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Integrating Honeywell C-Bus into the Tridium Niagara^{AX} Framework

Frequently asked questions

Q: Who developed the solution?
A: The solution was developed by Neopsis GmbH.

Q: What does Solmatic provide?
A: Solmatic is offering the solution in Canada, USA and Latin America. We provide support to everybody who would purchase the solution from us and free consultations to anybody who is interested in C-Bus integration to Niagara^{AX} framework using Neopsis solution.

Q: Where the solution was used the most recently?
A: The solution was recently installed in Vancouver (April/2010), the Annacis Island Wastewater Treatment Plant, installed and configured by Honeywell Canada. Contact information available upon request.

Q: What is IEC?
A: The IEC stands for "Intelligent External Controller", IEC is the hardware component that talks "C-Bus".

Q: What are the limitations of IEC?
A: The IEC can handle up to 29 C-Bus devices with maximum of 3000 data points.

Q; What are the licensing requirements?
A: The software component is Niagara^{AX} module that requires a licence. The module can be installed inside JACE or AX SUPV and it can manage multiple IECs. The basic driver includes 255 points. The increment of 100 points must be purchased separately and licensed within the IEC.

Q: What C-Bus speeds are supported?
A: The following C-Bus speeds are supported: 4 800, 9 600, 19 200, 38 400, 76 800 bps

Q: How about serial vs. Ethernet IEC?
A: The Serial IEC connects with JACE on 9 600bps. However, the C-Bus connection can be up to 76 800bps. The IEC has a built in ability (like BNA) to cache the points in Poll or change of value (COV) internally. The total capacity is up to 3000 points! Our recommendation is to use serial IEC with the C-Bus speed of 9 600bps and the Ethernet IEC for the higher speeds. The serial IEC can be upgraded to Ethernet if necessary. Solmatic Support Team is here to help you to analyze your setup and advise on the best approach.

Q: What types of Honeywell XL5000 controllers are supported by the Neopsis AX C-Bus Driver solution.
A: The AX driver supports the following XL5000 family controllers: XL50, XL80, XL100, XL500, XL-SMART, XL800, Zone Manager.

Q: What firmwares are supported by the driver?
A: The compatibility matrix is below:

XL A and B types firmwares

1.01.78 - Zone Manager (Q7750A)
1.2.0, 1.2.2, 1.2.4
1.3.0, 1.3.1,
1.3.89 - XL firmware for IRC integration is supported by C-Bus OPC Server 2.2.7 and higher
1.3.4, 1.5.0, 1.5.1

XL C type firmwares

2.00.01 - (first release of XL50 firmware) doesn't work writing to data points
solution: upgrade XL firmware to higher version
2.01.01 - doesn't work reporting values of data points by exceptions
solution: upgrade XL firmware to higher version
2.01.05, 2.02.05, 2.03.03, 2.03.04, 2.03.05, 2.04.00, 2.04.03, 2.04.04, 2.05.00, 2.06.01
2.06.02, 2.06.04, 2.06.05, 2.06.06, 2.06.10, 2.06.14
2.07.02 (Panther) supported only by IEC firmware 3.07 and higher

XL800 (LION) type firmwares

3.01.02
3.01.07 supported only by IEC firmware 3.07 and higher
3.02.02 supported only by IEC firmware 3.07 and higher

XD 505A firmwares

1.11, 1.13, 1.16, 1.27, 1.29

The C-Bus baud-rate 76800 bps is supported by IEC firmware 3.05 and higher!

Q: Can the AX driver co-exist with the existing front-end/central like proprietary Honeywell EBI, Symmetre, XBSi or XBS?
A: Yes, it can. The IEC is designed to integrate into the native Honeywell C-Bus architecture. Therefore, the IEC requires an unique C-Bus address (recommended address is 30, the IEC's address must be higher than Central C-Bus address due to nature of the protocol) and it acts as a native C-Bus controller. In addition, it will be detected by the XL Online as a regular controller.

Q: Can I connect 2 separate C-Bus trunks to a single IEC?
A: Only single C-Bus trunk can be connected to the IEC. If the dual channel BNA (Building Network Adapter) is used, than two separate IEC devices must be used. However, only single AX Driver is required. In such case you would require 1x SOL-SER-DRV-255, 1x SOL-ETH and the C-Bus points license for each IEC.

Q: I have multiple buildings in a campus with the existing Honeywell EBI and BNA(s). Do I need to install a JACE in every building in order to integrate the Neopsis AX C-Bus solution?

A: With Ethernet connectivity between the IECs and central monitoring station, the Niagara AX Supervisor can run the AX C-Bus driver and no JACE is required in the remote locations. This architecture can coexist with the existing Honeywell EBI front-end for a carefully planned switchover from EBI to AX Supervisor.

Q: Is the Change of Value (COV) data exchange supported?

A: Native C-Bus COV is fully supported based on the definition of Trend Hysteresis value for each active C-Bus point within the existing controller. The mechanism of the native C-Bus "Poll Only" is also fully implemented with configurable timing parameters.

Q: How do I import the existing controllers and the native C-Bus points into the Niagara^{AX} Framework?

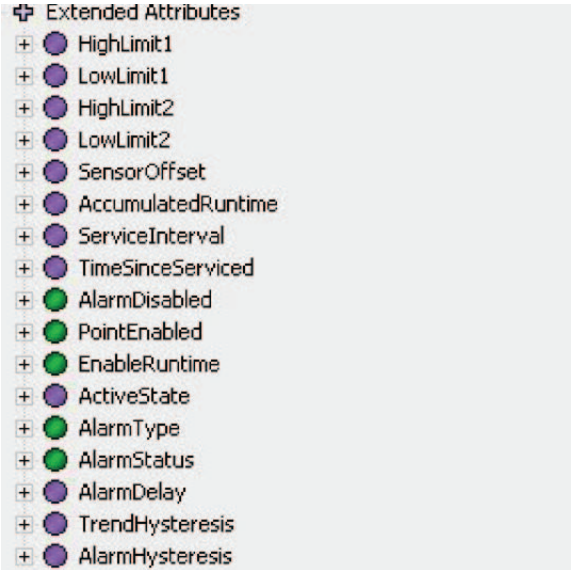
A: A simple CARE Printout RTF file can be created by CARE Engineering Tool and imported directly to the Niagara AX Framework.

Q: I have an existing C-Bus architecture with 23 XL5000 controllers of various types. However, CARE database is not available. How do I import all the points to the Niagara AX Framework?

A: A built-in "Autodiscovery" feature is available for the automatic point discovery directly from the XL5000 controllers regardless of the type and firmware. The Autodiscovery process is launched automatically and the estimated duration of the points discovery depends on the number of controllers and points.

Q: The existing Honeywell C-Bus installation is using very specific Alarm Ranges definitions. Could the native C-Bus parameters be imported directly from the controllers?

A: At this moment we have identified the most common C-Bus Point Attributes that can be integrated within the AX. In case of special requirements, the attribute list can be expanded. The screenshot directly from the AX Framework shows the paramaters.



Q: What is the C-Bus traffic estimator calculation for the best optimization of the data poll.

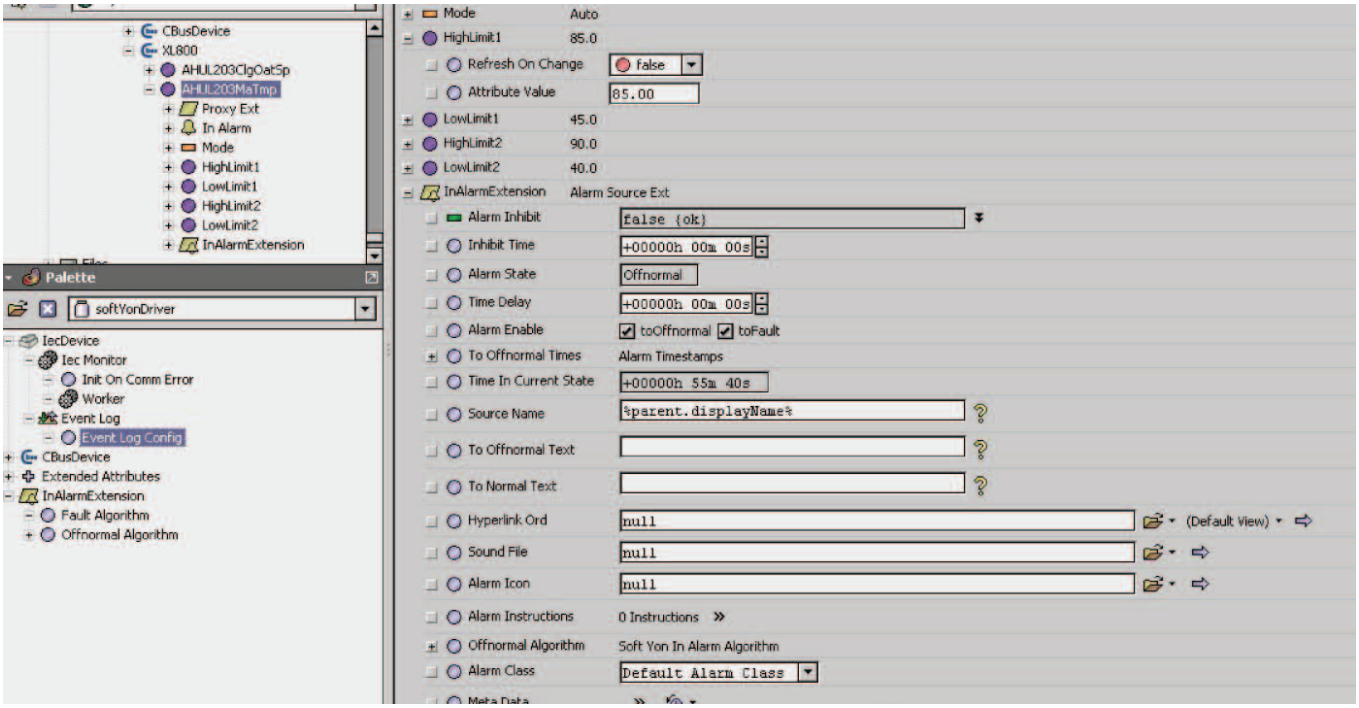
A: Typical the Niagara Scheduler Poll Rate properties define, how often the driver asks the fieldbus for new data. The C-Bus driver receives the data value changes automatically without polling. The polling mechanism is used for refreshing the point information in the controller and do not have to be executed too often. The optimal rate is calculated as

(Number of data points / 2) + 10%

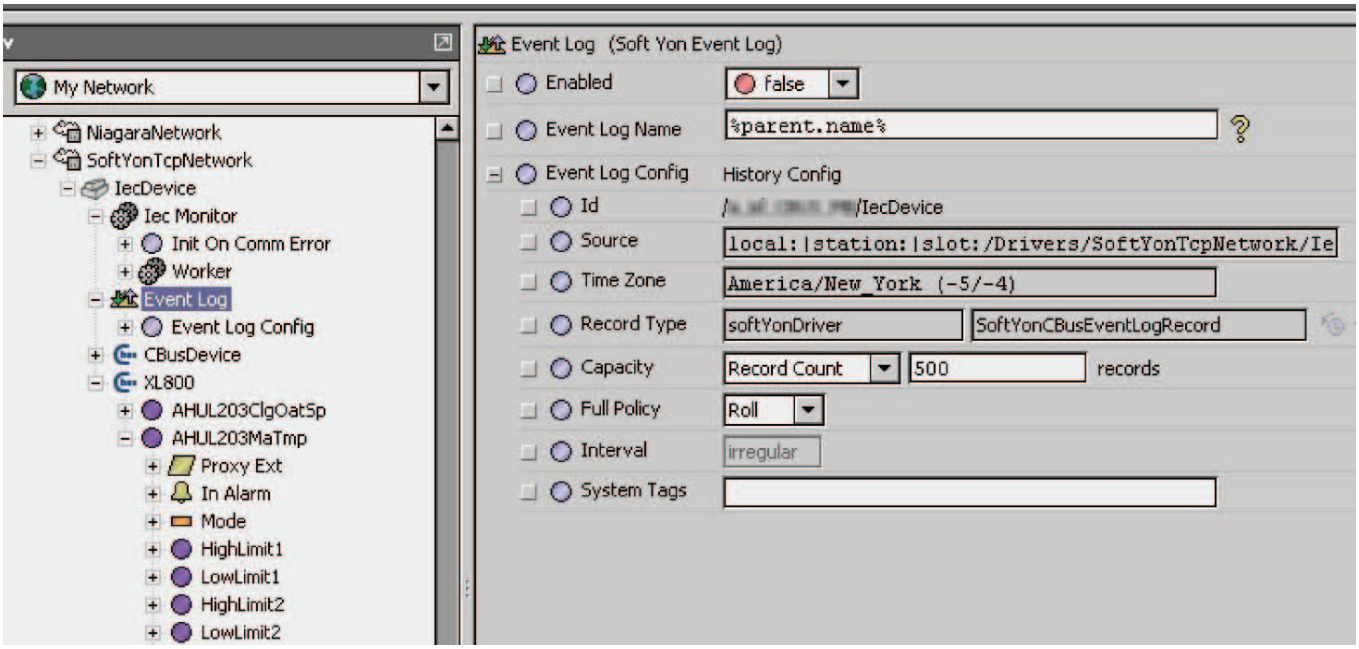
If you set the poll rate value too low (less seconds), the refresh queue causes too high I/O load and blocks the capture of changed values. You can see many unsolicited messages or even IEC initialization events. The first aid for unsolicited messages is to increase the Scheduler Poll Rate.

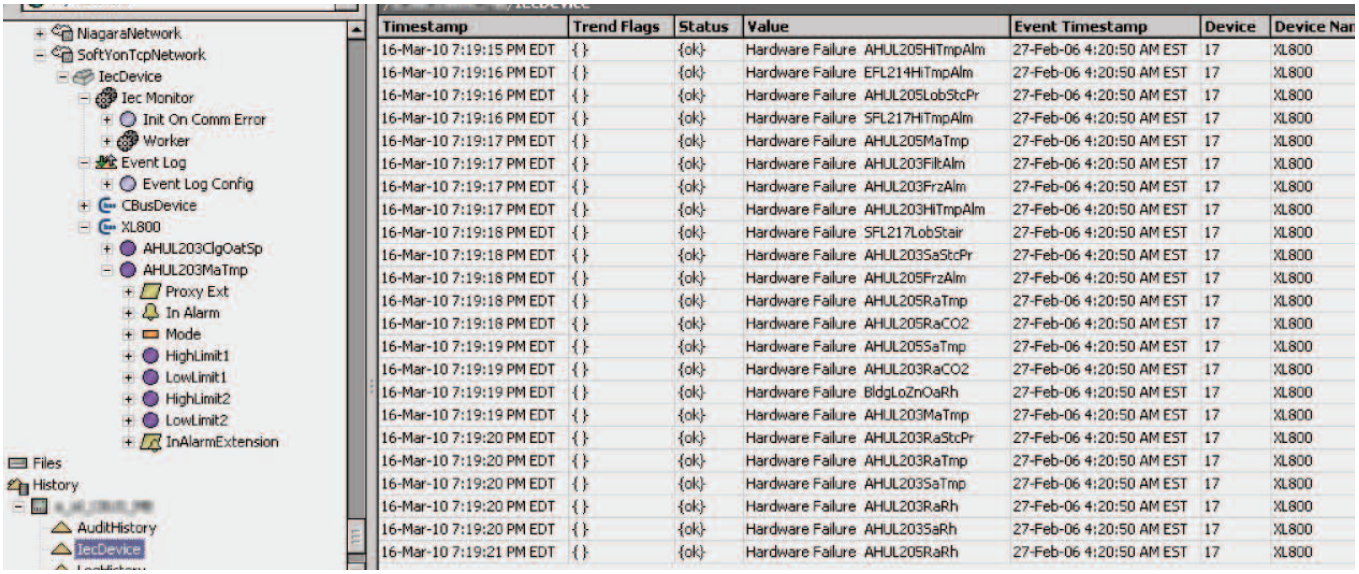
Q: How is the Alarm Notification mechanism implemented within the Neopsis AX C-Bus solution?

A: A full AX Alarm Notification mechanism is implemented. The InAlarm Extension is available for the AX Notification Class. XL5000 controllers are sending every alarm to the C-Bus instantly. The AX C-Bus Driver is monitoring the bus traffic for the following attributes: PointValue, PointMode and PointInAlarm. When alarm occurs on a particular point, "In Alarm" parameter will indicate the Fault Status. When the Extension is added to the Point definition, it will allow the exposure of the Alarm Flag to the AX Default Alarm Notification Class. Alarm Ranges for Low, LL, High, HH are adjustable from the AX Driver on the Analog Points.



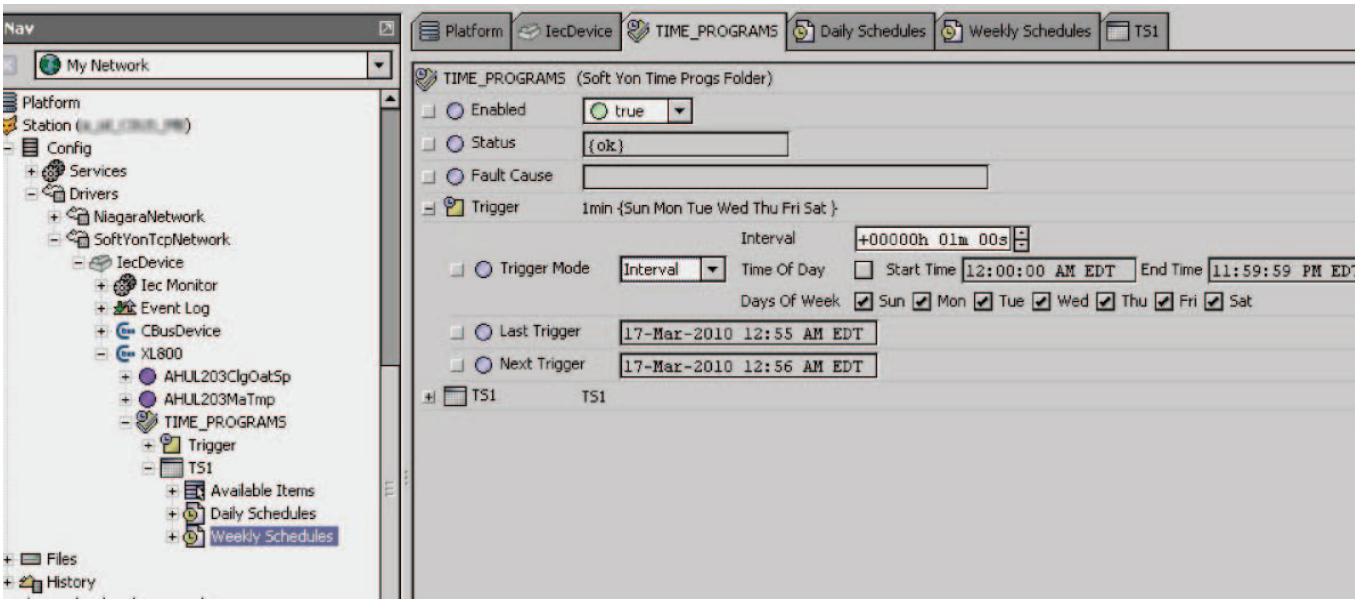
Another Alarm notification option is when the C-Bus AX Driver monitors the Controller Alarm Buffer. Once the EventLog is enabled, IEC AX History Log File is immediately created to display the Alarm Status known from XLOnline/XL584 consoles:





Timestamp	Trend Flags	Status	Value	Event Timestamp	Device	Device Nar
16-Mar-10 7:19:15 PM EDT	{}	{ok}	Hardware Failure AHUL205HiTmpAlm	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:16 PM EDT	{}	{ok}	Hardware Failure EFL214HiTmpAlm	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:16 PM EDT	{}	{ok}	Hardware Failure AHUL205LobStcPr	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:16 PM EDT	{}	{ok}	Hardware Failure SFL217HiTmpAlm	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:17 PM EDT	{}	{ok}	Hardware Failure AHUL205MaTmp	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:17 PM EDT	{}	{ok}	Hardware Failure AHUL203FiltAlm	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:17 PM EDT	{}	{ok}	Hardware Failure AHUL203FrzAlm	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:17 PM EDT	{}	{ok}	Hardware Failure AHUL203HiTmpAlm	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:18 PM EDT	{}	{ok}	Hardware Failure SFL217LobStair	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:18 PM EDT	{}	{ok}	Hardware Failure AHUL203SaStcPr	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:18 PM EDT	{}	{ok}	Hardware Failure AHUL205FrzAlm	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:18 PM EDT	{}	{ok}	Hardware Failure AHUL205RaTmp	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:18 PM EDT	{}	{ok}	Hardware Failure AHUL205RaCO2	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:19 PM EDT	{}	{ok}	Hardware Failure AHUL205SaTmp	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:19 PM EDT	{}	{ok}	Hardware Failure AHUL203RaCO2	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:19 PM EDT	{}	{ok}	Hardware Failure BldgLoZnOaRh	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:19 PM EDT	{}	{ok}	Hardware Failure AHUL203MaTmp	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:20 PM EDT	{}	{ok}	Hardware Failure AHUL203RaStcPr	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:20 PM EDT	{}	{ok}	Hardware Failure AHUL203RaTmp	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:20 PM EDT	{}	{ok}	Hardware Failure AHUL203SaTmp	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:20 PM EDT	{}	{ok}	Hardware Failure AHUL203RaRh	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:20 PM EDT	{}	{ok}	Hardware Failure AHUL203SaRh	27-Feb-06 4:20:50 AM EST	17	XL800
16-Mar-10 7:19:21 PM EDT	{}	{ok}	Hardware Failure AHUL205RaRh	27-Feb-06 4:20:50 AM EST	17	XL800

Q: Does Neopsis AX C-Bus driver supports the implementation of the native C-Bus Time Schedules?
A: The driver provides full implementation of the XL5000 Local Time Schedule. Native Weekly and Yearly XL5000 C-Bus Schedules are supported. There is a unique 2x16bit identifier in every XL5000 controller that determines a change of the local schedule either by MMI or by XBS/EBI (no need of the Global Schedule SQL subsystem in AX). When the UID is changed, the change triggers a periodic synchronization in AX. Synchronization can be also done manually, but we prefer on schedule daily, or on a periodic interval.



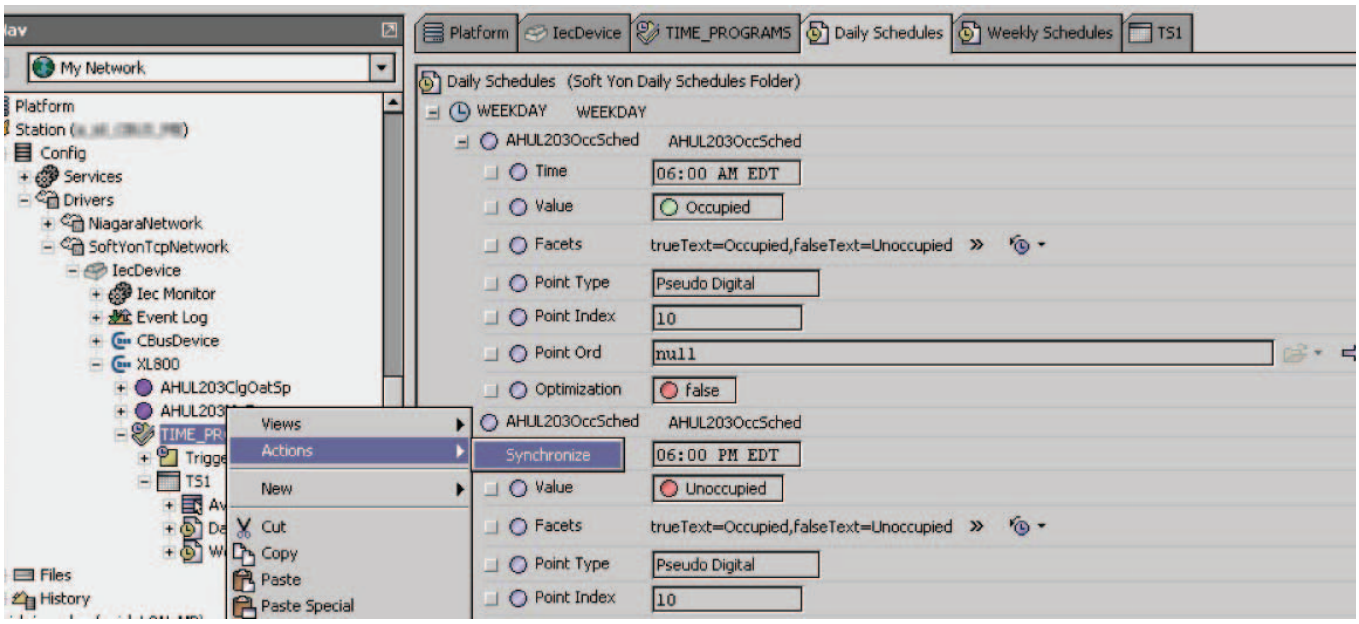
How to order?

SOL-SER-DRV-255 Solmatic Lite, Serial (HW interface for communication with Honeywell Excel 5000 family controllers - serial version RS-232 (RS-485) + Niagara driver including 255 data points

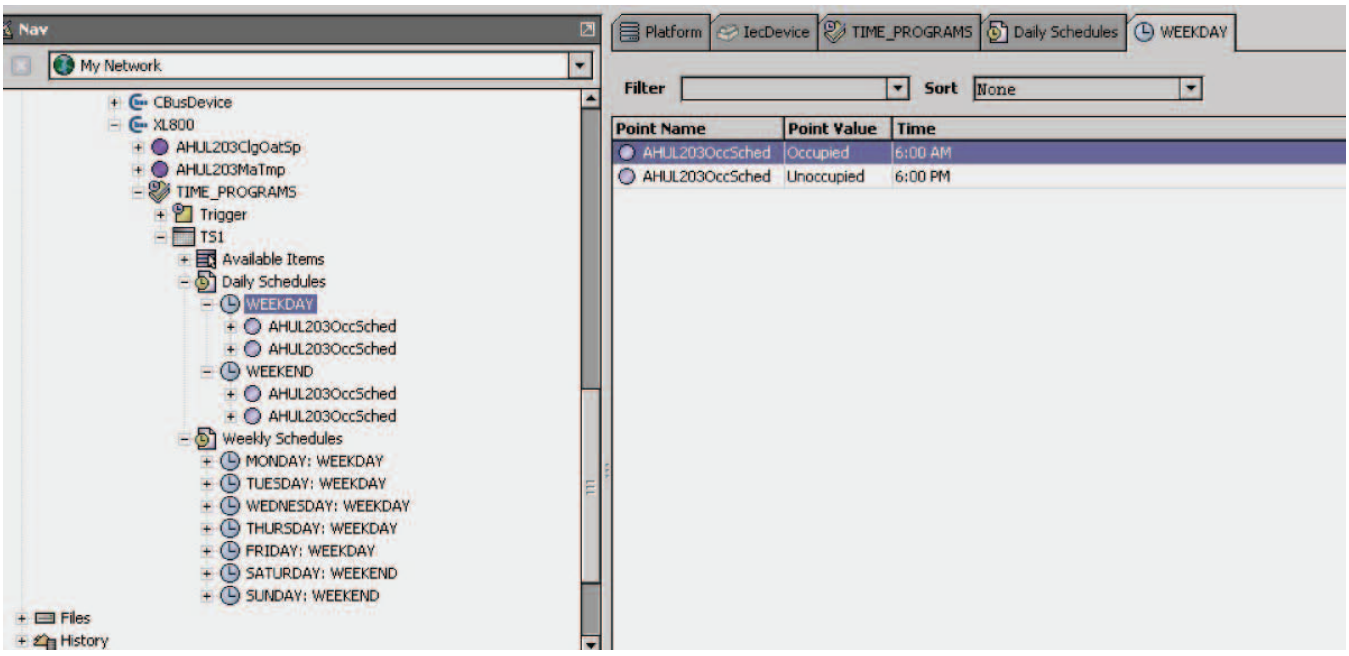
SOL-ETH-DRV-255 Solmatic Enterprise, Ethernet (HW interface for communication with Honeywell Excel 5000 family controllers - Ethernet version + Niagara driver including 255 data points)

SOL-UPG-100 Solmatic Additional 100 points

The points from the TS Object are polled to the AX Platform with the time assigned for OCC/UNOCC action.



An example of weekly schedule is displayed below.



Q: I have more questions, what to do?
A: Please send us an email at support@solmatic.ca and we will do our best to answer.