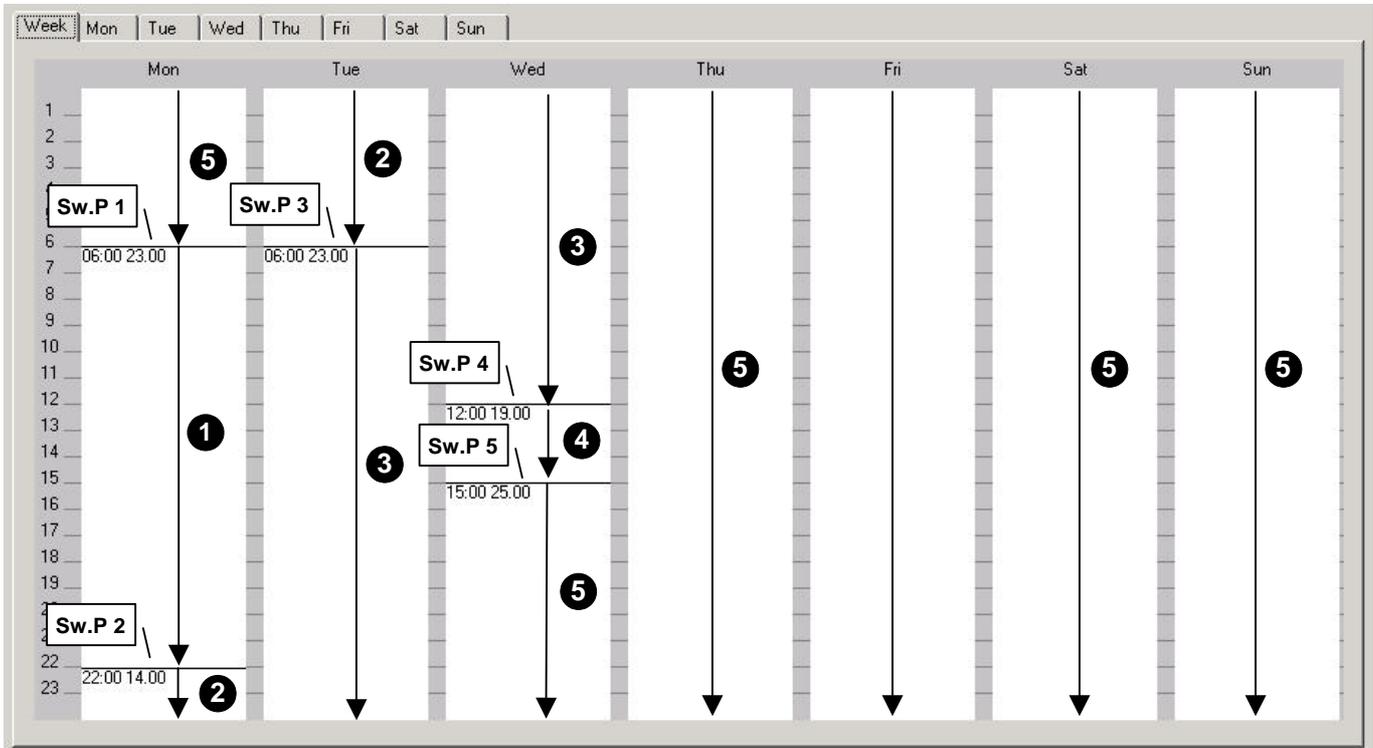
30. Click the **OK** button and click on the Week tab.

**RESULT:** On the Week tab, the switchpoints are shown in the daily time scale with start time and value. The end time of a switchpoint is determined by the starttime of the consecutive switchpoint. The period between two switchpoints is called a switchpoint block, that is, a week is normally divided into consecutive switchpoint blocks. Each switchpoint block has its special value which changes with the start time of the next switchpoint. A switchpoint block always extends to the next switchpoint independent of the next switchpoint's start time, that is, a switchpoint block can cover multiple days.

Example (see next figure):

Switchpoint block ❶ is defined by switchpoint 1 (Sw.P1) starting on Monday 6.00 and ending on Monday 22.00 with a value of 23.00.

Switchpoint block ❷ is defined by switchpoint 2 (Sw.P2) starting on Monday 22.00 and ending on Tuesday 6.00 with a value of 14.00. The corresponding behavior applies to switchpoint blocks ❸, ❹, and ❺. Note that switchpoint block ❺ starts with switchpoint 5 on Wednesday and extends to switchpoint 1 (Sw.P1) on Monday of the following week.



**Define Switchpoints Graphically**

- 31. On the Week tab, move cursor to the day and time where you want to insert the switchpoint.
- 32. Click right mouse button and click on **New** in the context menu.

**RESULT:** The Create/Edit Switchpoint dialog box displays. In the following example dialog box, the switchpoint was inserted at 6.00. and reaches to 6.00. This indicates, that no other switchpoint has been created yet. By default, the value set in this dialog will be valid until the consecutive switchpoint as indicated by the checked **next Sw.Point** checkbox.

**Create & Edit Switchpoint**

From: 6 0 Value: 0,00

To: 6 0

next Sw.Point

OK Cancel

33. In the upper Value field, enter the value for the switchpoint.

**Create & Edit Switchpoint**

From: 6 0 Value: 18

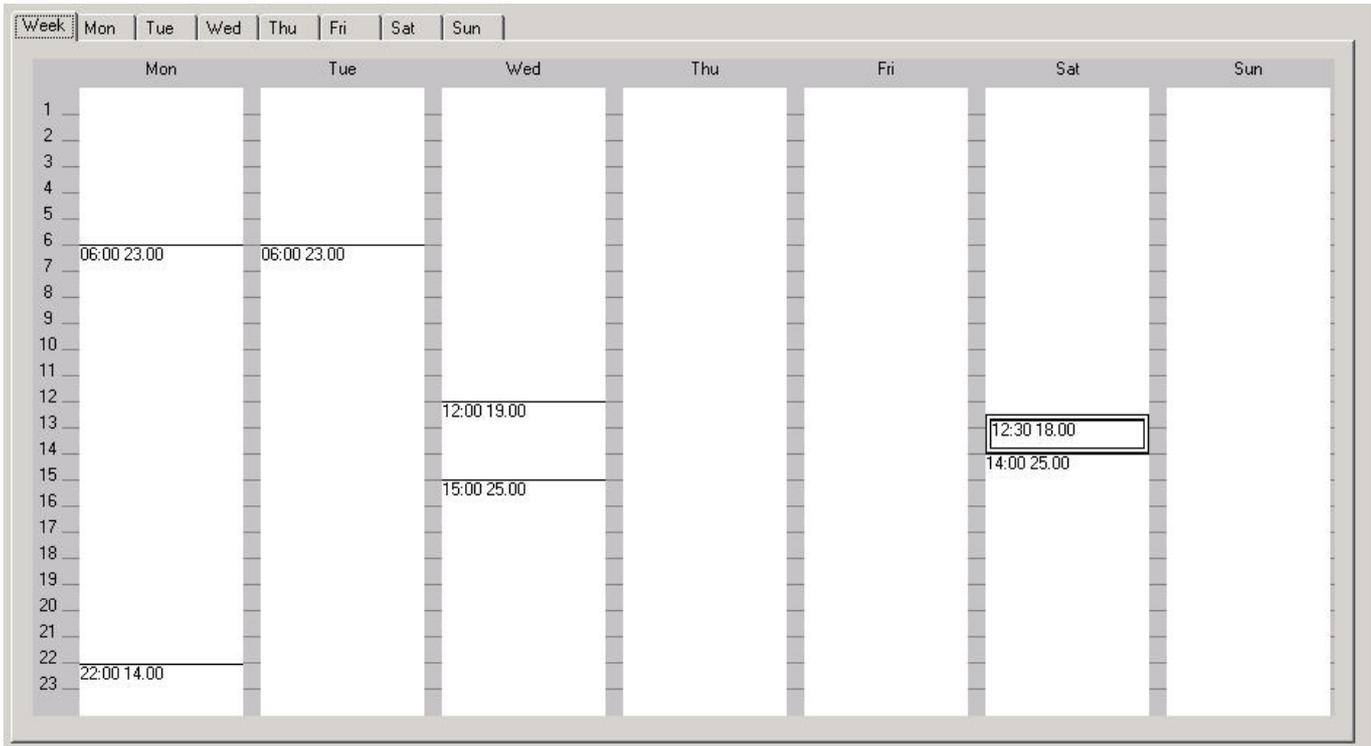
To: 12 0 Value: 21

next Sw.Point

OK Cancel

34. In the From field, enter the time when the switchpoint should change the previous switchpoint's value. If you want to create a switchpoint prior to the next switchpoint, uncheck the **next Sw. Point** checkbox and enter the time into the To field. Note that the end time can only be set on the same day, at 00.00. p.m. at the latest. In the lower Value field, enter the value for the switchpoint which starts at the time entered in the To field.
35. Click the **OK** button.

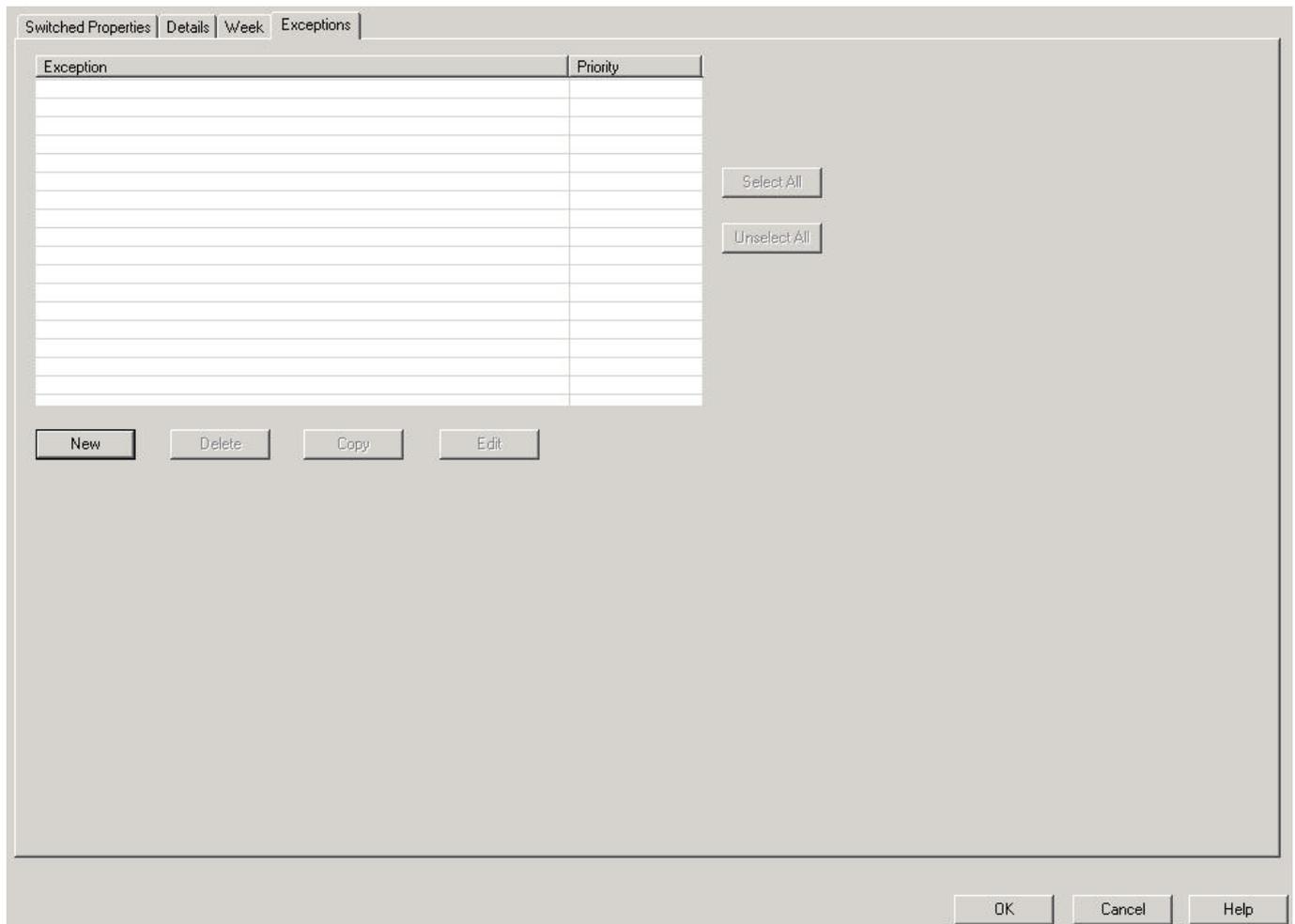
RESULT: The new switchpoint is added to the Week tab.



36. Continue by doing one the following:

- Copy switchpoint(s), (see Copy Switchpoints Graphically section)
- Edit switchpoint (see Edit Switchpoint Graphically section)
- Delete switchpoint (see Delete Switchpoint Graphically section)
- Proceed with the creation of an Exception (see step 37)

**Create Exception** 37. Click the Exceptions tab.



An exception is a special daily switching program that differs from the weekly program. Any exception has a higher priority than the weekly program. Exceptions themselves can be prioritized to define the processing sequence in case exceptions have overlapping time periods. If the current date enters the valid period of the exception, the exception overwrites the daily program of that day. Exceptions can be executed on particular dates, date ranges, as a recurrent event or on predefined calendar dates.

**38.** Click the **New** button.

**RESULT:** The Create & Edit Exception dialog box displays. On the Switched Properties tab, the switchpoints that will be switched by the exception are displayed. The engineering unit/state text of a selected switched property is shown on the right. To edit details of a switched property that is selected in the list, click the **Details** button.





**Create & Edit Exception**

Switch Points | **Valid Period**

Switched Datapoint Properties

Properties: AO\_1.Present\_Value Eng. Unit / State Text: %

Validity type

Specific Date  Date Range  Recurring Event  Calendar Reference

Date

Name: Specific date

Specific Date: 7.12.2004

every day  
 every month  
 every year

OK Cancel Help

46. Under Validity Type, select one of the following options by clicking the corresponding radio button:

**Specific Date**

Time period is one specific date (day, month, year) is to be defined, e.g. Christmas Eve or 5.5., the whole of May, or the whole year of 2004 (see step 8 for completion).

**Date Range**

Time period is a date range is to be defined, e.g. Summer holidays from 29.7-7.9.2004 (see step 10 for completion).

**Recurring Event**

Time period is a recurring event is to be defined, e.g. every last Friday of every month (see step 12 for completion)

#### Calendar Reference

A project-wide calendar can be selected that provides the specific dates, that is, the exception will be valid for all calendar entries of the referenced calendar

47. In the Name field, enter a name for the exception.

48. If Specific Date has been selected:

From the Specific Date drop-down list box, select the specific date, e.g. 5.5.2004. If the chosen date should be valid every day, check the **every day** checkbox. In this case, the specific date includes every day of May in 2004 indicated by an asterisk, \*.5.2004. If the chosen date should be valid every month, check the **every month** checkbox. In this case, the specific date is on every fifth of every month indicated by an asterisk, 5.\*.2004. If the chosen date should be valid every year, check **the every year** checkbox. In this case, the fifth of May every year will be the specific date indicated by an asterisk, 5.5.\*. Combinations of the three options are possible, e.g. assuming the 5.5.2004 sample, the selection of the **every day** and **every year** options determines the valid date to \*5\*, that is every May of every year.

49. Click the **OK** button to save specific date.

The screenshot shows a dialog box titled 'Validity type' with four radio buttons: 'Specific Date' (selected), 'Date Range', 'Recurring Event', and 'Calendar Reference'. Below this is a section titled 'Date' containing a 'Name' text box with 'Open House', a 'Specific Date' dropdown menu showing '27.11.\*', and three checkboxes: 'every day' (unchecked), 'every month' (unchecked), and 'every year' (checked).

50. If Date Range has been selected:

Check the checkboxes at **Date Range from** and **Date Range to** and select start and end date from the drop-down list boxes.

#### NOTE:

If the **Date Range from** checkbox is unchecked, the drop-down listbox is disabled. This means, that the date range will be any date up to and including the end date.

If the checkbox **Date Range to** is unchecked, the drop-down listbox is disabled. This means, that the date range will be on any date from the start date on.

If both drop-down listboxes are disabled, the date range will be all the time.

Validity type

Specific Date   
  Date Range   
  Recurring Event   
  Calendar Reference

Date

Name:

Date Range from:

Date Range to:

51. Click the **OK** button to save the date range.

52. If Recurring Event has been selected:

From the Recurring on drop-down list boxes, select the date options that define the recurring event.

Validity type

Specific Date   
  Date Range   
  Recurring Event   
  Calendar Reference

Date

Name:

Recurring on:

53. Click the **OK** button to save the recurring event.

54. If Calendar Reference has been selected:

Validity type

Specific Date   
  Date Range   
  Recurring Event   
  Calendar Reference

Referenced calendar

Calendar entries:

Name	Date
Open House	*.5.*

Under Referenced calendar, select the calendar from the drop-down list box.

RESULT: Under Calendar Entries, the entries of the selected calendar are shown by name and date.

55. If desired, click **Show References** button to view existing schedules which reference to the selected calendar.

56. If desired, create additional entries by clicking the **New Entry** button.

RESULT: The New & Edit Calendar Entry dialog box displays.

57. Define the time period of the calendar entry (see steps 46-53 for detailed information).

58. Click the **OK** button.

59. If desired, continue by creating additional entries.

60. To delete calendar entries on the Valid Period tab, mark the entries in the table and click the **Delete** button.

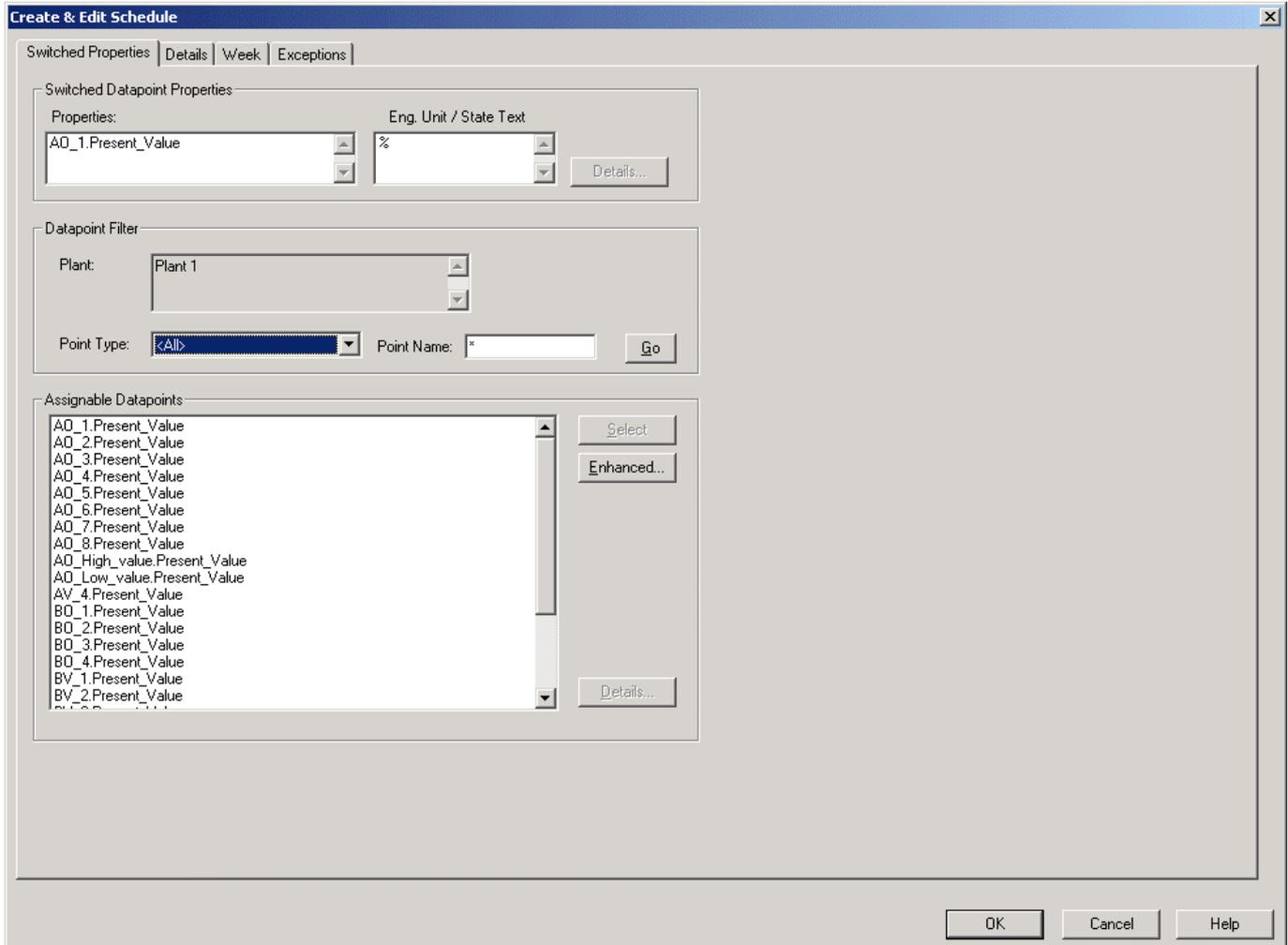
61. To create a new Calendar on the Valid Period tab, click the **New** button (see Calendars section for detailed information).

62. To save the Exception, click on the **OK** button.

RESULT: The Create & Edit Schedule dialog box redisplay. The Exception is listed by its name and priority. Exceptions can be copied, edited and deleted.







### Copy Switchpoint(s) Graphically

When copying a switchpoint, only the switchpoint itself defined by its time and value is copied, not the complete switchpoint block which extends to the next switchpoint. This means, for copying all switchpoints of a day, the switchpoint block of the last switchpoint that extends to the next day, must be selected.

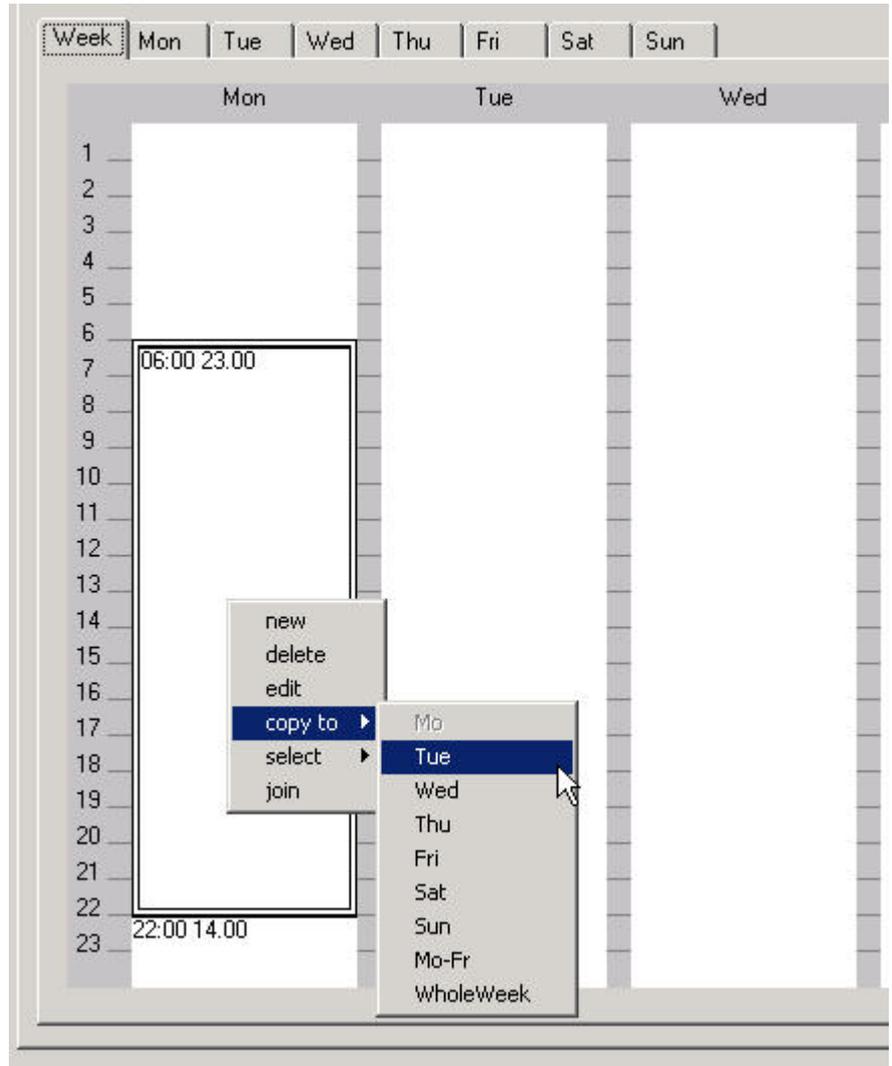
#### Procedures

##### Copy Single Switchpoint

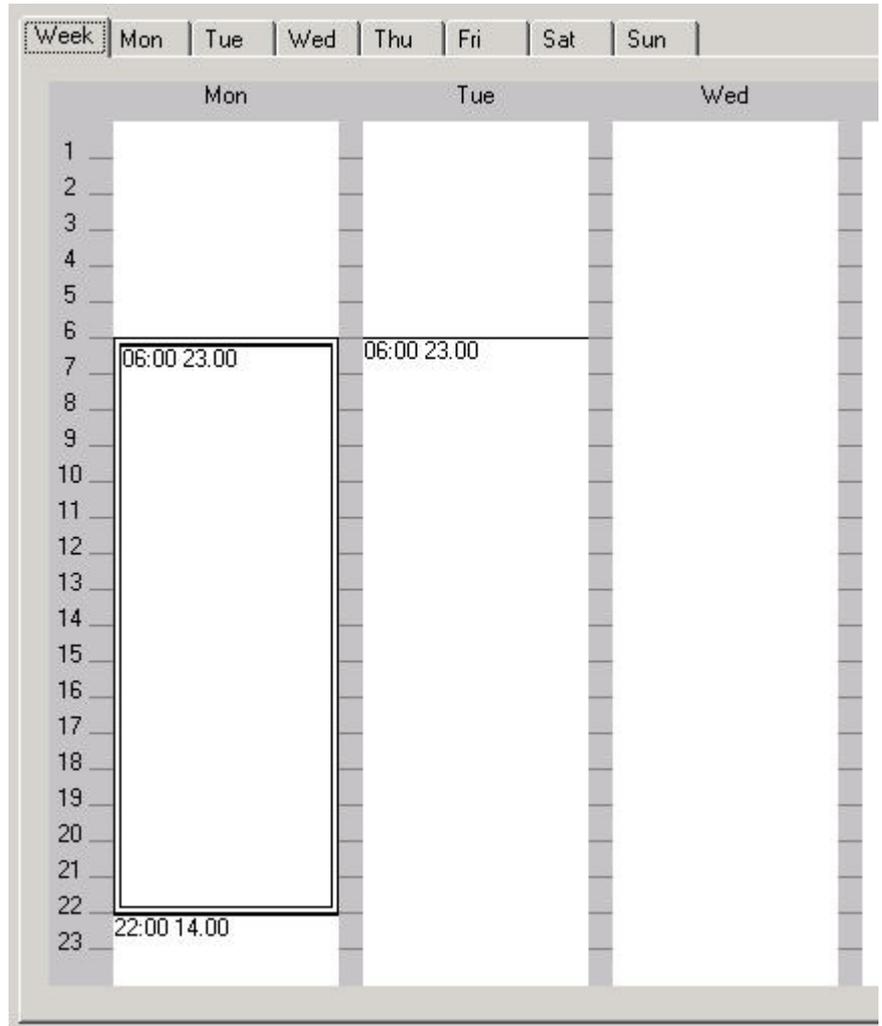
1. On the week tab, click on the switchpoint.

RESULT: The switchpoint block is marked with a double-lined rectangle.

2. Click right mouse button and with left mouse button, select **Copy to**, then click on the destination, day or whole week.



**RESULT:** The switchpoint is copied to the destination, in this case the switchpoint at 6.00 is copied to Tuesday. The copied switchpoint value is valid until the next switchpoint. Existing switchpoints of that day will be kept (see "Copy all Switchpoints of a Day" section).



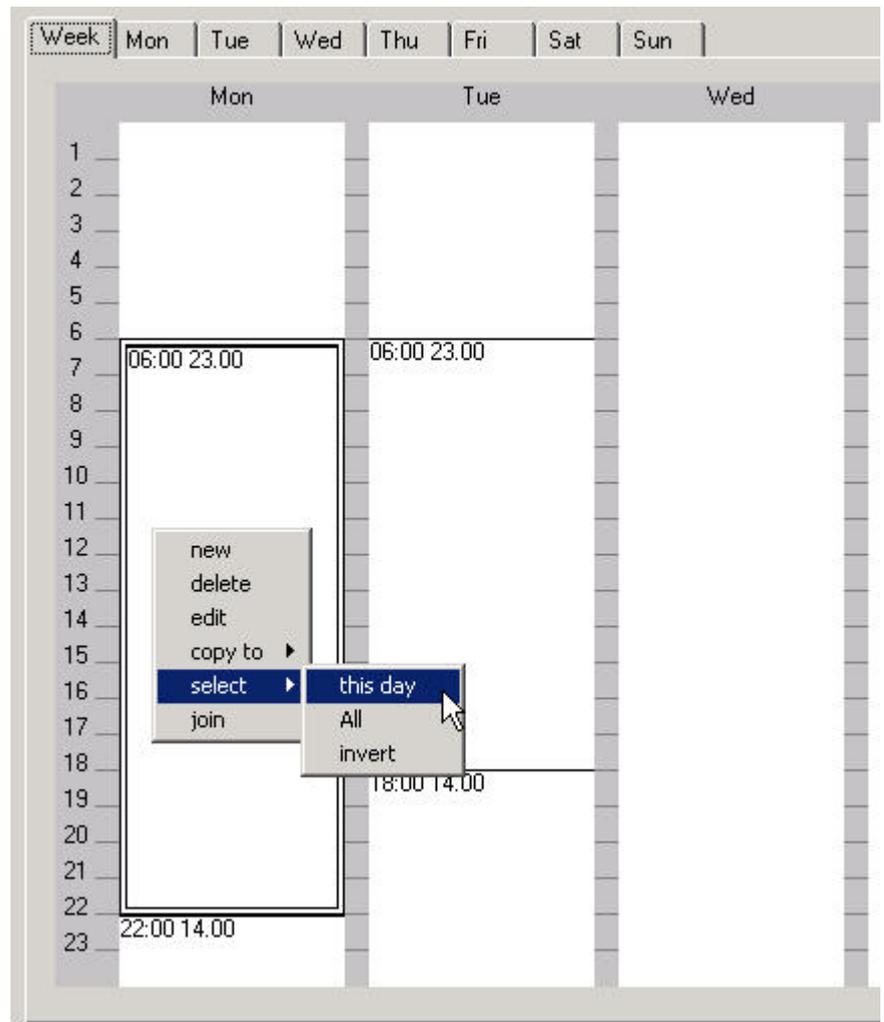
### Copy All Switchpoints of a Day

#### **IMPORTANT**

*When copying all switchpoints of a day, all switchpoints of the target day(s), to which the switchpoints are copied, will be deleted.*

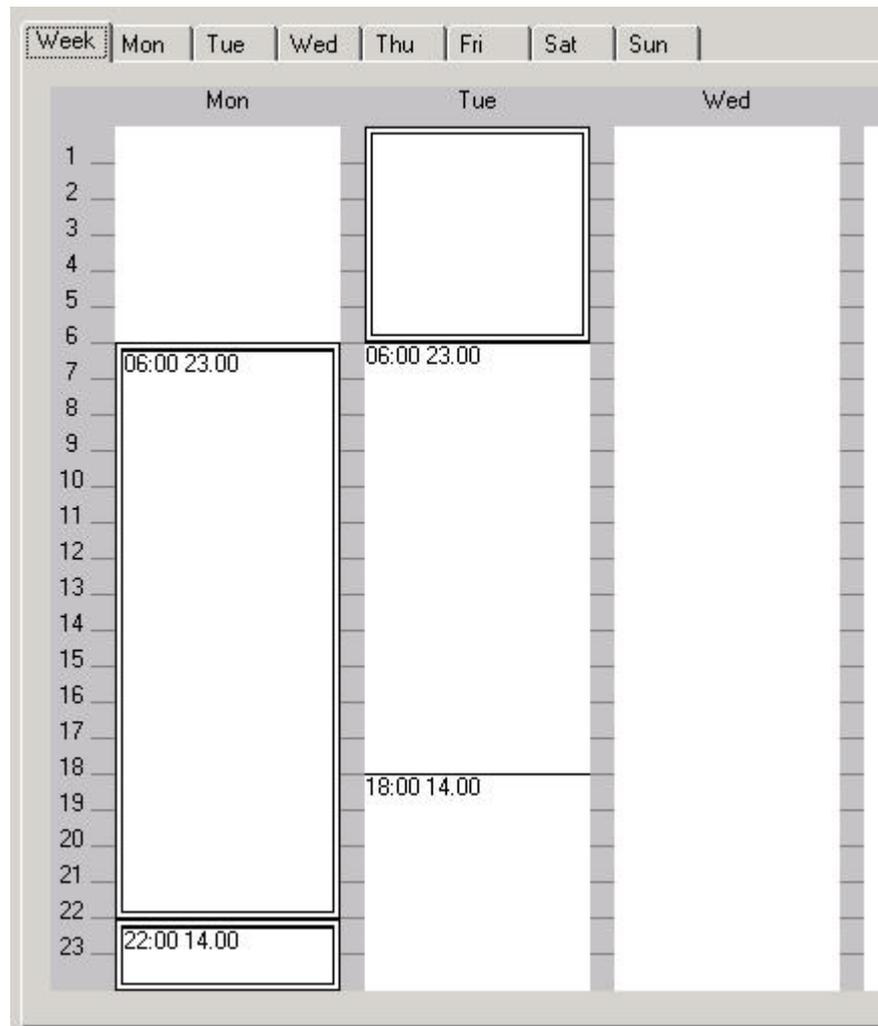
1. On the week tab, click on the first switchpoint of the day.

RESULT: The switchpoint block is marked with a double-lined rectangle.

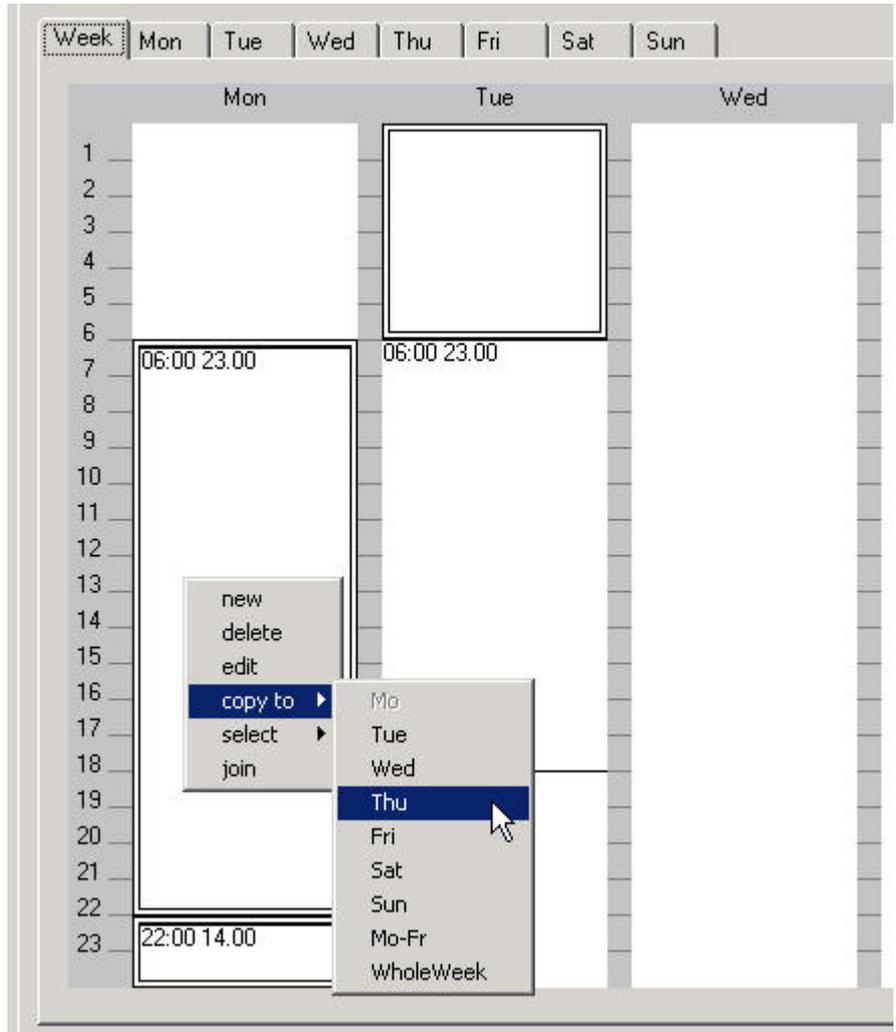


2. Click right mouse button and with left mouse button, select **select**, then click on **this day** in the context menu.

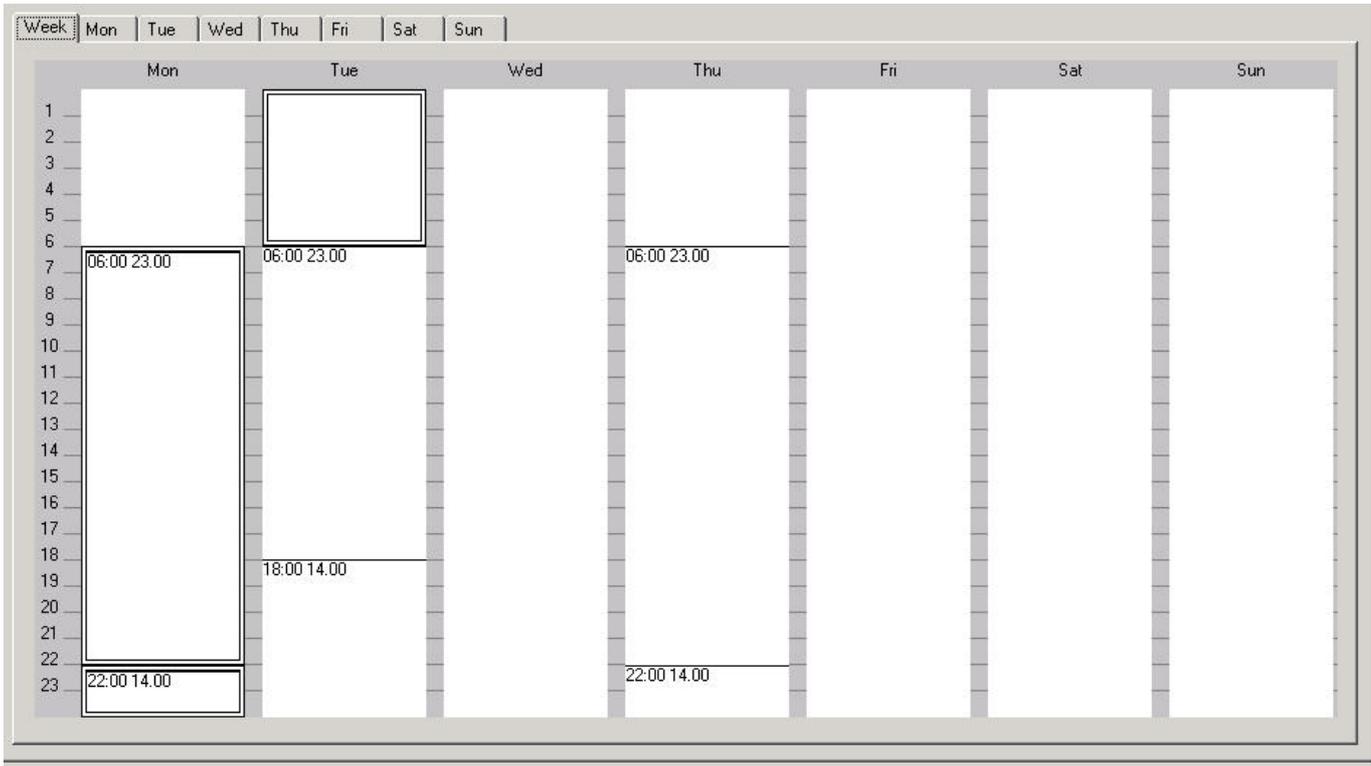
RESULT: All switchpoints of the day are marked with a double-lined rectangle.



3. Move cursor over the marked switchpoints, click right mouse button and with left mouse button select **Copy to**, then click on the destination, day or whole week.



RESULT: All switchpoints of the day are copied to the destination, in this case the switchpoints on Monday at 6.00 and 22.00 are copied to Thursday.



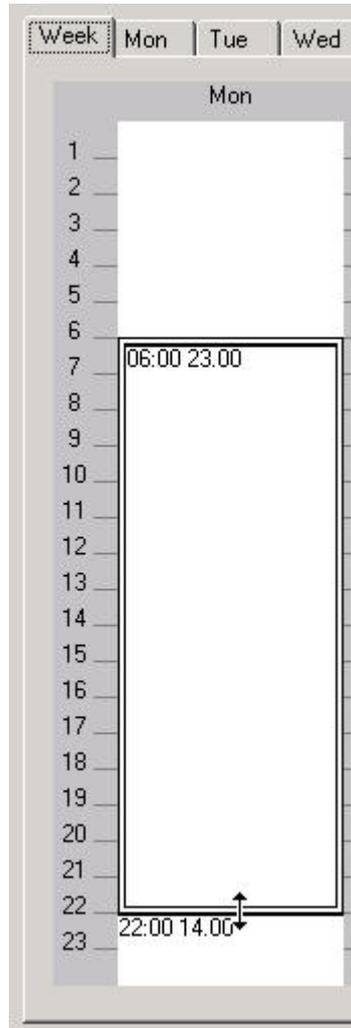
**Edit Switchpoint Graphically**

The time period of a switchpoint block can be reduced or prolonged by moving the start and end points (start and end time) up or down. In addition, the complete switchpoint block can be moved up or down so that the start and end time will be modified by the same time range.

**Procedures**

**Change Start Or End Time**

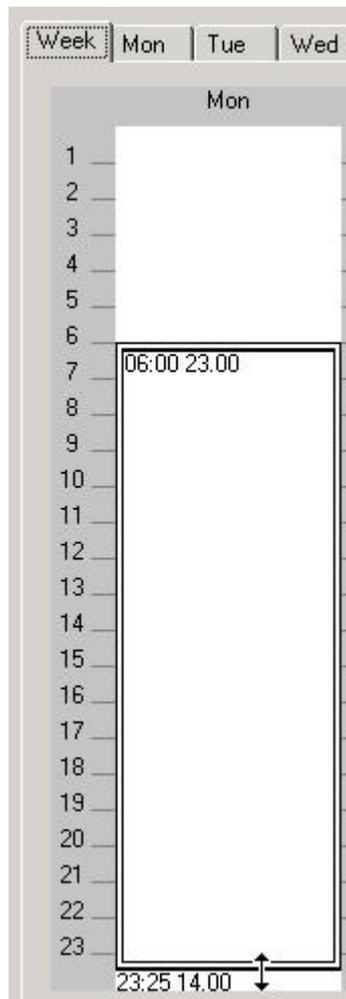
1. On the Week tab, click on the switchpoint.



2. Move cursor over the desired start time respectively end time until a double arrow displays.
3. Move cursor up or down to the new position.

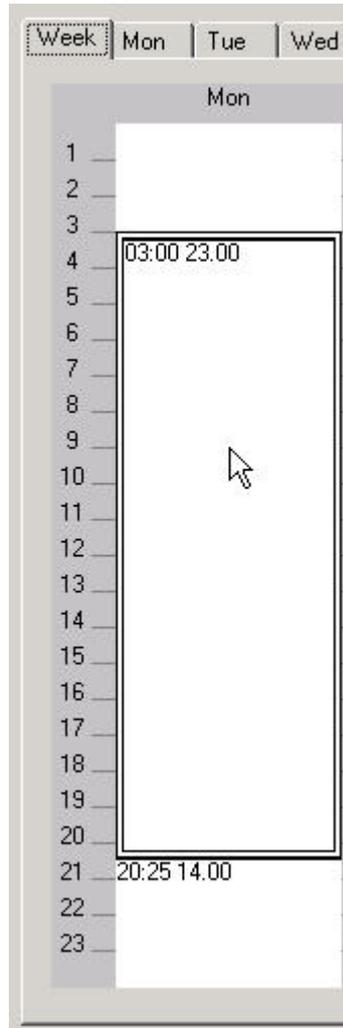
NOTE: Software allows change steps with the constant time interval of 5 minutes only.

RESULT: The adjacent switchpoint blocks will be moved and changed accordingly. In this case, the switchpoint block of the switch point starting at 6.00 has been prolonged from 22.00 to 23.25. This results in the reduction of the time period of the adjacent switchpoint block which previously started at 22.00.

**Change Start And End Time**

1. On the Week tab, click on the switchpoint (block) and, by keeping the mouse button pressed, move the switchpoint block to the desired position.

NOTE: Software allows change steps with the constant time interval of 5 minutes only.



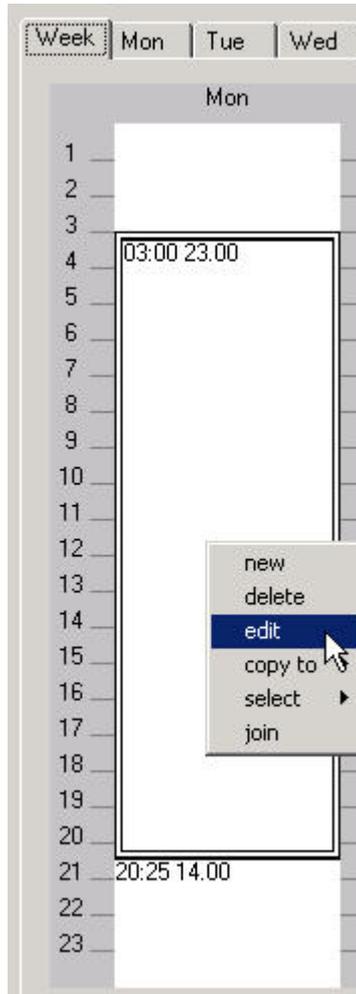
2. Release the mouse button.

RESULT: The complete switchpoint block has been moved and both, the start and end time have been changed. The adjacent switchpoint blocks will be moved and changed accordingly.

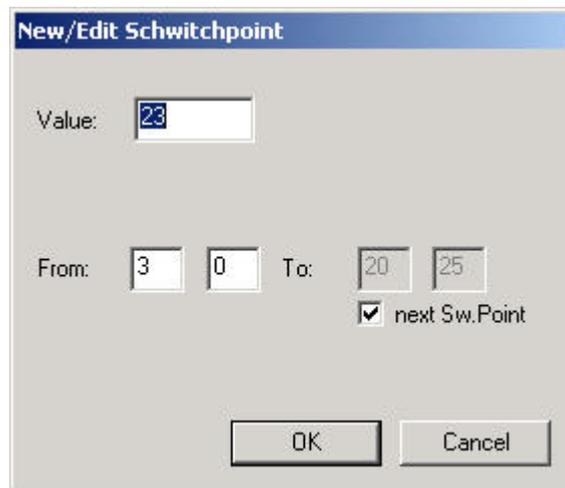
#### Change Switchpoint Value

1. On the Week tab, click on the switchpoint you want to edit.
2. Click right mouse button, and with left mouse button, click on **Edit** in the context menu.

Or, double-click on the switchpoint.

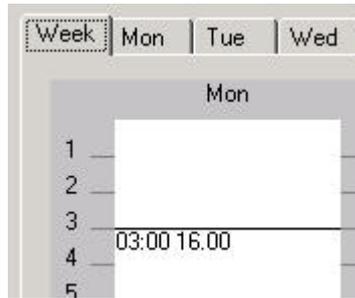


RESULT: The New/Edit Switchpoint dialog box displays.



2. In the Value field, enter the new value.
3. If desired, change the start and end time of the switchpoint block in the From and/or To fields.
4. Click the **OK** button.

RESULT: The updated value will be displayed on the Week tab.



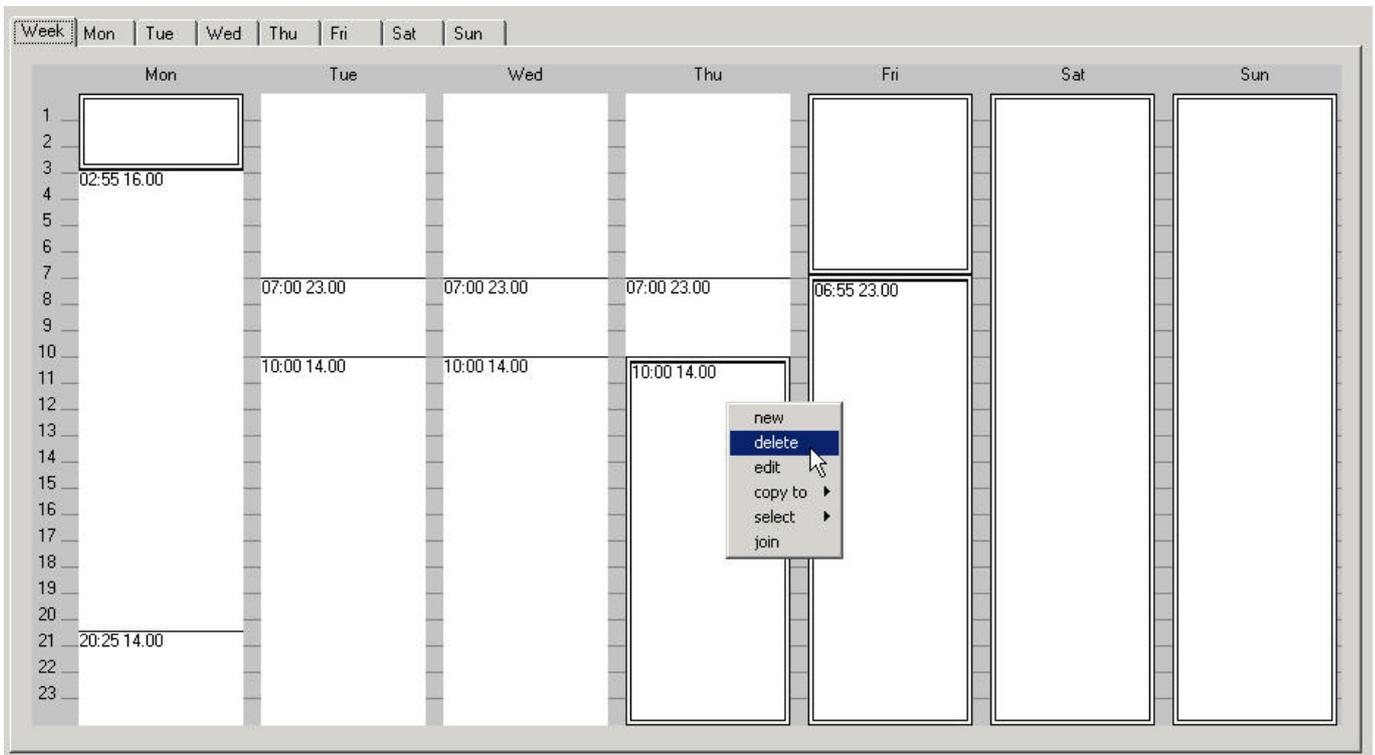
**Delete Switchpoint(s) Graphically**

**Procedures**

**Delete Multiple Switchpoints**

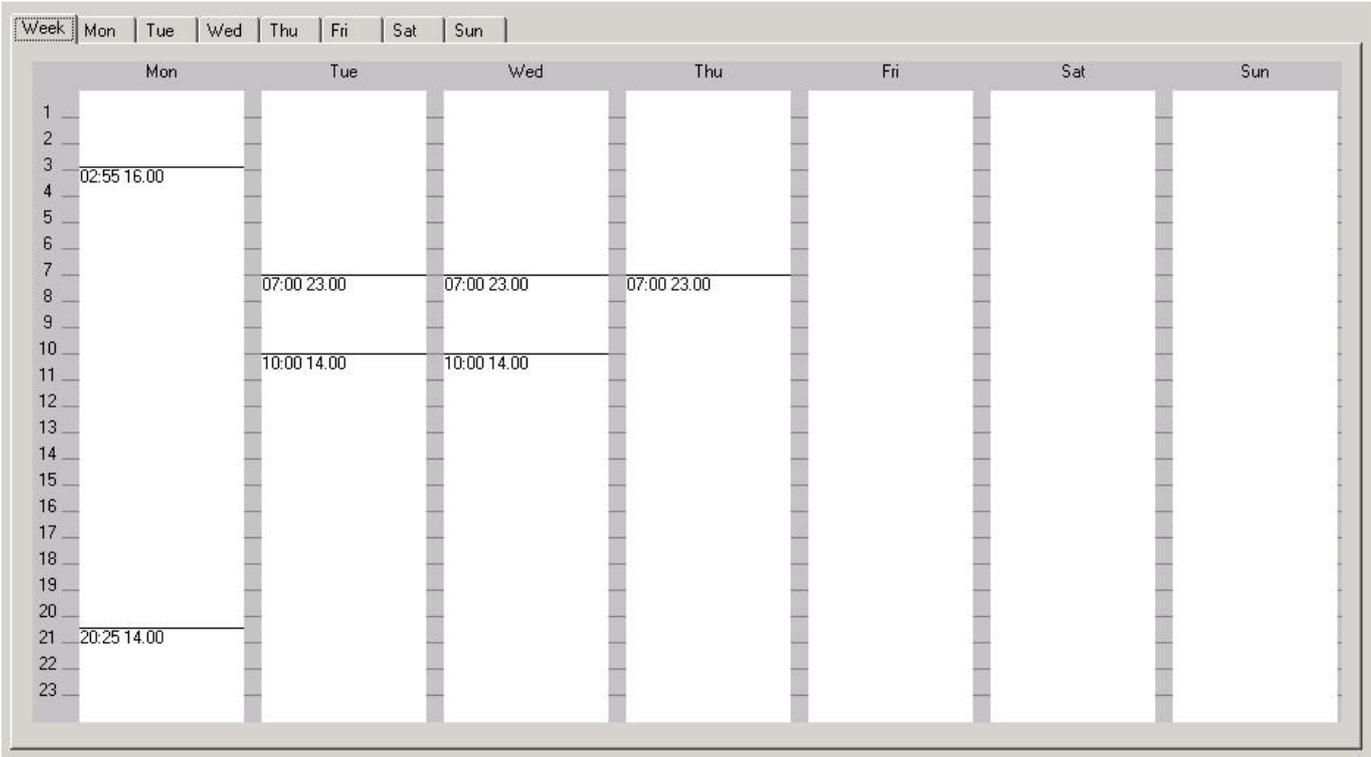
1. On the Week tab, click on the switchpoint. To select multiple switchpoints, use the CTRL key simultaneously.

RESULT: The switchpoint blocks are marked with a double-lined rectangle.



2. Click right mouse button and with left mouse button click on **Delete** in the context menu.

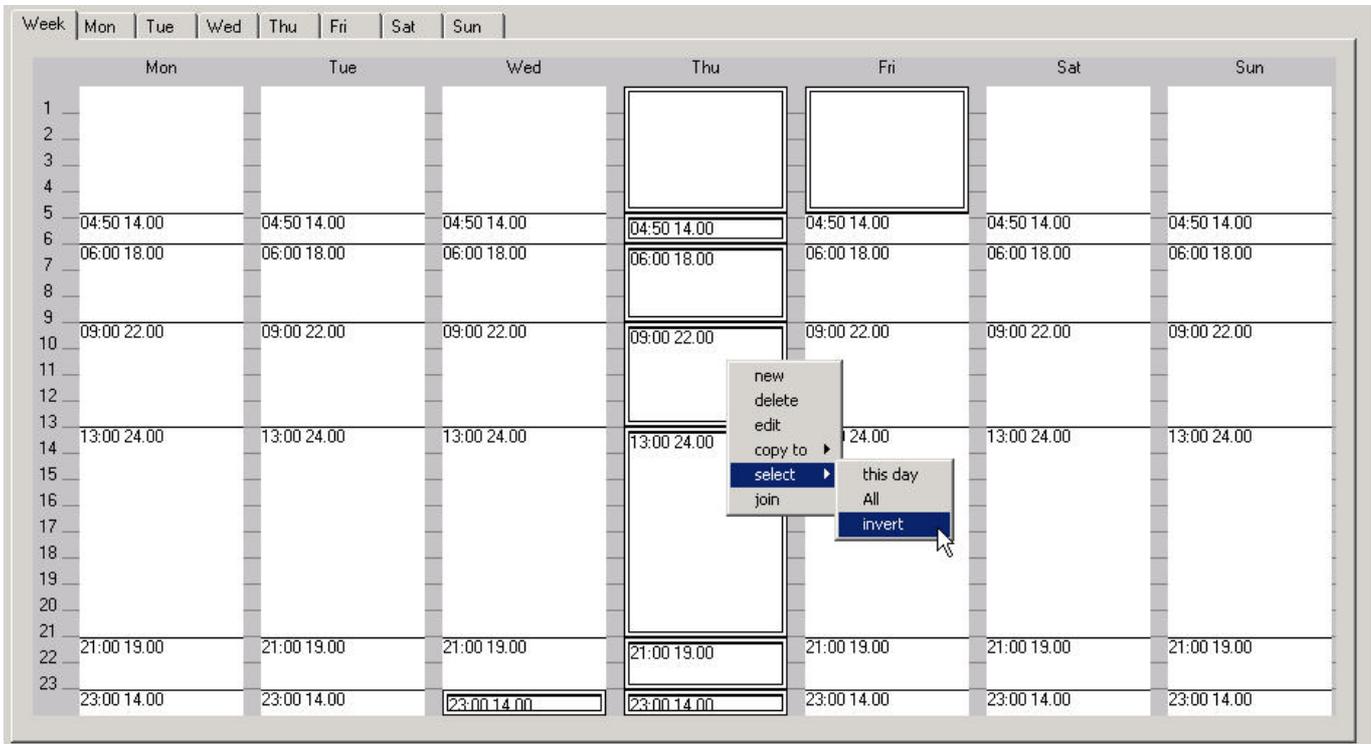
RESULT: The switchpoints are deleted.



**Delete All Switchpoints by Keeping Few Switchpoints**

1. On the Week tab, multi-select the switchpoints you want to keep by pressing CTRL key and left mouse button concurrently.

RESULT: The switchpoint blocks are marked with a double-lined rectangle.



2. Click right mouse button and click **Invert** in the context menu.

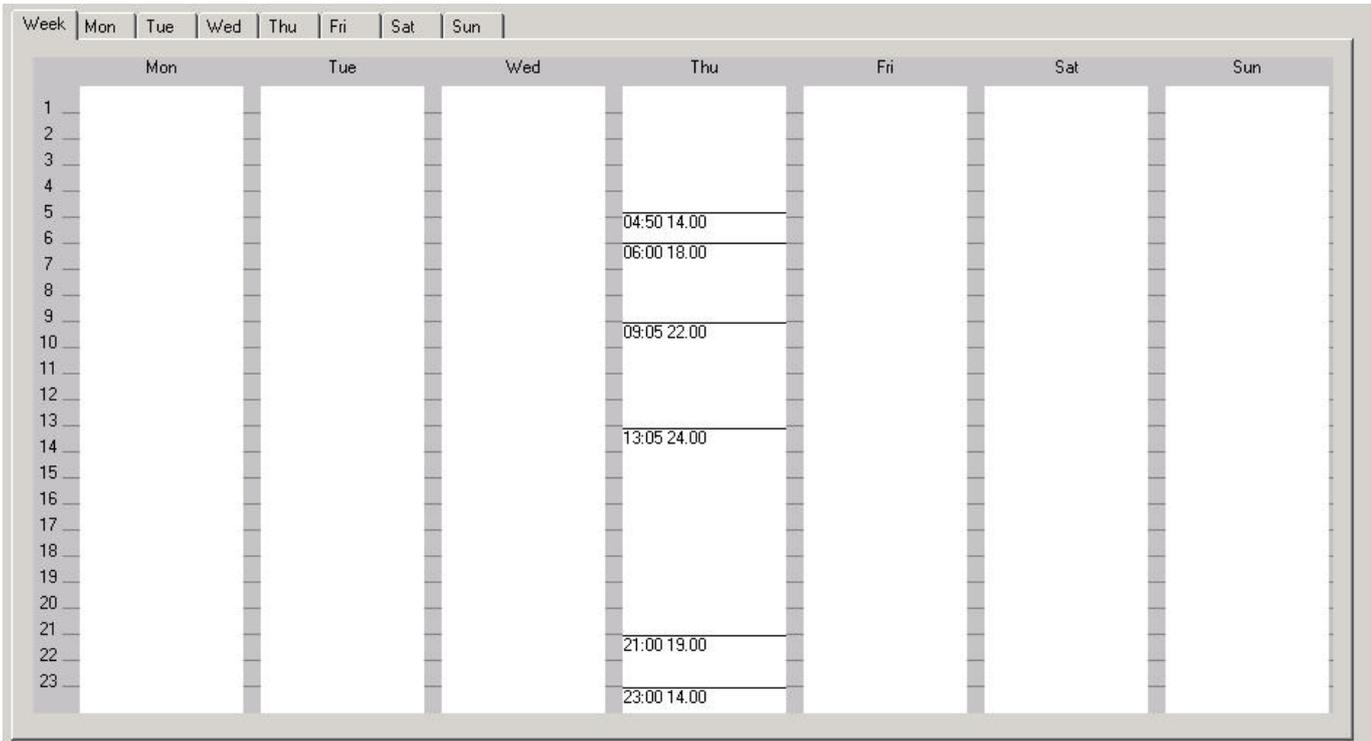
Week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1							
2							
3							
4							
5							
6	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00
7	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00
8							
9							
10	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00
11							
12							
13							
14	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00
15							
16							
17							
18							
19							
20							
21							
22	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00
23	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00

RESULT: All the other switchpoint blocks are now marked with a double-lined rectangle.

3. Click right mouse button and click **Delete** in the context menu.

Week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1							
2							
3							
4							
5							
6	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00
7	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00
8							
9							
10	09:00 22.00	09:00 22.00	09:00 22.00	09:05 22.00	09:00 22.00	09:00 22.00	09:00 22.00
11							
12							
13							
14	13:00 24.00	13:00 24.00	13:00 24.00	13:05 24.00	13:00 24.00	13:00 24.00	13:00 24.00
15							
16							
17							
18							
19							
20							
21							
22	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00
23	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00

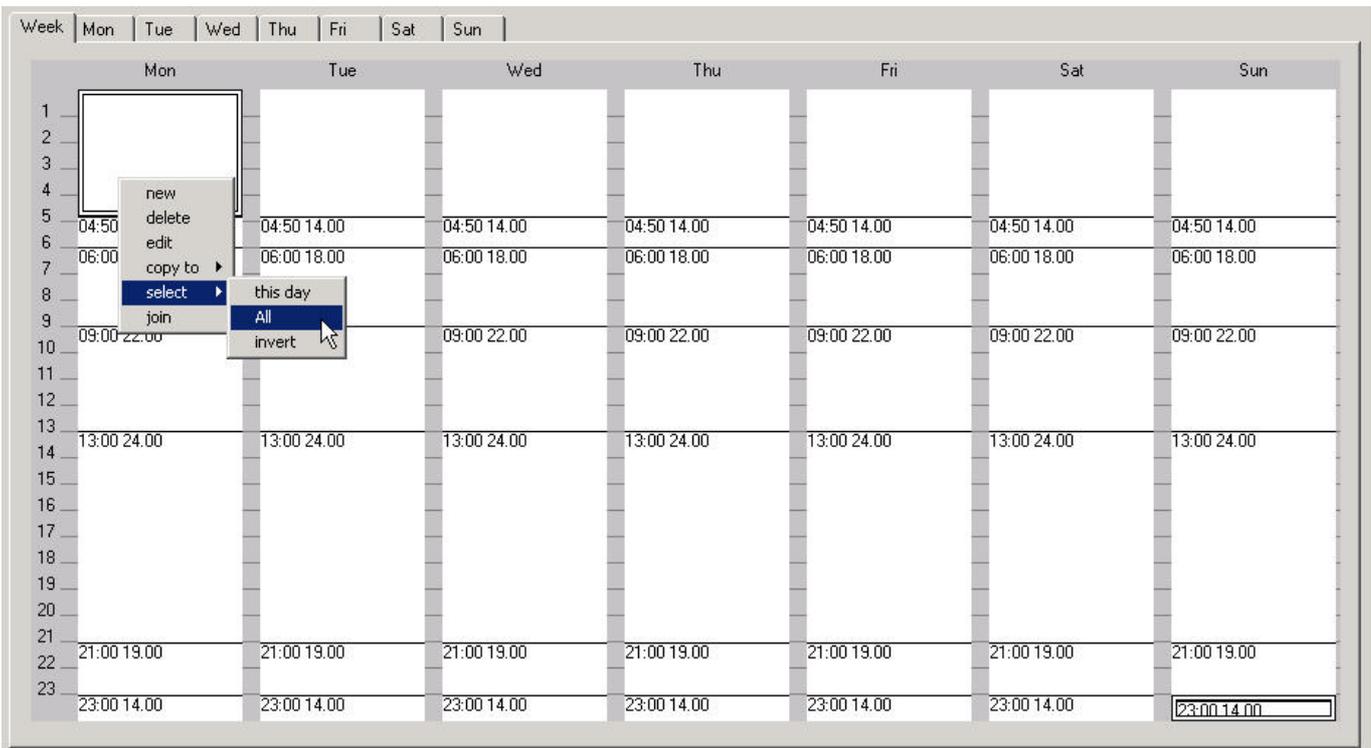
RESULT: The marked switchpoint blocks are deleted. In this case all switchpoints originally selected on Thursday have been kept.



**Delete All Switchpoints**

1. On the Week tab, click right mouse button and with left mouse button, select **Select**, then click on **All** in the context menu.

RESULT: All switchpoints are marked with a double-lined rectangle.



2. Click right mouse button and with left mouse button, click on **Delete** in the context menu.

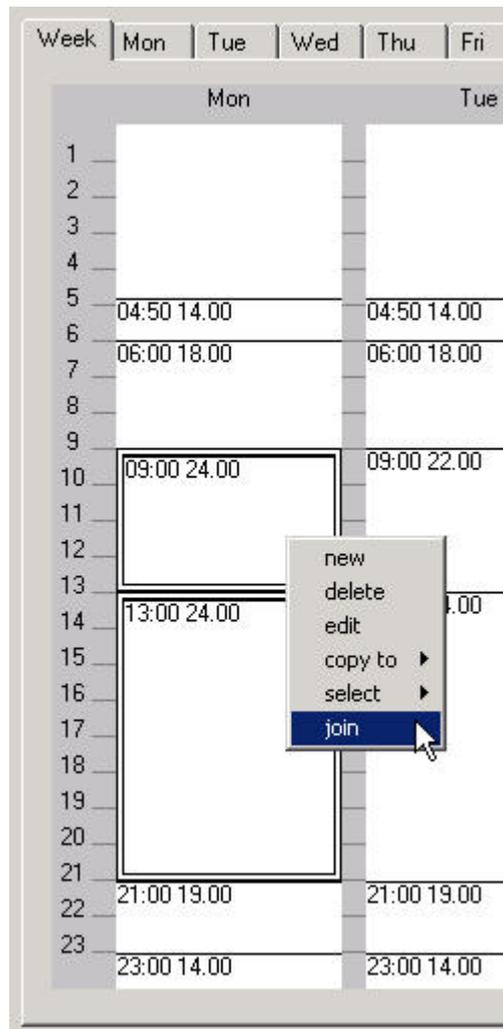
Week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1							
2							
3							
4							
5							
6	04:50 14.00	05:00 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00	04:50 14.00
7	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00	06:00 18.00
8							
9							
10	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00	09:00 22.00
11							
12							
13							
14	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00	13:00 24.00
15							
16							
17							
18							
19							
20							
21							
22	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00	21:00 19.00
23	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00	23:00 14.00

RESULT: All switchpoints are deleted.

**Join Switchpoints**

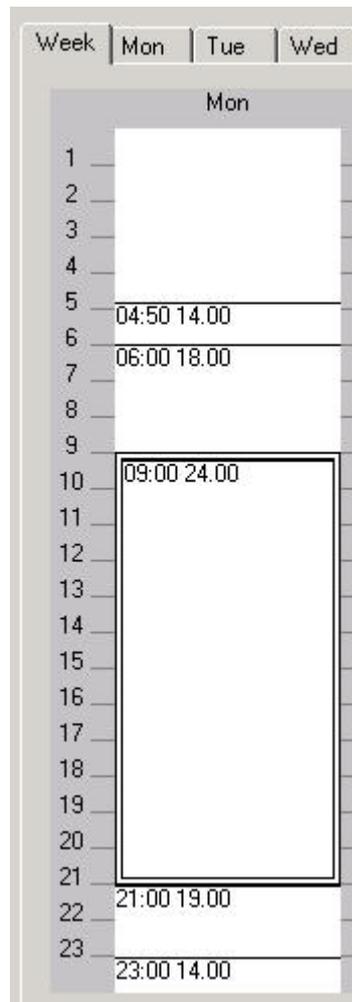
Multiple consecutive switchpoints which have the same value can be joined to one switchpoint (block).

- Procedure**
1. On the Week tab, multi-select the switchpoints you want to join.



2. Click right mouse button and with left mouse button, click on **Join** in the context menu.

RESULT: The selected switchpoints will be joined to one switchpoint (block).



**Delete Switchpoint in the Table**

- Procedure** 1. Click on the day's tab.

**RESULT:** The selected switchpoints are listed with their time and values.











The screenshot shows a dialog box titled "New & Edit Calendar Entry". It has two main sections: "Validity type" and "Date".

- Validity type:** Contains three radio buttons: "Specific Date" (which is selected), "Date Range", and "Recurring Event".
- Date:** Contains a "Name:" text input field. Below it is a "Specific Date" dropdown menu currently showing "18.11.2003". To the right of the dropdown are three checkboxes: "every day", "every month", and "every year", all of which are currently unchecked.

At the bottom of the dialog box are three buttons: "OK", "Cancel", and "Help".

- Under Validity Type, select one of the following options by clicking the corresponding radio button:

**Specific Date**

Time period is one specific date (day, month, year) is to be defined, e.g. Christmas Eve or 5.5., the whole of May, or the whole year of 2004 (see step 8 for completion).

**Date Range**

Time period is a date range is to be defined, e.g. Summer holidays from 29.7-7.9.2004 (see step 10 for completion).

**Recurring Event**

Time period is a recurring event is to be defined, e.g. every last Friday of every month (see step 12 for completion)

- Under Date, enter a name for the calendar entry.
- If Specific Date has been selected, select the specific date, e.g. 5.5.2004. from the Specific Date drop-down list box. If the chosen date should be valid every day, check the **every day** checkbox. In this case, the specific date includes every day of May in 2004 indicated by an asterisk, \*.5.2004. If the chosen date should be valid every month, check the **every month** checkbox. In this case, the specific date is on every fifth of every month indicated by an asterisk, 5.\*.2004. If the chosen date should be valid every year, check **the every year** checkbox. In this case, the fifth of May every year will be the specific date indicated by an asterisk, 5.5.\*. Combinations of the three options are possible, e.g. assuming the 5.5.2004 sample, the selection of the **every day of every year** options determines the valid date to \*5\*, that is every May of every year.
- Click the **OK** button to save the specific date.

**New & Edit Calendar Entry**

Validity type

Specific Date    Date Range    Recurring Event

Date

Name:

Specific Date:   every day  
 every month  
 every year

OK   Cancel   Help

9. If Specific Date has been selected:

Check the checkboxes at **Date Range from** and **Date Range to** and select start and end date from the drop-down list boxes.

NOTE:

If the **Date Range from** checkbox is unchecked, the drop-down listbox is disabled. This means, that the date range will be any date up to and including the end date.

If the checkbox **Date Range to** is unchecked, the drop-down listbox is disabled. This means, that the date range will be on any date from the start date on.

If both drop-down listboxes are disabled, the date range will be all the time.

**New & Edit Calendar Entry**

Validity type

Specific Date    Date Range    Recurring Event

Date

Name:

Date Range from:

Date Range to:

OK   Cancel   Help

10. Click the **OK** button to save the date range.

11. If Recurring Event has been selected, select the date options from the Recurring on drop-down list boxes.

**New & Edit Calendar Entry**

Validity type

Specific Date
  Date Range
  Recurring Event

Date

Name:

Recurring on:

OK Cancel Help

12. Click the **OK** button to save the recurring event.

RESULT: The Create & Edit Calendar dialog box redisplay.

**Create & Edit Calendar**

Calendar Properties

Name:

Description:

Import Export

Access Rights

Read Access Level:

Write Access Level:

List of Dates

Name	Date
Open House	*.5.*

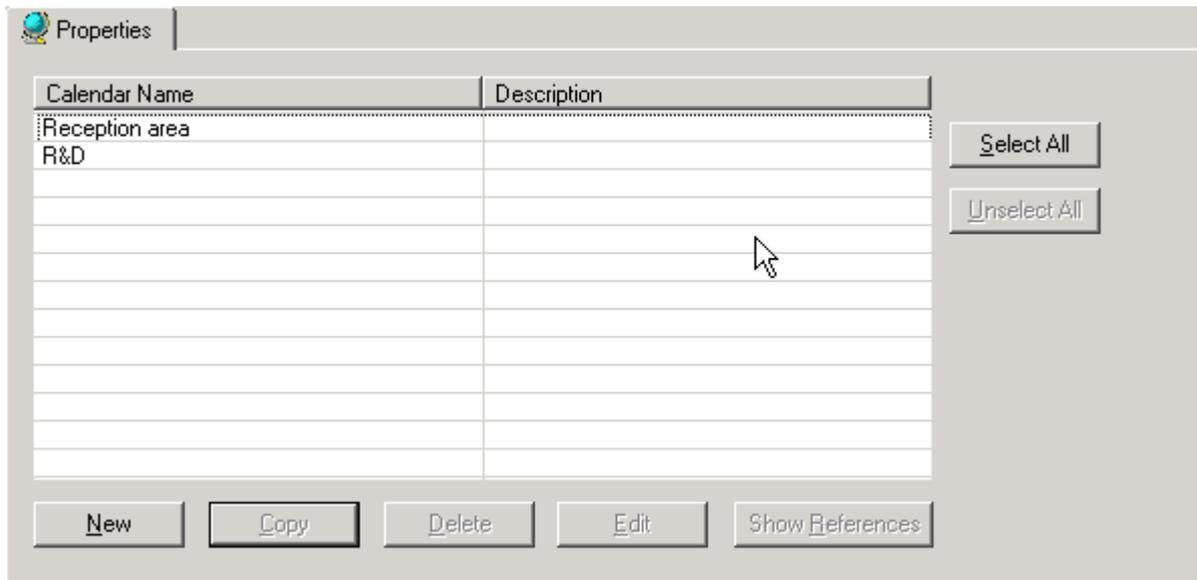
Select all Unselect all New Delete Edit

OK Cancel Help

13. If desired, continue with the creation of further calendar entries.

15. Click the **OK** button to save settings.

RESULT: The Calendars Properties tab redisplay listing the newly created calendar.



#### Edit Calendar

- Procedure**
1. On the Properties tab, select the calendar to be edited in the list and click the **Edit** button.

RESULT: The Create&Edit Calendar dialog box displays.

**Create & Edit Calendar**

Calendar Properties

Name:

Description:

Access Rights

Read Access Level:

Write Access Level:

BACnet Object Information

Object Type:  Instance ID:

Object ID:

List of Dates

Name	Date
Specific date	7.12.2004

Select all

Unselect all

New

Delete

Edit

OK Cancel Help

2. Edit the calendar by doing one of the following:

Under **Calendar Properties**, change the **Name** and the **Description** in the fields of the same name.

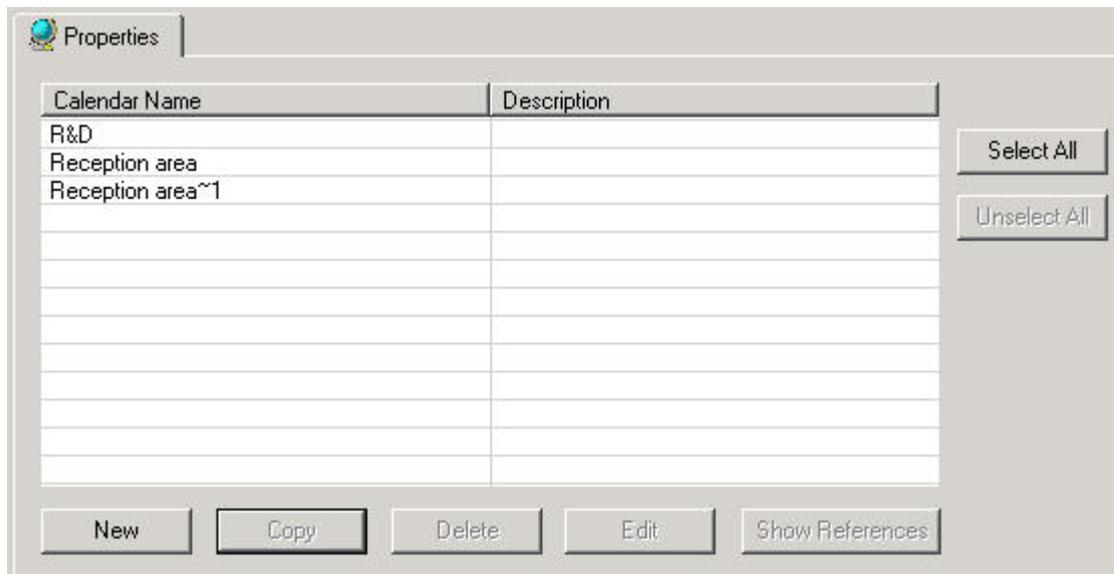
Under Access Rights, redefine the **Read Access Level** and **Write Access Level** by selecting it from the corresponding drop-down list box. For detailed information on access rights, please refer to the User Access Manager section.

Under List of Dates, add additional calendar date entries by clicking the **New** button. Or edit entries by selecting the entry and clicking the **Edit** button (see Create New Calendar section). Or, delete a calendar entry by selecting it and clicking the **Delete** button. For selection/deselection, the **Select all/Unselect all** button, for multiselection, simultaneously clicking the mouse and the CTRL or SHIFT key can be used.

**Copy Calendar**

- Procedure** 1. On the Properties tab, select the calendar to be copied in the list and click the **Copy** button.

**RESULT:** The calendar will be copied. The new calendar name is indicated by the ~ symbol and a consecutive number, e.g. Reception ~1.

**Delete Calendar**

- Procedure** 1. On the Properties tab, select the calendar to be deleted from the list and click the **Delete** button.

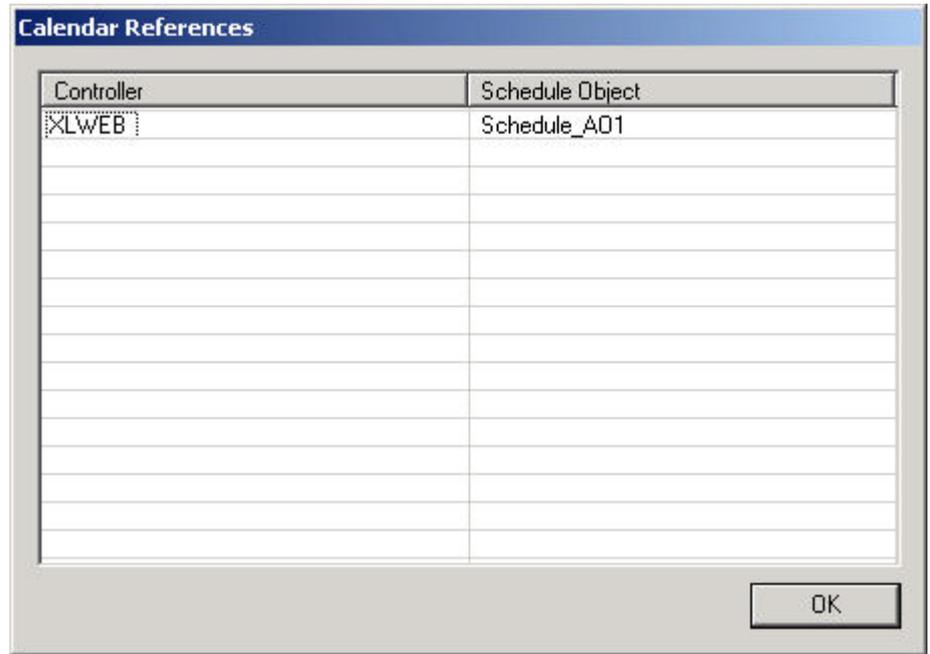
**RESULT:** The calendar will be deleted.

**Show References**

**Purpose** To view all schedules of any controllers that refer to the selected calendar.

- Procedure** 1. On the Properties tab, highlight the calendar and click the **Show References** button.

**RESULT:** The *Calendar References* dialog box displays listing all controllers with their referencing schedule (object).



2. Click the **OK** button to close the dialog box.



## EXCEL 10 APPLICATIONS

Excel 10 applications use an Excel 10 Zone Manager Controller as the interface between the EXCEL 5000 C-bus and an E-Bus with Excel 10 Controllers. In addition to providing point mapping between the C-bus and the E-Bus, the Excel 10 Zone Manager Controller has the functionality of an Excel 100, except that it has no physical points.

Excel 10 applications cover the Q7750A1xxx (1000-series) devices used with VAV 1 (Standard VAV) applications and the 2000-series including the Q7752A2xxx Zone Manager and its corresponding controllers such as VAV 2 and FCU.

The CARE process for Excel 10 applications is substantially different from that for other Excel Controllers.

CARE 4.00.00 and higher can only be applied to the engineering of 2000-series applications. The process is partly done in CARE and completed within the E-Vision software tool.

**Purpose** Applications using the C- and E-Bus need to be done within CARE and the E-Vision software tool. The CARE part is to define the C-Bus portions. This includes the following:

- Restore (Mapping) plants
- Time schedules
- Control strategies
- Switching tables
- Export to E-Vision

The E-Vision part includes the rest of the process like:

- Configuration
- Commissioning
- Check out
- Calibration

See the E-Vision User Guide 74-2588 for an overview of the use of both CARE and E-Vision for 2000-series Excel 10 applications. The following sections describe the CARE steps.

Step and Action	CARE Window and Menu Item Selections	Excel 10 Considerations
1. Install a CARE version lower than 3.00.00 and E-Vision on your PC		The E-Vision installation saves mapped point plant backups in the CARE directory.
2. Start CARE and create an Excel 10-ZM project.	Main window: <b>Project, New ...</b>	Unique is recommended.
3. Restore Excel 10 Mapped Point Plant Backup. For example: CVA1S.	Project window: <b>Plant, Restore</b>	The E-Vision installation saves mapped point plant backups in the CARE directory. Type the name of the target plant (use upper case characters), select the particular plant to restore based on the XL10 device type, and select the <b>Use plant backups</b> radio button. Restore all plants
4. Backup the Excel 10-ZM project	Main window: <b>Project, Backup ...</b>	The project backup provides the restored plants for a CARE project since in CARE 4.00.00 a plant restore is no longer possible
5. De-install current CARE version and install CARE version 4.00.00 or higher		
6. Restore the Excel 10-ZM project	Main window: <b>Project, Restore ...</b>	The project restore provides the backedup plants of CARE version lower than 3.00.00

7. Create new project	Project window: <b>Project, New ...</b>	The plants can be copied to the new project by the Replicate function.
8. Create the Excel 10-ZM Controller. For example: ELINK1.	Project window: <b>Controller, New ...</b>	Use upper case characters for controller name. Set Controller Type equal to Elink. Choose Version 1.01 for Controller OS. The Power Supply and Installation Type fields are gray because you do not define them for Excel 10-ZM Controllers. Select alarm files as E-VISION (default file setting).
9. Create an Elink Plant. For example: ELNKPLT.	Project window: <b>Plant, New ...</b>	Use upper case characters for plant name. Set Plant Type equal to Elink. Choose Version 1.01 for Controller OS. This plant is used for control strategy and switching logic.
10. Customize Excel 10 Mapping Points in the mapped plant (in this example, CVA1S).	Points can be deleted using any of the CARE <b>Delete Software Point</b> functions.	Enter the Switching Logic screen and use the "Delete unused SW points" function to reduce the list to the desired mapped points. Use this plant as a template for replication. Plant must be replicated to create unique user addresses in CARE.
11. Replicate Mapped Plant (in this example, CVA1S).	Plant window: <b>Plant, Replicate</b>	Replicate the Excel 10 plant as many times as the job requires. The plant replicate operation prefixes the user addresses in the plant with the target plant name, ensuring uniqueness of user addresses in CARE. Note that Excel 10 Controllers use some of the same user addresses, for example, a VAV II and a CVAHU can both use FAN_OUT. To make sure the user addresses are unique, replicate the plants (VAV II or CVAHU) and attach the replicated plants to the Excel 10-ZM Controller.
12. Attach Excel 10 Mapping Plant (in this example, CVA1S) to Excel 10-ZM Controller.	Controller window: <b>Controller, Edit, Attach/Detach Plants</b>	Select one or more plants to attach to the selected Excel 10-ZM Controller. During the attach, CARE prompts you to delete unused software points. Select <b>Cancel</b> for each plant.
13. Customize Excel 10 Point Attributes in the mapped plant (in this example, CVA1S).	Controller window: <b>Controller, Edit, Data Point Editor</b>	Points in mapping plants supplied with E-Vision come preset with analog and digital engineering units.
14. Attach Elink Plant (in this example, ELNKPLT) to Zone Manager Controller (in this example, ELINK1).	Controller window: <b>Controller, Edit, Attach/Detach Plants</b>	Select one or more plants to attach to the particular Zone Manager controller. During attach, software detects any duplicate user addresses and prompts you to make them unique.
15. Create Custom Control Strategy (if required). In this example, in ELNKPLT.	Plant window: <b>Plant, Control Strategy</b>	<p>Create control strategies only when confident that the selection of mapped points is correct. Create all custom control strategies in a separate Elink plant, not directly in the Excel 10 Mapping Plants. Create a new control loop by selecting <b>File, New</b>, and specifying a name for the new control loop. Place software points on the Zone Manager controller software bar by selecting <b>Edit, Load Existing Software Points</b>, selecting the appropriate point type, and selecting the point of interest from the list box of available points of the specified type. After you place a software point on the software bar, it can be used in a control strategy the same way as other software points.</p> <p>Software points to be used as the source of a Command Multiple Point relationship, or the destination of a Read Multiple Points relationship, are also created in control strategy by selecting a location on the software bar, selecting the desired point type, and providing a user address for the software point.</p>
16. Create Custom Switching Logic (if required). In this example, in ELNKPLT.	Plant window: <b>Plant, Switching Logic</b>	Create custom Switching Logic tables in a separate Elink plant, not directly in the Excel 10 Mapping Plants. Software points in the Excel 10-ZM Controller can then be used in a switching table by selecting <b>Software Points</b> , selecting the point type of the desired point, and selecting the point of interest from the list box of available points of the specified type.

<p>17. Create Custom Time Programs (if required). In this example, in ELNKPLT.</p>	<p>Controller window or attached plant window: <b>Plant, Time Programs</b></p>	<p>Specify Time programs to control the software points in the Excel 10-ZM Controller. See the CARE Time Schedules section (Page 844) for methods to create time schedules that control Excel 10s.</p>
<p>18. Translate Excel 10-ZM. In this example, ELINK1.</p>	<p>Controller window or attached plant window: <b>Controller, Translate</b></p>	<p>Translate generates the C-Bus controller files and skeleton E-bus controller files that are later populated by E-Vision.</p>
<p>19. Export C-Bus Mapped Point Information from CARE.</p>	<p><b>Project, Export to E-Vision</b></p>	<p>Select the Excel 10-ZM project to export. The Export Zone Manager dialog box displays. See the next section for a description. Exported files have the extension .ZMX and are stored in the CARE directory.</p>

**Mapped Point Plant Note**

The Excel 10 Mapped Point Plant Backup file is a predefined CARE plant that contains standard point mappings. When E-Vision is installed, it places one backup file for each Excel 10 controller type into the CARE directory. Plants are named the same as the controller they represent with a PLT extension, for example, FCU2S.PLT (Fan Coil unit) and CVA1E.PLT (Constant volume AHU). Note that the 5<sup>th</sup> character is either S for International System of Units (SI, also known as metric) or E for English units of measurement.

In addition there are new “default” files required to work with these plants. These default files are as follows:

- E-VISION.ADL
- E-VISION.ALX
- E-VISION.ID
- E-VISION.KDX
- E-VISION.KLX
- E-VISION.PHX

These default files are installed in C:\CARE\PCBSTD\EL\_1.1 by the E-Vision installation program.

**Plant Name Changes**

If a plant name is changed in CARE and reimported into E-Vision, E-Vision cannot track this change and mapping errors will result in the plant to device C-bus point mapping. If it is necessary to rename a plant in CARE, manually unmap the plant in E-Vision from all relationships, then reimport the modified CARE data. Complete the plant to device C-bus point mapping as necessary.

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## Export Zone Manager File to E-Vision

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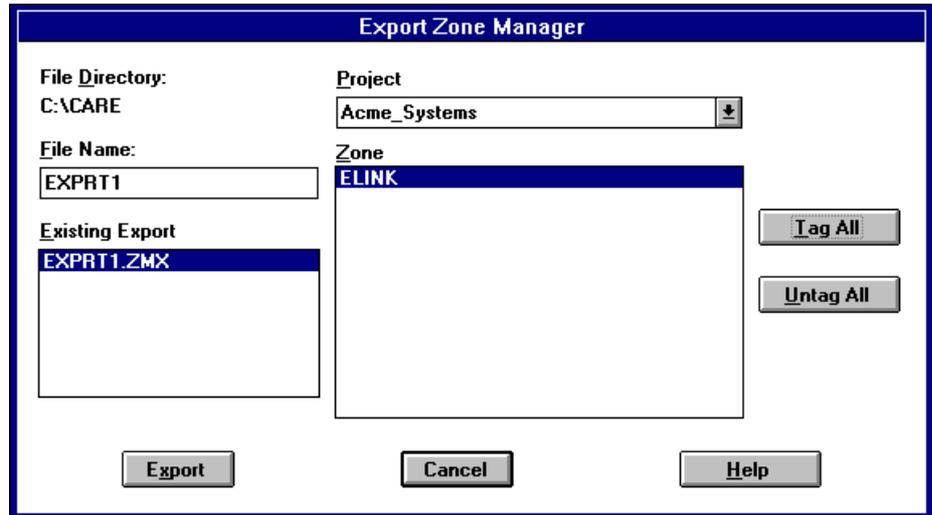
**Purpose**

Export all points from one or more Zone Managers to a user-defined file. The information in this file is used to map between C-Bus points and E-Bus points..

**Procedure**

1. Within CARE, open the Excel 10-ZM project. Select menu items Project, Export to E-Vision.

**RESULT:** The Export Zone Manager dialog box appears. File Directory displays the location of the export file; its default is the location where CARE is installed.



2. Enter or select the desired file name for the controller in E-Vision. The Existing Export box lists all ZMX files in the CARE directory. Name must be between 2 and 8 characters long and a valid DOS file name. File extension is .ZMX (for Zone Manager Export). The **Export** button is disabled if the file name is invalid.

3. In the Project field, select the CARE project that has the Excel 10-ZM Controller. Click the down arrow to view a list of projects.

**RESULT:** The Zone box lists all the Zone Managers within the project. Note that any Zone Managers that have VAV 1 controllers (Standard) assigned to them in CARE are not in this list. This omission means that you cannot create a Zone Manager in CARE, assign VAV 1 Controllers to the Zone Manager, and then also use E-Vision to assign other devices to that same Zone Manager.

4. Select one or more desired Zone Managers. To select all, click **Tag All**. To deselect all, click **Untag All**.

5. Click **Export** to perform the export. The Export button is enabled when a valid file name is entered and one or more Zone Managers are selected.

**RESULT:** Software creates the desired export file. If one already exists with the same name, a warning message appears.

#### Stand-alone Operation

You can initiate Export Zone Manager outside of CARE by executing the EXPEV.EXE file in the E-Vision directory.

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## CARE Time Schedules

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There are two acceptable methods to create time schedules to control Excel 10s. The first method is a Command Multiple relationship. The second method places points from each mapping plant directly in a time schedule.

#### Command Multiple Mechanism

1. Always remove points to be used in a Command Multiple relationship from the Mapping Plants. If a point is MAPPED, it cannot be used in a Command Multiple relationship. For instance, if SchedOcc for the CVAHU is to be used in a Command Multiple relationship, it must be deleted from the mapping plant. Follow the CARE procedure outlined earlier in this section.
2. Use the Switching Logic mode to add a VD point. Match the number of states and digital engineering units to the Excel 10 points to be controlled.
3. Place this point in a time schedule following the Time Schedule procedure outlined in the CARE literature.
4. Translate and export to E-Vision.
5. Launch E-Vision. Create and configure the network.
6. Import from CARE.

7. Select Command Multiple from the Network menu.
8. Set up a Command Multiple relationship for the time schedule point.

### Time Schedule Controlling a Mapped Point Directly

1. DO NOT delete the point to be controlled by the time schedule from the mapping plant.
2. Place this point directly in a time schedule. Multiple points can be placed in a single time schedule. Follow the Time Schedule procedure outlined in the CARE literature.
3. Translate and export to E-Vision.
4. Launch E-Vision. Create and configure the network.
5. Import from CARE.
6. Select Map C-Bus Points from the Network menu to verify that the point was automapped.

## CAUTION

*A Command Multiple relationship can only be used for controllers of the same type. For example, CVAHU and FCU controllers cannot be commanded by the same time schedule point.*

*DO NOT create a time schedule point that controls a number of Excel 10 controllers from switching logic tables. The point DestSchedOcc is related to other points. Tuncos and TodEventNext are automatically updated by the time schedule program. The point DestSchedOcc must be controlled directly from a time schedule or via a command multiple relationship in order for Tuncos and TodEventNext to update correctly.*



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## EXCEL LINK CONTROLLER

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**Purpose** Process description of engineering an Excel Link (XLink) application. Excel Link enables the connection of controllers on a Honeywell Control Network Automation Protocol ("C-NAP" or "CNAP") bus to an EXCEL 5000 C-bus. C-NAP bus controllers can include Excel MicroCel, Excel MacroCel, Excel W7620, and W7600 Controllers.

**Requirements** You must be familiar with CARE software and either M-PPT software for MicroCel/MacroCel Controllers or ZM 7601, 3, or 4 software for W7620/W7600 Controllers.

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### Steps

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**Step 1** CARE configuration of Excel Link plant and subsystem plants

**Step 2** Subsystem controller configuration

**Step 3** Excel Link Configurator/Mapper

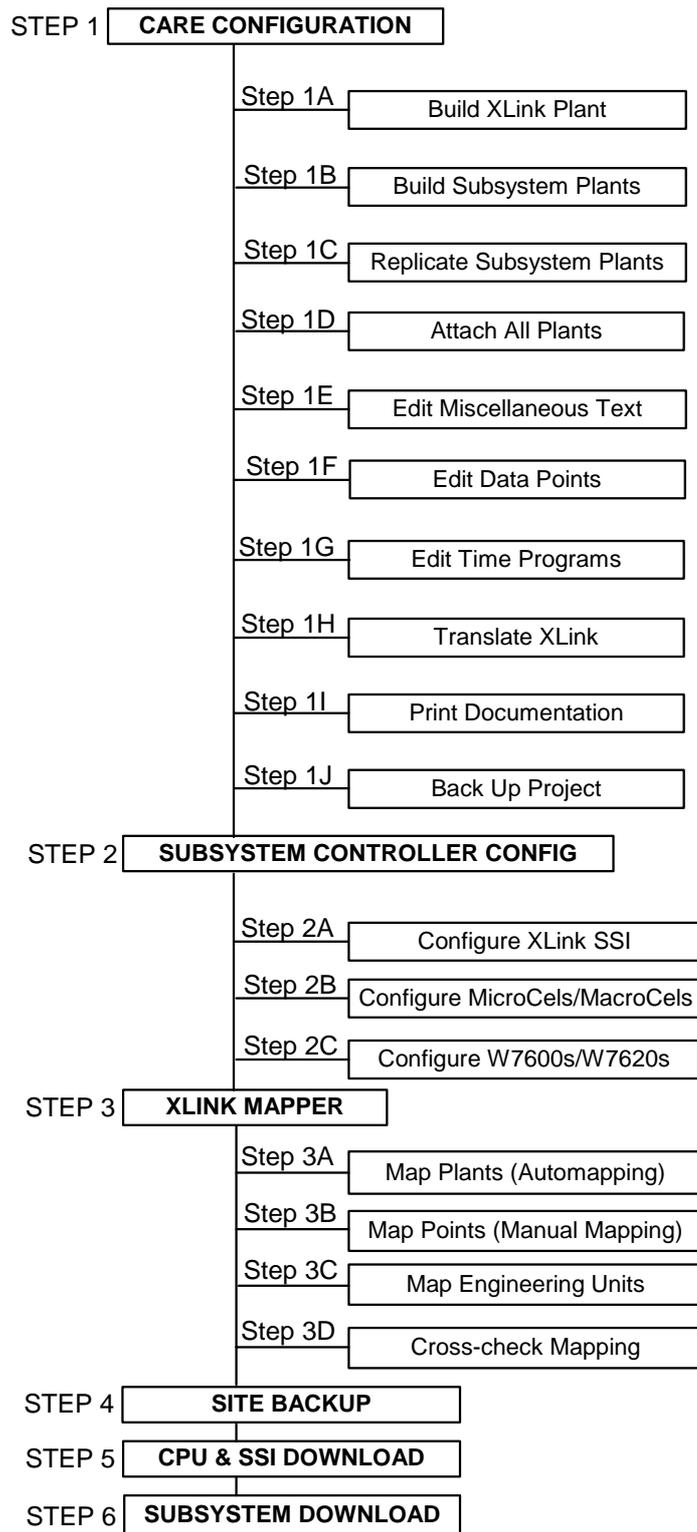
**Step 4** Subsystem site backup

**Step 5** Excel Link CPU and SSI download

**Step 6** Subsystem controller download

Steps 1 through 4 are "off-line" procedures that you can do without the controller. Steps 5 and 6 are "on-line" procedures that require the controller.

**Excel Link Flowchart** The following flowchart diagrams the necessary steps and sub steps.



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## Step 1 CARE Configuration

**Purpose** Define an Excel Link plant and its schematic, control strategy, and switching logic. Then, define subsystem plants (MicroCel/MacroCel, W7600, and/or W7620) and their schematics. Control strategies and switching logic for the subsystem plants are not necessary. Finally, complete the CARE process through the documentation step and back up the completed project.

This section details the required CARE steps as follows:

- Step 1A** Build the Excel Link plant.
- Step 1B** Build the subsystem plants.
- Step 1C** Replicate the subsystem plants.
- Step 1D** Attach the plants to the Excel Link controller.
- Step 1E** Edit Excel Link descriptors, messages, engineering units, and I/O characteristics in the Excel Link controller.
- Step 1F** Edit Excel Link points.
- Step 1G** Set up Time Programs in the Excel Link controller.
- Step 1H** Translate Excel Link controller.
- Step 1I** Print documentation.
- Step 1J** Back up project.

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### Step 1A Build the Excel Link Plant

**Procedure** The CARE process for Excel Link controllers is nearly the same as for other C-bus controllers. The following paragraphs detail the CARE process and note where there are Excel Link options.

**Project and Plant Definition** Define a project as usual.

Define a plant as usual. Select XLINK as plant type. It may be useful to name the plant to identify it as the Excel Link plant, for example, XLINK01.

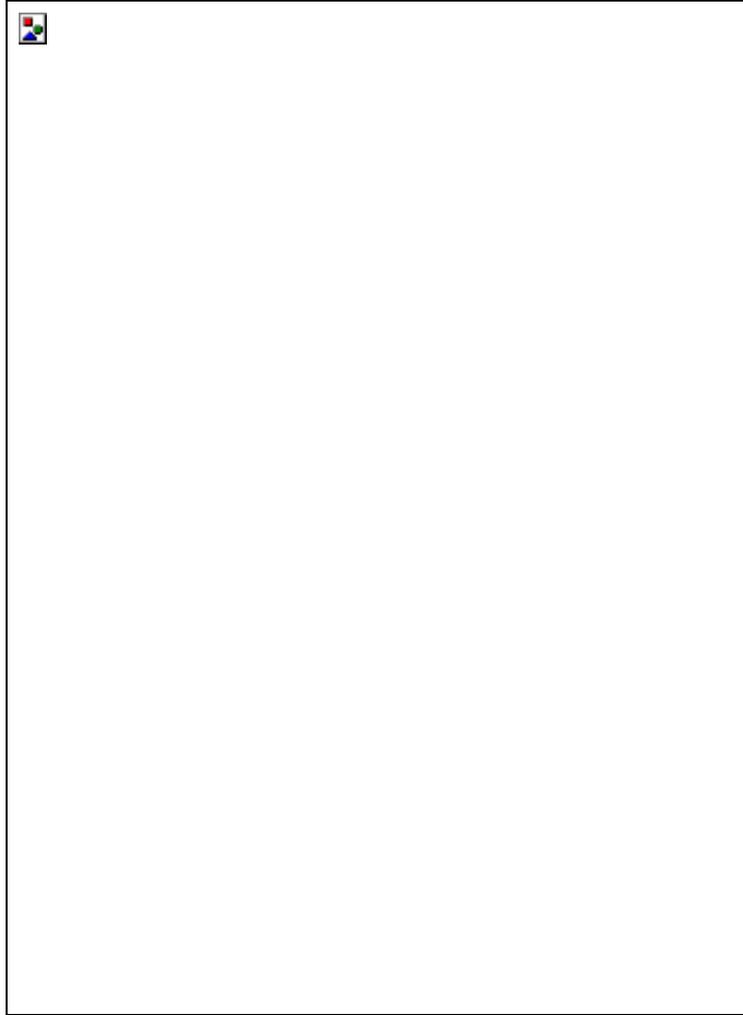
This plant is optional and contains the "system" points to be mapped from the C-bus to the C-NAP bus and vice versa. Typical mapping points are outdoor air temperature, discharge air temperature, bypass, morning warm-up, min/max/average space temperature, occupancy/nonoccupancy, and restore/shed. Later, you manually map these points via the XLink Configurator/Mapper.

**Schematic** Create a plant schematic by selecting segments that meet the point requirements of the subsystem. These segments (listed by controller type) have simple elements that represent the points you need to map to and from the C-bus. Use the Point without graphic function if you need to map a point not represented in the segment lists.

If there are global input points (for example, DaTemp, Warmup) in the Xlink CPU that come from another C-bus controller, they cannot be directly mapped to a C-NAP point. You must run them into IDT icons and out to a pseudopoint. Then, map the pseudopoint to the C-NAP point.

**Control Strategy** If required, create a control strategy for the plant. Control strategy rules are the same for Excel Link plants as they are for other plants. Control sequences that cannot be accomplished in the subsystem controllers can reside in this plant.

You cannot directly map global input points (for example, DaTemp, Warmup) in the Xlink CPU that come from a C-bus controller to a C-NAP point. You must input them to IDT icons and output them to a pseudopoint. Then, map the pseudopoint to a C-NAP point.

**Switching Logic**

If required, create switching logic for the plant. Switching logic rules are the same for Excel Link plants as they are for other plants.

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**Step 1B Build the Subsystem Plants**
**Procedure**

The CARE process for subsystem controllers is similar to that for other C-bus controllers. Note that control strategy and switching logic are not required.

**Project and Plant Definition**

Use the same project as set up for the Excel Link plant.

Define a new plant as usual. Name the plant the same as (or similar to) its corresponding controller on the C-NAP bus. For example, name the plant Rm102 for a C-NAP controller located in Room 102. To save time later, make the plant and controller names identical. If the names are not identical, you have to match each plant to its corresponding controller when you use the Excel Link Configurator/Mapper.

- Plant name plus any point user addresses within the plant must not exceed 18 characters. CARE truncates user addresses to 18 characters. The Replicator (Step 1C) combines each point user address with its plant name to form a complete user address.

Select the appropriate plant type (W7620 VAV, W7620 WSHP, MicroCel, or MacroCel). Use standard Air Conditioning or Chiller Water plants for W7600 applications.

- Points generated in these plant schematics are associated with specific C-NAP point numbers. If you use custom programs or modified standard programs in a C-NAP controller, automapping (Step 3) may not be accurate.

The following tables list the C-NAP point numbers associated with each CARE element that is automapped in ZM5001. The CARE User Address column lists default user addresses. You can modify these addresses in CARE without affecting the automapping function.

- Table 1.: MacroCel Automapping
- Table 2.: MicroCel Automapping
- Table 3.: W7620 Variable Air Volume (VAV) Automapping
- Table 4.: W7620 Water Source Heat Pump (WSHP) Automapping

**Schematic** Create a plant schematic. Select segments that represent the equipment the zone controller is handling. Excel Link can map a total of 768 points. Do not exceed this number when building the schematics.

For W7620, MicroCel, and MacroCel controllers only, use the Optional Points segment to add other points associated with the controller.

Use Modify user address under the **Edit** menu item to change default user addresses, if needed. As noted in the Project and Plant Definition note, the Replicator combines plant name and user addresses. The combination user address must not exceed 18.

Use **Point Without Graphic** under the **Edit** menu item to add points not represented by a standard segment.

**Control Strategy** Not required for W7600, W7620, MicroCel, and MacroCel plant types. The subsystem controller is self-sufficient.

**Switching Logic** Not required for W7600, W7620, MicroCel, and MacroCel plant types. The subsystem controller is self-sufficient. If you need to create pseudopoints that are not covered in a schematic element, Switching Logic is a convenient place to do so. Select Software Points, create the names, and exit Switching Logic without saving the switching table.

**TABLE 1: MACROCEL AUTOMAPPING**

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
Dampers	1. Outdoor Air Modulating	MaDmpr	22
	2. Outdoor Air 2-Position	MaDmpr	8
	3. Outdoor Air Floating Series 60	MaDmpr	61
Coils-Pre Heat	1. Analog Modulating	PrehtVlv	71
	2. Analog Floating (series 60)	PrehtVlv	71
Coils-Heating	1. Analog Modulating	HtgVlv	71
	2. Analog Floating (series 60)	HtgVlv	71
Coils-Cooling	1. Analog Modulating	ClgVlv	70
	2. Analog Floating (series 60)	ClgVlv	70
Supply Fan	1. Digital Status	SaFanStatus	56
	2. Variable Volume	SaFanVane	23
	2. Analog Sensor	SaFanDiffPres	11
Return Fan	1. Digital Status	RaFanStatus	58

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
	2. Variable Volume	RaFanVane	17
	2. Analog Sensor	RaFanDiffPres	40
Time-EMS	1. Standard Stop/Stop Schedules 1	SsSched1	95
	2. Standard Stop/Stop Schedules 2	SsSched2	96
	3. Unoccupied Override via Mark Time	UnoccOvrd	32
	4. Unoccupied Override via PB	UnoccOvrd	3
	5. Night Cycle Control	NightCycle	87
Filter-Return Air	1. Status/Alarm Contact	RaFiltAlm	62
	2. Differential Pressure Sensor	RaFiltPres	37
Filter-Supply Air	1. Status/Alarm Contact	SaFiltAlm	62
	2. Differential Pressure Sensor	SaFiltPres	37
Humidifier	1. Humidifier	DaHumidVlv	19
Discharge Air Setpoints (SPTS)	1. Outdoor Air Reset High	OaRstHi	75
	2. Outdoor Air Reset Low	OaRstLo	76
	3. Reset Setpoint High	DaRstHi	74
	4. Reset Setpoint Base	DaRstBase	73
	5. Return Air Reset High	RaRstHi	75
	6. Return Air Reset Low	RaRstLo	76
	7. Discharge Reset Enable	DaRstEn	77
	8. Auto Setpoint	DaTempAutoStpt	72
	9. Manual Setpoint	DaTempManStpt	73
Mixed Air Setpoints (SPTS)	1. Outside Air Reset High	MaOaRstHi	66
	2. Outside Air Reset Low	MaOaRstLo	67
	3. Reset Setpoint High	MaRstHi	65
	4. Reset Setpoint Base	MaRstBase	64
	5. Return Air Reset High	MaRaRstHi	66
	6. Return Air Reset Low	RaMaRstLo	67
Temperature Sensors	1. Mixed Air	MaTemp	49
	2. Discharge Air	DaTemp	50
	3. Return Air	RaTemp	55
	4. Outside Air	OaTemp	48
	5. Space	RmTemp	53
Humidity Sensors	1. Return Air	RaRh	25
	2. Discharge Air	DaRh	14
	3. Outside Air	OaRh	31
Static Pressure Sensor	1. Discharge	DaPres	11

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
CO2 Sensors	4. Return Air CO2 Sensor	RaCo2	34
Safeties	1. Freezestat Alarm	LoTempLim	38
	2. Fire Stat or High Temp Status	HiTempLim	26

TABLE 2: MICROCEL AUTOMAPPING

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
Single Duct Pressure Independent	1. Flow Only	DuctFlo	60
	2. Setpoint Only	DuctFloStpt	61
	3. Flow + Setpoint	DuctFlo	60
	3. Flow + Setpoint	DuctFloStpt	61
Single Duct Pressure Dependent	1. Flow Setpoint (Damper)	DmprFlowStpt	61
Dual Duct Pressure Independent	1. Cold + Hot Duct Flow Only	ClgDuctFlo	60
	1. Cold + Hot Duct Flow Only	HtgDuctFlo	69
	2. Cold + Hot + Total Flow Only	ClgDuctFlo	60
	2. Cold + Hot + Total Flow Only	HtgDuctFlo	69
	2. Cold + Hot + Total Flow Only	DuctFlo	59
	3. Cold + Hot Duct Setpoint Only	ClgDuctStpt	61
	3. Cold + Hot Duct Setpoint Only	HtgDuctStpt	70
	4. 2 + 3	ClgDuctFlo	60
	4. 2 + 3	HtgDuctFlo	69
	4. 2 + 3	ClgDuctFloStpt	61
	4. 2 + 3	HtgDuctFloStpt	70
	4. 2 + 3	DuctFlo	59
	5. Total Flow Only	DuctFlo	59
Single Duct Damper Actuator	1. Position Only	DuctDmprPos	62
	2. Control Only	DuctDmprCtrl	63
	3. Position + Control	DuctDmprPos	62
	3. Position + Control	DuctDmprCtrl	63
Dual Duct Damper Actuator	1. Position Only	ClgDmprPos	62
	1. Position Only	HtgDmprPos	71
	2. Control Only	ClgDmprCtrl	63
	2. Control Only	HtgDmprCtrl	72
	3. Position + Control	ClgDmprCtrl	63
	3. Position + Control	HtgDmprCtrl	72
	3. Position + Control	ClgDmprPos	62
	3. Position + Control	HtgDmprPos	71
Terminal Fan - Series	1. Output By Point 8	TermFan	8
	2. Output By Point 16	TermFan	16

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
Terminal Fan - Parallel	1. Output By Point 8	TermFan	8
	2. Output By Point 16	TermFan	16
Terminal Heat - Electric	1. One Stage	HtgStg1	9
	2. Two Stages	HtgStg1	9
	2. Two Stages	HtgStg2	16
	3. Three Stages	HtgStg1	9
	3. Three Stages	HtgStg2	16
	3. Three Stages	HtgStg3	17
Terminal Heat - Modulating	1. Position Only	HtgVlvPos	70
	2. Control Only	HtgVlvCtrl	71
	3. Position + Control	HtgVlvCtrl	71
	3. Position + Control	HtgVlvPos	70
Room Temperature	1. Temperature Only	RmTemp	49
	2. Setpoint Only	RmTempStpt	50
	3. Temperature + Setpoint	RmTemp	49
	3. Temperature + Setpoint	RmTempStpt	50
Miscellaneous - Flow Setpoints	1. Max Cooling Setpoint	MaxClgStpt	64
	2. Min Cooling Setpoint	MinClgStpt	65
	3. Reheat (Max) Heat Setpoint	MaxHtgStpt	66
	4. Min Heating Setpoint	MinHtgStpt	67
	5. Fan Flow Control Setpoint	FanFloStpt	68
Miscellaneous - Temperature Setpoints	1. Local Setpoint	LocRmStpt	51
	2. Remote Setpoint	RmTempRemStpt	2
	3. Occupied Cooling Setpoint	OccClgStpt	51
	4. Unoccupied Cooling Setpoint	UnoccClgStpt	53
	5. Occupied Heating Setpoint	OccHtgStpt	52
	6. Unoccupied Heating Setpoint	UnoccHtgStpt	54
Miscellaneous - Energy Monitoring	1. Cooling BTU	ClgBtu	72
	2. Heating BTU	HtgBtu	73
	3. Override Runtime (Cooling)	ClgOvrRunTime	74
	4. Override Runtime (Heating)	HtgOvrRunTime	75
	5. Percent Terminal Load	PctTermLoad	94

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
Miscellaneous	1. Occupied Status	OccStatus	55
	2. Control Status	HtgClgStatus	47
	3. Override Max Duration	OvrdMaxDur	57

**TABLE 3.: W7620 VARIABLE AIR VOLUME (VAV) AUTOMAPPING**

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
Single Duct Pressure Independent	1. Flow Only	DuctFlo	61
	2. Setpoint Only	DuctFloStpt	62
	3. Flow and Setpoint	DuctFlo	61
	3. Flow and Setpoint	DuctFloStpt	62
Dual Duct Pressure Independent	1. Cold + Hot Deck Flow Only	ClgDuctFlo	61
	1. Cold + Hot Deck Flow Only	HtgDuctFlo	65
	2. Cold + Hot Deck + Total Flow Only	ClgDuctFlo	61
	2. Cold + Hot Deck + Total Flow Only	HtgDuctFlo	65
	2. Cold + Hot Deck + Total Flow Only	DuctFlo	60
	3. Cold + Hot Deck Setpoint Only	ClgDuctStpt	62
	3. Cold + Hot Deck Setpoint Only	HtgDuctStpt	66
	4. 2 And 3	ClgDuctFlo	61
	4. 2 And 3	HtgDuctFlo	65
	4. 2 And 3	ClgDuctFloStpt	62
	4. 2 And 3	HtgDuctFloStpt	66
	4. 2 And 3	DuctFlo	60
Single Duct-Damper Actuator	1. Position Only	DuctDmprPos	63
	2. Control Only	DuctDmprCtrl	64
	3. Position And Control	DuctDmprPos	63
	3. Position And Control	DuctDmprCtrl	64
Dual Duct-Damper Actuator	1. Position Only	ClgDmprPos	63
	1. Position Only	HtgDmprPos	67
	2. Control Only	ClgDmprCtrl	64
	2. Control Only	HtgDmprCtrl	68
	3. Position + Control	ClgDmprCtrl	64
	3. Position + Control	HtgDmprCtrl	68
	3. Position + Control	ClgDmprPos	63
	3. Position + Control	HtgDmprPos	67
Terminal Fan-Series	1. Program S1	TermFan	9
	2. Program S2	TermFan	8
	3. Program S3	TermFan	18
	4. Program S4	TermFan	7
Terminal Fan-Parallel	1. Program S1	TermFan	9

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
	2. Program S2	TermFan	8
	3. Program S3	TermFan	18
	4. Program S4	TermFan	7
Terminal Heat-Electric	1. One Stage	HtgStg1	8
	2. Two Stages	HtgStg1	8
	2. Two Stages	HtgStg2	16
	3. Three Stages	HtgStg1	8
	3. Three Stages	HtgStg2	16
	3. Three Stages	HtgStg3	17
Terminal Heat-Modulating	1. Position Only	HtgVlv	67
	2. Control Only	HtgVlvCtrl	68
	3. Position + Control	HtgVlvCtrl	68
	3. Position + Control	HtgVlv	67
Space Sensor	1. Temperature Only	RmTemp	1
	2. Setpoint Only	RmTempStpt	50
	3. Temperature + Setpoint	RmTemp	1
	3. Temperature + Setpoint	RmTempStpt	50
Optional-Flow Setpoints	1. Maximum Cooling Setpoint	MaxClgFloStpt	71
	2. Minimum Cooling Setpoint	MinClgFloStpt	72
	3. Maximum Reheat Setpoint	MaxRhtFloStpt	73
	4. Minimum Reheat Setpoint	MinRhtFloStpt	74
Optional-Temperature Setpoints	1. Local Temp Setpoint	LocTempStpt	50
	2. Remote Temp Setpoint	RemTempStpt	2
	3. Occupied Heating Setpoint	OccHtgStpt	52
	4. Unoccupied Heating Setpoint	UnoccHtgStpt	54
	5. Unoccupied Cooling Setpoint	UnoccClgStpt	53
	6. Occupied Cooling Setpoint	OccClgStpt	51
Optional-Miscellaneous	1. Heating/Cooling Mode	HtgClgMode	47
	2. Occupied Status	OccStatus	56
	3. Terminal Load	TermLoad	59

TABLE 4.: W7620 WSHP AUTOMAPPING

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
Water Coil	1. Water Coil	HtgClgMode	47
	1. Water Coil	StagesOn	96
Zone Coil	1. Fan Start/Stop DO #6	HtgPumpFan	6
	2. Fan Start/Stop DO #16	HtgPumpFan16	16

Segment Name	CARE Schematic Element Name	CARE User Address	CNAP Pt. No.
Space Sensor	1. Temperature Only	RmTemp	1
	2. Setpoint Only	RmTempStpt	50
	3. Temperature + Setpoint	RmTemp	1
	3. Temperature + Setpoint	RmTempStpt	50
Optional Points	1. Resistive Input A	RstrInptA	10
	2. Voltage Input A	VoltInA	11
	3. Digital Input A	DigInA	12
	4. Resistive Input B	RstrInptB	13
	5. Voltage Input B	VoltInB	14
	6. Digital Input B	DigInB	15
	7. Remote Temp Setpoint	RmtRmStpt	2
	8. Occupied Clg Setpoint	OccClgStpt	51
	9. UnOccupied Clg Setpoint	UnoccClgStpt	53
	A. Occupied Htg Setpoint	OccHtgStpt	52
	B. UnOccupied Htg Setpoint	UnoccHtgStpt	54
	C. Setpoint Select	StptSelect	48

**Step 1C Replicate the Subsystem Plants**

**Purpose** To easily create more subsystem plants, duplicate the ones you created Step 1B. This step is optional; use if convenient.

**Procedure** For more details and examples of the replication process, please refer to the "Replicate Plants" section

**Step 1D Attach the Plants to the Excel Link Controller**

**Purpose** Attach the Excel Link plant and the replicated plants to the Excel Link controller.  
 When creating a plant it is automatically attached to the selected controller. When replicating attached plants they will be automatically detached and must be re-attached afterwards. To create unattached plants in the beginning, the project, instead of the controller must be selected. Plants can be detached or re-attached by simply dragging&dropping them to the desired destination (controller, project)

**Procedure**

1. To attach a plant, click on the unattached plant in the logical plant tree,
2. Drag the unattached plant to the controller, which you want attach the plant to, and drop it.

RESULT: The Plant will be added one level below the controller in the logical plant tree.

Software creates links between the Excel Link plant and the subsystem plants.

For detailed information on attaching/detaching plants, see "Attach/Detach Plant" section.

**Step 1E Edit Excel Link Point Characteristics**

<b>Purpose</b>	Customize point descriptors, alarm messages, engineering units, and I/O characteristics as desired.
<b>Procedure</b>	See "Miscellaneous Text Editor" section.
<b>I/O Characteristics</b>	Make sure there are linear I/O characteristics that cover the types of ranges that can occur for each analog input and analog output point to be attached to the Excel Link controller. If you have VAV boxes, you need to create a characteristic with a span which covers the CFM range of your job.

**Step 1F Edit Excel Link Points**

<b>Purpose</b>	Customize point attributes as desired.
<b>Procedure</b>	see "Datapoint Editor" section for details.
<b>Alarm Delays</b>	All CARE points that are mapped to a C-NAP alarming point must have the CARE 'Alarm Delay' attribute set to ZERO seconds. This rule applies to digital alarm points and analog input points with high and low limits. The Excel Link SSI controller has an inherent unprogrammable alarm delay of approximately 1 to 120 seconds, depending on the size of the application and when the alarm point was last read by the SSI. Digital points for status, not alarm, can have a time delay as usual.
<b>Engineering Units</b>	All points require an engineering unit. You can set up bus-to-bus engineering unit conversion in Step 3C. For example, a point can read in degrees Fahrenheit on the C-NAP bus and in degrees Celsius on the C-bus.
<b>I/O Characteristic</b>	Choose an I/O characteristic that has a span that covers the range of the C-NAP point.
<b>Alarm Delay</b>	If a point will be generating an alarm, the delay time MUST be set to zero.
<b>Other Point Attributes</b>	All other point attributes, for example, trending, runtime, descriptors, alarm limits, apply to Excel Link points in the same way as C-bus points.

**Step 1G Set Up Time Prog in Excel Link Controller**

<b>Purpose</b>	Set up scheduling functions as desired.
<b>Procedure</b>	See "Time Programs" section for details.
<b>NOTE</b>	Set up Time Programs just as you would for non-Excel Link plants. Time Programs for the central air handling unit plant(s) that serve the subsystem controllers attached to the Excel Link plant must reside here (if you are using SSI TOD Programs). The C-NAP subsystem controllers need the occupancy/nonoccupancy points associated with these Time Programs.

**IMPORTANT**

*The SSI TOD program assumes its CARE schedule point's active state represents occupied mode whether the active state attribute is 1 or 0. This assumption cannot be changed.*

*For the CARE schedule point, assign CARE engineering unit 17 (Occupied/active, Unoccupied/passive). It is recommended to set the CARE schedule point's active state to 1 to correctly match the C-NAP NFO point and set up these values: Occ=1=Active=On and Unocc=0=Passive=Off.*

**Step 1H Translate Excel Link Controller**

<b>Purpose</b>	Convert the plants to code.
<b>Procedure</b>	See "Translate Controller" in "Basic Steps" section.

---

**Step 1I Print Documentation**

See "Documentation" section for details on documentation in general.

---

**Step 1J Back Up Excel Link Project**

**Purpose** Copy ("back up") project to disk to save it before proceeding to the next step.

This step is not required, but is recommended.

See "File Management" section for procedure.

**IMPORTANT**

*If you make CARE and ZM7604 backups to be restored together later, make sure they are backed up together. If you back up one and then make changes to the other and back it up, the Excel Link may produce numerous alarms during start-up.*

---

**Step 2 Subsystem Controller Configuration**

**Purpose** Set up the files for the subsystem controllers. Depending on controller types, there are two or three steps to do this with Step 2A required in all cases:

**Step 2A Subsystem Interface Setup**

Set up the Excel Link controller subsystem interface (SSI). This step is required no matter which subsystem controllers are on the C-NAP bus.

**Step 2B MicroCel/MacroCel Controller Setup**

If there are MicroCel/MacroCel controllers on the C-NAP bus, do "MPPT" application programming, configuration, and loading.

**Step 2C W7620 Controller Setup**

If there are W7600 or W7620 controllers on the C-NAP bus, set up the files for these controllers.

**Requirement** The starting point for each step is the Excel Link controller, that is, first select the Excel Link controller in the logical plant tree.

---

**Step 2A Subsystem Interface Setup**

**Purpose** Set up the Excel Link controller (SSI) for the interface to the subsystem controllers. This step is required no matter which subsystem controllers are on the C-NAP bus. See ZM7604 Excel Link SSI CNAP Configurator and ZM5001 CNAP Configurator User's Guide 74-5588 for more information.

- Procedure**
1. Select the Excel Link controller in the logical plant tree. Click the Controller menu item, then drop-down items Tools, Xlink ZM 7604 Configuration.
  2. Select **Configure**, then drop-down item **Site**.
  3. Enter a new site name, for example, XLink01. A site corresponds to one C-NAP bus.

**Rules:** Project name must be exactly the same as the project name in CARE.

Site Name can be the same as the Excel Link controller name in CARE to clarify the relationship.

4. Select menu item **Configure**, then drop-down item **System**. This information applies only to the PC software, not the controllers. Change if necessary.

5. Select menu item **Configure**, then drop-down item **Communications**. Click the appropriate communication port. This setting is for downloading (writing) to the Excel Link controller.
6. Select menu item **File**, then drop-down item **Open Site**. Select the Excel Link site.
7. Select menu item **Configure**, then drop-down item **Controller**. Select **New Controller**. Type equal to XLink.

The Excel Link controller name can be the same as the site name.

Type the C-NAP Network Number (same as C-bus node number), range is 1-30. C-NAP Node Number range is 1-3. Always use 1 because the Excel Link must be the C-NAP master. These settings must match the DIP switches on the SSI hardware.

Program the Global Assignments for points such as outdoor air temperature, discharge air temperature, bypass, morning warm-up, occupancy/nonoccupancy, and restore/shed. There are defaults for these points. Modify them, as necessary.

### CAUTION

*If you are going to program global points in M-Cel Point Programming (MPPT, Step 2B), be aware that they use the same global point numbers as listed in the SSI. There will be a conflict if you configure a global point function in MPPT that uses a number already being used for a different function in the SSI.*

8. At this point, configure the subsystem controllers as described in "Step 2B MicroCel/MacroCel Controller Setup" and "2C". Then, return to this procedure and complete Steps 9 through 12.
9. Select menu item **Configure**, then drop-down item **Controller Groups**. Group controllers in a logical manner, for example, by AHU or zone.
10. If desired, select menu item **Configure**, then drop-down item **Point Groups**. This step is optional. You can use point groups to view one group of points by selecting only one point, using the ZM7604 software on-line.
11. Select menu item **Configure**, then drop-down item **Controller**. Select XLink. In the Command Center, set up Alarm Conditions as usual for C-NAP. Use this window to configure unmapped point alarms to show up as critical alarms on the C-bus. Otherwise, unmapped point alarms show up as noncritical on the C-bus. See ZM7604 Excel Link SSI CNAP Configurator and ZM5001 CNAP Configurator User's Guide 74-5588 for more details.

Alarm messages operate as follows:

Only the present value of a subsystem (C-NAP) point transfers across the Excel Link to the C-bus. You program all alarming attributes (high alarm, low alarm, etc.) in CARE. For a type of alarm like Sensor Open, the C-NAP generic alarm text and C-bus system alarm descriptor appears on the C-bus. A user must connect to the site with ZM7604 to pinpoint the problem sensor.

12. Also in the Command Center, select TOD Input/Output. Create a time-of-day (TOD) program for each zone, or controller group, as necessary. TOD programs apply only to W7620 Controllers, not MicroCel/MacroCels.
13. Also in the Command Center, set up Data Sharing as usual for C-NAP bus points ONLY. Data Sharing here does not apply to mapped points. See Excel Link System Engineering Manual 74-5591 for details on data sharing.

---

## Step 2B MicroCel/MacroCel Controller Setup

**Purpose** Set up the MicroCel/MacroCel controller files for the interface to the Excel Link. This step is required only when MicroCel/MacroCel controllers are on the C-NAP bus.

Note that DeltaNet M-Cel PPT (MPPT) software must be properly installed and your PC must have sufficient base memory in order to run MPPT.

**Procedure** 1. Select the Excel Link controller in the logical plant tree. Click the Controller menu item, then drop-down items Tools, Xlink MPPT Configuration.

RESULT: The *M-PPT* window opens.

2. Perform typical off-line application programming, configuration, and loading as detailed in DeltaNet M-Cel PPT Software User Guide 77-0165, "Excel Link" Mapper section.

Give each controller the exact same name as its corresponding Plant Name assigned in CARE when you replicated the plants, if you plan to automap the MicroCel/MacroCel points.

Remember that MPPT point programming must match the CARE schematic for automapping to be accurate. If you do not use standard MicroCel/MacroCel programs, do not plan on automapping.

### Step 2C W7600/W7620 Controller Setup

**Purpose** Set up the W7600/W7620 controller files for the interface to the Excel Link. This step is required only when W7600 or W7620 controllers are on the C-NAP bus.

**Procedure** 1. Select the Excel Link controller in the logical plant tree. Click the Controller menu item, then drop-down items Tools, Xlink ZM 7604 Configuration.

RESULT: The *ZM7604* main menu displays.

2. Select **File**, then drop-down item **Open Site**. Select the Excel Link site.

RESULT: The *ZM7604* main menu redisplay.

3. Select menu item **Configure**, then drop-down item **Controller**. Select **New Controller**. Select applicable Controller Type. Assign the controller the same name as the plant name assigned in CARE when you replicated the plants.

NOTE: For W7600s, see ZM7604 User Guide 74-5588 for configuration information. The rest of this step applies to W7620s.

Assign Serial Number and C-NAP Node Number.

Choose the Algorithm and Copy Sample as required. Choices here must match the choices made when creating the plant in the CARE schematic. If not, there will be errors when writing (downloading) the software application to the controller because the software application will not match the hardware configuration.

4. Select Globals and click **Add** to assign them to the corresponding controller points. Scroll through the **Global** list box to find the appropriate points.

Set the **Global Assignment Mode** to 'All W7620's' in a Controller Group to repeat this function for all controllers in the same controller group. After you set this field, you only need to enter this window once for each controller group.

5. Program the Setpoints, Parameters, Inputs, and Outputs as required.

To copy this controller configuration to others in the same controller group, create a New Sample of the one just programmed, back out, and make a New Controller and then for that new controller, do a Copy Sample of the original. Repeat as many times as necessary. This step is optional.

6. Exit.

---

## Step 3 Excel Link Configurator/Mapper

**Purpose** Match CARE plants to their corresponding C-NAP controllers. You can also manually map points that were not automatically mapped during the plant-controller matchup and convert engineering units, for example, English to Metric and vice versa. Finally, you can cross-check to verify the Excel Link Configurator/Mapper actions.

The following sections detail Excel Link Configurator/Mapper functions.

Perform each one in the order listed:

- Step 3A Plant-Controller Matchup
- Step 3B User Address-Point Manual Mapping
- Step 3C C-NAP to Eng Unit Conversion Mapping
- Step 3D Configurator Cross-Check

The starting point for each step is the Excel Link controller, that is, first select the Excel Link controller in the logical plant tree.

### CAUTION

*If, after mapping is complete, you use CARE or ZM7604 to make changes to the database that affect point mapping (for example, detach a plant, add a point), you must RE-DO the mapping.*

---

### Step 3A Plant-Controller Matchup

**Purpose** Match CARE plants and C-NAP controllers. During this process, the software automatically maps points between the plants and controllers. Only W7620, MicroCel, and MacroCel controllers can be automapped; W7600s cannot.

### CAUTION

*Automapping only works correctly if the subsystem controller points match the tables in Step 1B.*

- Procedure**
1. Select the Excel Link controller in the logical plant tree. Click the Controller menu item, then drop-down items Tools, Xlink ZM 5001 Mapper.
 

RESULT: A *Configurator* dialog box displays for entry of a project name and Excel Link controller name.
  2. Enter appropriate project name and Excel Link controller name.
 

RESULT: The *Mapper* window displays.
  3. Click **Plants**.
 

RESULT: A dialog box displays. The upper two list boxes are the CARE plants and C-NAP controllers that are not yet matched. The lower list box shows successfully matched plants and controllers.
  4. If the CARE plants and C-NAP controllers have identical names, click **Match Names**, then click **OK** button.
 

RESULT: The lower box displays the matches.

If the CARE plants and C-NAP controllers do not have identical names, highlight the CARE plant, highlight its corresponding C-NAP controllers, then click **Add**.

RESULT: The lower box displays the match.
  5. To unmatch a plant and controller combination, highlight the matched pair in the lower list box and click **Remove**.

RESULT: The CARE plant moves back to the upper left-hand list box and the C-NAP controller moves back to the upper right-hand list box.

6. When done, click **OK** to close the window and save the changes. Or, click **Cancel** to close the window without saving the changes.

RESULT: The window closes. If you made matches, software maps the points in the CARE plant(s) with the corresponding points in the C-NAP controller(s).

### Step 3B User Address-Point Manual Mapping

**Purpose** Map points that were not automatically mapped during the preceding step.

- Procedure**
1. Select the Excel Link controller in the logical plant tree. Click the Controller menu item, then drop-down items Tools, Xlink ZM 5001 Mapper.

RESULT: A *Mapper* dialog box displays for entry of a project name and Excel Link controller name.

2. Enter the XLink and choose menu item **Points**. Scroll through the **CARE Plant Name** box in the upper left-hand list box to choose a plant. The *All user addresses choice* is a comprehensive display.

RESULT: The *CARE User Addresses* box shows all unmapped points for the chosen plant. If you added points to the schematic for a subsystem controller using the **Point Without Graphic** option, software does not automatically map those points. The Point Without Graphic points display here. The bottom box shows all mapped points for the chosen plant (with their corresponding C-NAP points).

3. To manually map these points, highlight the CARE user address, highlight its corresponding C-NAP point, and click **Add**.

RESULT: The points move to the lower box.

4. To unmap a pair of points, highlight the mapped pair in the lower list box and click **Remove**.

RESULT: The CARE user address moves back to the upper left-hand list box and the C-NAP point moves back to the upper right-hand list box.

**C-NAP Groups/Wildcard Points Box** The Groups/Wildcard points box provides four options for accessing C-NAP points:

1. *Controller Groups* displays the names of all controller groups built during "Step 2, Subsystem Controller Configuration". To map a C-bus point to a controller group point using the Many-to-one logical statements (that is, OR, AND, AVE, MAX, and MIN), highlight the C-bus point, highlight the controller group, and click **Add**. A field of asterisks, \*, displays in the mapped point area for the C-NAP point name. Double-click the controller group again and the controllers within the group display. Double-click on any controller and its list of points displays. Click the desired point, then click **Add**. Software maps the highlighted C-bus point to this C-NAP point on all controllers within the controller group.
2. *Point Groups* displays the names of all point groups built during "Step 2, Subsystem Controller Configuration". Point groups are for viewing only; do not map these.
3. *Global Points* lists all C-NAP global points built during "Step 2, Subsystem Controller Configuration". To map a C-bus point to a C-NAP global point, highlight the C-bus point, click **Global Points**, highlight the corresponding C-NAP point, then click **Add**.

NOTE: You cannot map globals on the C-bus directly to globals on the C-NAP bus.

4. Controller: Point Wildcard Search is an easy way to use wild cards to find points on C-NAP. Use it, where it will save time, when doing manual mapping.

### Step 3C C-NAP to Eng Unit Conversion Mapping

- Purpose** Set up engineering unit conversions for points mapped from the C-NAP bus to the C-bus. For example, if a C-NAP point uses degrees Fahrenheit and you want the central PC to display in degrees Celsius, use this procedure to establish the conversion. All points that read in degrees F on C-NAP will read in degrees C on the C-bus.
- You can also set up automatic mapping of engineering units, that is, all units convert English to Metric, or vice versa.
- Procedure**
1. Select the Excel Link controller in the logical plant tree. Click the Controller menu item, then drop-down items Tools, Xlink ZM 5001 Mapper.
 

RESULT: A *Mapper* dialog box displays for entry of a project name and Excel Link controller name.
  2. Enter the XLink and choose menu item **Engineering Units**. To map a C-NAP engineering unit to a CARE engineering unit, highlight the C-NAP engineering unit, highlight the corresponding CARE engineering unit, and click **Add**.
 

RESULT: The mapped pair displays in the lower list box.
  3. To unmap a pair of engineering units, highlight the mapped pair in the lower list box and click **Remove**.
 

RESULT: The CARE engineering unit moves back to the upper left-hand list box and the C-NAP engineering unit moves back to the upper right-hand list box.
  4. To set up system-wide auto-mapping, select the appropriate CARE Units. You configured the C-NAP units during "Step 2, Subsystem Controller Configuration".

### Step 3D Configurator Cross-Check

- Purpose** Verify XLink Configurator/Mapper steps.
- Procedure**
1. Click Configurator Cross-Check.
 

RESULT: Results display. When good, back out to the **Xlink Options** menu.

### Step 4 Subsystem Site Backup

- Purpose** Save all subsystem and Excel Link Configurator/Mapper data to diskette/CD. You commission the systems from the medium via a portable PC.
- Procedure**
1. Select the Excel Link controller in the logical plant tree. Click the Controller menu item, then drop-down items Tools, Xlink ZM 7604 Configuration.
 

RESULT: The *ZM7604* main menu displays.
  2. Click **Utilities**, then drop-down item **Site Backup** from the main menu. Follow instructions on the screen.

#### **IMPORTANT**

*Make sure your ZM7604 and CARE backups are done together as compatible databases. Restoring incompatible backups can cause numerous alarms during Excel Link start-up.*

---

## Step 5 Excel Link CPU and SSI Download

- Purpose** Copy each Excel Link application program into the appropriate controller CPU. See Excel Link Checkout & Test 74-3557 for more details.
- Procedure**
1. Using the PC-to-Excel communication cable, connect the portable PC serial port (COM1 or COM2) to the Excel Link RS-232 port (see "Physically Connect to Controller" section).
  2. In CARE, with the Excel Link as the currently selected Controller, click menu item **Controller**, then submenu items **Tools** and **XL Online** (see "Download Controller" section).
  3. For the SSI download, set the C-NAP bus node switch on the SSI hardware to match the selections made in the CPU commissioning and ZM7604 SSI configuration screens.
  4. Click menu item **Controller**, then drop-down items **Tools** and **Excel Link ZM 7604 Configuration**.
  5. Click menu item **File**, then drop-down item **Open Site**.
  6. Select Excel Link site name and click **OK**.
  7. Click menu item **File**, then drop-down item **Connect**.  
RESULT: The *Site* box displays.
  8. Click **OK** button.  
RESULT: The word 'Connected' appears on the top line of the screen after a successful connection.
  9. Click menu item **File**, then drop-down item **Write Controller**. Select 'Excel Link'.
  10. In the *Write to Controller* box, select Excel Link controller name. Click the **All Files** button. Click **OK** button.  
RESULT: An *In Progress* box shows the number of requests pending.
  11. Wait until all data is downloaded to the SSI controller (about 7 minutes). The *In Progress* box displays "No requests pending" when complete. Check Total Errors. If not zero, retrace steps and repeat download.  
If download is complete and there are no errors, click **Cancel**.  
If there are problems, refer to Excel Link System Engineering Manual 74-5591 or Q7645A Excel Link Checkout & Test 74-3557.
  12. Exit ZM7604 by selecting, in sequence, **Disconnect**, **Close Site**, and **Exit** under the **File** menu item.  
RESULT: The SSI download is complete and the CARE window redisplay.

---

## Step 6 Subsystem Controller Download

- Purpose** Download subsystem controller application programs as necessary.

MicroCel/MacroCel controllers may not require a download at this time if, during their configuration in "Step 2, Subsystem Controller Configuration", they were downloaded. When the Excel Link starts running, the C-NAP bus activates and the MicroCels and MacroCels begin communicating.

For W7600 and W7620 Controller downloads, use the following procedure.

**Procedure**

1. While still connected to the Excel Link RS-232 port (previous Step 5), start CARE on the portable PC. Select the Excel Link plant. Select menu item Controller, drop-down item Xlink ZM 7604 Configuration.

RESULT: The *ZM7604* main menu displays.

2. Open the site, connect to the site, and write to subsystem controllers (procedure is the same as that in Step 5 for writing to the Excel Link SSI controller).
3. Refer to Q7645A Excel Link Checkout & Test 74-3557 to verify functionality.

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## OPEN LINK CONTROLLER

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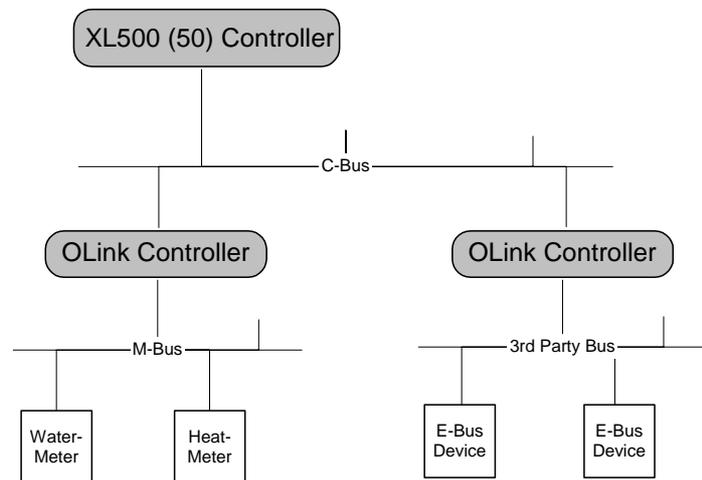
**General** The OpenLink (OLink) Controller is an application level integrator that facilitates interfacing third party HVAC controller networks (subsystem networks) into the Honeywell EXCEL 5000 system. Equipped with the appropriate vendor network interface (VNI), an OpenLink Controller provides control and/or monitoring of controller points for the subsystem controllers.

The OpenLink controller appears on the C-Bus network as any other Excel 500 controller (rev. 1.2), and occupies one of the standard 30 nodes. There can be up to 30 OpenLink controllers on a C-bus tied to 30 subsystem networks, each subsystem network can support 30 subsystem controllers.

The OpenLink Controller's CPU is configured using CARE and supports the same features as other C-Bus controllers, including schematics, control strategy, and switching logic (optional). A maximum of 768 CARE points (user addresses) can be configured in the OpenLink CPU.

The connection between the OLink controller and the subsystem network is established by the OLink interface that includes the VNI information. The OLink interface data can be stored as a template and then be reused for controllers with equivalent hardware configuration.

The OLink controller will be downloaded via B-port.




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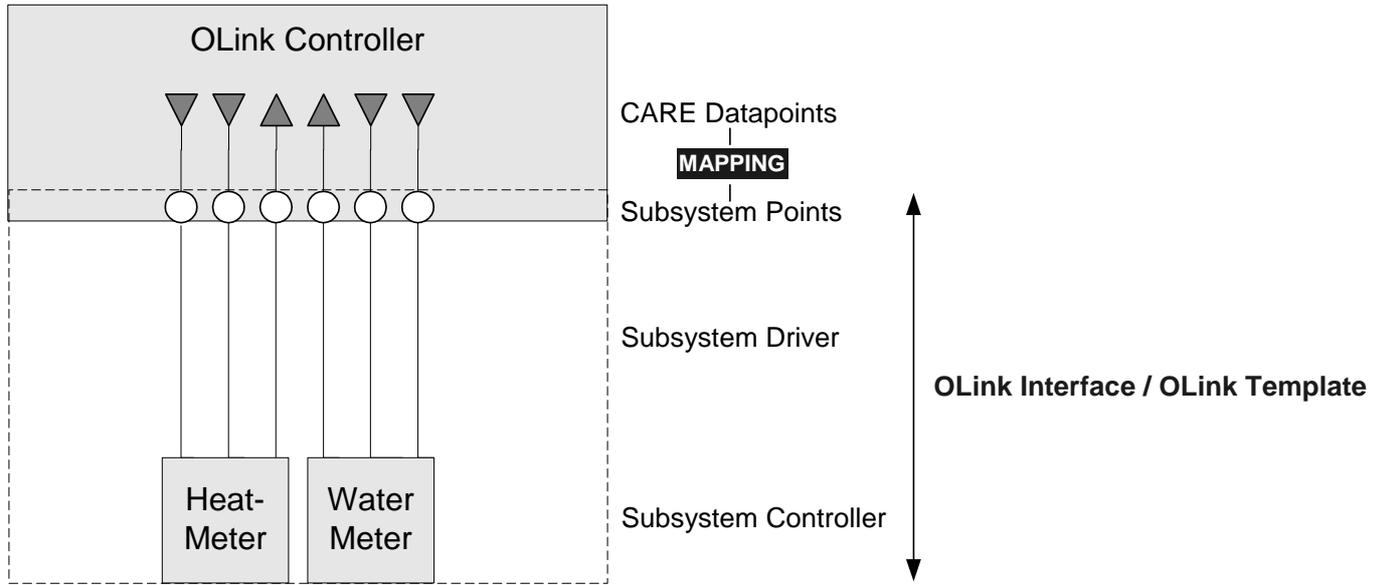
### OLink Interface/OLink Template

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The OLink interface represents a vendor-specific subsystem hardware configuration and consists of the following components:

- Subsystem driver (e.g. M-bus)
- Subsystem controllers (e.g. water meter, heat meter)
- Subsystem points = OLink points (e.g. watstat01, heatstat01)

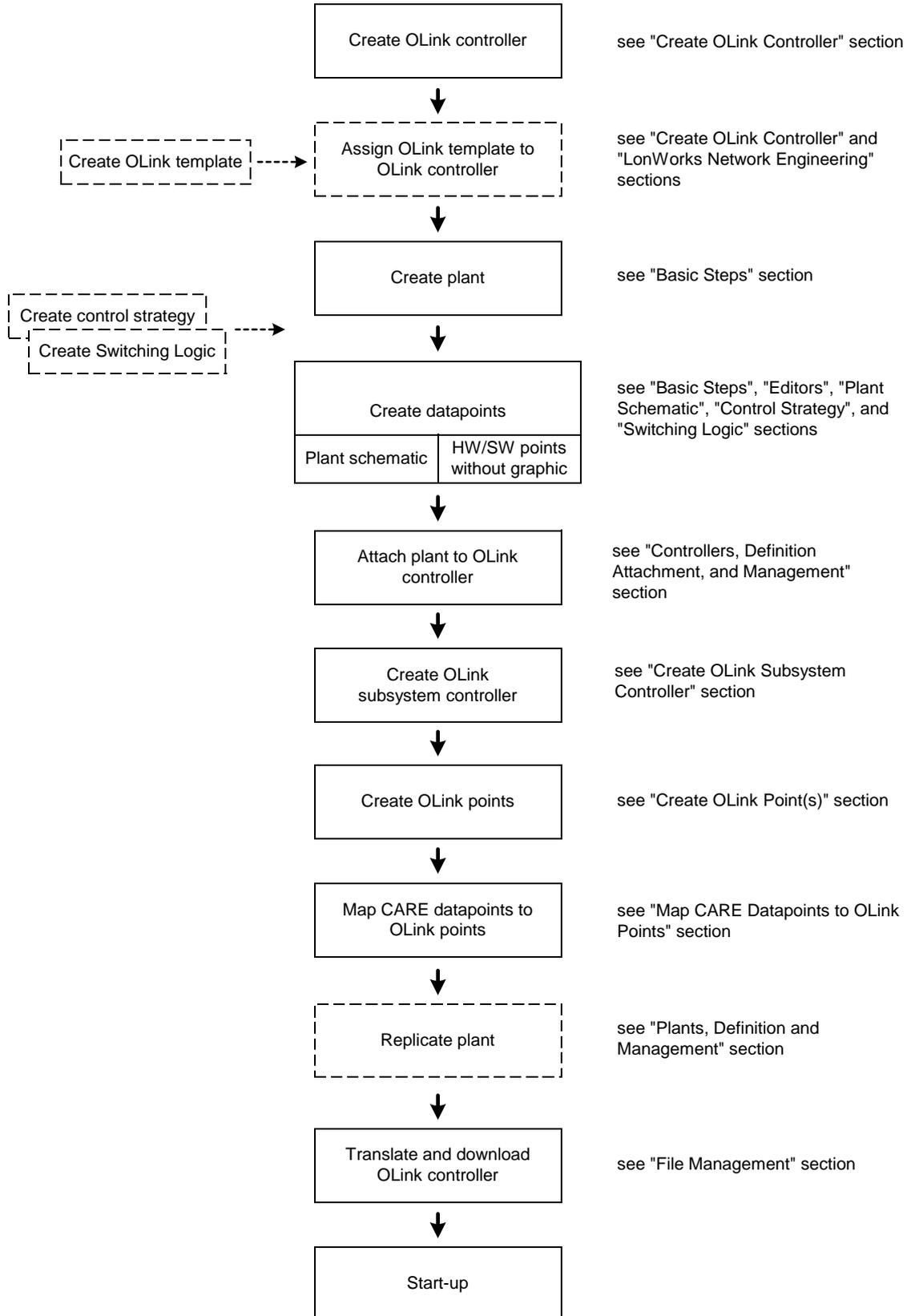
That configuration data may be provided by the vendor via the VNI data (VNI file). The OLink interface can be stored as an OLink template for reusing the hardware configuration many times.



OLink templates can be created in the device library. To create a template see "LonWorks Network Engineering" section.

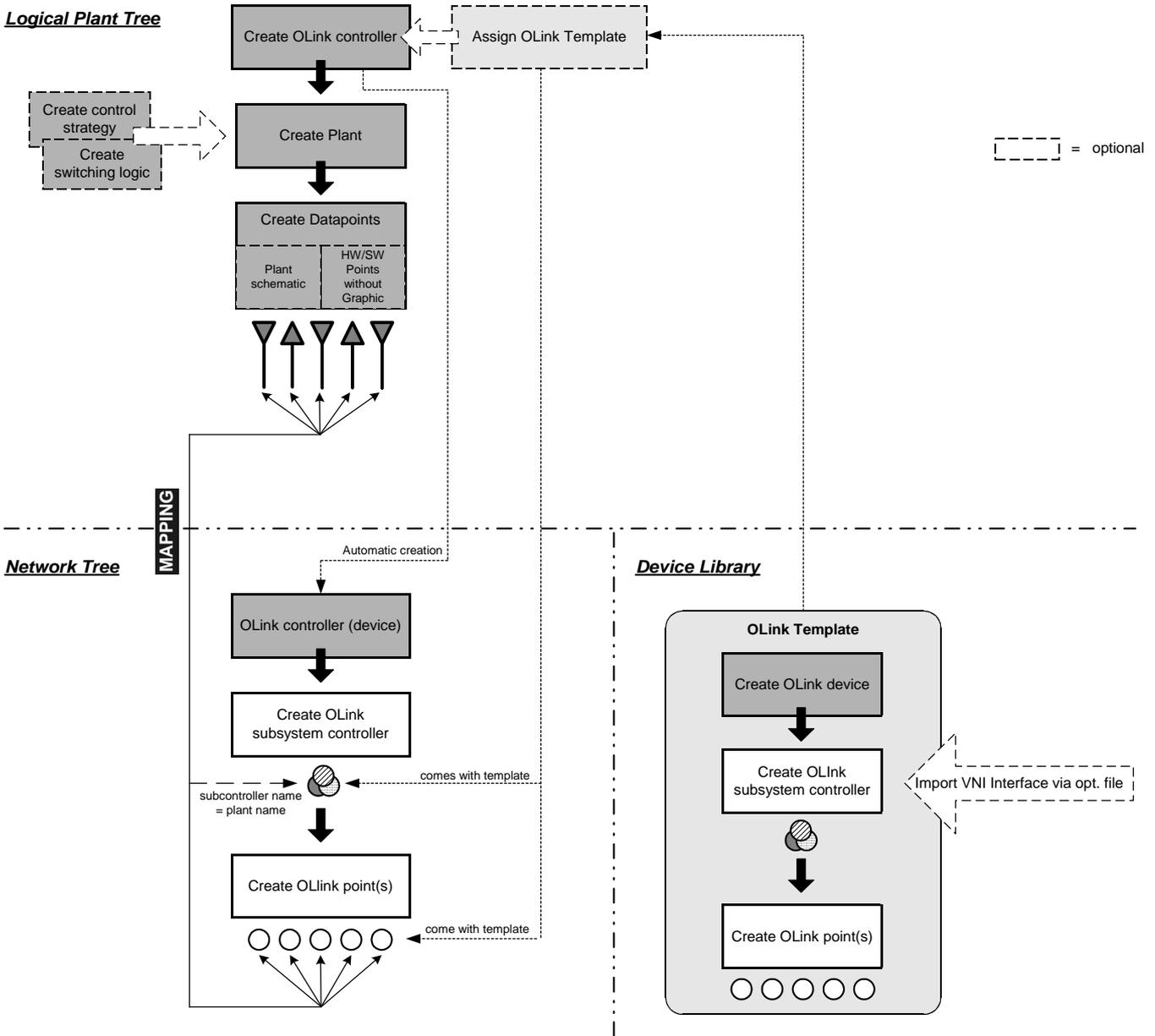
Engineering Process

OLink controller engineering is to be done by the following steps:



### CARE Environment View

The following flowchart explains where the OLink specific steps are to be done in the CARE environment.



### Create OLink Template

OLink templates are created in the device library and include basically the same steps as creating the OLink subsystem in the C-bus part of the network tree. To create a template see "LonWorks Network Engineering" section. To create the OLink subsystem in the Bus part of the network tree, continue with "Create OLink Controller" section

### Create OLink Controller

- Procedure** 1. Select menu item **Controller**, then submenu item **New**.

RESULT: The *New Controller* dialog box displays.

2. Into the **Controller Name** field, enter controller name.
3. From the **Bus Name** drop-down listbox, select the folder where the OLink controller should be saved.
4. From the **Controller Type** drop-down listbox, select 'OLink'.
5. From the **OLink template** drop-down list box, select a template (to create a template see "LonWorks Network Engineering" section).
6. Confirm by clicking **OK** button.

RESULT: The OLink controller (device) is added to the logical plant tree and to the Bus part of the network tree.

7. Click on the OLink device in the Bus part of the network tree and enter basic information on the *Properties* tab on the right as follows:

**OLink Device Name**

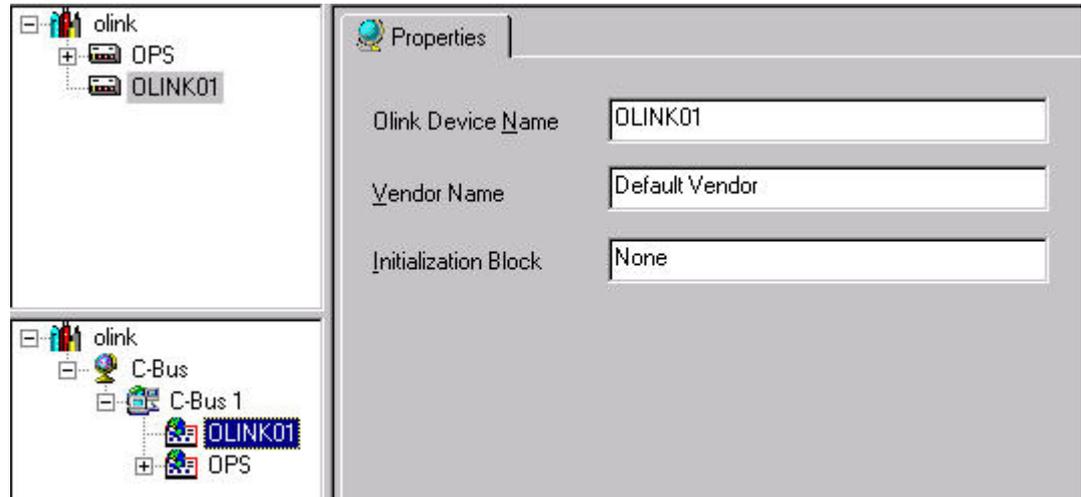
Name can be changed

**Vendor Name**

Name of vendor of which subsystem is to be connected to the C-Bus

**Initialization Block**

Contains communication and setup parameters



NOTE: In the Bus part of the network tree you can now add new OLink subsystem controllers and OLink points (right-click to open context menu).

**IMPORTANT**

*Changes on the template done in the Bus part of the network tree or in the device library are not reflected in a template already assigned to a controller. After the template has been assigned to the controller, it cannot be unassigned and replaced by another template.*

8. Continue by creating datapoints as described in the "Create OLink Point(s)" section.
9. Continue by creating a plant as described in the "Create OLink Plant" section.

---

## Create OLink Plant

Engineering of the plant including schematic, control strategy switching logic and datapoints is done in the same way as for a standard Excel 500 controller. The OLink plant can be of any type.

For detailed information on how to create a plant, refer to the "Basic Steps" section.

Continue by creating datapoints as described in the "Create CARE Datapoints" section.

---

## Create CARE Datapoints

CARE datapoints for mapping to OLink points can be created as follows:

- Create a plant schematic
- Directly create hardware/software points without a plant schematic

Refer to the "Basic Steps" section for detailed information on these items.

---

## Create Control Strategy and Switching Logic

Control Strategies and Switching Logics for an OLink controller are optional and can be done in the same way as for a standard Excel 500 controller. For detailed information on these items, please refer to the "Control Strategy" and "Switching Logic" sections.

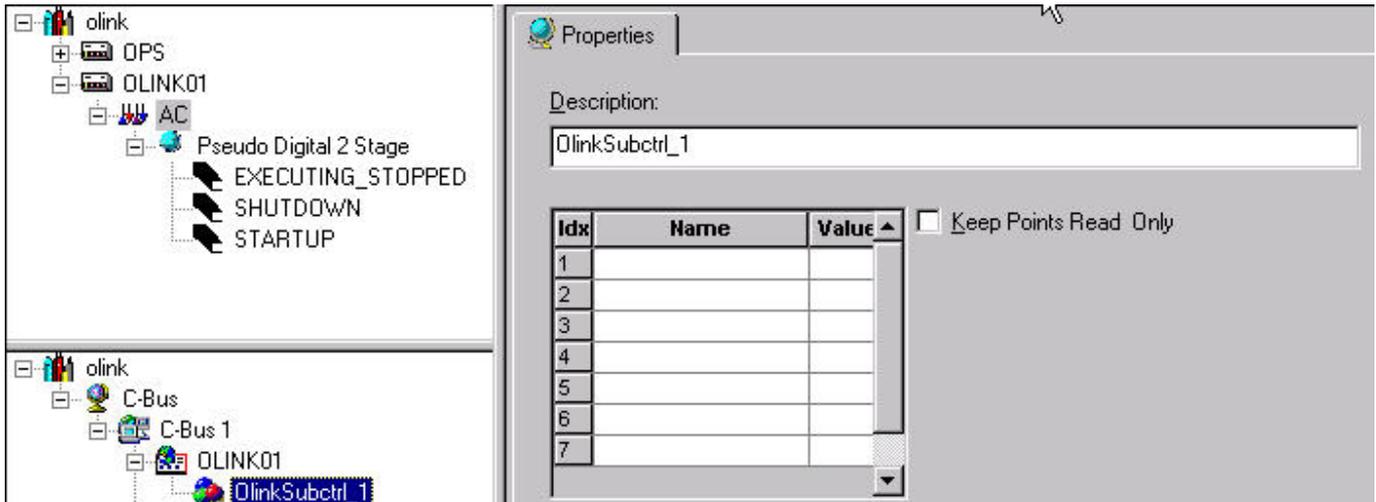
## Create OLink Subsystem Controller

**Prerequisites** The OLink controller has been created.

- Procedure**
1. In the Bus part of the network tree, click on the OLink controller.
  2. Click right mouse key and with left mouse key, click on **Create OLink Subsystem Controller** in the context menu

Or, click menu item **Controller**, then submenu items **OLink** and **Create OLink Subsystem Controller**.

**RESULT:** The OLink subsystem controller is assigned to the OLink controller in the Bus part of the network tree.

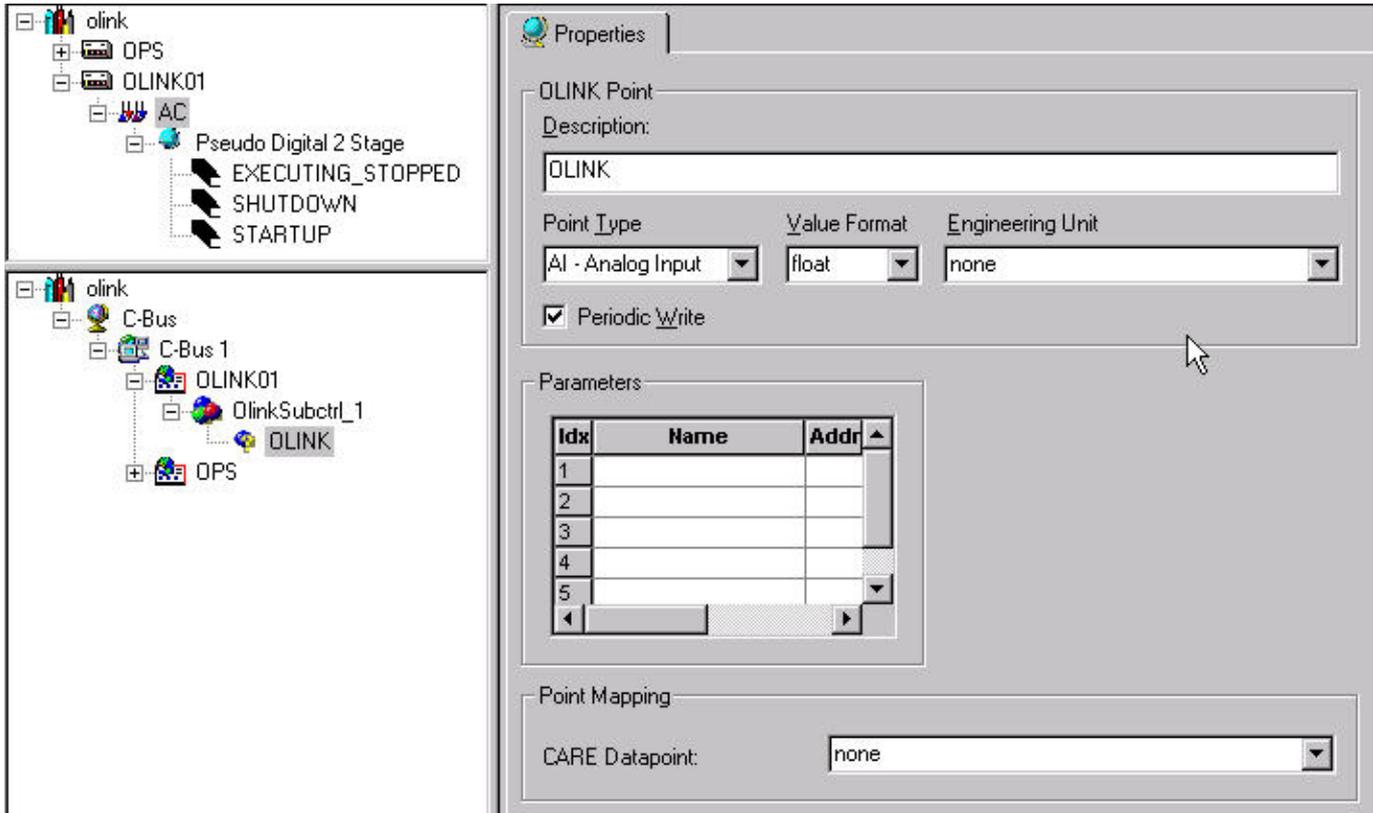


3. On the *Properties* tab on the right, enter a name in the **Description** field.
4. In the list below, enter names and values for the OLink interface in the **Value** and **Name** fields. Therefore you need the VNI description from the vendor which typically includes the list of points which are to be mapped to the C-bus, the engineering units, etc.
5. Check the **Keep Points Read Only** checkbox, if desired. In this case, point values cannot be overwritten.
6. Continue by creating OLink points as described in the "Create OLink Point(s)" section.

## Create OLink Point(s)

- Procedure**
1. In the Bus part of the network tree, click on the OLink subsystem controller.
  2. Click right mouse key and with left mouse key, click on **Create OLink Point** in the context menu
- Or, click menu item **Controller**, then submenu items **OLink** and **Create OLink Point**.

**RESULT:** The OLink point is assigned to the OLink subsystem controller in the Bus part of the network tree.



3. On the *Properties* tab on the right, define settings as follows:

**Description**

Enter a point name

**Point Type**

Select point type from drop-down list box

**Value Format**

Select value format from drop-down list box

**Engineering Unit**

Select engineering unit from drop-down list box, if desired. Here only those engineering units can be selected which have been especially defined for the OLink subsystem controller of the point. For more information on how to create engineering units for an OLink subsystem controller, refer to the "Define OLink Engineering Units" section.

**Periodic Write**

Check the checkbox, if you want the value to be written periodically.

**Parameters**

Enter names and values for the OLink interface in the **Name** and **Value** fields. Therefore you need the VNI description from the vendor which typically includes the list of points which are to be mapped to the C-bus, the engineering units, etc.

**Point Mapping**

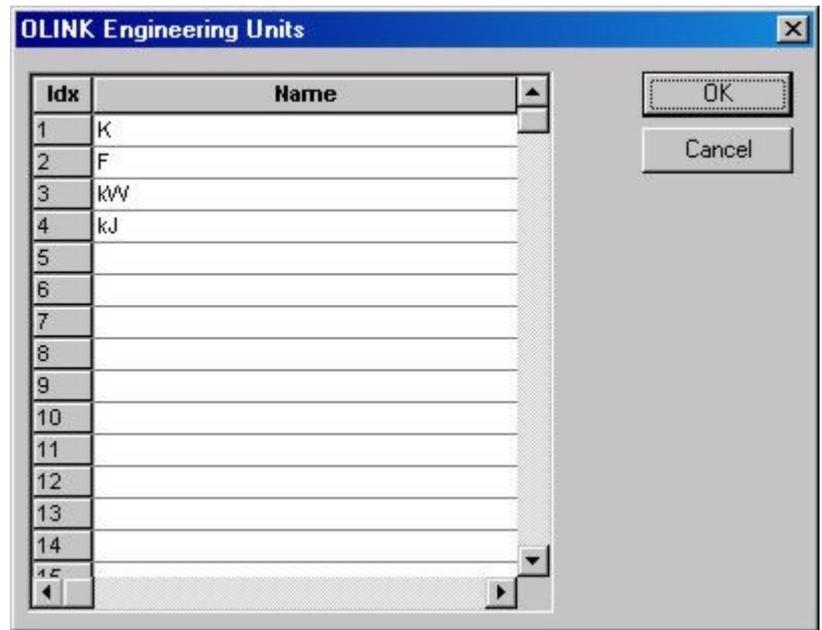
In this area, CARE points are available which have been previously defined as "OLink Manual Mapping" in order to be mapped to OLink points. From the **CARE Datapoint** drop-down listbox, select a datapoint you want to map to the OLink point.

## Define OLink Engineering Units

For each OLink controller, engineering units can be defined which allow converting OLink subsystem engineering units to C-bus engineering units through conversion tables.

- Procedure**
1. In the Bus part of the network tree, click on the OLink controller.
  2. Click menu item **Controller**, then submenu items **OLink** and **OLink Engineering Units**.

RESULT: The *OLink Engineering Units* dialog box displays.



3. To define an engineering unit, click in the line and enter the unit.
4. To save the engineering units list, click the **OK** button.

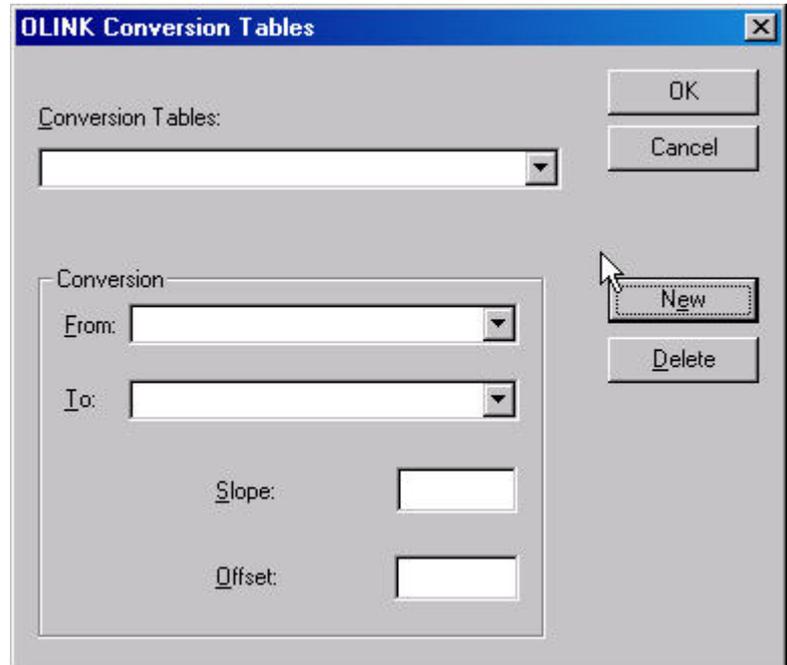
RESULT: Engineering units will be available on OLink point level (see "Create OLink Point(s)" section.) and for use in conversion tables (see "Create OLink Conversion Table" section)

## Create OLink Conversion Table

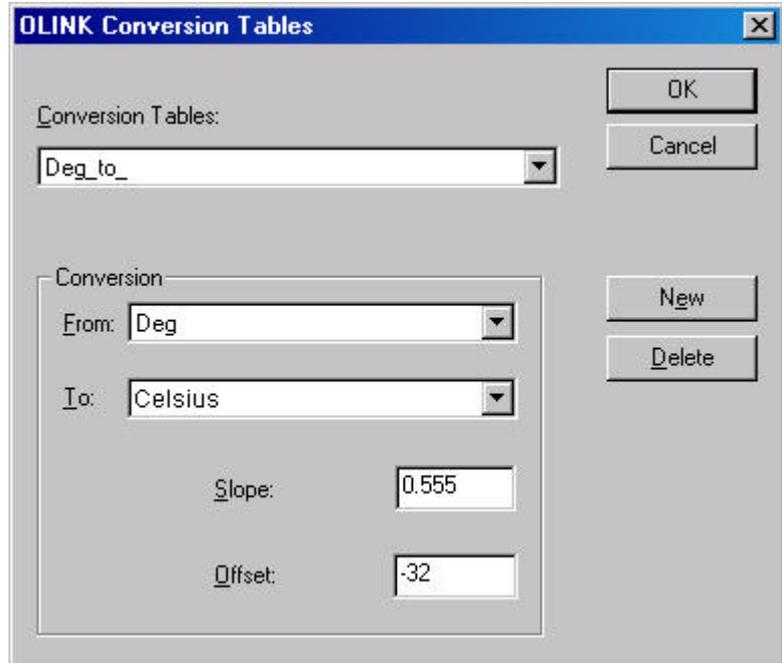
For each OLink controller, a conversion table can be defined. Conversion tables may be necessary for converting engineering units between the OLink subsystem and the C-Bus system. For example, the VNI file provides the temperature in Fahrenheit according to the U.S. American (Imperial) system and the C-bus provides centigrade according to the European (Metric) system.

- Procedure**
1. In the Bus part of the network tree, click on the OLink controller.
  2. Click menu item **Controller**, then submenu items **OLink** and **OLink Conversion Tables**.

RESULT: The *OLink Conversion Tables* dialog box displays.



3. To create a new conversion table, click on the **New** button
4. Under **Conversion**, select OLink subsystem unit engineering unit, for example Deg (F), from the **From** drop-down listbox.
5. Select C-bus engineering, for example Celsius, from the **To** drop-down listbox.
6. In the **Slope** field, enter the slope for the conversion, for example 0.55.
7. In the **Offset** field, enter the offset for the conversion, for example -32.

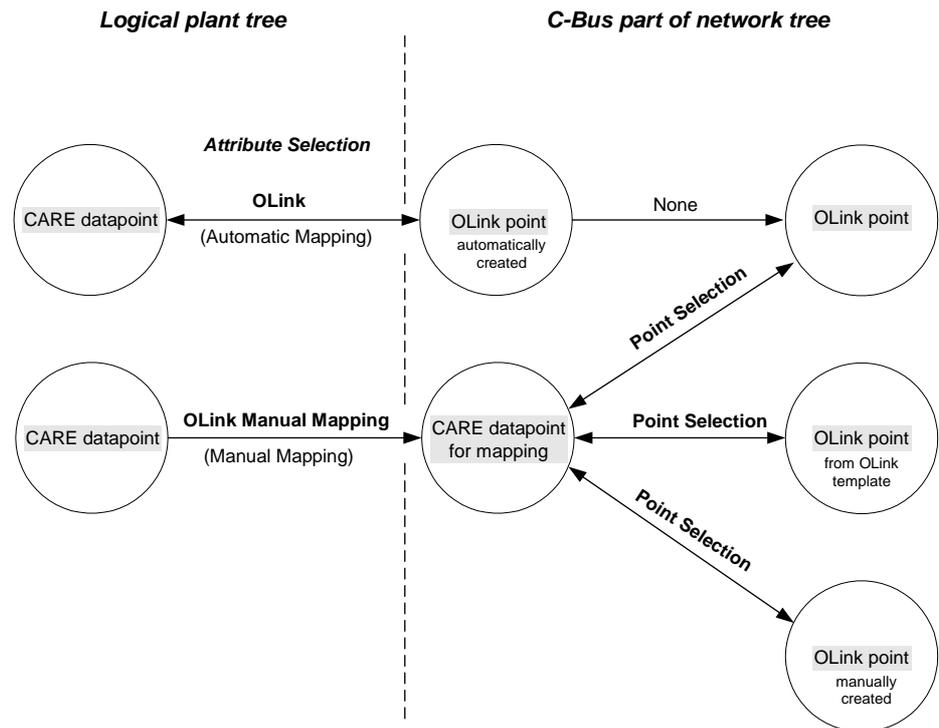


8. To delete the currently displayed conversion table, click **Delete** button.
9. To build further conversion tables, repeat procedure starting with step 3.
10. To save conversion table(s), click the **OK** button.

## Map CARE Datapoints to OLink Points

Mapping CARE datapoints to OLink points can be done in the following two ways:

- **Automatic Mapping** by assigning the 'OLink' Attribute to the CARE datapoint (logical plant tree). When mapping a CARE point automatically, the datapoint will be mapped to an unmapped OLink point with the same name as the CARE user address. If such an OLink point does not exist, it will be automatically created.
- **Manual Mapping** by assigning the 'OLink Manual Mapping' attribute to the CARE datapoint (logical plant tree). OLink Manual Mapping is a pre-definition. The datapoint can be mapped later to any unmapped OLink point available in the OLink controller (Bus part of the network tree).



### Automatic Mapping

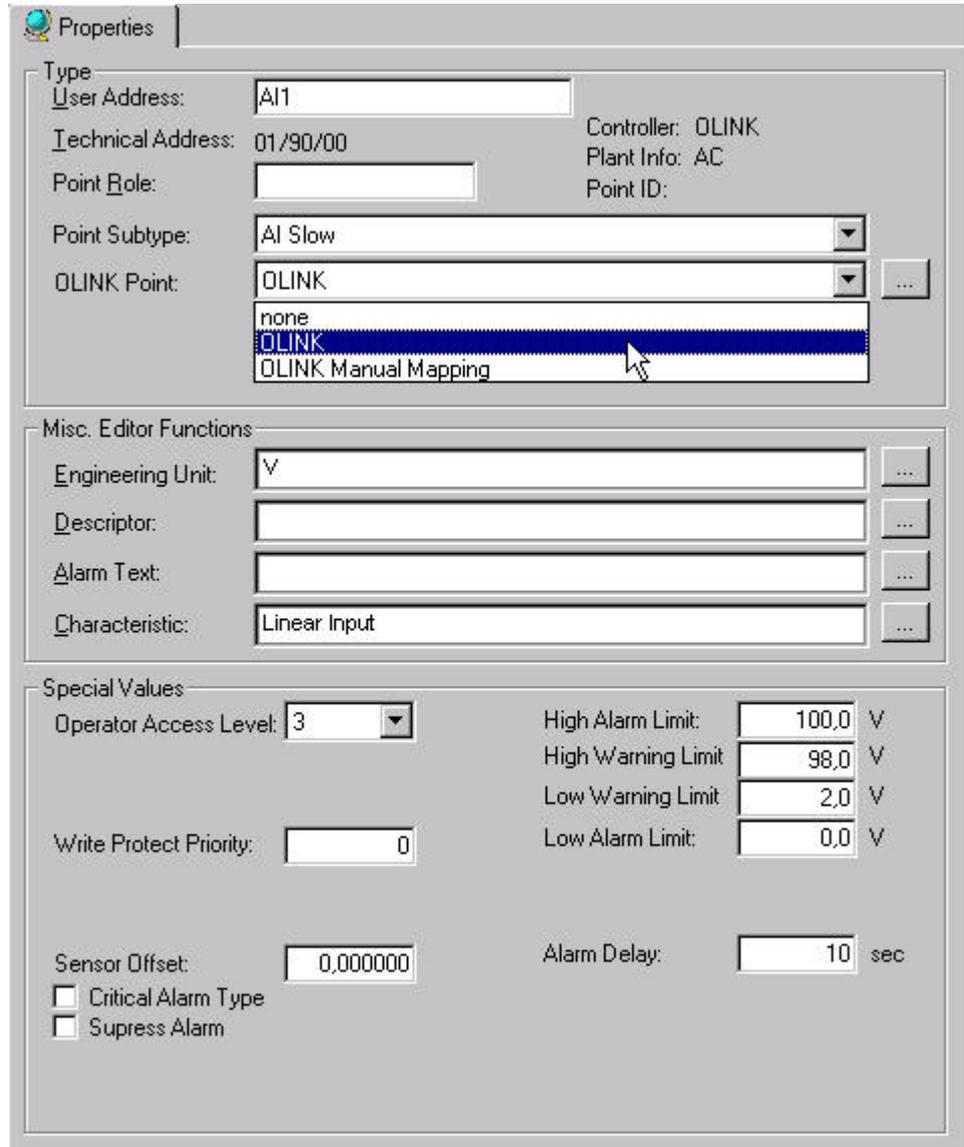
**Automatic Mapping** between CARE datapoints and OLink points includes the following 2 steps:

- Assign OLink attribute to the datapoint in the logical plant tree.
- Open *OLink Point Information* dialog box or shift to Bus part of the network tree and enter OLink point attributes such as point type, value format, etc.

#### Procedure

- In the logical plant tree, click on the datapoint, you want to have made an OLink point for, in this case for AI1.

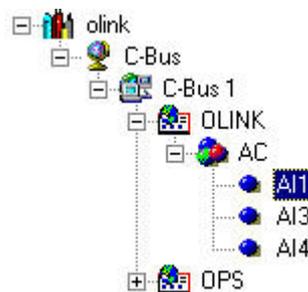
**RESULT:** On the right, the datapoint attributes are displayed in itemized display.



**2. From the OLink Point drop-down listbox, select 'OLink'**

**RESULT:** The datapoint will be automatically mapped to an existing or newly created OLink point with the same name as the datapoint.

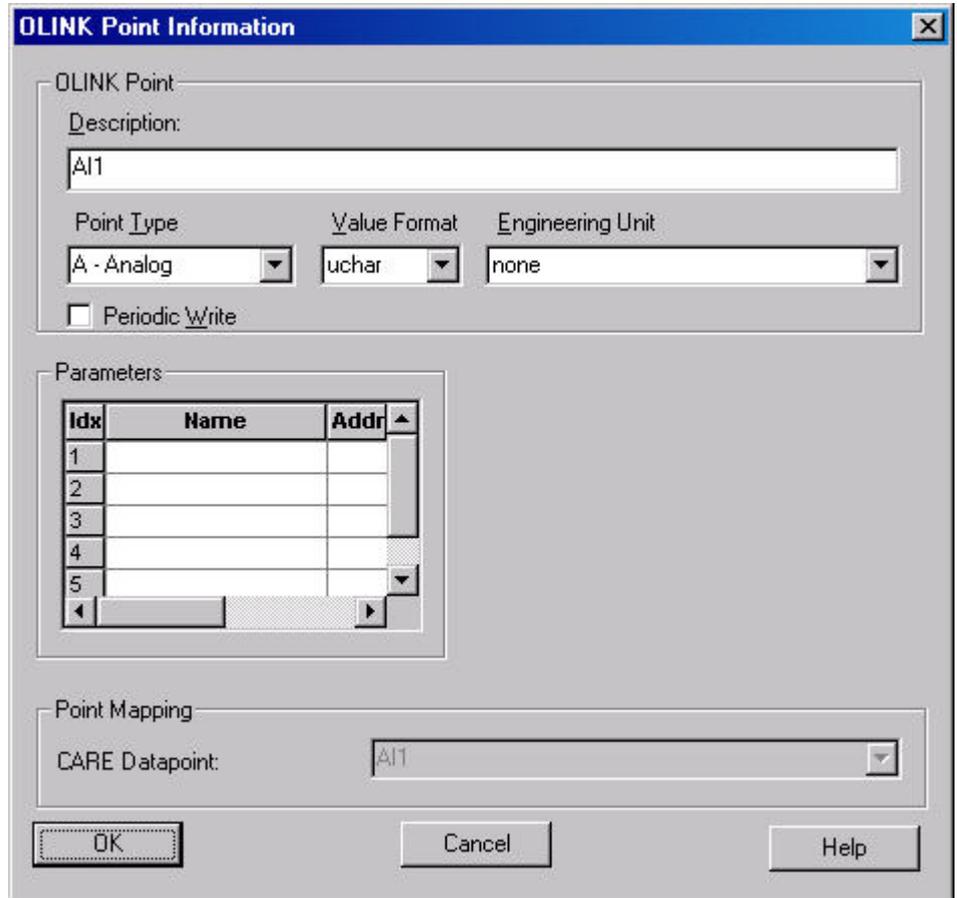
In the logical plant tree, the mapped CARE datapoint is displayed in yellow. In the Bus part of the network tree, the mapped OLink point is added. Mapping status is indicated by a blue icon.



3. To complete OLink interface creation, additional attributes need to be entered by doing one of the following:

In the itemized display of the CARE datapoint, click on the dotted button  right to the **OLink Point** drop-down listbox.

RESULT: The *OLink Point Information* dialog box displays.



**OLINK Point Information**

OLINK Point

Description: AI1

Point Type: A - Analog

Value Format: uchar

Engineering Unit: none

Periodic Write

Parameters

Idx	Name	Addr
1		
2		
3		
4		
5		

Point Mapping

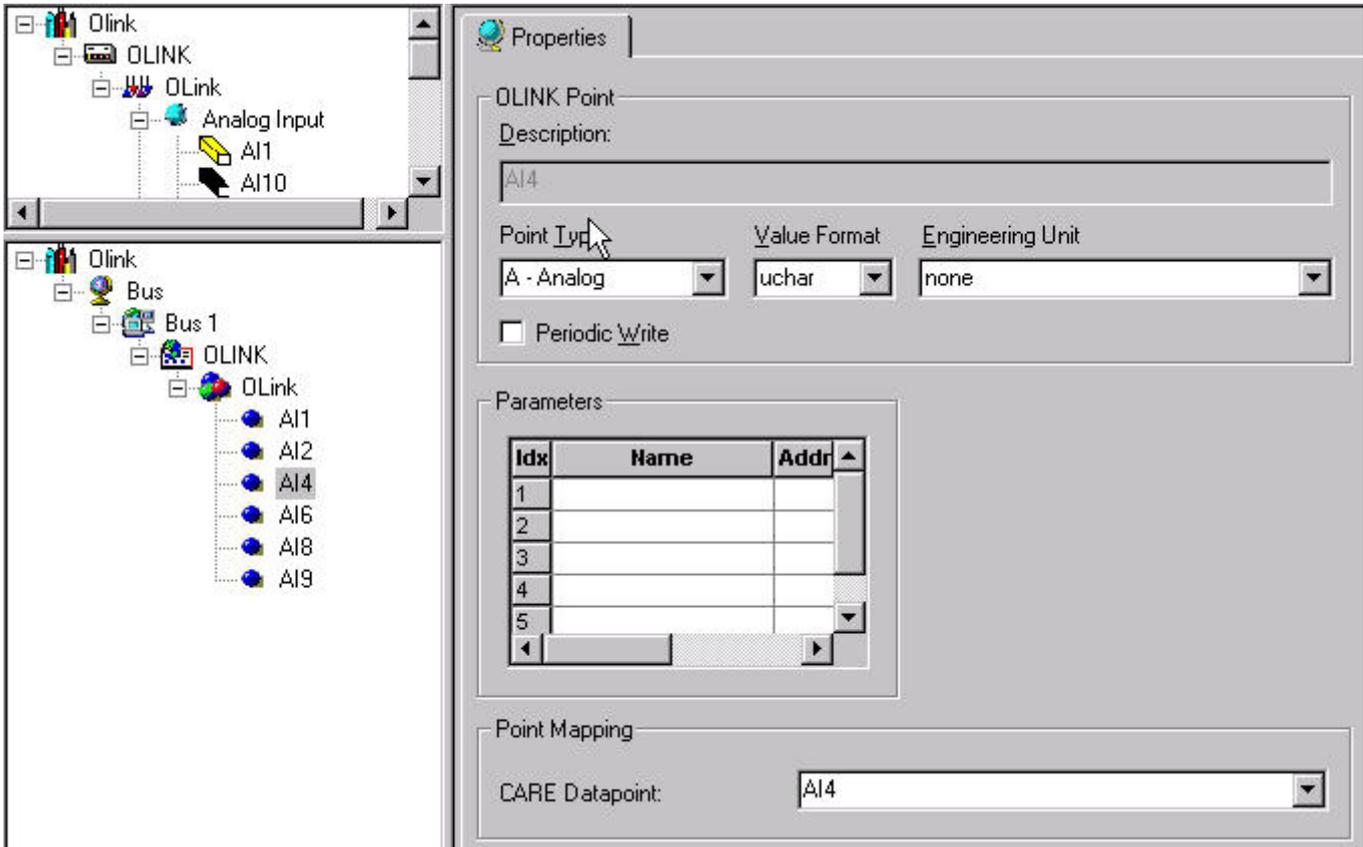
CARE Datapoint: AI1

OK Cancel Help

Enter point type, value format, engineering unit and parameter values and save settings by clicking **OK** button. For detailed description of these attributes, refer to the "Create OLink Point(s)" section.

Or,

To access all OLink points for editing, go to the Bus part of the network tree, browse to the OLink subsystem controller and click on the desired OLink point.



For detailed description of the attributes, refer to the "Create OLink Point(s)" section.

## Manual Mapping

**Manual Mapping** between CARE datapoints and OLink points includes the following 3 steps:

- a. Assign 'OLink Manual Mapping' attribute to the datapoint in the logical plant tree.
- b. Go to the Bus part of the network tree and map particular OLink point to this CARE datapoint.
- c. Enter OLink attributes such as point type, engineering unit, etc. for the OLink point.

### Procedure

1. In the logical plant tree, click on the datapoint, you want to have made an OLink point for, in this case AI10.

**RESULT:** On the right, the datapoint attributes are displayed in itemized display.

**Properties**

Type

User Address: AI10

Technical Address: 01/90/01

Point Role:

Point Subtype: AI Slow

OLINK Point: none

Controller: OLINK  
Plant Info: AC  
Point ID:

Misc. Editor Functions

Engineering Unit: V

Descriptor:

Alarm Text:

Characteristic: Linear Input

Special Values

Operator Access Level: 3

Write Protect Priority: 0

Sensor Offset: 0.000000

High Alarm Limit: 100.0 V

High Warning Limit: 98.0 V

Low Warning Limit: 2.0 V

Low Alarm Limit: 0.0 V

Alarm Delay: 10 sec

Critical Alarm Type

Suppress Alarm

- From the **OLink Point** drop-down listbox, select 'OLink Manual Mapping'. 'OLink Manual Mapping' is a pre-definition. The datapoint can be mapped later to any unmapped OLink point available in the OLink controller (Bus part of the network tree).

NOTE: No OLink point will be created.

**Properties**

Type

User Address: AI10

Technical Address: 01/90/01

Point Role:

Point Subtype: AI Slow

OLINK Point: OLink Manual Mapping

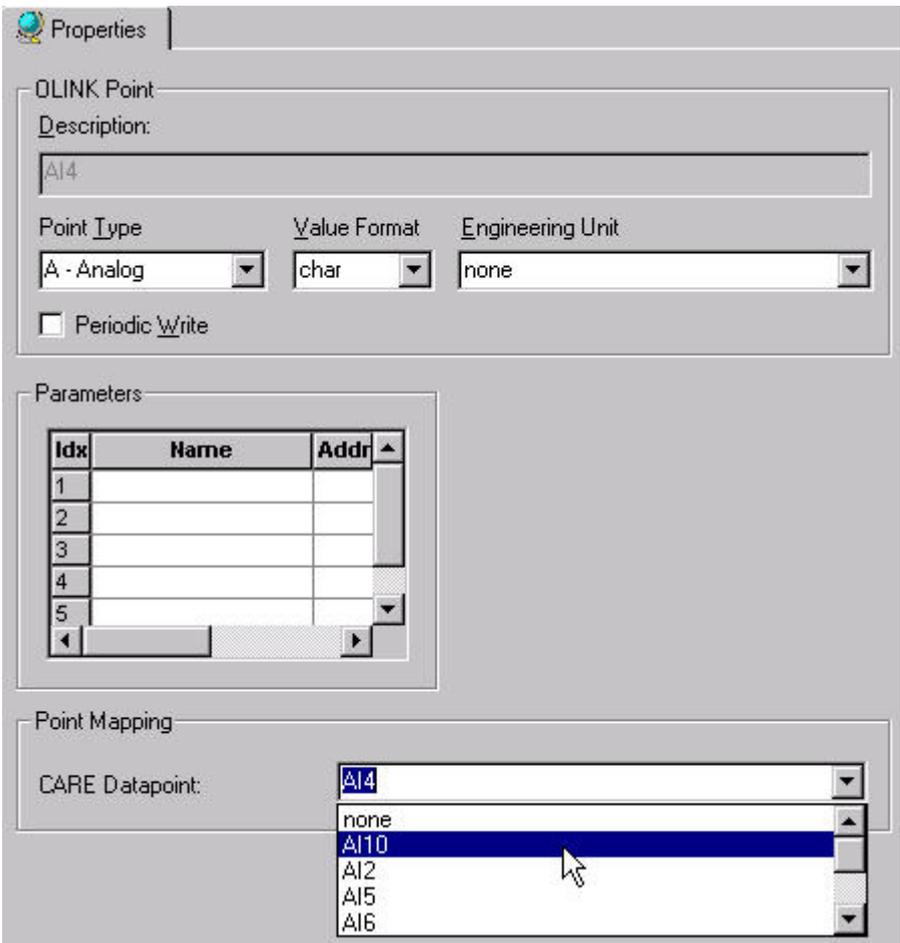
Controller: OLINK  
Plant Info: AC  
Point ID:

- Browse to the OLink subsystem controller in the Bus part of the network tree.

- In the Bus part of the network tree, select the OLink point to be mapped. An OLink point can originate from the OLink template, the manual creation in the Bus part of the network tree or by automatic creation.

Mapped points are indicated by a blue  icon, unmapped points are indicated by a  icon.

- Under **Point Mapping**, select CARE datapoint from the CARE Datapoint drop-down listbox.



Properties

OLINK Point

Description:

AI4

Point Type: A - Analog

Value Format: char

Engineering Unit: none

Periodic Write

Parameters

Idx	Name	Addr
1		
2		
3		
4		
5		

Point Mapping

CARE Datapoint: AI4

none

**AI10**

AI2

AI5

AI6

RESULT: The CARE datapoint is mapped to the OLink point. In the Bus part of the network tree, the mapped point is indicated by the blue  icon.

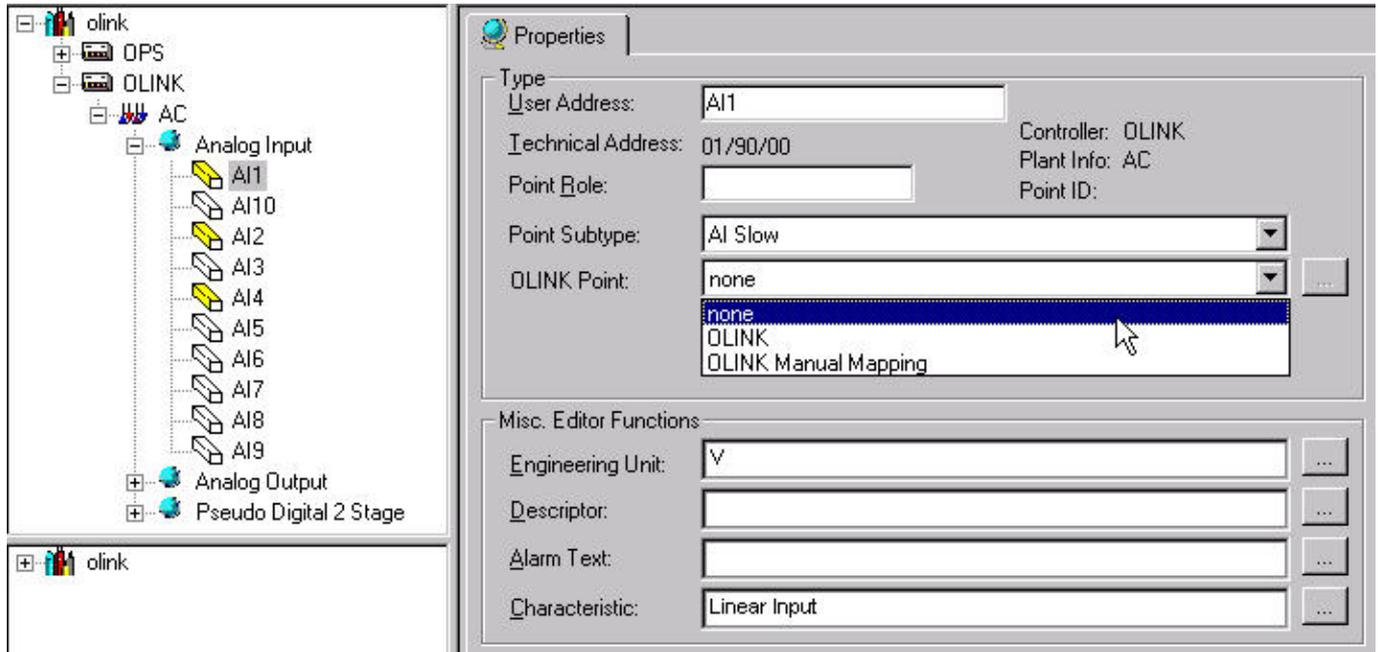
## Unmap OLink Points

### Procedures

#### Logical Plant Tree

- In the logical plant tree, click on point you want to unmap.

RESULT: On the right, the datapoint attributes are displayed in itemized display



2. From the **OLink Point** drop-down listbox, select 'None'.

RESULT: The OLink point will be unmapped.

#### Bus Part of the network tree

1. In the Bus part of the network tree, click on point you want to unmap.

RESULT: On the right, the OLink point attributes are displayed in itemized display.

The screenshot shows two network tree views on the left and a Properties dialog on the right.

**Top Network Tree:** olink (expanded) -> OPS -> OLINK -> AC -> Analog Input (expanded) -> AI1, AI10, AI2, AI3, AI4, AI5, AI6, AI7, AI8, AI9. Below are Analog Output and Pseudo Digital 2 Stage.

**Bottom Network Tree:** olink (expanded) -> C-Bus -> C-Bus 1 -> OLINK -> AC -> AI1, AI2, AI3, AI4. Below is OPS.

**Properties Dialog:**

- OLINK Point:** Description: AI2
- Point Type:** A - Analog
- Value Format:** char
- Engineering Unit:** none
- Periodic Write

**Parameters Table:**

Idx	Name	Addr
1		
2		
3		
4		
5		

**Point Mapping:** CARE Datapoint: none (selected in dropdown list)

- From the **CARE Datapoint** drop-down listbox, select 'None'

RESULT: The CARE datapoint will be unmapped.

## Move OLink Point

In the Bus part of network tree, OLink points can be moved between OLink subsystem controllers by Drag&Drop.

- Procedure**
- Browse to the OLink subsystem controller (source) in the Bus part of the network tree.
  - Click on OLink point and move it by Drag&Drop to the desired OLink subsystem controller (target).

## Delete OLink Subsystem Controller/OLink Point

In the Bus part of the network tree, OLink subsystem controllers and points can be deleted. OLink points can be mapped or unmapped. When deleting a mapped OLink point, the CARE datapoint gets unmapped. This applies also to an OLink subsystem controller deletion.

- Procedure**
- In the Bus part of the network tree, click on the OLink subsystem controller respectively the OLink point you want to delete.

- Click right mouse key and with left mouse key, click on **Delete** in the context menu.

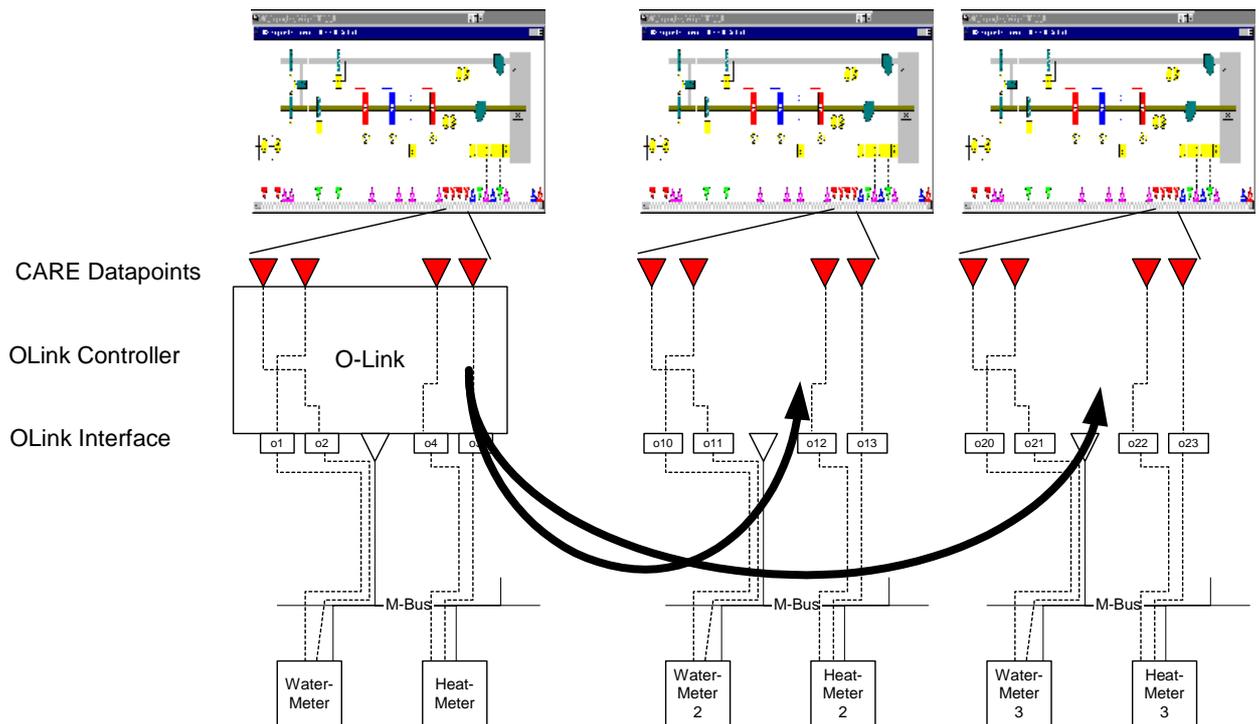
## Replicate Plant

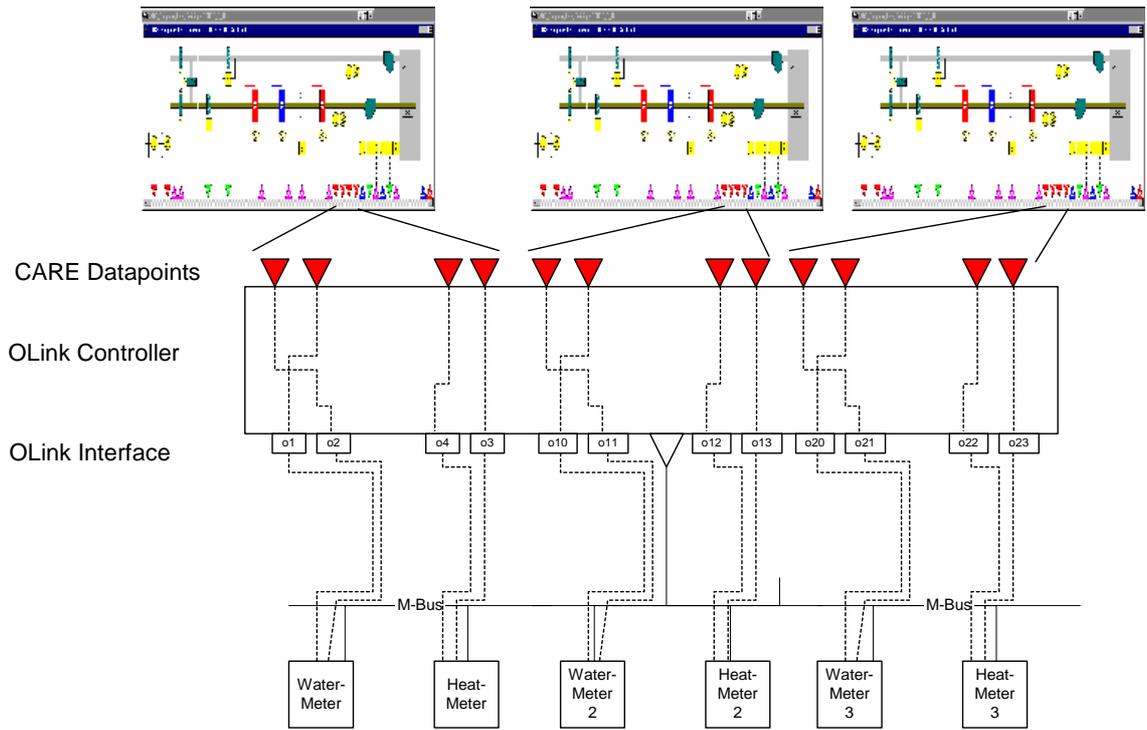
For streamlining the engineering process of OLink controllers, a plant can be replicated multiple times after the mapping has been done.

Replication will include:

- CARE datapoints
- Control strategies and switching tables, if assigned to the plant.
- Subsystem controllers and OLink points

After replication the plants will be available as unattached plants. After attaching the plants a "big" OLink interface will have been created.





Please, refer to the "Plants, Defintion and Management" section for detailed information on how to replicate a plant.

## Import/Export OLink Controller

An OLink controller can be imported, respectively exported at two points:

- From within the Bus part of the network tree
- From within the device library

When importing/exporting the OLink controller from within the device library, a pure template without any mapping information will be imported/exported whereas when importing/exporting the OLink controller from within the Bus part of the network tree, an OLink controller (OLink device) including all mappings will be imported/exported.

For the import into the OLink controller it means that all current OLink points will be deleted and replaced by the imported OLink points. Mappings between imported OLink points and CARE datapoints of the same name will be re-established.

For the import into the OLink template it means that the current OLink template data are deleted and replaced by the imported OLink controller data. No mapping information will be imported.

## Import OLink Controller

### Migration Strategy Note

If the Import OLink controller function is part of the migration strategy, first perform steps 1 through 7 from the "Migration Procedure" section.

### Import into Current OLink Controller

1. To import OLink controller data into the current OLink controller, browse to the OLink controller in the Bus part of the network tree.
2. Continue with "Common Steps".

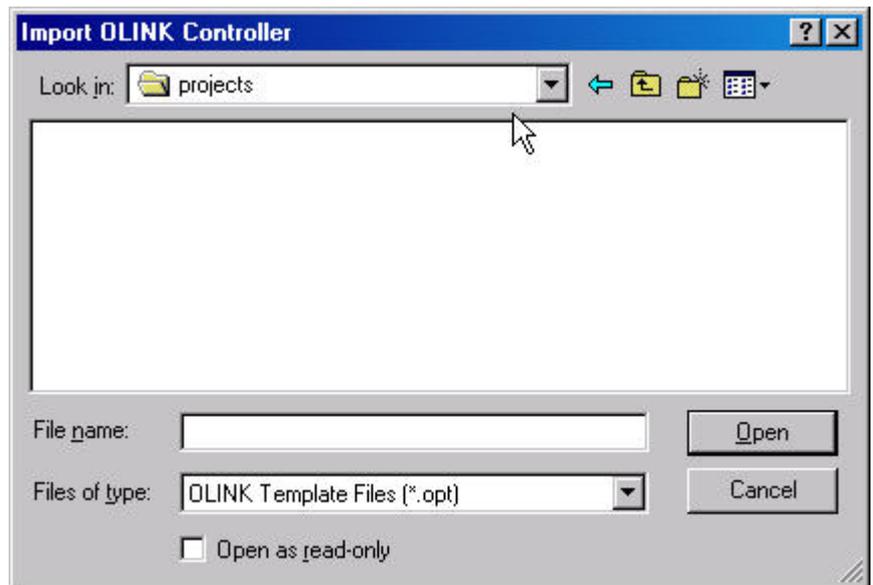
**Import into OLink Template**

1. To import OLink controller data into an OLink template, open the device library and browse to the OLink controller (see "LonWorks Network Engineering" section).
2. Continue with "Common Steps".

**Common Steps**

3. In the Bus part of the network tree and device library tree respectively, click on the OLink controller.
4. Click right-mouse key and with left mouse key, click on **Import OLink Controller** in the context menu.

RESULT: The *Import OLink Controller* dialog box displays.



5. Navigate to the folder where the *OPT* file resides and select it.
6. Check the Open as read-only checkbox if desired. .
7. Click **Open** button.

RESULT: The *Import OLink Controller Options* dialog box displays.

8. Select desired option.

RESULT: A message box displays. Note that the existing OLink device (controller) data will be overwritten when selecting **Yes**.

9. Click **Yes**.

RESULT: If the import was successful, a message box informs you about that.

10. Click **OK** button.

RESULT: The OLink information imported is displayed in the tree on the left.

**Export OLink Controller****Based on Current OLink Controller**

1. To export the OLink controller data based on the current OLink controller, first translate the OLink controller.
2. Browse to the OLink controller in the Bus part of the network tree.

3. Continue with "Common Steps".

#### Based on OLink Template

1. To export the OLink controller data based on the OLink template, open the device library and browse to the OLink controller (see Device Library section).

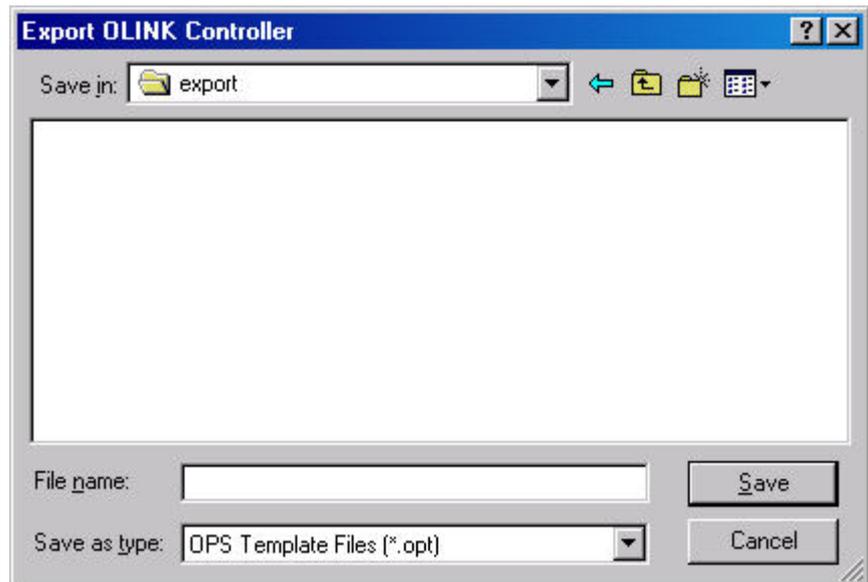
2. Continue with "Common Steps".

#### Common Steps

3. In the Bus part of the network tree and device library tree respectively, click on the OLink controller.

4. Click right-mouse key and with left mouse key, click on **Export OLink Controller** in the context menu.

RESULT: The *Export OLink Controller* dialog box displays.



5. Navigate to the folder where the *OPT* file should be saved.

6. Into the file name field, enter *OPT* file name.

7. Click **Save** button.

RESULT: A message box informs you about the successful export of the OLink controller.

8. Click **Save** button.

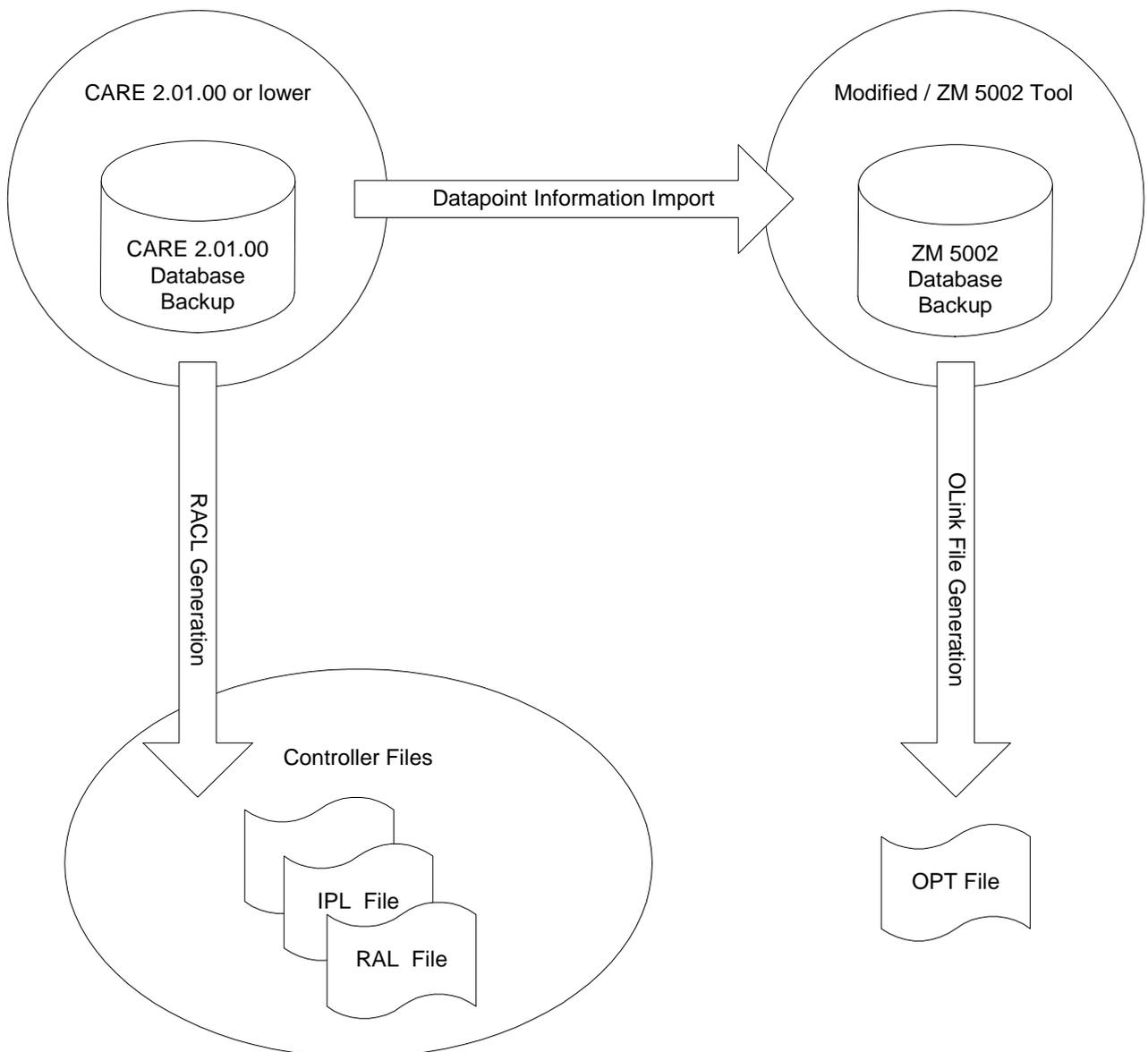
## Migration Strategy

CARE 4.02.00 and higher allows upgrading of old OLink projects to CARE 4.02.00 OLink projects. The exported data of the existing OLink project data can be imported in the same file format (*OPT*). An old OLink project consist of two main elements:

- The CARE database (version 2.01.00 or lower) where the OLink controllers and also the datapoints are stored.
- The ZM 5002 database (ZM 5002 project) which fits to this CARE project.

During the upgrade the XLink controller will be transformed to the OLink controller type (see steps 7 and 8). The technical address remains the same.

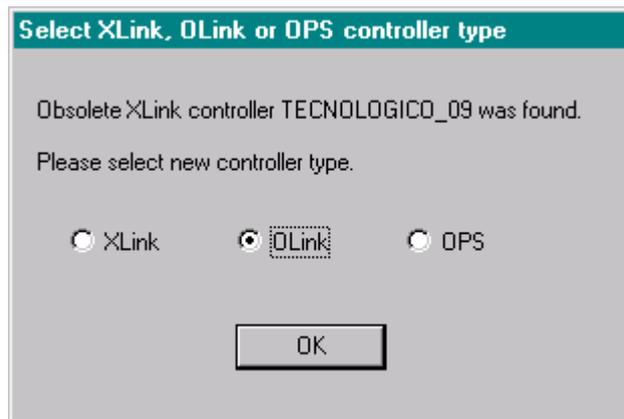
### Migration Procedure



1. You need to have CARE 2.01.00 installed first with the OLink controller project in the database.
2. Translate the controller.

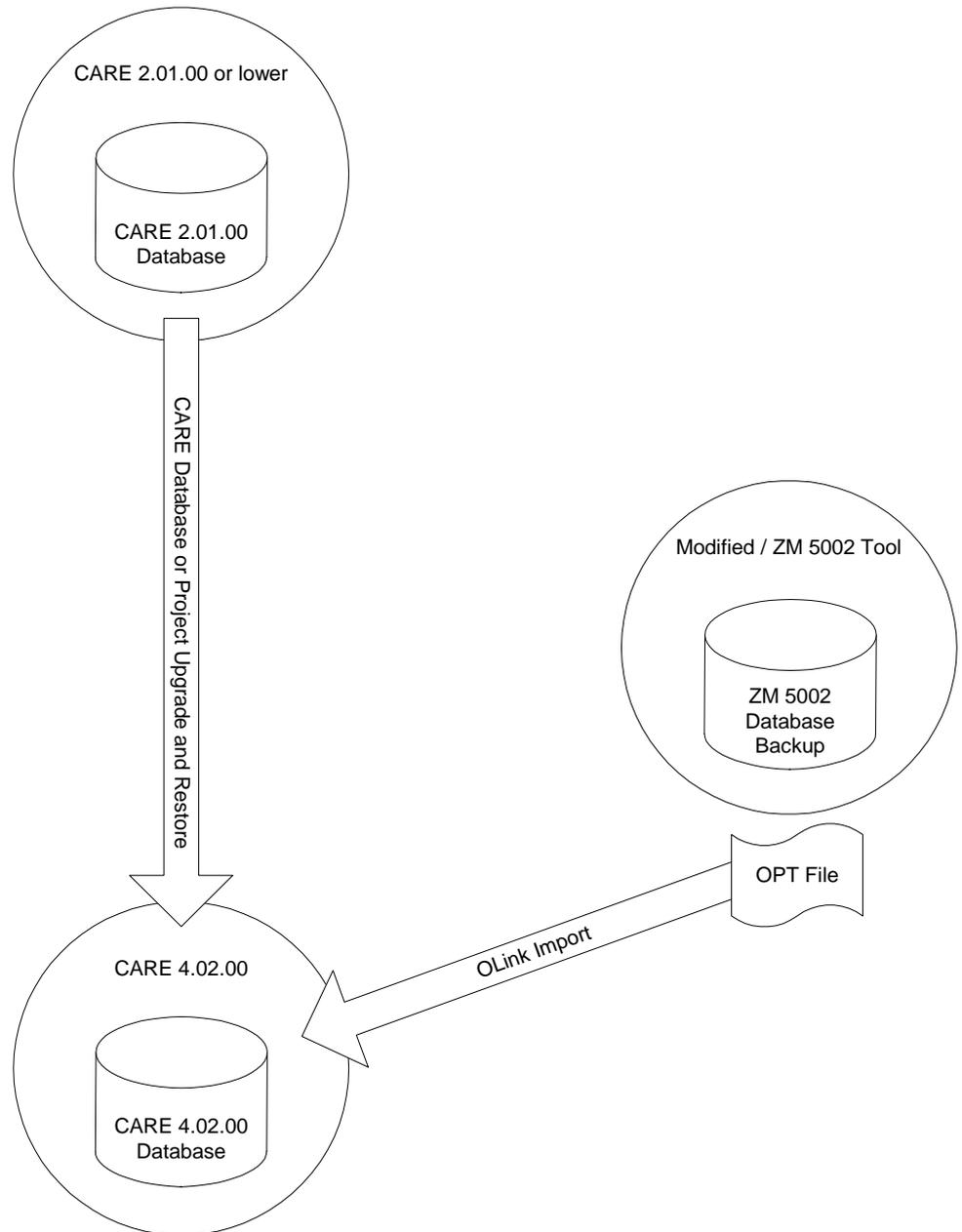
3. Start the modified ZM 5002 Tool, which will be provided by the CARE Team and select the corresponding site.
4. In the modified ZM 5002 tool an additional menu item will be available which allows creating (export) the *OPT* file.
5. Make a database backup of the CARE 2.01.00 database or a project backup.
6. Install CARE **4.02.00** or higher (CARE with OLink support).
7. Within the installed CARE version upgrade the CARE 2.01.00 database (or project) to the highest CARE version and then restore this database (or project).

RESULT: If an old XLink or OLink controller was found during the upgrade, the **Select XLink, OLink or OPS controller type** dialog box displays. An old XLink controller can be kept as XLink type or transformed to an OLink or OPS controller.



8. Select **OLink**, or, if you want to transform the controller to the OPS type, select **OPS**.
9. Click **OK** button.

RESULT: The upgrade will be finished.



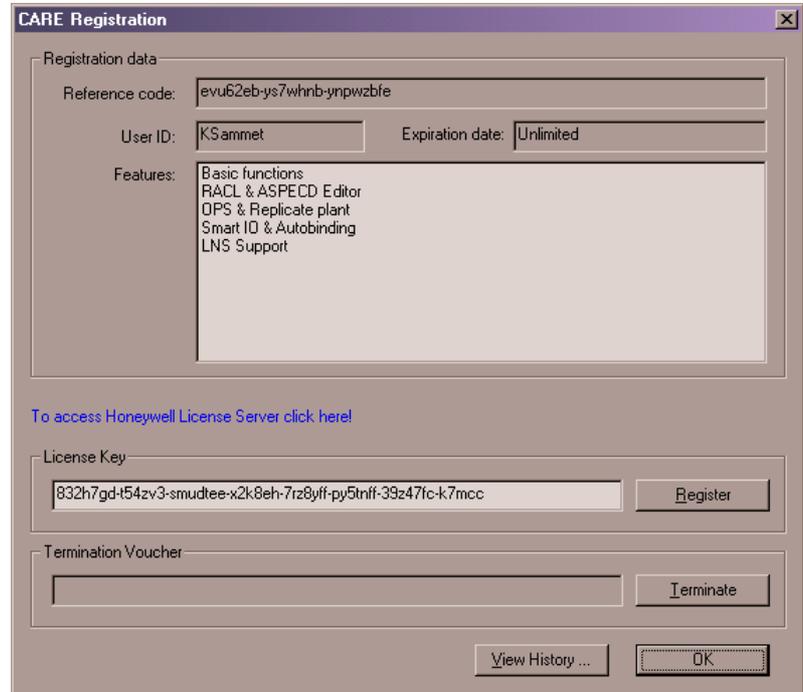
10. In the Bus part of the network tree, click on the OLink controller.
11. Click right mouse key and with left mouse key click on **Import OLink Controller** in the context menu (see "Import OLink Controller" section).
12. Import the *OPT* file. All mappings between datapoints to OLink points will now be available.

RESULT: Migration is completed.

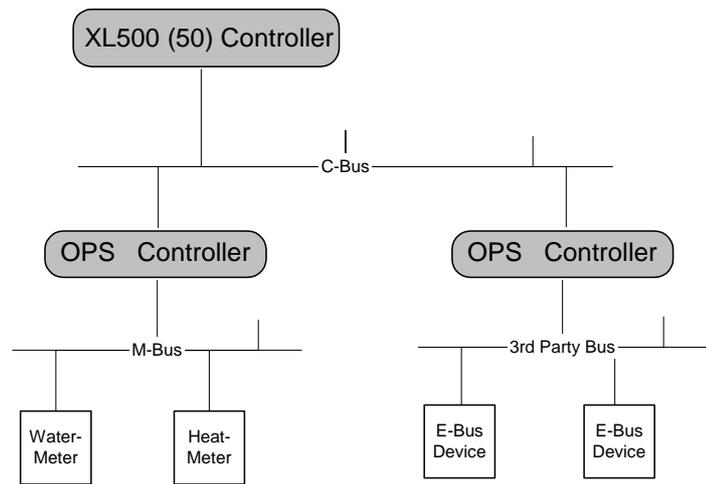


## OPS CONTROLLER

**Prerequisites** To work with OPS controllers when already using CARE 3.01.00 or higher, you must order a license key from Honeywell, which enables the OPS controller and Replicate functionality. Click menu item **Help**, then submenu item **Registration** and check License Key Info. If OPS and Replicate plant is shown as in the following dialog, you are allowed to work on OPS controllers. If not, order a license key from Honeywell as described in the "Ordering and Registering" section.



**General** CARE 3.01.00 and higher supports the OPS (Open Link Point Server) controller as the successor of the OpenLink controller. This controller is a gateway for integrating 3<sup>rd</sup> party devices of a subsystem running on busses such as Meter-bus or E-bus with the C-bus. The OPS controller is freely programmable in the same way as a standard XL500 controller. Engineering is done in a common way that 3<sup>rd</sup> party bus information can be mapped easily onto CARE datapoints (see also Migration Strategy section). The OPS controller can have at max. 970 pseudo points, or 128 hardware points of each type. Due to the different datapoint description size of hardware points and pseudopoints, when mixing hardware points and pseudopoints, it's not possible to simply calculate the max. number of the mixture by adding them in a one-to-one correspondence. When the RAM size max. of 64 K is exceeded, then datapoints need to be removed. The connection between OPS controller and the subsystem is established by the OPS interface. OPS interface data can be stored as a template and then be reused for controllers with equivalent hardware configuration.

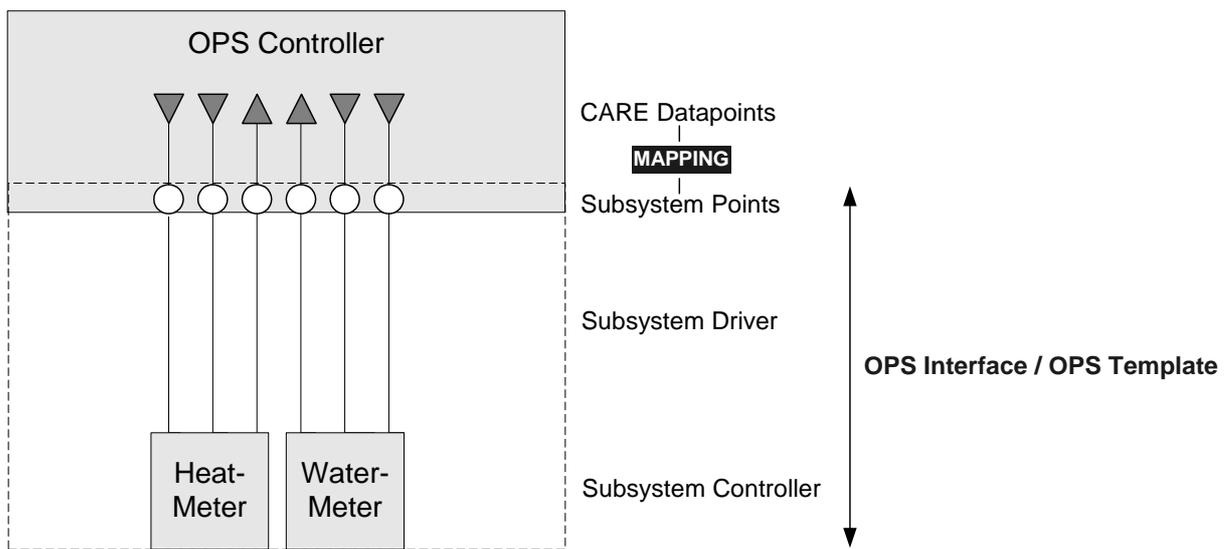


## OPS Interface (Template)

The OPS interface represents a special hardware configuration and consists of the following components:

- Subsystem driver (e.g. M-bus)
- Subsystem controllers (e.g. water meter, heat meter)
- Subsystem points = OPS points (e.g. watstat01, heat01)

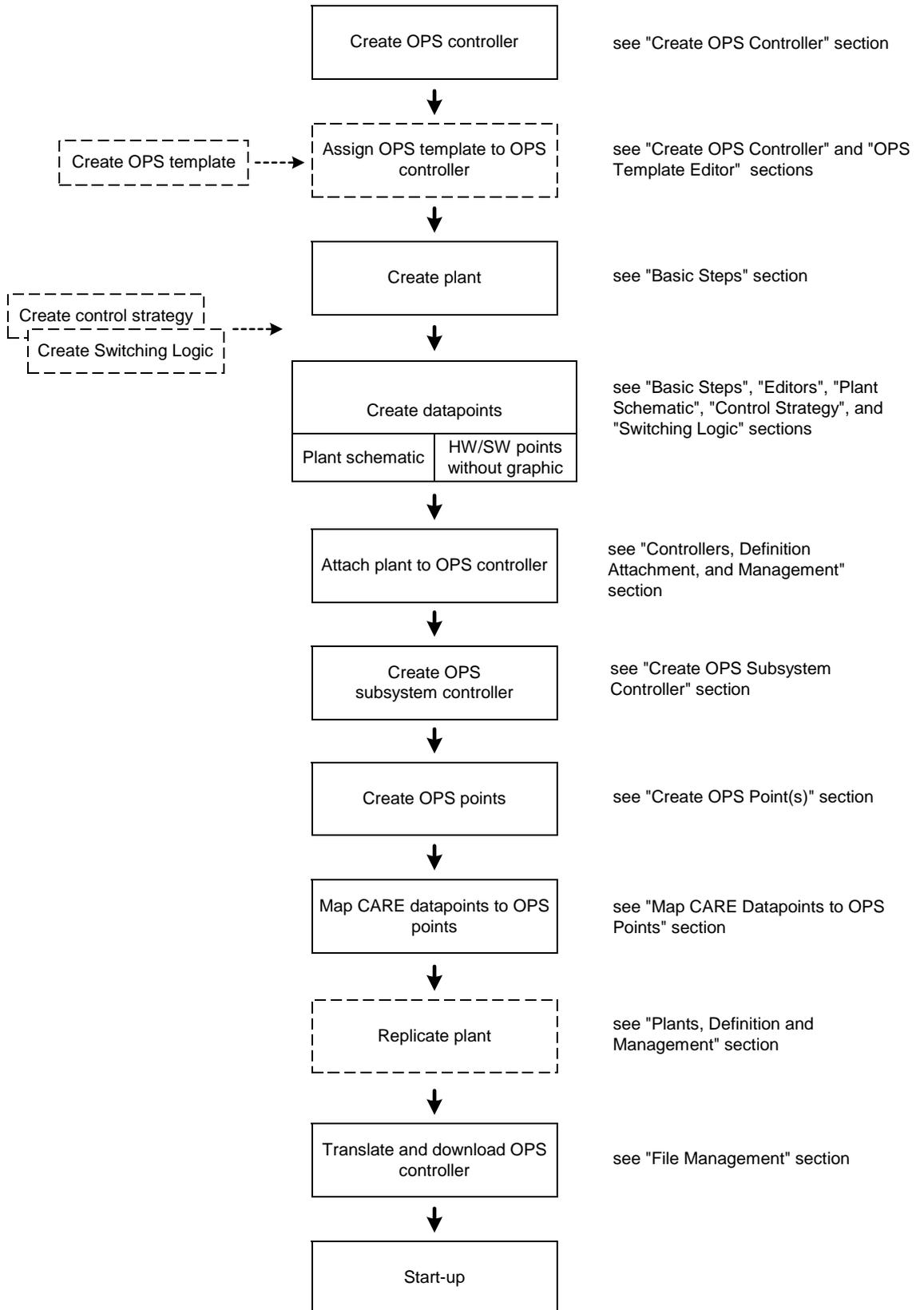
The OPS interface can be stored as a template for reusing hardware configuration many times.



OPS templates are created by using the device library and the OPS Template Editor (see "LonWorks Engineering" and "OPS Template Editor" sections)

Engineering Process

OPS controller engineering is done by the following steps:



---

## OPS Template Editor

---

An OPS template represents a hardware configuration consisting of one subsystem driver, one or several subsystem controllers and subsystem points. By saving OPS templates, the same hardware configuration can be used many times.

The OPS Template Editor supports the following functions:

- Creating, deleting and renaming of
  - OPS templates
  - Subsystem drivers
  - Subsystem controllers
  - Subsystem points
- Importing/Exporting OPS controllers
- Moving subsystem points between subsystem controllers

---

### Create OPS Template

An OPS template is created by creating an OPS device in the device library first and then editing the OPS device as template in the OPS Template Editor.

#### Procedures

##### Create OPS device

1. On the CARE toolbar, click on the Device Library icon .

RESULT: The *Library* dialog window displays.

2. Right-click on the folder, in which you want to create the OPS device (template), in this case, the default folder *OPS*, and click on **Create LON device** in the context menu.

RESULT: The OPS device is inserted into the tree.

3. On the Library toolbar on the top, click the  icon.

RESULT: The *OPS Template Editor* displays and the OPS device is shown in the tree.

4. On the right pane, edit the **Template Name** and enter the subsystem driver into the **Subsystem Driver** field.

5. From the **Port Assignment** drop-down listbox, select hardware interface.

6. Into the **Initialization Block** field, enter initialization block description. The initialization block contains communication and other setup parameters.

7. If desired, create new subsystem controllers and/or subsystem points as described in the following steps.

##### Create OPS Subsystem Controller

8. In the tree, click on controller icon, if not already selected.

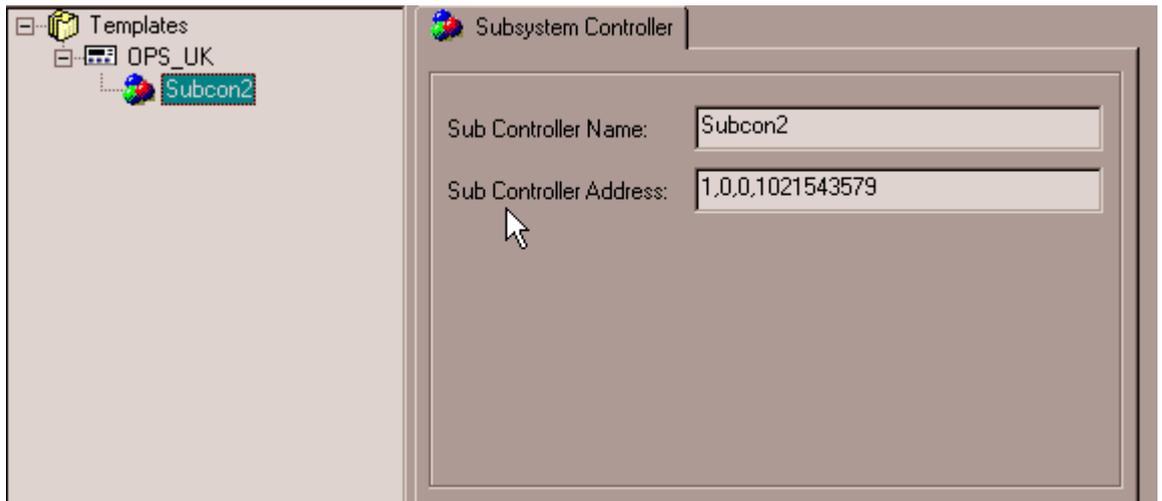
9. Click on  icon.

RESULT: The *Enter Subsystem Controller Name* dialog box displays.



- 10. Enter subsystem controller name.
- 11. Confirm by clicking **OK** button.

RESULT: The subsystem controller (point group) is created and assigned to the OPS device previously selected. On the right, its name and address is displayed.



- 12. In the **Sub Controller Address** field on the right, enter/change sub controller address.
- 13. Continue by creating subsystem points as described in the following steps.

**Create Subsystem Point**

- 14. In the tree, click on subsystem controller, which you want to create the subsystem point for.
- 15. On the OPS Template Editor toolbar, click on .

RESULT: The *Enter Point Name* dialog box displays.



- 16. Enter point name.
- 17. Confirm by clicking **OK** button.

RESULT: The subsystem point is created and assigned to the subsystem controller previously selected.

- 18. In the **Address** field on the right, enter address for subsystem point.

19. Under Scaling, enter value for:

**Factor**

Defines factor for measurement value amplification

**Offset**

Defines value for Offset

**Value Format**

Defines format necessary for compatibility with OpenLink projects.

**Scan Priority**

Defines whether the point should be scanned with higher priority than others,  
1: = normal, >1: = high priority

20. Under Enhanced, check desired options by clicking corresponding check box.

**Readable**

From OPS point of view, the value is readable

**Writable**

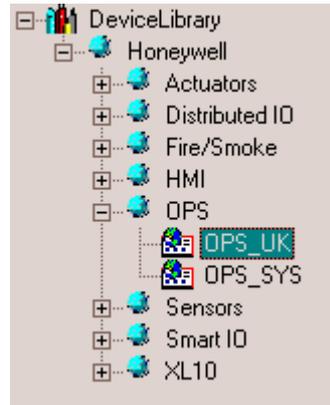
From OPS point of view, the value is writable

**Periodic Write**

From OPS point of view, the value will be periodically written

21. To save the OPS template, click **OK** button.

RESULT: The *Library* dialog windows redisplay and the OPS device is indicated as template by the  icon in the tree.



22. Click **Exit** button in the *Library* dialog window.

**RESULT** The template is now available for selection when creating a new OPS controller (see "Create OPS Controller" section)

### Save OPS Templates

**Procedure** 1. On the OPS Template Editor toolbar, click on  or click **OK** button.

**RESULT:** All templates will be saved.

### Rename OPS Template, Subsystem Controller, Subsystem Point

**Procedure** 1. In the tree, click on item, you want to rename.  
 2. On the OPS Template Editor toolbar, click on  and rename the item in the tree.

### Delete OPS Template, Subsystem Controller, Subsystem Point

**Procedure** 1. In the tree, click on item, you want to delete.  
 2. On the OPS Template Editor toolbar, click on .

**RESULT:** The item will be deleted.

### Expand and Collapse the Tree

**Purpose** Quickly expanding or collapsing the tree.

**Procedure** **Expanding/collapsing the whole tree**

When expanding the whole tree every hierarchical level is displayed. When collapsing the whole tree only the project name is visible.

1. Click any object in the tree (project, controller, etc.)
2. Click menu item Edit, then drop-down item Tree expand all or, click Tree expand all icon  on the toolbar, if you want to see all hierarchical levels of the tree.

or,  
 click menu item Edit, then drop-down item Tree collapse all or, click Tree collapse all icon  on the toolbar, if you want to see only the project name in the tree.

### Procedure Expanding/collapsing parts of the tree

When expanding/collapsing parts of the tree every hierarchical level below the object selected in the tree, is displayed/closed.

1. In the tree, click the object (project, controller, etc.), which hierarchical levels below should be displayed/closed (not displayed)
2. Click menu item Edit, then drop-down item Tree expand from here or, click Tree expand from here icon  on the toolbar, if you want to see all hierarchical levels below the object selected in the tree.

or,

Click menu item Edit, then drop-down item Tree collapse from here or, click Tree collapse from here icon  on the toolbar, if you want to close all hierarchical levels below the object selected in the tree.

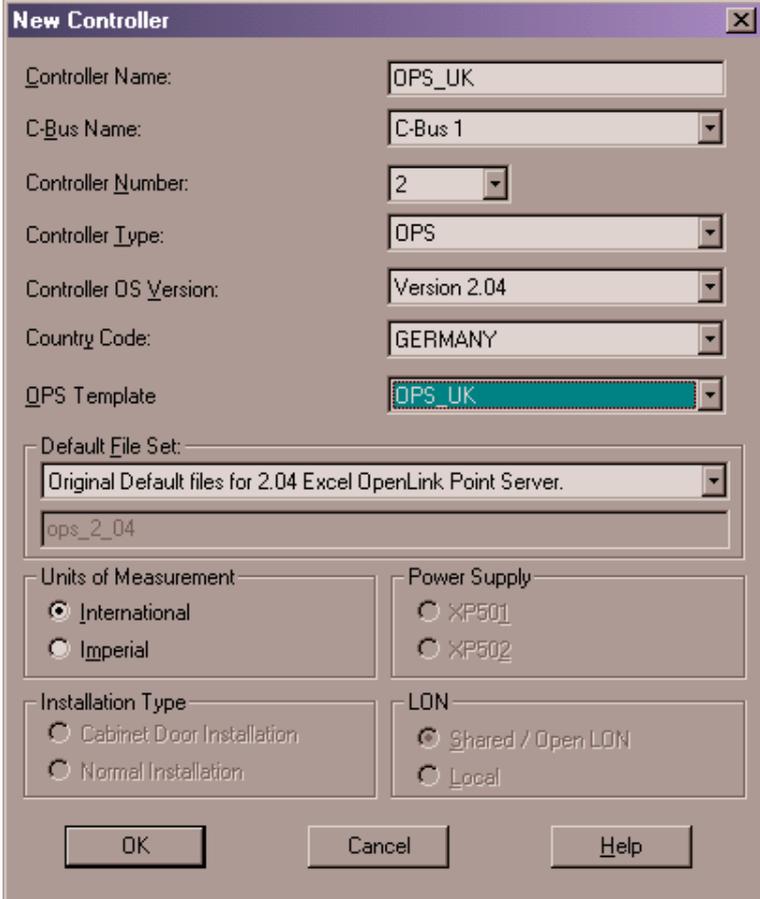
---

## Create OPS Controller

---

- Procedure** 1. Select menu item **Controller**, then submenu item **Create**.

RESULT: *The New Controller dialog box displays.*



**New Controller**

Controller Name: OPS\_UK

C-Bus Name: C-Bus 1

Controller Number: 2

Controller Type: OPS

Controller OS Version: Version 2.04

Country Code: GERMANY

OPS Template: OPS\_UK

Default File Set: Original Default files for 2.04 Excel OpenLink Point Server.  
ops\_2\_04

Units of Measurement  
 International  
 Imperial

Power Supply  
 XP501  
 XP502

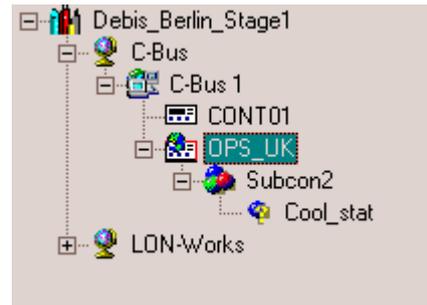
Installation Type  
 Cabinet Door Installation  
 Normal Installation

LON  
 Shared / Open LON  
 Local

OK Cancel Help

2. Into the **Controller Name** field, enter controller name.
3. From the **C-Bus** drop-down listbox, select the folder where the OPS controller should be saved.
4. From the **Controller Type** drop-down listbox, select OPS.
5. From the **OPS Template** drop-down list box, select a template.
6. Confirm by clicking **OK** button.

RESULT: The OPS device is added to the logical plant tree and the C-bus part of the network tree. The subcontroller and points are displayed as defined in the template.



NOTE: In the C-bus part of the network tree you can now add new subsystem controllers and OPS points (right-click to open context menu).

#### **IMPORTANT**

*Changes on the template done in the C-bus part of the network tree or in the OPS Template Editor are not considered for a template already assigned to a controller. After the template was assigned to the controller, it cannot be unassigned and replaced by another template.*

---

## Create OPS Plant

---

Engineering of the plant including schematic, control strategy switching logic and datapoints is done in the same way as for a standard Excel 500 controller. The OPS plant can be of any type.

For detailed information on how to create a plant, refer to the "Basic Steps" section.

Continue by creating datapoints as described in the "Create CARE Datapoints" section.

---

## Create CARE Datapoints

---

CARE datapoints for mapping to OPS points can be created as follows:

- Create a plant schematic
- Directly create hardware/software points without a plant schematic

Refer to the "Basic Steps" section for detailed information on these items.

---

## Create Control Strategy and Switching Logic

---

Control Strategies and Switching Logics for an OPS controller are optional and can be done in the same way as for a standard Excel 500 controller. For detailed

information on these items, please refer to the "Control Strategy" and "Switching Logic" sections.

---

## Create OPS Subsystem Controller

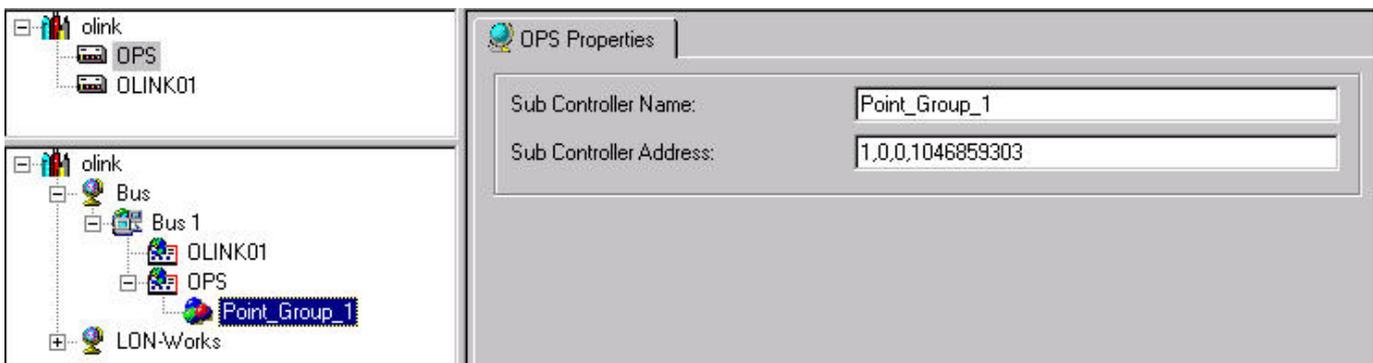
---

**Prerequisites** The OPS controller has been created.

- Procedure**
1. In the C-bus part of the network tree, click on the OPS controller.
  2. Click right mouse key and with left mouse key, click on **Create OPS Subsystem Controller** in the context menu

Or, click menu item **Controller**, then submenu items **OPS** and **Create OPS Subsystem Controller**.

**RESULT:** The OPS subsystem controller is assigned to the OPS controller in the C-bus part of the network tree.



3. On the *OPS Properties* tab on the right, enter/change name in the **Sub Controller Name** field.
4. In the **Sub Controller Address** field, enter/change subcontroller address.
5. Continue by creating OPS points as described in the "Create OPS Point(s)" section.

---

## Create OPS Point(s)

---

- Procedure**
1. In the C-bus part of the network tree, click on the OPS subsystem controller.
  2. Click right mouse key and with left mouse key, click on **Create OPS Point** in the context menu

Or, click menu item **Controller**, then submenu items **OPS** and **Create OPS Point**.

**RESULT:** The OPS point is assigned to the OPS subsystem controller in the C-bus part of the network tree.

The screenshot displays the CARE software interface. On the left, a project tree shows a hierarchy: 'olink' (root) contains 'OPS' and 'OLINK01'. Below this, another 'olink' instance contains 'Bus', 'Bus 1', 'OLINK01', 'OPS', and 'Point\_Group\_1'. At the bottom is 'LON-Works'. On the right, the 'OPS Properties' dialog box is open, showing the following settings:

- Sub Point:** Description: 'Cool\_stat\_1', Address: 'Sub\_point\_address', Id: 'OPS\_5ed8f67e-63e1-42c5-bcfe-62e3033fd2e0'
- Sub Controller:** Name: 'Point\_Group\_1', Address: '1.0.0.1046859303'
- Point Mapping:** CARE Datapoint: 'none' (dropdown)
- Scaling:** Factor: '1,000000', Offset: '0,000000', Value Format: 'uchar' (dropdown), Scan Priority: '1'
- Enhanced:**  Readable,  Writeable,  Periodic Write

3. On the *OPS Properties* tab on the right, define settings as follows:

4. In the **Address** field on the right, enter address for OPS point.

5. Under Scaling, enter value for:

**Factor**

Defines factor for measurement value amplification

**Offset**

Defines value for Offset

**Value Format**

Defines format necessary for compatibility with OpenLink projects.

**Scan Priority**

Defines whether the point should be scanned with higher priority than others, 1: = normal, >1: = high priority

6. Under Enhanced, check desired options by clicking corresponding check box.

**Readable**

From OPS point of view, the value is readable

**Writeable**

From OPS point of view, the value is writeable

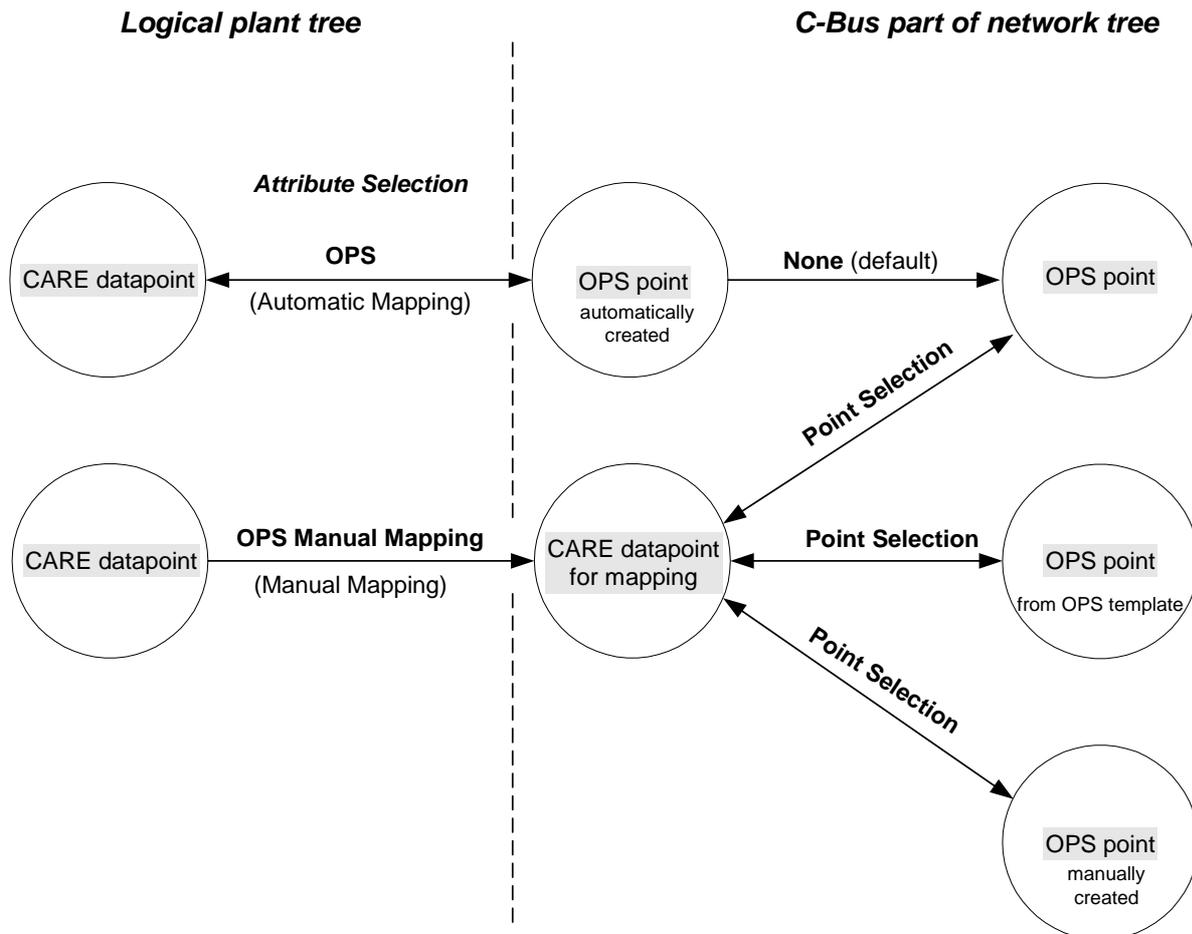
**Periodic Write**

From OPS point of view, the value will be periodically written

## Map CARE Datapoints to OPS Points

Mapping CARE datapoints to OPS points can be done in the following two ways:

- **Automatic Mapping** by assigning the OPS Attribute to the CARE datapoint (logical plant tree). When mapping a CARE point automatically, the datapoint will be mapped to an unmapped OPS point with the same name as the CARE user address. If such an OPS point does not exist, it will be automatically created.
- **Manual Mapping** by assigning the OPS Manual Mapping attribute to the CARE datapoint (C-bus part of the network tree) OPS Manual Mapping is a Pre-Definition. The datapoint can be mapped later to any unmapped OPS point available in the OPS controller (logical plant tree).



### OPS Point Naming Terminology

Regarding the Mapping any OPS point is defined by the following attributes:

- Description
- Address
- ID
- Mapped CARE datapoint

The most important attribute is the unique ID number, which will be automatically defined for the OPS point when it was created.

The ID number cannot be changed, whereas the description, the address and the CARE datapoint assignment can be changed.

This results in the following:

A CARE datapoint can only be mapped to one specific OPS point (ID). For this OPS point, the description, the address and the CARE datapoint assignment can be changed. Two different OPS points can have the same description and/or user address, but one CARE datapoint cannot be mapped to multiple OPS points.

When creating an OPS point automatically, the datapoint will be mapped to an unmapped OPS point with the same name as the CARE user address. If such an OPS point does not exist, it will be automatically created.

### Automatic Mapping

Automatic Mapping between CARE datapoints and OPS points includes the following 2 steps:

- a. Assign 'OPS' attribute to the datapoint in the logical plant tree.
- b. Open *OPS Point Information* dialog box or shift to C-bus part in the C-bus part of the network tree and enter OPS attributes such as address, Offset, etc. for the OPS point.

#### Procedure

1. In the logical plant tree, click on the datapoint, you want to have made an OPS point for, in this case for AI1.

RESULT: On the right, the datapoint attributes are displayed in itemized display.

2. From the **OPS Point** drop-down listbox, select OPS Point.

RESULT: The datapoint will be automatically mapped to an existing or newly created OPS point with the same name as the datapoint. In the logical plant tree, the CARE datapoint is displayed in yellow. In the C-bus part of the network tree, the created OPS point is added and indicated by a blue  icon. To complete OPS interface creation, additional attributes need to be entered by doing one of the following:

4. Click on the dotted button  right to the OPS point drop-down listbox.

RESULT: The *OPS Point Information* dialog box displays.

5. Enter **Address**, **Scaling** and **Enhanced** attributes. For detailed description of the attributes refer to the "Create Subsystem Point" section.

Or,

6. To access all OPS points for editing, go to the C-bus part in the C-bus part of the network tree, browse to the subsystem controller and click on the OPS point.

### Manual Mapping

Manual Mapping between CARE datapoints and OPS points includes the following 3 steps:

- a. Assign 'OPS Manual Mapping' attribute to the datapoint in the logical plant tree.
- b. Go to the C-bus part of the network tree and map particular OPS point to this CARE datapoint.

c. Enter OPS attributes such as address, offset, etc. for the OPS point.

**Procedure**

1. In the logical plant tree, click on the datapoint, you want to have made an OPS point for, in this case AI2.

RESULT: On the right, the datapoint attributes are displayed in itemized display.

3. From the OPS Point drop-down listbox, select 'OPS Manual Mapping'. OPS Manual Mapping is a pre-definition. The datapoint can be mapped later to any unmapped OPS point available in the OPS controller (C-bus part of the network tree).

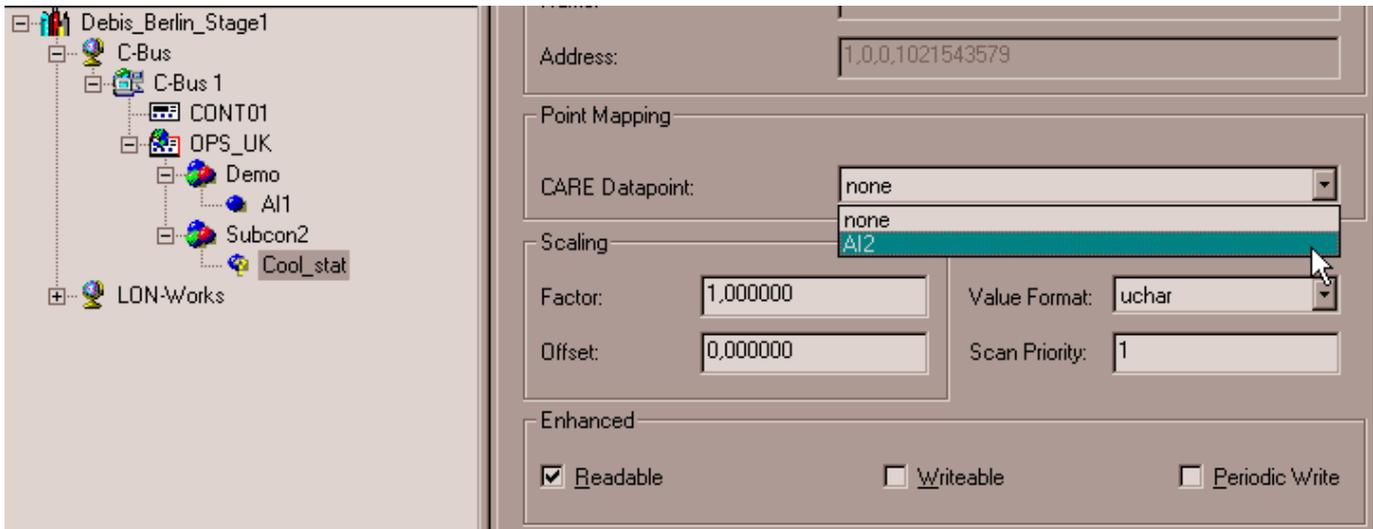
NOTE: No OPS point will be created.

4. Browse to the OPS subsystem controller in the C-bus part of the network tree.

5. In the tree, select OPS point to be mapped. OPS point can originate from the OPS template, manual creation in the tree or by automatic creation.

Mapped points are indicated by the blue icon, unmapped points are indicated by the icon.

6. On the right under *Point Mapping*, select CARE datapoint from the **CARE Datapoint** drop-down listbox.



RESULT: The CARE datapoint is mapped to the OPS point. In the C-bus part of the network tree, the mapped point is indicated by the blue icon.

**Unmap OPS Points**

**Procedures**

**Logical Plant Tree**

1. In the logical plant tree, click on point you want to unmap.

RESULT: On the right, the datapoint attributes are displayed in itemized display.

Type	
User Address:	DigOut
Technical Address:	02/90/08
Point Role:	
Point Subtype:	DO Normally Open not pulsed with switches
OPS Point:	OPS
Controller: KS_CSC	
Plant Info: ops	
Point ID:	

Misc. Editor Functions	
Engineering Unit:	On / Off
Descriptor:	

Special Values	
Operator Access Level:	3
Service Interval:	0 hrs
Write Protect Priority:	0
<input type="checkbox"/> Critical Alarm Type <input checked="" type="checkbox"/> Suppress Alarm <input type="checkbox"/> Hide Point <input type="checkbox"/> Runtime Enabled	

- From the **OPS Point** drop-down listbox, select 'None'.

RESULT: The OPS will be unmapped.

#### C-bus part of the network tree

- In the C-bus part of the network tree, click on point you want to unmap.

RESULT: On the right, the OPS point attributes are displayed in itemized display.

Sub Point

Description: DigIn

Address: Sub\_point\_address

Id: OPS\_01074e01-1f90-11d5-baac-00508bd7a7cb

---

Sub Controller

Name: ops

Address: 1,0,0,985353944

---

Point Mapping

CARE Datapoint: DigIn

---

Scaling

Factor: 1,000000

Offset: 0,000000

Value Format: uchar

Scan Priority: 1

---

Enhanced

Readable

Writeable

Periodic Write

2. From the **CARE Datapoint** drop-down listbox, select 'None'

RESULT: The OPS will be unmapped.

Sub Point

Description: DigIn

Address: Sub\_point\_address

Id: OPS\_01074e01-1f90-11d5-baac-00508bd7a7cb

---

Sub Controller

Name: ops

Address: 1,0,0,985353944

---

Point Mapping

CARE Datapoint: none

---

Scaling

Factor: 1,000000

Offset: 0,000000

Value Format: uchar

Scan Priority: 1

---

Enhanced

Readable

Writeable

Periodic Write

## Move Subsystem Point

Subsystem points can be moved between subsystem controllers by Drag&Drop in the C-bus part of the network tree.

- Procedures**
1. To move points in the current OPS controller, browse to the OPS subsystem controller in the C-bus part of the network tree.
  2. Click on OPS point and move it by Drag&Drop to the desired subsystem controller.

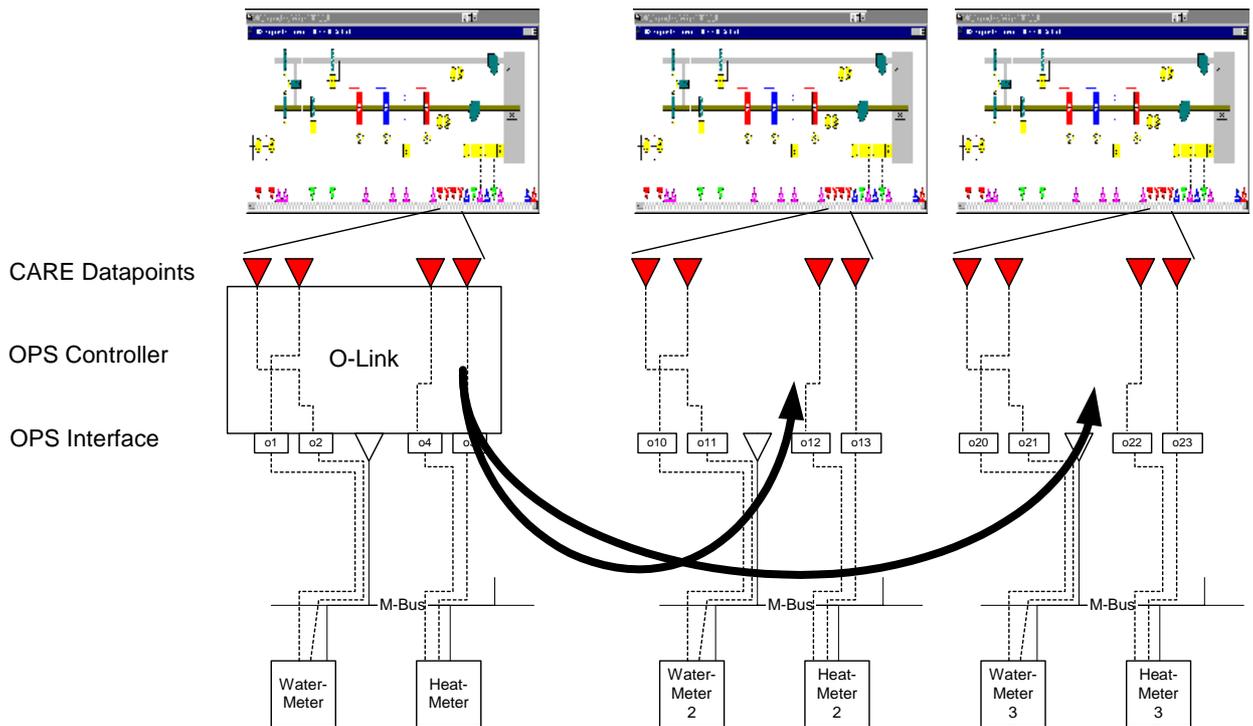
## Replicate Plant

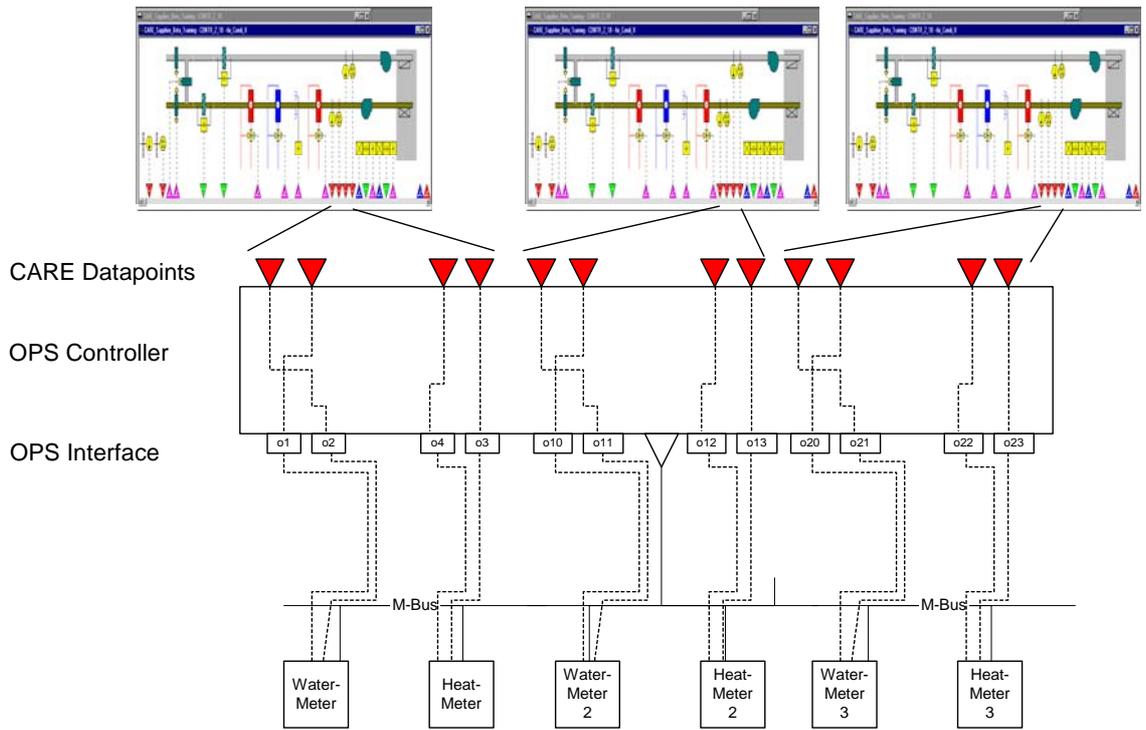
For streamlining the engineering process of OPS controllers, a plant can be replicated multiple times after the mapping has been done.

Replication will include:

- CARE datapoints
- Control strategies and switching tables, if assigned to the plant.
- OPS Subsystem controllers and OPS points

After replication the plants will be available as unattached plants. After attaching the plants a "big" OPS interface will have been created.





Please, refer to the "Plants, Defintion and Management" section for detailed information on how to replicate a plant.

## Import/Export OPS Controller

An OPS controller can be imported, respectively exported at two points:

- From within the OPS Template Editor
- From within the C-bus part of the network tree.

When importing/exporting the OPS controller from the OPS Template Editor a pure template without any mapping information will be imported/exported whereas when importing/exporting the OPS controller from within the C-bus part of the network tree an OPS controller (OPS device) including all mappings will be imported/exported.

This means for importing into the OPS device that all current OPS points will be deleted and replaced by the imported OPS points. Mappings between imported OPS points and CARE datapoints of the same name will be re-established.

For importing into the OPS template, the current OPS template data are deleted and replaced by the imported OPS controller data. No mapping information will be imported.

## Import OPS Controller

### Migration Strategy Note

If the Import OPS controller function is part of the migration strategy, first perform steps 1 through 7 from the "Migration Procedure" section.

### Import into Current OPS Controller

1. To import OPS controller data into the current OPS controller, browse to the OPS controller in the C-bus part of the network tree.
2. Continue with "Common Steps".

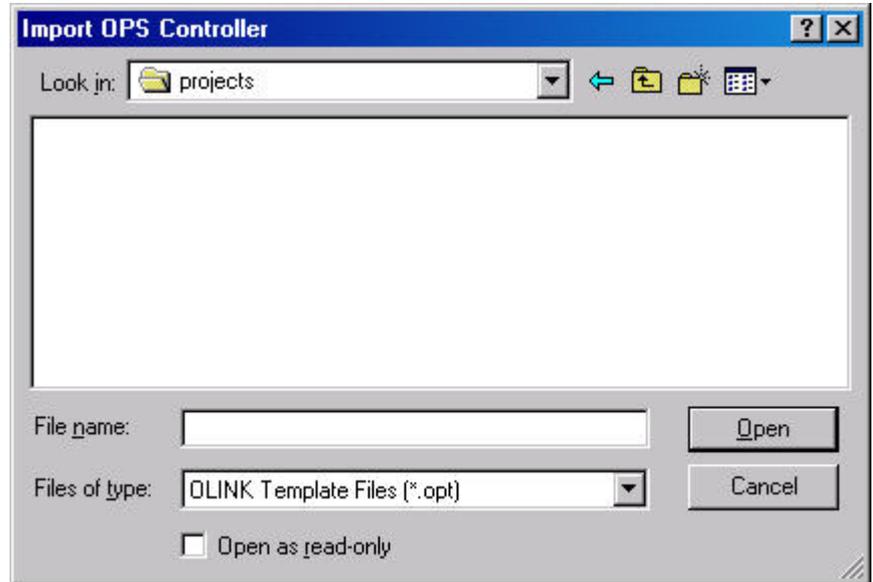
### Import into OPS Template

1. To import OPS controller data into the OPS template, open the OPS Template Editor (see "OPS Template Editor" section).

**Common Steps**

2. Continue with "Common Steps".
3. In the C-bus part of the network tree respectively in the OPS template editor tree, click on OPS controller, respectively on OPS template.
4. On the OPS toolbar, click .

RESULT: The *Import OPS Controller* dialog box displays.



5. Navigate to the folder where the *OPT* file resides and select it.
6. Click **Open** button.

RESULT: The *Import OPS Controller Options* dialog box displays.

7. Select desired option.

RESULT: A message box displays. Note that the existing OPS device (controller) data will be overwritten when selecting Yes.

8. Click **Yes** button.

RESULT: If the import was successful, the following message box informs you about that .

9. Click **OK** button.

RESULT: The OPS information imported is displayed in the tree on the left.

---

## Export OPS Controller

**Based on Current OPS Controller**

1. To export the OPS controller data based on the current OPS controller, first translate the OPS controller.
2. Browse to the OPS controller in the C-bus part of the network tree.
3. Continue with "Common Steps".

**Based on OPS Template**

1. To export the OPS controller data based on the OPS template, open the OPS Template Editor (see OPS Template Editor section).

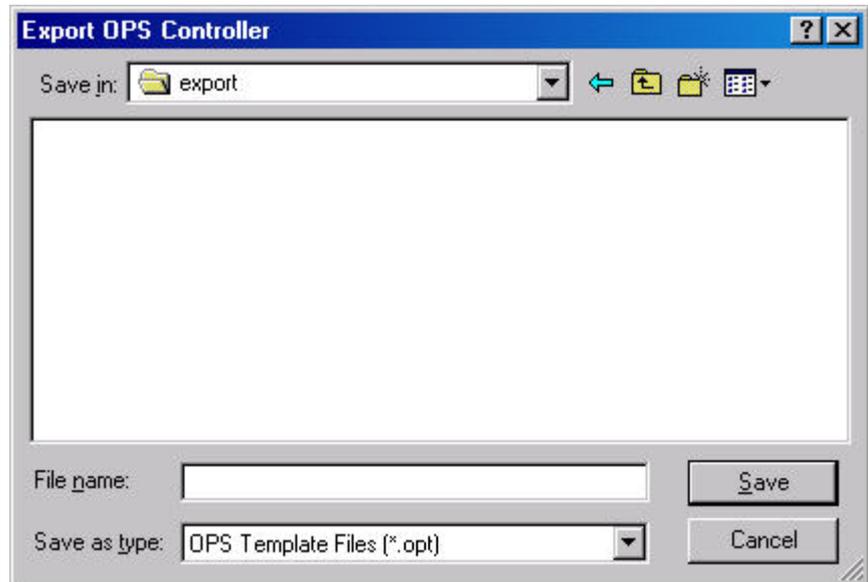
2. Continue with "Common Steps".

**Common Steps**

3. In the C-bus part of the network tree respectively in the OPS template editor tree, click on OPS controller, respectively on OPS template.

4. On the OPS toolbar, click .

RESULT: The *Export OPS Controller* dialog box displays.

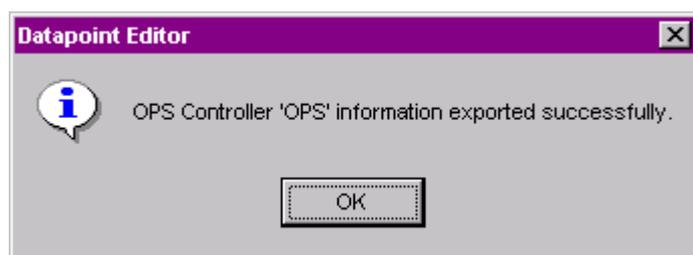


5. Navigate to the folder where the *OPT* file should be saved.

6. Into the **File Name** field, enter file name.

7. Click **Save** button.

RESULT: A message box informs you about the successful export of the OPS controller.



8. Click **Save** button.

---

## Migration Strategy

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CARE 3.01.00 and higher allows upgrading existing OLink projects to OPS projects. The exported data of the old OLink project data can be imported in the same file format (*OPT*).

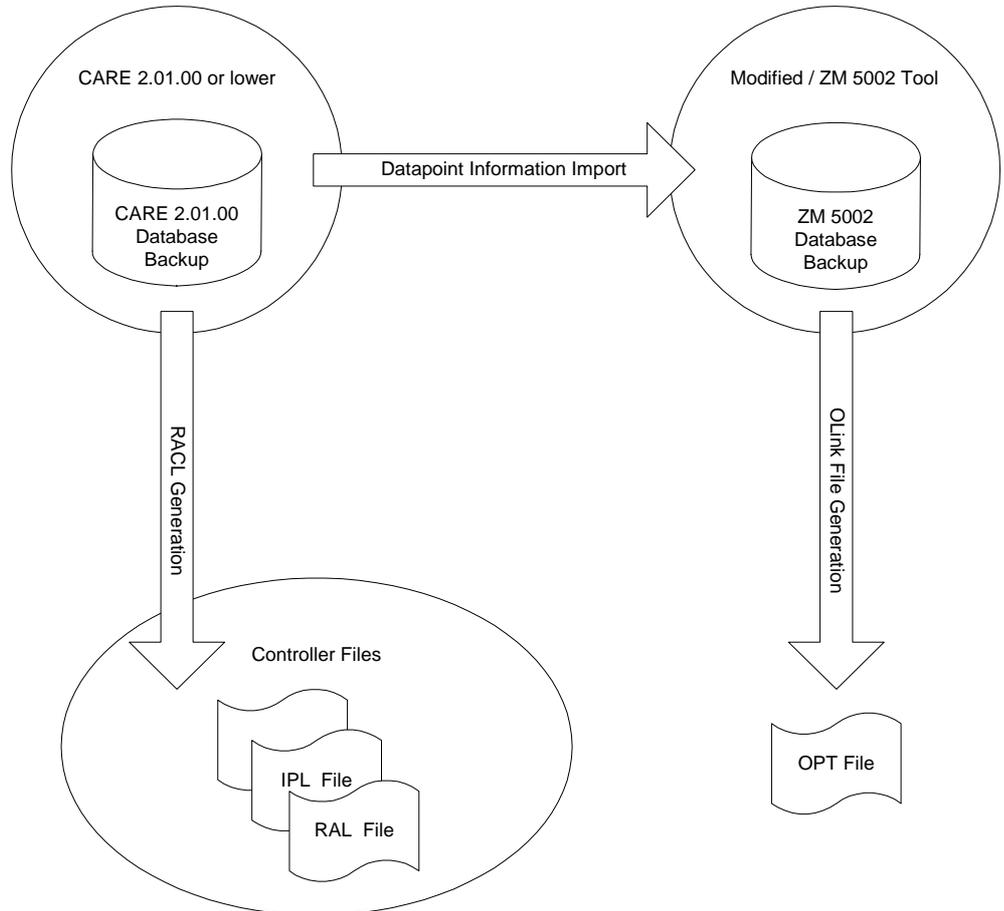
An old OLink Project consist of two main elements:

- The CARE database (version 2.01.00 or lower) where the OLink controllers and also the datapoints are stored.
- The ZM 5002 database (ZM5002 project) which fits to this CARE project.

During the Upgrade the attached XLink plant including control strategies and switching logics gets to Air-conditioning. The XLink controller will be transformed to the OPS controller type and the XLink datapoint technical address gets to standard technical address (see steps 7 and 8).

NOTE: An unattached XLink plant will no longer be supported.

### Migration Procedure



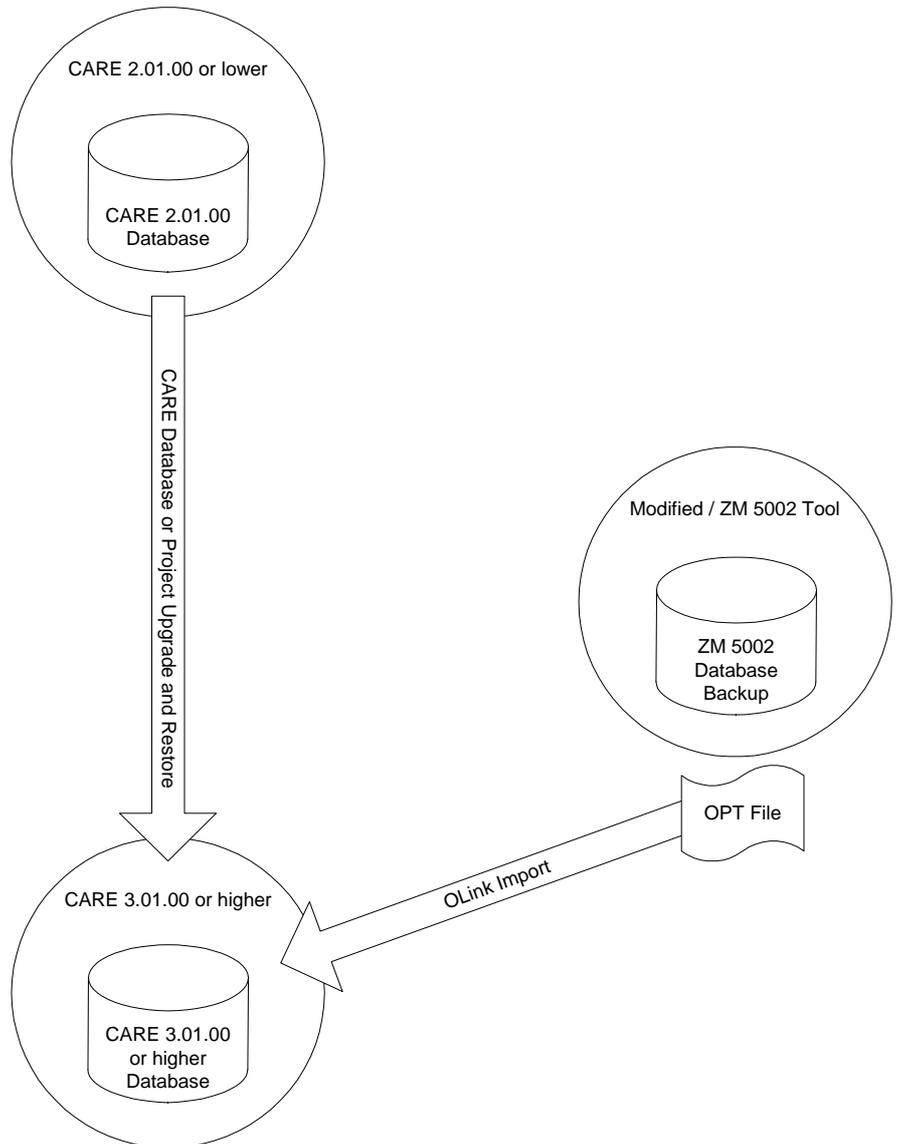
1. You need to have CARE 2.01.00 installed first with the OLink controller project in the database.
2. Translate the controller.
3. Start the modified ZM 5002 Tool, which will be provided by the CARE Team and import the CARE controller files.
4. In the modified ZM 5002 tool an additional menu item will be available which allows creating (export) the *OPT* file (opt file = ops file plus binary code).
5. Make a database backup of the CARE 2.01.00 database or a project backup.
6. Install CARE **3.01.00** or higher (CARE with OPS support).
7. Within the installed CARE version upgrade the CARE 2.01.00 database (or project) to the highest CARE version and then restore this database (or project).

RESULT: If an old XLink controller was found during the upgrade, the **Select XLink, OLink or OPS controller type** dialog box displays. An old XLink controller can be kept as XLink type or transformed to an OLink or OPS controller.



8. Select **OPS**, or, if you want to transform the controller to the OLink type, select **OLink**.
9. Click **OK** button.

RESULT: The upgrade will be finished.



10. In the C-bus part of the network tree, click on the OLink controller.
11. Click right mouse key and with left mouse key click on **Import OPS Controller** in the context menu (see "Import OPS Controller" section).
12. Import the *OPT* file. All mappings between datapoints to OLink points will now be available.
13. From menu item **Controller**, click drop-down item **Tools**, then submenu item **NO/NC Upgrade**, since the OPS controller is only supported by the new NO/NC mechanism.

RESULT: Migration is completed.



# LONWORKS ENGINEERING



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## LONWORKS NETWORK ENGINEERING

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Before engineering a LonWorks network, it is strongly recommended to get familiar with LonWorks technology by reading the Excel 50/50 LonWorks Mechanisms Interface Description, form number EN0B-0270 and the relevant Echelon documentation.

### Prerequisites

The controller, the plant and the datapoints have been created in the logical plant tree (see the CARE ENVIRONMENT, BASIC STEPS, CONTROLLERS DEFINITION AND MANAGEMENT, PLANTS DEFINITION AND MANAGEMENT and EDITORS chapters).

A LON application running on a LonWorks network is to be engineered in the network tree in interaction with the logical plant tree. LonWorks network engineering may include the following tasks:

- Model physical LonWorks structure by defining a channel structure
- Creation of routers
- Configuration of the network components, e.g. transceiver type for LON-channels, LON network interface, etc., routers
- Logical arrangement of controllers and LON devices
- Editing of the controller network interface by
  - Creating and deleting LON objects
  - Creating and deleting input and output NVs of standard and structured type
  - Creating and Mapping NVs to datapoints
  - Building and assigning value conversion tables
- Assignment of LON devices (Binding)
- Onnet network tuning

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## Excel 50/50 Controller Network Interface

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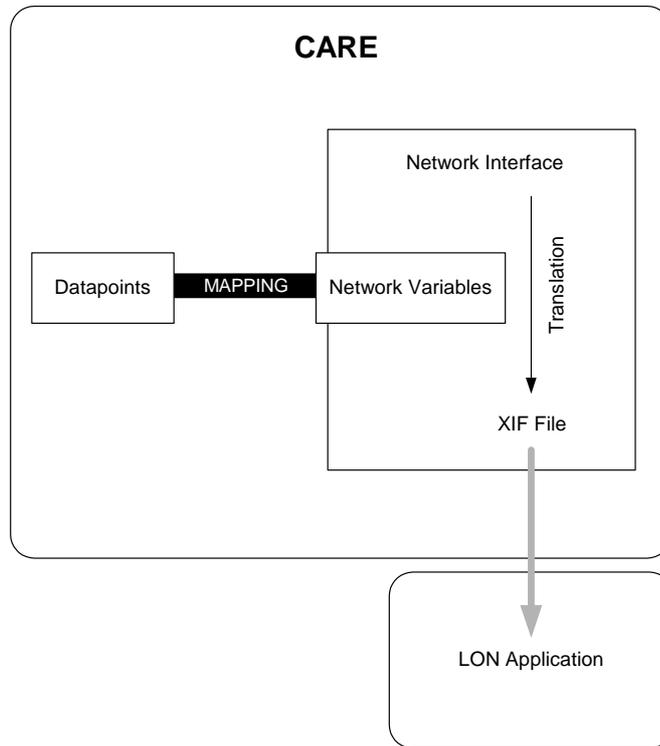
CARE provides all necessary functions to enable a CARE application running on a LonWorks network. The following sections shortly describe the interaction and relation between the "datapoint world of CARE" and the "network variables world of LON".

The network interface provides the information needed for installation and binding. The network interface is composed of the following key elements:

- Node object
- Generic LonMark objects
- Application specific LonMark objects such as sensor, actuator, or controller object
- Network variables
- Configuration parameters

CARE provides the network interface by creating the XIF file (E\_xternal I\_nterface f\_ile) for each controller (device) of the CARE project. The XIF file is automatically generated along with the application translation.

The "interface" between the CARE application and the network interface is implemented via mapping functionality between datapoints and NVs. Mapping can be created manually or automatically within CARE.



### Changes on the Controller Network Interface/CARE Application

When using CARE Versions **lower 4.00.00** respectively controller OS versions **lower 2.06**, changes on the controller network interface should be done as little as possible, since it affects the bindings. This means as soon as

- NVs are deleted or added
- Objects are deleted or added
- NVs have been moved between objects
- NV types have been changed
- Input NV has been changed into output NV and vice versa
- NV name has been changed
- Changing the mapping of datapoints to NVs
- NV self documentation has been changed
- Flags have been changed
- Value conversion tables have been added or changed

the network interface (XIF file) will be changed.

#### **IMPORTANT**

*When using OS 2.04 and downloading an application of which network interface was changed, the bindings will be eliminated and have to be re-done with a separate LON tool. When using OS 2.06 bindings will be kept when changing the network interface and therefore no bindings must be re-done.*

**NOTE:** The program ID will be kept even if the network interface was changed. Then, the LON device template with the program ID must be deleted in the LON tool.

The most actions mentioned above are exclusively applicable in the logical LON-bus part of the network tree. Any changes done in the logical plant tree will not affect the network interface. Thus, the following actions will **not** affect the network interface:

- Changing datapoint names
- Changing time programs
- Changing the datapoint description
- Adding/Deleting or Editing C-Bus datapoints

- Changing control strategies and switching tables

**IMPORTANT**

*As long as a network interface remains the same, for **OS 2.04** LON applications can be downloaded without elimination of the bindings.*

**Using a LNS tool additionally**

If a LON network interface has to be changed – because the LON application needs to be changed – when using a LNS tool, the following steps need to be taken:

1. Delete the LON device (controller) in LonMaker®  
This means that all bindings will be deleted and gone.
2. Delete the LON template in LonMaker®  
Download the changed application into the controller
3. Install a new LON device (controller) in LonMaker® by getting the information from the controller or the XIF file.
4. Re-do all bindings!

If a LON device like a controller has been deleted in LonMaker®, then the controller will restore the LON bindings after 3 minutes automatically, if no new or changed bindings will be done in LonMaker®.

When using **OS 2.06** in CARE the following steps need to be taken in case of necessary interface changes:

1. Translate the controller
2. Download the controller
3. Commission the controller
4. Synchronize with LNS (only when using additional LNS tools)

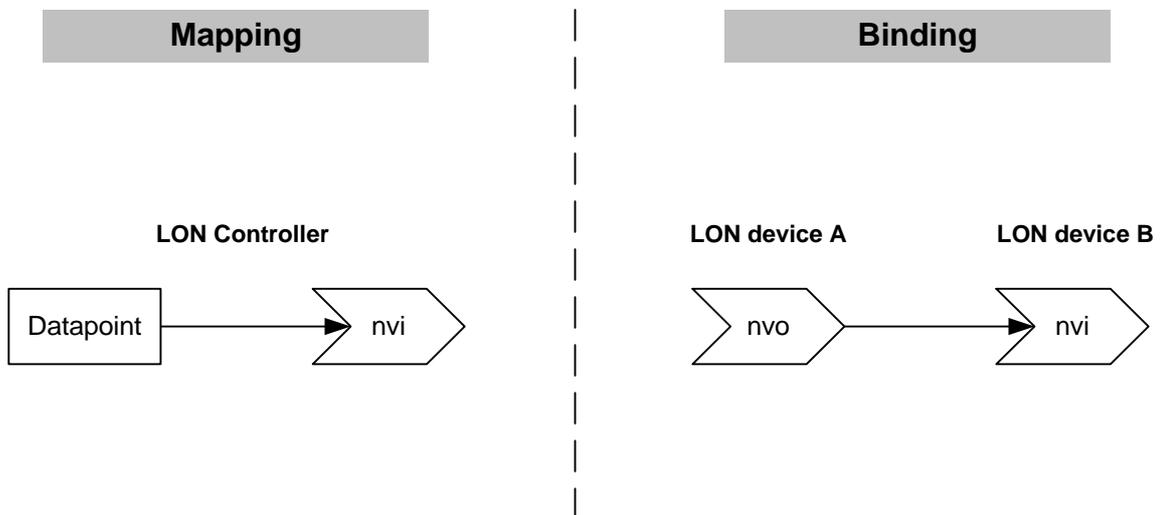
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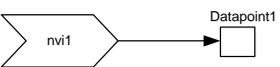
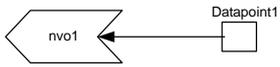
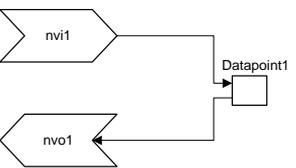
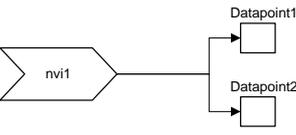
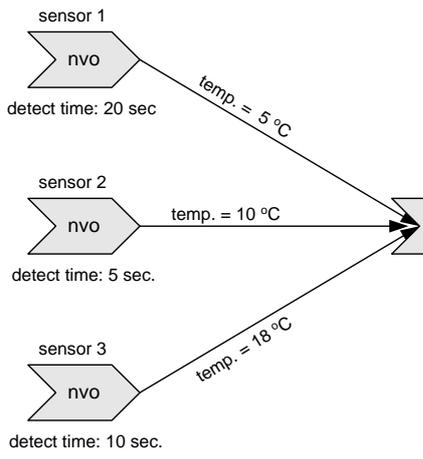
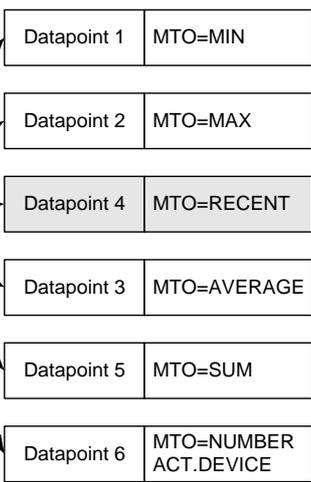
## Mapping and Binding

---

Mapping is the process of assigning a LON network variable (NV) to an Excel 50/500 datapoint. Mapping allows to use LON network information in Excel 50/500 datapoints and vice versa. Mapping has not to be mixed up with Binding.

Binding is defined as the process of interconnecting NVs (devices) on a LonWorks network. This is a standard functionality provided by LON tools and CARE.

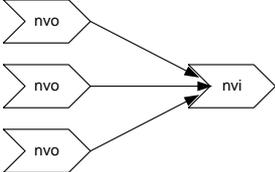


<b>Mapping Types</b>	
Within CARE the following mapping types are possible:	
	Software points can be of any type (input and output). Hardware points must be of the same type. Input NVs can also be mapped to multiple datapoints (see Many-to-one mapping).
	Software points can be of any type (input and output). Hardware points must be of the same type. Output NVs can only be mapped to one datapoint.
	Allows to map a maximum of one input NV and one output NV to the same software point.
	<p>For input NVs there are 2 different binding types on the LON part:</p> <p>One-To-One (1-1): The value of the input NV corresponds to the value of one bound output NV</p> <p>Many-To-One (n-1): The value of the input NV corresponds to a mathematical function (recent, min, max, average, sum, or number of devices) of all bound output NVs.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;">Binding via LON tool</div> <div style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;">Mapping via CARE</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%; text-align: center;"> <p><b>LON Devices</b></p>  </div> <div style="width: 45%; text-align: center;"> <p><b>LON Controller</b></p>  </div> </div> <div style="text-align: right; margin-top: 10px; background-color: #f0f0f0; padding: 2px;">MTO: Many-To-One</div> <p>On the CARE part, an input NV can be mapped to multiple datapoints. For each mapping one mathematical function out of all possible functions can be applied. However, for all mappings,</p>

<b>Mapping Types</b>	
	<p>the same value conversion table is used.</p> <p>The available functions are:</p> <p>None: Default</p> <p>Recent: Latest updated value of all bound output NVs is used</p> <p>Min: Minimum value of all bound NVs is used</p> <p>Max: Maximum value of all bound output NVs is used</p> <p>Average: Arithmetic average of all bound output NVs is calculated</p> <p>Sum: The sum of all incoming values is calculated</p> <p>Number of active devices: The number of active devices that deliver values via their bindings.</p>

The following point types cannot be mapped:

- FF Flex DO\_Feedback\_DI
- FM Flex Multistage
- FP Flex Pulse2
- GA Global Analog
- GD2 Global Digital 2state
- GDn Global Digital Nstate
- TO Totalizer

<b>Binding Types</b>	
Via LON tool the following two types of binding are possible:	
	<p><b>One-To-One (OTO):</b> One nvo is connected to one nvi.</p> <p>The value of the input NV corresponds to the value of the bound output NV. This is the Standard binding type.</p>
	<p><b>Many-To-One (MTO):</b> Multiple output NVs are bound to one input NV and vice versa.</p> <p>This results in the choice to analyze different mathematical calculations of the bound output NVs for the nvi. The value of the input NV corresponds to the chosen mathematical function (in, max, average, sum, recent, number of devices) of all bound output NVs. The results can be transferred to up to many datapoints via point mapping done in CARE.</p>

## Design and Configure Network

**Purpose** To structure the C-bus and LonWorks network according to conditions in the building.

This includes:

- Set global settings (Default LON Properties).
- Creation of a skeletal structure consisting of Default and subsystems
- Physical and logical arrangement of controllers and LON devices in these systems
- Configuration of the network components, e.g. transceiver type for LON-channels, LON network interface, etc.

For information on the BACnet-Bus network structure, please refer to the "BACnet Network Structure" section.

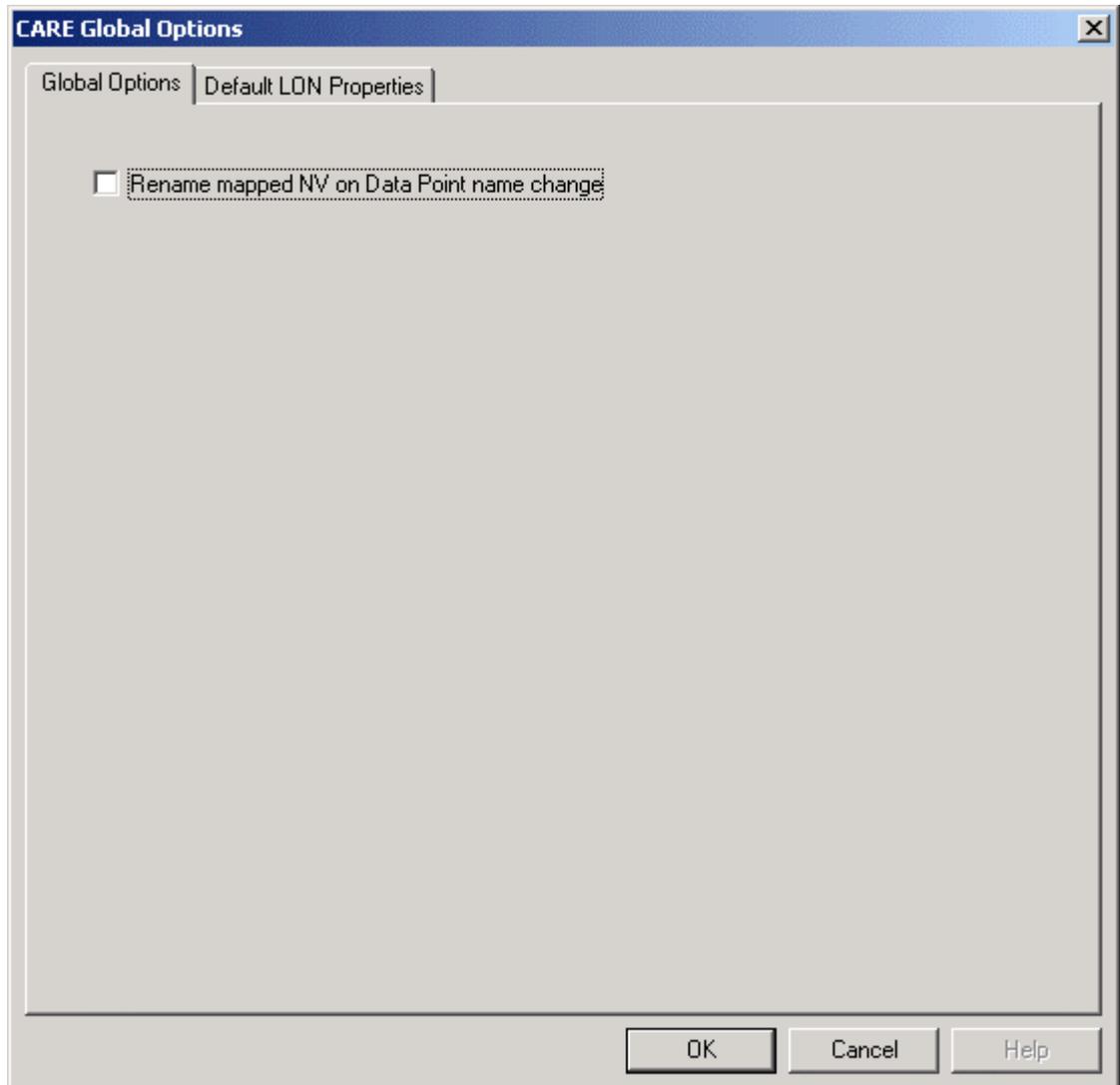
## Set Global Options

**Purpose** To define global settings for a LonWorks engineering session. This includes:

- Simultaneous NV renaming in case of datapoint renaming
- Display of a warning in case of changes on the LON interface
- Channel limit definition

**Procedure** 1. Click on menu item Options, then submenu item Global Options.

**RESULT:** The *Global Options* dialog box displays.



2. Check the **Rename mapped NV on datapoint name change** option if you want the NV to be changed accordingly when changing the referring datapoint name.

3. Click *Default LON Properties* tab.

**RESULT:** The default LON properties are shown. The Default System Name and Default Channel Name are displayed in disabled fields. These defaults have been set in the network tree and can be changed there at any time. The NV Type list Version displays the version number, which is useful for the Honeywell Technical Support Center (TAC) in case of updates.

**CARE Global Options**

Global Options | **Default LON Properties**

Default System Name: /LON-Works/Default System/

Default Channel Name: Channel\_1

NV Type List Version: 94

Generate LON interface change warning

Allow to exceed channel limit

**Default Connection Settings**

Warning !!  
Changing the Default Connection Settings will be reflected on all new bindings for this project !

Timers (Milliseconds)

Service Type: Ackd  Auto

Priority: No  Auto

Authentication: No  Auto

Transmit: 96  Auto

Repeat: 48  Auto

Receive: 128  Auto

Counts

Retry: 3  Auto

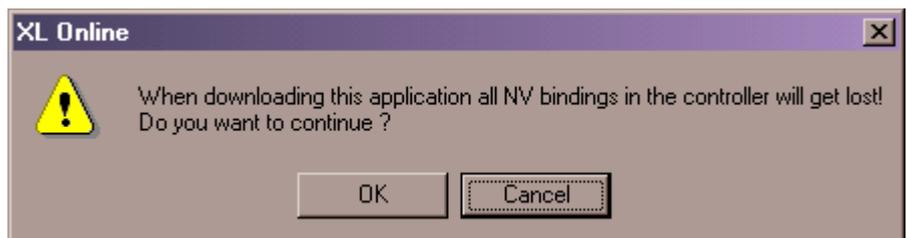
Repeat: 3  Auto

Use Broadcast: No

Multicast Method: Group

OK Cancel Help

4. Check the **Generate LON interface change warning** option if you want to display the following warning in case the LON interface has been changed.



This means that whenever you change the LON interface in the network tree by adding or deleting NVs and/or LON objects this warning will be displayed.

5. Check the **Allow to exceed channel limit** option if you want to allow exceeding the max. number of devices to be added to channels.

#### **IMPORTANT**

*The physical layer of the LonTalk protocol is designed for max. 64 devices per channel in order to assure a properly working network. Exceeding that number of devices may cause electrical problems. When adding more than 64 devices to the channel, increased traffic on the LonWorks network may also cause problems. It is recommended to avoid exceeding the limits. Whenever it may become necessary to exceed the limit of 64 devices, it is recommended to use a repeater.*

6. Under Default Connection Settings, check the settings that should be used for connections when creating bindings. Note that these settings will become valid only for bindings created from now on. If you are not an advanced user of LON technology, it is recommended to keep the settings as provided by CARE.
7. Confirm your settings by clicking OK.

## Change Service Type for BACnet Datapoints

Applies to analog, binary and multi-state output point types of the Excel Web controller.

In order to make sure that the Reliability property for the present value works properly, the service type of the point must be set to Acknowledged (Ackd). With acknowledged service, controller - I/O module disconnections are indicated by the relevant reliability 'No Sensor' or 'No Output'.

**NOTE:** If a large number of outputs (e.g. all outputs of multiple I/O modules) are set to acknowledged service, the performance on the LON bus may drastically decrease.

### Procedure

1. Expand the LON-bus part of the network tree and navigate to the output point in the plant.

The screenshot displays the software interface for configuring BACnet datapoints. On the left, a network tree is shown, expanded to the LON-Works section. Under 'CONT\_01', the 'Plant 1' sub-section is expanded, showing various input and output points. The 'nvoAO\_1 (Hub)' connection is selected. On the right, the 'Properties' dialog box is open, showing the 'Service Type' dropdown set to 'Ackd' and the 'Auto' checkbox unchecked. Other settings like Priority, Authentication, Timers, and Counts are also visible.

2. Click on the connection.
3. On the Properties tab on the right, uncheck Auto at Service type and select Ackd from the drop-down listbox.

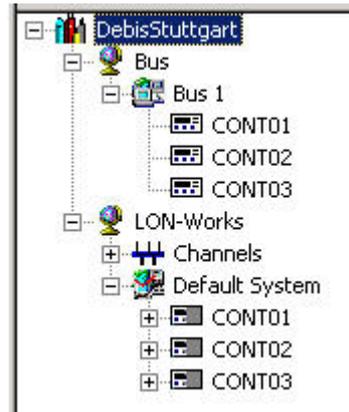
## The Default Network Structure

NOTE: For information on the BACnet-Bus network structure, please refer to the "BACnet Network Structure" section.

By default, the network tree shows the two basic bus types, Bus and LON-Works.



Each bus is sub-divided by default to allow an arrangement of the network components according to the physical conditions in the building.



The Bus folder contains the Bus 1 subfolder by default. Further created subfolders will be numbered continuously. The subfolders represent the physical C-Bus network structure of the project and contain the C-bus controllers, which control that segment of the building.



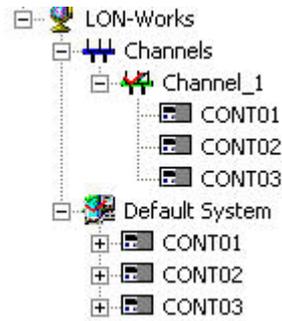
NOTE: The subfolder names are examples and freely editable. For example, the default Bus 1 subfolder can be named into Area1 or Block A.

The LON-Works folder represents the network interface of the LON-Bus and is subdivided by default into a physical part, called Channels and a logical part, called Default System.



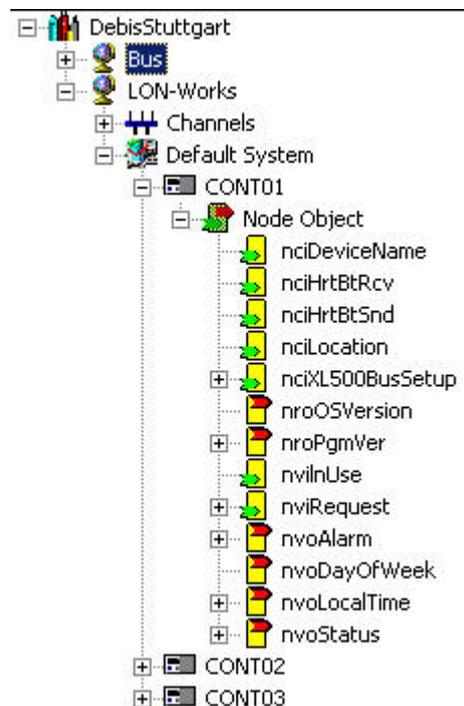
The Channels folder contains the Channel\_1 subfolder by default. Additional channels can be created and their names are freely editable.

A channel arranged in the Channels folder, represents the physical medium, for example twisted-pair cable, and lists all LON devices attached to this cable. Controllers can be shifted between channels to model the physical conditions in the building.



The Default System as the top-level system of the logical LON-Bus part provides all software functions necessary to work on LON devices, LON objects, NVs etc. It might contain the following components:

- Subsystems (to be created below the Default System)
- LON devices
- LON objects
- NVs (network variables)
- SCPTs (standard configuration property types)



NOTE: The Default System and subsystems can have further subsystems. Names as "Default System" and "Subsystem" are examples and freely editable.

## Create C-Bus Subsystems

NOTE: For information on the BACnet-Bus network structure, please refer to the "BACnet Network Structure" section.

### Procedure

1. With left mouse key, select the physical Bus folder in the network tree.
2. Click right mouse key and with left mouse key, click Create Bus in the context menu.

RESULT: The new subsystem folder will be added below the Bus folder, in this case called Bus 2. On the Properties tab on the right pane, the following properties can be defined:

**(Sub)System Name**  
Edit the name, if desired.

**C-Bus, C-bus baud rate**  
If the controllers communicate via physical C-Bus, click the C-Bus radio button and select the C-bus baud rate from the drop-down listbox.

**LON-Bus, Bus ID**  
If the controllers communicate via Building Management Functionality over LON (explicit messaging), click the LON-Bus radio button and select a bus ID from the drop-down listbox. The C-Bus architecture allows max. 30 controllers per physical C-Bus. Hence, a subsystem can include 30 controllers at maximum. For the 31<sup>th</sup> C-Bus controller a new subsystem must be created.

**Remote Host Name**  
In case you want to download an application remotely, enter the host name or the IP address.

**Remote Bus ID**  
For remote application download, enter the Cbus ID.  
To view the Cbus ID, open the Windows Control Panel and double-click the CBUS<sub>cbus</sub> icon on the remote PC (see "Download Application Remotely" section)

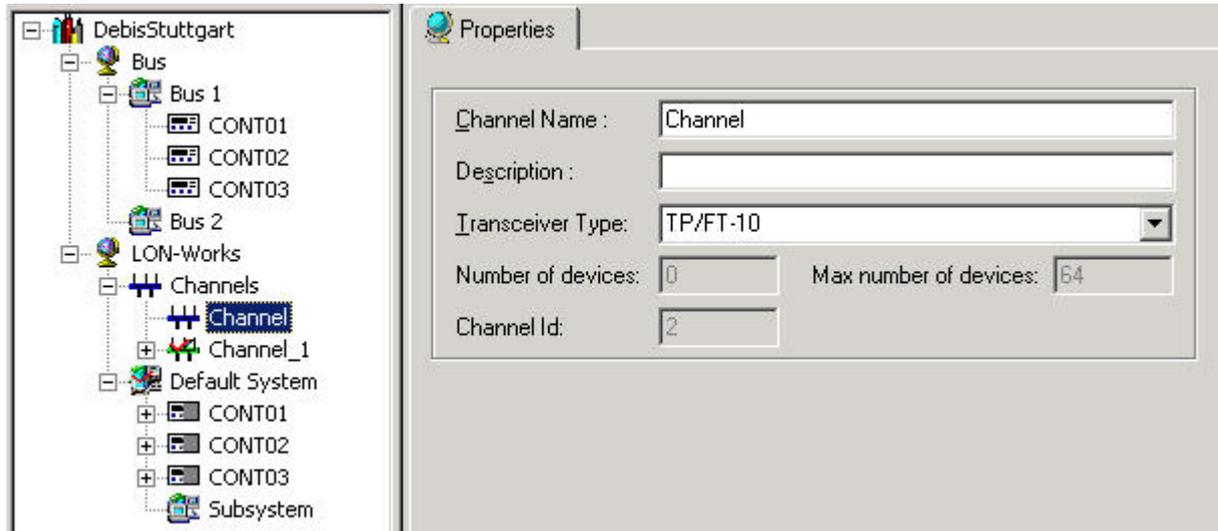
3. To position controllers in Bus subsystems, please refer to the Create and Place Controller in the Network tree section.

## Create Channel

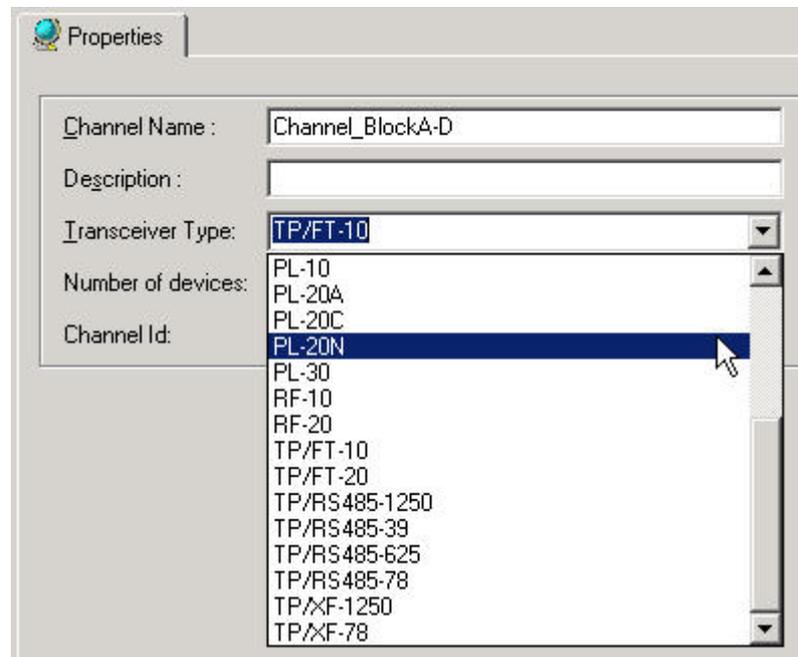
### Procedure

1. With left mouse key, click on the Channels folder.
2. Click right mouse key and with left mouse key, click Create Channel in the context menu.

**RESULT:** The new folder will be added to the Channels folder.



3. On the Properties tab on the right pane, edit the name in the Channel Name field and select the transceiver from the Transceiver Type drop-down listbox.



4. To position controllers in channels, please refer to the Create and Place Controller in the Network tree section.

## Connect Channels via Router

### IMPORTANT

*If two channels are used, they must be connected via router.*

#### Procedure

1. With left mouse key, click on the channel you want to connect via router, respectively on the Default System or a subsystem folder.
2. Click right mouse key and with left mouse key, click Create Router in the context menu.

RESULT: The New Router dialog box displays.

**New Router**

Router Name : BlockA-D\_to\_BlockE-H

Router Type : Configured

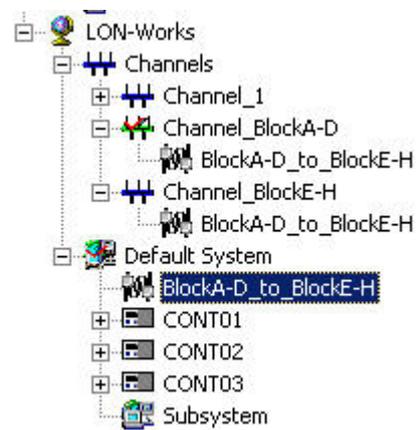
Near Side Channel : Channel\_BlockA-D

Far Side Channel : Channel\_BlockE-H

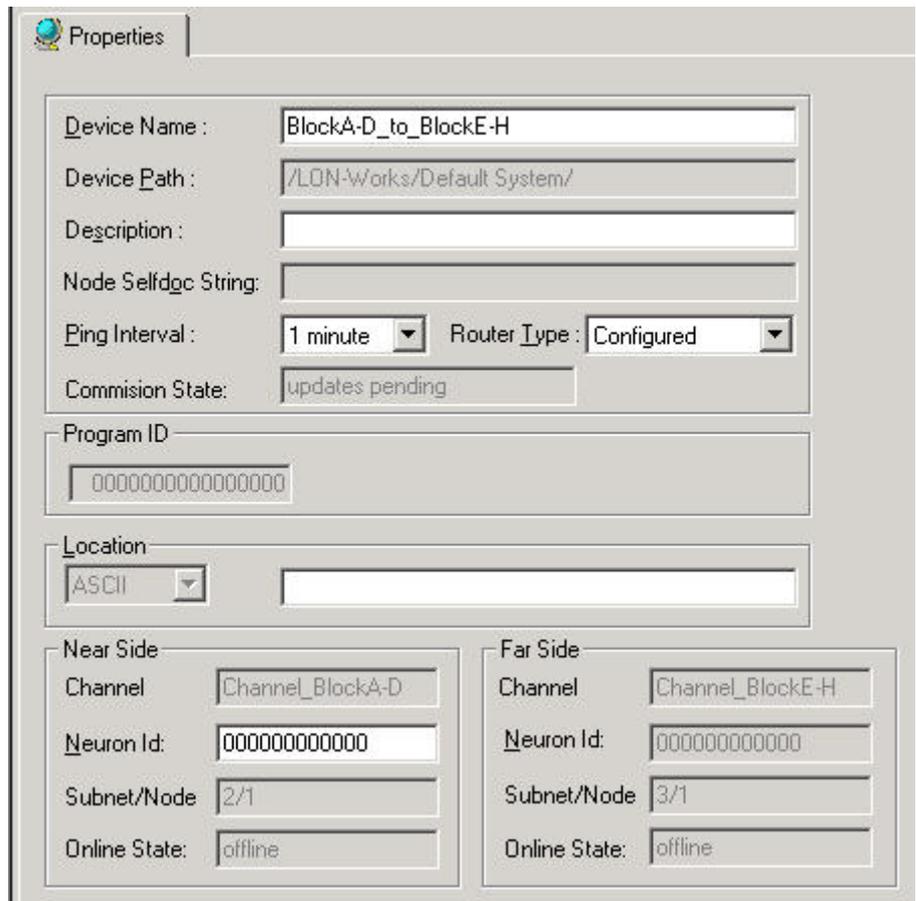
OK Cancel Help

3. Enter the name in the Router Name field and select the Near Side and the Far Side for the router in the corresponding Channel drop-down listboxes.

**RESULT:** The router is assigned to the Default System, respectively subsystem folder and it appears in each channel.



4. In the network tree, click on the router to display router properties on the right pane.



Properties

Device Name : BlockA-D\_to\_BlockE-H

Device Path : /LON-Works/Default System/

Description :

Node Selfdoc String:

Ping Interval : 1 minute Router Type : Configured

Commission State: updates pending

Program ID

0000000000000000

Location

ASCII

Near Side

Channel Channel\_BlockA-D

Neuron Id: 000000000000

Subnet/Node 2/1

Online State: offline

Far Side

Channel Channel\_BlockE-H

Neuron Id: 000000000000

Subnet/Node 3/1

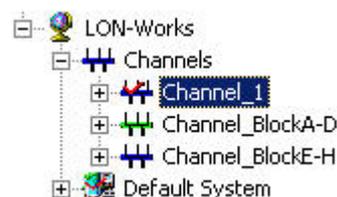
Online State: offline

- On the Properties tab, enter description and values for Node Selfdoc String, Ping Interval, Individual Program ID, Location String in ASCII code and the neuron Ids for the Near Side and the Far Side. For detailed descriptions on the items, please refer to relevant Echelon documentation.

### Set Default Channel

**Purpose** To define the default channel where a created controller will be inserted and where a device will be inserted out of the device library when dragging it on the Terminal Assignment tab. The presetting for the channel is "Channel\_01". Note that only one single channel can be the default channel. The default channel can also be used as network interface channel (see Set Network Interface Channel section).

- Procedure**
- In the LON-bus part of the network tree, right-click on the Channel and click on Default channel in the context menu.



**RESULT:** The defined default channel gets a red checkmark . Next time, when creating a controller or dragging a LON device onto the Terminal Assignment tab, it will be inserted into the defined default channel.

## Set Network Interface Channel

**IMPORTANT**

*This function is of high importance when using multiple channels, which are connected via routers. Make sure to connect physically to that channel which has been set as the network interface channel in CARE.*

**Purpose** To define the channel via which the CARE PC should connect to the LonWorks network. Note that only one single channel can be the interface channel. The network interface channel can also be used as default channel (see Set Default Channel section).

**Procedure** 1. In the LON-bus part of the network tree, right-click on the Channel and click on NI Channel in the context menu.



**RESULT:** The selected channel gets green and is now the interface channel via which CARE connects to the LonWorks network when going Onnet.

## Create LON-Bus Subsystems

**Purpose** To arrange the network components according to the physical conditions in the building.

**Procedure** 1. With left mouse key, select the Default System folder or an existing subsystem folder where you want to create another subsystem for.

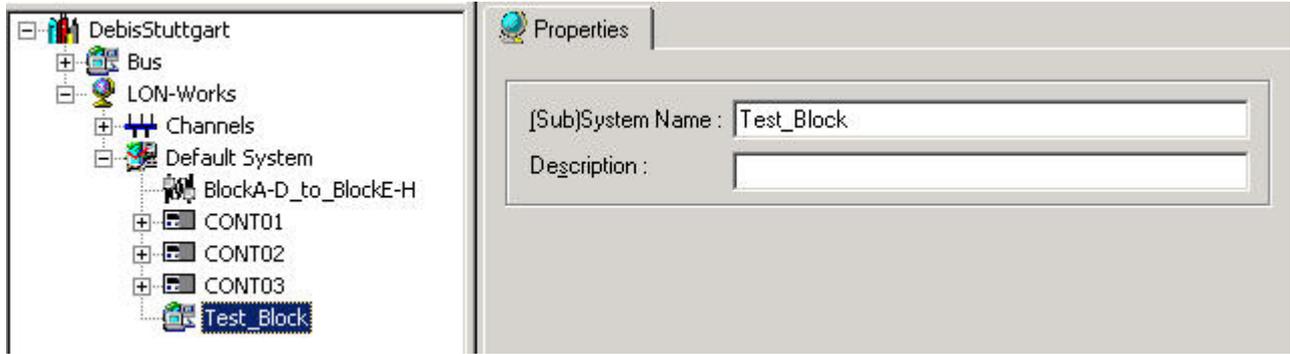
2. Click right mouse key and with left mouse key, click Create Subsystem in the context menu.

**RESULT:** The new subsystem folder will be added to the logical LON-Bus part of the network tree.



3. On the Properties tab on the right pane, edit the name in the (Sub)System Name field, if desired, and click on the created subsystem folder in the logical LON-Bus network tree.

**RESULT:** The newly named subsystem folder displays.



NOTE: Top-level systems as the Default System and subsystems can have further subsystems.

4. If desired, continue creating further subsystems on the same or lower level by repeating step 1 ff. with the appropriate selected folder you want to create the subsystem for.

### Create and Place Controller in the Network tree

When creating a controller, the C-Bus subsystem and the LON-Bus subsystem, where the controller should be placed, can be pre-defined.

#### Set C-Bus Default

**Purpose** To define the C-Bus where a created controller should be inserted by default. The presetting for the default system is "Bus 1".

- Procedure**
1. When creating the new controller by menu item Controller and submenu item New, select the default Bus system in the Bus name drop-down listbox.

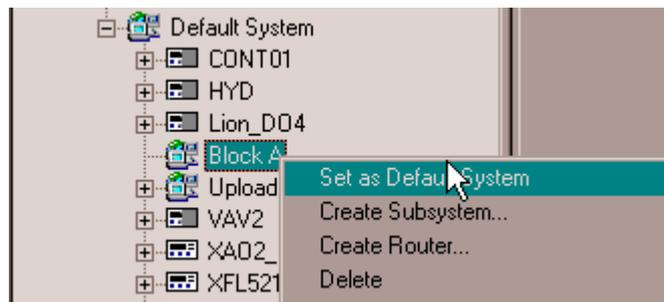


NOTE: After creation of the controller, it can also be moved between different subsystems by Drag&Drop.

#### Set LON-bus Default System

**Purpose** To define the LON-bus system where a created controller should be inserted by default. The presetting for the default system is "Default System".

- Procedure**
1. In the LON-bus part of the network tree, right-click on the subsystem folder, in this case Block A, and click on Set as Default System in the context menu.



**RESULT:** When creating a controller next time, it will be inserted into the folder, defined as default system. The LON-bus default system is indicated by a checkmark.

**NOTE:** After creation of the controller, it can also be moved between different subsystems by Drag&Drop.

### Move Controllers in the Network Tree by Drag&Drop

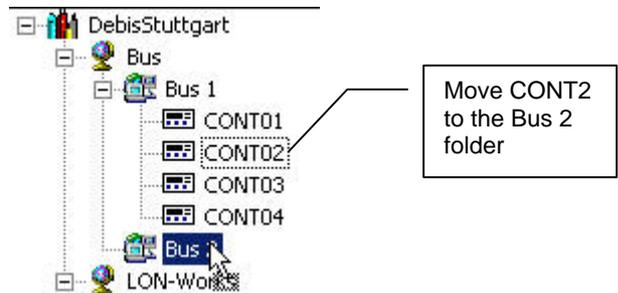
**IMPORTANT**

*Do not move controllers, which are already bound to other devices. First, move the controller and then do the binding. When moving controllers between different channels, the channels must be connected via routers.*

In the C-Bus part of the network tree, controllers can be moved between different subsystem folders.

In the logical LON-Bus part of the network tree, controller devices can be moved between the top-level system and/or subsystem folders.

- Procedure**
1. In the source folder, select controller (controller device), drag it to the desired target folder and drop it.



**Example 1: Move C-Bus Controller between Bus Subsystems**

### Configure Channel

**Purpose** Configuration of the physical part(s) of the LON-Bus includes the naming, description (optional) and the definition of the transceiver type.

**Procedure** Refer to the Create Channel section.

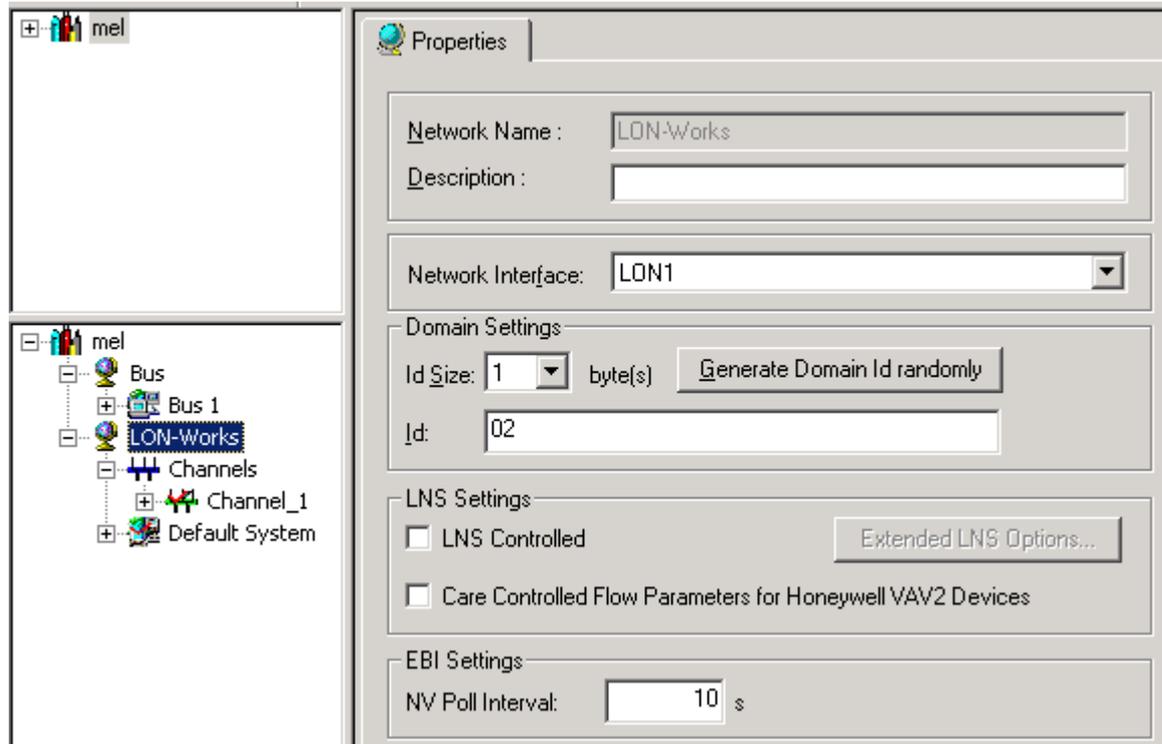
### Configure LON-Bus

**Purpose** Configuring the LON-Bus includes the definition of the:

- network interface type
- domain settings
- LNS settings
- EBI settings.

**Procedure**

1. In the network tree, click on the LON-Works folder.



2. On the Properties tab on the right pane, select the network interface from the Network Interface drop-down list box.
3. In the Id Size field, set the Id size in bytes format and enter the domain Id into the ID field. If you want to get a randomly generated domain ID, click the Generate Domain ID randomly button. In this case the Id Size previously selected must be higher than 0.
4. Check the LNS Controlled checkbox if you want to enable the LNS Controlled mode which allows the incremental updating of the LNS database with changed information done in CARE. For detailed information on this topic and on the Extended LNS Options button, please refer to the "CARE and LNS" section.
5. Check the **CARE Controlled Flow Parameters for Honeywell VAV2 Devices checkbox** if want to update the LNS database with the current CARE values of the flow parameters 'duct area', 'flow setpoint minimum' and 'flow setpoint maximum'.
6. In the NV Poll Interval, enter the interval in seconds in which all NVs will be polled by the EBI LON point server. For each NV, the poll interval can also be set individually (see "EBI Settings" section).

---

## Enter Project Offset

---

- |                  |   |
|------------------|---|
| <b>Purpose</b>   | The project offset is used for calculating unique program IDs for the network interfaces if more than one CARE project is used for the same construction project. The offset is only effective for controllers being newly created. |
| <b>Procedure</b> | <ol style="list-style-type: none"> <li>1. In the logical LON-bus part of the tree, double-click on project name.</li> </ol>   |

2. In the Offset field on the right pane, select an offset value.

---

## Enter Program ID

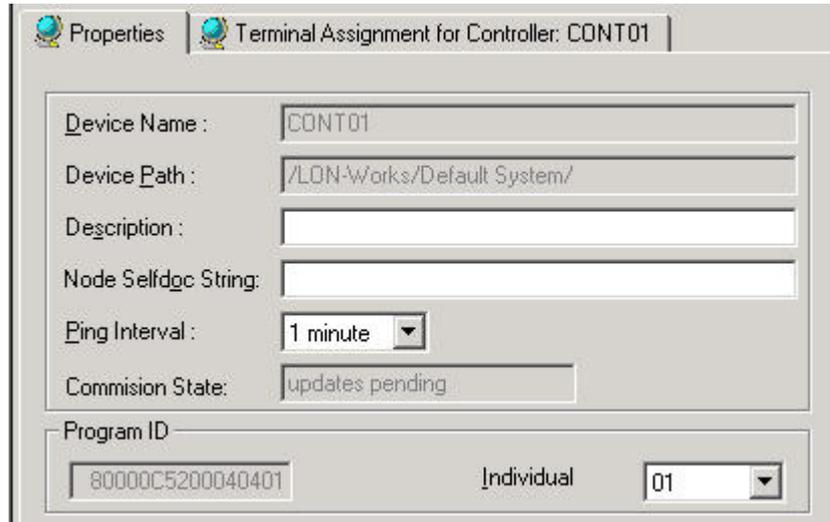
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**Purpose** The program ID is provided in the XIF file and is used by a network management tool to identify the type of device (network interface). The program ID is a unique ID for one special type of device. The same device type can be used multiple times within one project; the program ID will then be the same for every device. When using different devices having different network interfaces in one or more projects, the program ID has to be different.

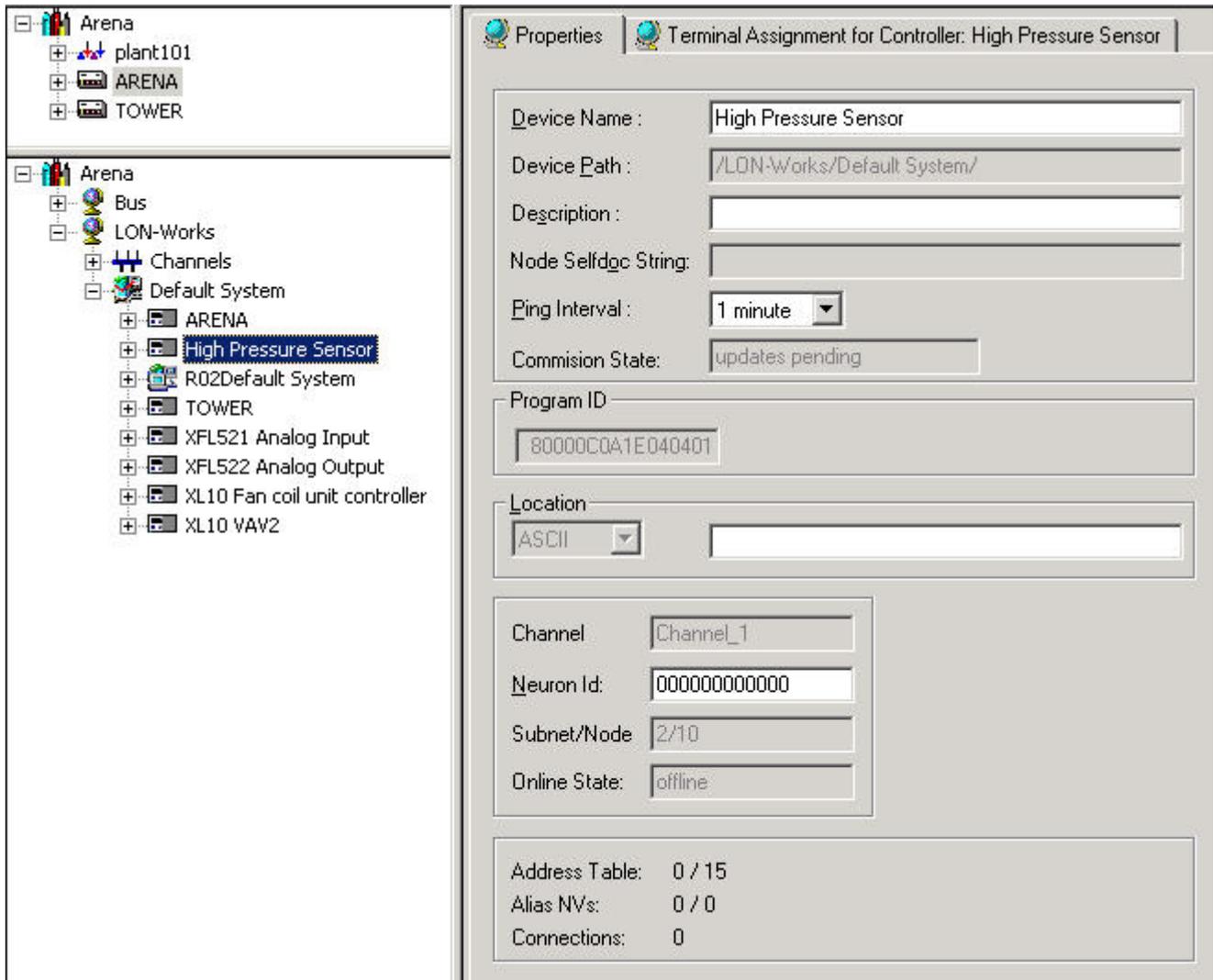
The program ID consists of two parts. One part is calculated due to controller type related data. The second part consists of an offset you can enter for the project, and the controller number that is freely editable.

- Procedure**
1. Enter project Offset as described in the Enter Project Offset section.
  2. In the logical LON-bus part of the tree, click on the controller.

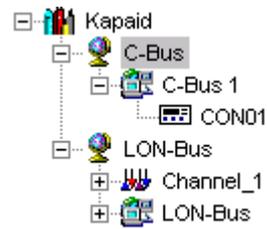
**RESULT:** On the Properties tab on the right, the calculated part of the program ID is displayed in the Program ID field.



- By default the controller number is taken over and displayed in the Individual drop-down listbox at the right. Select desired value (optional).



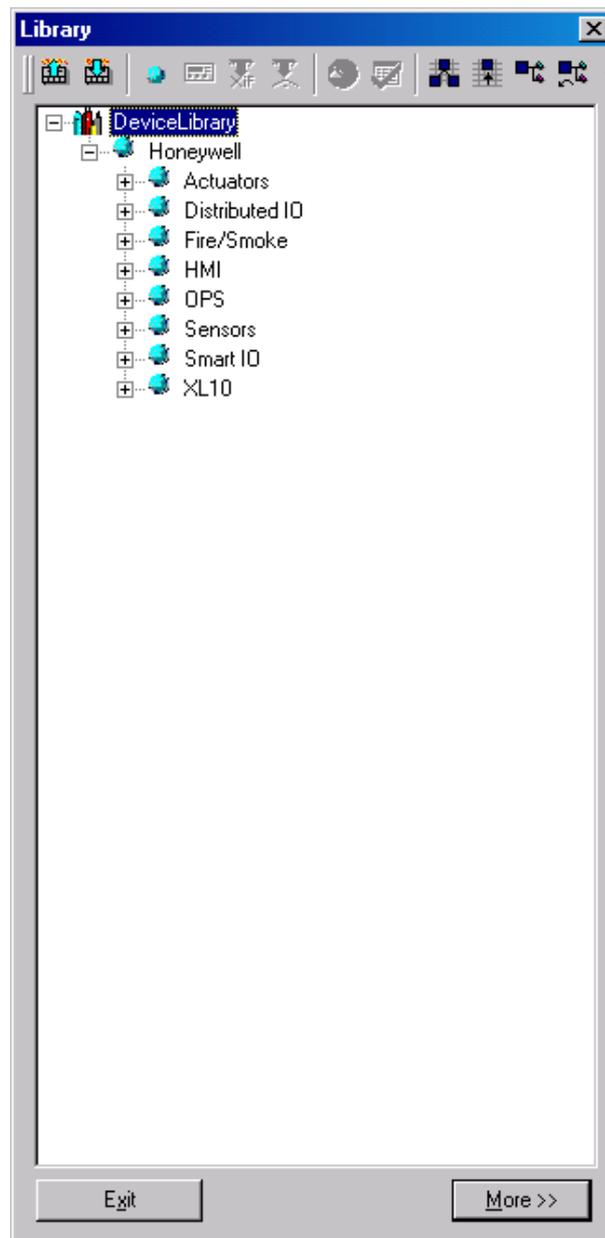




RESULT: The controller is highlighted in yellow.

2. On the right pane, select the Terminal Assignment tab.
3. On the Terminal Assignment pane, click right mouse key, then click Device Library in the context menu.

RESULT: The Library dialog box displays.



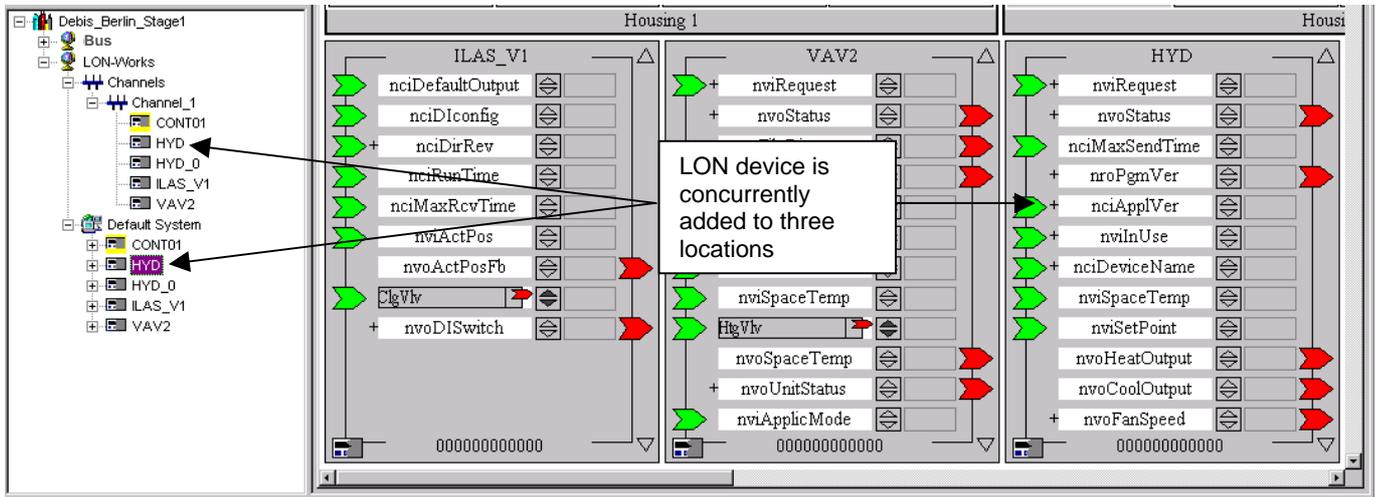
4. Open the Device Library tree, to display the available devices.

NOTE: Creating, deleting and renaming folders can structure the tree.

5. Select the device in the DeviceLibrary tree, drag it to a blank spot on the Terminal Assignment tab and drop it there.

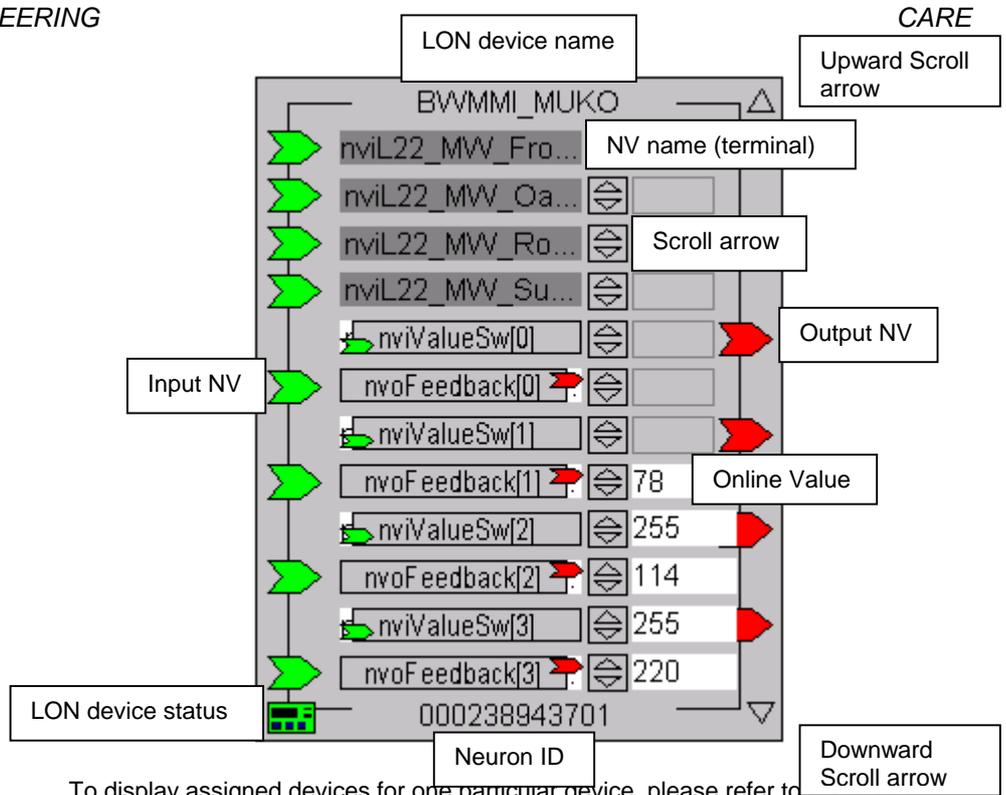
RESULT: The LON device is concurrently added to three locations:

- to the terminal assignment tab
- to the channel where the selected LON device resides
- in the logical LON-Bus part of the network tree, to the folder where the selected LON device resides



6. To assign the device, continue by interconnecting the devices as described under the Connect CARE Datapoints/NVs to NVs section.

On the top of the LON device the name is displayed. The terminals display the NV name. Input-NVs are indicated on the left as green arrows, Output-NVs are indicated on the right as red arrows. Upward- and downward scroll arrows on the right top and at the bottom allow to scroll through all available NVs of the device. Scrolling is also possible when dragging a datapoint/NV onto a terminal by positioning the datapoint/NV over the upward or downward scroll arrow. Right to the terminal a combined upward-downward arrow allows to display bound NV/datapoint names. Right to the upward-downward arrow, a field allows displaying the current online value of the NV. A tool tip displays the engineering unit when moving the cursor over the field. When setting the terminal online, the field is white. When setting the terminal offline, the field is gray. A plus symbol at an NV indicates components of a structured NV. In the middle at the bottom, the neuron ID is displayed. On the left at the bottom the color of the LON device status icon indicates the current status of the device (white = unknown-not initialized, green = application is running, red = not available-application stopped). Fully-colored means that the current status in CARE and the device status is the same. Half-colored means "Updates pending". Certain devices such as distributed I/O modules and Smart I/O modules can be displayed in two different modes (see Show LON device as Open LON section).



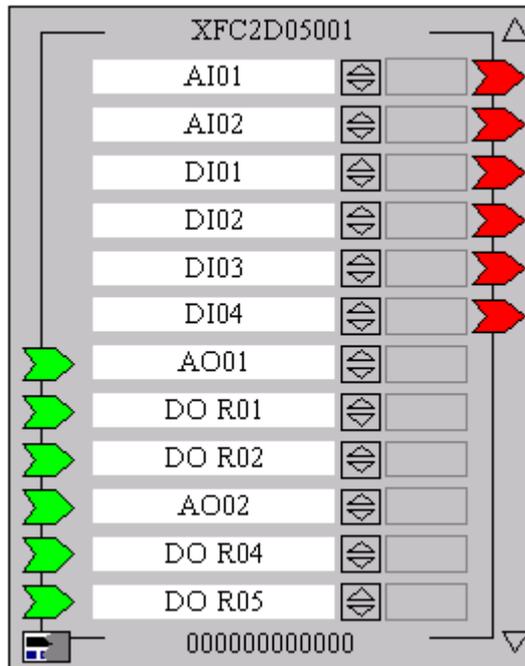
To display assigned devices for one particular device, please refer to the Display Connected Devices section.

### Show LON Device as Open LON

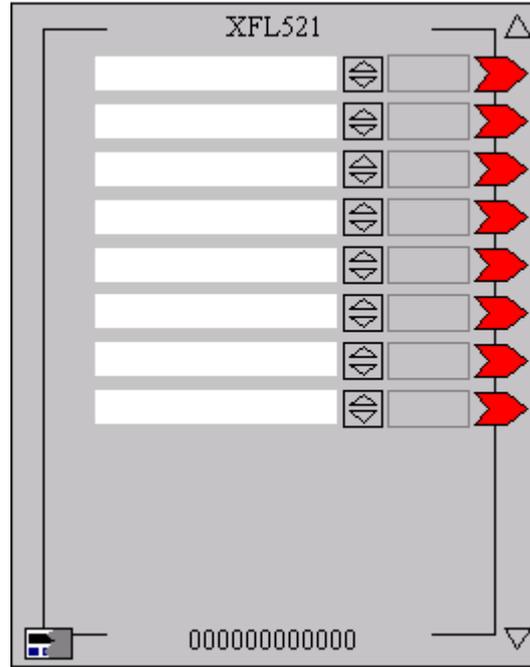
Some devices such as Smart I/O modules or distributed I/O modules can be displayed in two different modes, as:

- Standard mode
- Open LON mode

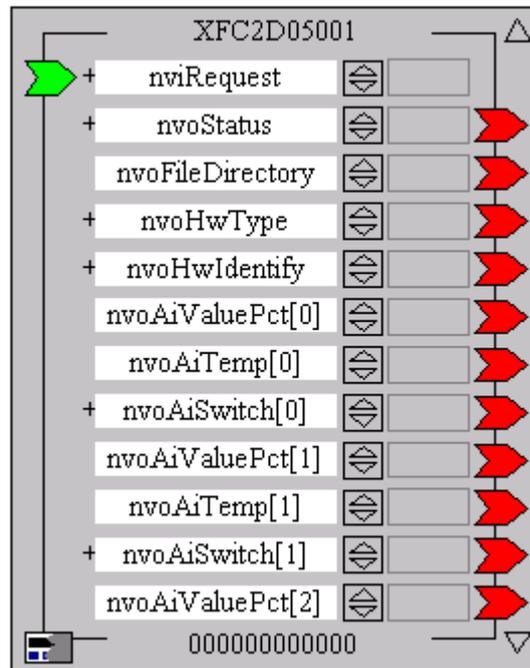
A Smart I/O module such as XFC2D05001 shows the terminals in standard mode as follows:



A distributed I/O module such as XFL 521 of B-type shows the terminals in standard mode as follows:



As Open LON, the NVs residing on the device terminals are shown:



**IMPORTANT**

*When connecting CARE datapoints to a distributed I/O or Smart I/O module in the standard mode, that is no NVs are shown, CARE automatically creates the proper connections through the CARE Autobinding mechanism. Hence, the standard mode is recommended for the binding of distributed I/O or Smart I/O modules to an Excel 500 controller. Do not display distributed I/O or Smart I/O modules as Open LON when binding them to an Excel 500 controller. The Open LON display mode is recommended if NVs from Open LON devices should be connected to a distributed I/O or Smart I/O module.*

- Procedure**
1. To toggle between the Standard and the Open LON mode, do the following:
  2. Move cursor over the device.
  3. Click right mouse key and with left mouse key, click on Show as Open LON to check/uncheck the option.

**RESULT:** The device is displayed in Open LON mode (Show as Open LON checked), respectively standard mode (Show as Open LON unchecked).

---

## Connect CARE Datapoints/NVs to NVs

Assigning LON devices to others will be done by connecting the appropriate NVs of the two devices. If one LON device is an Excel 50 or 500 controller, assignment will simply be done by connecting the CARE datapoints to the appropriate NVs of the LON device (CARE Autobinding). When connecting datapoints to NVs, CARE internally creates the corresponding NVs of the same name (Mapping). In case of the assignment of two LON devices, the NVs of the corresponding devices will be directly connected.

- Procedure**
1. Make sure that the LON device to which you want assign another device has been selected by double-clicking in the network tree (highlighted in yellow) and the Terminal Assignment tab has been selected on the right pane.

**RESULT:** On the terminal assignment tab, already assigned LON devices are displayed (see Add LON device to the Network section).

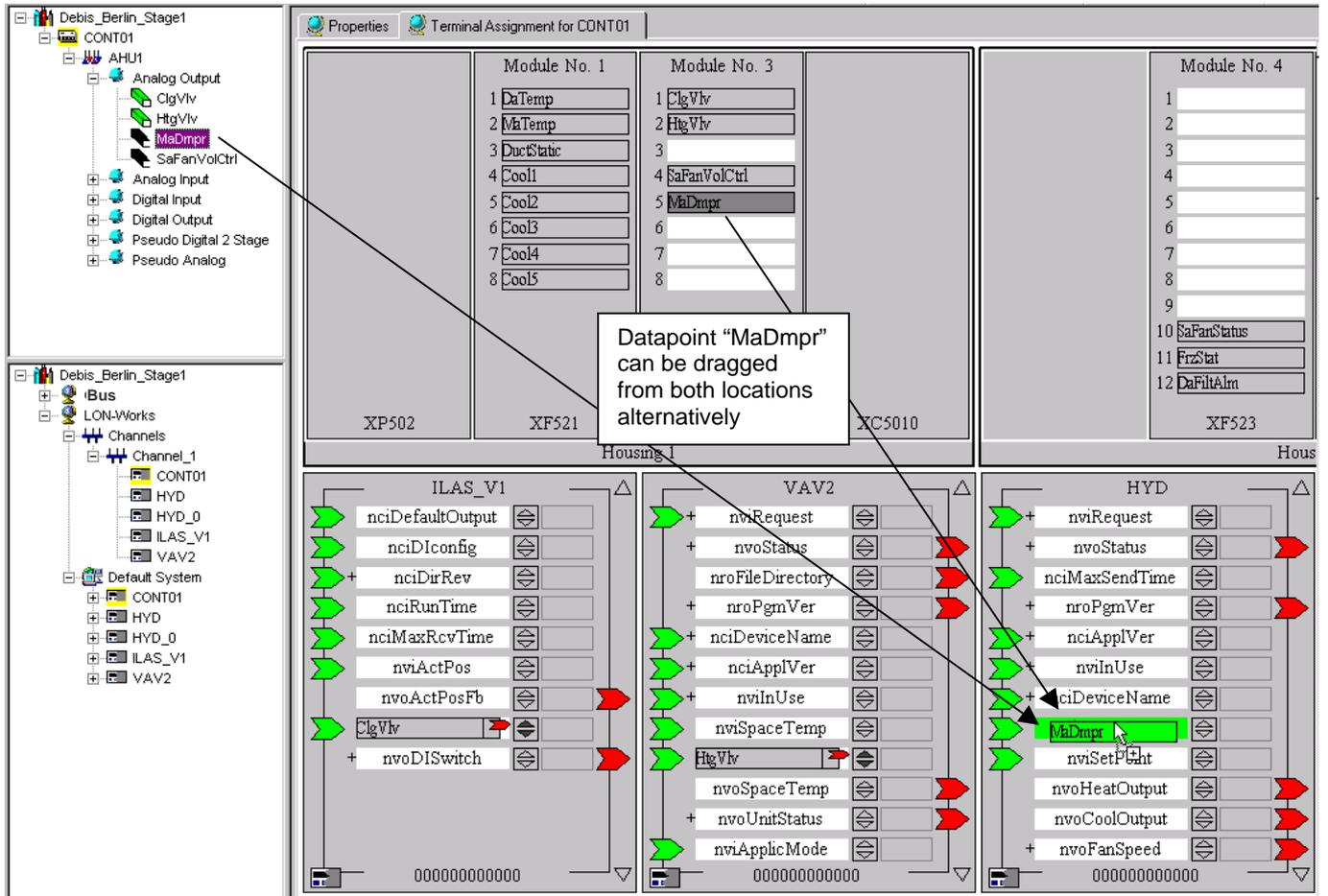
2. In the logical plant tree, click on the datapoint.

Or, if the datapoint is also assigned to a module, click on the terminal on the terminal assignment tab on the right.

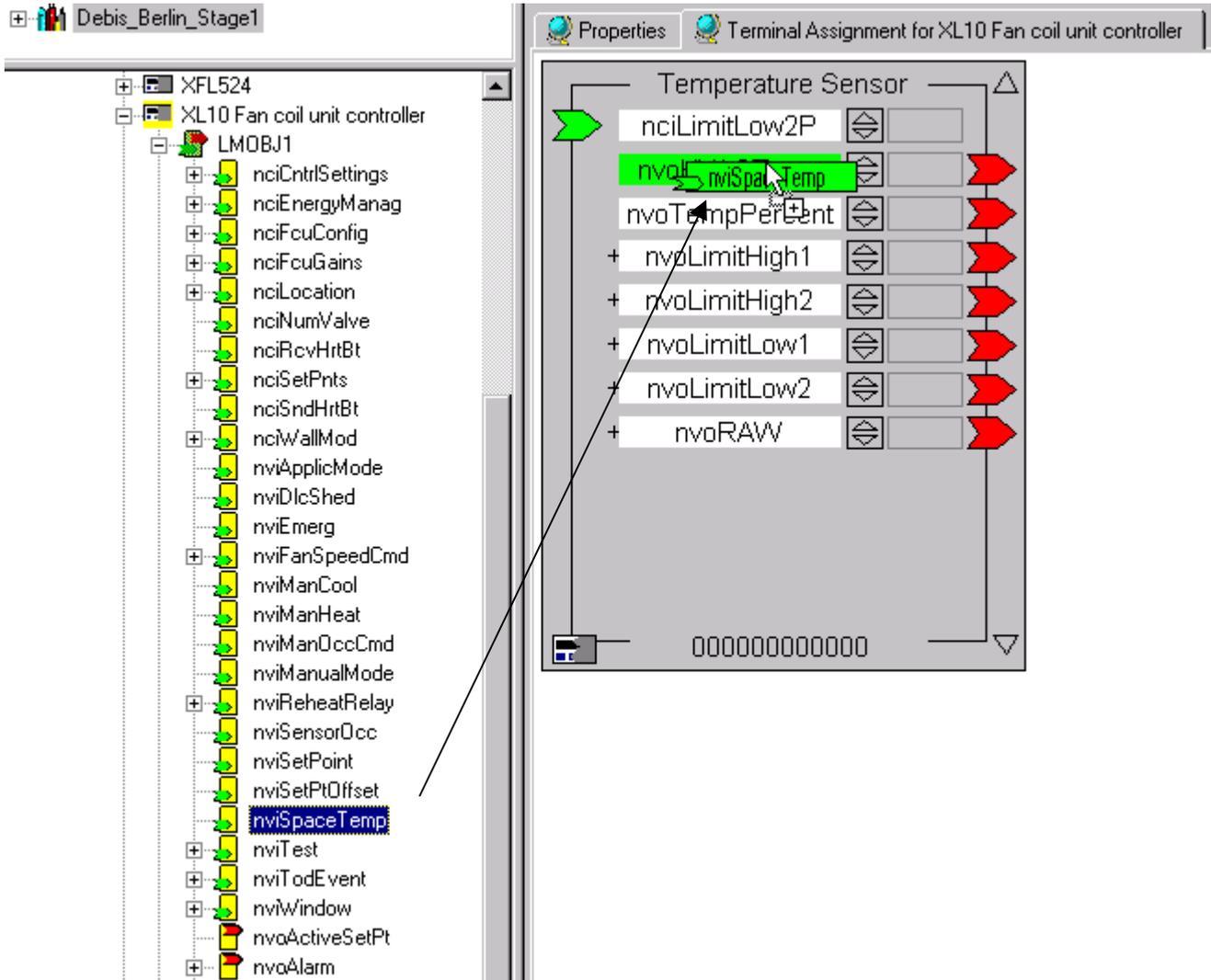
Or, when assigning two Open LON devices to each other, click on the NV in the logical LON-Bus part of the network tree, you want to connect to the LON device displayed on the terminal assignment tab.

3. Drag it to the desired terminal on the LON device and drop it.

**RESULT:** When moving the datapoint/NV over the LON device, CARE shows any NV type in green that matches to the datapoint/NV. In the status line at the bottom, the corresponding NV name, NV type and the LON object, which the NV belongs to, is displayed.

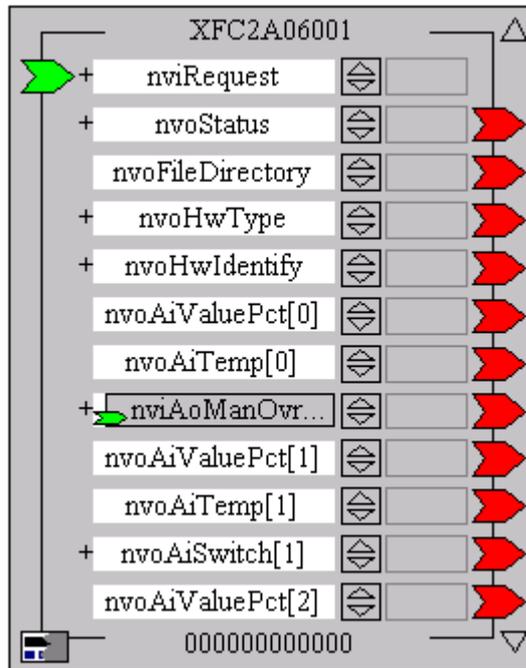


Example 4: Connection of CARE Datapoint to NV of an Open LON Device (Excel 500 to Excel 10 Hydronic controller)



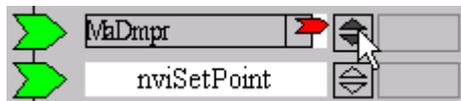
**Example 5: Connection of NVs of two Open LON Devices**

RESULT: The connection is indicated as follows:



When a CARE datapoint was connected, CARE automatically creates a NV of the same name, in the previous case (see figure, respectively Example 4) nvoMaDmpr for the datapoint MaDmpr. On the device in the terminal assignment tab, the connected datapoint with the newly created NV name is shown as "terminal" covering the NV where the datapoint has been dropped. A small green, respectively red arrow indicates the NV type, input or output NV.

You can toggle between the display of the datapoint name and the corresponding NV name MaDmpr ↔ nvoMaDmpr by clicking the  the terminal.

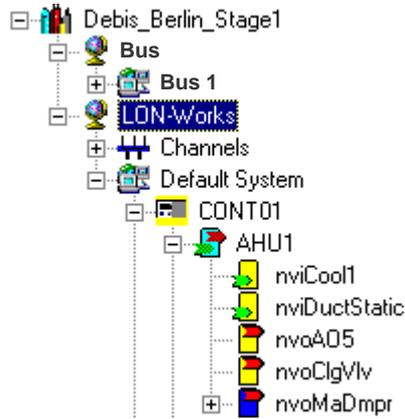


If multiple datapoints or NVs have been dropped onto the same terminal, you can scroll with the dark upward-downward arrows and all of them will be displayed with their datapoint name and NV name.

If (only) two NVs are mapped to a each other, see figure, respectively Example 5, toggling is not possible.



In the LON-Bus part of the network tree, any bound NV is indicated by its blue background, which previously was yellow in the unbound state.



For a connection between two NVs, in the status line at the bottom, the NV name and NV type of the moved NV (left side), the NV name, NV type and the LON object where the NV has been dropped (right side), is displayed.

Point Type: AI	Subtype: SLOW	NV Name: nvoAiValuePct[0]	NV Type: SNVT_lev_percent	LON Object: AI[0]
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**Example 6: Status display of two connected NVs**

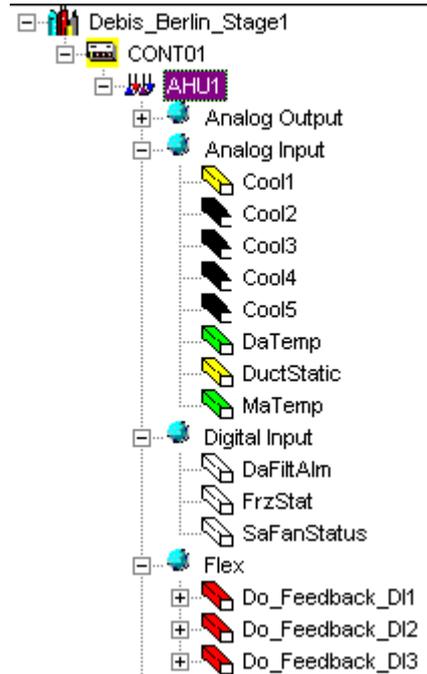
For a connection between CARE datapoint and NV, in the status line at the bottom, the datapoint type and subtype (left side), the NV name, NV type and the LON object, where the datapoint has been dropped (right side) is displayed.

Point Type: AI	Subtype: SLOW	NV Name: nvoAiValuePct[0]	NV Type: SNVT_lev_percent	LON Object: AI[0]
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**Example 7: Status display of connected CARE Datapoint and NV**

**Datapoint Display** Depending on their status/type, datapoints are displayed in different colors in the logical plant tree:

Point Status/Type	Color
On board	black
Boardless	white
On board and mapped	yellow
Boardless and mapped	yellow
On board, mapped and bound	green
Boardless, mapped and bound	green
Boardless Flexpoint	red



**NV and LON Object Display**

Depending on their status, NVs and LON objects are displayed in different colors in the LON-bus part of the network tree:

Tree Item	Status	Color
NV	Unbound	Yellow background with green left-handed arrow (inputs) and red right-handed arrow (outputs)
	Bound	Dark blue background with green left-handed arrow (inputs) and red right-handed arrow (outputs)
LON Object	No bound NVs included	Green background with green left-handed arrow and red right-handed arrow
	At least one bound NV included	Bright blue background with green left-handed arrow and red right-handed arrow

NOTE: How connections are displayed in the logical LON part of the network tree, please refer to the Show Connections of Devices section.

**What Kind of NV Types can be bound together?**

The following describes the different ways of binding mechanisms for Excel 500, 50 and Smart controllers depending on the provided network variables types of the used devices.

Autobinding can only be applied to a certain number of standard network variable types (SNVTs) and user-defined network variable types (UNVTs). This is a subset of the total number of NV types supported by CARE.

**Autobinding of unstructured SNVTs and UNVTs supported by the controller**

Standard network variable types (SNVTs) that are supported by Excel 500, 50 or Smart controller can only be bound together if they are of the same type.

Example: An output NV of type SNVT\_temp can only be bound to an input NV of type SNVT\_temp and vice versa. CARE considers this automatically when binding a CARE datapoint to a NV of another LON device (autobinding).

### **Autobinding of structured SNVTs and UNVTs supported by the controller**

Mainly for autobindings to Excel 10 controllers, CARE provides a couple of special structured UNVTs. All those NV types are indicated by '80000' at the beginning of their name, for example, 80000C5007030403\_nvoAlarmStatus\_XL500.

For the Excel 500, 50 and Smart controller, CARE provides some special adapted variants of structured LonMark SNVTs that the controller can use either for autobinding or manual binding. All those SNVTs are indicated by the suffix '\_XL500', for example, SNVT\_switch\_XL500 or SNVT\_switch\_struct\_XL500.

#### **Compact structured SNVTs**

For autobinding the structured SNVTs are of type 'compact' and consist of multiple components, for example the NVT\_switch\_XL500 consists of the two components value and state. Structured compact SNVTs are indicated by the suffix '\_XL500'.

Compact '\_XL500' SNVTs are designed for autobinding between one datapoint and one NV without the necessity of mapping each component to one separate datapoint.

When applying a compact '\_XL500' SNVT, the controller automatically calculates the proper result out of the components according to the implemented controller algorithm.

#### **Mappable structured SNVTs**

In comparison to the structured compact SNVTs to be used for autobinding, CARE provides structured SNVTs for manual binding. In this case, each component of the SNVT can be mapped to a separate datapoint. Structured SNVTs to be used for manual binding are indicated by the suffix '\_struct\_XL500', for example SNVT\_tod\_event\_struct\_XL500. Structured SNVTs with mappable components can be used in case the automatic algorithm of the controller should be evaded and specific engineering should be applied.

For all above mentioned structured SNVTs and UNVTs, CARE automatically assigns the appropriate structured NV type to a datapoint when the datapoint is connected to corresponding structured NV respectively component.

### **Manual binding of structured UNVTs or SNVTs supported by the controller**

For the Excel 500, 50 and Smart controller, CARE provides some special adapted variants of structured LonMark SNVTs that the Excel 500, 50 and Smart controller can use for manual binding.

For detailed description, please refer to the "Autobinding of structured SNVTs and UNVTs supported by the controller" section.

### **Manual Binding of unstructured SNVTs and UNVTs not supported by the controller**

If non-supported unstructured SNVTs or UNVTs from another LON device should be bound to the Excel 500, 50 or Smart controller, user-defined network variable types (UNVTs) must be applied for the controller in CARE.

NOTE: The CARE autobinding mechanism is not possible.

The following UNVTs are provided by CARE:

- UNVT\_byte
- UNVT\_ubyte
- UNVT\_word
- UNVT\_uword
- UNVT\_long
- UNVT\_ulong
- UNVT\_float

The UNVTs consist of 1, 2 or 4 bytes and are signed or unsigned (u). The scale factor for all CARE UNVTs is as follows: a = 1, b = 0, c = 0.

**IMPORTANT**

*In order to bind an UNVT to a non-supported SNVT or UNVT, they must have the same byte size (contact device manufacturer for detailed information of NV structure). The type definition such as integer, floating (including the algebraic sign) and the scale factor is not checked for plausibility. Hence, you should consider the scale factors and the type definitions of the SNVT and the UNVT in order to get a proper result.*

Example: An input NV of type SNVT\_volt\_kilo can be bound to an output UNVT of type UNVT\_word. Both have a byte size of 2, both are signed, but the scale factor is as follows: a = 1, b = -1, c = 0.

**Manual binding of structured UNVTs or SNVTs not supported by the controller**

If non-supported structured SNVTs or UNVTs from another LON device should be bound to the Excel 500, 50 or Smart controller, user-defined network variable types (UNVTs) must be applied in CARE for the controller.

To bind non-supported structured SNVTs or UNVTs from another LON device, CARE provides a set of structured UNVTs that consist of 1 to 31 components.

Each component is of type UNVT\_ubyte (u=unsigned) with the byte size = 1.

The structured UNVTs are named as follows:

- UNVT\_struct1\_XL500
- UNVT\_struct2\_XL500
- 
- 
- 
- UNVT\_struct31\_XL500

The binding is done as follows:

1. Check the byte size of the non-supported structured NV, you want the Excel 500, 50 or Smart controller NV bind to.
2. For the controller, create a structured NV of type UNVT\_struct"xx"\_XL500 of the same byte size.
3. Connect the structured NV (nvi or nvo icon in the LON-bus part of the network tree) to the NV on the device terminal.
4. Manually map a datapoint to each component of the created structured NV. This provides the further processing of the values by assigning switching tables or mathematical functions via the Switching Logic feature of CARE.

**IMPORTANT**

*Before mapping the components to datapoints, you should know the type definition structure (see LonMark SNVT master list respectively get the UNVT structure definition from the device manufacturer).*

*Note, that the type definition structure of the NV as it is displayed on the device on the terminal assignment tab is decisive regarding the byte-byte assignment, not the alphanumerical components' sequence displayed in the LON-bus part of the network tree.*

*In order to bind a self-defined structured UNVT to a non-supported structured UNVT or SNVT, they must have the same byte size. The type definition such as integer, floating (including the algebraic sign) and the scale factor is not checked for plausibility. Hence, you should consider the scale factors and the type definitions of the **components** to be connected in order to get a proper result.*

**Manual Binding of Structured UNVTs or SNVTs with bit field components**

To bind CARE datapoints to structured UNVTs or SNVTs that contain bit fields, in general the same procedure as for the manual binding of structured UNVTs or

SNVTs has to be applied. In addition, you must consider to arrange the bit fields in byte groups. Bit fields can be further processed via switching tables and/or XMFs and can be used for controlling the status of bound LON devices via Excel 50/500 Controller time programs.

**How to Control the Status of a bound LON Device via an Excel 50/500 Controller Time Program?**

The status of a LON device bound to an Excel 50 or Excel 500 controller, for example, the occupied/unoccupied status of an Excel 10 controller, can be controlled by the time program of the Excel 500 or Excel 50 controller.

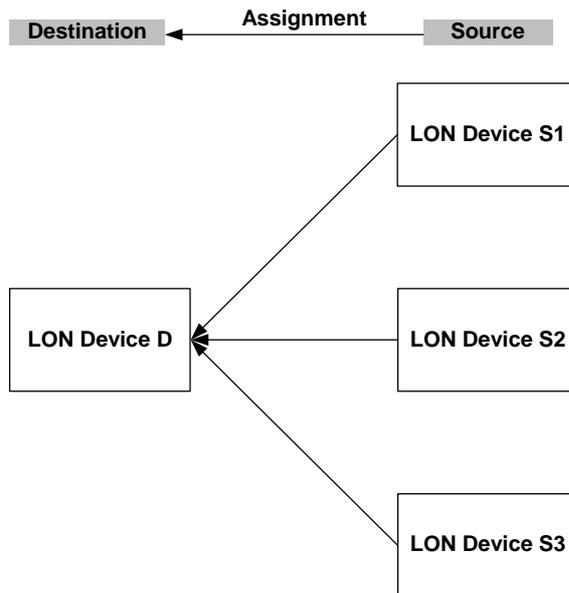
This is to be done by mapping the relevant datapoints of the Excel controller and the NVs of the LON device to each other whereby the datapoint must be a switchpoint of the Excel controller's time program

One of the following connections must be applied:

Point Type in Time program of Excel 50/500 Controller	NV Type in LON Device
1 Digital Multistage point	SNVT_tod_event_XL500
1 Digital Multistage Point	SNVT_tod_event_struct_XL500
1 Digital Multistage Point	- Current_state datafield: to be mapped on a datapoint that contains current state
1 Digital Multistage Point	- Next_state datafield: to be mapped on a datapoint that contains next state
1 Pseudo Analog Point	- Time_to_next_state datafield: to be mapped to a datapoint which is switched by the controller's time program

**Display Connected Devices**

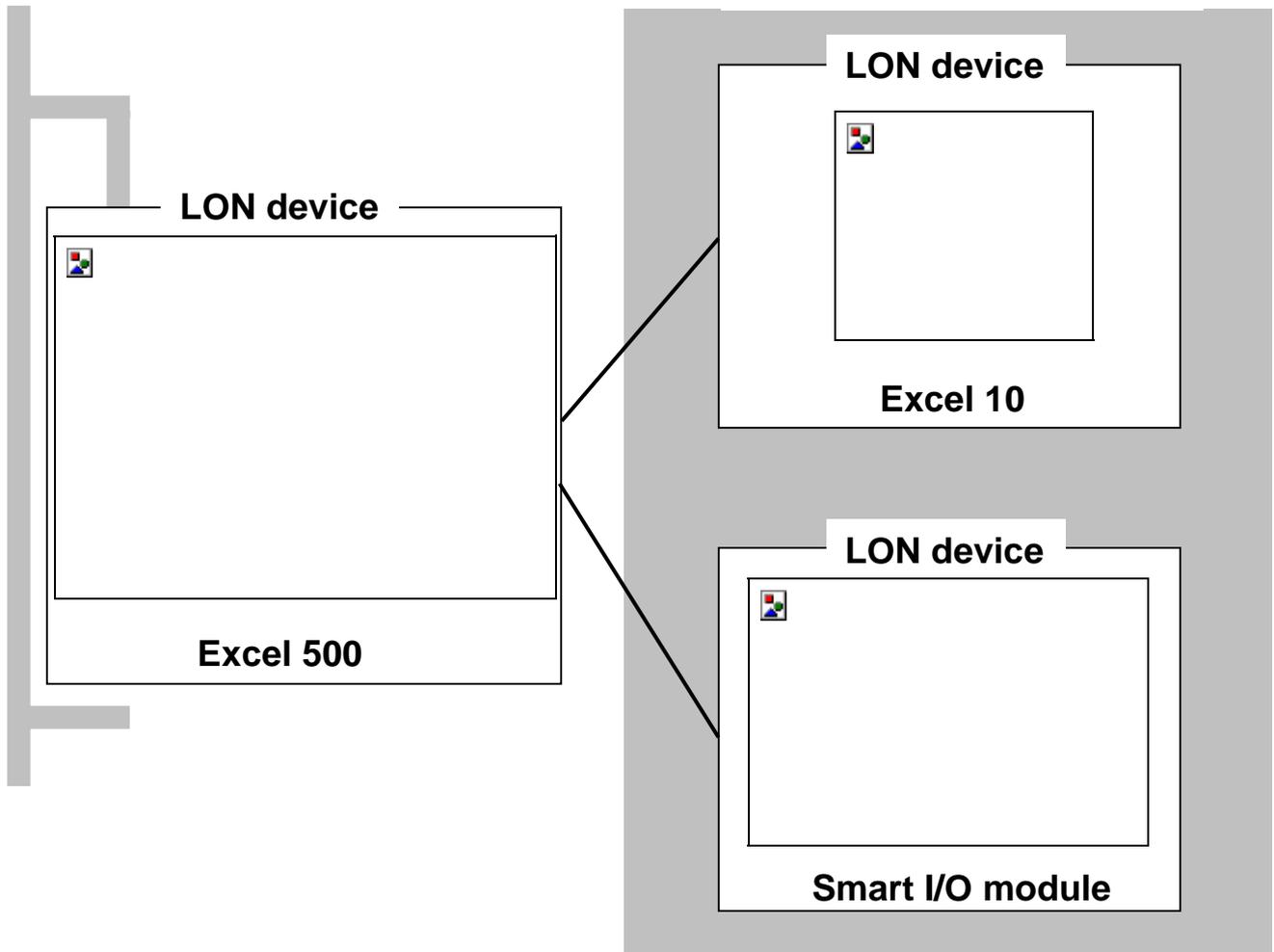
When interconnecting LON devices, you will select a destination device to which you can assign up to multiple source devices.

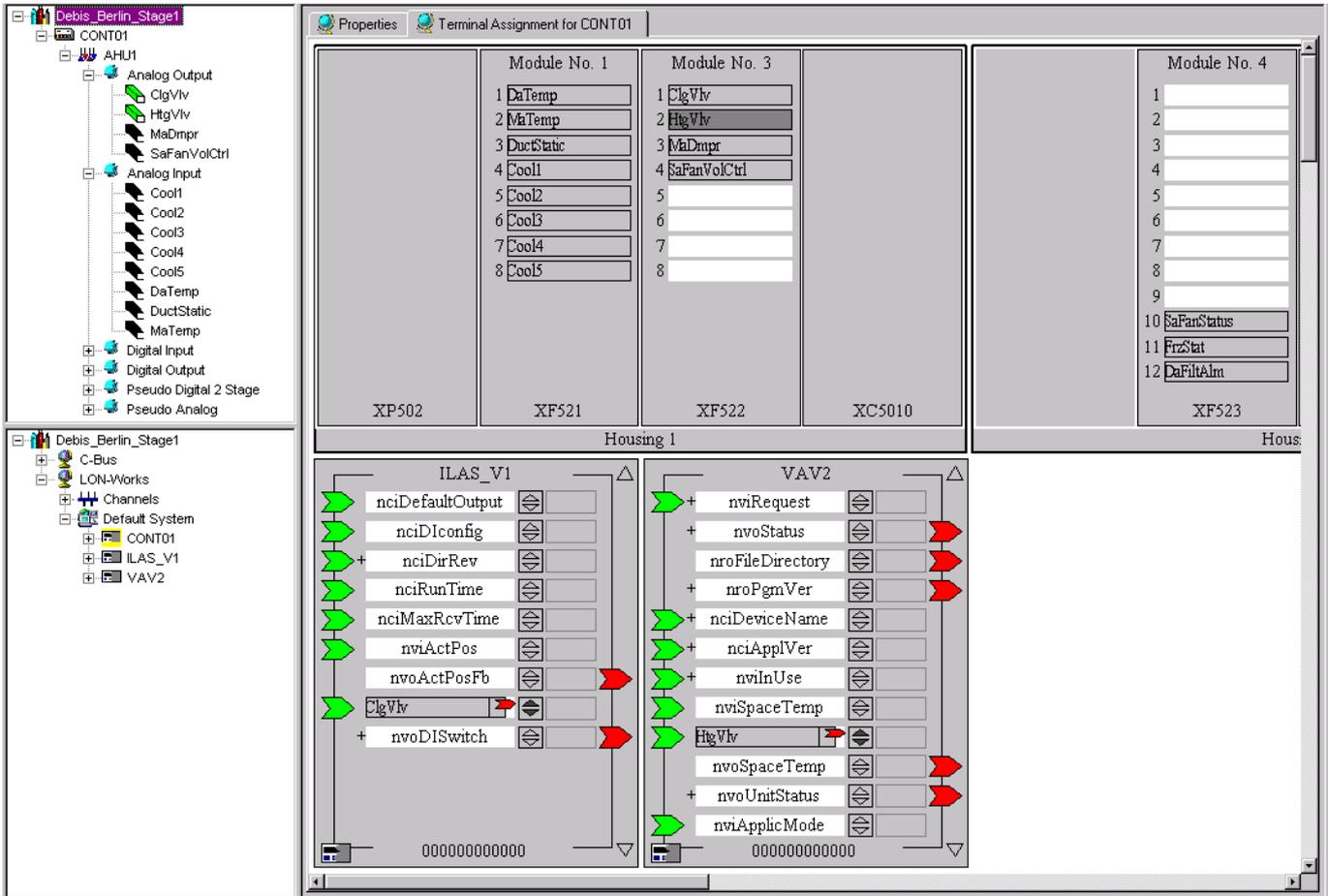


**Idea** To display all assigned devices of one particular device, either destination or source device, imagine you are sitting in the LON device selected by **double-click** in the logical LON-Bus part of the network tree. Imagine you are looking outside. You will then see all connected devices on the terminal assignment tab.

**Network Tree**

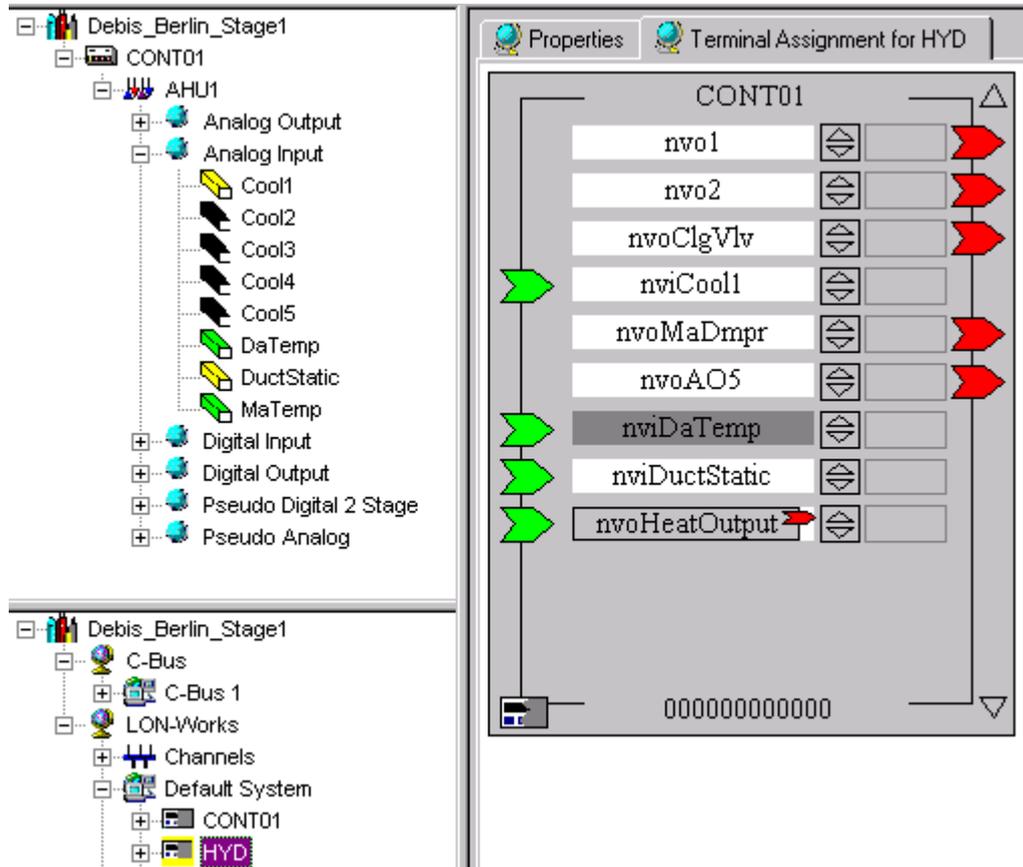
**Terminal Assignment Tab**





**Example 8: Display of assigned devices**

If a device is connected to multiple devices, the connected datapoints/NVs are shown in dark gray. In the following example, the controller CONT1 is connected to the Hydronic controller currently selected in the network tree. This is indicated by the nvoHeatOutput terminal. In addition CONT1 is connected to another device, which is indicated by the dark gray nviDaTemp terminal.



**Example 9: Display of a multiple connected device**

## Permanent and Temporary Display of Devices

The assignment of LON devices includes two main steps:

1. Add LON device to the network
2. Connect CARE datapoints, respectively NVs to NVs (Binding)

When adding the device to the network in step 1, the device is **permanently** inserted and displayed into the **network tree**, but **temporarily** added and displayed on the **terminal assignment tab**.

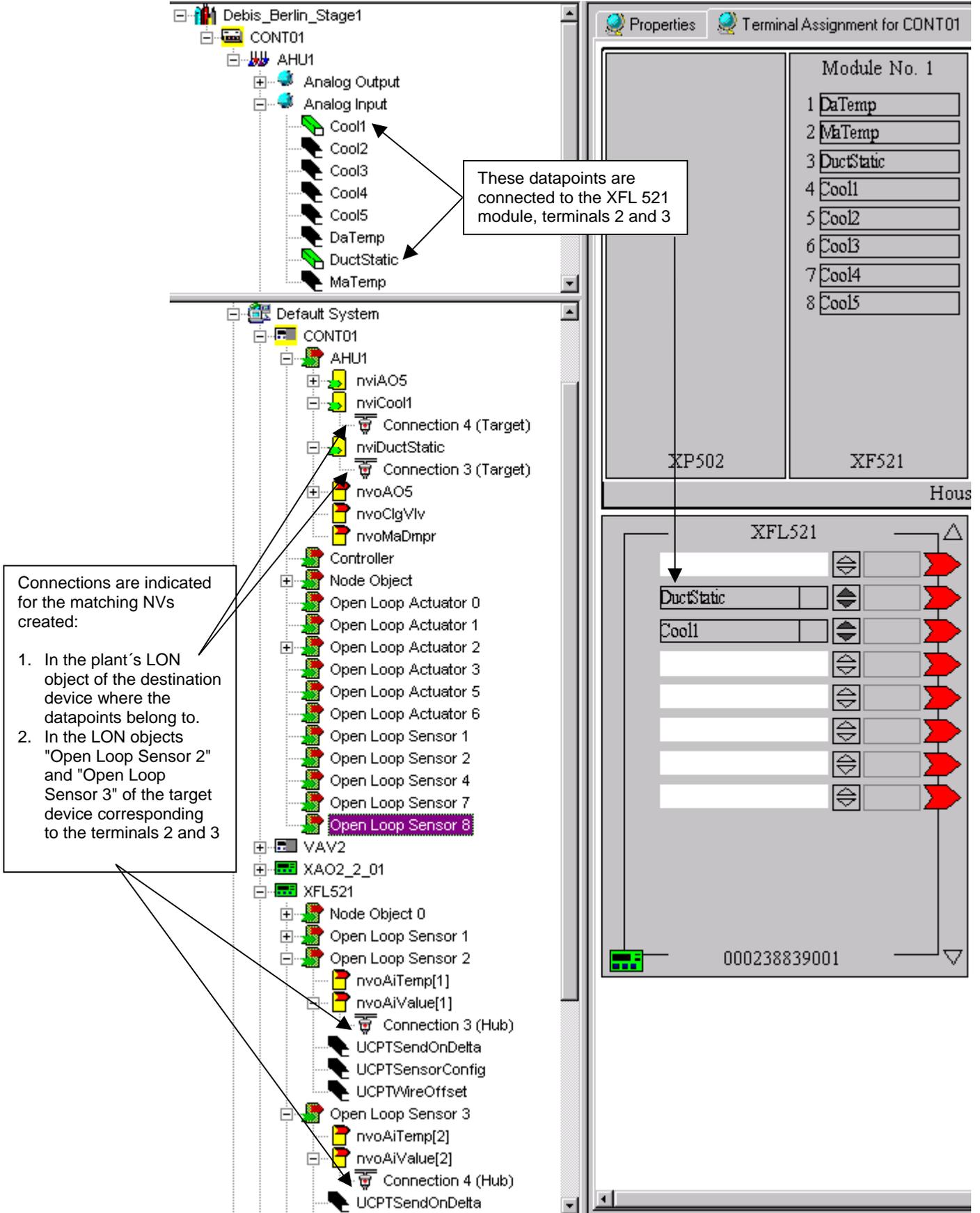
### **IMPORTANT**

*If the destination device in the network tree will be de-selected, **before** the source device has been bound in step 2, the temporary device will be removed from the terminal assignment tab. The temporary source device on the terminal assignment tab will only be displayed permanently after step 2 has been done.*

*Once the device has been imported from the device library, it is still available in the network tree. Do not import the device twice from the device library. Instead, drag&drop it from the network tree to the terminal assignment tab.*

## Show Connections of Devices

See next page.



For each binding done between datapoint to NV or NV to NV, the connection is indicated in the logical LON-bus part of the network tree.

By double-clicking on the connection on the Properties tab on the right pane, the connection structure (hub-target) is displayed graphically. For example, the following Hubs/Targets field for the Connection 4 (Target) shows:

- Controller CONT01 is bound to XFL521 via the nviCool1 (Target) belonging to the AHU1 LON object and the
- nvoAiValue(2)(Hub) belonging to the Open Loop Sensor 3 LON object

The screenshot displays the CARE software interface. On the left, the LON-Works network tree is visible, showing a hierarchy from C-Bus down to Node Objects. The 'Connection 4 (Target)' is highlighted in the tree. On the right, the 'Properties' dialog box is open, showing various configuration options for the selected connection. The 'Hubs/Targets' section of the dialog shows a graphical representation of the connection structure, including the controller (CONT01), the AHU1 object, and the specific target (nviCool1) and hub (nvoAiValue[2]) devices.

The reverse way is also possible:

In the connection structure you can double-click on an NV to display the corresponding hub/target of the assigned device in the logical LON-bus part of the network tree.

**NOTE:** If you would like to configure connection properties, it is strongly recommended to get familiar with the relevant Echelon documentation.

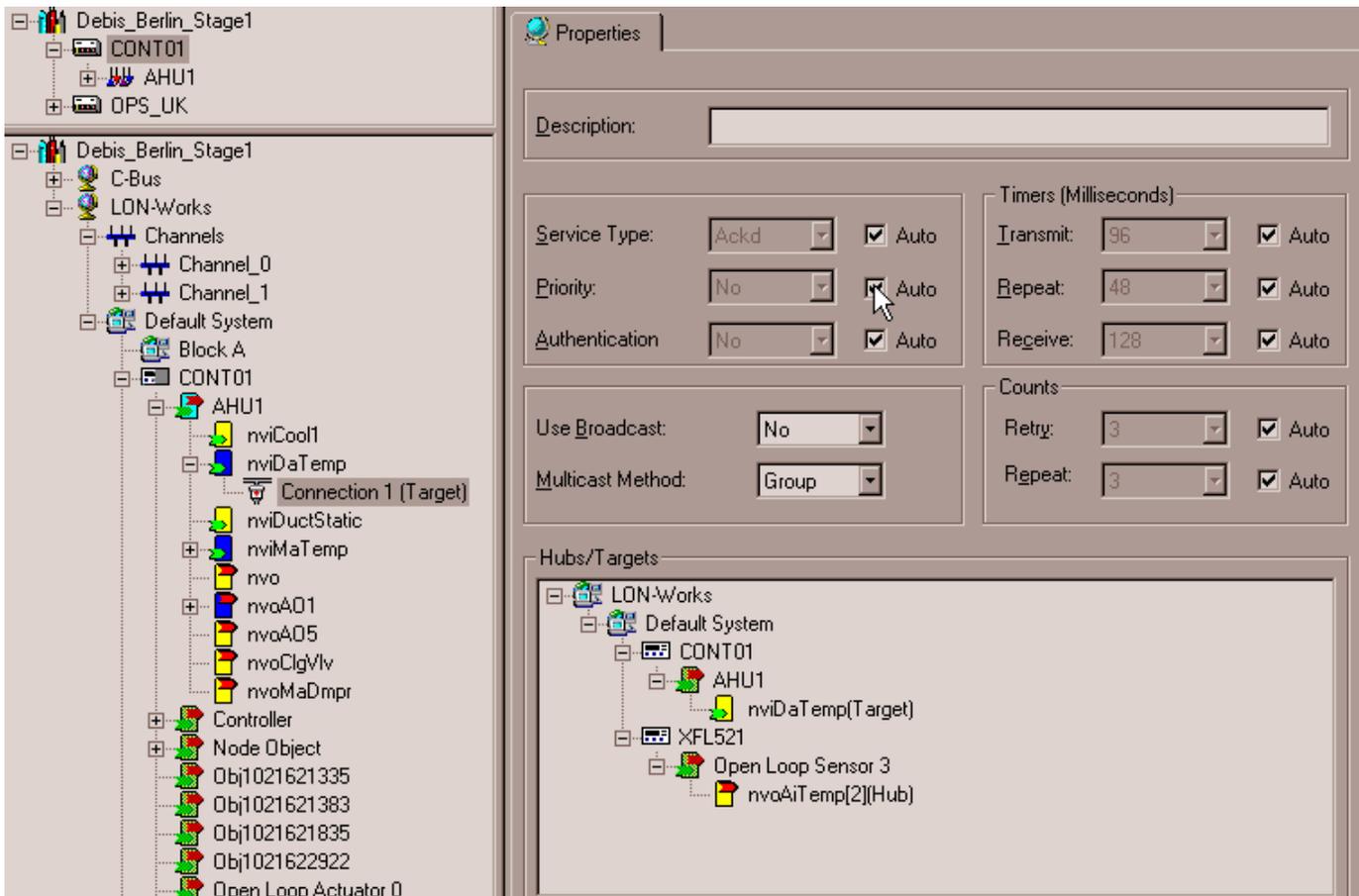
## Configure Connection

**Purpose** To define settings for a connection between 2 NVs.

**NOTE:** If you would like to configure connection properties, it is strongly recommended to get familiar with the relevant Echelon documentation.

**Procedure 1.** In the LON-bus part of the network tree, click on the connection.

**RESULT:** On the right pane, the connection properties are displayed. Settings include, for example, the service type, broadcast-multicast mode, timers and counts. Below under Hubs/Targets the devices, LON objects and NVs building up the connection are hierarchically displayed.



2. Select desired options from the corresponding drop-down listboxes. If the Auto checkbox is checked for an option, CARE will use the value resulting from the actual peripheral conditions of the NVs building up the connection.

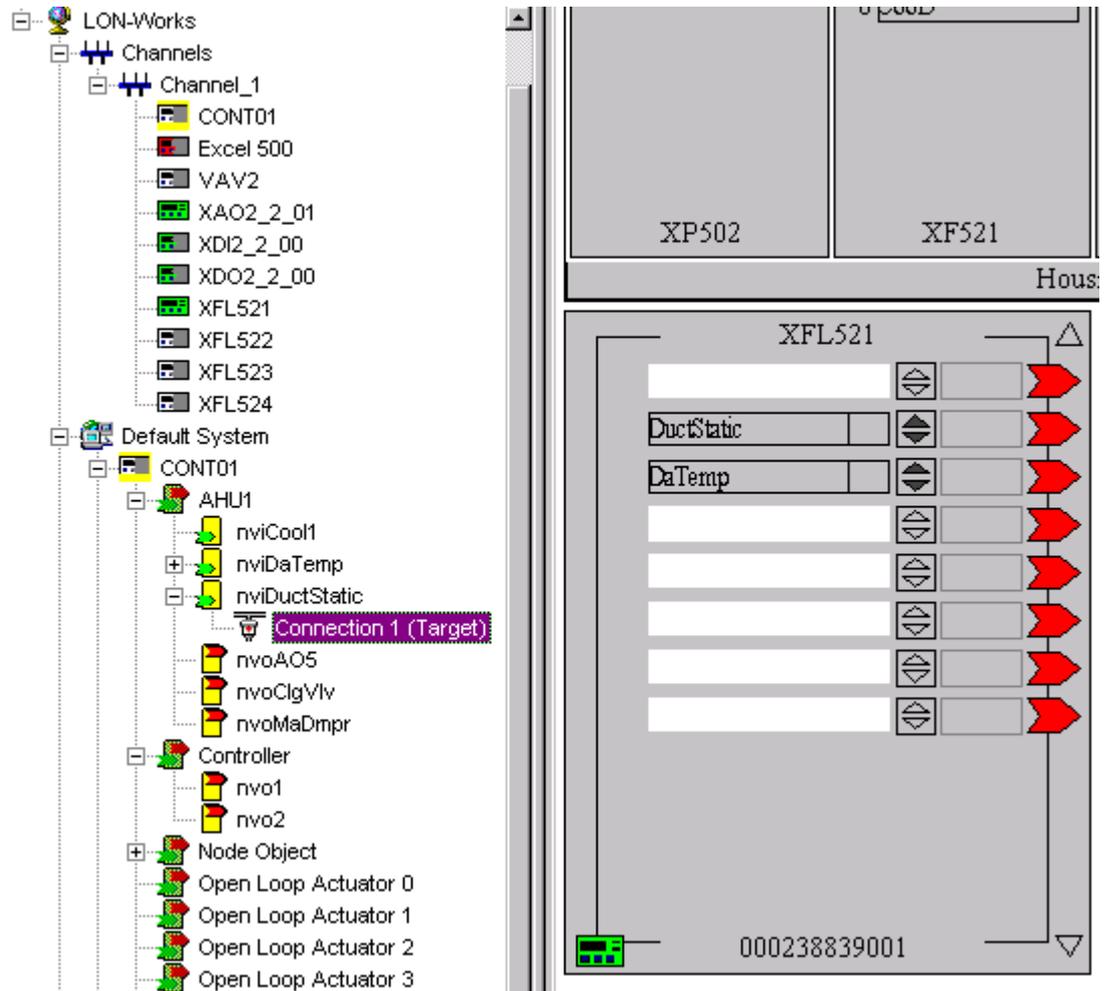
**NOTE:** It is strongly recommended not to change the AUTO settings without having advanced knowledge of relevant Echelon technology. For detailed information, please refer to the relevant Echelon documentation.

## Delete Connection / Remove Binding

Deleting a connection removes the binding between two NVs.

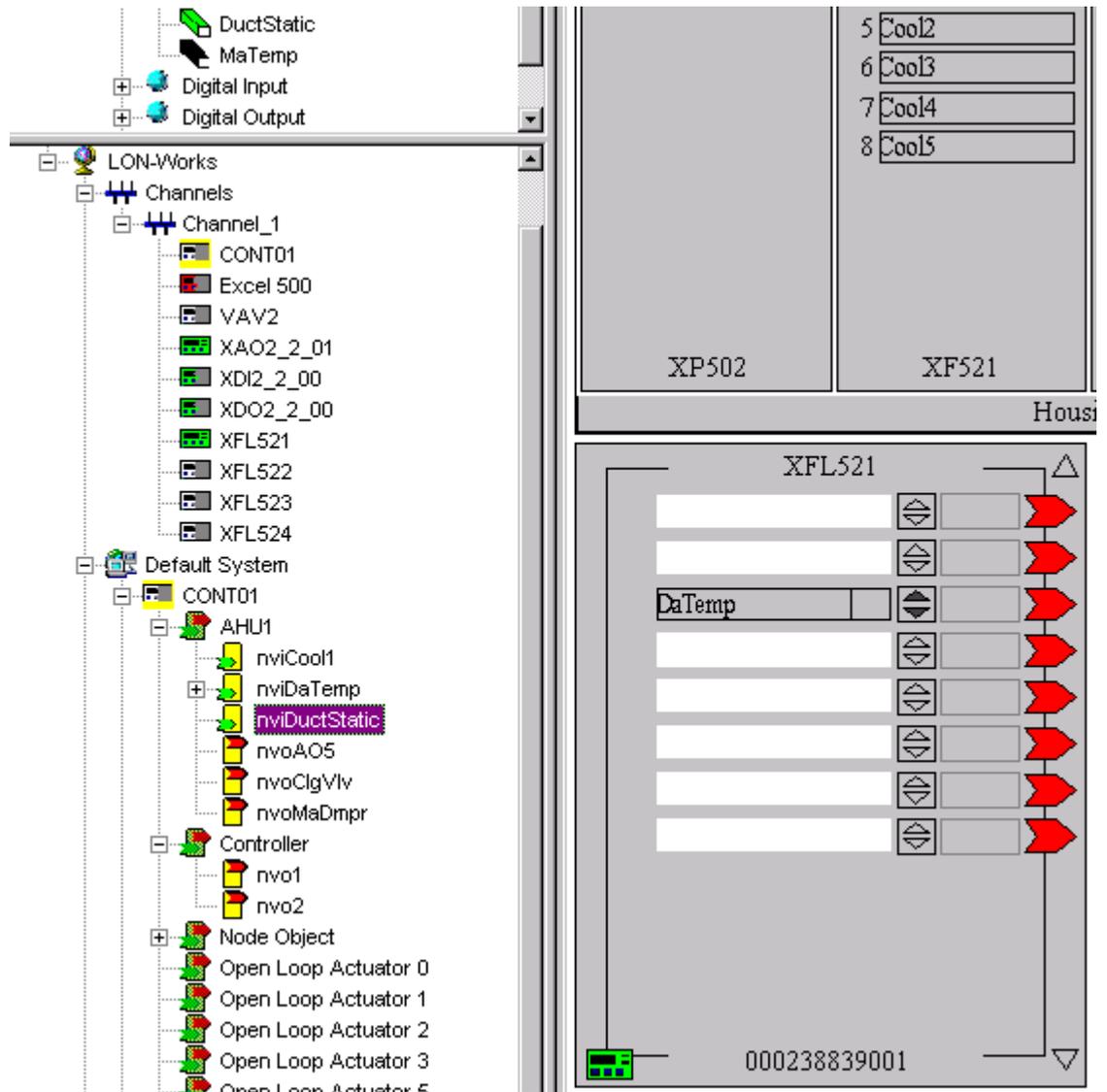
### Procedure

1. In the logical LON-bus part of the network tree, double-click on the destination device to display assigned devices on the terminal assignment tab on the right pane.
2. With right mouse key click on the connection in the logical LON-bus part of the network tree.



3. With left mouse key, click Delete in the context menu.

RESULT: The connection is deleted in the tree and the datapoint and the NV is removed from the terminal on the device. Note, that the mapping between NV and datapoint still remains as the NV is displayed in the tree, in this case the nviDuctStatic. In the logical plant tree, the datapoint is displayed in yellow indicating that is already mapped.

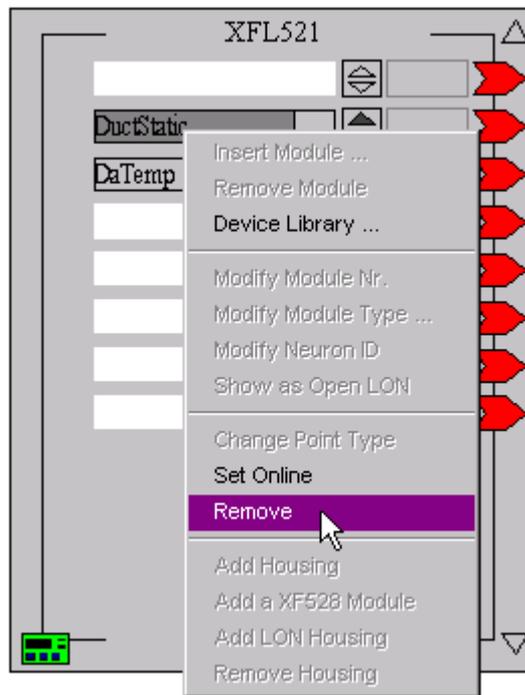


### Remove Datapoint / NV from Terminal

In comparison to the deletion of a connection where the mapping between a NV and a datapoint is kept, the binding and mapping is deleted when removing a datapoint/NV from a device terminal.

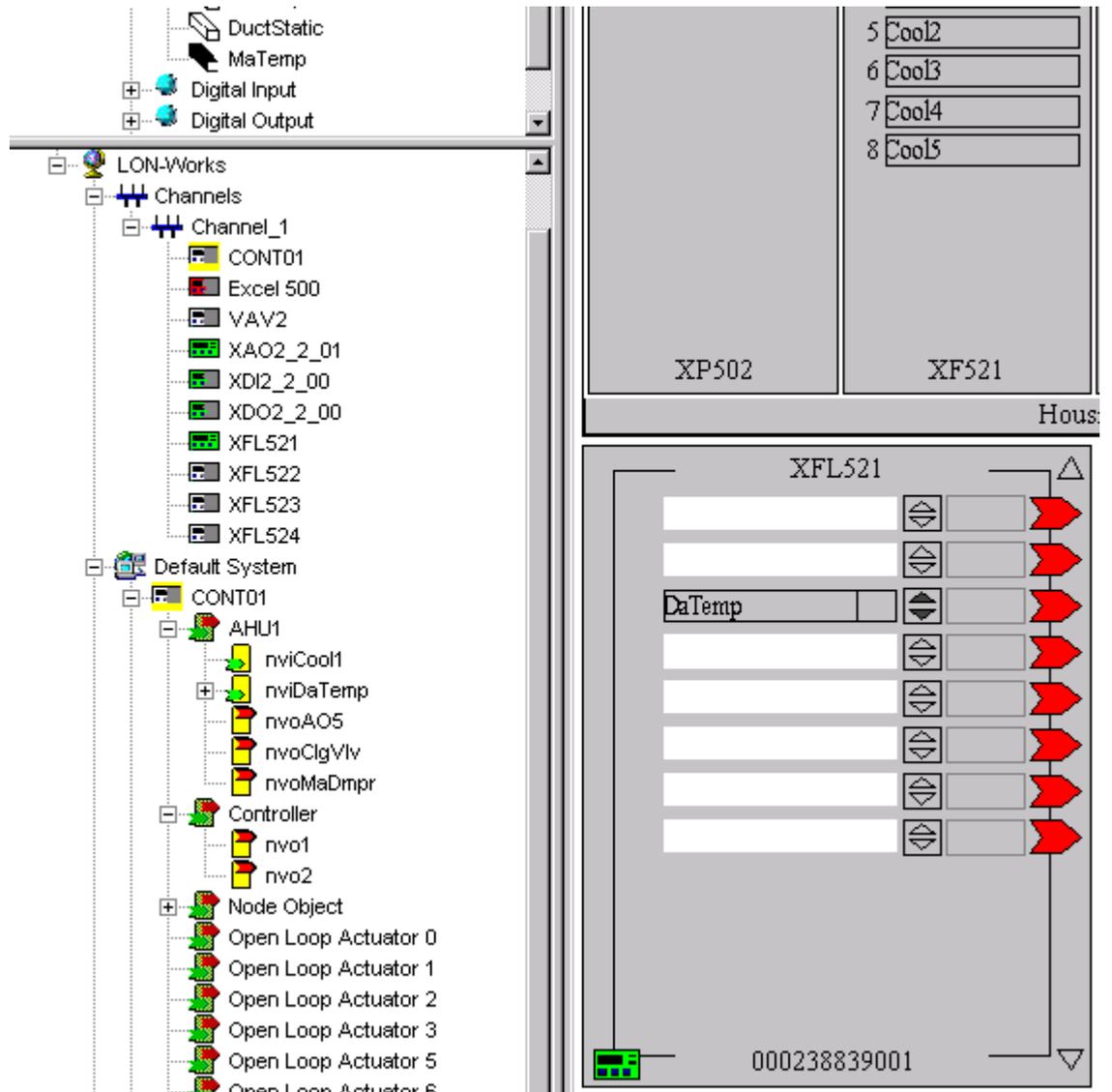
#### Procedure

1. In the logical LON-bus part of the network tree, double-click on the destination device to display assigned devices on the terminal assignment tab on the right pane.
2. With right mouse key, click on the terminal of which datapoint/NV you want to remove.



3. With left mouse key, click Remove in the context menu or press DELETE key on the keyboard.

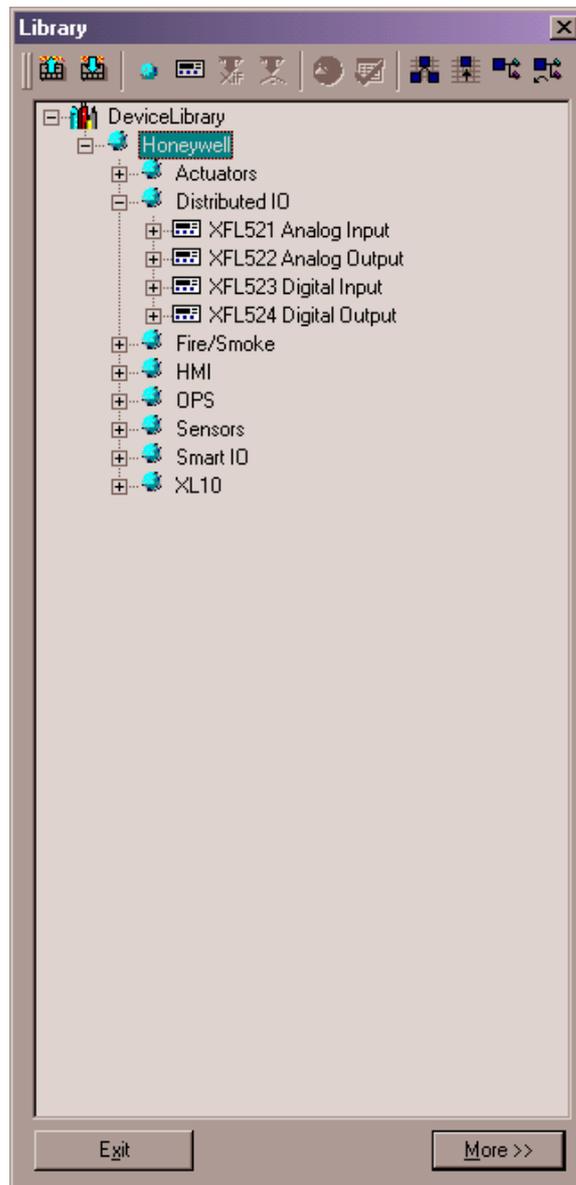
**RESULT:** The datapoint/NV is removed from the terminal on the device and the connection and the NV itself is deleted in the tree. Note, that the binding is removed and the mapping between NV and datapoint too indicated by the white display of the datapoint in the logical plant tree.



## The Device Library

The device library stores LON devices for adding them to the network tree, respectively to the terminal assignment tab. By default, it includes all currently available Honeywell LON devices. 3<sup>rd</sup> party LON devices can be imported via XIF file into the library additionally. In addition, OLink and OPS devices can be created. In addition, devices can be copied from the network tree to the device library.

The device library dialog window looks as follows:



The devices are arranged in a hierarchical tree. The icons in the device library tree have the following meaning:

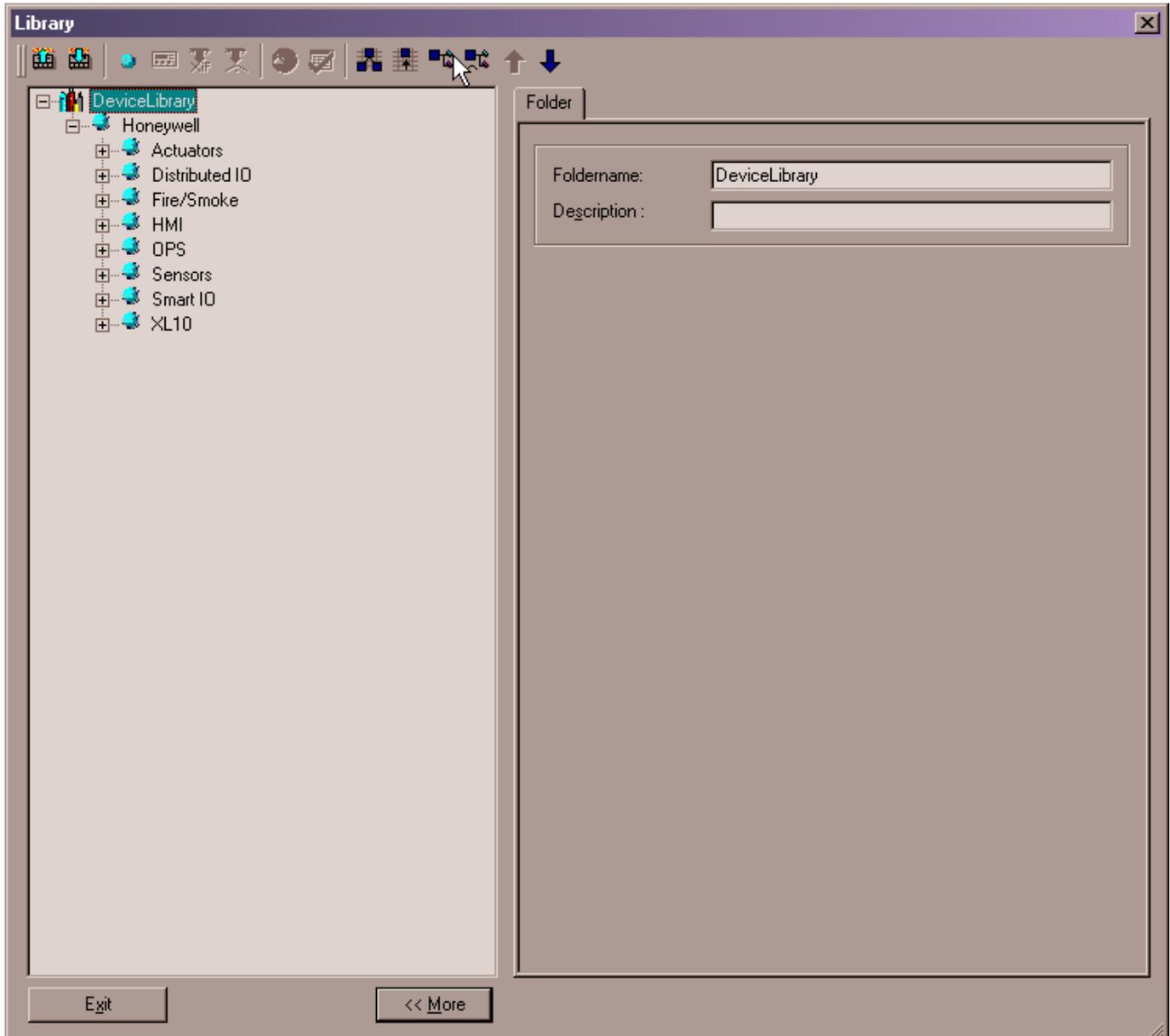
 = Device library

 = Folder

 = LON Device

As any hierarchical tree, the device library tree can be structured by creating, deleting, copying and renaming folders and LON devices.

Click the More button to display details for the selected tree item, in this case for the XFL521 Analog Input.



The device library provides the following functions:

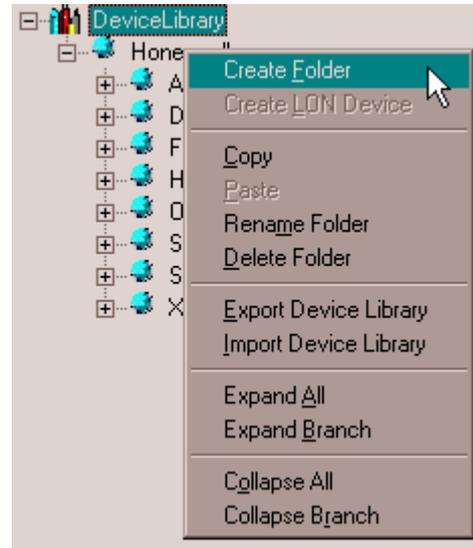
- Create LON devices by importing data from XIF files or Online
- Create OPS devices by using the OPS Template Editor
- Import LON objects from XIF files or Online
- Edit devices
- Assign value conversion tables to devices
- Rename devices
- Copy devices
- Delete devices
- Export and import device library
- Set Values for NVs, SCPTs/UCPTs and NCIs (see Set Values for NVs, SCPTs/UCPTs and NCIs section)

### Structure Device Library Tree

The device library tree can be structured by creating, deleting, copying and renaming folders and LON devices.

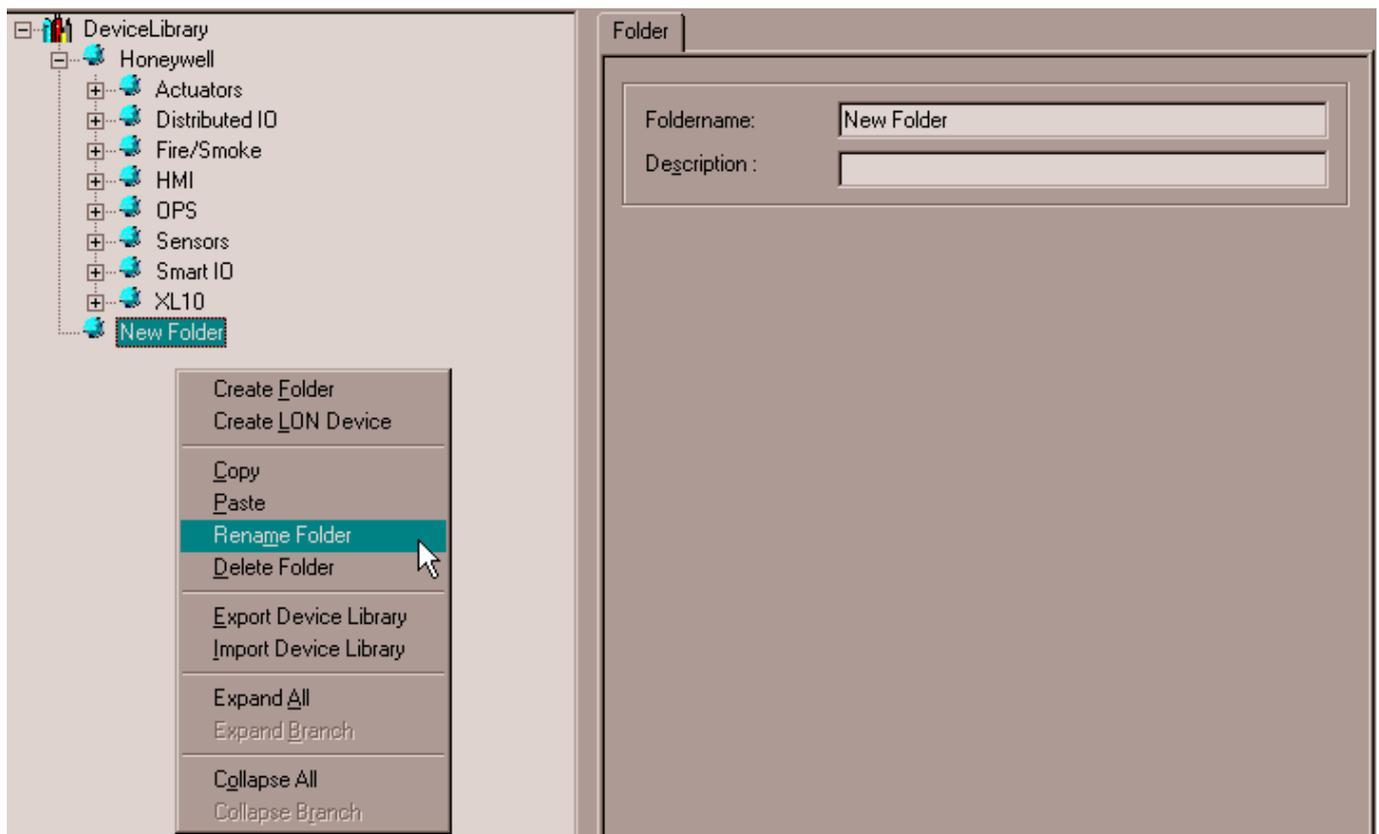
## Create Folder

- Procedure**
1. In the tree, right-click on the device library icon or an existing folder, where the new folder should be created.



2. In the context menu, click on Create Folder.

RESULT: The new folder is created one level below and named NewFolder.



3. To name the folder individually, right-click on the new folder and click Rename Folder in the context menu. Rename the flashing name in the tree.

Or, on the bottom of the Device Library window, click the More button and

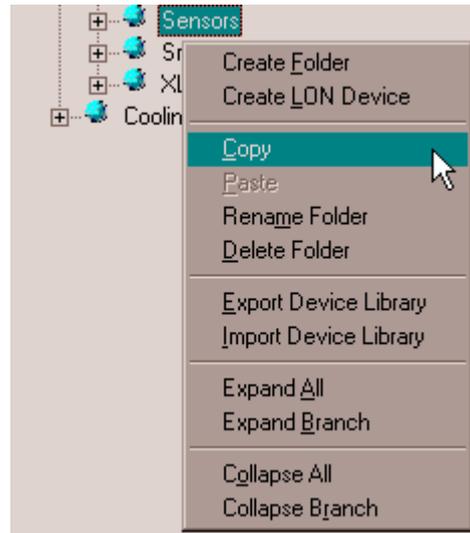
rename the folder in the Folder Name field on the right pane. Add a description, if desired.

### Rename Folder

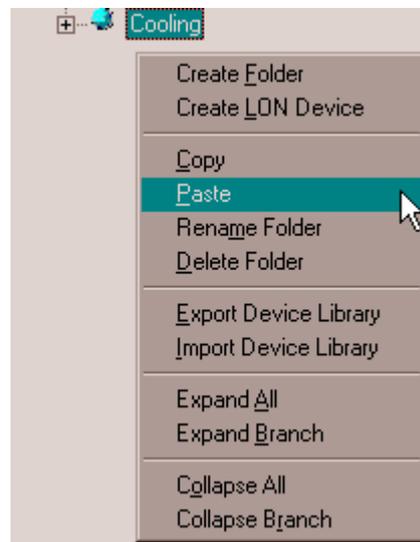
Refer to step 3 of the Create Folder section.

### Copy Folder

- Procedure**
1. In the tree, right-click on the folder, you want to copy and click Copy in the context menu.



2. In the tree, right-click on target folder you want to copy the selected folder to and click on Paste in the context menu.



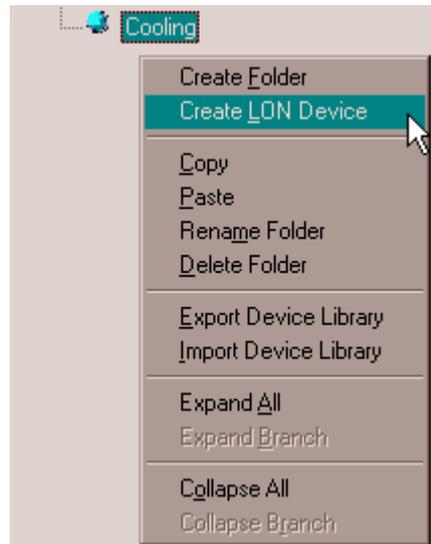
RESULT: The folder is copied.

### Delete Folder

- Procedure**
1. In the tree, right-click on the folder, you want to delete and click Delete in the context menu.

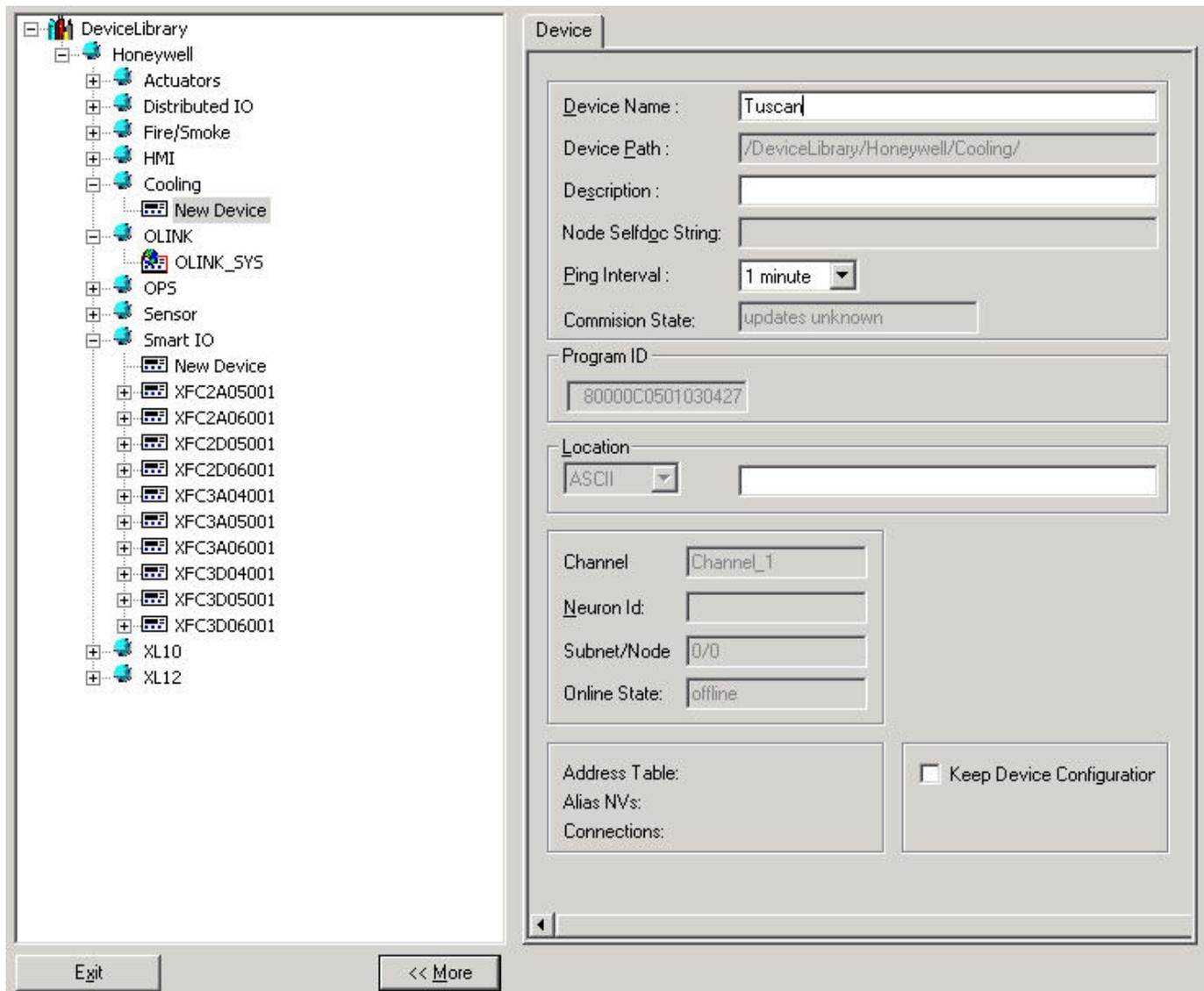
## Create LON Device

- Procedure**
1. Click on the **More** button on the bottom of the Device Library window.

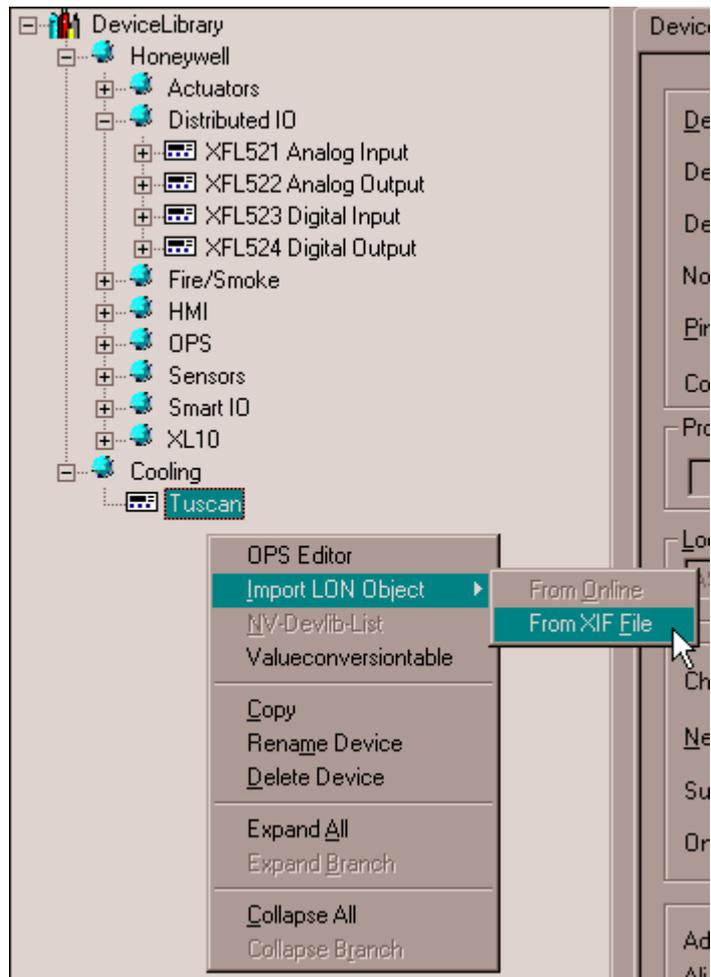


2. In the tree, right-click on the folder, in which you want to create the LON device and click on Create LON device in the context menu.

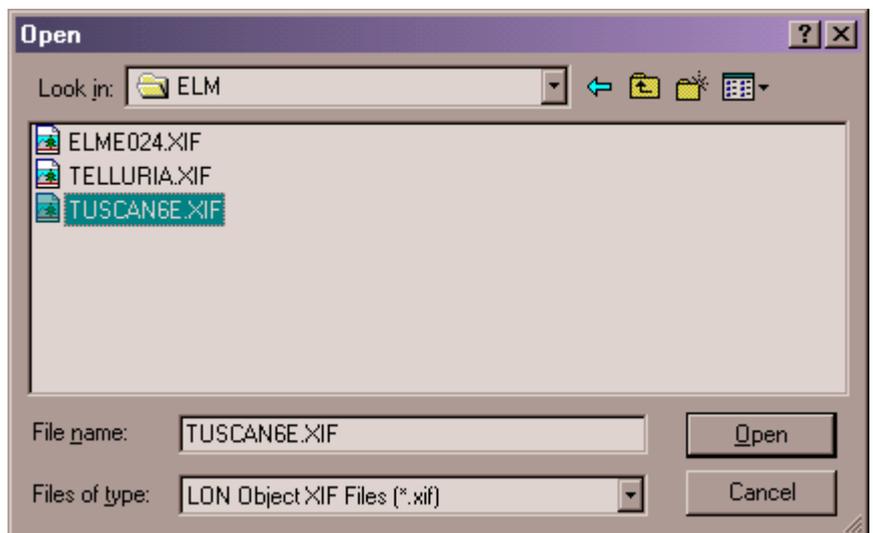
**RESULT:** The LON device is inserted into the tree.



3. Click the a name and enter a description if desired on the right pane.
4. Issue a name and enter a description if desired on the right pane.
5. Select the ping intervall from the Ping Intervall drop-down listbox and enter the location string in ASCII format into the Location field, if desired.
6. Check the Keep Device Configuration checkbox if you want to keep the configuration parameters of the device when applying one of the following functions: plug-in offline or online, commissioning or synchronizing with LNS. Setting this option prevents unintentional overwriting of the current configuration of the physical device. The above functions are not available until the parameters have been uploaded from the device. When setting this option, each device of this type will have the “Keep Device Configuration” automatically checked when it will be added to the network tree, respectively to the terminal assignment tab (for further information, please refer to the Keep Device Configuration section).
7. Right-click on the device icon in the tree.
8. Click on Import LON object and from XIF file if the XIF file is available. Or, click on From Online, if you want to import the information online directly from the device connected to the LonWorks network.

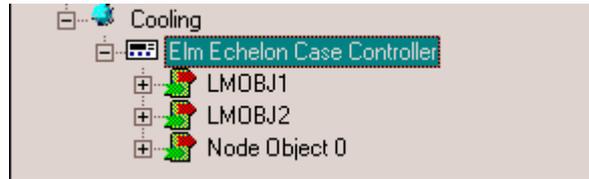


RESULT: If the “From XIF file” option has been selected, the Open dialog box is displayed.



9. Browse to the folder where the XIF file has been saved, select the XIF file and click the Open button.

RESULT: The corresponding LON objects are imported and displayed in the tree. The LON device name is re-named by the name saved in the XIF file, in this case Elm Echelon Case Controller.



RESULT: If the "From Online" option has been selected, the Get Service Pin dialog box is displayed.



10. Press the service pin on the hardware.

RESULT: The corresponding LON objects are imported and displayed in the tree. The LON device name is re-named by the name saved in the XIF file, in this case Elm Echelon Case Controller.

**IMPORTANT**

*The 'From Online' option should only be used if the device's XIF file is not available and/or the CARE database is not to be synchronized with LNS.*

## Create OLink Template

The device library provides the creation of OLink templates for multiple use of OLink hardware configurations. Templates can be created by step-by-step procedure or automatically by importing the vendor network interface via *opt* file.

**IMPORTANT**

*Changes on an OLink template done in the device library are not reflected in a template already assigned to a controller. After the template has been assigned to the controller, it cannot be unassigned and replaced by another template.*

Creating an OLink template, includes the following steps:

- Create OLink controller (device)
- Create OLink subsystem controller
- Create OLink point(s)

### Procedures

#### Create OLink device

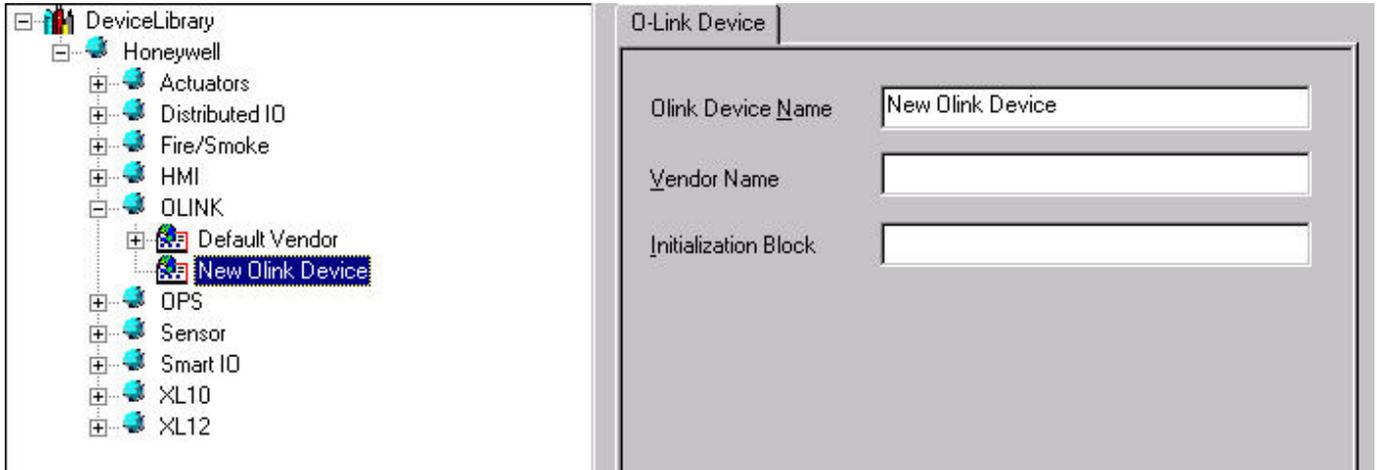
1. On the CARE toolbar, click on the Device Library icon 

RESULT: The *Library* dialog window displays.

2. At the bottom, click on the **More >>** button to activate the itemized display for items selected in the tree.

- Right-click on the folder, in which you want to create the OLink device (template), in this case, the default folder *OLink*, and click on **Create OLink device** in the context menu.

RESULT: The OLink device is inserted into the tree.



- Enter basic information on the *OLink Device* tab on the right as follows:

**OLink Device Name**

Name of device

**Vendor Name**

Name of vendor of which subsystem is to be connected to the C-Bus

**Initialization Block**

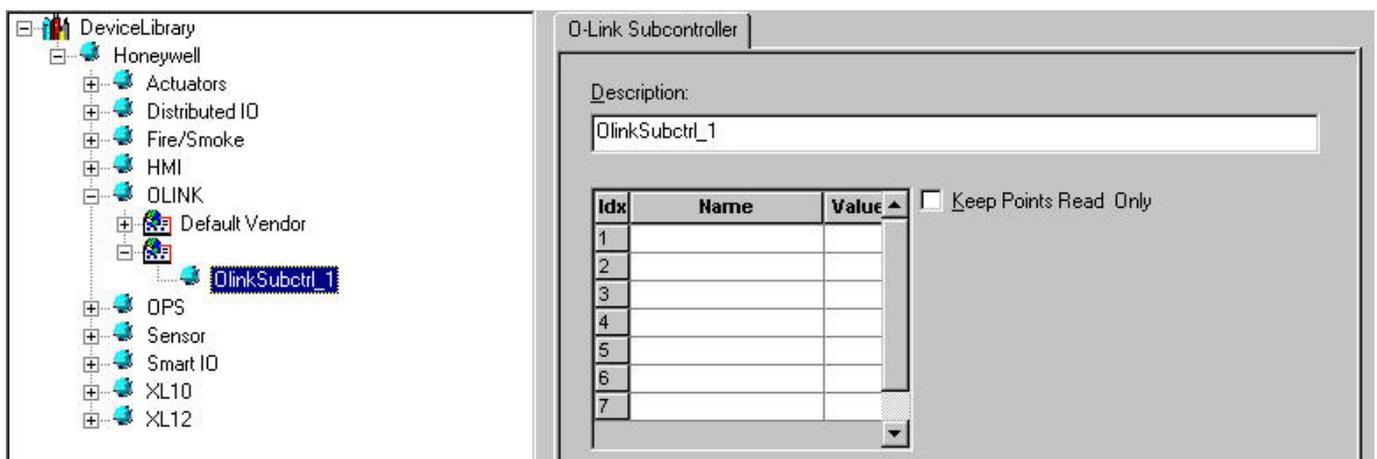
Communication and setup parameters

- Continue by creating OLink subsystem controller(s) as described in the following steps.

**Create OLink Subsystem Controller**

- In the network tree, click on the OLink device.
- Click right mouse key and with left mouse key, click on **Create OLink Subsystem Controller** in the context menu

RESULT: The OLink subsystem controller is assigned to the OLink controller in the tree.



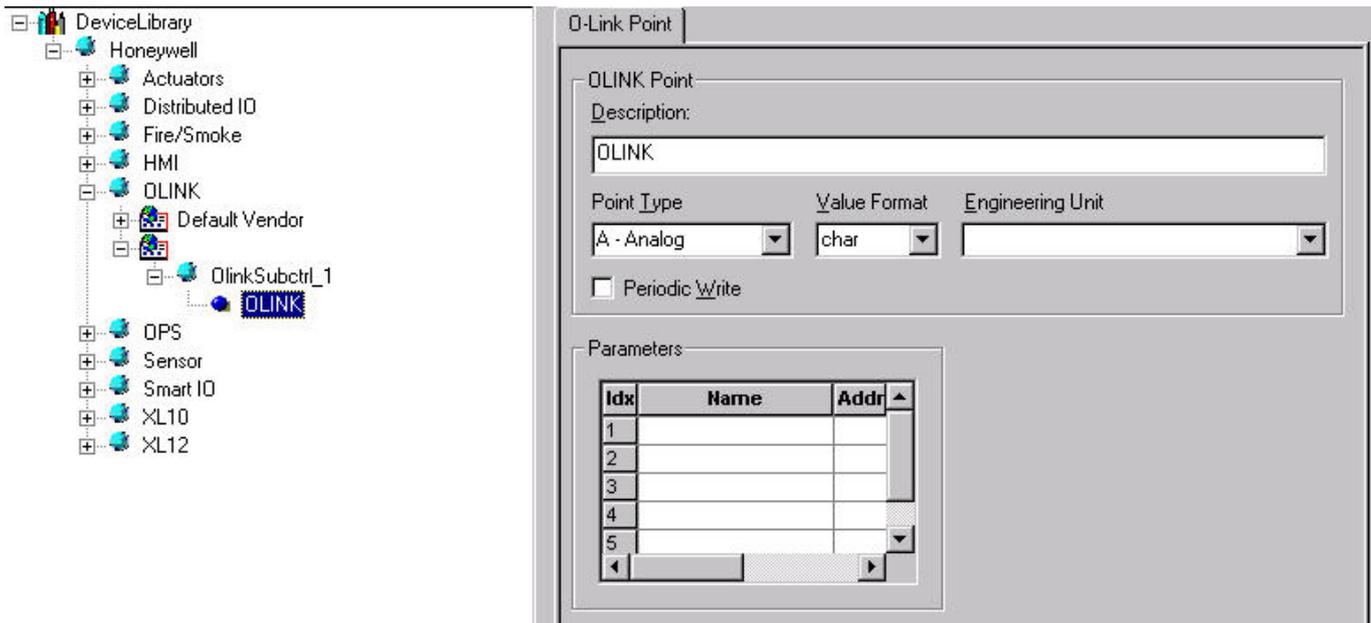
- On the *OLink Subcontroller* tab on the right, enter a name in the **Description** field.

9. In the list below, enter names and values for the OLink interface in the **Value** and **Name** fields. Therefore you need the VNI description from the vendor, which typically includes the list of points which are to be mapped to the C-bus, the engineering units, etc.
10. Check the **Keep Points Read Only** checkbox, if desired. In this case, point values cannot be overwritten.
11. Continue by creating OLink points as described in the following steps.
12. In the tree, click on the OLink subsystem controller.

### Create OLink Point

13. Click right mouse key and with left mouse key, click on **Create OLink Point** in the context menu

RESULT: The OLink point is assigned to the OLink subsystem controller in the tree.



14. On the *OLink Point* tab on the right, define settings as follows:

#### Description

Enter a point name

#### Point Type

Select point type from drop-down list box

#### Value Format

Select value format from drop-down list box

#### Engineering Unit

Select engineering unit from drop-down list box, if desired. For more information on how to create engineering units for an OLink controller, refer to the "Define OLink Engineering Units" section.

#### Periodic Write

Check the checkbox, if you want the value to be written periodically

#### Parameters

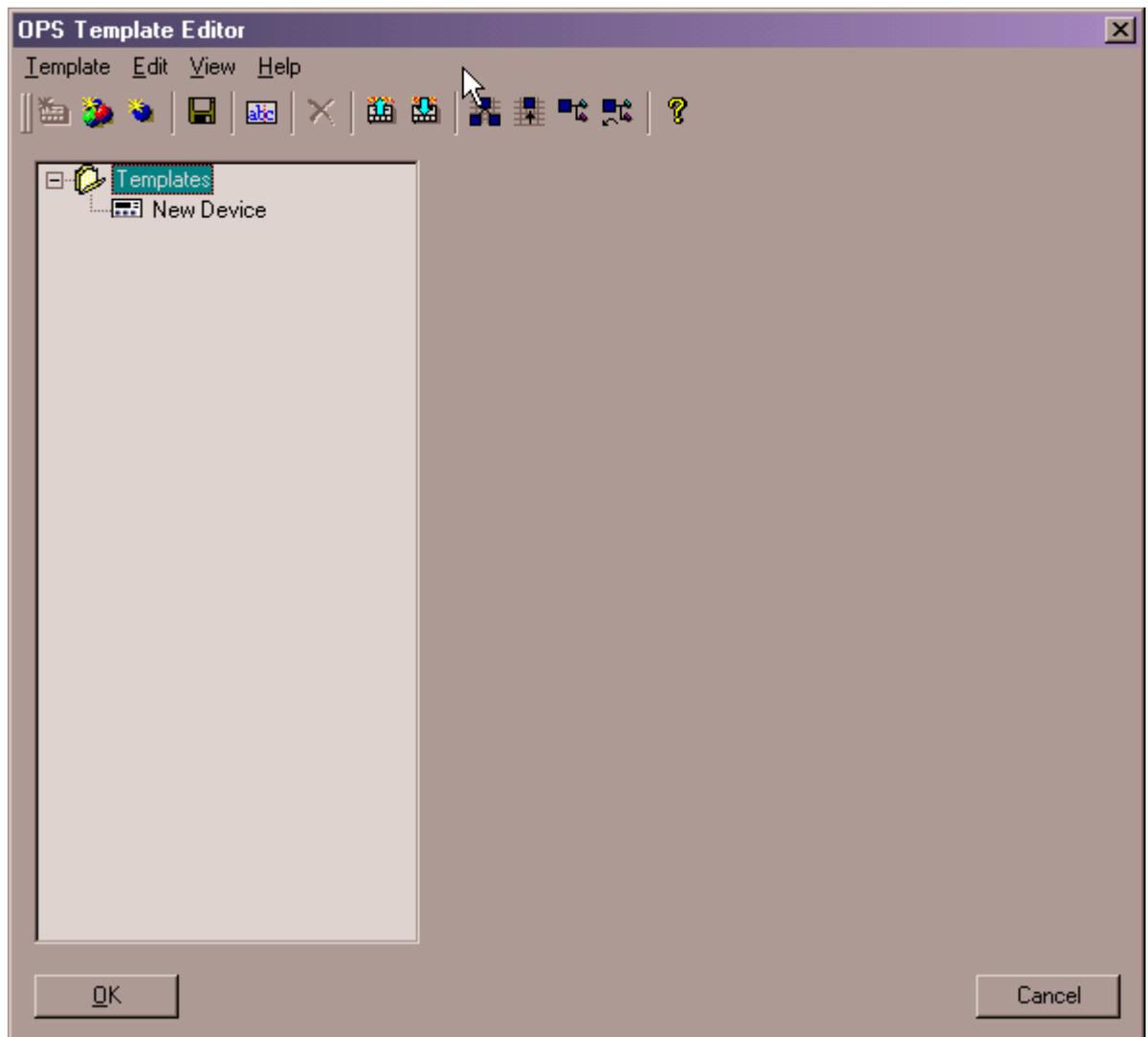
Enter names and values for the OLink interface in the **Name** and **Value** fields. Therefore you need the VNI description from the vendor which typically includes the list of points which are to be mapped to the C-bus, the engineering units, etc.

15. To save the template, click **Exit** button at the bottom of the *Device Library* window.

## Create OPS Device

- Procedure**
1. In the tree, right-click on the folder, in which you want to create the OPS (Open Point Server) device and click on Create device in the context menu.

**RESULT:** The LON device is inserted into the tree.



For detailed description on how to edit the OPS device in the OPS Editor, please refer to the OPS Editor section.

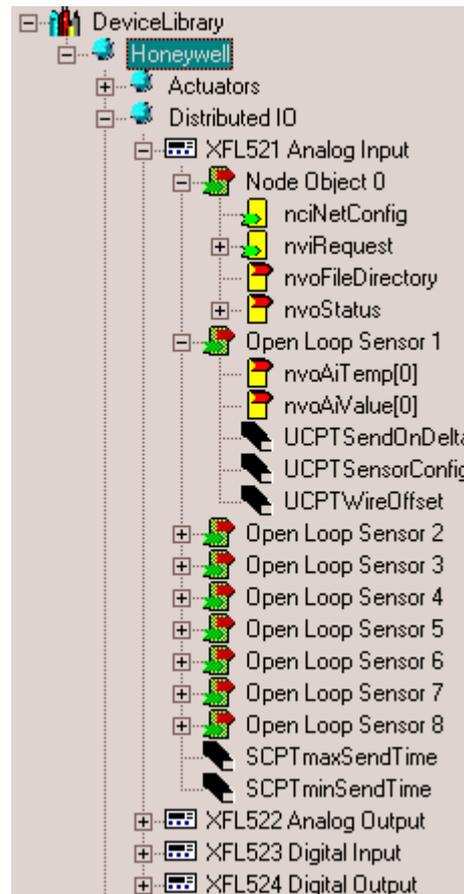
7. When finished creating the OPS data, click **OK** button to close the OPS Template Editor.

## Configure NV List Display

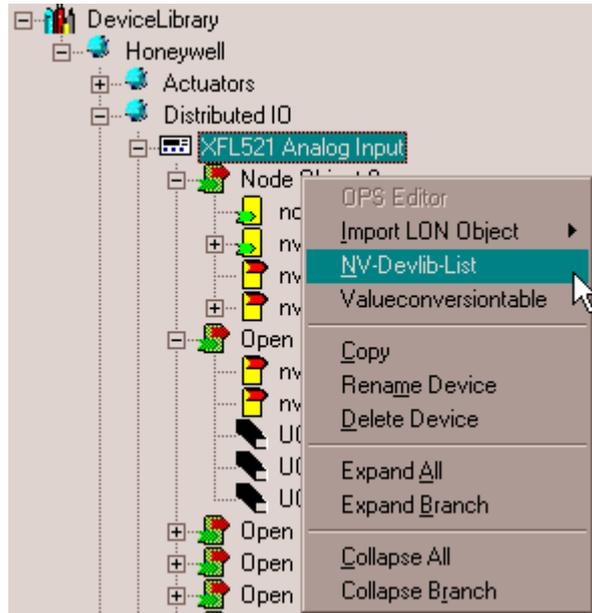
**Purpose** To define which NVs should be displayed for a LON device in the device library tree.

**NOTE:** The same functionality is available for a particular device displayed on the terminal assignment tab.

- Procedure**
1. In the tree, double-click on the LON device to display its LON objects.
  2. Double-click on the LON object(s) whose NVs you want to display.



3. Right-click on the LON device and click on NV-Devlib-List in the context menu.



RESULT: The NV-Devlib-List dialog box displays. For all NVs of the selected LON device, the following is shown:

**NV name**

e.g. nviRequest

**LON object**

LON object which the NV belongs to, e.g. Node object

**NV Type**

SNVT\_object\_request

**I/O**

Type of NV, input or output

**CARE Visual**

Whether the NV should be displayed on the Terminal Assignment Tab in CARE or not, that is, whether the NV should be displayed for the LON device in the device library tree and the LON network tree or not. Check/uncheck the corresponding checkbox(es) for the desired result. To select/deselect all NVs, highlight the column and

click the  /  icon.

**Central Usage (for future use)**

Whether the NV should be used on a central, such as XBS or not. Check/uncheck the corresponding checkbox(es) for the desired result.

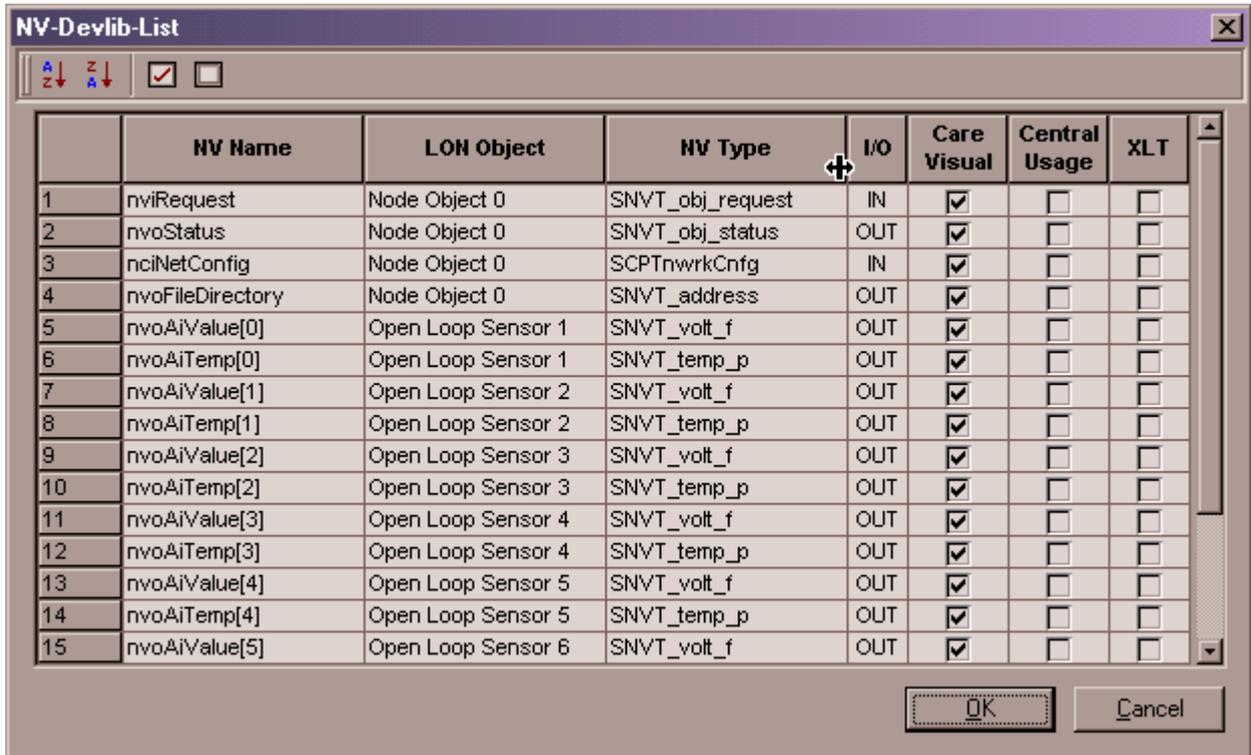
**XLT (for future use)**

Whether the NV should be used for the Excel toolkit or not. Check/uncheck the corresponding checkbox(es) for the desired result.

To select/deselect all NVs of a column, highlight the corresponding column and click the / icon.

To sort a column ascending/descending, highlight the

corresponding column and click the  /  icon.

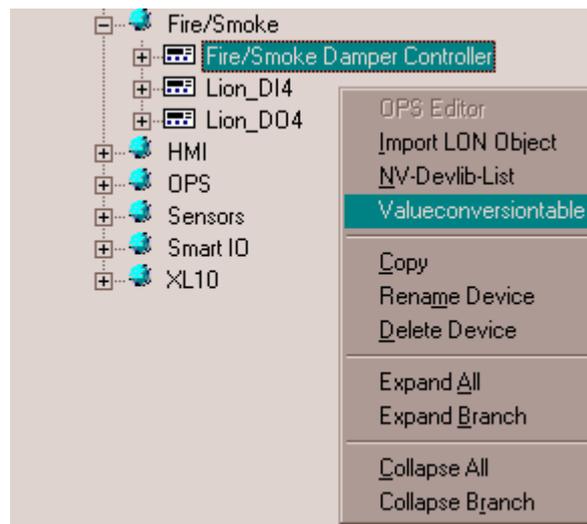


4. Confirm your settings by clicking OK.

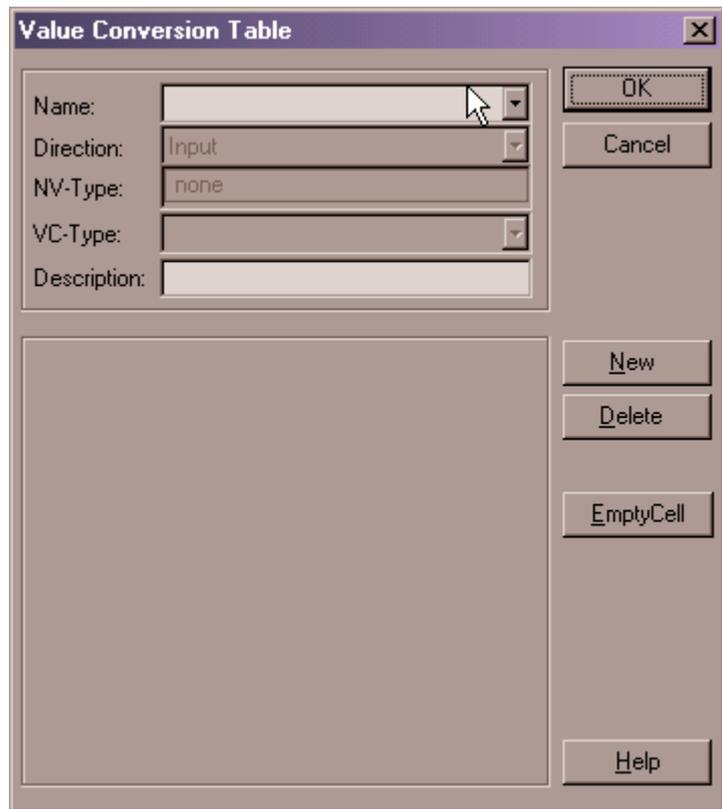
## Assign Value Conversion Table

**Purpose** To assign a value conversion table to a LON device. This can be applied especially to the Excel 500 - Smart I/O autobinding. When binding a Smart I/O module that has value conversion table assigned to a Excel 500 controller, the value conversion table will be used automatically by the Excel 500 controller.

**Procedure** 1. In the tree, right-click on the LON device and click on ValueConversionTable in the context menu.



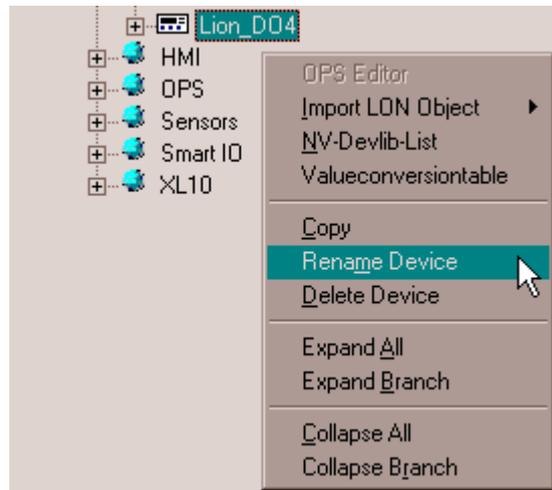
RESULT: The Value Conversion Table dialog box displays.



For detailed description on how to build a value conversion table, please refer to the Build Conversion Table section.

## Rename LON Device

- Procedure**
1. In the tree, right-click on the LON device and click on Rename Device in the context menu. Rename the flashing name in the tree.



Or, on the bottom of the Device Library window, click the More button and rename the folder in the Folder Name field on the right pane. Add a description, if desired.

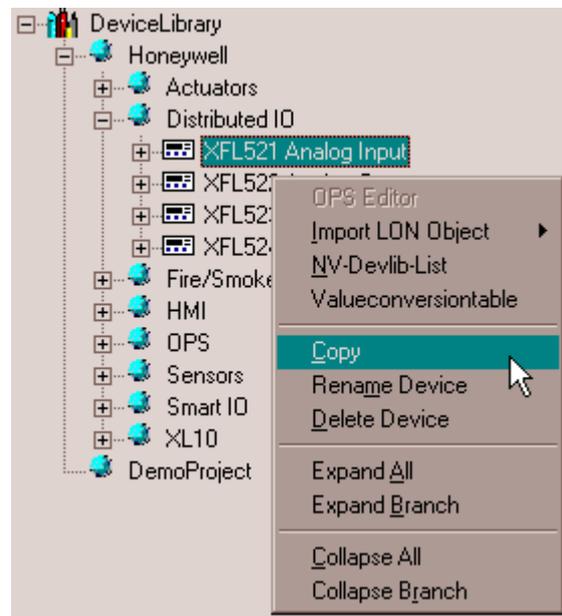


## Copy LON Device

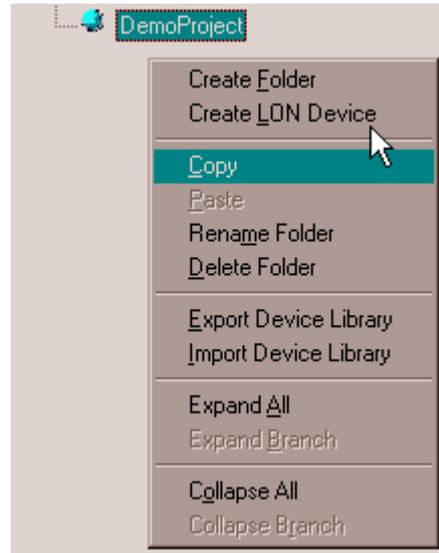
A LON device can be copied within the device library with its default configuration or by dragging&dropping it from within the LON-bus part of the network tree. In this case individually configured devices, either by plug-in or by CPs change, can be added to the device library for re-use (see Import device library and Export device library sections).

### Copy Default LON Device within Device Library

- Procedure**
1. In the tree, right-click on the LON device, you want to copy and click Copy in the context menu.



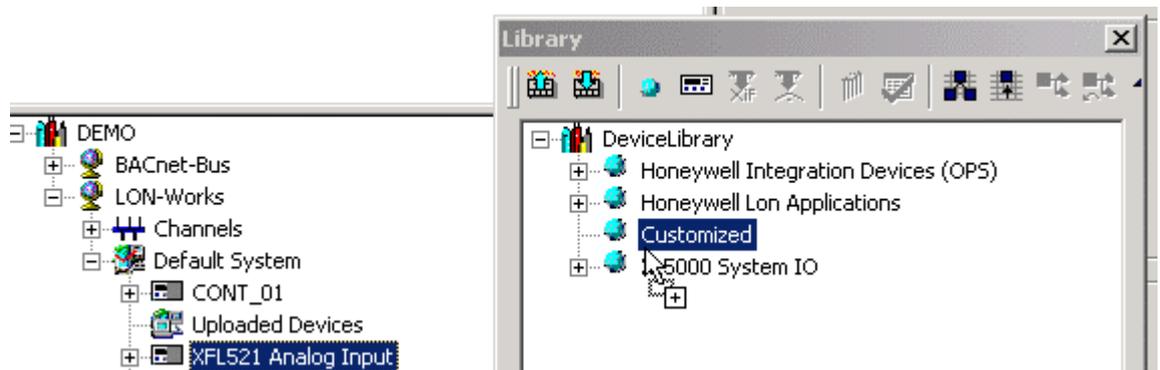
2. In the tree, right-click on target folder you want to copy the selected folder to and click on Paste in the context menu.



RESULT: The folder is copied.

**Purpose** To copy individually configured device from within the logical LON-bus part of the network tree to the device library.

- Procedure**
1. In the logical LON-bus part of the network tree, configure device via plug-in or by editing CPs directly.
  2. Open the device library and browse to the target folder you want to copy the LON device to.
  3. In the logical LON-bus part of the network tree, click on the device.
  4. Drag it to the device library and drop it to the target folder.



RESULT: In the above example, the XFL521 Analog Input device is copied to the Customized folder.

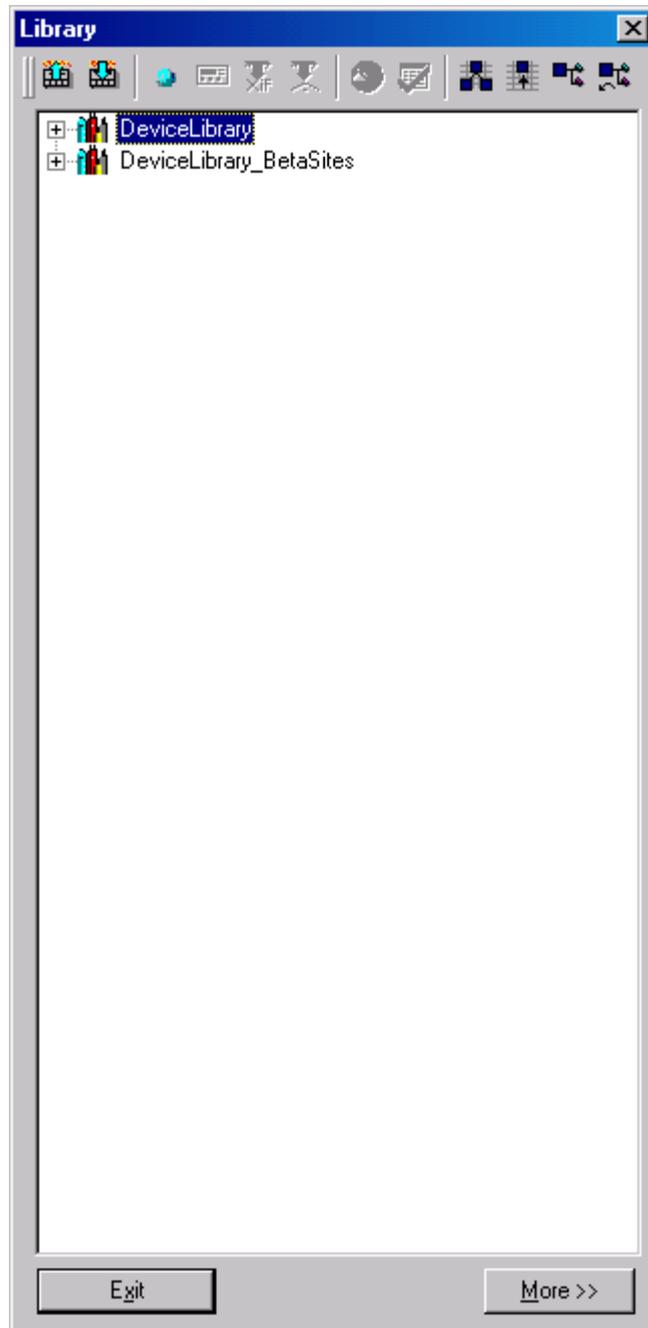
### Delete LON Device

- Procedure**
1. In the tree, right-click on the LON device, you want to delete and click Delete in the context menu.

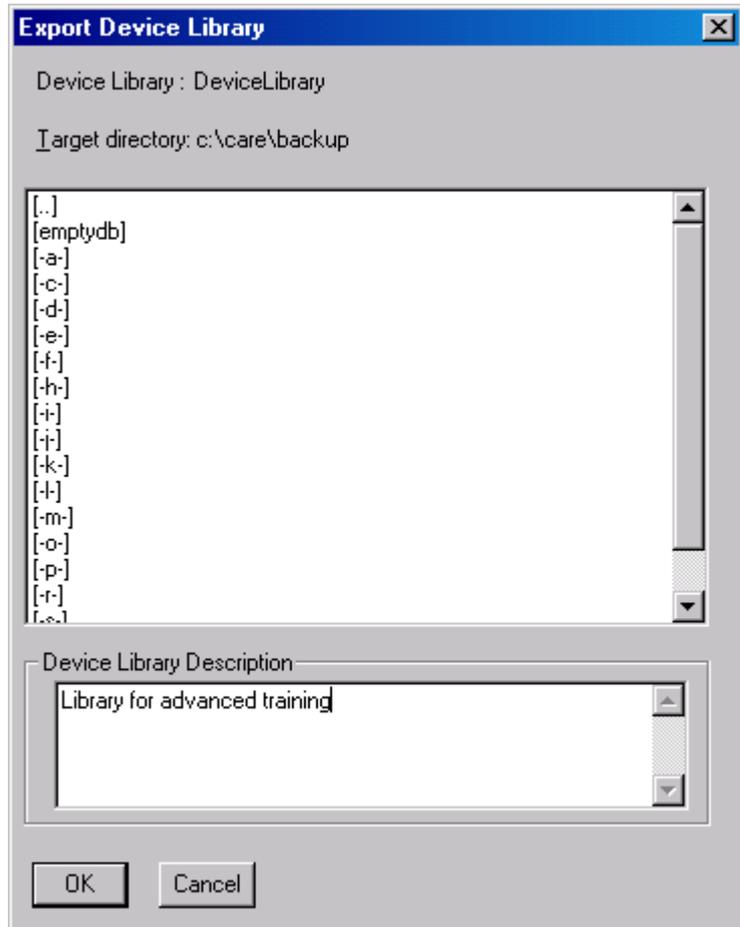
## Export Device Library

**Purpose** To backup a device library for repeatedly or multiple use, for example, on a laptop PC.

- Procedure**
1. In the device library window, select the device library in the tree and click on the Export Device Library icon 

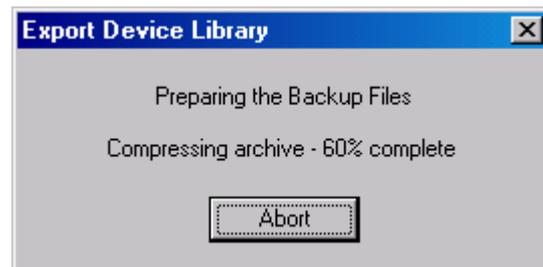


**RESULT:** The Export Device Library dialog box displays.



2. Under Target directory, select the target directory where the device library should be saved.
3. Under Device Library Description, enter a description, if desired.
4. Click OK.

RESULT: The Export is starting as the following dialog box displays.



5. Confirm the Export by clicking OK in the Backup / Restore dialog box.



## Import Device Library

**Purpose** To restore a backed-up device library. Copies can be created by importing the library multiple times and saving it under different target library names.

**Procedure**

1. In the device library window, click on the Import Device Library icon 

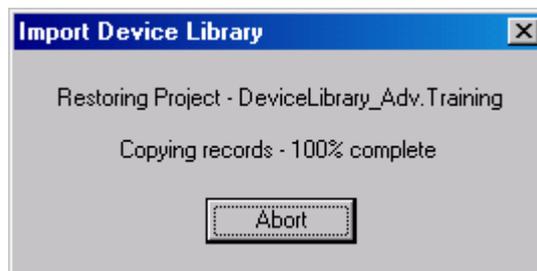
**RESULT:** The Import Device Library dialog box displays.  
The device library is saved with its name as it is shown as top-level folder in the device library tree, in this case DeviceLibrary.

2. Under Source directory, browse to the directory where the device library had been saved.
3. In the Device Library's list below, click on the library you want to import.
4. In the Target Device Library Name field, enter a new name for the library.

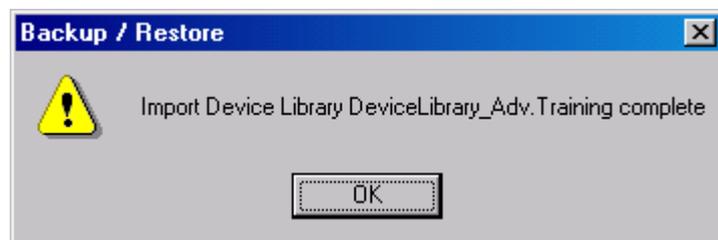
**NOTE:** The same source library can be imported multiple times (copy) by saving it under different target names.

5. Click the Import button.

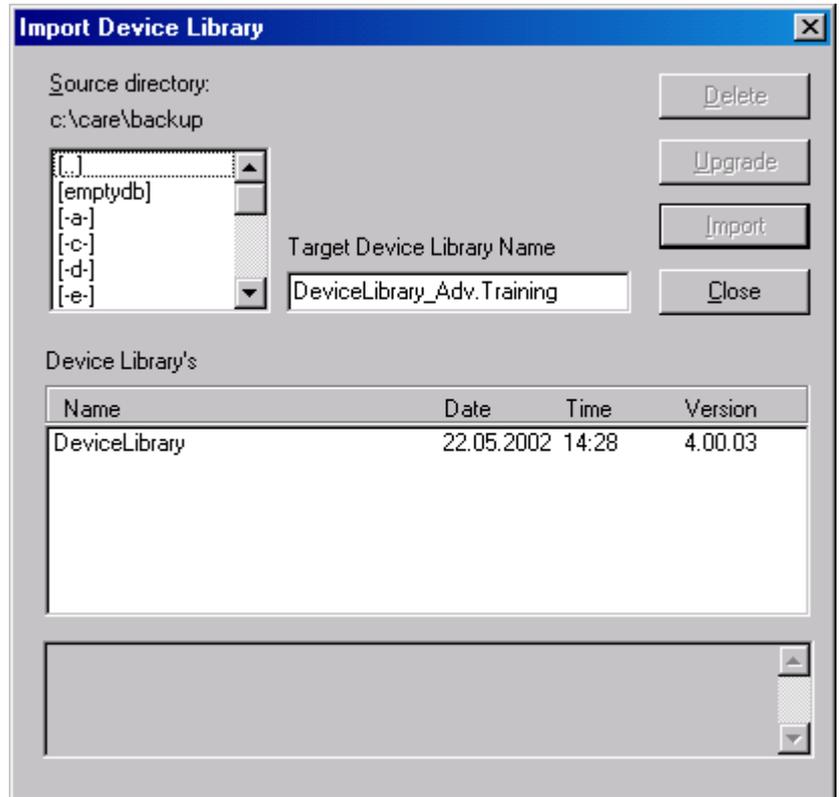
**RESULT:** The Import is starting as the following dialog box displays.



6. Confirm the Import by clicking OK in the Backup / Restore dialog box.

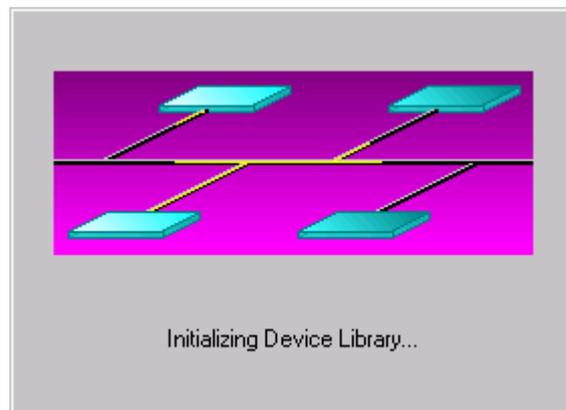


**RESULT:** The Import Device Library dialog box re-displays.

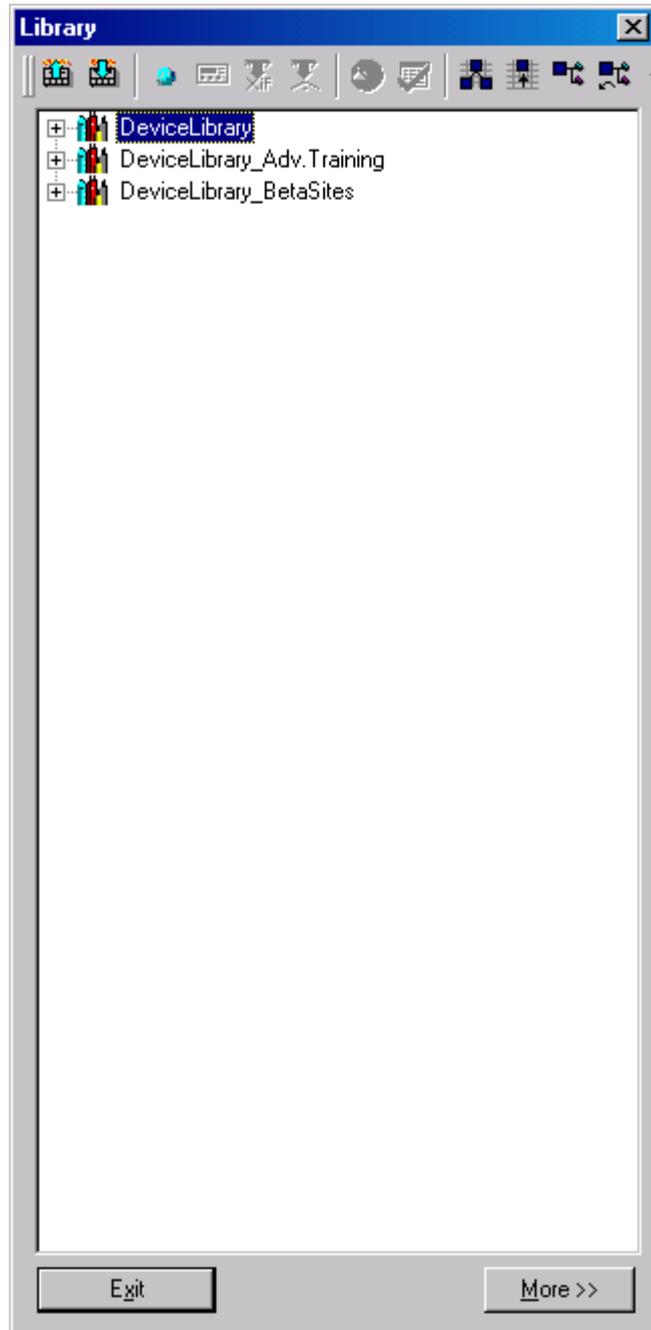


7. Click the Close button.

RESULT: The Device Library will be initialized.



RESULT: Finally the device library is added to the tree in the Device Library window.



### Import Single LON Device into the Device Library

**Purpose**  
**Procedure**

To import a single LON device into the device library.

1. Import the source device library that contains the LON device you want to import (see Import Device Library section).
2. Open the copied source device library tree and copy the particular device to the target device library (see Copy LON device section).
3. Delete the source device library (see Delete Folder section).

**Troubleshooting on Errors during Import into the Device Library**

If the device library import has any errors importing a 3<sup>rd</sup> party device, the object server log will capture the errors if the TRACE=1 is added under the object server header in the CARE.INI file.

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## Copy LON Device Settings

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### Copy NV Settings

**Purpose** To copy the NV settings of a single device to one or multiple other devices of the same type. You can set the display of NVs on the device in the terminal assignment tab. In addition, the online availability of NVs can be defined when you are Onnet with CARE.

- Procedure**
1. In the logical LON-bus part of the network tree, click on the LON device of which NV settings you want to copy.
  2. Click right mouse button and with left mouse button click on **Copy NV Settings** in the context menu.

**RESULT:** The Select NVs dialog box displays showing the following properties for all NVs:

Select NVs

Copy	Care Visual	Online	NV Name	LON Object	NV Type	I/O
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nviRequest	Node Object 0	SNVT_obj_request	IN
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoStatus	Node Object 0	SNVT_obj_status	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nciNetConfig	Node Object 0	SCPTnwrkCnfg	IN
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoFileDirectory	Node Object 0	SNVT_address	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[0]	Open Loop Sensor 1	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[0]	Open Loop Sensor 1	SNVT_temp_p	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[1]	Open Loop Sensor 2	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[1]	Open Loop Sensor 2	SNVT_temp_p	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[2]	Open Loop Sensor 3	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[2]	Open Loop Sensor 3	SNVT_temp_p	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[3]	Open Loop Sensor 4	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[3]	Open Loop Sensor 4	SNVT_temp_p	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[4]	Open Loop Sensor 5	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[4]	Open Loop Sensor 5	SNVT_temp_p	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[5]	Open Loop Sensor 6	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[5]	Open Loop Sensor 6	SNVT_temp_p	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[6]	Open Loop Sensor 7	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[6]	Open Loop Sensor 7	SNVT_temp_p	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiValue[7]	Open Loop Sensor 8	SNVT_volt_f	OUT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nvoAiTemp[7]	Open Loop Sensor 8	SNVT_temp_p	OUT

< Back    Next >    Cancel

**CARE Visual**

Whether the NV should be displayed in CARE on the Terminal Assignment Tab. Check/uncheck the corresponding NVs for the desired result.

**Online**

Whether the current value of the NV should be displayed in the Online field on the device.

**NV name**

e.g. nviRequest

**LON object**

LON object which the NV belongs to, e.g. Node object

**NV Type**

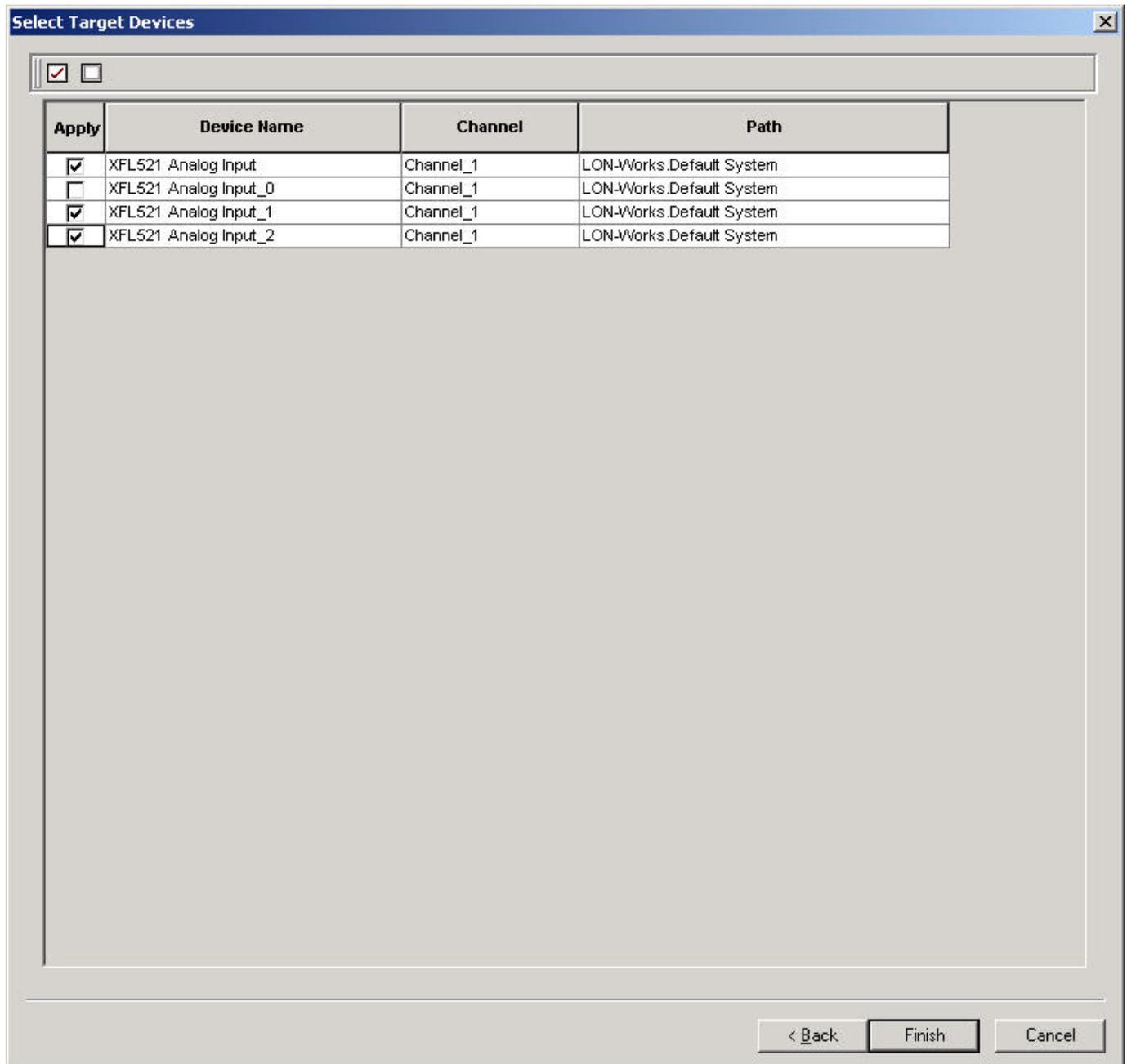
SNVT\_object\_request

**I/O**

Type of NV, input or output

- In the Copy column by default all NVs are checked for copying. To uncheck a selected NV, click the check bar. To uncheck all NVs, click the  icon at the top. To check all NVs, click the  icon at the top.
- Click the **Next** button.

**RESULT:** The Select Target Devices dialog box displays all devices which are of the same type as the source device. For each device, the channel and the path is shown, that is where the target device resides in the physical and logical structure in the network tree.



- In the Apply column, check the devices to which the NV settings should be copied. To check all devices, click the  icon at the top. To uncheck all devices, click the  icon at the top.

6. Click the **Finish** button.

**RESULT:** The Select Target Devices dialog box closes and the NV settings were copied to the selected target devices.

---

## Copy CPs and NCIs

**Purpose** To copy the configuration values of a device to one or multiple other devices of the same type. Hence, LON device configuration via Plug-In must to be done only once. Configuration values can be CPs (standard and user defined configuration parameter types) and NCIs (network variables using the config class keyword for configuration).

**NOTE** CPs and NCIs of Excel 500 controllers as well as extension records cannot be copied.

- Procedure**
1. In the logical LON-bus part of the network tree, click on the LON device of which CPs and NCIs you want to copy.
  2. Click right mouse button and with left mouse button click on **Copy CPs/NCIs** in the context menu.

**RESULT:** The Select CPs/NCIs dialog box displays showing the following properties:

Select CPs/NCIs

Copy	CP Name	Lon Object	NV Type	Type	Value
<input checked="" type="checkbox"/>	UCPTSensorConfig	Open Loop Actuator 1	80000C050303040F_UCPT_1	CP	0 - 10V Output
<input checked="" type="checkbox"/>	UCPTdriveTimeClose	Open Loop Actuator 1	80000C050303040F_UCPT_2	CP	90
<input checked="" type="checkbox"/>	UCPTdriveTimeOpen	Open Loop Actuator 1	80000C050303040F_UCPT_3	CP	90
<input checked="" type="checkbox"/>	SCPTdelayTime	Open Loop Actuator 1	SCPTdelayTime	CP	5
<input checked="" type="checkbox"/>	SCPTminDeltaLevel	Open Loop Actuator 1	SCPTminDeltaLevel	CP	1
<input checked="" type="checkbox"/>	UCPTsyncMin	Open Loop Actuator 1	80000C050303040F_UCPT_4	CP	2
<input checked="" type="checkbox"/>	UCPTsyncMax	Open Loop Actuator 1	80000C050303040F_UCPT_5	CP	98
<input checked="" type="checkbox"/>	UCPTsyncCharge	Open Loop Actuator 1	80000C050303040F_UCPT_6	CP	100
<input checked="" type="checkbox"/>	UCPTSensorConfig	Open Loop Actuator 2	80000C050303040F_UCPT_1	CP	0 - 10V Output
<input checked="" type="checkbox"/>	UCPTdriveTimeClose	Open Loop Actuator 2	80000C050303040F_UCPT_2	CP	90
<input checked="" type="checkbox"/>	UCPTdriveTimeOpen	Open Loop Actuator 2	80000C050303040F_UCPT_3	CP	90
<input checked="" type="checkbox"/>	SCPTdelayTime	Open Loop Actuator 2	SCPTdelayTime	CP	5
<input checked="" type="checkbox"/>	UCPTSensorConfig	Open Loop Actuator 3	80000C050303040F_UCPT_1	CP	0 - 10V Output
<input checked="" type="checkbox"/>	UCPTdriveTimeClose	Open Loop Actuator 3	80000C050303040F_UCPT_2	CP	90
<input checked="" type="checkbox"/>	UCPTdriveTimeOpen	Open Loop Actuator 3	80000C050303040F_UCPT_3	CP	90
<input checked="" type="checkbox"/>	SCPTdelayTime	Open Loop Actuator 3	SCPTdelayTime	CP	5
<input checked="" type="checkbox"/>	UCPTSensorConfig	Open Loop Actuator 4	80000C050303040F_UCPT_1	CP	0 - 10V Output
<input checked="" type="checkbox"/>	UCPTdriveTimeClose	Open Loop Actuator 4	80000C050303040F_UCPT_2	CP	90
<input checked="" type="checkbox"/>	UCPTdriveTimeOpen	Open Loop Actuator 4	80000C050303040F_UCPT_3	CP	90
<input checked="" type="checkbox"/>	SCPTdelayTime	Open Loop Actuator 4	SCPTdelayTime	CP	5
<input checked="" type="checkbox"/>	UCPTSensorConfig	Open Loop Actuator 5	80000C050303040F_UCPT_1	CP	0 - 10V Output
<input checked="" type="checkbox"/>	UCPTdriveTimeClose	Open Loop Actuator 5	80000C050303040F_UCPT_2	CP	90
<input checked="" type="checkbox"/>	UCPTdriveTimeOpen	Open Loop Actuator 5	80000C050303040F_UCPT_3	CP	90
<input checked="" type="checkbox"/>	SCPTdelayTime	Open Loop Actuator 5	SCPTdelayTime	CP	5
<input checked="" type="checkbox"/>	UCPTSensorConfig	Open Loop Actuator 6	80000C050303040F_UCPT_1	CP	0 - 10V Output
<input checked="" type="checkbox"/>	UCPTdriveTimeClose	Open Loop Actuator 6	80000C050303040F_UCPT_2	CP	90
<input checked="" type="checkbox"/>	UCPTdriveTimeOpen	Open Loop Actuator 6	80000C050303040F_UCPT_3	CP	90
<input checked="" type="checkbox"/>	SCPTdelayTime	Open Loop Actuator 6	SCPTdelayTime	CP	5
<input checked="" type="checkbox"/>	UCPTSensorConfig	Open Loop Actuator 7	80000C050303040F_UCPT_1	CP	0 - 10V Output
<input checked="" type="checkbox"/>	UCPTdriveTimeClose	Open Loop Actuator 7	80000C050303040F_UCPT_2	CP	90
<input checked="" type="checkbox"/>	UCPTdriveTimeOpen	Open Loop Actuator 7	80000C050303040F_UCPT_3	CP	90
<input checked="" type="checkbox"/>	SCPTdelayTime	Open Loop Actuator 7	SCPTdelayTime	CP	5

< Back    Next >    Cancel

**CP name**

Name of configuration parameter/NCI, e.g. SCPTdelayTime

**LON object**

LON object which the CP/NCI belongs to, e.g. Open Loop Actuator 1

**NV Type**

NV type which the CP/NCI belongs to, e.g. SCPTdelayTime

**Type**

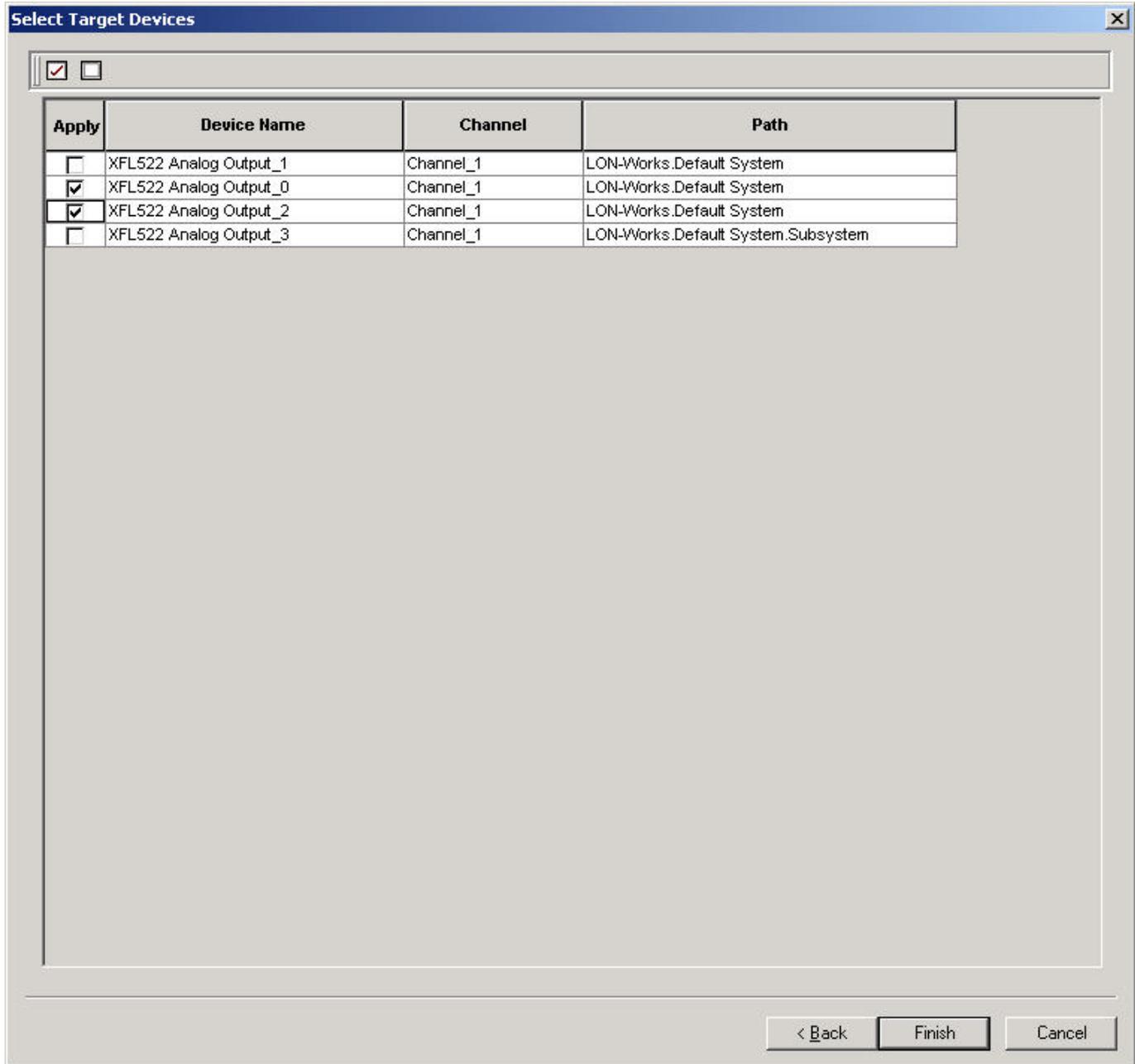
CP type, e.g. CP

**Value**

CP value. 0-10V Output

3. In the Copy column by default all CPs/NCIs are checked for copying. To uncheck a selected CPs/NCI, click the check bar. To uncheck all CPs/NCIs, click the  icon at the top. To check all CPs/NCIs, click the  icon at the top.
4. Click the **Next** button.

**RESULT:** The Select Target Devices dialog box displays all devices which are of the same type as the source device. For each device, the channel and the path is shown, that is where the target device resides in the physical and logical structure in the network tree.



5. In the Apply column, check the devices to which the CPs/NVIs should be copied. To check all devices, click the  icon at the top. To uncheck all devices, click the  icon at the top.
6. Click the **Finish** button.

RESULT: The Select Target Devices dialog box closes and the CPs/NCIs were copied to the selected target devices.

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## Edit Excel 500 Controller Network Interface Manually

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The following main functions will change the network interface of an Excel 500 Controller:

- Creating and Mapping NVs to datapoints
- Creating and deleting LON objects
- Creating and deleting input and output NVs of standard and structured type
- Move NVs between LON objects
- Building and Assigning value conversion tables

Refer to the "Changes on the Controller Network Interface/CARE Application" for actions to be performed if the network interface has been changed.

---

## Create and Manually Map NV to Datapoint

**Purpose** NVs can simply be created and mapped to a datapoint by assigning LON attributes to the datapoint. LON attributes are:

- LON point type (input, output, input&output, manual mapping)
- NV type (SNVT\_temp\_P, UNVT\_byte, Boolean etc.)

**Procedure** 1. In the logical plant tree, click on the datapoint, you want to create a NV for and to be mapped to it.

RESULT: On the right, the datapoint attributes are displayed in itemized display.

2. From the Lon Point drop-down listbox, select where the datapoint should be mapped to:

**IMPORTANT**

*Note that the length of the user address of the datapoint should not exceed 18 characters when creating Lon points, since the length for NV names when using LNS tools is restricted to 21 characters. NVs names longer than 21 characters will abort the translation of the application and must be reworked.*

*The value is set to 21 by default in the CARE.INI file and can be changed if longer names are desired for exclusive use in CARE.*

- NV-Input  
Datapoint is mapped to an input NV with the prefix nvi at the datapoint name,

e.g. nviMW\_OaTemp.

- NV-Output  
Datapoint is mapped to an output NV with the prefix nvo at the datapoint name, e.g. nvoMW\_OaTemp.
- NV-Input & Output  
Datapoint is mapped to both an input NV and an output NV. Two NVs will be created with its corresponding prefixes, e.g. nviMW\_OaTemp and nvoMW\_OaTemp.
- Manual Mapping  
Pre-Definition. Datapoint can be mapped to an input NV created. Select Manual mapping if you want to consider this datapoint for many to one mapping or if you want to map it to another NV.

NOTE: No NV will be created.

4. From the NV-Type drop-down listbox(es), select NV-Type.

RESULT: The created NV with its assigned type is created and added to the plant object in the logical LON-Bus part (Default System folder) of the network tree. The NV can also be displayed and edited directly by clicking on the dotted button  right to the Output drop-down listbox. This dialog provides working on a single Lon point/NV in more detail whereas in the network tree all created NVs can be displayed in an overall view.

The screenshot displays the Lon Dialog interface with two network trees on the left and a Properties panel on the right. The top tree shows a hierarchy: Debis\_Berlin\_Stage1 > CONT01 > AHU1 > Analog Output > MaDmpr. The bottom tree shows: Debis\_Berlin\_Stage1 > LON-Works > Channels > Default System > CONT01 > AHU1 > nviMaDmpr. The Properties panel shows 'Input NV' set to 'nviMaDmpr' and 'NV:' set to 'SNVT\_amp\_mil'. The 'Point Mapping' table is as follows:

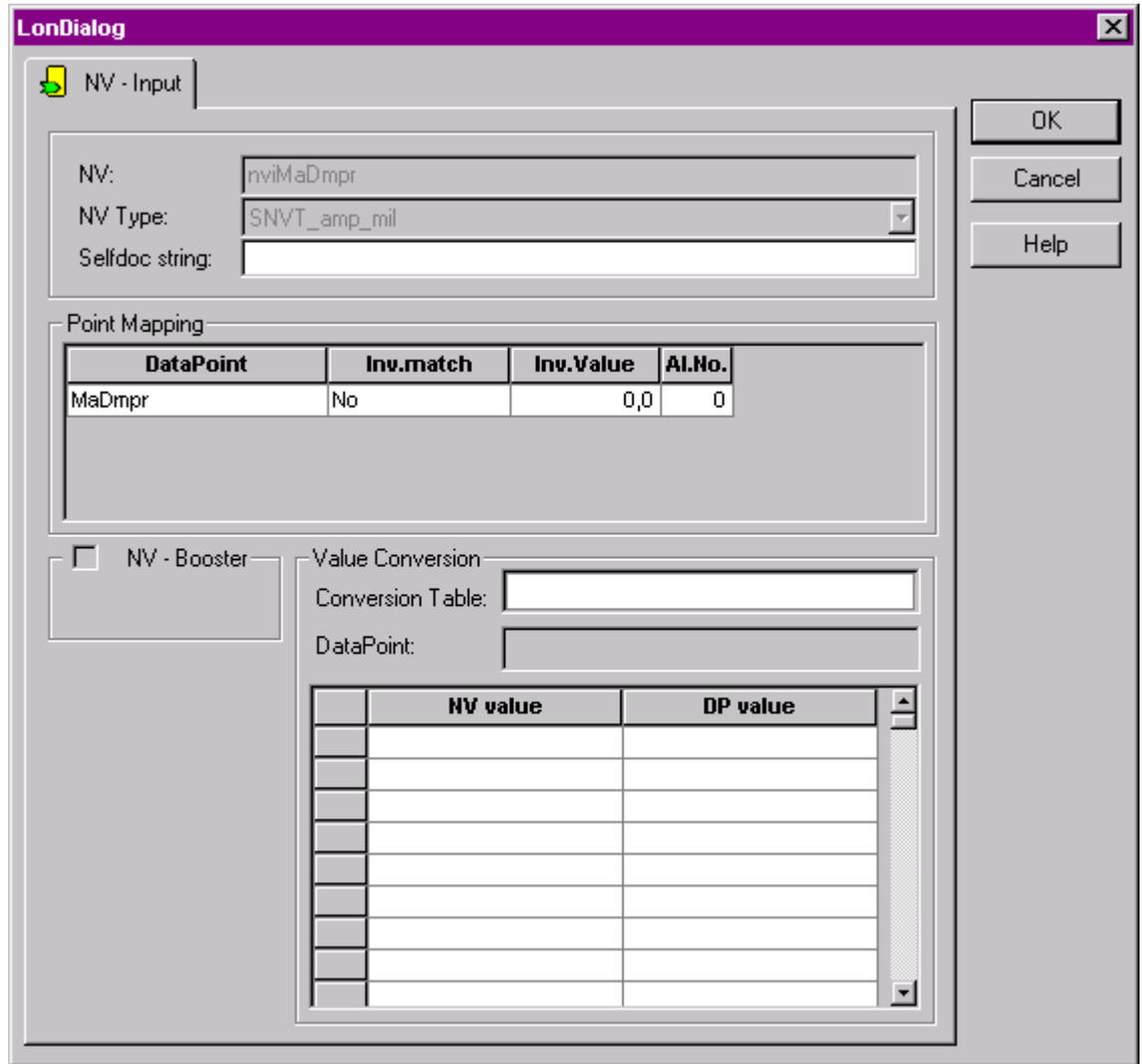
DataPoint	Inv.match	Inv.Value	AI.No.
MaDmpr	No	0,0	0

Below the table, there is a 'Value' section with a 'Conversion Table' and a 'DataPoint' field. At the bottom, there is a table for mapping NV values to DP values:

NV value	DP value

Annotations in the image include: 'Datapoint "MaDmpr" is indicated in yellow as mapped datapoint' pointing to MaDmpr in the top tree; 'NV "nviMaDmpr" is created and mapped to datapoint "MaDmpr"' pointing to nviMaDmpr in the bottom tree; and 'This pane shows the NV properties for nviMaDmpr (selected in network tree)' pointing to the Properties panel.

Lon Dialog accessible by selecting created NV in logical LON-bus part of network tree



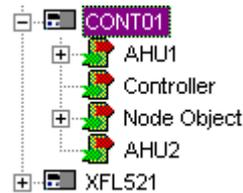
Lon Dialog invoked by clicking dotted button  for displaying/editing one single Lon point/NV

Regarding a single Lon point/NV, the functionality is slightly different for both dialogs.

### Create LON Object

**Purpose** LON objects can be used for hierarchical structuring of the controller network interface. The following two LON objects are created automatically and will be displayed in the logical LON-bus part.

- Node Object
- Controller (no NVs by default)



When creating new LON objects, they will be assigned to the LON device (controller icon). Hierarchically they are positioned below the LON device. The node object

includes pre-defined network variables and provides the “communication” between the objects belonging to a LON device (node).

When creating NVs for a datapoint in the logical plant tree, a LON object with the plant name, which the LON point belongs to, is automatically created.

Any object can be deleted, except the node object.

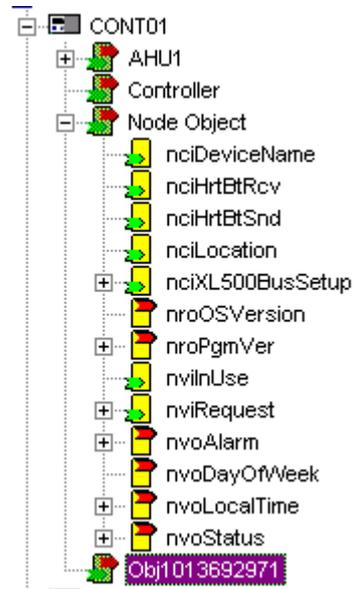
**Procedure**

1. In the logical LON-bus part of the network tree, click on the controller symbol , which you want, assign the new LON object to.
2. Click menu item Controller, then submenu item LON and Create LON-object.

Or, click Create LON object icon .

Or, click right mouse key and with left mouse key click on Create LON-object in the context menu.

RESULT: The LON object is created as pre-defined name in the tree.

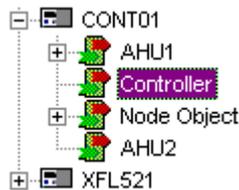


3. On the right pane, enter desired name for the LON object in the LonObjectName field.
4. Enter a description if desired in the Description field.

**Create/Edit Input - / Output NV**

**Procedure**

1. In the logical LON-bus part of the network tree, click on a LON object or NV, but not the Node object.



2. To create an Input Network Variable (NV-IN), click menu item Controller, then submenu item LON and Create NV-IN.



**Enter Name for NV**

- Under Input NV and Output NV, respectively, the default name as created in the tree is displayed in the NV field. Change the item to a meaningful name according to your needs, for example nviSensor.

**IMPORTANT**

*Note that the length for NV names is restricted to 21 characters. NV names longer than 21 characters will abort the translation of the application and must be reworked.*

**Select NV Type**

- From the NV Type drop-down listbox select the desired NV type.

**NOTE:** Pre-defined input and output NVs are delivered with CARE. The user cannot create NV types by herself/himself. When selecting structured NV types (SNVT\_setting and SNVT\_preset), refer to the Select Input - / Output NV of structured type section.

**Enter Selfdoc string**

- In the Selfdoc string field, enter the self-documentation string. The self documentation string is used to map object indices defined on the node to their LonMark object types. It has the following structure.

Example:

The node has the following five LonMark Objects defined within it: one node object (type 0); and four closed loop sensor objects (type 2). Suppose that the developer plans to include additional installation information about the node, in this case "Installation Text". The entry would be the following:

**&3.2@0,2,2,2,2;Installation Text**

**IMPORTANT**

*In this field only text to be defined as additional textual information after the semicolon can be entered.*

**Map Datapoint**

- Under Point Mapping you can assign (map) one to several points to the NV, if desired.

**NOTE:** Only points, which were set to Manual Mapping in the logical plant tree, are selectable from the drop-down listbox. Several points can only be mapped if the NV-Booster check box is checked and the max. bindings are set (refer to Many-to-One Mapping/NV-Booster® section).

DataPoint	Inv.match	Inv.Value	Al.No.	Man.t.One
MW_DischarTemp	No	0	0	Min
ST_KL_DistrAir	No	0,0	0	Recent
SM_Frostwatch	No	MALFUNCTION	0	Average

In the first row of the **Datapoint** column, select the datapoint you want to map to the NV from the drop-down list.

In the **Inv.match** column, select whether the mapped datapoint should be checked for invalidity (Yes) or not (No).

Checking for Invalid match makes sure that in case an invalid information comes from an NV or datapoint, the controller will still work with a "defined value". The invalidity check works as follows:

**Input NVs**

In the Inv.match field, select Yes. Enter a datapoint value into the Inv.Value field in case the Input NV gets invalid (FF). The controller checks the Input NV value for invalidity. If the Input NV value is invalid, the datapoint will take the set datapoint value.

Example

An Input NV of type "unsigned byte" is mapped to a datapoint. Invalid match is set to Yes and the datapoint value is set to 5. As soon as the Input NV value becomes invalid (e.g. because the mapping is broken) the datapoint value will be 5.

**Output NVs**

In the Inv.match field select an operator. Enter a comparison value into the Inv.Value field. The controller compares the datapoint value with the comparison value, using the comparison operator. If the comparison result is TRUE, then the Output NV will take the invalid value (FF).

Possible operators for invalid match are: Exact, Lower, Greater, Lower or Greater, Lower or Equal, Greater or Equal, Auto.

NOTE: For the Auto operator, the output NV always sends Invalid.

Example

A Output NV of type unsigned byte is mapped to a datapoint. Invalid match is set to 'Lower'. The comparison value is set to 5. As soon as the datapoint's value drops below 5, the Output NV's value will become invalid.

In the **Inv.Value** column, enter the value that should be used for Invalid Match checking of the mapped datapoint.

In the **Al.No.**, enter the alarm number (5 - 23, or none) for the datapoint. Applies to AI, PA and DI points only.

In the **Many.t.One** column select one the following options to be applied for the mapped datapoint:

## Recent

Latest updated value of the bound output NVs is taken into the data Pont

## Min

Minimum value of the bound output NVs is taken into the datapoint

## Max

Maximum value of the bound output NVs is taken into the datapoint

## Average

Average value of the bound output NVs is taken into the datapoint

## Sum

Sum value of the bound output NVs is taken into the datapoint

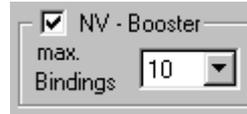
## Number Active Devices

Number Active Devices of the bound output NVs is taken into the datapoint

If desired, map further datapoint(s), starting with the Datapoint column.

**Set max. Bindings  
(NV-Booster ®)**

8. Check NV-Booster checkbox if you want to display/set the max. bindings the input NV can get via LON tool. This selection is for pre-setting memory in the controller (see Many-to-One Mapping/NV-Booster). From the drop-down listbox select desired number.



**Set Heartbeat for NV**

- 9. Check/uncheck Heartbeat checkbox if you want the controller to cyclically check if the heartbeat activation is still alive/or not.

The heartbeat can be activated or deactivated for every single NV. If heartbeat is checked for an input NV, this NV is to be checked according to nciHrtBtRcv, and all mapped NVs are sent in this way by default. If the controller does not receive an update within the specified interval, it will try to poll the output NV from the source device. In this way, the heartbeat mechanism also works for devices without periodic updates. If the polling also fails, the data point mapped with this NV is set to NO RESPONSE and the invalid value (if specified) is adopted. Additionally, if alarming has been enabled for the data point, a NO RESPONSE alarm will be issued. If the value of nciHrtBtRcv is changed using a LONWORKS network management tool, and if the application is saved to Flash memory, the value is saved as well.

If heartbeat is checked for an output NV, this NV is to be sent periodically, and all mapped NVs are sent in this way by default. If the value of nciHrtBtSnd is changed using a LONWORKS network management tool, and if the application is saved to Flash memory, the value is saved as well.

For all mapped input NVs and output NVs, heartbeat defaults to checked.

**Set Flags for NV**

- 10. Check Enhanced checkbox if you want to display/edit one of the following flags for the NV:



**auth\_config**

Defines whether the authentication of the NV may be modified by a LONWORKS network management tool (checked) or not (unchecked). Defaults to checked.

**priority conf**

Defines whether the priority of the NV may be modified by a LONWORKS network management tool (checked) or not (unchecked). Defaults to checked.

**service type**

Defines whether the service type of the NV may be modified by a LONWORKS network management tool (checked) or not (unchecked). Defaults to checked.

**offline**

Defines whether a NV can only be changed in Offline mode (checked) or not (unchecked). Defaults to unchecked.

**polled**

Defines whether the NV can be bound (unchecked) or not (checked). Defaults to unchecked.

**sync**

Defines whether the NV is synchronous (checked) or not (unchecked). Defaults to unchecked.

**ext\_rec**

Defines whether the NV has an extension record following the node's self-documentation string (checked) or not (unchecked). Defaults to checked and cannot be changed.

11. Check/uncheck desired flags described in step 9.

**Assign Value Conversion Table**

- 12. First read the general information about conversion tables in the Build a Conversion Table section.
- 13. From the Conversion Table drop-down list box, select desired conversion table. The conversion table is displayed.

**Input NV**

NV:

NV Type:

Selfdoc string:

---

**Point Mapping**

DataPoint	Inv.match	Inv.Value	Al.No.	Man.t.One
SM_Smokedetect	No	MALFUNCTION	0	Recent
MWV_OaTemp	No	0	0	Average
MWV_SupplyTemp	No	0	0	Recent
MWV_RoomTemp	No	0	0	Recent

---

NV - Booster

max. Bindings:

Enhanced

**Value Conversion**

Conversion Table:

DataPoint:

	NV value	DP value
<	2,00000	10,00000
>=	2,00000	15,00000
>=	15,00000	20,00000
>=	18,00000	25,00000
>=	24,00000	3,00000
>=	30,00000	35,00000
>=		
>=		
>=		

NOTE: In the list, only conversion tables of the same NV type as selected in the NV Type field above, are selectable.

The conversion table is applied to all points displayed in the Point Mapping list. When selecting a special datapoint, the datapoint values of the conversion table change depending on the datapoint type. When selecting no datapoint, the conversion table is displayed with its "original values" as they were entered when building the table. Refer to the Build Conversion Table section for detailed information.

**Select Input - / Output NV of structured type**

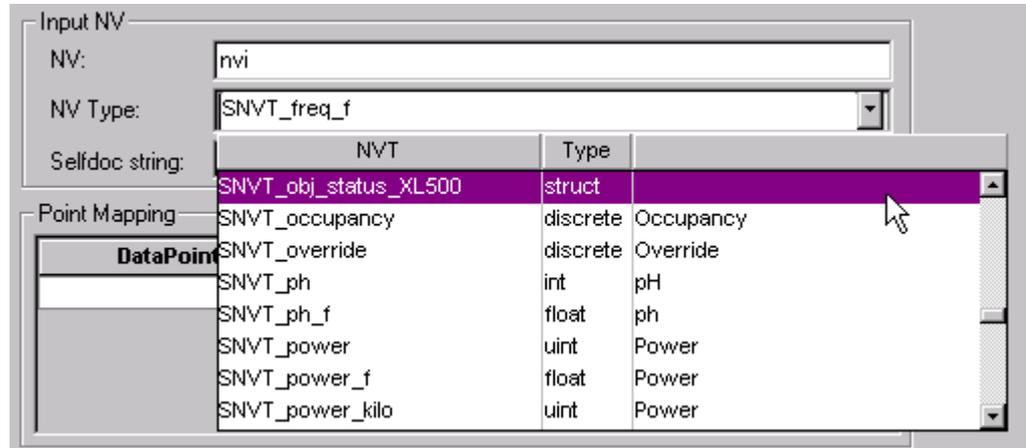
Structured NV types consist of components with pre-assigned NV types, then called component types, which cannot be edited. Pre-defined Structured input and output NV types are delivered. with CARE. The user cannot create Structured input and output NV types by herself/himself. To each component a single datapoint can be

mapped. In the logical plant tree, for this mapped datapoint, the NV-type, not the component type of the structured NV is displayed.

**IMPORTANT**

*Note, that once a structured NV type was selected for the NV, it cannot be reverted to a NV type of other type, e.g. to float or integer etc.*

- Procedure**
1. In the logical LON-bus part of the network tree, click on the NV.
  2. From the NV Type drop-down list on the right, select structured NV type.



**RESULT:** A message is displayed asking if you really want to use only the structured NV type.

3. Confirm by clicking OK for creating the structured NV type.

**RESULT:** In the tree, the components are displayed below the NV. On the right, point mapping can be done. To each component one single datapoint, which has previously been set to "Manual Mapping" in the logical plant tree, can be mapped. Many-to-One mapping is not possible. As the figure shows, Invalid match checking and Alarm No functions can be applied.

The screenshot displays the CARE software interface. On the left, there are two hierarchical tree views. The top tree shows a path from 'Debis\_Berlin\_Stage1' to 'CONT01' and then 'AHU1', with 'MaTemp' selected. The bottom tree shows a path from 'Debis\_Berlin\_Stage1' through 'LON-Works', 'Channels', 'Default System', 'CONT01', 'AHU1', 'AHU2', 'Controller', and 'nviObjStatus\_XL500', with 'MaTemp' selected under the 'DataPoint' column.

The right side of the interface is the 'Properties' tab, which is divided into several sections:

- Input NV:** NV: nviObjStatus\_XL500, NV Type: SNVT\_obj\_status\_XL500, Selfdoc string: (empty)
- Structured Type Component:** Component: object\_id, Component Type: UNVT\_uword
- Point Mapping:** A table with columns 'DataPoint', 'Inv.match', 'Inv.Value', and 'AL.No.'. The 'DataPoint' column has a dropdown menu with 'none' and 'MaTemp' (highlighted).
- NV - Booster:** (checkbox, unchecked)
- Enhanced:** (checkbox, unchecked)
- Value Conversion:** Conversion Table: (empty), DataPoint: (empty)
- Table:** A table with columns 'NV value' and 'DP value'.

When selecting the mapped datapoint in the logical plant tree, the NV-type, not the component type of the structured NV is displayed on the Properties tab.

For the datapoint "MaTemp" the mapped NV "SNVT\_obj\_status\_XL500" is displayed even if the component "object\_id" was previously selected for mapping

NOTE: For structured NVs, a conversion table cannot be applied.

### Many-to-One Mapping/NV-Booster®

Honeywell's NV-Booster allows binding all of the output NVs to a single input NV with a many-to-one binding (for details refer to Mapping and Binding section). The controller keeps a background copy of the input NV for each of the different controller output NVs bound to it for performing the mathematical functions. For pre-setting the memory of the controller, it has to be defined how many bindings at max. the controller should allow.

The input NV can be mapped to multiple datapoints. For each mapped datapoint one of the following mathematical functions can be applied.

- Recent: Latest updated value of all bound output NVs is used
- Min: Minimum value of all bound NVs is used
- Max: Maximum value of all bound output NVs is used
- Average: Arithmetic average of all bound output NVs is calculated
- Sum: The sum of all incoming values is calculated
- Number of active devices: The number of active devices that deliver values via their bindings.

- Procedure**
1. In the logical LON-bus part of the network tree, select input NV.
  2. On the right, check NV-Booster checkbox, and select max. Bindings from the drop-down listbox.
  3. In the Datapoint column, select datapoint you want to map the input NV to.
  4. In the Man.t.One column, select mathematical function, which should be applied.

Point Mapping

DataPoint	Inv.match	Inv.Value	Al.No.	Man.t.One
MW_OaTemp	No	0	0	Min
BM_But_Climate	No	OFF	0	Recent
ST_KL_Mixer	No	0,0	0	Max
ST_KL_SupplAir	No	0,0	0	Sum

NV - Booster  
max. Bindings: 10

Enhanced

Value Conversion  
Conversion Table: none  
DataPoint: ST\_KL\_SupplAir

## Arrange NVs

**Purpose** By default the LON device comes with the node and the controller object. When creating the network interface by mapping NVs to datapoints, newly created NVs are automatically assigned to the respective controller object. If desired, NVs can be grouped and allocated to self-defined objects. This function allows to structure the LON device according to your needs. It is only applicable when working in the logical LON-bus part of the network tree.

- Procedure**
1. Create LON object(s), if not already done.
  2. Move existing NVs to the desired object(s) per drag&drop. When creating new NVs, select the object that the NVs should be allocated to.

**NOTE:** Even if NVs are grouped in certain self-defined objects, all NVs belong to one controller.

## Delete NV/LON Object

**NOTE** The network interface should be changed as little as possible. Therefore deleting NVs should be as few as possible. NVs can only be deleted in the logical LON-bus part of the network tree. When removing the LON attribute or changing the NV type in the Datapoint Editor view, a NV will not be deleted. NVs from the Node object can

be deleted on no account (refer to Changes on the Network Interface/CARE Application section).

- Procedure**
1. In the logical LON-bus part of the network tree, click on the NV/LON object you want to delete.
  2. Click menu item Controller, then submenu item Lon and Delete LON-object/NV.  
Or, click Delete icon .

RESULT: The NV/LON object is deleted from the tree.

NOTE: The Node and the controller objects cannot be deleted.

## Build Conversion Table

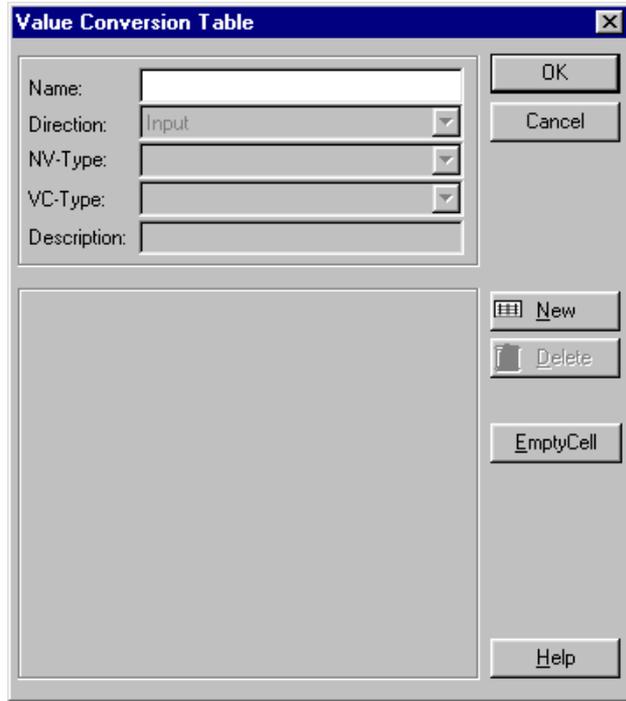
**Purpose** When mapping datapoints to NVs a conversion between NV and datapoint values can be done. Therefore two conversion table types are known, the discrete and the linear characteristic conversion tables. It can be used for both, input and output NVs. But, value conversions are direction sensitive: Value conversions for input NVs cannot be used for output NVs and vice versa. In addition the NV type, e.g. SNVT\_hvac\_mode must match. For a single NV max. one conversion table, characteristic or discrete, can be used. A conversion table either for input NVs or output NVs is always applied to the whole controller – in other words, each controller needs its own conversion tables. By default pre-defined conversion tables are shipped with CARE. In addition own conversion tables can be created.

The following conversions are possible:

NV	Datapoint
Analog	Discrete
Discrete	Discrete

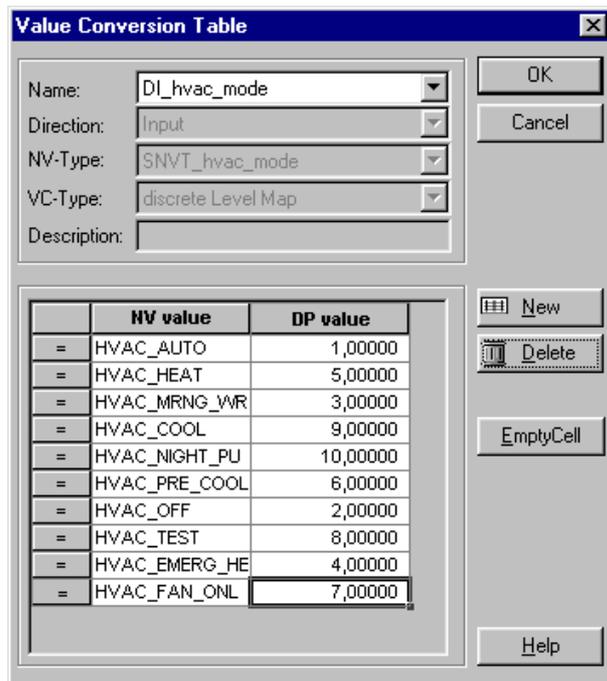
- Procedure**
1. In the logical LON-bus part of the network tree, click on the controller.
  2. Click menu item Controller, then submenu item Lon and Value Conversion Table.  
Or, click Conversion tables icon .

RESULT: The Value Conversion Table dialog box displays.



3. To build a new conversion table, click the **New** button and enter a name into the Name field.
4. From the Direction drop-down listbox, select whether the conversion direction is from NV to datapoint, then select Input, or from datapoint to NV, then select Output.
5. From the NV-Type drop-down listbox, select the NV type.
6. From the VC-Type (value conversion type) drop-down listbox, select type. It can be of analog or discrete type.

RESULT: When a discrete NV type was selected and the direction is Input, the Value Conversion Table dialog box displays as follows:



The NV value column displays the discrete LON states. In the DP value column, you can enter the corresponding values the datapoint should have. The conversion is characterized by the = operator which means that each discrete state of the NV corresponds to a defined discrete state indicated by its number of the mapped datapoint.

- To discard a value, select cell and empty the cell by pressing the EmptyCell button.

**IMPORTANT**

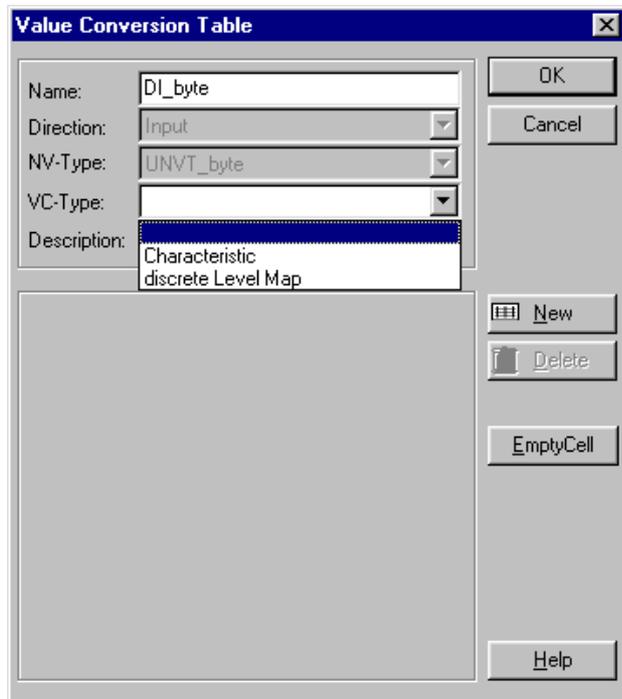
*Depending on the datapoint type that is mapped to the NV, the conversion table values of the datapoint are processed differently for the mapped point. The following tables give examples how the entered values will be processed by CARE:*

**Discrete NV mapped to digital datapoint**

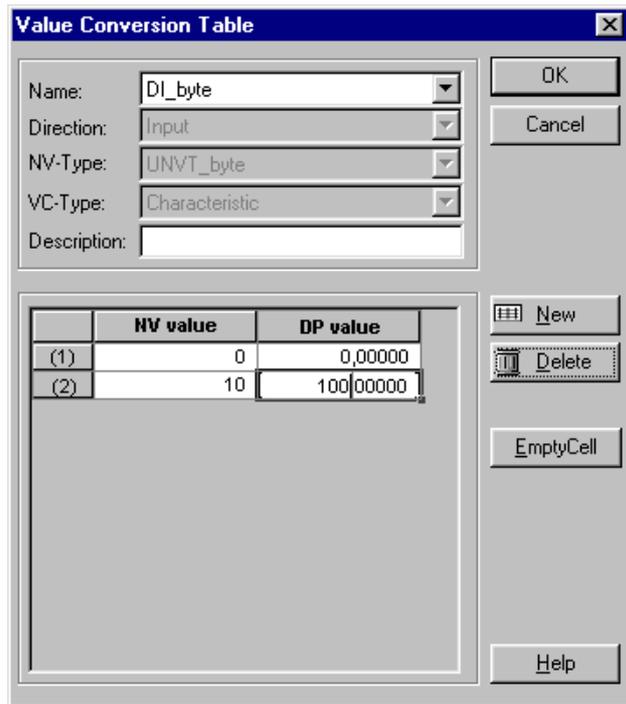
Operator	NV value	Entered datapoint (DP) value	Processed value in mapped datapoint
=	HVAC_AUTO	1	ON
=	HVAC_HEAT	5	OPERATION
=	HVAC_MRNG_WR	3	MALFUNCTION
=	HVAC_COOL	9	PRESENT
=	HVAC_NIGHT_PU	10	OPERATING
=	HVAC_PRE_COOL	6	OPEN
=	HVAC_OFF	2	OFF
=	HVAC_TEST	8	STAGE N
=	HVAC_EMERG_HE	4	ALARM
=	HVAC_FAN_COIL	7	CLOSED

When building a conversion table using a discrete NV type the corresponding datapoint values are assigned by entering the state numbers into the DP column. If there is no DP value assigned, the NV value will be deleted later when the NV is mapped to the datapoint. If a value greater than the max. states number is entered, e.g. 12 for the above example, this number is displayed in the Value Conversion field.

RESULT: When an analog NV type was selected and the direction is Input, the Value Conversion Table dialog box displays as follows:



For analog NV types, e.g. UNVT\_byte, a Characteristic or discrete Level Map can be selected. When using a characteristic the Value Conversion Table dialog box displays as follows:



**Analog NV with characteristic mapped to analog datapoint**

NV value	Entered datapoint (DP) value
0	0
10	100

When the NV is mapped to an analog datapoint, the entered values for the datapoint will be processed depending on the engineering unit as follows:

If the engineering unit has no digits after the colon, the values will be rounded and the digits entered after the colon are cut. If the engineering unit has digits after the colon the digits are considered as they were entered.

When using a discrete Level Map, the Value Conversion Table dialog box displays as follows (next page):

When building a conversion table using an analog NV type and converting it via discrete level map the corresponding datapoint values are assigned by entering the state numbers into the DP column. If there is no DP value assigned, the NV value will be deleted later when the NV is mapped to the datapoint.

**IMPORTANT**

*Note that the operator for the NV values is >=*

**Analog NV mapped to digital datapoint with discrete level map**

Operator	NV value	Entered datapoint (DP) value	Processed value in mapped datapoint
<	-40	1	Sensor Break
>=	-40	2	Heating OFF
>=	30	3	Heating ON
>=	110	4	Malfunction

8. When finishing the conversion table, click **OK** to confirm.

---

## Copy Conversion Table

**Purpose** To copy a conversion table from one LON device to one or multiple other LON devices. A conversion table can be assigned to each kind of LON device but only an Excel 5000 controller is able to analyze the data. For detailed information on conversion table creation and usage, please refer to the Build Conversion Table section. The Copy function for Conversion tables is also available in the device library.

- Procedure**
1. In the logical LON-bus part of the network tree, click on the LON device of which conversion table you want to copy.
  2. Click right mouse button and with left mouse button click on **Copy Value Conversion Table** in the context menu.

**RESULT:** The Select Conversion Table dialog box displays showing the following conversion table properties column wise:

**Name**

Name of the conversion table

**Direction**

IN (input) = value conversion table was created for inputs, or OUT (output) = value conversion table was created for outputs,

**NV Type**

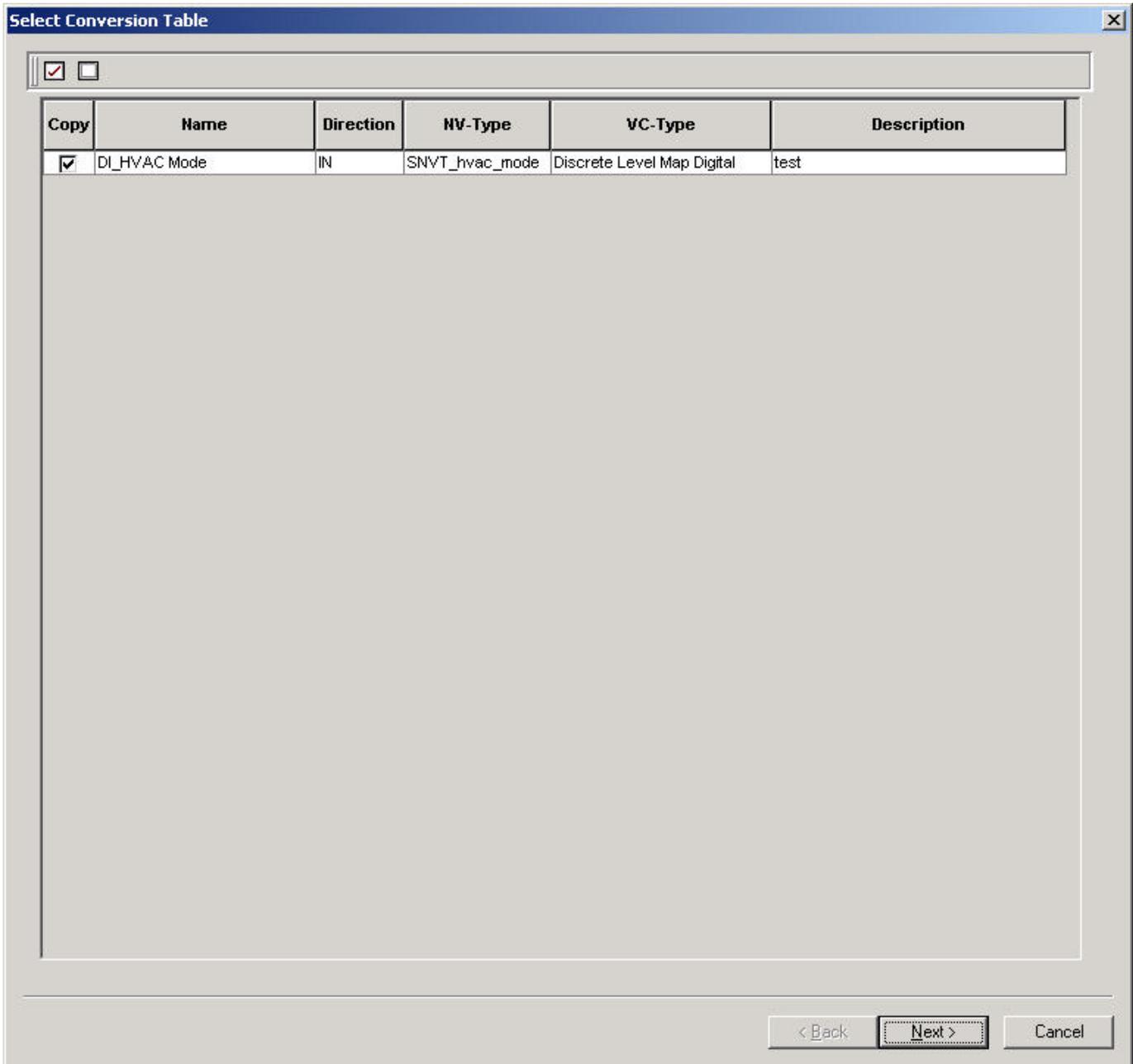
e. g. SNVT\_hvac\_mode

**VC Type**

Type of the value conversion table, discrete or linear characteristic

**Description**

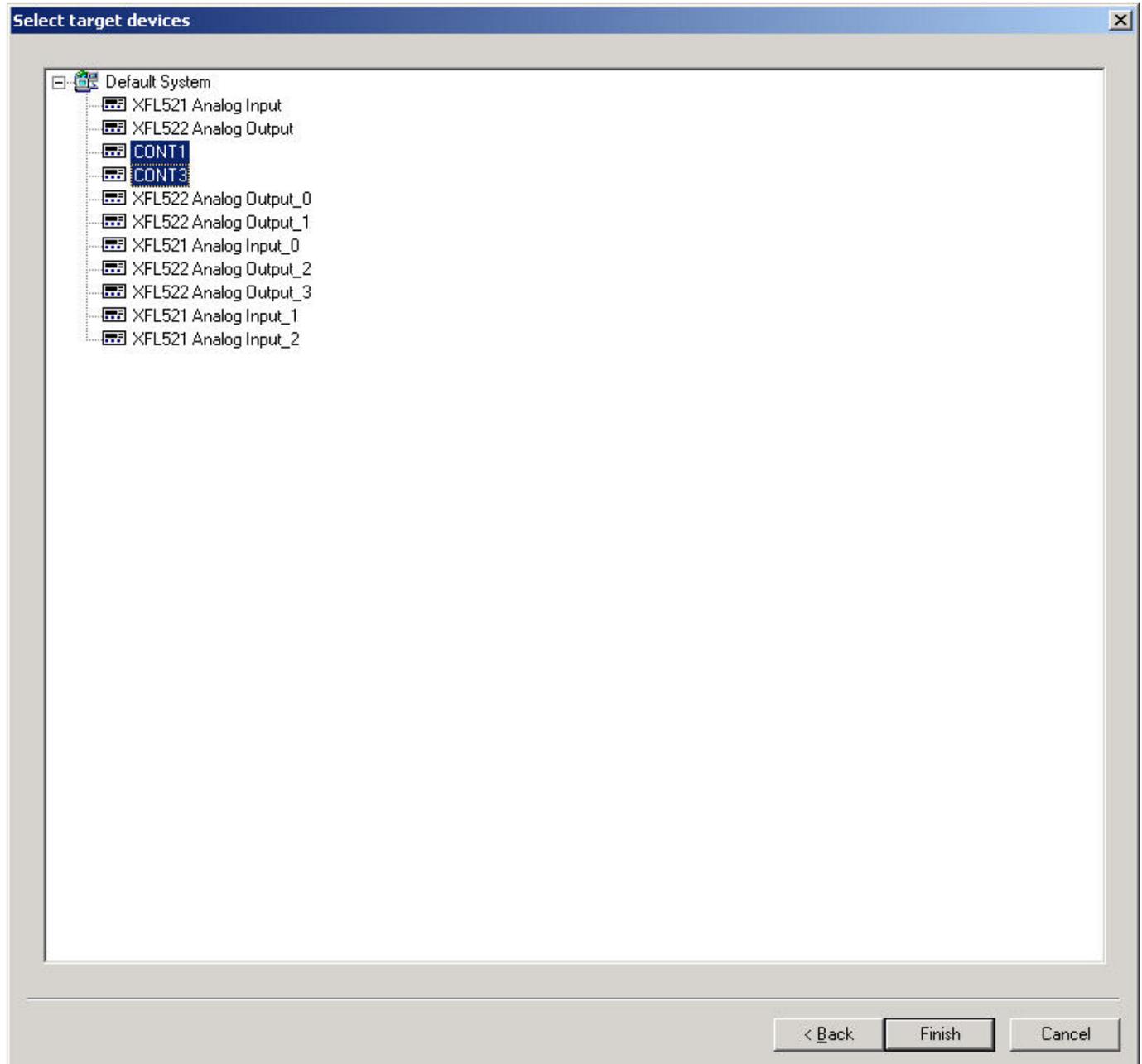
Additional information about the value conversion table.



In the Copy column by default all conversion tables are checked for copying. To uncheck a selected conversion table, click the check bar. To uncheck all conversion tables, click the  icon at the top. To check all conversion tables, click the  icon at the top.

3. Click the **Next** button.

**RESULT:** The Select Target Devices dialog box displays all devices of the project as they are arranged in the system. A hierarchical tree structure can be expanded to view all devices.



4. Click on the device to which the conversion table should be copied. Multiselection is possible by concurrent usage of the STRG key.

5. Click the **Finish** button.

**RESULT:** The Select Target Devices dialog box closes and the conversion table was copied to the selected target devices.

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## Onnet Tuning

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**Prerequisites** To perform onnet tuning you must have installed the corresponding PC-LON-interface (SLTA 10, PCLTA-10 FT-10, PCLTA-20 PCI 20, LonDongle) and drivers from Echelon on the PC and the connection between PC and the LonWorks network via COM1 or COM2 must be established (see Echelon documentation).

To perform onnet tuning you have to go onnet. When being onnet you can do one of the following procedures:

- Commissioning/Decommissioning devices
- Addressing Devices
- Setting certain devices online/offline
- Resetting devices
- Winking devices
- Testing devices
- Replacing Devices
- Configuration and monitoring of devices via Plug-Ins (offline and online)
- Get online values of NVs
- Set values for NVs, SCPTs, UCPTs and NCIs
- Modify configuration parameters
- Synchronize with LNS
- Downloading Firmware

**IMPORTANT**

*Certain functions are restricted respectively workarounds have to be applied if a Synchronization with LNS is to be considered and a LNS tool is used in parallel for the LonWorks network engineering. For detailed information, please refer to the Synchronize with LNS section.*

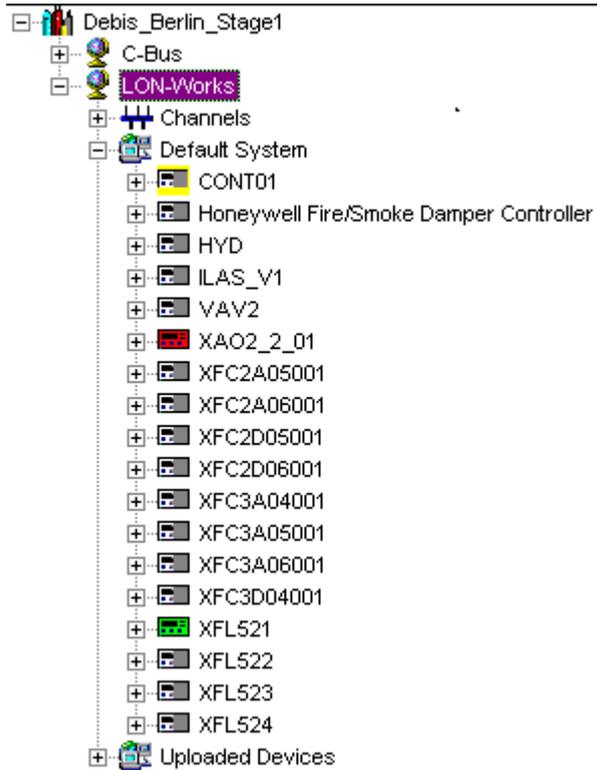
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### Go Onnet

Going onnet is the first step before any onnet tuning procedure can be done.

- Procedure**
1. With left mouse key, click on the LonWorks folder in the logical LON-bus part of the network tree.
  2. Click right mouse key and with left mouse key click Onnet in the context menu.

**RESULT:** You are now onnet. CARE is checking the current state of all devices in the network tree. Depending on the current state, devices are displayed in different colors (see Status of Devices section). The status may not instantly be visible since it is updated in the background.



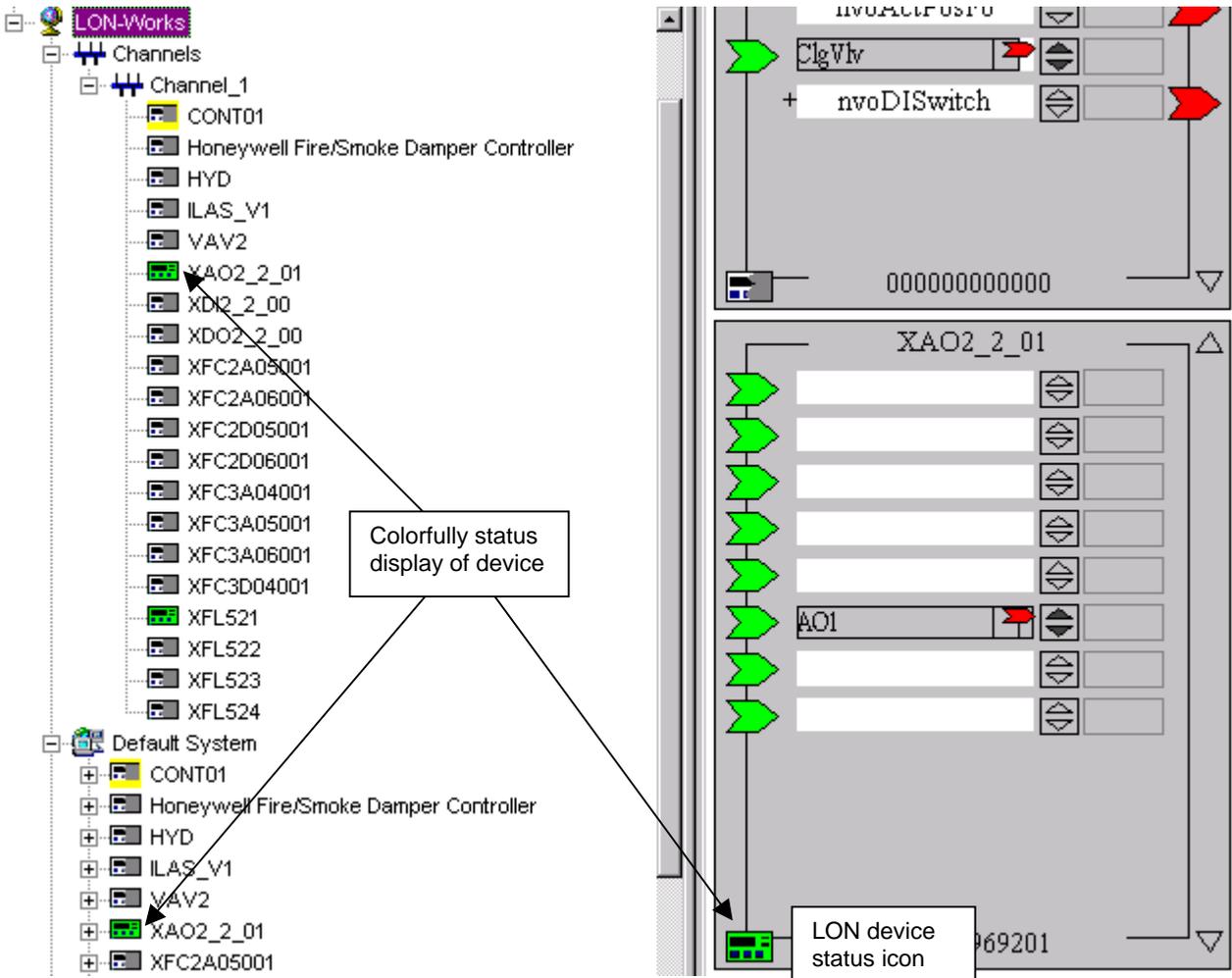
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## Status of Devices

**Prerequisites** To view the status of devices, you have to be onnet (see Go Onnet section).

The status of a device is indicated three times:

- In the channel folder of the network tree
- In the logical LON-bus part of the network tree
- On the device located on the terminal assignment tab



The states can be described via the following table:

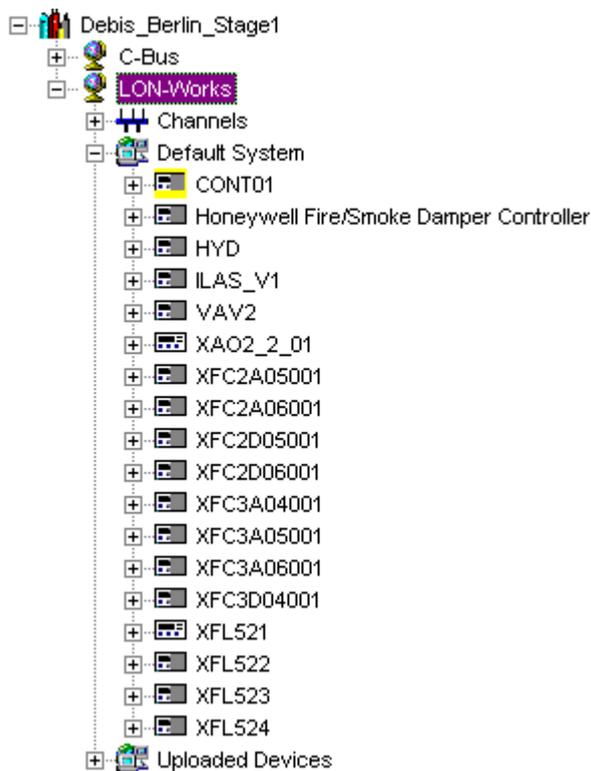
Status of Device		
Color	Half-colored <i>(Different status of CARE and device, Updates pending)</i>	Fully-colored <i>(Same status between CARE and device)</i>
White	Unknown, not initialized	
Green	Application is running	
Red	Not available (damaged), applicationless	

**Go Offnet**

To work offline, you have to go offnet in CARE.

- Procedure**
1. With left mouse key, click on the LonWorks folder in the logical LON-bus part of the network tree.
  2. Click right mouse key and with left mouse key click Offnet in the context menu.

**RESULT:** You are now offnet. All devices in the network tree are displayed in fully or half-white depending on their status.




---

## Address Device

**Prerequisites** You have to be onnet (see Go Onnet section).

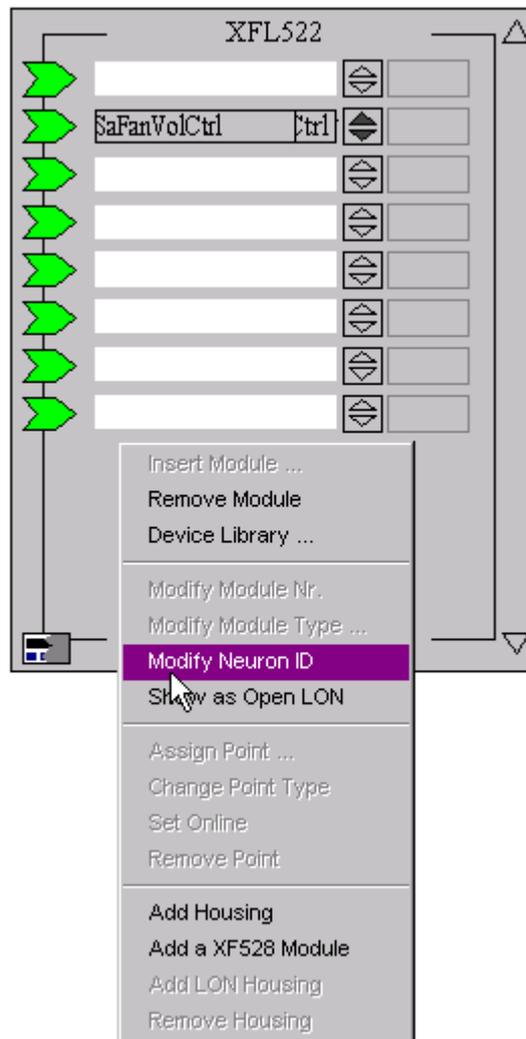
Addressing is the first step of the commission procedure. Addressing can be done by

- Entering the neuron ID on the device
- Get the neuron ID by pressing the service pin
- Uploading devices by scanning the network

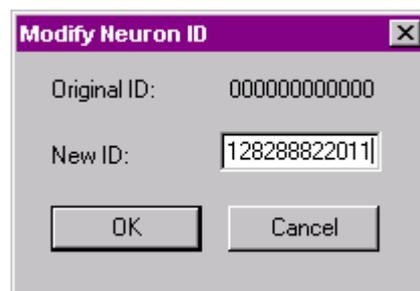
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## Enter Neuron ID on Device

- Procedure**
1. With right mouse key, click on the device on the terminal assignment tab.
  2. With left mouse key, click on Modify Neuron ID in the context menu.

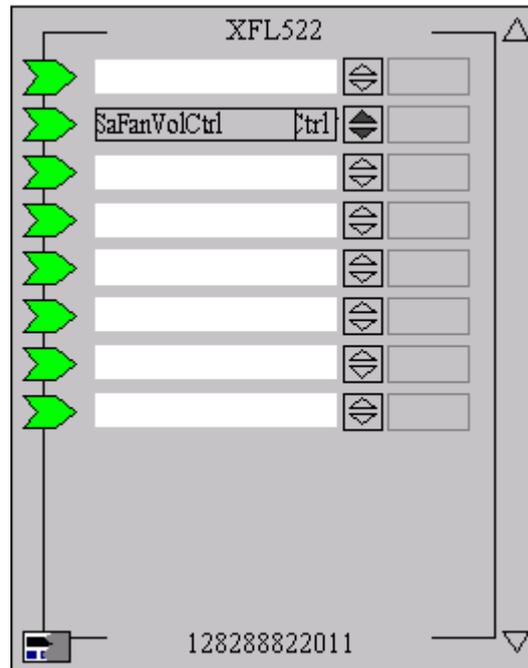


RESULT: The Modify Neuron ID dialog box displays.



3. Enter the neuron ID for the device and confirm by clicking OK.

RESULT: The neuron ID is assigned to the device and displayed on the bottom of the device.

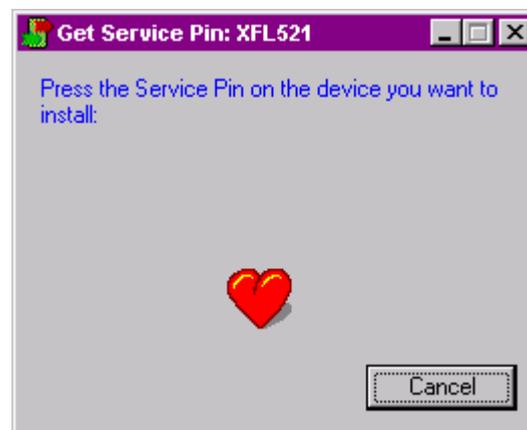


### Get Neuron ID by Pressing Service PIN

If the neuron ID is not known, it can be get by pressing the service pin at the device.

- Procedure**
1. In the logical LON-bus part of the network tree, click on the device.
  2. Click right mouse key and with left mouse key, click on Get Service Pin in the context menu.

RESULT: The Get Service Pin:<name of device> dialog box is displayed.



3. Press the service pin at the device.

RESULT: The dialog box is closed. The neuron ID is assigned to the device and displayed on the bottom of the device.

### Scan Network

With this function CARE automatically uploads all devices to the network tree residing on the current domain that is set on the LonWorks folder properties tab. For example, these can be devices from another project. The current states and

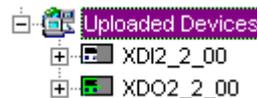
configurations of the uploaded devices are indicated by the appropriate color (see Status of Devices section).

- Procedure**
1. In the network tree, click on the LON-Works folder.
  2. Click right mouse key and with left mouse key, click on Scan Lon-Network.

**RESULT:** The network is scanned and devices are uploaded and add to the network tree. When scanning the network the first time, an Uploaded Devices folder is created and the uploaded devices will be put in there. All devices show a half-colored status that means that they need to be addressed and/or commissioned.

Already uploaded devices will not be uploaded twice during further scanning.

They can be moved to other folders in the logical LON-bus part of the network tree.



**Commission Device(s)** It is possible to commission a single device or all devices of a system (top level system such as the Default System or subsystem) or the complete LonWorks network.

When commissioning all devices of a system or the network, only those devices will be commissioned which **network interface, configuration or bindings** had been changed in CARE since the latest commissioning, that is, the current state of the device is different to the current state in CARE.

**NOTE:** When performing onnet binding changes (hotbinding) on devices other than Excel 50/500 controllers, the devices are instantly commissioned. When performing offnet binding changes on devices other than Excel 50/500 controllers, you must go onnet again and commission, respectively recommission the corresponding devices again. Excel 50/500 controllers need to be commissioned, respectively recommissioned again in any case.

**Prerequisites** Devices must be addressed (see Address Device section) and you have to be onnet (see Go Onnet section).

**Procedures**      **A) Commission all devices of the network**

1. With left mouse key, click on the LonWorks folder in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key click Commission in the context menu.

**RESULT:** For any device, which is not addressed yet, the Get Service Pin dialog box displays asking you to press the service pin. Press the service pin and Click OK. After all devices have been addressed, they will be commissioned. Commissioned devices are indicated by the fully colored green display of the devices in the network tree as well as on the device status icon on the devices.

**B) Commission all devices of a system (top level or subsystem)**

1. With left mouse key, click on the system folder (top level = Default System or another individually named subsystem folder) in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key click Commission in the context menu.

**RESULT:** For any device, which is not addressed yet, the Get Service Pin dialog box displays asking you to press the service pin. Press the

service pin and Click OK. After all devices have been addressed, they will be commissioned. Commissioned devices are indicated by the fully colored green display of the devices in the network tree as well as on the device status icon on the devices.

### C) Commission single device

1. With left mouse key, click on the device in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key, click Commission in the context menu.

**RESULT:** If the device which is not addressed yet, the Get Service Pin dialog box displays asking you to press the service pin. Press the service pin. After the device has been addressed, it will be commissioned. The commissioned devices are indicated by the fully colored green display of the device in the network tree as well as on the device status icon on the device.

### Recommission All Devices

It is possible to recommission devices of a system (top level system such as the default System or subsystem) or the complete LonWorks network.

When recommissioning all devices of a system or the network, all devices will be commissioned despite of their current states. That means, that even those devices will be commissioned of which network interface, bindings or configuration had **not** been changed since the latest commissioning.

**NOTE:** When performing onnet binding changes (hotbinding) on devices other than Excel 50/500 controllers, the devices are instantly commissioned. When performing offnet binding changes on devices other than Excel 50/500 controllers, you must go onnet again and commission, respectively recommission the corresponding devices again. Excel 50/500 controllers need to be commissioned, respectively recommissioned again in any case.

### Prerequisites

Devices must be addressed (see Address Device section) and you have to be onnet (see Go Onnet section).

### Procedures

#### A) Recommission all devices of the network

1. With left mouse key, click on the LonWorks folder in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key click Recommission All in the context menu.

**RESULT:** For any device, which is not addressed yet, the Get Service Pin dialog box displays asking you to press the service pin. Press the service pin and Click OK. After all devices have been addressed, they will be recommissioned. Recommissioned devices are indicated by the fully colored green display of the devices in the network tree as well as on the device status icon on the devices.

#### B) Recommission all devices of a system (top level or subsystem)

1. With left mouse key, click on the system folder (top level = Default System or another individually named subsystem folder) in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key click Recommission All in the context menu.

**RESULT:** For any device, which is not addressed yet, the Get Service Pin dialog box displays asking you to press the service pin. Press the service pin and Click OK. After all devices have been addressed, they will be recommissioned. Recommissioned devices are indicated by the fully colored green display of the devices in the network tree as well as on the device status icon on the devices.

<b>Decommission Device</b>	Single devices can be decommissioned which results in an unconfigured "virgin" device.  NOTE: Routers have not to be decommissioned.
<b>Prerequisites</b>	The device must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section).
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. With left mouse key, click on the device in the logical LON-bus part of the network tree.</li> <li>2. Click right mouse key and with left mouse key click Decommission in the context menu.</li> </ol> <p>RESULT: The device is decommissioned indicated by a half-colored white display.</p>

## Set Device(s) Offline/Online

Devices can be set online/offline. Setting devices offline means that the device is switched into a kind of "Standby mode". In this mode, the communication between the application and the neuron chip of the device is interrupted and the device sends no data on the bus. Setting devices offline is helpful, for example, in order to avoid interfering bus traffic when testing particular sections/devices of the network. You can set all devices or a certain device offline/online.

<b>Prerequisites</b>	Devices must be addressed (see Address Device section) and you have to be onnet (see Go Onnet section).
<b>Procedures</b>	<p><b>A) Set all devices offline/online</b></p> <ol style="list-style-type: none"> <li>1. With left mouse key, click on the top level (e.g. Default System) folder of the logical LON-bus part in the network tree.</li> <li>2. Click right mouse key and with left mouse key, <ul style="list-style-type: none"> <li>click Set devices offline in the context menu, if you want to set all devices offline, respectively</li> <li>click Set devices online in the context menu. if you want to set all devices online.</li> </ul> </li> </ol> <p>RESULT: All devices are set offline, respectively online. Each device set offline, is displayed in fully or half-white color. Each device set online, is displayed in its original color (see Status of Devices section).</p> <p><b>B) Set single device offline/online</b></p> <ol style="list-style-type: none"> <li>1. With left mouse key, click on the device in the logical LON-bus part of the network tree.</li> <li>2. Click right mouse key and with left mouse key, <ul style="list-style-type: none"> <li>click Set device offline in the context menu, if you want to set the device offline, respectively</li> <li>click Set device online in the context menu. if you want to set the device online.</li> </ul> </li> </ol> <p>RESULT: The device is set offline, respectively online. A device set offline, is displayed in fully or half-white color. A device set online, is displayed in its original color (see Status of Devices section).</p>

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## Reset Device(s)

Resetting a device means an application restart in the device.

**Prerequisites** Devices must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section).

**Procedures**

**A) Reset all devices**

1. With left mouse key, click on the LonWorks folder or on the top level (e.g. Default System) folder of the logical LON-bus part in the network tree.
2. Click right mouse key and with left mouse key, click Reset in the context menu.

RESULT: The application in each device will be restarted.

**B) Reset single device**

1. With left mouse key, click on the device in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key, click Reset in the context menu.

RESULT: The application in the node will be restarted.

---

## Wink Device(s)

NOTE: The device must support the wink command feature.

**Prerequisites** Devices must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section).

**Procedures**

**A) Send Wink to all devices**

1. With left mouse key, click on the LonWorks folder or on the top level (e.g. Default System) folder of the logical LON-bus part in the network tree.
2. Click right mouse key and with left mouse key, click Wink in the context menu.

RESULT: A Wink command has been sent to the selected devices.

**B) Send Wink to single device**

1. With left mouse key, click on the device in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key, click Wink in the context menu.

RESULT: A wink command has been sent to the selected device.

x

---

## Test Device(s)

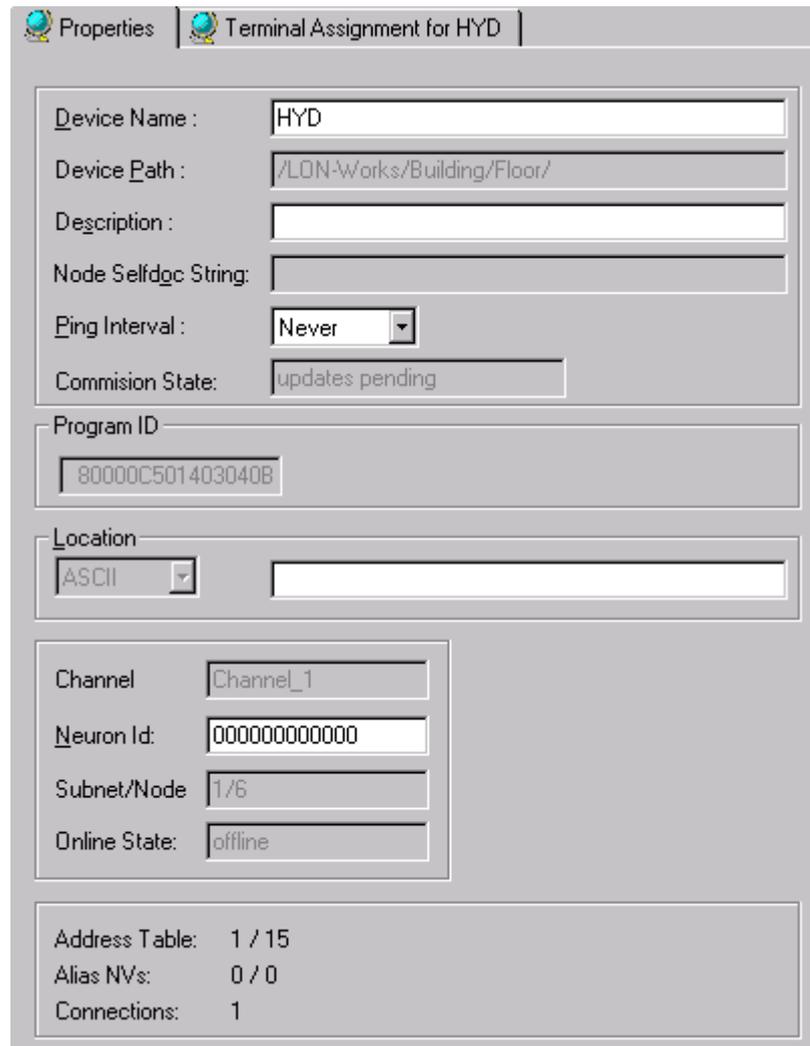
**Prerequisites** Devices must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section).

**Procedures**

**A) Test all devices**

1. With left mouse key, click on the LonWorks folder or on the top level (e.g. Default System) folder of the logical LON-bus part in the network tree.
2. Click right mouse key and with left mouse key, click Test in the context menu.

**RESULT:** The commission and online state for all devices will be checked and updated. View state changes on the Properties tab of the corresponding devices and note eventual color changes of the devices in the logical LON-bus part of the network tree.



Properties | Terminal Assignment for HYD

Device Name : HYD

Device Path : /LON-Works/Building/Floor/

Description :

Node Selfdoc String:

Ping Interval : Never

Commission State: updates pending

Program ID

80000C501403040B

Location

ASCII

Channel Channel\_1

Neuron Id: 000000000000

Subnet/Node 1/6

Online State: offline

Address Table: 1 / 15

Alias NVs: 0 / 0

Connections: 1

### B) Test a single device

1. With left mouse key, click on the device in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key, click Test in the context menu.

**RESULT:** The commission and online state for the device will be checked and updated. View state changes on the Properties tab of the corresponding device and note eventual color changes of the device in the logical LON-bus part of the network tree.

## Replace Device

In case a device has been replaced physically, it must be replaced in CARE too. Devices must match each other, that is, their program IDs must correspond. Devices must be addressed (see Address Device section) and you have to be onnet (see Go Onnet section).

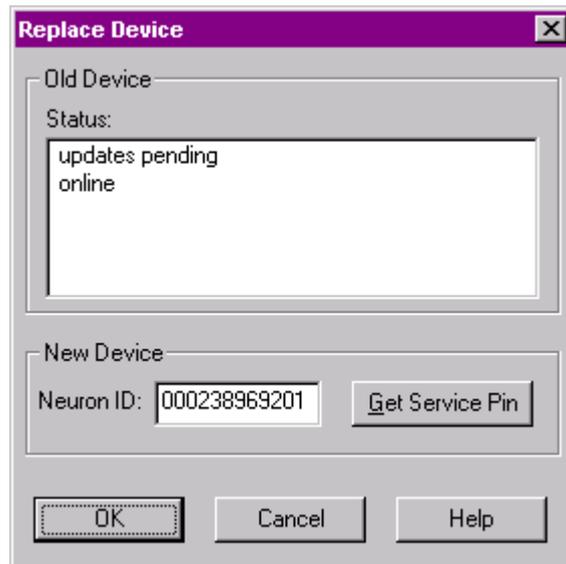
### Prerequisites

### Procedure

1. In the logical LON-bus part of the network tree, click on the device, you want to replace.

2. Click right mouse key and with left mouse key, click Replace Device.

RESULT: The Replace Device dialog box is displayed.



In the Status field, the current status and in the Neuron ID field, the neuron ID of the device to be replaced is displayed. The device will be decommissioned.

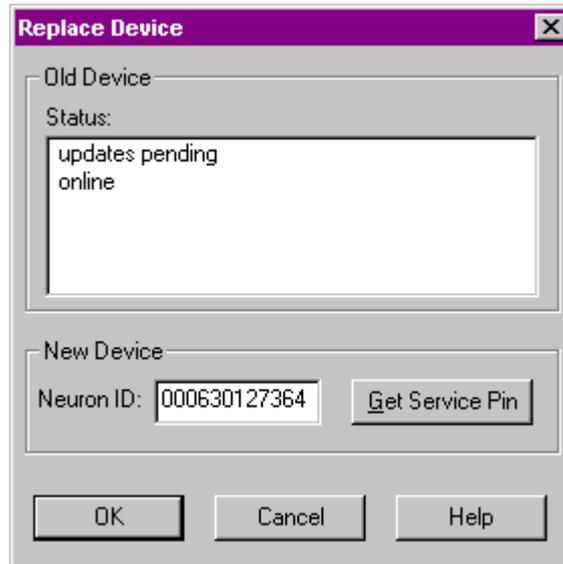
3. Click the Get Service Pin button.

RESULT: The Get Service is displayed.



4. At the new device, press the service pin button.

RESULT: The neuron ID of the new device is displayed in the Neuron ID field.



5. Click OK to finish the replacement.

## Upload Parameters

It is possible to upload the current configuration parameters into CARE from:

- all devices of the complete LonWorks network
- all devices of a system (top level system such as the Default System or subsystem)
- a single device

If CARE is in LNS controlled mode, the parameters will be uploaded from the device via LNS database.

**Prerequisites** Devices must be addressed (see Address Device section) and you have to be onnet (see Go Onnet section).

### **Procedures** A) Upload parameters from all devices of the complete network

1. With left mouse key, click on the LonWorks folder in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key click Upload Parameters in the context menu.

**RESULT** The current parameters from all devices of the complete network will be uploaded into CARE.

### **B) Upload parameters from all devices of a system (top level or subsystem)**

1. With left mouse key, click on the system folder (top level = Default System or another individually named subsystem folder) in the logical LON-bus part of the network tree.
2. Click right mouse key and with left mouse key click Upload Parameters in the context menu.

**RESULT:** The current parameters from all devices residing in the selected system will be uploaded into CARE.

### **C) Upload parameters from a single device**

1. With left mouse key, click on the device in the logical LON-bus part of the network tree.

2. Click right mouse key and with left mouse key, click Upload Parameters in the context menu.

RESULT: The current parameters from the selected device will be uploaded into CARE.

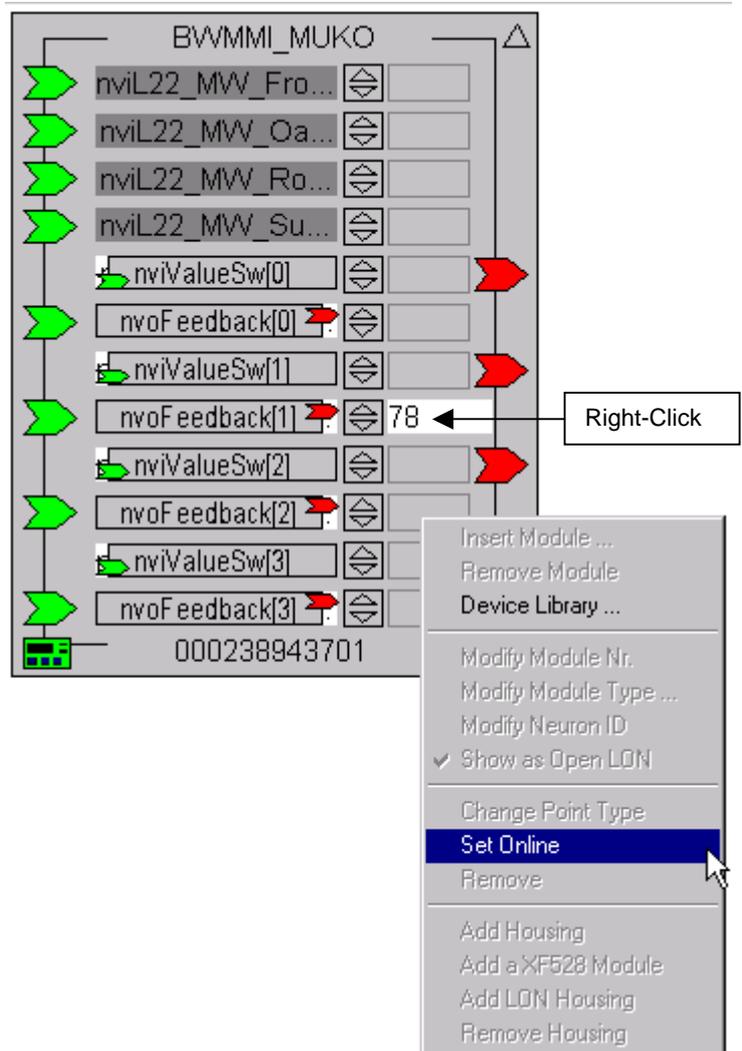
### Get Online Value of NV

**Purpose** To get the current value of a bound NV from the LON-bus.

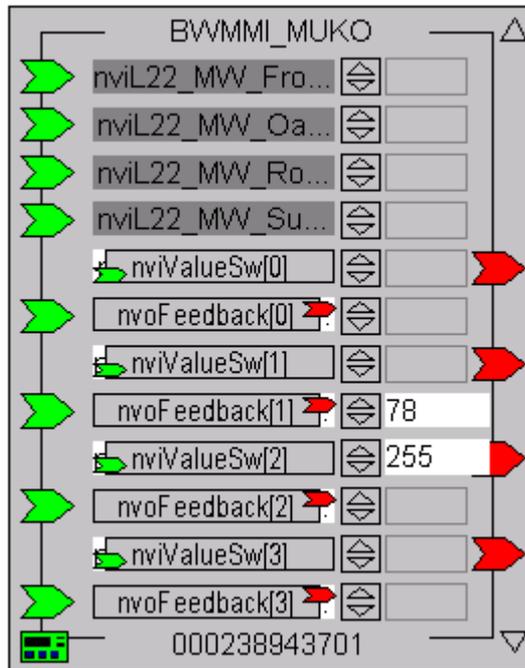
**Prerequisites** Devices must be addressed (see Address Device section) and you have to be onnet (see Go Onnet section).

- Procedure**
1. In the LON-Bus part of the network tree, double-click on the LON device.
  2. On the right pane, click on the terminal assignment tab to display the device.
  3. Right-click on the field of the NV (terminal) and click on Set Online in the context menu.

NOTE When moving the cursor over the field, a tool tip displays the corresponding engineering unit.



RESULT: The field gets white and the current value of the NV is displayed.



NOTE: When being Offnet (see Go Offnet section) and setting the NV online, the field gets grayed and the latest value displayed will be reloaded.

### Set NV Offline

- Purpose** To hide current value of a bound NV.
- Prerequisites** NV (terminal) must be in online mode.
- Procedure**
1. Right-click on the field of the NV (terminal) and click on the checked "Set Online" command in the context menu.
- RESULT: The field gets grayed and no value is displayed.

### Set Values for NVs, SCPTs/UCPTs and NCIs

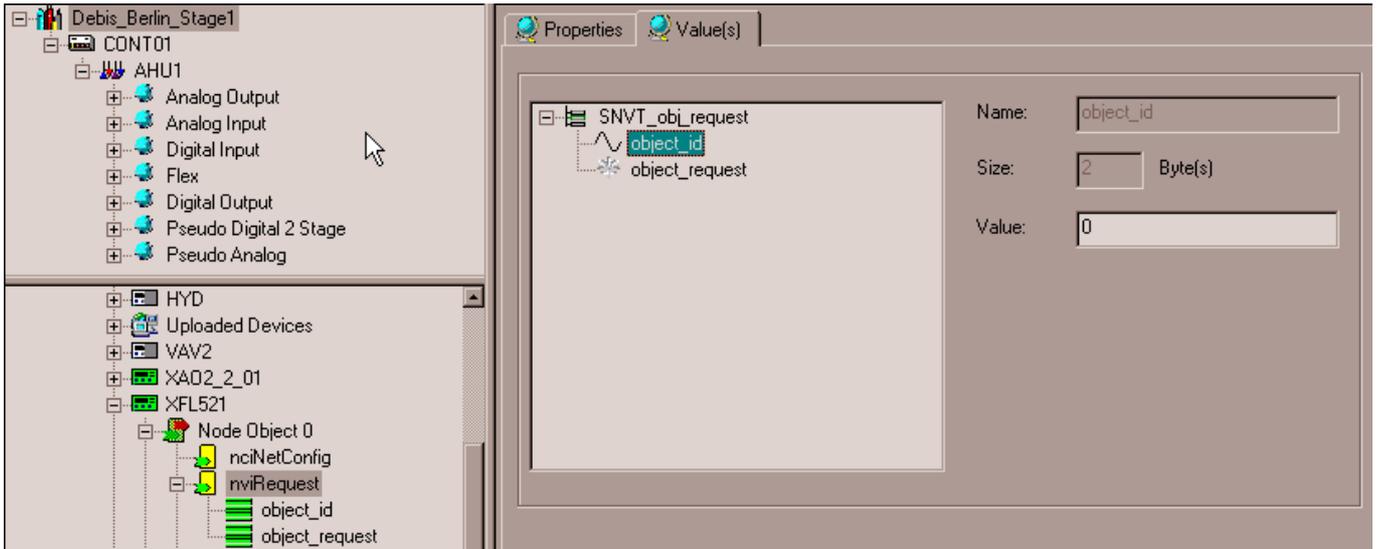
CARE allows to enter values for Input NVs (network variables), SCPTs (standard configuration parameter types) and NCIs (network variables using the config class keyword for configuration). Values can be entered online or offline as the following table shows:

	Input NVs	NCIs	SCPTs
Online	+	+	+
Offline	-	+	+

### Set Value for NV

- Prerequisites** Device must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section), respectively the device must be online.
- Procedure**
1. In the LON-bus part of the network tree, click on the input NV.
  2. On the right pane, click on the Value(s) tab.
  3. In case the NV is structured and has components, select the component in the Value(s) tree.

4. In the Value field, enter the value.



RESULT: The value is written into the device.

**Set Value for SCPT**

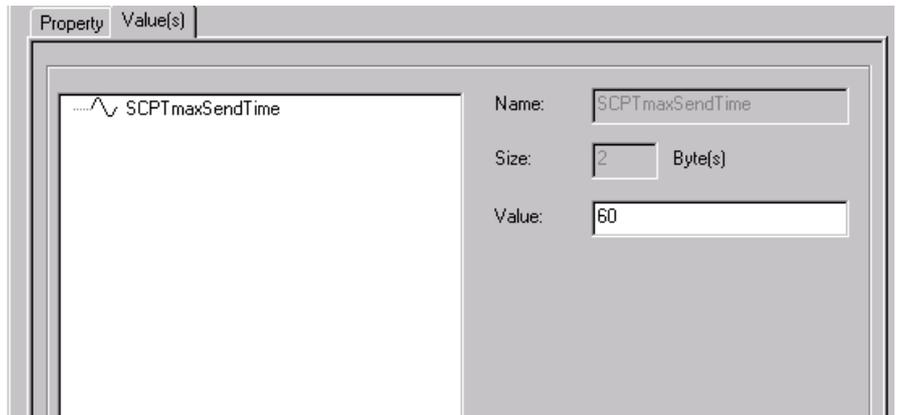
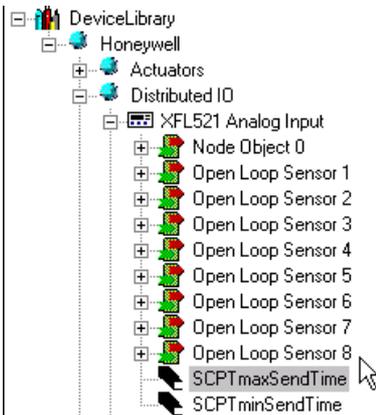
For SCPTs values can be set in online or offline mode and either in the device library or in the LON-bus part of the network tree. Values that had been set in offline mode will be issued as soon as the device has been set online.

**Prerequisites**

In case you want to set the value online, the device must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section).

**Procedure**

1. In the LON-bus part of the network tree, respectively in the device library tree, click on the SCPT.
2. On the right pane, click on the Value(s) tab and enter the value into the Value field.



**Example 10: Value input in LON-bus part of network tree**

RESULT: The value is written into the device as soon as the device is online.

**Set Value for NCI**

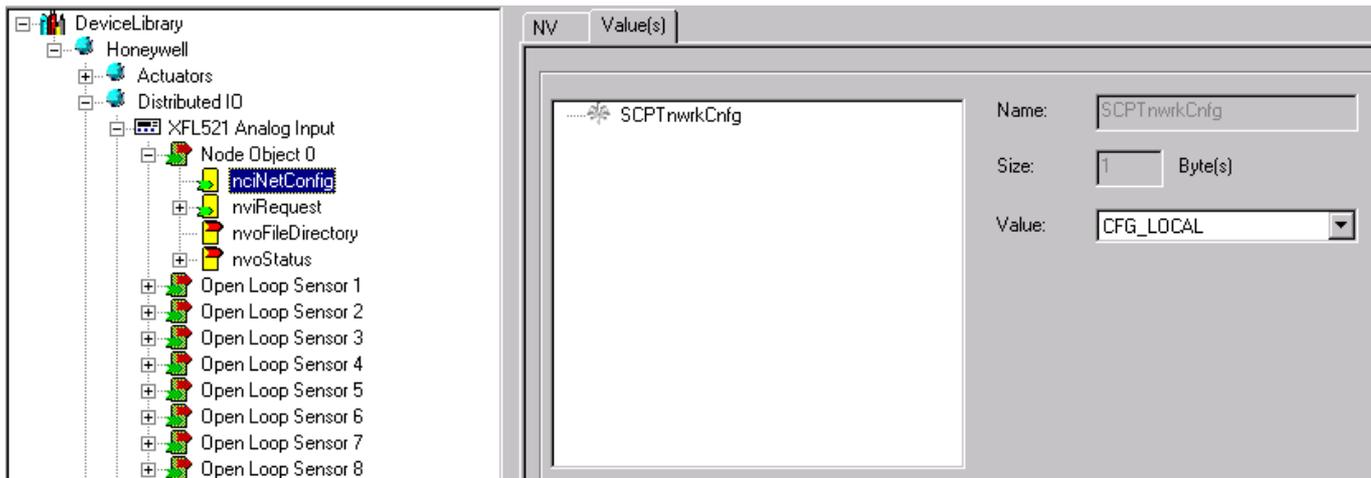
For NCIs values can be set in online or offline mode and either in the device library or in the LON-bus part of the network tree. Values that had been set in offline mode will be issued as soon as the device has been set online.

**Prerequisites**

In case you want to set the value online, the device must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section).

**Procedure**

1. In the LON-bus part of the network tree, respectively in the device library tree, click on the NCI.
2. On the right pane, click on the Value(s) tab and enter the value into the Value field, respectively select the value from the drop-down listbox.



**Example 11: Value input in device library tree**

RESULT: The value is written into the device as soon as the device is online.

## Integrate Third Party Devices

**Main Steps**

The integration of third party devices includes the following main steps:

1. Import the XIF file into the device library (see Add LON Device to the Network section)
2. Add the device to the **NI** channel in the network tree (see Add LON Device to the Network and Set Network Interface Channel sections)
3. Install the plug-in for the device
4. Go onnet and start the plug-in (see Plug-In Online Functions in CARE Controlled Mode section)

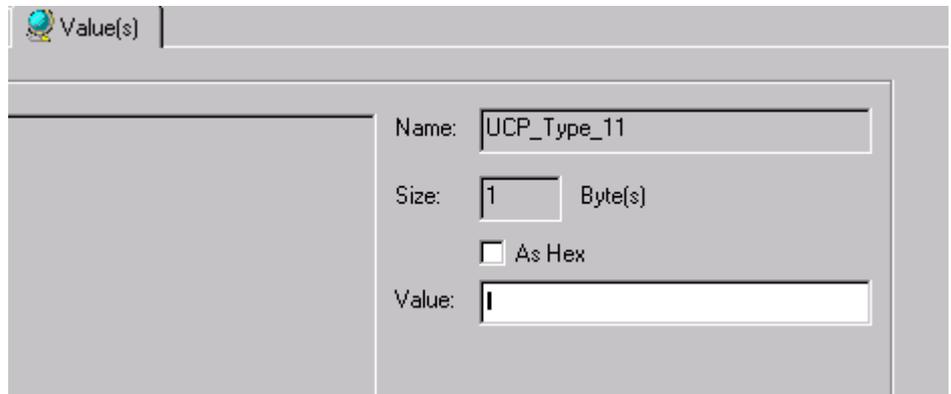
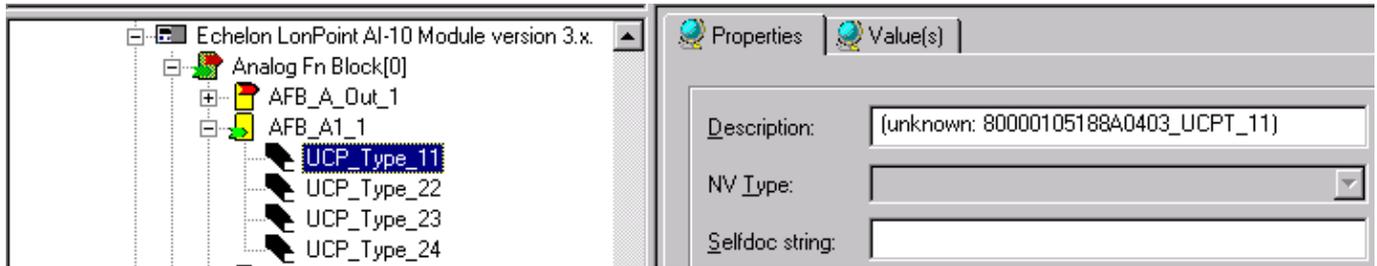
### Troubleshooting on Errors during Import into the Device Library

If the device library import has any errors importing a 3<sup>rd</sup> party device, the object server log will capture the errors if the TRACE=1 is added under the object server header in the CARE.INI file.

### Troubleshooting on unknown CPs

When starting the plug-in (step 4), some unknown CPs may not be identified and displayed properly. Those CPs will be listed in a log file which is displayed when invoking the plug-in. The unknown status can also be viewed as Description on the Properties tab by clicking on the device in the network tree.

Example: Description and value of an unknown CP



If unknown CPs were detected, please check whether they should be used in your application or not.

If the CPs will not be used at all, you can ignore the message and no further actions have to be done.

If you want to use unknown CPs, it is recommended to send the drf file set to the Honeywell Technical Assistant Center (TAC) in Schönaich.

TAC will check the drf file set and update the NVT\_list.ltc file with proper CP information for the corresponding device.

1. After receiving the updated NVT\_list.ltc file, do the following:
2. Copy the updated NVT\_list.ltc file to the CARE folder.

RESULT: The current NVT\_list.ltc file will be overwritten.

NOTE: The current NVT\_list.ltc file version can be viewed in the NV Type List Version field of the Default LON Properties dialog box (see ["Set Global Options" section](#)).

3. Backup the database by clicking menu item Database, then submenu item Backup.
4. Restore the database by clicking menu item Database, then submenu item Restore.

RESULT: From now on, CARE will use the updated NVT\_list.ltc file.

#### **IMPORTANT**

*Before you continue to work with the new and proper CP information (updated NVT\_list.ltc file), delete the corresponding device in the device library and in the network tree. Then add the device to the device library and to the network tree again.*

## CARE and LNS

In large installations with several different crafts e.g. HVAC, security or light, LNS is used as common standard. CARE supports LNS by providing the transfer of binding and configuration information of a LonWorks network from CARE to LNS via the Synchronize with LNS mechanism.

### Synchronize with LNS

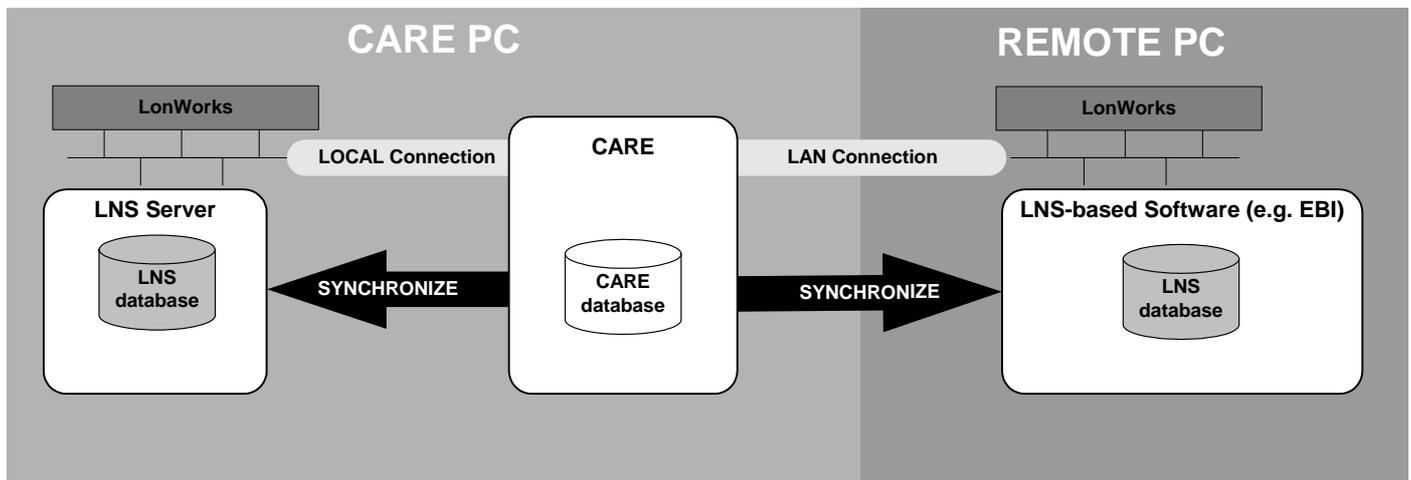
**Purpose** The Synchronize with LNS mechanism (LNS Controlled mode) allows the incremental updating of the LNS database with changed information done in CARE.

The communication between CARE and the LNS database can be in the following ways:

- Remote mode via LAN: CARE and LNS-based software including the LNS database are on different PCs.
- Local mode: CARE and the LNS database is on the same PC.

In LNS controlled mode, CARE has no longer commissioning control on the **remote** network. Instead the LNS-based software controls and commissions the network.

### Synchronization in LNS Controlled Mode



The most common way is the remote mode with two different PCs, one client PC with CARE running (CARE PC) and another host PC (Remote PC) with an LNS-based application such as EBI, SymmetrE or LonMaker running on it. The PCs communicate via LAN remotely.

To setup a proper working system, the following requirements must be fulfilled:

#### Assumptions and Prerequisites

##### Remote Mode

##### CARE PC

Fully licensed CARE 5.0 and LNS 3.08 must be installed. CARE must be running.

##### Remote PC

LNS 3.08 and Remote Sync Server (RSS) must be installed. Normally these two software applications come with EBI and SymmetrE.

On the remote PC Make sure that sufficient LNS credits are available for the LON devices included in the CARE project (see LNS Credits Handling section).

Ask the I.T administrator for the remote PC address, host name or IP address, and port number and note it down.

**Local Mode**

Fully licensed CARE 5.0 and LNS 3.08 must be installed. CARE must be running.

On the CARE PC, make sure that sufficient LNS credits are available for the LON devices included in the CARE project (see LNS Credits Handling section).

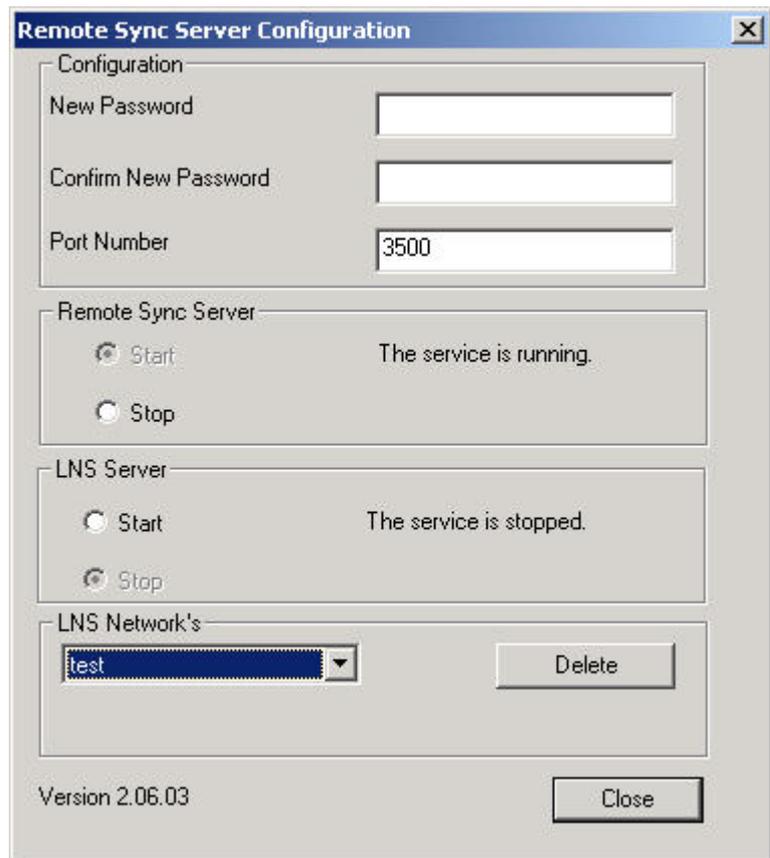
**IMPORTANT**

For all LON devices which are not included in the CARE device library by default, you must provide the corresponding XIF files for LNS synchronization.

**Procedures****Remote PC (LAN Mode)**

1. Start Windows control panel and double-click on the Remote Sync Server icon  in the control panel.

RESULT: The Remote Sync Server Configuration dialog box displays.



2. In the New Password field, enter the password.
3. In the Confirm New Password field, enter the same password.
4. In the Port Number field, keep the default port number 3500.

**IMPORTANT**

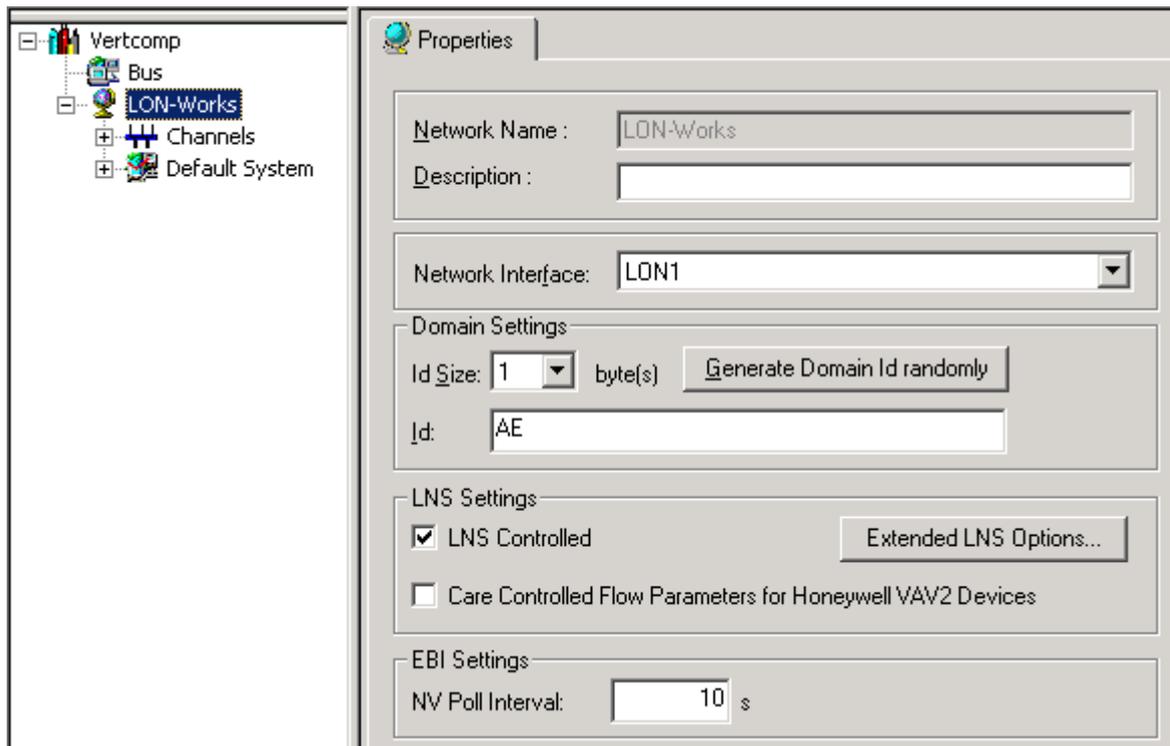
*Make sure that the server port number displayed by default, has been enabled by the I.T. administrator. If the I.T. administrator has enabled another port, enter the provided port number.*

5. Note down the password, the port number, and the server address (IP or host name) for later use on the CARE PC.
6. Under Remote Sync Server, click the Start radio button if the service is stopped.

7. Click the **Close** button.

### CARE PC (Local Mode and LAN Mode)

1. In the physical LON bus part of the network tree, click on LonWorks.



2. On the Properties tab on the right, set the following settings:

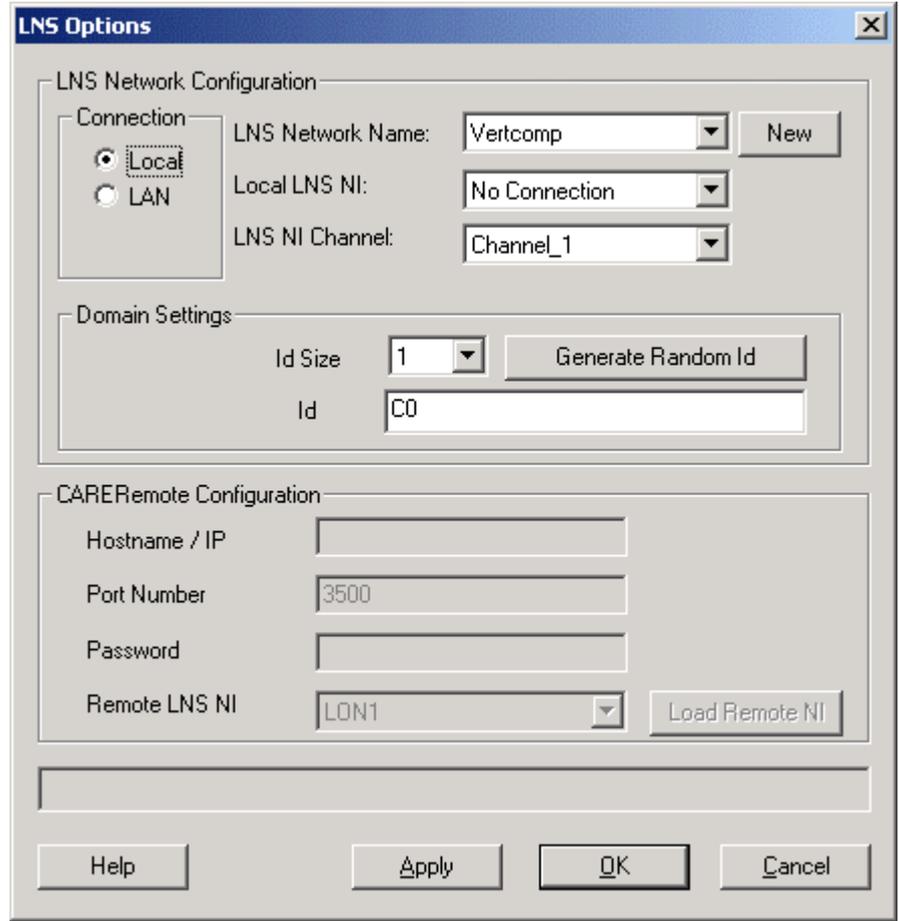
Check the **LNS Controlled** checkbox. In LNS controlled mode, CARE has no longer commissioning control. Instead LNS controls and commissions the network.

Check the **CARE Controlled Flow Parameters for Honeywell VAV2 Devices** checkbox if want to update the LNS database with the current CARE values of the flow parameters 'duct area', 'flow setpoint minimum' and 'flow setpoint maximum'.

In the NV Poll Interval, enter the interval in s by which all NVs will be polled by the EBI LON point server. For each NV, the poll interval can also be set individually (see "EBI Settings" section).

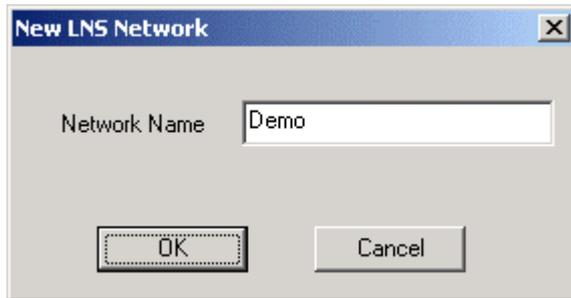
3. Click the Extended LNS Options button.

RESULT: The LNS Options dialog box displays.



4. Under Connection, click the LAN radio button, if CARE and the LNS-based software including the LNS database are on different PCs. Or, click on the Local radio button, if CARE and the LNS database is on the same PC.
5. From the LNS Network Name drop-down listbox, select the LNS network name. It is defaulted to the same name as the project.
6. To create a LNS network other than the default, click the New button.

RESULT: The New LNS Network dialog box displays.



**IMPORTANT FOR LAN CONNECTION**

*During testing it may be typically that multiple networks have been opened on the remote PC. Because LNS does not allow having multiple remote LAN connections, the following message displays if the networks are different:*



*To resolve the conflict, manually shut down all LNS databases on the remote PC and make sure that only **one single** network and the **same** network is opened on the remote PC as on the CARE PC. Having one and the same network on the CARE and the remote PC is presumed for an error-free running in normal operation mode (see also CARE and EBI Upgrades section).*

7. Enter a name in the Network Name field.
8. Click the OK button.
9. From the Local LNS NI drop-down listbox, select the network interface that LNS should use for connection to the LON network.
10. From the LNS NI Channel drop-down listbox, select the NI (network interface) channel that LNS should use for connection to the LON network (locally or remotely). The NI channel is the segment of a LON network where CARE/LNS is physically connected to.

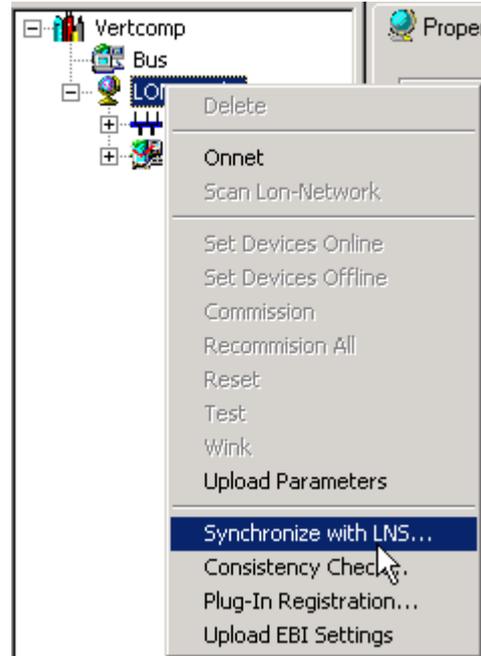
Note that the network interface channel on the CARE and Remote PC can be different. Often EBI on the remote PC may be connected to the backbone and CARE PC is connected to another channel.

11. Under Domain Settings, set the Id size in bytes format the Id Size field and enter the domain Id into the ID field. If you want to get a randomly generated domain ID, click the Generate Domain ID randomly button. In this case the Id Size previously selected must be higher than 0. It is recommended to use a different domain as in the CARE project.
12. Under CARE Remote Configuration, enter the host name or IP address of the remote PC into the Hostname / IP field.
13. In the Port Number field, enter the same port number as defined in RSS application (see steps 1 to 6 of the Remote PC Procedure) on the remote PC.
14. In the Password field, enter the same password as defined in RSS application (see steps 1 to 6 of the Remote PC Procedure) on the remote PC.
15. Click the Load Remote NI (network interface) button, to enable the selection of the remote LNS NI from the drop-down listbox. By clicking the Load Remote NI button CARE automatically checks the communication between the CARE PC and the Remote PC. In case the communication works properly, the network interface of the remote PC can be selected from the Remote LNS NI drop-down listbox. In the Status line, the current status and errors that may occurred are displayed.

16. Click the OK button.

RESULT: The settings are saved. Whenever starting the synchronize process from now on, CARE will use the settings defined here.

17. Click the Synchronize with LNS icon  on the toolbar.  
Or, click on the LON-Works folder in the network tree, the click right mouse button and with left mouse button click on Synchronize with LNS in the context menu.



**RESULT:** The LNS Network Synchronization dialog box displays. On the top the network status is displayed by connection type (LAN, Local) and the network name. The  /  plug icon status indicates whether the network interface of the remote PC is physically connected to the network  or not  respectively whether it is working properly or not.

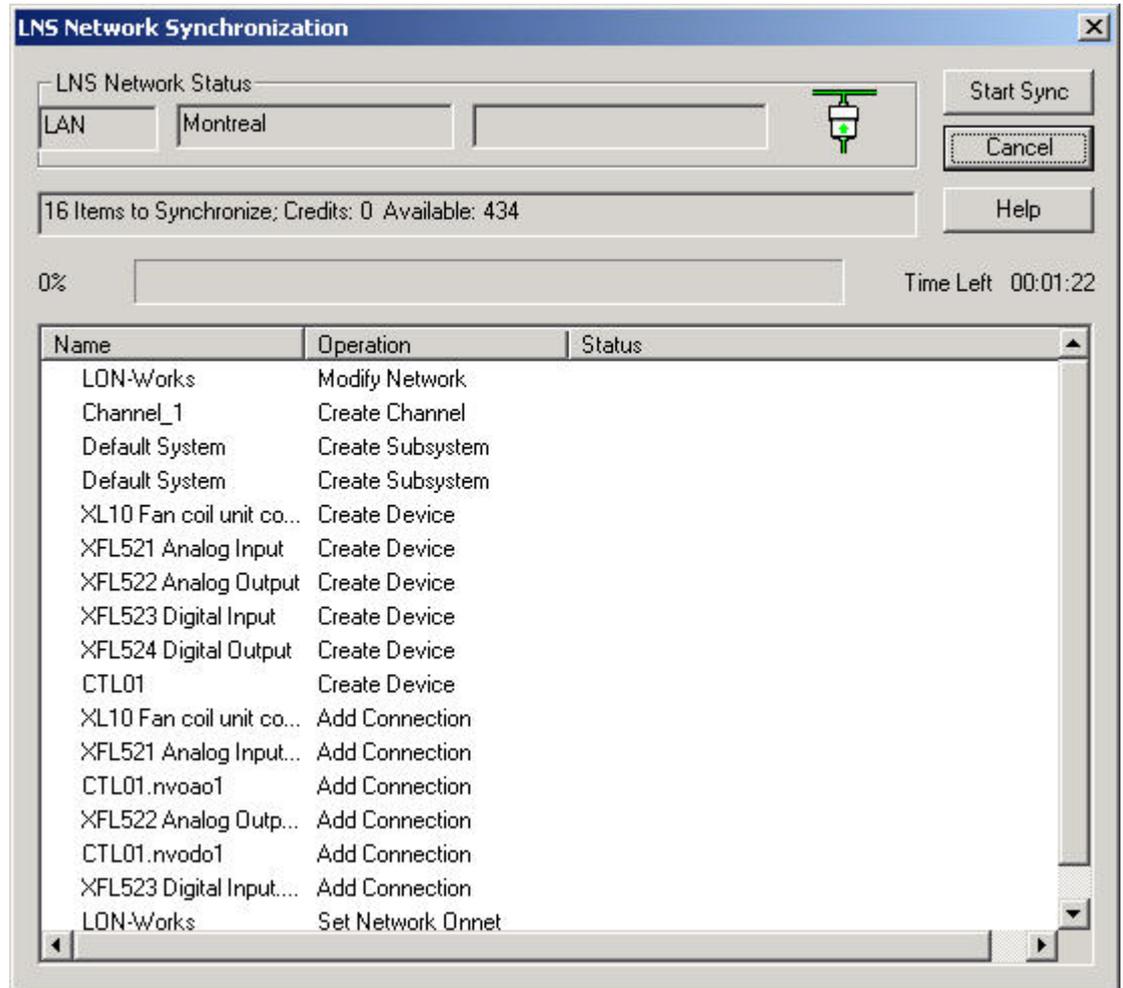
In the second line, the number of inconsistent database items to be synchronized, and the number of credits needed for synchronization as well as the number of available credits are listed (see LNS Credits Handling section).

In the third line on the right, the estimated time to execute the synchronize process is shown.

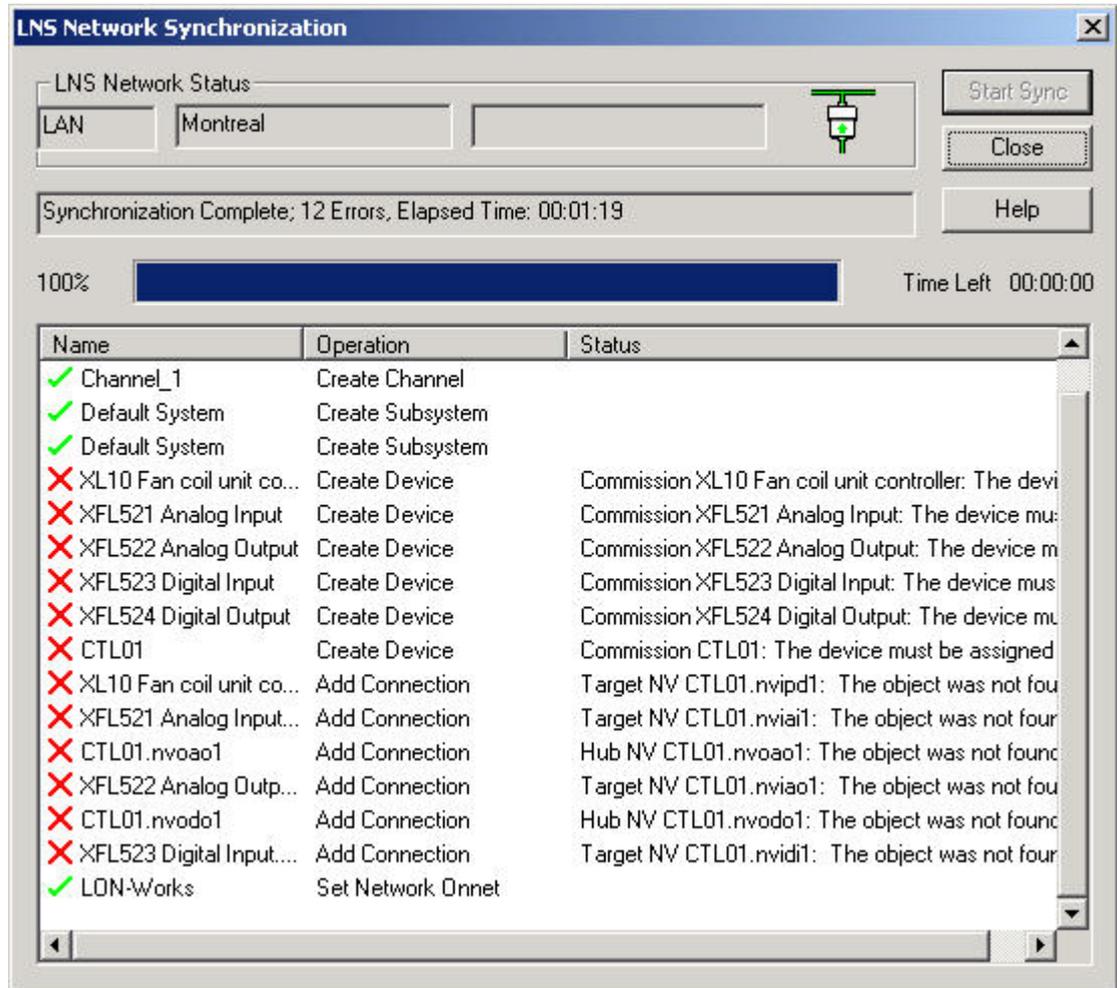
**IMPORTANT**

*CARE cannot consider manipulations of the LNS database done with 3<sup>rd</sup> party LNS-based software. To get those kind of changes reported, please use the Consistency Check function (see Consistency Check section).*

In the list, the name of the inconsistent database items and the corresponding operation to be executed are listed.

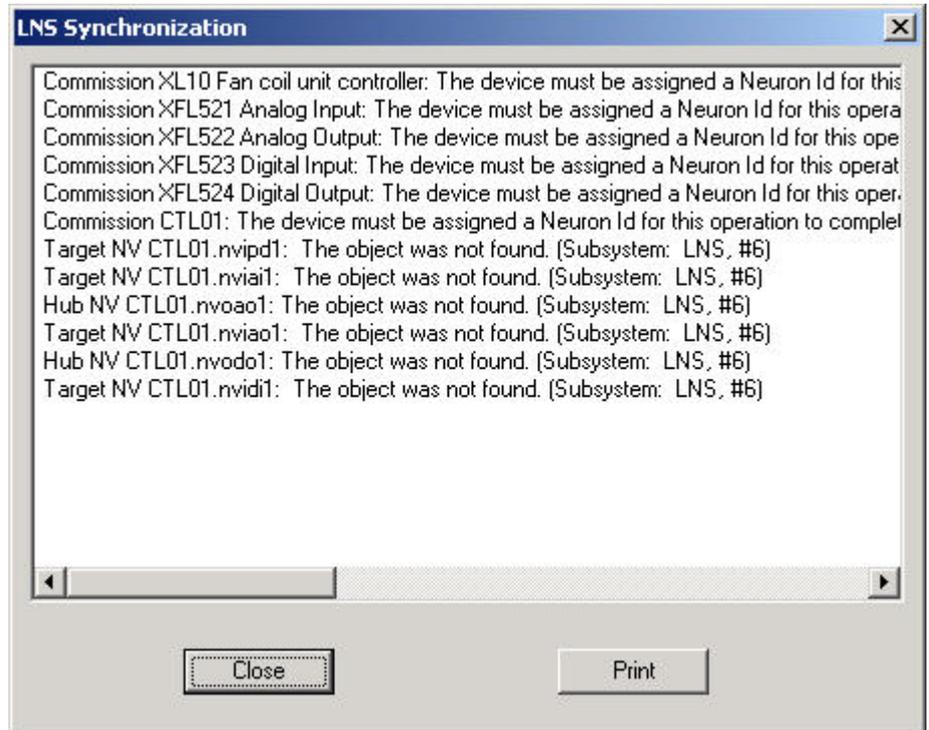


**18.** To start Synchronizing, click the Start Sync button.



**RESULT:** The inconsistent items will be synchronized. Successful execution of an operation is indicated by a green checkmark. Abortive execution is indicated by a red cross and the status/reason is described in the Status column. Successfully modified devices are automatically set to online. Changes made in EBI during synchronization are not written to the devices until the synchronization has been finished.

Abortive execution messages are displayed in parallel in the LNS Synchronization dialog box.



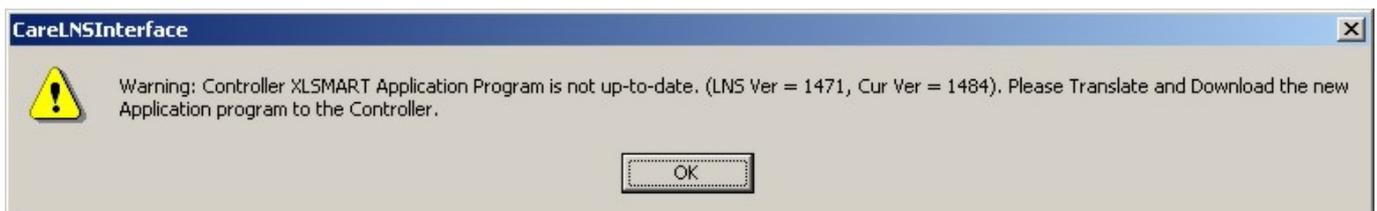
19. To print the status messages, click the Print button, then click the Close button.

20. To perform a successful synchronization, solve the problems as described in the status messages and synchronize again.

RESULT: A successful synchronization is indicated by an empty items list and the message "LNS is synchronized" in the LNS Network Synchronization dialog box.

**Controller Application Verification Note**

When starting Synchronization, CARE verifies whether the currently running applications in the controllers are consistent with the applications to be used for synchronization. In case of application inconsistencies, the following message box displays.



Click the OK button. To make the applications consistent, translate the controller and download the application into the controller.

In case LNS cannot read the controller version due to communication problems or an uncommissioned network, the following message box displays.



Click the OK button. Connect the controller to the network. Download the correct application into the controller and commission the network.

**Available Functions and Restrictions**

When CARE is in the Synchronized mode by checking the LNS controlled option on the LON-Works Properties tab, you cannot apply any of the following onnet functions:

- LON network scanning
- Set device offline/online
- Commission device/network
- Recommission complete network
- Decommission device
- Replace device
- Test device
- Upload Parameters directly into CARE

In synchronized mode, the following CARE functions are still available when being onnet:

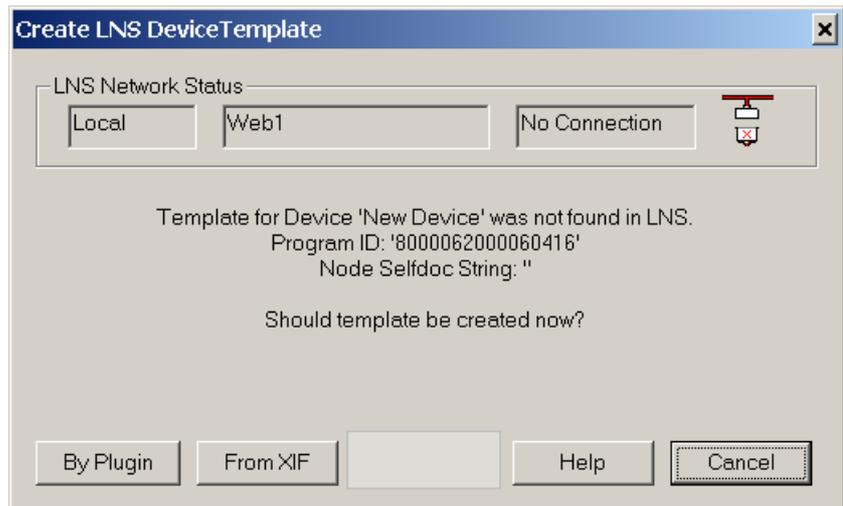
- Get service pin
- Reset device
- Wink device
- Monitor NV values (in NI Channel only)

**Create LNS Device Template**

For proper LNS synchronization, the LNS database must include all device templates of the LON devices included in the project. A template will be created during Plug-In registration or by importing the information from the XIF file. For all currently available Honeywell Plug-Ins/LON devices, CARE provides an "empty" template database that includes the corresponding device templates. Hence, during LNS Synchronization, separate Plug-In registration or importing XIF file information is not necessary.

Device templates of 3<sup>rd</sup> party devices are not saved in the template database. During the first LNS synchronization of the project, those device templates will be registered in a separate step per device in any case. After the first synchronization, all created device templates, Honeywell device templates and 3<sup>rd</sup> party device templates are saved with the project.

During Synchronization for any device type, which no device template has been created for in the LNS database, the Create LNS Device Template dialog box displays. The device template can be created either by the Plug-In registration or importing XIF file information.



**Create Template by Plug-In Registration** 1. Click the By Plug-In button, if you want to create the device template by registering the plug-in.

RESULT: The Plug-In Registration dialog box displays.

2. In the "Not Registered" list, select desired plug-in(s) and click Add button.

RESULT: The plug-in is added to the "To Be Registered" list.

3. Click Register button.

RESULT: The registration process starts and creates the device template.

4. Confirm message boxes, which might be generated and displayed by the plug-in.

NOTE: A plug-in, which is already registered as listed under the "Already Registered" list, can be reregistered in case it does not work properly. To reregister a plug-in, select it in the "Already Registered" list, add it to the "To Be Reregistered" list by clicking the Add button and click Register button.

#### Create Template from XIF File

1. Click the From XIF button, if you want to create the device template by using XIF file information.

RESULT: The Open XIF File dialog box displays.

2. Browse to folder where the XIF file is saved.
3. Select the XIF file in the list and click Open button.

RESULT: The device template is created by using XIF file information.

---

#### Resynchronize Complete LNS Network

<b>Purpose</b>	To synchronize the complete LNS network not only inconsistent LON information.
<b>Local</b>	Delete the LNS project on the CARE PC and synchronize again (see Delete LNS Projects section).
<b>Remote</b>	Delete LNS project manually on the Remote PC and synchronize again.

---

#### Consistency Check

<b>Purpose</b>	To verify whether the CARE database and the LNS database are consistent or not. Especially to check if the LNS database has been modified with another LNS-based application (e.g. LonMaker) which causes manual re-engineering to be done in CARE.
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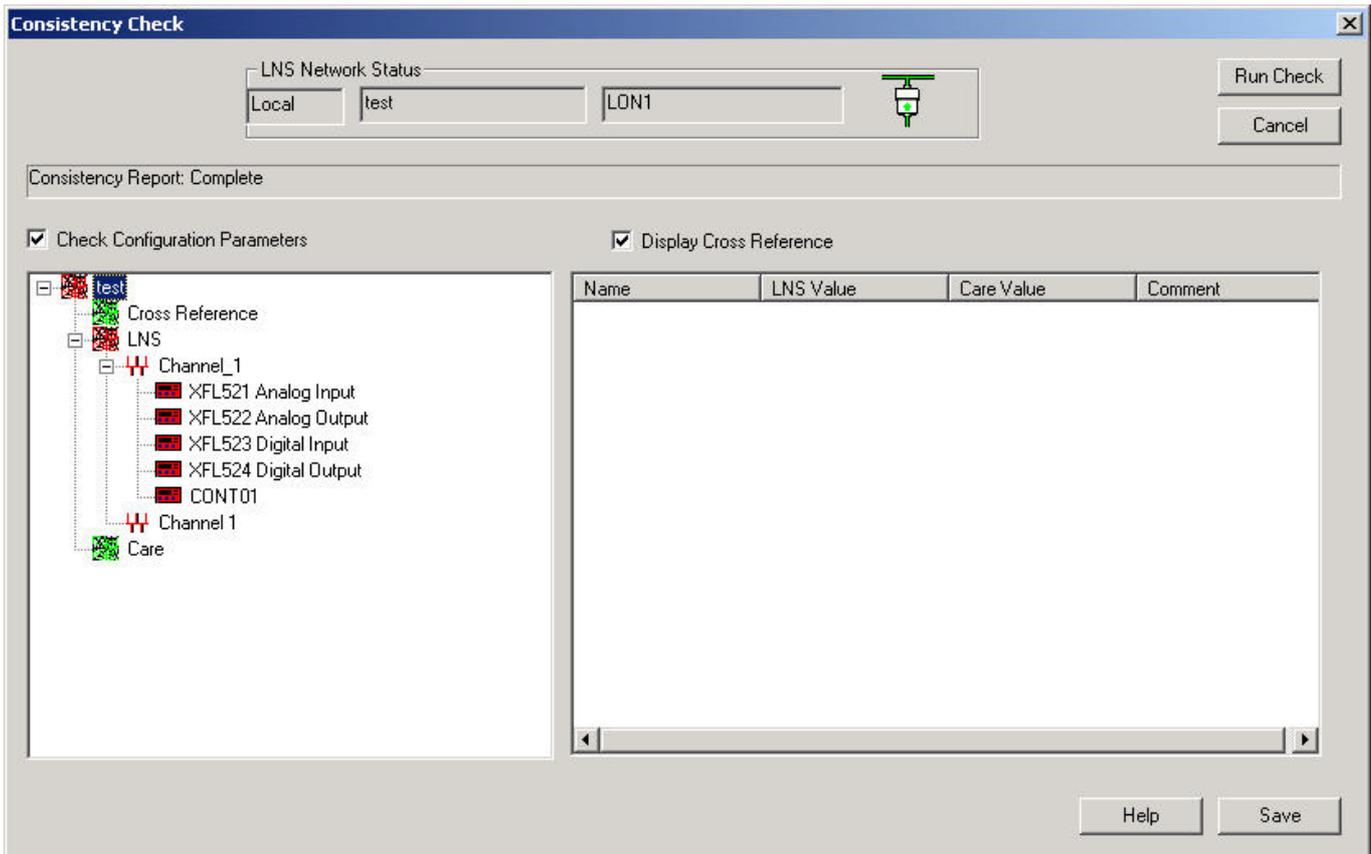
CARE compares the following items:

- CARE and LNS database versions
- Channel, subsystem definitions
- Devices and device interfaces
- Parameters
- Bindings
- Additional or other items in LNS database than in CARE database

NOTE: It is recommended to perform a consistency check after a synchronization and not before, in order to minimize the detectable inconsistencies. In some cases it may need a resynchronization of the project to get consistent. But a consistency check may take the same amount of time or more than a resynchronization of the project. Changes of device statuses (e.g. from online to offline), NV values (except CPs and NCIs) are not considered to be relevant.

- |                  |   |
|------------------|---|
| <b>Procedure</b> | 1. In the toolbar, click the Consistency Check icon  . |
|------------------|---|

RESULT: The Consistency Check dialog box displays.



On the top the network status is displayed by connection type (LAN, Local) and the network name. The  /  plug icon status indicates whether the network interface of the remote PC is physically connected to the network  or not  respectively whether it is working properly or not.

2. Click the Check Configuration Parameters checkbox, if you want to check the configuration parameters in addition. Note, that this takes additional time.

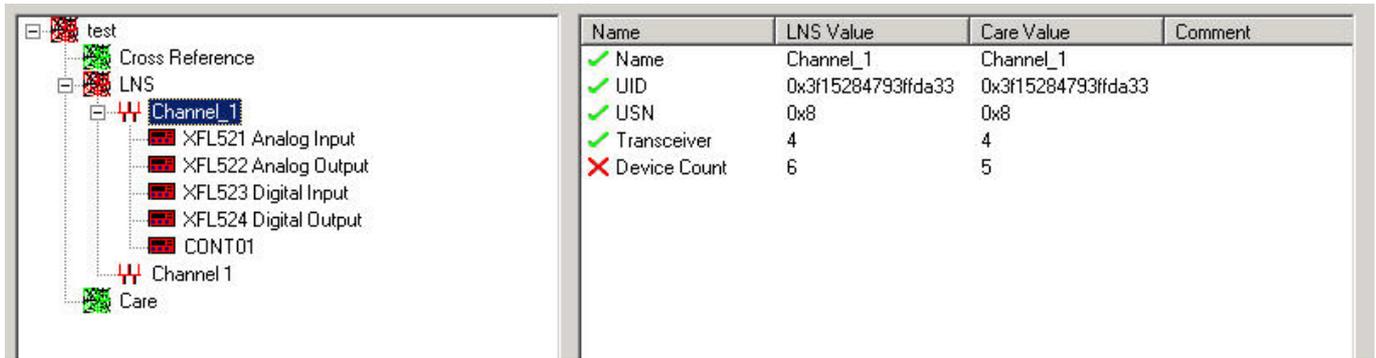
NOTE: The Click the Display Cross Reference option is for internal use only.

3. Click the Run Check button.

RESULT: Status of analyzing is displayed in the Status field above the lists areas. On the left list area, the analyzed network is displayed as hierarchical structure. If all items of the network are consistent the components are displayed in green. If at least one item is not inconsistent, the network name icon is displayed in red.

On the right list area, by default the analyzed items of the highest tree level, that is, the network, are displayed by Name, LNS Value, CARE Value and Comment. Consistent items are indicated by a green checkmark, inconsistent items are displayed by a red cross and a corresponding comment.

To display analyzed items of lower network components, select the corresponding component in the tree on the left.



Name	LNS Value	Care Value	Comment
✓ Name	Channel_1	Channel_1	
✓ UID	0x3f15284793ffda33	0x3f15284793ffda33	
✓ USN	0x8	0x8	
✓ Transceiver	4	4	
✗ Device Count	6	5	

When consistency check is finished, the message “End of Report” is displayed in the Status field above the report list.

4. Click the Save button and save the report as csv. file.
5. Print the report and resolve the conflicts described in the report either by manual operation in CARE or by LNS-based software usage on the LNS database.
6. Click the Cancel button to close the Consistency Check dialog box.

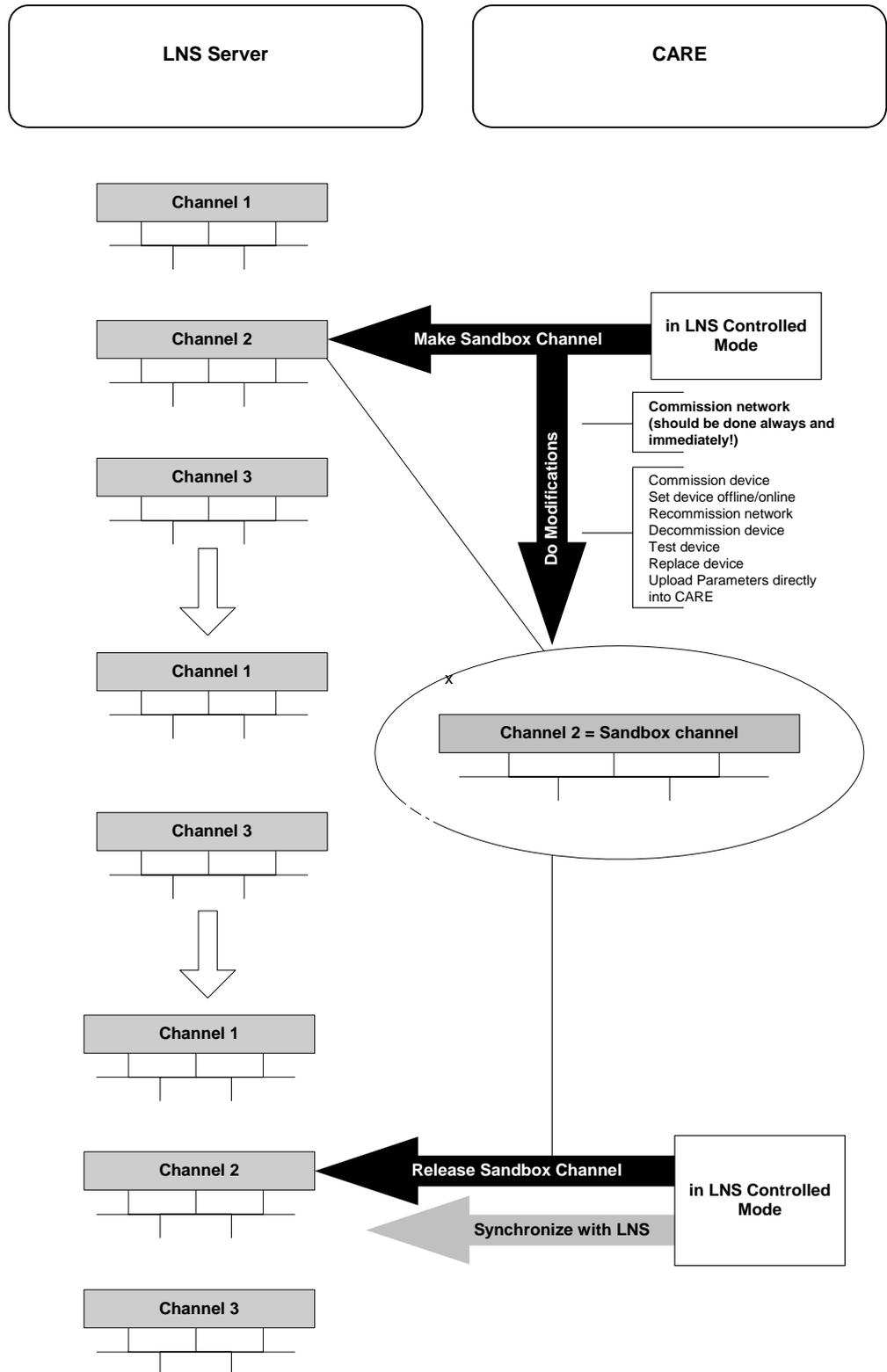
## Apply “Sandbox” Channel

**Purpose** To control one particular channel while LNS has control over the complete network. This may necessary for testing purposes and starting up in case of major structural changes of the network. Although the network is LNS controlled, for the sandbox channel, all CARE Onnet functions can be applied as follows:

- Set device offline/online
- Commission network/device
- Recommission network
- Decommission device
- Test device
- Replace device
- Upload Parameters directly into CARE

### **IMPORTANT**

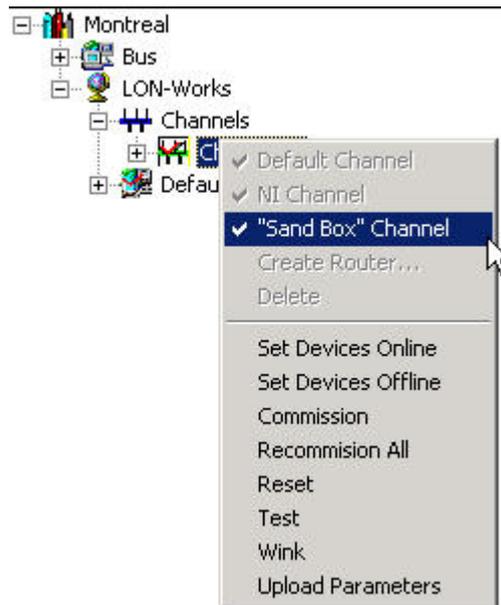
*When setting the channel to sandbox, the devices in the channel will be automatically decommissioned. Hence, after setting the channel to sandbox, it is strongly recommended to commission the “ownerless” devices immediately in order to restore normal control functionality.*



**Restrictions** Plug-ins functionality is restricted to the offline start of a plug-in. Only one channel can be defined as sandbox channel. Devices of other channels cannot be reached via routers and therefore bindings between devices of different channels will not work. Routers cannot be modified or commissioned. This will be done during the following Synchronize process.

**Domain Settings** It is recommended to use different domain settings as LNS.

- Procedure**
1. In the physical part of the LON-Works bus, click on the channel you want to make the sandbox channel.
  2. With right mouse button, click on the channel you want to make the sandbox channel and with left mouse button click on "Sandbox" Channel in the context menu.



3. Click right mouse button and with left mouse button click on Onnet.

**RESULT:** The following functions are now enabled for working on the channel's devices:

- Set device offline/online
- Commission network/device
- Recommission network
- Decommission device
- Test device
- Replace device
- Upload Parameters

The sandbox channel is automatically defined as NI channel.

4. Select the channel and commission the channel by selecting Commission in the context menu.
5. Make the changes to the channel's devices and do the testing and startup.
6. Release the channel to the normal state by disabling the "Sandbox" Channel option in the context menu.
7. Synchronize the CARE database with the LNS database as described in the Procedures of the Synchronize with LNS section.

---

## Upload Parameters from LNS Database

**Purpose** To upload parameters directly modified in the devices by usage of e.g. a handheld calibration tool or EBI. CARE allows uploading of the complete set of parameters such as CPs, NCIs including related extension records.

Uploading can be done for a single device, all devices of a subsystem, a channel or the LNS database.

**NOTE:** Uploading parameters of a complete subsystem or network may lead to a very high busload. Hence, it is strongly recommended to upload parameters only from changed devices.

For procedure please refer to the Upload Parameters section.

---

## LON Device Monitoring

When the LNS tool/workstation is already running, you can go Onnet with CARE and perform the following action:

- Monitor online values in the terminal assignment tool

**NOTE:** This works only for the NI Channel and when using the same domain ID as LNS.

---

## EBI Settings

For the communication with the EBI, general settings which apply to all NVs and individual settings which apply to particular NVs, can be selected.

The settings are as follows:

### Settings for All NVs

- NV Poll Interval  
Defines the NV Poll Interval in s in which all NVs will be polled by the EBI LON point server.

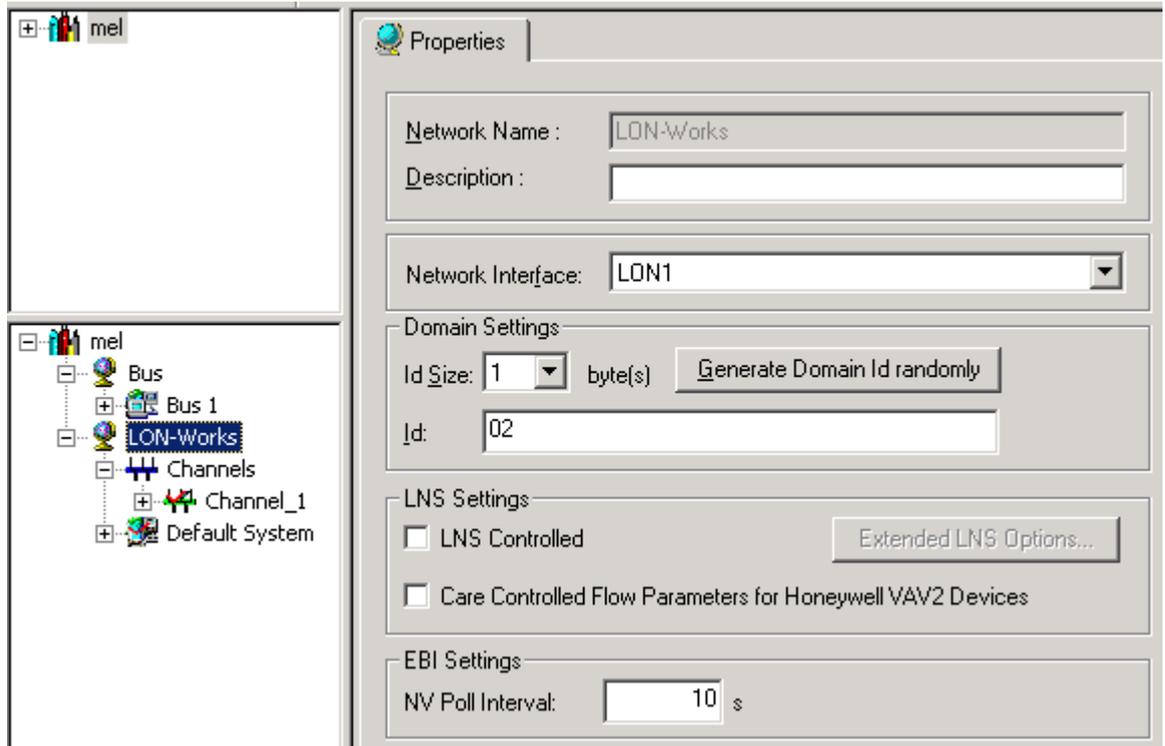
### Settings for Particular NVs

- NV Poll Interval  
Defines the NV Poll Interval in s by which a NVs will be polled by the EBI LON point server.
- Report by Exception  
For a particular NV, LNS uses a report by exception message transfer as opposed to a polling mechanism to the LNS client. In this case the LonWorks Point Server is the LNS client. It is recommend that this bit is always set and perhaps this option should not even be shown.
- Use Bound Updates  
Binds the respective network variable to the host network interface (host binding).

### Select NV Poll Intervall for all NVs

### Procedure

1. In the network tree, click on the LON-Works folder.



2. On the Properties tab on the right pane, enter the interval in the NV Poll Interval field.

#### Select Settings for Particular NV

#### Procedure

1. Expand the network tree, navigate to the NV and select it.

The screenshot shows the CARE software interface. On the left, there are two project trees. The top tree shows a hierarchy: FDM > CONT01 > HVAC > Analog Input > AI1, AI2, AI3, and Pseudo Digital 2 Stage. The bottom tree shows: FDM > Bus > Bus 1 > LON-Works > Channels > Channel\_1 > CONT01 > XFCL3A1\_24V > Default System > CONT01 > HVAC > nviAI3 > Node Object > XFCL3A1\_24V.

The right pane has two tabs: 'Properties' and 'Value(s)'. The 'Properties' tab is active and contains the following sections:

- Input NV:** NV: nviAI3, NV Type: SNVT\_char\_ascii, Selfdoc string: (empty)
- Point Mapping:** A table with columns DataPoint, Inv.match, Inv.Value, and AI.No.
 

DataPoint	Inv.match	Inv.Value	AI.No.
AI3	No	0,0	0
- Value Conversion:** Conversion Table: (empty), DataPoint: (empty)
- EBI Settings:**
  - NV - Booster
  - Heart Beat
  - Enhanced
  - Use Network Poll Interval
  - Individual Poll Interval: 10 s
  - Report by Exception
  - Use Bound Updates

2. On the Properties tab on the right pane, select the desired options under EBI Settings.
3. Apply settings to further NVs if desired.

**CARE and EBI Upgrades**

When upgrading CARE and/or EBI, please note the following essential information:

**CARE Upgrade from Ver. 5 to 7.01**

CARE Version >= 7.x supports the synchronization of EBI LNS settings. If EBI version < 300.3 is part of the project, the EBI settings should be uploaded into the CARE database to keep the current settings of the EBI. The upload is possible via the "Upload EBI Settings" option in the context menu (see "Upload EBI Settings" section). Further changes of the EBI settings should then only be done in CARE. When synchronizing to LNS next time, all changed parameters are updated in LNS.

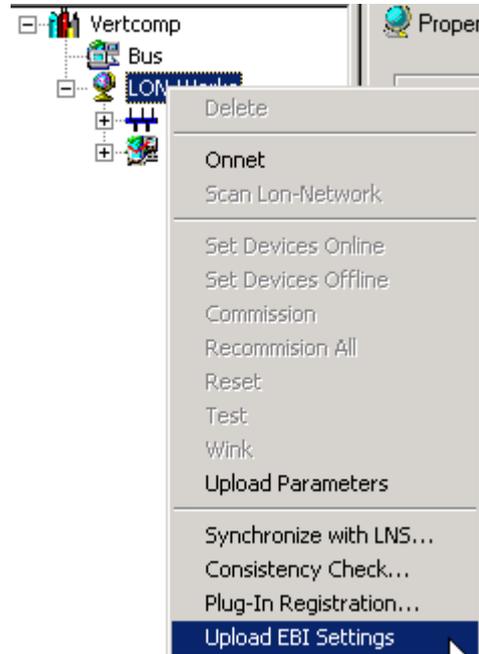
**CARE Upgrade from Ver. 5 to 7.01 and EBI Upgrade from Ver. < 300.3 to 310**

With LNS Turbo Edition it is possible to synchronize multiple CARE projects to the same LNS server. EBI 310 can access each project simultaneously (multiple LON point server). CARE Version >= 7.x is a prerequisite for EBI R310 support. Before upgrading the EBI, the EBI settings must also be uploaded as described in the above scenario.

## Upload EBI Settings

To avoid problems when upgrading CARE and/or EBI, it is highly recommended to upload the EBI settings into CARE before doing the upgrade (see also "CARE and EBI Upgrades" section).

- Procedure**
1. In the logical LON-bus part of the network tree, right-click on the LonWorks folder and click on Upload EBI Settings in the context menu.



**RESULT:** The parameters NV Poll Interval, Report by Exception and Use Bound Updates will be uploaded.

## LNS Plug-Ins

CARE provides access to Honeywell LNS-based Plug-Ins in order to configure, calibrate and/or monitor the corresponding LON devices.

LNS Plug-Ins will be installed with their own setup program and can then be executed from within CARE for the selected device.

LNS Plug-Ins can be invoked locally on the CARE PC and remotely on a PC connected via LAN. For details, please refer to the Synchronize with LNS section.

Honeywell Plug-Ins can be downloaded from "<http://www.honeywell.de/plugin>".

## Plug-In Registration

To use a Plug-In it must be registered first in the LNS database. *Inter alia* the registration process creates the necessary device template for the corresponding LON device. For Honeywell Plug-Ins/LON devices, CARE provides an "empty" template database that includes all current device templates.

**NOTE:** Registration depends on the LNS network status, which indicates the connection mode, local or remote. For both connection modes, local and remote, a plug-in must be registered separately one-time.

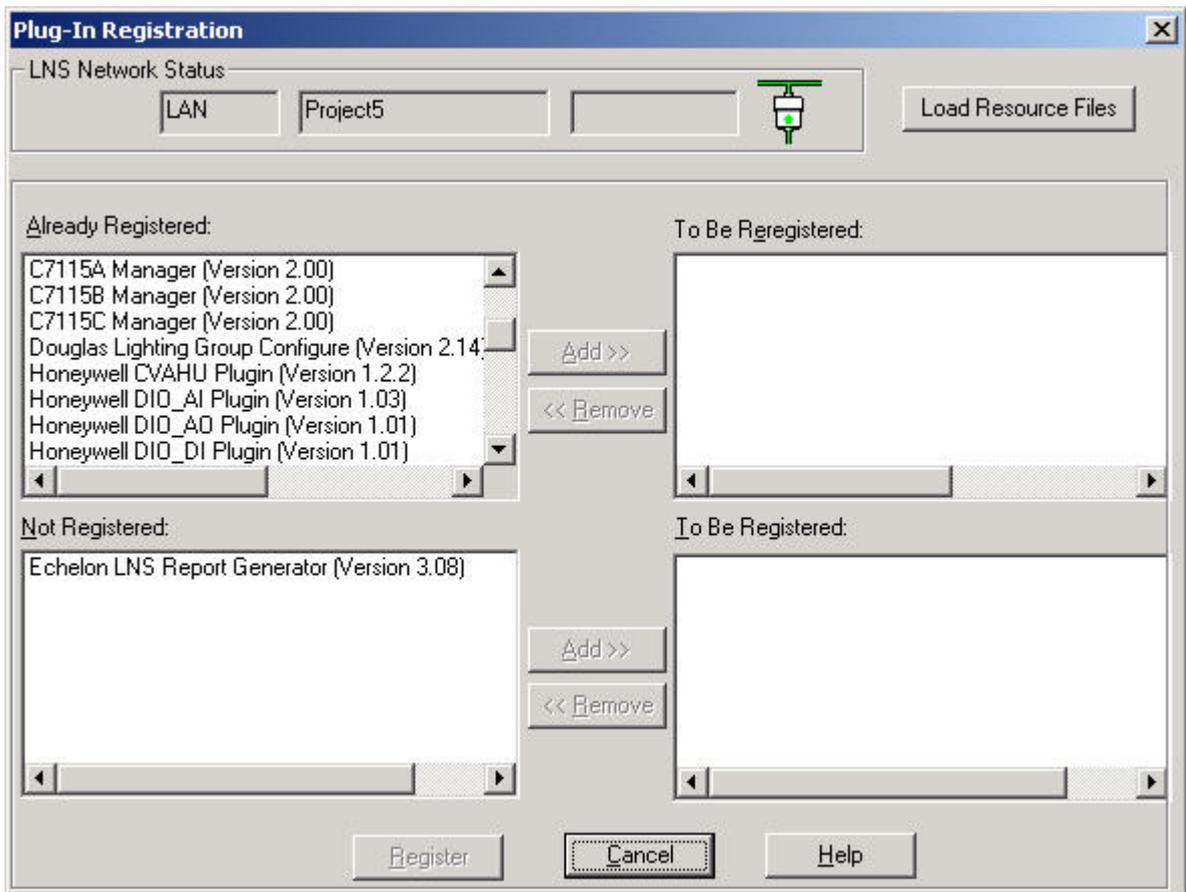
- Procedure** 1. In the logical LON-bus part of the network tree, right-click on the LonWorks folder and click on Plug-In Registration in the context menu.

**RESULT:** The Plug-In Registration dialog box displays.

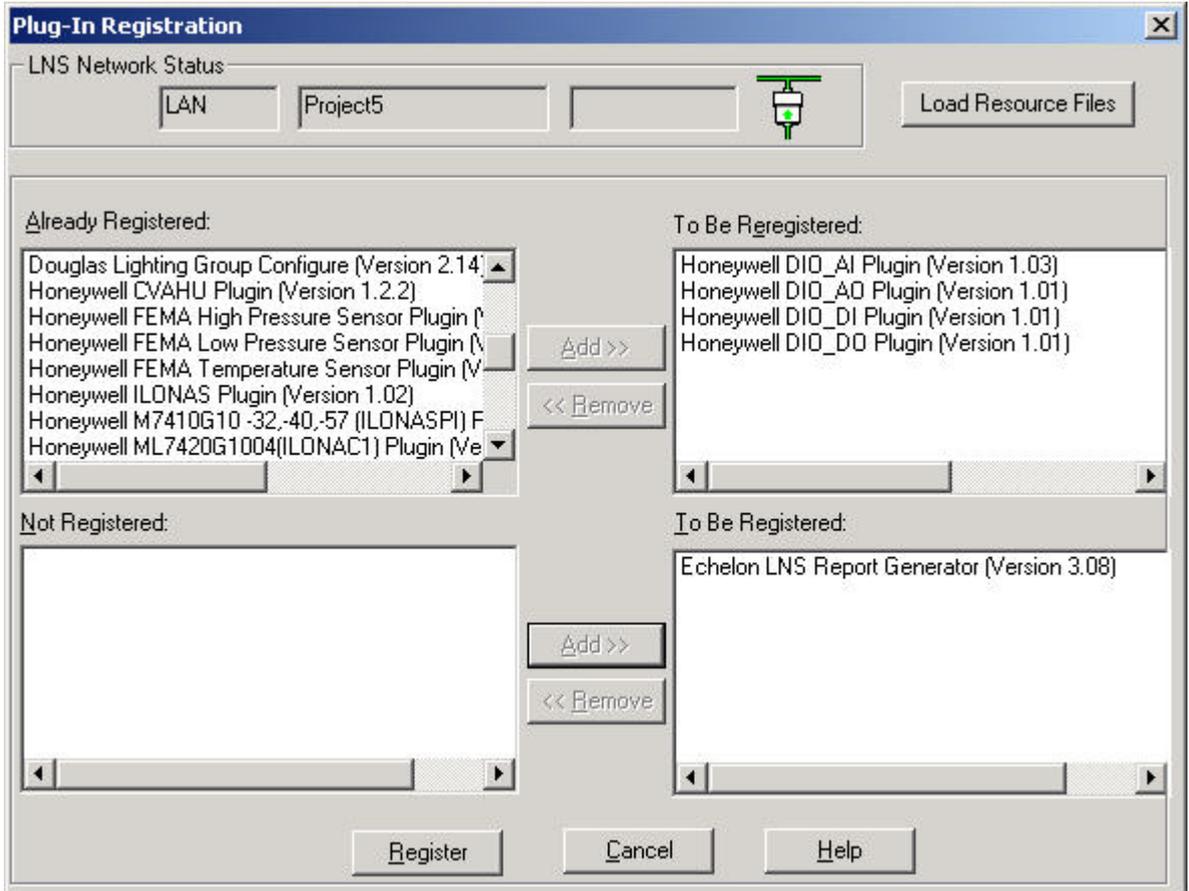
On the top the network status is displayed by connection type (LAN, Local) and the network name. The  /  plug icon status indicates whether the network interface is physically connected to the network  or not  respectively whether it is working properly or not.

Note that if CARE is not in LNS controlled mode, the connection type is always local.

In the upper left, the Already Registered list shows all plug-ins which have been already registered. In case of plug-in updates they can be re-registered. In the lower left, the Not registered list shows all plug-ins which have not been registered yet.



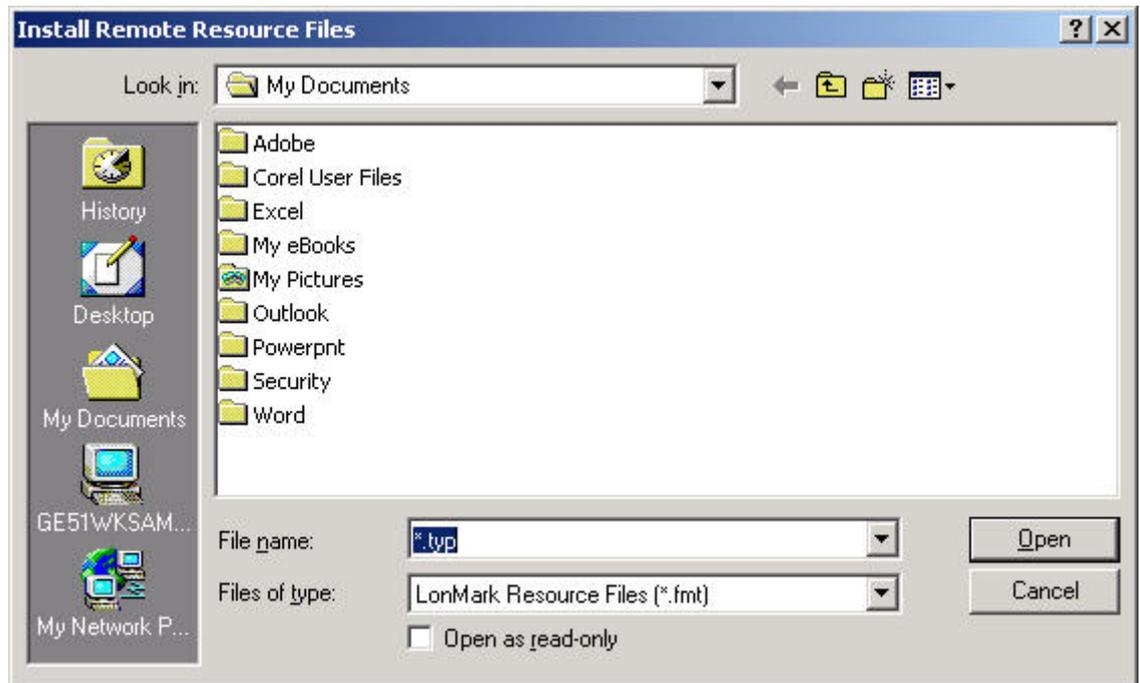
2. In the corresponding list(s), select the plug-ins to be registered and click the Add button(s).



3. If remote operation of the plug-in is required, click the Load Resource Files button.

NOTE: Loading resource files is only possible via LAN connection mode not via LON.

RESULT: The Install Remote Resource Files displays.



4. Browse to the folder where the resource files are located and select the file.
5. Click the Open button.
6. Click the Register button.

RESULT: The registration process starts and creates the device templates for the plug-ins. If the resource files have been loaded, they will be installed on the remote PC.

7. During the registration process, confirm message boxes, which might be generated and displayed by the plug-in.

## Plug-In Functions

Plug-ins provide configuration, calibration and monitoring functions dependent on the device the plug-in is designed for. The kind of access to the various plug-In functions such as depends on the LNS Controlled option setting.

### LNS Controlled Mode

In LNS Controlled mode, the full functionality as designed for the plug-in is available while LNS is running.

### CARE Controlled Mode

In CARE Controlled Mode, LNS Plug-In functions are restricted. While LNS is running by the parallel use of a LNS tool, proper operation is only possible for

- Configuration
- Calibration

While LNS is running,

- Monitoring  
does not work properly because the device will be operated standalone without any bindings. Hence, if a LNS tool is used in parallel for the LonWorks network engineering, it is not allowed to go Onnet with CARE and monitor devices via Plug-In Online if the LNS tool is already running.

In CARE Controlled Mode plug-in functions can be executed in offline and/online mode as follows:

- Configuration (offline or online)
- Calibration (online)
- Monitoring (Test and Diagnostic, online)

As the list shows, configuration can be done offline as well online, whereas calibration and monitoring can only be done online.

Normally, configuration will be the first step, then the device can be calibrated and/or monitored.

Depending on the mode, offline or online, the interaction between CARE (database), LNS database, Plug-In and LON device will be different for the procedures (see "Plug-In Offline Functions in CARE Controlled Mode (Configuration)" and "Plug-In Online Functions in CARE Controlled Mode (Configuration, Calibration, Monitoring)" sections.

### Prerequisites

The plug-in must be installed and registered on the CARE PC. For remote plug-in operation on a PC connected via LAN, the device templates and the *DRF* files must be installed on the remote PC. This will be done remotely during registering the plug-in on the CARE PC (see Plug-In Registration section).

Re-registering is also possible in the same way.

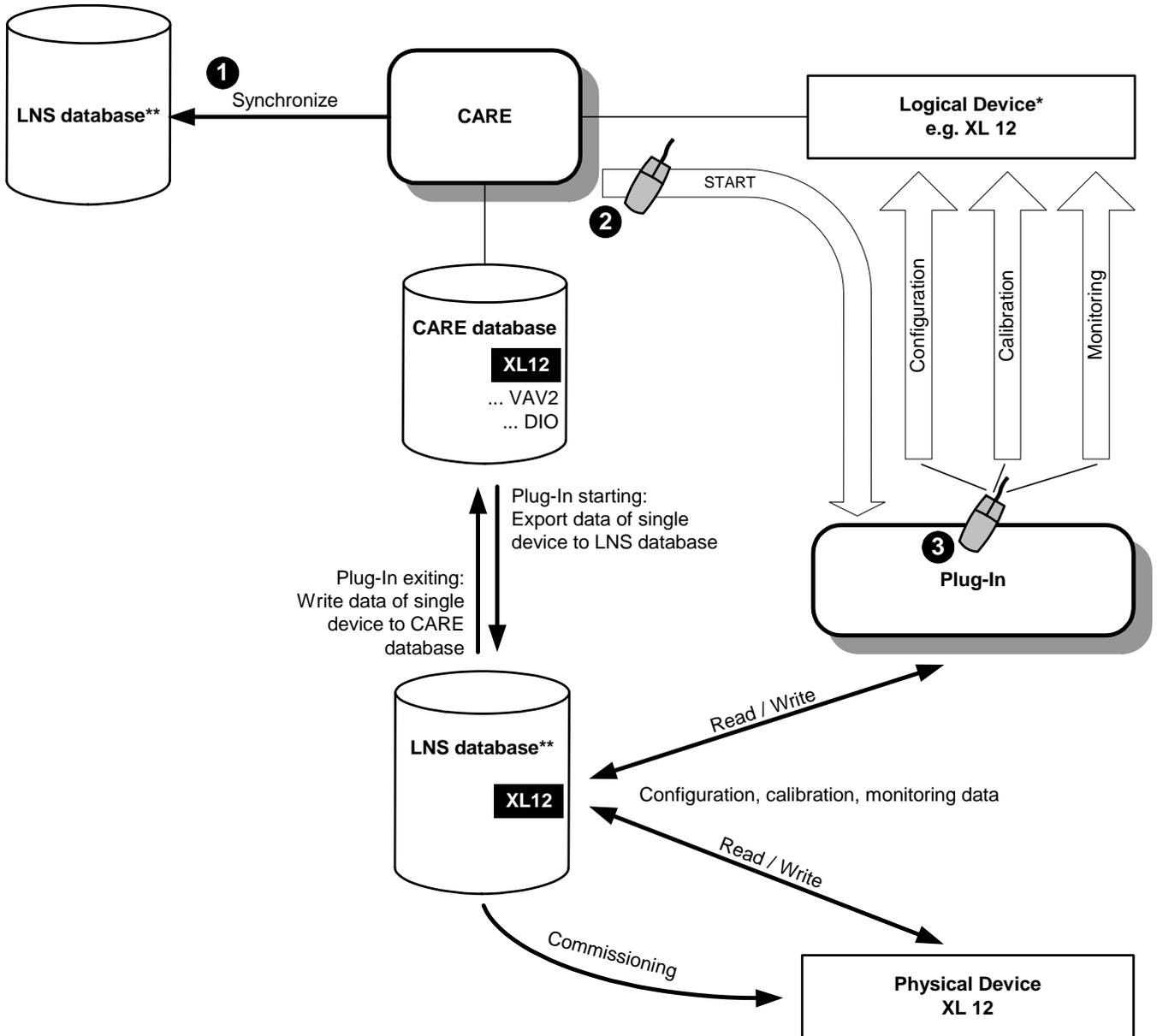
## Plug-In Functions in LNS Controlled Mode

In LNS Controlled mode, the full functionality (calibration, configuration and monitoring) of the plug-in is available while LNS is running (offline or online).

NOTE: It is recommended to perform a Synchronize with LNS before launching the Plug-in.

The CARE process when working in LNS controlled mode is as follows:

### Plug-In in LNS Controlled Mode



\* Device in network tree

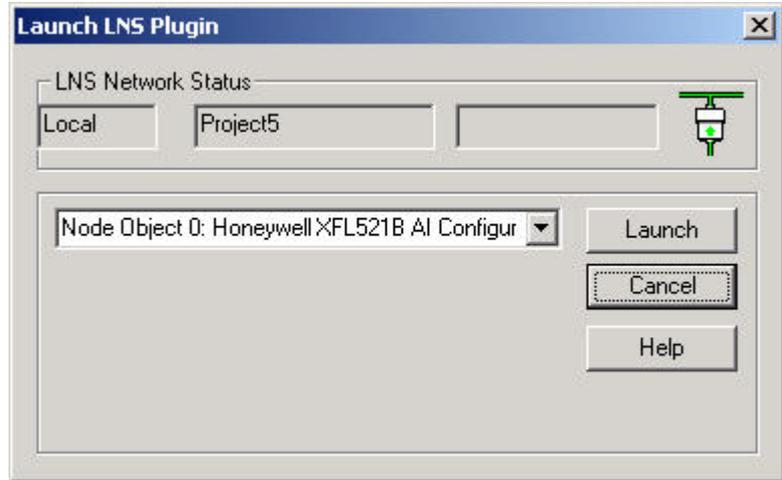
\*\* One and the same LNS database

**Prerequisites** see Prerequisites in Plug-In Functions section.

**Procedure** 1. If not already done, install the LNS software and the Plug-In.

2. Set CARE into LNS controlled mode and Synchronize with LNS as described in the Synchronize with LNS section.
3. In the logical LON-bus part of the network tree, click on the device, of which plug-in you want to start.
4. Click right mouse key and with left mouse key, click Plug-Ins.

RESULT: The Launch LNS Plugin dialog box displays.



5. Select desired option, in this case, under Configure, Monitor, and Honeywell project settings.

NOTE: The Honeywell project settings allow defining global settings such as engineering unit, fail detect time, etc., for example, for each XL 10 controller type. Those global settings are saved in the LNS project and not in the CARE database. Hence, when changing such a global setting via plug-in, the changed value is not taken over after the plug-in has been closed.

6. Click the **Launch** button.

RESULT: The plug-in is started. The physical device is commissioned.

7. In the Plug-In, define the settings

RESULT: The data are saved to the physical device and to the logical device respectively to the LNS and to the CARE database.

8. Exit the Plug-In.

---

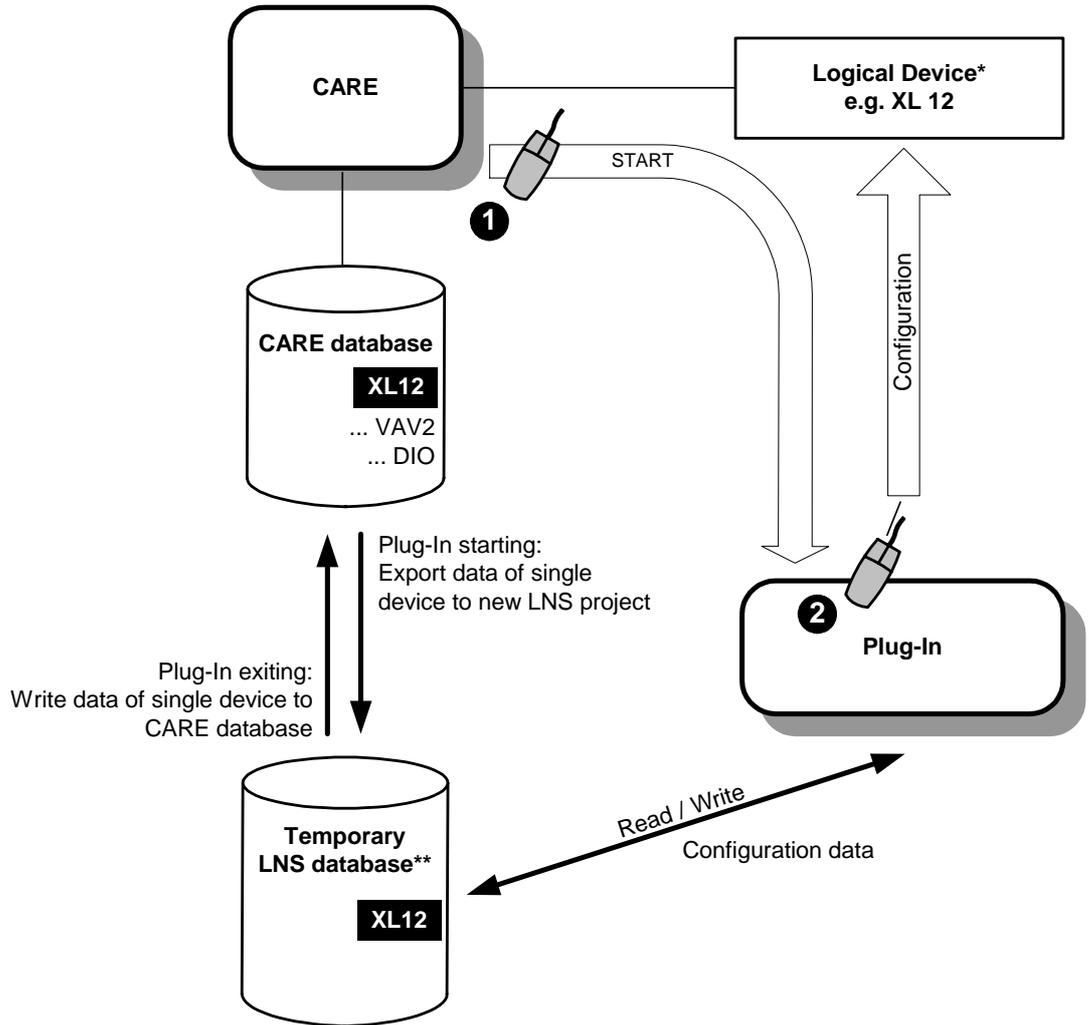
### Plug-In Offline Functions in CARE Controlled Mode (Configuration)

Configuring a device means to define device-specific settings, for example "the time to open / time to close a valve" in an air handling unit. The configuration can be done offline or online and is saved in the LNS, respectively in the CARE database. When the logical device (logical device=device in network tree) has been configured offline, the configuration data must then be saved to the physical device by commissioning in a second step.

When the logical device has been configured online, the configuration data is automatically saved to the physical device.

The CARE process when working offline on a Plug-In is as follows:

### Plug-In Offline in CARE-Controlled Mode



\* Device in network tree

\*\* Not the LNS database used for Synchronize

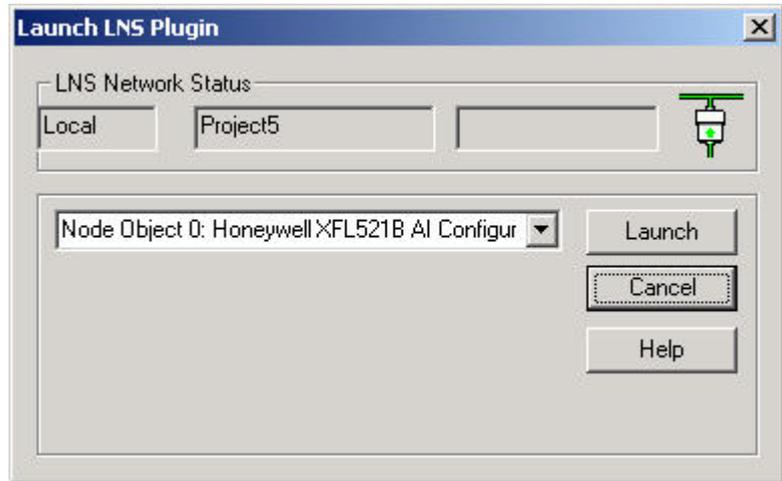
**Prerequisites** see Prerequisites in Plug-In Functions section.

NOTE: If DIO/Smart I/O Plugins are used, the point attributes will not be updated.

**Procedure**

1. If not already done, install the LNS software and the Plug-In.
2. In the logical LON-bus part of the network tree, click on the device, you want to configure.
3. Click right mouse key and with left mouse key, click Plug-Ins Offline.

RESULT: The Launch LNS Plugin dialog box displays.



4. Select the Configure option.

5. Click **Launch** button.

RESULT: The plug-in is started.

6. Configure the device.

RESULT: The configuration data are saved to the logical device respectively to the LNS and to the CARE database.

7. Exit the Plug-In.

8. To save the configuration data in the device, commission the device as described in the "Commission Device(s)" section.

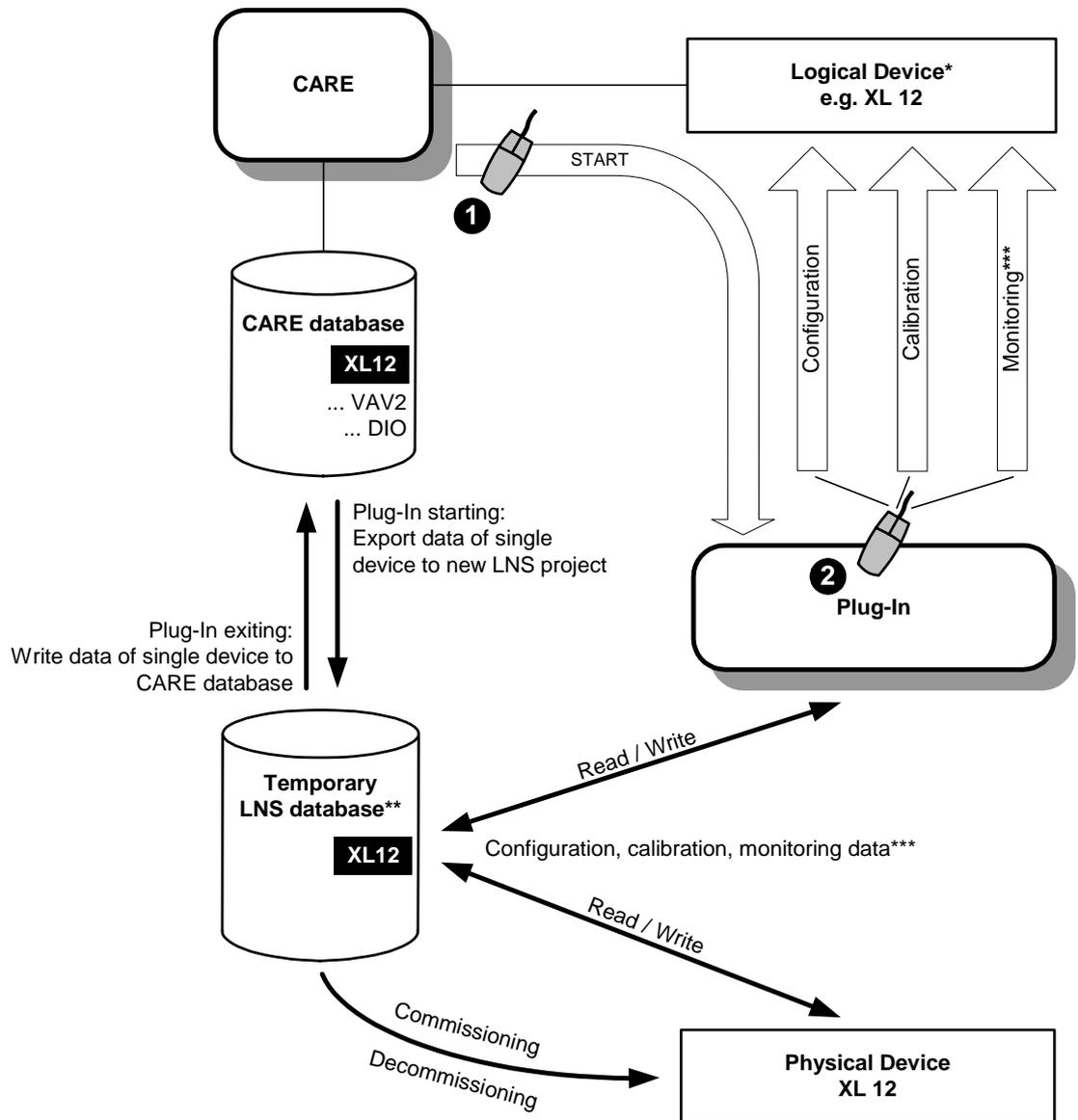
---

#### Plug-In Online Functions in CARE Controlled Mode (Configuration, Calibration, Monitoring)

Plug-In online operation can properly be used for calibration and configuration only. The monitoring does not work properly because the device will be operated standalone without any bindings.

The CARE process when working online on a Plug-In is as follows:

### Plug-In Online in CARE-Controlled Mode

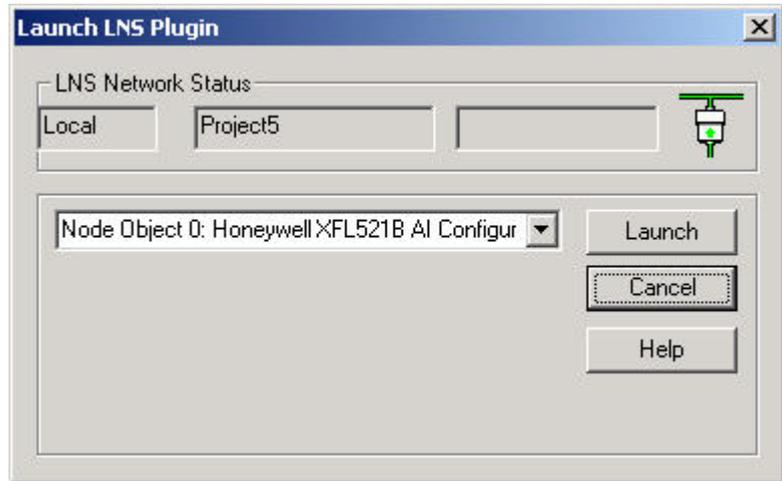


\* Device in network tree  
 \*\* Not the LNS database used for Synchronize  
 \*\*\* Proper Monitoring not possible due to standalone status of commissioned device

**Prerequisites** see Prerequisites in Plug-In Functions section.

- Procedure**
1. If not already done, install the LNS software and the Plug-In.
  2. In the logical LON-bus part of the network tree, click on the device, you want to monitor.
  3. Click right mouse key and with left mouse key, click Plug-Ins Online.

**RESULT:** The LNS Plugin dialog box displays.



4. Select desired option, in this case, under Configure, Monitor, and Honeywell project settings.

NOTE: The Honeywell project settings allow defining global settings such as engineering unit, fail detect time, etc., for example, for each XL 10 controller type. Those global settings are saved in the LNS project and not in the CARE database. Hence, when changing such a global setting via plug-in, the changed value is not taken over after the plug-in has been closed.

5. Click the **Launch** button.

RESULT: The plug-in is started. The physical device is commissioned.

6. In the Plug-In, define the settings

RESULT: The data are saved to the physical device and to the logical device respectively to the LNS and to the CARE database.

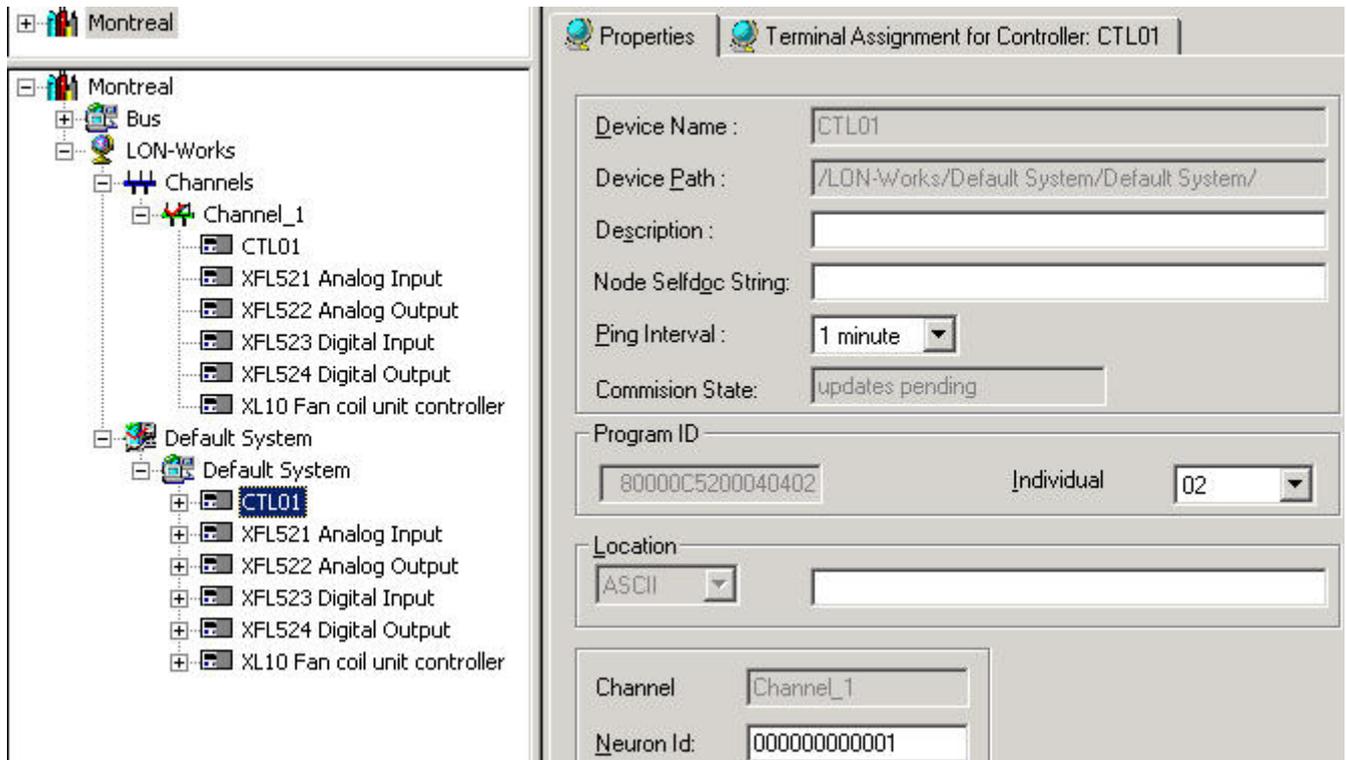
7. Exit the Plug-In.

RESULT: The device is decommissioned.

---

## Replace Device in LNS Controlled Mode

Devices can be replaced in the LNS database without using any additional credits. A device can be replaced by simply changing the neuron ID on the Properties tab of the device.



During the next synchronization, LNS replaces the device by commissioning the new device and decommissioning the old device.

## Restore CARE Projects

When restoring a project created with an older CARE version than 5, the default status of the project regarding LNS is "not yet synchronized".

When restoring an old CARE project which has been changed and synchronized in the meanwhile, it may result in the need to start again. That is, the LNS project must be deleted in CARE respectively on the Remote PC and the restored project must be synchronized.

When back upping a project, LNS extensions will be included, but LNS related files such as XIF; DRF and LNS database files will not.

## Delete LNS Project(s)

Whenever synchronizing the LNS database with the CARE database, the CARE project is stored as LNS project for usage within the LNS-based tool.

In case the CARE project name is changed and the corresponding LonWorks network is synchronized again, the old LNS project can be deleted to save disk space.

Depending on the LNS controlled mode (Local or LAN), that is, whether CARE and the LNS server reside on the same PC or on different PCs, LNS projects are to be deleted in different ways.

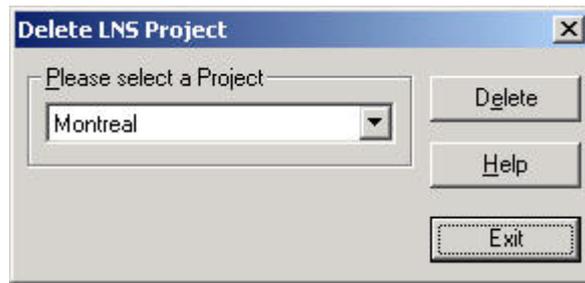
See also "LNS Credits Handling" section.

### Procedure (Local LNS Server)

1. Click menu item Database, then submenu item Delete LNS Project(s).

RESULT: The Delete LNS Project dialog box displays.

2. Select the project from the Please select a Project drop-down listbox.

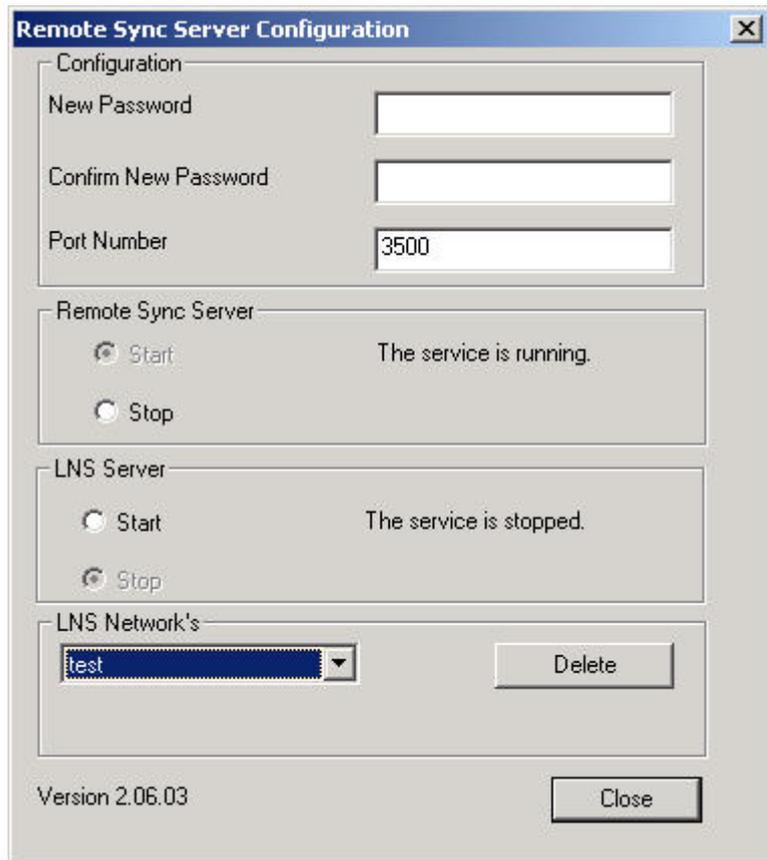


3. Click the Delete button.

### Procedure (Remote LNS Server)

1. Start Windows control panel and double-click on the Remote Sync Server icon  in the control panel.

RESULT: The Remote Sync Server Configuration dialog box displays.



2. Under Remote Sync Server, click the Stop radio button.
3. Under LNS Server, click the Stop radio button.
4. From the LNS Network's drop-down listbox, select the network (project) you want to delete and click the **Delete** button.
5. Click the **Close** button.

---

## LNS Credits Handling

**IMPORTANT**

*By default CARE provides one credit necessary for the Plug-Ins Online function. Hence, make sure that least one credit is always available in the LNS database. Also make sure, that the job specific number of credits has been ordered before starting the Synchronize with LNS function.*

The credits count will be affected when applying one of the following functions:

**Synchronization with LNS**

In case devices have been added, for each device one credit will be subtracted from the credits count available. In case devices have been deleted, for each device one credit will be returned. The credits will be count on the PC where the LNS database is installed.

**Delete LNS Project**

When deleting an LNS project, the credits that have been subtracted during LNS Synchronization will be returned.

**Plug-In Online**

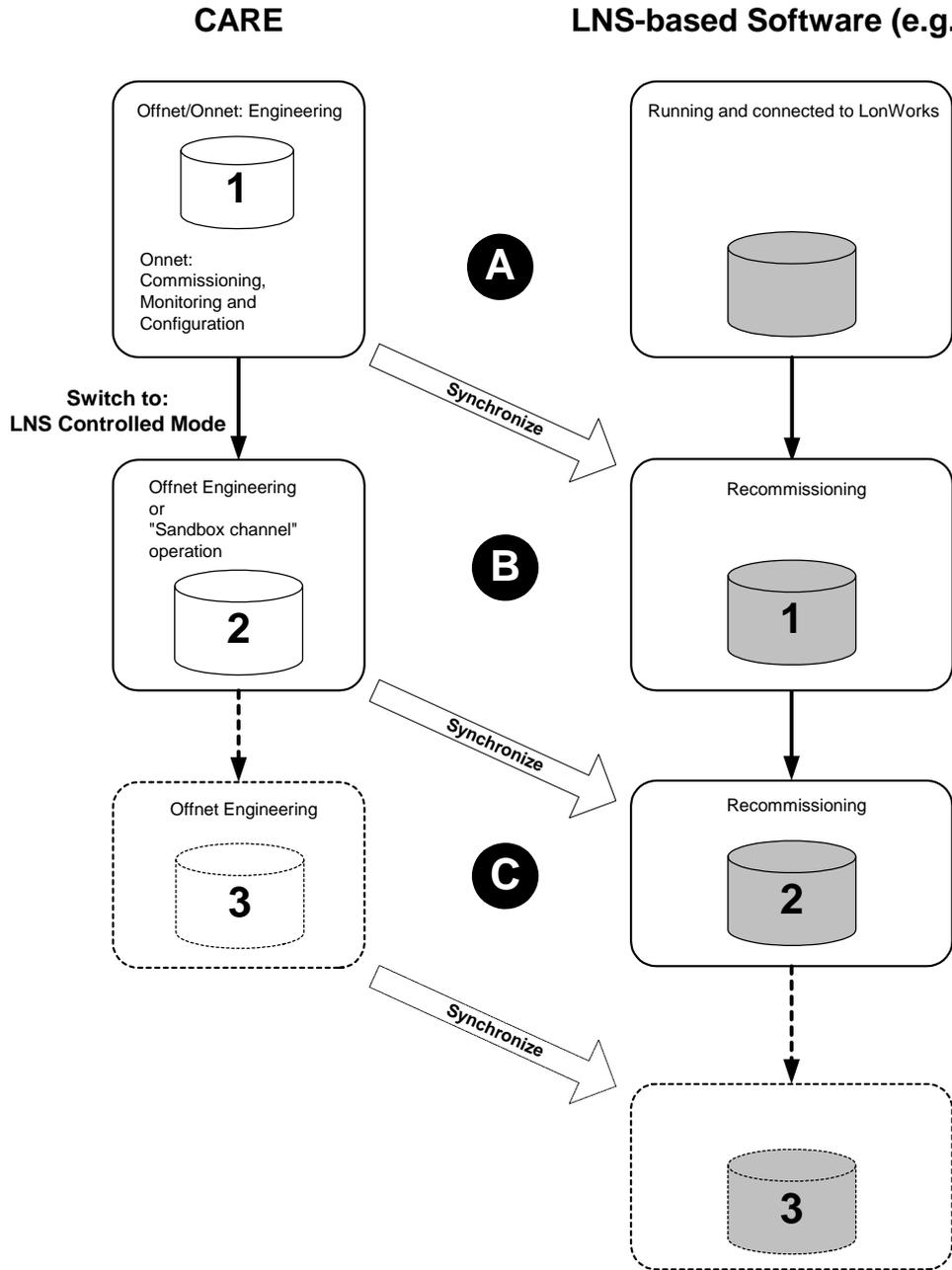
When working Online with a LNS Plug-In, one credit will be issued during commissioning and returned after decommissioning (temporary issue).

---

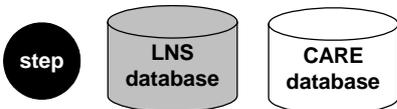
## Incremental LonWorks Engineering

**Workflow**

Incremental engineering means that CARE will be used in combination with a LNS-based software such as EBI whereas CARE is running in LNS controlled mode in which the LNS-based software is controlling the LonWorks network. The following diagram describes the engineering workflow during incremental engineering:



**Cutline:**



- A.** The initial engineering is done with CARE in Offnet mode respectively in Onnet mode. Usually in Offnet mode, you structure the LON network and do the bindings. Then you go Onnet, commission and configure the devices/LON network. To bring the LNS database into the actual state, you switch CARE into LNS Controlled mode. Then you synchronize the LNS network/database with the CARE network/database. The LNS-based software gets Online and recommissions the complete network. All LON devices are displayed on the workstation.
- B.** As it is typical for incremental project engineering, you may add and configure some new components, such as LON devices, channels, and/or routers in CARE. This can be done offnet or onnet. In order to apply the full set of CARE

onnet functions, the respective channel can be separated as a “sandbox” channel, even if the LNS-based software is running and controlling the network.

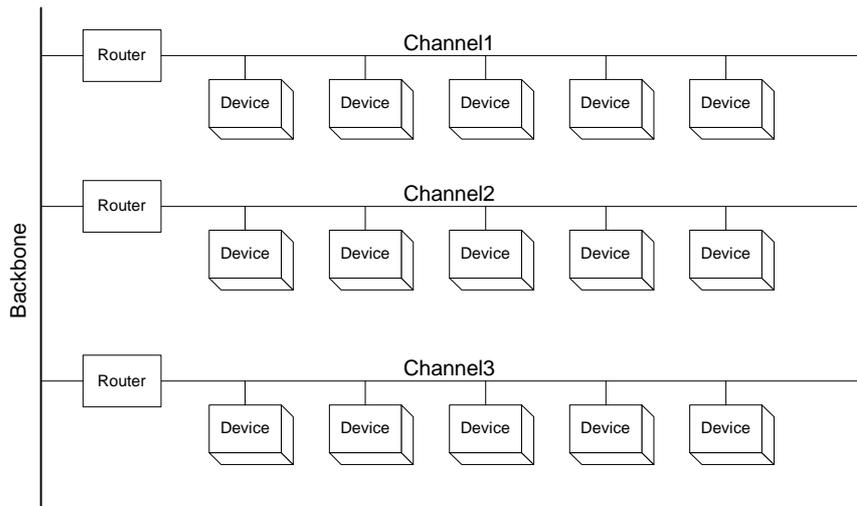
*After completing the changes and still in LNS controlled mode, you synchronize the LNS network with the CARE network again. The LNS database will be updated with changed information done in CARE.*

C. Repetition of step B, and so forth.

Architectures

For big jobs it is possible to startup the plant incrementally. In this case, some precautions need to be taken as described in the following sections.

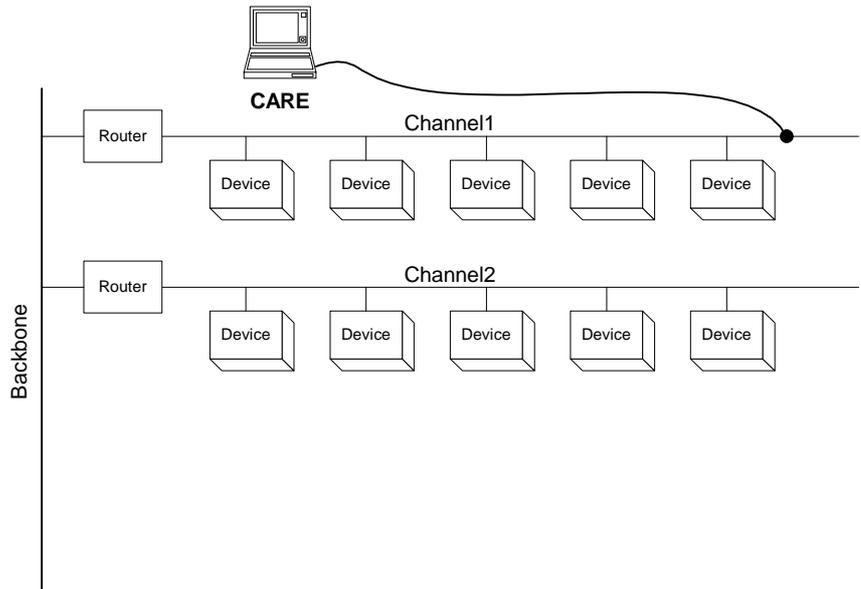
**Example Architecture**



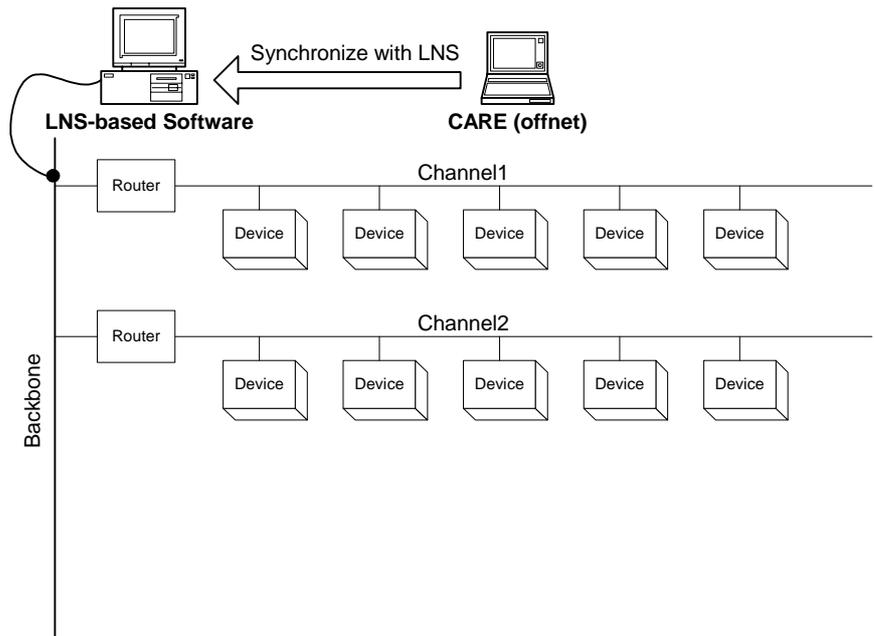
**Initial Engineering**

**Procedure**

1. Connect the CARE PC to any channel of the LON network and set this channel to the network interface channel (NI channel).
2. Do complete network startup with CARE using the complete CARE onnet functions.

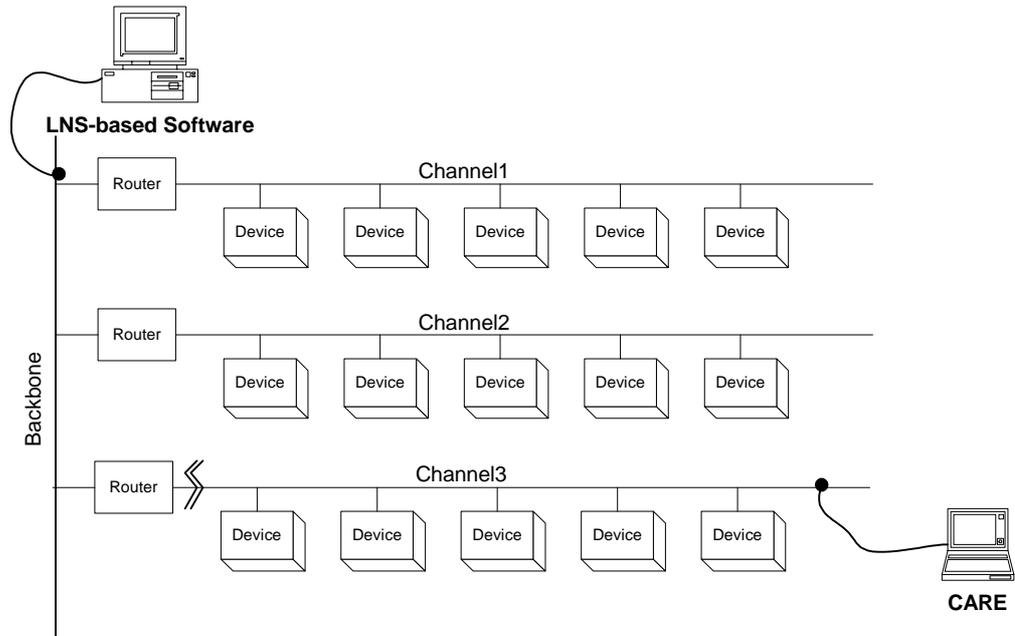


3. Disconnect CARE from the LON network by setting it Offnet.
4. Connect the PC with the LNS-based software, e.g. EBI, physically to the backbone and open the LNS network.
5. In CARE (Extended LNS Options), make the backbone channel to the LNS NI channel.
6. Synchronize the LNS network with the CARE network.



### Adding a Channel

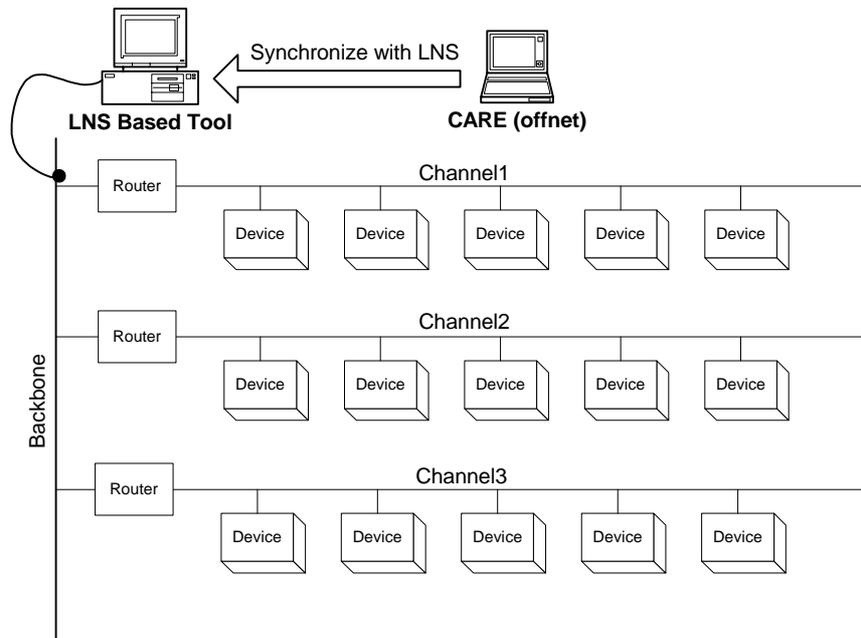
If a new channel should be added, it must be engineered offnet with CARE.



1. Engineer the new channel in CARE.
2. Connect CARE PC physically to the new channel.
3. In CARE, make the new channel to the "sandbox" channel.
4. Do the complete startup of this channel with full onnet functionality of CARE.

**NOTE:** Bindings between new channel(s) and existing channels that had been synchronized will not work during this start-up.

5. Disconnect the CARE PC from the LON network by setting it offnet.
6. Release the sandbox channel.
7. Synchronize the LNS network with the CARE network.
8. Integrate the new channel into the LNS-based software.



## Download Firmware

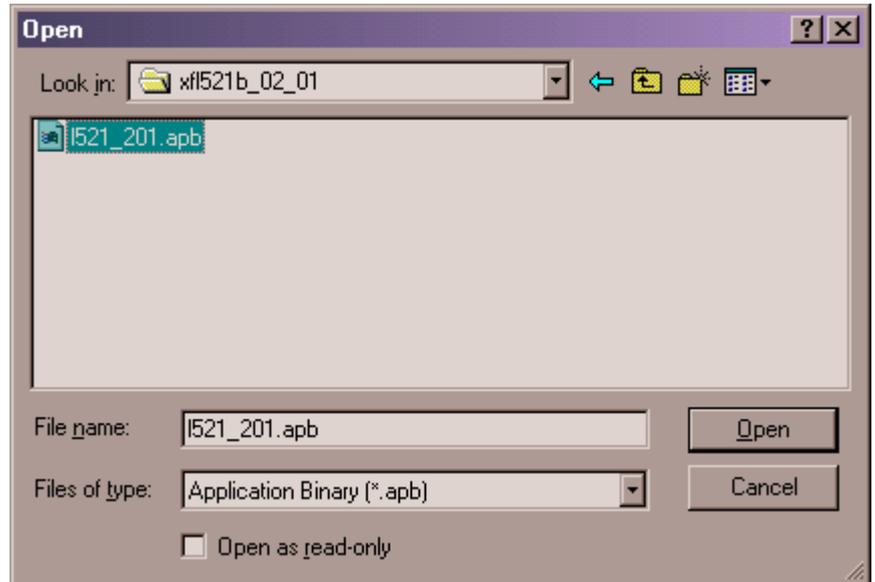
**Prerequisites** The device must be commissioned (see Commission Device(s) section) and you have to be onnet (see Go Onnet section).

**NOTE:** Only .APB files can be downloaded and downloading is only possible, if the existing program ID, the chip version and the firmware version match the application file to be downloaded. If not, error messages occur, for example:



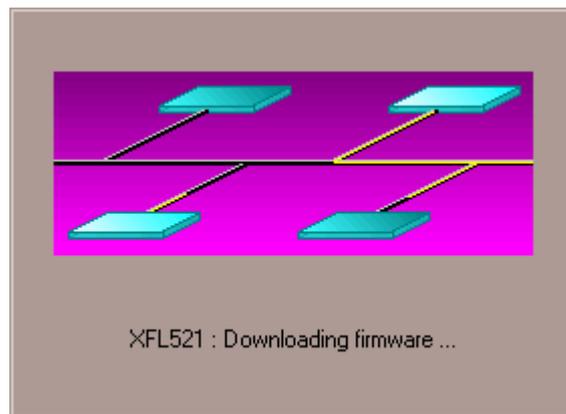
- Procedure**
1. In the tree, click on the device, you want to download an application to.
  2. Click right mouse key, and with left mouse key click on Firmware Download.

**RESULT:** The Open dialog box displays.



3. Browse to folder and select desired application file.
4. Click Open button.

RESULT: CARE starts downloading firmware.



The process window disappears when download is finished and the device gets white-colored in the network tree.

## Download Application Remotely (Excel Online Remote)

**Purpose** To download and start an application remotely. In addition, status information and values can be viewed. The application will be downloaded from the CARE PC to the Remote PC (EBI, SymmetrE) which is connected to the controller.

**Prerequisites** To enable the remote download function (Excel Online Remote), the following prerequisites must be fulfilled:

- The application must be translated and loaded into the controller
- LAN connection between CARE PC and Remote PC must be working
- Remote PC must have access to the controller via e.g. XPC500, BNA, LON, etc.
- Server on Remote PC must be running
- Excel 500 point server service (C-Bus driver service) must be running on the Remote PC. In general, the service is running as soon as EBI has been started. For information on the Cbus address, see Procedure.

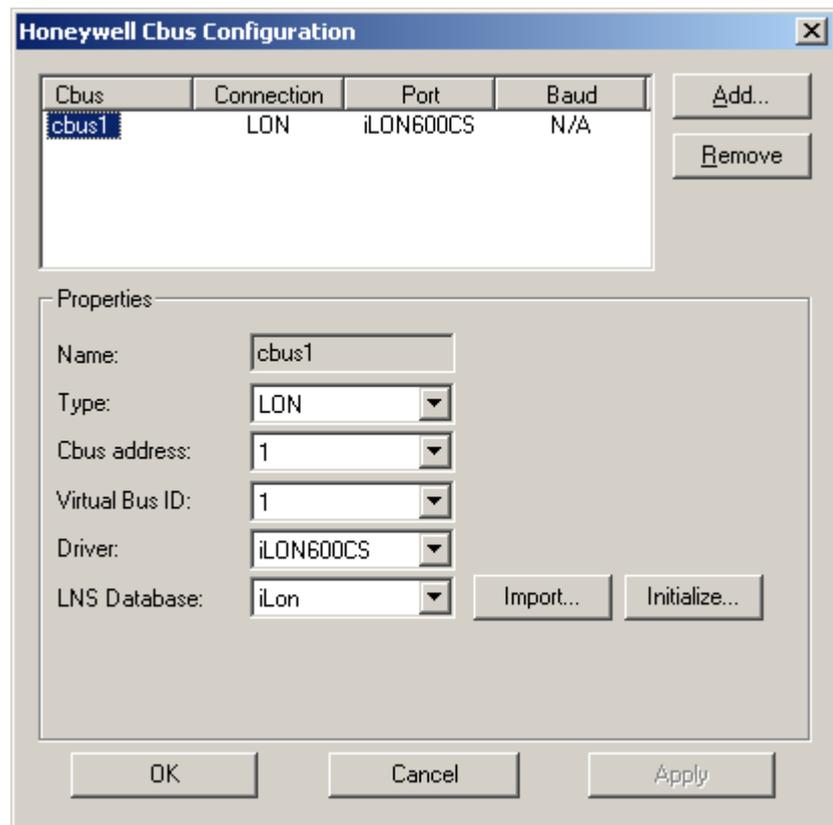
### Access Principle of Excel Online Remote

After the LAN connection between CARE PC and remote PC is established, a service of the Remote PC is used to access the XL5000 controller. Starting Excel Online Remote is independent on the connection (interface) type (XPC500, BNA, LON, etc.). As soon as the controller and datapoint online changes can be seen on the Remote PC, Excel Online Remote can be started.

### Procedure (Remote PC)

1. In the Windows Control Panel, double-click the CBUS  icon.

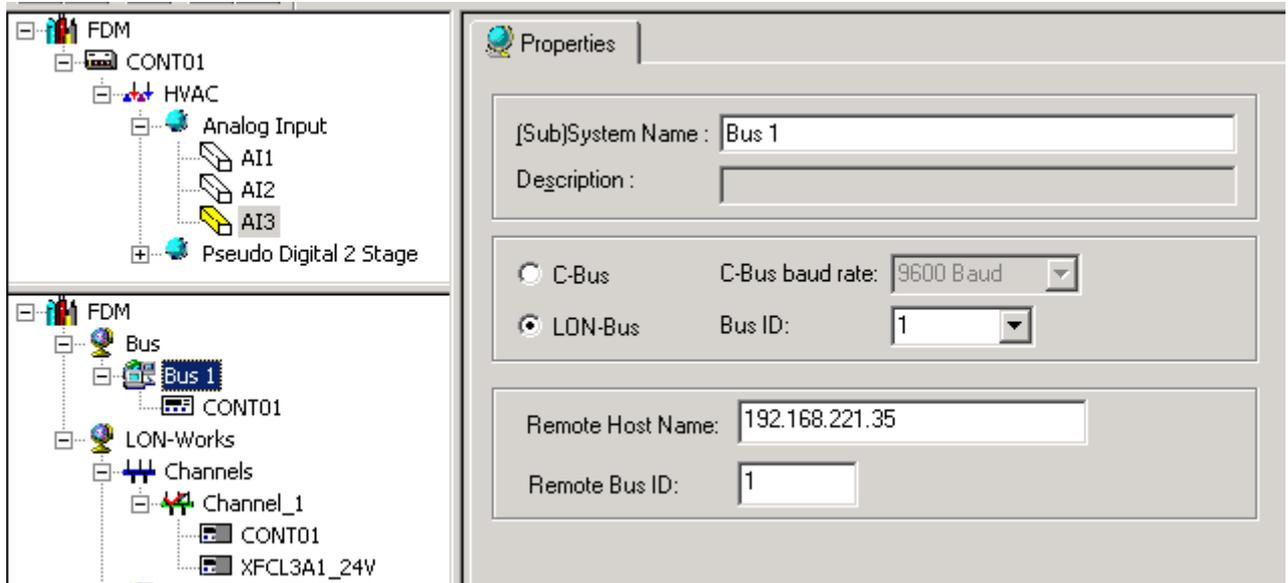
RESULT: The Honeywell Cbus Configuration dialog box displays.



2. To create a connection, click the **Add** button. A connection is inserted named cbus1 in the Cbus column. When adding further connections, the names are consecutively numbered as cbus2, cbus3, etc. The Cbus entry represents the remote Cbus ID, e.g. for cbus1 the remote bus ID is 1, and so on. This remote bus ID is needed in CARE for providing a proper remote download.

3. Click on the entry in the Cbus column and select the connection from the Type drop-down listbox, e.g. LON.
4. If a LON connection is selected, click the Initialize button to initialize the LNS database.
5. Click the **OK** button.
6. Expand the network tree, and click on the subsystem of the C-bus network, which includes the controller.

**Procedure (CARE PC)**



7. On the Properties tab on the right, select the connection, C-Bus or LON-bus.
8. In the Remote Host Name field, enter the host name or the IP address of the remote PC.
9. In the Remote Bus ID field, enter the remote bus ID (see Step 2).
10. Translate the controller if not already done.
11. Translate the controller if not already done.
12. In the physical LON bus part of the network tree, click on the controller.



13. In the CARE toolbar, click the  icon.

RESULT: Excel Online Remote is started.

14. Download the controller as described in the ONLINE SERVICE AND COMMISSIONING section.

**Restrictions**

MMI Emulation and all related functions do not work. Alarms are received but the alarm buffer cannot be uploaded. Firmware cannot be downloaded.

**Keep Device Configuration**

**Purpose** To avoid impermissible or unintentional overwritings of actual device configurations, the configuration of each device can optionally be kept. The actual configuration of the device cannot be overwritten as long as the parameters have not been uploaded from the device.

After the parameters have been uploaded, the configuration can be overwritten by usage of one of the following functions:

- Plug-In online or offline
- Commissioning
- Synchronization with LNS.

The Keep Device Configuration property can be assigned to the LON device in the network tree as well as in the device library. When setting the property for a device in the device library, each imported device out of the library will have it automatically checked as it was added to the network tree/terminal assignment tab.

**IMPORTANT**

*When upgrading a project created with a CARE version lower than 5.0, CARE automatically sets the property of any device to not “Keep Device Configuration” and assumes that the parameters are already uploaded. If the upgraded project includes physically pre-configured devices such VAV 2 it is strongly recommended to check the property of the device(s) to “Keep Device Configuration”, or to upload the parameters prior to using any of the above-mentioned functions in order to change a device’s configuration.*

**Plug-In Online and Plug-In Offline Behavior**

In case the Keep Device Configuration property is checked for a single device, the plug-in cannot be invoked from within the device as long as the parameters have not been uploaded.

**Commissioning Behavior**

In case the Keep Device Configuration property is checked for a single device, commissioning cannot be done for a single device as long as the parameters have not been uploaded. Unexported devices will be shown in a list.

**Synchronize to LNS Behavior**

In case the Keep Device Configuration property is checked for a single device, Synchronize with LNS is possible but the corresponding device will not be exported/synchronized as long as the parameters have not been uploaded. A system/subsystem can be commissioned whereas only the devices which have the Keep Device Configuration property not assigned will be commissioned and the uncommissioned devices will be shown in a list.

**Procedure**

1. In the logical LON part of the network tree, click on the device.
2. On the Properties pane on the right, check the Keep Device Configuration checkbox.

The screenshot displays a software interface for configuring a LONWORKS network device. On the left is a tree view showing the project structure: Montreal > Bus > LON-Works > Channels > Default System > Default System > CTL01 > XFL521 Analog Input. The right side is a 'Properties' panel titled 'Terminal Assignment for Controller: XFL521 Analog Input'. It contains several fields: Device Name (XFL521 Analog Input), Device Path (/LON-works/Default System/Default System/), Description (empty), Node Selfdoc String (XAI2\_2\_02), Ping Interval (1 minute), and Commission State (updates pending). Below these are sections for Program ID (80000C050103040E), Location (ASCII), Channel (Channel\_1), Neuron Id (000000000002), Subnet/Node (1/3), and Online State (offline). At the bottom, there is a summary table and a checkbox for 'Keep Device Configuration'.

Address Table:	1 / 15
Alias NVs:	0 / 0
Connections:	1

Keep Device Configuration

For the procedure in the Device Library please refer to the Create LON Device section under Device Library.



# ONLINE SERVICE AND COMMISSIONING



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## ONLINE SERVICE AND COMMISSIONING

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### Overview

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XL Online provides the following commissioning and service functions online:

- Changing datapoint values
- Viewing datapoints in a watch list
- Setting parameters
- Monitoring z and x/y registers
- Set RACL cycle time
- Start/stop application
- Editing time programs
- Set system clock
- Saving and erasing application in the Flash EPROM
- Point trending
- Up-/downloading controller application
- Changing controller number and viewing bus configuration
- Downloading firmware
- Download Application Remotely
- Viewing alarms
- Repair *PRA* file

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### Getting started

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To perform online commissioning and service functions, the following steps have to be done before:

- Physically connect to the controller
- Get the controller files on digital media (CD, floppy disk) and/or translate the controller in CARE (only if a download is necessary)

---

### Physically Connect to Controller

<b>Purpose</b>	Physically connect controller to Personal Computer (PC).
<b>Requirements</b>	The PC must be within 49 ft. (15m) of the controller. At greater distances (up to 3281 ft. [1000m]), you must add a line driver.  Use a XW585 Connection Cable.
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. Insert plug on the XW585 connection cable into the socket on the front of the controller computer module.</li> <li>2. Insert the other plug on the XW585 connection cable to the serial interface socket on the back of the PC (COM 1 or COM 2).</li> <li>3. Power on the PC.</li> <li>4. Start XL Online as described in the "Start XL Online" section.</li> </ol>

---

### Start XL Online

---

#### Start separately

- Procedure**
1. If XL Online has been ordered and registered separately, click on XL Online icon  in the Windows **Start** menu.

RESULT: If XL Online has not been registered yet, the *Registration* dialog box displays.

2. Register XL Online as described in the "Registering the first Time" section.

RESULT: The *XL Online* main window displays. Software tries to connect to the port according to the settings defined in the *XL Online Options* dialog box (see "Port Settings" section).

If no controller is connected to the port or software cannot connect to the controller due to wrong port settings, the XI 581/2 MMI is gray and the status message "No connection" is displayed.

If the connection is completed, the MMI is displayed in blue. If no text is displayed, click on another tab or click the ESC button on the MMI emulation.

3. Continue with step 3 of the "Start from within CARE procedure".

### Start from within CARE

#### Procedure

1. If XL Online has been registered within a CARE license, select the controller in the logical plant tree in CARE.

2. Click menu item **Controller**, then submenu items **Tools** and **XL Online**.

RESULT: The *XL Online* main window displays. Software tries to connect to the port according to the settings defined in the *XL Online Options* dialog box (see "Port Settings" section).

If no controller is connected to the port or software cannot connect to the controller due to wrong port settings, the XI 581/2 MMI is gray and the status message 'No connection' is displayed.

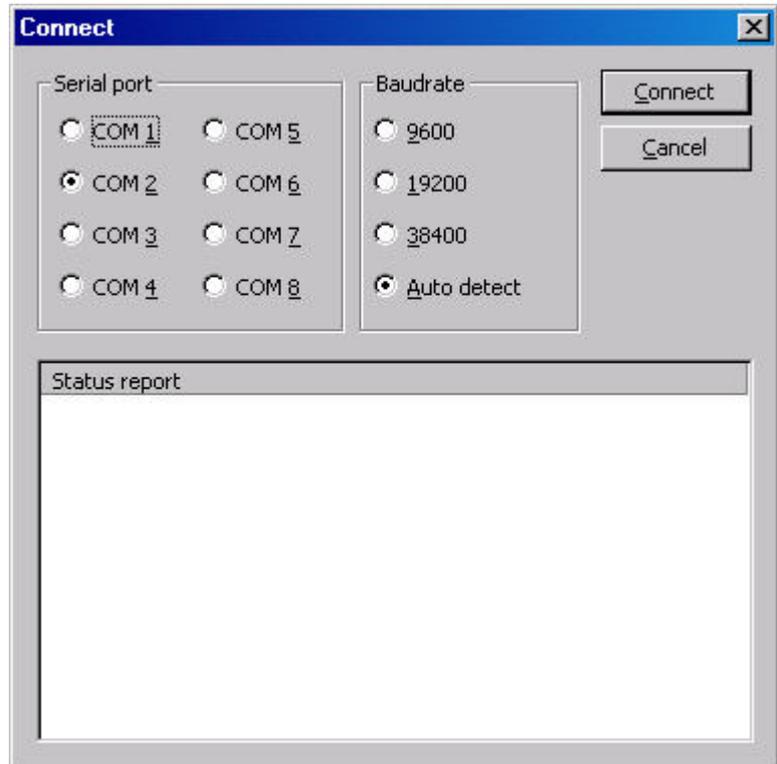
If the connection is completed, the MMI is displayed in blue. If no text is displayed, click on another tab and back or click the ESC button on the MMI emulation.

3. If 'no connection' is displayed in the status line, connect the controller to the port as follows:

4. Click menu item **File**, then submenu item **Connection**.

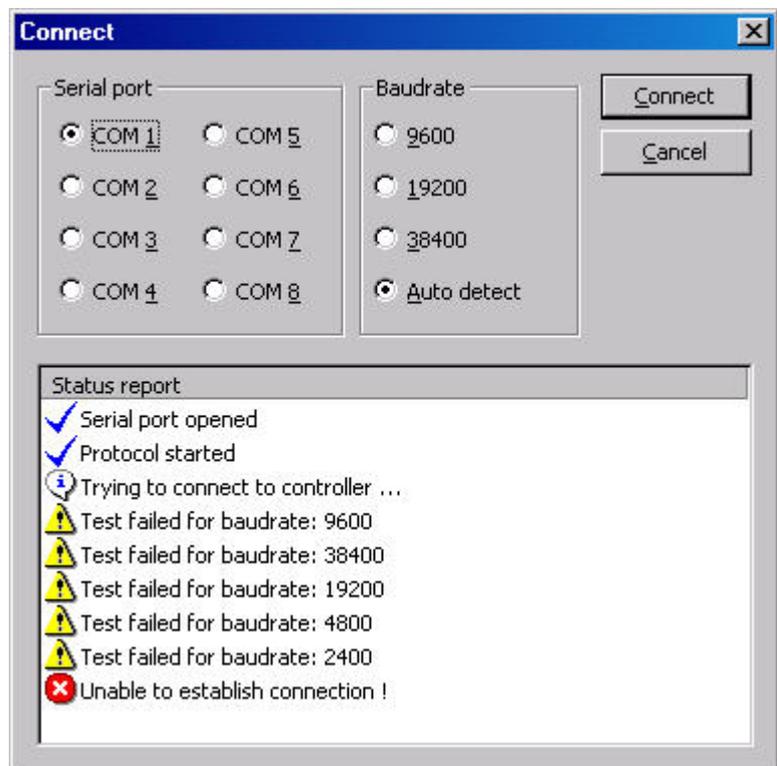
Or, click on the *Change serial port settings* icon  on the button bar.

RESULT: The *Connect* dialog box displays.

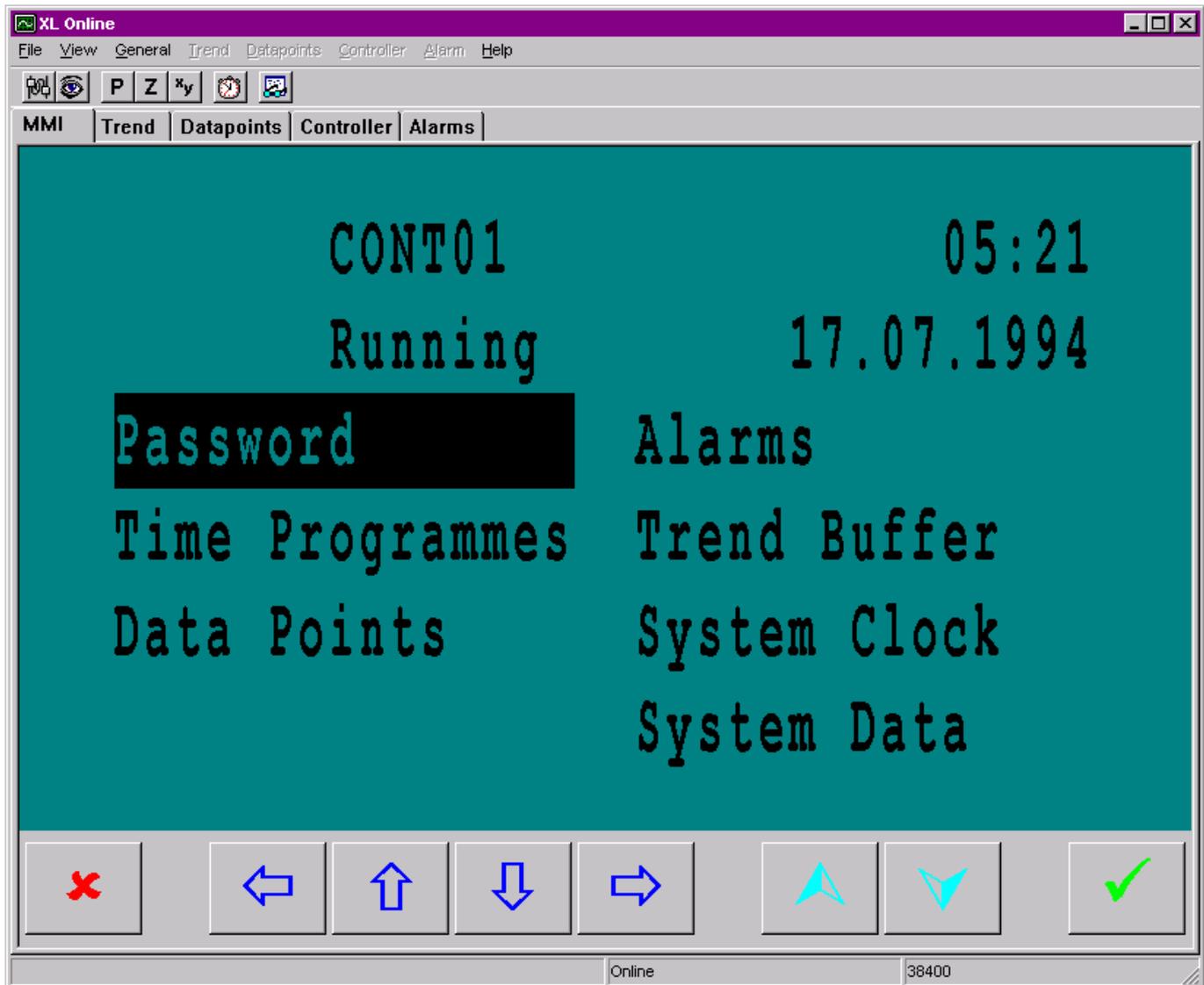


5. Select the **serial port** and the **baud rate** by clicking the corresponding radio buttons. Select **Auto detect**, if you do not know the baud rate (default setting).
6. Click the **Connect** button.

RESULT: If the connection could not be completed, the following status report is displayed.



RESULT: If the connection could be completed, the MMI is displayed in blue.  
 If no text is displayed, click on another tab and back or click the ESC button on the MMI emulation.



7. Click the *Controller* tab.

RESULT: Controller status information is listed.

The screenshot shows the 'XL Online' software window with the 'Controller' tab selected. The main display area contains a table of controller parameters and their values. The status bar at the bottom indicates the controller is 'Online' and the address is '38400'.

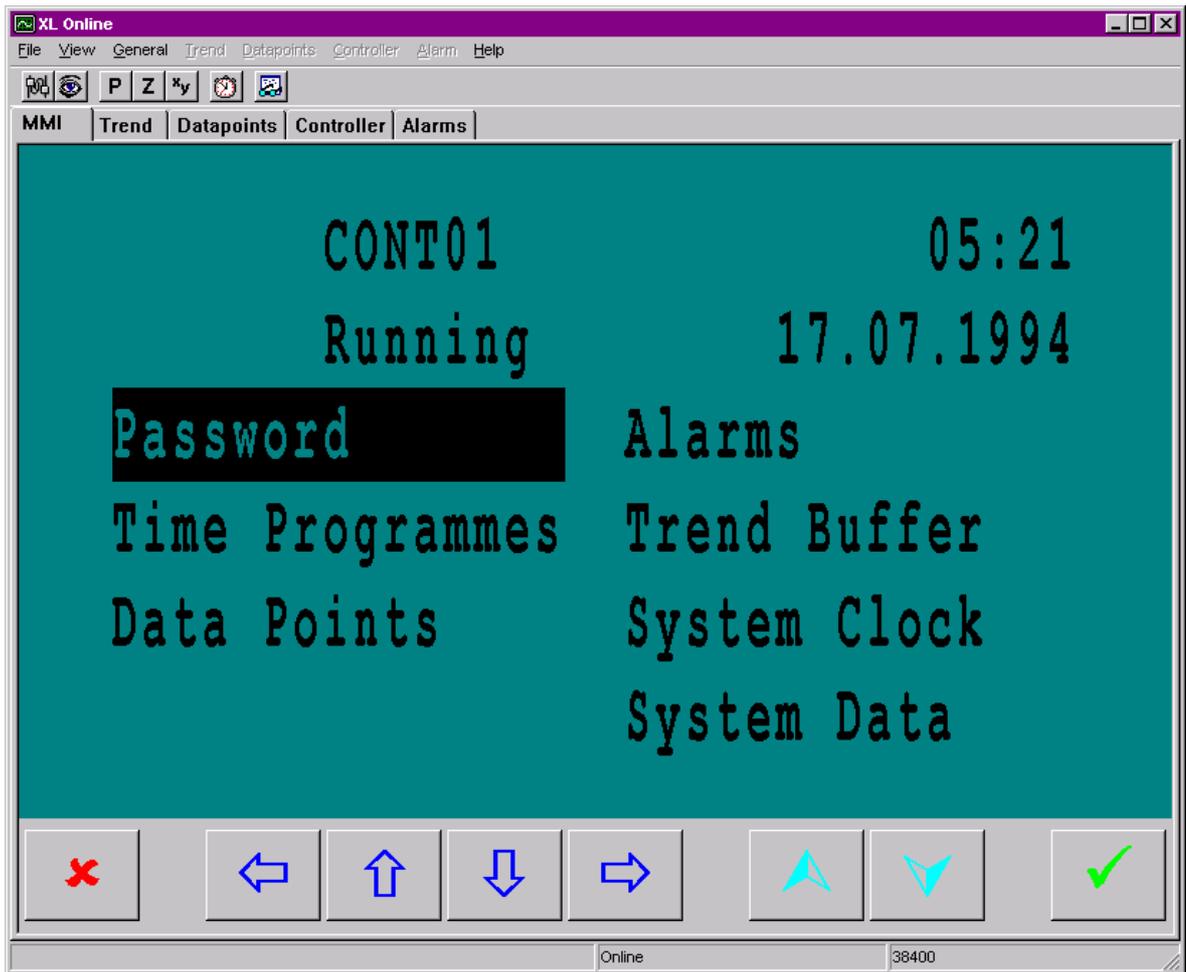
Description	Value
Controller name	CONT01
Program name	CONT01
Controller no.	22
Device type	XL500 - Version 2.04.94
Download time	16. July 94 - 13:54:01
Country code	Germany
--- Application status ---	
Application status	Running
AppPart: Common value	Running
AppPart: Field ID	Running
AppPart: Timeprogram	Running
AppPart: RACL	Running
AppPart: ASPECCD	Running
Logon status	Inactive
--- Application parts ---	
RACL application (ral)	3.1 - 192 Bytes
RACL Parameter (rap)	3.1 - 496 Bytes
RACL Z-Register (raz)	3.1 - 16 Bytes
RACL T-Register (rat)	3.1 - 16 Bytes
ASPECCD (adl)	3.1 - 20320 Bytes
Time program (zpg)	3.2 - 4416 Bytes
Datapoint description (ipl)	3.1 - 3632 Bytes
Descriptors (klx)	3.1 - 592 Bytes
Alarm text (alk)	3.1 - 2240 Bytes
State text (zsx)	3.1 - 464 Bytes
Engineering units (phx)	3.1 - 1024 Bytes
Characteristics (kdx)	3.1 - 512 Bytes
Configuration (kfx)	3.1 - 144 Bytes
Project (pra)	3.1 - 112 Bytes
NV Mapping table (ymp)	3.1 - 176 Bytes
NV Conversion (ycv)	3.1 - 48 Bytes
NV Configuration (ynv)	3.1 - 1504 Bytes

Online 38400

### 8. Check the information.

## The XL Online Main Window

The main window is designed as follows:



**Tabs** The main functions are provided on the following tabs:

**MMI**

Allows changing values in the controller via XI581/82 emulation

**Trend**

Allows trending datapoints

**Datapoints**

Allows changing datapoint attributes, writing them to the controller, and invoking a watch list for certain datapoints.

**Controller**

Displays controller information. Allows printing the controller information in HTML format. Allows up-/downloading a controller application, downloading firmware, changing the controller number, and viewing bus configuration.

**Alarms**

Displays critical and non-critical alarms

When selecting a tab, the corresponding menu is enabled in the menu bar providing the appropriate submenu items:

**Menus File**

Provides submenu items to:

- Connect to the controller including port and baud rate selection and detection
- Set default options for XL Online
- Repair *PRA* file
- Print controller information in HTML format
- Exit XL Online

**View**

Provides submenu items to:

- Enable/disable the bars display
- Select tabs
- Invoke watch list

**General**

Provides submenu items to:

- Set parameters, z and x/y register, RACL cycle time, system clock
- Start/stop the application in the controller
- Edit time programs
- Save and erase application in the Flash EPROM

**Trend**

Provides submenu items to:

- Perform trend sessions
- View and export records

**Datapoints**

Provides submenu items to:

- Write value changes to the controller
- Add points to a watch list
- Select/deselect points in manual mode

**Controller**

Provides submenu items to:

- Display controller information
- Up-/download controller
- Download firmware
- Change controller number and view bus configuration

**Alarms**

- Clear alarms

**Help**

- Invoke Online-Help
- Register XL Online
- Display About information

**Button Bar**

Depending on the current tab selection, the button bar provides the following functions:



Connect to the controller and change serial port settings for an online session.



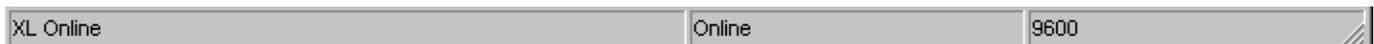
Detect baud rate of current serial port



Show/hide parameter dialog box

	Show/hide z-register dialog box
	Show/hide x/y-register dialog box
	Open time program editor
	Show/hide datapoint watch list
	Show/hide line info window
	Open new trend data file
	Open existing trend data file
	Select datapoints for trend recording
	Start/stop trend recording
	Reload datapoint list/Refresh controller info
	Add selected datapoints to watch list
	Upload controller application
	Download controller application

**Status Line** Displays port, current status, e.g. Online, baud rate = 9600 etc., or the current trend file.



## Exit XL Online

**Procedure** 1. Click menu item **File** then submenu item **Exit**, or click on default Windows *Close* icon at the top right corner.

**RESULT:** XL Online is closed.

## Procedures

## Define Default Settings

For the following default settings can be defined:

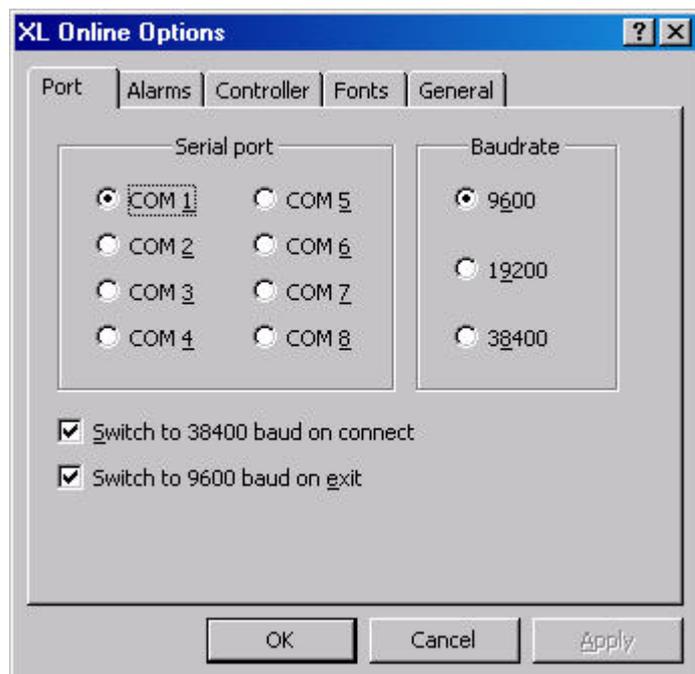
- Port
- Alarms
- Controller
- Font
- General

## Port Settings

**Purpose** Define default settings for the port and baud rate XL Online should use when starting it. After the start, XL Online searches automatically for the port and the baud rate defined in this dialog box. If the port configuration matches, the MMI displays. If the port configuration is different, the MMI remains gray and displays the status 'No connection` in the status line.

**Procedure** 1. Click menu item **File**, then submenu item **Options**.

RESULT: The *XL Online Options* dialog box is displayed.



2. Under **Serial port** and **Baudrate**, select desired port respectively baud rate which software should use as default connection settings.
3. To increase the download/upload speed after the connection has been completed, check the **Switch to 38400 baud on connect** check box, to increase the baud rate to 38400 baud.

NOTE: For an automatic baud rate switch, the controller OS must be 2.04 or higher.

4. Check the **Switch to 9600 baud on exit** check box, to reset the baud rate to 9600 baud when XL Online is closed.

NOTE: If the controller supports a baud rate of 38400 baud , it is recommended to check both, the Switch to 38400 baud on connect and the Switch to 9600 baud on exit option.

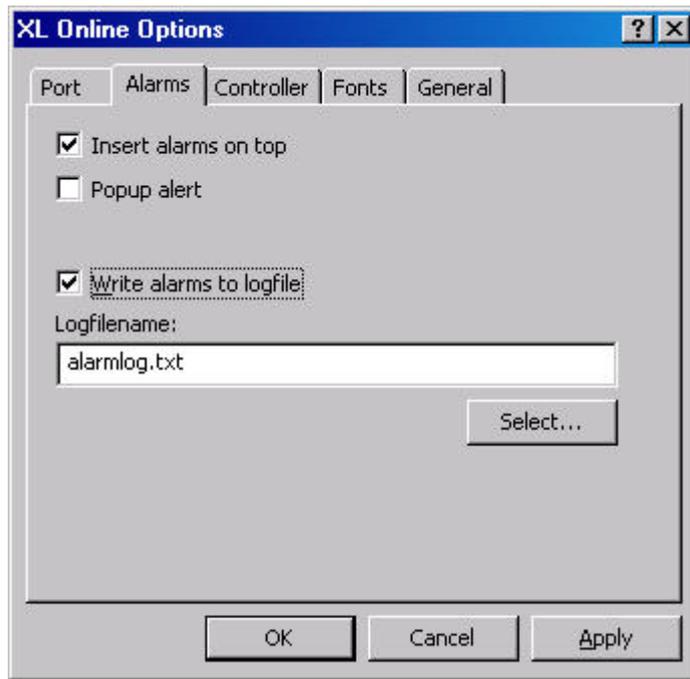
5. Click **OK** button to confirm settings.

**Alarm Settings**

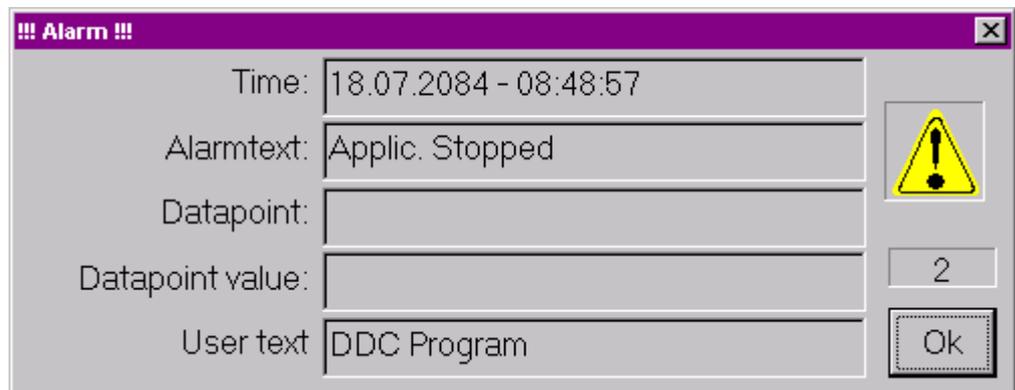
**Purpose** Define default settings for the alarm display.

- Procedure** 1. Click menu item **File**, then submenu item **Options**.

RESULT: The *XL Online Options* dialog box is displayed.



2. Click the *Alarms* tab.
3. To let the alarms be inserted at the top of the list on the *Alarm* tab, check the *Insert alarms on top* check box.
4. To let an additional popup alert display, check the **Popup alert** checkbox on the *Alarm* tab. The following popup alert will then display when new alarms arrive.



5. To let the alarms be saved into a log file, check the **Write alarms to log file** check box. The alarms will be saved into a *.TXT* file. The name of the file can be changed in the **Log file name** field and an existing file can be used by

clicking the **Select** button and selecting it. New alarms will be added continuously to the end of the log file.

6. Click **OK** to confirm settings.

### Controller Upload-/Download Settings

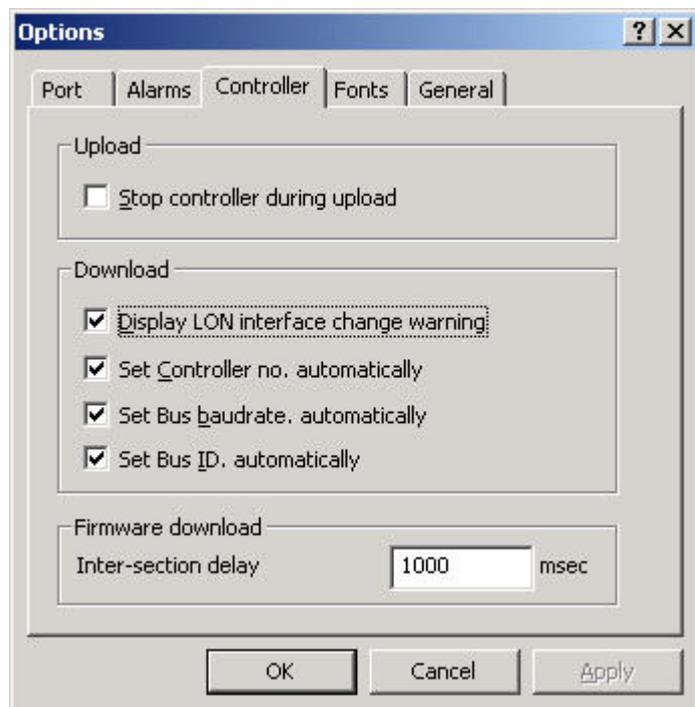
**Purpose** Set whether the controller should be stopped or not when uploading the application.

Set whether the settings of the controller number, bus baud rate and bus ID issued during engineering in CARE should be used when downloading an application. For detailed information on these items, please refer to the "LonWorks Network Engineering" section in the CARE User Guide EN2B-0182 (Europe) / 74-5587 (U.S) and the LonWorks Mechanisms Interface Description EN0B-0270.

In addition, the option whether a warning should be displayed or not when an application with a changed LON interface will be downloaded, can be set.

- Procedure**
1. Click menu item **File**, then submenu item **Options**.

RESULT: The *XL Online Options* dialog box is displayed.



2. Click the *Controller* tab.
3. Check one of the following options:

**Stop controller during upload**

Defines whether the application should be stopped during upload or not.

**Display LON interface change warning**

Defines whether warning messages are to be displayed or not in case a changed LON network interface will be downloaded.

Enabling the option is recommended when using controller OS lower than 2.06 and bindings might be deleted. Disabling the option is recommended when using controller OS 2.06 where any bindings will be kept even if the LON interface has been changed.

**Set Controller no. automatically**

Defines whether the controller number set in CARE should be used or not when downloading the application.

**Set Bus baudrate automatically**

Defines whether the C-bus baud rate set in CARE should be used or not when downloading the application.

**Set Bus ID automatically**

Defines whether the LON ID set in CARE should be used or not when downloading the application.

**Inter-section delay**

Defines a delay while burning the sections of the FLASH EPROM. Default is 1000 msec. The range is between 0 and 9999 msec. The time should be increased if the firmware download repeatedly stops on one and the same section.

7. Click **OK** button to confirm settings.

For further instructions, refer to the "What kind of application to download?" section.

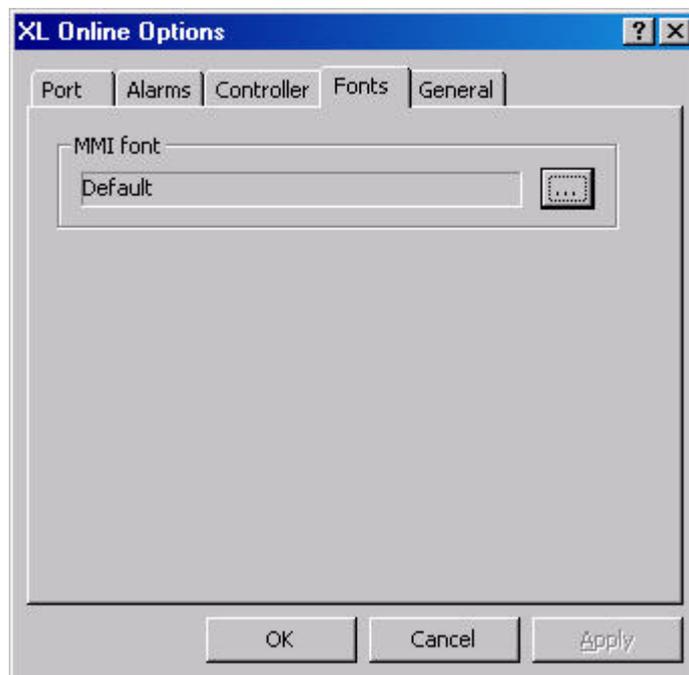
**Font Settings**

**Purpose** Define default settings for the MMI font display. Font modification can be used, for example, to match country specific (e.g. Japanese or Cyrillic) controller operating sequences with the MMI display and/or in case a notebook is used.

By default, XL Online uses a bold true type font with fixed width, indicated by 'Default' in the **MMI** field. Note, that 'Default' cannot be re-selected after another font had been selected. To get a font similar to the default font, it is recommended to select the 'Courier new' font as it is described in the procedure.

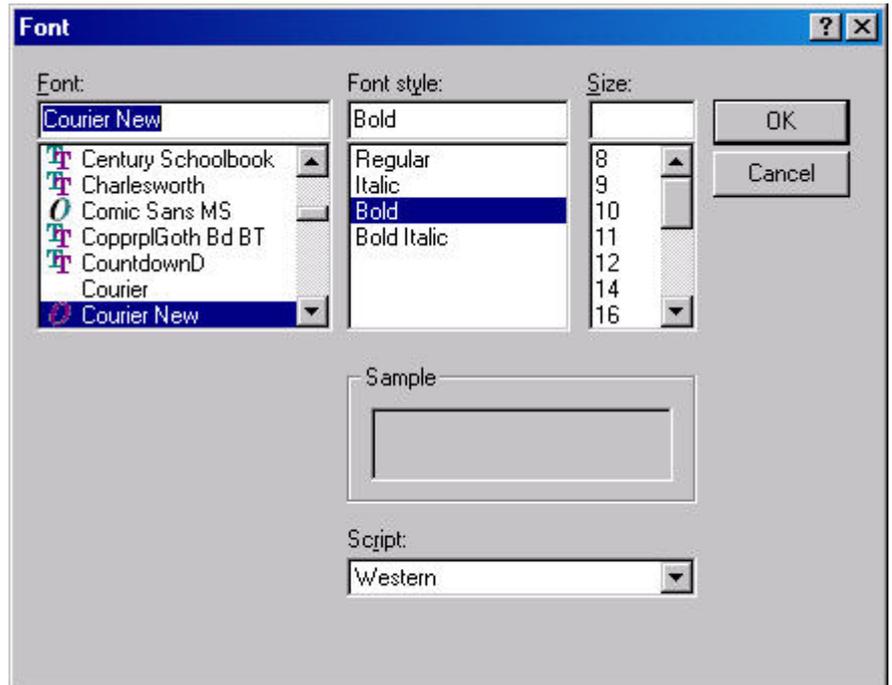
- Procedure**
1. Click menu item **File**, then submenu item **Options**.

RESULT: The *XL Online Options* dialog box is displayed.



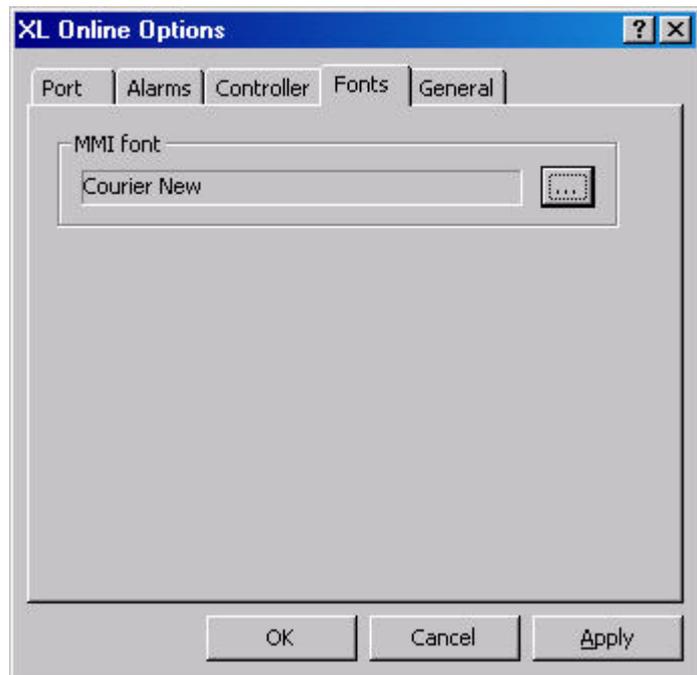
2. Click the *Fonts* tab.
3. To select another font than the "default font", click the  button.

RESULT: The *Font* dialog box is displayed.



4. Select the desired font (the font size is not relevant) and click **OK** button.

RESULT: The font is displayed in the **MMI** field on the *Fonts* tab.



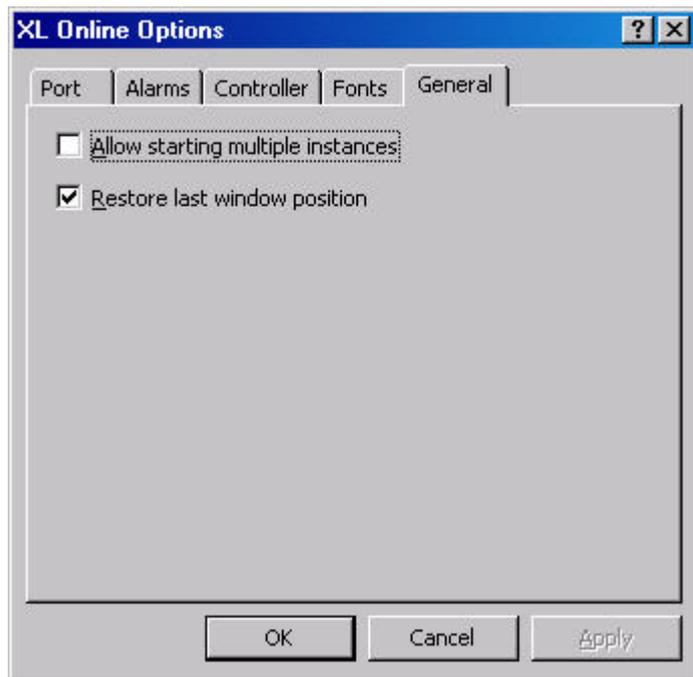
5. Click **OK** button to confirm settings.

**General XL Online Settings**

**Purpose** Define general settings for XL Online.

- Procedure** 1. Click menu item **File**, then submenu item **Options**.

RESULT: The *XL Online Options* dialog box is displayed.



2. Click the *General* tab.

3. Select options under:

**Allow starting multiple instances**

Defines whether XL Online can be opened in multiple instances or not. Multiple instances of XL Online can be used for example, to communicate with multiple controllers at the same time or to compare an old trend with a currently running trend.

**Restore last window position**

Defines whether XL Online should be opened with the last window position and size on the desktop. When unchecked, XL Online opens with the default position and size.

4. Confirm settings by clicking **OK** button.

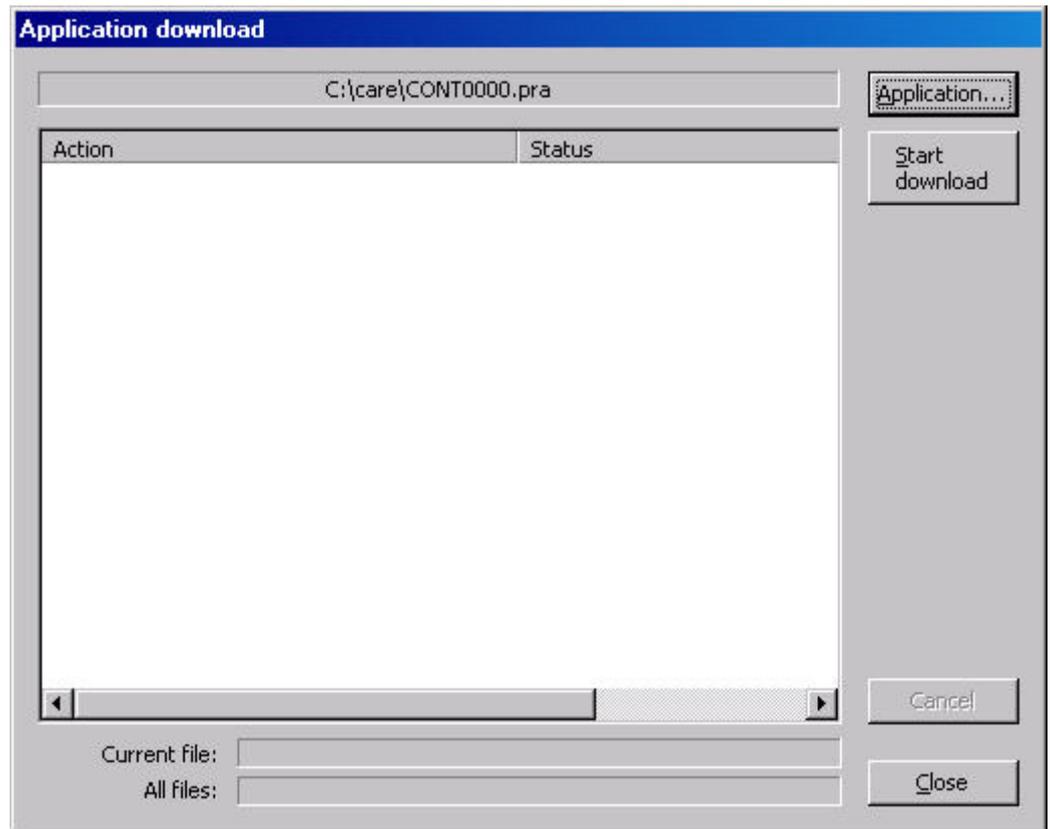
## Download Controller

**Purpose** Copy translated files to a controller (step 2 of commissioning procedure).

NOTE: Make sure that the controller number in CARE and in the MMI is the same. If they are different, set them equal either in CARE or in the MMI or by **Set controller no.** command (see "Set Controller Number" section). For operating instructions of the MMI refer to the XI581/2 Operator Terminal Manual.

- Procedure**
1. Physically connect to controller as described in the "Connect to Controller" section.
  2. Start XL Online as described under the "Start XL Online section".
  3. Click menu item **Controller**, then submenu item **Download** or,  
click on *Download to Controller* icon  on the toolbar.

RESULT: The *Application download* dialog box displays.

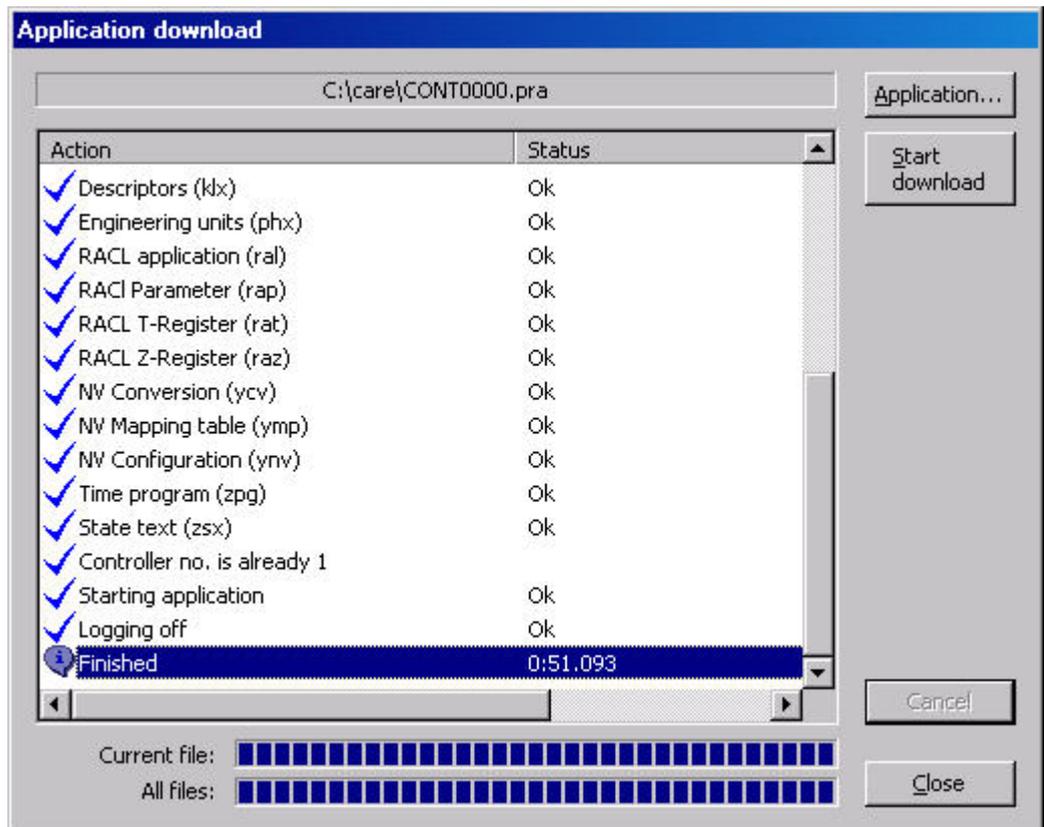
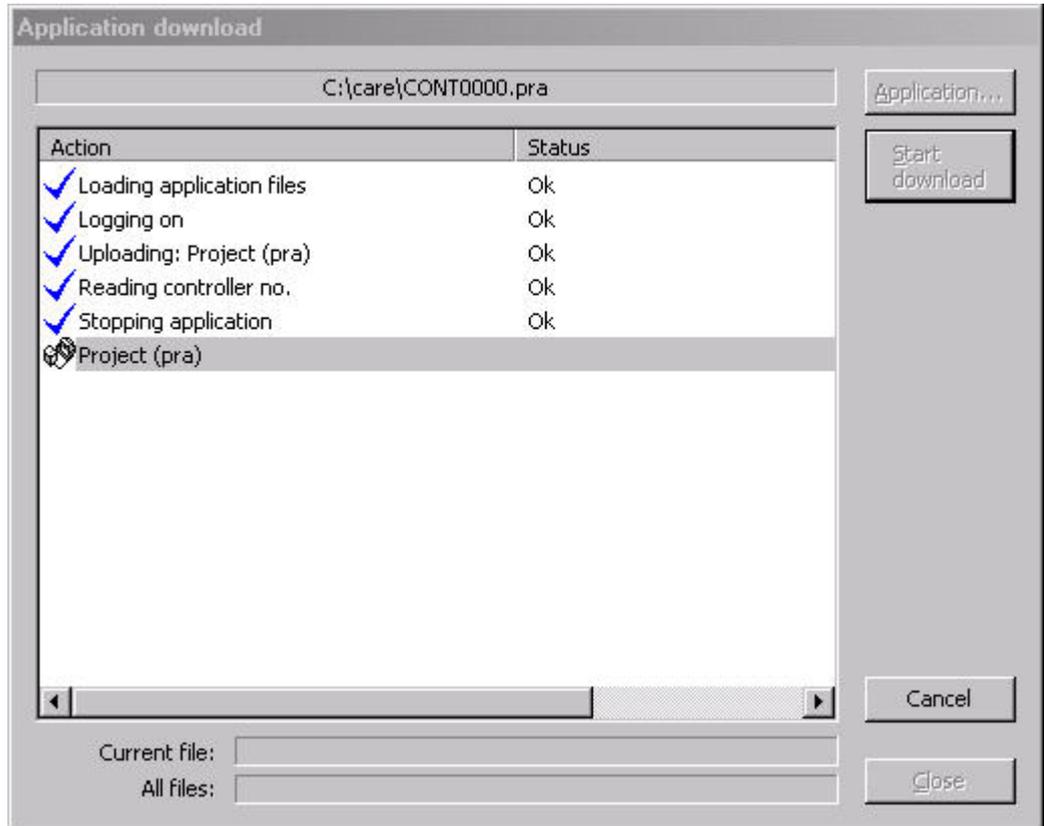


RESULT: At the top, the path of the previously downloaded application is displayed.

4. If you want to download a new application, click **Application** button and select the desired application (.PRA file).
5. Click **Start download** button if you want to download the previously downloaded application or the new application.

RESULT: Depending on the kind of application you want to download, different messages can appear (see "What kind of Application to Download" section).

The download starts. Action and status messages will be listed while the download proceeds.



6. Click the **Close** button when the download is finished.

RESULT: Eventually alarms are generated as indicated by the flashing *Alarm* icon on the *Alarms* tab.

- Click the *Alarms* tab, check the messages and perform appropriate troubleshooting procedures if necessary.

### What Kind of Application to Download?

When using controller OS 2.06 for binding LON devices, the bindings will be kept when downloading an application with a changed LON network interface.

When using controller OS lower than 2.06 in combination with a separate LON tool for creating the bindings, different messages will occur when downloading a changed interface. In XL Online, it is possible to enable/disable the display of the corresponding warning messages generally.

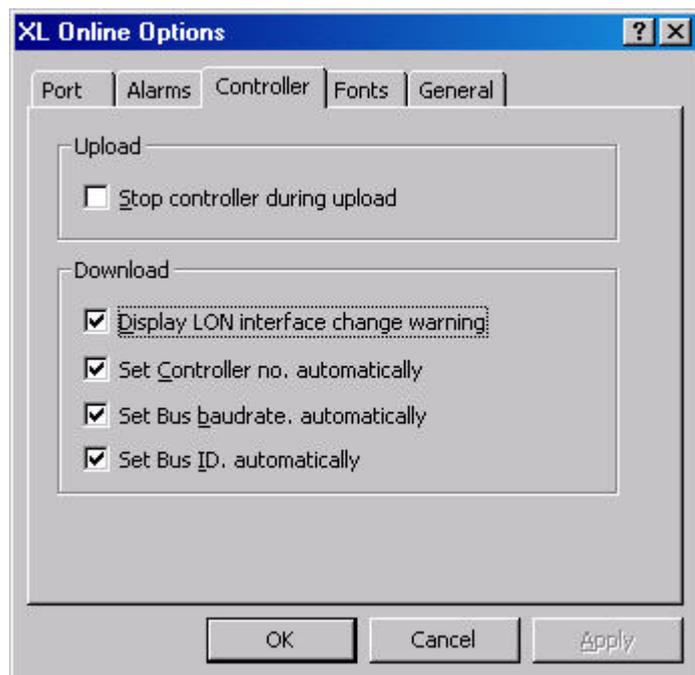
#### Enable/Disable LON Interface Change Warning

In XL Online, click menu item **File**, then submenu item **Options** to open the *XL Online Options* dialog box.

Click *Controller* tab.

Check the **Display LON interface change warning** check box if you want to get the warning messages in case a changed LON network interface will be downloaded. Enabling the option is recommended when using controller OS lower than 2.06 and bindings might be deleted.

Uncheck the **Display LON interface change warning** check box if warning messages should not be displayed when downloading a changed LON network interface. Disabling the option is recommended when using controller OS 2.06 where any bindings will be kept even if the LON interface has been changed.



**LON Interface Change Warning Enabled** As CARE allows the creation of LON applications, it has to be considered, whether the application you want to download is a LON application having a LON network interface or whether it is a "normal" application without a LON network interface. CARE allows the partial download of a LON application, where changes had been made to the CARE application itself, with keeping an unchanged LON network interface.

### IMPORTANT

*It is of high importance to know what kind of application you want to download and what kind of application is currently running in the controller, since CARE allows the choice of keeping or eliminating the bindings.*

*Although CARE compares the controller application and the application to be downloaded regarding the LON network interface, you should also know, whether the LON network interface and/or the CARE application had been changed or not.*

The following table summarizes the different possibilities when downloading "normal" applications and LON applications:

<b>Download of Normal Application without LON Network Interface</b>	
<b>Controller</b>	<b>CARE</b>
No application in controller	Download without response
Normal application in controller	Download without response
LON application in controller	Download with response asking: <i>The LON interface of this application has changed. If you download now, your existing bindings will get lost.</i> When confirming with <b>OK</b> , the bindings will get lost and need to be re-done with a LON tool. The (modified) CARE application will be downloaded. When canceling the download, the bindings will be kept and the CARE application will not be downloaded.
<b>Download of LON Application</b>	
<b>Controller</b>	<b>CARE</b>
No application in controller	Download without response
Normal application in controller	Download without response
LON application in controller	Download with response. Message depends on, whether the network interface was changed or not. <b>If Network interface had been changed:</b> <i>The LON interface of this application has changed. If you download now, your existing bindings will get lost.</i> When confirming with <b>OK</b> , the bindings will get lost. The (modified) CARE application will be downloaded. When canceling the download the bindings will be kept. The CARE application will not be downloaded. <b>If LON interface had not been changed:</b> <i>Do you want to keep existing NV bindings. If you select NO, then all bindings will get lost.</i> When confirming with <b>OK</b> , the bindings will be kept. The (modified) CARE application will be downloaded (partial download). When confirming with <b>NO</b> , the bindings will get lost and need to be re-done with a LON tool. The (modified) CARE application will be downloaded. When canceling the download the bindings will be kept. The CARE application will not be downloaded.

**Upload Controller**

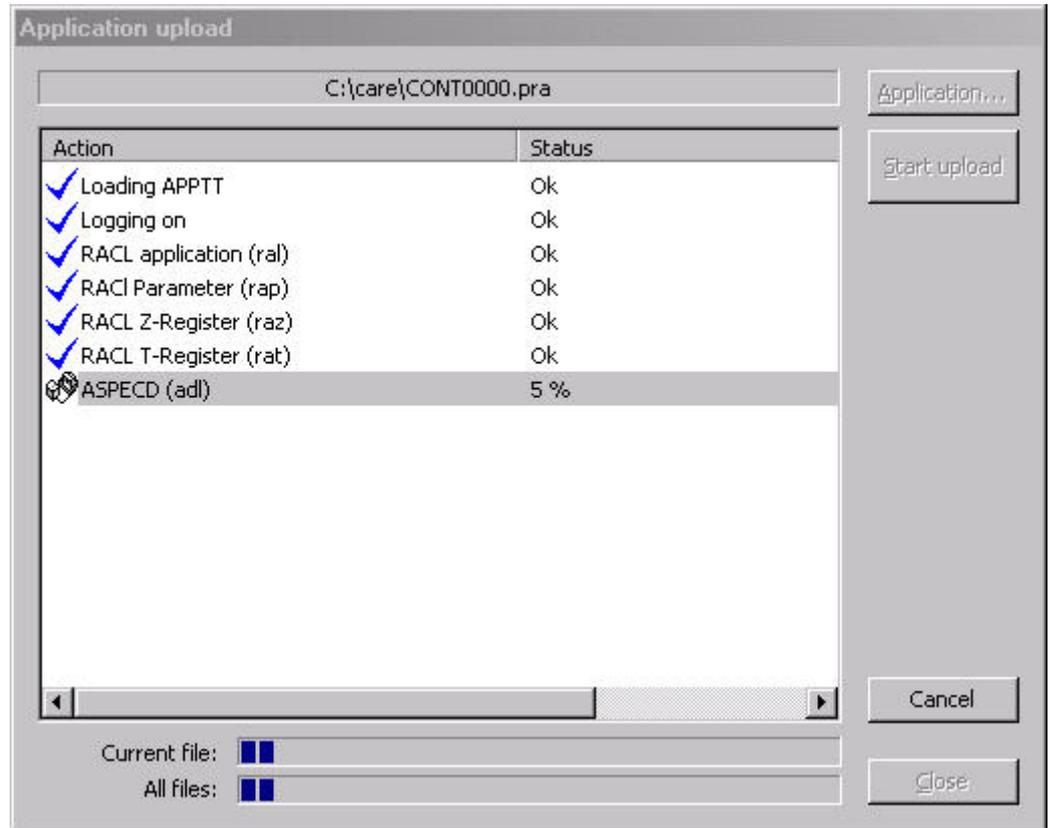
Check **Upload** setting in the *XL Online Options* dialog box (see " Controller Upload-/Download Settings" section).

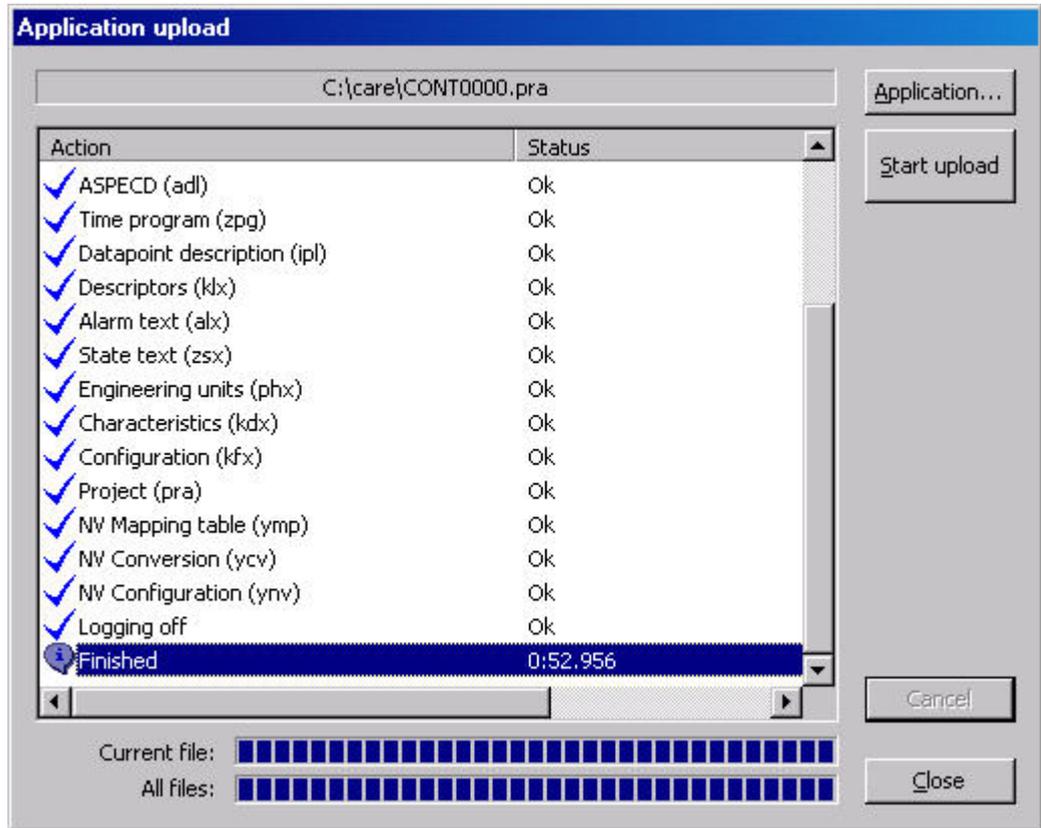
1. If not already connected to the controller, follow steps 1 to 10 of the Download Controller procedure.
2. Click menu item **Controller**, then submenu item **Upload**

or,

click on *Upload from Controller* icon  on the toolbar.

RESULT: The upload starts. Action and status messages will be listed while the upload proceeds.





3. Click the **Close** button to finish the Upload.

**Detect Baud rate**

**Purpose** Scan for baud rate of the port where the controller is connected. This function can be used if the connection to the controller is completed after XL Online has been started, but the baud rate does not match.

**Procedure** 1. Click menu item **File**, then submenu item **Detect Baudrate**.

or,  
click on *Detect baudrate for current serial port* icon  on the toolbar.

**RESULT:** Software scans for baud rates and autodetects the baud rate that matches to the baud rate of the controller.

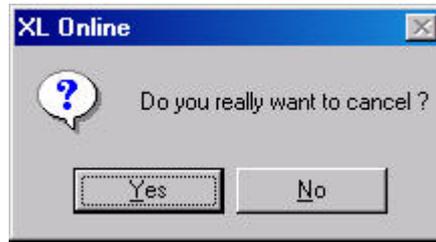
**NOTE:** While detecting the baud rate, the 'Wait cursor' symbol appears and no actions are possible.

**Cancel Up- / Download**

**Purpose** To correctly finish the up- or download, if for example, the communication was interrupted during the process or, if you want to definitely cancel the up- or download.

**Procedure** 1. In the *Download application* or *Upload application* dialog box, click the *Cancel* button.

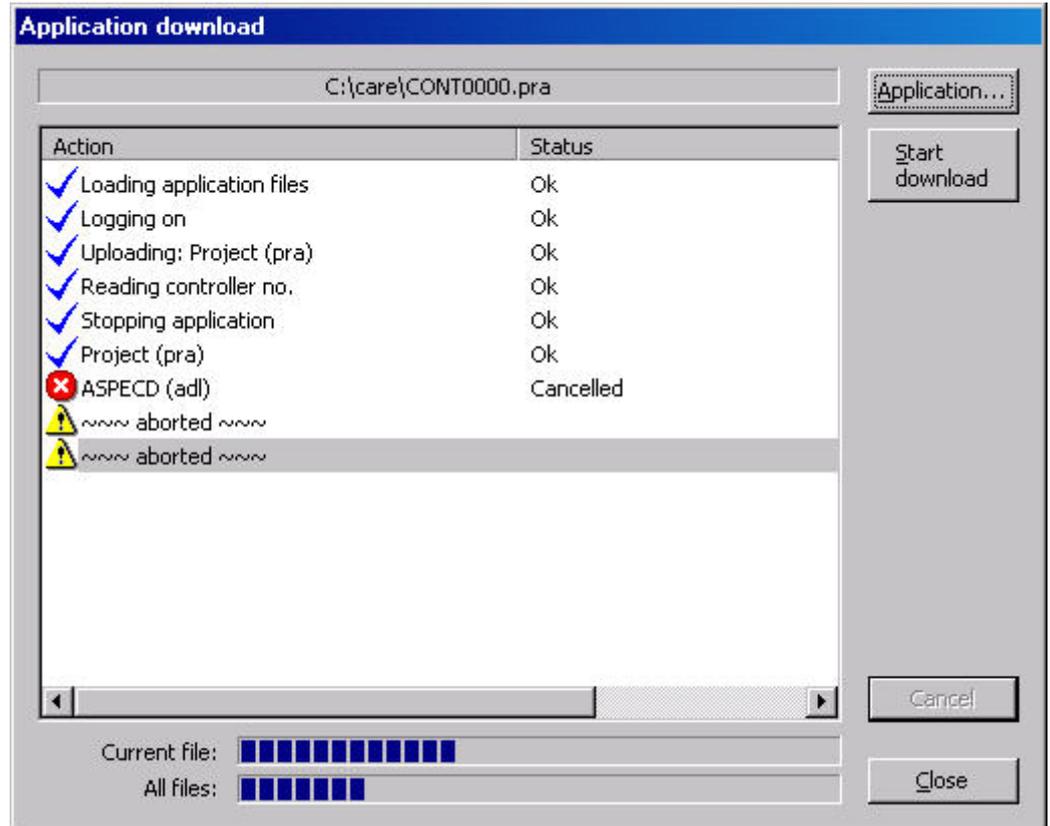
**RESULT:** A message is displayed asking, if you really want to cancel the up- or download.



RESULT: The current up- or download process is cancelled.

2. Click **Yes** button to cancel.

RESULT: The current up- or download process is cancelled.



**Repair PRA File**

**Purpose** To repair a corrupted *PRA* file. The repaired *PRA* file can then be used for proper download.

- Procedure**
1. Click menu item **File**, then submenu items **Support** and **Repair PRA file**.

RESULT: The *Repair PRA file* dialog box displays.

- Open the corrupted *PRA* file by clicking the **Open** button and selecting it in the *Open* dialog box.

RESULT: The *PRA* file data is displayed.

**IMPORTANT**

*Check the data and make sure that they are correct by entering/selecting the appropriate settings.*

- Normally controller and program name are the same. To change the program name use check **Program name** checkbox and change program name.
- The **Sequence** value is typically '0'.
- For all controller OS's lower than 2.04, select '1.00.xx ... 1.01.xx' from the **Controller OS** drop-down listbox.
- Save the *PRA* file by clicking the **Save** button and saving it in the *Save as* dialog box.

RESULT: The *PRA* file is repaired.

- Click **Close** button.

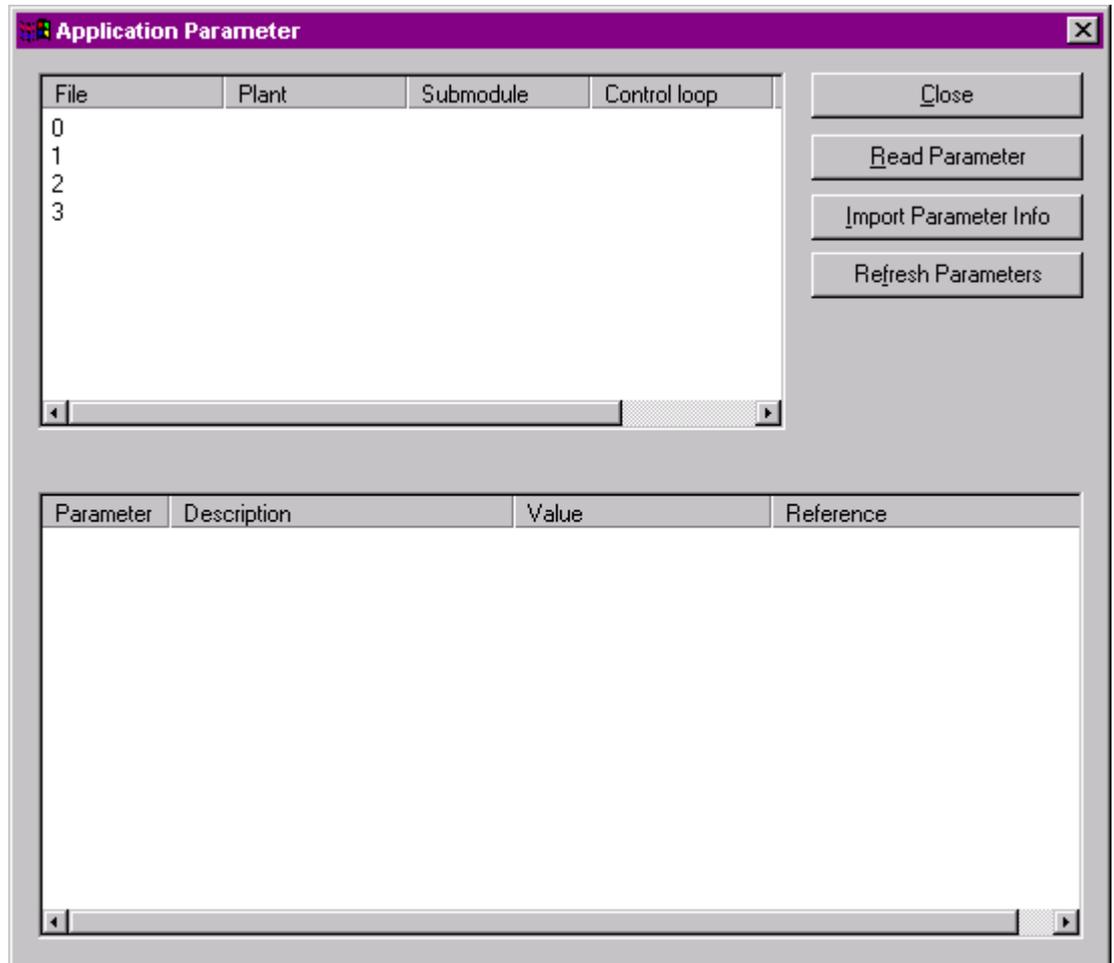
## View/Change Application Parameters

**Purpose** To view and/or change parameters of the controller parameter file (.RAP).

**Procedure** 1. Click menu item **General**, then submenu items **Application** and **Parameter**.

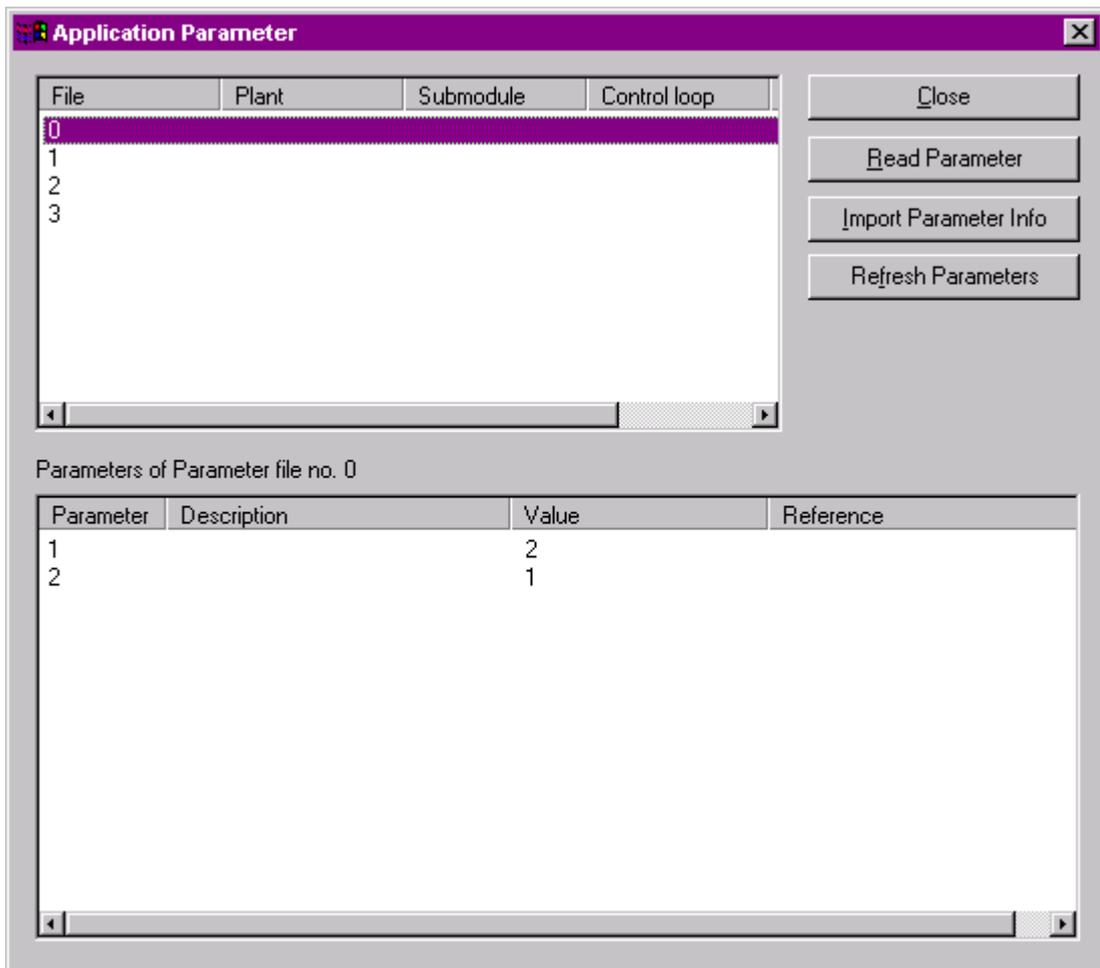
Or, click the **Show/hide parameter dialog** button **P**.

**RESULT:** The *Application Parameter* dialog box displays and software is checking the parameter files (may take a few seconds). Finally in the list at the top, the used parameter files are displayed.



2. To display the parameters for a parameter file, select the file in the top list and click the **Read Parameter** button, or double-click on the file in the top list.

**RESULT:** In the list at the bottom, the parameters for the parameter file are displayed.

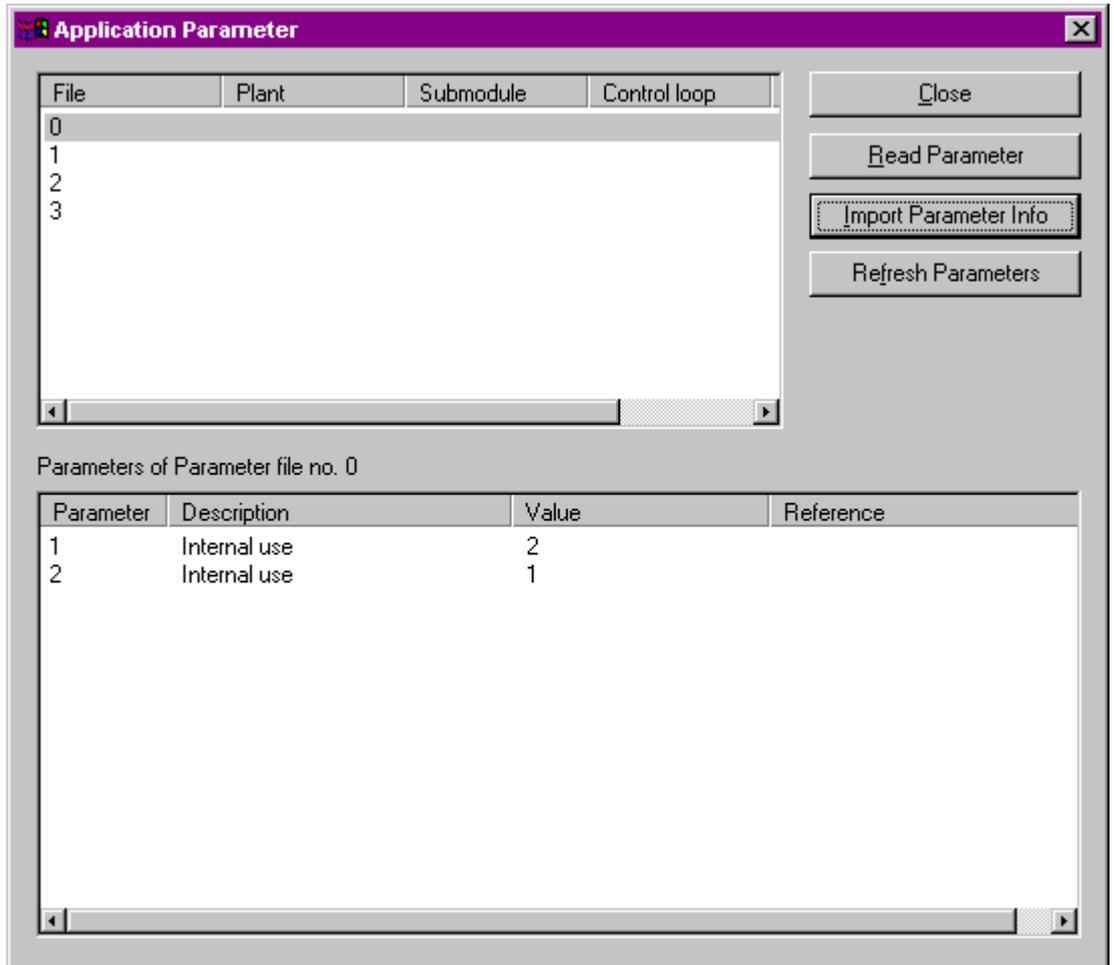


3. To display the descriptions for the displayed parameters, click the **Import Parameter Info** button.

RESULT: The descriptions are displayed in the **Description** column in the list at the bottom.

**IMPORTANT**

*There is no consistency check for the matching text file. Selecting a wrong text file results in wrong display.*

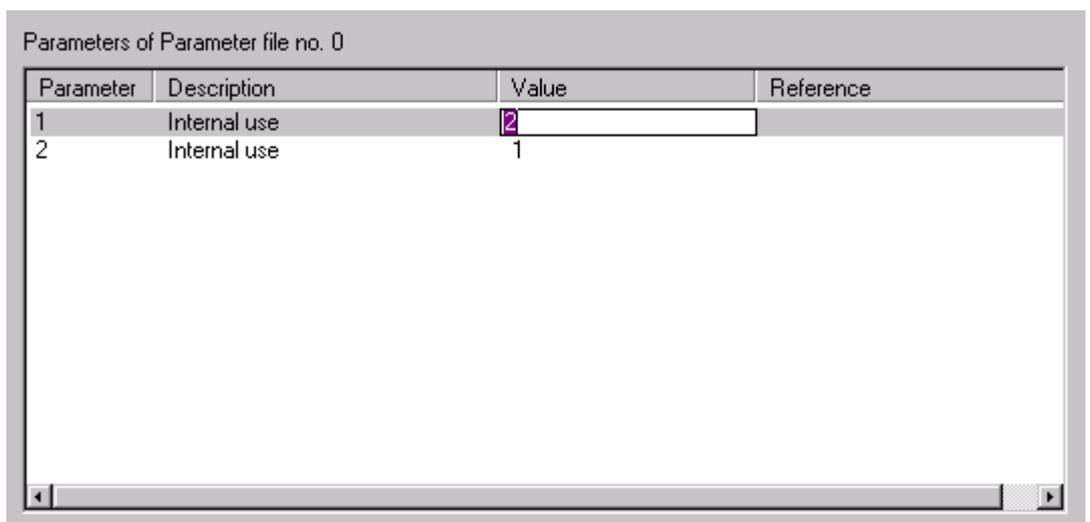


- To view updated values generated during a RACL cycle, click the **Refresh Parameters** button.

RESULT: The current parameter values will be displayed.

- To change a parameter value, select the parameter in the list at the bottom.

- Click the **Value** column, change the value and press ENTER key.



RESULT: The changed value has been written to the selected parameter file.

Parameters of Parameter file no. 0

Parameter	Description	Value	Reference
1	Internal use	6	
2	Internal use	1	

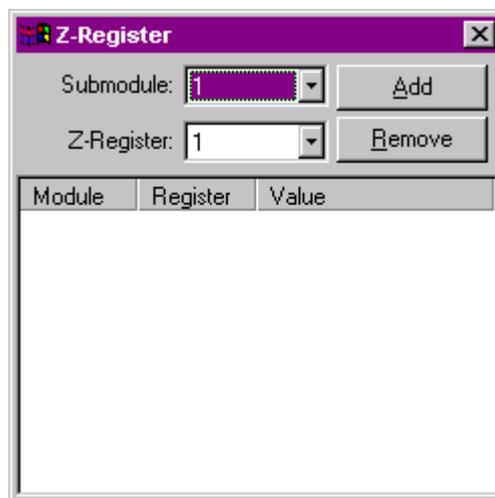
### Monitor Z-Registers

**Purpose** Display of a selected z-register value as it changes in the controller and change the value of a z-register. Z-registers can be accessed in general, from special flag points, and from XFMs. When debugging XFMs, open the relevant application with the RACL Editor in parallel. With the procedure described in this section you can select and monitor any existing z-register.

**Procedure** 1. Click menu item **General**, then submenu item **Z-register**.

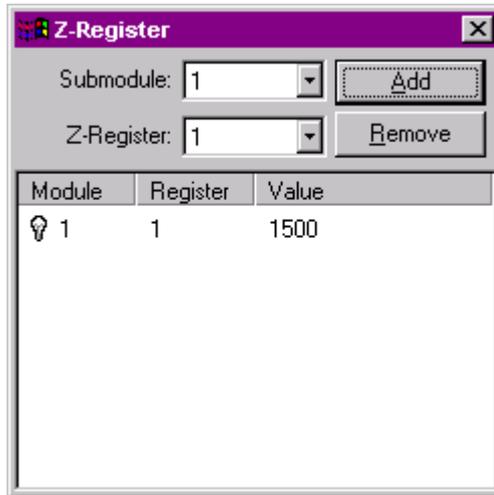
Or, click the **Show/hide z-register dialog** button .

**RESULT:** The *Z-Register* dialog box displays. The dialog box can be displayed permanently while performing other functions in XL Online.



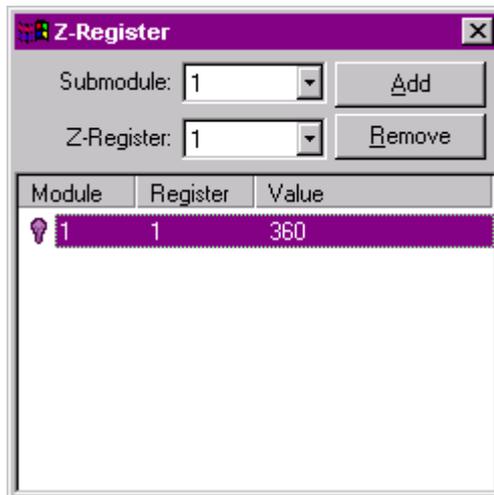
2. To monitor a z-register, select the submodule and the z-register (index number) in the fields of the same name and click the **Add** button. Max. 10 z-registers can be monitored concurrently and displayed in the dialog box.

**RESULT:** The z-register is added to the list. Software polls the z-register and displays updated values.



3. To check z-register functions, select the z-register in the list.
4. Click the **Value** column, enter the value and press ENTER key.

RESULT: The value is written to the z-register. Software polls the z-register and displays updated values. Note value changes



5. To remove a z-register, select the z-register in the list and click the **Remove** button.
6. To end monitoring, close the dialog box.

NOTE: A changed z-register may be overwritten immediately by the application.

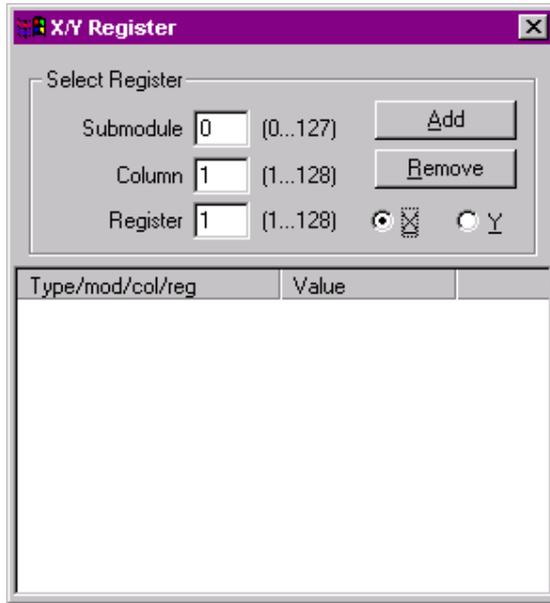
## Monitor X/Y-Registers

**Purpose** Display of a selected x/y register value as it changes in the controller and change the value of an x/y register. X/Y registers can be accessed in general, from special flag points, and from XFMs. When debugging XFMs, open the relevant application with the RACL Editor in parallel. With the procedure described in this section you can select and monitor any existing x/y register.

NOTE: For this you must know the submodule, the column and the index number from the x/y register you want to monitor.

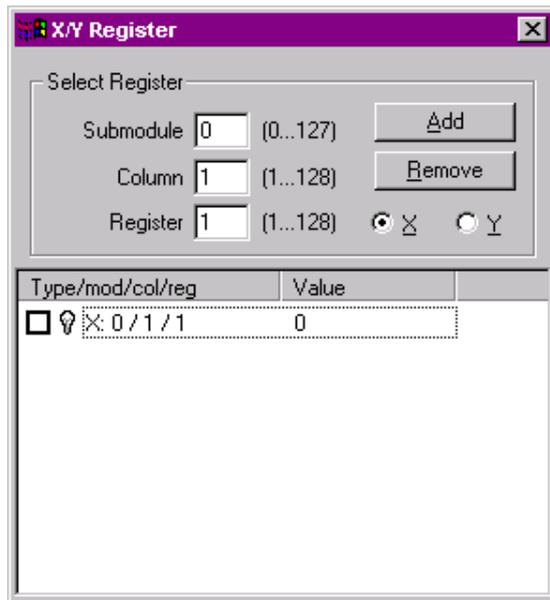
- Procedure**
1. Click menu item **General**, then submenu item **X/Y register**.  
Or, click the **Show/hide x/y register** dialog button .

**RESULT:** The *X/Y Register* dialog box displays. The dialog box can be displayed permanently while performing other functions in XL Online.



2. Click **X** or **Y** radio button dependent on which registers, x or y registers you want to monitor.
3. Enter the submodule, column and register (index number) for the register in the fields of the same name and click the **Add** button. Max. 10 x and 10 y registers can be monitored concurrently and displayed in the dialog box.

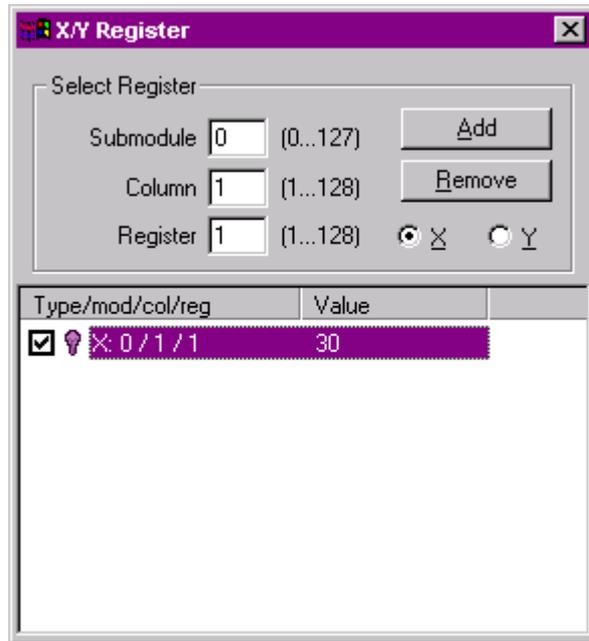
**RESULT:** The x/y register is added to the list. Software polls the x/y register and displays updated values.



4. To check x/y register functions, check the check box in the line.

- Click the **Value** column, enter the value and press ENTER key.

RESULT: The value is written to the x/y register. Software polls the x/y register and displays updated values. Note value changes.



**IMPORTANT**

*As long as the register is checked, the setting is permanent and the controller cannot overwrite the value, even if XL Online is closed.*

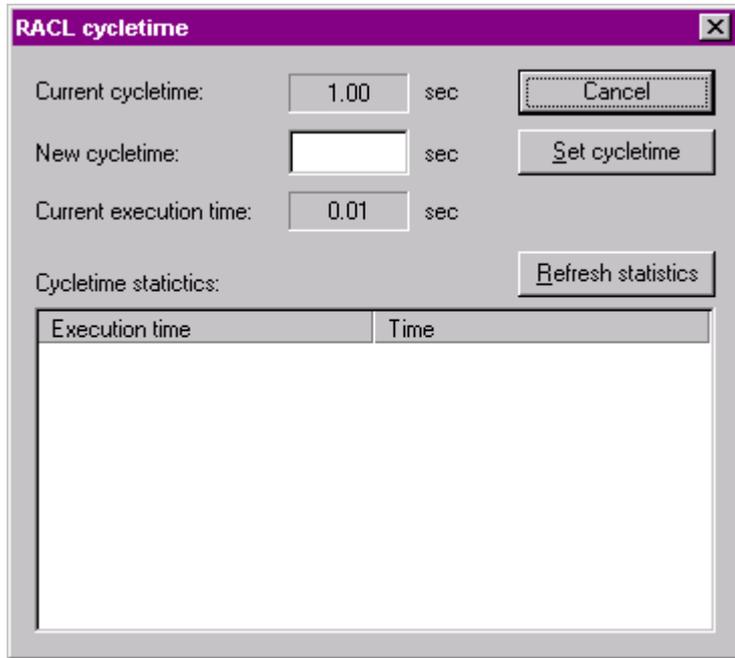
- To remove an x/y register, select the x/y register in the list and click the **Remove** button.
- To end monitoring, close the dialog box.

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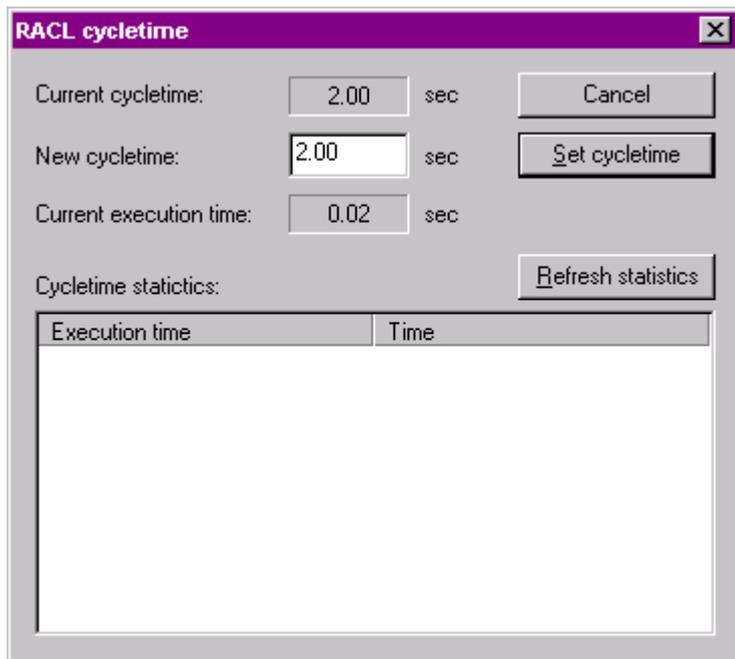
## Set RACL Cycle time

- Procedure**
- Click menu item **General**, then submenu items **Application** and **RACL Cyclotime**.

RESULT: The *RACL cyclotime* dialog box displays.

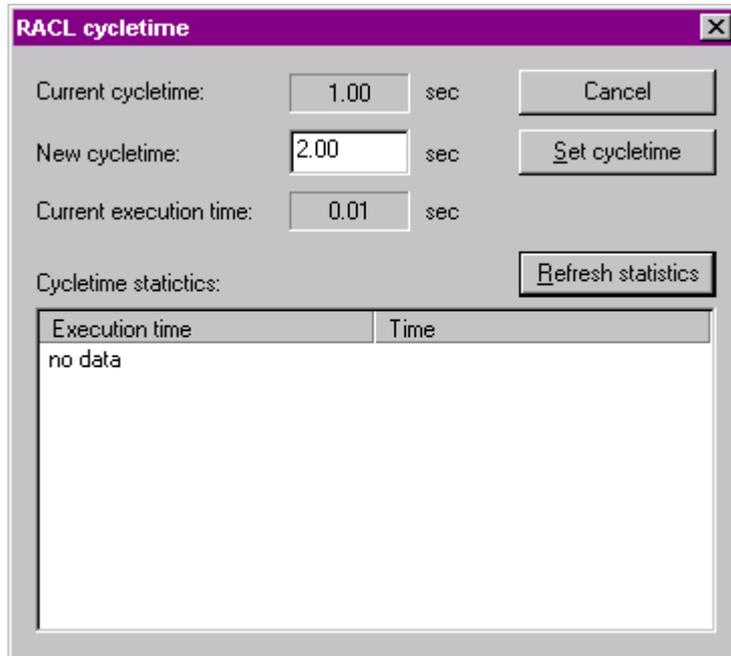


2. To change the current cycle time, enter desired value in the **New cyclotime** field and click **Set cyclotime** button.



3. To view the last ten RACL cycles that have been taken longer than the set cycle time, click the **Refresh statistics** button

**RESULT:** If the case, the last ten RACL cycles are displayed with execution time (duration) and start time in the **Cyclotime statistics** list.



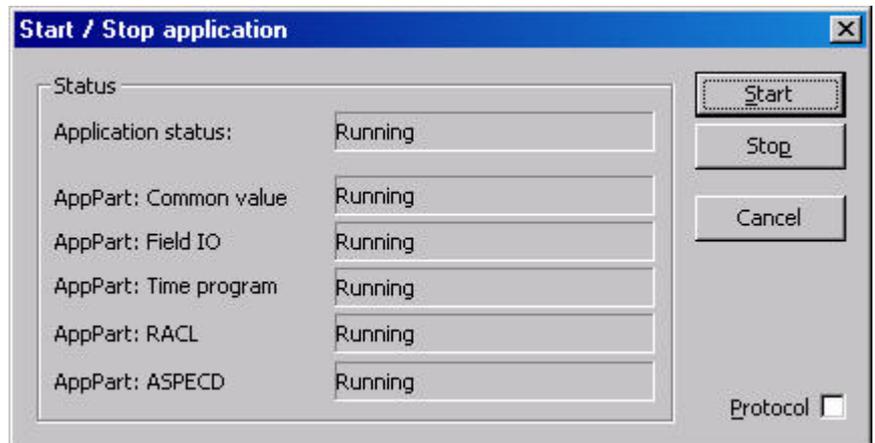
NOTE: For controller OS 2.0 and higher, the cycle time is automatically adapted to the execution time, that is a set value may then be changed.

## Start / Stop Application

**Purpose** To start or stop the application running in the controller.

**Procedure** 1. Click menu item **General**, then submenu items **Application** and **Start /Stop**.

RESULT: The *Start / Stop application* dialog box displays. The current status of the application parts are displayed.



2. To start a stopped application, click the **Start** button.

3. To stop a running application, click the **Stop** button.

RESULT: The application is stopped.

4. When stopping and starting the application, note alarms that may occur on the *Alarms* tab and in the popup alert (if enabled in the *XL Online Options* dialog box).

5. Check **Protocol** check box if you want to save the start/stop changes continuously in a log file called *StartStop.log* (saved in the current directory, normally the CARE root directory).



NOTE: The data will only be saved to the log file as long as the *Start / Stop Application* dialog box is opened.

## View/Modify Time Programs

**Purpose** Display and modify time sequences for controller operation. For example, set HVAC start and stop times. Time Programs implement these command schedules. A controller can have a maximum of 20 Time Programs. Each Time Program specifies a list of points to command and a *Weekly Program*. This Weekly Program defines the normal daily activity of the system by specifying which Daily Programs a controller should use for each day of the week (Sunday through Saturday). The Weekly Program applies for each week of the year. There is only one Weekly Program per Time Program. Daily Programs list points and point actions and times for the controller to implement. Operators assign Daily programs to Weekly programs or as date override to provide for automatic operations on scheduled dates. Yearly Programs define time periods with special daily programs. Yearly programs are suited to consider specific local conditions, for example, regional vacation and public /religious festivals. Yearly programs can be defined for more than one year.

Example:

Controller 1  
 Time Program 1  
*Point Assignments*  
 hvac\_ctrl  
 min\_hvac

<i>Weekly Program</i>	<i>Daily Program Name</i>
Monday	<b>normal_daily</b>
Tuesday	<b>normal_daily</b>
Wednesday	<b>normal_daily</b>
Thursday	<b>normal_daily</b>
Friday	<b>normal_daily</b>
Saturday	<b>Weekend</b>
Sunday	<b>Weekend</b>

Where the **normal\_daily** Daily Program includes the following items (time, user address, command):

06:00	hvac_ctrl	on
18:00	hvac_ctrl	off

And the **Weekend** Daily Program includes the following items (time, user address, command):

12:01	min_hvac	on
23:59	min_hvac	off

**Today (Point) Overrides**

You can assign different commands and times to selected points within a time program. These changes are "today overrides".

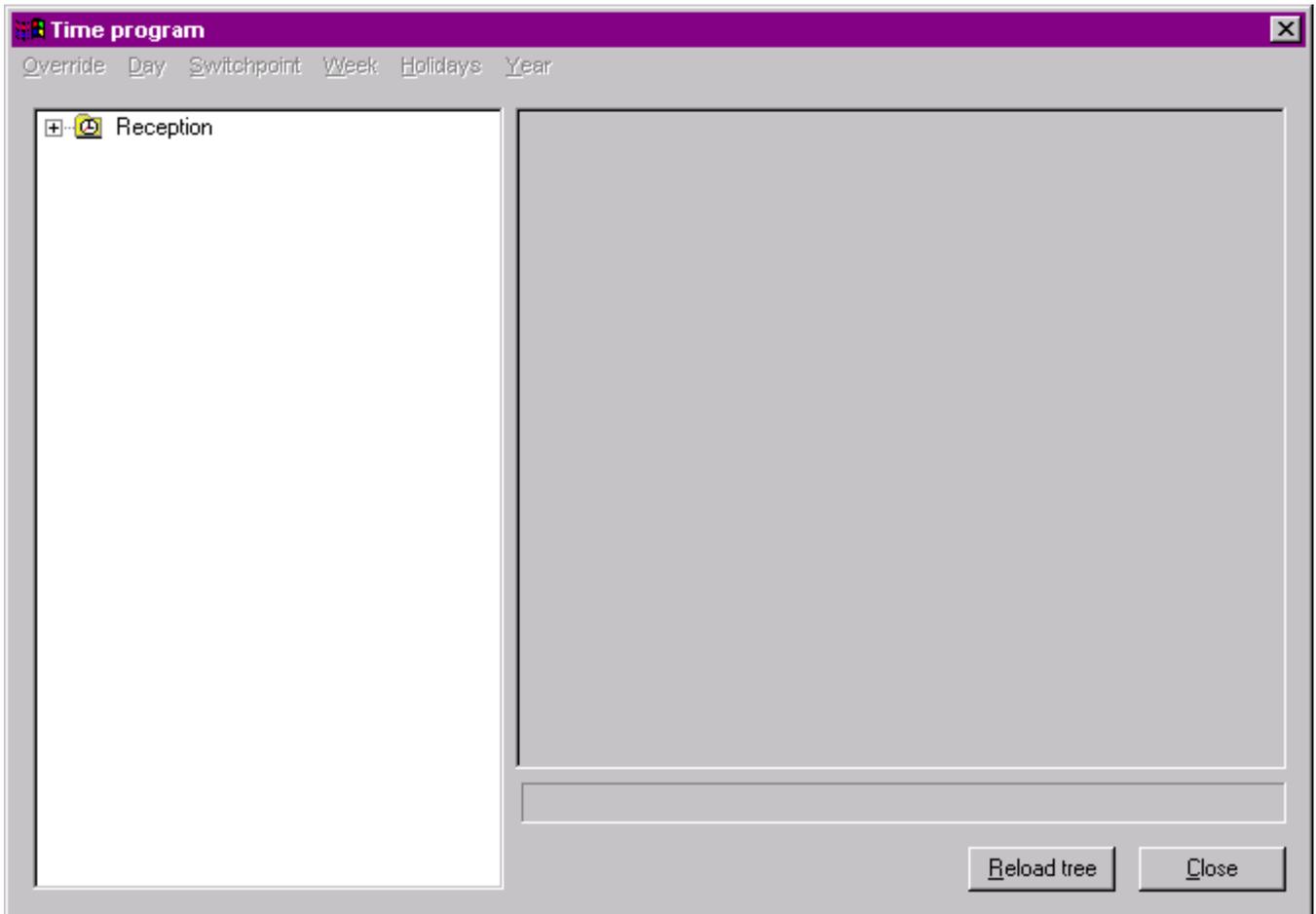
**Date Overrides**

You can also assign temporary schedules to replace daily schedules when holidays or other events occur that require different times and commands. These schedules are "date overrides".

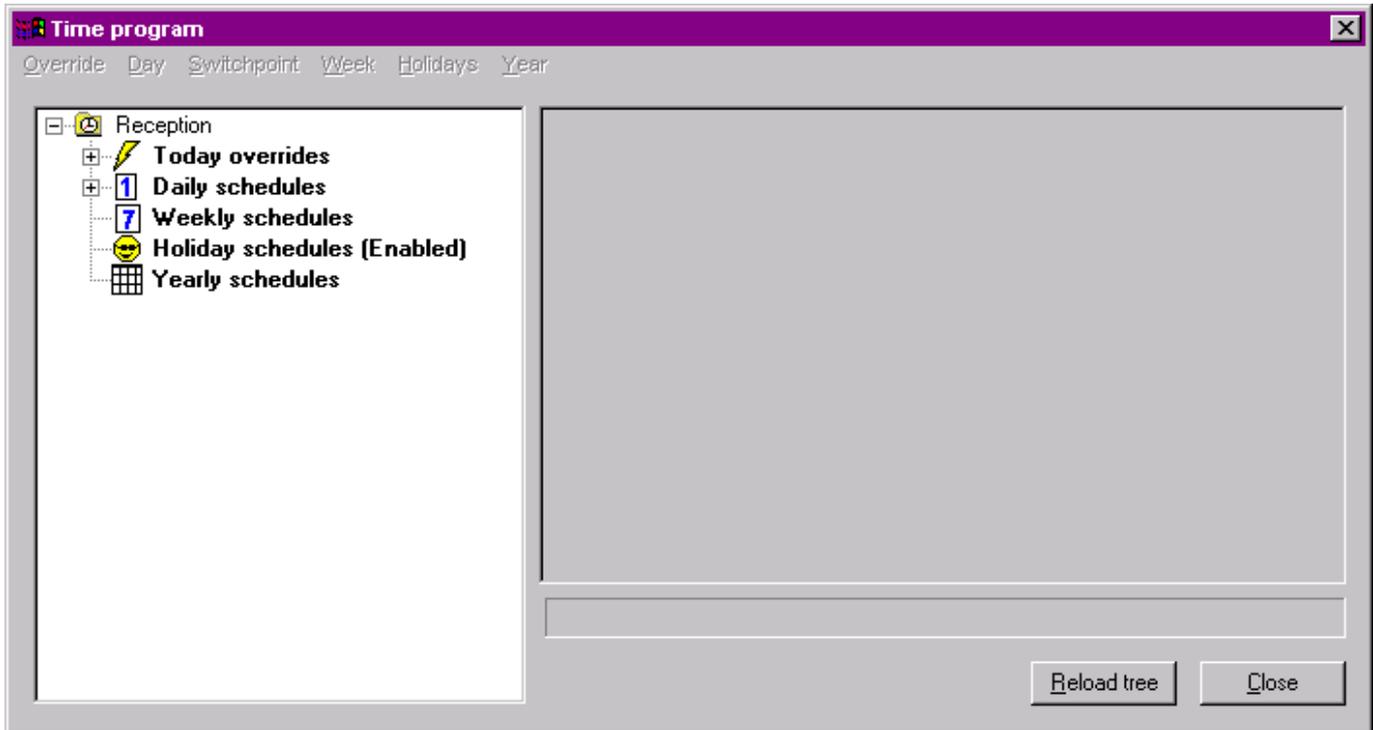
**Open Time Program Editor****Procedure**

1. Click menu item **General**, then submenu items **Application** and **Time Program**.

RESULT: The *Time program* main window displays.



2. Open the tree on the left to display the available time programs. In this case the time program 'Reception' is displayed.




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#### Close Time Program Editor

- Procedure**      1. In the *Time program* main window, click the **Close** button.

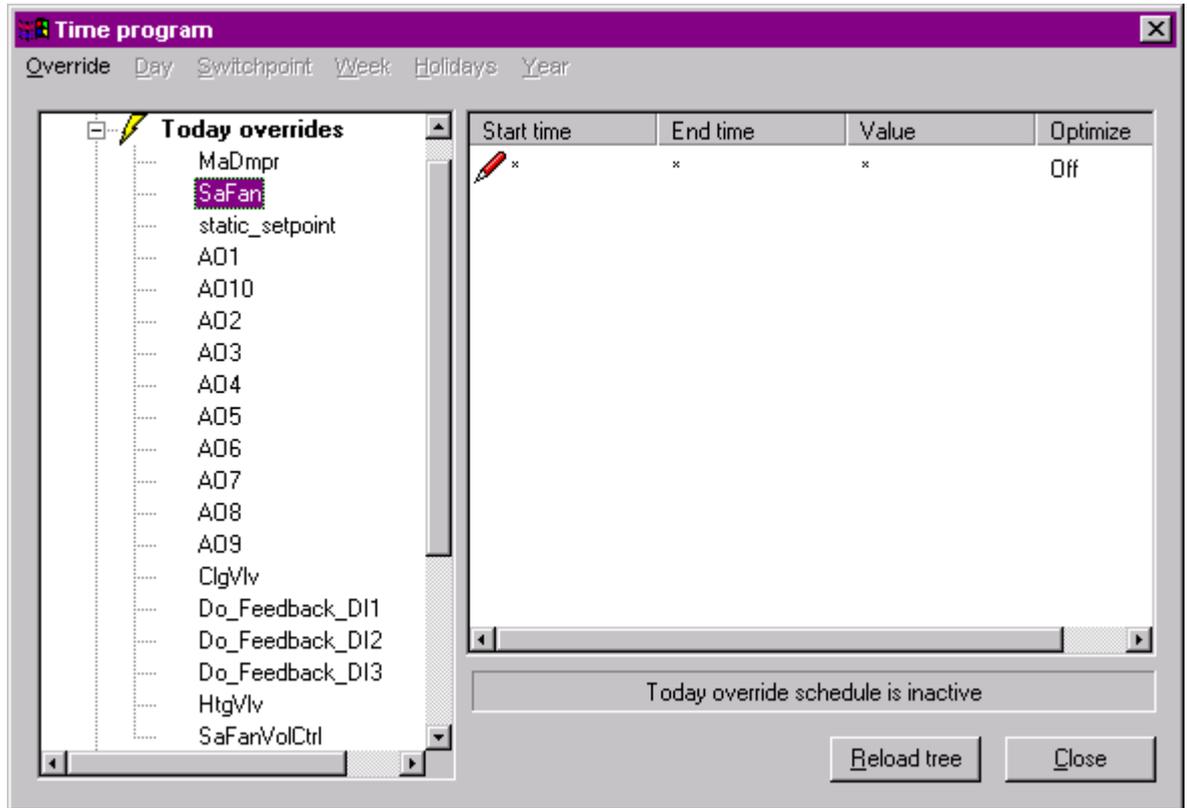
---

#### Override Today Schedule

**Purpose**      Override a normal day's activity for a selected point.

- Procedure**
1. Open the time program editor as described in the "Open Time Program Editor" section.
  2. In the tree, open the *Today overrides* folder and click on the point you want to override.

**RESULT:**      At the bottom, the status message and on the right, a *pencil* icon indicates that the point has currently no override and can be edited for overriding the today schedule.



3. Click in the **Start time** column  
Or, click menu item **Override**, then submenu item **Edit Start time**.
4. Enter the time when the override should start (the blue checkmark indicates the editing mode of the field).
5. Press ENTER key.



6. Continue by setting the end time, the value and the optimize status in the corresponding fields in the same manner as described in steps 3 through 5. Use appropriate submenu items in the **Override** menu alternatively.

Start time	End time	Value	Optimize
✓ 16:00	17:00	On (1)	Off

7. If desired, edit further points for overriding the schedule for today.

**IMPORTANT**

*Once a Today schedule override has been set, it cannot be deleted. In case you want to "delete" an override, set the start-end time difference to 1 min.*

**Modify Daily Schedule**

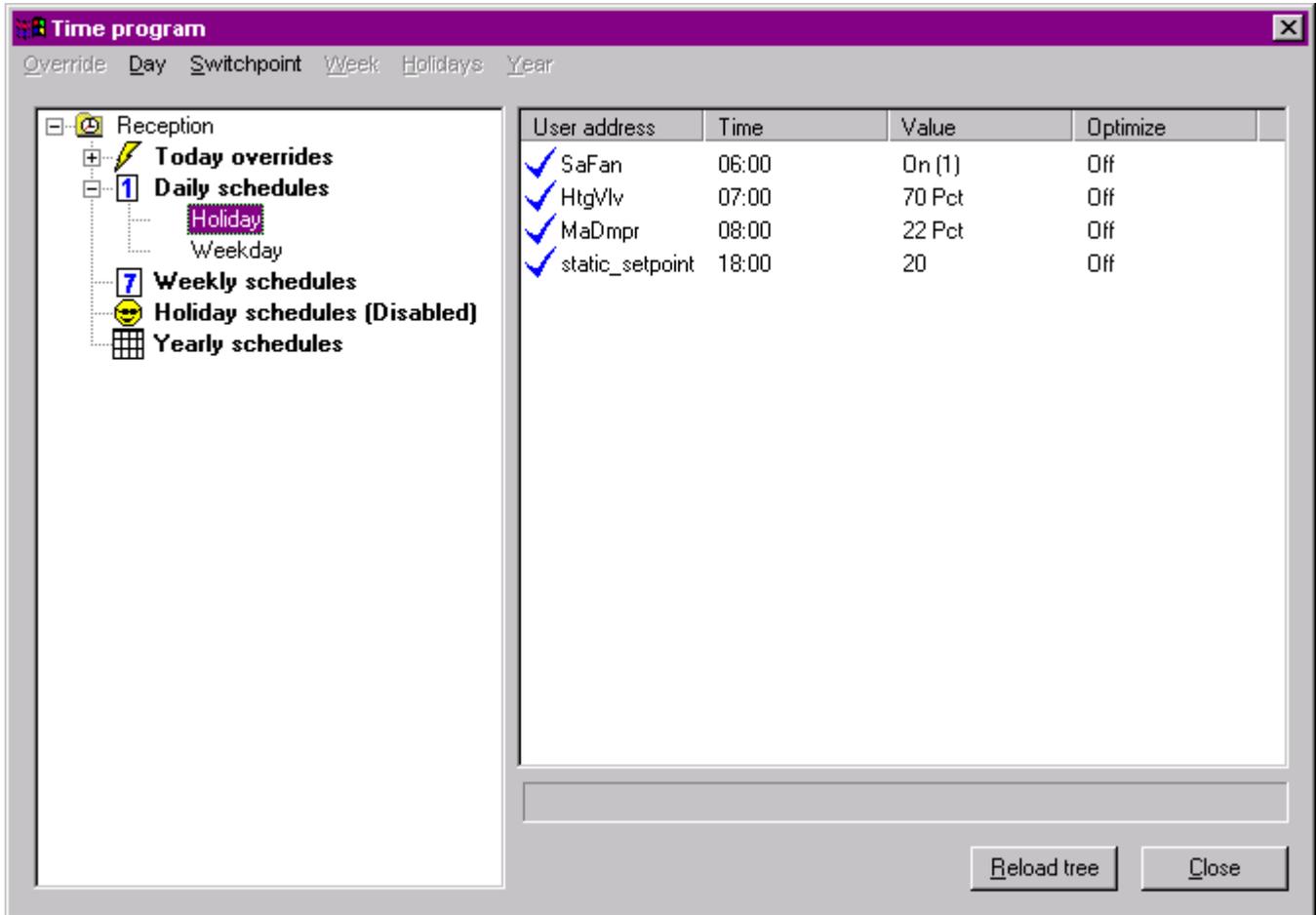
**Purpose** Edit, create, rename or delete a daily schedule.

**Procedures** ...

**Edit daily schedule**

1. Open the time program editor as described in the "Open Time Program Editor" section.
2. In the tree, open the *Daily schedules* folder and click on the daily program you want to modify.

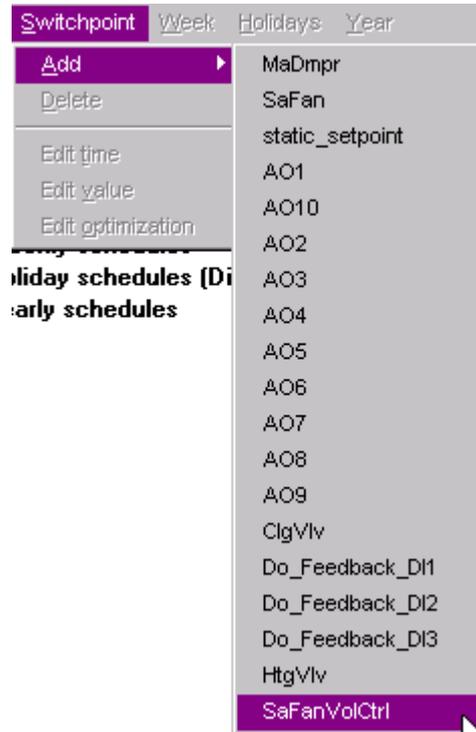
RESULT: On the right, all points assigned to the daily program are displayed.



3. Select the point in the list.
4. Set the time, the value and the optimize status in the corresponding fields in the same manner as described in steps 3 through 5 of the "Override Today Schedule" section.

**Add New Point**

1. Click daily schedule in the tree.
2. Click menu item **Switchpoint** then submenu item **Add** and select the point.



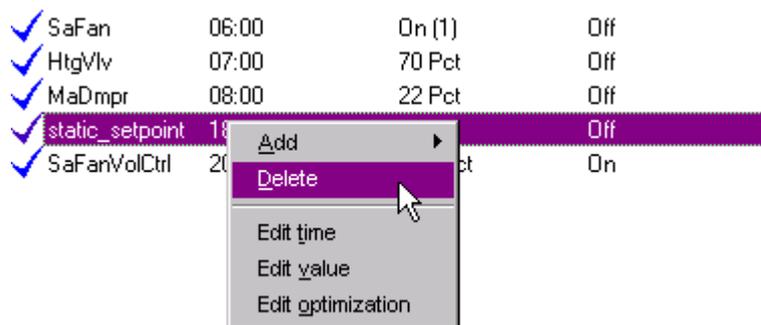
RESULT: The point is added to the list.

User address	Time	Value	Optimize
✓ SaFan	07:00	Off (0)	On
✓ HtgVlv	07:00	70 Pct	Off
✓ MaDmpr	08:00	22 Pct	Off
✓ static_setpoint	18:00	20	Off
✎ SaFanVolCtrl	*	*	On

3. Set the time, the value and the optimize status in the corresponding fields in the same manner as described in steps 3 through 5 of the "Override Today Schedule" section.

**Delete Point**

1. To delete a point from the daily schedule, select the point in the list.
2. Click right mouse key and with left mouse key click **Delete** in the context menu. Or, click menu item **Switchpoint**, then submenu item **Delete**.



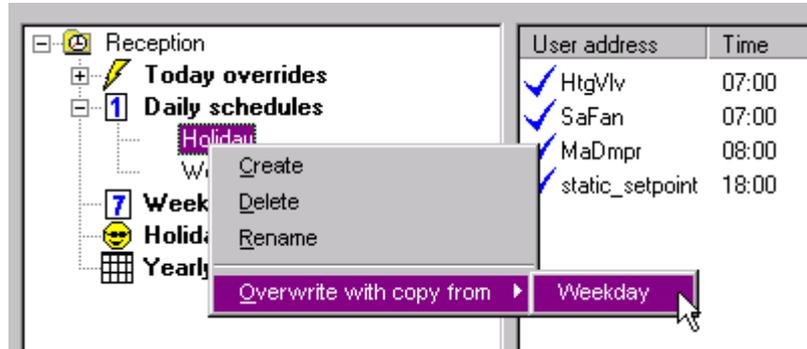
RESULT: The point is deleted from the list.

**Overwrite Daily Schedule**

All points will be deleted. You can only overwrite a daily schedule that is not used in any weekly, holiday or yearly program. To overwrite a daily schedule with another daily schedule do the following

1. In the tree, click the daily schedule you want to overwrite.
2. Click right mouse key and with left mouse key, click on **Overwrite with copy from** and select the daily schedule, in this case **Weekday** in the context menu.

Or, click menu item **Daily**, then submenu item **Overwrite with copy from** and select the daily schedule.

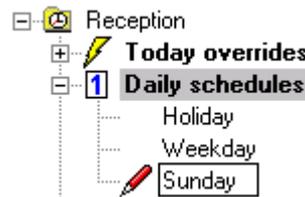


RESULT: The selected daily schedule points will delete the current points.

User address	Time	Value	Optimize
✓ SaFan	06:00	On (1)	Off
✓ HtgVlv	07:00	70 Pct	Off
✓ MaDmpr	08:00	22 Pct	Off
✓ SaFanVolCtrl	20:00	200 Pct	On

**Create New Daily Schedule**

1. To create a new daily schedule, click on the *Daily schedules* folder in the tree.
2. Click right mouse key and with left mouse key, click on **Create** in the context menu.  
Or, click menu item **Day**, then submenu item **Create**.
3. In the folder, enter the name for the new daily schedule, e.g. 'Sunday'.



4. Add points to the new daily schedule by clicking menu **Switchpoint**, then submenu item **Add** and selecting the desired point (see "Edit Daily Schedule" section).

**Rename Daily Schedule**

1. To rename a daily schedule, click on the schedule in the tree.
2. Click right mouse key and with left mouse key, click on **Rename** in the context menu.  
Or, click menu item **Day**, then submenu item **Rename**.
3. Rename the flashing folder name.

**Delete Daily Schedule**

1. To delete a daily schedule, click on the daily schedule.
2. Click right mouse key and with left mouse key, click on **Delete** in the context menu.  
Or, click menu item **Day**, then submenu item **Delete**.

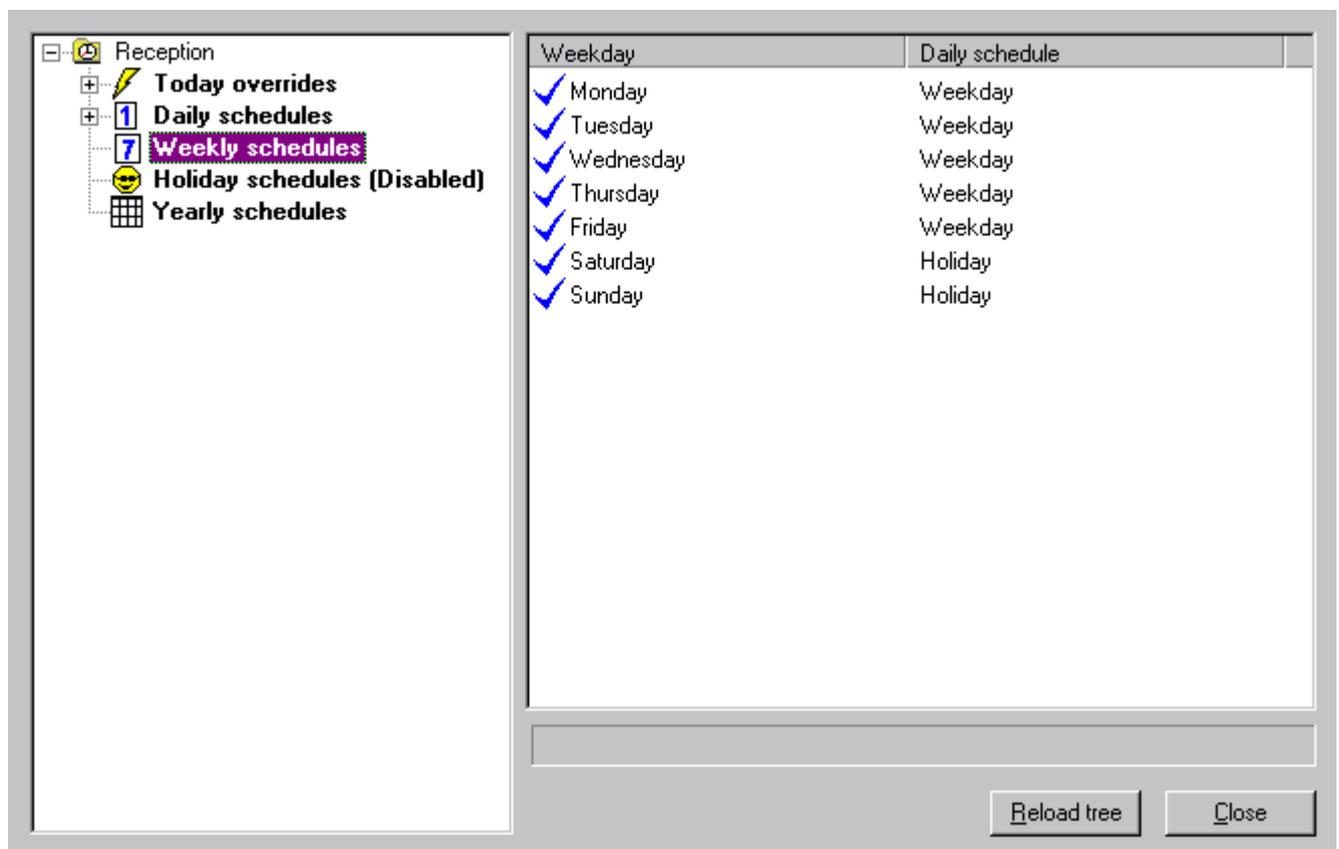
NOTE: You can only delete a daily schedule that is not used in any weekly, holiday or yearly program.

**Modify Weekly Schedule**

**Purpose** Define the weekly schedule for a controller by selecting the daily schedules the controller should use each day (Sunday through Saturday) of a normal week.

- Procedure**
1. Open the time program editor as described in the "Open Time Program Editor" section.
  2. In the tree, click on the *Weekly schedules* folder.

RESULT: On the right, the week with its assigned daily schedules is displayed.



3. To assign another daily schedule to a weekday, click on the weekday in the **Daily schedule** column.
4. Select the desired daily schedule and press ENTER key.

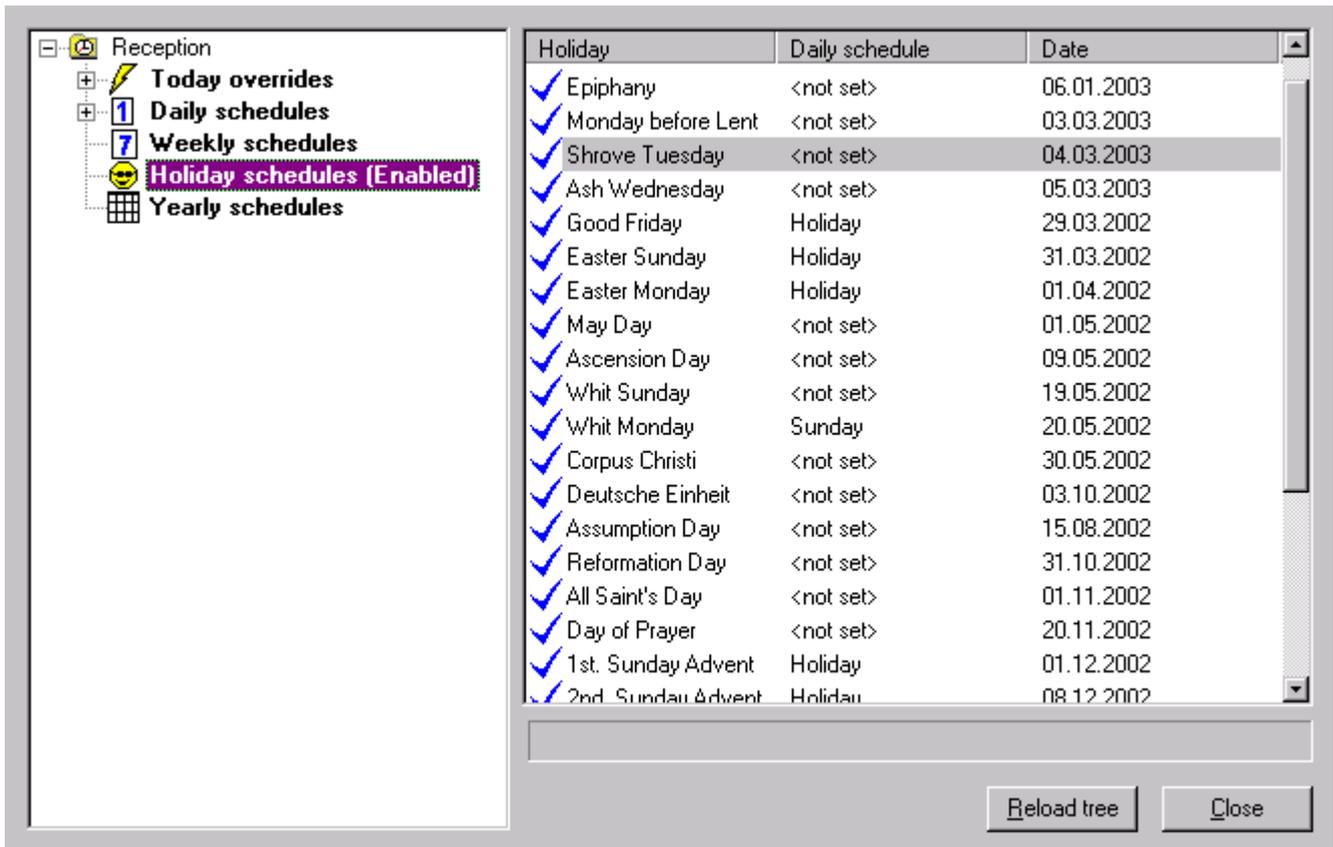
NOTE: It is also possible to remove an assigned daily schedule by selecting <not set>. This means, that on that day no daily schedule is executed.

**Modify Holiday Schedules**

**Purpose** Holiday schedules are saved with the application and can be enabled or disabled as a whole since they are country specific. To each holiday a daily schedule can be assigned.

- Procedure**
1. Open the time program editor as described in the "Open Time Program Editor section".
  2. In the tree, click on the *Holiday schedules* folder.

**RESULT:** On the right, all holidays with its assigned daily schedules are displayed. Note that the blue checkmark appears for the enabled as well as for the disabled mode.



**Enable/Disable Holiday Schedules**

3. Click right mouse key and with left mouse key, click on **Enable**, respectively **Disable**.

**Assign Daily Schedules**

5. To assign another daily schedule to a holiday, click on the holiday in the **Daily schedule** column.
6. Select the desired daily schedule and press ENTER key.

**NOTE:** It is also possible to remove an assigned daily schedule by selecting <not set>.

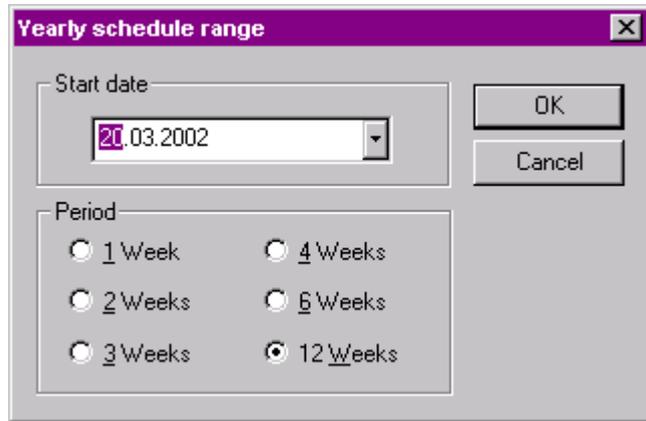
**Modify Yearly Schedules**

**Purpose** Setup exception for specific days (period) of the year.

- Procedure**
1. Open the time program editor as described in the "Open Time Program Editor" section.

2. In the tree, click on the *Yearly schedules* folder.
3. Click right mouse key and with left mouse key, click on **Load** in the context menu.  
Or, click menu item **Year**, then submenu item **Load**.

RESULT: The *Yearly schedule range* dialog box is displayed.



4. Open calendar by clicking the **Start date** drop-down listbox and define the start date of the range.
5. Under period, define the desired duration by clicking the corresponding radio button.

RESULT: On the right, the current yearly schedule is displayed for the defined period. The weekdays show their assigned daily schedules. For the assigned daily schedule, the following descending priority is used: *yearly schedule* → *holiday schedule* → *weekly schedule*.

That is, by default a weekday has the daily schedules of the week schedule assigned. If a weekday has a holiday schedule assigned, the daily schedule of that holiday is used and the name of the holiday is shown in the source column. Note, that in this case holidays must be enabled. If a weekday is part of a yearly schedule period, the daily schedule defined for that period is used. In the source column 'Yearly schedule' is displayed.

For each weekday the source of the assigned daily schedule is indicated by the following icons and a description in the source column:

Icon	Assigned daily schedule	Source Display
	"according to the weekly schedule"	"No display"
	"according to the holiday schedule"	Name of holiday
	"according to the yearly schedule"	Yearly schedule

**IMPORTANT**

*When changing the daily schedule for a weekday, the weekday gets always part of the yearly schedule as indicated by the source description "yearly schedule" and the icon.*

Weekday	Time	Daily schedule	Source
7 Wednesday	20.03.2002	Weekday	
7 Thursday	21.03.2002	Weekday	
7 Friday	22.03.2002	Sunday	
7 Saturday	23.03.2002	Holiday	
7 Sunday	24.03.2002	Sunday	
7 Monday	25.03.2002	Weekday	
7 Tuesday	26.03.2002	Weekday	
7 Wednesday	27.03.2002	Weekday	
7 Thursday	28.03.2002	Weekday	
☺ Friday	29.03.2002	Holiday	Good Friday
7 Saturday	30.03.2002	Holiday	
☺ Sunday	31.03.2002	Holiday	Easter Sunday
☺ Monday	01.04.2002	Holiday	Easter Monday
7 Tuesday	02.04.2002	Weekday	
7 Wednesday	03.04.2002	Weekday	
7 Thursday	04.04.2002	Weekday	
7 Friday	05.04.2002	Sunday	
☐ Saturday	06.04.2002	Sunday	Yearly schedule
7 Sunday	07.04.2002	Sunday	
7 Monday	08.04.2002	Weekday	
7 Tuesday	09.04.2002	Weekday	
7 Wednesday	10.04.2002	Weekday	
7 Thursday	11.04.2002	Weekday	
7 Friday	12.04.2002	Sunday	
☐ Saturday	13.04.2002	Sunday	Yearly schedule
7 Sunday	14.04.2002	Sunday	

6. To assign another daily schedule to a weekday, click on the weekday in the **Daily schedule** column.

7. Select the desired daily schedule and press ENTER key.

NOTE: It is also possible to remove an assigned schedule by selecting <not set>.

RESULT: In this case, for the defined period, on Wednesday 10.04.2002, the daily schedule 'Sunday' will be used.

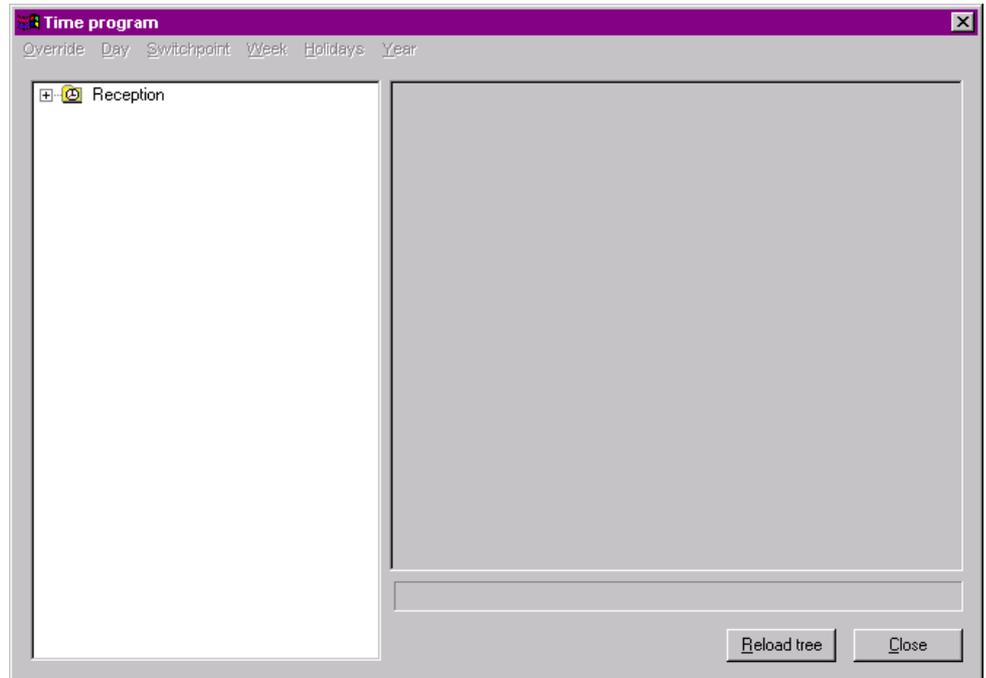
☐ Wednesday	10.04.2002	Sunday	Yearly schedule
7 Thursday	11.04.2002	Weekday	
7 Friday	12.04.2002	Sunday	
☐ Saturday	13.04.2002	Sunday	Yearly schedule
7 Sunday	14.04.2002	Sunday	

**Reload Tree**

**Purpose** Load the current schedules from the controller.

**Procedure** 1. In the *Time program* main window, click the **Reload** button.

RESULT: The tree is collapsed and the current schedules from the controller were loaded.

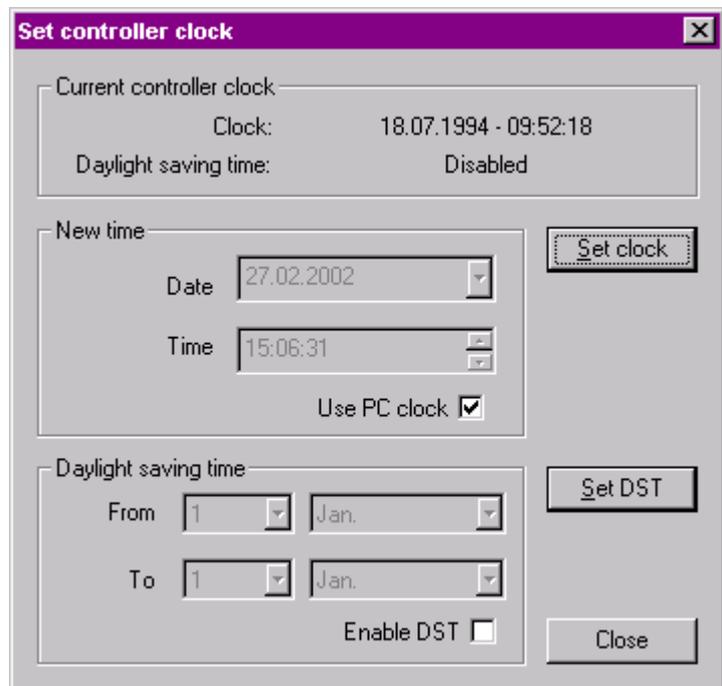


### Set System Clock

**Purpose** To set the controller clock.

**Procedure** 1. Click menu item **General**, then submenu item **System Clock**.

**RESULT:** The *Set controller clock* dialog box displays.



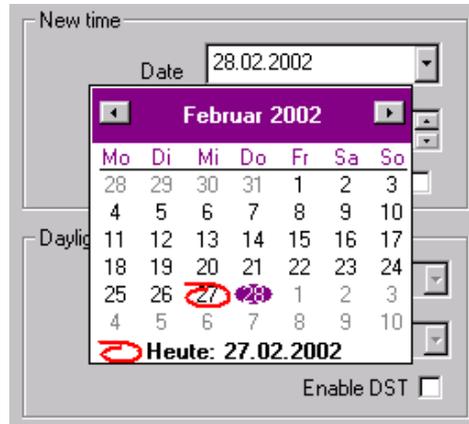
Under *Current controller clock*, the current time in the controller and whether the daylight saving time is enabled or disabled, is displayed.

2. To set a new time do one of the following:

To use the current PC clock as new time, check the **Use PC clock** checkbox (default) and click the **Set clock** button.

RESULT: The controller clock is set to the current PC clock.

To set an individual time, uncheck the **Use PC clock** checkbox. Into the **Date** and **Time** field, enter the desired time (each item part separately).



Or, click on the drop-down arrow at the **Date** field and select data in the calendar (use keyboard arrows to scroll through). Close the calendar by clicking on any location outside the calendar.

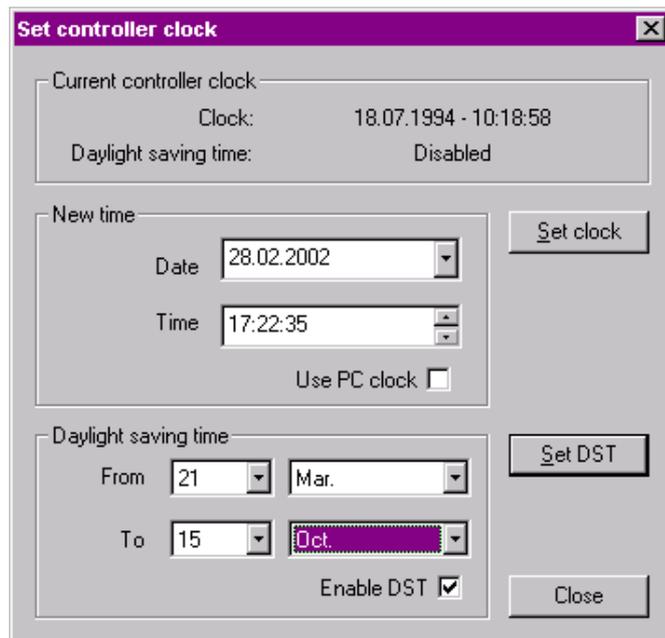
Or, use the scroll arrows at the time field to set the time. Click the **Set clock** button

RESULT: The controller clock is set to the new individually set time.

3. To set daylight saving time (DST) do the following:

Check the **Enable DST** checkbox.

Under *Daylight saving time*, set the time in the **From** and **To** fields. Click the **Set DST** button.



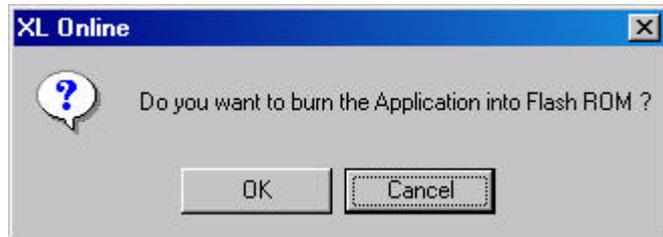
RESULT: The controller uses the set DST.

---

## Save Application in Flash ROM

- Procedure**
1. Click menu item **General**, then submenu items **Flash ROM** and **Save Application**.

RESULT: The following dialog box displays.



2. To save the application in the Flash ROM, click **OK** button.
3. Confirm the following message.



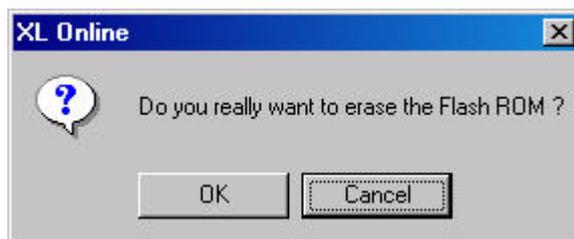
NOTE: Saving an application to the Flash ROM can take up to 30 seconds.

---

## Erase Flash ROM

- Procedure**
1. Click menu item **General**, then submenu item **Flash ROM** and **Erase**.

RESULT: The following dialog box displays.



2. To erase the Flash ROM, click **OK** button.
3. Confirm the following message.



NOTE: Erasing the Flash ROM can take up to two minutes.

## Work with MMI

XL Online provides an emulation of the XI581 AH / XI582 AH bus wide operator interface to change basic information programmed into the Excel controller. For detailed description on those functions, please refer to the XI581 AH/ XI582 AH user guide, form EN2B-0126 (European) / 74-3554 (U.S.).

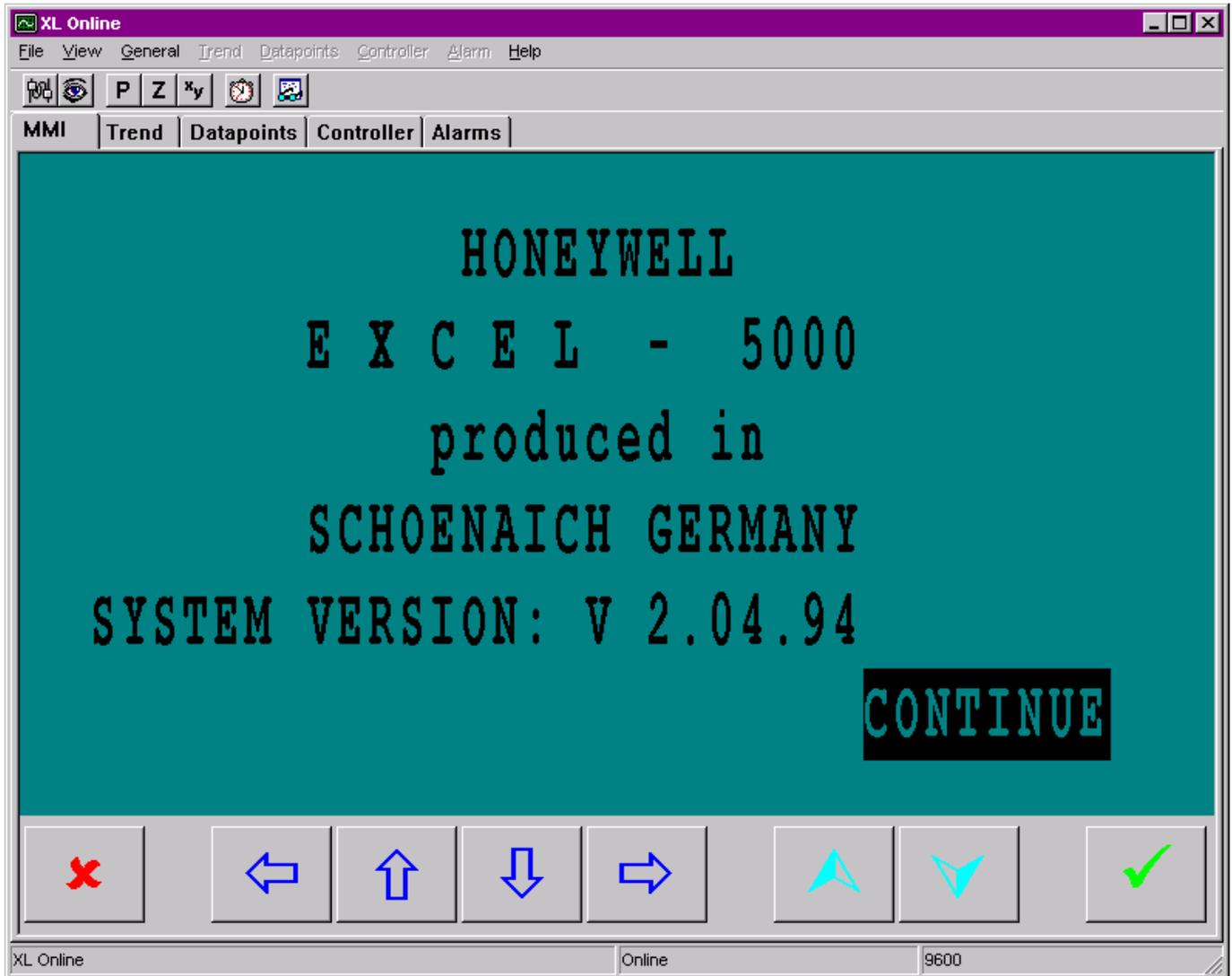
**Start MMI** Click on the *MMI* tab in the *XL Online* main window. The *XL Online* main window displays. Software tries to connect to the port according to the settings defined in the *XL Online Options* dialog box (see "Port Settings" section).

**Connection and Display Problems** If no controller is connected to the port or software cannot connect to the controller due to wrong port settings, the MMI is gray and the status message No connection is displayed. If a connection is completed and no application is running, the MMI is blue and blank. If an application is running, the MMI is blue and the initial text is shown.

- Procedures**
1. If the MMI is gray, connect the controller to the port as follows:
  2. Click menu item **File**, then submenu item **Connection**.  
Or, click on the *Change serial port settings* icon  on the button bar.
  3. In the *Connect* dialog box, select the **serial port** and the **baudrate** by clicking the corresponding radio buttons. Select **Auto detect**, if you do not know the baudrate (default setting).
  4. Click the **Connect** button.

**RESULT:** If the connection is completed, the MMI is displayed in blue. If no text is displayed, click on another tab or click the ESC button on the MMI emulation.

5. Make sure that the controller number in CARE and in the MMI is the same. If they are different, set them equal either in CARE or in the MMI or by **Set controller no.** command (see "Set Controller Number and View Bus Configuration" section). For operating instructions of the MMI refer to the XI581/2 Operator Terminal Manual.



### Initial Screen

To work with the MMI, the buttons at the bottom must be used. Note that you cannot click on selected items in the screen displays.

Example: To get from the initial screen (see above) to the next screen (Continue item is highlighted) you must click the **Enter** button.

In the following, the operating buttons of the MMI emulation will be explained.

Button	Key	Scroll Description
	Escape, delete, backspace	End the task you are performing and return to a previous display window. If you click this key after you modify a field, but before clicking Enter, √, the X1581/2 erases any new information you input and retains the original information. If you click this key after you modify a field <i>and</i> press Enter, √, the X1581/2 retains the new information you input.
	left arrow	Within a menu or a line of items, the left arrow moves the cursor from one column (or item) to another. Within a data field, the left arrow moves the cursor to the left one digit.
	up arrow	Move the cursor to the previous field, the previous column, or to the previous line in a column.
	down arrow	Move the cursor to the next field, the next column, or to the next line in a column.
	right arrow	Within a menu or a line of items, the right arrow moves the cursor from one column (or item) to another. Within a data field, the right arrow moves the cursor to the right one digit.
	plus	Increase the value of a digit by one (for example, from 2 to 3). You can also use this key to change the condition of a digital point. For example, click this key to flip a digital point from OFF to ON.
	minus	Decrease the value of a digit by one (for example, from 2 to 1). You can also use this key to change the condition of a digital point. For example, click this key to flip a digital point from OFF to ON.
	Enter	Enter and confirm input values or command choices for the controller. When you click this key, it allows modification of the highlighted field. Clicking Enter again stores the value in memory.

**Moving Between Columns**

To move horizontally between columns in a menu or list, press the down arrow key, , until you reach the bottom of the column. When you click the down arrow key again, the cursor automatically jumps to the first item in the next column.<sup>1</sup> If the cursor is on the first item in the first column, clicking the right arrow key, , moves the cursor to the first item in the second column. If the cursor is on the last item in the second column, clicking the down arrow key, , moves the cursor to the first item in the first column.<sup>1</sup>

<sup>1</sup> NOTE: In case not all entries are displayed (e.g. no password entered), this may differ slightly.

**Modifying a Field**

To change information in a field, first use the arrow keys to move to and highlight the field. Then click, . After the change is made, the Enter button must be clicked again to confirm the change.

**Moving From Field to Field**

Once you begin modifying the digits in a field, you can move from digit to digit within that field using the arrow keys. However, to move to a different field, you must click Enter, , after making your last change to the field. The field is then highlighted. You can then use the arrow keys to move to and highlight the next field you wish to modify.

**Point Order in Lists** Points are listed according to hardware type. In other words, all analog points appear first, followed by digital points, and finally totalizer points.

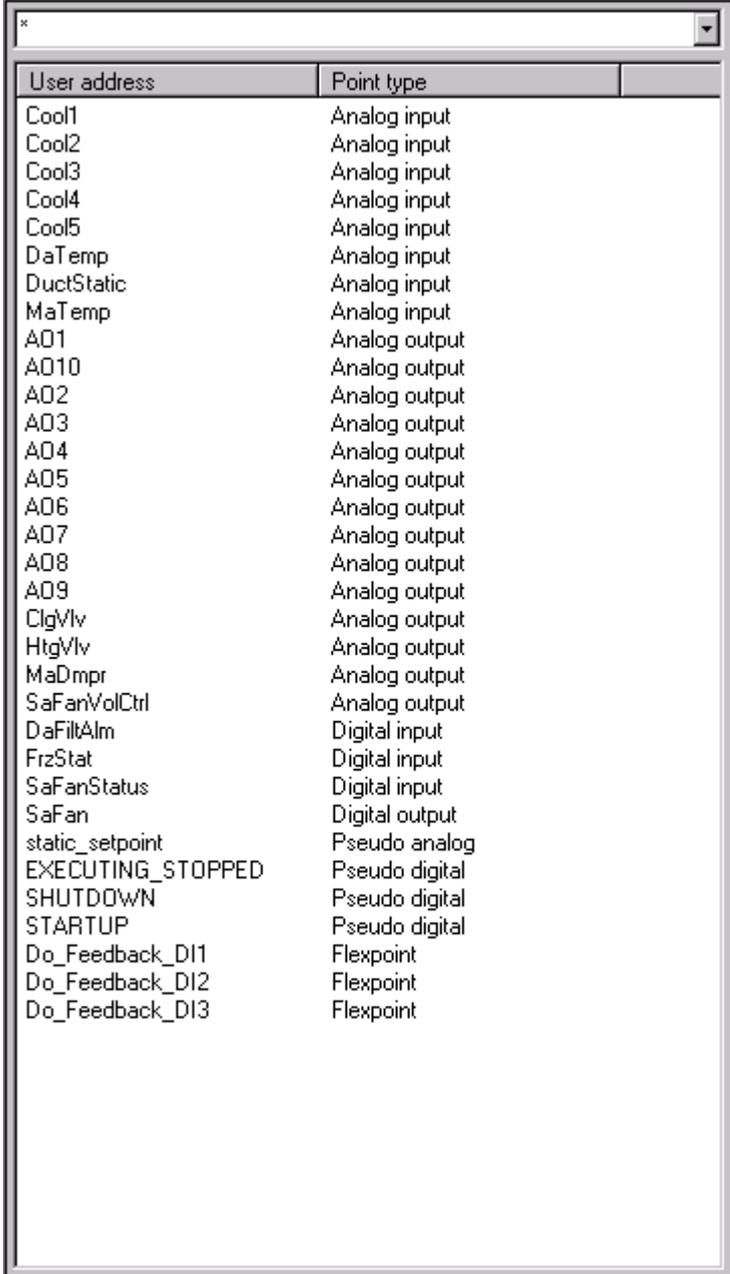
**Monitor Points**

**Load Points**

**Purpose** To upload and view points from the controller

- Procedure**
1. Click on the *Datapoints* tab.
  2. Click menu item **Datapoints** then submenu item **Load points** or click  button.

**RESULT:** All points except hidden points will be uploaded from the controller and displayed.



User address	Point type
Cool1	Analog input
Cool2	Analog input
Cool3	Analog input
Cool4	Analog input
Cool5	Analog input
DaTemp	Analog input
DuctStatic	Analog input
MaTemp	Analog input
A01	Analog output
A010	Analog output
A02	Analog output
A03	Analog output
A04	Analog output
A05	Analog output
A06	Analog output
A07	Analog output
A08	Analog output
A09	Analog output
ClgVlv	Analog output
HtgVlv	Analog output
MaDmpr	Analog output
SaFanVolCtrl	Analog output
DaFiltAlm	Digital input
FrzStat	Digital input
SaFanStatus	Digital input
SaFan	Digital output
static_setpoint	Pseudo analog
EXECUTING_STOPPED	Pseudo digital
SHUTDOWN	Pseudo digital
STARTUP	Pseudo digital
Do_Feedback_DI1	Flexpoint
Do_Feedback_DI2	Flexpoint
Do_Feedback_DI3	Flexpoint

**Apply Filter**

You can apply a filter using wildcards (?) and jokers (\*) to list certain points according to their user address. The filter is case-sensitive. When composing the search name, the list is instantly updated. By default all points are listed with the joker \* in the drop-down list. The user addresses can be sorted ascending or descending by clicking on the **User address** column title.

User address	Point type
Cool1	Analog input
Cool2	Analog input
Cool3	Analog input
Cool4	Analog input
Cool5	Analog input
DaTemp	Analog input
DuctStatic	Analog input
MaTemp	Analog input
A01	Analog output
A010	Analog output
A02	Analog output
A03	Analog output
A04	Analog output
A05	Analog output
A06	Analog output
A07	Analog output
A08	Analog output
A09	Analog output
ClgVlv	Analog output
HtgVlv	Analog output
MaDmpr	Analog output
SaFanVolCtrl	Analog output
DaFiltAlm	Digital input
FrzStat	Digital input
SaFanStatus	Digital input
SaFan	Digital output
static_setpoint	Pseudo analog
EXECUTING_STOPPED	Pseudo digital
SHUTDOWN	Pseudo digital
STARTUP	Pseudo digital
Do_Feedback_DI1	Flexpoint
Do_Feedback_DI2	Flexpoint
Do_Feedback_DI3	Flexpoint

- Procedure**
1. Into the drop-down listbox at the top, enter search name using wildcards and/ or jokers.

Example: In the following, all user addresses beginning with 'S' are displayed.

User address	Point type
SaFanVolCtrl	Analog output
SaFanStatus	Digital input
SaFan	Digital output
SHUTDOWN	Pseudo digital
STARTUP	Pseudo digital

**Edit Points**

**Purpose** Edit point values and write them to the controller.

**Procedure** 1. In the list on the left, click on datapoint.

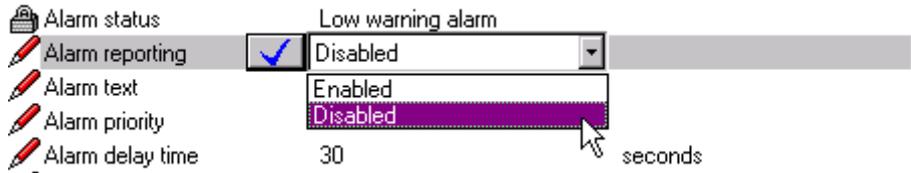
**RESULT:** On the right pane, the datapoint's attributes with value and unit are displayed. The *pencil* icon indicates attributes that can be edited. The *lock* icon indicates read-only attributes. In the yellow field at the top the user address name is displayed.

**NOTE:** The points will not be polled. To refresh point values, double-click on the point in the left list.

The screenshot shows the 'XL Online' software interface. The 'Datapoints' tab is active, and 'DuctStatic' is selected in the left pane. The right pane displays the following attributes for 'DuctStatic':

Attribute	Value	Unit
Tech. addr. (C/B/T)	22 / 90 / 5	
Point subtype	Slow AI	
Point descriptor	0	
Manual point value	0	Inw
Automatic point value	0	Inw
Last change	01.03.2002 - 16:47:58	
High alarm limit	2	Inw
High warning limit	2	Inw
Low warning limit	0	Inw
Low alarm limit	0	Inw
Engineering unit	16: "Inw" #2	
Characteristics index	1	Pressure 0-3" (0/-0.75) (2/...
ADC offset	0	Inw
Point enabled	Enabled	
Alarm status	Low limit alarm	
Alarm reporting	Enabled	
Alarm text	0	
Alarm priority	Critical	
Alarm delay time	30	seconds
Alarm hysteresis	0.3	Inw
Trend recording	Disabled	
Trend hysteresis	0.1	Inw
Trend cycle counter	0	seconds
Health status	Online	
Password level	3	
Access control priority	0	
Mapped NVI name	(20) <not available>	
Mapped NVO name	(-1) <not available>	

2. In the left list, click on the point, you want to edit.
3. On the right pane, click into the **Value** column of the attribute.
4. Enter value and press ENTER key or click  button.



RESULT: The value is written to the controller.



5. Note, that alarms that may occur and be displayed on the *Alarms* tab and/or in the *Alarm* popup alert.

**Set Points to Manual Mode**

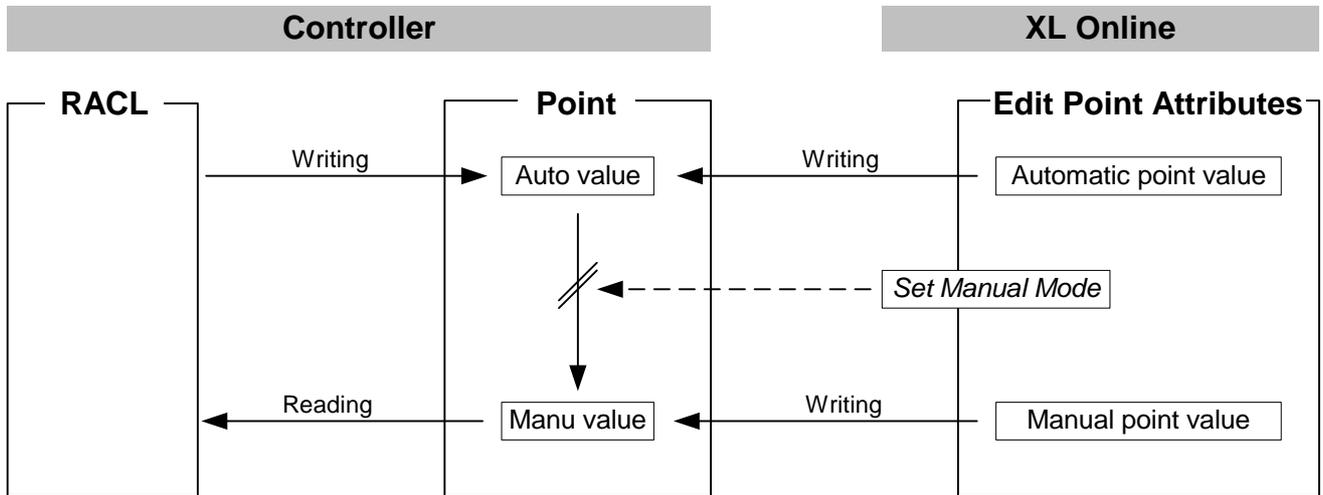
Changing a point value via XL Online is handled by the controller internally as follows:

The changed value is written to the **Auto value** field and by default automatically copied to the **Manu value** field. RACL writes to the **Auto value** field and reads from **Manu value** field. To disable the automatic copy, the manual mode option can be set. In this case RACL always reads the given manual point value, which may differ from the automatic point value.

Examples:

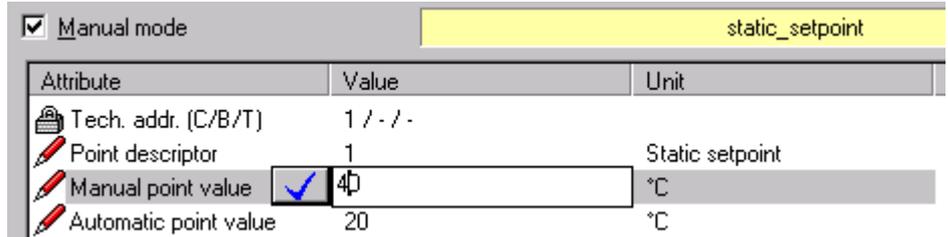
For a pseudopoint, use the automatic point value attribute and write a constant value to the controller, e.g. room temperature = 26 degrees C.

For a digital output, set the manual mode and switch on a pump constantly by setting the manual point value to ON.



To set the manual mode, check the **Manual Mode** checkbox.

To enter a manual value, click into the **Value** field of the **Manual point value** attribute and enter desired value.



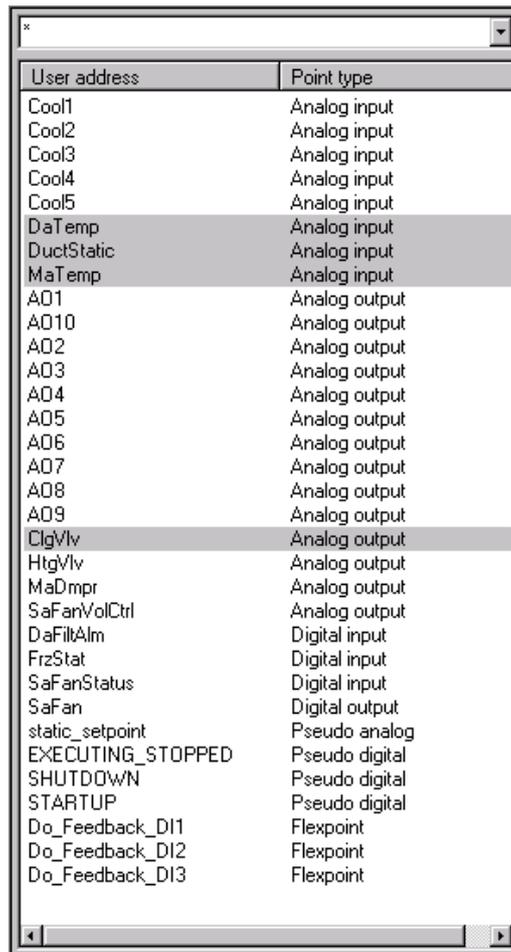
**Set Point to Manual Mode**

- Procedure**
1. Check **Manual Mode** checkbox to put a point into manual mode.
  2. Note alarms that may occur and be displayed on the *Alarms* tab and/or in the *Alarm* popup alert.

**Select Points in Manual Mode**

**Purpose** Highlights all points currently displayed that are in manual mode. Note, in case a filter is applied, points will be searched only in the currently displayed list.

- Procedure**
1. Click menu item **Datapoints**, then submenu item **Select points in manual mode**.
- RESULT:** Software is scanning and all found points are highlighted in gray in the list.

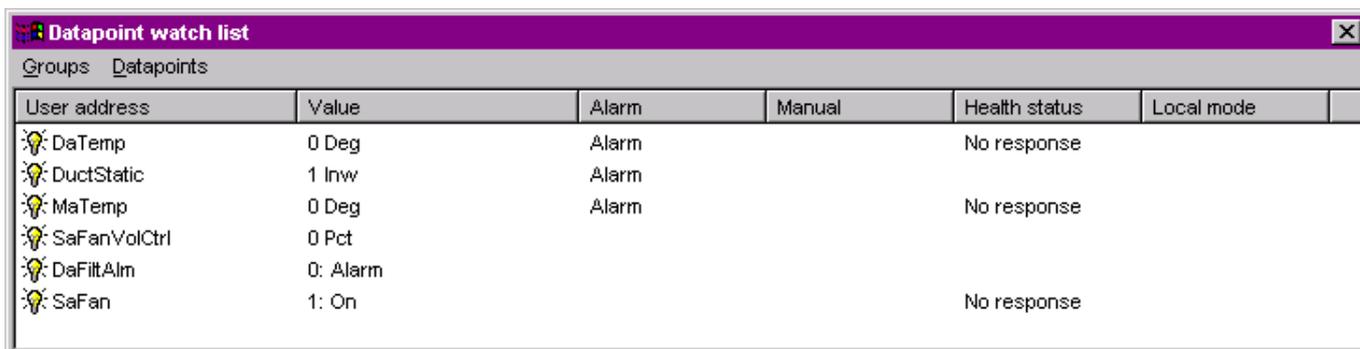


**Clear Manual Mode for Selection**

- Purpose** Sets all points that are in manual mode into automatic mode.
- Procedure**
1. Click menu item **Datapoints**, then submenu item **Clear manual mode for selection**.
- RESULT: Software is setting automatic mode for all selected points.
2. Note alarms that may occur and be displayed on the *Alarms* tab and/or in the *Alarm* popup alert.

**Add Points to Watch list**

- Purpose** Add selected points to a watch list. In this watch list certain states for the points will be polled and displayed. Points can be removed from the watch list and new points can be added to the watch list. Multiple points can be added and saved to a group for re-use. This group can also be used for trending.
- Procedure**
1. In the list select points by using left mouse key and STRG key, respectively SHIFT key.
  2. Click menu item **Datapoints**, then submenu item **Add point to watchlist** or click  button.
- RESULT: In the *Datapoint watch list* window selected points are displayed. Max. four points are polled and updated concurrently as indicated by the flashing *yellow light* icon. The following states are continuously updated:
- Value**  
Displays the current value of the point.
- Alarm**  
Shows whether the point is in alarm or not
- Manual**  
Displays whether the point is in manual operation or not
- Health status**  
Shows whether the I/O module, the point is assigned to, communicates with the controller or not. 'No response' means that there is no communication.
- Local mode**  
Shows whether the point is in manual override or not.



User address	Value	Alarm	Manual	Health status	Local mode
DaTemp	0 Deg	Alarm		No response	
DuctStatic	1 Inw	Alarm			
MaTemp	0 Deg	Alarm		No response	
SaFanVolCtrl	0 Pct				
DaFiltAlm	0: Alarm				
SaFan	1: On			No response	

- Remove Point(s) from Watch list**
1. In the *Datapoint watchlist* window, select points by using left mouse key and STRG key, respectively SHIFT key.
  2. Click menu item **Datapoints**, then submenu item **Remove** or press DEL key.

RESULT: The selected points are removed from the list.

**Save Point(s) in Group**

1. Click menu item **Groups**, then submenu item **Save as**.
2. In the *Save as* dialog box, save the file.

RESULT: All points are saved in the *.HGF* file and can be re-used later.

**Load Point Group**

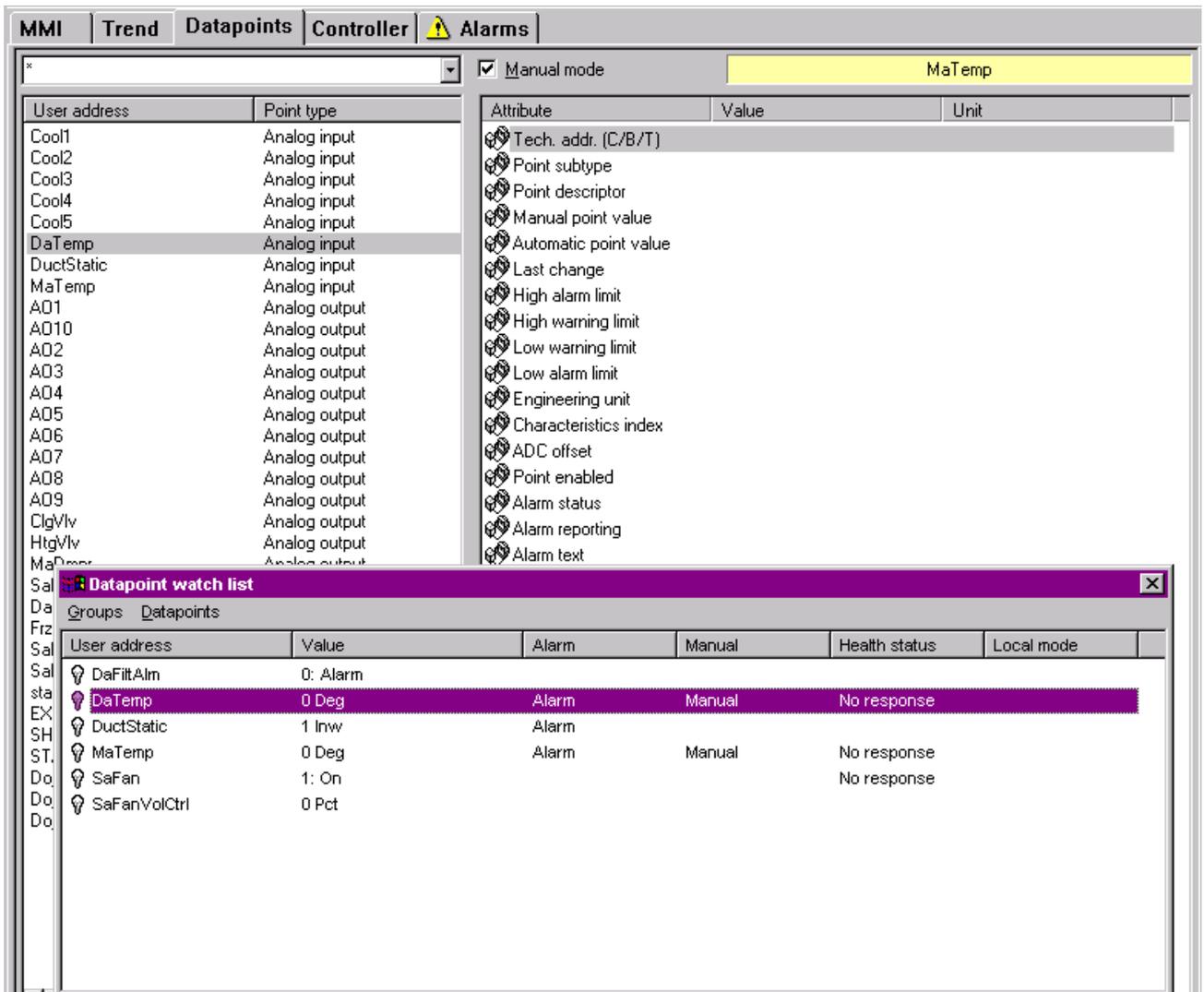
1. Click menu item **Groups**, then submenu item **Load**.
2. In the *Open* dialog box, open the *.HGF* file.

RESULT: The points of the group are displayed in the watch list and will be polled. All previously loaded point will be removed from the list.

**Show Attributes for Watched Point on Datapoints tab**

1. For a watched point in the *Datapoint watchlist* window, the attributes for the point can be viewed concurrently on the *Datapoints* tab in the *XL Online* main window.
2. In the *Datapoint watchlist* window, double-click on the point.

RESULT: In the following example, the 'DaTemp' datapoint has been double-clicked. On the **Datapoints** tab, the point is highlighted and its attributes are shown.



View Watch list

- Procedure** 1. Click menu item **View**, then submenu item **Watchlist**.

**RESULT:** The *Datapoints watchlist* window displays showing the previously watched points. Polling starts. Points not being found in the controller, will be indicated by a green *question mark* icon.

Trend Points

**Purpose** To graphically record point value changes. Datapoints to be recorded will be defined and saved in an *.HTF* file. For the recorded trend data, time and used datapoints are continuously saved block by block into a history file and can be exported as *.CSV* file to MS Excel.

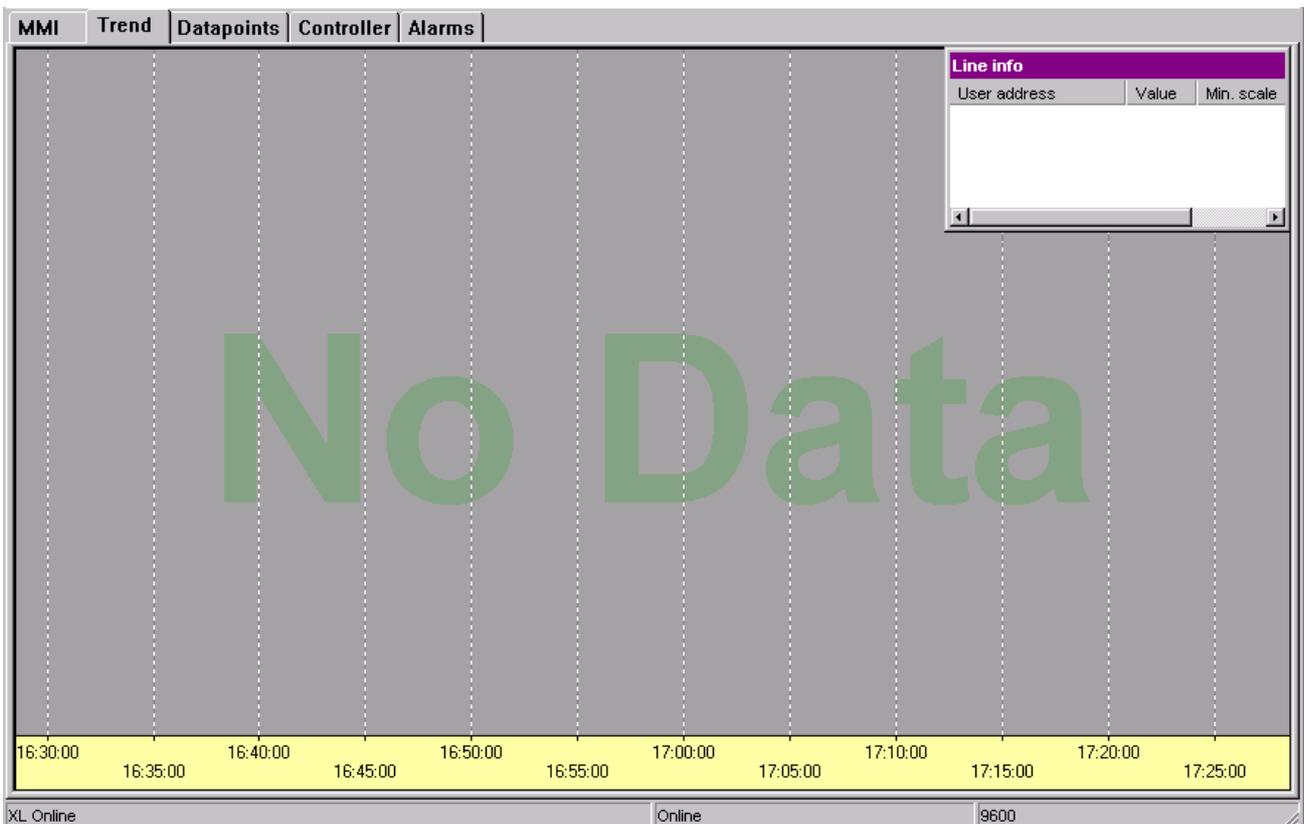
A trending session includes the following steps:

1. Initiate trending by creating a new or open an existing *.HTF* file
2. Select datapoints for recording
3. Start recording
4. Stop recording
5. Close trending

**NOTE:** Steps 1 to 4 create one block in the history file and can be repeatedly done for different datapoint combinations (*.HTF* files). For one and the same *.HTF* file, it is not possible to continue a stopped recording at the same point (value/time) where it was finished. The new recording starts from scratch. But, every record is saved as block in the history file.

- Procedure** 1. Click *Trend* tab.

**RESULT:** The recording pane shows the recording status 'No Data' and the *Line info* is empty.



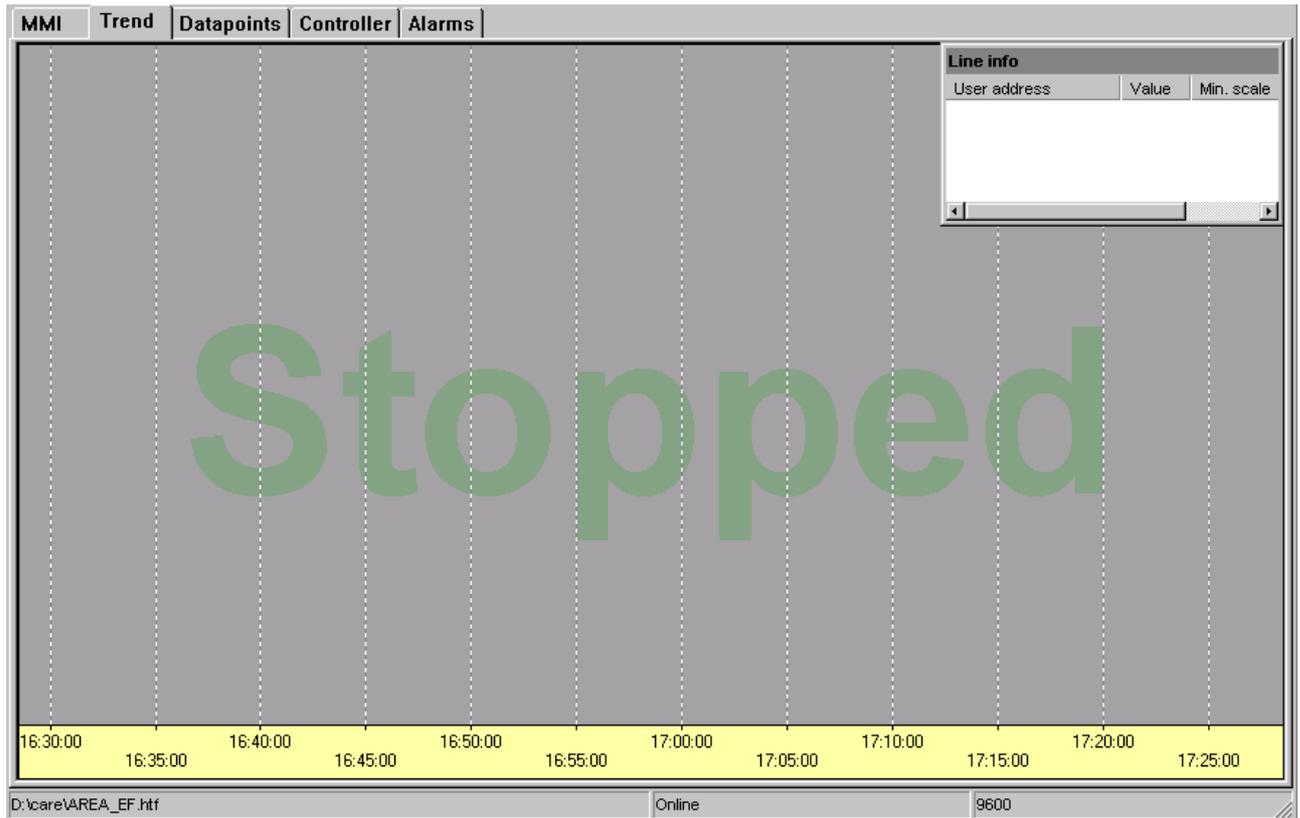
2. If you want to start the session with a new combination of datapoints, click menu item **Trend**, then submenu item **New**.
3. In the *Save as* dialog box, enter the file name, e.g. AREA\_EF and click **Save** button.

Or,

If you want to open an already recorded combination of datapoints, click menu item **Trend**, then submenu item **Open**.

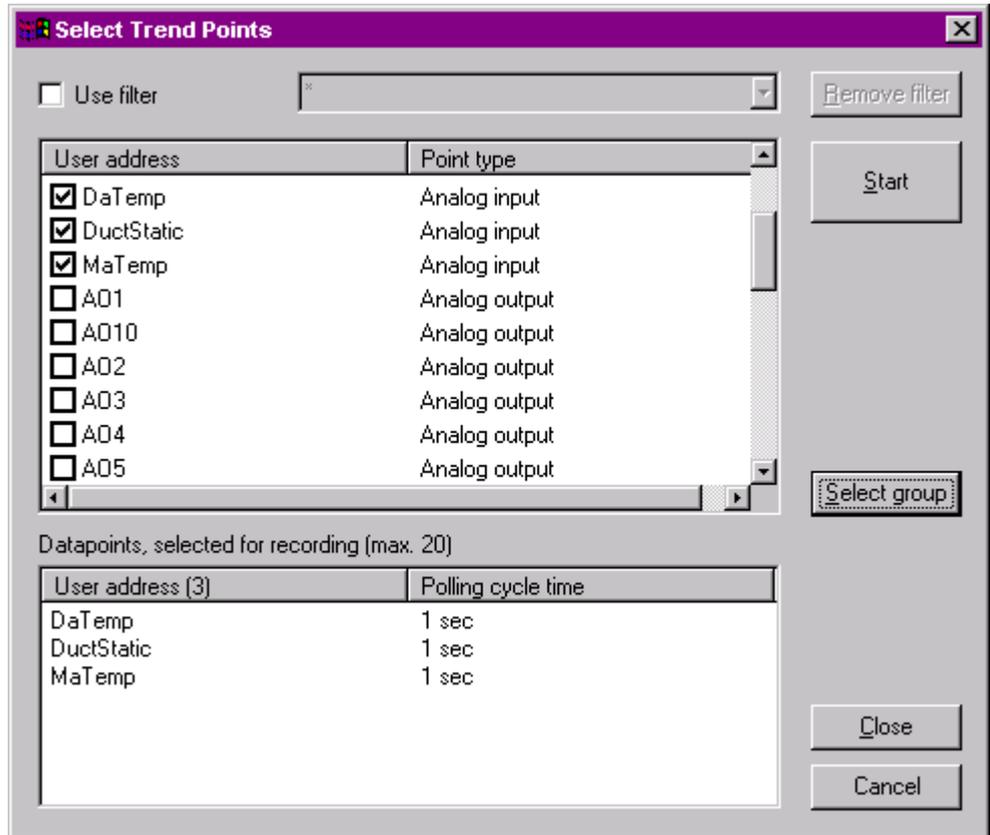
In the *Save as* dialog box, select the file and click **Save** button.

**RESULT:** On the pane the recording status 'Stopped' is displayed. The status line shows the *.HTF* file name, in this case *AREA\_EF.HTF*.



4. Click menu item **Trend**, then submenu item **Select datapoints**.

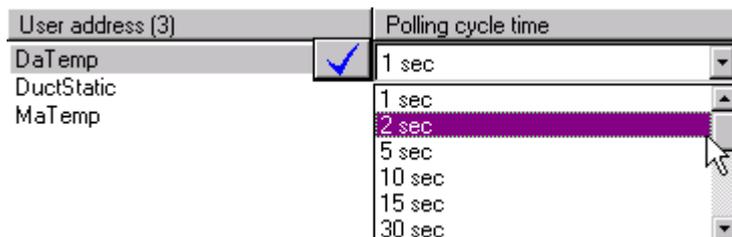
**RESULT:** The *Select Trend Points* dialog box displays.



5. Select datapoints for recording by checking the corresponding checkboxes. If desired, use a filter by checking the **Use filter** checkbox and entering the filter criteria in the same manner as described under the "Apply Filter section".

Or, select a point group previously created for the watch list as follows: Click the **Select group** button. In the *Open* dialog box, enter the file name, e.g. *myGroup.HGF* and click **Open** button. Note, that if a group is selected datapoints previously checked as described in step 5 will be de-selected.

6. If desired, change the polling cycle time for points as follows: Click into the **Polling cycle time** column for the point, select the value and press the ENTER key.



7. Click **Start** button

**RESULT:** The points are copied to the *Line info* window. Software starts trending as indicated by the recording status 'Recording'. The actual record start time is centered in the yellow time scale at the bottom.



- In the *Line info* window, check the datapoints you want to display by clicking the corresponding checkbox.

**RESULT:** In the *Line info* window, each point gets a display color by accident and the current values are continuously displayed in the **Value** column. On the recording pane, a colored line graphically displays the point's values. Start and end of the line are enlarged.

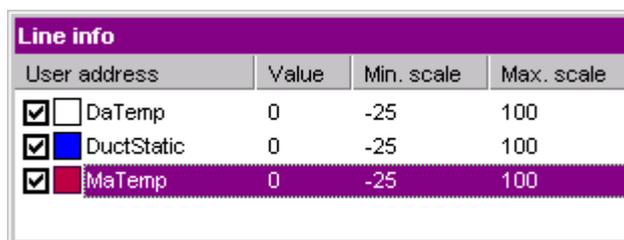
**NOTE:** All points will be recorded, even a point was not selected for graphical display.



9. When recording multiple points, it is recommended to move the recording lines by customizing the scales (see "Customize Scales" section).
10. To stop recording, click menu item **Trend**, then uncheck submenu item **Start / Stop recording** or press  button.  
  
NOTE: It is not possible to continue a stopped recording at the same point (value/time) where it was finished. The new recording starts from scratch. But, every record is saved as block in the history file.
11. To directly start a new recording for the same datapoint combination press  button.
12. To start a new recording with a different datapoint combination, repeat steps 2 to 10.
13. To end the trend session, click menu item **Trend**, then submenu item **Close**.

### Show/Hide Line Info Window

- Procedure**
1. To view/hide the *Line info* window, check/uncheck the **Show Info** submenu item in the **Trend** menu.



Line info			
User address	Value	Min. scale	Max. scale
<input checked="" type="checkbox"/> <input type="checkbox"/> DaTemp	0	-25	100
<input checked="" type="checkbox"/> <input type="checkbox"/> DuctStatic	0	-25	100
<input checked="" type="checkbox"/> <input type="checkbox"/> MaTemp	0	-25	100

### Customize Scales

The horizontal time scale and the vertical value scale can be customized while recording and after the recording has been stopped. In case of multiple point recording, the recording lines can be individually displayed by setting individual scales for the points.

### Customize Time Scale

The time scale can be set to three different time ranges and for each range different resolutions can be adjusted.

**Set Time Range** With right mouse key, click on the gray area of the recording pane.

With left mouse key, click **Time scaling**, and then click desired **time range** in the context menu:

**1 hour**  
Displays 1 hour in the format hh.mm.ss (seconds not used and set to 00)

**1 day**  
Displays 1 day in the format hh.mm.ss (seconds not used and set to 00)

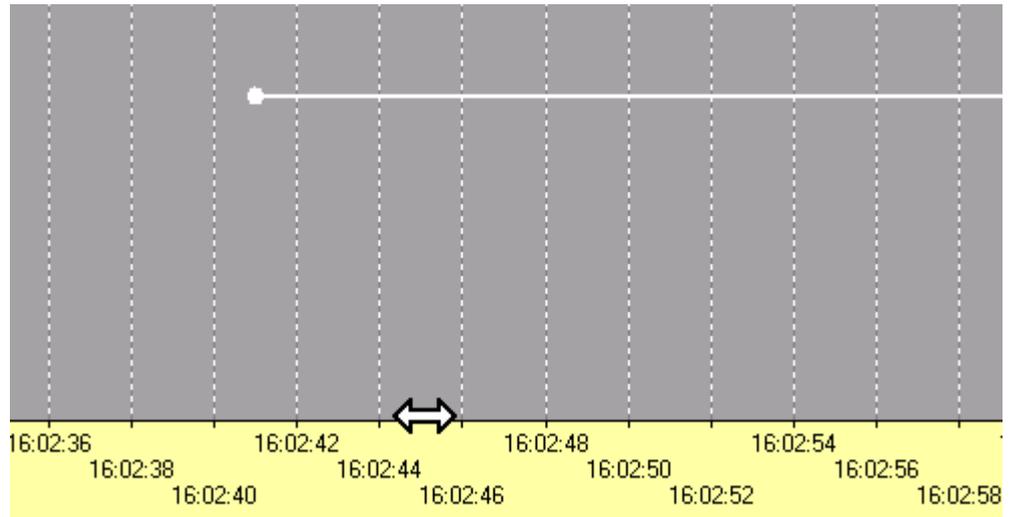
**Full range**  
Displays range covering the first and the last value in the format hh.mm.ss

**Center Scale** With left mouse key, double-click on the time scale to center the scale around the current PC time.

**Move View**

To move the viewed area to the left or right do the following:  
Click on the coordinate axis area till a double arrow appears and move the line to the left or right.

At the desired position, release left mouse key.

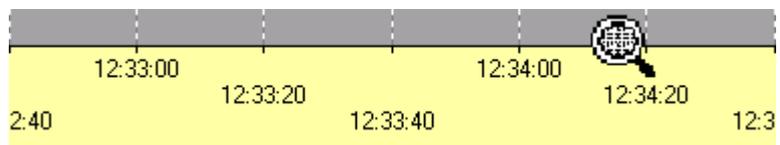


**Change Resolution**

To change the resolution, click right mouse key over the time scale till the magnifying glass symbol displays.

With pressed right mouse key, move the magnifying glass symbol horizontally to the left or right and release right mouse key as soon as the desired resolution is shown on the scale. Pressing SHIFT key concurrently speeds up the movement by factor 3.

Examples: Range = full scale, resolution = 10, 15, 20 seconds



**Customize Value Scale**

When starting a recording session, the value scale is set to default values, which depend on the source of the datapoints (new selected points or a block from a history file). For example, when starting a session from scratch, the minimum scale value is '-25' and the maximum value is '100'. The recording lines start at the shifted origin '0'. The origin can be restored which means that the scale starts with the value '0' at the origin of the coordinate axes.

For each datapoint's recording line, the scale values can be set individually. Scale settings can be copied from one datapoint to another.

**Set Min and Max Value**

In the *Line info* window, click into the **Min. scale**, respectively **Max. scale** column. Type in value and press ENTER key.

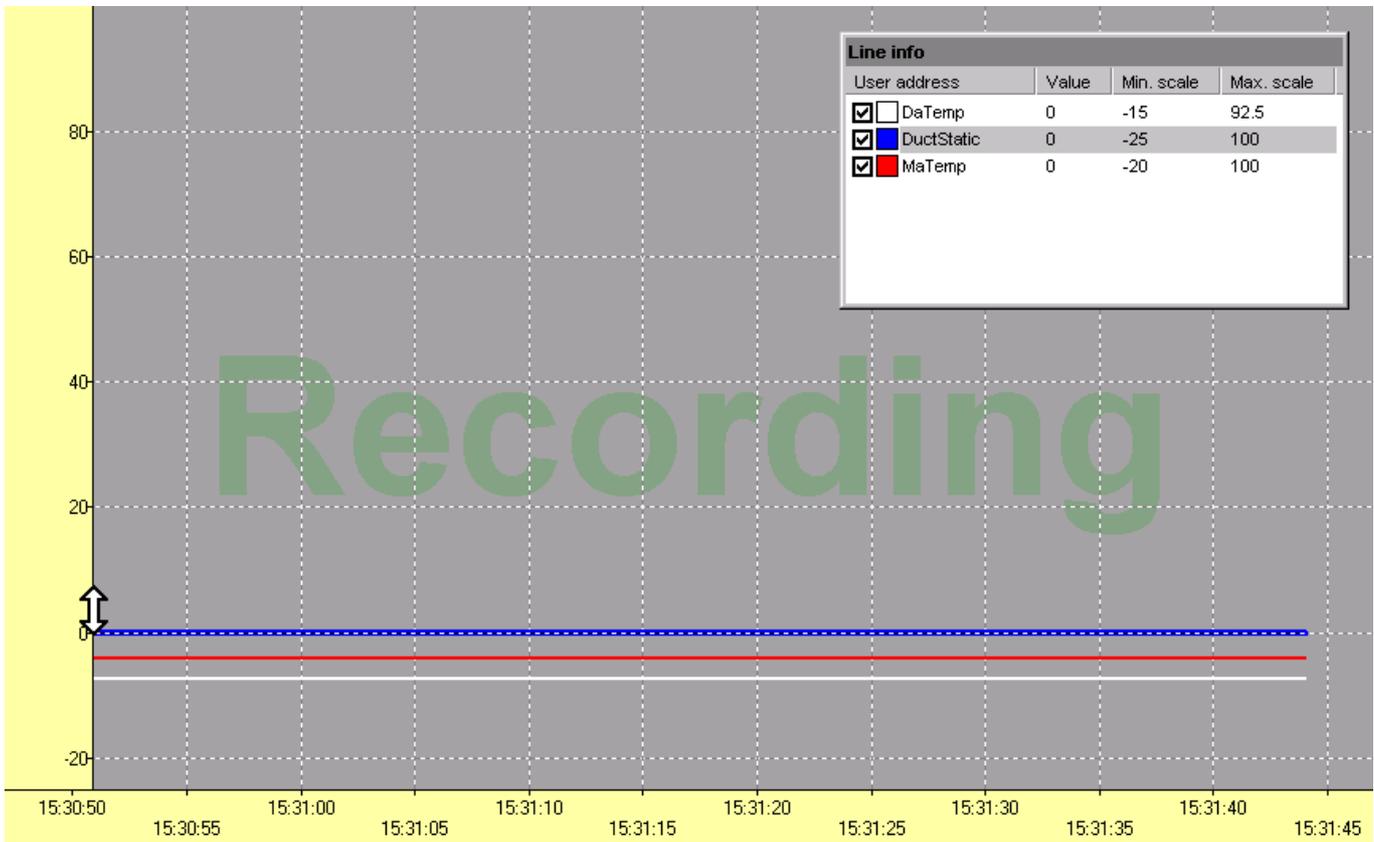
Line info			
User address	Value	Min. scale	Max. scale
<input checked="" type="checkbox"/> DaTemp	0	-15	92.5
<input checked="" type="checkbox"/> DuctStatic	0	-25	100
<input checked="" type="checkbox"/> MaTemp	0	-20	100

Or, with left mouse key, click on the line.  
 On the left, the value scale appears.  
 Click on the coordinate axis area till a double arrow appears and move the line up or down.  
 At the desired position, release the left mouse key.  
 Pressing SHIFT key concurrently speeds up the movement by factor 3.

Or, with left mouse key, click on the line.  
 Click right mouse key and with left mouse key, click on **Full scale** in the context menu.  
 The scale is set to the range covering all recorded values of this time.

Note the min and max scale value changes in the *Line info* window.

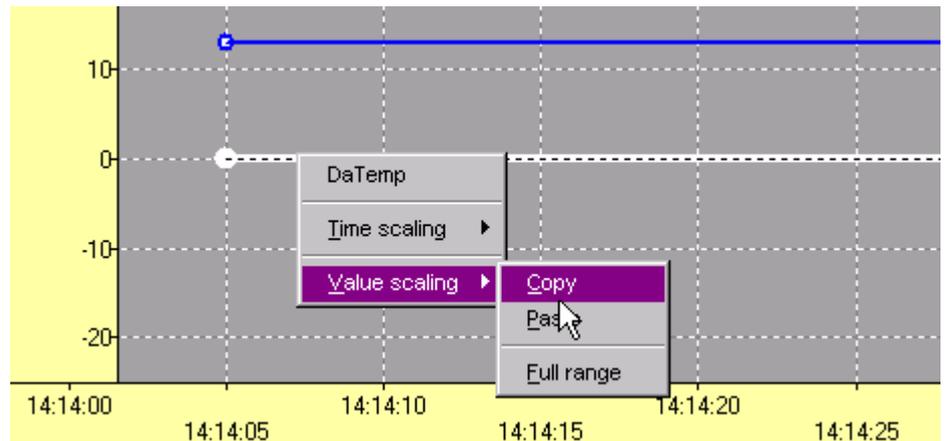
NOTE: If a recording line cannot be clicked on, since it is not visible in the recording pane, select the datapoint in the *Line info* window and set proper scale values for re-display.



**Copy Scale Setting**

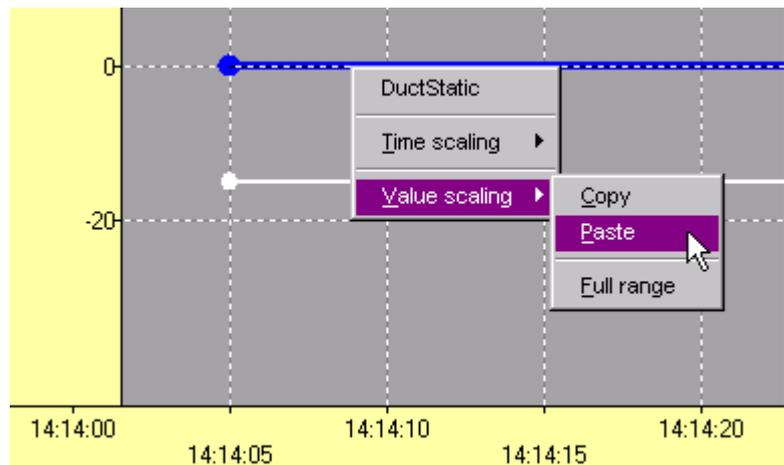
To copy a scale setting from one point to another do the following:

Click on the recording line, in this case the lower one, or select datapoint in the *Line info* window.



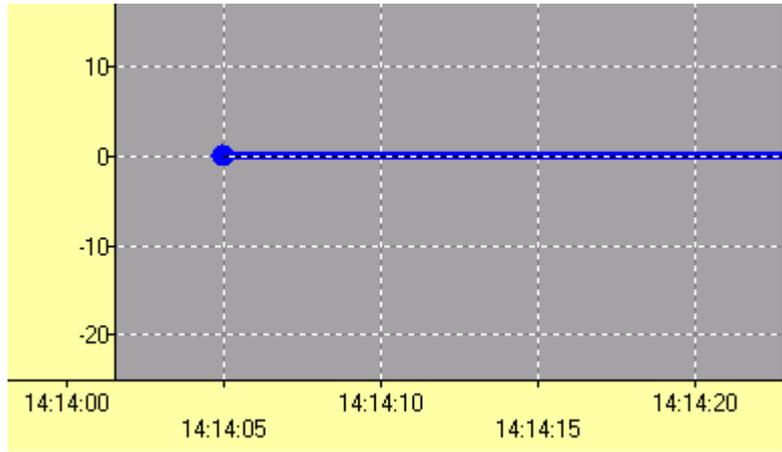
Click right mouse key, and with left mouse key click **Value scaling** and **Copy** in the context menu.

Click on the recording line, in this case the upper one, or select datapoint in the *Line info* window to which you want to copy the scale setting.



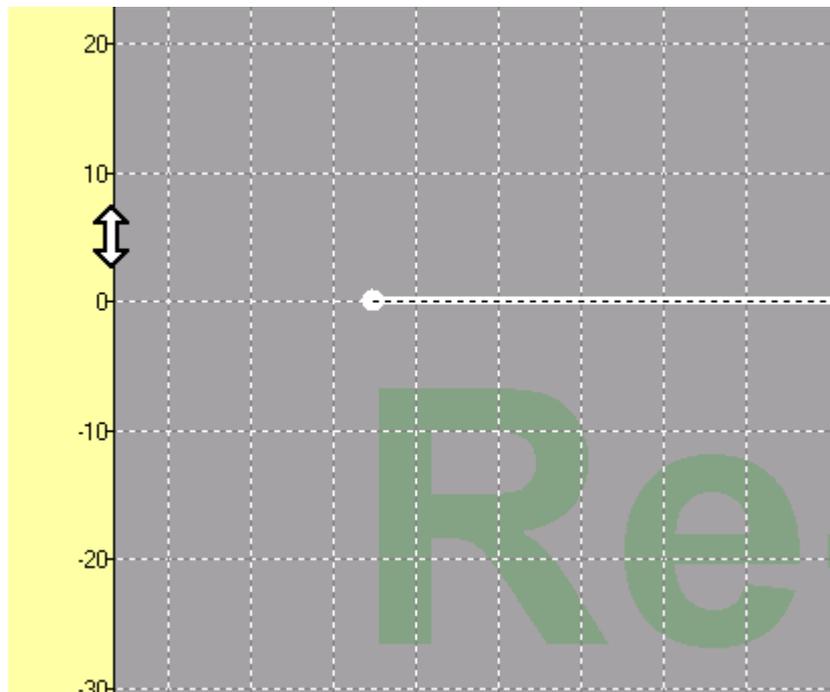
Click right mouse key, and with left mouse key click **Value scaling** and **Paste** in the context menu.

**RESULT:** The upper line gets the scale settings of the below line which is now covered.



**Move baseline** To move the baseline of a recording line upwards or downwards do the following:

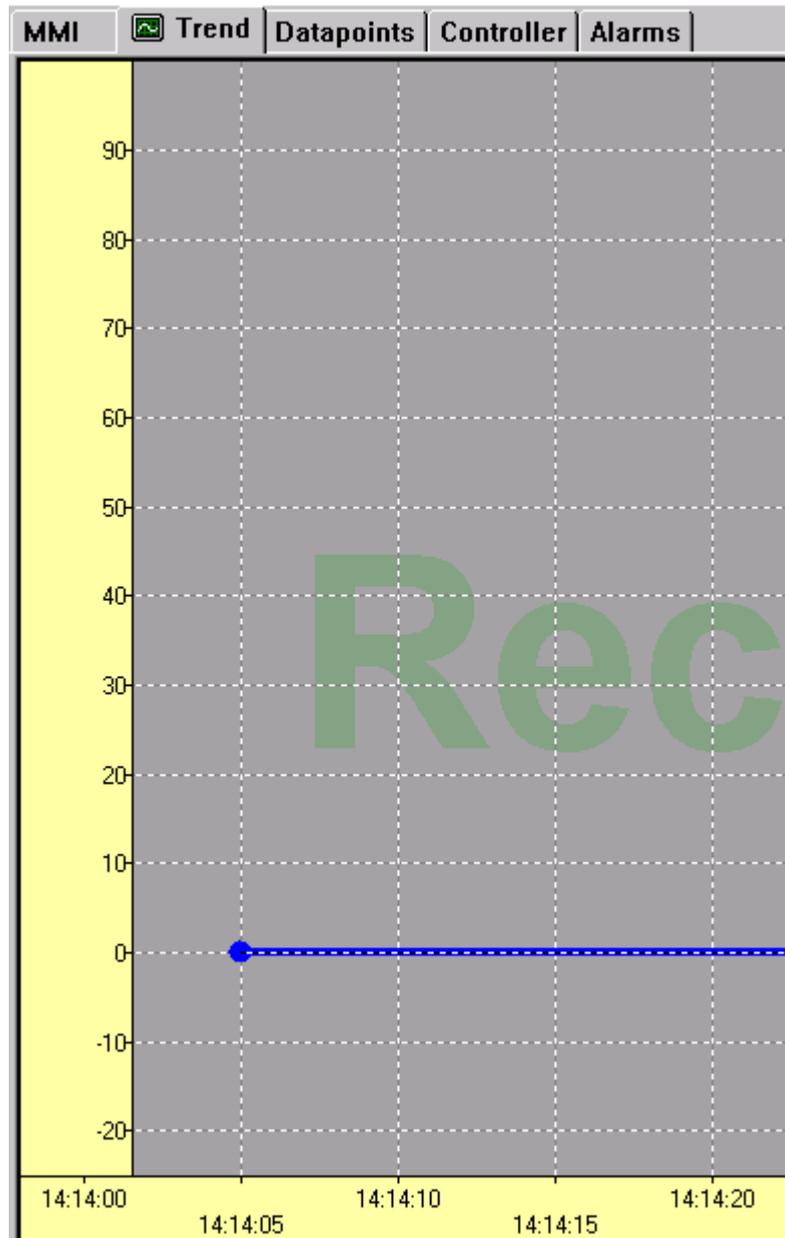
- Click on the recording line.
- On the left, click on the coordinate axis area of the value scale till a double arrow appears and move the line up or down.
- At the desired position, release the left mouse key.
- Pressing SHIFT key concurrently speeds up the movement by factor 3.



**Change Resolution** Changing the resolution for the value scale can be done in the same manner as described for the Time scale.

**Restore Baseline** Click on the recording line.

RESULT: On the left, the value scale displays.



Double-click on the value scale.

RESULT: The baseline is set to the origin, that is, the scale starts with the value '0' at the origin of the coordinate axes.



**View Record History**

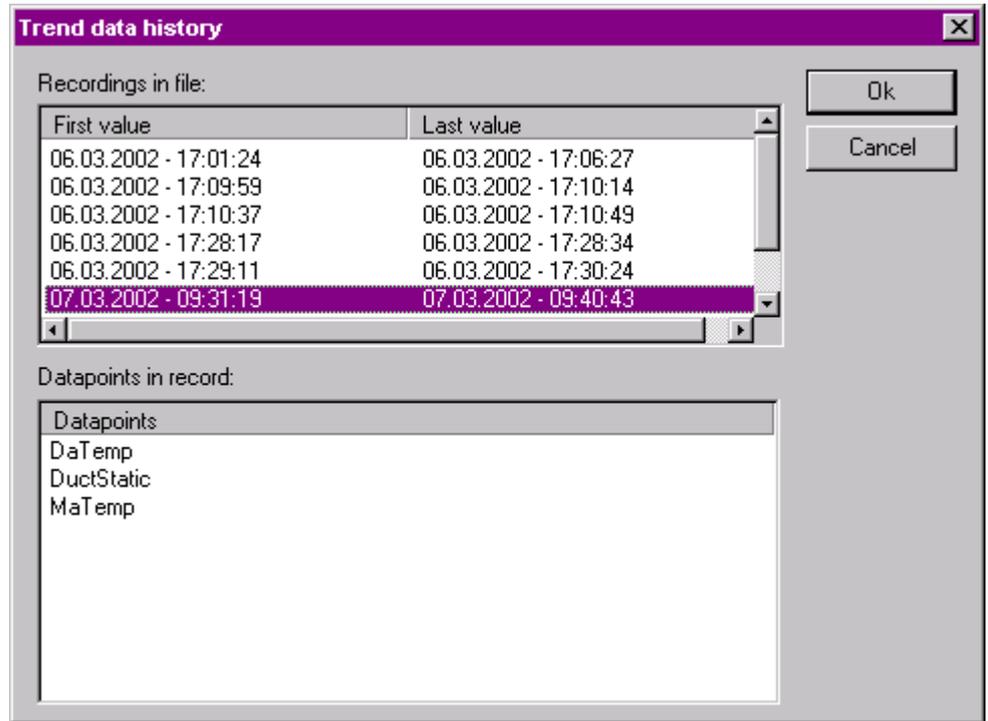
**Purpose** To view recording blocks by time and datapoints.

**Procedure** 1. Click menu item **Trend**, then submenu item **History**.

**RESULT:** The *Trend data history* dialog box displays. The recordings are displayed with start time (**First value**) and end time (**Last value**) in the **Recordings in file** list field.

2. To view the recorded datapoints of a record, click on the record in the list.

**RESULT:** In the **Datapoints in record** field, the datapoints, which are recorded in this time frame, are displayed.



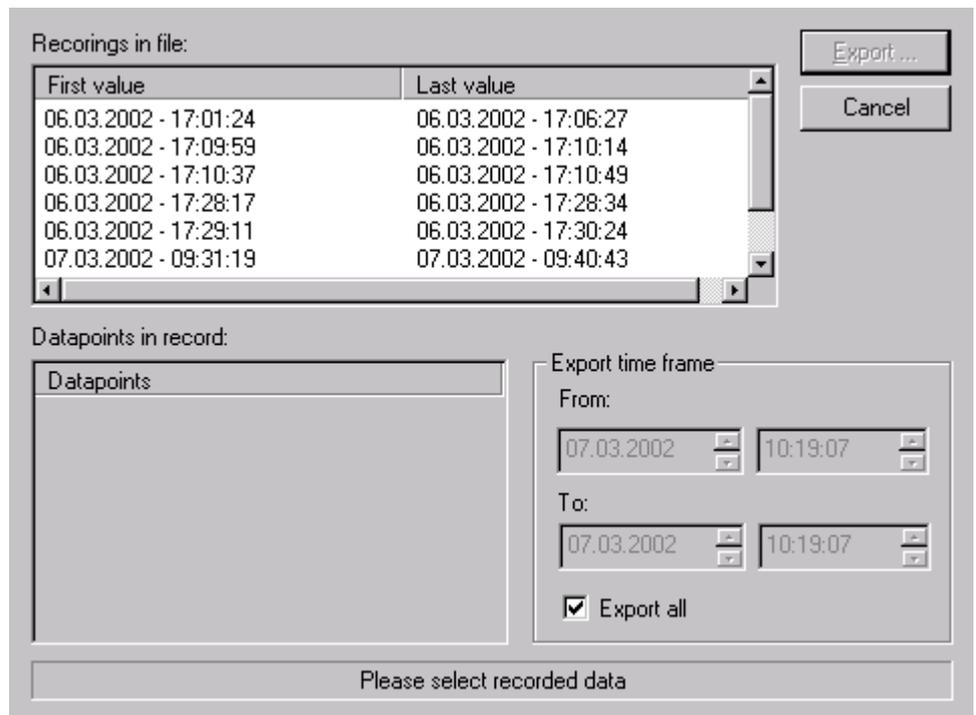
3. Close the *Trend data history* dialog box by clicking **OK** or **Cancel** button.

**Export Record Data**

**Purpose** To export records as .CSV file to e.g. MS Excel.

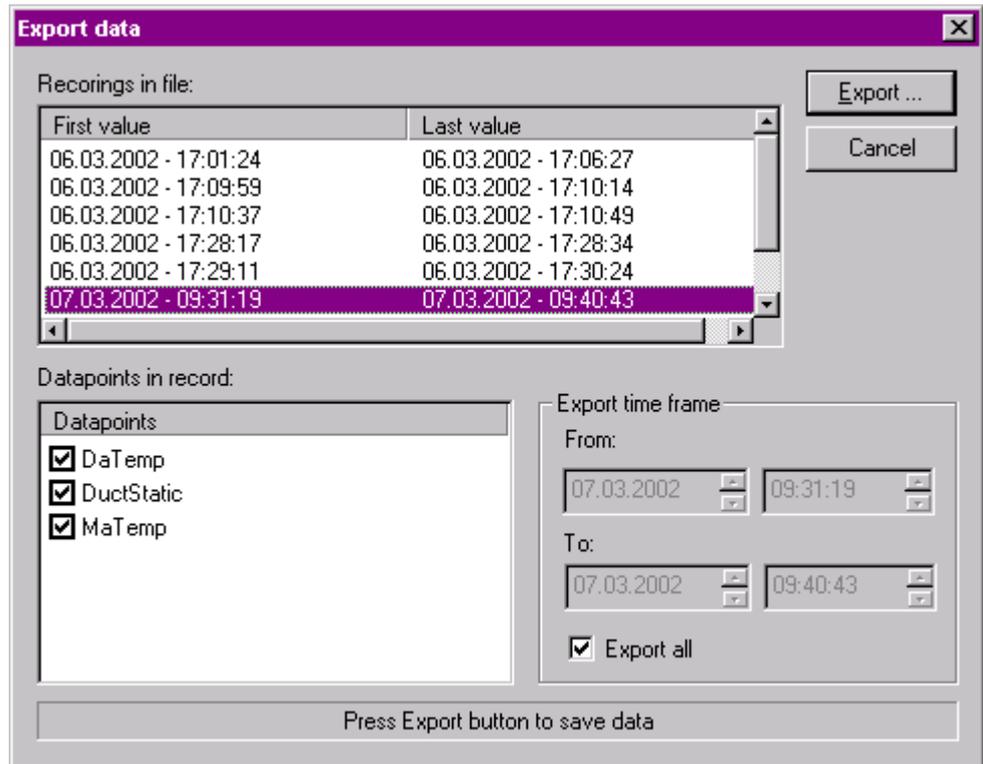
**Procedure** 1. Click menu item **Trend**, then submenu item **Data Export**.

**RESULT:** The *Export data* dialog box displays. The recordings are listed with start time (**First value**) and end time (**Last value**) in the **Recordings in file** list field.



- To view the recorded datapoints of a record, click on the record in the list.

RESULT: In the **Datapoints in record** field, the datapoints are displayed.



- If you want to except a datapoint's data from the export, uncheck the point.
- If you want to export not the complete time frame of a record, uncheck the **Export all** checkbox and set the time frame in the **From** and **To** fields on the right.
- Click the **Export** button.
- In the *Save as* dialog box, enter the name for the .CSV file and click the **Save** button.

## View Alarms

**Purpose** View critical and non-critical alarms.

Critical alarms are controller system alarms and alarms that arise for points that have the critical alarm attribute assigned. Non-critical alarms arise for points that have the non-critical alarm attribute assigned.

Datapoint attribute related alarms arise due to limiting value exceeding or undershooting of either the critical or non-critical attribute value.

When controllers report alarms, they report critical alarms first, then any non-critical alarms they may have.

NOTE: Alarms are displayed. They can be cleared but not acknowledged. Alarms can be saved into a printable log file. New alarms will be added continuously to the end of the log file. An alarm history file is not available.

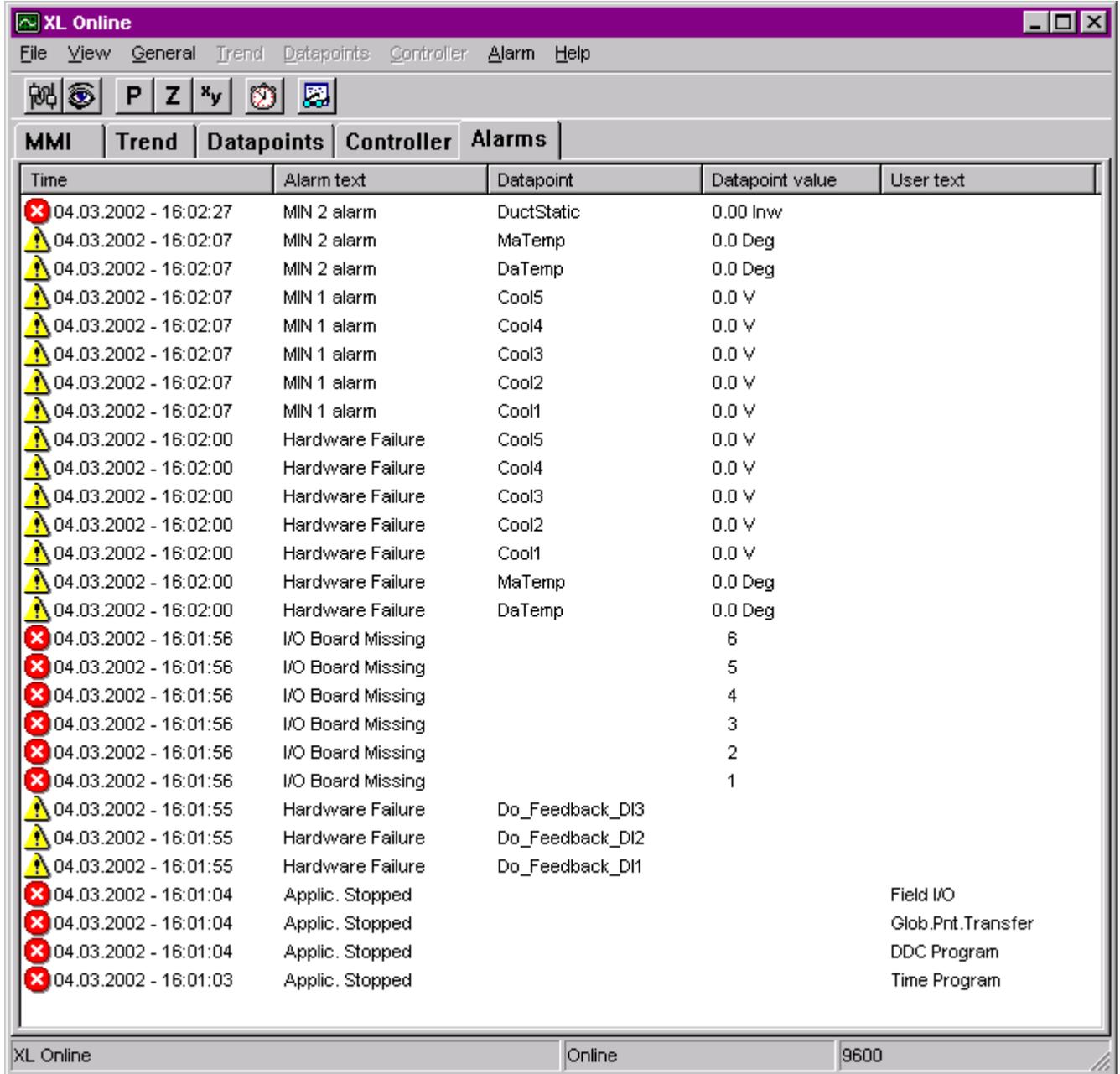
Alarms will be displayed on the *Alarms* tab by default and in an additional popup alert (optional).

Check the general alarm settings (see "Alarms Settings" section) for new alarm insertion, popup alert display and log file creation.

**Procedure** 1. Click on the *Alarms* tab.

NOTE: The *Alarms* icon  **Alarms** is flashing on the *Alarm* tab as long as the tab has not been selected yet.

RESULT: The alarms are displayed as follows:



Time	Alarm text	Datapoint	Datapoint value	User text
04.03.2002 - 16:02:27	MIN 2 alarm	DuctStatic	0.00 Inw	
04.03.2002 - 16:02:07	MIN 2 alarm	MaTemp	0.0 Deg	
04.03.2002 - 16:02:07	MIN 2 alarm	DaTemp	0.0 Deg	
04.03.2002 - 16:02:07	MIN 1 alarm	Cool5	0.0 V	
04.03.2002 - 16:02:07	MIN 1 alarm	Cool4	0.0 V	
04.03.2002 - 16:02:07	MIN 1 alarm	Cool3	0.0 V	
04.03.2002 - 16:02:07	MIN 1 alarm	Cool2	0.0 V	
04.03.2002 - 16:02:07	MIN 1 alarm	Cool1	0.0 V	
04.03.2002 - 16:02:00	Hardware Failure	Cool5	0.0 V	
04.03.2002 - 16:02:00	Hardware Failure	Cool4	0.0 V	
04.03.2002 - 16:02:00	Hardware Failure	Cool3	0.0 V	
04.03.2002 - 16:02:00	Hardware Failure	Cool2	0.0 V	
04.03.2002 - 16:02:00	Hardware Failure	Cool1	0.0 V	
04.03.2002 - 16:02:00	Hardware Failure	MaTemp	0.0 Deg	
04.03.2002 - 16:02:00	Hardware Failure	DaTemp	0.0 Deg	
04.03.2002 - 16:01:56	I/O Board Missing		6	
04.03.2002 - 16:01:56	I/O Board Missing		5	
04.03.2002 - 16:01:56	I/O Board Missing		4	
04.03.2002 - 16:01:56	I/O Board Missing		3	
04.03.2002 - 16:01:56	I/O Board Missing		2	
04.03.2002 - 16:01:56	I/O Board Missing		1	
04.03.2002 - 16:01:55	Hardware Failure	Do_Feedback_DI3		
04.03.2002 - 16:01:55	Hardware Failure	Do_Feedback_DI2		
04.03.2002 - 16:01:55	Hardware Failure	Do_Feedback_DI1		
04.03.2002 - 16:01:04	Applic. Stopped			Field I/O
04.03.2002 - 16:01:04	Applic. Stopped			Glob.Pnt.Transfer
04.03.2002 - 16:01:04	Applic. Stopped			DDC Program
04.03.2002 - 16:01:03	Applic. Stopped			Time Program

Critical alarms are indicated by the red  icon, non-critical alarms are indicated by the  icon. For each alarm the following information is displayed:

**Time**

Time when the alarm was generated

**Alarm text**

System alarm text of the controller

**Datapoint**

Name of datapoint

**Datapoint value**

Value of the datapoint when the alarm was generated

**User text**

Alarm text attribute defined for the datapoint.

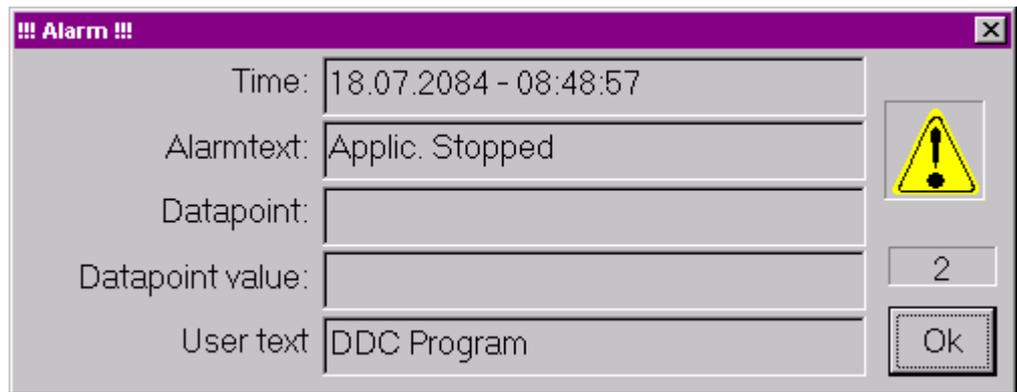
2. To clear the list from certain alarms, select alarms by using STRG and/or SHIFT key and click menu item **Alarm**, then submenu item **Clear selection**.
3. To clear the list completely, click menu item **Alarm**, then submenu item **Clear all**.

**View Alarms in Popup Alert**

**Purpose** To display new alarms in an additional popup alert.

**Procedure** 1. To enable the popup alert display, see "Alarms Settings" section.

RESULT: New alarms will be displayed additionally in a popup alert. Both, critical and non-critical alarms are displayed one after the other with time, alarm text, datapoint name, value and user-defined text.



2. Check and respond to the alarms.
3. To clear an alarm, click the **OK** button.
4. To clear all alarms, close the dialog by clicking the *Close* icon at the top right corner.

NOTE: The yellow icon on the right remains the same for both, critical and non-critical alarms.

**View Alarm History Buffer**

**Purpose** To display the alarm messages saved in the alarm history buffer.

**Procedure** 1. Click menu item **Alarm**, then submenu item **Alarm History Buffer**.

RESULT: At max. the last 99 messages from the alarm history buffer are displayed (use scroll buttons on the left).

Time	Alarm text	Datapoint	Datapoint value	User text
23.05.2002 - 14:15:45	Power failure			
22.05.2002 - 12:41:02	New appli. loaded			
22.05.2002 - 12:40:42	Applic. Stopped			DDC Program
22.05.2002 - 12:40:42	Applic. Stopped			Glob.Pnt.Transfer
22.05.2002 - 12:40:42	Applic. Stopped			Field I/O
22.05.2002 - 12:40:42	NV Bindings lost			
22.05.2002 - 12:40:40	Applic. Stopped			Time Program
21.05.2002 - 15:59:16	New appli. loaded			

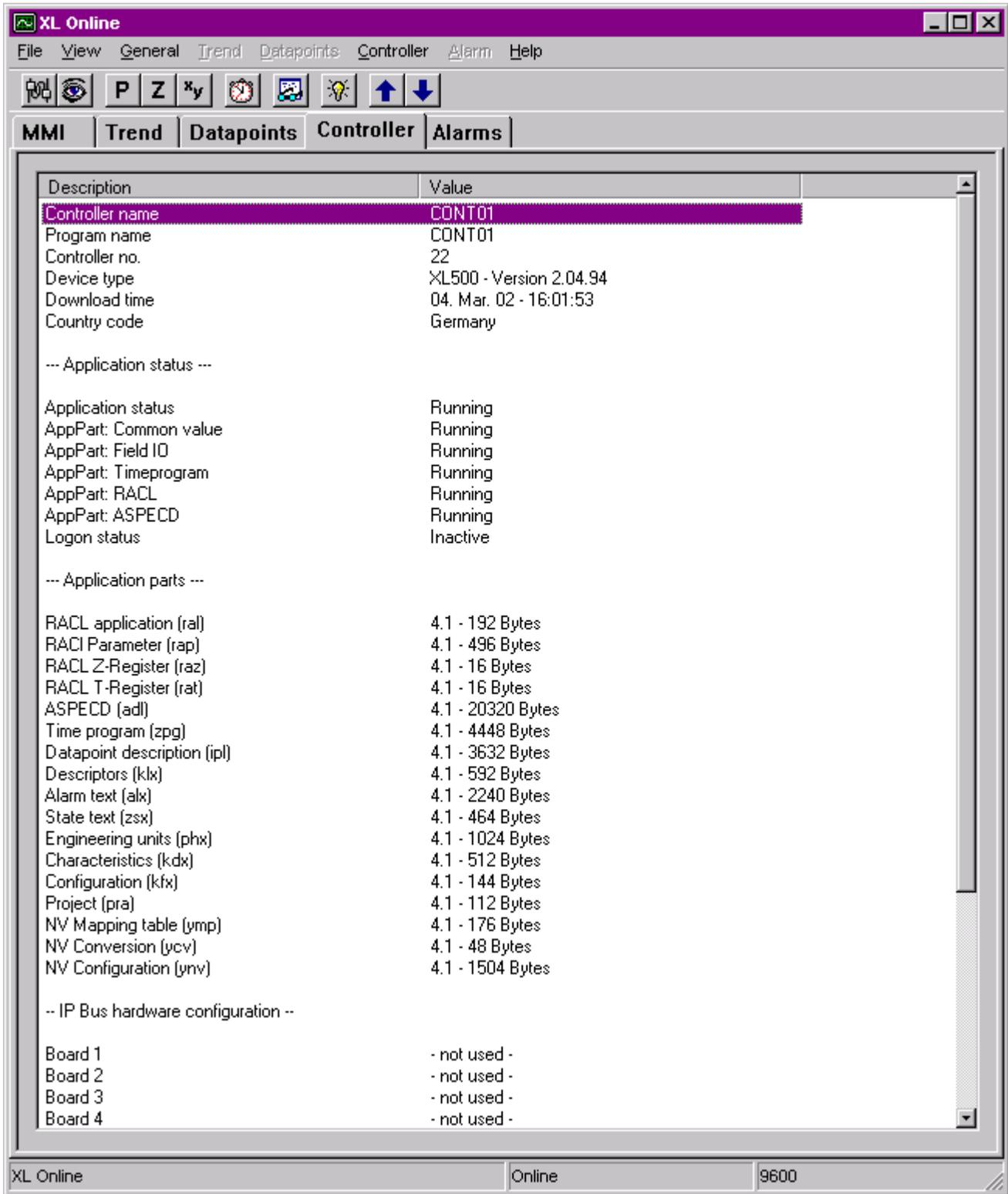
2. To view just the currently active alarms, click **Active Alarms** button.

## View Controller Status

**Purpose** To view controller status information such as:

- Controller name, number, device type
- Application status and parts
- Hardware configuration

**Procedure** 1. Click on the *Controller* tab in the *XL Online* main window.



2. Check controller status information.

3. To print the controller status information in HTML format, click menu item **File**, then submenu item **Print**.

NOTE: Under IP Bus hardware configuration only those modules are listed that are physically connected and used by the application.

---

## Refresh Controller Status

- Procedure**
- To refresh the controller status information on the *Controller* tab, click menu item **Controller**, then submenu item **Refresh Info**, or click the  icon on the button bar or press F5 key.

RESULT: The controller status display on the *Controller tab* is refreshed.

---

## Set Controller Number/View Bus Interface Configuration

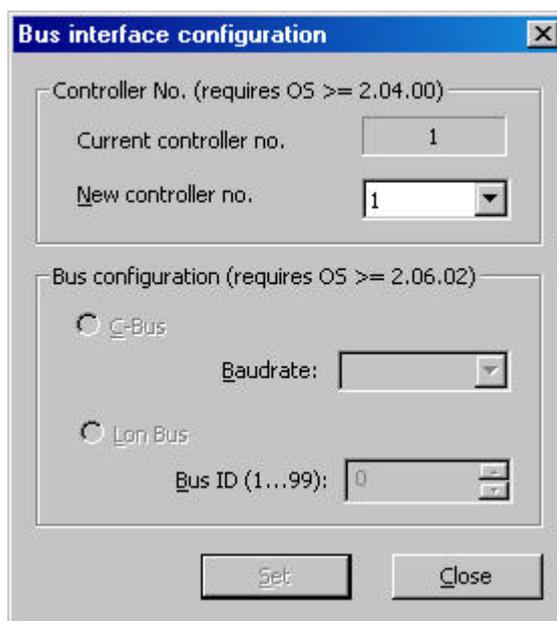
**Purpose** To set the controller number the same as in the translated application if they are different. To view the bus interface configuration such as bus ID and baudrate.

NOTE: The controller number of EXCEL 5000 controllers can only be changed for OS 2.04 and higher. For controller OS lower 2.04 the MMI emulation must be used. For the OPS controller, the controller number cannot be set.

Bus configuration data are only displayed for OS 2.06.02 and higher

- Procedure**
- Click menu item **Controller**, than submenu item **Bus configuration**.

RESULT: The *Bus interface configuration* dialog box is displayed.



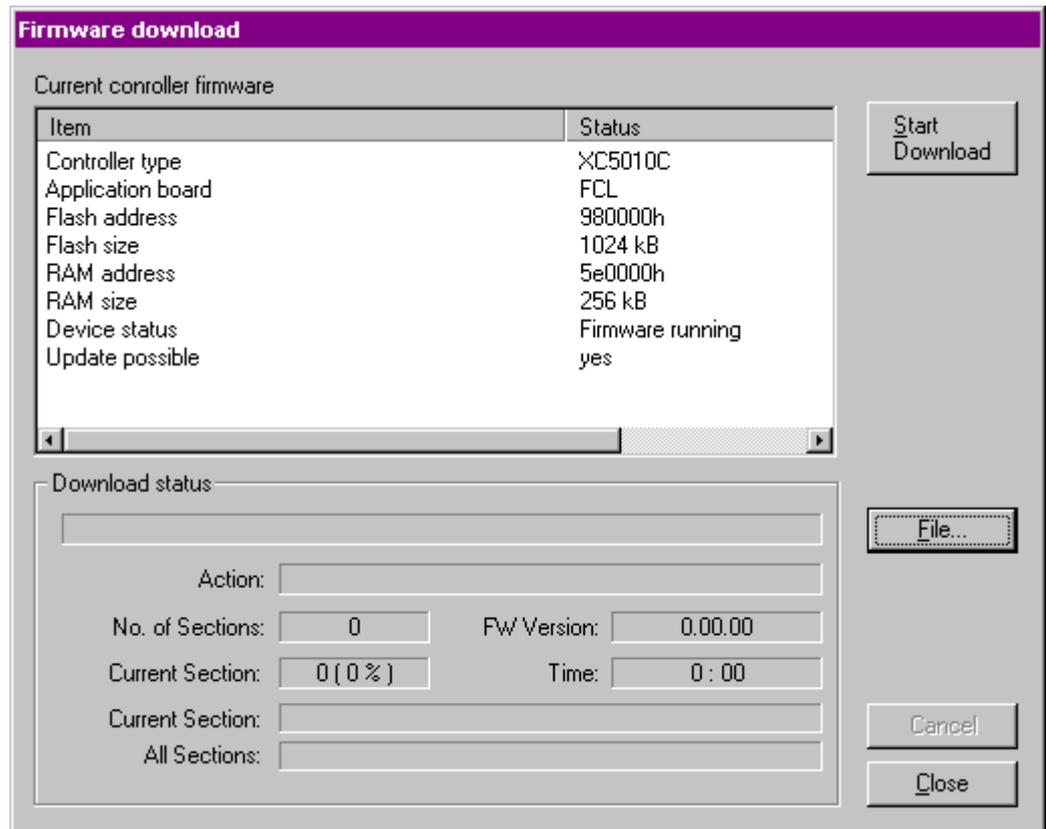
- From the **New controller no.** drop-down listbox, select the controller number you want to change the controller to.
  - Click the **Set** and then the **Close** button.
- 

## Download Firmware

**Purpose** Download firmware, e.g. in case of firmware updates, into an Excel controller with flash EPROM.

- Procedure**
- Click menu item **Controller**, then submenu item **Firmware download**.

RESULT: The Firmware download dialog box displays.



RESULT: Under current controller firmware, the status information of the firmware is displayed.

2. If you want to download a new firmware, click **File** button and select the desired firmware (.XXC file).

NOTE: xx are the last two digits of the OS Version.

Example: XL500204.02c for OS 2.04.02 of Excel 500 controller

3. Click **Start Download** button if you want to download the firmware.

RESULT: The download process is displayed under the **Download status** fields.

4. After download is finished, click the **Close** button.

## Download Application Remotely

For detailed information please refer to the Download Application Remotely subsection in the LONWORKS NETWORK ENGINEERING section.

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