Honeywell

Excel 100/500/600
CONTROLLERS

EXCEL *5000* OPEN ™
S Y S T E M

SYSTEM OVERVIEW

Excel Building Supervisor XBS

Report Printer

Alarm Printer

C-Bus

XW 570

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Local LonWorks Network

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Distributed I/O

Local LonWorks Networ

LonWorks Network

Excel 50

Excel 500 (XC5010C)

Excel 10 Chilled Ceiling Controller

Third-party LonWorks product

Distributed I/O

Excel 500-XCL5010

Modem/ ISDN Adapter

Modem/GSM/ ISDN Adapter

Modem/GSM/ ISDN Adapter

Excel 500 (XC5010C)

LonWorks Network

Third-party LonWorks product

Distributed I/O

Excel 10 Fan Coil Unit Controller

Distributed I/O

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C-Bus

Excel 500 (XC5210C)

EXCEL 5000 system

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Trademark Information   Echelon, LON, LONMARK, LONWORKS, LonBuilder, NodeBuilder, LonManager, LonTalk, LonUsers, LonPoint, Neuron, 3120, 3150, the Echelon logo, the LONMARK logo, and the LonUsers logo are trademarks of Echelon Corporation registered in the United States and other countries. LonLink, LonResponse, LonSupport, and LonMaker are trademarks of Echelon Corporation.

REVISION OVERVIEW

The following pages have been changed from the previous release of this document:

Pages	Changes
throughout	"XI584" changed to "Excel Online".
1	Information added regarding support for BM with controller firmware 2.06.xx and higher.
1	Information added regarding Excel Smart I/O modules.
14	Section "Excel Smart I/O Modules" added.
17	Table 6 added.

THE EXCEL 100/500/600 SYSTEM

Excel 100/500/600

Excel 100/500/600 is a freely programmable control and monitoring system for building applications.

In addition to control applications for heating, ventilation and air conditioning, Excel 100/500/600 also performs energy management functions such as optimum start/stop, night purge, maximum load demand, and many others.

Freely programmable LONMARK controller (Excel 500, only)

The Excel 500 controller complies with the LONMARK ® Interoperability Guidelines. It supports up to 512 NVs which can be mapped to data points. It can function on a LONWORKS® network with Excel 10 and Excel 50 controllers, other Excel 500 controllers and their Distributed I/O modules, and third-party LONWORKS devices and centrals. The Excel 500 provides the following unique benefits:

- Automatic binding of Excel 500 controllers and Honeywell I/O modules. This saves engineering time and cost over usual network variable (NV) binding. In addition, this saves on Echelon® node royalty fees.
- 512 NVs supported for integration and interoperation with other devices on the LONWORKS network.
- NV-Booster® functionality avoids multiple NVs with many-to-one bindings and thus reduces the number of Excel 500 controllers needed.
- All binding information from and to the Excel 500 controller can be saved in Flash memory or uploaded together with the application and restored after power failure. This also allows exchange of controller hardware without redoing the complete binding.
- The Excel 500 controller allows conversion of NV types which increases flexibility and interoperability on a LONWORKS network.
- With firmware 2.06.00 and higher, Excel 500 controllers support full Building Management Functionality (BMF) over LonWorks (alarming, scheduling, trending).

Connection to building supervisors

Up to 8 building supervisors can be connected via the Honeywell system bus (C-Bus). Excel 100/500/600 allows communication with up to 3 XBS building supervisors via modem, ISDN terminal adapter, or 900 MHz GSM wireless system (via Siemens M20 Terminal).

Communication via analog/ISDN/GSM modem or TCP/IP network

The system incorporates modem units to that a standard modem can be connected for communication via the public telephone network or via TCP/IP networks. Excel 500 (with firmware version 2.01.00 and higher) and Excel 100C allow direct connection of a analog modem, ISDN terminal adapter, or Honeywell TCP/IP modem (XM500) with data transmission rates of up to 38.4 Kbaud. With firmware 2.03.01 and higher, wireless data communication via the GSM 900 MHz network is supported.

Modular design and easy operation

The modular design enables the system to be expanded to meet the growing needs of the building. The user addresses and the full English-language descriptors are stored in the controller and are, therefore, available to be viewed locally, at the operator unit, without the need for a central PC.

NOTE: The Excel 500-XCL5010 and the Excel 100C have no internal display; thus, an XI582 or an Excel Online (formerly: XI584) is needed.

Distributed I/O modules and Excel Smart I/O modules connected via LONWORKS bus

The modules consist of an electronic module and a terminal module. The terminal module provides terminals for all field signals. Internal wiring between the Excel 500 controller and the field terminals is not required (except for the 2-wire LONWORKS bus connection). Optional manual override modules and manual disconnect modules are available.

Excel Smart I/O modules are LONMARK association-compliant devices, and are thus suitable for all LONWORKS environments. They feature a variety of software-configurable digital and analog inputs and outputs and can be installed at strategic locations throughout buildings.

NOTE: The Excel 500-XCL5010 can be connected only to external I/O modules. The connection of internal plug-in modules is not possible.

Large remote trend buffer The XC5210C Excel 500 CPU module provides an enlarged remote trend buffer which allows more than 10,000 historical values to be stored and transmitted to a building supervisor.

The User Programs

Free selection of applications The Excel 100/500/600 receives its user programs in three different ways:

Permanent applications from EPROM With the selection of the applications for the EPROM, the user program is assembled from permanently programmed functions when starting the system for the first time – no further programming tools are necessary. With Flash-EPROM, applications can be stored restored via the operator interface.

Configurable applications With the **CARE** engineering system, standard applications for heating, ventilation and air conditioning technology can be assembled and extended as desired.

No programming experience needed With free program preparation using **CARE**, the user program is generated auto-matically after graphical preparation of the system schematic diagram, the instrumentation and control strategies.

Excel 100 Modules

MCE 3 and MCE 1	The MCE 3 and MCE 1 are analog/digital converters that convert analog outputs of the Excel 100 into digital outputs. The MCE 1 converts one analog output into one voltage-free changeover contact. The MCE 3 converts three analog inputs into two voltage-free outputs and one N.O. contact.
MCD 3	The MCD 3 is an analog/digital converter that converts 1 analog output into one voltage-free changeover contact and one analog output into a three-point output.
MCM 1	The MCM 1 is a 4-channel separation module that provides active switching voltages to the digital inputs of the Excel 100 from up to four voltage-free contacts.

Excel 100 Technical Data

Voltage:
24 Vac, ± 20%, 50 to 60 Hz
24 Vdc, + 20%, – 10%

IMPORTANT
If the Excel 100C is supported with, e.g. a battery or accumulator, it has to be assured that no "pumping" of the power supply occurs.

Maximum number of devices per System Bus:
30

Power consumption:
max. 40 VA (max. 30 W)

Ambient temperature:
During operation: 0 to 50°C (0 to 45°C when mounted horizontally)
During storage: -20 to 60°C

Ambient humidity:
During operation and storage 5 to 90% r.h.

Dimensions of housing:
235 x 192 x 72 mm (H x W x D)

Mounting:
Wall or DIN rail mounting

Program back-up during power failure:
72 hours via gold capacitor

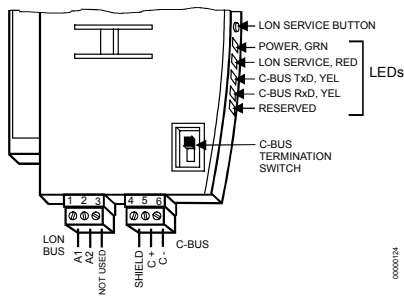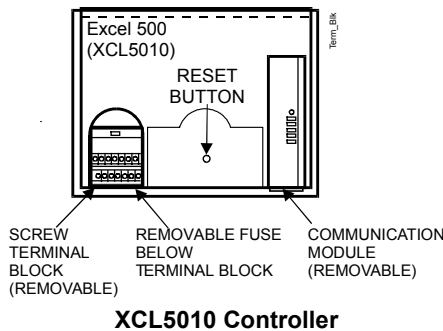**Protection class:**
IP 30 (with cover mounted)

Operator units:
Operator unit XI582 desktop or wall mounting
Excel Online (formerly: XI584)

Table 1. Excel 100 Modules

Module	Type	Hardware
Analog/digital converter	MCD 1	1 analog input for one voltage-free changeover contact
Analog/digital converter	MCD 3	1 analog input for one voltage-free changeover contact 1 analog input for one three-point output
Analog/digital converter	MCE 3	2 analog inputs for two voltage-free changeover contacts; 1 analog input for one voltage-free N.O. contact
Separation module	MCM 1	4 voltage-free contacts for 4 digital inputs

The Excel 500–XCL5010

Excel 500
(XCL5010)

RESET
BUTTON

SCREW
TERMINAL
BLOCK
(REMOVABLE)

REMOVABLE FUSE
BELOW
TERMINAL BLOCK

COMMUNICATION
MODULE
(REMOVABLE)

XCL5010 Controller

LON SERVICE BUTTON
POWER, GRN
LON SERVICE, RED
C-BUS TxD, YEL   LEDs
C-BUS RxD, YEL
RESERVED

C-BUS
TERMINATION
SWITCH

LON
BUS

A1
A2
NOT USED
SHIELD
C +
C -
C-BUS

Communication Module XDL505

LONMARK™

The Excel 500–XCL5010 controller is specially designed for exclusive operation with Distributed I/O modules via a LONWORKS bus. Control and monitoring functions are performed by means of programmable, 16-bit microprocessor controlled, digital technology. The Excel 500 System is freely programmable and can be used as a stand-alone controller or as part of a network of up to 30 controllers connected via a C-bus (9.6 Kbaud up to 76.8 Kbaud) or as part of an open LONWORKS network.

The Excel 500 System provides energy management and control functions in Honeywell C-Bus networks or in LONWORKS networks. In the case of a Honeywell C-Bus network, up to 16 Distributed I/O modules with up to 128 inputs and outputs can be connected. A maximum of 10 modules of the same type is allowed per system. In the case of a LONWORKS network, the maximum number of Distributed I/O modules is determined by the number of NVs needed for interoperation. In a typical case, 190 physical inputs and outputs can be controlled per Excel 500.

Applications for the Excel 500 can be programmed during CARE engineering and then downloaded in the Flash EPROM.

Memory is buffered by a gold capacitor and will be supported for approximately 72 hours in case of a power failure.

The XCL5010 controller comprises an internal power supply and allows the connection of CPU and I/O modules to the same transformer (shared transformer).

An external MMI, modem, ISDN adapter, GSM adapter, or TCP/IP modem (XM500) can be connected to the controller's serial port.

The Communication Module provides ports for C-bus and LONWORKS bus connection as well as LEDs for indicating the controller's operational status, transmit status, and receive status.

The Excel 500/600 Internal Modules (not XCL5010)

The Excel 500/600 system with internal modules is comprised of the XC5010C (Excel 500) or XC6010 (Excel 600) computer modules for freely programmable applications, the power supply module XP501 or XP502 with an external transformer as well as a range of input and output modules.

Clear functional allocation

The internal input and output modules are:

Analog input modules	XF521A / XF526
Analog output modules	XF522A / XF527
Digital input modules	XF523A / XF528
Digital output modules	XF524A / XF529
Three-position output module	XF525A

One important functional characteristic of the output modules XF522A, XF524A and XF525A is the integral manual override facility to switch equipment and position actuators directly from the module. The output modules XF527 and XF529 are equipment variants without manual override switches. The status of the inputs and outputs is shown by LEDs.

An Excel 500/600 can consist of 16 input and output modules providing a total of 128 points. The system can be expanded by connecting additional controllers if the number of inputs and outputs is insufficient for a particular application. Communication is performed via the system bus.

In general, the maximum system bus length is 1200 meters. However, a bus repeater XD509, is available to exceed this limit.
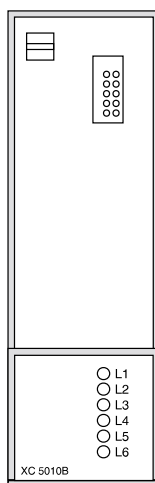
XC5010C Computer Module
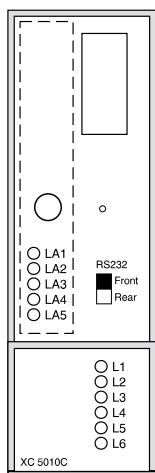
The XC5010C computer module is the brain of Excel 500 with internal modules. Control and monitoring functions are performed by means of programmable, 16-bit microprocessor controlled, digital technology. The program is held in RAM but it can in addition be saved onto a Flash-EPROM. RAM is buffered by a gold capacitor and will be supported for approximately 72 hours in case of a power failure.

The XC5010C adds support for a LONWORKS network connection to Distributed I/O modules and to other controllers and LONMARK devices. Serial interface communication support for MMI is possible via two interfaces, Sub-D (front) and 18 pin male (back), which can be selected using a switch on the front panel. The interface enables the system to be expanded to up to 30 devices including a building supervisor. Communication is performed via the system bus using a token passing multi-master structure. LEDs indicate the operational and the transmit and receive status of the interfaces.

XC5210C Computer Module

The XC5210C computer module has all the same functions and capabilities as the XC5010C described above with one exception. Increased memory allows for a greatly increased remote trend buffer capacity – up to 10,000 values can be stored.

XC6010 Computer Module

The XC6010 computer module is the 32 bit, high performance version of the computer module XC5010C. It features larger memory and faster DCC cycle-times as well as faster scanning times in combination with some of the input / output modules.

The XC6010 computer module has only a single serial interface connection and does not support LONWORKS bus connections; therefore, Distributed I/O modules cannot be used with the XC6010C.

XD505A / 508 Communication Submodules

The submodules XD505A and XD508 are used for C-bus communication with older Excel 100/500 and Excel 600 controllers. The submodules are plugged onto the Excel 100B or XC5010B/XC6010 computer modules.

XP502 Power Supply Module
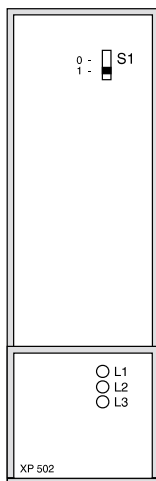
The XP502 power supply module supplies the low voltage power to the internal modules via the internal bus.

- The on/off switch for the power supply is situated on the front panel of the XP502 power supply module.

- The module can be connected with an external uninterrupted power supply (UPS), XAPU 24-2F.

- LEDs indicate the operating status, status of the watchdog relay and operation by battery.

XF521A Analog Input Module
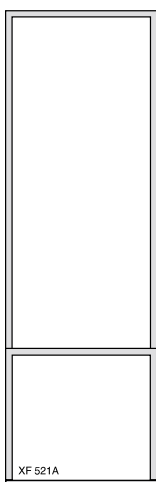
The XF521A analog input module has 8 inputs. It converts data from analog sensors PT 1000, NTC 20K, 0 to 10V and (0 to 20 mA, 4 to 20 mA). The resolution is 12 bit. The characteristic curves for the different sensor types are entered in the data point description.

XF526 Analog Input Module
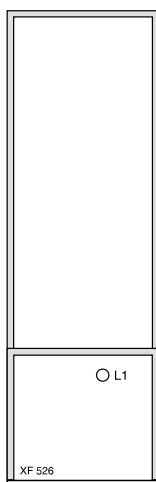
The XF526 analog input module has 8 inputs. It converts data from additional analog sensors: PT 100, PT 1000, PT 3000, BALCO 500, NTC 20K, 0 to 10V and (0 to 20 mA, 4 to 20 mA). The characteristic curves for the different sensor types are entered in the data point description.

The single LED indicates that the internal processor is working.
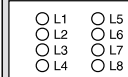
XF522A Analog Output Module
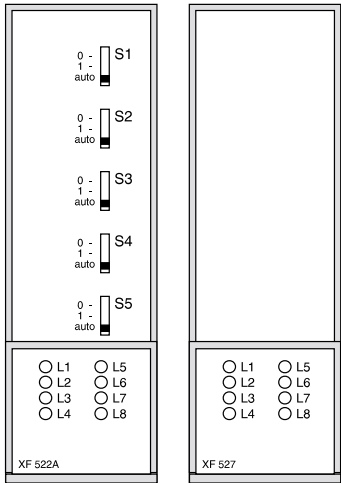
The XF522A analog output module has 8 outputs that supply a 0 to 10V signal. The resolution is 8 bit.

Five of the outputs are equipped with a manual override switch that can be used to select 0V, 10V or automatic operation.

The module can be adapted to suit a variety of actuators by entering the characteristic curves in the data point description.
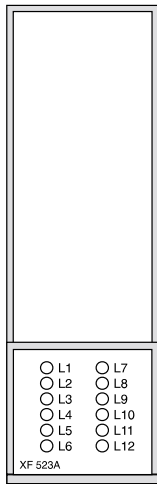
The intensity of the LEDs is proportional to the output voltage.

XF527 Analog Output Module

This module has the same functionality as XF522A, but without manual override switches. The analog outputs are controlled by software, only.

XF523A Digital Input Module

The XF523A digital input module has 12 inputs. It processes floating signals as well as non-floating signals up to 24 V AC/DC. The inputs can also be used as totalizer inputs.

The following specifications apply to totalizer inputs:

- Inputs 1 and 2:
Maximum frequency	15 Hz
Minimum pulse duration	20 msec
Minimum pulse interval	33 msec

- Inputs 3 to 12:
Maximum frequency	0.4 Hz
Minimum pulse duration	1.25 sec
Minimum pulse interval	1.25 sec

- LEDs indicate the respective status of the inputs. The LEDs are invertible (NO/NC).

XF524A Digital Output Module
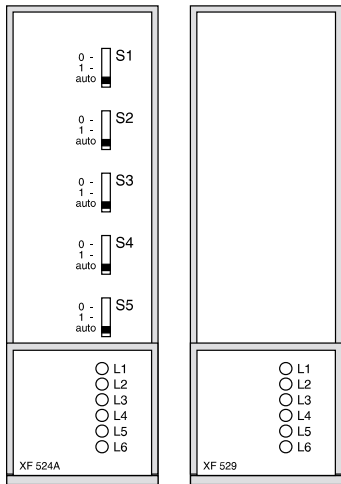
The XF524A output module has six relay outputs, including five with changeover contacts and one with a normally open contact.

The five changeover contacts can be activated and deactivated independent of the user program by a manual switch. This is particularly useful for commissioning and servicing. The relays are integrated in the XF524A module and eliminate the need for externally mounted interlocking relays and their associated additional wiring.
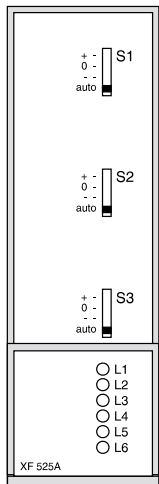
LEDs indicate the status of all 6 outputs.

XF529 Digital Output Module

This module has the same functionality as XF524A, but without manual override switches. The digital outputs are controlled by software, only.

XF525A Three-Position Output Module

The XF525A three-position output module was specifically developed for controlling reversible actuators.

A total of three actuators can be connected directly to the XF525A three-position output module. Both 24 Vac and 240 Vac actuators can be operated. The module features radio interference suppression for actuators with a current draw of up to 0.2 A (240 Vac) or 1.2 A (24 Vac). The control relays are already incorporated in the three-position output module and eliminate the need for externally mounted interlocking relays and their associated additional wiring.

Actuators with different running times can be connected directly to this output module. The OPEN and CLOSE running times can be individually entered in the data point description for each actuator connected.

The three outputs can be independently set to + | 0 | - | AUTO by means of the manual override switch.

LEDs indicate if a signal is present at the output.

Summary of Internal Modules

Table 2. Excel 500/600 internal modules

Module	Name	Inputs	Outputs	Manual override switches	LED display
Computer module	**XC5010C** (16-bit)	*	*		Normal System error Transmit Receive Ground loop LONWORKS service C-bus receive C-bus transmit
	XC5210C (16-bit, large trend buffer)	*	*		Normal System error Transmit Receive Ground loop LONWORKS service C-bus receive C-bus transmit
	XC6010 (32-bit)	*	*		System bus transmit System bus receive
Power supply module	**XP502**			(1 x) 0 1	Power supply Watch dog Battery
Analog input module	**XF521A**	8			
	XF526	8			
Analog output module	**XF522A**		8	(5 x) 0 1 Auto	8 x Output intensity
	XF527		8		8 x Output intensity
Digital input module	**XF523A**	12			12 x Status LEDs inevitable
Digital output module	**XF524A**		5 changeover 1 N.O. contact	(5 x) 0 1 Auto	6 x Status
	XF529		5 changeover		6 x Status
			1 N.O. contact		
Three-position output module	**XF525A**		3 three-position	(3 x) + 0 - Auto	3 x Open close
C-bus repeater	**XD509**				

* RS232 connection on front or rear of XC5010C (switchable), only on rear of XC6010.

For XC6010, only, there are submodules for system bus combination, XD505A (10 KBit) / 508 (1 MBit), and for stand-alone modem communication, XDM506.

Additional Parts

Excel 500/600 Socket / Housing (not XCL5010):

Socket for wall mounting **XS563**
Socket for front door mounting........................ **XS564**
Housing (empty, without socket) **XH561**
Blank cover **XH562**
Operating unit, controller cover **XIS581**

Excel 500/600 Cable for housing connection:

⚠ **CAUTION**

Incorrectly inserted cables can destroy the modules installed.
Use the cables only as described.

Cable 80 mm (not XCL5010) **XW568**
Only for horizontal housing connection (housing along side one another).

Cable 330 mm (not XCL5010) **XW569**
Only for vertical housing connection (housings one above the other).

Cable for connection from controller to XI582:

Cable to XI582 (2.5 m) (XC6010)..................... **XW564**
Cable to XI582 (5 m) (not XCL5010)................ **XW565**
Cable to XI582 (15 m) (not XCL5010).............. **XW566**
Cable to XI582AH (5 m)
(front Excel 100C, XC5010C/XC5210C/
XCL5010) **XW582**
Cable to XI582AH (5 m)
(back Excel 100C, XC5010C/XC5210C).......... **XW583**
Adapter cable (for connection of
Excel 100B, XC5010B/XC6010)....................... **XW584**

Cable for connection from computer module to PC / Excel Online (formerly: XI584):

Cable to Excel Online (2.5 m) (XC6010).......... **XW567**
Cable to Excel Online (5 m)
(Excel 100C, XC5010C/XC5210C/XCL5010)... **XW585**

Distributed I/O Modules
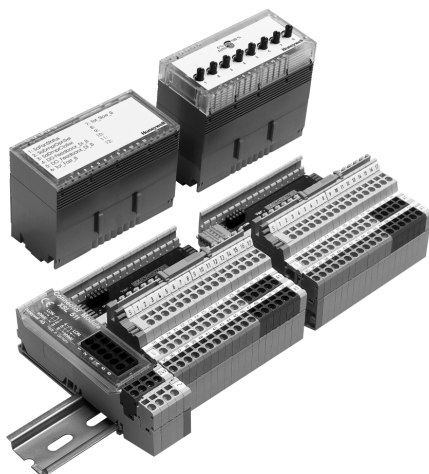
Distributed I/O modules are LONMARK -approved and can therefore be used in a LONWORKS network independently of an Excel 500 controller. See Distributed I/O Modules Product Data, EN0B-0090, for more information.

Distributed I/O modules can be operated with Excel 500 controller in C-Bus networks or in LONWORKS networks.

In C-Bus networks, it is possible to control up to a maximum of 16 I/O Distributed I/O modules. For the XC5010C, this means 16 total modules are supported, including both internal and distributed. The XCL5010 supports only Distributed I/O modules.

In LONWORKS networks, the maximum number of Distributed I/O modules to be used by a controller is determined by the number of NVs to be used for communication and interoperation. In a typical case, 190 physical inputs and outputs can be controlled per Excel 500.

The XFL521, 522, 523 and 524 modules are digital and analog I/O modules that can be installed at strategic locations within a building. As part of the EXCEL 5000 system, these modules convert sensor readings and provide output signals used for operating actuators.
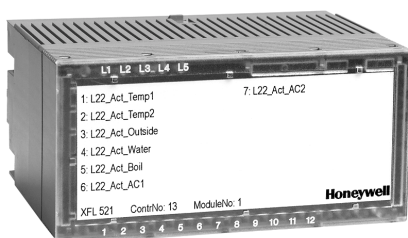
The input and output modules are:
Analog input module	XFL521B
Analog output module	XFL522B
Digital input module	XFL523B
Digital output module	XFL524B

Each I/O module plugs into a base terminal block allowing communication with the CPU via the built-in LONWORKS bus and easy wiring to the devices. Each set of up to 10 Distributed I/O modules is connected to the LONWORKS bus via the XSL511 connector module. The modular system allows I/O modules to be removed from the system without disturbing the other modules.

A power LED (L1) and a service LED (L2) are located on each module. L2 indicates the current state of the bus node. ON indicates that the node has no application loaded, BLINKING indicates that the node has an application but has not yet been configured, and OFF indicates loaded application and configured.
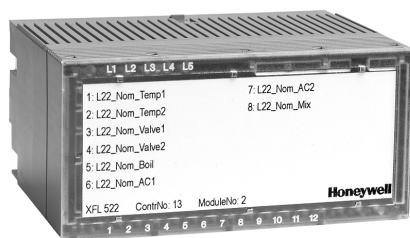
Analog Input Module XFL521B

The XFL521B analog input module has 8 input channels that can be used for connecting sensors or any device that provides an analog output (e.g. PT 1000, NTC 20K, 0 to 10 Vdc, 0 to 20 mA, 4 to 20 mA). The input values are read by the CPU and can then be used for monitoring or as parameters that can be used for controlling other devices. The resolution is 12 bit.
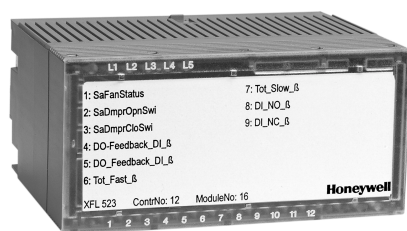
Analog Output Module XFL522B

The XFL522B analog output module has 8 output channels that supply a 0 to 10V signal. The resolution is 8 bit. The outputs can be used to control actuators or other suitable analog devices.

Digital Input Module XFL523B

The XFL523B digital input module has 12 input channels that can be used for connecting sensors or any device that provides a digital input. The input values are read by the CPU and can then be used for monitoring or as parameters that can be used for controlling other devices.

LEDs indicate the respective status of the inputs. Two different LED color sets for indicating the on/off states can be selected via a DIP switch (sw1: LEDs DI1 to D6; sw2: LEDs DI 7 to DI 12). The possible on/off colors are: yellow/none or red/green.

Digital Output Module XFL524B
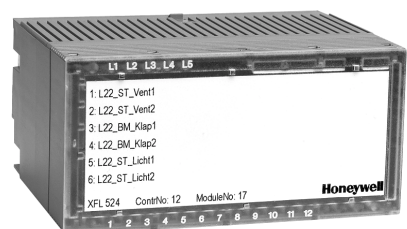
The XFL524B digital output module has 6 isolated changeover contacts that can be connected to actuators or other switchable devices. LEDs indicate the status of all 6 outputs.
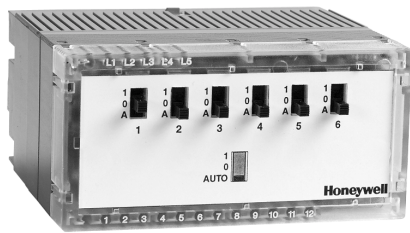
Manual Override Unit XFR522A for XFL522A

The XFR522A manual override module mounts directly on top of the XFL522A. Eight potentiometers on top of the module can be used to independently vary the output of each channel from 0% to 100%. Each potentiometer also has an automatic setting that causes the channel to operate normally. The LEDs of the XFL522A are also visible.

The manual override unit works independently from the CPU. A feedback signal that includes the user address, the operating mode (manual/auto), and its value is sent to the CPU if any changes are made using the manual override unit.

Manual Override Unit XFR524A for XFL524A

The XFR524A manual override module mounts directly on top of the XFL524A. Six switches on top of the module can be used to independently switch each of the digital outputs OFF (0) or ON (1). Each switch also has an automatic setting that causes the channel to operate normally. The LEDs of the XFL524A are also visible.

The manual override unit works independently from the CPU. A feedback signal that includes the user address, the operating mode (manual/auto), and its value is sent to the CPU if any changes are made using the manual override unit.

Summary of Distributed I/O Modules

Table 3. Excel 500 Distributed I/O modules

Module	Name	Inputs	Outputs	Manual override with feedback	LED display
Analog input module	**XFL521B**	8			
Analog output module	**XFL522B**		8		8 x output intensity
	with **XFR522A**		8	(8 x) potentiometers	8 x output intensity
Digital input module	**XFL523B**	12			12 x status LEDs (selectable colors)
Digital output module	**XFL524B**		6 changeover		6 x status LEDs
	with **XFR524A**		6 changeover	(6 x) 1 0 Auto	6 x status LEDs

Additional Parts

Socket / Housing:
Terminal block for XFL521/522A/523.............**XSL513**
Terminal block for XFL524A..........................**XSL514**

Additional modules:
LONWORKS connector module.......................**XSL511**
Manual disconnect module **XSL512**

Accessories:
Cover release tool **XAL2**
Swivel label **XAL1**
Termination module **209541B**
Mounting clamps (for XSL512–514)

Excel Smart I/O Modules
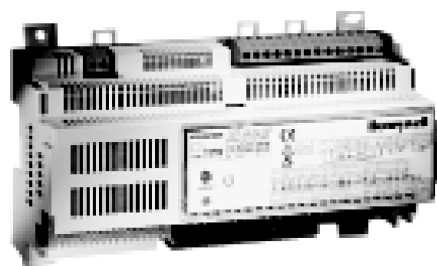
Excel Smart I/O modules are LONMARK association-compliant devices, and can thus be used in all open LONWORKS environments. They feature a variety of software-configurable digital and analog inputs and outputs and are suitable for installation at strategic locations throughout your buildings. The modules convert physical input signals from sensors into network variables and the network variables into physical output signals for operating actuators.

The diverse mix of inputs and outputs (flexibly configurable using Honeywell's LonMaker for Windows™ plug-in) makes the Excel Smart I/O ideally suited for a wide range of intelligent, distributed applications.

Time Programs

Simple and flexible time programs	The daily programs must first be defined before a time program can be created. A daily program is assigned to each weekday in the weekly program. This weekly program is automatically copied for every week in the annual program. Exceptions can be defined for any number of days by replacing the daily program directly in the annual program.
Automatic summer/winter changeover	The beginning and end of daylight savings time can be stored to automate the changeover from daylight savings time to standard time. The changeover is then performed automatically on the appropriate days.

System Texts

Flexible text files	The text files are stored in the controller.

Installation and Commissioning

Freely programmable application programs	When the application program for a freely programmable application is generated during CARE engineering, the complete documentation for the system and the wiring diagram are generated automatically.
Protection against program loss	The application program can be either loaded into the RAM of the computer module from disk or stored in the computer module's Flash-EPROM.
User friendly service level	The various operating levels can be accessed by means of passwords.
	In operator level 3, "read and make changes", all inputs and outputs can be queried, set, or simulated. The current status of each input and output can be queried. All relay outputs can be activated or deactivated. Analog outputs can be set to a value between 0 and 100%. In order to simulate operating conditions, each digital input can be commanded ON or OFF and each analog input can be assigned a value between 0 and 100%.
	This service level is useful for both commissioning and servicing.
Menu driven programming level	Operator level 4 of the Excel Online (formerly: XI584) is primarily used to set the system parameters. Additionally, the system text and the time program can also be edited.
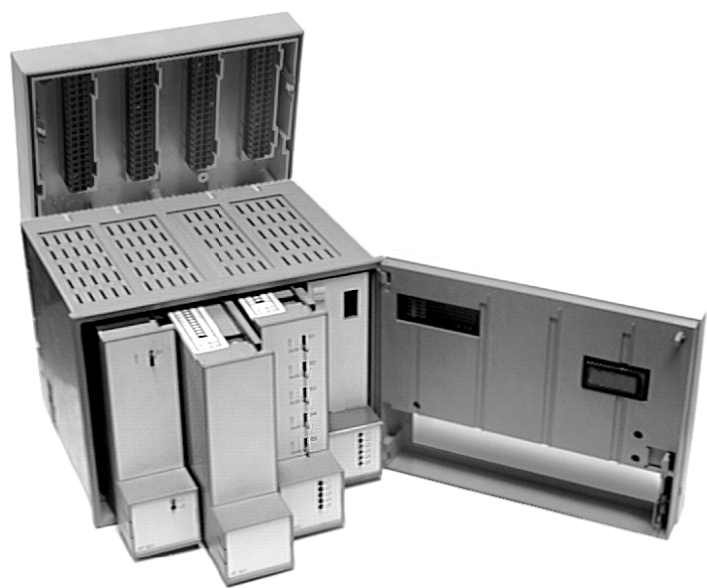
Excel 500/600 Technical Data

Voltage:
XC5010C/
XC6010: 24 Vac/dc, ± 20%
XCL5010: 24 Vac, ± 20%

Maximum number of modules per Excel 500/600:
16 I/O modules (internal + Distributed; XCL5010 Distributed, only) with up to 128 inputs and outputs.
Up to 10 per module type.
Up to 10 XF524A digital output modules and XF525A three-position output modules combined (not XCL5010).

Maximum number of devices per System Bus:
30

Power consumption:
XC5010C/XC5210C/
XC6010: max. 40 VA (max. 30W)
XCL5010: max. 5 VA (max. 4W)

Ambient temperature:
During operation: 0 to 45 °C
During storage: -20 to 70 °C

Ambient humidity:
During operation and storage 5 to 90% r.h. (non-condensing)

Dimensions of housing:
XC5010C/XC6010: 144 x 192 x 188 mm (H x W x D)
XCL5010: 150 x 198 x 97 mm (H x W x D)

Mounting:
Front door (not XCL5010) or panel mounting on DIN-rail

Program back-up during power failure:
72 hours for RAM (XC5010C/XCL5010)
1 month for RAM (XC6010)

Protection class:
IP 30

Operator units:
Operator unit XI581 on unit housing (not XCL5010)
Operator unit XI582 desktop or wall mounting
Excel Online (formerly: XI584)

Table 4. Excel 500/600 controllers and internal modules

Module	Type	Hardware	Software
Computer module	XC5010C/XC52010C, XCL5010	16 bit (internal + distributed) 16 bit (distributed, only)	Freely programmable LONWORKS network interface
	XC6010	32 bit	Freely programmable No LONWORKS network interface
Power supply module	XP502		
Modem device	XM100 A		
Analog input module	XF521A / XF526	8 analog inputs	polling every sec. (240 ms with XC6010 fast mode)
Analog output module	XF522A / XF527	8 analog 0...10 V outputs	polling every 2 sec.
Digital input module	XF523A	12 digital inputs	polling every sec. (125 ms with XC6010)
Digital output module	XF524A / XF529	5 changeover contacts 1 normally open contact	polling every 2 sec.
Three pos. output. module	XF525A	3 three-position outputs	polling every 0.5 sec.

Table 5. Excel 500 Distributed I/O modules

Module	Type	Hardware	Software
Analog input module	XFL521B	8 analog inputs	polling every sec.
Analog output module	XFL522B	8 analog outputs	updating every sec.
Digital input module	XFL523B	12 digital inputs	polling every sec.
Digital output module	XFL524B	6 changeover contacts	updating every sec.

Table 6. Excel Smart I/O modules

Type	Power	Overrides	Universal inputs	Digital inputs	Analog inputs	Relays
XFC2A05001	230 Vac	no	2	4	2	4
XFC2A06001	230 Vac	no	4	4	2	4
XFC3A04001	24 Vac	no	4	4	2	4
XFC3A05001	24 Vac	no	2	4	2	4
XFC3A06001	24 Vac	no	4	4	2	4
XFC2D05001	230 Vac	yes	2	4	2	4
XFC2D06001	230 Vac	yes	4	4	2	4
XFC3D04001	24 Vac	yes	4	4	2	4
XFC3D05001	24 Vac	yes	2	4	2	4
XFC3D06001	24 Vac	yes	4	4	2	4

REMOTE COMMUNICATION

There are several possibilities for communication of alarms, trending information, and system data points to remote building supervisors via modem.

Excel 100C / Excel 500

Excel 500 controllers with firmware version 2.1.x and higher and Excel 100C controllers can have a modem or ISDN terminal adapter connected directly to their serial port. This allows communication with up to three XBS building supervisors at data transmission rates of up to 38.4 Kbaud (requires XBS 1.4.1 or later with modem/ISDN adapter connected).

The Excel 100C or Excel 500 controller connected to the modem/ISDN terminal adapter may function as a normal building controller, but it has a buffer that can store up to 100 trend samples per building supervisor.

NOTE: Direct connection of modem/ISDN terminal adapter does not permit communication with XBSi building supervisors or IRC alarming. For these functions an XM100A modem adapter must be connected to the bus.

GSM Communication

With firmware 2.03.01 and higher, wireless data communication via the GSM 900 MHz network is supported. GSM 900 MHz is the Global System for Mobile communication, also referred to as the mobile or cellular phone network.

At the remote site, the cellular engine SIEMENS M20T (T for terminal) is connected to the RS232 port of the XC5010C or XCL5010 or Excel 100C. The M20T translates Excel CPU data received in transparent mode into the GSM standard. The maximum communication speed is determined by the current GSM standard, which is 9.6 Kbaud.


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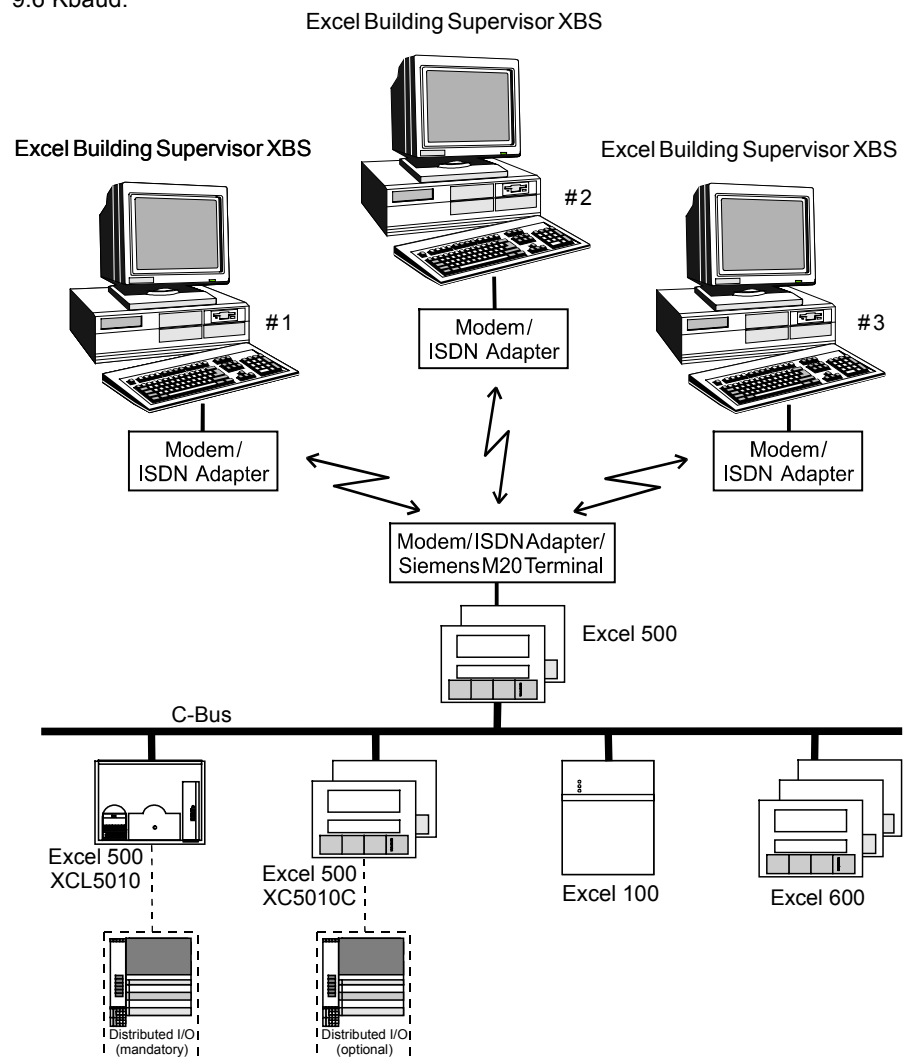
TCP/IP Communication   In order to avoid installation of telephone connections and in order to make use of existing TCP/IP networks (Ethernet LAN/WAN installations), the Honeywell XM500 TCP/IP modem can be used. This will enable a dial-up connection that functions like an analog modem on an analog telephone network but with higher speeds possible (up to 38.4 Kbaud).
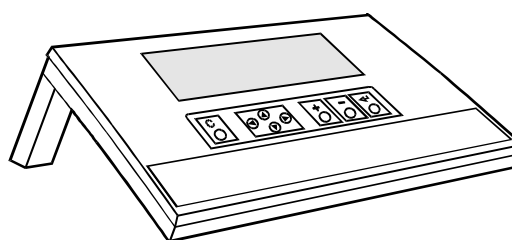
XI581 / XI582 OPERATOR UNIT

Easy handling on site The XI581 (XC5010C/XC6010, only) or XI582 is the command and information center of the Excel 100/500/600. Data, such as setpoint values and time switching programs, can be entered via the operator unit. Important information such as actual temperature values, control status, etc. can also be displayed.

Buswide access Buswide access allows communication between an XI581 or XI582 and an Excel Controller that is not directly connected to this operator unit. Communication can include reading from and writing to the remote controller as well as receiving alarm status information.

Clear display A menu-driven graphic display with 6 lines, 34 characters per line and 8 clearly marked keys make the device easy to use. The entire operation uses plain language text stored in the controller, which can be freely accessed by the user. In addition, the display features a backlight.

Security due to password controlled operating levels The device can be operated at three levels, thereby protecting the data from unauthorized access.

Level 1: Read only without password
Level 2: Read plus limited changes with a password
Level 3: Read and make changes with a password

Operator units can be positioned anywhere XI581 is mounted directly on the unit housing (XC5010C/XC6010, only).

XI582 is the desktop model and is also suitable for wall mounting.

Both devices are connected to the operating interface on the computer module. The wall and desktop units can be positioned up to 15 meters from the computer module. Distances of up to 1000 meters are possible using line drivers.
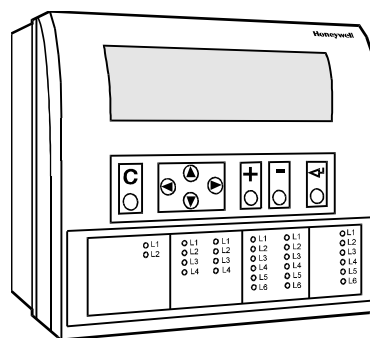
XI581 Controller-mounted operator terminal

XI582 Desktop operator terminal

EXCEL ONLINE (FORMERLY: XI584)

User friendly operation

The Excel Online is the local intelligent operating and service device. It performs all the operating functions of the XI581/XI582 as well as having all the advantages of a PC. In addition to being able to make major modifications, such as changing setpoint values and time program switching points, the Excel Online also offers all the service and commissioning functions.

Password protected operating levels for:
- User functions
- Service functions
- Programming functions

The Excel Online can be operated at five levels, 3 of which are protected against unauthorized access

Level 1: Read only
Level 2: Change data (e.g. time program)
Level 3: Change data (e.g. data point description)
**Level 4:** Change parameters
Level 5: Definition of new operators

A printer can be connected to the Excel Online's parallel interface to log alarms and messages.

Like the XI582, the Excel Online can also be placed up to 15 meters from the computer module. Distances of up to 1000 meters between the Excel Online and the computer module are also possible by using line drivers.
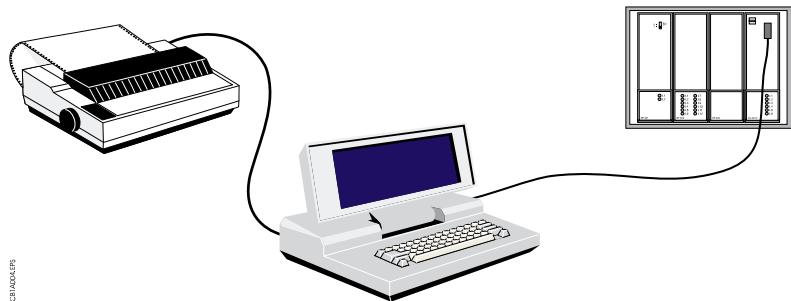
Excel 500/600 with Excel Online operator and service computer and printer
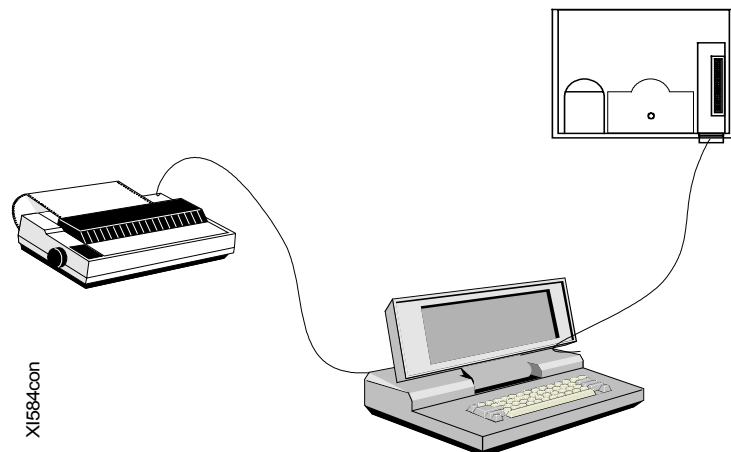
Excel 500–XCL5010 with Excel Online operator and service computer and printer

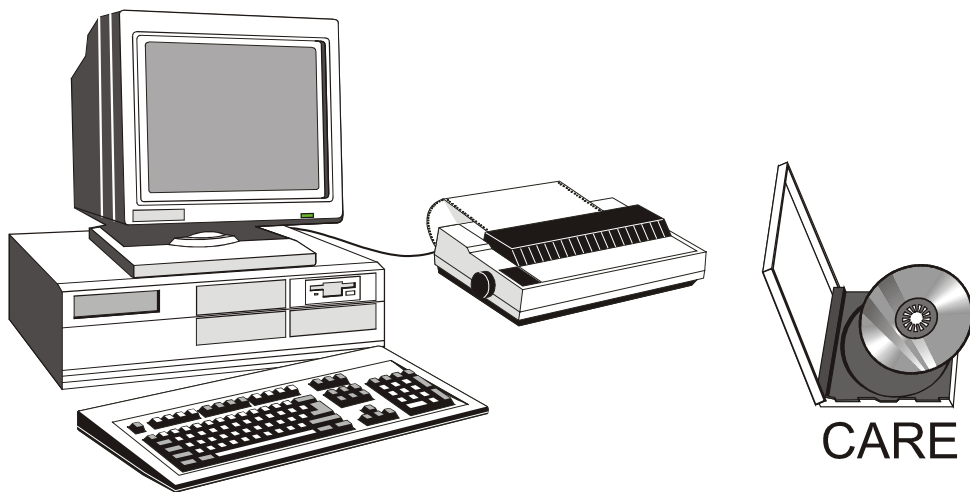# CARE ENGINEERING SYSTEM

Hardware requirements   The **CARE** engineering system is a software package that can be installed on a personal computer.

The PC must satisfy the following requirements:

- Pentium 90 MHz CPU (166 MHz recommended)
- 1 free serial interface
- VGA graphics card (800 x 600 points)
- Color monitor
- 32 MB RAM (64 MB recommended)
- 1 floppy disk drive
- 50 MB of available hard disk space (100 MB recommended)
- Printer supported by MS WinWord® (HP LaserJet® recommended)
- Microsoft® or compatible mouse

Software requirements   - Microsoft® Windows™ 95/98, -NT 4.0 SR1
- For enhanced printing: MS WinWord® V7.0 or higher

Personal computer with CARE system disk

Program generation without programming knowledge   The **CARE** engineering system is a software package that enables an application program to be generated, which may be loaded and executed without any prior programming knowledge.

**Control strategy using CARE**   Heating, ventilating and air conditioning systems are designed from pre-prepared individual diagrams using a menu driven system. The system is designed on the screen, and the control strategies and switching tables can be defined using graphical symbols.

In addition to the **CARE** engineering system's main function of designing the system diagram with the appropriate control strategies and automatic generation of the application program, it can also generate time programs and system texts.

Automatic documentation The user is then presented the final result by the **CARE** system. These results may be printed to a Winword document

- List of required CPU hardware
- Wiring diagram
- Data point description
- Text lists
- Parameter list for each control circuit
- System diagrams
- Control strategies
- Switching tables
- Time programs
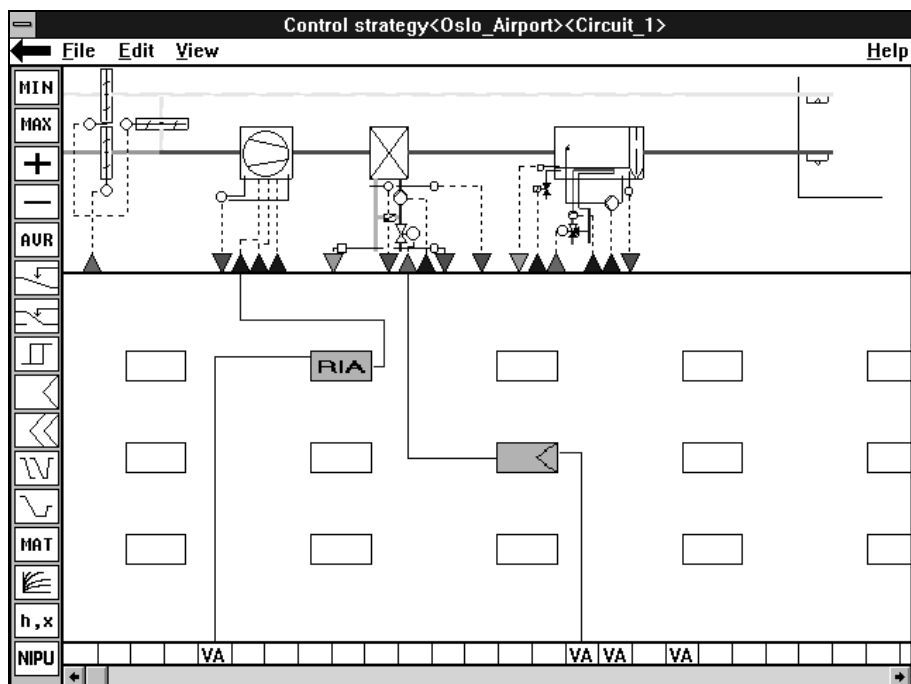
System design using CARE

Modular application library In addition to generating fully customized control strategies, the user may select pre-defined control solutions from a large set of applications. These intelligent Excel function modules (XFMs) provide configurable, easy-to-use control solutions for all kinds of HVAC applications.

# LIVE CARE MONITORING AND SIMULATION TOOL

Watch applications at work

Live CARE is an integral part of the CARE engineering system that allows online access to controllers. When working with Live CARE, the application is presented to the user in the same way as in the CARE engineering tool. This provides a convenient way to access and modify control parameters and data point values, thus allowing easy plant start-up and fine-tuning.

Static simulator

In addition to online access to controllers, the Live CARE simulator allows you to check and tune controller applications by simulating the behavior of the controller. This includes real-time, single-step or accelerated real-time simulation of:

- Time programs
- Control strategies
- Switching tables
- Data points

EXCEL 100/500/600
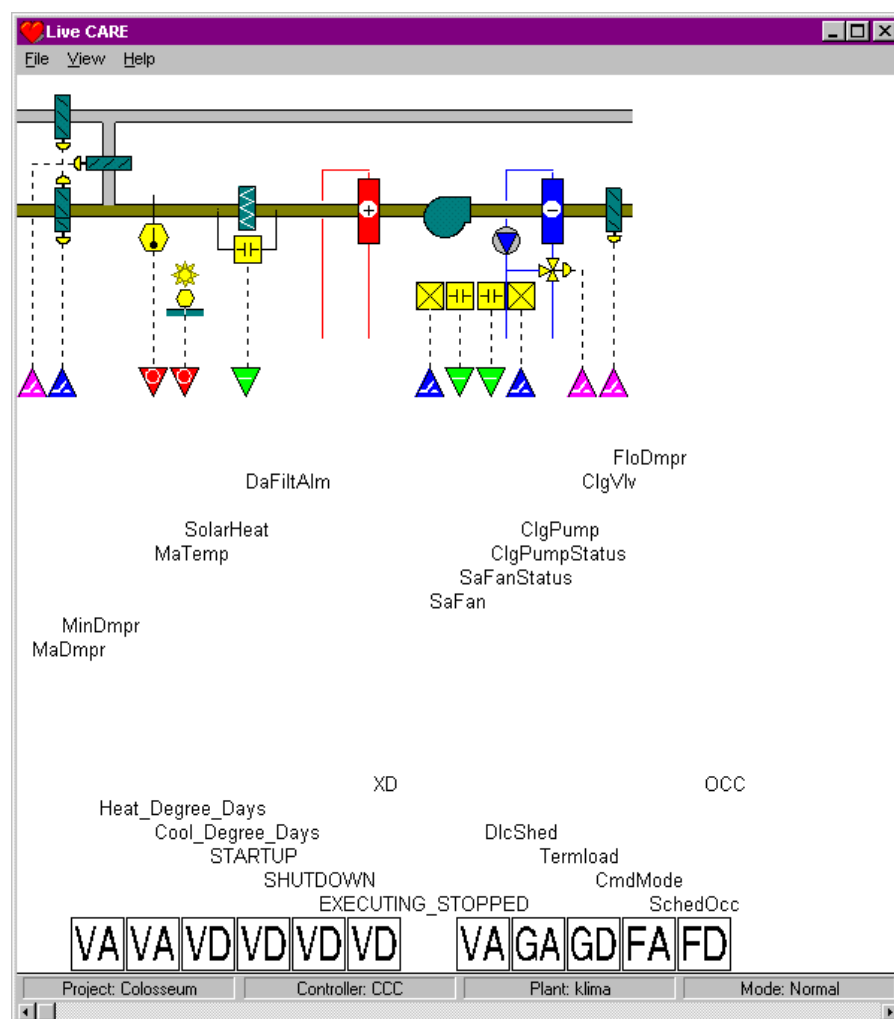
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