CXpro^{HD} USER GUIDE



SMART ENERGY CONTROL

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CXpro^{HD} (MAN0133 rev 9)

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UniPut[™] technology is covered by UK Patent GB 2 400 991 and Irish Patent 84413



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Style conventions used in this document: UI Text: Text that represents elemets of the UI such as button names, menu options etc is presented with a grey background and border, in Tahoma font which is traditionally used in Windows UIs. For example: Ok Standard Terms (Jargon): Text that is not English Language but instead refers to industry standard concepts such s Strategy, BACnet, or Analog Input is represents in slightly condensed font. For example: BACnet Code: Text that represents File paths, Code snippets or text file configuration settings is presented in fixed-width font, with a grey background and border. For example: \$config file = c:\CYLON\settings\config.txt Parameter values: Text that represents values to be entered into UI fields, or displayed in dialogs is represented in fixed-width font with a shaded background. For example: 10°C Product Names: Text that represents a product name is represented in bold coloured text. For example: CBX-8R8-H Process or Feature: Text that represents a particular task that the product performs (Download, LiveLog), or a specific attribute of the product that appears as a separate entity (log) is displayed bold and condensed. For example: LiveLog PC Keyboard keys: Text representing an instruction to press a particular key on the keyboard is enclosed in square brackets and in bold folt. For example: [Ctrl]+[1]

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SECTION 1: CYLON BUILDING MANAGEMENT SYSTEM



The **Cylon BACnet Building Management System** is made up of several components, which fall into two main categories:

- Hardware the products that monitor and control a building's environment.
- **Software** the interface which allows users to configure and monitor Cylon Hardware.

HARDWARE COMPONENTS

Cylon BACnet uses the following main hardware components:

- Routers.
- I/O Field Controllers.
- Keypad
- PC

There may also be other supplementary hardware components such as printers, modems, pagers etc., but these are not essential to the basic system.

Routers

CBR devices route communications between BACnet IP and BACnet MS/TP networks.

Aspect® MATRIX Series and **NEXUS Series** devices are programmable communications controllers, which provide supervision of Cylon BACnet networks, and route communications between BACnet IP and BACnet MS/TP networks.

3rd-party BACnet Routers can also be used with the Cylon BACnet system.

I/O Field Controllers

CBM and **CBT** Field Controllers take inputs from sensors and Building Control plant, and send output to Building Control plant in response. They are available as programmable or unitary controllers, with various input/output configurations.

These I/O controllers can be programmed with **Strategies**, which configure them to send specific outputs to connected devices in response to events occurring on their inputs. For example, you can create a **Strategy** in **CXpro^{HD}** and download it to a **Field Controller** specifying that a valve be opened if the temperature being input to the controller rises above a predetermined level.

Cylon Field controllers are networked together using RS485 by BACnet Routers, which in turn are networked by Ethernet. A Field Controller can also be linked directly to a PC, as well as to a modem or a printer.

РС

The PC is connected to a Cylon network by Ethernet, RS232 or modem connection. The PC can also be connected directly to a Field Controller for small installations with stand-alone controllers.

CXpro^{HD} software - which is used to configure the controllers, schedule events and extract reports - is run on the **PC**, which must have **Windows 10** Professional 64-bit and **Windows 7** Professional / Enterprise / Ultimate 64-bit installed and running.

The <u>minimum</u> configuration to run this application is: **Core 2 Duo E6300**, 1Gb **RAM**, 80Gb hard drive.

The recommended configuration is: Core 2 Duo E6600, 2Gb RAM, 160Gb hard drive.

Connections between hardware components

The following types of connections exist between the hardware components:

- Fast Ethernet bus connecting CBR routers and Aspect® devices with the CXpro^{HD} PC.
- An RS485 fieldbus, using shielded twisted pair cables, connecting the BACnet Router to the I/O controllers.

SOFTWARE COMPONENTS

The Cylon suite of software applications is used to set up, maintain and control the Cylon system in operation.

CXpro^{HD} modules

The following applications are available from **CXpro^{HD}** group in the **Windows** Start menu :

• Configuration (CCConfig)

The **Configuration** program contains a blueprint of the system, which can be accessed by other programs as required. It is used to define systems, networks, sites, authorised users, modem protocols, port setups, etc. and to activate alarms. Levels of access for different users can also be defined here. (See also *MAN-0100 Configuring the Cylon System.*)

• Database Interface

The **Database Interface** program allows you access to the database that contains details of all the point values on each Field Controller in the network. You can set point values graphically in **CXpro^{HD}**, or you can enter or delete them in the **Database Interface** program.

• Datalog Manager

A datalog in **CXpro^{HD}** logs the value of a specified point in a **Field Controller** at a specified interval so that it contains a record of the changes in that point value over a period of time. The **Datalog Manager** program allows you to display the contents of a datalog in either graphic or tabular form. (see also *MAN-0043 Datalog Manager User's Guide*)

Engineering Tool

CXpro^{HD} is a graphical interface created for programming the Cylon the product range. In **CXpro^{HD}**, strategies (which tell a controller how its outputs should respond to conditions on its inputs) can be designed, edited and downloaded to, or uploaded from, **Field Controllers**. **CXpro^{HD}** could be described as the most important of all the Cylon applications, as it is the application that programs the Cylon controllers. This manual describes how to carry out a variety of tasks in **CXpro^{HD}**.

- Manage Software Licence
- Site Organiser

The **Site Organiser** is an easy way to configure and examine a complete site or part of a site. Instead of downloading strategies individually to all the controllers on a site, this can be done in one simple task. Any combination of strategies can be downloaded to any combination of controllers or to one type of controller in a *.ins* batch file. (See also *MAN-0020 Site Organiser manual.*)

• Start CXpro^{HD}

$CXPRO^{HD} - OVERVIEW$

CXpro^{HD} provides all of the tools required to design, configure, test, commission and maintain **Cylon BACnet** systems automatically.

You can use **CXpro^{HD}** to:

- Graphically create strategies that implement solutions to conditions on site.
- Save those strategies for future editing, testing or reference.
- Test the operation of strategies.
- Debug and edit strategies.
- Download strategies to the appropriate controllers.
- Define and assign **3rd party blocks** to carry data across a **Fieldbus**.
- Define and assign wide 3rd party blocks to carry data between Fieldbusses and across the network of a site.
- Upload existing strategies from controllers.
- Upload analog and digital point values from controllers.
- Upload statistical and reference information from controllers.
- Record changes that occur on a site as they happen and save the record to a file.

INSTALLING CXPROHD

To install **CXpro^{HD}**, run the program CXpro^{HD} Setup.exe from the provided USB drive or download:

	-	•	
Name	Date modified	Туре	Size
JAO350	27/07/2018 11:00	File folder	
🌗 Firmware upgrade utilities	27/07/2018 11:00	File folder	
]]vcredist_x86	27/07/2018 11:00	File folder	
]) vcredist_x86_2008	27/07/2018 11:00	File folder	
]) vcredist_x86_2010	27/07/2018 11:00	File folder	
📋 autorun.inf	19/01/2017 12:50	Setup Information	1 K
🕞 CXproHD Setup.exe	27/07/2018 03:20	Application	138,322 Ki
dotNetFx40_Full_x86_x64.exe 😡	19/01/2017 12:50	Application	49,268 K
🖏 hinstall.exe	21/06/2018 02:12	Application	20,926 K
💷 Isinit.exe	19/01/2017 12:50	Application	524 K
📄 Readme.txt	19/01/2017 12:50	Text Document	2 K
ShelExec.exe	19/01/2017 12:50	Application	19 K
🥙 UnitronFingerprintCollection.exe	19/01/2017 12:50	Application	1,212 K
🛃 UnitronSymbolsLibrarySetup.exe	19/01/2017 12:50	Application	768 K
📢 WindowsInstaller-KB893803-x86.exe	19/01/2017 12:50	Application	2,525 K
WindowsXP-KB899418-x86-ENU.exe	19/01/2017 12:50	Application	550 K

Press Next on the installation screen,

😽 Setup - CXproHD	– 🗆 X
	Welcome to the CXproHD Setup Wizard
HD	This will install 1.01.00-304 on your computer.
C X pro	It is recommended that you close all other applications before continuing.
	Click Next to continue, or Cancel to exit Setup.
, XXX	
	Next > Cancel
眇	Setup - CXproHD – 🗆 🗙
License Agreement Please read the following in	mportant information before continuing.
Please read the following L agreement before continui	icense Agreement. You must accept the terms of this ng with the installation.
READ CAREFULLY!	
a legal agreement betwe known as "Customer") computer software engi and "on-line" or electro printed materials (collec	d. End-User License Agreement ("Agreement") is seen you (either an individual or a single entity and Cylon Controls Ltd., which owns a proprietary neering system which includes computer software nic documentation and associated media and tively known as Unitron Command Centre, Cylon U Unitron Weblink, and hereafter referred to as a constine a schemica with Schumer and Schemen and Sche
I accept the agreement I do not accept the agr	
	< Back Next > Cancel

then read and accept the License Agreement

Specify the location into which **CXpro^{HD}** will be installed.

Note: Make sure there are **no spaces** in the location, and that none of the following characters are used: . ! \$

Enter a name for **CXpro^{HD}**'s Windows Program Group.

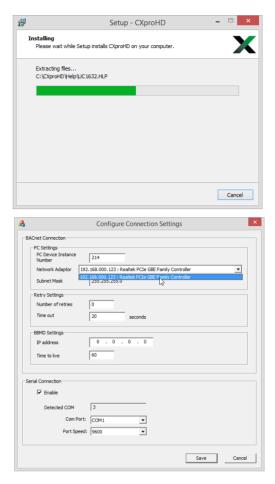
If you would like a Desktop Icon for **CXpro^{HD}**, check the box on the **Select Additional Tasks** dialog.

You can also specify if you want to use US imperial units for sensor readings, or not.

Click Next.

Click the Install button to start the install process...

₿	Setup - CXproHD	-		×
	elect Destination Location			_
	Where should CXproHD be installed?			
	Setup will install CXproHD into the following folder.			
	To continue, click Next. If you would like to select a different folder, click Brow	wse.		
		mac.		
	At least 177.8 MB of free disk space is required.			
	< Back Next >		Cancel	
	K	_		_
₿	Setup - CXproHD	-		×
56	elect Start Menu Folder			/
	Where should Setup place the program's shortcuts?			
	Setup will create the program's shortcuts in the following Start Menu	ı foldı	er.	
	To continue, click Next. If you would like to select a different folder, click Brow			
		wse.		
	< Back Next >		Cancel	
-	20			
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When the install process finishes, you will be prompted to configure the **BACnet** connection settings.

The **PC Device Instance Number** will be set to "-1". This must be changed to a unique **Device Instance Number**.

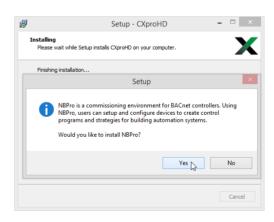
In the Network Adapter drop-down list, select one of the PC's network adapters to be used as the channel for all BACnet communication.

If you wish to connect to a remote BACnet Site, enter that Site's IP address in the BBMD settings section.

If **CXpro^{HD}** will connect to the BMS **Site** through a Serial Connection, that connection can be configured in this dialog.

When the **Configure Connection Settings** dialog is complete, click **Save**.

You will be offered the option to install Cylon's BACnet exploration/commissioning utility, **NBpro**.



If you click Yes , the NBpro Setup Wizard will open:

	Welcome to the NBPro Setup
	Wizard
	This wizard will guide you through the installation of NBPro.
	It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your
	computer.
	Click Next to continue.
	Next
	NPDro Sotup
Choose Components	NBPro Setup – 🗆 🗙
Choose which features of NBPr	o you want to install.
Check the components you war	to install and uncheck the components you don't want to
install. Click Next to continue.	at to install and uncheck the components you don't want to
Select components to install:	W Decore and Flant
	Program files Install/Upgrade Sentinel Super-Pro Dongle Start Menu Shortcuts
	Start Mend Shortcut
Space required: 32.7MB	
© American Auto-Matrix	
G American Auco-Matrix	<back next=""> Cancel</back>
Ð	NBPro Setup – 🗆 🗙
Choose Install Location	
Choose the folder in which to in	stall NBPro.
Setup will install NBPro in the fo	lowing folder.
To install in a different folder, d	lick Browse and select another folder. Click Next to continue.
Destination Folder C:\Program Files (x86)\Ame	erican Auto-Matrix NBPro Browse
Space required: 32.7MB Space available: 21.6GB	
© American Auto-Matrix	
	< Back Instal Cancel
•	
	•
•	NBPro Setup – – ×
Installing Please wait while NBPro is being	NBPro Setup – 🗆 🗙
Installing Please wait while NBPro is being	NBPro Setup - • ×
Installing Please wait while NBPro is being	NBPro Setup – 🗆 🗙
Installing Please wait while NBPro is being	NBPro Setup - • ×
Installing Please wait while NBPro is being Registering: C:\Program Files (x	NBPro Setup - • ×
Installing Please wait while NBPro is being Registering: C: \Program Files (x	NBPro Setup - • ×
Installing Please wait while NBPro is being Registering: C: \Program Files (x	NBPro Setup - • ×
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Installing Please wait while NBPro is being Registering: C:\Program Files (v Show details	NBPro Setup - • ×
Installing Please wait while NBPro is being Registering: C:\Program Files (v Show details	NBPro Setup – instaled. (66)/ChroHD VBPro Inscendt acc < Back Next > Cancel
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup -
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup – instaled. (66)/ChroHD VBPro Inscendt acc < Back Next > Cancel
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup -
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup - KBPro Setup - KBPro Setup - KBPro Setup - KBPro Setup - KBPro Setup Wizard
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup -
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup -
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup - instaled. BS)/CloreHD NBPro Inscorned.occ BSD/CloreHD NBPro Inscorned.occ Stack NBPro Setup NBPro Setup Completing the NBPro Setup Wizard NBPro has been instaled on your computer.
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup - instaled. BS)/CloreHD NBPro Inscorned.occ BSD/CloreHD NBPro Inscorned.occ Stack NBPro Setup NBPro Setup Completing the NBPro Setup Wizard NBPro has been instaled on your computer.
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup -
Installing Please wait while NBPro is being Registering: C:Program Files (Show details	NBPro Setup -

You will be offered the option to generate a licence request file for the PC on which you are installing \mathbf{CXpro}^{HD} .

You can do this now, or at a later time - see *Requesting and Applying a Licence to CXpro*^{HD} on page 18 for details.

If you have already installed a Cylon licence on this PC you may skip this step.

InstallLice	enceChecker	×
?	The application will require a licence. If you want to get the licence now, licence details will automatically be created and you will be asked for a file name to save them. You will then have to send the file to CYLON. Do you want to create the file now?	
	Yes No	

If you select Yes, then you will be prompted for a filename and location. Save the Licence request file, and then email it to Cylon in order to receive the Software Dongle.

CXpro^{HD} is now installed. If prompted, you may need to restart the PC before using **CXpro^{HD}**.

🛃 Setup - CXproHD	- 🗆 ×
	Completing the CXproHD Setup Wizard
⊂X pro [⊮]	Setup has finished installing CXproHD on your computer. The application may be launched by selecting the installed icons. Click Finish to exit Setup.
	Finish

REQUESTING AND APPLYING A LICENCE TO CXpro^{HD}

CXpro^{HD} requires a valid licence in order to operate. The licence is provided by Cylon via email.

Note: Before getting a licence, ensure that your computer is not connected to a network through an external device (such as a docking station). Othewise, the licence may not be valid once the docking station is disconnected from the PC. A cable directly attached to the PC or a Wi-Fi connection are OK.

Requesting a licence

When the PC does not contain a licence when **CXpro^{HD}** is being installed, you will be offered the option to generate a licence request file for the PC on which you are installing **CXpro^{HD}**.

InstallLic	enceChecker	\times
?	The application will require a licence. If you want to get the licence now, licence details will automatically be created and you will be asked for a file name to save them. You will then have to send the file to CYLON. Do you want to create the file now?	
	Yes No	

If you select Yes, then you will be prompted for a filename and location. Save the Licence request file, and then email it to Cylon in order to receive the Software Dongle.

When running the application

If you choose **not** to request a licence during the installation process, the software will operate for a period of time. After that period has expired, you will not be able to use **CXpro^{HD}**, and a message will be displayed prompting you to register the software:



Click Yes to open the Licence Details dialog:

Cylon Controls Ltd. Dealer Version I	Dongle - Not for Resale	
Licensee Serial Number Status	0 No licence	
Select a location and file name and	." button below. A key will be created and ask you to save it to a file. d press Save. presentative. A new license will be produced and sent to you.	
Select the file and press open.	button below. It will ask you to select the file sent from Cylon.	
<		>
Request new licence App	ply new licence	Close

If you click the **Request new licence**... button you will be prompted for a filename and location. Save the **Licence Request** file, and then **email it to Cylon** in order to receive the "**Software Dongle**" (licence file).

Note: If the PC does have an active licence or is still in the grace period, the Licence Details dialog can be accessed by selecting Licence Details from the File menu. 💺 💾 🏟 💉 🏑 😓 🕫 File Home Controller Strategy s Search New **Recent Documents** ? Strategy Help 🗁 Open 1 C:\CXproHD\...\002\002_02.s32 Configuration Da Save Reopen Strategies 2 C:\CXproHD\...\001\001_02.s32 Save As Save All 3 003_00_rebuilt.s32 Footers 4 C:\CXproHD\...\001\001_02.s32 🛯 Page Size Printer Scaling 5 C:\CXproHD\...\010\010_00.s32 Print Setup 6 C:\CXproHD\...\009\009_00.s32 Print Licence Details X Close (?) Help (i) About X Exit E. TEXSITEMODBUS

Applying a licence

When the licence file is received from Cylon, it must be applied to **CXproHD** as follows:

Select Licence Details from the File menu to open the Licence Details dialog.

Cylon Controls Ltd. Dealer Version	Dongle - Not for Resale	\times
Licensee Serial Number Status	0 No licence	
Select a location and file name an Send the file to your local Cylon re	" button below. A key will be created and ask you to save it to a file. Id press Save. presentative. A new license will be produced and sent to you. button below. It will ask you to select the file sent from Cylon.	
<		> *
Request new licence Ap	ply new licence	Close

Click the Apply new licence... button.

In the Windows Open File dialog, select the file supplied by Cylon, and click Open.

A message is displayed indicating that the licence has been applied successfully:

Cylon Controls Ltd. Dealer Version	Dongle - Not for Resale	\times
Licensee Serial Number Status	0 No licence	
	CXproHD X	
No licence! To obtain a licence: Click on the "Request new licence Select a location and file name an		^
Send the file to your local Cylon re Click on the "Apply new licence"	OK nd sent to you. ent from Cylon.	
Select the file and press open.		>
Request new licence Ap	ply new licence	Close

When you click **OK**, the details of the licence will be displayed:

Cylon Controls Ltd. Dealer Version Dongle - Not for Resale	>
Licensee Serial Number Dealer Status Registered Expiry Date 2020/4/18	
# Cylon CX pro HD license file # General Information DateGenerated=2019/04/18 HardwareID= Dealer=	^
SiteID= Comment = SerialNumber= SalesOrder= OEM = Cylon	>
Update licence Apply new licence	Close

The software is now licenced.

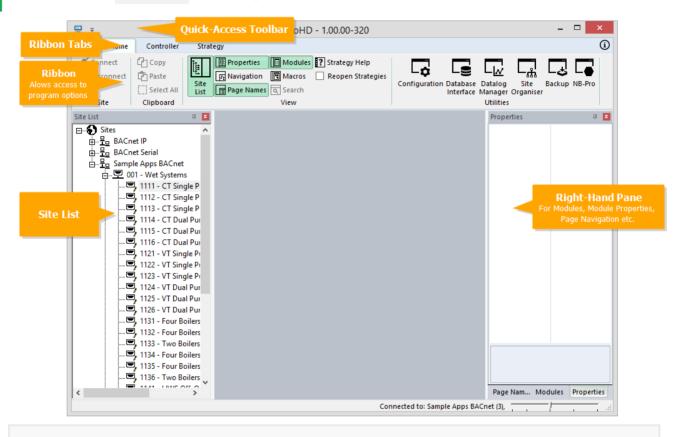
SECTION 2: BASIC TASKS



STARTING CXPROHD

Open the **CXpro^{HD}** section on the **Windows** Start menu or start screen , or search for "**CXpro^{HD}**" in the Application search box .

Click on the Start CXpro^{HD} icon. The CXpro^{HD} interface will open:



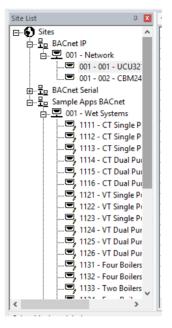
Note: If other Cylon Engineering Softwre, e.g. **CEC7** is installed on the same PC, then instead of the **CXpro^{HD}** interface opening directly, a "Chooser" dialog opens first allowing the user to select the software to be opened.

THE CXPRO^{HD} INTERFACE

The **CXpro^{HD}** User Interface consists of the following sections:

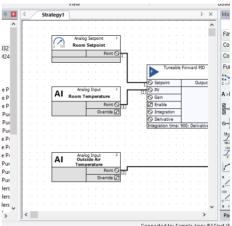
The Site List

This gives an overview of the BMS Sites that are accessible from this PC



The Strategy Drawing Area

This part of the UI shows the **modules** and **points** in the current **Strategy**, and the connections between them,



The Right-Hand Pane (Inspector)

On the right-hand side of the UI there is an area that displays the Modules library, a Module Property editor, a BACnet properties inspector and Page navigation panels.

By default these panels are displayed oneby-one in a tabbed interface,



but the layout can be configured by dragging the tabs so that the panels can be displayed all togetheras shown here:

Page Names	Ф 🗙	Pro	perties	д 🔀	Modules	Д
+ 🗙 🔽 Sh	ow Page Numbers On	<	> ? Tuneable	Forward PID 🔹		
Page Number	Page Name		General Informatio	n	Favorites	
1	Inputs		Туре	Tuneable Forward PID	Constants	
			Service Order	1	C	
			Synchronised Stat	Disconnected	Digital Constant	
			Inputs		Integer Constant	
			 Setpoint 	Analog 1 Room Setpo		
			Process Variable	Analog (1) Room Te	Real Constant	
			Gain	Analog	Controls	
			Enable	Digital		
			 Integration time 	Analog	Functions	
			 Derivative time 	Analog	Math	
			Constants		Schedules, Timers, and L	_
			Integration time	900	Setpoints, Inputs, and O	_
			Derivative time	0		
			Service time	1	Statistics	
		-	Outputs		VAV	
			Output	Analog (9) Heating V	Virtuals	-
					Tradio	
		Inte	egration time			
				difference between the		
		Set		s Variable. Set to zero to		
BACnet					100% OVR CAP NUM SC	

The Ribbon

At the top of the **CXpro^{HD}** User Interface, there is a palette similar to many Windows applications called the Ribbon. The Ribbon allows access to the majority of **CXpro^{HD}** features.



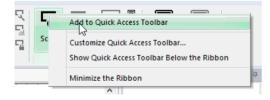
The feature options are grouped into tabs each of which contains a different set of options.

The Quick Access toolbar

If there are specific Ribbon feature options that you use often, you can add them to the **Quick Access Toolbar** where they will be accessible at all times:



To do this, right-click on the feature in the Ribbon and select Add to Quick Access Toobar :



CONNECTING TO A FIELD CONTROLLER

Work in **CXpro^{HD}** can be done on-line or off-line. When on-line, the **PC** can communicate directly to the controller. When off-line, there is no direct link between the **PC** and the **controller**. For tasks that involve direct communication between the **PC** and the **controller**, e.g. uploading or downloading information, it is necessary to work on-line.

• To work on-line, you must connect to the controller by clicking on the **Connect** button in the **Home** tab of the **Ribbon** :

💻 🗧											
File - Home	Controller	Strate	gy								
🚿 Connect	습 Copy	i.	🔢 Prop	oerties		Mo	dul	es	? 9	trat	egy
🖋 Disconnect	Paste		Navi	igation		Ma	cros	5	- F	leop	ben
	Select All	Site List	Pag	e Name	s Q	Sea	arch				
Site	Clipboard					View	N				
Site List		Ф 🗙	4	Strate	egy1						
E Sites E म BACn E I = 0	et IP 01 - Network										

• To work off-line, click the **Disconnect** button.

OPENING STRATEGY FILES

To open a strategy file in **CXpro^{HD}**, you can

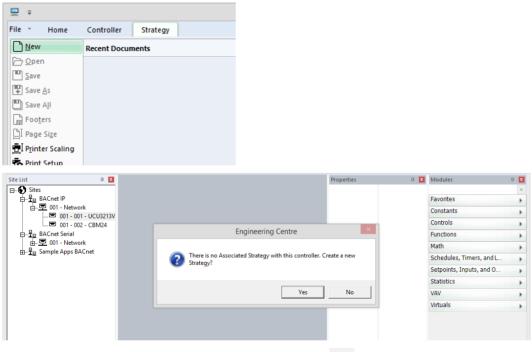
• Create a new strategy

or

• Open an existing strategy file.

It is possible to open multiple files: multiple new strategies in different controllers, multiple existing files, or a mixture of both (see page 27)

To create a new Strategy, either double-click on a Field Controller in the Site List that does not already have a Strategy associated with it, or select New from the File menu



You will be asked if you want to create a new strategy - click Yes .

To open an existing **Strategy** file, double-click on a **Field Controller** that has an associated **Strategy**, or select **Open** from the **File** menu:

= =		Engineering Centre
File - Home	Controller Strategy	
<u>N</u> ew	Recent Documents	BACnet Pc
🔁 Open	1 001_01.s32	BAChet Ur
Save Save	7.0017011325	dules 🔓 Strategy D
Save <u>A</u> s		ategy
Save A <u>I</u> I		
Footers		

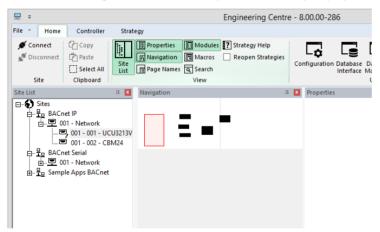
NAVIGATING A MULTI-PAGE STRATEGY

For clarity, many strategies are drawn over several print-pages. To facilitate navigation through these pages, **CXpro^{HD}** provides a **Page Navigation** panel.

To open it, select Navigation on the Home Ribbon.

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File Thome	Controller	Strate	gy														
💋 Connect 🔊 Disconnect Site	Copy Paste Select All Clipboard	Site List	Pr Na Pa	aviga	tior		Ma			? S					ies	Co	onfiguration Database D Interface M
Site List		Д 🗙	4	0	01_0	1.s32									⊳	×	Properties
⊡ <u>12</u> BACn ⊡ 12 0	01 - Network 9, 001 - 001 - UCI 9 001 - 002 - CBI						* * * * * * * * * * * *	· · · · · · · · · · · · · · · · · · ·	· · · · ·	* * * * * * * * * * * *	• • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·				^	

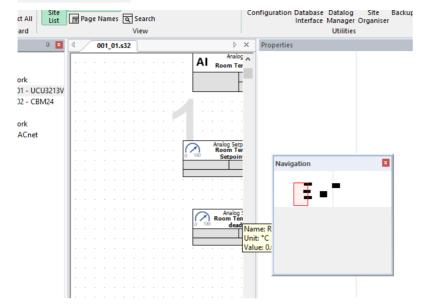
The button turns green to indicate the panel is currently displayed:



The **Navigation** panel appears by default as a docked panel within the **CXpro^{HD}** window, but by dragging its title bar it can be repositioned within the window or even 'popped out' as an independent window that you can position anywhere on your monitor:

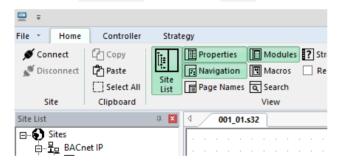
Navigation		×
Ξ	-	

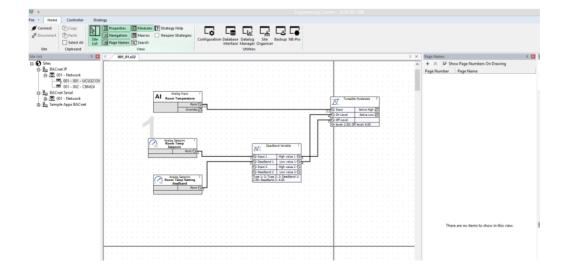
The Navigationpanel shows blank rectangles to indicate strategy blocks, and a red rectangle to who the currentStrategy Drawing Pane. Dragging the red rectangle moves the display within theStrategy Drawing Pane :



Labelling the pages within a strategy drawing

An alternative method for navigating a large Strategy is to use page names. A pane is available for this, to open it click on the Page Names button in the Home ribbon:





The **Page Names** panel appears by default as a docked panel within the **CXpro^{HD}** window, but by dragging its title bar it can be repositioned within the window or even 'popped out' as an independent window that you can position anywhere on your monitor.

— =											
File Y Home C	Controller St	ategy									
🖋 Connect 🛛 🖓	Copy	Properties 🚺 Mod	ules 🕐 Strategy Help								
			os 🗌 Reopen Strategies			ap NB-Pro					
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Site List		4 001_01.s32							Þ.>		4 🖬
E-S Sites E-To BACnet IP E-TO 001 - N											
B-To BACnet IP										Page Number Page Name	
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	01 - 001 - UCU3213 01 - 002 - CBM24										
BACnet Se ⊕- 型 001 - N ⊕- 型 Sample Ap	erial		Analog Input	1							
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						<mark></mark>					
				1							
										There are no items to show in this view	y. P

The Page Names pane allows you to hide the page number on the Strategy Drawing:

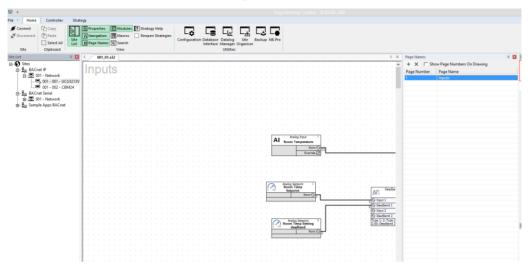
And allows you to add names for pages instead numbers:

Þ ×	<	Page Nam	ies						Ļ	x	T
111	^	+ ×	🔲 Sho	ow Page	Numbe	rs On Dr	rawing				Γ
		Page Nu	mber	Page N	lame						
		1		New P	age Nar	ne					
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isconnect Copy isconnect Deficiency Ste Clipboard	All List	Page Names & Search View	teopen Strategies Configura	tion Database Datalog St	a Backup NE-Dro						
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annett C Copy huornett C Parts Site Sites Sites Sites	All Ste bst a II - UCU3213V - CBM24	Page Names Search View	Configura	tion Database Datalog St Interface Manager Orga	is Backup NE-Pro	Nig box 1 Legender Torregenze		A + X F1		ers On Drawing	
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Connett C Copy Disconnett C Copy Site Clabboard at Site Clabboard Sites	All Ste bst a II - UCU3213V - CBM24	Page Names Search View	Configura	tion Database Datalog St Interface Manager Orga	En Backup NE Pro	Percontante	M ^{bu}	A + X F 1 Page Number		ers On Drawing	
Connect Characterial Characteri	All Ste bst a II - UCU3213V - CBM24	Page Names Search View	Configura	tion Database Datalog St Interface Manager Orga	En Backup NE Pro	Nemperature Fount G Overnile 2	<u>М</u> бал 5 рад	A + X F 1 Pege Riseber		ers Dn Dieseing	
Connect Characterial Characteri	All Ste bst a II - UCU3213V - CBM24	Page Names Search View	Configura	tion Database Datalog St Interface Manager Orga		Percontante	MI for	A + X F 1 Pege Riseber		en On Drawing	

Double-click on the name in the Page Names pane to edit it:

Page Names		Д X						
+ X 🗆 Sho	+ X 🗆 Show Page Numbers On Drawing							
Page Number	Page Name							
1	Inputs							

and the new name is displayed on the Strategy Drawing:



Click on a name in the Page Names pane to align the top left corner of that page in the top left corner of the Strategy Drawing Pane :

🖳 ÷	Engineering Centre - 8.00.00-286
File - Home Controller Stra	tegy
Ø Connect Ø Disconnect Site Cipboard	Improperties Improvements Improvements <td< th=""></td<>
Site List 📮 🕱	↓ 001_01.s32 ▷ × Page Names 및 🛛 N
⊡€ Sites	A + X □ Show Page Numbers On Drave
BACnet IP	Process Page Number Page Name
	, · · · · · · · · · · · · · · · · · · ·
001 - 001 - UCU3213	2 Proces
BACnet Serial	
	P
	Tuneable Hysteresis 2
	(1) O Input Active High D O On Level Active Low D
	On level: 2.00; Off level: 4.00

FINDING AN ELEMENT IN A STRATEGY

CXpro^{HD}'s Find pane is a facility for locating specific objects in a strategy,

It is opened by either pressing [Ctrl]+[F], or by selecting the search window from the Home tab of the Ribbon.

Search Results			
X Delete 🗌 Select All Module	▼ Type Boolean	▼ Name	Vumber Q Find Q Q
□· □ Search results for "subtype: Boolean,type Boolean	: Module" in strategy BACnet IP: 001 - Net	twork: 001 - 002 - CBM24 (2 m	natches)
Boolean			

This pane contains a number of lists in which you can specify a number of filters to reduce the kinds of items that will be located – for example in the screenshot above, only Boolean modules are shown.

You can then step through all of the matching items in the strategy drawing using the **using the mouse or arrow keys and selecting on the module discovered in the search results**. The current match will be highlighted in the drawing:

D D	olean 1		D B	oolean ²
🗗 Input A	Output 🗗	1 1	Input A	Output
🗗 Input B	Complement	-	🗗 Input B	Complement
Input C			Input C	
🗗 Input D			🗗 Input D	

<		
Search Results		
X Delete Select All Module	▼ Type Boolean ▼ Name	Vumber Q Find Q Q

🖃 🔲 Search results for "subtype: Boolean,type: Module" in strategy BACnet IP: 001 - Network: 001 - 002 - CBM24 (2 matches)

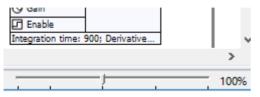
Boolean Boolean

ZOOMING AND NAVIGATING THE DRAWING AREA

The drawing area can be displayed in an enlarged or reduced view. The default view is 100 %, i.e. full size.

With a mouse, zoom in and out by rotating your mouse wheel with the control button pressed on your keyboard.

If you do not have a mouse with a mouse wheel or are using a trackpad, you may use the zoom slider at the bottom of the drawing area to zoom in and out.



For navigating around the drawing area, you can use the scrolls located on the right and bottom of the drawing area.

The mouse wheel may also be used to move around the drawing. Scrolling up and down with the mousewheel will move the drawing up and down. Scrolling up and down with the Shift button pressed on your keyboard, you may move right and left.

You may also use the right mouse button to drag the strategy around in the drawing area.

If you are using a trackpad, the Navigation Pane makes it easy to get around your strategy.

CHANGING THE DISPLAY

The following features of **CXpro^{HD}** can be customized:

- Drawing Area (Grid Settings). To simplify positioning modules on the drawing area, you can choose a grid of either lines or dots. You can also customize the size of the grid from 8-pixel to 56-pixel squares (see page 33).
- **Colours.** The colour of either the background or the grid can be customized using the **Colour** menu option from the **Display** menu. In addition to the standard colours available, custom colours can also be defined *(see page 33)*.
- Macros. If the work you do in CXpro^{HD} involves repetitive strategies or parts of the strategies, you can create macros (*see page 142*) to automate much of that work. You can arrange those macros in groups and, using an art tool, such as Microsoft Paint, you can draw icons to represent the macro groups and individual macros you have created.

MODIFYING THE DRAWING AREA (GRID SETTINGS)

From the Strategy tab on the Ribbon , choose Grid .

🛱 Grid	New Connections
Frid Colour	
Background Co	olour
	Display

This opens the **Grid** dialog box, where you can specify whether or not to show the grid, and if it is shown, whether you prefer lines or dots. You can also set the spacing of the grid.

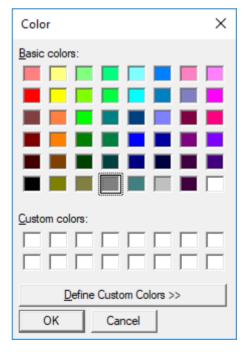


MODIFYING DISPLAY COLOUR SETTINGS

From the Strategy tab on the Ribbon , choose Grid Colour or Background Colour .



In both cases, the **Colour** dialog box is called. This allows you to select from a range of colours. You can also make custom colours, by clicking on the **Define Custom Colours** button. When you have selected the colour you require, click **OK**. The colour is applied immediately.



SAVING FILES

CXpro^{HD} allows you store files on disc by:

- Saving a new file
- Saving changes to an existing file
- Saving multiple files at once

Files will be saved in the "strat5" folder of the relevant site directory, under a numbered directory. The number of the directory matches the number of the BACnet Router to which the targeted controller is attached - for example:

```
C:\CXproHD\Lan\strat5\001\001_01FanCoil.stg
```

would be a strategy in a controller on the first BACnet Router of the site called "LAN".

Saving a new file

If a file is being saved for the first time, press [Ctrl]+[s] on your keyboard or choose Save from the File drop-down.

<u> </u>	Ŧ					
File	•	Home	Controller	Strategy		
Ľ	<u>N</u> ew		Recent Docum	ents		
	<u>O</u> per	n	<u>1</u> 001_01.s32			
	<u>S</u> ave Saγ	A -	2 001 02.s32			
	- 11ª	Save (
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_				(?) <u>H</u> elp	() About	X Exit
		-	e Apps BACnet e Apps Unitron			

This produces the **Save As** dialog box allowing you to specify how the file is to be saved:

<u> </u>	Save As	×
(<i>(<i>) → ↑ ↓ ≪ strat5 → 001</i></i>	 く C Search 001 	P
Organise 🔻 New folder	8=== 👻	0
CAMPBLOR ARCHIVE Control Co	▲ Name ↓ Upload ☐ 001_01.s32	
Upload	< <	>
File name: 001_01.s32 Save as type: V6 Strategy (*.s32)		>
Alide Folders	Save Cancel	

Saving changes to an existing file

If you have made changes to an existing file and wish to save those changes, but do not wish to rename the file, nor save it to a different location on the PC, you can save the file in two ways:

- Press [Ctrl]+[s] from the keyboard or
- choose choose Save from the File drop-down.

🖳 🗧			
File 🔹 🛛 Home	Controller	Strategy	
<u>N</u> ew	Recent Docume	nts	
Den <u>O</u> pen	<u>1</u> 001_01.s32		
Save <u>A</u> s	<u>2</u> 001_02.s32		
Sat Save As	strategy with a n	ew name.	
⊡I Page Si <u>z</u> e ⊡ I P <u>r</u> inter Scaling			
Print Setup			
Print			
Close		A	0
		() <u>H</u> elp	0
i <u> </u>	Apps BACnet		

Saving more than one file

If you have a number of files open and wish to save them all, choose Save All from the File drop-down. This saves each of the files.

File - Home	Controller	Strategy			
<u>N</u> ew	Recent Docur	ments			
├── Open ▲ Save	<u>1</u> 001_01.s32				ar di
Save As	2 C:\CXproHD)\\001\001_0	1.s32		а
Save All Footers ³⁵ I Page Size I Printer Scaling Fint Setup Fint Licence Details Signs	<u>3</u> C:∖CXproHD	N\001_03VA	V.s32		
		G	<u>H</u> elp	(i) About	X E <u>x</u> it
T T	Wet Systems 111 - CT Sing	le Pump DPS			

If one of the open files is being saved for the first time, **CXpro^{HD}** will prompt you to specify a drive, directory, name and file extension for that file by calling the **Save As** dialog box.

PRINTING

CXpro^{HD} can generate a hard-copy **printout** of the current strategy.

Including a footer in a printed strategy

When you print files created in **CXpro^{HD}**, they include additional information at the end of the printed page in the form of a footer. The footer includes the name of the site, as well as the **BACnet Router** and **Field Controller** for which the strategy is designed. You can edit the footer to include your name, your company's name, the name of the project to which the file belongs, the number of the drawing, if any, and the date and details of any revisions made to the drawing.

How to edit the footer that will appear with the strategy when it is printed:

Choose Footers from the File tab of the Ribbon .

This opens the Footers Details dialog box:

Footer Details					×
Company Name Cylon Controls Ltd. Company Address Clonshaugh Business and Technology Park. Clonshaugh Dublin 17 D17 A662					
Project Project <u>T</u> itle Open-Pla <u>F</u> ile 001_01.st			, control i	E. Peelo 14 5	
Revision Rev Date A 23/07/ B C D	Drawing 15 3	Checked EP	Remarks		
			<u>S</u> av	e	<u>C</u> ancel

Enter the required details and click Save.

Altering the print set-up

To define how the strategy is to be printed, choose **Print Setup** from the **File Tab of the Ribbon** to open the standard **MSWindows Print Setup** dialog box, where you can specify the required printer, paper, etc.

Print Setup		×
Printer		
<u>N</u> ame:	Brother HL-2170W series Printer	<u> </u>
Status:	Ready	
Type:	Brother HL-2170W	
Where:	WSD-63b62ecc-9045-4af1-b52e-8efa8	3b006811.006f
Comment	:	
Paper		Orientation
Size:	Letter	C Portrait
<u>S</u> ource:	Automatically Select	A C Landscape
Net <u>w</u> ork		OK Cancel

Printing a file

To print a file, choose the **Print** option from the **File** tab of the **Ribbon**. This opens the standard **MSWindows Print** dialog box to specify the required printer, pages to be printed and number of copies.

<u> </u>		
le - Home	Controller Strategy	Print
<u>N</u> ew	Recent Documents	Printer
→ <u>O</u> pen ¶ <u>S</u> ave	<u>1</u> 001_01.s32	Name: Brother HL-2170W series Printer Properties Status: Ready
Save <u>A</u> s Save A <u>I</u> I	<u>2</u> 001_02.s32	Type: Brother HL-2170W Where: WSD-63b62ecc-9045-4af1-b52e-8efa8b006811.006f
Footers		Comment: Print to file
I Page Si <u>z</u> e I P <u>r</u> inter Scaling		Print range Copies Copies Number of gopies: 1
Print Set <u>up</u>		C Pages from: 1 to: 12
Close Print Print ₽rint	the strategy.	OK

Changing the size of a Printout

If a strategy is large, it may not be possible to view enough modules on each page with a standard printout. **CXpro^{HD}** has a Printer Scaling option, which allows you to decrease the printed size of the strategy so that more of it is visible per page.

Also, if you have set a strategy up for printing on a particular printer, you may find that if you try printing on a different printer it may not fit properly on the page. The Printer Scaling option allows you to adjust the printout size to compensate for this.

To resize a printout, select Printer Scaling... from the File menu

This opens the **Printer Scale** dialog box:

Printer Scale	×
Printer Scale 100 🔶 %	
Apply to all open documents	
<u>OK</u> Cancel	

Enter a scaling factor between 20% and 300%.

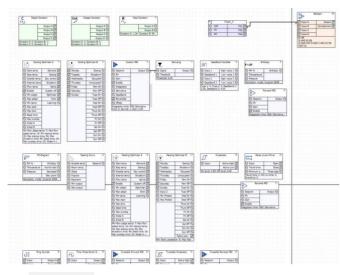
- Factors from 20% to 99% will decrease the size of the modules in the printout.
- Factors from 101% to 300% will increase the size of the modules in the printout.

Ticking the Apply to all open documents box will set all currently-open Strategies to print with the same scale.

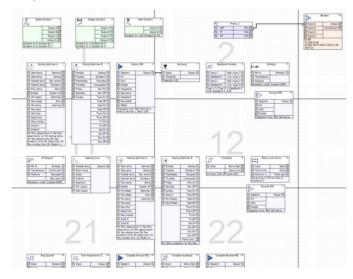
Basic tasks

Fitting a Strategy to a page size when printing.

The **Strategy** drawing indicates where Modules will appear on the printed page, by drawing gray borders on the **Strategy** drawing. In this example, the printer scaling is 100%



The **Printer scale** setting will change the size of the pages relative to the modules. Below shows an example of the printer scale of 200%



The physical page size represented by the gray borders is set by selectingPage Sizefrom theFiletab of theRibbonThis opens thePage Sizedialog:dialog:dialog:dialog:dialog:

Page Size ×
Use Standard Page Size
A4 💌
C Use Custom Page Size
1130 x 799 x
<u>OK</u> Cancel

CLOSING FILES

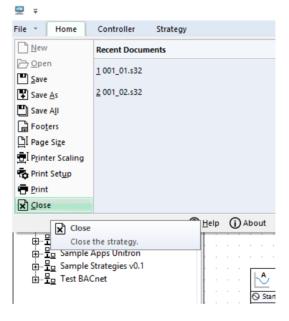
You can close an open **Strategy** file in two ways:

Click the Close button at the top right-hand corner of the file window,

	CXproHD - 8.00.00-304			×
	CAPIOHD * 6.00.00*504			G
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N Disconnect Paste	importies Imported Impo			
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□ Stees □ □ □ 001 - Network □ □ 001 - 001 - UCU3213VAV □ □ 001 - 002 - CBM24 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □<	C Digital Constant Imt Integer Constant Imt Integer Constant Imt Imt Integer Constant Imt Imt <td< td=""><td>Properties</td><td></td><td></td></td<>	Properties		
Strategy saved successfully.	Connected to: BACnet IP (3), Remote - E	100% OVR C	AP NUM	SCRI 🔡

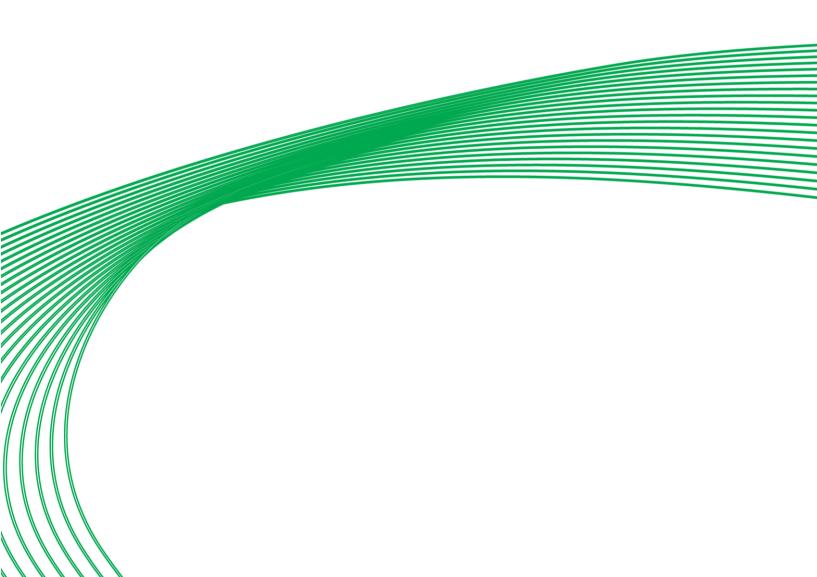
or

Select Close from the File tab of the Ribbon.



If changes have been made to the file since the last save, **CXpro^{HD}** will prompt you to save it before closing. If more than one file is open, selecting **Close** from the **FileTab of the Ribbon** closes the active window.

SECTION 3: USING MODULES



MODULES - OVERVIEW

Modules are the building blocks from which strategies are constructed. They are the basic units of operation in **CXpro^{HD}**.

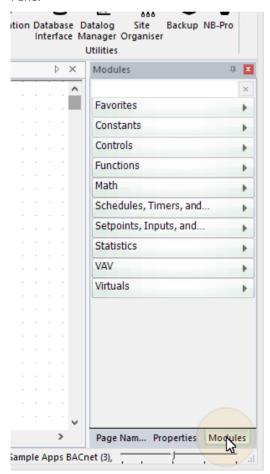
Modules perform tasks within a strategy such as

- bringing controller inputs into the strategy
- changing the values of points in the strategy according to mathematical rules
- comparing the values of points in the strategy
- recording the values of points in the strategy
- sending point values to the controller's outputs.

Modules can be grouped and saved as in order to avoid repetitive tasks, i.e. if you use a particular strategy or part of a strategy frequently, you can save it as a **macro** and reuse it without having to repeatedly re-create it.

ACCESSING MODULES

By default, **Modules** are available from the right-hand pane, by clicking the **Modules** tab at the bottom of the Pane:



CXproⁿ

 Modules
 Pane
 groups
 the
 available
 modules
 into
 Constants
 Controls
 Functions
 Math

 Schedules/Timers
 Setpoints/I/O
 Statistics
 VAV
 and
 Virtuals
 . To access individual modules, click on one of the

 groups:
 Setpoints/I/O
 Statistics
 VAV
 and
 Virtuals
 . To access individual modules, click on one of the

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					Schedules, Timers, and
					Setpoints, Inputs, and
					Statistics
					VAV
					Virtuals
				\mathbf{v}	

There is also a "**Favourites**" group, where you can set up a custom list of modules that you use frequesntly or want to be able to access quickly.

To add a module to the Favourites group, right-click on the module in the Modules Pane and select Pin to favourites :

Setp	oints, Inj	puts, an 👻			
AI	Analog Input				
AO	Analog	Output			
0 •	An Place	Add to Strategy			
BAC	net A	Pin to Favorites			
		: Binary			

To remove a module from the Favourites Group, right-click on ity and select Unpin from Favourites:

Modu	iles		Д	
			×	
Favo	rites		-	
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A>B	Com	 Unpin fro 	m Favorites	
Int	Inte	Remove	rom list	
AI	Anal	Help		
Cons	tants		•	
Cont	rols		•	
Func	tions		•	

In order to use a module in a **strategy**, you must place it in the **strategy**'s 'drawing area'.

⊒ ∓	CXproHD - 1.00.00-320	×
File - Home Controller Strat	egy	(i)
Connect Copy	Properties Modules ? Strategy Help	
Disconnect	Navigation Macros Reopen Strategies	¢ LS LM L _m Ly Le
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Site Clipboard	View	Interface Manager Organiser Utilities
Site List 4 X	Strategy1	▷ × Modules ♀ X
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BACnet IP 다		Favorites
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001 - 002 - CBM24		Controls
BACnet Serial		
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		Setpoints, Inputs, an
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<	<	> Page Nam Properties Modules
	Connected to	: Sample Apps BACnet (3),

To do this, click on the module name in the Modules pane:

Then click on the **Strategy** Drawing Area at the position where the module is to be placed (note the cursor changes to the "Module Cursor" i during this process):

— =			CXproHD	- 1.00.00-320		- 🗆 🗙
File - Home	Controller	Strategy				i
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	1114 - CT Dual Pu					Al Analog Input
	🗐, 1115 - CT Dual Pu 🗐, 1116 - CT Dual Pu	л — — — — — — л — — — — — — — —				AO Analog Output
	1121 - VT Single P 1122 - VT Single P					Analog Setpoint
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	🗐 1125 - VT Dual Pu					BACnet Analog Priority
	1126 - VT Dual Pu 1131 - Four Boiler	s				BACnet Binary
	1132 - Four Boiler 1133 - Two Boiler				· · · · · · · · · · · · · · · •	Const Disport Driarity A
<					>	Page Nam Properties Modules
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CXpro^{HD}

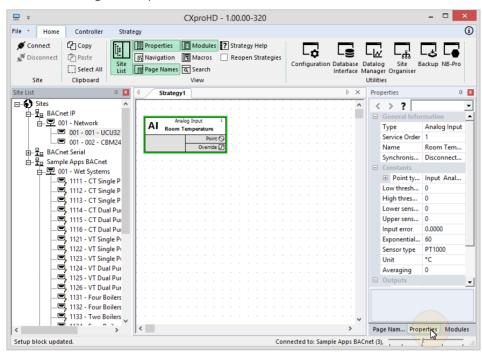
Some modules (e.g. Analog Input) prompt for basic configuration information when they are first placed. When this happens, fill in the dialog and click **OK**

□ -	CXproHD - 1.00.00-320	- 🗆 ×
File - Home Controller Strat	egy	i
	Im Properties Im Modules Im Strategy Help Im Mavigation Im Macros Reopen Strategies Im Page Names Im Search Configuration View View	Datalog Site Backup NB-Pro Manager Organiser Utilities
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	Point Name	Controls
由… 물 BACnet Serial 는… 물 Sample Apps BACnet		Functions
□	Point Name Room Temperature	Math
		Schedules, Timers, a
		Setpoints, Inputs, an 👻
	<u>O</u> K Cancel	Al Analog Input
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		BACnet Analog Priority
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		AConst Dispar Driarity A
<	<	Page Nam Properties Modules
Setup block updated.	Connected to: Sample Apps BA	Cnet (3),

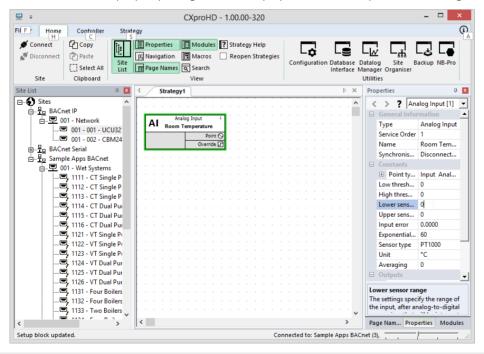
The module is displayed on the Strategy Drawing, and as it has just been placesd it is automatically selected. This is indicated by a green outline:

File Home Controller Strategy	
Isconnect Paste Site Image: Select All Site <td>1 X</td>	1 X
Site List A 🛛 4 Strategy1 b × Modules	
Image: Second	
BACnet Binary Priority A	~
> Page Nam Properties Modu Setup block updated. Connected to: Sample Apps BACnet (3), >	ies .

It is possible to examine and edit the properties of the selected module by clicking on the **Properties** tab at the bottom of the Right-Hand pane:



You can edit the properties of the selected module by clicking in the propety's value in the righ-hand pane. Help text relevant to the property being edited is displayed in the lower portion of the Right-Hand pane



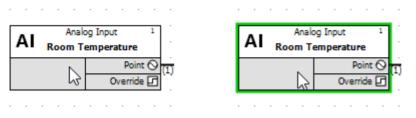
Note: If you have multiple strategies open at once, ensure that you select the strategy into which you would like to place the module before you select the module from the modules bar.

The module can now be selected, and edited, moved, copied, cut, or joined to other modules.

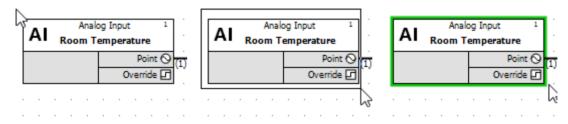
Selecting modules on the drawing area

Before you can move, copy, cut or delete a module, you must first select it. This can be done by:

Clicking on the module symbol,



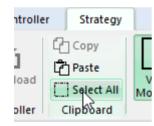
Or by clicking and dragging from the top left to the bottom right of the module symbol(s) as shown. When you release the mouse button, the module will be selected



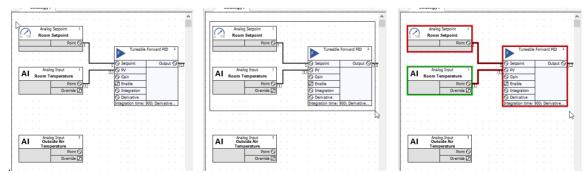
To select more than one module on the drawing area:

You can select multiple modules at once by the following methods:

- 1. Press and hold down the [Ctrl] button while clicking the modules required.
- 2. if you want to select every item in the drawing simultaneously, click on Select All in the Strategy tab.

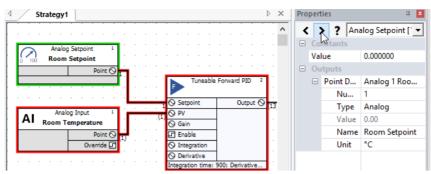


3. Click and drag a box around all the modules you want to select. When you release the mouse button, all the modules within the box will have been selected.



Selected modules (and points, which are represented by lines) are surrounded by coloured borders. Most modules will have a red border, but one will be green. This is the module (or point/line) whose properties are currently displayed in the Properties Pane – i.e. the module that is "in focus".

You can change which of the selected modules is "in focus" by using the navigation controls at the top of the properties pane, eith the arrows:



Or the drop-down, which lists the currently selected modules and points:

Strategy1		⊳ ×	Propert	ies	Д
		^	< 2	? Tur	neable Forward 💌
Analog Setpoint 1			⊟ Ge Ty	A	alog Input [1] alog Setpoint [1]
Room Setpoint	Tuneable Forward PID 2		Sei	vice Or 1 (A	nalog): Roward PID
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Override 🔽	O Integration	1	÷	Enable	Digital
	O Derivative		+	Integrat	Analog
	Integration time: 900; Derivative			Devicesti	Analan

Move, Delete, Cut or Copy a module or modules on the Strategy drawing area

In order to Move, Delete, Cut or Copy a module or modules, you must first select the module(s) as described above. Then:

Moving modules

To **move** the selected module(s) on the drawing area, drag any one of the selected modules. The modules and their connected points (lines) will move together. Alternatively, you can also use the arrow keys on the PC's keyboard to move all of the selected modules at the same time.

Deleting modules

To **delete** the selected module(s) from the drawing area press the **[Delete]** button on the PC's keyboard.

Copying modules on the drawing area

To **copy** the selected module(s) to the PC's clipboard, in order that they can be pasted to another part of the drawing area or to a different Strategy, either

- press [Ctrl]+[c] on the PC's keyboard, or
- click on Copy in the Home tab:

Home	Controller
nnect	Сору
sconnect	Paste
	Select All
Site	Clipboard

A copy of the module(s) will be saved on the Clipboard until placed (pasted) elsewhere.

Then, **paste** the module(s) to a specific point within the same strategy, or to another strategy, by first either

- pressing [Ctrl]+[v] on the PC's keyboard, or
- clicking on Paste in the Home tab:

Home	Controller
nnect	Сору
sconnect	Paste
	Select All
Site	Clipboard

then click on the drawing area in the target Strategy with the mouse. The top left-hand corner of the module(s) will be positioned on the point where the mouse was clicked.

Note: Pasted hardware point modules may adapt some parameters to the destination point but retain others. For example, an analog input configured as PT1000 when pasted to a UniPut will change to a voltage input, but retain the max and min limits (in the Advanced button) which for PT1000 could be min 0 and max 0, leading to incorrect operation of the UniPut.

Tool Tip Data on Modules

To view details of a specific Module, hover the mouse pointer over the Block in the Strategy drawing.

		Е	• •		P	Analog Output 13
2		1	40	•	Н	eating Valve
	(स्ट	τē) Po	int		XO Type: Output
0	<u> </u>) =	-	-	_	Ănalog/Digital Type: Analog
<u> </u>	(1,3)					8 bit range: 0-255
					·	Type of Input Sensor: Volts
						Lower actuator: 0
						Higher actuator: 10000
						Strategy lower: 0
						Strategy upper: 100
	· .					Output error: 0.00
						Sensor Type: 0-10Kohms
						Sequence on period: 0
						Unit: °C

JOINING MODULES IN A STRATEGY

Modules in a strategy must be **joined** together to allow information to flow from input to output. The flow is from left to right, so that controller input **connection points** are on the left of the drawing area, controller outputs are on the right, and the modules are positioned between the inputs and outputs in the centre of the drawing area.

Notes on joining modules

- A connection is possible only if both the input and the output are of the same type (analog or digital).
- An output of a module can be linked as often as required with inputs of other modules.
- An input of a module can be linked with only one output of a module.

Module connection points

Connection points are marked on module symbols as blue circles or squares on the left and right edges of the module. When the mouse pointer is placed over a connection point, it changes to a cross-hair.

- Circular connection points are analog.
- Square connection points are digital

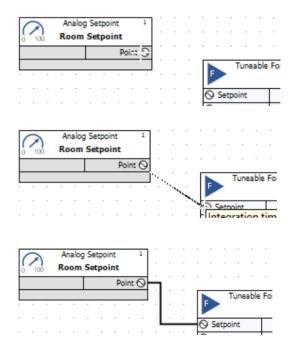
If you want to connect two points, make sure they are both either digital **or** analog. You cannot connect analog to digital or vice versa.

How to join modules

Place the mouse pointer over the required output of the first module so that it changes toa cross-hair.

Click and drag the mouse from the output to the required input of the other module. You will see that the cross-hair changes back to a mouse pointer once you have left the blue connection point and return to cross-hair format when you reach the next blue connection point.

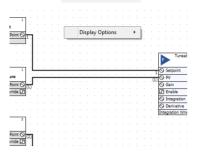
Release the mouse when you have reached the required input. The two modules are now joined. The connection between the two modules is marked by a coloured line. The default colour is black, but this can be customised by clicking on the connection line with the right mouse button.



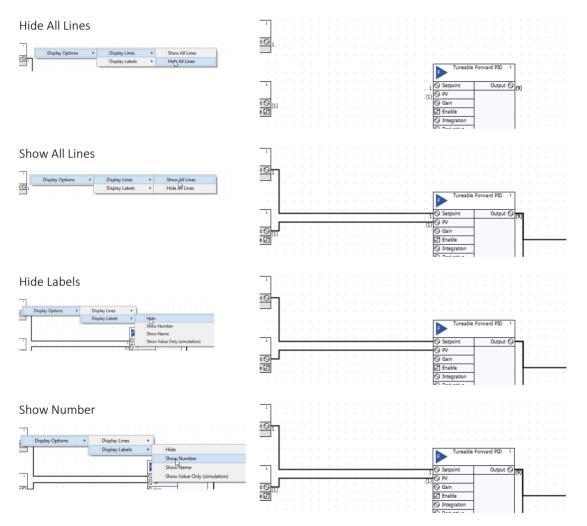
How connections are represented

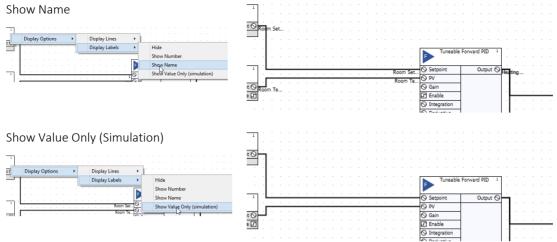
By default, the connection between 2 modules is represented by a black line with the numbers of the points at each end of the connection also displayed (as in the above example).

You can customise the way in which all connections are represented by right-clicking on the **Drawing Area** to open the **Display Options** menu:



This give access to the following options:





You can customise the line and label visibility of a single point (line) in the properties panel:

Pro	perties	Д
<	> ?	-
	Point Details	Analog 1 Room S
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	Туре	Analog
	Value	0.00
	Name	Room Setpoint
	Unit	°C
-	Display Propert	ies
	Show Line	True
	Labels	Show value only 🗸
		Hide
		Show number
		Show name 😼
		Show value only (sin

You can also change the default visibility using the New Connections option on the Strategy tab of the Ribbon :

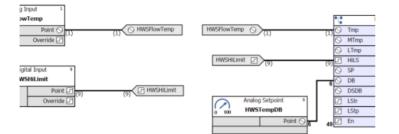
Strategy				
Paste	View Nodules Add I/O Recorder 10 BACnet Doints Add I/O Recorder 10 BACnet Doints BACnet Units Bachet Units Bachet Units Bachet Units Bachet Doints Bachet Do	View Macros	Start/Pause Stop Reset	Grid Colour Grid Colour
Clipboard	Strategy	Macros	Simulation	Display
4	Strategy1			▷ × Modules

This opens the **New Connections** dialog, where you can set the appearance of new **module** connections:

New Connect	ons ×
✓ Display lines on newly created	onnections.
Configure how point information created connections.	s display on newly
Show value only (sime Hide Show number Show name Show value only (sime	Gancel

Connectors

Lines are a convenient and intuitive way to connect modules that are close together in the Strategy drawing. However, clicking and dragging to connect modules that are far apart in the drawing can be impractical. To overcome this, **CXpro^{HD}** provides an alterative way to connect modules using named **Connectors**.



A Connector creates an invisible channel of information between a single Source and multiple Destinations.

Add a Source Connector

To set up a Source Connector, right-click on any output on any module and select Add Source Connector.

/lax	Maximum	۹												
) Input A	Maximum (5						-					-	-
) Input B		1	Sho	w li	nes									
) Input C														
) Input D			Add			~ -								
) Input E			Con	iver	t Lii	hos	to	Со	nn	ect	ors			
) Input F														
) Input G			Sim	ulat	ion	Pr	op	erti	es					
) Input H		-		-	-	-	-	-	-	-	-	-	-	-

In the dialog that opens, enter a name for the point that will be exposed by the **Source Connector** you are creating.

Point Name
Point Name MaxHWater
OK Cancel

The Source Connector is now created.

lax	Maximum	4									
Input A	Maximu	m 🛇 78			. 2	K	0	Max	HW	ater	
) Input B											
Input C											

Note: Points exposed by Source Connectors must be named.

Adding a Destination Connector

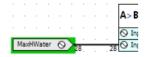
To connect a module to a point exposed by a **Source Connector** you must create a **Destination Connector** as follows: Right-click on any input of any module and select **Add Destination Connector**.

A> B	Com	parator	1				
) Inpu Inpu		Outpu Complemen					
1	Show	lines					
	Add D	estination	Conne	cto	r		
	Conve	rt Lines to	Conne	cto	rs		
	Simula	ation Prop	erties				

A list of Source Connectors will be displayed.

	Select	Source	Con	necto	or 📕
Name					
MaxHW	ater				
	caler Block				
Weathe	rCom Block	c 8001 Inj	pu		
				1	
		C)K	N	Cancel

Choose the appropriate **Source Connector** and click **OK** to complete the connection. The new destination connector is added to the input of the module.



Deleting Connectors

The rules for deleting connectors are as follows:

Source: If a Source Connector is deleted, <u>all</u> Destination Connectors connected to the Source Connector will also be deleted.

Destination: If a Destination Connector is deleted, it is the same as disconnecting an input from any output.

If the **Destination** Connector is the last one connected to the source, a dialog will be displayed asking the user to if they want to delete the source. If they decide to do so, then the **Source** Connector will also be deleted. If the user does not delete the **Source** Connector, that point will be available for new Destination Connectors.

Quick Searching for Connectors

• Jumping from a Destination Connector

Right-click on the Destination Connector and choose either Jump to Source or Jump To Other Destination .

•	O Input A
L	MaxHWater O 78 78 Input B Comp
	Jump to Source
	Jump to Other Destination
	· · · //2· · · · · · · · · · · · · · · ·

If you choose Jump to Source you will immediately be taken to that Connector .

If you choose Jump To Other Destination and there is only one available, you will immediately be taken to that Connector .

If you choose Jump To Other Destination and there is more than one available Destination, then the Search Results window (below the Strategy Drawing window) will display them as a list so that you can select which one to view.

	O Input A
	MaxHWater O 28 28 O Input B Comp
8 Imp DPS Imp Trip Imp Speed np DPS np Trip	Maximum A Maximum O 28 28 Q MaxiMitter C Search Results X Delete Select All Module Type
np Speed imp DPS imp Trip imp Speed np DPS np Trip np Speed OnOff Modulating	Name Number Q, Find Q, Q □ □ Search results for "MaxHWater Destination Connectors" in strategy PL Office I Source Connector 1: MaxHWater Destination Connector 2: MaxHWater Destination Connector 3: MaxHWater Destination Connector 3: MaxHWater

• Jumping from a Source Connector

Right-click on the source connector and choose Jump to Destination .



If there is only one **Destination** Connector, then that Connector will immediately be displayed. If there is more than one, then the Search Results window (below the Strategy Drawing window) will display them as a list so that you can select which one to view.



Convert Lines to Connectors

It is possible to quickly convert an existing Line to a set of Connectors (one Source and one Destination).

Right-click on a Line and choose Convert Line to Connector .



If the point is not named, you will be given the option to name it.

Viewing Point properties

The **Properties** panel in the **CXpro^{HD}** Right-hand pane can be used to examine points and routing. To do this, select a line (representing a connection between two modules, usually meaning a point). The properties of the point are displayed in the **Properties** panel:

Properties	Д 🗙
< > ?	•
Point Details	Analog (9) Heati
Number	9
Туре	Analog
Value	0.00
Name	Heating Valve
Unit	°C
Display Proper	ties
Show Line	True
Labels	Show value only
Number	
The point number path of data in a st	that represents a rategy. There are a
Properties Page N	Names Modules

Some attributes of a point (such as Name or Unit) are editable, and can be changed directly in the Properties panel.

Viewing BACnet properties

If the BACnet Properties option is enabled in the Home tab of the Ribbon,

J	Home	Controller	Strat	egy		
r	nect	С Сору	i.	Properties	Page Names	Q Search
(connect	Paste	че С	BAGnet Properties	Modules	? Strategy Help
		Select All	Site List	Navigation	Macros	📃 Reopen Strat
i	te	Clipboard			View	

then in the right-shand pane, alongside the **Properties** panel, there is a **BACnet Properties** panel:

O Input E			
>	Properties	BACnetProperties	

When a BACnet-exposed point (the line representing the point has hexagon indicators near each end) is selected

A	I			-	Inpu atu			3] .			:			ſ	-		Hys	teres	sis
							oint	-	(3)	÷			-	(3)	⊙ Ir	put				cti
Override 🗗						.						On: 2	.00;	Off	4.0		kct			
Ċ	÷	÷.	÷	÷	÷	÷	÷	Ĵ	÷	Ċ			÷	Г						

and the controller is connected in CXpro^{HD}

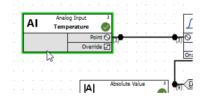
File	*	Home	С
,Ø 33 ³⁶		connect	
	S	ite	Cli

then **CXpro^{HD}** will interrogate the **BACnet** network in real-time, and live **BACnet** property values for the selected point will be displayed in the **BACnet Properties** panel.

		ice properties		
	ob	ject-name (77)	Temperature	
	ob	ject-type (79)	0	
	ob	ject-identifier (Analog Input (0),	
	pre	esent-value (85)	1000.000000	
	+	status-flags (1		
	ev	ent-state (36)	normal	
	rel	iability (103)	No Fault Detected	
	ou	t-of-service (81)	False	
	un	its (117)	62	
	mi	n-pres-value (78.000000	
	ma	ax-pres-value (120.000000	
	co	v-increment (22)	0.100000	
	tin	ne-delay (113)	0	
	no	tification-class	0	
	hig	gh-limit (45)	0.000000	
	lov	v-limit (59)	0.000000	
	de	adband (25)	0.000000	
	+	limit-enable (
	+	event-enable		
	÷	acked-transiti	to-offnormal, to	
	no	tify-type (72)	Alarm	
_		•		_

Viewing Module BACnet Properties

The **BACnet Properties** panel can also be used to view and edit BACnet information related to certain modules as well as points.



The following modules are supported:

- Binary input/output
- Analog input/output
- Setpoints
- BACnet Schedules
- Unitron Schedules
- Broadcast transmit and receive
- Modbus Analog and Digital
- Accumulator
- BACnet Trendlogs

Viewing Device BACnet Properties

At the top of the **BACnet Properties** panel there is a **Device Properties** checkbox:



Checking this box changes the contents of the panel from the properties of the selected point or module, to the **BACnet** properties of the device that contains that point or module:

Device properties			Device properties	
ANALOG INPUT		▲ 	DEVICE	
object-name (77)	Temperature		object-name (77)	CBx CCBX819002
object-type (79)	0	-	object-type (79)	8
object-identifier (Analog Input (0),		object-identifier (Device (8), Instan
present-value (85)	1000.000000		system-status (112)	Operational
status-flags (1			vendor-name (121)	Cylon Controls,
event-state (36)	normal		vendor-identifier	171
reliability (103)	No Fault Detected		model-name (70)	CBx
out-of-service (81)	False		firmware-version	CBx 7.9.0f 18-08-
units (117)	62		application-softw	Plant Controller
min-pres-value (78.000000	-	location (58)	Location not set
max-pres-value (120.00000		description (28)	Plant Controller
cov-increment (22)	0.100000		protocol-version	1
time-delay (113)	0		protocol-revision	14
notification-class	0		🖭 protocol-servi	acknowledgeAla
high-limit (45)	0.000000		😟 protocol-obje	analog-input, a
low-limit (59)	0.000000		object-list (76)	DE819002AI2AI3
deadband (25)	0.000000		max-apdu-length	480
🗉 limit-enable (segmentation-su	Segmented Both
\pm event-enable			local-time (57)	12:29:59
🗄 acked-transiti	to-offnormal, to		local-date (56)	26/04/2019
notify-type (72)	Alarm	-	utc-offset (119)	0

HOW TO ADD TEXT TO A STRATEGY

You can add text comments to a Strategy drawing by selecting Add Text from the Strategy tab on the Ribbon :

Strategy]		
Copy	View Modules	Adas Text	I/C Termir
Clipboard			

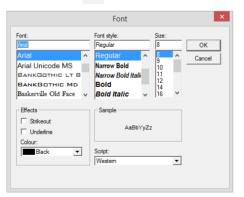
Click the drawing area at the point where you want the text to be displayed.

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			i.																		
Ir	۱D	u	τ	S																	
	3.														Г	_		 		_	
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	• •						•				•			•						P	oin
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				Anal m T					1												

The Add Text dialog box will be displayed:

	· -		Add ⁻	Text		×	-			
	1				 	_				
									tpoint t poin t	t
	Font			OK	Cancel		-	•		Point
Ľ	A	Roor	n Temperature		 					

To select the type of font in which the text should be displayed, click Font . The standard Windows Font dialog box will be displayed in which you can choose a font, style, point size, etc. Once you have chosen the required font, click the OK button.



Note: It is recommended that you always use "True-type" fonts. When the printing is scaled, non true-type fonts do not scale properly.

Add Text

 B1 DS floor temp sensors

 Font

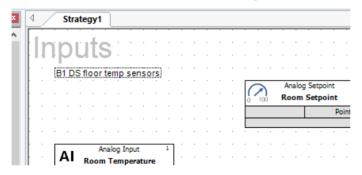
 QK

 Cancel

In the Add Text dialog box, type the text that you would like to include in the strategy

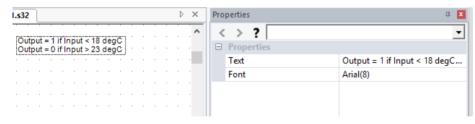
And click OK .

The text will then be displayed on the drawing area on the point at which you clicked the mouse.



How to change text that has been added to the stategy drawing

To change text, select the text and edit its content or font directly in the **Properties** pane.



VIRTUAL MODULES

Virtual modules are so-called because they do not result in point values being downloaded to the Cylon controllers, i.e. they do not represent real points. The basic function of a virtual module is to allow for greater flexibility in connecting modules, e.g. backward connection of modules. Virtual modules are also used when creating macros, as they allow one external point of a macro to be connected, via a virtual, to many internal macro points. There are two virtual modules on a floating toolbar – one analog and one digital.

Analog Virtual Module: 🔯	0
Digital Virtual Module:	

Placing Virtual modules on the drawing area

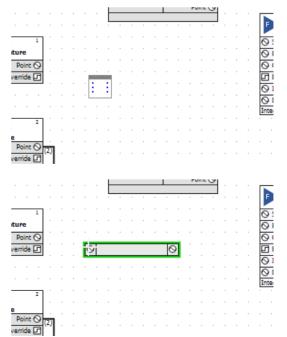
The procedure for placing virtual modules on the drawing area is similar to that for any other module.

Select the required module from the Virtuals group in the Moules panel:

Modules	д X
	×
Favorites	•
Constants	•
Controls	+
Functions	•
Math	•
Schedules, Timers, and Logic	+
Setpoints, Inputs, and Outputs	•
Statistics	•
VAV	•
Virtuals	-
V Analog Virtual	
V Digital Virtual	
Properties Page Names Modul	es

And click in the drawing area (note the cursor changes to the "Module Cursor" is during this process)

The top left hand corner of the module's symbol will be placed on the point where the mouse was clicked.



Rules for connecting to virtual modules

- 1. If the point being connected to the virtual module has a point number, then this becomes the number of all the inputs and outputs of the virtual module. Any modules that are then connected will have the same point number.
- 2. If the point being connected to the virtual module does not have a point number, **CXpro^{HD}** chooses a new number and this becomes the number of all the inputs and outputs of the virtual module.
- Rules 1 and 2 describe how the inputs and outputs of the virtual module are numbered once a connection has been made. This is why **CXpro^{HD}** will not allow you, once the first connection has been made, to connect another module that has a number. You can, however, connect a module if its point number box is blank.

Numbering virtual modules

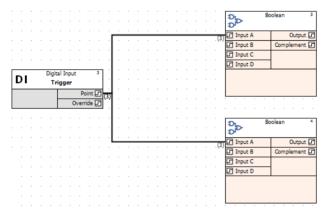
Since virtual modules are not downloaded, they do not use any memory in the controller and do not need to be numbered in the Block Manager like other modules.

Virtual modules have their own numbering system. The first virtual module used in a strategy is numbered V1, the second V2, etc.

Virtual modules in macros

Virtual modules are useful when creating macros as they allow one input to be used several times.

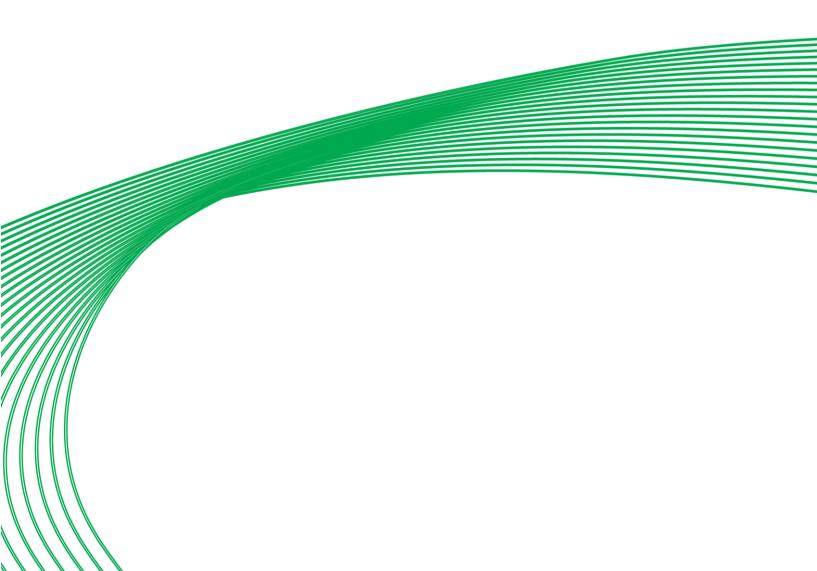
For example, to create a macro from the strategy shown, it would be necessary to include two inputs in the macro.



Creating the same macro with a virtual module requires just one macro input.

																		D	Boo	lean	3
																		-P			
																		0			_
																	(3)	Input A		Output	G
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																		Input C	-		-
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																		Input B		Complement	
																		Input C	-		_
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																		🗗 Input D			_

SECTION 4: POINTS AND POINT VALUES



A **Point** is an area in a **Controller** where data is collected and stored. The data stored by the point is referred to as the **Point**'s "value". Controllers in the Cylon system include input, output, set and virtual **Point**s.

Note: Cylon's Controllers are sometimes referred to as "universal controllers", where "universal" means that they can contain both analog and digital Points.

WHAT ARE BLOCKS?

An important aspect of **CXpro^{HD}** is the concept of **blocks**.

Blocks can be seen as units of measurement for the number of modules and points used in a Strategy – one block corresponds to one module, one hardware input Point, one hardware output Point or one virtual point.

The Managers dialog, accessible from the View menu, allows you to see at a glance which of the blocks in the controller are occupied and which are not.

When **Points** or **Strategies** are downloaded to a **Controller**, the **Controller** must also be informed of how many **blocks** are needed to store the required information.

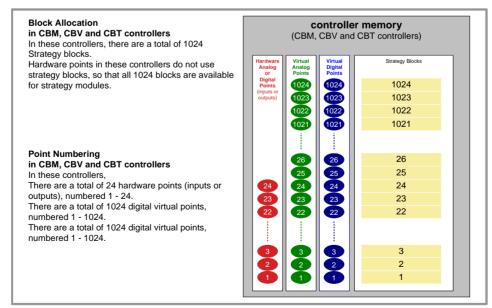
- If you are using Automatic Download (see page 69), CXpro^{HD} automatically recognizes how many blocks are required and it sends this information to the Controller.
- If you are not using Automatic Download you must, when downloading Points and Strategies, send specific "Setup" information to the Controller, instructing it as to how many blocks it must service in the Strategy. This procedure is called Sending Setup (see page 169).

BLOCK NUMBERS

An important aspect of **CXpro^{HD}** is the concept of **blocks**.

Blocks can be seen as units of measurement for the number of both modules and points used in a strategy.

• In the **CBM**, **CBV** and **CBT** controllers, the Hardware **Point** numbers are from 1 to 1024 and **Strategy blocks** go from 1 to 1024. Note however that only **Hardware Points** 1-24 are used on the **CBM24**, only **Hardware points** 1-16 are used on the **CBM16** etc.



POINT NUMBERS

In **CXpro^{HD}**, the connections between modules are referred to as '**Points**'. These **Strategy Points** can represent physical inputs and outputs on a **Controller**, or Analog/Binary values (referred to in **CXpro^{HD}** as '**Virtual Points**').

Each Analog Input, Analog Output, Binary Input, Binary Output, Analog Value and Binary Value is assigned a number, and how these points are numbered depends on the controller type.

In **CBM**, **CBV** and **CBT** controllers, controller terminals (i.e. inputs and outputs) - "hardware points" in **CXpro^{HD}** - are assigned numbers between 1 and 24. Each terminal can be either an input or an output, so that there cannot be two hardware points with the same number. For example if there is an **Analog Input** 3 there cannot be an **Analog Output** 3 or **Binary Input** 3 at the same time.

Note: In theory, hardware Point numbers could be up to 1024, but is limited by the Controller hardware so that the current maximum is 24.

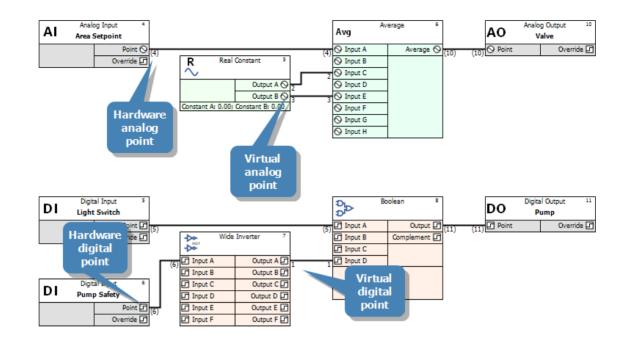
Analog Values ("Analog virtual points") can be numbered 1-1024, and Binary Values ("Digital virtual points") can be numbered 1 - 1024, so that there could be for example both Analog Value 3 and Binary Value 3.

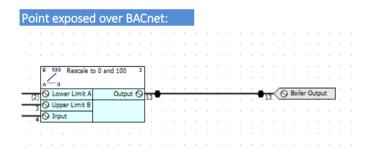
Note: The combined number of Analog Values and Binary Values that can be exposed on a BACnet network by a single **CBM** or **CBT** is 225. As a result, it is recommended to keep the total number of defined setpoints in a Strategy below this value.

However it is possible to have up to 100 additional setpoints **that are not exposed on BACnet**. Such setpoints in effect act as constants, because they cannot be changed by the Strategy nor via BACnet, but can be set using **CXpro^{HD}**.

In **Strategy** drawings generated by **CXpro^{HD}** for **CBM**, **CBV** and **CBT** controllers, it is possible to identify a **Strategy** Point's nature as follows:

- If the number has brackets around it is a "hardware point" Analog Input, Analog Output, Binary Input or Binary Output.
- If the number is not bracketed, but is connected to a circular connection point, it is an Analog Value ("analog virtual point").
- If the number is not bracketed, but is connected to a square connection point, it is a **Binary Value** ("digital virtual point").
- If the line representing the point has a hexagon near each end, then that point is exposed on the **BACnet** network.





DEFINING HARDWARE POINTS

Hardware points are the inputs and outputs of Field Controllers.

To define a hardware point it is necessary to define the following features:

- Point number
- Point name
- Point type (input, output, digital, analog)
- Unit of measurement
- Damping (for analog inputs only)

Once the required hardware points have been defined in **CXpro^{HD}**, they are then downloaded to the **Field Controller** for which they are intended.

How to define hardware points

The procedure for defining hardware points is as follows:

- Specify (Target) the controller for which the hardware point is being defined
- Choose the module from the modules bar
- Place the module on the drawing area
- **Complete** the module dialog box
- Save the hardware point definition
- Log in to the Field Controller
- Download the hardware point definition to the Field Controller

Defining Hardware points – Target the controller

in the Site List select the BACnet Router and Field Controller that you want to target. This specifies the Field Controller on which the hardware point is being defined and the location in the database on the PC's hard disk in which the point definition will be stored.

Defining Hardware points - Place the module on the drawing area

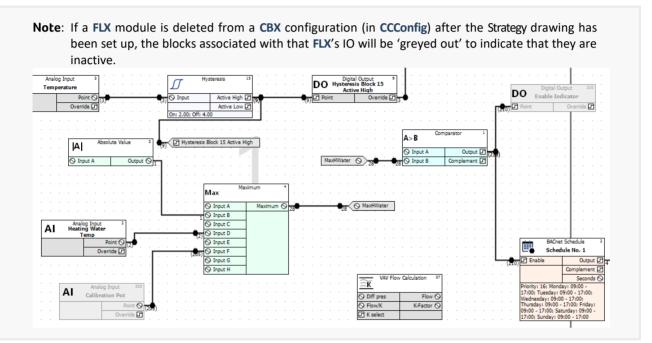
Once you have selected a module from the **modules bar**, place it on the drawing area by simply clicking the drawing area. A dialog box will appear prompting you to enter a name for the hardware point.

Enter a name and click **OK** to close the dialog box.

The top left hand corner of the module's symbol, i.e. the graphical symbol for the analog input point, will be placed on the point on the drawing area where the mouse was clicked.

Expandable I/O – Hardware Points on CBX + FLX devices

In the **Strategy** drawing, IO blocks can be added up to the total on the configured **FLX** modules plus the **CBX** onboard IO.



Note: Unlike CBM UniPuts, if UniPuts on CBX/CBXi devices are configured as Analog Inputs, they have all of the parameters that are available in Universal inputs. Also, the "Operation Mode" parameters, which are applicable only to certain CBM UniPuts, are not used by CBX/CBXi.

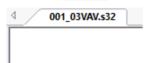
Defining Hardware points - Save the hardware point definition

Save the edited strategy by choosing Save or Save As... from the File menu. The Save As dialog box appears:

2	Save As	>
🔄 🍥 🔻 🕈 🎽 « BACNETIP 🔸 strat5 i	001 v C Search 001	ρ
Organise 👻 New folder	III 👻 (0
BACNETIP	^ Name	
Archive		
DBASE	No items match your search.	
DRAWINGS		
🎍 Keypad		
Macros		
🎳 strat5		
Jan 001		
🍌 Strategy	v «	
File name: 001_02.s32		•
Save as type: V6 Strategy (*.s32)		,
Hide Folders	Save Cancel	

Enter a name under which the strategy should be saved. **CXpro^{HD}** enters a default file name that identifies the **BACnet** Router and Field Controller for which the **Strategy** has been designed, e.g. if Field Controller #3 on BACnet Router #1 was connected to a **VAV**, its strategy might be named: "001_03VAV.s32".

When the Save As dialog box is complete, click OK. The name of the strategy will appear in the Drawing tab:



Connect to the controller

Connect to the controller by clicking the Connect button on the Strategy tab of the Ribbon

File - Home	Controller	Strategy	1
	Controller	Strategy	
Conrect	Download	습 Copy 한 Paste Select All	
Site	Controller	Clipboard	

Download the hardware point definition.

You can download a strategy to a controller in just one step, provided you are using Automatic Download.

To enable Automatic Download, choose Communications from the Controller tab of the Ribbon .

* Home	Controller Stra	ategy
Connect	to Communications	📩 Download 🛛 [김 Co
Disconnect	Controller	Wipe Controller 🚉 SI
	BACnet	💾 Auto Online
Site	Configuration	

This opens the Communications Configuration dialog:

Communications Configuration	×
Download Options Scan Options	
I Automatic Download I Wipe controller	
Automatic Download Wipe Defaults	
Vipe Strategy	
Vipe Points	
Wipe Time Schedules	
Wipe Hardware Points	
BACnet	
Wipe BACnet Objects (Excluding Devi	
Wipe BACnet Binary Unit Strings	
Wipe BACnet Device Name	
Other	
Automatic Online Downloading	
Automatically Send Setup	
Field Controller will be wiped before download.	
OK Cancel	

which allows you to enable Automatic Download by clicking the Automatic Download check box.

Click OK to close the Communications Configuration dialog box, and download the hardware point definition to the Field Controller by choosing Download from the Controller tab of the Ribbon .

•	⊷ ⊡		
ne	Controller	Stra	ategy
	tommunica	tions	📥 Download
ct	😼 Controller		Download
	BACnet		🛃 Auto Online
	Configuration	on	

CXpro^{HD} will automatically wipe the Field Controller's memory, download the hardware point and send the setup to the UC, i.e. the number of blocks it is to service. While it is doing this, it will display the **Downloading** window. As the point is being downloaded, the **Downloading** window displays the progress and in the **System status** section it shows which of the 3 stages (wiping memory, downloading strategy or sending set-up) **CXpro^{HD}** is currently completing. If only one hardware point is being downloaded, the process will take place so quickly that the downloading window will appear only for a brief moment.

It is more usual to download an entire strategy, with several hardware points and other modules. In that case, the **Downloading** window will remain visible for longer and the progress of the download will be measured in the progress bars.

Downloading		>
Controller		
Hardware Points		16
Strategy Blocks		500
Analog Setpoint Values		389
Digital Setpoint Values		314
BACnet Point Config		212
Sending BACnet data via file tra	Close	Abort

Summary of procedure for defining hardware points

In practice, the procedure for defining hardware points is as follows:

- Define all hardware points whose values are already known, in the module dialog boxes and place the corresponding modules somewhere on the drawing area.
- Save the strategy.
- Click Communications Setup from the Communications menu and enable Automatic Download.
- Log in
- Choose Download from the Communications menu.

Point numbers for inputs and outputs

When another input module is selected, **CXpro^{HD}** automatically assigns to it the next unused input, i.e. the unused input with the smallest point number.

Defining digital and analog outputs follows the same principle. As outputs are numbered in the range 9 to 16, **CXpro^{HD}** assigns point number 9 to the first output.

For **CBX** and **CBXi** devices, point numbers are defined by the I/O module in which they reside – internal I/O on the **CBX/CBXi** device are I/O module "0", any attached **FLX** devices are I/O modules 1,2 or 3

I/O Module	Terminal Number	Туре
CBX8R8	1 8	Universal Input
	<mark>9</mark> <mark>16</mark>	UniPut™
FLX8R8 adress 1	<mark>101</mark> 108	Universal Input
	109 <mark>116</mark>	UniPut™
FLX8R8 adress 2	201 <mark>208</mark>	Universal Input
	209 216	UniPut™
FLX8R8 adress 3	301 <mark>308</mark>	Universal Input
	309 316	UniPut™

A short cut to defining hardware points

To save time when defining the hardware points you can bring the definitions directly to the database by using the **Database Interface**.

The types ("A" for analog, "D" for digital), point names and point numbers and units can be written as commaseparated or tab-separated lists in a word processing application, copied and pasted via the clipboard to the Database Interface. This avoids unnecessary writing work and typing errors. Using external applications for text handling also saves time because of their Copy, Search, Replace and Pasting features.

The point list shown below was created in **Microsoft Windows Notepad**. Other software applications, such as Excel and Word may also be used.

A	Room Temperature 1 °C	1	
A	Room Temperature 2 °C	2	
A	Outair Temperature South-East	°C	3
A	Outair Temperature North-West	°C	4
A	Supply Water Temperature 1 °C	5	
A	Supply Water Temperature 2 °C	6	
A	Valve 1	olo	9
A	Valve 2	00	10
D	Pump 1 ON/ OFF	11	
D	Pump 2 ON/ OFF	12	

When preparing a hardware point definition list you must separate the values (type, point name, unit, point number, etc.) by using tabs or commas, not spaces.

Note: This shortcut for defining hardware point values should only be used for UCs that do not already have hardware point definitions in the database on the PC's hard disk, since existing database entries are not deleted. The Database Interface does not check for uniqueness. This means that there is a danger of defining more than one entry per point, which will cause a lot of confusion in later use of the point in other programs.

WHAT ARE **UNIPUTS™**?

A UniPut[™] can act as an input or an output, so that you can now have a controller that fits your BMS design exactly - no need to use an extra controller to gain an extra output while leaving an input on the original controller unused. BMS sites can make more efficient use of a smaller number of controllers, saving on cost and complexity.

A UniPut[™] can be configured as any one of the following:

- an Active Input, reading between $0 \dots 10$ V at 40 K Ω , with 9-bit resolution.
- an Active Output, outputting 0 ... 10 V at a maximum load of 20 mA
- a Digital Volt-Free contact.
- a digital input detecting the presence or absence of 24Vac

or

• a relay switched output.

The Cylon range of controllers has a number of different combinations of UniPuts[™] and standard Universal Inputs.

UniPuts[™] are used in controller **strategies** through standard Analog and Digital Input and Output modules. However, before it is possible to add a module for a **UniPut[™]** to the strategy, the **UniPut[™]** must be configured using **CXpro^{HD'}s I/O Terminals** dialog box.

CONFIGURING THE FIELD CONTROLLER'S INPUTS AND OUTPUTS

Cylon controllers have a mixture of **Universal Inputs** and **UniPuts™**. The **Universal Inputs** are fixed as inputs, but **UniPuts™** may be configured as analog or digital inputs or outputs using the **I/O Terminals** panel.

How to open the " I/O Terminals " panel.

The I/O Terminals panel is opened by clicking the I/O Terminals button in the Strategy tab of the Ribbon :

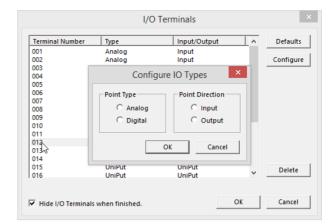
	iew dules Text Term	Reorder Modules & Strateg Strategy	e u	
	I/C) Terminals		
Terminal Number	Туре	Input/Output		Defaults
001	Analog	Input		Derudits
002	Analog	Input		Configure
003	Digital	Input		configure
004	Analog	Input		
005	Digital	Input		
006	Digital	Input		
007	Universal	Input		
008	Universal	Input		
009	Analog	Output		
010	Analog	Output		
011	Digital	Output		
012	UniPut	UniPut		
013	UniPut	UniPut		
014	UniPut	UniPut		
015	UniPut	UniPut		Delete
016	UniPut	UniPut	*	

How to configure a UniPut[™]

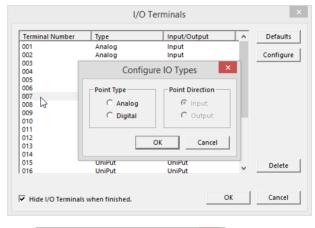
To configure a particular UniPut[™] (UIO), double-click on its terminal number in the I/O Terminals panel.

Terminal Number	Туре	Input/Output	^	Defaults
001	Analog	Input		
002	Analog	Input		Configure
003	Digital	Input		
004	Analog	Input		
005	Digital	Input		
006	Digital	Input		
007	Universal	Input		
008	Universal	Input		
009	Analog	Output		
010	Analog	Output		
011	Digital	Output		
012	UniPut	UniPut		
0165	UniPut	UniPut		
014	UniPut	UniPut		
015	UniPut	UniPut		Delete
016	UniPut	UniPut	~	Delete

The Configure IO Types box opens



Note: Terminals marked Universal are not UniPuts[™], so the Configure IO Types dialog for these terminals does not allow the terminal to be changed from Input to Output



Set whether the UniPut^m is to deal with Analog or Digital signals (the following illustrations show the UniPut^m being set as an analog output),

Configure IO Types

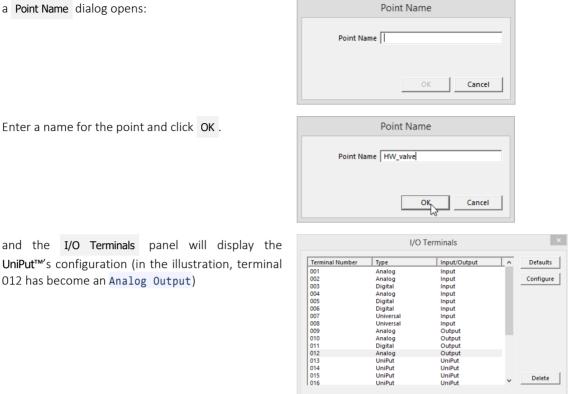
© Analog © Digital OK Cancel

Configure IO Types

Click on OK to close the Configure IO Type box,

and whether it is to be an input or an output

a Point Name dialog opens:



Analog UniPut UniPut UniPut UniPut

F Hide I/O Terminals when finished

and the I/O Terminals panel will display the UniPut[™]'s configuration (in the illustration, terminal 012 has become an Analog Output)

Repeat this process	until all required UniPuts	M have been contigured
nepcat this process		nave been configured.

Note: When the I/O Terminals dialog is closed, point modules will be added to the strategy drawing for any newly-configured terminals which were not already in the strategy.

Delete

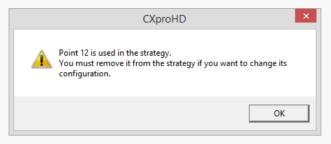
Cancel

ОК

Changing the configuration of a UniPut™

If you want to change the configuration of an existing UniPut[™], you must 'delete' its configuration from the I/O Terminals panel.

Note: The DeleteDeletebutton on theI/O Terminalspanel will not work if there is a module in the strategy forthat point. If you click onDeletewhen a point is selected for which there is a module in thestrategy, a message will appear to alert you of this fact.



In order to proceed in this case you must delete the module representing that point from the Strategy drawing area by selecting it and pressing the **[Delete]** button on the PC's keyboard.

Open the I/O Terminals panel, by clicking on the I/O Terminals button in the Strategy tab of the Ribbon :

rolle	r Strategy					
ad	Copy Paste	View Modules	Add Text	I/O Terminass	Reorder Modules	BACnet P BACnet L BACnet L
ler	Clipboard				Strategy	

I/O Terminals Terminal Number Defaults Туре Input/Output ^ Analog Analog Digital Analog Digital 001 Input Input Input Input Input Input Input Output Output 002 003 004 005 006 007 008 009 010 011 Configure Digital Universa Universa Analog Analog Digital 012 013 014 015 016 UniPut UniPut UniPut UniPut UniPut UniPut Delete UniPut ₩ Hide I/O Terminals when finished. OK Cancel I/O Terminals Terminal Number Туре Input/Output 1 Defaults Analog Analog Digital Analog Digital Input Input Input Input Input 001 002 003 004 005 006 007 Configure Input Input Input Output Output Output Digital Universal Universal 008 009 010 011 Analog Analog Digital 013 UniPut UniPut 014
015
016 UniPut UniPut UniPut UniPut Delete UniPut OK Cancel Hide I/O Terminals when finished.

Select the terminal number

and click on Delete

The selected terminal has now been returned to the blank 'UniPut' configuration.

The terminal can now be re-configured as detailed in *How to configure a* on page 74.

Terminal Number	Туре	Input/Output	^	Default
001	Analog	Input		
002	Analog	Input		Configur
003	Digital	Input		
004	Analog	Input		
005	Digital	Input		
006	Digital	Input		
007	Universal	Input		
008	Universal	Input		
009	Analog	Output		
010	Analog	Output		
011	Digital	Output		
012	UniPut	UniPut		
013	UniPut	UniPut		
014	UniPut	UniPut		
015	UniPut	UniPut		Delete
016	UniPut	UniPut	~	Leiece

Example: Configuring Analog Input module properties

01_01.s32	Þ	×	Prop	erties	Д X
		^	<	> ? Analog Input [1]	•
				General Information	
				Туре	Analog Input
				Service Order	1
				Name	Outside Air Temperature
			1	Synchronised Status	Checking
				Constants	-
	Analog Input 1			Point type	Input Analog
	Analog Input 1 Outside Air Temperature			Low threshold	78
	Point () (1)			High threshold	120
	Override 🖸	Ľ		Lower sensor range	-50
	· · · · · · · · · · · ·			Upper sensor range	150
				Input error	0.0000
				Exponential filter	20
			1	Sensor type	PT1000
	Analog Input 2 Heating Water			Unit	°C
	Temp			Averaging	0
	Point Q (2)		-	Outputs	
	Override 🗖			Point	Analog (1): 0.00 Outside Air T
				 Manual override 	Digital
		· 🗸			
		>	Pro	perties Page Names Mode	ules

• General Information

Туре

CXpro^{HD}

(not editable) shows that this is an Analog input.

Service Order

(not editable) indicates the order in which this block will be processed by the controller.

Name

Shows the text identifier for the point, which must be no more than 24 alphanumeric characters. Spaces, commas, full stops may also be used. Each point in a Field Controller must have a point name that is unique within that controller.

Synchronised Status

Shows whether the Strategy Drawing matches the Strategy in the connected Controller.

Constants

```
Low Input Threshold / High Input Threshold / Low Strategy Value / Hight Strategy Value
```

The threshold settings specify the on/off turnover point on a digital input or output.

Input Error

A constant with the same unit as the input value, which is added to the input value to compensate for errors in input arising from factors such as resistance of long cables or positioning of sensors. Temperature values (sensor type PT1000) are corrected in mV. To compensate for 1 °C, the input error is 2.5 mV. For example, a decrease in temperature of 2 °C requires an input error of -5.0 mV to be entered. This feature is only available for analog passive inputs.

• Exp. Filter Constant

An individual time constant for the analog input., behaving as a damping filter. The measured input value will be averaged over the time specified in seconds by the **Exponential Filter** constant, so that short-term variations of the measured value can be filtered out if the **Exponential Filter** value is longer than the sensor response time.

• Sensor Type

Select the required filter from the Sensor Type list. Some of the available options are:

- Pt1000: This configures the analog input for reading temperatures from a standard Pt1000 sensor. The Controller will convert the measured resistance (voltage) to a temperature signal.
- 0-10 V: This converts the hardware voltage signal 0...10 V DC to a software value in the range 0...100 %. For example, the voltage signal 6.7 V DC will be converted to 67.0 %.
- 0-20 mA: This converts the hardware current signal 0...20 mA to a software value in the range 0...100 %. For example, a current of 15.0 mA gives the software a value of 75.0 %.
- Pulse(V/F): This is designed for reading voltage-free contacts, which can be operated at a frequency of up to 12 Hz. The value of the input will be incremented by 1 after each detected pulse. Evaluation and resetting of the counter will be done by using the Meter Module (module 63).

Additional sensor types can be allowed for by defining extra units of measurement - see Appendix :: Adding units of measurement to the system on page 209.

• Unit

The Unit list box contains a collection of text strings, one of which will be displayed together with the point value. Choose from the list the type of unit that corresponds to the type of input, e.g. if an analog input point represents a temperature reading in degrees Celsius, you may choose DegC from the Units list box. If necessary, additional units may be defined in the C:\CXproHD\(*SITENAME*)\SYSTEM\site.ini file. *Appendix :: Adding units of measurement to the system* on page 209 contains details of how this is done.

• Point

The output of the Analog Point module assumes the type, Name and units of the point module. A point number is automatically assigned (though this can be edited by selecting the connecting line, which represents the point itself)

Note: Point numbers 1...8 represent controller inputs 1...8.

Point numbers 9...16 represent controller outputs 1...8.

Viewing used blocks

To check which blocks have been used in a Strategy, select Strategy Details from the Strategy tab of the Ribbon :



This opens the Strategy Details dialog:

Strategy Details			
Rrategy Blocks Controller Resources Points Manager			
001 Comparator 002 BACnet Schedule	^		
003 Absolute Value			
004 Maximum			
005 Analog Gate			
006 Limit to 0 or 100			
007 Rounding			
008 Integer Constant			
009 Real Constant			
010 VAV Differential Pressure 011 Not Used			
11 Not Used 112 Not Used			
112 Not Used			
14 Not Used			
115 Not Used			
D16 Not Used			
017 Not Used			
D18 Not Used			
19 Not Used			
120 Not Used			
121 Not Used 122 Not Used			
022 Not Used			
020 NOL 0800	~		
	OK		

Viewing the list of blocks

Click on the **Strategy Blocks** tab to see which of the available blocks have been used in the active strategy and which have not.

Strategy Details	×
trategy Blocks Controller Resources Points Manager	
001 Comparator 002 BACent Schulule 003 Absolute Value 003 Absolute Value 004 Maximum 005 Analog Gate 006 Lint to 0 r 100 007 Rounding 008 Integer Constant 009 Real Constant 010 VAV Differential Pressure 011 Nort Used 012 Nort Used 013 Nort Used 014 Nort Used 015 Nort Used 016 Nort Used 017 Nort Used 018 Not Used 019 Not Used 020 Not Used 021 Not Used 022 Not Used 023 Not Used 024 Not Used 025 Not Used 026 Not Used 027 Not Used 028 Not Used 029 Not Used <th>~</th>	~
	ОК

In the above example, the Strategy Blocks tab indicates that the first block (block no. 001) is being used as a Comparator module.

Block 002 is an BACnet Schedule module, block 003 is an Absolute Value module etc.

Blocks 011 to 023 have not been used in the strategy.

To view the remaining blocks (in the above example, blocks 024 ... 1024), use the horizontal scroll bar to move down the Strategy Blocks tab.

Viewing the blocks associated with each point

The **Points Manager** tab allows you to examine points in a **strategy**, listing the **strategy blocks** to which each **point** is connected.

	Strategy Details	×
Strategy Blocks Controller Resources Points Manager		_
□ = := Points □ = := Hardware Analog Points □ = :: Strategy Blocks □ = :: 3 □ = :: 4 □ = :: 4 □ = :: Hardware Digital Points □ = :: Digital Points □ = :: Digital Points		
	ОК	

In this example, Analog Point number 2 is connected to strategy blocks numbered 3 and 4.

Strategy Compare

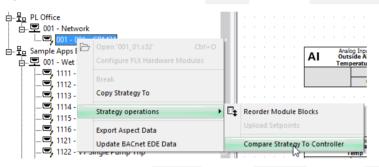
When connected to a site, it is possible to compare the strategy in CXpro^{HD} with that in the Controller.

To compare **CXpro^{HD}** and **Controller** strategies,

Connect to the Controller by clicking on the Connect button in the Home tab of the Ribbon :

⊒ ∓									
File T Home	Controller	Strat	egy						
🚿 Connect	Сору	ii-	Properti	ies [🛛 Mo	dules	?	Stra	tegy
Jisconnect	Paste	<u>e</u>	🕞 Navigat	ion [🛚 Ma	cros		Reo	pen
	Select All	Site List	📑 Page Na	imes 🛛	a Sea	arch			
Site	Clipboard				View	w			
Site List		ф 🗙		ategy1					
⊡ Sites □ = BACr	net IP 01 - Network		Str	ategy1	·				

Right-click on the Field Controller in the Site List and select Strategy operations > Compare Strategy To Controller ,



Alternatively you can select Compare from the Controller tab of the Ribbon .

·						
ie	Controller	Stra	ategy			
	🔥 Communicat	tions	📥 Download	Compare	1.23 Version	Чв
:t	Gontroller		Wipe Controller	Show Compare	🗟 Time and Date	<u>51</u>
	BACnet		🛃 Auto Online		Maximums	e Le
	Configuratio	on		Oper	rations	

Only strategy modules are compared.

Note: Parts of the strategy that can be modified using tools other than the Engineering Tool (e.g. CCView) are not compared. For example, the sample interval on a Datalog module is excluded from the comparison, but the Type of datalog is included.

Compare Process

When the **Compare** process is requested, the **Select Items to Compare** dialog is displayed:

Select Iten	ns to Compare ×					
Hardware Blocks						
Range	001-024					
Strategy Block:						
Range	001-1024					
Analog Setpoint Va	Analog Setpoint Values					
🗌 Range	001-1024					
🔽 Digital Setpoint Val	ues					
🗌 Range	001-1024					
BACnet Points						
Range	001-224					
Select / deselect all	,					
	Compare Cancel					

This allows specific subsets of the strategy to be compared if required.

Clicking the Compare button starts the process, and shows the Uploading progress dialog:

Uploading				\times
Controller				
Hardware Points			16	
Strategy Blocks			1025	
Analog Setpoint Values			3	
Digital Setpoint Values				
BACnet Point Config				
Receiving analog setpoints				
		Close	Abort	

and when upload is complete, a comparison report dialog is displayed

ype	Service Or	Block Type	Difference		
LX Module trategy Blocks trategy Blocks trategy Blocks trategy Blocks	1 1 3 6 1025	Configuration Boolean Adder/Scaler Modbus analog FLX port configurat	The Output " The Input "Inp The block of t	Complement" has address: - out B" has address: - < Unco type Modbus analog at add	on controller but is not configu «Unconnected» on the Controller - «2 ess 6 on the strategy is not press n the Controller - «None» on th
		C 		C Show all blocks	
×c		Show only blocks with the second s	th differences	Controller	
		^ <u>j</u>	imp to		^
<		×		<	×

This dialog lists all of the differences between the PC version of the Strategy and the Controller version, with a facility to jump to each of the modules that contains a difference, so that the difference can be manually resolved.

When the differences have been resolved, clicking on the Close button terminates the Compare process.

Strategy Synchronization

CXpro^{HD} will evaluate whether its copy of the **strategy** and the **Controller's** are fully synchronized at the following times:

- When a module is selected in the Strategy drawing
- When a strategy is closed following a partial download
- When Scan Mode is enabled

If any potential discrepancy is found, the user will be prompted to run the Strategy Compare feature.

Modules in the drawing that do not match the controller strategy are marked with an icon showing a red circle containing an "x" to indicate that it is no in sync:

	A> B	Com	parator	
5	🚫 Input A		0	utput 🖸 1
í	🚫 Input B		Compler	ment 🖸

The user is not blocked or forced to take any action, and no changes take place in the background.

Note: The checks apply to all strategy modules with the following exceptions:

- Macros
- DI Modules
- Set Point Modules
- IO Modules (On UC16 controllers)
- Comment Modules

When a module properties are edited:

When a module is selected, its Synchronised Status is displayed in the properties inspector:

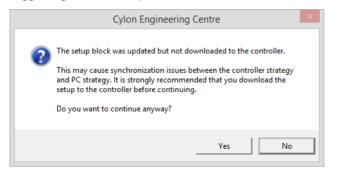
																		-			
s32													Þ	×	Pro	ope	erties				џх
														^	<	c	>	? Analog Inpu	t [3]		-
																1	Гуре			Analog Input	
•																S	Servic	e Order		3	
																ľ	Name	1		Outside Air Temperature	
																S	Synch	ronised Status		Checking	
																	Const				
	Г	_	 _	Ana	loa	Inp	ut.	-	_	3							± Po	oint type		Input Analog	
	L	AI		Ou	tsíd	le A ratu	ir									L	.ow t	hreshold		78	
•	h			i cii		acu			int (0	311	÷				ł	ligh t	threshold		120	
	L						Ov	erri	de (5		Ľ		-		L	ower	sensor range		-50	
																ι	Jpper	sensor range		150	
																I	nput	error		0.0000	
																	-	10.100		20	

When a strategy is closed following a partial download:

A partial download takes place when Automatic Download is <u>disabled</u> (see *How to download a strategy manually* on on page 120). In this case selecting Compare from the Controller tab of the Ribbon will open a Select items to Download dialog allowing different subsets of the strategy to be downloaded individually.

This dialog is similar to the Select Items to Compare dialog used in the compare process (see *Strategy Compare* on page 82).

However, if you carry out a partial download the **setup block** is not downloaded. The next time you close the strategy, the **Synchronisation** process will register a discrepancy between **PC** and **Controller** strategies. When this happens, a warning will be displayed stating that the "setup block was updated but not downloaded" and suggesting that the setup is downloaded:



Clicking on the No button will allow you to save the setup block. If you do not wish to do so, click the Yes button and the strategy will be closed without updating the setup block on the Controller.

When Scan mode is enabled

When **Scan Mode** is activated (see *Activate scan mode* on page 130) the **PC** version of the **strategy** is compared to the **Controller** version and if any discrepancies are found, the mismatched modules will be identified by a flashing 'highlight box' and a message in the status bar will inform the user

READING LIVE POINT VALUES (LIVELOG)

The **LiveLog** feature in **CXpro^{HD}** allows you to read the values of points in the controllers on your site (i.e. it reports "live" or in real-time from the site).

As well as reading point values, the LiveLog also scans time schedules, the **BMS** network and its Fieldbusses and, if configured to do so, it will log those values to a text file. It can also show **HOA** values.

Configuring Live Log

Livelog can scan just one strategy or all open strategies, can either append to the log or wipe the log each time it starts, and can write the log to a file for later analysis.

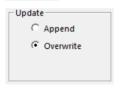
To set up these options, select LiveLog Setup from the Controller tab of the Ribbon

	itegy	_	_			_	
Communications	법 Download 집 Comp 게 Wipe Controller 중 Show 법 Auto Online	180	Board Diagnostics	Scan	™ ⊘ 	LiveLog Setup LiveLog Report Upload BACnet Points	Interface Configu
Configuration		Operations				sting	Keypad
	џ <mark></mark>	4 001_01.s32		⊳ :	× Properties	LiveLog Setup	
	^				^	Configure LiveLog ope	ration.

This opens the Livelog Setup dialog.

Livelog Set	up ×
Scan ^(*) All Opened Strategies ^(*) Active Strategy Scan Interval (<60s) 5	Update C Append C Overwrite
✓ Log To File \SYSTEM\iowin.log	OK Cancel

In the Update section, select Append to cause the LiveLog add new scan data to the end of the existing list, or Overwrite to cause the LiveLog list to be replaced each time a scan is completed.



In the Scan section you can either click the All Opened Strategies radio button to allow the LiveLog to show point values from all of the strategies that are currently opened, or else restrict the log to the point values of the active strategy only, by clicking the Active Strategy radio button.

- Scan		
C All Opened Strate	gies	
Active Strategy		
Scan Interval (<60s)	5	

If you chose to scan the Active Strategy only, enter a number between 1 and 60 in the Scan Interval edit box. This represents the number of seconds CXpro^{HD} will remain idle after scanning the strategy before it will scan the strategy again. (The LiveLog continuously scans the strategy until you press the Stop Scan button on the Livelog dialog)

If you would like the results of the LiveLog to be written to a text file and saved, click the Log to File checkbox. By default, logs are saved to \SYSTEM\iowin.log

To view the contents of the LiveLog text file, click LiveLog Report in the Controller tab of the Ribbon :

Controller Stra	ategy							
Communications	법 Download 집 Con 집 Wipe Controller 값 Sho 갑 Auto Online		🛃 Version 💀 Time and Date 🔓 Maximums	Statistics	Scan	Ove	rride LiveLog Report	Interface Cor Builder
Configuration		Ope	rations				Testing	Keypad
	ů	☑ ◁ ∕	001_01.s32		⊳	×	Properties	
нP		^				^		

This will open the **log** file in your default text editor:

	iowi	n.log - Notepad		-		×
File Edit Forn	nat View Help					
Currently Sc	anning Scanning	Real Points (1-16))			^
001_01.s32	PL Office	001 - Network	001 - 00:	ı -	CBM24	
001_01.s32	PL Office	001 - Network	001 - 00:	1 -	CBM24	
						\sim
<					>	

Running LiveLog

Select from the Site List the site the BACnet Router and Field Controller containing the point that is to be read.

Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :

😐 🗧			
File 🕆	Home	Controller	Strategy
	anect	Сору	Fine Properties Modules ? Strateg
Dis 🕈	connect	Paste	Navigation Macros Reoper
		Select All	Site List Page Names Search
S	ite	Clipboard	View

Activate LiveLog by clicking the LiveLog option in the Controller tab of the Ribbon

File - Home	Controller Stra	ategy							
🚿 Connect 💉 Disconnect	Communications	由 Download 게 Wipe Controller 샵 Auto Online		Time and Date	GRAND BOARD Diagnostics	Scan	Override Point	LiveLog Setup LiveLog Report	Linteri Buik
Site	Configuration		Oper	rations				Testing	
Site List			# 🖬 🖣	001_01.s32		⊳	× Prop	Livelog (Shift+F3)	
⊡- Sites			^ [^	View Livelog output.	

This opens the Livelog dialog:

8		Livelog	1			
Livelog of Site Strategy Target PL Off	lice	001 - Network	001 - 00	11 - CBM24	_	
Mode © Points © Time Schedules © Network: Scanning © IO Points © Analogs © Digitals	Point No 002 003	Point Name Heating Water Temp Outside Air Temperature	Point Type Analog Analog	Value 0.01 0.01	Override	Time 14:31:58 14:31:58
	Override]	Stop	Scan C	lear	

LiveLog - Scanning Definition

In the LiveLog dialog, you can view the following parameters for the LiveLog, and change them where it is appropriate to do so:

- The **name** of the current strategy
- The Mode of the LiveLog, i.e. whether the LiveLog will log points, schedules or the network status
- The Target Controller for the current strategy
- The type of points to be scanned
- Whether or not points will be overwritten

Strategy name tab

•	Livelog
Livelog of Site	

The name of the strategy which is actively being scanned is displayed on the strategy name tab . If you chose the scan Active Strategy option in the Livelog Setup dialog box (see *Configuring Live Log* on page *86*), the file name tab will display the name of the active strategy. If you chose the scan All Opened Strategies option in the Livelog Setup dialog box, there will be a file name tab for every open strategy.

Strategy Target

				_	
Strateg	y Target	PL Office	001 - Network	ſ	001 - 001 - CBM24

This window shows the target of the currently selected **strategy**. The values cannot be changed in the **LiveLog** dialog.

LiveLog mode

Mod	de
•	Points
0	Time Schedules
0	Network

The LiveLog interface changes, depending on the mode that is being logged:

• Points mode

In this view you can see points in the selected strategy, their types and values, and you can overwrite them if required.

• LiveLog: Time Schedule mode

You can examine the time schedules in the selected strategy with this dialog box.

• LiveLog: Network mode

You can view the status of the RS485 Fieldbus with this screen, i.e. which controllers are online or offline, and which controllers are servicing or not servicing.

Scanning definition

Scanning	
IO Points	
C Analogs	
C Digitals	

The Scanning section of the LiveLog window allows you to decide which values to scan.

To scan the values of the controller's hardware points, click IOPoints .

To scan analog points only, click	Analogs	in the sca	nning section.	To scan	a specific	number	of analog	g points,
enter a range of point numbers in	the edit	box under	Digitals .					

To scan digital points only, click **Digitals** in the scanning section. To scan a specific number of digital points, enter a range of point numbers in the edit box under **Digitals**.

Override Status

When a scan has been stopped, you can change the **override** status of any point listed in the **LiveLog** window by selecting the the point from the list and clicking on the **Override** button at the bottom left of the window.

-	Joor metholik	100.00	- comer		
Point No	Point Name	Point Type	Value	Override	Time
002	Heating Water Temp	Analog	0.01		15:44:08
003	Outside Air Temperature	Analog			15:44:09
l					
J					
Ownerida	1	Chara.	c	Chara I	
Overvide		Stop	scan	Clear	

This opens the **Override Point** dialog, where the current override status of the point is displayed and can be changed if necessary.

Point Value Point Type C Analog	
 Analog 	
C Digital	
✓ Hardware Point	
Override Duration for Hardware Point	
Off C 1 Hour	
C Midnight C Continuous	

For the point currently selected in the LiveLog dialog, the Override Point dialog displays the following:

- The radio buttons labelled Analog and Digital specify whether the point is analog or digital.
- The **Point Number** box displays the number of the currently selected point.
- A value for the currently selected point can be entered in the **Point Value** box. The point will be set to the entered value when the **Override** button is pressed.

Note: If you want to change the override status of the point in any way, after editing the appropriate boxes you must press the Override button to close the dialog box and apply the changes.

Overriding points

Point values can be overridden using the **Override Point** dialog, which allows you to set a point in a **strategy** to a particular value, regardless of conditions at a **controller's** inputs or outputs, or conditions within the **strategy** itself.

- When a hardware **output** is manually overridden (disabled), the modules in the **strategy** do not affect the point value.
- When a hardware **input** is manually overridden (disabled), the hardware signal which is connected to the input (PT1000, transmitter, dry contact, etc.) is ignored by the input.

In both cases, the overridden hardware point keeps the value that is assigned to it in the Override Point dialog.

The only way to change the value of a hardware point which has been manually overridden to another specified value is to use the **Override** option again, assigning a new value in place of the first.

Note: Some specific controllers, such as **CBX-8R8-H** and **FLX-4R4-H**, have "HOA" controls built in to them. When these HOA controls are active, **CXpro^{HD}** cannot affect them but can display the overridden values, but not affect them.

Removing manual override status from a hardware point (enabling) means that the point can now be influenced by the connected hardware or **strategy** once again. The length of time that a hardware point will remain in the overridden state can be set in **CXpro^{HD}**.

It is only possible to disable and enable hardware point values from **CXpro^{HD}** if the **PC** is connected to a **controller** (either directly or via a **BACnet** Router) and **CXpro^{HD} Connect** button is active.

How to open the Override Point dialog

The **Override Point** dialog box allows you to

- Override or "disable" a hardware point, i.e. set it to a constant value regardless of conditions at the controllers inputs and outputs
- "enable" a hardware point, i.e. return the point's value to the automatic state.
- Change the value of a setpoint

To open the **Override Point** dialog, select **Change Point** from the **Controller** tab of the **Ribbon**

Controller Strategy													
G Controller	Nownload Participation Provided Provide	Compare Show Compare	123 Version Time and Da Maximums	ite 🖪 Statisti	Diagnostics ics nd Unlock	₽ Scan	Override Point	LiveLog		reLog S reLog R pload B	· · ·	ints	Int Bu
Configuration		Ope	rations					Te	sting				
		# 🔟 🗸 🗸	001_01.s32										
et IP et Serial fice						· · ·	 		· ·				
or click on the	Override	buttor	in the	Livelog	dialog	5.							

Overside	Stop Scan	Clear

How to select a point to be changed in the Override Point dialog

When changing the value of a point using the **Override Point** dialog box, you must specify the point by either:

• Entering the number in the Point number box:

Fill in the Point Number field in the dialog of the Override Point dialog

You must specify whether or not the point is analog or digital, because there could be one point of each type for each number.

Override	Point ×
Point Number 2	3
Point Value	
Point Type	
C Analog	
O Digital	
Hardware Point	
Override Duration for Ha	ardware Point
C Off	C 1 Hour
C Midnight	Continuous
Ready	
Override	Close

• Selecting point before opening from LiveLog window:

If the LiveLog window is not already open, open it by clicking the LiveLog option in the Controller tab of the Ribbon

🚿 Connect 💉 Disconnect	Communications	Lownload Compare Wipe Controller Show Compare Auto Online	및 Version 당 Time and Date G Maximums	Board Diagnostics	₽ Scan	Override LiveLo	LiveLog Setup LiveLog Report VPLoad BACnet Points	Inter Built
Site	Configuration	Ope	ations				esting	
Site List		부 🖬 🖣	001_01.s32		Þ	× Prop	Livelog (Shift+F3)	
□- Sites		^ [⊼ L↑.	View Livelog output.	

Click Stop Scan :

J		
Override	Stop Scan	Clear

Select the point from the list in the LiveLog window (I/O window):

Point No	Point Name	Point Type	Value	Override	Time
002	Heating Water Temp	Analog	0.01		15:44:08
	Outside Air Temperature	Analog	0.01		15:44:09
Overside	1	Stop	s 1	Clear	

Click on the **Override** button at the bottom left of the window to open the **Override Point** dialog.

HOW TO OVERRIDE (DISABLE) A HARDWARE POINT

Hardware points can be overridden by the **CXpro^{HD} Override Point** dialog, or by **HOA** switches on the **Controller** itself. In either case **CXpro^{HD}** is aware of the override state and value, and displays it in the **LiveLog** window.

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								^	
Analog Output 209 Anl Output 209	📧 Livelog								×
AU Anl Output 209	Livelog of Site								
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		JUESK		, .		,			_
	Mode		Point No 209	Point Name Anl Output 209	Point Type Analog	Value 46.00	Override HOA	Time 11:31:09	-
	Points Dime Scher	lules					Variation		
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<u> </u>								~	Ivavigati
Analog Output 209	I Livelog								
AO Anl Output 209	Livelog								^
Point Override	Livelog of Site								
	Strategy Target	Desk		Cylon BACr	et Router (Chri	002 - 00	1 - CBX8R8 this cor		
	Mode		Point No	Point Name	Point Type	Value	Override	Time	_
	Points		209	Anl Output 209	Analog	15.00	One Hour	11:32:50	
	C Time Schoo	lular							
001_01.s32								⊳ ×	Navigati
								^	
Analog Output 209 Ani Output 209	Livelog								\times
Point Override	Livelog of Site								
	Strategy Target	Desk		Culon RACe	et Router (Chri	002 00	1 - CBX8R8 this cor		
		Desk		, .		,			_
	Mode		Point No 209	Point Name Anl Output 209	Point Type Analog	Value 15.00	Override Continuous	Time 11:33:18	
	Points O Time Scher	ules.							
4 (-						
001_01.s32								> ×	Navigat
AO Analog Output 209 Anl Output 209	Livelog								×
O Point Override	Livelog of Site								
	Strategy Target	Desk		Cylon BACr	net Router (Chri	002 - 00	1 - CBX8R8 this cor		
		,	Point No	Point Name	Point Type	Value	Override	Time	
	Mode Points		209	Anl Output 20		0.00	ovenide	11:31:39	
	C Time Scher	lular							

The point's **Strategy module** has a digital output labelled **Override**, which is set to a value of **1** if an override is in effect (i.e. the hardware point is 'disabled'), or **0** if the point is not overridden (i.e. the point is 'enabled').

AO	Analog Ou Analog Ou		DO	Digital Out Boiler Ena	
⊘ Point		Override 🗖	Point		Override 🗖

Using the Override Point dialog:

Open the Override Point dialog by

1. selecting Change Point from the Controller tab of the Ribbon

Communications Controller BACnet Configuration	ontroller 🚉 Show Compare				-			ate	Board Diagnostics				Sca	Scan Override Point			LiveLog Setup LiveLog Report LiveLog Report CureLog Report LiveLog BACnet Point Testing			ts	is B					
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t IP																										

2. or by clicking on the **Override** button in the **Livelog** dialog

Point No	Point Name	Point Type	Value	Override	Time
002	Heating Water Temp	Analog	0.01		15:44:08
003	Outside Air Temperature	Analog	0.01		15:44:09

and select the point to be overridden

The **override** facility can be set to one of the following states:

- inactive at all times Off
- active until the controller time passes 00:00 Midnight
- active for one hour from the time at which it becomes active 1 Hour
- active at all times Continuous
- If the override is caused by a Controller's HOA switch, the override state is reported as "HOA"

The 'midnight' and '1 hour' options are provided to conveniently avoid problems that could arise if the override is not removed when it is no longer required.

Note: Even if 'Off' is selected in the Override Duration for Hardware Point section, setting a value (analog) or state (digital) for the point will still have an effect. When the Override button on the dialog is pressed, the value is sent to the point in the controller strategy, which stays at that value until the next time that the controller scans its strategy.

Tick the Hardware Points checkbox in the Point Type section of the dialog.

This will enable the Override Duration for Hardware Point options.

Hardware Point	
Override Duration for	Hardware Point
🖲 Off	C 1 Hour
C Midnight	C Continuous

Enter a value for the point.

In this instance, a value of 25 is being is being entered for an analog point.

A value of 1 or 0 can be entered for digital points.

Select the length of time that the value of the point will be changed in the **Override Duration for** Hardware Point section of the dialog.

Point Number 1 Point Value 25
Hardware Point Override Duration for Hardware Point Off J Hour Midnight Continuous
Override Close

The point will be set to the entered value when the **Override** button is pressed:

Click the **Close** button to close the dialog.

Notes about overriding BACnet points

Inputs

When an input is overridden via **CXpro^{HD}**, both the "out of service" and the "override" flags are automatically set.

When an overridden input comes out of its **CXpro^{HD}** override both the "out of service" and the "override" flags are reset. It will be put into service regardless of the state it was in prior to going into override.

To override an input via BACnet, the "out of service" flag is manually set by writing to the "out of service" property. Then the desired value is written to the present-value. The OWS can clear any **CXpro^{HD}** override by putting the point back into service and then back out again. From **CXpro^{HD}** side, the "override" flag will disappear and be replaced with an "overridden" flag.

Putting an input in service will clear all overrides both **CXpro^{HD}** and BACnet and will flag the change appropriately on both protocols.

Outputs

When an output is overridden via **CXpro^{HD}**, both the "out of service" and the "override" flags are set. The information in the present-value property will still be delivered to the hardware layer despite being out of service.

When an overridden output comes out of its **CXproHD** override, the point is put back in service and both the "out of service" and the "override" flags are reset.

To override an output via BACnet, it is presumed that the priority array will be used, and clear all overrides and flag the change appropriately on both sides.

All I/O blocks have an output labelled Override. This output is true any time the point is "out of service" or "overridden" via **CXpro^{HD}**. This way the point reflects the status of the data regardless of whether it is being overridden via BACnet or **CXpro^{HD}**.

HOW TO ENABLE A HARDWARE POINT VALUE (REMOVE MANUAL OVERRIDE STATUS)

Removing manual override status from a hardware point (enabling) means that the point will once again respond to hardware connections or **strategy** conditions.

If the override duration on a hardware point has been set to 1 hour or until Midnight the point will be enabled when the specified period has elapsed. However,

- If the override is identified as "HOA" you must use the switch on the **Controller** to disable it.
- if the override duration as been set to Continuous the following procedure must be carried to enable the point:

Open the **Override Point** dialog by selecting **Change Point** from the **Controller** tab of the **Ribbon** or by clicking on the **Override** button in the **Livelog** dialog, and select the point to be overridden.

Select the **Off** option in the **Override Duration** section of the dialog,

Click the **Override** button to apply the change.

Click the **Close** button to close the dialog.

are Point
1 Hour
Continuous

If you opened the **Override** dialog from the **Livelog** dialog, then to see the new value of the point, click the **Restart** button.

The next time the **LiveLog** scans that point, its new value will be displayed. The **LiveLog** window displays the symbol ¶ beside the value of points that have been changed.

Note: Double-clicking a point number in the LiveLog window places an asterisk beside it allowing it to be monitored more effectively.

HOW TO CHANGE THE VALUE OF A VIRTUAL POINT

The value of a virtual point can be changed using the **Override Point** dialog box, in a similar way to changing the value of a hardware point. However, virtual points cannot be overridden – if conditions in a strategy change, a virtual point may change from the value given to it in the **Override Point** dialog. As a result, changing the value of a virtual point is usually only relevant in the case of setpoints, because their values are not affected by the **strategy**.

The procedure for changing the value of a setpoint is as follows:

Open the Override Point dialog by selecting Change Point from the Controller tab of the Ribbon

Controller Stra	ategy							
tommunications	📥 Download	Compare	1.23 Version	Board Diagnostics			LiveLog Setup	C
Gontroller	Wipe Controller	Show Compare	🗟 Time and Date	Statistics	Q	-0	LiveLog Setup	1-4-
🗞 BACnet	🛃 Auto Online		Maximums	Lock and Unlock	Scan	Point	LiveLog Upload BACnet Points	Inte Bui
Configuration		Oper	ations				Testing	
		a 🛛 🗸	001_01.s32					

or by clicking on the Override button in the Livelog dialog.

Point No	Point Name	Point Type	Value	Override	Time
002	Heating Water Temp	Analog	0.01		15:44:08
003	Outside Air Temperature	Analog	0.01		15:44:09

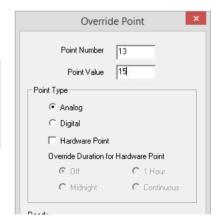
and select the virtual point (setpoint) that is to be changed.

Enter the new value for the virtual point.

Note: Because the point is a virtual point, the Override Duration for Hardware Points options are 'greyed out' and cannot be selected.

Click the **Override** button to apply the change.

Click the Close button to close the dialog,

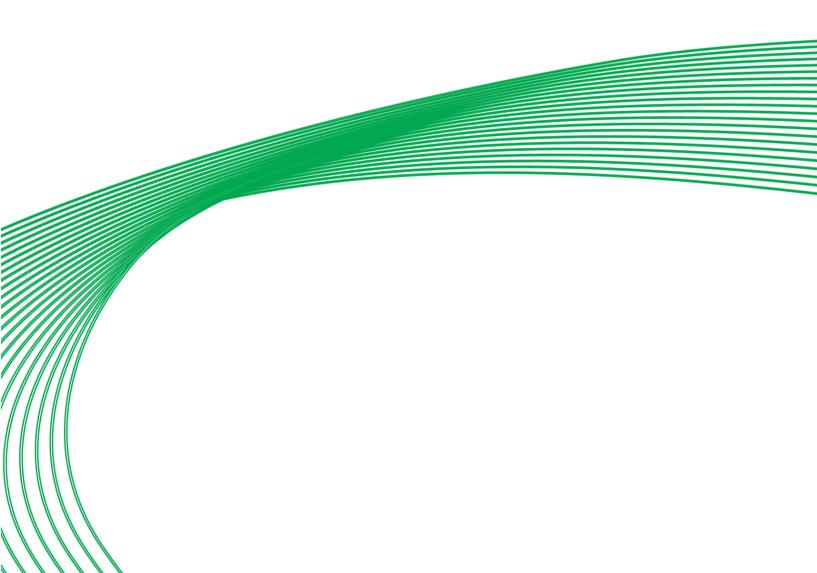


If you opened the **Override** dialog from the **Livelog** dialog, then to see the new value of the point, click the **Restart** button.

The next time the LiveLog scans that point, its new value will be displayed. The LiveLog displays the symbol ¶ beside the value of points that have been changed.

Note: Double-clicking a point number in the LiveLog window places an asterisk beside it allowing it to be monitored more effectively.

SECTION 5 : CREATING STRATEGIES



A Cylon Field Controller interacts with HVAC and other equipment by varying its outputs in response to inputs such as temperature, switch settings, air flow speed etc.

The way that the controller's outputs react in response to the controller's inputs can be defined by the user. The definition is called a 'strategy'.

A strategy is the 'user program', stored in a Cylon Field Controller, which configures the controller for a specific role in a BMS site. It can be described as the "implementation of a solution to a requirement on a site".

In CXpro^{HD}, a strategy is designed graphically using the algorithmic modules available on the modules panel. It is saved as a strategy file on the Engineering PC and then downloaded to the controller for which it was designed, where it tells the **controller** how to behave within the BMS site.

The simplest of strategies is made up algorithmic modules, hardware and virtual points. Strategies are often more complex, however, and can also include time schedules, trendlogs and alarms.

CXpro^{HD}

The Problem

The heating system of a building is too costly to run constantly.

The Solution

The heating system should be switched off when the outside air temperature rises above a certain point (for example 23°C). It should not be switched on again until the outside air temperature drops below another predefined point (in this case, 18°C).

The Strategy

A **strategy** to implement this solution to the problem can be designed in **CXpro^{HD}** and downloaded to the controller connected to the heating system, where it will be applied.

The strategy shown below uses the Hysteresis module to compare the outside air temperature to the two set points defined in the module (in this case, these are set at 18 °C and 23 °C). If the outside air temperature is greater than 23 °C, the H output is unset (off). If it is less than 18 °C, the H output is set (on).

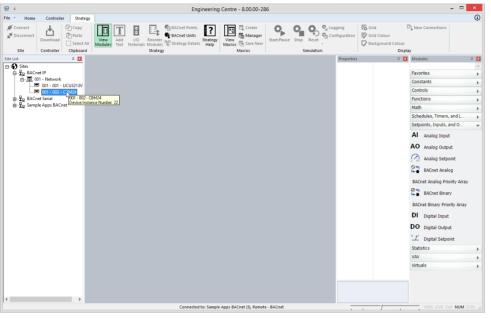
The strategy is saved and then downloaded to the Field Controller connected to the heating system.

Analog Input Temperature		3	· ·		<i>Д</i> Нуз	iteresis 15].					DO	Digit Heati	al Output ng Enable	9
	Point Override	0(3)	· ·	. (3)	On level: 2.00; Of	Active High Active Low f level: 4.00	(9)	•	•	· ·	(9) Poir	t 	Overrid	e 🗗

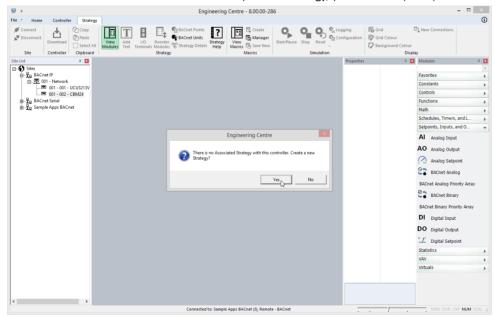
•

To create a **strategy**, follow these steps:

Select Site, BACnet Router, and Field Controller in the Site List and double-click to open its strategy:

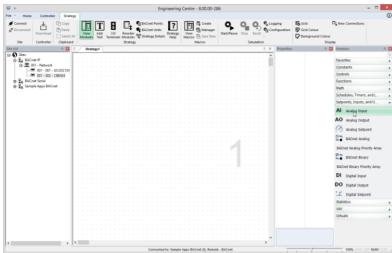


If the selected Feld Controller does not already have a strategy, you will be prompted to create a new one:

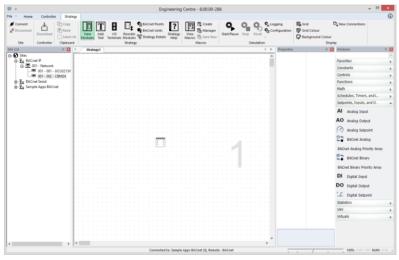


Click Ok to open a blank strategy

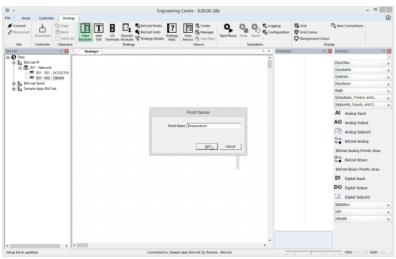
• Select a module from the modules panel



and place it on the drawing area



If the module represents a point you will be prompted to enter a name. Enter one and click Ok .



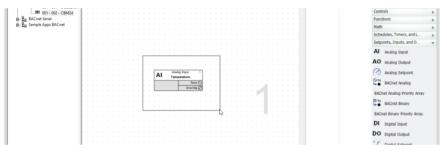
The module is now on the drawing area. It can now be moved, deleted, copied, or linked to other modules.

✓ Connect	Download	Copy Paste Select All Clipboard	View Modules	dd VO ext Termin	Reorder als Modules Strategy	BACnet Points BACnet Units Categy Details	Strategy Help	View Macros	Create Manager Save New Iacros	Start/Pause		*) c	ogging onfiguration	Grid Colour Grid Colour Background Colour Displ	New Connections	
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E-Te BACn	et IP														Favorites	,
8-20	01 - Network 001 - 001 - UC												1		Constants	,
	001 - 001 - 0C														Controls	
B-To BACm	et Serial	men													Functions	
B-To Sampl	le Apps BACnet														Math	
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															Schedules, Timers, an	
															Setpoints, Inputs, and	10 •
															Al Analog Input	
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						Al Analog D									Analog Setpoint	t
							Point Q								BACnet Analog	
							Override [7]									
															BACnet Analog Priorit	y Array
															BACnet Binary	
															BACnet Binary	
											1.1				BACnet Binary Priority	Array
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To operate on a module, it must be selected, by right- clicking on it,

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CONTRACTOR AND A CONTRACTOR AND A		Lower sens 0	Al Analog Input
		Upper sens 0	AO Analog Output
the man man man and		Input error 0.0000	AO Analog Output
110 ULC 012 ULC 012 UCC 02	Analog Stout 1	Exponential 60	Analog Setpoint
	Al Temperature	Sensor type PT1000	
a ha ha a ha	Point ()	Unit *C	BACnet Analog
	Override (2)	Averaging 0	and the second second second
	The second s	G Outputs	BACnet Analog Priority Array
100 000 000 000 000		Point Analog (1) Te	m. E . BACnet Binani
		Manual Digital	
	a and a share allow allow allow a share share the state of the share of		DACast Distance Bright Amount

or by dragging a selection box around the module symbol (or symbols)



Once a module has been selected, it can then be:

moved	by using the mouse to drag the module to its new location;
deleted	by pressing the [DELETE] key on the keyboard;
cut	by pressing [Ctrl] + [x] on the keyboard
copied	by pressing [Ctrl] + [c] on the keyboard
pasted	by pressing [Ctrl] + [v] on the keyboard

Note: Pasted hardware point modules may adapt some parameters to the destination point but retain others. For example, an analog input configured as PT1000 when pasted to a UniPut[™] will change to a voltage input but retain the max and min limits (in the Advanced button) which for PT1000 could be min 0 and max 0, leading to incorrect operation of the UniPut[™].

Place all the required modules on the drawing area and join them

Place other modules required to implement the strategy on the drawing area.

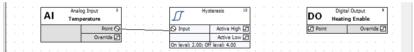
Modules must be positioned from left to right on the drawing area. Hardware inputs must go on the left side of the drawing area, hardware outputs on the right. Between the inputs and the outputs, organize the modules so that a signal flows from left to right across the strategy.

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Join the modules together as required, by placing the mouse pointer over module inputs or outputs

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and dragging to another modules output or input.



CXpro^{HD} displays lines between linked modules:



If you cannot see a line connecting the two modules, right-click on the drawing area and select Display Options >

Display Lines > Show All Lines from the menu that appears

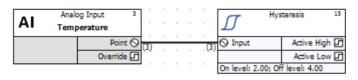
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		D	isp	lay	Ор	tio	ns		۲	Display Lines	•	Show All Lines	Ľ	
t ()	1.									Display Labels	•	Hide Al Lines	ľ.	
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Continue joining modules until all the required connections have been made.

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Automatic point selection

When two unconnected modules are linked together, **CXpro^{HD}** automatically selects the next available virtual point. This is the lowest numbered unused point. This number is entered in the two modules that are linked, as an input and an output, and it is also displayed at either end of the connecting line. In the example below, the number of the virtual point connecting the two modules is 1 and it is displayed at both ends of the connection:



If you cannot see the point number at either end of a connection line, click Module Setup from the Display menu. right-click on the drawing area and select Display Options > Display Labels > Show Number from the menu that appears

1	1					•				•			•	•	•	•					•			•			•				•	
-		Dis	pla	y C	pt	ion	s	×			Di	spl	ay	Lin	es			•														
_					Ĩ			÷			Di	spl	ay	Lab	oels			۲			Hi	de										
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•														÷				0	PV Gol	_	-		F					÷				

When the output of a module which is already connected is connected to the input of another module, the point number of this output will be written in the input.

Selecting a connection line

To select a line connecting two modules, click the line with the left mouse button. Selected lines are displayed with a green hidhligh. Selected lines can then be:

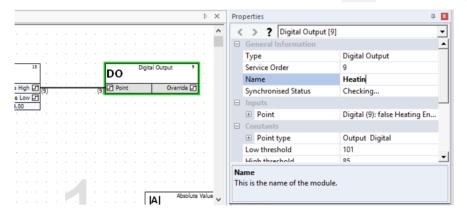
moved	by using the mouse to drag the line to its new location
deleted	by pressing the [Delete] key on the keyboard

When a connection line is deleted, the point number in the input of the target module will be removed.

If this connection was the only one for the output of the source module, the point number will be removed from there too. The point will now be available for other connections.

Naming a point

To give a point a name, select it and then edit the text in the Name property on the Properties pane.



When finished, press enter and the name will be displayed on the module in the Drawing Area.

	▷ × Properties	џ х
	A State of the	-
	General Information	
	Type Digital Output	
15 Digital Output 9	Service Order 9	
DO Heating Enable	Name Heating Enable	
E High (9)	Synchronised Status Checking	
e Low 🗗	□ Inputs	
	Point Digital (9): false Heating Er	n
	Constants	
	Point type Output Digital	
	Low threshold 101	
	High threshold 85	-
	Name	
	This is the name of the module.	
Absolute V		

The name can have no more than 24 alphanumeric characters. Spaces, commas and full stops may also be used. Each point in a controller must have a point name that is unique in that controller.

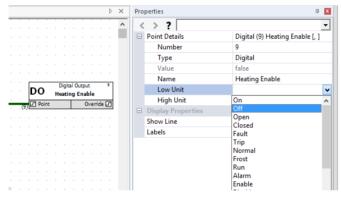
Assigning a unit to a point

In the case of Analog points, the **Units** list box (which is displayed in **Properties** pane) contains a collection of text strings, one of which will be displayed together with the point value.

To specify a type of unit for a point, select the line that represents it, and select a value from the Unit list.

																	Þ	×	Pro	operties		ф 🗙
																		^	-	<>?		•
																				Point Details	Analog (3) Temperature	[°C]
																				Number	3	
AI		An	alog I	nput		3	1				Γ	π			Hy	stere	isis			Туре	Analog	
AI		Ter	nper	atur							Ŀ	υ					_			Value	0.00	
						int 6) .		.(3) 6) In	put			-	Activ			Name	Temperature	
				0	verri	de [/	1					n lei	/el:	2.00	: 0	ff lei	Acti cel:			Unit	°C	~
											1						-			Display Properties	°Fdays	
																					Years	
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																					Weeks	
																					Days Hours	
			Anal	on I			2												U		Min	
· /	AI	ł	Anal leati			er i		1											Т	his is the unit of measure for th	Sec	
· F			_	em	p	Poir	16	2													m/s	
- II.				H	-	-	~	읔(4	4.									~			km/h	

If the point is a digital point, select the required unit in the Low Unit and High Unit list boxes. The units of a digital point are text strings, which are displayed instead of the digital values 0 or 1.



If the list does not contain the unit you require, additional application-specific units can be entered manually in the C:\CXproHD\(SITENAME)\SYSTEM \site.ini file. For details on how this is done, see Appendix :: Adding units of measurement to the system on page 209.

Additional units of measurement can also be added if points are defined using the shortcut method (see *A short cut to defining hardware points* on page 72). When the tab (or comma) separated list of point definitions is prepared, units of measurement which are not already defined in C:\CXproHD\(SITENAME)\SYSTEM \site.ini can be used. When the definitions are pasted to the **Database Interface**, the new units of measurements will be added automatically to site.ini.

Creating Strategies - Set the values of the module's Constants

Many modules can be configured by setting internal constant values. These are accessible in the Properties pane when the module is selected. For example, the **Timer with Constant Inputs** module has the following properties:

1	×	Propert	ies	Д 🗙
Timer with Constant 16		 < 3 Ge 	eral Information	•
Trigger Output		Ту	0e	Timer with Constant Inputs
Reset Complement			vice Order	16
On delay: 10; Off delay: 10; Mini		Syr	nchronised Status	Disconnected
		🕀 Inp	outs	
		+	Trigger	Digital
		÷	Reset	Digital
		🗉 Co	nstants	
		On	delay	10
		Off	delay	10
		Mi	nimum on time	0
		🗉 Ou	tputs	
		÷	Output	Digital
		+	Complement	Digital
	~			
	>	Proper	ties Page Names	Modules

Creating Strategies - Add explanatory text if necessary

Text can be added to the drawing area to label parts of the strategy to explain the purpose of certain modules, or groups of modules, within the strategy,

You can add text or edit text that is already in the strategy drawing. You can also delete, cut or copy text in a strategy.

For details see How to add text to a strategy on page 59

It is possible to change the order of blocks within a Strategy, which can help to optimize the servicing process.

From the Site List , right-click on the controller and select Strategy Operations > Re-Order Module Blocks

E To protection												
D- 2 001 - Network	01.43.4											
	Open '001 01.s32'	Ctrl+O	١Ŀ.									
🗄 🗄 🔤 Sample Apps B4 🗁												
🖨 🖳 001 - Wet Sy	Configure FLX Hardware Mo		11									
 , 1111 - C												
= , 1112 - C			Ш.									
🔍 1113 - C	Copy Strategy To		11									
- , 1114 - C	Strategy operations	•	E.	R	eord	er N	lod	ule	Blo	cks		
 , 1115 - C			-			N						
🗢, 1116 - C	Export Aspect Data					PG 0						
🗢 1121 - V	Update BACnet EDE Data					are						
	gieramp mp				-				·		 	 _

This opens the Reorder Block dialog:

Service Order	Module	7	Σ
1	1 - Comparator		_
2	2 - BACnet Schedule		
3	3 - Absolute Value		_
4	4 - Maximum		
5	5 - Analog Gate		-
6	6 - Limit to 0 or 100		<u> </u>
7	7 - Rounding		
8	8 - Integer Constant		
9	9 - Real Constant		
10	10 - VAV Differential Pressure		
11	11 - BACnet Schedule		
12	12 - Holiday Schedule		
13	13 - Time Schedule		
14	14 - Comparator		
15	15 - Hysteresis		
16	16 - Timer with Constant Inputs		

The list shows modules in their Service Order .

Note: Some modules serviced based on a time schedule, not necessarily according to their Service Order . Any modules in the list that are in this category will be highlighted.

Select a module in the list and use the buttons on the right-hand side of the dialog to change its position in the list:

$\overline{}$	Move the highlighted block to the top of the list (Service number = 1)
-	

- Move the highlighted block up one position in the list
 - Move the highlighted block down one position in the list
 - Move the highlighted block to the bottom of the list
 - Highlight the selected block in the Strategy drawing.

Repeat until the list is in the required order.

•

▼

Find

HOW TO UPLOAD SETPOINT VALUES

It is possible for all of the controller values for all **setpoints** in a single **Strategy** to be retrieved in a single operation.

From the Site List, right-click on the controller and select Strategy Operations > Upload Setpoints

Site Navigation	×	
🛛 🖂 🕎 Sites		
🗄 🚰 East Hall		
📄 🖳 🖳 001 - Network	Fn 110	Strategy ID 22
	© (001_01_222'	845
	🙀 Break	
🖨 📲 Local Network	Copy Strategy To	
CommsControl	Strategy operations	Re-Order Module Blocks
UC32 · 02	Show Globals Issues Report	Upload Setpoints
🚊 🕎 002 - UCC4net	Show <u>G</u> lobals Table	Compare Strategy To Controller
ia∰a Optimizer ia∰a Sample Strategies v	Update BACnet EDE Data	

This opens the Upload Setpoints dialog:

Point Name	Address	Type 🛛	Local	Controller
a	1	Analog	0.00	0.00
a A	2	Analog	9.00	9.00
aB	3	Analog	3.00	3.00
Select/Unselect All		Update Se	heted	Close

Select the points to be uploaded and click the Update Selected button

NAMING STRATEGY FILES

When saving **Strategy** files, it is recommended that you use a name which indicates the site, the **BACnet** Router number and the **Field Controller** number.

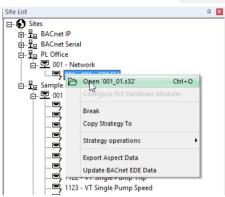
For example, the strategy for the Air Handling Unit controller, which is Field Controller number 1 on the Rooftop subnet (which is BACnet Router number 1) on the Office Block site might be named office 001-01 AHU.STG

HOW TO OPEN AN EXISTING STRATEGY:

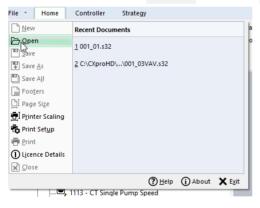
A Strategy file can only be opened if it is Associated with a controller.

You can open a contoller's Associated Strategy in one of the following ways:

- 1. Double-click on the **controller** in the Site Tree
 - Site List
- 3. Right-click on the controller in the Site Tree, and select the filename



4. Select the controller in the Site Tree , and select Open from the File drop-down



- Note: If the strategy for the selected controller is already opened, all of these options will be disabled (greyed-out).
- **Note**: If you want to open a different strategy file for a controller you must first remove the existing association, then associate the controller with the required strategy.

STRATEGY ASSOCIATIONS

What is an "Associated" Strategy?

Each of the Field Controllers in the Site List can have a Strategy Drawing file 'associated' with it, which means that CXpro^{HD} is aware of the filename of the strategy corresponding to that Field Controller. When a Field Controller is selected, its associated strategy can be opened by double-clicking, or by selecting from the right-click menu.

The icon representing the field controller changes when Strategy file is associated with it.

The relationships between controllers and strategy filenames for a particular site are stored in the file

```
C:\CXproHD\[siteFolderName]\SYSTEM\associations.xml
```

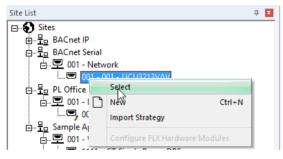
Note: CBXi controllers at the 'network' level can also have Strategies associated with them.

Creating Associations

New strategies

When a new **Strategy** Drawing is created, a target **controller** must be selected. When that **Strategy** is saved for the first time, it is associated with the selected target **controller**.

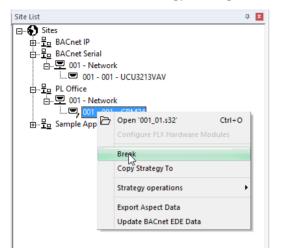
Existing strategies - manual



A **strategy** can be associated with a field controller by right-clicking on the Field Controller and selecting "**Select**". A list of all existing **strategy** files that are eligible to be **associated** with the selected **controller** will be displayed.

Breaking Associations

Associations can be broken using a toolbar or right-clicked popup menu option; the link between the Site Tree Field Controller and the Strategy Drawing is removed.



If an association is broken for an opened Strategy Drawing, then the Strategy Drawing will be closed and the user will be prompted to save it if changes have been made. Breaking an Association allows the User to associate a different Strategy Drawing to the Field Controller, using a toolbar or right-click popup menu option on the Site Tree Field Controller.

Copying associated strategies

From the Site List , it is possible in a single operation to create a copy of the strategy associated with any Field Controller node and associate that copy with another Field Controller node, as long as the target is of a compatible controller type and does not already have a strategy associated with it.

Note: A Strategy can**not** be copied if it is open and has been modified but not saved (the user is prompted to save the Strategy so that the Strategy can be copied).

To copy a **strategy** in the **Site List** interface:

- 1. Right-click on the source Field Controller node i.e. the controller to which the existing strategy is associated.
- 5. In the pop-up menu, select Copy Strategy To



6. In the **Copy Strategy** dialog that appears, click on the **Field Controller** to which you want the copied strategy to be associated

	Copy Strategy		_
Copying Strategy '001_01	.s32' from		
Site	PL Office		
Comms Controller	001 - Network		
Field Controller	001 - 001 - CBM24		
L	• Network 001 • 001 • UCU3213VAV Serial	1	

The Copy Strategy dialog displays the source Site, BACnet Router and Field Controller node details as well as the Strategy that will be copied.

The To box contains a "tree" list of potential target Field Controllers, grouped by Site. Potential target Field Controllers are those that:

- are of a Controller Type that is compatible with the source Field Controller Node
- do not already have an Associated Strategy
- do not have a newly created **Strategy**

The next available Field Controller node is always selected on the source Site. If no Field Controllers are available on the source Site then no Field Controller is selected and the Site Tree is shown collapsed (closed).

The **Copy** button is enabled when a **Field Controller** Node is selected. When it is clicked, a new **Strategy** is created and opened with the contents of the source **Strategy** being copied, including the Database names and Keypad Details. The copied **Strategy** is then **Associated** with the Target **Field Controller** node.

Importing a Strategy

The Copy Strategy To function applies to strategy files that reside in the current Site file structure. It is possible that files which were associated with a specific folder have been copied to locations outside the Site folders, and will not be found by the Copy Strategy To process. In that case the Import Strategy function may be used.

To Import a strategy in the Site List interface:

1. Right-click on the target Field Controller node

The target Field Controller is the controller to which the Imported strategy will be associated.

2. In the pop-up menu, select Import Strategy .

Site List		ά	L.
⊡€ Sites ⊕₽ BACnet IP ⊡₽ BACnet Seria			
	Select New	Ctrl+N	
	Import Strategy Configure FLX H	ardware Modules	

The system will scan for suitable strategies for import

Import a Strategy	

And display a list of the results.

				-
	OK	1	Cancel	

Note: It is possible that the list will be blank, because a strategy file will only be listed if:

- a. It does **not** reside in the current site.
- b. It has the correct embedded site, BACnet Router address and field controller address.
- c. It is not already associated with any controller.

You cannot for example import a strategy from controller number 006 on BACnet Router 5 on a remote site onto controller number 005 on BACnet Router 5 on the local site. Neither can you for example import a strategy from controller number 006 on BACnet Router 5 on a remote site onto controller number 006 on BACnet Router 2 on the local site.

i.e. The file to be imported must have originated on the same controller on the same site.

3. Select a **strategy** file and click **OK**. The strategy will be copied to the current **site**, and the copy will be associated with the selected **controller**.

OPENING MULTIPLE STRATEGIES

CXpro^{HD} allows you to have several **strategies** open at once. Each **strategy** must be opened individually as described above. Each **strategy** can be minimised, maximised and arranged in a number of ways in relation to the other open **strategies**.

DOWNLOADING A STRATEGY

When you have created a **strategy** in **CXpro^{HD}**, you must download it to the targeted **controller** before it will function.

CXpro^{HD} provides three different ways in which you can download a strategy to a controller:

- Using Automatic Download, where CXpro^{HD} automatically wipes the controller's memory and sends setup. You only have to download the strategy.
- Using Automatic Online Downloading, where CXpro^{HD} automatically downloads a module to the controller as soon as it is placed on the drawing area. (If the strategy is newly created, you must first wipe the controller's memory, place and join the modules on the drawing area and send the set-up).
- Downloading **manually**, where you must wipe the **controller**'s memory, send the number of blocks to be serviced and then download the **strategy**.

DOWNLOADING A STRATEGY USING AUTOMATIC DOWNLOAD

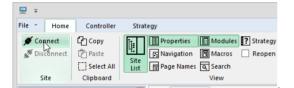
To download a strategy to the targeted controller using Automatic Download, proceed as follows:

- 1. Open the strategy and connect to the controller
- 2. Enable Automatic Download
- 3. Download the **strategy**
- Note: When you download a Strategy to a BACnet controller from CXpro^{HD}, any configuration that has been set by a separate B-OWS e.g. an Alarm Recipients list will be **wiped**. You must re-download the Alarm Recipients list, and any other B-OWS specific configuration after the Strategy download is complete.

Open the strategy and connect to the controller

Select the target controller in the Site List and open its associated **Strategy** by double-clicking or selecting **Open** from the File menu or right-click menu.

Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :



Enable Automatic Download

To enable Automatic Download, open the Communications Configuration dialog box by clicking Communications from the Controller tab of the Ribbon .



Click the Automatic Download check box in the Download Options tab.

Communications Configuration
Download Options Scan Options
Automatic Download Automatic Download Wipe Defaults Common
Vipe Strategy

Click OK to close the Communications Configuration dialog.

Download the strategy

Download the strategy to the targeted controller by clicking on **Download** in the **Controller** tab of the **Ribbon**

Controlle	r Stra	ategy
tommun 🔥	ications	📩 Download 🛛 🖓 Com
😼 Controll	er	Download Com
BACnet		💾 Auto Online
Configur	ation	k

When you use Automatic Download, CXpro^{HD} automatically deletes all previous points and strategies from the controller as these could conflict with the strategy being downloaded. It then downloads the strategy and sends the set-up (i.e. it informs the controller of the number of blocks it must service in the strategy).

While this is happening, the **Downloading** window is displayed.

Downloading		×
Controller		
Hardware Points		16
Strategy Blocks		500
Analog Setpoint Values		389
Digital Setpoint Values		314
BACnet Point Config		212
Sending BACnet data via file tra	Close	Abort

The progress bar at the top of the **downloading** window shows the progress of the download, while the status box (at the bottom of the window) tells which of the three stages in the download process (wiping the memory, downloading the **strategy** or sending the set-up) **CXpro**^{HD} is currently completing.

The **Downloading** window also includes a **Complete** box, which displays the number of the block of the **strategy**, analog point or digital point that is currently being downloaded. In the above example, the progress bar shows that the download is 79% complete, the complete box tells us that **CXpro**^{HD} is downloading block number 251 of the **strategy** and the status box tells us that **CXpro**^{HD} is busy downloading the **strategy** to the **controller**.

DOWNLOADING A STRATEGY USING AUTOMATIC ONLINE DOWNLOADING

Automatic Online Downloading is a feature of **CXpro^{HD}** which causes any changes you make to a **strategy** to be sent to the **controller** as soon as they are made.

Warning: Automatic Online Download is not recommended for use on live plant equipment, since downloading the Strategy in this manner can cause outputs to toggle.

To use this feature, proceed as follows:

- 1. Open the strategy and connect to the controller
- 7. Enable Automatic Online Downloading
- 8. Edit the strategy

To check that the strategy has been correctly downloaded, you can test the strategy. (See *Testing a strategy with Scan Mode* on page 128)

Tip:

If you enable both options (Automatic download and Automatic online downloading) on the Download Options tab, **CXpro^{HD}** will automatically wipe the controller's memory, download the modules as soon as they are placed on the drawing area and then automatically send the set-up.

Down	load Options Scan Op	ptions	
▼ A	utomatic Download	Wipe controller	
Aut	tomatic Download Wipe	e Defaults	
	Common		
	Wipe Strategy		
	Wipe Points		
	Wipe Time Sci	hedules	
	Wipe Hardwar	re Points	
	BACnet		
	Wipe BACnet	Objects (Excluding Devi	
	Wipe BACnet	Binary Unit Strings	
	Wipe BACnet	Device Name	
	Other		
	Wipe Keypad		
	utomatic Online Downlo		
45	Automatically Send	Setup	
Field	Controller will be wiped	before download.	
		ОК	Canc

An example of why you would choose both options would be if you wanted to design a basic **strategy**, download it and then download any additional modules or changes you make. In that case, you would enable the first option, i.e. **Automatic Download**, create the basic **strategy** and download it by clicking **Download** in the **Controller** tab of the **Ribbon**. **CXpro^{HD}** will send the set-up automatically. Then you would enable the second option on the **Download Options** tab of the **Communication Configuration** dialog, **Automatic on-line Downloading**, so that each time you make a change to the original **strategy** or add another module, the changes are downloaded and the set-up is sent automatically.

Open the strategy and connect to the controller

Select the target controller in the Site List and open its associated **Strategy** by double-clicking or selecting **Open** from the File menu or right-click menu.

Note: If you want to change the Strategy's target to a controller on a different Site, you must change Site using CCView or the Configuration program - selecting the controller on the CXpro^{HD} Site List will not change the site.

Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :

⊒ ∓						
File 🕆	Home	Controller	Strate	egy		
💉 Cor	anect	습 Copy	ii:	Properties	Modules	? Strategy
🖋 Dis	connect	Paste	1921 L	Navigation	Macros	Reopen
		Select All	Site List	Page Names	Q Search	
S	ite	Clipboard			View	

Enable Automatic Online Downloading

To enable Automatic Online Downloading, open the Communications Configuration dialog box by clicking Communications from the Controller tab of the Ribbon.

ne	Controller	Stra	ategy
:t	Compunica Controller BACnet		법 Download 낀 Wipe Contro 냅 Auto Online

Click the Automatic Online Download check box in the Download Options tab.

,
Automatic Online Downloading
Kr Automatically Send Setup
Field Controller will be wiped before download.
OK Cancel

Click OK to close the Communications Configuration dialog.

Note: By opening a new Strategy you automatically deselect the Automatic Online Downloading command. Click the Auto Online button on the the Controller tab of the Ribbon to restore the option.

Edit the strategy

Edit the **strategy** by placing and joining the required modules on the drawing area and editing their values and units.

Each time a module is placed on the drawing area, two modules are joined or their values are edited, **CXpro^{HD}** will automatically download the information to the controller.

To download manually, proceed as follows:

- 1. Open the strategy and connect to the controller
- 9. Disable Automatic download and Automatic online downloading
- 10. Wipe the controller's memory
- 11. Edit the strategy
- 12. Download the strategy
- 13. Send the set-up

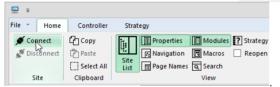
To check that the strategy has been correctly downloaded, you can test the strategy. (See *Testing a strategy with Scan Mode* on page 128)

Open the strategy and connect to the controller

Select the target controller in the Site List and open its associated **Strategy** by double-clicking or selecting **Open** from the File menu or right-click menu.

Note: If you want to change the Strategy's target to a controller on a different Site, you must change Site using CCView or the Configuration program - selecting the controller on the CXpro^{HD} Site List will not change the site.

Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :



Disable Automatic download and Automatic online downloading

Open the Communications Configuration dialog box by clicking Communications from the Controller tab of the Ribbon .

ie	Controller	Stra	ategy
t.	Compunica Controller BACnet		由 Download " Wipe Contro ☆ Auto Online

Clear the checkboxes for both Automatic Download and Automatic Online Download check box in the Download Options tab.

Automatic Download	🔲 Wipe controller
- Automatic Download Wipe	e Defaults
Wipe Strategy	
Wipe Points	
□ Wipe Time So	hedules
🗖 Wipe Hardwa	re Points
BACnet	
■ Wine BáCnet	Objects (Excluding Dev
	Binary Unit Strings
☐ Wipe BACnet	
Other	
🗖 Wipe Keypad	
Automatic Online Downl	oadiog
Automatically Sond	
Deselecting 'Automatic Dow JC and send the setup	rnload' will require you to manually erase the

Click OK to close the Communications Configuration dialog.

Wipe the controller's memory

Wipe the controller's memory by choosing Wipe Controller from the Controller tab on the Ribbon .

e	Controller	Stra	itegy	
	🍓 Communica	tions	📥 Download	Compare
t	😼 Controller		Wipe Controller	Show Comp
	BACnet		🛃 Auto Online	
	Configuratio	on		(

This opens the Wipe Controller dialog box, allowing you to choose individual parts of the controller memory to be wiped

Wipe Controller ×				
Clear Strategy Clear Points Clear Modem Strings Clear Keypad	Clear Schedules			
Clear BACnet Data Number of datalogs Wipe All Current Status	BACnet Options No change			
	Wipe Close			

Click Wipe to close the Wipe Controller box.

CXpro^{HD} will display a message to confirm that the controller's memory has been wiped. Click **OK** to close the message box.

How to check the controller type to which you are downloading

To find the type of the controller to which you are downloading, open the Strategy Details dialog by clicking on

Strategy Details in the Strategy tab of the Ribbon

r Strategy Copy Paste Select All Clipboard	
Strategy Details	×
Strategy Blocks Controller Resources Points Manager	
001 Comparator 002 Accent Schedule 003 Absolute Value 004 Maxmum 005 Analog Gate 006 Limit to 0 or 100 007 Rounding 008 Integer Constant 009 Real Constant 010 VAV Differential Pressure 011 BAChet Schedule 012 Holded Schedule 013 Time Schedule 014 Comparator 015 Hysteresis 016 Time with Constant Inputs 017 Not Used 018 Not Used 019 Not Used 019 Not Used 020 Not Used 021 Not Used 022 Not Used 023 Not Used 024 Not Used	~
	ОК
	-

Click the Controller tab.

		Strategy Details		×
Strategy Blocks Control	er Resources Points Manager Control Control Number of Modules per Number of Datalogs per	,		
	Inputs 8 Universal Inputs 8 Digital Inputs 0 Analog Inputs 0	Outputs Universal Outputs Digital Outputs Analog Outputs	0 0 0	
	Va	nable IO 16	[ОК

In the example shown, the Controller Type box shows that the selected controller is a CBM24 controller.

Edit the strategy

Edit the **strategy** by placing and joining the required modules on the drawing area and editing their values and units.

Download the strategy

When you have completed the strategy, you must then download it.

Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :

. 🛄	7					
File	Home	Controller	Strategy			
ø	Connect Disconnect	Сору	ī. I	Properties	Modules	? Strategy
1. St.	Disconnect	Paste		Navigation	Macros	Reopen
		Select All	Site List	Page Names	Q Search	
	Site	Clipboard			View	

Download the strategy to the targeted controller by clicking on **Download** in the **Controller** tab of the **Ribbon**

Controller	Stra	ategy	
👆 Communicat	tions	📩 Download 📐 🖓 Compare	
Controller		Wipe Controller 🕄 Show Compare	•
BACnet		🛃 Auto Online	
Configuratio	n	Op	e

A warning is displayed

CXproHD	
Warning: Downloading will wipe the controller and cycle the outputs. Continue?	
Do not ask me again during current session. Yes No	

The **Downloading** window will appear, to display the progress of the download.

Downloading		×
Controller		
Hardware Points		16
Strategy Blocks		500
Analog Setpoint Values		389
Digital Setpoint Values		314
BACnet Point Config		212
Sending BACnet data via file tr	ansfer	
	Close	Abort

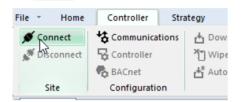
When **CXpro^{HD}** has downloaded all the blocks that you specified, it will automatically close.

Following a manual download, you must "Start" the **strategy** by sending the setup information to the controller – see *Starting a strategy (sending the Setup)* on page 125.

STARTING A STRATEGY (SENDING THE SETUP)

When the memory of a **Field Controller** has been wiped and the **strategy** has been downloaded to it, the **Controller** must be told how many blocks are to be serviced. This is called the **Setup** of the **Strategy**. Sending **Setup** is also referred to as **starting the strategy**. If you are using **Automatic download**, **CXpro**^{HD} sends the **Setup** automatically when you download a **strategy** to the controller. (See *Downloading a strategy using Automatic Download* on page 115) Otherwise, you must send the Setup as described below.

Select the **Controller** in the **Site Tree**, and connect to it by clicking on the **Connect** button in the **Controller** tab of the **Ribbon**



Open the Controller Configuration dialog by clicking on Controller in the Controller tab of the Ribbon



Controller Configuration	×
Number Of Strategy Blocks To Service Last Composed Time 14:00:16 Date 10/08/2018 Time 14:00:16 Date 10/08/2018	Send Receive
User ID 0 User Name Synchronisation Wait After 0	
Current Status Attention ! Error receiving setup.	Close

The number in the Number of Strategy Blocks To Service box, X (which is automatically entered by CXpro^{HD} but can be changed by the user), activates the first X blocks of the strategy in the Field Controller. This number, X, must be greater than or equal to the number of the highest numbered block used by the strategy. Otherwise, the parts of the strategy which occupy blocks with a higher number will not be serviced, and their point values will not be updated, which may cause the strategy to fail.

Note: If you cannot see how many blocks you have used in the strategy, open the Strategy Details dialog by clicking on Strategy Details in the Strategy tab of the Ribbon

	0	57	57	
Strateg	av			
] Copy] Paste] Select Al Clipboard	View Modules		tegy	Viev Macr
			Strategy Details	
Strategy Block	ks Controller Res	ources Points Manager		
017 Not U 018 Not U 019 Not U 020 Not U 021 Not U 022 Not U 023 Not U 024 Not U 025 Not U 025 Not U 025 Not U 025 Not U 027 Not U 028 Not U 029 Not U 030 Not U	arator resis with Constant Inputs leed leed leed leed leed leed leed lee			^
031 Not U 032 Not U 033 Not U 034 Not U 035 Not U	lsed Ised Ised			~
				ОК

This lists all of the blocks in the targeted controller. The highest block number that is marked as used is the number of blocks the controller must service.

The Last Composed section of the Controller Configuration dialog automatically contains the current PC time and date. If the strategy is uploaded later, this time and date will indicate when the strategy was started.

The User ID parameter allows the application engineer to enter a unique identifying character. If the strategy is uploaded later, this number will indicate who started the strategy.

In the User Name field the engineer can enter the name of the person that started the strategy and this can be retrieved from the controller if the strategy is uploaded. A string of up to sixteen characters can be entered in this field.

In the **Drawing Name** field the name drawing can be entered. It is recommended that the name of the drawing containing information relevant to the **strategy** is stored here. If the **setup** is uploaded from the **controller** the drawing name will be displayed in this field.

The effects of sending the setup

Sending the setup to a controller has the following effects:

- All blocks entered in the Number of blocks to service section will be serviced, even if they are not occupied by modules. For example, if you entered 100 as the number of modules to be serviced, the first 100 blocks will be serviced by the controller.
- A controller which is sent a setup with blocks to be serviced, but without any strategy, will not send any output signals and will not read any input signals.

- **Note:** If a strategy is downloaded after setup is sent, the strategy is serviced immediately. This means the outputs will receive values from the strategy immediately after downloading. It would be preferable to download the strategy before sending setup, since untested strategies can cause problems in devices connected to the outputs if the output values are unstable or incorrect.
 - Output points of modules which occupy serviced blocks take their values from the module.
 - If the controller is running without a network (stand-alone), the green LED is constantly illuminated.
 - If the **controller** is running on a fieldbus (connected to a **BACnet** Router), the green LED flashes with regular pulses.
 - An alarm appears on the monitor of the connected **PC** if the alarm feature is active.
 - The keypad program, if one exists and has been downloaded to the controller, will be started.

TESTING A STRATEGY WITH SCAN MODE

It is important to test a strategy at various stages in its creation, to check for mistakes or faults in its design. This is done by using **Scan mode**.

Preparing to test a strategy

To test a **strategy** the following conditions must be satisfied:

- The **strategy** must be open (see *How to open an existing strategy:* on page 110).
- The strategy must have been sent to the controller (See Downloading a strategy on page 114).

Note: Make sure that the downloaded strategy and the open strategy are the same.

• The strategy must have been started (see *Starting a strategy* on page 125).

How to test a strategy

In Scan mode, CXpro^{HD} allows you to view the changes in values in a strategy as the strategy is serviced in the controller. This is useful for testing strategies and parts of strategies for correct operation. In Scan mode, the point values of an uploaded strategy are read by CXpro^{HD}, displayed next to their respective inputs/outputs and updated in real time.

To activate scan mode:

- Open the strategy and Connect to the controller by clicking the Connect button on the Strategy tab of the Ribbon
- Display the strategy's point and constant values (page 129)
- Set the **Scan mode** (page 129)
- Activate scan mode (page 130)

In scan mode, the variable point values of a strategy are updated in real time as they are serviced by the strategy and displayed clearly in the module symbols on the drawing area. In the **Rescale to 0 or 100** module of the example above, the values of the 3 input points were changed to 10, 20 and 149.86 and its output was changed to 100 as they were serviced by the **strategy**.

• Watch the changing values of the modules in scan mode to ensure they are being serviced correctly by the controller.

How to Display the strategy's point and constant values

isplay Options		
isplay Options	Display Lines 🔹 🕨	<u> </u>
	Display Labels	Hide
		Show Number
		Show Name
		Show Value Only (simulation)

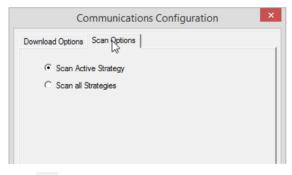
Display the point and constant values of the strategy by right-clicking on the Drawing Area and select Display Options > Display Labels > Show Value Only (simulation)

Setting the Scan mode

CXpro^{HD} can scan either the current active **strategy** or all of the currently open **strategies**. To set this, open the **Communications Configuration** dialog by clicking **Communications** in the **Controller** tab of the **Ribbon**



Select the Scan Options tab in the dialog, and select either the Scan Active Strategy or the Scan all Strategies radio button.



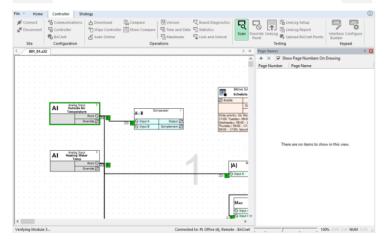
Click **OK** to close the dialog.

Activate scan mode

Begin scanning by clicking Scan in the Controller tab in the Ribbon .

- <u></u>		expresses bee	
Controller Stra	ategy		
🔩 Communications	📩 Download 🛛 🖓 Compare	1.23 Version 🔍 Board Diagnostics	
😼 Controller	Wipe Controller 🔄 Show Compare		२ ⊘
BACnet	💾 Auto Online	Maximums 🔓 Lock and Unlock	an Override Point
Configuration	Ope	rations	~~
			_

The **CXpro^{HD}** window will change to the **CXpro^{HD}** scan mode window, hiding the **Site List**, displaying the **Page Names** pane and disabling all of the Ribbon items except the **Scan** button



• To deactivate scan mode, i.e. to stop scanning the point values of the strategy, click the Scan button again.

Suggestions for testing strategies

- If a number of modules are selected in the strategy when **Scan mode** is activated, then only those modules will be scanned.
- The module to be tested must have been downloaded to the controller. That is, the **Block number** of the module must be within the range of modules which were downloaded to the controller (see *Downloading a strategy* on page 114)
- A strategy should be tested in small steps during the creation process. Simple faults such as selecting the wrong module or joining to the wrong inputs and outputs can be difficult to correct in a finished strategy. There is also the danger that faults can result in other faults appearing in different parts of the strategy or in other controllers.
- At the end of the creation of a strategy, the whole strategy should be tested again. This prevents later problems and time losses during the setting-up process in site.
- The strategy should be checked module by module from left to right, starting with the hardware inputs and finishing with the hardware outputs.
- Individual strategy parts can be functioning correctly themselves but cause problems when connected to other correctly functioning strategy parts. For example, the direction of analog values may fall in the range 0 % to 100 % or in the range 100 % to 0 %. Digital values and their inversion may also cause confusion.
- Test a strategy before copying it or using it in another controller. Otherwise, all copies of the strategy will also have to be tested.

• Manually overriding hardware points allows simulation of each environmental situation to which the strategy would be exposed.

SECURING CBM DATA

Unlike other BMS controllers, in the **CBM Strategy** information can be secured against accidental loss or unauthorised modification by password-protecting the ability to view or edit **strategy** information and system information.

How to password-protect a range of blocks in a CBM strategy

To lock a range of blocks in a strategy, select Lock and Unlock from the Controller tab of the Ribbon .

Controller Stra	tegy				
tommunications	📥 Download	Compare	1.23 Version	🖳 Board Diagnostics	E
Controller	Wipe Controller	Show Compare	🗟 Time and Date	Statistics	-(
BACnet	🛃 Auto Online		Maximums	Lock and Unlock	Sci
Configuration		Oper	rations	13	

This opens the Lock and Unlock dialog

Lock and Unlock	×
Enter Password	Lock
	Unlock
Current Status	
	Close

Enter a numericial password (note: the Enter Password field will only accept numbers) and click Lock

Lock and Unlock	×
Enter Password ****	Lock
	Unlock
Current Status	
	Close

The Lock Blocks dialog opens. Specify the start and end of the range of blocks that will be protected:

Enter Start Block 12
Enter End Block

Click OK to close the Lock Blocks dialog

When the lock command has been received by the controller a confirmation message is displayed in the Lock and Unlock dialog.

All of the **strategy** blocks within the specified range are now locked, and cannot be accessed until they are unlocked using the password set above.

How to access locked strategy blocks

If a range of strategy blocks in a **CBM** controller have been locked, it is only possible to access, view, and edit them by first unlocking them, using the password set during the locking process.

To remove password protection from a locked range of strategy blocks, select Lock and Unlock from the Controller tab of the Ribbon .

Controller Stra	itegy				
Communications	📥 Download	Compare	123 Version	Board Diagnostics	C,
Scontroller	Wipe Controller	Show Compare	喝 Time and Date	Statistics	
BACnet	🛃 Auto Online		Maximums	Lock and Unlock	Sci
Configuration		Oper	ations	13	1

This opens the Lock and Unlock dialog. Enter the required numerical password (set during the locking process) and click on Unlock .

Lock and Unlock	×
Enter Password ****	Lock
Current Status Idle	
	Close

When the blocks are successfully unlocked in the controller, a message is displayed in the Lock/Unlock dialog.

The strategy blocks are now unprotected, and can be accessed from **CXpro^{HD}** as normal.

HOW TO EXPOSE POINTS ON A BACNET SYSTEM

When the **Strategy** has been configured for a controller that is part of a **BACnet Site**, the points within the controller that are to be available to the **BACnet** system must be specified by selecting **BACnet Points** from the **Strategy** tab of the **Ribbon**

olle	er Strategy							
ad er	Copy C Paste Select All Clipboard	View Modules	Add Text	I/O Terminals	Reorder Modules Strategy	BACnet Points BACnet Units Control Control C	Strategy Help	Vi Ma
	n 💌 4							

The BACnet Points dialog opens, listing all of the points used in the Strategy:

BACnet	Export	Point Name	Point Addr	Point Type
~		Room Setting	5	Analog Setpoint
✓		MaxHWater	28	Analog Virtual
~		Adder/Scaler Block 19 Output	29	Analog Virtual
✓		WeatherCom Block 8001 Inpu	30	Analog Virtual
✓		Heating Water Temp	2	Analog Input
✓		Temperature	3	Analog Input
✓		Alarm Enable	2	Digital Setpoint
~		DigVirt_3	3	Digital Virtual
 Image: A start of the start of		Schedule No. 1 (On)	4	Digital Virtual
✓		Hysteresis Block 15 Active High	9	Digital Output
Max Use Avai	int Usage - imum BAC d BACnet lable BACr ort Total	net 224	ary Unit String (Maximum Bir Used Binary (Available Bin	nary Unit 32 Unit 3
tpoint L				
Max	Unexpose	d Setpoint and BACnet 324	Unexpos	ed 0
Avail	able Setpo	oints / BACnet Points 314		

Tick the checkbox beside each of the points that are to be exposed, then click on OK.

Note: In BACnet, the point name must be unique. In the Cylon BACnet system they may not be unique, so some duplicate names may appear in the list. If this is the case, click the Resolve Duplicate Point Names... button.

This opens the Resolve Duplicate Point Names dialog, where names can be changed.

Note: The BACnet Points dialog also includes columns of checkbox to identify points that should be included in any export to ASPECT[®] / INTEGRA[™] – see ASPECT[®] / INTEGRA[™] Export on page 206.

Creating Strategies

HOW TO VIEW BACNET POINTS FROM A CONTROLLER

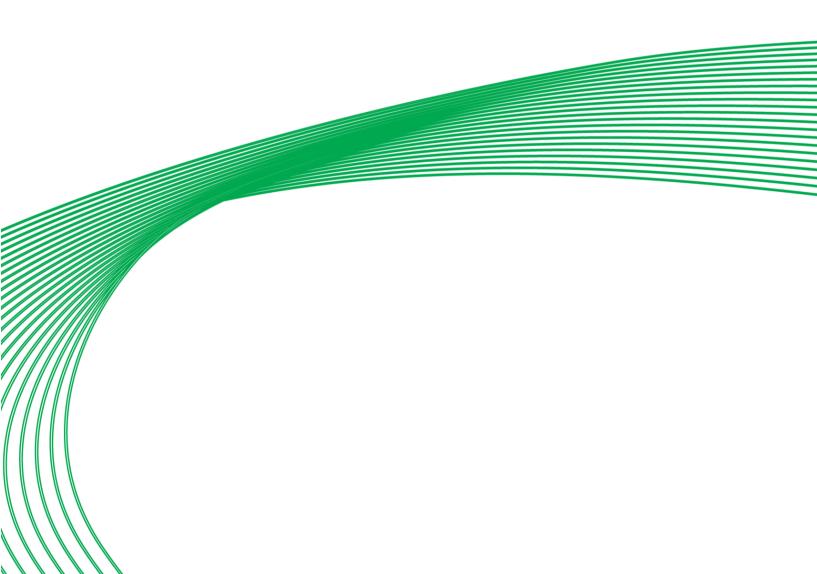
You can view **BACnet** points from a Controller by selecting **Upload BACnet Points** on the **Controller** tab on the **Ribbon**

ne	Controller Stra	ategy						
ct	Communications	Download Ti Wipe Controller d d d Auto Online	【 Compare 금: Show Compare Oper	123 Version Time and Date Maximums rations	Statistics	-q	Override LiveLog Report Point Testing	Interfa Build

This opens the **Controller BACnet Points** dialog. The points are automatically uploaded so that they can be viewed, and the dialog shows the progress of the upload and the points that have been uploaded:

	oller BACnet Points					×
Upl	oaded BACnet Points					
	Point Name	Point Addr	Point Type	Active Unit	Inactive Unit	
-						
- 1						
Sta	tus					
- 1	Uploading BACnet point 41 of 225					
						_
				Upload	Close	

SECTION 6: NAMING OBJECTS



WHY OBJECTS ARE NAMED

Objects in the Cylon system, such as **controllers**, points, time schedules, datalogs, etc. are given names to make them more identifiable. For example, it is easier to recognize a datalog named "Water Supply Temperature" than one named "datalog_1", which is the default name of the first datalog used inside a **controller**, automatically given by the database.

RULES FOR NAMING OBJECTS

When naming an object in the system, the following rules should be remembered:

- Names inside a controller must be unique.
- Names can have a maximum of 24 characters.
- All alphanumeric characters are permitted, except commas.
- If the name of an object in a controller is changed to a name that already exists in that controller, the name of the original object will be deleted.

PROCEDURES FOR NAMING OBJECTS

The following list contains some of the objects in the system that can be named:

- Sites
- Field Controllers and BACnet Routers
- Points (both hardware points and virtual points)
- Datalog and Time Schedule modules

NAMING POINTS

Types of point

There are three main types of point in the Cylon system:

- A hardware point is an input or output of a Field Controller.
- A virtual point is used to save internal information for a **controller**.
- A setpoint is a type of virtual point, but its value is constant, whereas the value of a virtual point is determined by the **strategy**.

Hardware points, virtual points and setpoints can be either analog or digital.

How to name points

Only hardware and setpoints can be named in **CXpro^{HD}**. Virtual points are identified by their block numbers. The procedure for naming or changing the name of a set point is the same as that for a hardware point. A brief summary of the procedure is presented below. (For a more detailed description of how to name a point, see *Defining hardware points* on page 67)

- Open the **strategy**.
- Select the Point module on the drawing area that is to be named or have its name changed.
- Enter or edit the ntext in the Name field of the properties pane.
- Choose Save from the File menu to save the changes made to the strategy.

The **Database Interface** module can be used to enter/edit/delete names of hardware points non-graphically.

Virtual points which are placed in a **strategy** as digital setpoints or analog setpoints, are points which are controlled from outside the **Field Controller**. The name of such a virtual point should indicate how its value is passed to it. The following table illustrates this:

	Setpoint name	How set point value is controlled			
	Outair Temperature_LG	Controlled by 3rd party block			
	Room Temperature_WG	Controlled by 3rd party block			
	Set point_KP	Can be changed via keypad			
	Gain Factor_PC	Can be changed via PC (B-OWS)			

NAMING FIELD CONTROLLER TIME SCHEDULES

Controller time schedules are saved and serviced just like modules in a controller. Naming Controller time schedules makes it easy to locate them for editing, either using the PC, CCView or a keypad.

How to name a Field Controller time schedule

The procedure for naming or changing the name of a Controller time schedule is defined below:

- Open the **strategy**.
- Select the Point module on the drawing area that is to be named or have its name changed.
- Enter or edit the text in the Name field of the properties pane.
- Choose Save from the File menu to save the changes made to the strategy.

When naming the schedule, it is a good idea to give an indication of the module's function. For example, if the module is a time schedule for the heating system of the site, and is set for Monday to Friday only, the module might be named "Heating Schedule (Mon to Fri)".

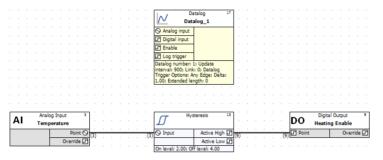
NAMING DATALOGS

Datalogs are saved and serviced just like modules in a **controller**. The contents of a **Datalog** can be viewed and analysed using the **Datalog Manager** module. So that they can easily be identified by the **Datalog Manager**, they are automatically given the same name as the point that they are logging. They are given this name when the point is connected to the **datalog**. In the **Reports** program **datalogs** can be configured and archived.

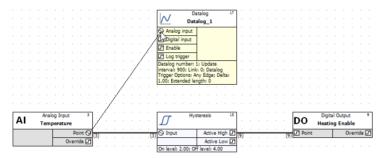
How to name a datalog

Datalogs are automatically named as soon as they are connected to a point:

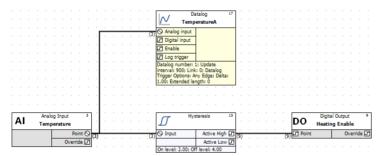
Open the **strategy** that contains the **datalog**.



Join the datalog to a point by clicking on the point to be logged, and dragging to the Datalog's input:



The name of the **Datalog** is changed to the name of the point, and displayed in the **Datalog** module in the strategy.

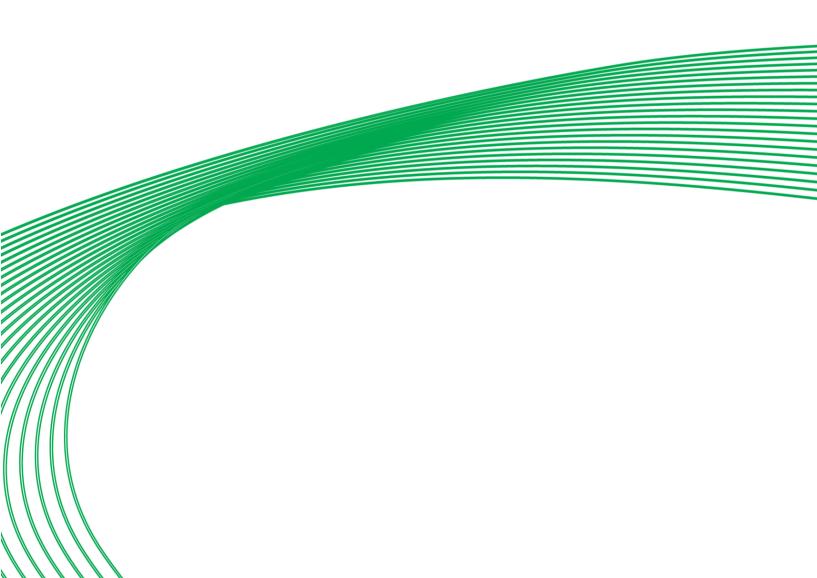


If you want to modify the name that is automatically given, you can edit it by selecting the **datalog** module and editing the Name field in the **Properties** pane.

It is a good idea to give an indication in the name of what part of the **site** the **datalog** belongs to, but it is not necessary to indicate in the name that the module is a **datalog**, as it will only appear in list boxes allowing the selection of a **datalog**. Names given to speed up the copying of strategies (for example, "Temp. Channel 1", "Temp. Channel 2", "Temp. Channel 3", ...), and which save time for creating dynamic graphics, are not helpful for the end user.

Choose Save from the File menu to save the changes made to the strategy.

SECTION 7: USING MACROS



MACROS - OVERVIEW

If your work in **CXpro^{HD}** involves creating the same or similar **strategies** repeatedly, you'll find **Macros** useful for reducing the time involved in these tasks. A **Macro** is a set of **strategy** modules grouped together into a single unit.

Macros and Macro Templates

A Macro Template is used to create a macro within a strategy. It is a definition of module types and connections, and when it is inserted into a strategy a new Macro is created containing new instances of those module types connected together to match the Macro Template.

- Each time a Macro Template is inserted into a strategy, a new Macro is created.
- Each Macro is an instance of a Macro Template, but a strategy can contain multiple Macros that are based on a single Macro Template.
- Macro Templates can be stored, and copied between strategies and controllers.
- Each Macro can be configured and adjusted independently of the Macro Template used to create it.
- When a Macro Template is saved, it is assigned to a floating toolbar, so that it is as convenient to use as any Engineering Centre module.

Example: An "Adder" macro.

An Adder/Scaler module accepts four inputs A, B, C and D, and operates according to the equation

Output = A*C + B*D

It can be made into an Adder, which operates according to the equation

Output = C + D

by ensuring that its A and B inputs are always set to 1. This can be done by connecting a Real Constant module to the A and B inputs as shown below.

\sim^{R}	Constant 18] .	•	×+ Add	der/Scaler 19
	Output A 🛇	6	. 6	🛇 Input A	Output 🛇
	Output B 🛇	7	7	🛇 Input B	
Constant A: 1.00;	Constant B: 1.00	<u> </u>		🛇 Input C	7
				🛇 Input D	

This combination of modules can be saved as a Macro Template and reused whenever an adder is required.

MACRO STRUCTURE

Macro Templates are stored in **CXpro^{HD}** in groups and sub-groups. A maximum of 10 **Macro groups** can be created. Each **Macro group** can contain 20 sub-groups and each sub-group can contain up to 100 **Macro Templates**. In total, 20 000 **Macro Templates** can be created and stored in **CXpro^{HD}**.

For example, you may want to store all **Macro Templates** relating to heat control **strategies** in a group called Heat. This group may contain a sub-group called Boiler, which would contain **Macro**s for boiler control strategies, such as Optimizer, Heating Curve, etc.

MACRO DESCRIPTION (HELP) FILES

A Macro Description File is a Help file generated by the person who created the Macro Template, and is associated with the Macro Template (it is opened by right-clicking on the Macro button). It is normally used to describe the function and usage of the Macro Template.

When a user right-clicks on a Macro button on the floating Macro bar CXpro^{HD} opens the editable description file associated with that specific Macro Template. If none exists, CXpro^{HD} opens a blank text file, which when saved will be associated with that Macro Template. This file can be used to provide documentation about how the Macro should be used or to record history, author or changelog details for the Macro Template.

The program used by **CXpro^{HD}** to open the history file, e.g., MS Wordpad, must be specified in the C:\CXproHD\System\wn3000.ini file under UC16et.

HOW TO CREATE A MACRO TEMPLATE

There are a number of steps involved in creating a Macro Template:

- 1. Create the **strategy**.
- 2. Add modules to the Macro Template.
- 3. Select the inputs and outputs for the Macro Template, and change their names if required.
- 4. Set names for each of the points within the Macro Template if required.
- 5. Choose a Macro group and sub-group, and give the Macro Template a name.
- 6. Choose whether to insert the Macro Template into the active strategy as a Macro.
- 7. Save the Macro Template.

The following guide to creating a Macro uses as an example a typical strategy that you might want to save as a Macro – a "weather compensator" strategy. As an exercise in creating Macros, you may want to follow this guide, using the weather compensator as an example.

Create the strategy

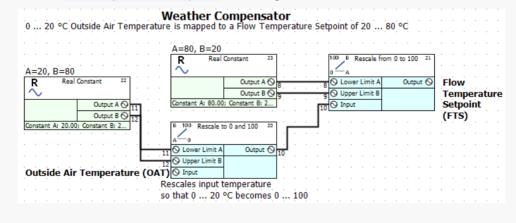
Create the strategy or part of a strategy on which you are basing your Macro Template. (If you are forming your Macro Template from an existing strategy, then open that existing strategy).

Example – Weather Compensator macro

For example, if you were to create a Macro Template from a weather compensator strategy, you would place two Real Constant modules and two Rescale to 0 and 100 modules on the drawing area and join them as shown below:

The third input of the first Rescale module (Rescale to 0 and 100) is to be the input of the Macro. It is marked Outside Air Temperature in the diagram below.

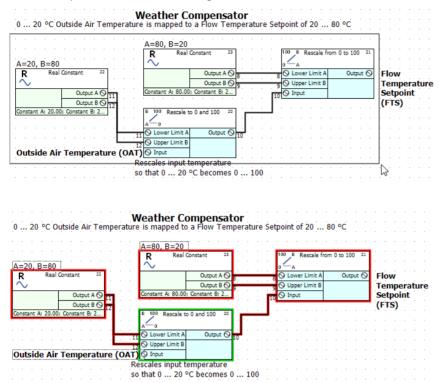
The output of the 2nd Rescale module (Rescale from 0 to 100) is to be the output of the Macro. It is marked Flow Temperature Setpoint in the diagram below.



Select the modules for the macro

The next stage in creating a **Macro** is to select on the drawing area the modules and any text that you want to be included in the **Macro**. Selected modules are marked by red squares around their edges.

To select the modules for the **Macro**, you can drag the mouse from the top left-hand corner to the bottom righthand corner of the strategy to draw a box around the entire strategy so that each module and its inputs and outputs is selected. It is not a problem if, when drawing the box, you included some unwanted modules – they can be easily removed at the next stage.



Add the selected modules to the Macro Template

Select Create from the Macro section of the Strategy tab on the Ribbon.



This will open the Add Modules to Macro dialog box, in which all of the modules that you selected for the Macro Template will be listed.

Add Modules to Macro ×			
Modules Selected for 020 Rescale to 0 and 100 021 Rescale from 0 to 100 022 Real Constant 023 Real Constant 1025 Outside Air Temperature (OA' 1026 A=20, B=80 1027 A=80, B=20	Modules Added to		
NOTE: Hardware modules can not be added to Macros.	Continue Cancel		

Note: A Macro cannot include hardware points, so if any were included in the selection they will not be listed in the Add Modules to Macro dialog.

Note:	If you click the	macro	button or	macro	menu without first selecting the modules for the macro,
	you will be pro	mpted	to do so wi	th the	following error message:
	Cylon Engineering	Centre	×		
	A Please select the modules	for the macro.			
		ОК			

Select the modules in the left list box that you want to include in the **Macro** by holding down the **[Ctrl]** key and clicking each one with the left mouse button. The selected modules will be highlighted.

Add Mod	dules to Macro ×
Modules Selected for 020 Rescale to 0 and 100 021 Rescale from 0 to 100 022 Real Constant 023 Real Constant 1025 Outside Air Temperature (OA' 1026 A=20, B=80 1027 A=80, B=20	Modules Added to
NOTE: Hardware modules can not be added to Macros.	Continue, Cancel

Note: For illustration, only the functional modules have been selected in this example. It is also possible to include text in a Macro Template for clarity.

Add the selected modules to the Macro Template using the following buttons:

>
>>
<
<<

Add a selected module or several selected modules to the Macro Template Add all modules to the Macro Template

Remove a selected module or several selected modules from the Macro Template

Remove all modules to the Macro Template

This Add Modules to Macro list box displays all the modules that have been added to the Macro Template. If you add a module or modules that you later decide you do not want, you can remove that module or modules from the Macro Template using the remove buttons (see above).

Modules Selected for	Modules Added to
020 Rescale to 0 and 100 021 Rescale from 0 to 100 022 Real Constant 023 Real Constant 1025 Outside Air Temperature (OA 1026 A=20, B=80 1027 A=80, B=20	020 Rescale to 0 and 100 021 Rescale from 0 to 100 022 Real Constant 023 Real Constant <
NOTE: Hardware modules can not be	Continue Cancel

In this example, all 4 modules of the weather compensator strategy are required for the Macro Template and so they are added to the list box on the right. The text has been excluded in this case, but could be included for extra information.

Click Continue... when you have added the required modules to the Macro Template.

Define the Macro Inputs, Outputs, Group and Name (the Create Macro dialog box)

Pressing Continue in the Add Modules to Macro dialog will open the Create Macro dialog box:

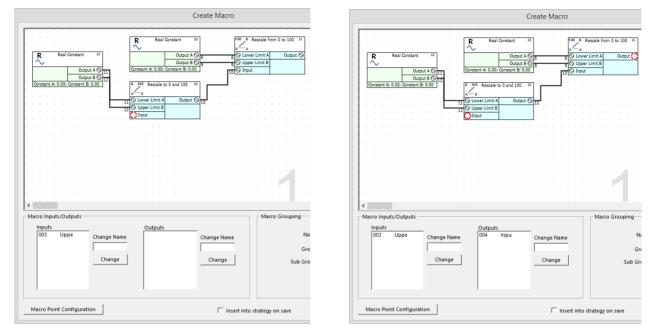
			Sub Group	Macro Manager	
Change		Change	Group Sub Group	Cylon Macros	
Inputs Change Name	Outputs	Change Name	Name		
Macro Inputs/Outputs			Macro Grouping		
					>
) Input]			
12 6) Upper Limit B				
	Lower Limit A Output 🛇	10			
Constant A: 0.00; Constant B: 0.00	100 Rescale to 0 and 100 20				
Output B O 12			· · · · · · · · · ·		
	Instant A: 0.00; Constant B: 0.00	9 9 9 0 Upper	LIMIE 8		
R Real Constant 22	Output A 🛇 Output B 🛇				
	\sim	· · · · ·A			
· · · · · · · · · · · · · · · ·	R Real Constant 23	100 B R	escale from 0 to 100 21		

The **Create Macro** dialog shows the four modules that were added in the **Add Modules to Macro** box, and allows you to edit input and output names, create **Macro** groups and sub-groups and create a history file to record any changes that may be made to the **Macro Template** later.

Define the inputs and outputs for the macro

This step refers to the Weather Compensator example (see page 144).

When you click on a module output, or an unconnected module input in the drawing area of theCreate Macrodialog, it is highlighted on the drawing area, and added to the relevantMacro InputsorMacro Outputslist at thebottom of the dialog.



- **Note:** If you click on a connected input, an error message will be displayed: "Cannot select a module input that is already connected to a line."
- **Note**: The number beside each module input is the Node number, and does not relate to the module number.

Note: The default name for node 3 in the illustration is "Inpu", but this can be edited - see *Change input or output label if* necessary on page 150.

To remove an input or output that has been added to the **Macro Template**, click on it in the drawing area. The input/output will then no longer be highlighted in the drawing area, and it will be removed from the relevant **Macro Inputs** or **Macro Outputs** list.

You can rearrange the order of the inputs or outputs to the Macro, by double-clicking on an entry in the relevant Macro Inputs or Macro Outputs list, and dragging it up or down within the list.

Change input or output label if necessary

By default, the text that will be displayed on the Macro module as a label for each input will be "Inpu" and for each output will be "Outp":

Τ	test		
0	Inpu	Outp 🛇	

but these names can easily be edited.

To edit a Macro input or output name, select the input/output in the relevant list box

003 Louto	Input Name: Outp
	Change

Type a new name in the relevant Name edit box, and click Change .

An input or output label can have no more than 4 alphanumeric characters.

003	Outp	Input Name: OAT Change
003	OAT	Input Name:

Name and group the Macro

In order to use a Macro Template that you have created, you must give the Macro Template a name, and assign it to a Macro group so that it can be accessed from the Macro bar.

Macro Name

In the Macro Name box, enter a name for the Macro Template.

The name provided here will appear on the **Macro** instance when it is displayed on the drawing area. It can have no more than 10 alphanumeric characters.

In this example, the name given to the Mac	ro Macro Grouping
Template is "WeatherCom".	Name WeatherCom
	Group Cylon Macros 💌
	Sub Group BACnet 💌
	Macro Manager

Note: The following names cannot be used when naming a macro, because they are used to indicate Inputs, Outputs, constants etc. internally within **CXpro^{HD}**:

pi	(n)	where n = a numeric value in the range 0-9
ро	(n)	where n = a numeric value in the range 0-9
sb		
с (n)	where n = a numeric value in the range 0-9
bc		

When the Macro Template is named, choose a Macro group and sub-group for it

• Macro Group and Sub-Group

From the **Group** box, select the group to which the Macro you are creating will belong.

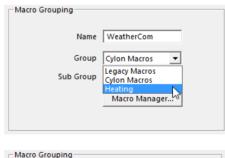
The Macro Group chosen for this example is heating.

If no Macro Group exists, you must create a new group (see *How to create a new macro group and sub-group* on page 154) by clicking the Macro Manager... button.

From the **Sub Groups** box, select the sub-group to which the **Macro Template** you are creating will belong.

The sub-group chosen for this example is **Boiler**.

If no sub-group exists, you must (see *How to create a new macro group and sub-group* on page 154) by clicking the Macro Manager... button.



Macro Grouping	
Name	WeatherCom
Group	Heating
Sub Group	Boiler 💌
	Boiler Macro Manager

Set names for all of the points in the Macro

When creating a Macro Template, there is a facility to edit the names of all of the points in the Macro in a single interface. A Macro Point Configuration button is available on the Create Macro dialog:

Clicking the Macro Point Configuration button opens the Macro Point Configuration dialog:

Simply enter text in the Name column against each point, and click the OK button.

Note: If the modules selected when creating the Macro included any Setpoints, it is possible to set labels for specific setpoint values

Macro Point Configuration

Macro I	Details				
N	ame WeatherCom				
<i>c</i> -	oup Cylon Macros				
Gr	oup Cylon Macros				
Subgr	oup BACnet				
Num	Name	Туре	Value	High U	Low Un
8		Analog		°C	
9		Analog		°C	
10		Analog		°C	
11		Analog		°C	
12		Analog		°C	
<					>

Note: This is different from setting the Input and Output names (labels) as described in *Change input or output label if necessary* on page 150. Those input and output names are labels displayed on the Macro module, the point names set here are the descriptive names stored for each of the points in the Strategy.

Choose whether to insert the macro into the active strategy

The Insert into Strategy checkbox allows you to immediately insert a new Macro based on this Macro Template into the active strategy.

If you want to insert the Macro into the active strategy, select this option before saving the Macro Template.

$\overline{K}_{\mathcal{S}}$ Insert into strategy on save	Sa

Save the Macro Template

To save the Macro Template, click the Save button.

	Macro Manayer		
	c	Consel	
ve	Save	Cancel	

The Macro Template is saved to the C:\CXproHD\Macros\ directory if it was created in a UCU or UC16 strategy, or in the C:\CXproHD\UC32Macros\ directory if it was created in a CBM or CBT strategy. The group and subgroup information is stored in the macro_database.db file in the same directory.

If you decide not to save the Macro Template, click the Cancel button to close the Create Macro dialog box without saving.

When you save the Macro Template, an entry is added to the Macro pane:



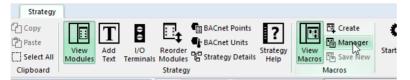
The Macro symbol is the bitmap that represents the Macro on the drawing area. (See Working with Macros on page 162).

Τ	WeatherCom				
0	OAT	Dmnd 🛇			

HOW TO CREATE A NEW MACRO GROUP AND SUB-GROUP

Macro Groups and Sub-Groups are defined in the Macro Manager interface.

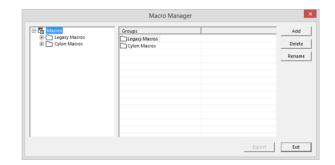
Open the Macro Manager by selecting Manager from the Macro group on the Strategy tab of the Ribbon



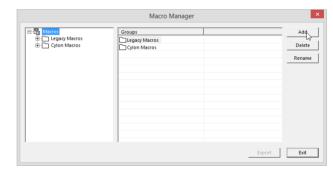
or by clicking the Macro Manager... button on the Create Macro dialog

Macro Grouping	
Name	
Group	Cylon Macros 💌
Sub Group	BACnet
	Macro Manager

This opens the Macro Manager window



To add a group, click the Add button while the Macros root is selected in the explorer pane (left hand side of the window)



A new group appears in the Right-hand side **Group** pane.

Type in a name for the new group.

Hacros	Groups	Add
Legacy Macros Cylon Macros	Cylon Macros	Delete
⊡- Heating	Heating	Rename

To make a sub group in the new group, first make groups visible by clicking on the + sign to the left of the **Macros** root.

Click on the group under which you want to make a sub group.

r which		Macro Mana	ager	×
oup.	□ □ □-□ Legacy Macros □-□ Cylon Macros □-□ Cylon Macros □-□ Heating	Sub Groups		Add Delete
	da - Carlos			Rename
	,	,	Export	Exit
		Macro Mana	ager	×
	E-E Macros	Sub Groups		Add
s in the	E - Cylon Macros H- Cylon Macros Heating			Delete
ine.	Heating			Rename
group.				
			Export	Exit
				×
os under		Macro Mana	iger	
ne " + "	E-C Legger Macros	Sub Groups		Add
p in the	Cylon Macros Heating Heating Heating	Boiler		Delete
p in the	Heating			Rename
		1		
			Export	Exit

Click on the Add button.

A new sub group appears in the right-hand " Sub groups " pane.

Type in a name for the sub group.

You can view the subgroups under a group by clicking on the " + " sign to the left of the group in the left-hand **explorer pane**.

To close the Macro Manager , click Exit .

When a new Macro group is created, it will be listed under Macros in the View menu. When a new sub-group is created, an icon is also created for that sub-group and displayed in the Macro sub-group bar.

HOW TO RENAME POINTS IN A MACRO TEMPLATE

Points can be renamed from the Macro Manager interface.

Open the Macro Manager by selecting Manager from the Macro group on the Strategy tab of the Ribbon

Strategy								
Copy	View Modules	T Add Text	I/O Terminals	Reorder Modules	BACnet Points BACnet Units Carategy Details	Strategy Help	View Macros	Start
Clipboard				Strategy			Macros	

or by clicking the Macro Manager... button on the Create Macro dialog

Mana Casuaina	
Macro Grouping	
Name	
	· · · · · · · · · · · · · · · · · · ·
Group	Cylon Macros 💌
Sub Group	BACnet 🔻
	Macro Manager
	-0

Clicking on a Macro Template in the left-hand-side 'Tree view' pane of the Macro Manager displays properties of the Macro Template in the right-hand pane.

The Macro Name , Macro ID , User Created flag, and the list of point names are displayed.

If point names have already been defined, then an **Edit Point Names** button will be displayed on the right-hand side of the dialog.

If there is no point names list, then a **Create Point** Names button will be displayed instead.

Clicking either button will open the Macro Point Name **Prefix** dialog, allowing point names to be edited for the current instance.

However, if this dialog is opened from theMacroManageras shown here instead of from theCreateMacrodialog, then whenOKis clicked theMacroTemplateis changed and anyMacro instances createdafterwards will use the updated point names list.

∃ 🚰 Macros	Property	Name	Туре	Import
Legacy Macros Cylon Macros Dr Cylon Macros Dr BACnet	Macro Name	WeatherCom		
	Macro ID	(D8F90DE3-7A64-4531-B		Delete
	User Created	True		Rename
🗄 🗁 Heating	Point 13		Analog	Kename
Boiler	Point 14		Analog	Edit Points
WeatherCom	Point 15		Analog	
26	Point 16		Analog	
	Point 17		Analog	

	Mad	ro Point Conf	iguration		
	ame WeatherCom oup Heating				
Num	Name	Туре	Value	High U	Low Un
13		Analog		°C	
14		Analog		°C	
15		Analog		°C	
16		Analog		°C	
17		Analog		°C	
<					>
			(ок	Cancel

HOW TO SET MACRO SETPOINT UNIT LABELS

In the Macro Point Configuration dialog, it is possible to set labels for specific setpoint values, so that a user can for example select "Night" and "Day" for a digital setpoint, or "off", "on", "trip" and "switch" for an analog point, without the need to know which numerical value matches each function.

To set an enumerated list for a setpoint, right-click on the setpoint in the Macro Point Configuration dialog, and select Add/Edit Enumerates .

Note: This option is only available for setpoints.

Note: This option will not be available when a Macro is being added to a strategy, or when a Macro instance is being edited within a strategy – in those cases, when the Macro Point Configuration dialog opens the user will be allowed only to select from an existing enumerated list, or to type a value.

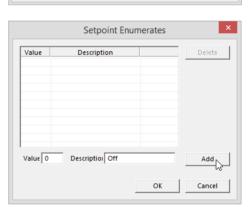
	ame HtgFreeClg oup Cylon Macros				
Num	Name	Type	Value V	High U	Low
4	ClgRange	Analog Setpoint	40.00	96	
33	HtgRange	Analog Setpoint	40.00	96	
2	FreeRange	Analog	1 00 00	l or	_
7	HtgFrostStatPos	Analog Ad	d/Edit Enume	rates	
13	HtgWarmUpPos	Analog Setpoint	10.00	70	
46	HtgFrost1_2Pos	Analog Setpoint	100.00	%	
5	DamperMinPos	Analog Setpoint	10.00	96	
8	FreeFrostStatPos	Analog Setpoint	0.00	%	
9	ClgFrostStatPos	Analog Setpoint	0.00	%	
14	FreeWarmUpPos	Analog Setpoint	0.00	96	
47	FreeFrost1_2Pos	Analog Setpoint	0.00	%	
48	ClgFrost1_2Pos	Analog Setpoint	0.00	%	
51	ClgWarmUpPos	Analog Setpoint	0.00	96	
16		Analog		°C	
17		Analog		°C	
19		Analog		°C	
20		Analog		°C	
21		Analog		°C	
22		Analog		°C	
23		Analog		°C	
25		Analog		°C	
26		Analog		*C	
27		Analog		*C	
<					>

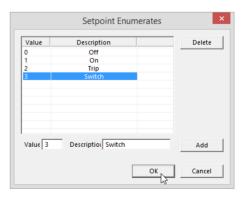
This will open the Setpoint Enumerates dialog.

Enter a Value and Description pair, and click the Add button. The Value/Description pair will be added to the list.

If an entry is made in error it can be removed from the list by selecting it and clicking the **Delete** button.

When the list is complete, click **OK** to close the **Setpoint** Enumerates dialog.





Now, when editing the setpoint, the user can select the required value from a drop-down list.

	ame HtgFreeClg oup Cylon Macros				
Num	Name	Туре	Value V	High U	Low
4	ClgRange	Analog Setpoint	40.00	%	
33	HtgRange	Analog Setpoint	40.00	%	
2	FreeRange	Analog Setpoint	1:0n	%	
7	HtgFrostStatPos	Analog Setpoint		%	
13	HtgWarmUpPos	Analog Setpoint	0:Off	%	
46	HtgFrost1 2Pos	Analog Setpoint	1:On 2:Trip	%	
5	DamperMinPos	Analog Setpoint	3:Switchs	%	
8	FreeFrostStatPos	Analog Setpoint	20.00:CurVal	%	
9	ClgFrostStatPos	Analog Setpoint	0.00	%	
14	FreeWarmUpPos	Analog Setpoint	0.00	%	
47	FreeFrost1 2Pos	Analog Setpoint	0.00	%	
48	ClaFrost1 2Pos	Analog Setpoint	0.00	%	
51	ClgWarmUpPos	Analog Setpoint	0.00	%	
16		Analog		*C	
17		Analog		*C	
19		Analog		*C	
20		Analog		*C	
21		Analog		*C	
22		Analog		*C	
23		Analog		*C	
25		Analog		*C	
26		Analog		*C	
27		Analog		**	
<					>

The setpoint value is displayed in the list with the text description.

	lame HtgFreeClg roup Cylon Macros				
Num	Name	Туре	Value V	High U	Low
4	CloRange	Analog Setpoint	40.00	%	
33	HtgRange	Analog Setpoint	40.00	%	
2	FreeRange	Analog Setpoint	2:Trip	%	
7	HtgFrostStatPos	Analog Setpoint	100.00	%	
13	HtgWarmUpPos	Analog Setpoint	100.00	%	
46	HtgFrost1_2Pos	Analog Setpoint	100.00	%	
5	DamperMinPos	Analog Setpoint	10.00	%	
8	FreeFrostStatPos	Analog Setpoint	0.00	%	
9	CIgFrostStatPos	Analog Setpoint	0.00	%	
14	FreeWarmUpPos	Analog Setpoint	0.00	%	
47	FreeFrost1_2Pos	Analog Setpoint	0.00	%	
48	ClgFrost1_2Pos	Analog Setpoint	0.00	%	
51	ClgWarmUpPos	Analog Setpoint	0.00	%	
16		Analog		°C	
17		Analog		°C	
19		Analog		°C	
20		Analog		°C	
21		Analog		°C	
22		Analog		°C	
23		Analog		°C	
25		Analog		°C	
26		Analog		°C	
27		Analog		•	
<					>

The enumerated list is saved with the Macro template, and will be available in all instances of the Macro created afterwards.

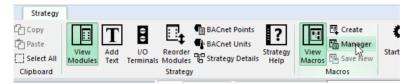
HOW TO TRANSFER MACROS FROM ONE COMPUTER TO ANOTHER

It is possible to use Macro Templates created on one PC on a different PC. They must be exported from the PC on which they are created, and added to the 'host' PC system (i.e. the PC on which they will be used) as follows:

Export macros from the PC on which they were created

Exporting Macro Templates as follows puts each Macro Template in a separate file with a user-identifiable name, so that they can be easily identified and moved to the 'host' PC system.

Open the Macro Manager by selecting Manager from the Macro group on the Strategy tab of the Ribbon



or by clicking the Macro Manager... button on the Create Macro dialog

Macro Grouping	
indere ereeping	
Name	
Group	Cylon Macros 💌
Sub Group	BACnet 💌
	Macro Manager

Select the Macro group that contains the Macro Templates you wish to export,

select all of the Macro Templates within that group that you wish to export,

and click the **Export** button.

A Select Folder dialog will open. Select the location into which the selected Macros will be saved.

	Macros Macros Marcos		Import Delete Rename
	11 104 TOIset	Export	Exit
	Select Folder	×	
Current Selection			
Documents ▶ ▶ Down ds		^	
 Music Pictures 			
Videos			
4 🏭 OS (C:)		~	
Folder: Documents			
Make New Folder		OK Cancel	

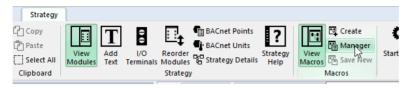
Macro Manager

×

Add exported Macros to the host PC system

Once all required Macros have been exported, copy them onto the PC on which they will be used.

Open the Macro Manager by selecting Manager from the Macro group on the Strategy tab of the Ribbon



or by clicking the Macro Manager... button on the Create Macro dialog

Macro Grouping	
Name	
Group	Cylon Macros 💌
Sub Group	BACnet 💌
	Macro Manager

Select the group and subgroup **into** which you wish to import **Macro Template**s,

and click on the Import button.

In the standard **Windows Open** dialog. Multiple files can be selected by holding the [CTRL] key while clicking on each file.

Select the Macro Templates you wish to add, and click the Open button.

The selected **Macro Templates** will be imported into the selected group.

If the Macro Template already exists on the host PC, an alert box will be displayed identifying the group and subgroup of any duplicates.

If you wish to import any of the listed Macro Templates, tick the box beside its name before clicking the OK button. This will create a new Macro Template on the host PC, in addition to the existing duplicate.

	Macr	o Manager		×
⊟-ta Macros	Macros	1		Import
E-La Macros	WeatherCom			
E Cylon Macros	U Ca WeatherCom			Delete
BACnet				
E Heating				Rename
Boiler WeatherCom				
			Expo	rt Exit
8		Open		×
🛞 🌛 🝷 🕇 퉬 « temp	▹ Macros	v C	Search Macros	Q
Organise 👻 New folder			0000	II • 🔟 🔞
sources	^	Name	^	Date mo
lemp				
		A03.m32		03/12/2
attachments		A06.m32		03/12/2
Macros		WeatherCo	۸۶ mm m32	07/01/2
📕 ro		_ weathered	inition of the second s	01/01/2
VirtualMachines	~	<		>
File name	: "A06.m32" "A03.r	m32"	✓ *.m32	~
			<u>O</u> pen	Cancel
	Impor	ting Macros		×
Some of these macros already been imported import anyway.				
Issue				File
Macro <a03> has</a03>	same ID as <a0< td=""><td>3> in <uc32 ma<="" td=""><td>cros->Air Syst</td><td>A03.m32</td></uc32></td></a0<>	3> in <uc32 ma<="" td=""><td>cros->Air Syst</td><td>A03.m32</td></uc32>	cros->Air Syst	A03.m32
Macro <a06> has</a06>				
<				>
Select All			OK	Cancel
				Curreer

Note: Each newly imported Macro Template will be named "x New Macro", where x is the index of the Macro Template in the list.

To change this name, select it in the Macro Manager dialog, and click the Rename button.

Once all Macro Templates have been added, they are available for use in the 'host' PC.

WORKING WITH MACROS

To access the Macro groups and sub groups that exist in a site, click on View Macros in the Strategy tab of the Ribbon .

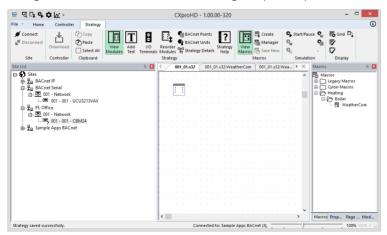
er Strategy					
다 Copy 한 Paste Select All Clipboard	View Modules	I/O Reorder Terminals Module: Strateg	BACnet Points BACnet Units BACnet Units Call Strategy Details	Strategy Help	View Macws Macros

The Macros pane will be displayed on the right-hand side of the **CXpro^{HD}** window



How to insert a macro into a strategy

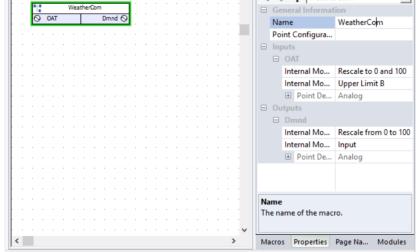
To insert a **Macro** in a strategy, select it in the **Macros** pane and click in the drawing area (note the cursor changes to the "Module Cursor" : during this process)



<u>⊐</u> दि⊑ ,,,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		CV 115 400.00 0			_ 🗆 🛛
File Home Controller Strateg	Ν	Aacro Point Configuration	l.		()
Connect Disconnect Download Site Controller Coller Coller	Macro Details Name WeatherCom Group Heating Subgroup Boiler	Point Name Prefix This text wil each point Prefix	be prepended to name below.	Start/Pause 9	Display
Site List	,			I × Mac	nos 🕮 🗷 Macros
	Num. Name 23 24 25 25 26 27	Type Valu Analog Analog Analog Analog Analog Analog	2 High U Low Un 'C 'C 'C 'C 'C 'C		iespacy Macros ⊖ Gylon Macros Heating ⊟ ∰ Boiler ⊢ ∰ WeatherCom
Setup block updated.	¢	CXproHD - 1.00.	ок	> Mac	rros Prop Page Mod
File Home Controller Strateg	N	CAPIOITD - 1.00.	0-520		
Ø Connect Ø Disconnect Download Site Controller Clipboard	TB	Reorder Modules & Strategy	Strategy Help	ager O	°a ♥ □
Site List	Д 🔀	4 001_01.s32 001_0	1.s32:WeatherCom 001_0	1.s32:Wea ▶ ×	Macros 🏨
□ ● Stes □ ▲ BACnet IP □ ▲ BACnet Serial □ ▲ ■ □ ▲ ■ □ ■ <td>,</td> <td>P<mark>: WesterCon</mark> ⊙ CAT Cr</td> <td>ल ह</td> <td></td> <td>Image Marcos Image Marcos</td>	,	P <mark>: WesterCon</mark> ⊙ CAT Cr	ल ह		Image Marcos Image Marcos
		<		>	Macros Prop Page Mod
Setup block updated.		Connected	to: Sample Apps BACnet (3),		100% OVR (

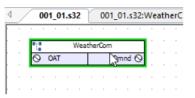
The Macro instance can be renamed, and its details viewed, through the Properties pane. Properties џ× < > ? WeatherCom \mathbf{h} - General Information
 Name
 WeatherCom

4



How to view the modules in a macro ("Expanding" a macro)

To expand a Macro, double-click on the Macro symbol on the drawing area.



CXpro^{HD} will open a new strategy for the Macro's constituent modules.

4	/	00	1_0	1.s	32	r	00	1_0	1.s	32:V	Vea	the	rC	om	Y	0	01_	01.	s32	2:W	eat	her	Coi	m	Y	001	_01	1.53	2:W	Vea	the	erCo	om	1		Þ	×
	0	20	°C (Dut	side	e Ai	r Te	emp	pera	itur	e is	w ma	lea opp	ath	er to	Co a F	om lov	ipe / Te	e ns emp	ato	o r tur	e S	etp	oin	t of	20	8	30 °	Ċ.								^
		20, E			Con	-							_	=80 R ∼	, в		0 Real	Con				35					10				_	om		0 100		3	
				(eal		0	it utpu utpu	t A	0	23			G	onsta	int /	A: 8	0.00); ()	0	lutpu lutpu ant	t B (~	26 27	•	•	, 26 , 27 25	0	_	perl	Limi Limi				Outp	ut (נ	
	Cons	stant	A: 2	0.0); O						-	. 23	B A	<u>_</u>				to 0		l 100 Outp		32 O	25		-												
	Ou	tsid	e A	ir 1	en	npe	rat	ur	e ((r)	.24 Re	C)In ale	s in	put	t te	mp	era	ture	2	-10															
	· ·																																				
						•		•							•		•					•		•													
<																																				>	ř

- **Note**: The view settings for Lines and Point Numbers are saved with the Macro. They are not inherited from the parent strategy. For example, if lines are not visible when a Macro is expanded, simply right-click on the strategy drawing, select Display Options, and specify that lines are to be shown.
- **Note:** To distinguish between the inputs and outputs of individual modules and the inputs and outputs of the overall Macro module red highlighting is used to mark the connection points of the Macro module. It also provides the full path of the strategy file that it just created when expanding the Macro in the **Window** menu.
- **Note:** Any changes made to a macro within a strategy will only affect the current strategy. The macro and all of its module blocks are saved within the active strategy. To edit the macro strategy itself you must open the *.etm file.

How to Edit a Macro

It is not possible to edit an existing Macro Template, but it is possible re-save a modified Macro as a new Macro Template. To do this, expand the Macro by double-clicking on the Macro symbol on the drawing area.

1	/		00	1_0	l.s	32	ľ	00	1_0	1.s	32:\	Ne	ath	erC
	•	·	•	•	•						•	•	•	•
		۹Ţ			1	Wea	the	rCon	n			1		
		6)	OAT) Ju	nnd	0	1		
	÷													÷

CXpro^{HD} will open a new strategy for the Macro's constituent modules.

001_01.s32	001_01.s32:WeatherCom	001_01.s32:WeatherCom	001_01.s32:WeatherCom	×
0 20 °C Outsid	Weathe Air Temperature is mapped to	r Compensator a Flow Temperature Setpoint	of 20 80 °C	^
	A=80,	B=20 Real Constant 35	100 B Rescale from 0 to 100 33	1
A=20, B=80	\sim		0 <u>_</u> A	
R Real Cor		Output A Output B 26 27 A: 80.00; Constant B: 2	. 26 O Lower Limit A Output O . 27 O Upper Limit B . 25 O Input	
Constant A: 20.00; C	Output B Q 23	Rescale to 0 and 100 32	25 G mpor	
		er Limit A Output Output		
Outside Air Ten	perature (OAT)			
	Rescales i so that 0	nput temperature 20 °C becomes 0 100		
			,	,

Make any required changes to the component modules of the Macro by clicking on the symbol and editing its properties in the **Properties** pane.

To save the changes select Save New from the Macros section of the Strategy tab on the Ribbon .



This opens the Create Macro dialog, but in this case Macro Inputs and Macro Outputs cannot be added or deleted.

The input and output point names can be changed, as can the Macro Name, Group and Sub Group.

	Weather Comp	ensator												
0 20 °C Outside Air Temperature is	a mapped to a Flow	Temperature	Setpoint of	20 80 9	°C .									
	A=80, B=20													
		onstant 35		100	Rescale	from 0 tr	0 100 33	n - 1						
A=20, B=80	- I 💫 👘			·										
R Real Constant 34	· •	Output A (S		26 O Lo	ver Limit /	A	Output	5						
· 💫	·	Output B G		- THE U	iper Limit B	3		4						
Output A Q 77	Constant A: 0.00; C	ionstant B: 0.00		DT O In	put	1		1						
Output B Q 24														
Constant A: 0.00; Constant B: 0.00	8 100 Rescale to	0 and 100 32		1										
	A-0													
	.23 O Lower Limit A	Output 6	25											
	24 O Upper Limit B													
Outside Air Temperature (OAT)	OInput													
	Rescales input tem													
	so that 0 20 °C H		100											
		ecomes 0	100											
	so that 0 20 °C b		100											
	so that 0 20 °C b		100											
	so that 0 20 °C b		100											
	so that 0 20 °C b		100											
	'so that 0 20 °C b		100	· · · · ·							-			
acro inputs/Outputs	'so that 0' 20 °C E		100		Macro	Group	bing				-			
Inputs	So that 0 20 °C E	ecomes 0	100		Macro	o Group	-							
	So that 0 20 °C E	iecomes 0	100		Macro	o Group	bing	me						>
Inputs	So that 0 20 °C E	iecomes 0	100		Macro	o Group	Na							>
000 OAT Change Name	So that 0 20 °C E	iecomes 0	-		Macro	Group	-		Heatir	ng]	>
Inputs	So that 0 20 °C E	iecomes 0	ange Name		Macro		Na	up	Heatir	_				
000 OAT Change Name	So that 0 20 °C E	iecomes 0	-		Macro		Na Gro	up	Boiler			-		
000 OAT Change Name	So that 0 20 °C E	iecomes 0	-		Macro		Na Gro	up	Boiler		anag	-		
000 OAT Change Name	So that 0 20 °C E	iecomes 0	-		Macro		Na Gro	up	Boiler		anag	-		
000 OAT Change Name	So that 0 20 °C E	iecomes 0	-		Macro		Na Gro	up	Boiler		anag	-		>

SECTION 8: COMMUNICATING WITH CONTROLLERS

COMMUNICATING WITH CYLON CONTROLLERS

When you are using **CXpro^{HD}**, you will need to communicate with the Cylon **controllers** on the site.

- You may need to **send** information **to** a **controller** such as a control **strategy**, a command to erase its memory, details of its **setup**, etc.
- You may need to **get** information **from** a **controller** such as its version, current **setup** and details of any **strategies** it may contain.
- You may wish to view events **within** a **controller**, such as changes in values when a **strategy** is being serviced. This can be done in **Scan** mode or by using the **LiveLog** menu option.

SENDING INFORMATION TO A FIELD CONTROLLER

In **CXpro^{HD}**, downloading a strategy can be completed in a single step, when you use **Automatic Download** (see page 115). When the strategy is ready to be downloaded, simply click the download button on the toolbar or choose **Download** from the **Communications** menu and **CXpro^{HD}** will download the strategy and send the set-up automatically. Alternatively, you can use **Automatic On-line Download** (see page 117), where **CXpro^{HD}** automatically downloads a module as soon as it is placed on the drawing area. Or finally, if you are already familiar with **CXpro^{HD}**, you can download manually.

Automatic download

For details of how to enable Automatic Download, refer to *Downloading a strategy using Automatic Download* on page 115.

Automatic on-line download

If you use **Automatic on-line download**, **CXpro^{HD}** will download to the controller the contents of the drawing area as soon as each module is placed on the drawing area. In other words, you do not have to press the download button on the toolbar or choose **Download** from the **Communications** menu. **CXpro^{HD}** will download automatically. For more detail see *Downloading a strategy using Automatic Online Downloading* on page 117.

The following criteria must be met for automatic on-line download to function:

- You must wipe the controller's memory before beginning the strategy.
- You must be working on-line, i.e. you must be logged in to the controller.
- You must enable automatic on-line download.
- When the strategy is completed, you must send details of the number of blocks to service to the controller, i.e. send the set-up.

Downloading tip

If you enable both options (Automatic download and Automatic online downloading) on the Download setup tab, **CXpro^{HD}** will automatically wipe the controller's memory, download the modules as soon as they are placed on the drawing area and then automatically send the set-up. For example, supposing that you want to design a basic **Strategy**, download it and then download any changes that you make. In that case, you would enable the first option, i.e. Automatic Download, create the basic **Strategy** and download it by clicking the toolbar. **CXpro^{HD}** will send the set-up automatically. Then you would enable the second option on the **Download Setup** tab, Automatic on-line downloading, so that each time you make a change to the original strategy or add another module, the changes are downloaded and the set-up is sent automatically.

Wiping a Field Controller's memory

Although it is no longer necessary to wipe the Field Controller's memory before downloading if automatic download is enabled, it is still necessary to wipe the controller's memory before using it for the first time. If you are not using automatic download, you must manually wipe the controller's memory before downloading.

The effect of wiping a Field Controller's memory

Wiping Field Controller memory has the following effect:

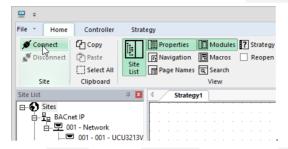
- All blocks are deleted (the strategy is deleted).
- The functions of the site (valves, pumps, dampers, etc. controlled by this Field Controller, are no longer available.)
- The number of serviced blocks will be set to zero. Field Controller Set-up has to be sent again.
- All virtual points are assigned the value zero.
- All hardware points are assigned the value zero.
- All outputs go to zero volts.
- Inputs do not read any signals from connected devices. This is true for manually overridden points too.
- The green LED on the Field Controller flashes rapidly. If the Field Controller is running without a network (standalone), the flashes are regular. If the Field Controller is running on a network (connected to a BACnet Router), the flashes are irregular.
- If the alarm feature is active, an alarm appears on the monitor of the connected PC.
- If a keypad program for that Field Controller exists, it will be deleted.

Sending the setup to a Field Controller

If you are using **Automatic Download**, it is not necessary to send the **setup** to the **controller** after downloading. Otherwise, **setup** must be sent manually as described in *Starting a strategy (sending the Setup)* on page 125.

How to get the Controller version

- Select the **controller** in the **Site List**
- Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :



• Select Version from the Operations section of the Controller tab in the Ribbon .

ne	Controller Stra	itegy			
	tommunications	📩 Download	Compare	L23 Version	Reard Diagnostics
rt	Controller	Wipe Controller	Show Compare	🗟 Time and Date	Statistics
	BACnet	者 Auto Online		Maximums	Lock and Unlock
	Configuration		Oper	ations	

CXpro^{HD} will get the version from the **controller** and display it.

	Version		×
Version	UC32.8B 7.6.9 05/05/16 Boot Ver:06.00		_
Serial Number	CU12205068F		_
	ECP		
		Close	

Click OK to close the Version window.

How to get the controller setup

- Select the **controller** in the **Site List**
- Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :

File - Home	Controller	Strategy									
S Connect	Copy Paste		Prope Navig Page	ation		Mo Ma Sea	cro	s		ate <u>o</u> ope	
	C Derece An	List 🗔	ruge		~ ~	1.200					
Site	Clipboard	LIST	ruge			View					
Site Site List				Strate		-					

• Select Time and Date from the Operations section of the Controller tab in the Ribbon .

Controller Stra	ategy			
to Communications	📥 Download	Compare	L23 Version	Reard Diagnostics
Gontroller	Wipe Controller	Show Compare	🗟 Time and Date	Statistics
BACnet	者 Auto Online		Maximums	Lock and Unlock
Configuration		Oper	ations	

CXpro^{HD} will get the **Setup** of the **controller** and display it.

Controller Configuration	×
Number Of Strategy Blocks To Service Description Last Composed Strategy Last Modified Time 11:57:35 Date 14/08/2018 Time 11:57:35	Send Receive
User ID User Name User Name Strategy ID 0 Drawing Reference Min Service Time 0 Time Synchronisation Wait After 0	
Current Status Received setup from controller	Close

Click OK to close the Time and Date window.

How to get controller statistics

- Select the **controller** in the **Site List**
- Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :

🛄 후											
File • Home	Controller	Strat	egy								
🚿 Connect	습 Copy	Ĩ:	Prop	erties		Mo	dul	es	?	Strat	eg
🖋 Disconnect	Paste	Site Navigation			Ma				Reop	oer	
	Select All	List	Pag	e Name	s a	Sea	arch				
		LISC				-					
Site	Clipboard	List				Vie					
Site Site List	Clipboard	Д 🗙		Strate		-					
		д X				-					

• Select Statistics from the Operations section of the Controller tab in the Ribbon .

h	e	Controller	Stra	itegy			
		🎝 Communica	tions	📥 Download	Compare	1.23 Version	Board Diagnostics
c	t	Controller		Wipe Controller	Show Compare	🗟 Time and Date	Statistics
	- I •	BACnet		🛃 Auto Online		Maximums	Lock and Unlock
		Configuratio	on		Oper	rations	

The **Statistics** dialog box, shown below, appears. The **Statistics** dialog box contains information that comes directly from the controller – this information allows you to check the status of the controller.

Statistics	×
Engineering Statistics System Statistics Serial Port Statistics	1
Number of Resets 0 Clear Number of Crash Detects 0 Comm. Checksum Errors 0 Number of Bad Blocks 0 Status	
	ОК

The Statistics dialog box has three tabs - Engineering Statistics , System Statistics , and Serial Port Statistics .

Engineering statistics tab

Sta	atistics		×
Engineering Statistics System Statistics Serial Port St	atistics		1
Number of Resets Number of Crash Detects Comm. Checksum Errors Number of Bad Blocks Status ☐ WatchDog On ☐ Real Time Clock present		Cear	
			ок

Number of resets indicates how many times the Field Controller has been powered up and down

Number of crash detects the number of crash events detected since the Strategy started

Comm. Checksum errors the number of data errors that have occurred in communications

Number of bad blocks the number of bad or corrupted blocks that have been detected in the strategy

Watchdog on This shows the current status of the "Watchdog" on the Field Controller – the box is checked if the watchdog is switched on (a watchdog is a hardware component in the controller that checks if the controller is serviceable. When the watchdog is off, the controller is not operating)

Real time clock present indicates if a real time clock is present in the Field Controller

System statistics tab

This tab provides information on any problems the controller may have in servicing the strategy.

Engineering Statistics System Statistics Senal Port Statistics Last Reset Last Reset Invalid Setup Block Number Of Blocks Servicing Number of Bad Block First Bad Block C Last Bad Block C

Last reset Shows the date and time that the Field Controller was last reset

Set-up block indicates if the **Setup** block (the block in the controller that stores details of the number of blocks in the **strategy**) is in place.

Number of blocks servicing shows how many blocks are servicing in the Field Controller

Number of bad blocks shows how many bad or corrupted blocks are detected in the Field Controller

First bad block The number of the first of the bad blocks (if any)

Last bad block The number of the last of the bad blocks (if any)

Serial Port Statistics tab

CXpro^{HD} can display information about messages passing through the **Field Controller**'s serial ports as follows:

	Statistics ×
Engineering Statistics System Statistics Serial P	ort Statistics
Serial Port Type	
Subnet	Receive
C Service	Clear
C Internal Keypad	
C External Keypad	
Total Number	Keypad Information
Bytes Received 0 Overrun En	Tors 0 Unexpected Responses 0
Bytes Sent 0 Framing En	rors 0 Rx Timeouts 0
Packets Received 0 Parity En	rors 0 Resends 0
Packets Sent 0 Standard B	eceived Errors Packet Size NACKS
NACKS Received 0	0 Undefined NACKS 0
NACKS Sent 0 Break Cond	litions Broadcast Information
ACKS Received 0	0 Faults 0
ACKS Sent 0	CRC Errors 0
Checksum Errors 0	Packets Received OK
	Packets Received 0
	OK

The first section of this panel, Serial Port Type allows you to select which of the four possible serial ports the displayed information refers to.

Pressing the **Receive** button causes **CXpro^{HD}** to upload information about the selected port from the Field **Controller**.

Clicking on Clear causes the Field Controller to clear its memory of port statistics for the selected port.

The information displayed is the number of each of the following messages that passed through the selected serial port since the controller's memory was last cleared:

- Number of Bytes received
- Number of Bytes Sent
- Number of Packets received
- Number of Packets Sent
- Number of NACKs received
- Number of NACKs sent
- Number of ACKs received
- Number of ACKs sent
- Number of Checksum errors
- Number of Overrun errors
- Number of Framing errors
- Number of Parity errors
- Number of break conditions

This information can be used to diagnose low-level problems with the **Field Controller's** serial-port communications, and this is usually done in consultation with Cylon Technical Support.

How to get Field Controller Diagnostic information

CXpro^{HD} has a facility to display information about the operation of the UC32 controller's hardware system. This information, referred to as 'board diagnostics' can be of use in troubleshooting unusual and low-level problems on a Cylon site, and is intended for use primarily when communicating with Cylon technical support.

Board Diagnostic information may be viewed by selecting Diagnostics from the Controller tab on the Ribbon .

Controller Str	ategy			
tommunications	📥 Download	Compare	L23 Version	🖳 Board Diagnostics
Controller	Wipe Controller	Show Compare	🗟 Time and Date	Statistics
BACnet	🛃 Auto Online		Maximums	Lock and Unlock
Configuration		Oper	ations	

This opens a display panel showing categories of information about the Field Controller's hardware.

	Board Diagnostics	ĸ
Battery Status	Vector	
Battery	VECTOR COUNT VALUE	
DAC Reading for Ov switch to		
Port Setup Address		
Board ID Resistors		
Daughter Board		
	< >	
Ready		-
	Receive Close	1

Clicking on the **Receive** button causes **CXpro^{HD}** to upload the relevant information from the targeted Field Controller.

How to get Field Controller Configuration information

Field Controller configuration information can be of use in troubleshooting unusual and low-level problems on a Cylon site, and is intended for use primarily when communicating with Cylon Technical Support.

To view this information, select Maximums from the Controller tab of the Ribbon

Controller	Stra	itegy				
🔥 Communicat	tions	📥 Download	Compare	123 Version	🥄 Board Diagnostics	
Gontroller		Y Wipe Controller	Show Compare	🗟 Time and Date	Statistics	
BACnet		者 Auto Online		Maximums	Lock and Unlock	
Configuratio	n		Oper	ations		

This opens a display panel showing the configuration of the Field Controller's hardware.

Maximums	×
Maximum Subnet Address	63
Maximum Strategy Block	1024
Maximum Number of Datalogs	32
Maximum Keypad Program Size	20003
	Close

HOW TO SET THE CONTROLLER TIME AND DATE

- Select the **controller** in the **Site List**
- Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :

<u> </u>	Ŧ						
File	+	Home	Controller	Strat	egy		
ø	Con	nect Sonnect	Сору	1.	Properties	Modules	? Strategy
1	Disc	Sonnect	Paste	141 C 1	Properties	Macros	🗌 Reopen
			Select All	List	📑 Page Names	Q Search	
	Si	te	Clipboard			View	

• Select Time and Date from the Operations section of the Controller tab in the Ribbon .

ne	Controller	Strat	tegy			
	🔩 Communicati	ions	📥 Download	Compare	1.23 Version	Reard Diagnostics
rt	Gontroller		Wipe Controller	Show Compare	🗟 Time and Date	Statistics
	BACnet		🛃 Auto Online		Maximums 🗟	Lock and Unlock
	Configuration	n		One	rations	

This opens the Time and Date dialog.

Time and Date	×
Time and Date Time C: 06:57 • System Time/Date Date 14/08/2018 •	Send Receive
Time Based On C None C EU C US C US C Use Point 0	
Current Status Error receiving time and date from controller	Close

In this dialog, you can check the time and date set in the targeted **controller** by clicking on the **Receive** button (time and date are automatically received when you first open the dialog).

The Time and Date can be changed by typing a new date, by scrolling, or by pressing the System Time / Date button, which sets the time and date to match the settings in the PC on which CXpro^{HD} is running.

The daylight saving time scheme can be selected in the Time based on box on the Time and Date dialog:

- If the None option is selected for Daylight Savings, then the controller will not automatically adjust its time to match conventional Summer and Winter time.
- If the EU option is selected for Daylight Savings, then the controller will automatically adjust its time according to the standard European rules for Summer and Winter time.
- If the **US** option is selected for Daylight Savings, then the controller will automatically adjust its time according to the standard rules used in the USA for Summer and Winter time.
- If the Use Point option is selected for Daylight Savings, then you can specify a point whose value will determine Summer and Winter time.

If the time and date settings have been changed in the dialog box, they must be sent to the controller before they will take effect. This is done by clicking the Send button:

Clicking the **Close** button closes the dialog box without sending or receiving further information.

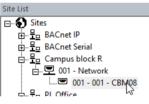
CHANGING THE ADDRESS OF A CONTROLLER (CBM ONLY)

CBM controller addresses must be set from software, because there are no Address **DIP** switches on this type of **controller**. To set a **controller's** address from **CXpro^{HD}**:

- Make sure that the PC, running CXpro^{HD}, is directly connected to the Field Controller's service port.
- Make sure that there is a **site** set up in **CXpro^{HD}** with the **PC** connected to **COM** port:

	Sites Configura	ation	
Site Information			
Name	Campus block R		Add New Site
Directory	CAMPBLOR		Change Site
Type of Conne	ction for this Site		
	Serial Connection		
	O BACnet IP		Clear
BACnet IP BACnet Serial Campus block R PL Office			Edit Controller
BACnet Serial Campus block R	Cnet		Edit Controller
BACnet Serial Campus block R PL Office	Enet		Edit Controller Delete Site

• Make sure that the directly connected controller is targeted in **CXpro^{HD'}**s Site List



• Connect to the controller by clicking on the Connect button in the Home tab of the Ribbon :

<u> </u>	Ŧ						
File	-	Home	Controller	Strat	egy		
\$		connect ite	Copy	Lite Site	Properties	Modules Macros Search View	Strategy Reopen

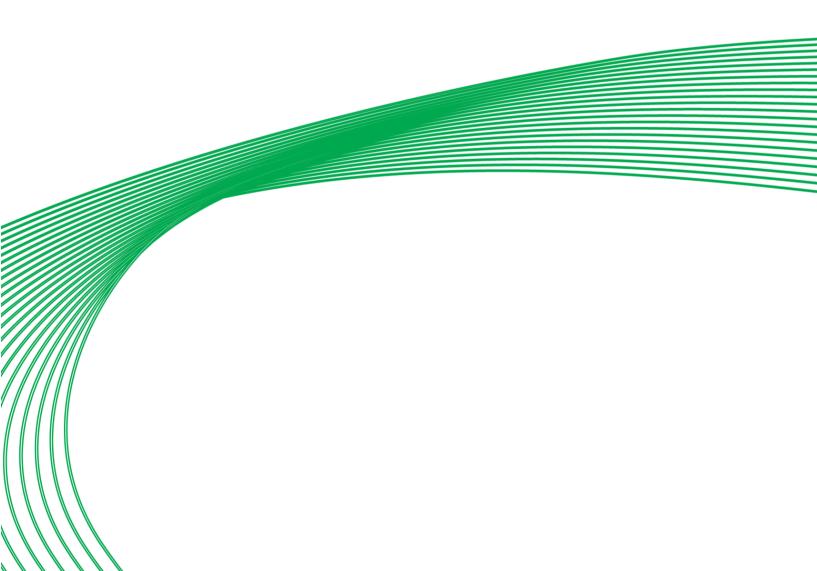
• Select BACnet from the Configuration section of the Controller tab in the Ribbon

Controller	Stra	ategy	
🎝 Communica	tions	📥 Download	Compare
Gontroller		Wipe Controller	Show Compare
BACnet Configuratio		者 Auto Online	
Configuratio	on		Op

In the BACnet Configuration dialog you can set the address for the controller

	BACnet Configuration ×					
	Controller	Config	New			
Controller	1	1	25			
Device Instance	41	41				
Device Name	001 - 001 - CBM08	001 - 001 - CBM08	001 - 001 - CBM0			

SECTION 9: DATALOGS AND ALARMS



DATALOGS

Datalogs (Trendlogs) are a feature of **Field Controllers** that allows point values to be recorded over a period of time. The recorded data can be later retrieved, displayed, and analyzed with the **Datalog Manager** module.

Analysis of logged data is often useful in optimizing the effectiveness of a Cylon site's **controllers** and **strategies**, and Identifying opportunities for energy savings.

The datalog function module

The collection of point values in a **datalog** is implemented in a **strategy** by either the Datalog module or the BACnet Trendlog module.

Datalog 2 Datalog_1	
Analog input Digital input	BACnet Trendlog 4 Outside Air Temperature Trend
Enable	Digital input
Log trigger	O Analog input
Datalog number: 1; Update interval: 900; Link: 0; Datalog	Enable
Trigger Options: Any Edge; Delta:	Log trigger
1.00; Extended length: 0	Datalog Trigger Options: Any Edge

The content of a Datalog can be viewed with the Cylon Datalog Manager, and the content of a BACnet Trendlog can be examined by a BACnet supervisor. Their use in the **Strategy** is identical.

Restrictions on the use of datalogs

The number of Datalogs (Trendlogs) permitted in a strategy depends on the type of controller in which the strategy will be used.

Some controllers, such as the **CBM24** can have up to 32 datalogs, with a maximum of 1024 entries per datalog. Other controllers, such as the **CBT12**, have up to 6 datalogs, with a maximum of 1024 entries in each. You can determine the number of datalogs that a particular controller can hold using the **Maximums** dialog box, available from the **Operatons** section of the **Controller** tab on the **Ribbon** menu.

Standard Datalog sampling period

Each standard **datalog** module can be configured with an individual time constant for sampling data. To make the evaluation of **datalogs** easier it is advisable to use the same time period for sampling data in all **datalog** modules. A sampling period of 15 minutes is suggested.

The period of time over which the datalog samples is equal to the product of number of entries (104 or 192) and the sampling frequency. For example, a datalog module on a UC16PG with a sampling frequency of 15 minutes (900 seconds) will take samples for (192 X 15) minutes = 48 hours.

Time Stamped Datalogs

A time-stamped **datalog** records the time and date at which a value was recorded, along with the value. A logging interval is not set - instead the value of the specified point is recorded:

- when the digital trigger point changes state
- when a logged digital point changes state
- or when a logged analog point changes state by more than a predefined amount from the last value that was logged for it.

There are several situations when such a **datalog** would be particularly useful. For instance, if you log the value of a point with a conventional **datalog** and set the logging interval to 10 minutes, the value of the point may change significantly and return to its original value over a period of 3 minutes, and that change might occur during the 10 minutes when the **datalog** is not recording. If so, the event would not be logged at all. On the other hand, if the logging interval was 30 seconds, the event would be recorded - but the datalog could fill up and the event could be 'flushed' before it is viewed. If so, the event would also be lost. In both of these cases, a time-stamped **datalog** could record data over the period of the event only, so that the necessary data is recorded without the **datalog** filling up.

The other primary use of a time-stamped **datalog** is to log conditions that surround an event. For instance, when a window is opened, the temperature of the surrounding area could be logged to see how it reacts.

Datalog sampling of digital and analog point values

Both digital and analog point values can be sampled. The datalog module has a digital input and an analog input.

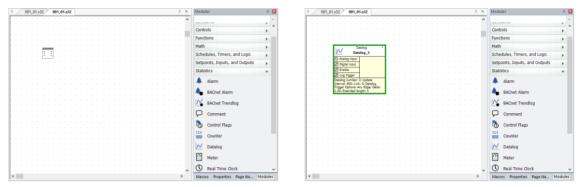
Analog Input n Temperature	1		Datalog 2 Room TemperatureA
Poin	(<u>)</u>	(1)	Analog input
Override	· 6		Digital input
 			Enable
 			Log trigger
			Datalog number: 1; Update interval: 900; Link: 0; Datalog
 			Trigger Options: Any Edge; Delta:
 			1.00; Extended length: 0
Digital Input	2		Datalog 3 Valve 209A
Valve 209			♦ Analog input
Point	(<u>)</u>	(2)	Digital input
Override			🗗 Enable
			Log trigger
 			Datalog number: 2; Update
 			interval: 900; Link: 0; Datalog
 			Trigger Options: Any Edge; Delta: 1.00; Extended length: 0

How to define a datalog

To define a datalog, proceed as follows:

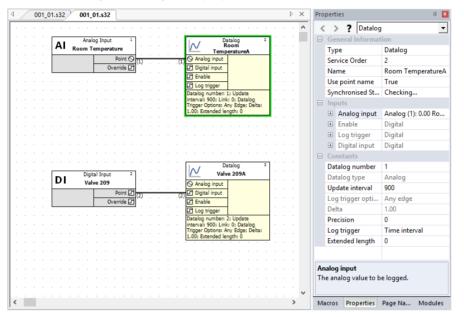
Select the Datalog module in the Modules pane

		×
	,	×
Controls	•	^
Functions	•	
Math	•	
Schedules, Timers, and Logic	•	
Setpoints, Inputs, and Outputs	•	
Statistics		
🌲 Alarm		
A BACnet Alarm		
BACnet Trendlog		
Comment		
Control Flags		
nnn Counter		1
✓ Datalog		
Meter		
Real Time Clock		~



and place it on the drawing area (note the cursor changes to the "Module Cursor" 🛄 during this process)

Select the datalog, and configure its properties



Name

A datalog is automatically given the same name as the point to which it is joined, but can be edited if the Use Point name property is set to False.

Use Point name

If True, then the Name property matches the connected point and cannot be edited.

Analog input

This shows details of the point to be logged, if an Analog point is connected

Enable

The Enabling Point is a digital point, connected to the "Enable" input of the datalog module, which restarts the sampling process if its value changes from 0 to 1. If this point is not connected, then the **datalog** samples continuously. In typical applications this input is not used.

Log Trigger

In Time-stamped **datalogs**, it is possible to record data when this trigger point changes. If the trigger point is not connected, logging occurs according to the '**Minimum Change**' parameter.

Digital input

This shows details of the point to be logged, if a Digital point is connected

Datalog Number

This shows the automatically-assigned number for the Datalog within the strategy.

Datalog Type

The type (analog or digital) of the point being sampled is shown in the Type of Point to Log.

Update Interval

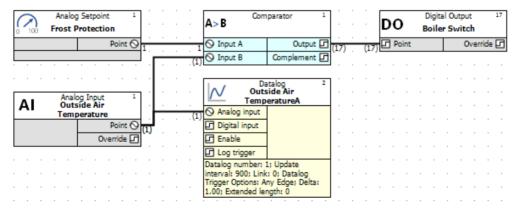
This is the frequency of sampling (in seconds). By default this is 900 (15 minutes) but can be edited in the **Properties** pane.

Delta

If the datalog type is set to 'Time Stamped', and if the type of point being logged is analog, it is possible to trigger a sample whenever the point value changes by more than a particular amount. This field specifies that amount of change.

Starting a datalog

A datalog is part of a strategy and is saved with the strategy. The example below shows a datalog module linked to a strategy:



Datalogs are started along with the rest of the strategy in which they are contained, when the strategy has been saved (see page 109), downloaded (see page 114), started (see page 125) and tested (see page 128).

Note: If the block on which a datalog module is placed is downloaded again to the Field Controller, the sampled data is deleted.

Viewing the contents of a datalog

This is done on a PC running Cylon software.

The **Datalog Manager** program is used to view or print out datalogs, on screen or printer, as text or graphics. To open is, click on the **Datalog Manager** icon in the **Home** tab of the **Ribbon**.

Home	Controller	Strategy							
nnect	Сору	Properties	Modules ? Strateg	gy Help					
sconnect	Paste	INavigation	🖪 Macros 🗹 Reope	n Strategies	- p		ட்க்	<u>ت</u>	
	Select All	Site List Page Names	Search		Configuration	Mana 2r (Backup	NB-Pro
Site	Clipboard		View			Utilities			1

The Datalog Manager allows data from Field Controller datalogs to be viewed in a variety of ways:

- The data can be listed as text.
- A datalog can be viewed as a graph.
- Information from multiple datalogs can be superimposed on one graph.
- The status of data points can be viewed in real-time.
- 'Snapshots' can be made of data from any set of analog points in a controller strategy.

For further details on the display and printing of datalogs, see the Datalog Manager manual.

Archived datalogs can be statistically evaluated by using programs like Microsoft Excel. This provides valuable information about the operation of the site.

ALARMS

Alarms are used in a BMS system to alert site supervisors/engineers to any difficulties that may occur on a Site. The Cylon BACnet range supports BACnet Alarm notifications which can be made available to BACnet supervisors such as Cylon's Aspect[™] UI.

The **BACnet** Alarm module is joined to a digital point (**Binary Value**). When the digital point has the value 1, the **BACnet** Alarm module is activated. The **Binary Value** may indicate an error condition, for example a sensor going out of normal range or a fire alarm being activated.

Alarms can also be set up directly on BACnet points via standard BACnet protocol.

Starting alarms

Alarms are parts of **strategies** and are saved with the **strategies**. The examples belowshow how alarm modules can be linked to a strategy.

Alarms are started after the related strategies have been saved, downloaded, started and tested.

Examples of Strategies containing alarms

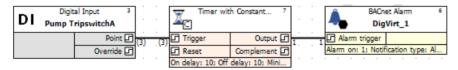
Alarms - Example 1: Pump Trip Switch

To illustrate the use of an alarm module in a strategy, this guide takes as an example a simple case where a digital hardware input represents a trip-switch contact of a pump. Joining the digital input to an alarm module means that an alarm will be generated if the pump goes off-line.



Alarms - Example 2: Pump Trip Switch with delay

This case joins a digital virtual point (a delay of 60 seconds on the digital hardware input) to the alarm record function module.

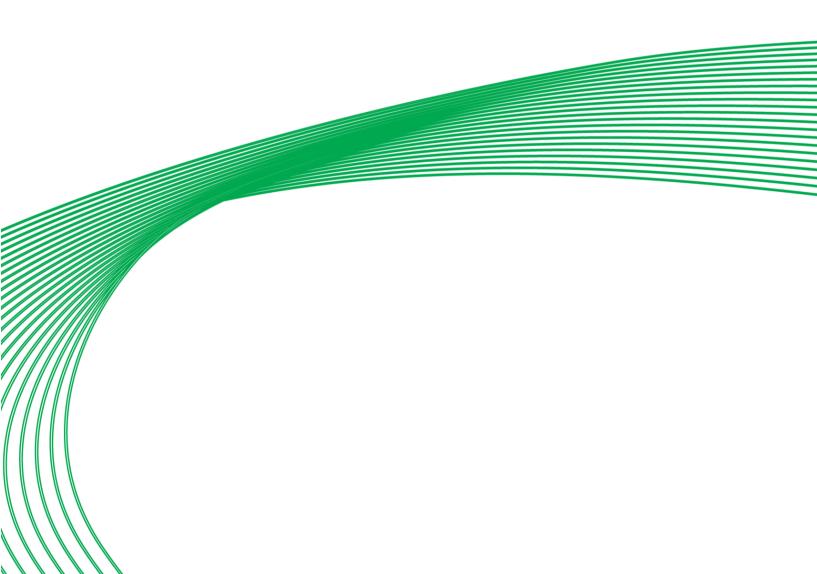


Alarms - Example 3: Room Temperature Input

In this case, an analog input (room temperature) is joined to the alarm record function module, and will cause an alarm to be sent to the Alarm Handler program if the input value is not within the range specified in the real constant module.

$\stackrel{\rm R}{\sim}$	Real Co	nstant ⁸			B > (A	Win	dow	Cor	npa	rato	r	9			Ĵ	,			et Ala Virt_			10
		Output A 🚫	,		0	Lowe	er lim	iit A	(Dut \	vind	low		,	, 0	A	arm	trig	ger				
		Output B 🚫	2		0	Uppe	r lim	it B		In v	vind	low		-	 A	arm	on:	1;	Notif	icatio	n typ	e: A	
Constar	nt A: 0.00; Co	onstant B: 0.00	ſ	.(4)	0	Input	C																
AI	Analog Room Ten										÷												
	_	Point O	(4)						:														
		Override 🗗																					

SECTION 10: SIMULATION MODE



INTRODUCTION

A **Simulation Mode** is available within **CXpro^{HD}**, which allows the operation of a **strategy** to be simulated without the requiring a **controller** to be connected. This is done, in most cases, by using actual Firmware code to ensure the simulation is as close as possible to real controllers.

Simulation Mode is access through the Simulation section of the Strategy tab on the Ribbon

ler	Strategy										
	Copy Paste Select All lipboard	View Modules Add Text	I/O Reor Terminals Mode Stra	BACnet Points BACnet Units BACnet Units BACnet Units BACnet Units BACnet Units	Strategy Help	View Macros	Start/Pause	Stop Stop	Reset mulatio	Logging Configuration 1 seconds	唐 明 し



Clicking this button will start and pause the simulation for the current strategy. It is enabled only if **CXpro^{HD}** is **not** logged into the site. When the **strategy** is paused, the current simulation state is still visible on the **strategy**.



Clicking this button will stop the simulation and clear the simulation information from the screen. However, the simulation state will still be preserved, and pressing the **Start/Pause** button will restart from where it stopped.



Clicking this button will stop the simulation, clear the simulation information from the screen and clear any other simulation information for the strategy.

Clicking this button will enable or disable logging of data. When released, no point logging will happen. When pushed, any point that has logging information set will have its values logged accordingly.

Clicking this button opens the Simulation Configuration dialog.

CONFIGURING THE SIMULATION

Several aspects of the Simulation can be configured by pressing the **Simulation** button the **Simulation** section of the **Strategy** tab on the **Ribbon**. This opens the **Simulation Configuration** dialog.

Simulatio	on Configuration
General configuration – Simulation <u>Speed</u>	Normal
Display Progress As	Runtime
Current simulation confi	iguration 7:46:18
	Cancel

The Simulation Cycle

The basic unit for a simulation is a **Simulation Cycle**. This corresponds to approximately 1 second of runtime on a controller. Some modules (Hardware, Globals, time dependent modules) will be processed a fixed number of time during a cycle. Most of the other modules will be processed a number of times that depends on the size of the strategy. The bigger the strategy, the less the modules will be processed.

Simulation speed

The Simulation can be run manually ("Step by Step") where each click on the start button runs one Simulation Cycle, or automatically at one of 3 speeds: **Slow** (once cycle every 5 seconds), **Normal** (one cycle per second) or **Fast** (5 cycles per second).

Display Progress As:

The progress of the current simulation is displayed in the right-most section of the Simulation Toolbar. This progress can be displayed as **Runtime** (number of seconds since the simulation started) or **Date/Time** (current simulation date and time)

Current simulation configuration

Start time/date:

When the Simulation Cycle is run, any time and date dependent modules – such as Time Schedules or Datalogs/Trendlogs - will use a simulated time. The value used will be the time and date set in the **Current simulation configuration Start time/date** field of the **Simulation Configuration** dialog, incremented by one second on each Simulation Cycle.

This allows a Strategy to be tested for unusual behaviours at specific times such as daylight savings time, yearend, leap years etc.

The value of this time and date will be displayed in the right-most section of the **Simulation Toolbar** if the **Display Progress As** field is set to **Date/Time**.

RUNNING A SIMULATION

When a Simulation runs, the labels at the end of lines will be updated to show the point values.

log Setpoint 1 t Protection		A>B Com	parator 1		
Point 🛇	1:10 1:10	🛇 Input A	Output 🗗	(17):	
	(1); 0	🛇 Input B	Complement 🗗	Ľ	
		-			
alog Input 1 Itside Air		Outs ∩√	atalog ² side Air eratureA		
ype: Input og/Digital Type: thered/Dithered		Analog input Digital input Enable			· ·

A green background means that the value is calculated by the simulation.

A red background indicates that the value has been overridden by the user.

Note: It is possible to add, update and delete modules and lines while the simulation is running. The simulation will take it instantly into account in its calculations.

Livelog

During a simulation the livelog will display values from a simulation run so that it is possible to view point values from different parts of the strategy simultaneously.

POINT PROPERTIES

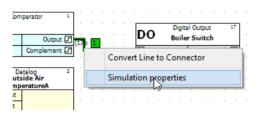
The Simulation mode has two sets of point properties:

- one for input points that feed into the Strategy (hardware inputs and Globals' destinations),
- one for all the other points whose values result from the Strategy's internal calculation.

Accessing the points properties

To open the Simulation Properties for a specific point right click and select Simulation properties. This can be done on either Lines, Hardware I/O modules or connected nodes:

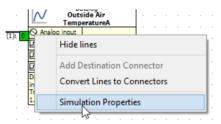
Lines



Hardware I/O modules

AI	Analog Input 1 Outside Air Temperature (1):	\ /
	Simulation properties	E
	Dat	L

Connected nodes



Point value override

In a point's Simulation properties dialog you can specify whether the value for the point will be calculated by the Simulation, or set to a fixed value:

Analog points:

Point calculated automatically:

Point Value Point Loggin	a
Override	0.00
Input points	

Point overridden and set to 18.5:

Point Value Point Logging	1	
All Points	18.50	
- Input points		

Digital Points:

Point calculated automatically:

Point Value Point Loggi	ng	
All Points	Γ	
- Input points		

Point overridden, and set to "Off" (boolean 0)

Point Value Point Loggi	ng	
All Points		
Input points		

Point overridden, and set to "On" (boolean 1)

Point Value Point Loggi	ng	
All Points	v	
- Input points	Y	

Input point options

For input point, a selection of options is available to simulate different types of inputs. For Digital points there are two options, for Analog points there are 7:

Digital Input point options

one	-
None	
Fixed	13
Periodic change	

• Fixed value

The point will have a fixed value throughout the Simulation run.

Value is "Off" for the whole Simulation run:

Input points		
Fixed	•	
Value:		

Value is "On" for the whole Simulation run:

Input points		
Fixed	•	
Value:		

• Periodic change

This option will change the value of the digital point during the Simulation run.

If the Random period box is unchecked, the value will change after the Basic Period specified:

Input points	
Periodic change	•
Random period	
Basic period	2 Secs. 💌

If the **Random period** box is checked, the value will change after a random period which is less than the specified **Basic Period**:

Input points	
Periodic change	•
Random period	
Basic period	2 Secs. 💌

Analog Input point options:

Random Value	N
None Fixed	7.00
Random Value	
Up (down) only Up (down) only with limit	1.00
Up and down	
Values from File	

• None

The point is not assigned a value. The value will either be the last value that the point had, or zero if no previous value existed.

⊢ k	nput points –				
	None		-		
	,		_		

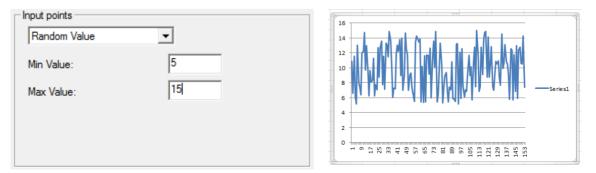
• Fixed

The point will have a fixed value throughout the Simulation run.

Input points		
Fixed	•	10
Value:	10	8 Piot Area
		6Series1
		4
		2
		88 113 113 113 113 113 113 113 113 113 1

• Random value

During each simulation cycle, the point will be assigned a random value between a given minimum and maximum.



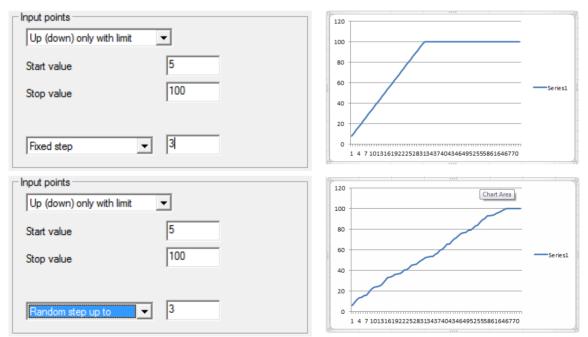
• Up (down) only

The value will change in only one direction (up or down). Use a negative step limit to go down.

Input points	
	180
Up (down) only	160
	140
Start value 5	120
	100
	80
	40
Fixed step	
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Input points	
Input points Up (down) only	
Up (down) only	80
Up (down) only	80 70 70
Up (down) only	
Up (down) only	80 70 60 50 40 30 50 50 50 50 50 50 50 50 50 50 50 50 50
Up (down) only	80 70 60 50 40 30 20 20
Up (down) only	80 70 60 50 40 30 20 10
Up (down) only	80 70 60 50 40 30 20 20

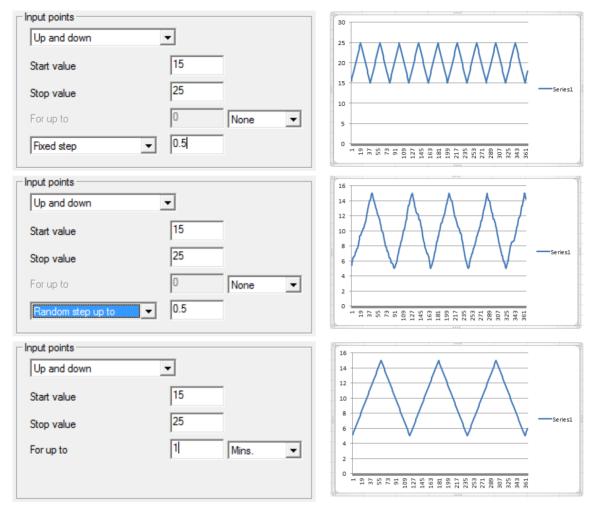
• Up (down) only with limit

The value will go from a Start value to a Stop value.



• Up and down

The value will go up and down continuously between two limits either by a specified step (fixed or random) with a specified period (specify the time to go from one limit to the other).



• Values from file

The point value will be taken from a datalog file – at each simulation cycle the next value will be read from the file.

This allows using real data such as a datalog of outside air temperature in the simulation. It also makes it possible to repeat a simulation exactly if the input points from the original simulation have been logged.

Input points		
Values from File	-	
File		

Simulation Mode

POINT LOGGING

Point Value Point Logg None None Time stamped logging	ing V	
Point Value Point Log		
File Sample interval Datalog capacity (50-4096)	900 1024	

Any point in the strategy can be logged to a file. This can be used to review values after the strategy has run, and analyse issues. It can also be used to feed back the value in another simulation (see "Input points options").

Note: Logging will occur only if both

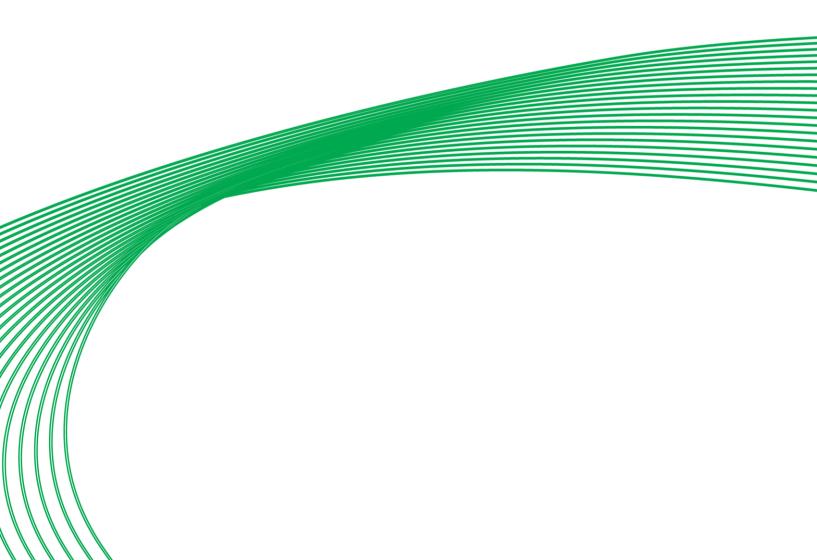
1. the settings in the point Simulation properties dialog are set and



2. the logging button $_{\text{Start/Pause}}$ is pressed in the Simulation section of the Strategy tab on the Ribbon .

This means that logging can be switched on or off during a simulation by clicking the logging button.

SECTION 11: SITES



OVERVIEW

A site is the name given to one or more controllers, optionally connected to a PC. The following are examples of sites.

- A standalone Field Controller.
- One BACnet Router with a Fieldbus of one or more Field Controllers
- A network of **BACnet Routers**, each with a **Fieldbus** of one or more **Field Controllers**, connected to each other via TCP/IP.

Sites are configured in the Configuration program.

Some common procedures carried out on sites include:

- Installing a new site on the PC (see page 200)
- Site backup (see page 201)

INSTALLING A NEW SITE ON THE PC

To install a new site on a PC, the Cylon Software Suite must be installed already.

A new site is one which has not been installed on this PC before, and for which a backup from another PC does not exist.

WHAT HAPPENS WHEN A NEW SITE IS INSTALLED

Installing a new site involves the following events:

- Site-specific directories are created on the hard disk.
- Site-specific information (information about network ID, telephone number, ID code, etc.) is entered in the wn3000.ini file.
- The network size (number of **BACnet** Routers) is specified.
- The BACnet Routers and Field Controllers are named.

The **Configuration** program performs all these steps. For further details, see *MAN-0041 Configuration User Manual.*

Note: Do not manually make entries to the WN3000.ini when installing a site on the PC. All necessary changes will be made to the WN3000.ini file by the Configuration utility.

HOW A NEW SITE IS INSTALLED ON THE PC

Installing a new site on the PC involves the following procedures:

- Naming the new site in the **Configuration** program.
- Entering the size of the site (number of **BACnet** Routers) in the **Configuration** program.
- Naming the **BACnet** Routers and **Field Controllers** in the **Configuration** program.
- If the site is not a remote site, it can be configured as the default site (see MAN-0134 MAN0134US CXpro^{HD} System Configuration).
- Restarting **Microsoft Windows** and the **CXpro^{HD}** for the changes to take effect.

SITE BACKUP

Making a site backup means making a copy of all site-relevant data on the PC onto removable media such as network, USB **flash** drive, external **Hard Disk** or tape. A **site** can then be recreated on another PC running **CXpro**^{HD} from this site backup.

Making a site backup

To backup a site, right-click on the site in the Site Tree, and select Backup Site from the context menu:



You will be prompted for a location to save the backup file:

					ρ.
janise = New folder				100 •	0
This PC	 Na 	me	Date modified	Type	Sk
3D Objects		10020601	04/12/2018 14:55	File folder	
Desktop		APPLBACN	04/12/2018 14:07	File folder	
Documents		Archive	04/12/2018 14:07	File folder	
Downloads		BACNETIP	04/12/2018 14:07	File folder	
h Music		BACNSERI	04/12/2018 14:07	File folder	
Pictures		Bitmaps	04/12/2018 14:07	File folder	
Videos		CAMPBLOR	04/12/2018 15:58	File folder	
Local Disk (C:)		Help	24/04/2019 08:46	File folder	
		PLOFFICE	02/05/2019 12:56	File folder	
CXproHD		STORES	01/02/2019 11:50	File folder	
10020801		Symbols6	15/03/2019 12:21	File folder	
APPLBACN		System	02/05/2019 10:16	File folder	
Archive		Temp	01/02/2019 12:01	File folder	
BACNETIP		Template	04/12/2018 14:07	File folder	
BACNSER		UC32Macros Utilities	15/03/2019 12:23 24/04/2019 08:46	File folder File folder	
Bitmaps		Utilities	24/04/2019 08:46	Filefolder	
CAMPBLOR	~ <				>
File name: PL Office.C/8					
	-				
Save as type: C/tproHD Backup (".C	(B)				~

Select any suitable device or folder and click Save .

Restoring a Site from a backup file

To restore a site from a backup, right-click on the Sites node in the Site Tree, and select Restore Site from the context menu:

Site List	д	x
□··· ♥ Sit □··· 문 Discover Site □··· 문 Import V7 Sites □··· 문 Restore Site □··· 문 Campus block R □··· 문 PL Office	;	

Choose the required backup file and click **Open** :

→ ✓ ↑ → This PC → Local	UISK (C) > CAPIOHD	✓ Ŏ Search CXp	م, DHD
Organise 🔻 New folder			BH 🔹 🛄 🔞
💂 www	A Name	Date modified	Туре
🥑 manuals	10020801	04/12/2018 14:55	File folder
source	APPLBACN	04/12/2018 14:07	File folder
g source	Archive	04/12/2018 14:07	File folder
temp	BACNETIP	04/12/2018 14:07	File folder
	BACNSERI	04/12/2018 14:07	File folder
Desktop	Bitmaps	04/12/2018 14:07	File folder
ConeDrive	CAMPBLOR	04/12/2018 15:58	File folder
Eugene Peelo	- Help	24/04/2019 08:46	File folder
This PC	PLOFFICE	02/05/2019 12:56	File folder
3D Objects	STORES	01/02/2019 11:50	File folder
Desktop	Symbols6	15/03/2019 12:21	File folder
Coursents	System	02/05/2019 10:16	File folder
Downloads	Temp	01/02/2019 12:01	File folder
h Music	Template	04/12/2018 14:07	File folder
•	UC32Macros	15/03/2019 12:23	File folder
E Pictures	Utilities	24/04/2019 08:46	File folder
Videos			
Local Disk (C:)			
CXproHD	v <		
File name:		CXproHD	Backup (*.CXB) V

If no site with the same name exists, then the restored site is added to the system as new site.

If a site by the same name exists, the user will be asked to choose either to overwrite the existing site or to create a new site.

- If you choose to overwrite the site that has the same name, the existing site will be completely overwritten. You will be asked to confirm that you want to proceed.
- If you choose to create a new site, you will be asked to enter a new name, and a new site will be added to the site tree. The chosen name must be unique.

You can cancel the restore process at any time.

SITE DISCOVERY

Strategy block data can now be uploaded from **Cylon** controllers and re-assembled into an easy-to-view layout. This is useful when you have a **Site** where you do not have existing **Strategy** drawings or other information.

The purpose of the discovery process is to determine all of the Subnets (i.e. a Fieldbus connected to a BACnet Router) on a Site.

Note: All Subnets are searched so that the integrity of the data passed between Subnets (e.g. wide globals) remains intact. This happens even if you are looking for information on a single Subnet.

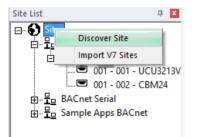
This process can be lengthy, so please ensure that sufficient time is allocated for it.

However, you do not have to upload all Subnets at one time. If you specify a Subnet Range for a specific upload, you can retrieve the other Subnets at a later point in time.

The upload process is started from the Site Tree, either from the Sites Icon (if the Site is not already in the tree) or from the relevant Site node.

If the Site is not yet configured in the Site Tree

Click on the Sites icon in the Site Tree, and select Discover Site



This opens the Discovery Site Details dialog with all fields editable.

Discovery Site D	etails ×
Enter the details of the site you would like to disc large number of devices, please ensure the Timeou	
Site Details Site Name Site Directory Site Number 4 (Next free: 4) Device ID Range 1 to 4194302	Network Type C BACnet Serial G BACnet IP
Wait Timeout (s) 25 MSTP Network	Discover Cancel

Enter the Site Name and Site Directory directory.

If you do not want to retrieve all Fieldbusses on the Site, specify a Subnet Range .

Sites can be uploaded either through TCP/IP or through a serial connection. For TCP/IP connections, include the IP Address and verify the port. Port 4950 is the default.

When configured, click Discover .

Sites

If the Site is already configured in the Site Tree

If the Site is represented in the Site Tree – i.e. if it has been configured locally configured using the Configuration Utility (CCConfig), click on its node in the Site Tree and select Upload Site :

	무 ×
∃ 🚯 Sites	
⊞= BACnet IP	
🖽 📲 🗖 BACnet Serial	
Discover Site	
Export Aspect Data	
⊡ <u>H</u> ⊒ PL Of	
	ta
🗢, 001 - 001 - CBM24	
🗄 📲 🔤 Sample Apps BACnet	
📩 📼 001 - Wet Systems	
Discovery S	ite Details ×
Please ensure the information is correct for BACnet sites, ensure the Timeout value is lar	rge enough.
Site Details	Network Type
Site Name Campus block R	
	C BACnet Serial
Site Directory CAMPBLOR	© BACnet Serial © BACnet IP
Site Directory CAMPBLOR Site Number 5	
Site Directory CAMPBLOR Site Number 5 Device ID Range 1 to 4194302	
Site Directory CAMPBLOR Site Number 5	
Site Directory CAMPBLOR Site Number 5 Device ID Range 1 to 4194302	

The **Discovery Site Details** dialog will be displayed as before, but in this case the **Site** details are not editable.

When configured, click Discover .

After the discovery process is started, the Site Discovery Progress dialog appears showing its progress:

	Site Discov	ery Progress
		ess. Please wait until this is finished before te or press cancel to finish the process early.
Site Details		Summary
Name	Campus block R	"I-Am" Received Count 0
Number	5	Properties Read Count 0
Network	BACnet	
- Controller Di	scovery Calling Whols on Network	
	Reading Device properties	
Attempting to	connect to site <campus blo<="" td=""><td>ck R> Cancel</td></campus>	ck R> Cancel

If you click Cancel to stop the process, any uploaded information is discarded and not applied to Site in CXpro^{HD}.

When the discovery has concluded, the discovered Fieldbusses /BACnet Routers are displayed in the Discovery Results dialog:

Site	Details Name Number Network	8 TCP/				Comms Controller Cour Field Controller Count	t 1 2	
	Name	Num	Default Type	UC32	No. Types	Version	IP Address	
7	001 - UC32Net	1	UC32.netK/WEB	Y	2	net WM 2.03.03	192.168.5.46	Configure
-	001 - UC32.24	1	UC32.24	Y	3	UC32.246.2.1		Configure
	002 - UC32.16	2	UC32.16	Y	2	UC32.16 6.2.1		Configure
xpor	t to CSV					Rescan	Continue	Cancel

The **Export to CSV** feature provides a convenient way to get subnet information and firmware versions of controllers in the networks in CSV format that can be easily imported into Microsoft Excel.

If all known **BACnet Routers** are displayed and online in the **Discovery Results** dialog, click **Continue** to upload **Strategy** information.

ASPECT[®] / INTEGRA™ EXPORT

This feature saves data for a **Controller**, **Fieldbus** (**Subnet**), or **Site** into a JSON-formatted text file for import into ASPECT[®] or INTEGRA[™], allowing applications to be automatically configured in **ASPECT[®]-Studio** or **INTEGRA[™] IT-8000**.

Starting the Export

To export a Field Controller, BACnet Router, or Site, right-click on its node in the Site Tree and choose Export ASPECT/INTEGRA Data .

	ACnet IP ACnet Serial
P	Discover Site
5	Export Aspect/Integra Data
	Create BACnet EDE Data
	Upgrade BACnet Units

If a Field Controller is selected, that controller's information is exported to the **ASPECT[®]** / **INTEGRA™**. json file, along with the parent network and parent site information as required to correctly import into **ASPECT[®]** or **INTEGRA™**.

If a **Fieldbus** is selected, information for all controllers in that **Fieldbus** is exported along with the parent site information as required to correctly import into Aspect.

If a Site is selected, information for all Controllers on all Fieldbusses within that site will be exported.

The points that will be exported will be those that are specified in theExportcolumn of theBACnet Pointsdialog.TheBACnet Pointsdialog is opened by clicking onBACnet Pointsin theStrategytab of the ribbon – seeHow toexpose Points on a BACnet system on page 134.

BACnet	Export	Point Name	Point Addr	Point Type
•		Room Setting	5	Analog Setpoint
~		MaxHWater	28	Analog Virtual
~		Adder/Scaler Block 19 Output	29	Analog Virtual
¥	-	WeatherCom Block 8001 Inpu	30	Analog Virtual
•		Heating Water Temp	2	Analog Input
v	R.	Temperature	3	Analog Input
v	L3	Alarm Enable	2	Digital Setpoint
~		DigVirt_3	3	Digital Virtual
v		Schedule No. 1 (On)	4	Digital Virtual
~	Ц	Hysteresis Block 15 Active High	9	Digital Output
Used Avail	mum BAC I BACnet able BACr rt Total	10	Maximum Bir Used Binary Available Bir	Unit 3
tpoint Li Max l		d Setpoint and BACnet 324	Unexpos	ed 0
Availa	able Setpo	ints / BACnet Points 314		,

After exporting, set a name for the export file that you want. By default it is set to the name of the Site. The filename extension must remain as .json for easy import into **ASPECT**[®] or **INTEGRA**TM.

Save A	As	×
(<) → ↑ ↓ ≪ CXproHD → CAMPBLOR	✓ C Search CAMPBLOR	P,
Organise 🔻 New folder	·== ▼	0
AITEMP CXproHD CXproHD Archive Archive BACNETIP BACNSERI Bitmaps CAMPBLOR ACCHIVE	 Name ARCHIVE dbase DRAWINGS KEYPAD MACROS strat5 STRATEGY 	^ ~ >
File name: Campus block R.json Save as type:	Save	

After setting the filename, click Save .

The process will begin to export information. The **Creating Aspect Data**... dialog will be displayed to show the progress of the export:

Creating Aspect Data	
001 - UC32netK - 007 - UC3224	
Processing: 6 of 12	<u>Stop</u>
001 - UC32netK - 012 - UC3224: Datalog block 14 has a connected point that is not named.	^
001 - UC32netK - 012 - UC3224: Datalog block 131 has a connected point that is not named. 001 - UC32netK - 012 - UC3224: Datalog block 250 has a connected point that is not named. 001 - UC32netK - 012 - UC3224: Datalog block 251 has a connected point that is not named.	
001 - UC32netK - 012 - UC3224: Datalog block 252 has a connected point that is not named. 001 - UC32netK - 012 - UC3224: Datalog block 253 has a connected point that is not named.	
001 - UC32netK - 012 - UC3224: In path "/C/Aspect_v_Unitron/001_UC32netK/012_UC3224", "reset" 001 - UC32netK - 011 - UC3224: Datalog block 14 has a connected point that is not named.	is a reserved word
001 - UC32netK - 011 - UC3224: Datalog block 131 has a connected point that is not named. 001 - UC32netK - 011 - UC3224: Datalog block 250 has a connected point that is not named.	~
<	>
	Close

For any errors or warnings encountered, you will see the network (Fieldbus) name, the name of the Controller and the action that should be taken. Correct these errors in the appropriate Strategy or configuration and then start the Export process again.

You may stop the export process at any time and review the errors and warnings.

You may copy the errors and warnings from the dialog into a document or email.

When finished, click **Close** to complete the process.

Import into ASPECT[®]-Studio and INTEGRA[™]-ProPack

Refer to MAN0129 ASPECT®-Studio for details about importing the .json data into ASPECT®.

Refer to MAN0140 INTEGRA™ ProPack for details about importing the .json data into INTEGRA™.

Launching CXpro^{HD} from INTEGRA[™]-ProPack

When an export file from **CXpro^{HD}** is imported into an **IT-8000**, it is then possible to launch **CXpro^{HD}** from the **INTEGRA™** UI – targeting a specific controller for engineering or debugging.

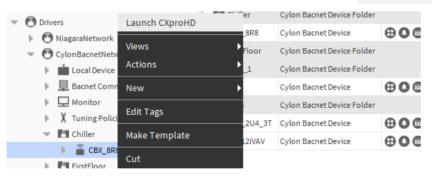
In order to do this, ensure you have **CXpro^{HD}** installed on your computer and **INTEGRA™** version 4.7 or greater is installed on the **IT-8000** or supervisor. Also, ensure that the **CylonService** is installed.

You must also have a copy of the **CXpro^{HD}** project and **strategies** in **CXpro^{HD}**.

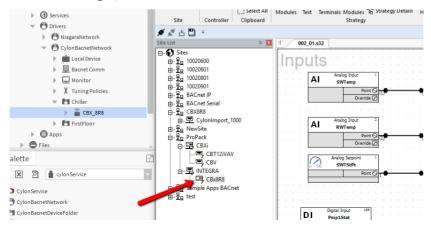
Note: The CylonService uses the site name and device instance numbers to locate the strategy in CXpro^{HD}, so you must ensure that the site name in the INTEGRA[™] station matches the site name in CXpro^{HD}. To verify or edit the site name in the INTEGRA[™] station, open the property sheet for CylonBacnetNetwork :

Pr	ope	erty Sheet	
0	Cyl	onBacnetNetwork (Cylo	on Bacnet Network)
		Status	{ok}
		Enabled	true -
		Fault Cause	
Þ	\Box	Health	Ok [06-May-19 10:34 AM EDT]
₽	0	Alarm Source Info	Alarm Source Info
₽	모	Monitor	Ping Monitor
Þ	旦	Bacnet Comm	Bacnet Stack
Þ	,	Local Device	Local Bacnet Device [device:10000]
Þ	X	Tuning Policies	Bacnet Tuning Policy Map
		Site Name	ProPack
		uploadOnStart	true
Þ	PI	INTEGRA	BacnetDeviceFolder:INTEGRA

To launch **CXpro^{HD}**, right-click on the Cylon controller and choose Launch CXproHD :



CXpro^{HD} will open at the project and the last-saved **strategy** for the selected controller, allowing you to debug, make code changes, and download to the controller.



SECTION 12: APPENDIX :: ADDING UNITS OF MEASUREMENT TO THE SYSTEM

ADDING UNITS OF MEASUREMENT

Additional units of measurement may be added to the existing list of units in a site to allow for a greater range of applications. Units must be added to the site.ini file in the C:\CXproHDCXproHD(SITENAME)\SYSTEM directory

Note: Before changing the site.ini file, make a backup copy (for example, site.ini.bak).

The site.ini file can be edited in a word-processing program such as **Microsoft Windows Notepad**, or **Microsoft Word**. If you use Word to edit the file, make sure to save the file as a "Text Only" document.

How to add units of measurement to the system

- Make a backup copy of site.ini.
- Open site.ini, using a word processing program.
- Search for the [AnalogUnits] section if adding analog units, and the [DigitalUnits] section if adding digital units.
- Either
 - o edit one of the entries marked "spare"
 - (e.g. change UNITS61="Spare1" to something like UNITS61="m/s")

<u>or</u>

o append the new units to the list of units

(for example, add something like UNITS74="m/s" to the end of the list of analog units).

If you add to the list in this manner, be sure also to increment the NumberUnits parameter so that it matches the final number of units. Ensure the the number at the end of the units variable (e.g. UNITS74) has a number at the end that matches its place in the list of units.

- Save the amended site.ini file.
- Close and restart **CXpro^{HD}**, to allow the changes to take effect. The new units can then be selected from list boxes for point configurations.

Appendix :: Adding units of

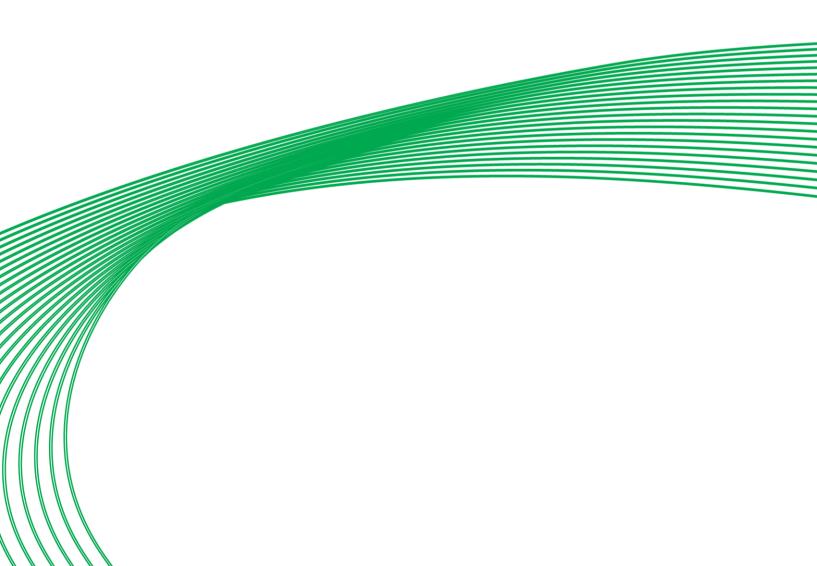
EXAMPLE OF ADDING UNITS TO ANALOG UNITS LIST

Old analog units list:	New list after changing:
[AnalogUnits]	[AnalogUnits]
NumberUnits=19	NumberUnits=21
Title="IU"	Title="Unit"
UNITS1=""	UNITS1=" "
UNI TS2=" %"	UNI TS2=" %"
UNITS3=" %rH"	UNITS3=" %rH"
UNITS4=" °C"	UNITS4=" C"
UNITS5=" Bits"	UNITS5=" Bits"
UNITS6="g/kg"	UNITS6="g/kg"
UNITS7=" Hz "	UNITS7=" Hz"
UNITS8=" kj/kg"	UNITS8=" kj/kg"
UNI TS9=" kWh"	UNITS9="kWh"
UNITS10=" L/s"	UNITS10=" L/s"
UNITS11=" Min"	UNITS11=" Min"
UNITS12=" mV"	UNITS12=" mV"
UNITS13=" Pa"	UNITS13=" Pa"
UNITS14="Sek"	UNITS14="Sek"
UNITS15=" Std"	UNITS15=" Std"
UNITS16=" Volt"	UNITS16=" Volt"
UNITS17=" bar"	UNITS17=" bar"
UNITS18=" K"	UNITS18=" K"
UNITS19=" Uhr"	UNITS19=" Uhr"
	UNITS20=" m/s"
	UNITS21=" kg/m3"

Note: Units are also listed in the C:\CXproHDCXproHDCXproHD(SYTEM\WN3000.ini. However, this file is for legacy applications only and applies throughout the Cylon Software system, and so must not be edited.

Note: Take care when editing site.ini not to change the section headings [AnalogUnits], [DigitalUnits] etc. in any way, because this can cause errors in the Cylon Software system.

SECTION 13: APPENDIX :: FILE MANAGEMENT



FILE MANAGEMENT IN CXPROHD

On a large site with multiple BACnet Routers where more than one engineer will be commissioning software at any one-time file management becomes very important.

You must insure that no one modifies the same strategies / global files that an engineer is currently commissioning. To guard against this, we would recommend that all files are stored on a central computer and only the files required for commissioning are copied onto the engineer's laptop. We would also recommend that each engineer is allocated a single BACnet Router to work on at any one time. At the end of each day / commissioning period the data files for the BACnet Router are copied back onto the central computer.

The data files required to commission a single LAN are as follows:

C:\CXproHDCXpro^{HD}\[SiteName]\dbase *

Where * is the address of the BACnet Router to be commissioned.

All files under

C:\CXproHDCXpro^{HD}\ [SiteName]\strat5***

Where ******* is the address of the BACnet Router to be commissioned.

The same files should be copied back to the central computer at the end of each day / commissioning period.

SECTION 14: APPENDIX :: BACNET EXPLORERS

CXpro^{HD} includes two utilities that facilitate the commissioning of BACnet Sites: the integrated **Discovery Tool**, accessible from the **Site Tree**, and the separate application **NB-Pro**.

NB-PRO

NB-Pro is a generic commissioning environment for BACnet controllers. Using **NB-Pro**, users can setup and configure devices to create control programs and strategies for building automation systems, including Cylon BACnet. For details see *MAN0122 NB-Link & NB-Pro*.

Note: For NB-Pro to work with CXpro^{HD}, you must open the Settings menu NB-Pro and select Network Configuration . In the Network Configuration dialog, select the Remote IP radio button in the Communicate Via: section so that NB-Pro does not attach to the BACnet UDP port of the PC as this would block CXpro^{HD}. Also, register NB-Pro as a foreign device on a CBR on the network by entering the CBR's IP address in the Network Configuration dialog's BBMD Device field.

DISCOVERY TOOL

The purpose of the **Discovery Tool** is to allow users to see all live BACnet devices, objects and properties on the network via **CXpro^{HD}**. It also allows some or all of the discovered objects to be added to an existing **Engineering Centre** Site or allow a new Site to be created with the discovered objects.

For existing sites, this tool is used to compare the site configuration with the devices that are live on the network. It is possible to change the present_value property of some objects.

BACnet Explorer

The Explorer is an extension of the Discovery Tool. It is available in **CXpro^{HD}** by right-clicking on a BACnet Site in the **Site Tree** and selecting **Discover Site**.



This opens the Site Discovery dialog, which is prefilled with the selected Site's information:

Site Details		Network Type
Site Name	East Hall	C Serial Connection
Site Directory	EASTHALL	C Unitron
		C BACnet
Site Number	4	Remote Connection
Address Range	1 to 4194302	C Unitron TCP/IF
Wait Timeout (s)	25	© BACnet IP
MSTP Network N		

If the Discover Site option is selected from the context menu of the Site Tree's root node,



then the Site Discovery dialog will be blank, and can be used to create a new Site.

enough.	per of devices, please ensure the Ti	
Site Details Site Name Site Directory Site Number Address Range Wait Timeout (s) MSTP Network		Network Type C Serial Connection C Unitron C BACnet Remote Connection C Unitron TCP/IP C BACnet IP

The Site Discovery dialog has the following fields:

Network Type

(If an existing Site is selected, this selection cannot be changed).

If a site is not selected, select a Network Type that will apply if you choose to create a site from the Explorer during the current exploration:

- Network 1 for Serial and Modem Sites
- Network 2 for TCP/IP or BACnet Sites

Site Name

(If an existing Site is selected, this field will not be editable).

If a site is not selected, enter a new Site Name here. If you choose to create a site from the Explorer during the current exploration, this is the name that will be used for it.

Site Directory

The **Site Directory** is automatically generated from the **Site Name**, but it can also be user defined. Do not use special characters in the **Site Directory** Name.

Site Number

(If an existing Site is selected, this field will not be editable).

If a site is not selected, specify a Site Number. If you choose to create a site from the Explorer during the current exploration, this is the Site Number that will be used for it.

Address Range

This can be used to limit the Discovery process. Only BACnet addresses within this range will be tested.

Wait Timeout (s)

This sets the length of time that the process will listen for I-Am responses during discovery.

Larger Sites require higher Wait Timeout(s) to explore the entire site (default 10 seconds)

Network

The user can choose a specific network to discover in this dialog box. If the user enters a network number, only devices on that network will be displayed. Leave this blank if you want to show devices on all networks.

The **Discover** button will launch the progress dialog.



A Whols call is made, and then the system waits for the specified timeout (default is 10 seconds) after which it reads the BACnet information for each Device that responded with an I-Am message. When this is complete, the results dialog opens:

Ite Details Name BACnetExplorer Number 5 Num. Devices 9	This is the BACnet	Explore	r dialog.						
BACnetExplorer	Name	MAC	Def. Type	Types	Model	ID	Vendor	Network	IP Addr
Cylon BACnet Router - Chris (60	Cylon BACnet Ro Unitron Slave UC		CBR UC32.24 B	3	Cylon BACnet R Unitron Virtual	6000 1220	171 171	0 61000	192.168.6.38
		2	CBR	2	UC32.24 Cylon BACnet R	1054 49	171 171	60000 0	192.168.6.40
Controller type UC32.24 (10	Controller type U Controller type U	2	UCU12 BAC	2	UC32.24 UCU12	6767 3752	171 171	51 51	100 100 0 0
🕀 🗌 🗐 Object-List	Cylon BACnet Ro 001 - UC3224 BA			3 2 2	Cylon BACnet R UC32.24	141078	171	0 51 51	192.168.6.35
Controller type UC32.24 (67 Controller type UCU12 (375)	002 - CBT12	2	UCU12 BAC	2	UCU12	141079	171	51	
🛛 🖳 Cylon BACnet Router 49 (14107									
🛨 🗹 🖾 002 - CBT12 (141079)									
4 III									
Select all devices to add to Site	Rescan Network	1			Add Sala	cted Devic	es to Site	7	Close

The results dialog contains two panels:

- The left panel contains a tree view list of the BACnet devices and objects discovered.
- The right contains information regarding the selected device or object.

It is possible that not all devices would be discovered during the specified Wait Timeout(s) ., so if necessary you can re-scan the network for further devices by clicking the again so that the settings for Address Range , Wait Timeout(s) and Network number can be adjusted. Devices that have already been discovered will be skipped, so that further devices may be discovered even if none of the settings are changed.

The tree view is similar to the existing site list in other applications. The site is the root node of the tree, followed by the routers and then devices under those. Under the device nodes there are other nodes in the Object List. Expanding this will show each object read in from the parent device.

As an extension of the **Site Discovery Tool**, the Explorer allows devices to be added to the Site specified in the top left corner of the **Cylon BACnet Explorer** dialog (which may be an existing site or a new site that will be created when devices are added).

To add devices to the selected site, check the box beside each required device in the Site Tree and click on the Add Selected Devices to Site button. To quickly select all of the discovered devices check the Select all devices to add to Site box beneath the Site Tree. Non-Cylon devices will be added as virtual controllers and have a Cylon address of 131 or above.

When the root of the tree view is selected, the right panel contains a list of the BACnet devices found, along with: device name, MAC address, vendor ID, model name, IP or MSTP Address, Network and estimated Controller Type.

BACnet Explorer Number 9 Num. Devices 8	item in the list. T Any newly disco Green means tha	o begin vered de at the de	reading in the vices will be in vice discovere	object list of a white. Device d matches the	devices that were dis device expand its noc is that have already be addressing of the site device information in th	le in the Tree een configuree configuratior	View. d will be hig n. Red mear	hlighted in (Green or Red.
BACnet Explorer	Name	MAC	Type	No. Types	Model	Instance	Vendor	Netw	IP Addr
	Cvlon BACnet Ro	1	CBR	6	Cvlon BACnet R	3000	171	515	192, 168, 6,
	Controller type U	4	CBT13VAV	1	UCU13	2221	171	515	1921100101
	Cylon BACnet Ro	2	CBR	6	Cylon BACnet R	49	171	77	192.168.6.
🗄 🗹 😇 Controller type UCU13 (222	Controller type U	1	CBM24	1	UC32.24	141078	171	77	
UNDER Cylon BACnet Router 49 (49)	UCU12 CT12229	2	CBT12	1	UCU12	141079	171	77	
⊡									
🛨 🗹 🖾 Controller type UC32.24 (14									
🗄 🗹 😇 UCU12 CT12229032A (1410									
4 III	•								
		1							
Select all devices to add to Site	Rescan Network				Add Selecte	d Devices to S	Site		Close

There is also a column (**No. Types**) which shows the number of possible Cylon controller types this device could be.

Cylon devices are initially set as a **CBM24** controller type, but this can be changed in the **Controller Properties** dialog. The 'Type' of a non-Cylon device cannot be changed in the **Controller Properties** dialog, but if they are added to the Site, they will appear as **CBM24** in **CXpro^{HD}**, and this can be changed in the **Configuration utility** (**CCConfig**).

To open the **Controller Properties** dialog, double-click on the device in the right-hand panel.

Controller Properties		C	ontroller Properties	
Model BA Address 4 Possible Types 3rd	ASRT-8 ASRT-8 d Party v		Controller Details Name Model Address Possible Types Device Instance Number	Controller type UC3224 UC32.24 1 CBM24 v 141078
ОК	Cancel		ОК	Cancel

You can then change the Name, Type, Address, and Device Instance Number before adding them to the site.

Note: This will only change the name of the device in the database on the PC, it will not change the name on the device itself.

When the device node of the tree is expanded or double-clicked, the object list of that device will be read in. As each object is received from the device it will be added as a child to that device node. At this stage the right-hand

panel will display the object list with a column for object ID , object type , object name , and present value and this list will be populated as objects are read in.

Num. Devices 10					
BACnetExplorer	Object Name	Object ID	Object Type	Value	
	Unitron Slave UC1 (2)	1220	(8) Device	0.00	
	1. 17 analog	1220	(2) Analog Value	0.00	
	1.18 analog	18	(2) Analog Value	0.00	
	1. 19 analog	19	(2) Analog Value	0.00	
	1.20 analog	20	(2) Analog Value	0.00	
	1.20 analog 1.21 analog	20	(2) Analog Value	0.00	
	1.22 analog	22	(2) Analog Value	0.00	
	1. 129 digital	129	(5) Binary Output	0.00	
	1.130 digital	130	(5) Binary Output	0.00	
	1.131 digital	131	(5) Binary Output	0.00	
	1. 132 digital	132	(5) Binary Output	0.00	
	1. 133 digital	133	(5) Binary Output	0.00	
	1.134 digital	134	(5) Binary Output		
1.22 analog (22)	1110 Folgital	201	(b) bindi y buqut	0.00	
🗍 1.129 digital (129)					
1.130 digital (130)					
···· 🔲 🗐 1.131 digital (131)					
🔲 🗾 1.132 digital (132)					
1.133 digital (133)					
🔲 🗐 1.134 digital (134) 🔜					
🖻 🔽 Controller type UC32.24					
BACnet RTC Trendle					
🔲 🗐 BACnet RTC Trendlo					
Cylon BACnet Router 49 (49)					
🗄 🗌 🚺 Object-List 🛛 👻					

When an object is selected in the tree view, the properties of that object will be read from the device and the right-hand panel will contain the properties and values of that object.

From the results dialog, the user will be able to change the present value property for some of the objects.

Note: To refresh a specific object, right-click on that object.

Check Against Existing Devices

When using the **BACnet Explorer** on an existing site, any discovered devices must be checked against those that have already been configured. This is done by comparing the Device Instance Number of each discovered device against the Device Instance Number of any devices on the site configuration already.

For any discovered devices that have the same Device Instance Number as a device on the PC, there will be a comparison made between the MAC address discovered and the Cylon address.

- If these match, the device will be highlighted in the list in green to signify that the devices match. A matching device cannot be edited.
- If they do not match, then the device in the list control will be highlighted in red to alert the user to this mismatch. The user will be given a choice to resolve the mismatch
- If the Device Instance Number does not match any other ID on the PC, then this discovered device will not be highlighted and will be left white. Non-matching devices can be edited.

Changing the Present_Value Property

The present value can only be written to commandable BACnet objects. Commandable objects always have the 'present value' property and two additional properties – Priority Array and Relinquish Default.

- Analog Output, Binary Output and Multi-State Output objects are always commandable.
- Analog Value, Binary Value and MultiState Value objects can be commandable, but this is decided by the vendor.

To change the present value of a commandable object, double-click on the present value property in the right panel. If the object has the required properties, this will open the **Change Present Value Dialog** :

Change Present Value Dialog				x
Below is the Priority Array of the		Priority	Value	
selected object. To change a value, select the checkbox and		1	NULL	
enter the new value. Leave the		2	NULL	
value blank or set to "NULL" if you would like to relinguish this		3	NULL	
value,		4	NULL	
		5	NULL	
Object Details		6	NULL	
Device ID 1054		7	NULL	
		8	NULL	
Object Name Analog		9	NULL	
Object Instance 10		10	NULL	
Object Instance 10		11	NULL	
Object Type (1) Analog Outpu		12	NULL	
Present Value 12.57		13	NULL	
Present Value 12.57		14	NULL	
		15	12.567	
		16	2.58	
Change Selected Values]	Close		

The table on the right-hand side of this dialog shows the current priority array of the object. To change or relinquish the value, you must select the checkbox beside the relevant priority index. By selecting the checkbox, you can edit the value at that array. To relinquish that value, clear the contents in the box or set it to "NULL".

When the Change Selected Values button is clicked, the value for any priorities whose checkbox is ticked will be sent to the BACnet object. This will update the priority array on the device and to show this, the list items, present_value and priority_array, in the Explorer dialog will be updated too.

SECTION 15: COMMISSIONING CONTROLLERS WITH CXPRO^{HD}

HOW TO CONFIGURE A CONTROLLER'S BACNET SETTINGS

When a Field Controller is first commissioned, its address must be set by connecting **CXpro^{HD}** directly to the controller by **RS232** link (Service Port). If points on the controller are to be exposed on a BACnet network, or if **CXpro^{HD}** is to communicate with the Field Controller by BACnet Tunneling, then the Field Controller's BACnet address (Device Instance Number) must also be set.

These device settings, and others, can be set from **CXpro^{HD}** as follows:

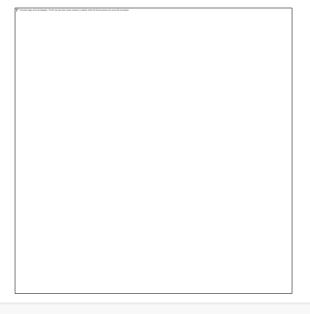
Note: Some parameters can be set over Ethernet connection, but Controller Address and Baud Rate can only be set when the Engineering PC is connected to the controller by RS232 link.

In **CXpro^{HD}**, select **BACnet Configuration** from the **Controller** tab of the **Ribbon**



This opens the **BACnet Configuration** dialog, which defines how the **Controller** will communicate on the **BACnet** network, and how it will communicate with **CXpro^{HD}** for configuration over **BACnet**.

In this dialog, each current value and the proposed new values can both be displayed at once. Defaults can also be automatically generated.



Note: Only Device Name, Router Address and MSTP Max Masters will be editable when the Engineering PC is connected over Ethernet. In order to edit the other parameters, it must be connected by RS232 serial link.

The parameters that define how the Controller communicates on the BACnet system are:

• Device Instance

```
Enter the required BACnet address (0 – 4194303).
```

Note: The number set here in the Field Controller (when connected serially) must match the Device Instance Number set in CXpro^{HD}.

• Device Name

Any descriptive text.

• Tunneling Properties: Site and Comms Ctrl

Note: All of the Cylon controllers throughout the BACnet system **must** have the same **CXpro^{HD}** "Site Number".

In the **Device Properties** dialog set the **Site** and **Comms Ctrl** matching the position of this Controller in the **Site** defined in the **Cylon Configuration utility (CCConfig)**.

• MSTP Max Masters

This must be equal to or greater than the highest address used on the BACnet **MS/TP** fieldbus, because this controller will not pass data to devices with addresses higher than this. The optimum situation is that this value is set in all devices to exactly the value of the highest address on the fieldbus. (1 - 127)

 Note:
 It is recommended that you address your controllers consecutively starting at 1, with the
 MAX

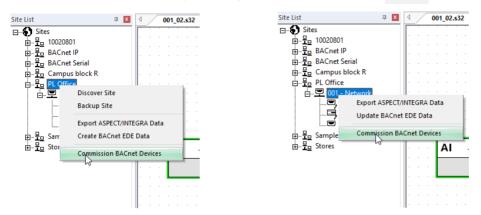
 Master
 value matching the
 Maximum Controller address
 value. For optimum efficiency there should be no gaps in the device addresses.

• APDU Timeout

(0 ... 60 seconds) this value should be left at its default unless there is a problem.

COMMISSIONING A RANGE OF CONTROLLERS QUICKLY (MASS COMMISSIONING)

CXpro^{HD} includes a utility to quickly commission the MAC, Max Masters, Device IDs and Names of Cylon controllers. The utility can be launched by right-clicking on a Site or a Router in the Site List :



Note: The devices must be configured within **CXpro^{HD}** before they can be accessed by this utility.

If launched from a router, only the devices on that subnet will be pinged. If launched from the site, all devices on the site will be pinged.

		Se	erial Number	Network 515	MAC 30	Device ins 3001	Name CBM desk test	Max Masters 0	Strategy Type Strategy ID: 0		
Offline / Misconfi	Findir	nission D ng online	evices e devices								Apply
Serial Number	515 515	2 1	4000 405			001 - 002 - CBX Chris D	CBX CBX-8R8 esk CBX-8R8		Strategy ID: 0 Strategy ID: 0	Offline Offline	

When pinging is complete, the **Commission BACnet Devices** dialog is displayed:

Devices			al Number	Network			ame	Max Masters	Strategy Type	
			2142008F	515	30	3001 Cł	BM desk test	127	Strategy ID: 0	
	ured Devices	MAC	Instance (PC) Ins	stance (Ctrl)	Name	Type (PC)	Type (Ctrl)	Strategy Type	Apply
ffline / Misconfigu Serial Number			Instance (PC) Ins	stance (Ctrl)	Name 001 - 003 - CB.		Type (Ctrl)	Strategy Type Strategy ID: 0	
	Network	MAC		PC) Ins	stance (Ctrl)		CBM08	Type (Ctrl)	Strategy Type Strategy ID: 0 Strategy ID: 0	Issues
	Network 515	MAC 3	3443	PC) Ins 400		001 - 003 - CB.	CBM08 K CBX-8R8	Type (Ctrl) CBX-8R8	Strategy ID: 0	Issues Offline Offline

The upper-right pane of the the **Commission BACnet Devices** dialog lists all of the devices configured in the **CXpro^{HD} Site** that have been successfully discovered on the BACnet network.

The lower pane of the the Commission BACnet Devices dialog lists devices that are configured in the CXpro^{HD} Site but have not been successfully identified on the BACnet network. Devices that partially match the CXpro^{HD} Site configuration are highlighted in red – for example a device has been found that matches the MS/TP Network Number and MAC Address of a configured device, but the Device Instance Number does not match.

If you want any of the devices highlighted in red to be included in the Commissioning process, tick the checkbox to the right of red highlight. When all such devices have been selected, click the **Reconcile Issues** button.

The configuration of the device in the **CXpro^{HD} Site** will be updated to match the corresponding discovered device, and the device listing will move to the top-right pane:

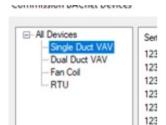
Commission BACnet Devices								
All Devices	Serial Number Net CX16744168C 515 CU12142008F 515		4000	Name CBX Chris Desk CBM desk test	Max Masters 50 127	Strategy Type CBV US - Integral Actuator Strategy ID: 0		
Offline / Misconfigured Devices	,							Apply
Serial Number Network M	AC Instance (PC)	Instance (Ctrl)	Name	Type (PC)	Type (Ctrl)	Strategy Type	Issues	
515 3 515 2			001 - 003 - 0 001 - 002 - 0	B CBM08 BX CBX-8R8		Strategy ID: 0 Strategy ID: 0	Offline Offline	
<								>
								Reconcile Issues
Rescan Timeout (s) 5								Close

Note: If reconciling might create duplicate IDs, the conflicting offline devices are renumbered to a value above 4000000 to ensure that they will be unique.

If no match is found for the MS/TP Network Number and MAC Address of a configured device, that device is listed in the lower pane as Offline, marked with a grey background and cannot be included in the Reconcile Issues process.

To retry pinging offline devices, click the Rescan button on the bottom left of the dialog.

The upper-left pane of the Commission BACnet Devices dialog shows categorized devices found organized by strategy ID.



This groups devices by the type of strategy they contain (e.g. single or dual duct VAV, or RTUs, Fancoils etc), so that common properties can be edited together.

Clicking on All devices will show only the properties that are common to all devices of MAC, Max masters, Device ID, Name, Serial Number and Strategy Type.

Clicking on a strategy type in the left-hand pane means that additional parameters common to that strategy type will become available in the right-hand pane:

- All Devices	Serial Number	MAC	Max Masters	Device ID	Name	Туре	Input Config	Output Config
- Single Duct VAV - Dual Duct VAV	12345671	1	127	12341	VAVST386	137	48	18
- Fan Col	12345672	2	127	12342	VAVST388	137	48	18
RTU	12345673	3	127	12343	VAVST390	137	48	18
	12345674	4	127	12344	VAVST392	137	48	18
	12345675	5	127	12345	VAVST394	137	48	18
	12345676	6	7	12346	VAVST396	137	48	18

Each of the fields can be edited individually.

However, it is also possible to copy a single value to multiple controllers at once, so that device types that are installed identically - for example VAVs – can be configured in bulk very quickly (similar to copy & paste in a spreadsheet program).

When appropriate, editing a single field will be assisted by a properties window that indicates what the setting value will mean:

Serial Number	MAC	Max Masters	Device ID	Name	Туре	Input Con	Output Config
12345671	1	127	12341	VAVST386	137	48	18
12345672	2	127	12342	VAVSTOOD	107	10	10
12345673	3	127	12343	VAVS1 VAVS	F386 Config P	Properties	
12345674	4	127	12344	VAVST A	xillary heat	True	
12345675	5	127	12345		ontrol Method		
12345676	6	7	12346	VAVST			
					ol Method	quence applied to	this
				VAV	and control act	queriee applied to	una

vices

When all of the fields have been configured, click the Apply button, and the full set of edited parameters will be sent to all controllers. A progress dialog will be displayed, indicating progress and highlighting any failures:

Serial N	MAC	Max Masters	Device ID	Name	Progress
2345671	1	127	12341	VAVST386	Complete
2345672	2	127	12342	VAVST388	Controller write failure.
2345673	3	127	12343	VAVST390	Complete
2345674	4	127	12344	VAVST392	In Progress
2345675	5	127	12345	VAVST394	
12345676	6	7	12346	VAVST396	





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