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PT-Link II N2-4[®] Technical Guide

VCM-X Controller Code: SS1026 & Y200920 Version 2.0 and up;

VCM-X WSHP Controller Code: SS1032 & SS1033

SA Controller Code: Y200921

VCM Controller Code: SS1016, Y200409, Y200616, Y200822



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The OE368-23N-N2-4, PT-Link II N2-4® provides bi-directional communication between your N2® MS/TP protocol network and up to four* of any of the following types of Orion controllers—VCM-X, SA, VCM, MUA II, or VAV/CAV:

VCM-X Controller (SS1026, SS1032, SS1033, 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 EPROM. 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 N2®.

***NOTE:** The PT-Link II N2® device can be used to connect to only four Orion controllers. If more than four Orion controllers are present in a system, you will need one or more additional PT-Link II N2® devices for integration with an N2® protocol network.

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

Data Sharing

The PT-Link II N2® interface provides the following data sharing capabilities:

- Provides values from points on the Orion side of the gateway to N2® devices as if the values were originating from N2® objects.
- Allows N2® devices to modify point values on the Orion controller side of the PT-Link II N2® by using standard N2® write services.

Scheduling

- Ability to allow N2® devices to send Schedule events to the Orion controller side of the gateway by using standard N2® services.

Hardware Specifications

Table 1 contains the hardware specifications for the PT-Link II N2® interface.

Technical Data	
N2®-MS/TP Loop	9600 Mbps
Controller Loop	RS-485, 9600 Baud Rate
Protocol (N2® Loop)	Metasys® N2 Open
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.
Device Type	External Vendor Device

Table 1: PT-Link II N2® Interface Technical Data

System Requirements

- The PT-Link II N2® interface is packaged and assembled as surface mount. Surface mount components are included for your convenience.
- Computer running Microsoft Windows™ operating system.
- Ethernet Crossover Cable (supplied).
- PT-Link II N2 software—located on included CD-ROM and downloadable from www.orioncontrols.com.
- RUINET software—located on included CD-ROM and downloadable from www.orioncontrols.com. The software is not necessary for the initial setup.
- Prism 2 software—downloadable from www.orioncontrols.com.

Setting Up Your PT-Link

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**).
NOTE: The DIP Switches should be left in their default position which is all OFF. They are not used in this application.
2. Connect your PT-Link II to the Controller(s) on your system (up to four) and connect your PT-Link II to the N2-4 Network (**Figure 2**).
3. Copy the contents of the PT Link II CD to your PC's Desktop. You can also download the files from orioncontrols.com under PT-Link II Setup Files. These files include RUINET.
4. Connect your PT-Link II to your computer using an Ethernet connection (**Figure 3, page 6**).
5. Change your PC's IP Address. Follow the directions that match your current operating system - Windows XP, Vista, 7, 8 or 10. See directions on **pages 7 & 8**.
6. Obtain the following from your Building Automation System Integrator: the N2-4 Device Instant Number (Client Node ID).
7. Using FieldServer's Graphical User Interface, edit the Config.csv file and verify PT Link II communications. Follow the directions on **pages 9-11**.
8. If you run into any problems, follow the instructions in the Troubleshooting section starting on **page 12** of this guide.

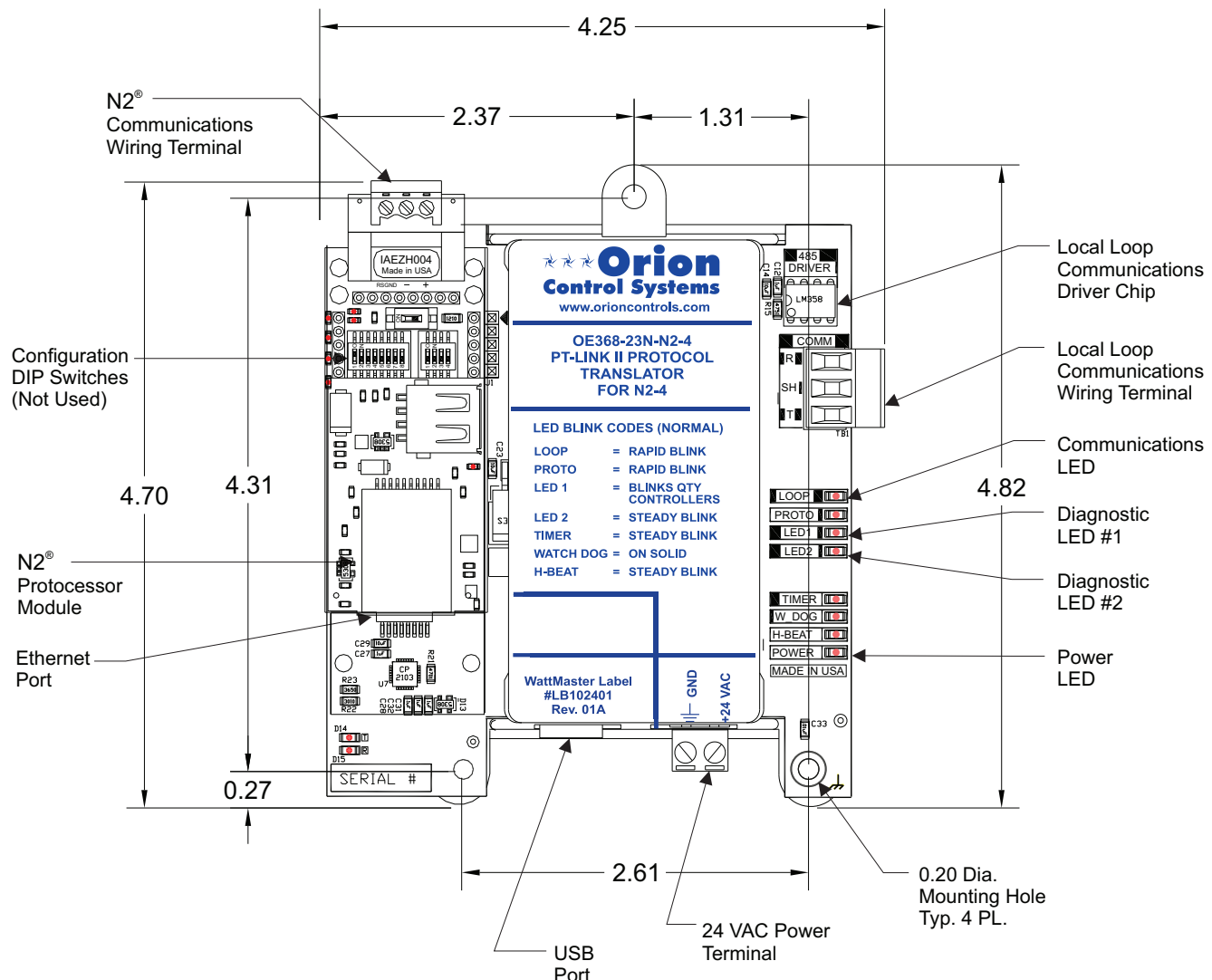


Figure 1: PT-Link II N2-4® Dimensions and Components

PT-Link II N2-4® Technical Guide

Connection and Wiring Information

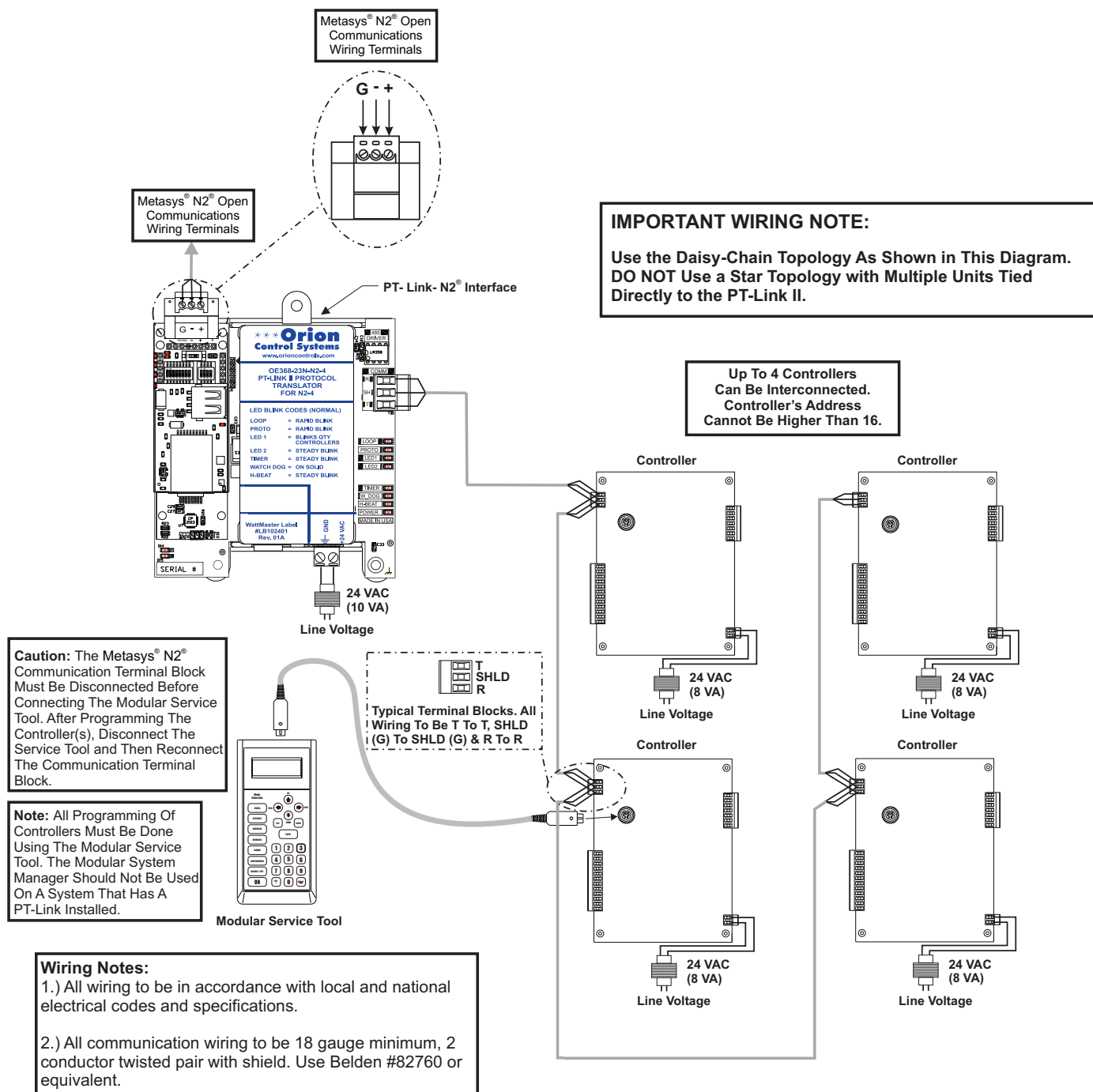


Figure 2: PT-Link II N2® Interface Wiring

PT-Link II Ethernet Connection

PT-Link II Hardware Connection

- 1.) Connect the PT-Link II directly to your PC by using a standard CAT5 or crossover cable (by others) as shown. See **Figure 3** 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 17, page 14** for a diagram showing the location of the ProtoCessor RUN LED.

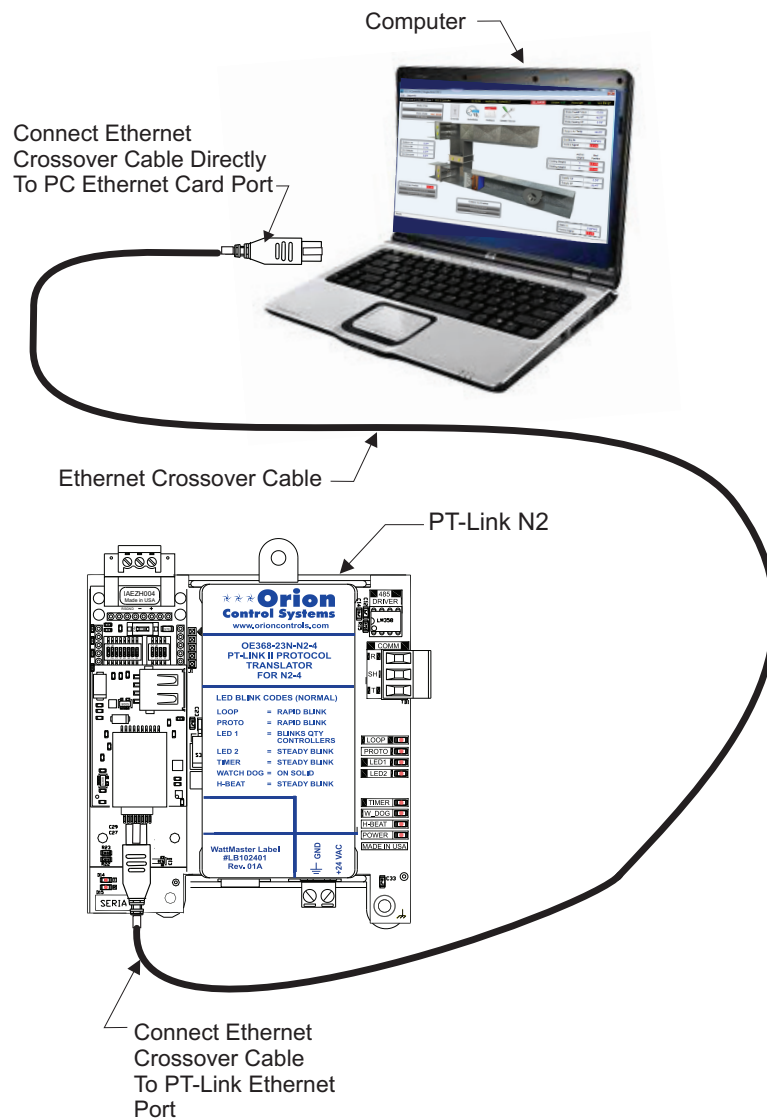


Figure 3: Connecting With Crossover Cable

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.

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 4**).

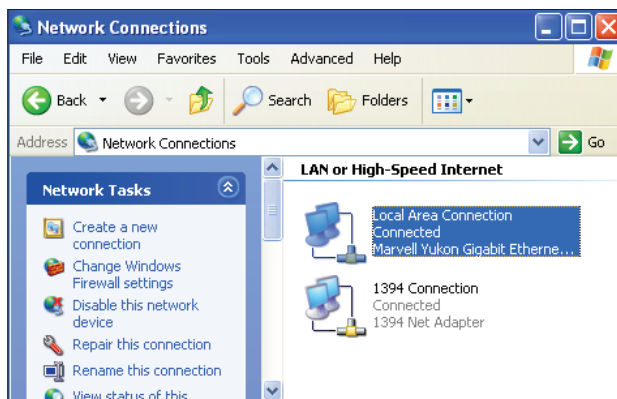


Figure 4: Network Connections Window

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 5**).

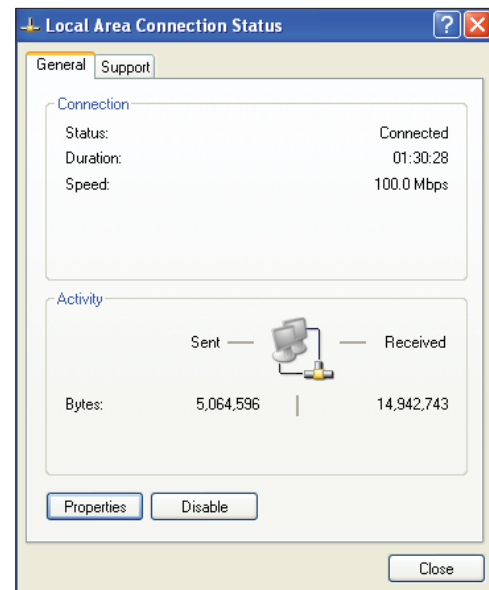


Figure 5: Local Area Connection Status Window

- 4.) As shown in **Figure 5**, click **<Properties>** in the lower left of the window. The *Local Area Connection Properties Window* will appear.

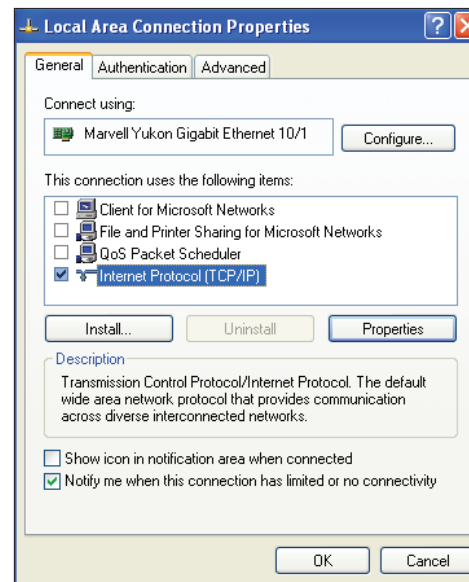


Figure 6: Local Area Connection Properties Window

- 5.) As shown in **Figure 6**, 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.

IP Address Configuration

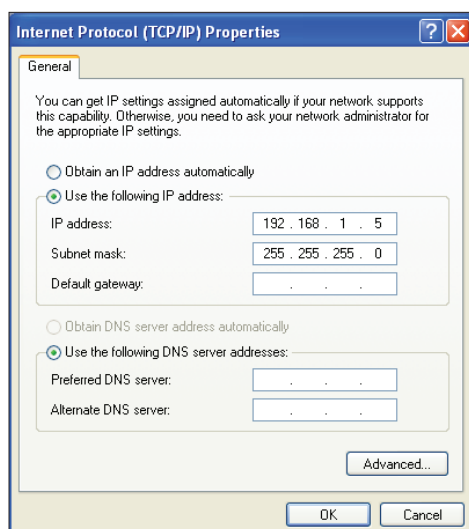


Figure 7: Internet Protocol Properties Window

- 6.) Select the radio button in front of **Use the following IP address (Figure 7)** and write down the current defaults so that you can re-enter them when you finish configuring the PT-Link II 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.

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 & 8).
- 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 7).
- 7.) Select the radio button in front of **Use the following IP address (Figure 7)** and write down the current defaults so that you can re-enter them when you finish configuring the PT-Link II 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.

FS-GUI Overview and Config.csv File

Overview

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

- 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
- Transfer files to and from the PT-Link
- Delete files on the PT-Link
- Change the PT-Link's IP address
- Restart the PT-Link

Hardware and Software

The following items are needed to be able to run the FS-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 FS-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, and 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

FS-GUI Reference Guide

An *FS-GUI Reference Guide* can be found in **Appendix A, page 22**.

Changing the Config.csv File

NOTE: You may need Administration rights to perform this function. See the Password Section on **page 23**.

1.) *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 will launch. See **Figure 8**.



Figure 8: The FS-GUI Main Screen

2.) In the *Navigation Window* on the left of the *FS-GUI Screen*, click **<Setup>** and then click **<File Transfer>**. See **Figure 9**.

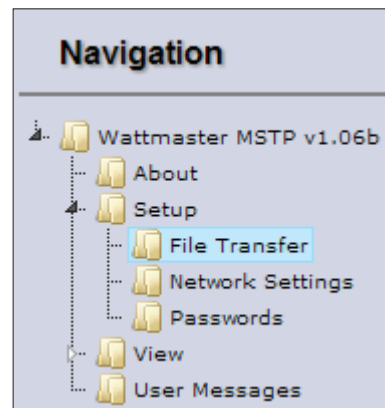


Figure 9: Navigation Window - File Transfer

Changing the Config.csv File

3.) Refer to the *File Transfer Window* below (**Figure 10**). In the *Configuration Tab*, under Retrieve, *click* the config.csv file in order to save it to a destination and then open it.

Figure 10: File Transfer - Configuration Tab

4.) Open the config.csv file in Notepad. See **Figure 11**.

WARNING: Only edit the config.csv file using Notepad. **DO NOT** use Excel. Using Excel to edit the config.csv file will corrupt its contents!

```

//-----
//      Common Information
//-----
Bridge
Title      CN0051 Wattmaster N2 v2.00f , System_Node_ID
//-----
//      Data Arrays
//-----
Data_Arrays
Data_Array_Name , Data_Format , Data_Array_Length
WattMstr-Dump   , Uint16      , 2000
//-----

```

Figure 11: Config.csv File

5.) Another change you may need to make is the Node_ID under 'Client Side Nodes' which is the N2-4 Device Instance Number (**Figure 12**). The default is 1. You can obtain the Node ID from your BAS Integrator.

```

//-----
//      Client Side Nodes
//-----
Nodes
Node_Name , Node_ID , Protocol , Port , Readback_Option
NODE_01   , 15      , WattMstr , 51   , Readback Asynch
//-----

```

Figure 12: Client Node ID

6.) Once all changes have been made to the text file, while still in Notepad, *click* **<File>** in the upper left and then *click* **<Save>**. Now close the file and return to the *FS-GUI Screen* open in your browser.

NOTE: Do not rename the file. The file must always be named "config.csv"; otherwise, it will be ignored by the PT-Link.

7.) In the *File Transfer Window* under Update Configuration, *click* **<Choose Files>** or **<Browse>** and locate the config.csv file you just saved. Then *click* **<Submit>**. See **Figure 13**. Wait until the message, "Configuration update complete" appears and then *click* the **<System Restart>** button at the bottom of the *File Transfer Window* to activate the new configuration file.

Figure 13: Update Configuration

FS-GUI File Transfers and Data Arrays

NOTE: The following files can also be updated in *File Transfer Window*:

Firmware Files: The FieldServer Firmware contains the application program commonly referred to as the DCC or the PCC. This program contains the protocol drivers applicable to the application and the Field-Server Operating System Kernel. A Firmware update is only required when updated files are received from FieldServer support. Firmware files have a *.bin extension. The procedure for updating these is the same as for the configuration files, but the update needs to be made in the *Firmware Tab*.

General (Other) Files: Other files that can be updated include the FS-GUI image and other files described in driver manuals. The procedure for updating these is the same as for the configuration files, but the update needs to be made in the *General Tab*.

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 15**.

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 15: VCM-X Data Array Table

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 14**.

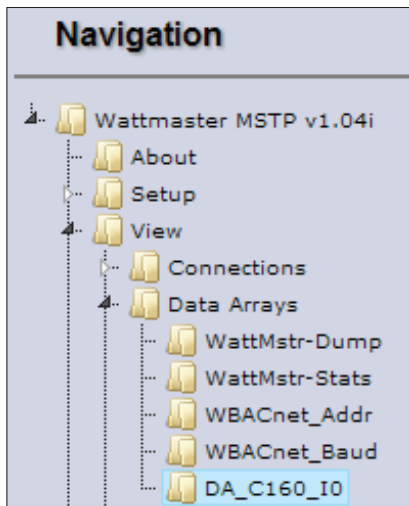


Figure 14: Navigation Window - View Data Arrays

3) You can now cross reference the values shown in **Figure 15** with the listed parameter names in the appropriate Data Array Table for your controller type. These tables can be found on **pages 19-21**.

Troubleshooting the PT-Link II N2

Addressing WattMaster Devices in an N2® Network.

Each PT-Link II N2® has the ability to generate virtual devices for all of the WattMaster controls connected to it. Each virtual device operates as an independent device and has all of the parameters pertinent to its kind of control—VCM, VAV/CAV, or MUA II. The address of the virtual device is calculated using the following formula:

Virtual Device Address = [unit address (address set using DIP switches on WattMaster controls) + Node_ID (value in the PT-Link II N2® configuration file) - 1]. Example:

- 1.) The PT-Link II N2® has a Node_ID equal to five.
- 2.) Two WattMaster controls connected and addressed to one and four.
- 3.) The N2® client will see two devices—one will be device five and the other will be device eight.

Virtual N2 Device Address Example Calculation			
AHU Controller Address		1	4
Node_ID	+	5	5
	-	-1	-1
Virtual N2 Device Address	=	5	8

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

Troubleshooting the PT-Link II Controller

PT-Link II Board LEDs

The PT-Link II N2® is equipped with LEDs that can be used for troubleshooting. There are eight LEDs on the PT-Link II board. See Figure 16 for the locations of the LEDs on the PT-Link II board. The LED descriptions and functions are listed in the following paragraphs.

POWER LED

When the PT-Link II N2® 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 N2®, the “**LOOP**” LED will also light up. The LED should flicker rapidly, indicating that the PT-Link II 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 N2®. 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 II baseboard is communicating with the Protocontroller Module. If “**LED 2**” does not blink, check that the Protocontroller Module is installed correctly on the PT-Link II baseboard and that the “**PWR**” LED is lit up on the Protocontroller Module.

PROTO LED

When the PT-Link II is first powered up, the “**PROTO**” LED should light up and stay on continuously. If the LED doesn’t light up, check that the Protocontroller is installed correctly and firmly connected to the Base Board. The “**PWR**” LED should also be lit up on the Protocontroller Module.

TIMER LED

The “**TIMER**” is used for troubleshooting by WattMaster Controls Technical Support. The “**TIMER**” LED should always have a steady blink.

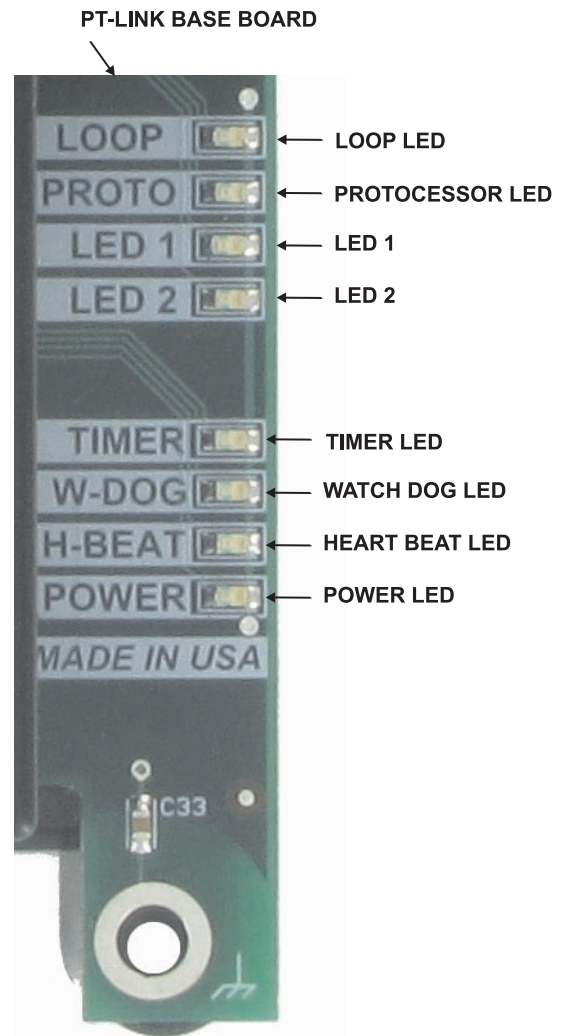


Figure 16: PT-Link II N2® LED Locations

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 there is communication between the controllers and the PT-Link. 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.

Troubleshooting the PT-Link II Controller - OE368-23N-N2-4

ProtoCessor Module LEDs

Refer to **Figure 17** 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.

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.

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.

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.

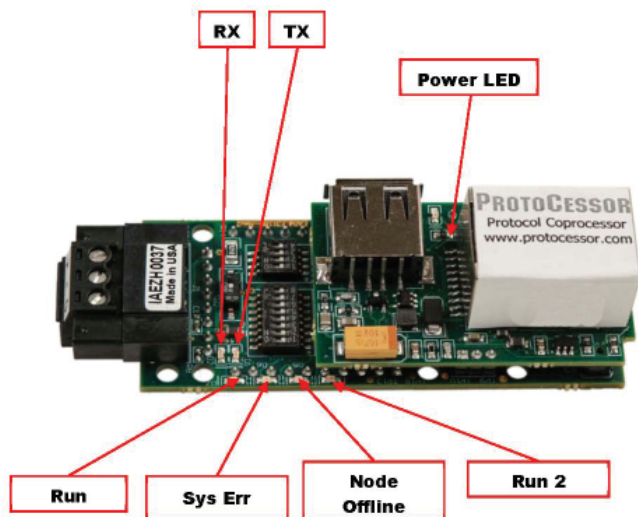


Figure 17: PT-Link II N2-4® LED Locations

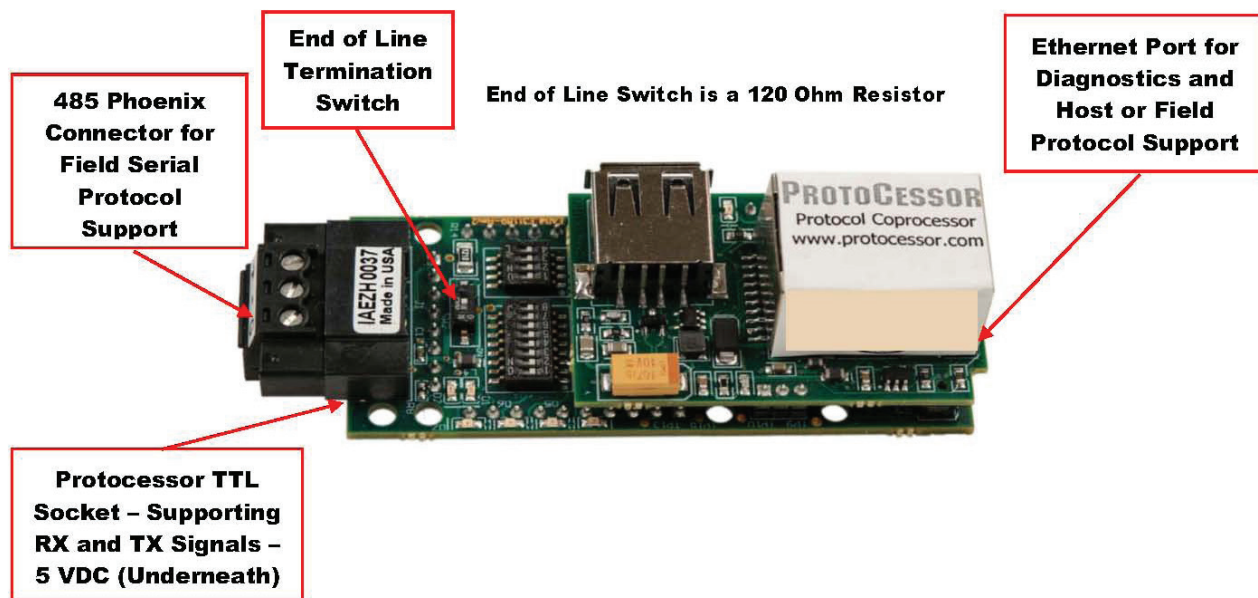


Figure 18: PT-Link II N2-4® ProtoCessor Components

Updating the PT-Link II Controller

Programming the PT-Link II with BootLoader

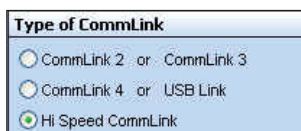
The PT-Link II is equipped with the ability to update its software with the use of a computer. You will need the following before you begin:

- 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 located on the PT-Link II CD or downloaded from any of our websites
- USB cable

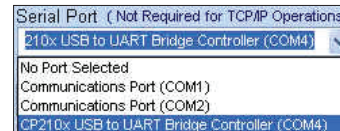
Follow these simple steps to update the PT-Link II:

- 1.) Turn on your computer and download the latest Prism 2 software from www.orioncontrols.com.
- 2.) Either download the PT-Link II update file from <http://techsupport.wattmaster.com> or 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. Also, print the software sheet provided for future reference.
- 3.) Run the USB Driver Setup.exe file located 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.
- 4.) Plug the USB cable into the computer's and PT-Link II's USB ports.
- 5.) 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.
- 6.) 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.

- 7.) Click on the **<Job-Site>** icon. The *Job-Sites Window* will appear. In the *Type of CommLink Dialog Box*, select "Hi Speed CommLink."



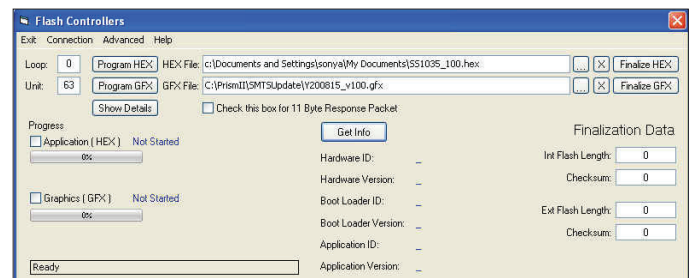
- 8.) In the *Job-Sites Window*, from the Serial Port drop down list, *select* the correct COM port. If you don't know the COM port number or if the number is 10 or higher, follow the directions on [pages 17-18](#).



- 9.) From Prism 2's Communications tab, *select* "Flash Selected Controller."



- 10.) The *Flash Controller Window* will appear.



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



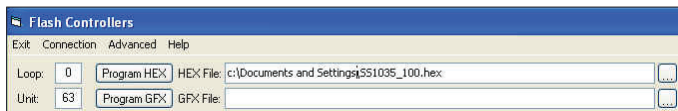
- 12.) Cycle power to the PT-Link II and within 5 seconds, *click* the **<Get Info>** button in the *Flash Controller Window*. The PT-Link II information will now appear in the window under the **<Get Info>** button.



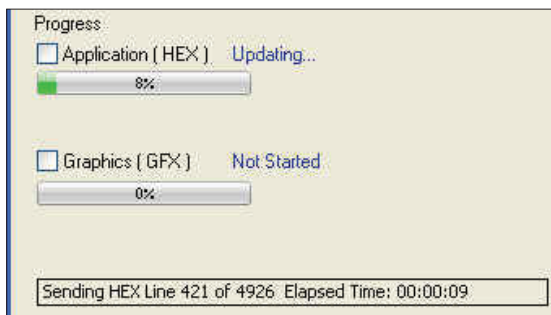
Updating the PT-Link II Controller

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

14.) 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.



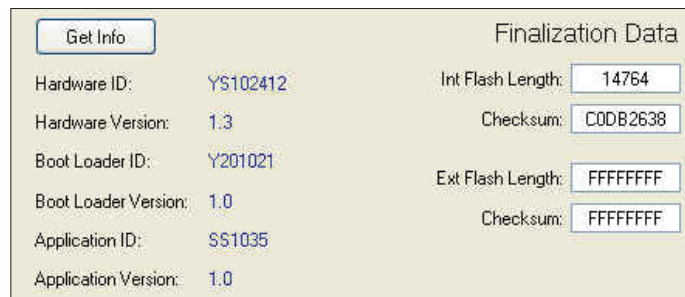
15.) Now, cycle power to the PT-Link II once again and within 5 seconds *click* on the **<Program HEX>** button (shown above). If successful, you should see the Progress Application HEX bar showing the progress percentage.



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

17.) 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.

18.) 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.

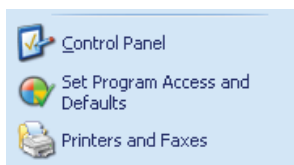


Finding What COM Port Number the PT-Link II is Using

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



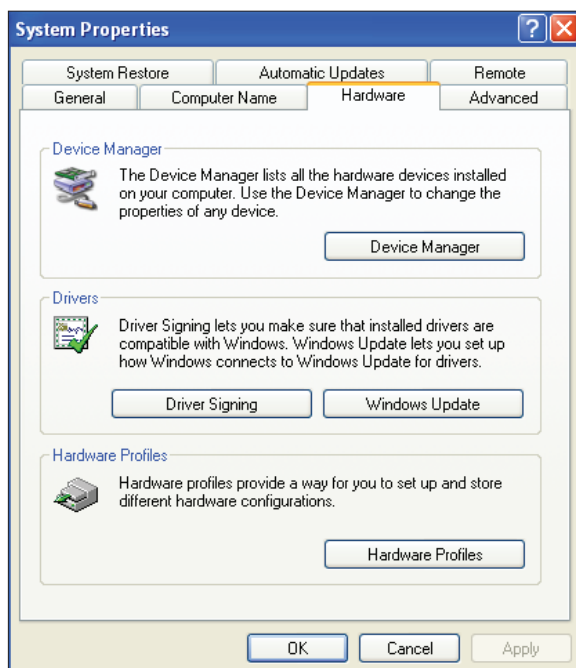
2. Select **<Control Panel>**.



3. Double-click the System Icon.

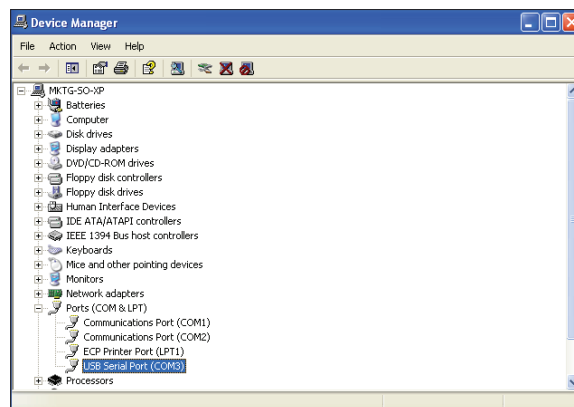


4. Click the **<Hardware>** tab.



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

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



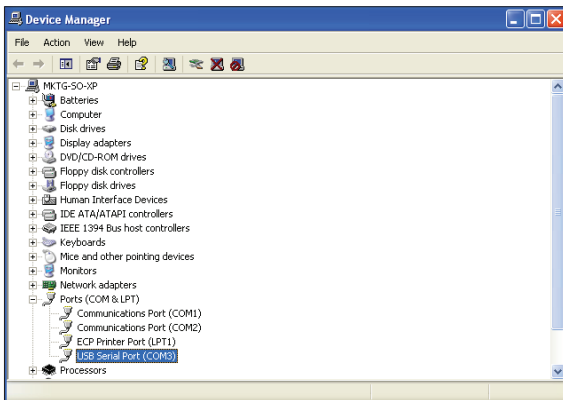
7. Locate the USB Serial Port (COM#). The COM# in parentheses is the port it is located on. Write this COM port number down. You will need to know this when setting up the Prism software.
8. If the COM port number is 10 or greater, go to "Changing the USB COM Port Number" on page 18.

Updating the PT-Link II Controller

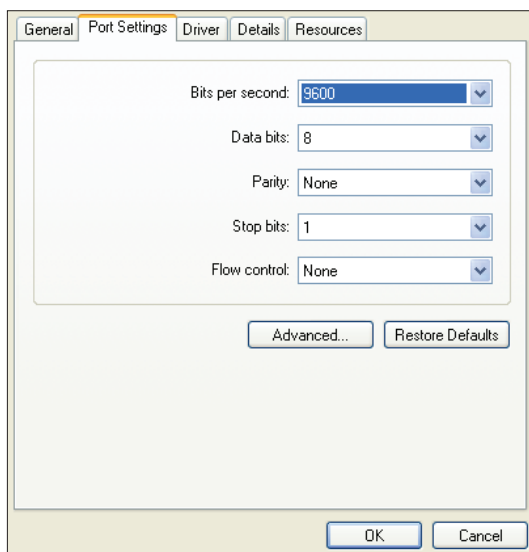
Changing the USB COM Port Number

When the CommLink 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.

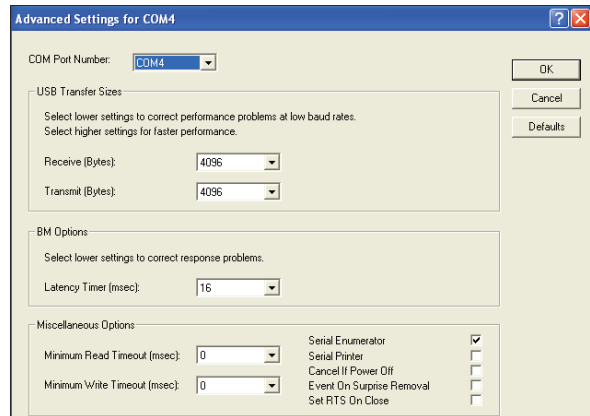
1. Click **<Start>**, click **<Control Panel>**, click **<System>**, click the **<Hardware>** tab, and then click **<Device Manager>** to get to the *Device Manager Window*.
2. Click on the plus sign next to Ports to see all of the COM ports.



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.

VCM-X WSHP Tulsa & Coil 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	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	MdCmp2	HdPr1	HdPr2	CdFan1
110	CdFan2	WaterTpA	WaterTpB	A1LSPAIm	A1LktAlm	A2LSPAIm	A2LktAlm	B1LSPAIm	B1LktAlm	B2LSPAIm
120	B2LktAlm	LWT1Alm	LWT2Alm	POWF1Alm	POWF2Alm	ComMAlm	RmVFDPos	–	–	–

Table 2: 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	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	MdCmp2	HdPr1	HdPr2	CdFan1
110	CdFan2	WaterTpA	A1LSPAIm	A1LktAlm	B1LSPAIm	B1LktAlm	LWT1Alm	POWF1Alm	ComMAlm	RmVFDPos

Table 3: VCM-X WSHP (Coil) Data Array For Field Server

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	CISt	HtSt	OaWtbl	TpDmnd	SpcTp	SaTp	RaTp	OaTp	DuctPr
10	OaRh	UnitMode	CtrlSts	CIEnbl	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	OcpCISt	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	–	–	–	–

Table 4: 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	CISt	HtSt	TpDmnd	SpcTp	SaTp	DuctPr	UnitMode	CtrlSts	CIEnbl
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	OcpCISt	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	–	–	–	–	–	–	–	–

Table 5: SA Controller Data Array For Field Server

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 6: VCM Data Array For Field Server

Appendix A - FieldServer Graphical User Interface

The FieldServer Graphical User Interface (FS-GUI) 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 will launch. See **Figure 19**.

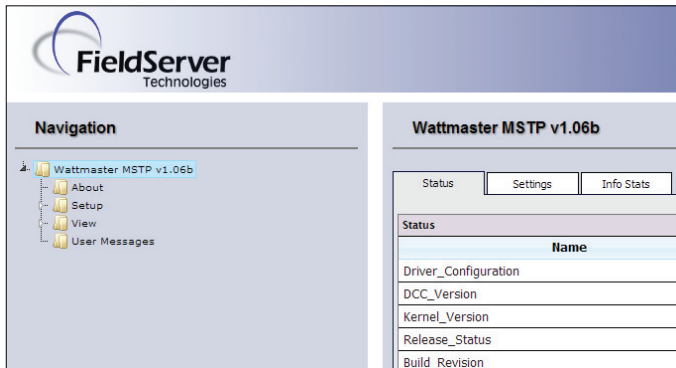


Figure 19: The FS-GUI Main Screen

Refer to the **Figure 20** to navigate the FS-GUI.

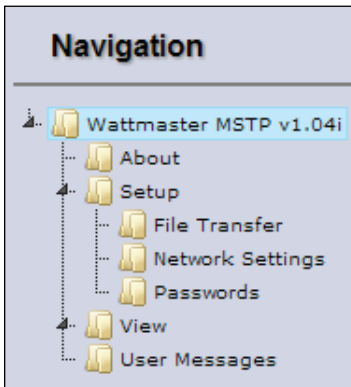


Figure 20: The Navigation Tree

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 **pages 9-11**.

Network Settings—Select “Network Settings” to access and modify network connection. See **page 23** for further information.

Passwords—There are 2 levels of passwords that can be set, Admin and User. See **pages 23-24** 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 the 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.

Appendix A - 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.

Network Settings

1.) In the *Navigation Window* on the left of the *FS-GUI Screen*, click **<Setup>** and then click **<Network Settings>**. See **Figure 21**. The *Networks Settings Window* will appear.

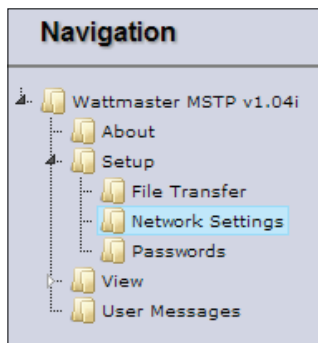


Figure 21: Setup - Network Settings

2.) In the *Network Settings Window* (**Figure 22**), 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 22: 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.

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 23**. The *Passwords Window* will appear.

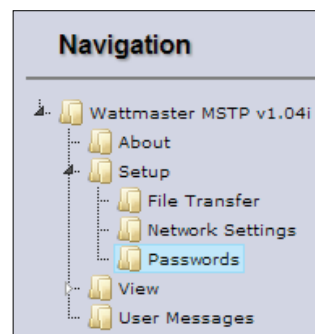


Figure 23: Setup - Passwords

Appendix - FS-GUI Passwordsa

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 24**. 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 24: 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 25**.

Figure 25: 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 26**.

Figure 26: 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 27**. The *Passwords Window* will appear.

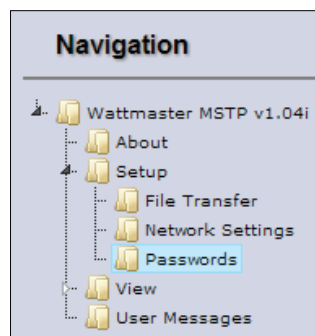


Figure 27: Setup - Passwords

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 28**.

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 28: Changing the User Password

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

Appendix B - VCM-X WSHP N2 Parameters

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

NOTE: The following points for the VCM-X WSHP Controllers are additional points. All points and property identifiers in the VCM-X Controller table (pages 27-32) also apply to the VCM-X WSHP Controllers.

NOTE: When a new setpoint is received from N2, 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.

N2 Properties for VCM-X WSHP (Tulsa)

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 of refrigerant for System A.	
Water Temp. B	WaterTpB	AI: 221	Current water temperature of refrigerant for System B.	
Compressor A1 Low Suction Pressure Alarm	A1LSPAIm	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.	

N2 Properties for VCM-X WSHP (Tulsa)

Parameter	Name	Object	Description	Limits
Compressor A2 Low Suction Pressure Alarm	A2LSPAIm	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	B1LSPAIm	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	B2LSPAIm	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.	
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)	

Appendix B - VCM-X WSHP N2 Parameters

N2 Properties for VCM-X WSHP (Tulsa)

Parameter	Name	Object	Description	Limits	
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	ComMAlm	BI: 234	Alarm that indicates that one or more Modules are not communicating with the VCM-X WSHP Controller.		

N2 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.		
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.		

N2 Properties for VCM-X WSHP (Coil)

Parameter	Name	Object	Description	Limits	
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).		
Proof of Water Flow Alarm	POWF1Alm	BI: 232	Alarm that indicates no Proof of Water Flow.		
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	ComMAlm	BI: 234	Alarm that indicates that one or more Modules are not communicating with the VCM-X WSHP Controller.		

Appendix C - VCM-X N2 Parameters

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

NOTE: When a new setpoint is received from N2, 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.

N2 Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits
Alarm Status	AlrmSts	AI: 1	Needed only in legacy application.	
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	Needed only in legacy application.	
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.	

N2 Properties for the VCM-X Controller

Parameter	Name	Object	Description	Limits
Reheat Value 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	Needed only in legacy application.	
Alarm Group 2	AlrmGrp2	AI: 105	Needed only in legacy application.	
Alarm Group 3	AlrmGrp3	AI: 106	Needed only in legacy application.	
Dewpoint Setpoint Mirror	DptStM	AI: 110	Mirror of the DPtSt "read only."	
External Relays 1-2	ExRlys12	AI: 111	Needed only in legacy application.	
External Relays 3-4	ExRlys34	AI: 112	Needed only in legacy application.	

Appendix C - VCM-X N2 Parameters

N2 Properties for the VCM-X Controller					
Parameter	Name	Object	Description	Limits	
Indoor Rh Setpoint Mirror	InRhStM	AI: 114	Mirror of the InRhSt “read only.”		
Modulating Cool Position	MdCIPos	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	Needed only in legacy application.		
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	AO: 13	If the outdoor dewpoint rises above this setpoint, the unit will activate the Dehumidification Demand.	35	80
Occupied Mode Enable Cooling Setpoint	OcpClSt	AO: 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

N2 Properties for the VCM-X Controller					
Parameter	Name	Object	Description	Limits	
Occupied Mode Enable Heating Setpoint	OcpHtSt	AO: 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
Outdoor Air Sensor Offset	OaTpOst	AO: 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	AO: 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	AO: 66	0 = Auto/ Unoccupied Mode 1 = Forced On 2 = Forced Off	0	2
Space Sensor Offset	SpcTpOst	AO: 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	AO: 77	Supply Air Setpoint in Cooling Mode.	40	80
SAT Heating Setpoint	SaHtSt	AO: 78	Supply Air Setpoint in Heating Mode.	40	200
Supply Air Sensor Offset	SaTpOst	AO: 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

Appendix C - VCM-X N2 Parameters

N2 Properties for the VCM-X Controller					
Parameter	Name	Object	Description	Limits	
Warm Up Setpoint	WmupSt	AO: 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	AO: 92	The economizer is enabled if the outdoor temperature or wetbulb falls below this setpoint.	0	80
Coil Temperature Setpoint	CoilTpSt	AO: 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	AO: 118	This is the target building pressure to be maintained by the VFD Relief signal.	-0.2	0.2
Indoor Humidity Setpoint	InRhSt	AO: 120	If the indoor humidity rises above this setpoint, the unit will activate the Dehumidification Demand.	0	100
Unoccupied Cooling Offset	UnClOst	AO: 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

N2 Properties for the VCM-X Controller					
Parameter	Name	Object	Description	Limits	
Unoccupied Heating Offset	UnHtOst	AO: 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
CO ₂ Setpoint	CO2St	AO: 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	AO: 151	This is the minimum position of the economizer in the occupied modes.	1	100
Static Pressure Setpoint	DuctPrSt	AO: 152	This is the target duct pressure to be maintained by the VFD blower signal.	0.01	3
Preheater Setpoint	PreHtSp	AO: 196	Low Outside Air Ambient Protection Setpoint	0	100
Outdoor Air CFM Setpoint	OACfmSt	AO: 203	Minimum desired Outdoor Air CFM.	0.10 K	200 K
Outdoor Air CFM Reset Limit	OACfmRs	AO: 204	Maximum desired Outdoor Air CFM when CO ₂ reaches its reset limit.	0.10 K	200 K

Appendix C - VCM-X N2 Parameters

N2 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	CIEnbl	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.	

N2 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.	

Appendix C - VCM-X N2 Parameters

N2 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.	

VCM-X PT-Link II N2®

Property Identifier:

The PT-Link II N2® Link amends the following property identity to the N2® property identifier.

N2PropertyIdentifier :

WattN2ScheduleForce ::= 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)
}

Appendix C - VCM-X N2 Parameters

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)
}
```

VcmxAlarmGroup1Bits ::= BIT STRING {

```

SupplyTempSensorFailure    (0),
LostOutdoorTempSensorSignal (1),
LostSpaceTempSensorSignal  (2)
}
```

VcmxAlarmGroup2Bits ::= BIT STRING {

```

MechanicalCoolingAlarm     (0),
MechanicalHeatingAlarm     (1),
FanProvingAlarm            (2),
DirtyFilterDetected        (3),
SmokeDetected              (4)
}
```

VcmxAlarmGroup3Bits ::= BIT STRING {

```

LowSupplyAirTempAlarm      (0),
HighSupplyAirTempAlarm     (1),
LowControlTempAlarm        (2),
HighControlTempAlarm       (3)
}
```

Appendix D - SA Controller N2 Parameters

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

NOTE: When a new setpoint is received from N2, 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.

N2 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 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.	
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.	

N2 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	Needed only in legacy application.	
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.	

Appendix D - SA Controller N2 Parameters

N2 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	AO: 13	If the outdoor dewpoint rises above this setpoint, the unit will activate the Dehumidification Demand.	35	80
Occupied Mode Enable Cooling Setpoint	OcpClSt	AO: 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	AO: 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	AO: 66	0 = Auto/ Unoccupied Mode 1 = Forced On 2 = Forced Off	0	2
Space Sensor Offset	SpcTpOst	AO: 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	AO: 77	Supply Air Setpoint in Cooling Mode.	40	80
SAT Heating Setpoint	SaHtSt	AO: 78	Supply Air Setpoint in Heating Mode.	40	200

N2 Properties for SA Controller					
Parameter	Name	Object	Description	Limits	
Supply Air Sensor Offset	SaTpOst	AO: 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	AO: 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	AO: 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	AO: 120	If the indoor humidity rises above this setpoint, the unit will activate the Dehumidification Demand.	0	100
Unoccupied Cooling Offset	UnClOst	AO: 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

Appendix D - SA Controller N2 Parameters

N2 Properties for SA Controller					
Parameter	Name	Object	Description	Limits	
Unoccupied Heating Offset	UnHtOst	AO: 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	AO: 152	This is the target duct pressure to be maintained by the VFD blower signal.	0.01	3
Preheater Setpoint	PreHtSp	AO: 196	Low Outside Air Ambient Protection Setpoint	0	100
Entering Air Offset Setpoint	EaTpOst	AO: 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	AO: 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.		

N2 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	CIEnbl	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.
REHEAT II Connected	Rt2Ins	BI: 58	Status that indicates the MHGRV controllers is connected to the system.
Mechanical Cooling Alarm	MchCIAlm	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.

Appendix D - SA Controller N2 Parameters

N2 Properties for SA Controller

Parameter	Name	Object	Description
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.
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.

N2 Properties for SA Controller

Parameter	Name	Object	Description
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.
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.

SA Controller PT-Link II N2® Property Identifier:

The PT-Link II N2® Link amends the following property identity to the N2® property identifier.

N2PropertyIdentifier :

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


Appendix E - VCM N2 Parameters

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

NOTE: When a new setpoint is received from N2, 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.

N2 Parameters 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	AlrmSts	AI: 1	Needed only in legacy application.	
Unit Mode	UnitMode	AI: 123	Needed only in legacy application.	
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	Needed only in legacy application.	
External Relays 3-4	ExRlys34	AI: 112	Needed only in legacy application.	
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 Relay	OnRlys	AI: 44	Needed only in legacy application.	
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.	
Relief Pressure	RfPr	AI: 62	Current value of the building pressure sensor.	

N2 Parameters for the VCM Controller

Parameter	Name	Object	Description	Limits
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	Needed only in legacy application.	
Alarm Group 2	AlrmGrp2	AI: 105	Needed only in legacy application.	
Alarm Group 3	AlrmGrp3	AI: 106	Needed only in legacy application.	
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).	

Appendix E - VCM N2 Parameters

N2 Parameters for the VCM Controller					
Parameter	Name	Object	Description	Limits	
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 Dew Point	OaDwpt	AI: 47	Current calculated outdoor air dewpoint added on version 1.09.		
Current Supply Air Setpoint	SaTpStM	AI: 82	SAT/Reset 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	AO: 196	Low Outside Air Ambient Protection Setpoint	0	100
CO ₂ Setpoint	CO2St	AO: 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 LevelSetpoint and the Reset Range Setpoint.	0	3000
Static Pressure Setpoint	DuctPrSt	AO: 152	This is the target duct pressure to be maintained by the VFD blower signal.	0.01	3
Minimum Outside Air Setpoint	MinEcoSt	AO: 151	This is the minimum position of the economizer in the occupied modes.	1	100
Occupied Mode Enable Cooling Setpoint	OcpClSt	AO: 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

N2 Parameters for the VCM Controller					
Parameter	Name	Object	Description	Limits	
Occupied Mode Enable Heating Setpoint	OcpHtSt	AO: 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	AO: 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	AO: 118	This is the target building pressure to be maintained by the VFD Relief signal.	-0.2	0.2
Return Air Sensor Offset	RaTpOst	AO: 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	AO: 66	0 = Auto/ Unoccupied Mode 1 = Forced On 2 = Forced Off	0	2
Space Sensor Offset	SpcTpOst	AO: 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	AO: 77	Supply Air setpoint or Reset Source target temperature in Cooling Mode.	40	80
SAT/Reset Source Heating Setpoint	SaHtSt	AO: 78	Supply Air setpoint or Reset Source target temperature in Heating Mode.	40	200

Appendix E - VCM N2 Parameters

N2 Parameters for the VCM Controller

Parameter	Name	Object	Description	Limits	
Supply Air Sensor Offset	SaTpOst	AO: 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	AO: 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	AO: 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
Dewpoint Setpoint	DptSt	AO: 13	If the outdoor dewpoint rises above this setpoint, the unit will activate the Dehumidification Demand.	35	80
Coil Temperature Setpoint	CoilTpSt	AO: 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

N2 Parameters for the VCM Controller

Parameter	Name	Object	Description	Limits	
Indoor Humidity Setpoint	InRhSt	AO: 120	If the indoor humidity rises above this setpoint, the unit will activate the Dehumidification Demand.	0	100
Warm Up Setpoint	WmupSt	AO: 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	AO: 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.		
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.		

Appendix E - VCM N2 Parameters

N2 Parameters for the VCM Controller

Parameter	Name	Object	Description	Limits
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.	
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.	

N2 Parameters for the VCM Controller

Parameter	Name	Object	Description	Limits
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.	
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.	

Appendix E - VCM N2 Parameters

N2 Parameters for the VCM Controller

Parameter	Name	Object	Description	Limits
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.	

VCM PT-Link II N2®

Property Identifier:

The PT-Link II N2® Link amends the following property identity to the N2® property identifier.

N2PropertyIdentifier :

WattN2ScheduleForce ::= 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 {

AhuControlEconomizer (0),
NoOutdoorAirTempSensor (1),
CarbonDioxideSensorPresent (2),
HeatCoolStagingDisabled (3),
DehumidificationMode (4),
ModGasIIConnected (5),
ReheatIIConnected (6)
}

Appendix E - VCM N2 Parameters

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)

}

VcmAlarmGroup1Bits ::= BIT STRING {

SupplyTempSensorFailure	(0),
LostOutdoorTempSensorSignal	(1),
LostSpaceTempSensorSignal	(2)

}

VcmAlarmGroup2Bits ::= BIT STRING {

MechanicalCoolingAlarm	(0),
MechanicalHeatingAlarm	(1),
FanProvingAlarm	(2),
DirtyFilterDetected	(3),
SmokeDetected	(4)

}

VcmAlarmGroup3Bits ::= BIT STRING {

LowSupplyAirTempAlarm	(0),
HighSupplyAirTempAlarm	(1),
LowControlTempAlarm	(2),
HighControlTempAlarm	(3)

}



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