LMS-188-4P-BMS

4 POINT DIGITAL MONITOR/ALARM

WITH PROTOCOL CONVERTER

OPERATING INSTRUCTIONS

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Front Panel

The Multi-Probe Alarm System front panel consists of the following:

- Graphic LCD
- Channel Status LEDs (*STATUS*)
- Alarm LED (*ALARM*)
- Audible alarm indicator (buzzer)
- Buttons
    - Test & Reset (*TEST/RESET*)
    - Step button (*STEP*)
    - Alarm Limits & decrement button (▼) (*DOWN*)
    - Min/Max & increment button (▲) (*UP*)
    - Mute & Menu increment button (*MUTE/MENU*)

Sensor Probe

The probes supplied with the Multi-Probe Alarm System are highly accurate temperature sensors. The sensor may be put in water or other mild aqueous solutions from -148°F to 212°F.
NOTE: Avoid submerging the probe in solvents or harsh chemicals. Use protective thermowells when monitoring such materials.
NOTE: The warranty does NOT cover damage to probes or electronics that is caused by exceeding temperature limitations, or damage to probes caused by using them in solvents or other unsuitable environments.
NOTE: If the displayed temperature shows a consistent high (> 212°F) or low (< -148°F) value, most likely, the probe has failed.

Probe Installation

RTD sensors supplied with the LMS-188-4P should be installed using the supplied fittings, which are 1/2"
MNPT x 1/8" compression. After installing the fitting into a tee, insert the RTD into the fitting and adjust
the depth of the probe so as the tip of the probe is approximately at the center of the piping. Tighten
the nut finger tight, then with a small wrench turn the nut 1/4 to 1/2 turn past finger tight. Warning – do
not overtighten.

Power-up

Shows LMS-188-4P-BMS startup screen.

NO BATTERY
Power Down + Install Battery

The unit will run without a backup battery but will show "NoBatt!" on the display to indicate
lack of backup battery.

When a battery is properly installed battery status is shown on the display

up arrow	charging
solid block	full charge
flashing block or block with blank lines	battery problem

Power-down Sequence

To shut off the battery to allow complete power down:
Tap the TEST/RESET button to enter relay test, then unplug unit.
Alternately you may Press-and-Hold the TEST/RESET button to trigger a hardware reset, and
while the screen is blank unplug the unit and then Release the button.

Runtime Display

The runtime display shows the current readings of 4 probes. T1 Hot, T2 Cold, T3 Mixed and T4
Return.

```
1:    147'F
2:     55'F
3:    120'F
4:    110'F
```

Alarm Conditions

Temperature Alarms

If the readings are within the alarm limits, the STATUS LED will blink green.
When the temperature reading meets or exceeds the temperature limits the STATUS LED will blink red.
After the probe's alarm delay time is exceeded the unit will blink the ALARM LED and beep the buzzer.
The user can MUTE the buzzer by tapping the MUTE/MENU button. The unit will reduce the audible signal from a loud beep, to a quieter and less frequent chirp. It will remain muted until MUTE time expires or a different probe goes into alarm.
Once the Alarm state has been signaled the unit will wait the Relay Delay time before tripping the Relay.

Limit Parameters
```
 1 Low, 1 High, 2 Low, 2 High, 3 Low, 3 High, 4 Low, 4 High
```

Time Parameters
```
 1AlarmDelay, 2AlarmDelay, 3AlarmDelay, 4AlarmDelay,
     RelayDelay, Mute
```

Low / High Alarm Limits

For a quick view the Low and High Alarm Limits tap the DOWN ARROW.

1	AlarmLow	110'F
	AlarmHigh	160'F
2	AlarmLow	34'F
	AlarmHigh	130'F
3	AlarmLow	100'F
	AlarmHigh	130'F
4	AlarmLow	100'F
	AlarmHigh	130'F

Min/Max Actual Readings

To view the Min/Max readings since power up or user commanded reset, tap the UP ARROW.

1	ActualMin	144'F
	ActualMax	152'F
2	ActualMin	52'F
	ActualMax	59'F
3	ActualMin	118'F
	ActualMax	124'F
4	ActualMin	107'F
	ActualMax	118'F

To manually reset the Min/Max readings, while the Min/Max readings are shown on the display, tap the TEST/RESET button. You will be asked to repeat TEST/RESET to confirm.

Installation Instructions

Setting the IP Address

To begin, do not plug in the Ethernet cable at this time. First enter parameters in the LMS.

To configure the LMS to send temperature data to the ProtoNode please configure a static IP for the LMS and the ProtoNode and set the subnet mask and gateway.

At Runtime tap **MENU**, you will see "Edit Limits". Then tap **MENU** AND **RESET** simultaneously to access the ***SETUP*** group of parameters. Use **STEP** to advance to the IP parameters. If you need to step back, use the TEST/RESET button to step back.

Special Group ***SETUP***

LMS IP1, LMS IP2, LMS IP3, LMS IP4,	LMS IP 1.2.3.4
ProtoNode1, ProtoNode2, ProtoNode3, ProtoNode4,	ProtoNode IP 1.2.3.4
Netmask1, Netmask2, Netmask3, Netmask4,	Netmask 1.2.3.4
Gateway1, Gateway2, Gateway3, Gateway4,	Gateway 1.2.3.4
1 Offset, 2 Offset, 3 Offset, 4 Offset, # channels,	
1 Define, 2 Define, 3 Define, 4 Define, 0:tenthC 1:wholeC 2:tenthF 3:wholeF 4:wholeRH	
Relay Def, 0:single unit relay 1:individual channel relays	
DoorAlarm -1:AlarmOnContactClosed 0:NoAlarm 1:AlarmOnContactOpen	

To modify parameter values use **DOWN** and **UP**

- Enter the the IP Address for the LMS's Ethernet port in the "LMS IP" parameters.
- Enter the the IP Address for the ProtoNode's Ethernet port in the "ProtoNode" parameters.
- If necessary, change the Subnet Mask setting in the "Netmask" parameters.
- If necessary, change the IP Gateway setting in the "Gateway" parameters.

NOTE: If the LMS is connected to a router, the IP Gateway of the ProtoNode should be set to the IP Address of that router.

- Once you have set all parameters, use MENU to step back to the runtime screen
- Hold the TEST/RESET button until the screen goes blank. This will reset the unit and restart with the assigned IP
- Now plug the Ethernet cable from the LMS to:

    IF THE BUILDING MANAGEMENT SYSTEM USES ETHERNET

        the network hub or router. OR

    IF THE BUILDING MANAGEMENT SYSTEM **DOES NOT** USE ETHERNET

        the ProtoNode.

LMS-BMS/ProtoNode Connectivity/Wiring Diagrams

If Building Management System uses Ethernet/IP Protocol

Both the LMS-188-4P-BMS and the ProtoNode need to connect to separate 10/100 Ethernet jacks using standard CAT-5 Ethernet Patch Cables (supplied by others). They need to be connected to a switch or router on the same Ethernet Subnet as the BMS. See Figure 1.
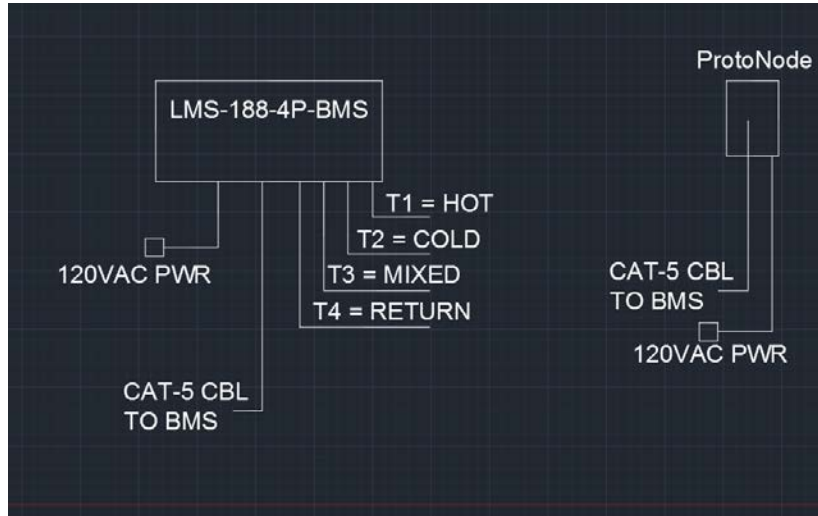

FIGURE 1

If Building Management System **DOES NOT USE** Ethernet/IP Protocol

In this case, the LMS-188-4P-BMS' Ethernet port can be directly connected to the ProtoNode's Ethernet port via standard CAT-5 Ethernet Patch Cables (supplied by others), and then the ProtoNode will be connected to the BMS via the output RS-485 connector on the ProtoNode box. In this case, serial communications with the BMS will be accomplished by using twisted pair wires on the RS-485 connection. See Figure 2.
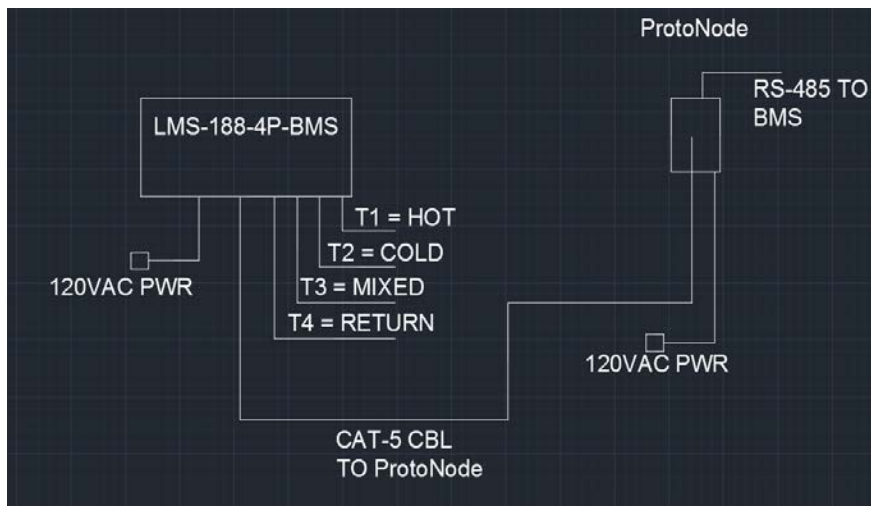

FIGURE 2

LMS Overview

Buttons: **TEST/RESET**, **STEP**, **DOWN**, **UP**, **MUTE/MENU**

Runtime Display

```
1:    147'F
2:     55'F
3:    120'F
4:    110'F
```

Edit Parameters

At Runtime tap **MENU**

`Edit Limits`
`1 Low`

    `110`

`To STEP BACK tap TEST`

Repeat **MENU**, **MENU**,.. To `Edit Limits`, `Edit Times`, Return to Runtime
or while in Edit tap **MENU** AND **RESET** simultaneously to access `*SETUP*` group

To step through parameters in group use **STEP**
To modify parameter values use **DOWN**, **UP**
To step out of edit and back to runtime screen use **MENU**

Group 1 `Limits`
`1 Low, 1 High, 2 Low, 2 High, 3 Low, 3 High, 4 Low, 4 High`

Group 2 `Times`
`1AlarmDelay, 2AlarmDelay, 3AlarmDelay, 4AlarmDelay, RelayDelay, Mute`

Special Group `*SETUP*`

`LMS IP1, LMS IP 2, LMS IP3, LMS IP4,`	LMS IP 1.2.3.4
`ProtoNode1, ProtoNode2, ProtoNode3, ProtoNode4,`	ProtoNode IP 1.2.3.4
`Netmask1, Netmask2, Netmask3, Netmask4,`	Netmask 1.2.3.4
`Gateway1, Gateway2, Gateway3, Gateway4,`	Gateway 1.2.3.4

`1 Offset, 2 Offset, 3 Offset, 4 Offset, # channels,`

`1 Define, 2 Define, 3 Define, 4 Define,`   0:tenthC 1:wholeC 2:tenthF 3:wholeF 4:wholeRH

`Relay Def,`   0:single unit relay 1:individual channel relays

`DoorAlarm`   -1:AlarmOnContactClosed 0:NoAlarm 1:AlarmOnContactOpen

Low/High Alarm Setpoint Display

At Runtime tap **DOWN**

```
1   AlarmLow    110'F
    AlarmHigh   160'F
2   AlarmLow     34'F
    AlarmHigh   130'F
3   AlarmLow    100'F
    AlarmHigh   130'F
4   AlarmLow    100'F
    AlarmHigh   130'F
```

Min/Max Temperatures Display

At Runtime tap **UP**

```
1   ActualMin   144'F
    ActualMax   152'F
2   ActualMin    52'F
    ActualMax    59'F
3   ActualMin   118'F
    ActualMax   124'F
4   ActualMin   107'F
    ActualMax   118'F
```

Min/Max Reset *while viewing Min or Max

tap **RESET**

`Min & Max`
   `Reset`
`RESET to confirm`
`STEP to cancel`

Relay Test

At Runtime tap **TEST**
`Relay Test`

`Relay  15`   * seconds counting down
`To Step, tap STEP`
`To Hold, hold STEP`

ProtoNode FPC-N34
Startup Guide

For Interfacing Leonard Valve Products: Temp Sensor

To Building Automation Systems:
BACnet MS/TP, BACnet/IP, Modbus RTU and Modbus TCP/IP

APPLICABILITY & EFFECTIVITY

Explains ProtoNode FPC-N34 hardware and how to install it.

The instructions are effective for the above as of March 2016.

Technical Support:

Thank you for purchasing the ProtoNode for Leonard Valve.

Please call Leonard Valve for Technical support of the ProtoNode product.

Sierra Monitor Corporation does not provide direct support. If Leonard Valve needs to escalate the concern, they will contact Sierra Monitor Corporation for assistance.

Support Contact Information:

Leonard Valve
1360 Elmwood Avenue
Cranston, RI 02910

Customer Service:

(401) 461-1200
(800) 222-1208

Website: leonardvalve.com

A Quick Start Guide

1. Record the information about the unit. (**Section** 2.1)

2. Set the IP Address for the device that will be connected to ProtoNode FPC-N34. (**Section** 2.2)

3. Select a stored configuration and set field protocol MAC address/Node-ID/Device Instance, and baud rate. (**Section** 2.3)

4. **Connect ProtoNode FPC-N34's** 3 pin RS-485 port to the Field Protocol cabling (**Section** 3.2)

5. Connect Power to ProtoNode's 6 pin connector. (**Section** 3.3)

6. BACnet/IP or Modbus TCP/IP (FPC-N34): Use the ProtoNode's embedded tool which is accessed with a browser, referred to in this manual as the Web Configurator, to change the IP Address. No changes to the configuration file are necessary. (**Section** 4)

<u>Certifications</u>

▪ **BTL MARK – BACNET TESTING LABORATORY**

The BTL Mark on ProtoNode is a symbol that indicates that a product has passed a series of rigorous tests conducted by an independent laboratory which verifies that the product correctly implements the BACnet features claimed in the listing. The mark is a symbol of a high-quality BACnet product. Go to http://www.BACnetInternational.net/btl/ for more information about the BACnet Testing Laboratory. Click here for BACnet PIC Statement.

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LIST OF FIGURES

1   INTRODUCTION

1.1   ProtoNode Gateway

ProtoNode is an external, high performance **Building Automation multi-protocol gateway** that has been preprogrammed for Leonard Valve' products (hereafter called "device") to various building automation protocols. These protocols include BACnet[1]MS/TP, BACnet/IP, Modbus RTU and Modbus TCP/IP. Configurations for the various protocols are stored within the ProtoNode and are selectable via DIP switches for fast and easy installation.

It is not necessary to download any configuration files to support the required applications. The ProtoNode is pre-loaded with tested Profiles/Configurations for the supported device.

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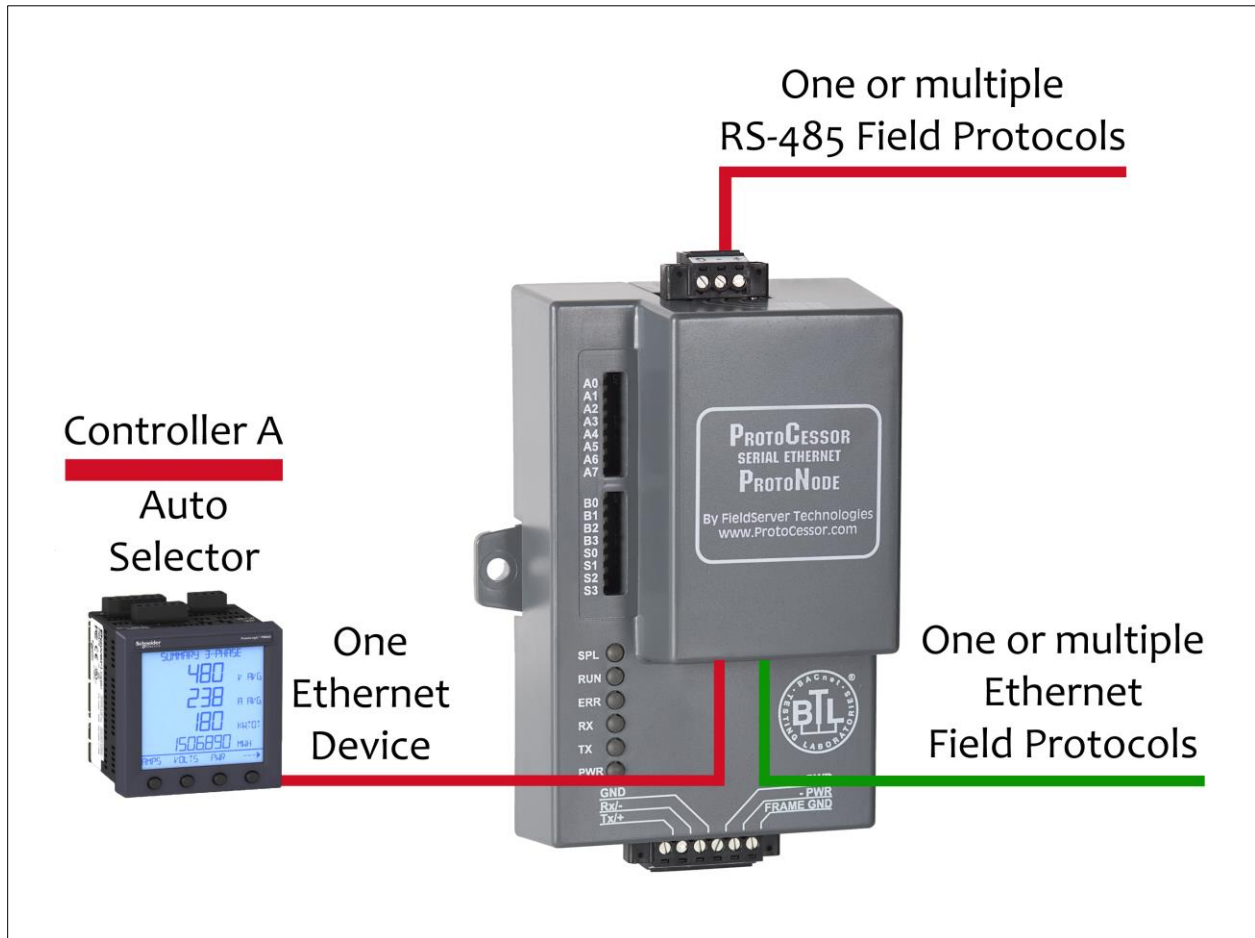
[1] BACnet is a registered trademark of ASHRAE

2 BACNET SETUP FOR PROTONODE FPC-N34

2.1 Record Identification Data

Each ProtoNode has a unique part number located on the side or the back of the unit. This number should be recorded, as it may be required for technical support. The numbers are as follows:

Model	Part Number
ProtoNode FPC-N34	FPC-N34-1304
Figure 1: ProtoNode Part Numbers	

- FPC-N34 units have the following 3 ports: RS-485 + Ethernet + RS-485.

2.2 Configuring Device Communications

2.2.1 Set IP Address Connected to the ProtoNode

- The device needs to be on the same IP subnet as the ProtoNode and the configuration PC.

- Record the following device information to start the setup:
    o IP Address
    o IP port

Note: This information is required for Section 4.

2.3 BMS Network Settings: Selecting Stored Configurations, Setting the Mac Address, Device Instance, and Baud Rate

2.3.1 Selecting Configuration Files for Device: "S" bank DIP Switches S0 – S3

- The S bank of DIP switches (S0 - S3) are used to select and load a configuration file from a group of pretested/preloaded configuration files which are stored in the ProtoNode FPC-N34.

S0 – S3 DIP Switches

S Bank DIP Switch Location
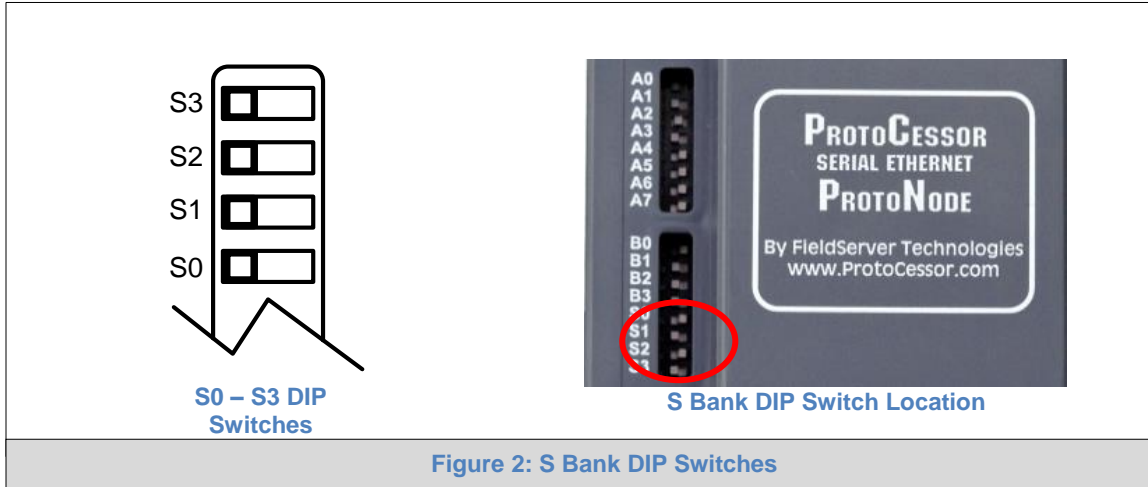
Figure 2: S Bank DIP Switches

2.3.1.1 DIP Switch Settings

The following chart describes S0 - S3 DIP Switch configuration settings for the device to support the listed protocols on a ProtoNode FPC-N34.

ProtoNode FPC-N34	S Bank DIP Switches			
Profile	S0	S1	S2	S3
BACnet/IP & BACnet MS/TP	Off	Off	Off	Off
Modbus TCP/IP & Modbus RTU	On	Off	Off	Off

NOTE: When setting DIP Switches, please ensure that power to the board is OFF.

2.3.2 BACnet MS/TP (FPC-N34): Setting the MAC Address for BMS Network

- Set the BACnet MS/TP MAC addresses of the ProtoNode to a value between 1 to 127 (MAC Master Addresses); this is so that the BMS Front End can find the ProtoNode via BACnet auto discovery.

NOTE: **Never set a BACnet MS/TP MAC Address from 128 to 255**. Addresses from 128 to 255 are Slave Addresses and can not be discovered by BMS Front Ends that support auto discovery of a BACnet MS/TP device.

- Set DIP switches A0 – A7 to assign MAC Address for BACnet MS/TP for the ProtoNode FPC-N34.

- Please refer to **Appendix C.1** for the complete range of MAC Addresses and DIP switch settings.

NOTE: **When using Modbus TCP/IP, the A Bank of DIP switches are disabled and not used. They should be set to OFF**.
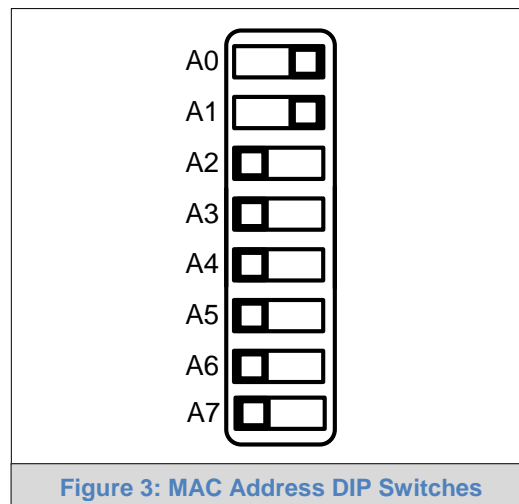
Figure 3: MAC Address DIP Switches

NOTE: When setting DIP Switches, please ensure that power to the board is OFF.

2.3.3 BACnet MS/TP and BACnet/IP (FPC-N34): Setting the Device Instance

- The A Bank of DIP switches are used for two purposes:
    - For BACnet MS/TP, they are used to set the BACnet MS/TP MAC address (**Section 2.3.2**)
    - For both BACnet MS/TP and BACnet/IP, they are also used to determine the BACnet Device Instance values

- The BACnet Device Instance can range from 1 to 4,194,303.

- The BACnet device instances will be calculated by taking the Node_Offset (default is 50,000) found in Web Configurator (**Section 5**) and adding it to the value of the A Bank DIP switches. When more than one device is connected to the ProtoNode, the subsequent BACnet Device Instance values will be sequential from the first/previous device.

  For example:

- **Given that Device Instance = Node_Offset + A Bank DIP switch value**
    - Default Node_Offset value = 50,000
    - A Bank DIP switch value = 11

- **Then the Device Instance value is:**
    - Device Instance = 50,011

2.3.3.1 BACnet MS/TP or BACnet/IP: Assigning Specific Device Instances

- With the default Node_Offset value of 50,000 the Device Instance values generated will be within the range of 50,001 to 50,127.

- The values allowed for a BACnet Device Instance can range from 1 to 4,194,303.

- To assign a specific Device Instance (or range), change the Node_Offset value.

- Methods for changing the Node_Offset value are provided in **Section 5**.
    - This step cannot be performed until after the unit is connected and powered

2.3.4 Modbus TCP/IP (FPC-N34): Setting the Node-ID

- Set DIP switches A0 – A7 to assign a Node-ID for Modbus TCP/IP to the ProtoNode FPC-N34.

- Modbus TCP/IP Node-ID Addressing: Modbus TCP/IP Node-ID's range from 1-255.

- Please refer to **Appendix C.1** for the full range of addresses for setting Node-ID.

2.3.5 BACnet MS/TP (FPC-N34): Setting the Serial Baud Rate for BMS Network

- DIP Switches B0 – B3 can be used to set the serial baud rate to match the baud rate required by the Building Management System for BACnet MS/TP.
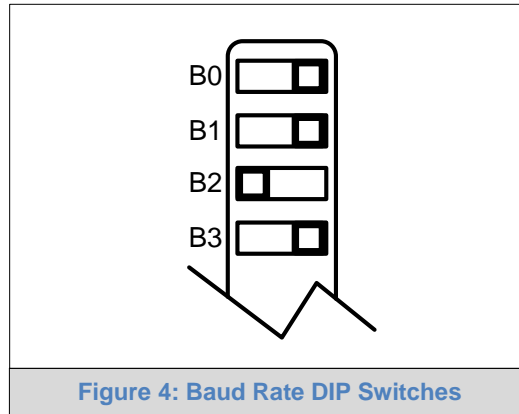
Figure 4: Baud Rate DIP Switches

NOTE: When setting DIP Switches, please ensure that power to the board is OFF.

2.3.5.1 Baud Rate DIP Switch Selection

Baud	B0	B1	B2	B3
9600	On	On	On	Off
19200	Off	Off	Off	On
38400*	**On**	**On**	**Off**	**On**
57600	Off	Off	On	On
76800	On	Off	On	On

Figure 5: BMS Baud Rate

* Factory default setting = 38400

3 INTERFACING PROTONODE TO THE DEVICE

3.1 ProtoNode FPC-N34 Showing Connection Ports
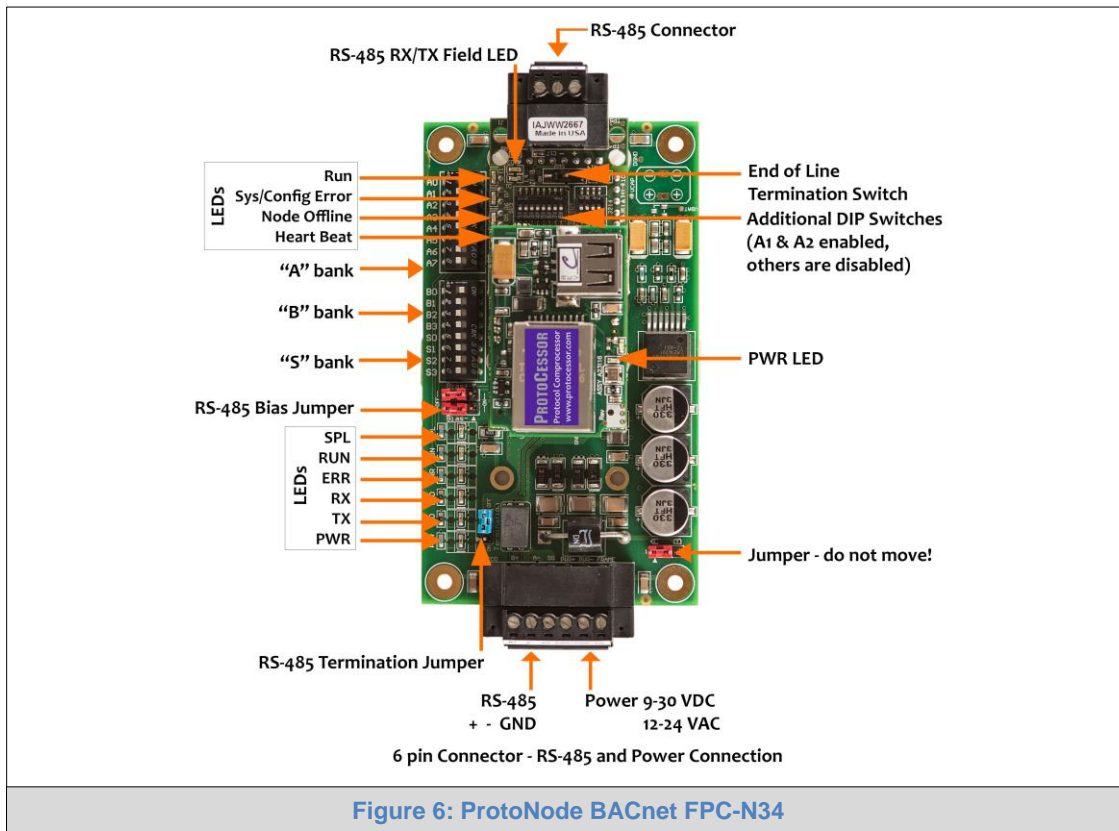
Figure 6: ProtoNode BACnet FPC-N34

3.2   BACnet MS/TP (FPC-N34): Wiring Field Port to RS-485 BMS Network

- Connect the BACnet MS/TP RS-485 network wires to the 3-pin RS-485 connector on ProtoNode FPC-N34 as shown below in **Figure 7**.

    o   The RS-485 GND (Pin 3) is not typically connected

- See **Section 4** for information on connecting to BACnet/IP network.

- If the ProtoNode is the last device on the BACnet MS/TP trunk, then the End-Of-Line Termination Switch needs to be enabled (**Figure 8**).

    o   The default setting from the factory is OFF (switch position = right side)

    o   To enable the EOL Termination, turn the EOL switch ON (switch position = left side)

BMS RS-485 Wiring	ProtoNode Pin #	Pin Assignment
RS-485 +	Pin 1	RS-485 +
RS-485 -	Pin 2	RS-485 -
-	Pin 3	RS-485 GND
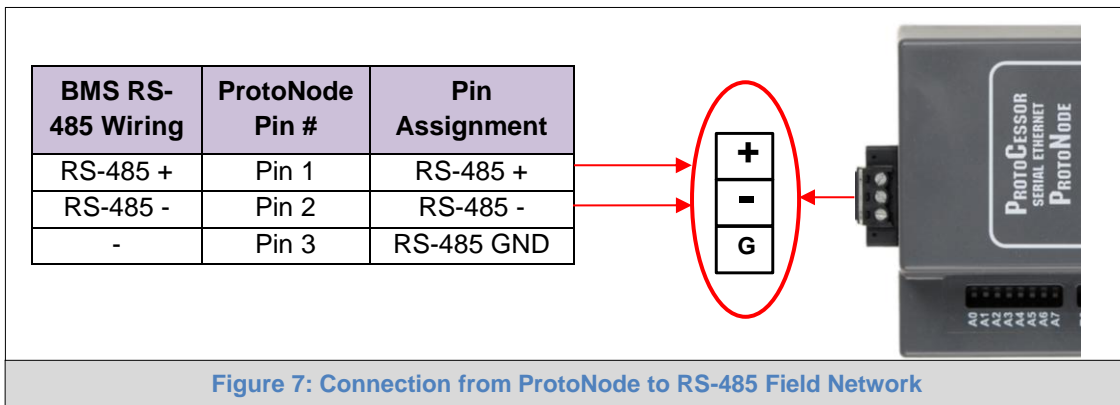
Figure 7: Connection from ProtoNode to RS-485 Field Network

End-of-Line Switch
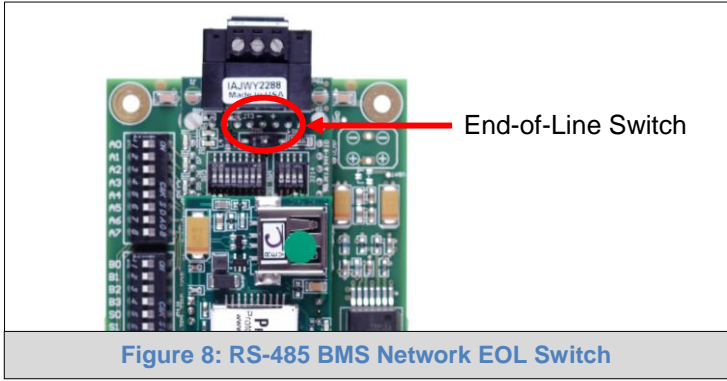
Figure 8: RS-485 BMS Network EOL Switch

3.3   Power-Up ProtoNode

Apply power to ProtoNode as show below in **Figure 10.** Ensure that the power supply used complies with the specifications provided in **Appendix D.1**.

- ProtoNode accepts either 9-30VDC or 12-24 VAC on pins 4 and 5.

- **Frame GND should be connected.**

Power Requirement for ProtoNode External Gateway			
	Current Draw Type		
ProtoNode Family	12VDC/VAC	24VDC/VAC	30VDC
FPC – N34 (Typical)	170mA	100mA	80mA
FPC – N34 (Maximum)	240mA	140mA	100mA
NOTE: These values are 'nominal' and a safety margin should be added to the power supply of the host system. A safety margin of 25% is recommended.			
Figure 9: Required current draw for the ProtoNode			

Power to ProtoNode	ProtoNode Pin #	Pin Assignment
Power In (+)	Pin 4	V +
Power In (-)	Pin 5	V -
Frame Ground	Pin 6	FRAME GND

Figure 10: Power Connections
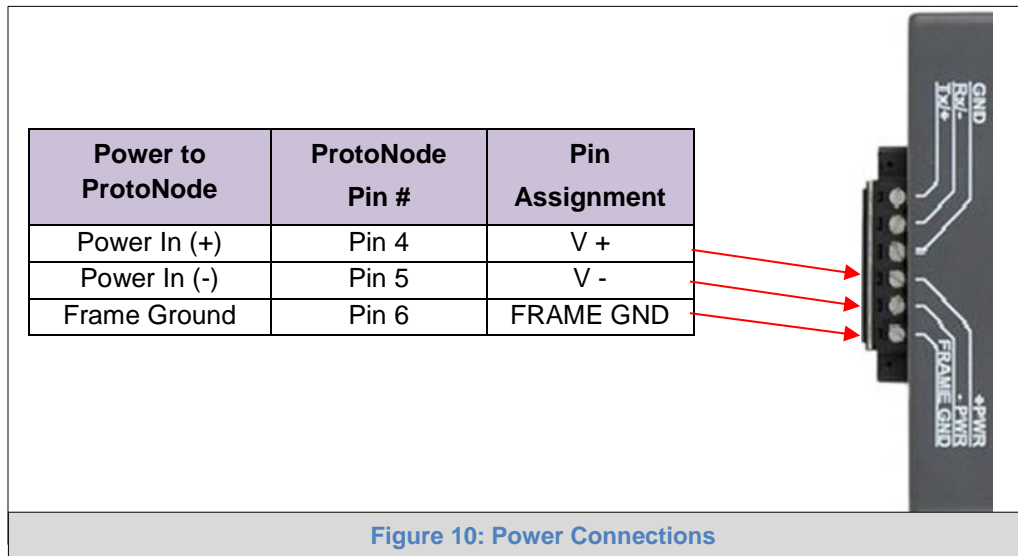
4 BACNET/IP AND MODBUS TCP/IP: CHANGE THE PROTONODE IP ADDRESS

4.1 Connect the PC to ProtoNode via the Ethernet Port

- Connect a CAT5 Ethernet cable (Straight through or Cross-Over) between the local PC and ProtoNode.

- The Default IP Address of ProtoNode is **192.168.1.24**, Subnet Mask is **255.255.255.0**. If the PC and ProtoNode are on different IP Networks, assign a static IP Address to the PC on the 192.168.1.xxx network.

- For Windows XP:

  Go to [start] > [Control Panel] > [Network Connections]

  Right-click on Local Area Connection > Properties

  Highlight [☑ Internet Protocol (TCP/IP)] > [Properties]

- For Windows 7:

  Go to [Windows] > [Control Panel] > [Network and Internet]

  > [Network and Sharing Center] > [Change adapter settings]

  Right-click on Local Area Connection > Properties
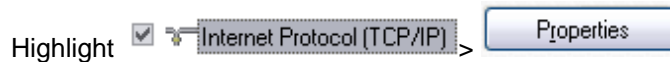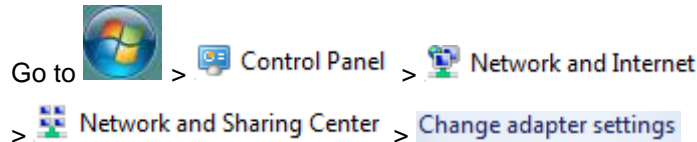
  Highlight [☑ Internet Protocol Version 4 (TCP/IPv4)] > [Properties]

- For Windows XP and Windows 7, use the following IP Address:

  ⊙ Use the following IP address:

IP address:	192 . 168 . 1 . 11
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	. . .

- Click [OK] twice.

4.2   BACnet/IP and Modbus TCP/IP: Setting IP Address for Field Network

- After setting a local PC on the same subnet as the ProtoNode (**Section 4.1**), open a web browser on the PC and enter the IP Address of the ProtoNode; the default address is 192.168.1.24.

- The Web Configurator will be displayed as the landing page. (**Figure 11**)

- From the Web Configurator landing page, click on the "Diagnostics & Debugging" button in the bottom right side of the page to access the Web GUI.
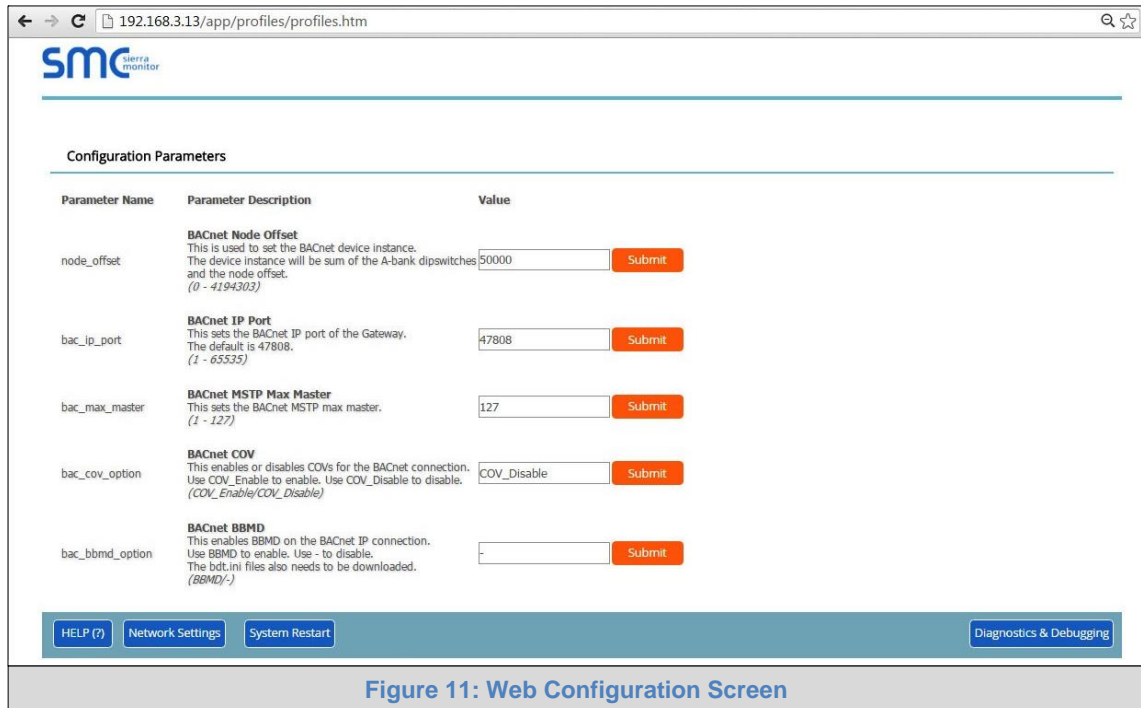
Figure 11: Web Configuration Screen

- From the Web GUI landing page, click on "Setup" to expand the navigation tree and then select "Network Settings" to access the IP Settings menu. (**Figure 12**)
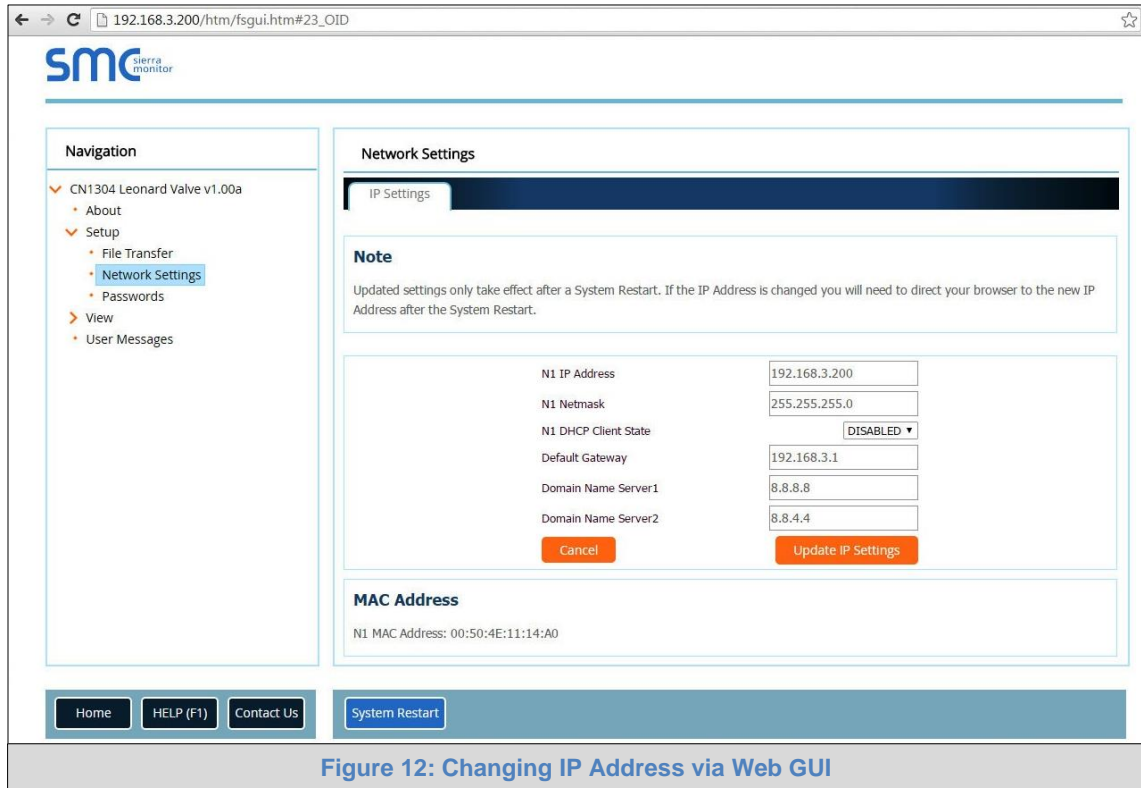
- Enter the new IP Address for the ProtoNode's Ethernet port in the "N1 IP Address" field.

- If necessary, change the Subnet Mask setting in the "N1 Netmask" field.

- If necessary, change the IP Gateway setting in the "Default Gateway" field.

NOTE: If the ProtoNode is connected to a router, the IP Gateway of the ProtoNode should be set to the IP Address of that router.

- Click the "System Restart" button at the bottom of the page to apply changes and restart the ProtoNode.

- Unplug Ethernet cable from PC and connect the ProtoNode to the network hub or router.

- **Record the IP Address assigned to the ProtoNode for future reference.**

5   BACNET MS/TP AND BACNET/IP: SETTING NODE_OFFSET TO ASSIGN SPECIFIC DEVICE INSTANCES

- After setting a local PC to the same subnet as the ProtoNode (**Section 4.1**), open a web browser on the PC and enter the IP Address of the ProtoNode; the default address is 192.168.1.24.

- The Web Configurator will be displayed as the landing page. (**Figure 13**)

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

- Change the value of Node_Offset to establish the desired Device Instance values, and click SUBMIT.
    - Given that: **Node_Offset + Modbus Node_ID = Device Instance**
    - Then: **Node_Offset (required) = Device Instance (desired) – Modbus Node_ID**

For example, if the desired Device Instance for the device is 1,001:

- Device has a Modbus Node-ID of 1
- **Node_Offset (required) = 1,001 – (Modbus Node_ID) = 1,001 – 1 = 1,000**

NOTE: The Node_Offset value will be applied to the device.

- Device Instance will then be = 1,000 + Modbus Node_ID = 1,000 + 1 = 1,001
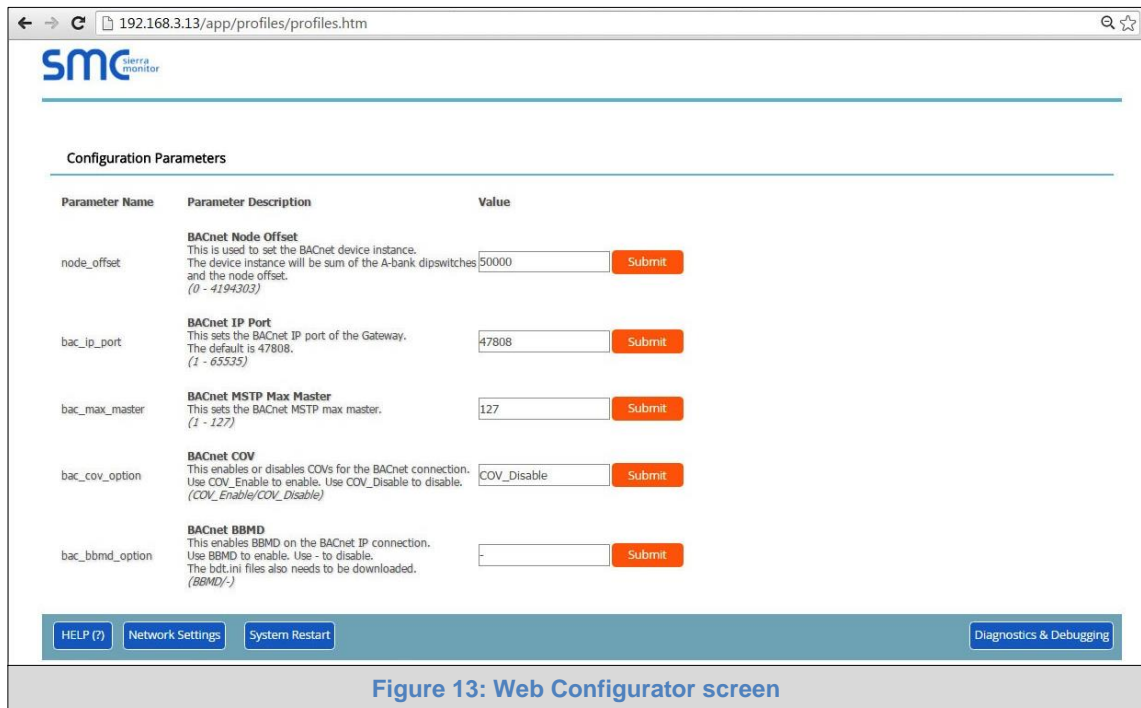
Figure 13: Web Configurator screen

6 CAS BACNET EXPLORER FOR VALIDATING PROTONODE IN THE FIELD

Sierra Monitor has arranged a complementary 2 week fully functional copy of CAS BACnet Explorer (through Chipkin Automation) that can be used to validate BACnet MS/TP and/or BACnet/IP communications of ProtoNode in the field without having to have the BMS Integrator on site. A Serial or USB to RS-485 converter is needed to test BACnet MS/TP.

6.1 Downloading the CAS Explorer and Requesting an Activation Key

- To request the complementary BACnet CAS key, go to http://app.chipkin.com/activation/twoweek and fill in all the information. **Enter Vendor Code "Leonard2BACnet".** This will register the email address that was submitted.

Request a two week account activation

You have two choices

1. **Activate your account for two weeks**
   To request a two week account activation, simply complete this form and request a new product key from within the CAS BACnet Explorer.
   Note: Your contact info will be used by chipkin to contact you. If your contact info is invalid or you are unreachable your account will be revoked.

   Name:
   Company:
   Address:

   Phone number:
   Email Address:
   Vendor code:
   Product: CAS BACnet Explorer
                     Request a two week account

1. **Purchase**
   You can buy the CAS BACnet Explorer to get a full account from If you have one, you can use your discount coupon on the web page. Visit this page

Feel free to contact us with any questions you may have.

Figure 14: Downloading the CAS Explorer

- Go to the following web site, download and install the CAS BACnet Explorer to the local PC: http://www.chipkin.com/technical-resources/cas-bacnet-explorer/.

- Open CAS BACnet Explorer; in the CAS Activation form, enter the email address that was registered and click on "Request a key". The CAS key will then be emailed to the registered address. Cut/paste key from email into the Product key field and click "Activate".

Settings

License
Network
Preferences
Auto Update
About

License

Email Address

Product key

Please copy and past the activation key from your email in to this dialog and click activate.
If you do not have an activation key, you can request now by entering a valid email address and clicking the request a key button.

Activate   Request a key

OK   Cancel   Apply

Figure 15: Requesting CAS Activation Key

6.2   CAS BACnet Setup

These are the instructions to set CAS Explorer up for the first time on BACnet MS/TP and BACnet/IP.

6.2.1   CAS BACnet MS/TP Setup

- Using the Serial or USB to RS-485 converter, connect it to the local PC and the 3 Pin BACnet MS/TP connector on ProtoNode FPC-N34.

- In CAS Explorer, do the following:

    o   Click on settings

    o   Check the BACnet MS/TP box and uncheck the BACnet/IP and BACnet Ethernet boxes

    o   Set the BACnet MS/TP MAC address to 0

    o   Set the BACnet MS/TP Baud Rate to 38400

    o   Click Ok

    o   On the bottom right-hand corner, make sure that the BACnet MS/TP box is green

    o   Click on discover

    o   Check all 4 boxes

    o   Click Send

6.2.2   CAS BACnet BACnet/IP Setup

- See **Section 4.1** to set the IP Address and subnet of the PC that will be running the CAS Explorer.

- Connect a straight through or cross Ethernet cable from the PC to ProtoNode.

- In CAS Explorer, do the following:

    o   Click on settings

    o   Check the BACnet/IP box and uncheck the BACnet MS/TP and BACnet Ethernet boxes

    o   In the "Select a Network Device" box, select the network card of the PC

    o   Click Ok

    o   On the bottom right-hand corner, make sure that the BACnet/IP box is green

    o   Click on discover

    o   Check all 4 boxes

    o   Click Send

Appendix A. Troubleshooting

Appendix A.1. Lost or Incorrect IP Address

- Ensure that FieldServer Toolbox is loaded on the local PC. If not, download FieldServer-Toolbox.zip on the Sierra Monitor webpage, under Customer Care-Resource Center, Software Downloads:
  http://www.sierramonitor.com/customer-care/resource-center?filters=software-downloads

- Extract the executable file and complete the installation.

Figure 16: Ethernet Port Location
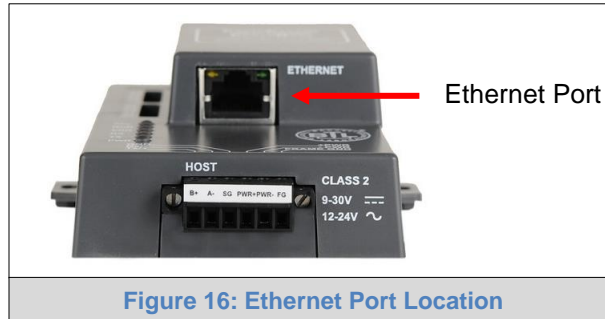
- Disable any wireless Ethernet adapters on the PC/Laptop.

- Disable firewall and virus protection software if possible.

- Connect a standard CAT5 Ethernet cable between the PC and ProtoNode.

- Double click on the FS Toolbox Utility.

- Check IP Addresses from the Device listings.
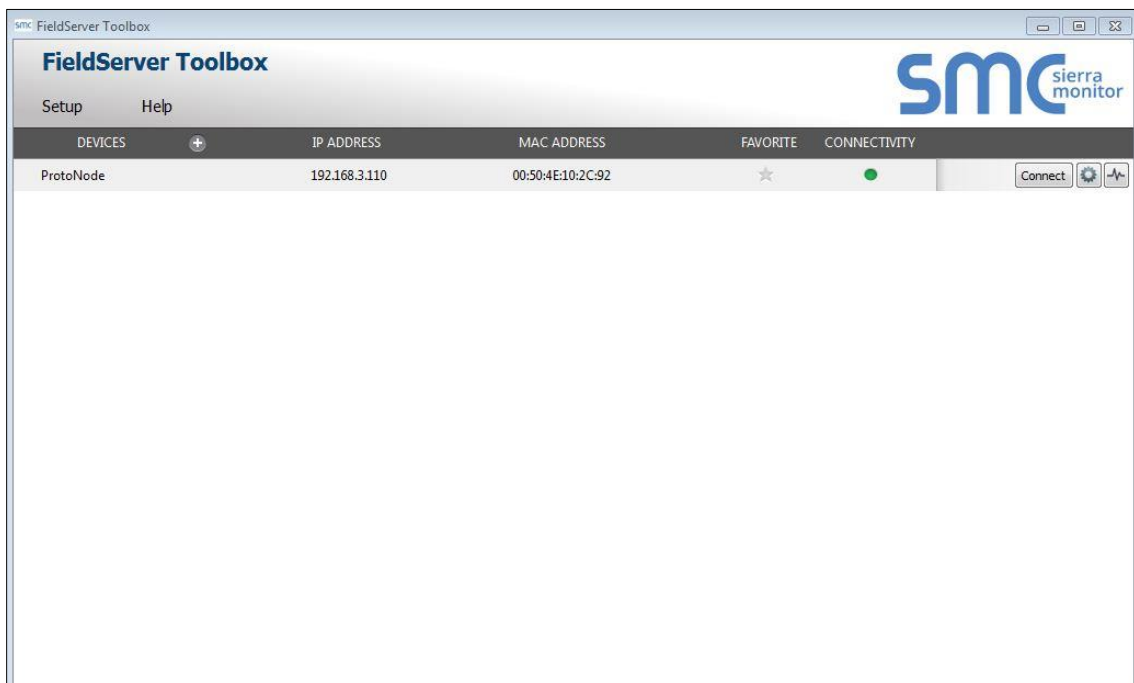
- Correct IP Address(es) by right clicking the settings icon ⚙ and changing the IP Address.

Appendix A.2. Viewing Diagnostic information

- Type the IP Address of the ProtoNode into the web browser or use the FieldServer Toolbox to connect to the ProtoNode.

- Click on Diagnostics and Debugging Button, then click on view, and then on connections.

- If there are any errors showing on the Connection page, please refer to **Appendix A.3** for the relevant wiring and settings.
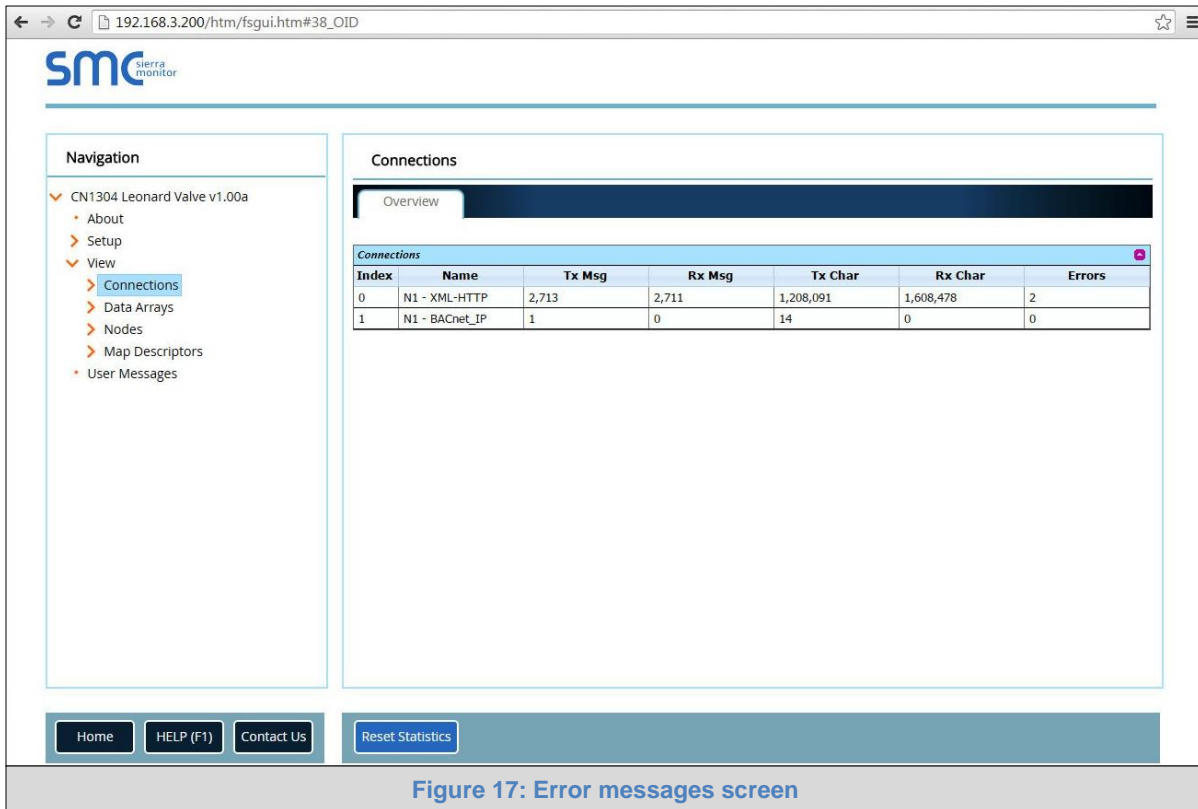
Figure 17: Error messages screen

Appendix A.3. Check Wiring and Settings

- No COMS on XML side. To fix this problem, check the following:

    o Visual observations of LEDs on ProtoNode (**Appendix A.5**)

    o Check IP Address

    o Check Ethernet Switch

    o Check Ethernet LEDs

    o Verify Ethernet Cable

- Field COM problems:

    o Visual observations of LEDs on ProtoNode (**Appendix A.5**)

    o Check dipswitch settings (using correct baud rate and device instance)

    o Verify IP Address setting

    o Verify wiring

If the problem still exists, a Diagnostic Capture needs to be taken and sent to Sierra Monitor Corporation. (Appendix A.4)

Appendix A.4. Take Diagnostic Capture With the FieldServer Utilities

- **Once the Diagnostic Capture is complete, contact Leonard Valve to deliver the file. The Diagnostic Capture will allow us to rapidly diagnose the problem.**

- Ensure that FieldServer Toolbox is Loaded on the PC that is currently being used, or download FieldServer-Toolbox.zip on the Sierra Monitor Corporation webpage, under Customer Care-Resource Center, Software Downloads: http://www.sierramonitor.com/customer-care/resource-center?filters=software-downloads

- Extract the executable file and complete the installation.
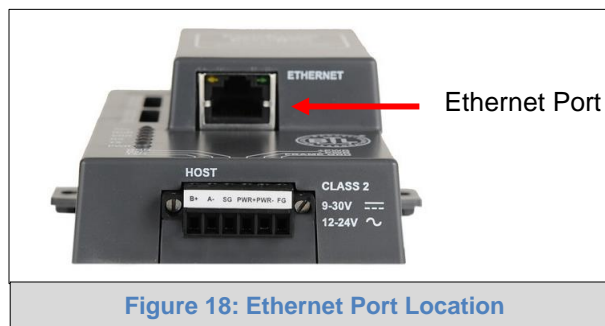
Ethernet Port

Figure 18: Ethernet Port Location

- Disable any wireless Ethernet adapters on the PC/Laptop.

- Disable firewall and virus protection software if possible.

- Connect a standard CAT5 Ethernet cable between the PC and ProtoNode.

- Double click on the FS Toolbox Utility.

- **Step 1:** Take a Log
  - o Click on the diagnose icon [icon] of the desired device.
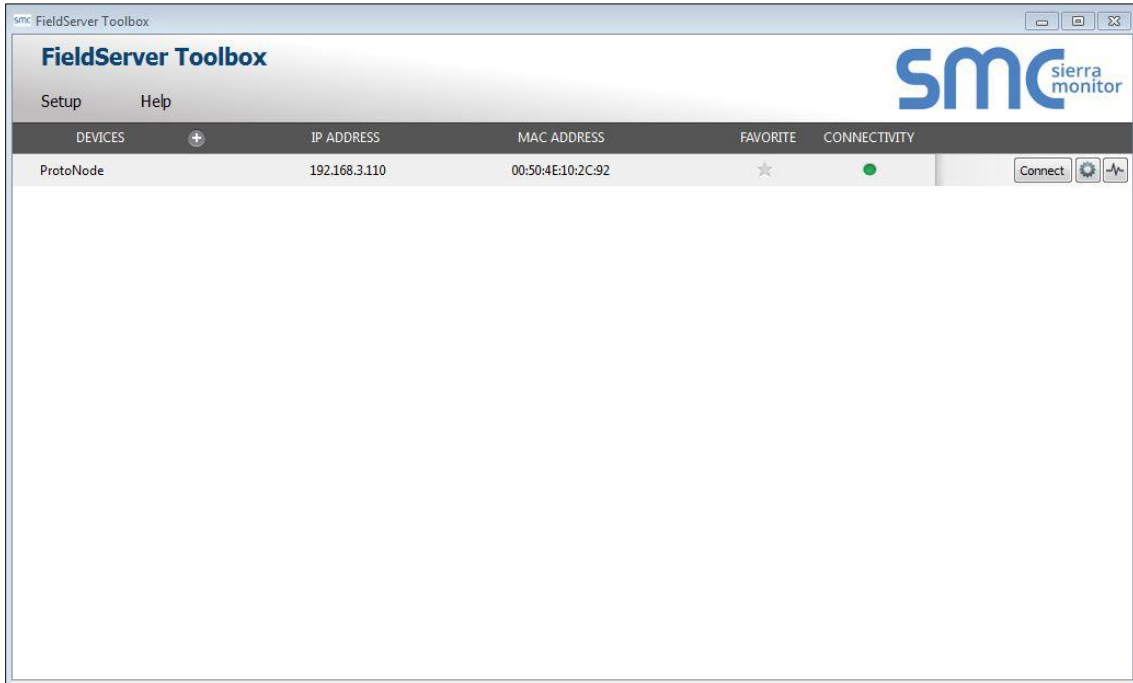
  - o Select full Diagnostic.
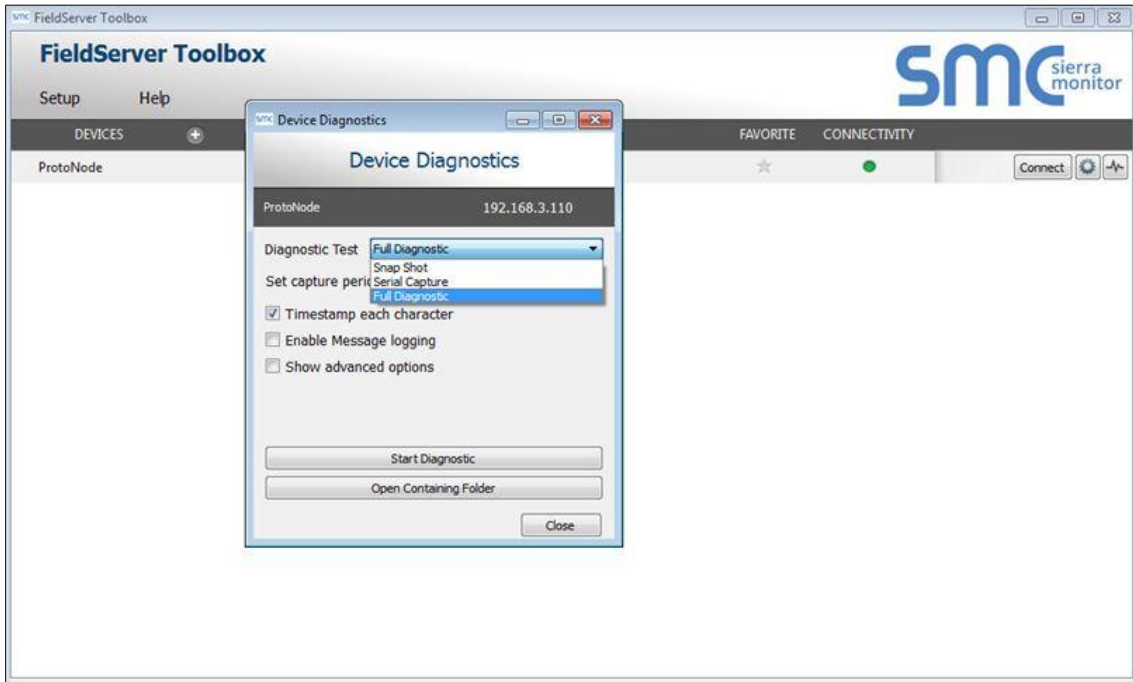
- o If desired, the default capture period can be changed.
- o Click on "Start Diagnostic".
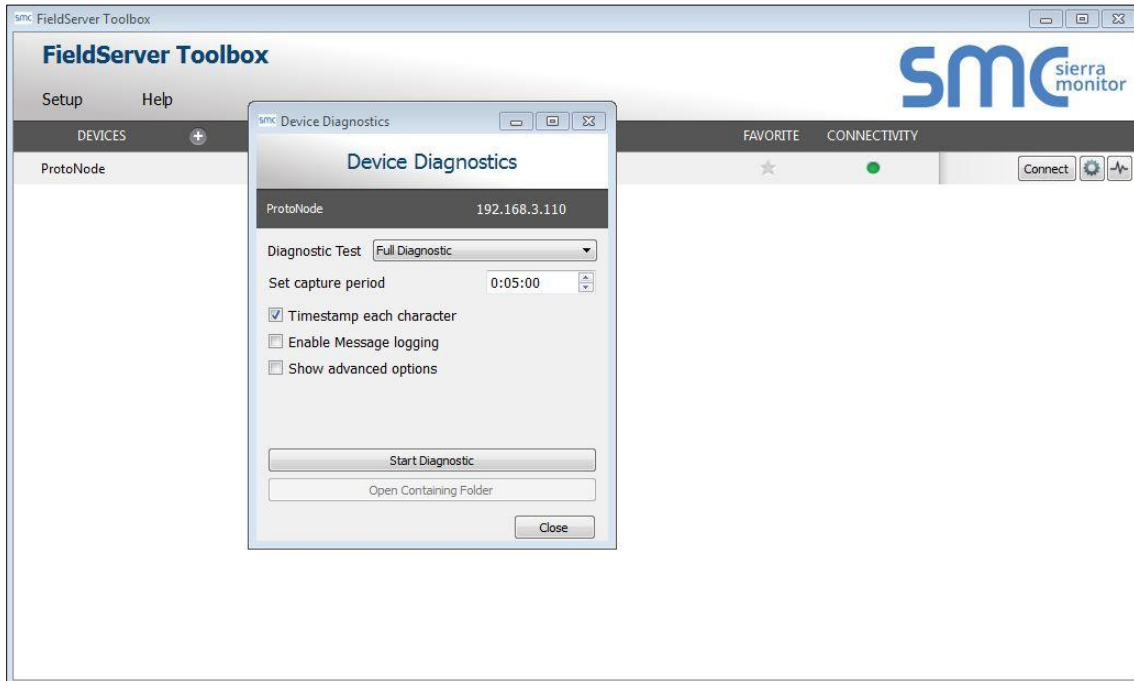
- o Wait for Capture period to finish. Diagnostic Test Complete window will appear.

- **Step 2**: Send Log
  - o Once the Diagnostic test is complete, a .zip file will be saved on the PC.
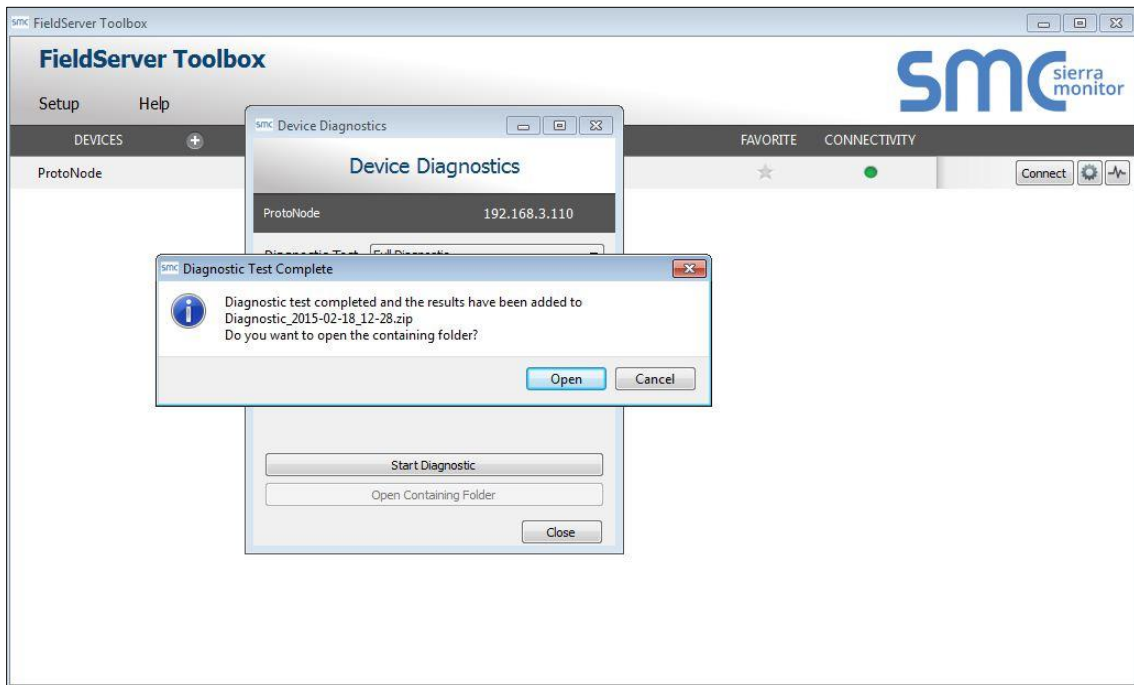
- o Choose open to launch explorer and have it point directly at the correct folder. Contact Leonard Valve to send the Diagnostic zip file.

Diagnostic_2014-07-17_20-15.zip   2014/07/17 20:16   zip Archive   676 KB

Appendix A.5. LED Diagnostics for Communications Between ProtoNode and Device

Please see the diagram below for LED locations to ProtoNode FPC-N34.

Tag	Description
SPL	The SPL LED will light if the unit is not getting a response from the configured device.
RUN	The RUN LED will start flashing 20 seconds after power indicating normal operation.
ERR	The SYS ERR LED will go on solid 15 seconds after power up. It will turn off after 5 seconds. A steady red light will indicate there is a system error on unit. If this occurs, immediately report the related "system error" shown in the error screen of the GUI interface to Leonard Valve for evaluation.
RX	**If socket protocol is serial,** the RX LED will flash when a message is received on the host port. **If socket protocol is Ethernet,** this LED is **not used**.
TX	**If socket protocol is serial,** the TX LED will flash when a message is sent on the host port. **If socket protocol is Ethernet,** this LED is **not used**.
PWR	This is the power light and should show steady green at all times when the unit is powered.

Figure 19: Diagnostic LEDs

Appendix A.6. Passwords

Access to the ProtoNode can be restricted by enabling a password. There are 2 access levels defined by 2 account names: Admin and User.

- The Admin account has unrestricted access to the ProtoNode
- The User account can view any ProtoNode information, but cannot make any changes or restart the ProtoNode

The password needs to be a minimum of eight characters and **is case sensitive**.

If the password is lost, click cancel on the password authentication popup window, and contact Leonard Valve to deliver the password recovery token and receive a temporary password from the customer support team. Access the ProtoNode to set a new password.

Appendix B. Vendor Information - Leonard Valve

Appendix B.1. Temp Sensor XML Mappings to BACnet and Modbus

Point Name	BACnet Object Type	BACnet Object ID	Modbus Register
Temperature 1	AI	1	30001
Temperature 2	AI	2	30002
Temperature 3	AI	3	30003
Temperature 4	AI	4	30004

Appendix C. "A" Bank DIP Switch Settings

Appendix C.1. "A" Bank DIP Switch Settings

Address	A0	A1	A2	A3	A4	A5	A6	A7
1	On	Off	Off	Off	Off	Off	Off	Off
2	Off	On	Off	Off	Off	Off	Off	Off
3	On	On	Off	Off	Off	Off	Off	Off
4	Off	Off	On	Off	Off	Off	Off	Off
5	On	Off	On	Off	Off	Off	Off	Off
6	Off	On	On	Off	Off	Off	Off	Off
7	On	On	On	Off	Off	Off	Off	Off
8	Off	Off	Off	On	Off	Off	Off	Off
9	On	Off	Off	On	Off	Off	Off	Off
10	Off	On	Off	On	Off	Off	Off	Off
11	On	On	Off	On	Off	Off	Off	Off
12	Off	Off	On	On	Off	Off	Off	Off
13	On	Off	On	On	Off	Off	Off	Off
14	Off	On	On	On	Off	Off	Off	Off
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27	On	On	Off	On	On	Off	Off	Off
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31	On	On	On	On	On	Off	Off	Off
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36	Off	Off	On	Off	Off	On	Off	Off
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42	Off	On	Off	On	Off	On	Off	Off
43	On	On	Off	On	Off	On	Off	Off
44	Off	Off	On	On	Off	On	Off	Off
45	On	Off	On	On	Off	On	Off	Off

Address	A0	A1	A2	A3	A4	A5	A6	A7
46	Off	On	On	On	Off	On	Off	Off
47	On	On	On	On	Off	On	Off	Off
48	Off	Off	Off	Off	On	On	Off	Off
49	On	Off	Off	Off	On	On	Off	Off
50	Off	On	Off	Off	On	On	Off	Off
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230	Off	On	On	Off	Off	On	On	On
231	On	On	On	Off	Off	On	On	On
232	Off	Off	Off	On	Off	On	On	On
233	On	Off	Off	On	Off	On	On	On
234	Off	On	Off	On	Off	On	On	On

Address	A0	A1	A2	A3	A4	A5	A6	A7
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236	Off	Off	On	On	Off	On	On	On
237	On	Off	On	On	Off	On	On	On
238	Off	On	On	On	Off	On	On	On
239	On	On	On	On	Off	On	On	On
240	Off	Off	Off	Off	On	On	On	On
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242	Off	On	Off	Off	On	On	On	On
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248	Off	Off	Off	On	On	On	On	On
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250	Off	On	Off	On	On	On	On	On
251	On	On	Off	On	On	On	On	On
252	Off	Off	On	On	On	On	On	On
253	On	Off	On	On	On	On	On	On
254	Off	On	On	On	On	On	On	On
255	On	On	On	On	On	On	On	On

Appendix D. Reference

Appendix D.1. Specifications

	ProtoNode FPC-N34
Electrical Connections	One 6-pin Phoenix connector with: RS-485 port (+ / - / gnd) Power port (+ / - / Frame-gnd) One 3-pin Phoenix connector with: RS-485 port (+ / - / gnd) One Ethernet 10/100 BaseT port
Approvals	CE Certified; TUV approved to UL 916, EN 60950-1, EN 50491-3 and CSA C22-2 standards; FCC Class A Part 15; DNP3 Conformance Tested; RoHS Compliant; CSA 205 Approved
	BTL Marked
Power Requirements	Multi-mode power adapter: 9-30VDC or 12 - 24VAC
Physical Dimensions	11.5 cm L x 8.3 cm W x 4.1 cm H (4.5 x 3.2 x 1.6 in.)
Weight	0.2 kg (0.4 lbs)
Operating Temperature	-40°C to 75°C (-40°F to167°F)
Surge Suppression	EN61000-4-2 ESD EN61000-4-3 EMC EN61000-4-4 EFT
Humidity	5 - 90% RH (non-condensing)
(Specifications subject to change without notice)	
Figure 20: Specifications	

Appendix D.1.1.   Compliance with UL Regulations

For UL compliance, the following instructions must be met when operating ProtoNode.

- The units shall be powered by listed LPS or Class 2 power supply suited to the expected operating temperature range.

- The interconnecting power connector and power cable shall:
    o Comply with local electrical code
    o Be suited to the expected operating temperature range
    o Meet the current and voltage rating for ProtoNode/Net

- Furthermore, the interconnecting power cable shall:
    o Be of length not exceeding 3.05m (118.3")
    o Be constructed of materials rated VW-1, FT-1 or better

- If the unit is to be installed in an operating environment with a temperature above 65 °C, it should be installed in a Restricted Access Area requiring a key or a special tool to gain access.

- This device must not be connected to a LAN segment with outdoor wiring.

Appendix E. Limited 2 Year Warranty

Sierra Monitor Corporation warrants its products to be free from defects in workmanship or material under normal use and service for two years after date of shipment. Sierra Monitor Corporation will repair or replace any equipment found to be defective during the warranty period. Final determination of the nature and responsibility for defective or damaged equipment will be made by Sierra Monitor Corporation personnel.

All warranties hereunder are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without Sierra Monitor Corporation's approval or which have been subjected to accident, improper maintenance, installation or application, or on which original identification marks have been removed or altered. This Limited Warranty also will not apply to interconnecting cables or wires, consumables or to any damage resulting from battery leakage.

In all cases Sierra Monitor Corporation's responsibility and liability under this warranty shall be limited to the cost of the equipment. The purchaser must obtain shipping instructions for the prepaid return of any item under this warranty provision and compliance with such instruction shall be a condition of this warranty.

Except for the express warranty stated above, Sierra Monitor Corporation disclaims all warranties with regard to the products sold hereunder including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of Sierra Monitor Corporation for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the product.