

PT-Link II BACnet4® Technical Guide

VCB-X Controller Code: SS1051 Version 2.0
VCM-X Controller Code: SS1026 & Y200920 Version 2.0 and up;
VCM-X Modular Controller Code: SS1030 & SS1034
VCM-X WSHP Controller Code: SS1032 & SS1033
SA Controller Code: Y200921
VCM Controller Code: SS1016, Y200409, Y200616, Y200822



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1. GENERAL INFORMATION

1.1 Overview and System Requirements

The OE368-23B-BACnet4, PT-Link II BACnet® provides bi-directional communication between your BACnet® MS/TP protocol network and up to four* of any of the following types of Orion controllers— VCB-X, VCM-X, SA, VCM, MUA II, or VAV/CAV:

VCB-X Controller (SS1051)

VCM-X Controller (SS1026, SS1030, SS1032, SS1033, SS1034, Y200920)

SA Controller (Y200921)

VCM Controller (SS1016, Y200409, Y200616, Y200822)

**VAV/CAV Controller (SS1003, Y200301) and
MUA II Controller (SS1004, Y200405)

To determine what controller you have, you must look at the label located on the controller. NOTE: The label is located on the EPROM on older devices. If the controller label does not match any of the SS or Y numbers listed above, your controller will not work with the PT-Link II BACnet®.

***NOTE:** The PT-Link II BACnet® device can be used to connect to four Orion controllers. If more than four Orion controllers are present in a system, you will need additional PT-Link II BACnet® devices.

****NOTE:** Documentation is available for MUA II/VAV/CAV on our Orion Controls website: www.orioncontrols.com.

1.1.1 Data Sharing

- Provides values from points on the Orion side of the gateway to BACnet® devices as if the values were originating from BACnet® objects.
- Allows BACnet® devices to modify point values on the Orion controller side of the PT-Link II BACnet® by using standard BACnet® write services.

1.1.2 Scheduling

- Allows BACnet® devices to send Schedule events to the Orion controller side of the gateway by using standard BACnet® services.

1.1.3 Hardware Specifications

Technical Data	
BACnet®-MS/TP Loop	9600, 19200, 38400, 76800 Mbps
Controller Loop	RS-485, 9600 Baud Rate
Network Protocol	BACnet®
Protocol (WattMaster Loop)	HSI Open Protocol Token Passing
Power Input Voltage	24 VAC
Power Consumption	10 VA Maximum
Operating Temp	-30°F to 150°F
Operating Humidity	90% RH Non-Condensing
Weight	4.5 oz.

Table 1: PT-Link II BACnet® Interface Technical Data

1.1.4 System Requirements

- The PT-Link II BACnet® interface is packaged and assembled for panel mounting. Panel mounting components are included for your convenience.
- Computer running Microsoft Windows™ operating system.
- Ethernet Crossover Cable (supplied).
- PT-Link II BACnet software—located on included CD-ROM and downloadable from www.orioncontrols.com.

2. QUICK PT-LINK SET-UP

2.1 Quick Start Guide

The following steps will get you up and running in no time:

1. Familiarize yourself with the PT-Link II components (**Figure 1**).
2. Connect your PT-Link II to the Controller(s) on your system (up to four) and connect your PT-Link II to the BACnet Network (**Figure 2**). **NOTE:** Controllers must be addressed as 1, 2, 3 & 4.
3. Obtain the following from your Building Automation System Integrator: the BACnet MAC address (System Node ID) and the MS/TP network baud rate. Also, relay to your System Integrator that the BACnet Device Instance Number for the PT-Link will be the MAC address + 50,000 (50,000 is the default Device Instance Number). If you want the Device Instance number to be anything other than 50,000, you will need to access the FS-GUI Toolbox. See **Section 3.3.2**
4. Configure your PT Link DIP Switches. See **Section 2.3, page 7**.
 - Set the BACnet MS/TP baud rate via the B Bank set of DIP switches.
 - Set the BACnet MS/TP MAC Address using the PT-Link A Bank DIP switches. The BACnet MS/TP MAC Address MUST be set between 1 and 127.

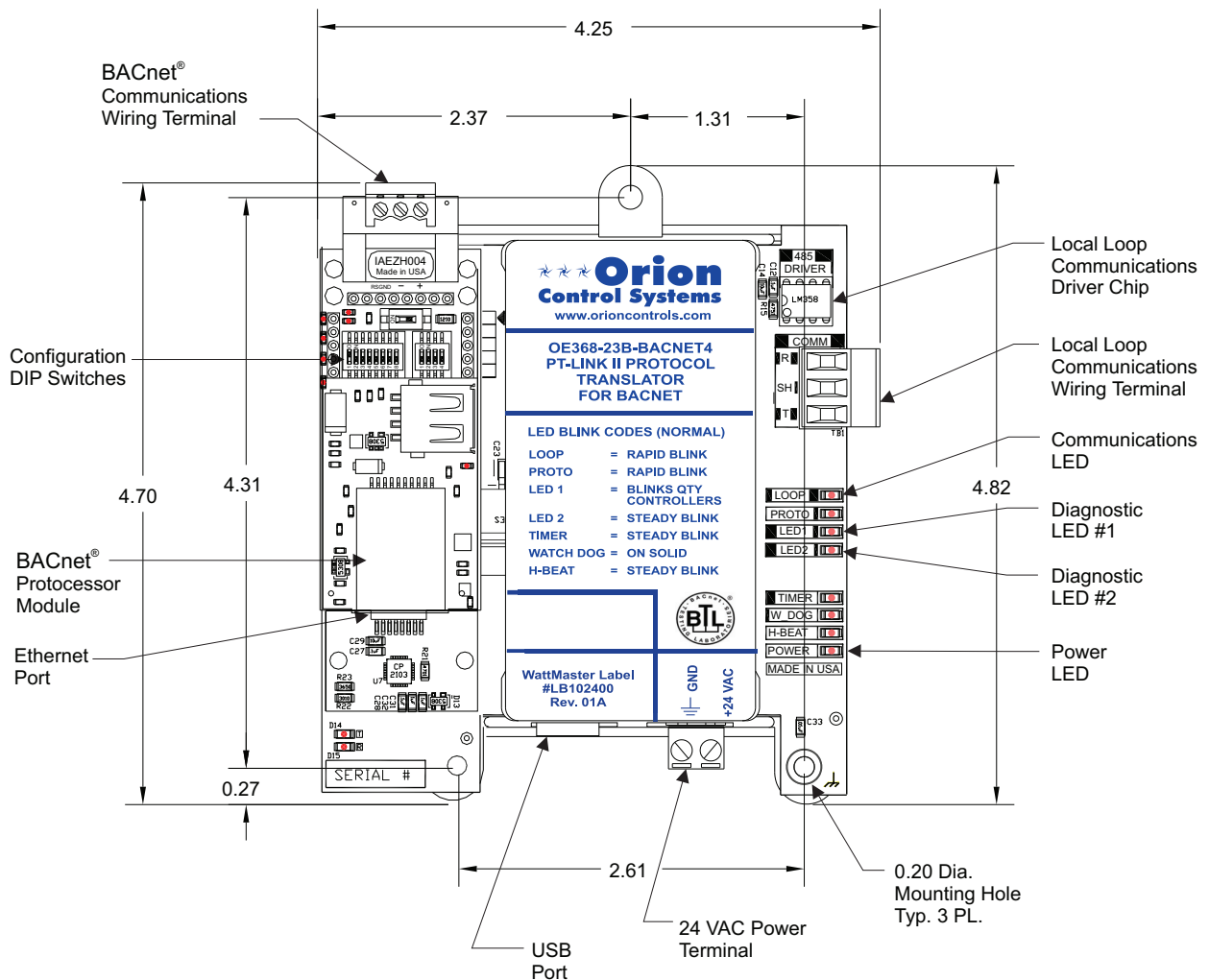


Figure 1: PT-Link II BACnet® Dimensions and Components

2. QUICK PT-LINK SET-UP

2.2 Connection and Wiring Information

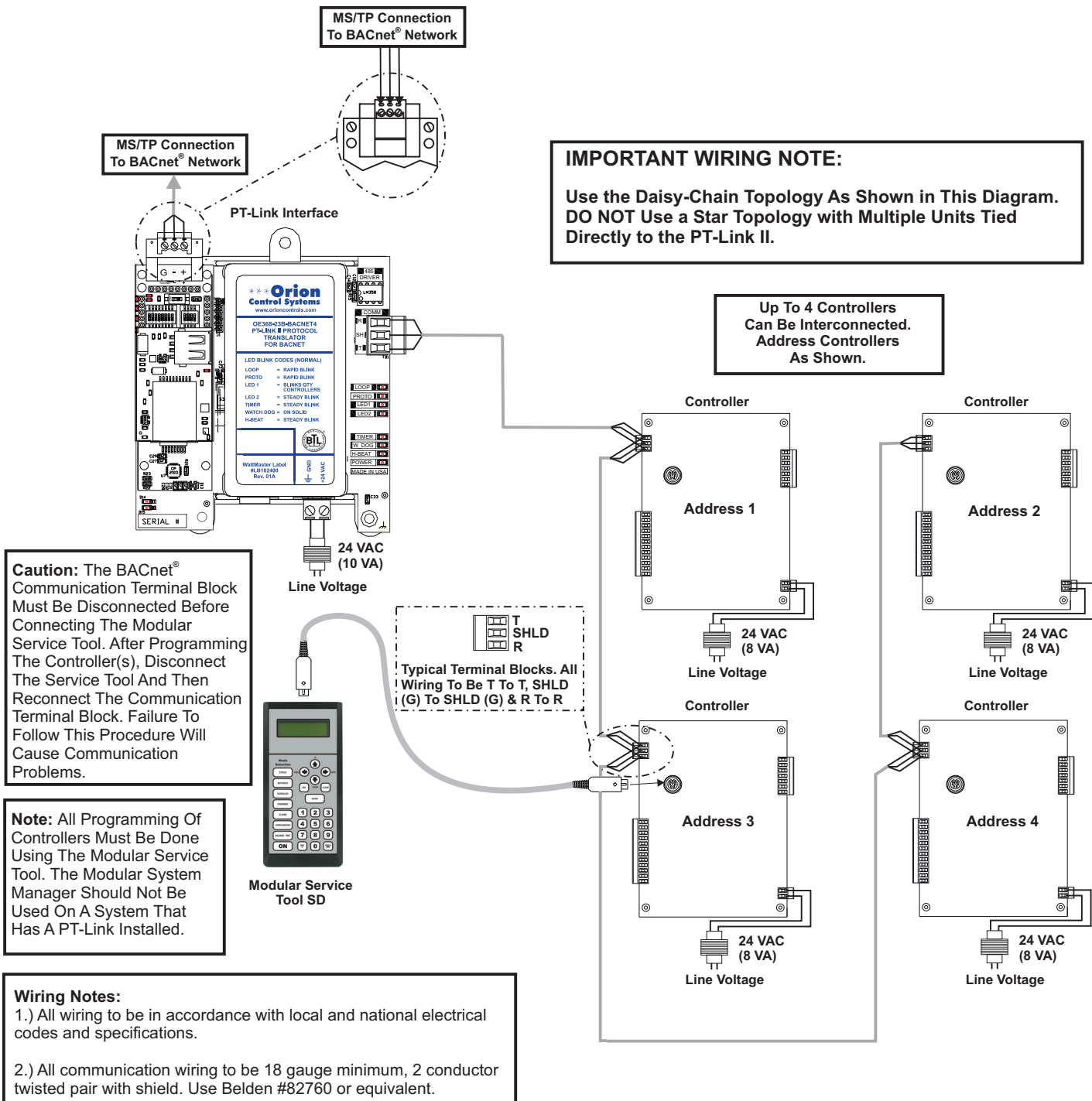


Figure 2: PT-Link II BACnet® Interface Wiring

2.3 Configuring the PT-Link DIP Switches

The DIP Switches allow you to set the protocol between BACnet MS/TP and BACnet IP (**WattMaster only supports BACnet MS/TP applications**), set the BACnet MS/TP Baud Rate, set the BACnet MS/TP MAC address, and set the BACnet MS/TP device instance. You can obtain the MAC address, Device Instance, and baud rate from your Building Automation System (BAS) Integrator. The DIP Switches are shown in **Figure 3**.

NOTE: You must cycle power after making changes to the DIP Switch Settings for the settings to take effect.

2.3.1 Set the BACnet MS/TP Baud Rate

“B” bank DIP switches B1 – B4 is used to set the BACnet MS/TP baud rate of the PT-Link. This matches the baud rate required by the Building

Using B1 – B4 to Set Baud Rate				
Baud	B1	B2	B3	B4
9600	ON	ON	ON	ON
19200	OFF	OFF	OFF	ON
38400	ON	ON	OFF	ON
57600	OFF	OFF	ON	ON
76800	ON	OFF	ON	ON

Table 2: Baud Rate Settings

2.3.2 Set the BACnet MS/TP MAC Address

- Only (1) MAC address is set for the PT-Link regardless of how many devices are connected to it.
- Set the BACnet MS/TP MAC addresses of the PT-Link to a value between 1 and 127 (MAC Master Addresses). This is so that the BMS Front End can find the PT-Link via the BACnet auto discovery function. MAC addresses from 128 to 255 cannot be auto discovered by the BMS Front End.
- Set “A” bank DIP switches A1 – A7 to assign a MAC Address to the PT-Link for BACnet MS/TP. Please refer to **Section 9, page 65** for the complete range of MAC Addresses and DIP switch settings.

NOTE: The BACnet Device’s Instance is generated by adding the MAC address to the Node Offset, which defaults to 50,000. If the Device Instance must be set to something other than in the range of 50,001 to 50,127, see **Section 3.3.2, page 12** to change the Node Offset value.

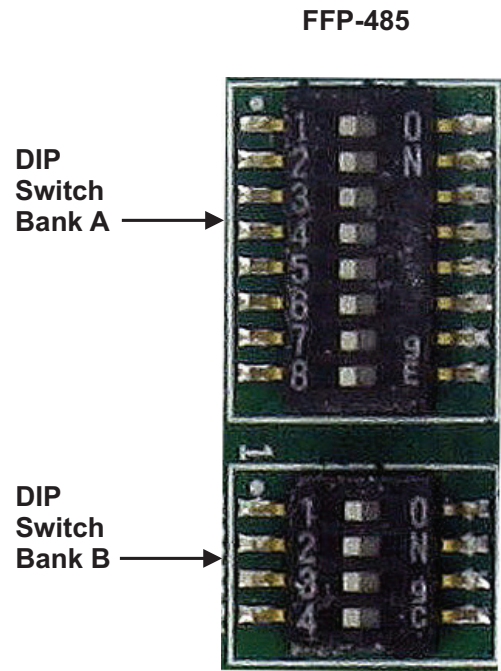


Figure 3: DIP Switches

CAUTION: DIP Switch 8 in Bank A must always remain off for proper operation.

3. PT-LINK CONFIGURATION

3.1 Graphical User Interface

The PT-Link is configured using a Graphic User Interface (GUI) which is a password protected web browser-based interface that uses a combination of technologies and devices to provide a platform from which you can gather and process information. The GUI allows you to do the following:

- Change the BACnet Device Instance to something other than 50,001 to 50,127
- Check the status and diagnostics of the PT-Link, such as network settings, connection information, node information, map descriptors, and error messages
- Monitor the PT-Link's internal data and parameters
- Change or update the PT-Link's internal data and parameters
- Restart the PT-Link

The following items are needed to be able to run the GUI:

- **PC Requirements**—a computer with a web browser that connects over the Ethernet on port 80*
***NOTE:** Computer and network firewalls must be opened for Port 80 to allow the GUI to function.
- **Software Requirements**—Mozilla Firefox 13.0 and up, Microsoft Internet Explorer 8 & 9**, Google Chrome 19.0 and up, Opera 11 and up, or Safari 4.1 and up
****NOTE:** Internet Explorer 8 does have some limitations in terms of graphical features. Some effects such as rounded corners and semi-opaque backgrounds are not supported. So, although technical functionality is operational, the looks might be slightly different

3.2 PT-Link II Ethernet Connection

- 1.) Connect the PT-Link II directly to your computer by using a standard CAT5 or crossover cable (by others) as shown. See **Figure 4** for details.
- 2.) Locate a CAT5 cable and plug one end into your computer's Ethernet port. Plug the other end of the Cable into the Ethernet port on the PT-Link II.
- 3.) Power up the PT-Link II by plugging in the power cable. The PT-Link II may take up to three minutes to power up completely. Once the PT-Link II is powered up, you should notice that the RUN LED is blinking continuously on the ProtoCessor Board. See **Figure 18, page 21** for a diagram showing the location of the ProtoCessor RUN LED.

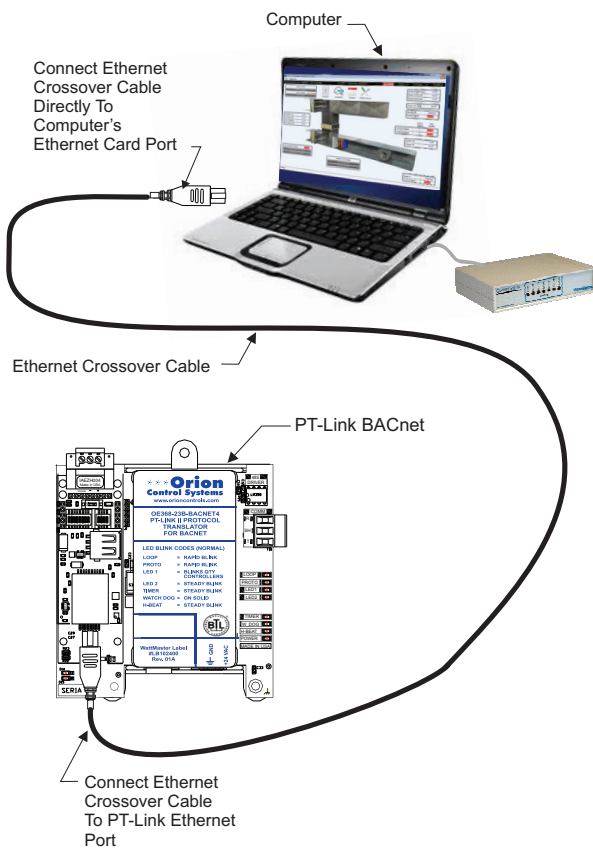


Figure 4: Connecting With Crossover Cable

3. PT-LINK CONFIGURATION

3.3 IP Address Configuration

3.3.1 Computer IP Address Set-up for Windows XP, Vista, 7, 8 & 10

In order for the PT-Link II to communicate properly, it is imperative to set the IP address of both the PT-Link II as well as the computer to be within the same netmask. You need to change the IP address on your computer. The following instructions will explain how to configure the IP address for Microsoft® Windows XP, Vista, 7, 8, & 10 operating systems.

NOTE: Consult your IT Specialist to ensure that your Firewall and anti-virus software are turned off before proceeding.

3.3.1.1 Computer IP Address Set-up for Windows XP

- 1.) Click **<start>**; then click **<Control Panel>**.
- 2.) Double-click on the **Network Connections** icon. The *Network Connections Window* will appear (Figure 5).

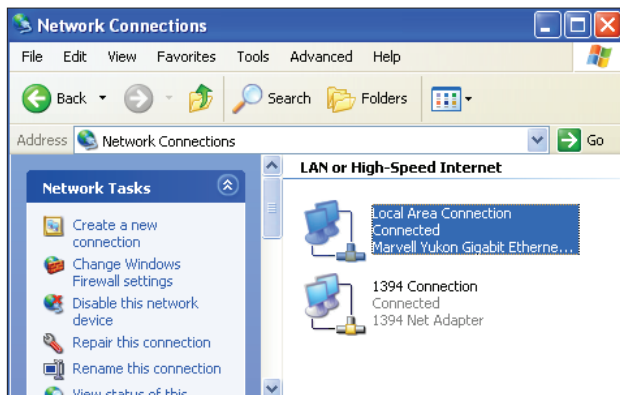


Figure 5: Network Connections Window

NOTE: If any wireless connections are listed, disable them by right-clicking the connection and selecting **<Disable>**.

- 3.) In the *Network Connections Window*, double-click the **Local Area Connections** entry. The *Local Area Connection Status Window* will appear (Figure 6).

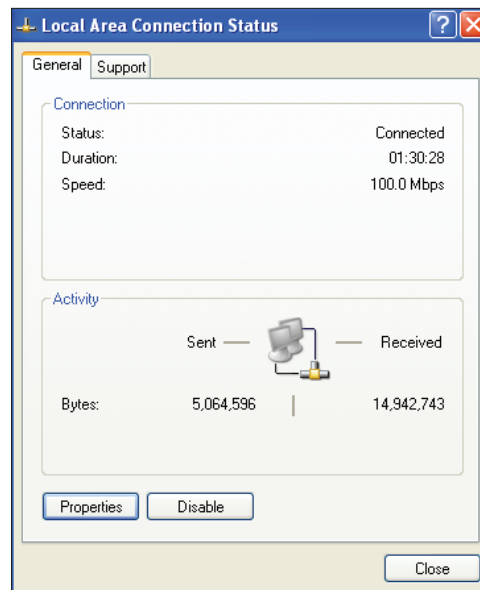


Figure 6: Local Area Connection Status Window

- 4.) As shown in Figure 6, click **<Properties>** in the lower left of the window. The *Local Area Connection Properties Window* will appear.

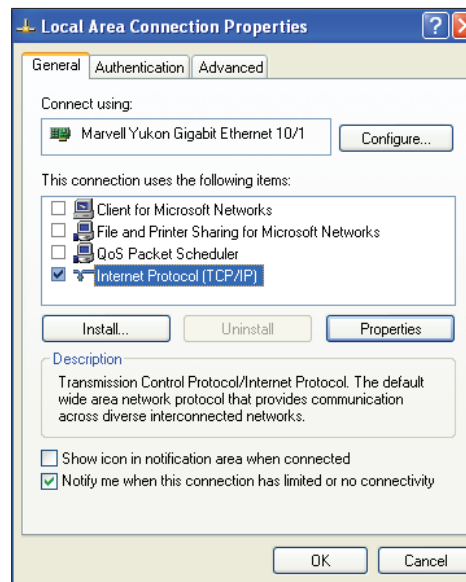


Figure 7: Local Area Connection Properties Window

- 5.) As shown in Figure 7, in the Connection Items list box, be sure the **Internet Protocol (TCP/IP)** is checked. Select the **Internet Protocol (TCP/IP)** item to highlight it and then click **<Properties>**. The *Internet Protocol Properties Window* will appear.

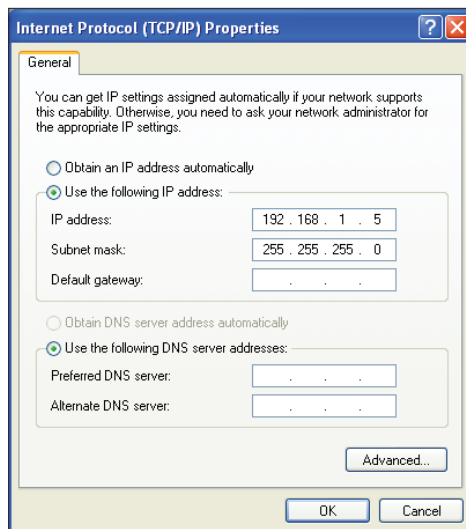


Figure 8: Internet Protocol Properties Window

- 6.) Select the radio button in front of **Use the following IP address (Figure 8)** and write down the current defaults so that you can re-enter them when you finish configuring the PT-Link and then type in the following information:
 - a.) IP address 192.168.1.5
 - b.) Subnet mask 255.255.255.0
 - c.) Default Gateway is blank
- 7.) Click **<OK>** until all of the above network configuration windows are closed. You may have to *reboot* the computer before the new values are valid.

3.3.1.2 Computer IP Address Set-up for Windows Vista, 7, 8 & 10

- 1.) Click **<start>**; then click **<Control Panel>** (Vista & Windows 7). Click **<start>**; then right-click for **<All apps>**. Click **<All apps>** and then click **<Control Panel>** (Windows 8).
- 2.) Click on the **Network and Internet** icon.
- 3.) Click **Network and Sharing Center**.
- 4.) From the shaded box in the left side of the window, select **Manage Network Connections** (Vista) or **Change adapter settings** (Windows 7).
- 5.) Right-click on the **Local Area Connection** icon and select **<Properties>** for the drop down window.
- 6.) Choose **Internet Protocol Version 4 (TCP/IPv4)** by highlighting it and then click **<Properties>**. The *Internet Protocol Properties Window* will appear (**Figure 8**).
- 7.) Select the radio button in front of **Use the following IP address (Figure 8)** and write down the current defaults so that you can re-enter them when you finish configuring the PT-Link and then type in the following information:
 - a.) IP address 192.168.1.5
 - b.) Subnet mask 255.255.255.0
 - c.) Default Gateway is blank
- 8.) Click **<OK>** until all of the above network configuration windows are closed. You may have to *reboot* the computer before the new values are valid.

3. PT-LINK CONFIGURATION

3.3 IP Address Configuration

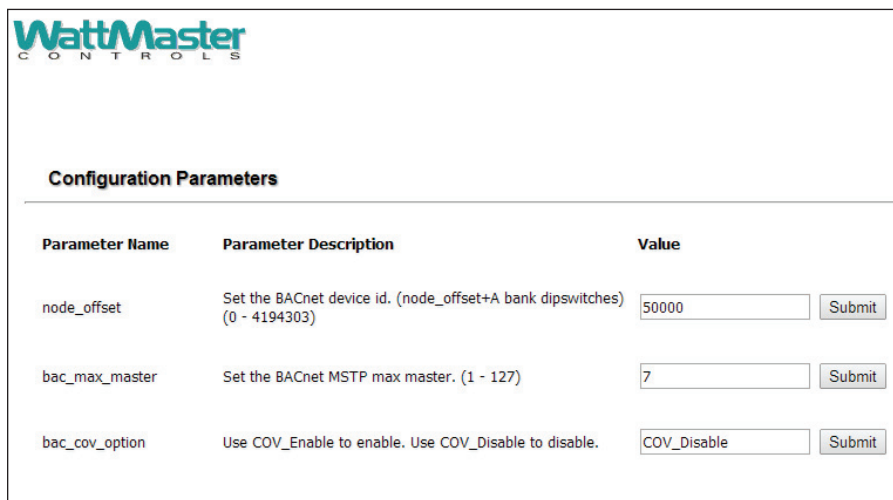
3.3.2 BACnet MS/TP - Setting Node_Offset to Assign Specific Device Instances

After setting your PC to be on the same subnet as the PT-Link, open a web browser on your PC and enter the IP address of the PT-Link; the default address is 192.168.1.24. (**Figure 9**).

1. If the IP address of the PT-Link has been changed by previous configuration, you will need to get the assigned IP address from the network administrator or use the FieldServer ToolBox to find the IP Address.

2. The configuration page will be displayed as your landing page. (**Figure 9**)

3. The node offset can be changed on the configuration page.



Parameter Name	Parameter Description	Value
node_offset	Set the BACnet device id. (node_offset+A bank dipswitches) (0 - 4194303)	50000 <input type="button" value="Submit"/>
bac_max_master	Set the BACnet MSTP max master. (1 - 127)	7 <input type="button" value="Submit"/>
bac_cov_option	Use COV_Enable to enable. Use COV_Disable to disable.	COV_Disable <input type="button" value="Submit"/>

Figure 9: BACnet MS/TP Settings for Node_Offset

4. The Node_Offset field will be presented displaying the current value (default = 50,000).

5. Change the value of Node_Offset to establish the desired Device Instance value, and click **<Submit>**.

$$\text{Device Instance} = \text{Node_Offset} + \text{A bank DIP switch setting (A1-A7)}$$

3.4.1 Verifying Communications

1.) In the *Navigation Window* on the left of the *FS-GUI Main Screen*, click **<View>** and then click **<Data Arrays>**. See **Figure 10**.

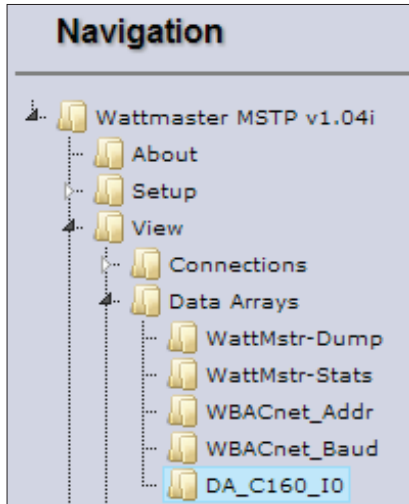


Figure 10: Navigation Window - View Data Arrays

2.) Click on the Controller name. In this case, it is DA_C160_I0, a VCM-X Controller. The Controller's Data Array Table will display. See **Figure 11**.

Data Array						
Offset	0	1	2	3	4	5
0	133.000000	105.000000	40.000000	0.000000	0.000000	40.000000
10	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000
20	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
30	8.000000	1.000000	1.000000	1.000000	0.000000	0.000000
40	0.000000	0.000000	1.000000	0.000000	0.000000	50.000000
50	0.000000	75.000000	70.000000	30.000000	30.000000	55.000000
60	0.000000	0.000000	0.000000	45.000000	55.000000	50.000000
70	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
80	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
90	900.000000	10.000000	0.000000	0.000000	100.000000	0.000000
100	0.000000	0.000000	0.000000	0.100000	0.100000	0.000000
110	70.000000	70.000000	0.000000			

Figure 11: VCM-X Data Array Table

3.) You can now cross reference the values shown in **Figure 11** with the listed parameter names in the appropriate Data Array Table for your controller type. These tables can be found on **pages 26-29**.

3.4.2 FS-GUI Reference Guide

An *FS-GUI Reference Guide* can be found in **Section 8, page 62**.

4. UPDATING THE SOFTWARE

4.1 Updating the PT-Link II Controller

4.1.1 Updating the PT-Link II with Prism 2

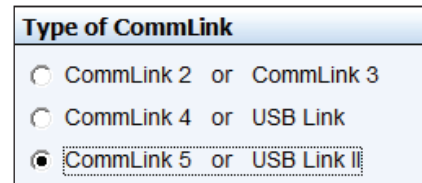
The PT-Link II is equipped with the ability to update its software with the use of a computer. You will need the following before you begin:

- PT-Link II in need of an update (powered up, no other connections necessary)
- Computer running Microsoft Windows™ operating system
- Prism 2 software from www.orioncontrols.com
- Latest version of PT-Link II software (e-mailed from our tech support staff or downloaded from any of our websites) and software sheet
- USB Driver Setup.exe file from PT-Link II CD or downloaded from any of our websites.
- USB cable

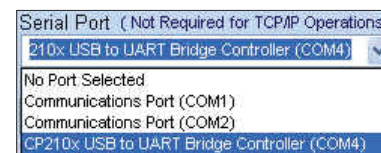
Follow these simple steps to update the PT-Link II:

- 1.) Power up the PT-Link II.
- 2.) Turn on your computer and download the latest Prism 2 software from www.orioncontrols.com.
- 3.) Either download and unzip the PT-Link II update file from <http://techsupport.wattmaster.com> or unzip and save the file to your computer from the e-mail you received from Tech Support. Record the path and name of the file for later use. You will need to know where the file is located for Step 16. Also, print the software sheet provided for future reference. **NOTE:** You must unzip the file in order for Prism to recognize the hex file.
- 4.) Run the USB Driver Setup.exe file (found on the PT-Link II CD or downloaded from any of our websites) so that Prism can communicate to the PT Link II. Unzip the file to the directory where you saved your PT-Link II software.
- 5.) Plug the USB cable into the computer's and PT-Link II's USB ports.
- 6.) A message will pop-up from the lower menu bar of Windows that reads, "Found New Hardware." Click on this message and follow the instructions that appear to install the USB drivers.
- 7.) Open Prism 2 and Login with the User Name, **admin** and the Password, **admin**. If successful, "Administrator Access" will appear at the lower right of the Prism program. **NOTE:** If using a Prism 2 version prior to 4.0, the Login is **flash**. If successful, "Level 4 Access" will appear at the lower right of the Prism program.

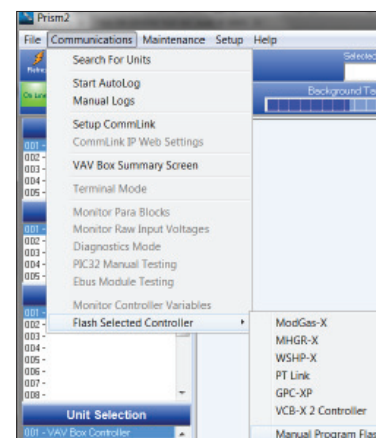
8.) Click on the **<Job-Site>** icon. The *Job-Sites Window* will appear. In the *Type of CommLink Dialog Box*, select "CommLink 5 or USB Link II."



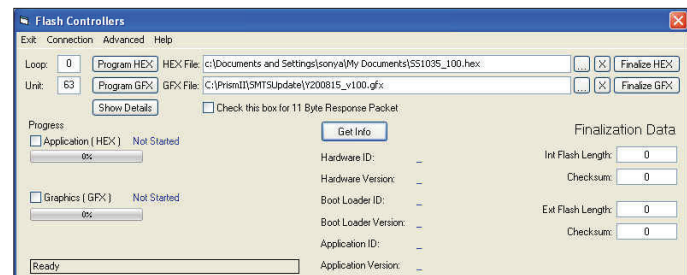
9.) In the *Job-Sites Window*, from the Serial Port drop down list, select the correct COM port. If you don't know the COM port number or if the number is 10 or higher, follow the directions on **pages 16 and 17**.



10.) From Prism 2's Communications tab, select "Flash Selected Controller", and then select "Manual Program Flash."



11.) The *Flash Controller Window* will appear.



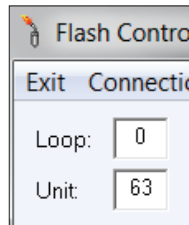
12.) From the *Flash Controller Window*'s Connection tab, select "Direct". Keep the *Flash Controller Window* open.



4. UPDATING THE SOFTWARE

4.1 Updating the PT-Link II Controller

13.) In the *Flash Controller Window*'s Loop and Unit fields, enter 0 for the Loop and 63 for the Unit, and then press **<ENTER>**.



The screenshot shows the 'Flash Controller' window. It has two input fields: 'Loop' with the value '0' and 'Unit' with the value '63'. There are buttons for 'Exit' and 'Connect' at the top.

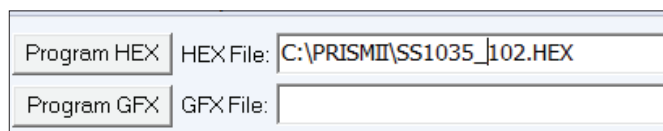
14.) Cycle power to the PT-Link II and within 5 seconds, click the **<Get Info>** button in the *Flash Controller Window*. The PT-Link II information will now appear in the window under the **<Get Info>** button.



This section shows the information retrieved after clicking 'Get Info'. It lists: Hardware ID: YS102412, Hardware Version: 1.3, Boot Loader ID: Y201021, Boot Loader Version: 1.0, Application ID: SS1035, and Application Version: 1.0.

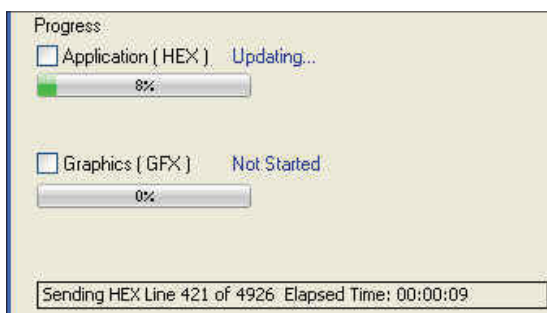
15.) The Application ID should be SS1035 and the Application Version should match the software version you will be updating to.

16.) In the HEX File field, enter the path and name of the HEX file you downloaded and/or copied to your hard drive. Use the Browse button (...) to the right of the field if you need help in locating the file.



The screenshot shows two input fields: 'Program HEX' with the value 'C:\PRISMII\SS1035_1102.HEX' and 'Program GFX' which is empty.

17.) Now, cycle power to the PT-Link II once again and within 5 seconds click on the **<Program HEX>** button (shown above). If successful, you should see the Progress Application HEX bar showing the progress percentage.

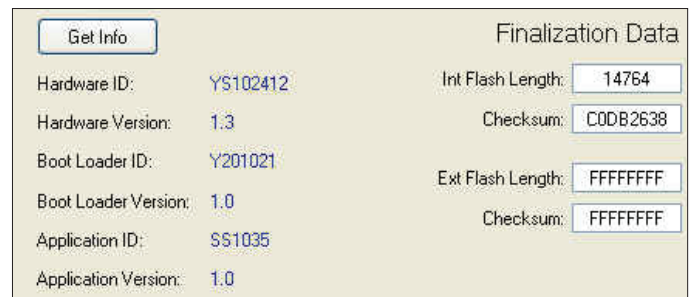


The screenshot shows a 'Progress' window. It has two progress bars: 'Application (HEX)' which is at 8% and 'Graphics (GFX)' which is at 0%. At the bottom, it says 'Sending HEX Line 421 of 4926 Elapsed Time: 00:00:09'.

18.) When the bar shows 100% completed, verify the PT-Link II's software is running by observing the Timer LED blinking.

19.) Verify the PT-Link II's Application Version by once again cycling power to the PT-Link II and within 5 seconds clicking the **<Get Info>** button.

20.) Verify all fields are correct in the information below the **<Get Info>** button and under "Finalization Data." The "Int Flash Length" and "Checksum" values should match the values provided with the software sheet.



This window shows 'Finalization Data'. It lists: Hardware ID: YS102412, Hardware Version: 1.3, Boot Loader ID: Y201021, Boot Loader Version: 1.0, Application ID: SS1035, and Application Version: 1.0. It also shows 'Int Flash Length: 14764', 'Checksum: C0DB2638', 'Ext Flash Length: FFFFFFFF', and 'Checksum: FFFFFFFF'.

4. UPDATING THE SOFTWARE

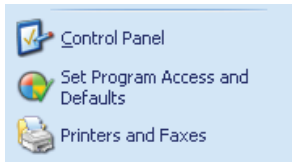
4.1 Updating the PT-Link II Controller

4.1.2 Finding What COM Port Number the PT-Link II is Using

1. *Left-click* on **<Start>**, located on the bottom left of the Windows Tool Bar.



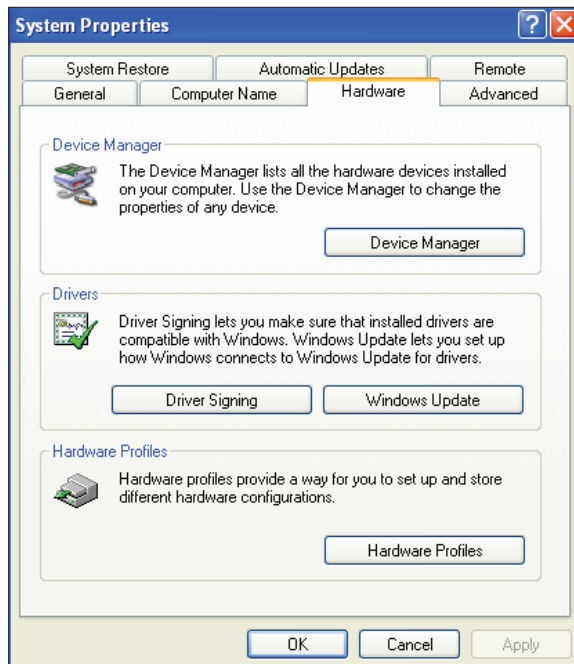
2. *Select* **<Control Panel>**.



3. *Double-click* the System Icon.

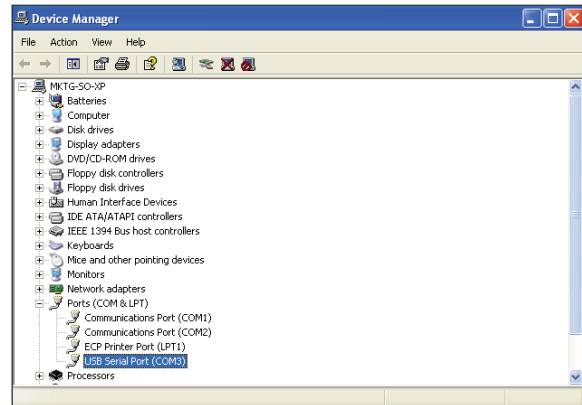


4. *Click* the **<Hardware>** tab.



5. *Click* the **<Device Manager>** button.

6. *Click* on the plus sign next to Ports to see all of the common ports.



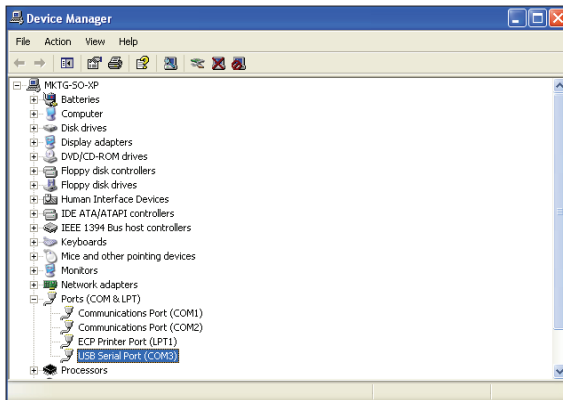
7. *Locate* the USB Serial Port (COM#). The COM# in parentheses is the port it is located on. *Write* this COM port number down. You will need to know this when setting up the Prism software.
8. If the COM port number is 10 or greater, go to "Changing the USB COM Port Number" on **page 17**.

4.1 Updating the PT-Link II Controller

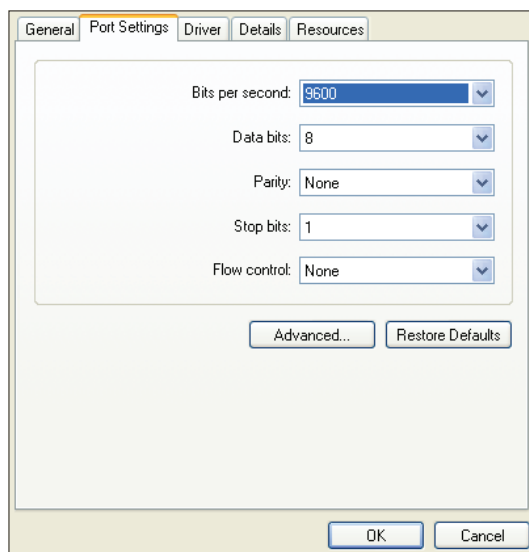
4.1.3 Changing the USB COM Port Number

When the PT-Link II is first plugged in, it will be assigned a COM port number to be used for communicating with the Prism software. If the port number is 10 or greater, it needs to be changed to a value less than 10 to be recognized by Prism.

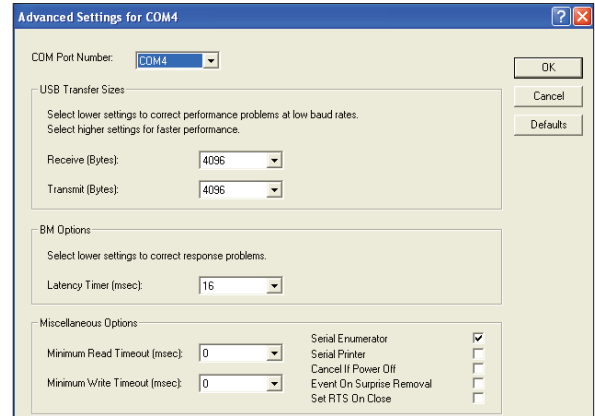
1. Click **<Start>**, click **<Control Panel>**, click **<System>**, click the **<Hardware>** tab, and then click **<Device Manager>** to get to the *Device Manager Window*.
2. Click on the plus sign next to Ports to see all of the COM ports.



3. Right-click on “USB Serial Port (COM#)” and select **<Properties>**. In the *Properties Window*, select the **<Port Settings>** tab.



4. To assign a port number less than 10, click on **<Advanced>**. The *Advanced Settings Window* will appear.



5. In the COM Port Number drop box, select which COM port you wish to use. Make sure you select a COM port number that is not currently in use (you can see the ports in use in the *Device Manager Window*). Select a port that is less than 10.

NOTE: Windows® will assign a port number to every device that has ever been installed on your computer. So if there are no available ports below 10, choose a port number less than 10 for a device listed that you know you are not currently using.

6. Once you select the correct COM port number, click **<OK>** and close any windows opened in the process of changing the port number. Make note of this number because you will need it for your Prism setup.

4. UPDATING THE SOFTWARE

4.2 Updating the Field Server Software

1.) Extract and save the update file you receive from Field Server onto your PC.

2.) Open your web browser, and type the IP Address of the PT-Link, which defaults to **<192.168.1.24>**, and press **<ENTER>**. The GUI will launch. Click **<Diagnostic and Debugging>**. The Main Screen will appear. See Figure 12.

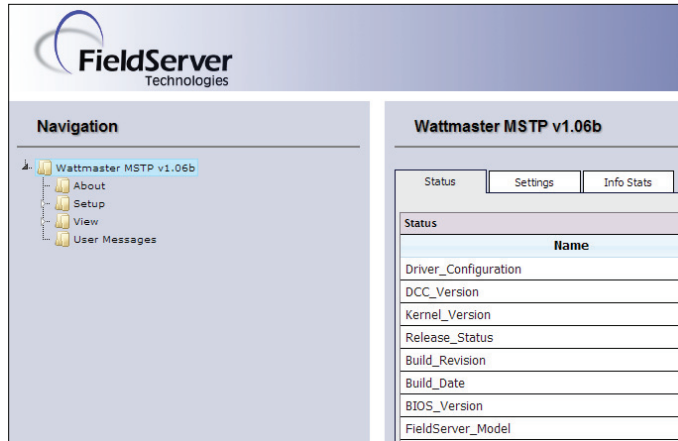


Figure 12: The FS-GUI Main Screen

3.) In the *Navigation Window* on the left of the FS-GUI Screen, click **<Setup>** and then click **<File Transfer>**. See Figure 13.

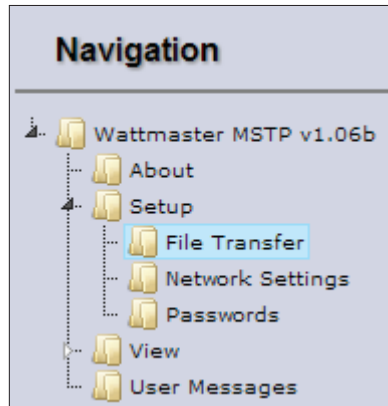


Figure 13: Navigation Window - File Transfer

4.) Refer to the *File Transfer Window* below (Figure 14). In the *General Tab*, click **<Browse>** and locate the file you saved in Step 1. Then click on **<Submit>**. When the download is complete, click on the **<System Restart>** button.

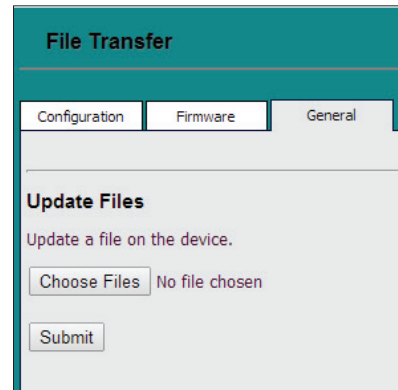


Figure 14: File Transfer - General Tab

5.1 Troubleshooting Communications

5.1.1 Check Wiring and Settings

No COMS on WattMaster side

If TX/RX are not flashing rapidly, then there is a COM issue on the WattMaster side and you need to check the following things:

- Visual observations of LEDs on ProtoNode. (Figure 18, page 21)
- Check baud rate, parity, data bits, stop bits
- Check WattMaster device address
- Verify wiring
- Verify all the WattMaster devices that were discovered in FST Web Configurator. (page 12)

NOTE: If the problem still exists, a Diagnostic Capture needs to be taken and sent to WattMaster Technical Support. See page 24.

Field COM problems

- Visual observations of LEDs on PT-Link. (Figure 17, page 20)
- Visual dipswitch settings (using correct baud rate and device instance)
- Verify IP address setting
- Verify wiring

NOTE: If the problem still exists, a Diagnostic Capture needs to be taken and sent to WattMaster Technical Support. See page 24.

5.1.2 Verifying Communications

1.) In the *Navigation Window* on the left of the *FS-GUI Main Screen*, click **<View>** and then click **<Data Arrays>**. See Figure 15.

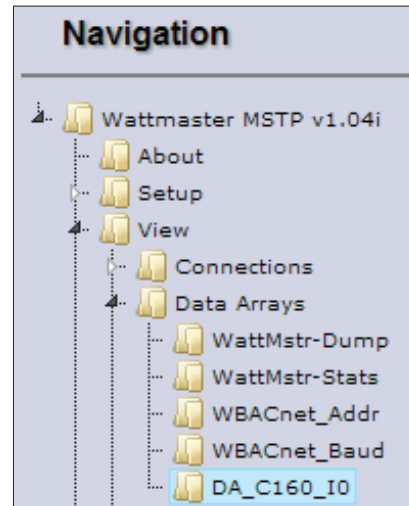


Figure 15: Navigation Window - View Data Arrays

2.) Click on the Controller name. In this case, it is DA_C160_I0, a VCM-X Controller. The Controller's Data Array Table will display. See Figure 16.

Data Array						
Offset	0	1	2	3	4	5
0	133.000000	105.000000	40.000000	0.000000	0.000000	40.000000
10	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000
20	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
30	8.000000	1.000000	1.000000	1.000000	0.000000	0.000000
40	0.000000	0.000000	1.000000	0.000000	0.000000	50.000000
50	0.000000	75.000000	70.000000	30.000000	30.000000	55.000000
60	0.000000	0.000000	0.000000	45.000000	55.000000	50.000000
70	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
80	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
90	900.000000	10.000000	0.000000	0.000000	100.000000	0.000000
100	0.000000	0.000000	0.000000	0.100000	0.100000	0.000000
110	70.000000	70.000000	0.000000			

Figure 16: VCM-X Data Array Table

3.) You can now cross reference the values shown in Figure 16 with the listed parameter names in the appropriate Data Array Table for your controller type. These tables can be found on pages 26-29.

5. TROUBLESHOOTING

5.2 Troubleshooting LEDs

5.2.1 PT-Link II Board LEDs

The PT-Link II BACnet® is equipped with LEDs that can be used for troubleshooting. There are eight LEDs on the PT-Link board. See **Figure 17** for the locations of the LEDs on the PT-Link board. The LED descriptions and functions are listed in the following paragraphs.

POWER LED

When the PT-Link II BACnet® is powered up, the “**POWER**” LED should light up and stay on continuously. If it does not light up, check to be sure that you have 24 VAC connected to the board, that the wiring connections are tight, and that they are wired for correct polarity. The 24 VAC power must be connected so that all ground wires remain common. If after making all these checks the “**POWER**” LED still does not light up, please contact WattMaster Controls Technical Support at our Toll Free number—866-918-1100—for assistance.

LOOP LED

When power is applied to the PT-Link II BACnet®, the “**LOOP**” LED will also light up. The LED should flicker rapidly, indicating that the PT-Link is trying to communicate with the controllers on the loop. A “**flicker**” is defined as a brief moment when the LED turns off and back on. If the “**LOOP**” LED does not operate as indicated above, first power down the unit and then reapply power. If this does not work, please contact WattMaster Controls Technical Support at our Toll Free number—866-918-1100—for assistance.

LED 1

When power is first applied, “**LED 1**” will be off temporarily and then will blink one time for each controller it is communicating with. For example, if you have 4 controllers on the loop connected to the PT-Link, “**LED 1**” will blink 4 times. If the amount of blinks does not match the number of controllers connected to the loop, it indicates there is a communications problem. The best way to find out which board is not communicating is to go to each controller and look at its “**COMM**” LED. The “**COMM**” LED should be solid and will flicker occasionally indicating communication with the PT-Link II BACnet®. If the “**COMM**” LED does not flicker, there is no communication with that controller.

LED 2

When power is first applied, “**LED 2**” will be off temporarily and then will blink slowly indicating that the PT-Link baseboard is communicating with the ProtoCessor Module. If “**LED 2**” does not blink, check that the ProtoCessor Module is installed correctly on the PT-Link baseboard and that the “**PWR**” LED is lit up on the ProtoCessor Module.

PROTO LED

When the PT-Link II is first powered up, the “**PROTO**” LED should blink rapidly and may appear to be on solid. This LED verifies communication with the board and the ProtoCessor. If the LED doesn’t light up, check that the ProtoCessor is installed correctly and firmly connected to the Base Board. The “**PWR**” LED should also be lit on the ProtoCessor Module.

TIMER LED

The “**TIMER**” LED is used for troubleshooting by WattMaster Controls Technical Support. The “**TIMER**” LED should always be blinking steadily.

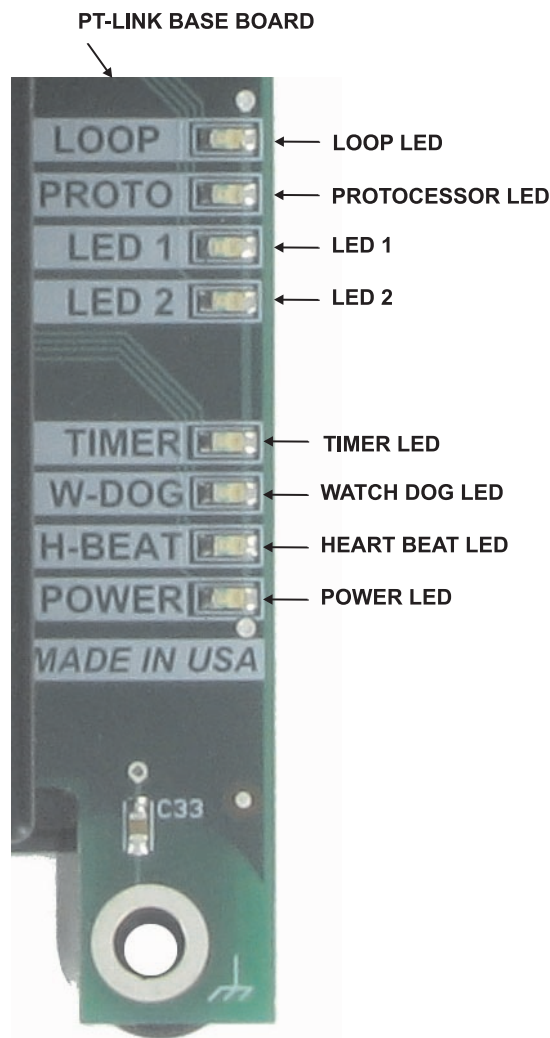


Figure 17: PT-Link II BACNET® LED Locations

WATCH DOG LED

The “**W-DOG**” LED is used for troubleshooting by WattMaster Controls Technical Support. The “**W-DOG**” LED should always be on solid.

HEARTBEAT LED

The “**H-BEAT**” LED blinks to show the PT-Link II board software is running. If the LED doesn’t light up, and all other checks have been made, please contact WattMaster Controls Technical Support at our Toll Free number—866-918-1100—for assistance.

5.2.2 PT-Link Module LEDs

Refer to **Figure 18** for LED locations.

PWR LED

When the PT-Link II is first powered up, the “PWR” green LED should light up and stay on continuously. If the LED doesn’t light up, check that the ProtoCessor is installed correctly and firmly connected to the Base Board.

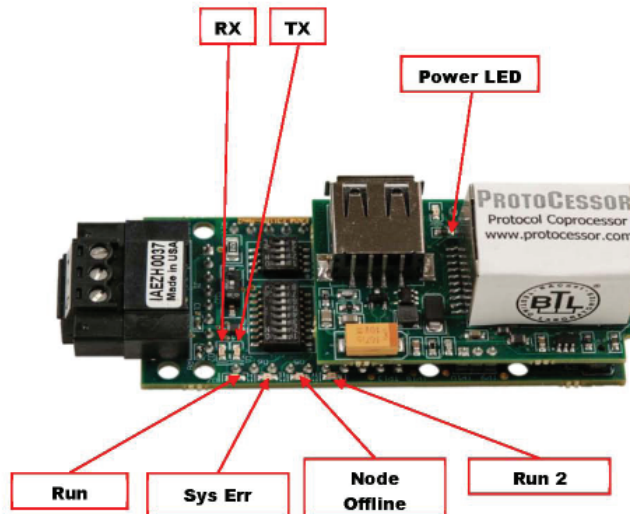


Figure 18: PT-Link II BACnet4® LED Locations

RX & TX LEDs

During normal operation, the “RX” LED will flash when a message is received on the field port of the ProtoCessor and the “TX” LED will flash when a message is sent on the field port of the ProtoCessor. The “TX” and “RX” LEDs work together to indicate that communication is being established with the desired protocol network. If both LEDs are blinking, then communication is working properly. If not, check the protocol network wiring and the baud rate in the configuration file.

RUN LED

Upon powerup, the “RUN” LED should light up and stay solid for 15 seconds. It should then blink steadily, signifying normal operation. The ProtoCessor will be able to access RUINET once this LED starts flashing.

RUN2 LED

The “RUN2” LED should blink steadily after power up, signifying normal operation. The ProtoCessor will be able to access RUINET once this LED starts flashing.

SYS ERR LED

The “SYS ERR” LED will go on solid 15 seconds after power up and then shut off. A steady red light will indicate there is a system error on the ProtoCessor. If this occurs, immediately report the related “system error” shown in the error screen of the Remote User Interface to Field-Server Technologies for evaluation.

NODE OFFLINE LED

The “NODE OFFLINE” amber LED will go on solid 15 seconds after power up and then shut off. A steady amber light indicates the ProtoCessor is not communicating with a device that it is polling.

NOTE: If all of these tests are made and the controller still doesn’t operate, please contact WattMaster Controls Technical Support at our Toll Free number—866-918-1100—for assistance.

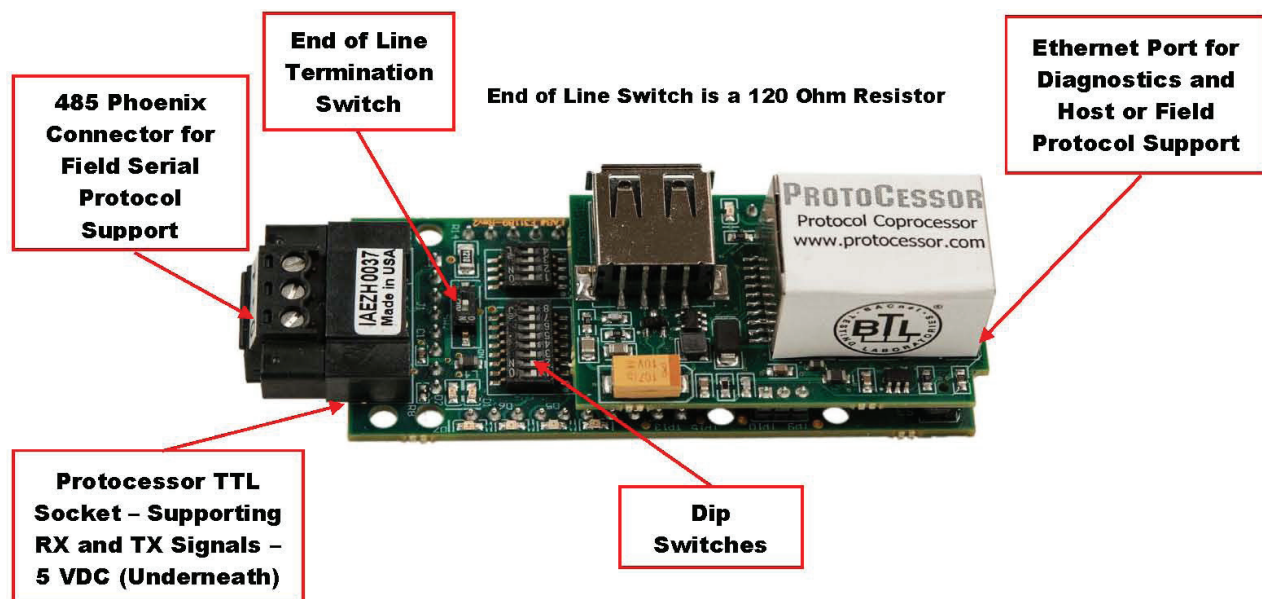


Figure 19: PT-Link II BACnet4® Components

5. TROUBLESHOOTING

5.3 Troubleshooting the PT-Link Controller

5.3.1 Addressing WattMaster Devices in a BACnet® Network

Each PT-Link II BACnet® generates only one BACnet® device regardless of the number of WattMaster controls connected to it. This device will have all the properties of all the WattMaster controls connected. The instance of the device is equal to the unit address. The properties of each control can be differentiated by an offset of 500.

Examples:

- 1.) Properties of the controller address as 1 will range from 0 to 499.
- 2.) Properties of the controller address as 2 will range from 500 to 999.
- 3.) Properties of the controller address as 3 will range from 1000 to 1499.

To search for the instance of a specific property, follow the next formula:

Property Instance = ((Controller Address – 1) * 500) + Instance Number from table.

Example:

- 1.) The PT-Link II BACnet® has a Node ID equal to five.
- 2.) Two VCM controllers connected and addressed to one and four.
- 3.) Searching for the Outdoor Temperature of each controller.
- 4.) Instance of the Outdoor Temperature in the VCM table equal to AI: 54.
- 5.) Client will only see Device 5.
- 6.) Under Device 5 it will see AI: 54 for the Outdoor Temperature of the unit addressed as 1 and AI: 1554 for the Outdoor Temperature of the unit addressed as 4.

NOTE: To simplify the calculation, we recommend that the WattMaster controllers be addressed in sequential order from one to the last controller without any unused address(es) in between.

5.3.2 BACnet® Explorer for Validating PT-Link in the Field

Sierra Monitor Corporation offers a tool, BACnet® Explorer, that can be used to validate BACnet® MS/TP communications of the PT-Link in the field without having to have the BMS Integrator on site.

For instructions on downloading BACnet® Explorer, go to www.sierramonitor.com/customer-care/resource-center and download *BACnet® Explorer Start-up Guide*.

For purchasing information, go to the BACnet® Explorer page on the Sierra Monitor website (www.sierramonitor.com/connect/all-protocol-gateway-products/bacnet-explorer) and *click* on the “BUY NOW” tab.

5.3 Troubleshooting the PT-Link Controller

5.3.3 Viewing Diagnostic Information

1. Type the IP address of the PT-Link into your web browser or use the FieldServer Toolbox to connect to the PT-Link
2. Click on **<Diagnostics and Debugging>** then click on **<View>**, and then click on **<Connections>**. See Figure 20.
3. If there are any errors showing in the *Connections Window*, please refer to **Section 5.1.1, page 19** for the relevant wiring and settings.

Connections						
Overview						
Connections						
Index	Name	Tx Msg	Rx Msg	Tx Char	Rx Char	Errors
0	R2 - PCP-WMST	12,139,181	12,139,180	95,964,580	93,009,282	0
1	R1 - BACnet_MSTP	1	0	14	0	0

Figure 20: Connections Window

5. TROUBLESHOOTING

5.4 FieldServer Diagnostic Utilities

5.4.1 Diagnostic Capture Procedures


1. Once the Diagnostic Capture is complete, email it to support@protoessor.com. The Diagnostic Capture will allow us to rapidly diagnose the problem.
2. Ensure that FieldServer Toolbox is Loaded on the PC that is currently being used, or download FieldServer-Toolbox.zip at <http://sierramonitor.com/customer-care/resource-center>
3. Extract the executable file and complete the installation.
4. Disable any wireless Ethernet adapters on the PC/Laptop. See **Figure 21**.
5. Disable firewall and virus protection software if possible.
6. Connect a standard Cat 5 Ethernet cable between the PC and ProtoNode.
7. *Double-click* on the FS Toolbox Utility. Refer to **Figure 26, page 25** for Toolbox components.
8. *Click* on the diagnose icon  of the desired device. See **Figure 22**.
9. *Select* Full Diagnostic. See **Figure 23**.



Figure 21: Ethernet Port Location



Figure 23: Full Diagnostic

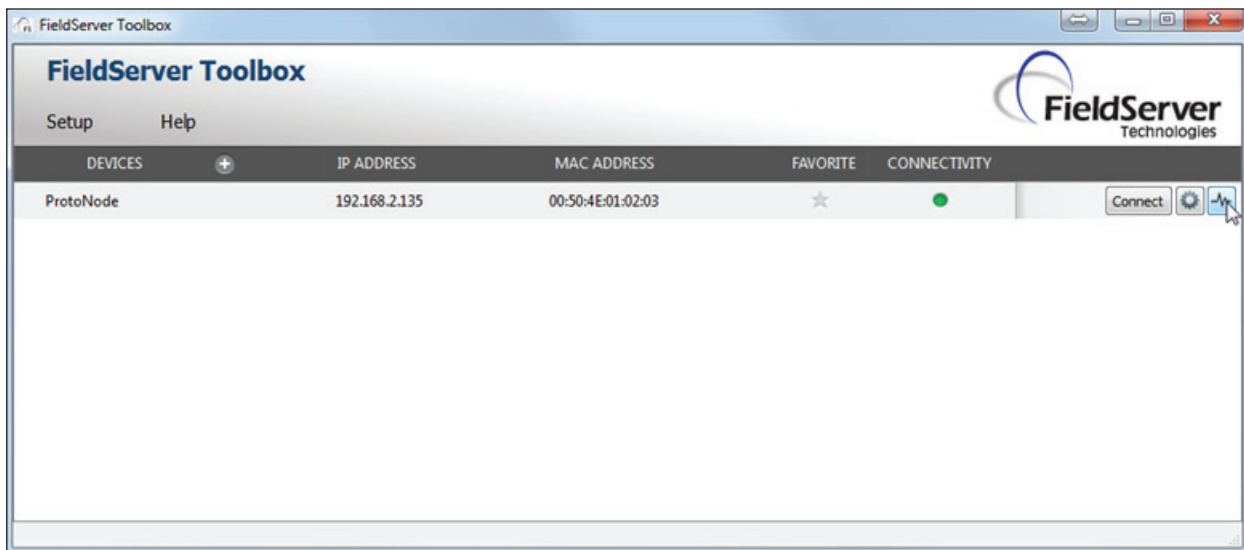


Figure 22: FieldServer Toolbox - Diagnostic Icon

5.4 FieldServer Diagnostic Utilities

10. If desired, the default capture period can be changed.
See **Figure 24**.

11. Click on **<Start Diagnostic>**. **Figure 24**.



Figure 24: Set Capture Period and Start Diagnostic

12. Wait for the Capture period to finish. The *Diagnostic Test Complete Window* will appear. **Figure 25**.

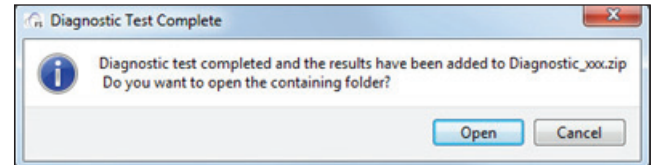
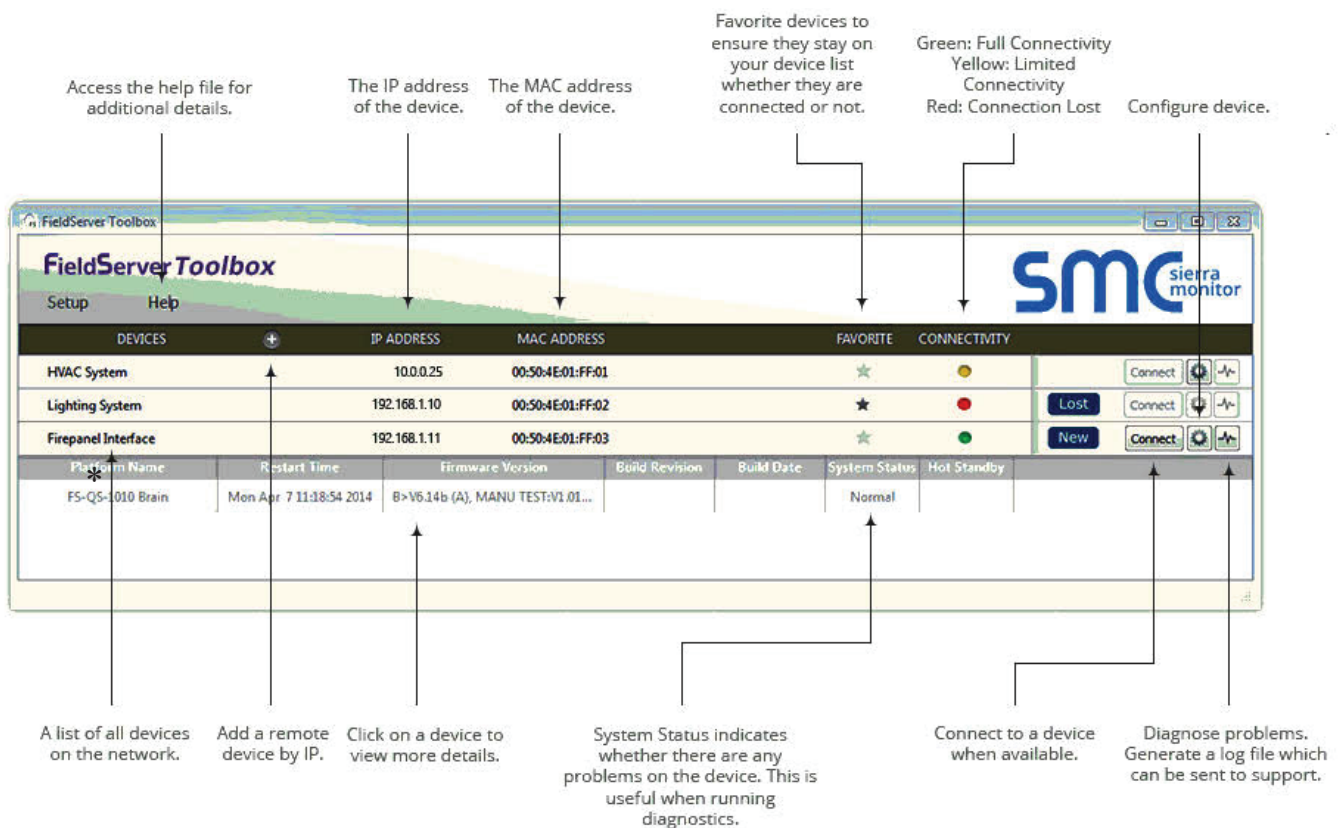


Figure 25: Diagnostic Test Complete Window

13. Once the Diagnostic test is complete, a .zip file will be saved on the PC.

14. Click **<Open>** in the *Diagnostic Test Complete Window* to launch explorer and have it point directly at the correct folder.

15. Send the Diagnostic zip file to support@fieldserver.com.



* **Note:** Blue: Limited connectivity. You might have an older software version on the FieldServer processor. You would need to run the RUINET setup instead of using the FS-GUI interface.

Figure 26: FieldServer Toolbox Components

6. DATA ARRAYS

6.1 VCB-X & VCM-X Modular Data Arrays

VCB-X Modular Data Array For Field Server										
Offset	0	1	2	3	4	5	6	7	8	9
0	AppVer	ClSt	HtSt	SpcTp	SaTp	OaTp	UnitMode	CtrlSts	ClEnbl	HtEnbl
10	EcoEnbl	FanDly	OnRlys	EcoPos	VfdBwPos	AlmSts	AlmGrp1	AlmGrp2	AlmGrp3	SaTpAlm
20	OaTpAlm	SpcTpAlm	MchClAlm	MchHtAlm	PofAlm	DrtFlAlm	SmokeAlm	LoSaAlm	HiSaAlm	CtrlTpCF
30	CtrlTpHF	CtrlTp	InRh	InRhStM	MdClPos	MdHtPos	OcpClSt	OcpHtSt	UnClOst	UnHtOst
40	SaClSt	SaHtSt	SpcTpOst	SaTpOst	OaTpOst	SchdFrc	OnRly1	OnRly2	OnRly3	OnRly4
50	OnRly5	OnRly6	MnExRly1	MnExRly2	MnExRly3	MnExRly4	MnExRly5	RIExRly1	RIExRly2	RIExRly3
60	RIExRly4	RIExRly5	RIExRly6	RIExRly7	RIExRly8	RIExRly9	RIExRly10	RIExRly11	RIExRly12	MinEcoSt
70	OaCFM	EtCFM	SaCFM	FrcHvacM	FrcFanSp	FrcEcono	SaTpStM	RaTp	OaRh	StaticPr
80	CO2	BuildPr	EtFnSpd	CoilTp	RaCFM	HeadPr	RtVlvPos	LvWtrTp	MdGsVPos	HeadPrSt
90	CdCtrSg1	OaClSt	OaHtSt	WmupTg	RhDewpSt	EcoEnbSt	RaTpOst	ColTpOft	LWAmbnt	PreHtAmb
100	CO2MinLv	CO2MaxLv	InRhSt	StatPrSt	RfPrSt	OACfmMin	HiInRh	CIHdPrSt	HtHdPrSt	LoClTpSt
110	HiClTpSt	SaClRt	SaHtRt	ClLoRt	CIHiRt	HtLoRt	HtHiRt	CtrlMod	DschgTp	OaWtbl
120	OaDewPt	SucPr	CoilTpSt	RetBydmp	RaDmp	RaRH	SldAdOfs	MdSelDb	ClStgWdw	HtStgWdw
130	MchClLkt	MchHtLkt	LoSaCf	HiSaCf	DfrSt	LvH2OOst	CO2Ost	CTpHiAlm	CTpLoAlm	HpLkt
140	VFDClMin	VFDHtMin	VFDVtMin	MaxEcoHt	MaxEcoCO	HpDfrInt	AptDfr	DuctPfDb	RlfPrDb	OaCfmDb
150	SZVAVFnI	SaWmupSt	SaCldnSt	RehtEnbl	EmHtEnbl	RaTpAlm	MisEM1	ColPfAlm	CO2Alm	DschgAlm
160	OaCfmAlm	ExtCmSr	SaCfmSr	RaCfmSr	MisMHGRV	MisMDGAS	Mis12Rly	HiCtrlMd	LoCtrlMd	DigCmpCf
170	DigCmpLk	HiHedPr	H2OProf	LoSucPr	HiSucPr	–	–	–	–	–

Table 3: VCB-X Modular Data Array For Field Server

VCM-X Modular Data Array For Field Server										
Offset	0	1	2	3	4	5	6	7	8	9
0	AppVer	ClSt	HtSt	OaWtbl	TpDmnd	SpcTp	SaTp	RaTp	OaTp	DuctPr
10	OaRh	UnitMode	CtrlSts	ClEnbl	HtEnbl	EcoEnbl	FanDly	PofCfg	CO2Cfg	MdHt2Ins
20	Rt2Ins	OnRlys	ExRlys12	ExRlys34	EcoPos	VfdBwPos	VfdExPos	AlmSts	AlmGrp1	AlmGrp2
30	AlmGrp3	SaTpAlm	OaTpAlm	SpcTpAlm	MchClAlm	MchHtAlm	PofAlm	DrtFlAlm	SmokeAlm	LoSaAlm
40	HiSaAlm	CtrlTpCF	CtrlTpHF	CtrlTp	InRh	InRhStM	DptStM	MdClPos	MdHtPos	MdHt2Pos
50	Rt2Pos	OcpClSt	OcpHtSt	UnClOst	UnHtOst	WtblSt	SaClSt	SaHtSt	WmupSt	SpcTpOst
60	SaTpOst	RaTpOst	OaTpOst	CoilTpSt	DptSt	InRhSt	DuctPrSt	RfPrSt	SchdFrc	OnRly1
70	OnRly2	OnRly3	OnRly4	OnRly5	ExRly1	ExRly2	ExRly3	ExRly4	ExRly5	ExRly6
80	ExRly7	ExRly8	ExRly9	ExRly10	ExRly11	ExRly12	ExRly13	ExRly14	ExRly15	ExRly16
90	CO2St	MinEcoSt	CO2Level	ByPasDmp	RaDmp	RfPr	OaDwpt	CoilTp	SaTpStM	PreHtSp
100	OaCFM	EtCFM	SaCFM	OACfmSt	OACfmRs	OACfmStM	MdCmp2	HdPr1	HdPr2	CdFan1
110	CdFan2	RmVFDPos	SaClRt	SaHtRt	ClLoRt	CIHiRt	HtLoRt	HtHiRt	T24EcFb	T24TpAlm
120	T24NEWS	T24EWISN	T24DpAlm	T24ExsOA	RaTpAlm	AlmGrp5	HdPr22	HdPr22	CdFan21	CdFan22

Table 4: VCM-X Modular Data Array For Field Server

6.2 VCM-X WSHP Coil & VCM-X WSHP Tulsa Data Arrays

VCM-X WSHP (Tulsa) Data Array For Field Server										
Offset	0	1	2	3	4	5	6	7	8	9
0	AppVer	ClSt	HtSt	OaWtbl	TpDmnd	SpcTp	SaTp	RaTp	OaTp	DuctPr
10	OaRh	UnitMode	CtrlSts	ClEnbl	HtEnbl	EcoEnbl	FanDly	PofCfgr	CO2Cfgr	MdHt2Ins
20	Rt2Ins	OnRlys	ExRlys12	ExRlys34	EcoPos	VfdBwPos	VfdExPos	AlmSts	AlmGrp1	AlmGrp2
30	AlmGrp3	SaTpAlm	OaTpAlm	SpcTpAlm	MchClAlm	MchHtAlm	PofAlm	DrtFAlm	SmokeAlm	LoSaAlm
40	HiSaAlm	CtrlTpCF	CtrlTpHF	CtrlTp	InRh	InRhStM	DptStM	MdClPos	MdHtPos	MdHt2Pos
50	Rt2Pos	OcpClSt	OcpHtSt	UnClOst	UnHtOst	WtblSt	SaClSt	SaHtSt	WmupSt	SpcTpOst
60	SaTpOst	RaTpOst	OaTpOst	CoilTpSt	DptSt	InRhSt	DuctPrSt	RfPrSt	SchdFrc	OnRly1
70	OnRly2	OnRly3	OnRly4	OnRly5	ExRly1	ExRly2	ExRly3	ExRly4	ExRly5	ExRly6
80	ExRly7	ExRly8	ExRly9	ExRly10	ExRly11	ExRly12	ExRly13	ExRly14	ExRly15	ExRly16
90	CO2St	MinEcoSt	CO2Level	ByPasDmp	RaDmp	RfPr	OaDwpt	CoilTp	SaTpStM	PreHtSp
100	OaCFM	EtCFM	SaCFM	OACfmSt	OACfmRs	OACfmStM	MdCmp2	HdPr1	HdPr2	CdFan1
110	CdFan2	WaterTpA	WaterTpB	A1LSPAIm	A1LktAlm	A2LSPAIm	A2LktAlm	B1LSPAIm	B1LktAlm	B2LSPAIm
120	B2LktAlm	LWT1Alm	LWT2Alm	POWF1Alm	POWF2Alm	ComMAlm	RmVFDPos	SaClRt	SaHtRt	ClLoRt
130	ClHiRt	HtLoRt	HtHiRt	T24EcFb	T24TpAlm	T24NEWS	T24EWISN	T24DpAlm	T24ExsOA	RaTpAlm
140	AlmGrp5	HdPr22	HdPr22	CdFan21	CdFan22	–	–	–	–	–

Table 5: VCM-X WSHP (Tulsa) Data Array For Field Server

VCM-X WSHP (Coil) Data Array For Field Server										
Offset	0	1	2	3	4	5	6	7	8	9
0	AppVer	ClSt	HtSt	OaWtbl	TpDmnd	SpcTp	SaTp	RaTp	OaTp	DuctPr
10	OaRh	UnitMode	CtrlSts	ClEnbl	HtEnbl	EcoEnbl	FanDly	PofCfgr	CO2Cfgr	MdHt2Ins
20	Rt2Ins	OnRlys	ExRlys12	ExRlys34	EcoPos	VfdBwPos	VfdExPos	AlmSts	AlmGrp1	AlmGrp2
30	AlmGrp3	SaTpAlm	OaTpAlm	SpcTpAlm	MchClAlm	MchHtAlm	PofAlm	DrtFAlm	SmokeAlm	LoSaAlm
40	HiSaAlm	CtrlTpCF	CtrlTpHF	CtrlTp	InRh	InRhStM	DptStM	MdClPos	MdHtPos	MdHt2Pos
50	Rt2Pos	OcpClSt	OcpHtSt	UnClOst	UnHtOst	WtblSt	SaClSt	SaHtSt	WmupSt	SpcTpOst
60	SaTpOst	RaTpOst	OaTpOst	CoilTpSt	DptSt	InRhSt	DuctPrSt	RfPrSt	SchdFrc	OnRly1
70	OnRly2	OnRly3	OnRly4	OnRly5	ExRly1	ExRly2	ExRly3	ExRly4	ExRly5	ExRly6
80	ExRly7	ExRly8	ExRly9	ExRly10	ExRly11	ExRly12	ExRly13	ExRly14	ExRly15	ExRly16
90	CO2St	MinEcoSt	CO2Level	ByPasDmp	RaDmp	RfPr	OaDwpt	CoilTp	SaTpStM	PreHtSp
100	OaCFM	EtCFM	SaCFM	OACfmSt	OACfmRs	OACfmStM	MdCmp2	HdPr1	HdPr2	CdFan1
110	CdFan2	WaterTpA	A1LSPAIm	A1LktAlm	B1LSPAIm	B1LktAlm	LWT1Alm	POWF1Alm	ComMAlm	RmVFDPos
120	SaClRt	SaHtRt	ClLoRt	ClHiRt	HtLoRt	HtHiRt	T24EcFb	T24TpAlm	T24NEWS	T24EWISN
130	T24DpAlm	T24ExsOA	RaTpAlm	–	–	–	–	–	–	–

Table 6: VCM-X WSHP (Coil) Data Array For Field Server

6. DATA ARRAYS

6.3 VCM-X & SA Data Arrays

VCM-X Data Array For Field Server										
Offset	0	1	2	3	4	5	6	7	8	9
0	AppVer	ClSt	HtSt	OaWtbl	TpDmnd	SpcTp	SaTp	RaTp	OaTp	DuctPr
10	OaRh	UnitMode	CtrlSts	ClEnbl	HtEnbl	EcoEnbl	FanDly	PofCfg	CO2Cfg	MdHt2Ins
20	Rt2Ins	OnRlys	ExRlys12	ExRlys34	EcoPos	VfdBwPos	VfdExPos	AlmSts	AlmGrp1	AlmGrp2
30	AlmGrp3	SaTpAlm	OaTpAlm	SpcTpAlm	MchClAlm	MchHtAlm	PofAlm	DrtFAlm	SmokeAlm	LoSaAlm
40	HiSaAlm	CtrlTpCF	CtrlTpHF	CtrlTp	InRh	InRhStM	DptStM	MdClPos	MdHtPos	MdHt2Pos
50	Rt2Pos	OcpClSt	OcpHtSt	UnClOst	UnHtOst	WtblSt	SaClSt	SaHtSt	WmupSt	SpcTpOst
60	SaTpOst	RaTpOst	OaTpOst	CoilTpSt	DptSt	InRhSt	DuctPrSt	RfPrSt	SchdFrc	OnRly1
70	OnRly2	OnRly3	OnRly4	OnRly5	ExRly1	ExRly2	ExRly3	ExRly4	ExRly5	ExRly6
80	ExRly7	ExRly8	ExRly9	ExRly10	ExRly11	ExRly12	ExRly13	ExRly14	ExRly15	ExRly16
90	CO2St	MinEcoSt	CO2Level	ByPasDmp	RaDmp	RfPr	OaDwpt	CoilTp	SaTpStM	PreHtSp
100	OaCFM	EtCFM	SaCFM	OACfmSt	OACfmRs	OACfmStM	SaClRt	SaHtRt	ClLoRt	ClHiRt
110	HtLoRt	HtHiRt	—	—	—	—	—	—	—	—

Table 7: VCM-X Data Array For Field Server

SA Controller Data Array For Field Server										
Offset	0	1	2	3	4	5	6	7	8	9
0	AppVer	ClSt	HtSt	TpDmnd	SpcTp	SaTp	DuctPr	UnitMode	CtrlSts	ClEnbl
10	HtEnbl	EcoEnbl	FanDly	MdHt2Ins	Rt2Ins	EcoPos	VfdBwPos	SaTpAlm	SpcTpAlm	MchClAlm
20	MchHtAlm	PofAlm	DrtFAlm	LoSaAlm	HiSaAlm	CtrlTpCF	CtrlTpHF	CtrlTp	InRh	InRhStM
30	DptStM	MdClPos	MdHtPos	MdHt2Pos	Rt2Pos	OcpClSt	OcpHtSt	UnClOst	UnHtOst	SaClSt
40	SaHtSt	WmupSt	SpcTpOst	SaTpOst	CoilTpSt	DptSt	InRhSt	DuctPrSt	SchdFrc	OnRly1
50	OnRly2	OnRly3	OnRly4	OnRly5	ExRly1	ExRly2	ExRly3	ExRly4	ExRly5	ExRly6
60	ExRly7	ExRly8	ExRly9	ExRly10	ExRly11	ExRly12	ExRly13	ExRly14	ExRly15	ExRly16
70	CoilTp	SaTpStM	PreHtSp	EaTp	EwTp	EaRH	HdPr1	HdPr2	CoilTp2	EaDpt
80	WSEByp	WSEByp2	MdCmp2	CoilTpSt	CdPos1	CdPos2	EaTpAlm	EmerAlm	PoWFAIm	DrnAlm
90	EaTpOst	EwTpOst	SaClRt	SaHtRt	ClLoRt	ClHiRt	HtLoRt	HtHiRt	—	—

Table 8: SA Controller Data Array For Field Server

6.4 VCM Data Array

VCM Data Array For Field Server										
Offset	0	1	2	3	4	5	6	7	8	9
0	AppVer	ClSt	HtSt	OaWtbl	TpDmnd	SpCtp	SaTp	RaTp	OaTp	DuctPr
10	OaRh	UnitMode	CtrlSts	ClDmnd	HtDmnd	DehmDmnd	ClEnbl	HtEnbl	EcoEnbl	FanDly
20	WmupDmnd	PofCfg	CO2Cfg	MdHt2Ins	Rt2Ins	OnRlys	ExRlys12	ExRlys34	EcoPos	VfdBwPos
30	VfdExPos	AlmSts	AlmGrp1	AlmGrp2	AlmGrp3	SaTpAlm	OaTpAlm	SpCtpAlm	MchClAlm	MchHtAlm
40	PofAlm	DrtFlAlm	SmokeAlm	LoSaAlm	HiSaAlm	CtrlTpCF	CtrlTpHF	CtrlTp	InRh	InRhStM
50	DptStM	MdClPos	MdHtPos	MdHt2Pos	Rt2Pos	OcpClSt	OcpHtSt	UnClOst	UnHtOst	WtblSt
60	SaClSt	SaHtSt	WmupSt	SpCtpOst	SaTpOst	RaTpOst	OaTpOst	CoilTpSt	DptSt	InRhSt
70	DuctPrSt	RfPrSt	SchdFrc	OnRly1	OnRly2	OnRly3	OnRly4	OnRly5	ExRly1	ExRly2
80	ExRly3	ExRly4	ExRly5	ExRly6	ExRly7	ExRly8	ExRly9	ExRly10	ExRly11	ExRly12
90	ExRly13	ExRly14	ExRly15	ExRly16	CO2St	MinEcoSt	CO2Level	ByPasDmp	RaDmp	RfPr
100	OaDwpt	CoilTp	SaTpStM	PreHtSp	–	–	–	–	–	–

Table 9: VCM Data Array For Field Server

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

NOTE: Objects labeled AI and BI are read-only. Objects labeled AV are read/writeable. You cannot write directly to Sensor Inputs.

NOTE: When a new setpoint is received from BACnet, it is maintained and used in temporary memory until the unit goes unoccupied. It is then stored in permanent memory and will become the new default setpoint even if power is cycled. Therefore, if power is cycled prior to the unit going unoccupied, the setpoint will not have been stored in permanent memory.

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits
Bad or Missing 12 Relay Expansion Board.	Mis12Rly	BI: 376	The 12 Relay Expansion Board is configured but not detected.	
Alarm Group 1	AlmGrp1	AI: 104		See Alarm Group Bits on page 41.
Alarm Group 2	AlmGrp2	AI: 105		See Alarm Group Bits on page 41.
Alarm Group 3	AlmGrp3	AI: 106		See Alarm Group Bits on page 41.
Alarm Status	AlmSts	AI: 1	Indicates that there is an alarm.	0 = Off 1 = On See Alarm Group Bits on page 41.
Application Software Version	AppVer	AI: 99	Current version of the software in the unit.	
Unit Mode	UnitMode	AI:123		See Unit Mode Bits on page 41.
Building Pressure	BuildPr	AI:272	Current value of the Building Pressure Sensor.	
Building Pressure Setpoint	RfPrSt	AV:118	Current Building Pressure Setpoint.	-.20 .20
Building Pressure Control Deadband	RfPrDb	AV:358	Value above and below the Building Pressure Setpoint where no control change occurs.	.01 0.1

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits
CO ₂	CO2	AI:271	Current CO ₂ Level.	
CO ₂ Sensor Calibration Deadband Offset	CO2Ost	AV: 348	If the CO ₂ Sensor is reading incorrectly, you can use this option to enter an offset value to adjust the Sensor's CO ₂ reading.	-500 ppm 500 ppm
CO ₂ Minimum Setpoint	CO2MinLv	AV:287	This is the threshold CO ₂ level at which the Economizer Min Damper Position Setpoint will begin to be reset higher.	0 2000
CO ₂ Maximum Setpoint	CO2 MaxLv	AV:288	This is the CO ₂ level at which the Economizer Min Damper Position will be reset to the Economizer Max Position in High CO ₂ . In between the Min and Max CO ₂ levels the Economizer Min Damper Position will be proportionally reset between the configured Min Damper Position and the Max Position in High CO ₂ .	0 2000
Bad CO ₂ Sensor	CO2Alm	BI: 368	Failure of the CO ₂ Sensor.	
Coil Temperature	CoilTp	AI: 181	Current coil temperature reading.	
Coil Temperature Offset	CoilTpOfst	AV:284	If the Coil Temperature Sensor is reading incorrectly, use this offset to adjust the Sensor's Temperature.	-100 100
Bad Coil Pressure Sensor	CoilPrAlm	BI: 367	Failure of the Coil Pressure Sensor. Will shut unit down.	

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller				
Parameter	Name	Object	Description	Limits
Coil Temperature Setpoint	CoilTpSt	AI: 334	This is the current calculated Coil Suction Temperature target during Dehumidification Mode.	
Low Coil Temperature Setpoint Limit	LoClTpSt	AV:295	This is the lowest that the Coil Temperature will be reset to during Space Humidity Reset of the Coil Suction Temperature Setpoint. If no coil temperature reset is required, this value should be set the same as the High Coil Temperature Setpoint.	35 70
High Coil Temperature Setpoint Limit	HiClTpSt	AV:296	This is the highest that the Coil Temperature will be reset to during Space Humidity Reset of the Coil Suction Temperature Setpoint. If no coil temperature reset is required, this value should be set the same as the Low Coil Temperature Setpoint.	35 70
Compressor Discharge Temperature	DschgTp	AI: 331	Current value of the Compressor Discharge Temperature Sensor.	
Bad Compressor Discharge Sensor	DschgAlm	BI: 369	Failure of the Digital Compressor Discharge Temperature Sensor.	

BACnet Properties for the VCB-X Controller				
Parameter	Name	Object	Description	Limits
Control Mode	CtrlMod	AI: 97		1=Constant Volume 2=Supply Air Cooling Only 3=Outdoor Temp Control 4=Single Zone VAV 5=Supply Air Tempering 6=Space Temp Control w/ High OA Content Unoccupied
Control Temperature Cooling Failure	CtrlTpCF	BI: 108	Activated if the control temperature does not get within 5°F to the occupied cooling setpoint in an hour in the cooling mode. This alarm is not used in 100% outside air units or supply air control.	
Control Temperature Heating Failure	CtrlTpHF	BI: 109	Activated if the control temperature does not get within 5°F to the occupied heating setpoint in an hour in the heating mode. This alarm is not used in 100% outside air units or supply air control.	
High Control Mode Temperature	HiCtrlMd	BI: 377	Occurs when the Controlling Sensor Temperature rises above the Cooling Mode Enable Setpoint plus the Control Mode High Alarm Offset. Applies only to Space or Return Air Temperature controlled units.	

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Low Control Mode Temperature	LoCtrlMd	BI: 378	Occurs when the Controlling Sensor Temperature falls below the Heating Mode Enable Setpoint minus the Control Mode Low Alarm Offset. Applies only to Space or Return Air Temperature controlled units.		
Cooling Low Reset Source	CILOrt	AV: 326	If doing Supply Air Setpoint Reset, this is the Low Reset Source value in Cooling that will correspond to the Supply Air Cool High Reset Setpoint.	1	150
Cooling High Reset Source	CIHiRt	AV: 327	If doing Supply Air Setpoint Reset, this is the High Reset Source value in Cooling that will correspond to the Supply Air Cooling Setpoint (Low Reset).	1	150
Condenser Control Signal	CdCtrSgl	AI:280	Condenser Fan Signal 1 Status.		
Controlling Sensor High Alarm Offset	CTpHiAlm	AV: 349	If the temperature of the controlling sensor rises above the Occupied Cooling Setpoint by this value, a High Control Temp Alarm will occur. Only applies if configured for Space or Return Air Temp Control, or as Single Zone VAV.	0	50

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Controlling Sensor Low Alarm Offset	CTpLoAlm	AV: 350	If the temperature of the controlling sensor falls below the Occupied Heating Setpoint by this value, a Low Control Temp Alarm will occur. Only applies if configured for Space or Return Air Temp Control, or as Single Zone VAV.	0	50
Control Status	CtrlSts	AI: 4	Current operational status.	See Control Status Bits on page 41.	
Control Temperature	CtrlTp	AI: 9	Current value of the control temperature sensor.		
Cooling Enabled	CIEnbl	AI: 6	Status that indicates mechanical cooling is enabled to operate.		
Mechanical Cooling Lockout	MchCILkt	AV: 342	The VCB-X will Lockout Mechanical Cooling when the Outdoor Air Temperature is below this Setpoint.	-30	100
Mechanical Cooling Alarm	MchCIAlm	BI: 94	Compressor Relays are enabled but the Supply Air Temperature has not fallen 5°F within a user-adjustable time period. This does not apply for Modulating Cooling.		
Cooling Setpoint Mirror	CISt	AI: 7	Occupied Cooling Mode Enable Setpoint.		

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Cool Staging Window	ClStgWdw	AV: 340	In Cooling Mode, if the Supply Air Temperature drops below the Active Supply Air Cooling Setpoint minus this Staging Window, a Cooling Stage will be deactivated after its Minimum Run Time.	1	30
Adaptive Defrost Interval Adjustment	AptDfr	AV: 356	Adjustment to the Heat Pump Defrost Interval depending on whether the Defrost Mode lasts 10 minutes or less than 10 minutes.	0 Min	30 Min
Dewpoint Setpoint	RhDewpSt	AV:282	On a MUA unit, if the outdoor dewpoint rises above this setpoint, the unit will activate Dehumidification.	35	80
Digital Compressor Cutoff	DigCmpCf	BI: 379	Occurs if the digital compressor discharge temperature rises above 268°F or the sensor is shorted. The compressor is disabled.		
Digital Compressor Lockout	DigCmpLk	BI: 380	Occurs if five Digital Compressor Cutoffs occur within four hours. The compressor will be locked out.		
Dirty Filter Alarm	DrtFlAlm	BI: 96	Alarm that indicates the filters are dirty.		
Economizer Enabled	EcoEnbl	AI: 15	Status that indicates the economizer is enabled.		
Economizer Enable Setpoint	EcoEnbSt	AV:283	The economizer is enabled if the outdoor drybulb, dewpoint, or wetbulb temperature falls below this setpoint.	-30	80

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Economizer Position	EcoPos	AI: 16	Current position of the economizer damper.		
Max Economizer in Heat Mode	MaxEcoHt	AV: 353	Max position the Economizer Damper can open in the Heating Mode. Takes priority over Max Position in High CO ₂ .	0%	60%
Max Economizer in High CO ₂ Mode	MaxEcoCO	AV: 354	The maximum value the Economizer Minimum Position can be reset up to during CO ₂ override.	0%	100%
Minimum Economizer Position	MinEcoSt	AV: 151	Minimum position of the economizer in the occupied mode.	0	100
Force Economizer	FrcEcono	AV: 267	Overrides all other Outdoor Air Damper position commands so as to maintain this fixed position. Configuring for "Auto" will restore normal unit control of the Outdoor Air Damper/Economizer operation.	0%	100%
Emergency Heat Enabled	EmHtEnbl	BI: 364	Shows the Emergency Heat is enabled based on the Compressor Heating Lockout.	Auto=65535	
Exhaust Fan CFM	EtCFM	AI:194	Current Exhaust Airflow Measurement		
Missing Exhaust CFM Sensor	ExtCfmSr	BI: 371	Indicates that the Exhaust CFM Sensor is not detected.		
Exhaust Fan Speed	EtFnSpd	AI: 273	Current value of the VFD relief fan signal.		
Missing EM1 Expansion Module	MisEM1	BI: 366	Indicates that the EM1 Expansion Module is not communicating with the VCB-X Controller.		

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Fan Starting Delay	FanDly	AI: 25	Indicates the current fan status related to request to run, fan starting delay or POF failure.	0=No Request 1=Fan Running 2=Fan Start Delay 3=POF Failure	
Leaving H2O Offset	LvH2OOst	AV: 347	If the Leaving Water Temperature Sensor is reading incorrectly, use this to enter an offset to adjust the Sensor's Temperature.	-100	100
Water Proof of Flow Failure	H2OProf	BI: 382	Indicates no Proof of Water Flow.		
Force HVAC Mode	FrcHvacM	AV: 262	Overrides normal controller operation in order to force the unit into this desired mode. Configuring for "Auto" will restore normal unit control of the mode of operation.	0=Auto 1=Vent 2=Cool 3=Heat 4=Vent Dehum. 5=Cool Dehum. 6=Heat Dehum.	
Head Pressure	HeadPr	AI:276	Current value of the Head Pressure Reading.		
Head Pressure Setpoint	HeadPrSt	AI:279	Current Head Pressure Setpoint.		
Head Pressure Setpoint in Cooling Mode	ClHdPrSt	AV:293	This is the Head Pressure Setpoint the unit will control to in the Cooling Mode.	240 PSI	420 PSI
Head Pressure Setpoint in Reheat Mode	HtHdPrSt	AV:294	This is the Head Pressure Setpoint the unit will control to in the Dehumidification Reheat Mode.	240 PSI	420 PSI
High Head Pressure	HiHedPr	BI: 381	Indicates the Head Pressure is too high.		

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
SAT Heating Low Reset Source	HtLoRt	AV: 328	If doing Supply Air Setpoint Reset, this is the Low Reset Source value in Heating that will correspond to the Supply Air Heating High Reset Setpoint.	1	150
SAT Heating High Reset Source	HtHiRt	AV: 329	If doing Supply Air Setpoint Reset, this is the High Reset Source value in Cooling that will correspond to the Supply Air Cooling Setpoint (Low Reset).	1	150
Heating Enabled	HtEnbl	AI: 30	Status that indicates that mechanical heating is enabled to operate.		
Heating Setpoint Mirror	HtSt	AI: 31	Occupied Heating Mode Enable Setpoint.		
Heat Staging Window	HtStgWdw	AV: 341	In the Heating Mode, if the Supply Air Temperature rises above the Active Supply Air Heating Setpoint plus the Heating Stage Off Window value, a Heating stage will be deactivated after its Minimum Run Time.	1	50
Mechanical Heating Lockout	MchHtLkt	AV: 343	The VCB-X will Lockout Mechanical Heating when the Outdoor Air Temperature is above this Setpoint.	-30	150

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Mechanical Heating Alarm	MchHtAlm	BI: 95	Heating Mode has been initiated but the Supply Air Temperature has not risen 5°F within a user-adjustable time period. This does not apply for Modulating Heating.		
Heat Pump Compressor Heating Outdoor Lockout	HpLkt	AV: 351	Compressor Heating will be locked out when the Outdoor Air Temperature is below this Setpoint.	-30	100
Heat Pump Defrost Interval	HpDfrInt	AV: 355	The Heat Pump Defrost Interval is the length of time that must be met between Defrost Modes.	10 Min	120 Min
Heat Wheel Defrost Setpoint	Dfrst	AV: 346	The unit will go into Heat Wheel Defrost Mode when the Outdoor Air is below this setpoint.	0	50
Indoor Humidity	InRh	AI: 67	Current value of the Indoor Humidity Sensor.		
Indoor Humidity Setpoint	InRhSt	AV:289	If Coil Temp Reset is being used this is also the lowest Space RH value that corresponds to the Hi Coil Temp Setpoint.	0	100
High Indoor Humidity Reset Limit	HiInRh	AV:292	During Coil Temp Reset, this is the highest Space RH value that corresponds to the Low Coil Temp Setpoint.	0	100
Indoor Humidity Setpoint Mirror	InRhStM	AI: 114	Mirror of the InRhSt “read only.”		
Leaving Water Temperature	LvWtrTp	AI:278	Leaving Water Temperature Value		

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Low Ambient Relay Setpoint	LWAmbnt	AV:285	Temperature at which the Low Ambient Relay will activate in the Occupied or Unoccupied Mode.	-30	70
Mode Select Deadband	MdSelDb	AV: 339	This Setpoint is added to and subtracted from the HVAC Mode Setpoints to determine when the unit enters and leaves a mode of operation.	1	10
Modulating Cooling Position	MdClPos	AI: 115	Current position of the modulating cooling signal (Chilled water or digital compressor).		
Modulating Gas Valve Position	MdGs VPos	AI:274	Current position of MODGAS modulating gas valve control.		
Modulating Heating Position	MdHtPos	AI: 116	Current position of the modulating heating signal (hot water or SCR heat).		
Missing MODGAS Module	MisMDGAS	BI: 375	Alarm that indicates that the MODGAS module is not communicating with the VCB-X Controller.		
Morning Warm-Up Return Air Target Setpoint	WmupTg	AV:281	If configured, upon entering the occupied mode, the Warm-up Demand will be activated if the return air temperature is one degree below this setpoint.	50	90

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Occupied Cooling Setpoint	OcpClSt	AV: 42	If the control temperature rises one degree above this setpoint, the control will activate the cooling demand. If the control temperature is the Supply Air Sensor, then the cooling demand is always active.	1	110
Occupied Heating Setpoint	OcpHtSt	AV: 43	If the control temperature drops one degree below this setpoint, the control will activate the heating demand. If the control temperature is the Supply Air Sensor, then there is no heating demand.	1	110
Hood On Outdoor Air Cooling Setpoint	OaClSt	AV:45	This is the Cooling Mode Enable Setpoint used only in Hood On Mode.	1	110
Hood On Outdoor Air Heating Setpoint	OaHtSt	AV:46	This is the Heating Mode Enable Setpoint used only in Hood On Mode.	1	110
Outdoor Air CFM	OaCFM	AI: 193	Current Outdoor Airflow Measurement		
Minimum Desired Outdoor Air CFM	OACfmMin	AV:291	Minimum Outdoor Airflow CFM Setpoint	.10K	200K
Missing Outdoor Air CFM Sensor	OaCfmAlm	BI: 370	Indicates Outdoor Air CFM Sensor is not detected.		
Outdoor Humidity	OaRh	AI:52	Current value of the Outdoor Humidity Sensor.		
Outdoor Air Dewpoint	OaDewPt	AI: 332	Current calculated Outdoor Air Dewpoint.		

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Outdoor Air Temperature	OaTp	AI: 54	Current value of the outdoor temperature sensor.		
Outdoor Air Temperature Offset	OaTpOst	AV: 53	If the Outdoor Temperature Sensor is reading incorrectly, use this to enter an offset to adjust the Sensor's Temperature.	-100	100
Minimum Outside Air CFM Deadband	OacfmDb	AV: 359	The Deadband is used both above and below the Outdoor Air CFM setpoint to help prevent hunting.	10	1000
Outdoor Air Temperature Sensor Lost	OaTpAlm	BI: 117	Indicates a failure of the Outdoor Air Temperature Sensor.		
Outdoor Wetbulb	OaWtbl	AI: 55	Current calculated value of the outdoor wetbulb temperature.		
Preheat Relay Setpoint	PreHtAmb	AV:286	If the Supply Fan is energized this is the temperature at which the Preheat Relay will activate. Operates only in the Occupied Mode.	-30	70
Proof of Flow Alarm	PofAlm	BI: 26	Indicates no Proof of Water Flow.		
Reheat Enabled	RehtEnbl	BI: 363	Modulating Hotgas Reheat Enabled.		
Reheat Valve Position	RtVlvPos	AI:277	Current position of MHGRV modulating hot gas reheat valve.		
Missing Reheat Module	MisMH-GRV	BI: 374	Indicates that the MHGRV Module is not communicating with the VCB-X Controller.		
Return Air CFM	RaCFM	AI:275	Current Return Airflow Measurement.		

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller					
Parameter	Name	Object	Description	Limits	
Missing Return Air CFM Sensor	RaCfmSr	BI: 373	Indicates that the Return Air CFM Sensor is not detected.		
Return Air Damper Position	RaDmp	AI: 336	Current Return Air Damper position.		
Return Air Humidity	RaRH	AI: 337	Current value of the Return Air Humidity Sensor.		
Return Air Temperature	RaTp	AI: 64	Current value of the return temperature sensor.		
Return Air Temperature Sensor Offset	RaTpOst	AV: 65	If the Return Temperature Sensor is reading incorrectly, use this to enter an offset to adjust the Sensor's Temperature.	-100	100
Bad Return Air Sensor	RaTpAlm	BI: 365	Indicates a failure of the Return Air Sensor.		
Return Bypass Damper Position	RetBydmp	AI: 335	Current Return Bypass Damper position.		
Schedule Force	SchdFrc	AV: 66	0 = Auto (uses controller's schedule) 1 = Forced Occupied 2 = Forced Unoccupied	0	2
Current Slide Adjust Offset	SldAdOfs	AI: 338	Current Slide Adjust Offset value.		
Smoke Alarm / Emergency Shutdown	SmokeAlm	BI: 119	Indicates the Smoke sensor has been activated. This will shut down the unit.		
Space Temperature	SpcTp	AI:72	Current value of the space temperature sensor.		
Space Temperature Offset	SpcTpOst	AV:71	If the Space Temperature Sensor is reading incorrectly, use this option to enter an offset to adjust the Sensor's Temperature.	-100	100

BACnet Properties for the VCB-X Controller					
Parameter	Name	Object	Description	Limits	
Space Temperature Sensor Lost	SpcTpAlm	BI: 101	Indicates a failure of the Space Temperature Sensor.		
Static Pressure	StaticPr	AI:270	Current Static Pressure.		
Static Pressure Setpoint	StatPrSt	AV:290	Current Static Pressure Setpoint.	.10	3.0
Static Pressure Setpoint Deadband	DuctPrDb	AV:357	Value above and below the Duct Static Pressure Setpoint where no control change occurs.	.01	0.5
Suction Pressure	SucPr	AI: 333	Current Suction Pressure value.		
High Suction Pressure Alarm	HiSucPr	BI: 352	Indicates Suction Pressure is above the High Suction Pressure Cooling (Heating) Setpoint.		
Low Suction Pressure Alarm	LoSucPr	BI: 383	Indicates Suction Pressure is below the Low Suction Pressure Cooling (Heating) Setpoint.		
Supply Air CFM	SaCFM	AI:195	Current Supply Airflow Measurement.		
High Supply Air Temperature Alarm	HiSaAlm	BI: 33	The Supply Air has risen above the High SAT Cutoff Setpoint. Heating stages begin to deactivate and the fan continues to run.		
Low Supply Air Temperature Alarm	LoSaAlm	BI: 37	The Supply Air has fallen below the Low SAT Cutoff Setpoint and cooling stages will begin to deactivate. If the unit is in Economizer, Vent, or Heating Mode the Supply Fan will shut off.		
Supply Air Cooling Setpoint	SaClSt	AV:77	Supply Air Cooling Setpoint. If Supply Air Reset is configured, this is the Low SAT Cooling Reset Value.	30	80

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Supply Air Cool High Reset	SaClRt	AV: 324	If Supply Air Reset is configured, this is the High SAT Cooling Reset Value.	0	100
Supply Air Heat High Reset	SaHtRt	AV: 325	If Supply Air Reset is configured, this is the High SAT Heating Reset Value.	0	250
Supply Air Heating Setpoint	SaHtSt	AV: 78	Supply Air Heating Setpoint. If Supply Air Reset is configured, this is the Low SAT Heating Reset Value.	40	240
Supply Air Temperature	SaTp	AI: 83	Current value of the Supply Air Temperature Sensor.		
Bad Supply Air Temperature Sensor	SaTpAlm	BI: 2	Indicates a failure of the Supply Air Temperature Sensor.		
Low Supply Air Temp Cutoff	LoSaCf	AV: 344	Cooling will be disabled if the Supply Air Temperature falls below this value. See sequence for more details.	0	100
High Supply Air Temp Cutoff	HiSaCf	AV: 345	Heating will be disabled if the Supply Air Temperature rises above this value. See sequence for more details.	0	250
Supply Air Temperature Offset	SaTpOst	AV: 80	If the Supply Air Temperature Sensor is reading incorrectly, use this offset to adjust the Sensor's Temperature.	-100	100
Current Supply Air Temperature Setpoint	SaTpStM	AI: 82	Current SAT Cooling or Heating setpoint if there is no reset source; Current calculated SAT setpoint with Reset Source.		

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits	
Cooldown Mode Supply Air Setpoint	SaCldnSt	AV: 362	Cooling will be controlled to this Supply Air Setpoint during Cool-Down.	30	80
Missing Supply Air CFM Sensor	SaCfmSr	BI: 372	Indicates the Supply Air CFM Sensor is not detected.		
Warmup Mode Supply Air Setpoint	SaWmupSt	AV: 361	Heating will be controlled to this Supply Air Setpoint during Morning Warm-Up.	40	240
SZ VAV Integral Constant	SZVAVFnl	AV: 360	This is the Integral Constant for controlling the SZ VAV Fan Speed.	0	10
Title 24 Economizer Feedback	T24EcFb	AI: 384	Current position of feedback from Economizer actuator.		
Title 24 Sensor Alarm	T24TpAlm	BI: 385	Outside Air or Supply Air Temperature Sensor is shorted or missing.		
Title 24 Not Economizing When It Should	T24NEWS	BI: 386	Economizer is enabled but not following the desired Economizer position commanded.		
Title 24 Economizing When It Should Not	T24EWISN	BI: 387	Economizer is not enabled but the feedback signal indicates a position more open than the minimum.		
Title 24 Damper Failure	T24DpAlm	BI: 388	Economizer is enabled but not within 10% of desired position within 150 seconds.		
Title 24 Excess Outdoor Air	T24ExsOA	BI: 389	Economizer feedback is lost or Economizer is not following commanded position.		

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller					
Parameter	Name	Object	Description	Limits	
Unoccupied Cooling Offset	UnCLOst	AV: 124	In Unoccupied Mode, this offsets the Occupied Cooling Setpoint by this user adjustable amount. If no Unoccupied Cooling is desired, use the default setting of 30°F for this setpoint.	0	30
Unoccupied Heating Offset	UnHtOst	AV:125	In Unoccupied Mode, this offsets the Occupied Heating Setpoint by this user adjustable amount. If no Unoccupied Heating is desired, use the default setting of 30°F for this setpoint.	0	30
VFD Position	VfdBwPos	AI:88	Current position of the VFD blower fan signal.		
VFD Min Position in Cool Mode	VFDCIMin	AV: 319	In Single Zone VAV configuration, this is the fan speed at which the VFD will start when Cooling is initiated. In a VAV configuration this is the lowest fan speed allowed in the Cooling Mode. In CAV and MUA configurations this should be set to 100%.	0%	100%

BACnet Properties for the VCB-X Controller					
Parameter	Name	Object	Description	Limits	
VFD Min Position in Heat Mode	VFDHtMin	AV: 320	In Single Zone VAV configuration, this is the fan speed at which the VFD will start when Heating is initiated. In a VAV configuration this is the lowest fan speed allowed in the Heating Mode. In CAV and MUA configurations this should be set to 100%.	0%	100%
VFD Min Position in Vent Mode	VFDVtMin	AV: 322	Speed at which the VFD will operate in the Vent Mode in Single Zone VAV.	0%	100%
Remote VFD Position Setpoint	FrcFanSp	AV: 266	Override to force the VFD to this percentage speed. Configuring "Auto" will restore normal unit control of the VFD speed.	0%	100% Auto=65535
OnBoard Relay Status	OnRlys	AI:44		See page 47.	
On Board Relay 1	OnRly1	BI: 127	Current status of VCB-X Main Board relay 1.		
On Board Relay 2	OnRly2	BI: 128	Current status of VCB-X Main Board relay 2.		
On Board Relay 3	OnRly3	BI: 129	Current status of VCB-X Main Board relay 3.		
On Board Relay 4	OnRly4	BI: 130	Current status of VCB-X Main Board relay 4.		
On Board Relay 5	OnRly5	BI: 131	Current status of VCB-X Main Board relay 5.		
On Board Relay 6	OnRly6	BI: 259	Current status of VCB-X Main Board relay 6.		
Expansion Module Relay 1	MnExRly1	BI:311	Current status of Relay 1 on the EM1 Expansion Module.		

7. PARAMETER TABLES

7.1 VCB-X BACnet Parameters

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits
Expansion Module Relay 2	MnExRly2	BI:312	Current status of Relay 2 on the EM1 Expansion Module.	
Expansion Module Relay 3	MnExRly3	BI:313	Current status of Relay 3 on the EM1 Expansion Module.	
Expansion Module Relay 4	MnExRly4	BI:314	Current status of Relay 4 on the EM1 Expansion Module.	
Expansion Module Relay 5	MnExRly5	BI:315	Current status of Relay 5 on the EM1 Expansion Module.	
12 Relay Expansion Module Relay 1	RIExRly1	BI:299	Current status of Relay 1 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 2	RIExRly2	BI:300	Current status of Relay 2 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 3	RIExRly3	BI:301	Current status of Relay 3 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 4	RIExRly4	BI:302	Current status of Relay 4 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 5	RIExRly5	BI:303	Current status of Relay 5 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 6	RIExRly6	BI:304	Current status of Relay 6 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 7	RIExRly7	BI:305	Current status of Relay 7 on the 12 Relay Expansion Module.	

BACnet Properties for the VCB-X Controller

Parameter	Name	Object	Description	Limits
12 Relay Expansion Module Relay 8	RIExRly8	BI:306	Current status of Relay 8 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 9	RIExRly9	BI:307	Current status of Relay 9 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 10	RIExRly10	BI:308	Current status of Relay 10 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 11	RIExRly11	BI:309	Current status of Relay 11 on the 12 Relay Expansion Module.	
12 Relay Expansion Module Relay 12	RIExRly12	BI:310	Current status of Relay 12 on the 12 Relay Expansion Module.	

7.1 VCB-X BACnet Parameters

7.1.1 VCB-X PT-Link II BACnet®

Property Identifier:

The PT-Link II BACnet® Link amends the following property identity to the BACnet® property identifier.

BACNETPropertyIdentifier :

VcbxUnitMode ::= ENUMERATED {

- Unoccupied (0)
- Occupied (1),
- Override Mode (2),
- Holiday Unoccupied (3),
- Holiday Occupied (4),
- Forced Occupied (5),
- Forced Unoccupied (6),
- }

VcbxControlStatusBits ::= ENUMERATED {

- Off (0),
- Vent Mode (1),
- Cooling Mode (2),
- Heating Mode (3),
- Vent RH Mode (4),
- Cooling RH Mode (5),
- Heating RH Mode (6),
- Warm Up Mode (7),
- Defrost Mode (8),
- Purge Mode (9),
- Cool Down Mode (10),
- Remote Cooling Mode (11),
- Remote Heating Mode (12),
- Remote Vent Dehum (13),
- Remote Cool Dehum (14),
- Remote Heat Dehum (15)
- }

VcbxAlarmGroup1Bits ::= BIT STRING {

- Bad Supply Air Sensor (0),
- Bad Return Air Sensor (1),
- Bad Outside Air Sensor (2),
- Bad Space Sensor (3),
- Bad Main Expansion Board (4),
- Bad Coil Temp Sensor (5),
- Bad Co2 Sensor (6),
- Bad Discharge Sensor (7),
- Bad OA CFM Sensor (8),
- Bad Exhaust CFM Sensor (9),
- Bad Supply CFM Sensor (10),

- Bad Return CFM Sensor (11),
- Bad Reheat Module (12),
- Bad ModGas Module (13),
- Bad Relay Expansion Module (14),
- Missing EM2 Expansion Board (15)
- }

VcbxAlarmGroup2Bits ::= BIT STRING {

- Mechanical Cooling Failure (0),
- Mechanical Heating Failure (1),
- Fan Proving Alarm (2),
- Dirty Filter Alarm (3),
- Emergency Shutdown Alarm (4),
- Economizer Air Temperature Failure (5),
- Not Economizing When It Should (6),
- Economizing When It Should Not (7),
- Economizer Damper Failure (8),
- Economizer Excess Outdoor Air (9)
- }

VcbxAlarmGroup3Bits ::= BIT STRING {

- High Supply Air Cutoff (0),
- Low Supply Air Cutoff (1),
- High Control Mode Signal Alarm (2),
- Low Control Mode Signal Alarm (3),
- Digital Compressor Cutoff Alarm (4),
- Digital Compressor Lockout Alarm (5),
- High Head Pressure (6),
- Loop Water Proof of Flow (7),
- Low Suction Pressure (8),
- Unsafe Suction Pressure (9),
- Low Leaving Water Temp (10)
- }

VcbxOnBoardRelaysBits ::= BIT STRING {

- On Board Relay 1 (0),
- On Board Relay 2 (1),
- On Board Relay 3 (2),
- On Board Relay 4 (3),
- On Board Relay 5 (4),
- On Board Relay 6 (5)
- }

7. PARAMETER TABLES

7.2 VCM-X Modular BACnet Parameters

NOTE: Objects labeled AI and BI are read-only. Objects labeled AV are read/writeable. You cannot write directly to Sensor Inputs.

NOTE: The following points for the VCM-X Modular, VCM-X & WSHP Controllers are additional points. All points and property identifiers in the VCM-X Controller table (**Section 7.5, page 46**) also apply to the VCM-X Modular, & VCM-X WSHP Controllers.

NOTE: When a new setpoint is received from BACnet, it is maintained and used in temporary memory until the unit goes unoccupied. It is then stored in permanent memory and will become the new default setpoint even if power is cycled. Therefore, if power is cycled prior to the unit going unoccupied, the setpoint will not have been stored in permanent memory.

BACnet Properties for VCM-X Modular					
Parameter	Name	Object	Description	Limits	
Modulating Compressor 2	MdCmp2	AI: 206	Current position of the 2nd Stage of Compressor Modulation.		
Head Pressure Signal 1 on Head Pressure Module 1	HdPr1	AI: 207	Head Pressure Signal 1 on Head Pressure Module 1		
Head Pressure Signal 2 on Head Pressure Module 1	HdPr2	AI: 208	Head Pressure Signal 2 on Head Pressure Module 1		
Condenser Fan Signal 1 On Head Pressure Module 1	CdFan1	AI: 209	Condenser Fan Signal 1 On Head Pressure Module 1		
Condenser Fan Signal 2 On Head Pressure Module 1	CdFan2	AI: 210	Condenser Fan Signal 2 On Head Pressure Module 1		
Title 24 Economizer Feedback	T24EcFb	AI: 384	Current position of feedback from Economizer actuator.		
Title 24 Economizer Alarms	AlmGrp5	AI: 391	Alarms for the 24 Title Economizer		

BACnet Properties for VCM-X Modular					
Parameter	Name	Object	Description	Limits	
Condenser Fan Signal 1 On Head Pressure Module 2	CdFan21	AI: 392	Condenser Fan Signal 1 On Head Pressure Module 2		
Condenser Fan Signal 2 On Head Pressure Module 2	CdFan22	AI: 393	Condenser Fan Signal 2 On Head Pressure Module 2		
Head Pressure Signal 1 on Head Pressure Module 2	HdPr21	AI: 394	Head Pressure Signal 1 on Head Pressure Module 2		
Head Pressure Signal 2 on Head Pressure Module 2	HdPr22	AI: 395	Head Pressure Signal 2 on Head Pressure Module 2		
Remote VFD Reset	RmVFDPoS	AV: 258	Remote VFD Position Reset	-1	100
Bad Return Air Sensor	RaTpAlm	BI: 365	Alarm that indicates a failure in the Return Air Sensor.		
Title 24 Sensor Alarm	T24TpAlm	BI: 385	Outside Air or Supply Air Temperature Sensor is shorted or missing.		
Title 24 Not Economizing When It Should	T24NEWS	BI: 386	Economizer is enabled but not following the desired Economizer position commanded.		
Title 24 Economizing When It Should Not	T24EWISN	BI: 387	Economizer is not enabled but the feedback signal indicates a position more open than the minimum.		
Title 24 Damper Failure	T24DpAlm	BI: 388	Economizer is enabled but not within 10% of desired position within 150 seconds.		
Title 24 Excess Outdoor Air	T24ExsOA	BI: 389	Economizer feedback is lost or Economizer is not following commanded position.		

7.3 VCM-X WSHP (Tulsa) BACnet Parameters

NOTE: Objects labeled AI and BI are read-only. Objects labeled AV are read/writeable. You cannot write directly to Sensor Inputs.

BACnet Properties for VCM-X WSHP (Tulsa) Controller					
Parameter	Name	Object	Description	Limits	
Modulating Compressor 2	MdCmp2	AI: 206	Current position of the 2nd Stage of Compressor Modulation.		
Head Pressure Signal 1 on Head Pressure Module 1	HdPr1	AI: 207	Head Pressure Signal 1 on Head Pressure Module 1		
Head Pressure Signal 2 on Head Pressure Module 1	HdPr2	AI: 208	Head Pressure Signal 2 on Head Pressure Module 1		
Condenser Fan Signal 1 On Head Pressure Module 1	CdFan1	AI: 209	Condenser Fan Signal 1 On Head Pressure Module 1		
Condenser Fan Signal 2 On Head Pressure Module 1	CdFan2	AI: 210	Condenser Fan Signal 2 On Head Pressure Module 1		
Water Temp. A	WaterTpA	AI: 220	Current water temperature of refrigerant for System A.		
Water Temp. B	WaterTpB	AI: 221	Current water temperature of refrigerant for System B.		
Condenser Fan Signal 1 On Head Pressure Module 2	CdFan21	AI: 392	Condenser Fan Signal 1 On Head Pressure Module 2		
Condenser Fan Signal 2 On Head Pressure Module 2	CdFan22	AI: 393	Condenser Fan Signal 2 On Head Pressure Module 2		
Head Pressure Signal 1 on Head Pressure Module 2	HdPr21	AI: 394	Head Pressure Signal 1 on Head Pressure Module 2		
Head Pressure Signal 2 on Head Pressure Module 2	HdPr22	AI: 395	Head Pressure Signal 2 on Head Pressure Module 2		
Remote VFD Reset	RmVFDPos	AV: 258	Remote VFD Position Reset	-1	100
Title 24 Economizer Alarms	AlmGrp5	AI: 391	Alarms for the 24 Title Economizer		

BACnet Properties for VCM-X WSHP (Tulsa) Controller					
Parameter	Name	Object	Description	Limits	
Compressor A1 Low Suction Pressure Alarm	A1LSPAlm	BI: 222	Alarm that indicates Suction Pressure for Compressor A1 is below the Low Suction Pressure Cooling (Heating) Setpoint.		
Compressor A1 Lockout Alarm	A1LktAlm	BI: 223	Alarm that indicates Compressor A1 is locked out.		
Compressor A2 Low Suction Pressure Alarm	A2LSPAlm	BI: 224	Alarm that indicates Suction Pressure for Compressor A2 is below the Low Suction Pressure Cooling (Heating) Setpoint.		
Compressor A2 Lockout Alarm	A2LktAlm	BI: 225	Alarm that indicates Compressor A2 is locked out.		
Compressor B1 Low Suction Pressure Alarm	B1LSPAlm	BI: 226	Alarm that indicates Suction Pressure for Compressor B1 is below the Low Suction Pressure Cooling (Heating) Setpoint.		
Compressor B1 Lockout Alarm	B1LktAlm	BI: 227	Alarm that indicates Compressor B1 is locked out.		
Compressor B2 Low Suction Pressure Alarm	B2LSPAlm	BI: 228	Alarm that indicates Suction Pressure for Compressor B2 is below the Low Suction Pressure Cooling (Heating) Setpoint.		
Compressor 4 Lockout Alarm	B2LktAlm	BI: 229	Alarm that indicates Compressor B2 is locked out.		

7. PARAMETER TABLES

7.3 VCM-X WSHP Tulsa BACnet Parameters

BACnet Properties for VCM-X WSHP (Tulsa) Controller					
Parameter	Name	Object	Description	Limits	
Low Water Temperature 1 Alarm	LWT1Alm	BI: 230	Alarm that indicates water temperature is below the Leaving Water Safety Setpoint (Heating only) for System A.		
Low Water Temperature 2 Alarm	LWT2Alm	BI: 231	Alarm that indicates water temperature is below the Leaving Water Safety Setpoint (Heating only) for System B		
Proof of Water 1 Flow Alarm	POWF1Alm	BI: 232	Alarm that indicates no Proof of Water Flow for System A (A1/A2)		
Proof of Water 2 Flow Alarm	POWF2Alm	BI: 233	Alarm that indicates no Proof of Water Flow for System B (B1/B2)		
Module Communications Alarm	ComMAIm	BI: 234	Alarm that indicates that one or more Modules are not communicating with the VCM-X WSHP Controller.		
Bad Return Air Sensor	RaTpAlm	BI: 365	Alarm that indicates a failure in the Return Air Sensor.		
Title 24 Economizer Feedback	T24EcFb	AI: 384	Current position of feedback from Economizer actuator.		
Title 24 Sensor Alarm	T24TpAlm	BI: 385	Outside Air or Supply Air Temperature Sensor is shorted or missing.		

BACnet Properties for VCM-X WSHP (Tulsa) Controller					
Parameter	Name	Object	Description	Limits	
Title 24 Not Economizing When It Should	T24NEWS	BI: 386	Economizer is enabled but not following the desired Economizer position commanded.		
Title 24 Economizing When It Should Not	T24EWISN	BI: 387	Economizer is not enabled but the feedback signal indicates a position more open than the minimum.		
Title 24 Damper Failure	T24DpAlm	BI: 388	Economizer is enabled but not within 10% of desired position within 150 seconds.		
Title 24 Excess Outdoor Air	T24ExsOA	BI: 389	Economizer feedback is lost or Economizer is not following commanded position.		

7.4 VCM-X WSHP (Coil) BACnet Parameters

BACnet Properties for VCM-X WSHP (Coil)					
Parameter	Name	Object	Description	Limits	
Modulating Compressor 2	MdCmp2	AI: 206	Current position of the 2nd Stage of Compressor Modulation.		
Head Pressure 1	HdPr1	AI: 207	Head Pressure for 1st Compressor		
Head Pressure 2	HdPr2	AI: 208	Head Pressure for 2nd Compressor		
Condenser Fan 1	CdFan1	AI: 209	Condenser Fan 1 Signal Status		
Condenser Fan 2	CdFan2	AI: 210	Condenser Fan 2 Signal Status		
Water Temp. A	WaterTpA	AI: 220	Current water temperature.		
Remote VFD Reset	RmVFDPos	AV: 258	Remote VFD Position Reset	-1	100
Compressor A Low Suction Pressure Alarm	A1LSPAlm	BI: 222	Alarm that indicates Suction Pressure for Circuit A is below the Low Suction Pressure Cooling (Heating) Setpoint.		
Compressor A Lockout Alarm	A1LktAlm	BI: 223	Alarm that indicates Circuit A Compressors are locked out.		
Compressor B Low Suction Pressure Alarm	B1LSPAlm	BI: 226	Alarm that indicates Suction Pressure for Circuit B is below the Low Suction Pressure Cooling (Heating) Setpoint.		
Compressor B Lockout Alarm	B1LktAlm	BI: 227	Alarm that indicates Circuit B Compressors are locked out.		
Low Water Temperature Alarm	LWT1Alm	BI: 230	Alarm that indicates water temperature is below the Leaving Water Safety Setpoint (Heating only).		

BACnet Properties for VCM-X WSHP (Coil)					
Parameter	Name	Object	Description	Limits	
Proof of Water Flow Alarm	POWF1Alm	BI: 232	Alarm that indicates no Proof of Water Flow.		
Module Communications Alarm	ComMAlm	BI: 234	Alarm that indicates that one or more Modules are not communicating with the VCM-X WSHP Controller.		
Bad Return Air Sensor	RaTpAlm	BI: 365	Alarm that indicates a failure in the Return Air Sensor.		
Title 24 Economizer Feedback	T24EcFb	AI: 384	Current position of feedback from Economizer actuator.		
Title 24 Sensor Alarm	T24TpAlm	BI: 385	Outside Air or Supply Air Temperature Sensor is shorted or missing.		
Title 24 Not Economizing When It Should	T24NEWS	BI: 386	Economizer is enabled but not following the desired Economizer position commanded.		
Title 24 Economizing When It Should Not	T24EWISN	BI: 387	Economizer is not enabled but the feedback signal indicates a position more open than the minimum.		
Title 24 Damper Failure	T24DpAlm	BI: 388	Economizer is enabled but not within 10% of desired position within 150 seconds.		
Title 24 Excess Outdoor Air	T24ExsOA	BI: 389	Economizer feedback is lost or Economizer is not following commanded position.		

7. PARAMETER TABLES

7.5 VCM-X BACnet Parameters

NOTE: Objects labeled AI and BI are read-only. Objects labeled AV are read/writeable. You cannot write directly to Sensor Inputs.

NOTE: When a new setpoint is received from BACnet, it is maintained and used in temporary memory until the unit goes unoccupied. It is then stored in permanent memory and will become the new default setpoint even if power is cycled. Therefore, if power is cycled prior to the unit going unoccupied, the setpoint will not have been stored in permanent memory.

BACnet Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits
Alarm Status	AlmSts	AI: 1		See Alarm Group Bits on page 51.
Control Status	CtrlSts	AI: 4	Current operational status.	
Occupied Mode Enable Cooling Setpoint Mirror	ClSt	AI: 7	Occupied Mode Enable Cooling Setpoint Mirror.	
Control Temperature	CtrlTp	AI: 9	Current value of the control temperature sensor.	
Duct Static Pressure	DuctPr	AI: 14	Current value of the duct static pressure sensor.	
Economizer Position	EcoPos	AI: 16	Current position of the economizer damper.	
Occupied Mode Enable Heating Setpoint Mirror	HtSt	AI: 31	Occupied Mode Enable Heating Setpoint Mirror.	
Modulating Gas Valve Position	MdHt-2Pos	AI: 38	Current position of MODGAS II modulating gas valve control.	
On Board Relays	OnRlys	AI: 44		See page 51.
Outdoor Air Dewpoint	OaDwpt	AI: 47	Current calculated outdoor air dewpoint added on version 1.09.	
Outdoor Air Humidity	OaRh	AI: 52	Current value of the outdoor humidity sensor.	
Outdoor Air Temperature	OaTp	AI: 54	Current value of the outdoor temperature sensor.	
Outdoor Air Wetbulb	OaWtbl	AI: 55	Current calculated value of the outdoor wetbulb temperature.	

BACnet Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits
Reheat Valve Position	Rt2Pos	AI: 60	Current position of MHGRV modulating hot gas reheat valve control.	
Relief Pressure	RfPr	AI: 62	Current value of the building pressure sensor.	
Return Air Temperature	RaTp	AI: 64	Current value of the return temperature sensor.	
Indoor Humidity	InRh	AI: 67	Current value of the indoor humidity sensor.	
Space Temperature	SpcTp	AI: 72	Current value of the space temperature sensor.	
Current Supply Air Setpoint	SaTpStM	AI: 82	Current SAT Cooling or Heating setpoint if there is no reset source; Current calculated SAT setpoint with Reset Source.	
Supply Air Temperature	SaTp	AI: 83	Current value of the supply air temperature sensor.	
Temperature Demand	TpDmnd	AI: 84	Based on the comparison between the current Control Temperature and the Heating or Cooling Setpoint Temperatures. Does not work for supply air control	
VFD Blower Fan	VfdBw-Pos	AI: 88	Current position of the VFD blower fan signal.	
VFD Relief Fan	VfdExPos	AI: 89	Current position of the VFD relief fan signal.	
Application Software Version	AppVer	AI: 99	Current version of the software in the unit.	
Alarm Group 1	AlrmGrp1	AI: 104		See Alarm Group Bits on page 51.
Alarm Group 2	AlrmGrp2	AI: 105		See Alarm Group Bits on page 51.
Alarm Group 3	AlrmGrp3	AI: 106		See Alarm Group Bits on page 51.
Dewpoint Setpoint Mirror	DptStM	AI: 110	Mirror of the DPtSt "read only."	
External Relays 1-2	ExRlys12	AI: 111		See page 51.

7. PARAMETER TABLES

7.5 VCM-X BACnet Parameters

BACnet Properties for the VCM-X Controller					
Parameter	Name	Object	Description	Limits	
External Relays 3-4	ExRlys34	AI: 112		See page 51.	
Indoor Rh Setpoint Mirror	InRhStM	AI: 114	Mirror of the InRhSt “read only.”		
Modulating Cool Position	MdClPos	AI: 115	Current position of the modulating cooling signal (Chilled water or digital compressor).		
Modulating Heat Position	MdHtPos	AI: 116	Current position of the modulating heating signal (hot water or SCR heat).		
Unit Mode	UnitMode	AI: 123		See page 51.	
Return Air CO ₂ Level	CO2Level	AI: 150	Current value of the CO ₂ sensor.		
Bypass Damper Position	ByPas-Dmp	AI: 153	Current position of the bypass damper signal.		
Return Damper Position	RaDmp	AI: 154	Current position of the return damper signal.		
Coil Temperature	CoilTp	AI: 181	Current coil temperature reading added on version 1.09.		
Outdoor Air CFM	OaCFM	AI: 193	Current Outdoor Airflow Measurement		
Exhaust CFM	EtCFM	AI: 194	Current Exhaust Airflow Measurement		
Supply Air CFM	SaCFM	AI: 195	Current Supply Airflow Measurement		
Current Calculated OA CFM setpoint	OACfm-StM	AI: 205	Current calculated Outdoor Air CFM based on CO ₂ level.		
Dewpoint Setpoint	DptSt	AV: 13	If the outdoor dewpoint rises above this setpoint, the unit will activate the Dehumidification Demand.	35	80
Occupied Mode Enable Cooling Setpoint	OcpClSt	AV: 42	If the control temperature rises one degree above this setpoint, the control will activate the cooling demand. If the control temperature is the Supply Air Sensor, then the cooling demand is always active.	0	99

BACnet Properties for the VCM-X Controller					
Parameter	Name	Object	Description	Limits	
Occupied Mode Enable Heating Setpoint	OcpHtSt	AV: 43	If the control temperature drops one degree below this setpoint, the control will activate the heating demand. If the control temperature is the Supply Air Sensor, then there is no heating demand.	0	99
Outdoor Air Sensor Offset	OaTpOst	AV: 53	If the Outdoor Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
Return Air Sensor Offset	RaTpOst	AV: 65	If the Return Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
Schedule Force	SchdFrc	AV: 66	0 = Auto/ Unoccupied Mode 1 = Forced On 2 = Forced Off	0	2
Space Sensor Offset	SpcTpOst	AV: 71	If the Space Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
SAT Cooling Setpoint	SaClSt	AV: 77	Supply Air Setpoint in Cooling Mode.	40	80
SAT Heating Setpoint	SaHtSt	AV: 78	Supply Air Setpoint in Heating Mode.	40	200
Supply Air Sensor Offset	SaTpOst	AV: 80	If the Supply Air Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100

7. PARAMETER TABLES

7.5 VCM-X BACnet Parameters

BACnet Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits	
Warm Up Setpoint	WmupSt	AV: 91	In a VAV application, upon entering the occupied mode, the Warm-up Demand will be activated if the return air temperature falls one degree below this setpoint.	50	90
Wet Bulb Setpoint	WtblSt	AV: 92	The economizer is enabled if the outdoor temperature or wetbulb falls below this setpoint.	0	80
Coil Temperature Setpoint	CoilTpSt	AV: 107	This is the coil suction temperature target during dehumidification mode. Produces dewpoint in the supply air approximately 10°F above this setpoint.	35	70
Relief Pressure Setpoint	RfPrSt	AV: 118	This is the target building pressure to be maintained by the VFD Relief signal.	-0.2	0.2
Indoor Humidity Setpoint	InRhSt	AV: 120	If the indoor humidity rises above this setpoint, the unit will activate the Dehumidification Demand.	0	100
Unoccupied Cooling Offset	UnClOst	AV: 124	During the Unoccupied Mode of Operation, this Setpoint spreads the Occupied Cooling Setpoint out by a user adjustable amount. If you do not want Cooling to operate during the Unoccupied Mode, use the default setting of 30°F for these setpoints.	0	30
Unoccupied Heating Offset	UnHtOst	AV: 125	During the Unoccupied Mode of Operation, this Setpoint spreads the Occupied Heating Setpoint out by a user adjustable amount. If you do not want Heating to operate during the Unoccupied Mode, use the default setting of 30°F for these setpoints.	0	30

BACnet Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits	
CO ₂ Setpoint	CO2St	AV: 149	When the CO ₂ level rises above the CO ₂ Protection Limit Max Level, the Economizer's Minimum Position will begin to reset open proportionally between the CO ₂ Protection Limit Max Level Setpoint and the Reset Range Setpoint.	0	3000
Minimum Outside Air Setpoint	MinEcoSt	AV: 151	This is the minimum position of the economizer in the occupied modes.	1	100
Static Pressure Setpoint	DuctPrSt	AV: 152	This is the target duct pressure to be maintained by the VFD blower signal.	0.01	3
Preheater Setpoint	PreHtSp	AV: 196	Low Outside Air Ambient Protection Setpoint	0	100
Outdoor Air CFM Setpoint	OACfmSt	AV: 203	Minimum desired Outdoor Air CFM.	0.10 K	200 K
Outdoor Air CFM Reset Limit	OACfmRs	AV: 204	Maximum desired Outdoor Air CFM when CO ₂ reaches its reset limit.	0.10 K	200 K
Supply Air Cool High Reset	SaClRt	AV: 324	High Supply Air Cooling Reset Limit	40	150
Supply Air Heat High Reset	SaHtRt	AV: 325	High Supply Air Heating Reset Limit	40	150
Cooling Low Reset Source	ClLoRt	AV: 326	Low Cool Reset Source Setpoint	1	150
Cooling High Reset Source	ClHiRt	AV: 327	High Cool Reset Source Setpoint	1	150
Heating Low Reset Source	HtLoRt	AV: 328	Low Heat Reset Source Setpoint	1	150
Heating High Reset Source	HtHiRt	AV: 329	High Heat Reset Source Setpoint	1	150

7. PARAMETER TABLES

7.5 VCM-X BACnet Parameters

BACnet Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits
Bad Supply Air Sensor	SaTpAlm	BI: 2	Alarm that indicates a failure in the supply air sensor.	
CO ₂ Sensor Installed	CO2Cfg	BI: 3	Status that indicates the CO ₂ function has been configured.	
Cooling Enabled	ClEnbl	BI: 6	Status that indicates mechanical cooling is enabled.	
Economizer Enabled	EcoEnbl	BI: 15	Status that indicates the economizer is enabled.	
Fan Start Up Delay	FanDly	BI: 25	Status that indicates the fan is commanded to run, but it is in the start up delay mode.	
Fan Proving Alarm	PofAlm	BI: 26	Alarm that indicates a failure in the flow of the VFD blower.	
Heating Enabled	HtEnbl	BI: 30	Status that indicates that mechanical heating is enabled.	
High Supply Air Temperature Alarm	HiSaAlm	BI: 33	The Supply Air has risen above the Hi SAT Cutoff Setpoint. Heating stages begin to deactivate and the fan continues to run.	
Low Supply Air Temperature Alarm	LoSaAlm	BI: 37	The Supply Air has fallen below the Hi SAT Cutoff Setpoint and cooling stages will begin to deactivate. If the unit is in Economizer, Vent, or Heating Mode the Supply Fan will shut off.	
MODGAS II Connected	MdHt2Ins	BI: 39	Status that indicates the MODGAS II controller is connected.	
Proof of Flow Configured	PofCfg	BI: 57	Status that indicates the proof of flow function has been configured.	
REHEAT II Connected	Rt2Ins	BI: 58	Status that indicates the MHGRV controllers is connected to the system.	

BACnet Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits
Mechanical Cooling Alarm	MchClAlm	BI: 94	Compressor Relays are enabled but the Supply Air Temperature has not fallen 5°F w/in a user-adjustable time period. This does not indicate compressors are active and will not shut the unit down.	
Mechanical Heating Alarm	MchHtAlm	BI: 95	Heating Mode has been initiated but the Supply Air Temperature has not risen 5°F w/in a user-adjustable time period. This does not indicate heat stages are active and will not shut the unit down.	
Dirty Filter Detected	DrtFlAlm	BI: 96	Alarm that indicates the filters are dirty.	
Control Temperature Cool Failure	CtrlTpCF	BI: 108	This alarm is activated if the control temperature does not get within 5°F to the occupied cooling setpoint in an hour in the cooling mode. This alarm is not used in 100% outside air units or supply air control.	
Control Temperature Heat Failure	CtrlTpHF	BI: 109	This alarm is activated if the control temperature does not get within 5°F to the occupied heating setpoint in an hour in the heating mode. This alarm is not used in 100% outside air units or supply air control.	
Outdoor Air Temperature Lost	OaTpAlm	BI: 117	Alarm that indicates a failure in the outdoor air temperature.	
Smoke Detector Alarm	SmokeAlm	BI: 119	Alarm that indicates the Smoke sensor has been activated.	
Space Temperature Sensor Lost	SpcTpAlm	BI: 101	Alarm that indicates a failure in the space temperature sensor.	

7. PARAMETER TABLES

7.5 VCM-X BACnet Parameters

BACnet Properties for the VCM-X Controller				
Parameter	Name	Object	Description	Limits
On Board Relay 1	OnRly1	BI: 127	Current status of relay 1.	
On Board Relay 2	OnRly2	BI: 128	Current status of relay 2.	
On Board Relay 3	OnRly3	BI: 129	Current status of relay 3.	
On Board Relay 4	OnRly4	BI: 130	Current status of relay 4.	
On Board Relay 5	OnRly5	BI: 131	Current status of relay 5.	
Expansion Relay 1	ExRly1	BI: 133	Current status of relay 6.	
Expansion Relay 2	ExRly2	BI: 134	Current status of relay 7.	
Expansion Relay 3	ExRly3	BI: 135	Current status of relay 8.	
Expansion Relay 4	ExRly4	BI: 136	Current status of relay 9.	
Expansion Relay 5	ExRly5	BI: 137	Current status of relay 10.	
Expansion Relay 6	ExRly6	BI: 138	Current status of relay 11.	
Expansion Relay 7	ExRly7	BI: 139	Current status of relay 12.	
Expansion Relay 8	ExRly8	BI: 140	Current status of relay 13.	
Expansion Relay 9	ExRly9	BI: 141	Current status of relay 14.	
Expansion Relay 10	ExRly10	BI: 142	Current status of relay 15.	
Expansion Relay 11	ExRly11	BI: 143	Current status of relay 16.	
Expansion Relay 12	ExRly12	BI: 144	Current status of relay 17.	
Expansion Relay 13	ExRly13	BI: 145	Current status of relay 18.	
Expansion Relay 14	ExRly14	BI: 146	Current status of relay 19.	
Expansion Relay 15	ExRly15	BI: 147	Current status of relay 20.	
Expansion Relay 16	ExRly16	BI: 148	Current status of relay 21.	

7.5 VCM-X BACnet Parameters

7.5.1 VCM-X PT-Link II BACnet®

Property Identifier:

The PT-Link II BACnet® Link amends the following property identity to the BACnet® property identifier.

BACNETPropertyIdentifier :

WattBACNETScheduleForce ::= ENUMERATED {
 NormalOperation (0),
 ForceOccupied (1),
 ForceUnoccupied (2)
 }

VcmxUnitMode ::= ENUMERATED {
 Unoccupied (0),
 RemoteContactOccupied (1),
 NormalScheduleOccupied (2),
 PushButtonOrZoneOverride (3),
 HolidayModeActive (4),
 UnoccupiedZoneDemand (5),
 RemoteScheduleOverride (6),
 CurrentOutputForceMode (7),
 SATHighOrLowCutOff (8),
 CO2OverrideInProgress (9),
 PurgeModeActive (10)
 }

VcmxControlStatusBits ::= ENUMERATED {
 Off (0),
 Vent (1),
 Cool (2),
 Heat (3),
 Dehum (4),
 Dehum Cool (5),
 Dehum Heat (6),
 Warm Up Mode (7),
 Defrost (8)
 }

VcmxOnBoardRelaysBits ::= BIT STRING {
 OnBoardRelay1 (0),
 OnBoardRelay2 (1),
 OnBoardRelay3 (2),
 OnBoardRelay4 (3),
 OnBoardRelay5 (4)
 }

VcmxExternal Relays1-2Bits ::= BIT STRING {
 ExpansionBoard1Relay1 (0),
 ExpansionBoard1Relay2 (1),
 ExpansionBoard1Relay3 (2),
 ExpansionBoard1Relay4 (3),
 ExpansionBoard2Relay1 (4),
 ExpansionBoard2Relay2 (5),
 ExpansionBoard2Relay3 (6),
 ExpansionBoard2Relay4 (7)
 }

VcmxExternal Relays2-4Bits ::= BIT STRING {
 ExpansionBoard3Relay1 (0),
 ExpansionBoard3Relay2 (1),
 ExpansionBoard3Relay3 (2),
 ExpansionBoard3Relay4 (3),
 ExpansionBoard4Relay1 (4),
 ExpansionBoard4Relay2 (5),
 ExpansionBoard4Relay3 (6),
 ExpansionBoard4Relay4 (7)
 }

VcmxAlarmStatusBits ::= BIT STRING {
 Alarm Group1 (0),
 Alarm Group2 (1),
 Alarm Group3 (2),
 Alarm Group4 (3),
 Alarm Group5 (4)
 }

VcmxAlarmGroup1Bits ::= BIT STRING {
 SupplyTempSensorFailure (0),
 LostOutdoorTempSensorSignal (1),
 LostSpaceTempSensorSignal (2),
 ModuleAlarm (3),
 DemandVentilationAlarm (4),
 OutdoorCFMSensorFailure (5),
 ReturnTempSensorFailure (6)
 }

VcmxAlarmGroup2Bits ::= BIT STRING {
 MechanicalCoolingAlarm (0),
 MechanicalHeatingAlarm (1),
 FanProvingAlarm (2),
 DirtyFilterDetected (3),
 SmokeDetected (4)
 }

VcmxAlarmGroup3Bits ::= BIT STRING {
 LowSupplyAirTempAlarm (0),
 HighSupplyAirTempAlarm (1),
 LowControlTempAlarm (2),
 HighControlTempAlarm (3)
 }

VcmxAlarmGroup5Bits ::= BIT STRING {
 AirTempSensorFailure (0),
 NoEconWhenItShould (1),
 EconWhenItShouldNot (2),
 DamperFailure (3),
 ExcessOutdoorAir (4)
 }

7. PARAMETER TABLES

7.6 SA Controller BACnet Parameters

NOTE: Objects labeled AI and BI are read-only. Objects labeled AV are read/writeable. You cannot write directly to Sensor Inputs.

NOTE: When a new setpoint is received from BACnet, it is maintained and used in temporary memory until the unit goes unoccupied. It is then stored in permanent memory and will become the new default setpoint even if power is cycled. Therefore, if power is cycled prior to the unit going unoccupied, the setpoint will not have been stored in permanent memory.

BACnet Properties for SA Controller

Parameter	Name	Object	Description	Limits
Control Status	CtrlSts	AI: 4	Current operational status.	
Occupied Mode Enable Cooling Setpoint Mirror	ClSt	AI: 7	Occupied Mode Enable Cooling Setpoint Mirror.	
Control Temperature	CtrlTp	AI: 9	Current value of the control temperature sensor.	
Duct Static Pressure	DuctPr	AI: 14	Current value of the duct static pressure sensor.	
Economizer Position	EcoPos	AI: 16	Current position of the waterside economizer valve.	
Occupied Mode Enable Heating Setpoint Mirror	HtSt	AI: 31	Occupied Mode Enable Heating Setpoint Mirror.	
Modulating Gas Valve Position	MdHt-2Pos	AI: 38	Current position of MODGAS II modulating gas valve control.	
Reheat Value Position	Rt2Pos	AI: 60	Current position of MHGRV modulating hot gas reheat valve control.	
Indoor Humidity	InRh	AI: 67	Current value of the indoor humidity sensor.	
Space Temperature	SpcTp	AI: 72	Current value of the space temperature sensor.	
Current Supply Air Setpoint	SaTpStM	AI: 82	Current SAT Cooling or Heating setpoint if there is no reset source; Current calculated SAT setpoint with Reset Source.	
Supply Air Temperature	SaTp	AI: 83	Current value of the supply air temperature sensor.	

BACnet Properties for SA Controller

Parameter	Name	Object	Description	Limits
Temperature Demand	TpDmnd	AI: 84	Based on the comparison between the current Control Temperature and the Heating or Cooling Setpoint Temperatures. Does not work for supply air control	
VFD Blower Fan	VfdBw-Pos	AI: 88	Current position of the VFD blower fan signal.	
Application Software Version	AppVer	AI: 99	Current version of the software in the unit.	
Coil Temperature Setpoint	CoilTpSt	AI: 107	Current Coil Temperature Setpoint.	
Dewpoint Setpoint Mirror	DptStM	AI: 110	Mirror of the DPTSt "read only."	
Indoor RH Setpoint Mirror	InRhStM	AI: 114	Mirror of the InRhSt "read only."	
Modulating Cool Position	MdClPos	AI: 115	Current position of the modulating cooling signal (Chilled water or digital compressor).	
Modulating Heat Position	MdHtPos	AI: 116	Current position of the modulating heating signal (hot water or SCR heat).	
Unit Mode	UnitMode	AI: 123		See Unit Mode Bits on page 55.
Coil Temperature	CoilTp	AI: 181	Current coil temperature reading added on version 1.09.	
Modulating Compressor 2 Position	MdCmp2	AI: 206	Current position of the 2nd Stage of Compressor Modulation.	
Head Pressure 1	HdPr1	AI: 207	Head Pressure for 1st unit.	
Head Pressure 2	HdPr2	AI: 208	Head Pressure for 2nd unit.	
Entering Air Temperature	EaTp	AI: 235	Temperature of the air that is entering the unit.	
Entering Water Temperature	EwTp	AI: 236	Temperature of the water that is entering the unit.	
Entering Air Humidity	EaRh	AI: 237	Relative Humidity of the Entering Air.	
Coil Temperature 2	CoilTp2	AI: 240	Current Coil Temperature for 2nd unit.	

7.6 SA Controller BACnet Parameters

BACnet Properties for SA Controller					
Parameter	Name	Object	Description	Limits	
Entering Air Dewpoint	EaDpt	AI: 241	Current Entering Air Dewpoint		
Water Side Economizer Bypass	WSEByp	AI: 242	Current Water Side Economizer Bypass Position for 1st unit.		
Water Side Economizer Bypass 2	WSEByp2	AI: 243	Current Water Side Economizer Bypass Position for 2nd unit.		
Condenser Position 1	CdPos1	AI: 246	Current Condenser Position for 1st unit.		
Condenser Position 2	CdPos2	AI: 247	Current Condenser Position for 2nd unit.		
Dewpoint Setpoint	DptSt	AV: 13	If the outdoor dewpoint rises above this setpoint, the unit will activate the Dehumidification Demand.	35	80
Occupied Mode Enable Cooling Setpoint	OcpClSt	AV: 42	If the control temperature rises one degree above this setpoint, the control will activate the cooling demand. If the control temperature is the Supply Air Sensor, then the cooling demand is always active.	0	99
Occupied Mode Enable Heating Setpoint	OcpHtSt	AV: 43	If the control temperature drops one degree below this setpoint, the control will activate the heating demand. If the control temperature is the Supply Air Sensor, then there is no heating demand.		99
Schedule Force	SchdFrc	AV: 66	0 = Auto/ Unoccupied Mode 1 = Forced On 2 = Forced Off	0	2
Space Sensor Offset	SpcTpOst	AV: 71	If the Space Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
SAT Cooling Setpoint	SaClSt	AV: 77	Supply Air Setpoint in Cooling Mode.	40	80
SAT Heating Setpoint	SaHtSt	AV: 78	Supply Air Setpoint in Heating Mode.	40	200

BACnet Properties for SA Controller					
Parameter	Name	Object	Description	Limits	
Supply Air Sensor Offset	SaTpOst	AV: 80	If the Supply Air Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
Warm Up Setpoint	WmupSt	AV: 91	In a VAV application, upon entering the occupied mode, the Warm-up Demand will be activated if the return air temperature falls one degree below this setpoint.	50	90
Coil Temperature Setpoint	CoilTpSt	AV: 107	This is the coil suction temperature target during dehumidification mode. Produces dewpoint in the supply air approximately 10°F above this setpoint.	35	70
Indoor Humidity Setpoint	InRhSt	AV: 120	If the indoor humidity rises above this setpoint, the unit will activate the Dehumidification Demand.	0	100
Unoccupied Cooling Offset	UnClOst	AV: 124	During the Unoccupied Mode of Operation, this Setpoint spreads the Occupied Cooling Setpoint out by a user adjustable amount. If you do not want Cooling to operate during the Unoccupied Mode, use the default setting of 30°F for these setpoints.	0	30

7. PARAMETER TABLES

7.6 SA Controller BACnet Parameters

BACnet Properties for SA Controller					
Parameter	Name	Object	Description	Limits	
Unoccupied Heating Offset	UnHtOst	AV: 125	During the Unoccupied Mode of Operation, this Setpoint spreads the Occupied Heating Setpoint out by a user adjustable amount. If you do not want Heating to operate during the Unoccupied Mode, use the default setting of 30°F for these setpoints.	0	30
Static Pressure Setpoint	DuctPrSt	AV: 152	This is the target duct pressure to be maintained by the VFD blower signal.	0.01	3
Preheater Setpoint	PreHtSp	AV: 196	Low Outside Air Ambient Protection Setpoint	0	100
Entering Air Offset Setpoint	EaTpOst	AV: 238	If the Entering Air Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.		
Entering Water Offset Setpoint	EwTpOst	AV: 239	If the Entering Water Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.		
Supply Air Cool High Reset	SaClRt	AV: 324	High Supply Air Cooling Reset Limit	40	150
Supply Air Heat High Reset	SaHtRt	AV: 325	High Supply Air Heating Reset Limit	40	150
Cooling Low Reset Source	ClLoRt	AV: 326	Low Cool Reset Source Setpoint	1	150
Cooling High Reset Source	ClHiRt	AV: 327	High Cool Reset Source Setpoint	1	150
Heating Low Reset Source	HtLoRt	AV: 328	Low Heat Reset Source Setpoint	1	150
Heating High Reset Source	HtHiRt	AV: 329	High Heat Reset Source Setpoint	1	150
Fan Start Up Delay	FanDly	BI: 25	Status that indicates the fan is commanded to run, but it is in the start up delay mode.		

BACnet Properties for SA Controller			
Parameter	Name	Object	Description
Bad Supply Air Sensor	SaTpAlm	BI: 2	Alarm that indicates a failure in the supply air sensor.
Cooling Enabled	ClEnbl	BI: 6	Status that indicates mechanical cooling is enabled.
Economizer Enabled	EcoEnbl	BI: 15	Status that indicates the economizer is enabled.
Fan Proving Alarm	PofAlm	BI: 26	Alarm that indicates a failure in the flow of the VFD blower.
Heating Enabled	HtEnbl	BI: 30	Status that indicates that mechanical heating is enabled.
High Supply Air Temperature Alarm	HiSaAlm	BI: 33	The Supply Air has risen above the Hi SAT Cutoff Setpoint. Heating stages begin to deactivate and the fan continues to run.
Low Supply Air Temperature Alarm	LoSaAlm	BI: 37	The Supply Air has fallen below the Hi SAT Cutoff Setpoint and cooling stages will begin to deactivate. If the unit is in Economizer, Vent, or Heating Mode the Supply Fan will shut off.
MODGAS II Connected	MdHt2Ins	BI: 39	Status that indicates the MODGAS II controller is connected.
REHEAT II Connected	Rt2Ins	BI: 58	Status that indicates the MHGRV controllers is connected to the system.
Mechanical Cooling Alarm	MchClAlm	BI: 94	Compressor Relays are enabled but the Supply Air Temperature has not fallen 5°F w/in a user-adjustable time period. This does not indicate compressors are active and will not shut the unit down.
Mechanical Heating Alarm	MchHtAlm	BI: 95	Heating Mode has been initiated but the Supply Air Temperature has not risen 5°F w/in a user-adjustable time period. This does not indicate heat stages are active and will not shut the unit down.
Dirty Filter Detected	DrtFlAlm	BI: 96	Alarm that indicates the filters are dirty.
Control Temperature Cool Failure	CtrlTpCF	BI: 108	This alarm is activated if the control temperature does not get within 5°F to the occupied cooling setpoint in an hour in the cooling mode. This alarm is not used in 100% outside air units or supply air control.

7.6 SA Controller BACnet Parameters

BACnet Properties for SA Controller

Parameter	Name	Object	Description
Control Temperature Heat Failure	CtrlTpHF	BI: 109	This alarm is activated if the control temperature does not get within 5°F to the occupied heating setpoint in an hour in the heating mode. This alarm is not used in 100% outside air units or supply air control.
Space Temperature Sensor Lost	SpcTpAlm	BI: 101	Alarm that indicates a failure in the space temperature sensor.
On Board Relay 1	OnRly1	BI: 127	Current status of relay 1.
On Board Relay 2	OnRly2	BI: 128	Current status of relay 2.
On Board Relay 3	OnRly3	BI: 129	Current status of relay 3.
On Board Relay 4	OnRly4	BI: 130	Current status of relay 4.
On Board Relay 5	OnRly5	BI: 131	Current status of relay 5.
Expansion Relay 1	ExRly1	BI: 133	Current status of relay 6.
Expansion Relay 2	ExRly2	BI: 134	Current status of relay 7.
Expansion Relay 3	ExRly3	BI: 135	Current status of relay 8.
Expansion Relay 4	ExRly4	BI: 136	Current status of relay 9.
Expansion Relay 5	ExRly5	BI: 137	Current status of relay 10.
Expansion Relay 6	ExRly6	BI: 138	Current status of relay 11.
Expansion Relay 7	ExRly7	BI: 139	Current status of relay 12.
Expansion Relay 8	ExRly8	BI: 140	Current status of relay 13.
Expansion Relay 9	ExRly9	BI: 141	Current status of relay 14.
Expansion Relay 10	ExRly10	BI: 142	Current status of relay 15.
Expansion Relay 11	ExRly11	BI: 143	Current status of relay 16.
Expansion Relay 12	ExRly12	BI: 144	Current status of relay 17.
Expansion Relay 13	ExRly13	BI: 145	Current status of relay 18.
Expansion Relay 14	ExRly14	BI: 146	Current status of relay 19.
Expansion Relay 15	ExRly15	BI: 147	Current status of relay 20.
Expansion Relay 16	ExRly16	BI: 148	Current status of relay 21.
Emergency Shutdown Alarm	EmerAlm	BI: 219	Alarm that indicates Emergency Shutdown.

BACnet Properties for SA Controller

Parameter	Name	Object	Description
Drain Pan Overflow	DrnAlm	BI: 244	Alarm that indicates overflow of the drain pan.
Proof of Water Flow Alarm	PoWFAlm	BI: 245	Alarm that indicates no Proof of Water Flow.
Entering Air Temperature Alarm	EaTpAlm	BI: 248	Alarm that indicates failure in the Entering Air Temperature Sensor.

7.6.1 SA Controller PT-Link-BACnet® Property Identifier:

The PT-Link-BACnet® Link amends the following property identity to the BACnet® property identifier.

BACNETPropertyIdentifier :

```
SAUnitMode ::= ENUMERATED {
    Unoccupied                      (0),
    RemoteContactOccupied          (1),
    NormalScheduleOccupied         (2),
    PushButtonOrZoneOverride       (3),
    HolidayModeActive               (4),
    UnoccupiedZoneDemand            (5),
    RemoteScheduleOverride          (6),
    CurrentOutputForceMode          (7),
    SATHighOrLowCutOff              (8),
    CO2OverrideInProgress           (9),
    PurgeModeActive                 (10)
}
```

SAControlStatusBits ::= ENUMERATED {

```
    Off                            (0),
    Vent                           (1),
    Cool                           (2),
    Heat                           (3),
    Dehum                          (4),
    Dehum Cool                     (5),
    Dehum Heat                     (6),
    Warm Up Mode                   (7)
}
```

7. PARAMETER TABLES

7.7 VCM BACnet Parameters

NOTE: Objects labeled AI and BI are read-only. Objects labeled AV are read/writeable. You cannot write directly to Sensor Inputs.

NOTE: When a new setpoint is received from BACnet, it is maintained and used in temporary memory until the unit goes unoccupied. It is then stored in permanent memory and will become the new default setpoint even if power is cycled. Therefore, if power is cycled prior to the unit going unoccupied, the setpoint will not have been stored in permanent memory.

BACnet Properties for the VCM Controller

Parameter	Name	Object	Description	Limits
Application Software Version	AppVer	AI: 99	Current version of the software in the unit.	
Alarm Status	AlmSts	AI: 1		See page 61.
Unit Mode	UnitMode	AI: 123		See page 61.
Control Status	CtrlSts	AI: 4	Current operational status.	
Control Temperature	CtrlTp	AI: 9	Current value of the control temperature sensor.	
Occupied Mode Enable Cooling Setpoint Mirror	ClSt	AI: 7	Occupied Mode Enable Cooling Setpoint Mirror.	
Duct Static Pressure	DuctPr	AI: 14	Current value of the duct static pressure sensor.	
Economizer Position	EcoPos	AI: 16	Current position of the economizer damper.	
External Relays 1-2	ExRlys12	AI: 111		See page 61.
External Relays 3-4	ExRlys34	AI: 112		See page 61.
Indoor Humidity	InRh	AI: 67	Current value of the indoor humidity sensor.	
Occupied Mode Enable Heating Setpoint Mirror	HtSt	AI: 31	Occupied Mode Enable Heating Setpoint Mirror.	
On Board Relays	OnRlys	AI: 44		See page 61.
Outdoor Air Humidity	OaRh	AI: 52	Current value of the outdoor humidity sensor.	
Outdoor Air Temperature	OaTp	AI: 54	Current value of the outdoor temperature sensor.	
Outdoor Air Wetbulb	OaWtbl	AI: 55	Current calculated value of the outdoor wetbulb temperature.	

BACnet Properties for the VCM Controller

Parameter	Name	Object	Description	Limits
Relief Pressure	RfPr	AI: 62	Current value of the building pressure sensor.	
Return Air CO ₂ Level	CO2Level	AI: 150	Current value of the CO ₂ sensor.	
Return Air Temperature	RaTp	AI: 64	Current value of the return temperature sensor.	
Space Temperature	SpcTp	AI: 72	Current value of the space temperature sensor.	
Supply Air Temperature	SaTp	AI: 83	Current value of the supply air temperature sensor.	
Temperature Demand	TpDmnd	AI: 84	Based on the comparison between the current Control Temperature and the Heating or Cooling Setpoint Temperatures. Does not work for supply air control.	
VFD Blower Fan	VfdBwPos	AI: 88	Current position of the VFD blower fan signal.	
VFD Relief Fan	VfdExPos	AI: 89	Current position of the VFD relief fan signal.	
Modulating Gas Valve Position	MdHt2Pos	AI: 38	Current position of MODGAS II modulating gas valve control.	
Reheat Value Position	Rt2Pos	AI: 60	Current position of MHGRV modulating hot gas reheat valve control.	
Alarm Group 1	AlrmGrp1	AI: 104		See page 61.
Alarm Group 2	AlrmGrp2	AI: 105		See page 61.
Alarm Group 3	AlrmGrp3	AI: 106		See page 61.
Dewpoint Setpoint Mirror	DptStM	AI: 110	Mirror of the DPtSt “read only.”	
Indoor RH Setpoint Mirror	InRhStM	AI: 114	Mirror of the InRhSt “read only.”	
Modulating Cool Position	MdClPos	AI: 115	Current position of the modulating cooling signal (Chilled water or digital compressor).	

7.7 VCM BACnet Parameters

BACnet Properties for the VCM Controller

Parameter	Name	Object	Description	Limits	
Modulating Heat Position	MdHtPos	AI: 116	Current position of the modulating heating signal (hot water or SCR heat).		
Bypass Damper Position	ByPasDmp	AI: 153	Current position of the bypass damper signal.		
Return Damper Position	RaDmp	AI: 154	Current position of the return damper signal.		
Outdoor Air Dewpoint	OaDwpt	AI: 47	Current calculated outdoor air dewpoint added on version 1.09.		
Current Supply Air Setpoint	SaTpStM	AI: 82	Current SAT Cooling or Heating setpoint if there is no reset source; Current calculated SAT setpoint with Reset Source.		
Coil Temperature	CoilTp	AI: 181	Current coil temperature reading added on version 1.09.		
Preheater Setpoint	PreHtSp	AV: 196	Low Outside Air Ambient Protection Setpoint	0	100
CO ₂ Setpoint	CO2St	AV: 149	When the CO ₂ level rises above the CO ₂ Protection Limit Max Level, the Economizer's Minimum Position will begin to reset open proportionally between the CO ₂ Protection Limit Max Level Setpoint and the Reset Range Setpoint.	0	3000
Static Pressure Setpoint	DuctPrSt	AV: 152	This is the target duct pressure to be maintained by the VFD blower signal.	0.01	3

BACnet Properties for the VCM Controller

Parameter	Name	Object	Description	Limits	
Minimum Outside Air Setpoint	MinEcoSt	AV: 151	This is the minimum position of the economizer in the occupied modes.	1	100
Occupied Mode Enable Cooling Setpoint	OcpClSt	AV: 42	If the control temperature rises one degree above this setpoint, the control will activate the cooling demand. If the control temperature is the Supply Air Sensor, then the cooling demand is always active.	0	99
Occupied Mode Enable Heating Setpoint	OcpHtSt	AV: 43	If the control temperature drops one degree below this setpoint, the control will activate the heating demand. If the control temperature is the Supply Air Sensor, then there is no heating demand.	0	99
Outdoor Air Sensor Offset	OaTpOst	AV: 53	If the Outdoor Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
Relief Pressure Setpoint	RfPrSt	AV: 118	This is the target building pressure to be maintained by the VFD Relief signal.	-0.2	0.2
Return Air Sensor Offset	RaTpOst	AV: 65	If the Return Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100

7. PARAMETER TABLES

7.7 VCM BACnet Parameters

BACnet Properties for the VCM Controller					
Parameter	Name	Object	Description	Limits	
Schedule Force	SchdFrc	AV: 66	0 = Auto/ Unoccupied Mode 1 = Forced On 2 = Forced Off	0	2
Space Sensor Offset	SpcTpOst	AV: 71	If the Space Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
SAT/Reset Source Cooling Setpoint	SaClSt	AV: 77	Supply Air setpoint or Reset Source target temperature in Cooling Mode.	40	80
SAT/Reset Source Heating Setpoint	SaHtSt	AV: 78	Supply Air setpoint or Reset Source target temperature in Heating Mode.	40	200
Supply Air Sensor Offset	SaTpOst	AV: 80	If the Supply Air Temperature Sensor is reading incorrectly, you can use this option to enter an offset temperature to adjust the Sensor's Temperature.	-100	100
Unoccupied Cooling Offset	UnClOst	AV: 124	During the Unoccupied Mode of Operation, this Setpoint spreads the Occupied Cooling Setpoint out by a user adjustable amount. If you do not want Cooling to operate during the Unoccupied Mode, use the default setting of 30°F for these setpoints.	0	30
Unoccupied Heating Offset	UnHtOst	AV: 125	During the Unoccupied Mode of Operation, this Setpoint spreads the Occupied Heating Setpoint out by a user adjustable amount. If you do not want Heating to operate during the Unoccupied Mode, use the default setting of 30°F for these setpoints.	0	30

BACnet Properties for the VCM Controller					
Parameter	Name	Object	Description	Limits	
Dewpoint Setpoint	DptSt	AV: 13	If the outdoor dewpoint rises above this setpoint, the unit will activate the Dehumidification Demand.	35	80
Coil Temperature Setpoint	CoilTpSt	AV: 107	This is the coil suction temperature target during dehumidification mode. Produces dewpoint in the supply air approximately 10°F above this setpoint.	35	70
Indoor Humidity Setpoint	InRhSt	AV: 120	If the indoor humidity rises above this setpoint, the unit will activate the Dehumidification Demand.	0	100
Warm Up Setpoint	WmupSt	AV: 91	In a VAV application, upon entering the occupied mode, the Warm-up Demand will be activated if the return air temperature falls one degree below this setpoint.	50	90
Wet Bulb Setpoint	WtblSt	AV: 92	The economizer is enabled if the outdoor temperature or wetbulb falls below this setpoint.	0	80
Bad Supply Air Sensor	SaTpAlm	BI: 2	Alarm that indicates a failure in the supply air sensor.		
CO ₂ Sensor Installed	CO2Cfg	BI: 3	Status that indicates the CO ₂ function has been configured.		
Cooling Demand	ClDmnd	BI: 5	Status that indicates a demand for cooling.		
Cooling Enabled	ClEnbl	BI: 6	Status that indicates mechanical cooling is enabled.		
Economizer Enabled	EcoEnbl	BI: 15	Status that indicates the economizer is enabled.		

7.7 VCM BACnet Parameters

BACnet Properties for the VCM Controller

Parameter	Name	Object	Description	Limits
Fan Start Up Delay	FanDly	BI: 25	Status that indicates the fan is commanded to run, but it is in the start up delay mode.	
Fan Proving Alarm	PofAlm	BI: 26	Alarm that indicates a failure in the flow of the VFD blower.	
Heating Demand	HtDmnd	BI: 29	Status that indicates a demand for heating.	
Heating Enabled	HtEnbl	BI: 30	Status that indicates that mechanical heating is enabled.	
High Supply Air Temperature Alarm	HiSaAlm	BI: 33	The Supply Air has risen above the Hi SAT Cutoff Setpoint. Heating stages begin to deactivate and the fan continues to run.	
Low Supply Air Temperature Alarm	LoSaAlm	BI: 37	The Supply Air has fallen below the Hi SAT Cutoff Setpoint and cooling stages will begin to deactivate. If the unit is in Economizer, Vent, or Heating Mode the Supply Fan will shut off.	
MODGAS II Connected	MdHt2Ins	BI: 39	Status that indicates the MODGAS II controller is connected.	
Proof of Flow Configured	PofCfg	BI: 57	Status that indicates the proof of flow function has been configured.	
REHEAT II Connected	Rt2Ins	BI: 58	Status that indicates the MHGRV controllers is connected to the system.	
Warm Up Mode Active	WmupDmnd	BI: 90	Status that indicates the control is in the Warm-up mode.	
Mechanical Cooling Alarm	MchClAlm	BI: 94	Compressor Relays are enabled but the Supply Air Temperature has not fallen 5°F w/in a user-adjustable time period. This does not indicate compressors are active and will not shut the unit down.	

BACnet Properties for the VCM Controller

Parameter	Name	Object	Description	Limits
Mechanical Heating Alarm	MchHtAlm	BI: 95	Heating Mode has been initiated but the Supply Air Temperature has not risen 5°F w/in a user-adjustable time period. This does not indicate heat stages are active and will not shut the unit down.	
Dirty Filter Detected	DrtFlAlm	BI: 96	Alarm that indicates the filters are dirty.	
Control Temperature Cool Failure	CtrlTpCF	BI: 108	This alarm is activated if the control temperature does not get within 5°F to the occupied cooling setpoint in an hour in the cooling mode. This alarm is not used in 100% outside air units or supply air control.	
Control Temperature Heat Failure	CtrlTpHF	BI: 109	This alarm is activated if the control temperature does not get within 5°F to the occupied heating setpoint in an hour in the heating mode. This alarm is not used in 100% outside air units or supply air control.	
Dehumidification Demand	DehmDmnd	BI: 113	Status that indicates a demand for dehumidification.	
Outdoor Air Temperature Lost	OaTpAlm	BI: 117	Alarm that indicates a failure in the outdoor air temperature.	
Smoke Detector Alarm	SmokeAlm	BI: 119	Alarm that indicates the Smoke sensor has been activated.	
Space Temperature Sensor Lost	SpcTpAlm	BI: 101	Alarm that indicates a failure in the space temperature sensor.	
On Board Relay 1	OnRly1	BI: 127	Current status of relay 1.	
On Board Relay 2	OnRly2	BI: 128	Current status of relay 2.	
On Board Relay 3	OnRly3	BI: 129	Current status of relay 3.	
On Board Relay 4	OnRly4	BI: 130	Current status of relay 4.	

7. PARAMETER TABLES

7.7 VCM BACnet Parameters

BACnet Properties for the VCM Controller				
Parameter	Name	Object	Description	Limits
On Board Relay 5	OnRly5	BI: 131	Current status of relay 5.	
Expansion Relay 1	ExRly1	BI: 133	Current status of relay 6.	
Expansion Relay 2	ExRly2	BI: 134	Current status of relay 7.	
Expansion Relay 3	ExRly3	BI: 135	Current status of relay 8.	
Expansion Relay 4	ExRly4	BI: 136	Current status of relay 9.	
Expansion Relay 5	ExRly5	BI: 137	Current status of relay 10.	
Expansion Relay 6	ExRly6	BI: 138	Current status of relay 11.	
Expansion Relay 7	ExRly7	BI: 139	Current status of relay 12.	
Expansion Relay 8	ExRly8	BI: 140	Current status of relay 13.	
Expansion Relay 9	ExRly9	BI: 141	Current status of relay 14.	
Expansion Relay 10	ExRly10	BI: 142	Current status of relay 15.	
Expansion Relay 11	ExRly11	BI: 143	Current status of relay 16.	
Expansion Relay 12	ExRly12	BI: 144	Current status of relay 17.	
Expansion Relay 13	ExRly13	BI: 145	Current status of relay 18.	
Expansion Relay 14	ExRly14	BI: 146	Current status of relay 19.	
Expansion Relay 15	ExRly15	BI: 147	Current status of relay 20.	
Expansion Relay 16	ExRly16	BI: 148	Current status of relay 21.	

7.7 VCM BACnet Parameters

7.7.1 VCM PT-Link II BACnet®

Property Identifier:

The PT-Link II BACnet® Link amends the following property identity to the BACnet® property identifier.

BACNETPropertyIdentifier :

WattBACNETScheduleForce ::= ENUMERATED {
 NormalOperation (0),
 ForceOccupied (1),
 ForceUnoccupied (2)
 }

VcmUnitMode ::= ENUMERATED {
 Unoccupied (0),
 RemoteContactOccupied (1),
 NormalScheduleOccupied (2),
 PushButtonOrZoneOverride (3),
 HolidayModeActive (4),
 UnoccupiedZoneDemand (5),
 RemoteScheduleOverride (6),
 CurrentOutputForceMode (7),
 SATHighOrLowCutOff (8),
 CO2OverrideInProgress (9),
 PurgeModeActive (10)
 }

VcmControlStatusBits ::= BIT STRING {
 Cool Demand (0),
 Heat Demand (1),
 DehumidificationMode (2),
 Cooling Enabled (3),
 Heating Enabled (4),
 Economizer Enabled (5),
 Fan Start-up Delay (6),
 Warm-up Mode Active (7),
 Fan Proving (8),
 RH Priority (9),
 CarbonDioxideSensorPresent (10),
 ModGasIIConnected (11),
 ReheatIIConnected (12)
 }

VcmOnBoardRelaysBits ::= BIT STRING {
 OnBoardRelay1 (0),
 OnBoardRelay2 (1),
 OnBoardRelay3 (2),
 OnBoardRelay4 (3),
 OnBoardRelay5 (4)
 }

VcmExternal Relays1-2Bits ::= BIT STRING {
 ExpansionBoard1Relay1 (0),
 ExpansionBoard1Relay2 (1),
 ExpansionBoard1Relay3 (2),
 ExpansionBoard1Relay4 (3),
 ExpansionBoard2Relay1 (4),
 ExpansionBoard2Relay2 (5),
 ExpansionBoard2Relay3 (6),
 ExpansionBoard2Relay4 (7)
 }

VcmExternal Relays2-4Bits ::= BIT STRING {
 ExpansionBoard3Relay1 (0),
 ExpansionBoard3Relay2 (1),
 ExpansionBoard3Relay3 (2),
 ExpansionBoard3Relay4 (3),
 ExpansionBoard4Relay1 (4),
 ExpansionBoard4Relay2 (5),
 ExpansionBoard4Relay3 (6),
 ExpansionBoard4Relay4 (7)
 }

VcmAlarmStatusBits ::= BIT STRING {
 Alarm Group1 (0),
 Alarm Group2 (1),
 Alarm Group3 (2)
 }

8. FS-GUI REFERENCE GUIDE

8. FieldServer Graphical User Interface

8.1 The FieldServer Graphical User Interface (FS-GUI) with Configuration Parameter Page Navigation Tree

Open your web browser, and type the IP Address of the PT-Link, which is **<192.168.1.24>**, and press **<ENTER>**. The FS-GUI Configuration Parameter Page will launch. See Figure 27.

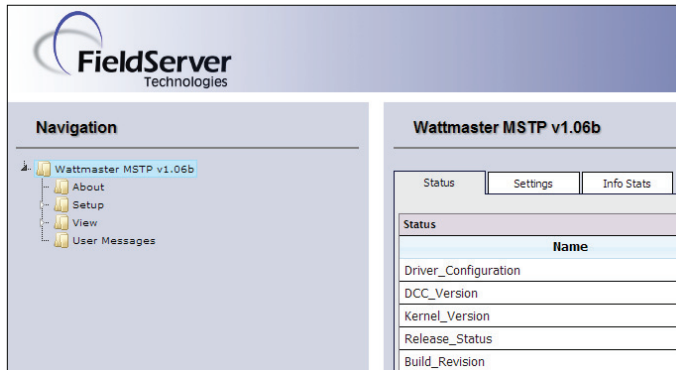


Figure 27: The FS-GUI Main Screen

Refer to the Figure 28 to navigate the FS-GUI.

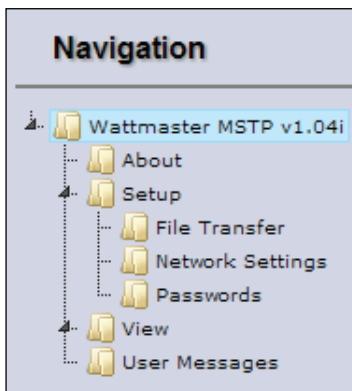


Figure 28: The Navigation Tree

Home or Root

The root of the navigation tree includes Status, Settings, and Info Stats. Status allows you to check the status of the PT-Link gateway, including the configuration code, version, memory, gateway type, and more. Under Settings, you can access important network information. The name of the root—Wattmaster MSTP v1.04i—is completely user definable. The **<Home>** button is found at the left bottom of the *FS-GUI Main Screen*. Press this button to return to *FS-GUI Main Screen*.

About

About allows you to check the current firmware of the Field Server gateway plus version identification of the interface and skin, plus contact information. Skin is either the default FieldServer template or a specific template specified by the user.

Setup

Setup includes File Transfer, Network Settings, and Passwords.

File Transfer—Select “File Transfer” to upload files to the FS gateway, including configuration files, firmware, upgrades, and more. Information regarding File Transfers can be found on **page 13**.

Network Settings—Select “Network Settings” to access and modify network connection. See **page 65** for further information.

Passwords—There are 2 levels of passwords that can be set, Admin and User. See **pages 63 and 64** for further information.

View

View includes Connections, Data Arrays, Nodes, and Map Descriptors.

Connections—This screen supplies information on communication between the FS and remote devices. A number of aspect screens are available including settings, info stats, and error stats. The information on these screens cannot be changed and is for viewing only.

Data Arrays—The *Data Array Screens* can be used to view the values in data arrays. The values can be changed by clicking the **<Enable Data Editing>** button. You can then edit setpoints by typing the new value and pressing **<ENTER>**. Note that if values are being written into the array by a driver, then any modifications made by grid editing will be overridden.

Nodes—On the *Nodes Screens*, information about the remote device on each connection can be viewed. A number of aspect screens are available, including settings, status, info stats, and error stats. The information on these screens cannot be changed and is for viewing only.

Map Descriptors—On the Map Descriptors Screens, information on each individual Map Descriptor can be viewed. A number of aspect screens are available, including settings, status, info stats, and error stats. The information on these screens cannot be changed and is for viewing only.

User Messages

The user message screens display FS messages generated by drivers and the operating system.

Error Screen—User messages on this screen usually indicate some problem with the configuration or communication and should be attended to.

Info Screen—User messages of an informational type will be displayed on this screen and no user action is usually required.

Driver Screen—Messages generated by protocol drivers will be displayed on this screen. These messages convey protocol specific information that can be useful for field integration purposes.

Combined Screen—This screen contains all messages chronologically from all the above message screens.

8. FieldServer Graphical User Interface

HELP or F1

The **<Help>** button is located at the bottom left of the FS-GUI Main Screen. Or, simply press **<F1>** for Help.

System Restart

The **<System Restart>** button is located at the bottom of the *FS-GUI Main Screen*. System Restart will restart the FS Gateway.

8.2 Network Settings

1.) In the *Navigation Window* on the left of the *FS-GUI Screen*, click **<Setup>** and then click **<Network Settings>**. See **Figure 29**. The *Networks Settings Window* will appear.

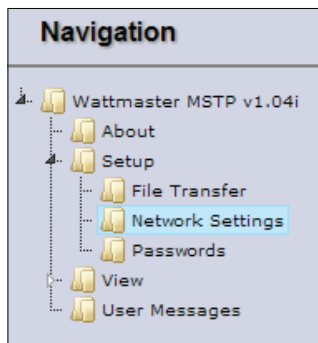


Figure 29: Setup - Network Settings

2.) In the *Network Settings Window* (**Figure 30**), the Ethernet adapter settings of the FieldServer can be changed. The N1 and N2 (if supported) adapter IP address, Netmask, and default Gateway can be changed by entering values in the applicable fields and clicking on **<Update IP Settings>**.

NOTE: The only time you should change the IP address is during the initial configuration and/or during troubleshooting.

N1 IP Address	192.168.1.24
N1 Netmask	255.255.255.0
N1 DHCP Client State	DISABLED ▼
N1 DHCP Server State	DISABLED ▼
Default Gateway	10.0.0.1
<input type="button" value="Cancel"/> <input type="button" value="Update IP Settings"/>	

Figure 30: Network Settings Window

NOTE: The FieldServer has to be restarted for any changed settings to take effect. Also note that enabling the DHCP client on an adapter will cause the static IP address settings to be overruled by a DHCP server on the network.

The FieldServer's built in DHCP server can be enabled to establish easy connection for Support purposes. Set the laptop or computer to automatically obtain an IP address to use this feature. Note that the Field Server DHCP server periodically checks for other DHCP servers on the network and will disable itself should any other DHCP servers exist on the network. This mode of operation is because the FieldServer DHCP server is strictly for support purposes and does not have all of the features of a commercial DHCP server. Setting the default gateway IP address to your network gateway will ensure the FieldServer is reachable on the internet.

8.3 Setting a Password for the FS-GUI

Access to the FS-GUI can be restricted by enabling a password. By default, there are no passwords required to access the FS-GUI. There are 2 access levels defined by 2 account names: Admin or User. The Admin account has unrestricted access to the FS-GUI. The User account can view any FS-GUI information, but cannot make any changes or restart the FS-GUI.

NOTE: The current Admin password (if set) is required to change all passwords. In other words, you must log in with the Admin password to change a password unless the password function is disabled.

1.) In the *Navigation Window* on the left of the *FS-GUI Screen*, click **<Setup>** and then click **<Passwords>**. See **Figure 31**. The *Passwords Window* will appear.

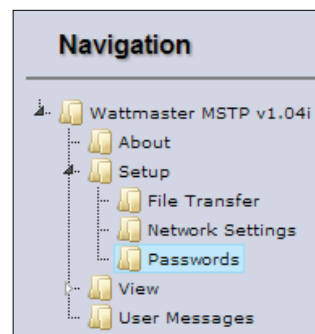


Figure 31: Setup - Passwords

8. FS-GUI REFERENCE GUIDE

8. FieldServer Graphical User Interface

2.) In the *Passwords Window*, select **<Admin>** as the Account Name. Then *type* a password in the New Password field, *retype* the password in the Confirm Password field and then *click* **<Update Password>**. See **Figure 32**. If you are changing the Admin password, you must *type* the current password in the Current Admin Password field.

NOTE: The password must be less than 20 characters in length. We recommend that the password be at least 8 characters in length and that $\frac{3}{4}$ of the characters should consist of the following: uppercase letters, lower case letters, numbers, and symbols.

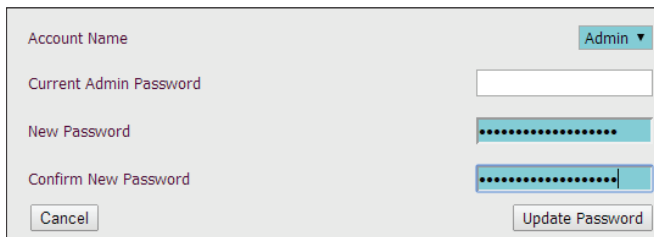


Figure 32: Changing the Admin Password

3.) If the passwords match, the Authentication Window may pop up. You must *type* the User Name “Admin” and the password you just created in the window to proceed. See **Figure 33**.

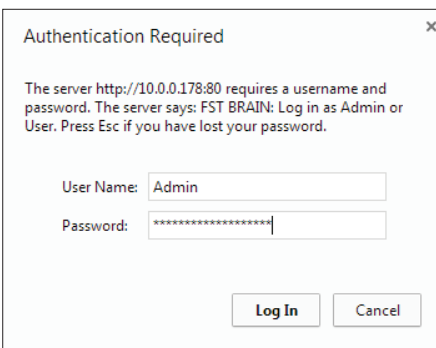


Figure 33: Authentication Log In

4.) After authentication takes place, the FS-GUI will return to the main screen.

NOTE: To disable password protection, clear the Admin password by simply *selecting* **<Admin>** as the Account Name, *typing* in the Admin password in the Current Admin Password field and leaving the last two fields blank. Then *click* **<Update Password>**. See **Figure 34**.

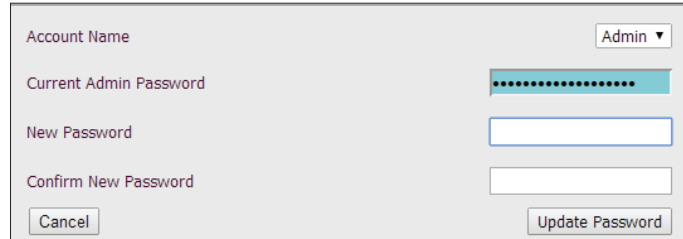


Figure 34: Clear Passwords

5.) In order to return to the *Passwords Window*, in the *Navigation Window* on the left of the FS-GUI Screen, *click* **<Setup>** and then *click* **<Passwords>**. See **Figure 35**. The *Passwords Window* will appear.

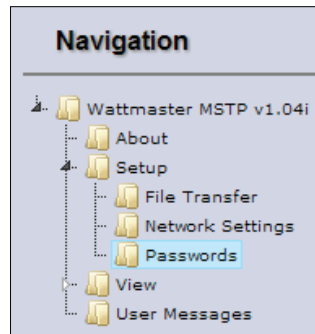


Figure 35: Setup - Passwords

6.) To create or update the User password, in the *Passwords Window*, *select* **<User>** as the Account Name. You must *type* the Admin password in the Current Admin Password field. Then *type* a password in the New Password field, *retype* the password in the Confirm Password field and then *click* **<Update Password>**. See **Figure 36**.

NOTE: The password must be less than 20 characters in length. We recommend that the password be at least 8 characters in length and that $\frac{3}{4}$ of the characters should consist of the following: uppercase letters, lower case letters, numbers, and symbols.

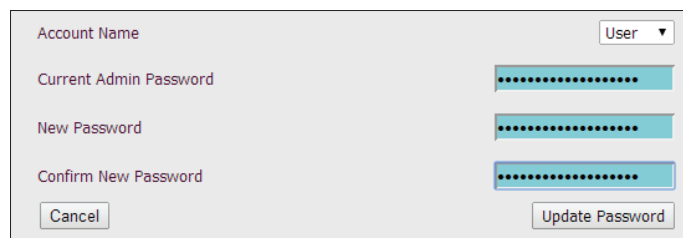


Figure 36: Changing the User Password

7.) If the user password update is successful, a message will pop up confirming the password update.

9. NODE ID INSTANCE & MAC ADDRESS

9. Node ID (Device Instance) & MAC Address

Bank A DIP Switch Settings								
Address	A1	A2	A3	A4	A5	A6	A7	A8
0	Off	Off	Off	Off	Off	Off	Off	Off
1	On	Off	Off	Off	Off	Off	Off	Off
2	Off	On	Off	Off	Off	Off	Off	Off
3	On	On	Off	Off	Off	Off	Off	Off
4	Off	Off	On	Off	Off	Off	Off	Off
5	On	Off	On	Off	Off	Off	Off	Off
6	Off	On	On	Off	Off	Off	Off	Off
7	On	On	On	Off	Off	Off	Off	Off
8	Off	Off	Off	On	Off	Off	Off	Off
9	On	Off	Off	On	Off	Off	Off	Off
10	Off	On	Off	On	Off	Off	Off	Off
11	On	On	Off	On	Off	Off	Off	Off
12	Off	Off	On	On	Off	Off	Off	Off
13	On	Off	On	On	Off	Off	Off	Off
14	Off	On	On	On	Off	Off	Off	Off
15	On	On	On	On	Off	Off	Off	Off
16	Off	Off	Off	Off	On	Off	Off	Off
17	On	Off	Off	Off	On	Off	Off	Off
18	Off	On	Off	Off	On	Off	Off	Off
19	On	On	Off	Off	On	Off	Off	Off
20	Off	Off	On	Off	On	Off	Off	Off
21	On	Off	On	Off	On	Off	Off	Off
22	Off	On	On	Off	On	Off	Off	Off
23	On	On	On	Off	On	Off	Off	Off
24	Off	Off	Off	On	On	Off	Off	Off
25	On	Off	Off	On	On	Off	Off	Off
26	Off	On	Off	On	On	Off	Off	Off
27	On	On	Off	On	On	Off	Off	Off
28	Off	Off	On	On	On	Off	Off	Off
29	On	Off	On	On	On	Off	Off	Off
30	Off	On	On	On	On	Off	Off	Off
31	On	On	On	On	On	Off	Off	Off
32	Off	Off	Off	Off	Off	On	Off	Off
33	On	Off	Off	Off	Off	On	Off	Off
34	Off	On	Off	Off	Off	On	Off	Off
35	On	On	Off	Off	Off	On	Off	Off
36	Off	Off	On	Off	Off	On	Off	Off
37	On	Off	On	Off	Off	On	Off	Off
38	Off	On	On	Off	Off	On	Off	Off
39	On	On	On	Off	Off	On	Off	Off
40	Off	Off	Off	On	Off	On	Off	Off
41	On	Off	Off	On	Off	On	Off	Off
42	Off	On	Off	On	Off	On	Off	Off
43	On	On	Off	On	Off	On	Off	Off
44	Off	Off	On	On	Off	On	Off	Off
45	On	Off	On	On	Off	On	Off	Off

Bank A DIP Switch Settings								
Address	A1	A2	A3	A4	A5	A6	A7	A8
46	Off	On	On	On	Off	On	Off	Off
47	On	On	On	On	Off	On	Off	Off
48	Off	Off	Off	Off	On	On	Off	Off
49	On	Off	Off	Off	On	On	Off	Off
50	Off	On	Off	Off	On	On	Off	Off
51	On	On	Off	Off	On	On	Off	Off
52	Off	Off	On	Off	On	On	Off	Off
53	On	Off	On	Off	On	On	Off	Off
54	Off	On	On	Off	On	On	Off	Off
55	On	On	On	Off	On	On	Off	Off
56	Off	Off	Off	On	On	On	Off	Off
57	On	Off	Off	On	On	On	Off	Off
58	Off	On	Off	On	On	On	Off	Off
59	On	On	Off	On	On	On	Off	Off
60	Off	Off	On	On	On	On	Off	Off
61	On	Off	On	On	On	On	Off	Off
62	Off	On	On	On	On	On	Off	Off
63	On	On	On	On	On	On	Off	Off
64	Off	Off	Off	Off	Off	Off	On	Off
65	On	Off	Off	Off	Off	Off	On	Off
66	Off	On	Off	Off	Off	Off	On	Off
67	On	On	Off	Off	Off	Off	On	Off
68	Off	Off	On	Off	Off	Off	On	Off
69	On	Off	On	Off	Off	Off	On	Off
70	Off	On	On	Off	Off	Off	On	Off
71	On	On	On	Off	Off	Off	On	Off
72	Off	Off	Off	On	Off	Off	On	Off
73	On	Off	Off	On	Off	Off	On	Off
74	Off	On	Off	On	Off	Off	On	Off
75	On	On	Off	On	Off	Off	On	Off
76	Off	Off	On	On	Off	Off	On	Off
77	On	Off	On	On	Off	Off	On	Off
78	Off	On	On	On	Off	Off	On	Off
79	On	On	On	On	Off	Off	On	Off
80	Off	Off	Off	Off	On	Off	On	Off
81	On	Off	Off	Off	On	Off	On	Off
82	Off	On	Off	Off	On	Off	On	Off
83	On	On	Off	Off	On	Off	On	Off
84	Off	Off	On	Off	On	Off	On	Off
85	On	Off	On	Off	On	Off	On	Off
86	Off	On	On	Off	On	Off	On	Off
87	On	On	On	Off	On	Off	On	Off
88	Off	Off	Off	On	On	Off	On	Off
89	On	Off	Off	On	On	Off	On	Off
90	Off	On	Off	On	On	Off	On	Off
91	On	On	Off	On	On	Off	On	Off

9. NODE ID INSTANCE & MAC ADDRESS

9. Node ID (Device Instance) & MAC Address

Bank A DIP Switch Settings								
Address	A1	A2	A3	A4	A5	A6	A7	A8
92	Off	Off	On	On	On	Off	On	Off
93	On	Off	On	On	On	Off	On	Off
94	Off	On	On	On	On	Off	On	Off
95	On	On	On	On	On	Off	On	Off
96	Off	Off	Off	Off	Off	On	On	Off
97	On	Off	Off	Off	Off	On	On	Off
98	Off	On	Off	Off	Off	On	On	Off
99	On	On	Off	Off	Off	On	On	Off
100	Off	Off	On	Off	Off	On	On	Off
101	On	Off	On	Off	Off	On	On	Off
102	Off	On	On	Off	Off	On	On	Off
103	On	On	On	Off	Off	On	On	Off
104	Off	Off	Off	On	Off	On	On	Off
105	On	Off	Off	On	Off	On	On	Off
106	Off	On	Off	On	Off	On	On	Off
107	On	On	Off	On	Off	On	On	Off
108	Off	Off	On	On	Off	On	On	Off
109	On	Off	On	On	Off	On	On	Off
110	Off	On	On	On	Off	On	On	Off
111	On	On	On	On	Off	On	On	Off
112	Off	Off	Off	Off	On	On	On	Off
113	On	Off	Off	Off	On	On	On	Off
114	Off	On	Off	Off	On	On	On	Off
115	On	On	Off	Off	On	On	On	Off
116	Off	Off	On	Off	On	On	On	Off
117	On	Off	On	Off	On	On	On	Off
118	Off	On	On	Off	On	On	On	Off
119	On	On	On	Off	On	On	On	Off
120	Off	Off	Off	On	On	On	On	Off
121	On	Off	Off	On	On	On	On	Off
122	Off	On	Off	On	On	On	On	Off
123	On	On	Off	On	On	On	On	Off
124	Off	Off	On	On	On	On	On	Off
125	On	Off	On	On	On	On	On	Off
126	Off	On	On	On	On	On	On	Off
127	On	On	On	On	On	On	On	Off
128	Off	Off	Off	Off	Off	Off	Off	On
129	On	Off	Off	Off	Off	Off	Off	On
130	Off	On	Off	Off	Off	Off	Off	On
131	On	On	Off	Off	Off	Off	Off	On
132	Off	Off	On	Off	Off	Off	Off	On
133	On	Off	On	Off	Off	Off	Off	On
134	Off	On	On	Off	Off	Off	Off	On
135	On	On	On	Off	Off	Off	Off	On
136	Off	Off	Off	On	Off	Off	Off	On
137	On	Off	Off	On	Off	Off	Off	On

Bank A DIP Switch Settings								
Address	A1	A2	A3	A4	A5	A6	A7	A8
138	Off	On	Off	On	Off	Off	Off	On
139	On	On	Off	On	Off	Off	Off	On
140	Off	Off	On	On	Off	Off	Off	On
141	On	Off	On	On	Off	Off	Off	On
142	Off	On	On	On	Off	Off	Off	On
143	On	On	On	On	Off	Off	Off	On
144	Off	Off	Off	Off	On	Off	Off	On
145	On	Off	Off	Off	On	Off	Off	On
146	Off	On	Off	Off	On	Off	Off	On
147	On	On	Off	Off	On	Off	Off	On
148	Off	Off	On	Off	On	Off	Off	On
149	On	Off	On	Off	On	Off	Off	On
150	Off	On	On	Off	On	Off	Off	On
151	On	On	On	Off	On	Off	Off	On
152	Off	Off	Off	On	On	Off	Off	On
153	On	Off	Off	On	On	Off	Off	On
154	Off	On	Off	On	On	Off	Off	On
155	On	On	Off	On	On	Off	Off	On
156	Off	Off	On	On	On	Off	Off	On
157	On	Off	On	On	On	Off	Off	On
158	Off	On	On	On	On	Off	Off	On
159	On	On	On	On	On	Off	Off	On
160	Off	Off	Off	Off	Off	On	Off	On
161	On	Off	Off	Off	Off	On	Off	On
162	Off	On	Off	Off	Off	On	Off	On
163	On	On	Off	Off	Off	On	Off	On
164	Off	Off	On	Off	Off	On	Off	On
165	On	Off	On	Off	Off	On	Off	On
166	Off	On	On	Off	Off	On	Off	On
167	On	On	On	Off	Off	On	Off	On
168	Off	Off	Off	On	Off	On	Off	On
169	On	Off	Off	On	Off	On	Off	On
170	Off	On	Off	On	Off	On	Off	On
171	On	On	Off	On	Off	On	Off	On
172	Off	Off	On	On	Off	On	Off	On
173	On	Off	On	On	Off	On	Off	On
174	Off	On	On	On	Off	On	Off	On
175	On	On	On	On	Off	On	Off	On
176	Off	Off	Off	Off	On	On	Off	On
177	On	Off	Off	Off	On	On	Off	On
178	Off	On	Off	Off	On	On	Off	On
179	On	On	Off	Off	On	On	Off	On
180	Off	Off	On	Off	On	On	Off	On
181	On	Off	On	Off	On	On	Off	On
182	Off	On	On	Off	On	On	Off	On
183	On	On	On	Off	On	On	Off	On

9. NODE ID INSTANCE & MAC ADDRESS

9. Node ID (Device Instance) & MAC Address

Bank A DIP Switch Settings								
Address	A1	A2	A3	A4	A5	A6	A7	A8
184	Off	Off	Off	On	On	On	Off	On
185	On	Off	Off	On	On	On	Off	On
186	Off	On	Off	On	On	On	Off	On
187	On	On	Off	On	On	On	Off	On
188	Off	Off	On	On	On	On	Off	On
189	On	Off	On	On	On	On	Off	On
190	Off	On	On	On	On	On	Off	On
191	On	On	On	On	On	On	Off	On
192	Off	Off	Off	Off	Off	Off	On	On
193	On	Off	Off	Off	Off	Off	On	On
194	Off	On	Off	Off	Off	Off	On	On
195	On	On	Off	Off	Off	Off	On	On
196	Off	Off	On	Off	Off	Off	On	On
197	On	Off	On	Off	Off	Off	On	On
198	Off	On	On	Off	Off	Off	On	On
199	On	On	On	Off	Off	Off	On	On
200	Off	Off	Off	On	Off	Off	On	On
201	On	Off	Off	On	Off	Off	On	On
202	Off	On	Off	On	Off	Off	On	On
203	On	On	Off	On	Off	Off	On	On
204	Off	Off	On	On	Off	Off	On	On
205	On	Off	On	On	Off	Off	On	On
206	Off	On	On	On	Off	Off	On	On
207	On	On	On	On	Off	Off	On	On
208	Off	Off	Off	Off	On	Off	On	On
209	On	Off	Off	Off	On	Off	On	On
210	Off	On	Off	Off	On	Off	On	On
211	On	On	Off	Off	On	Off	On	On
212	Off	Off	On	Off	On	Off	On	On
213	On	Off	On	Off	On	Off	On	On
214	Off	On	On	Off	On	Off	On	On
215	On	On	On	Off	On	Off	On	On
216	Off	Off	Off	On	On	Off	On	On
217	On	Off	Off	On	On	Off	On	On
218	Off	On	Off	On	On	Off	On	On
219	On	On	Off	On	On	Off	On	On
220	Off	Off	On	On	On	Off	On	On
221	On	Off	On	On	On	Off	On	On
222	Off	On	On	On	On	Off	On	On
223	On	On	On	On	On	Off	On	On
224	Off	Off	Off	Off	Off	On	On	On
225	On	Off	Off	Off	Off	On	On	On
226	Off	On	Off	Off	Off	On	On	On
227	On	On	Off	Off	Off	On	On	On
228	Off	Off	On	Off	Off	On	On	On
229	On	Off	On	Off	Off	On	On	On

Bank A DIP Switch Settings								
Address	A1	A2	A3	A4	A5	A6	A7	A8
230	Off	On	On	Off	Off	On	On	On
231	On	On	On	Off	Off	On	On	On
232	Off	Off	Off	On	Off	On	On	On
233	On	Off	Off	On	Off	On	On	On
234	Off	On	Off	On	Off	On	On	On
235	On	On	Off	On	Off	On	On	On
236	Off	Off	On	On	Off	On	On	On
237	On	Off	On	On	Off	On	On	On
238	Off	On	On	On	Off	On	On	On
239	On	On	On	On	Off	On	On	On
240	Off	Off	Off	Off	On	On	On	On
241	On	Off	Off	Off	On	On	On	On
242	Off	On	Off	Off	On	On	On	On
243	On	On	Off	Off	On	On	On	On
244	Off	Off	On	Off	On	On	On	On
245	On	Off	On	Off	On	On	On	On
246	Off	On	On	Off	On	On	On	On
247	On	On	On	Off	On	On	On	On
248	Off	Off	Off	On	On	On	On	On
249	On	Off	Off	On	On	On	On	On
250	Off	On	Off	On	On	On	On	On
251	On	On	Off	On	On	On	On	On
252	Off	Off	On	On	On	On	On	On
253	On	Off	On	On	On	On	On	On
254	Off	On	On	On	On	On	On	On
255	On	On	On	On	On	On	On	On

10. BACNET PICS STATEMENT

10. BACnet PICS Statement

10.1 ProtoCessor Driver - (PICS) BACnet Protocol Implementation Conformance Statement

BACnet® Protocol

Date: January 2012

Vendor Name: Sierra Monitor Corporation
FieldServer Technologies

Product Name: FieldServer QuickServer, ProtoNode,
ProtoCarrier, ProtoCessor

Product Model
Number: ProtoCessor FFP-485 (FPC-FD2)

Product Description: ProtoCarrier and ProtoCessor are products
supplied to OEMs to rapidly
implement BACnet in their products.

BACnet Protocol
Version: Version 1 Revision 4

BACnet Standardized Device Profile (Annex L) - [Note: FieldServer is a gateway device]

- ☒ BACnet Application Specific Controller (B-ASC)

BACnet Interoperability Building Blocks Supported (Annex K):

- ☒ K.1.2 BIBB - Data Sharing - ReadProperty-B (DS-RP-B)
- ☒ K.1.4 BIBB - Data Sharing - ReadPropertyMultiple-B (DS-RPM-B)
- ☒ K.1.8 BIBB - Data Sharing - WriteProperty-B (DS-WP-B)
- ☒ K.1.10 BIBB - Data Sharing - WritePropertyMultiple-B (DS-WPM-B)
- ☒ K.1.12 BIBB - Data Sharing - COV-B (DS-COV-B)
- ☒ K.2.2 BIBB - Alarm and Event-Notification Internal-B (AE-N-I-B)
- ☒ K.2.5 BIBB - Alarm and Event-ACK-B (AE-ACK-B)
- ☒ K.2.11 BIBB - Alarm and Event-Information-B (AE-INFO-B)
- ☒ K.5.1 BIBB - Device Management - Dynamic Device Binding-A (DM-DDB-A)
- ☒ K.5.2 BIBB - Device Management - Dynamic Device Binding-B (DM-DDB-B)
- ☒ K.5.4 BIBB - Device Management - Dynamic Object Binding-B (DM-DOB-B)
- ☒ K.5.6 BIBB - Device Management - Device Communication Control-B (DM-DCC-B)
- ☒ K.5.12 BIBB - Device Management - Time Synchronization-B (DM-TS-B)
- ☒ K.5.22 BIBB - Device Management – List Manipulation-B (DM-LM-B)

Segmentation Capability: None

For all of these properties, the following applies:

Object Types and Optional Properties Supported

Object Type	Optional Properties Supported
<input checked="" type="checkbox"/> Device Object	Location Description UTC Offset Active COV Subscriptions
<input checked="" type="checkbox"/> Analog Input	Reliability Description
<input checked="" type="checkbox"/> Analog Output	Reliability Description Max_Pres_Value Min_Press_Value
<input checked="" type="checkbox"/> Analog Output	
<input checked="" type="checkbox"/> Binary Input	Reliability Description Active_Test Inactive_Test
<input checked="" type="checkbox"/> Binary Output	Reliability Description Active_Test Inactive_Test
<input checked="" type="checkbox"/> Binary Value	Reliability Description Active_Test Inactive_Test
<input checked="" type="checkbox"/> Multi State Input	Reliability Description State_Test
<input checked="" type="checkbox"/> Multi State Output	Reliability Description State_Test
<input checked="" type="checkbox"/> Multi State Value	Reliability Description State_Test
<input checked="" type="checkbox"/> Notification Class Object	

- 1.) Does not support BACnet CreateObject
- 2.) Does not support BACnet DeleteObject
- 3.) No proprietary properties exist

Data Link Layer Options:

- ☒ MS/TP master (Clause 9), baud rate up to 76.8 Kbps
- ☒ MS/TP slave (Clause 9), baud rate up to 76.8 Kbps

Device Address Binding: Not supported

Character Sets Supported:

Where support for multiple character sets is indicated, this does not imply that they can all be supported simultaneously.

- ☒ ISO 10646 (UTF-8) / ANSI X3.4

