ProtoCessor FPC-ED2
Start-up Guide

For Interfacing Electro Industries Products:

Meter

To Building Automation Systems:

BACnet MS/TP, BACnet/IP, Modbus TCP/IP, Modbus RTU, Metasys N2, and SMC Cloud

APPLICABILITY & EFFECTIVITY

Explains ProtoCessor hardware and how to install it.

The instructions are effective for the above as of July 2019.

Document Revision: 1.E
Web Configurator
Template Revision: 3

07/10/2019 BI805

Technical Support

Thank you for purchasing the ProtoCessor for Electro Industries.

Please call Electro Industries for technical support of the ProtoCessor product.

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

Support Contact Information:

Electro Industries, Inc.
2150 West River Street
PO Box 538
Monticello, MN 55362

Customer Service:
800.922.4138
763.295.4138

Email: sales@electromn.com

Website: www.electromn.com

Quick Start Guide

1. Record the information about the unit. (**Section** 3.1)
2. Configure COM settings for the device to connect to the ProtoCessor. (**Section** 3.3)
3. Connect the ProtoCessor 3 pin RS-485 port to the field protocol cabling. (**Section** 4.3)
4. Connect a PC to the ProtoCessor via Ethernet cable. (**Section** 5.1)
5. Use a web browser to access the ProtoCessor Web Configurator page to enter any necessary device information for the device attached to the ProtoCessor. The ProtoCessor automatically builds and loads the configuration. (**Section** 5.3)
6. Ethernet Network: Use a browser to access the ProtoCessor Web Configurator to change the IP Address. No changes to the configuration are necessary. (**Section** 5.4)

TABLE OF CONTENTS

1 Certification 6
1.1 BTL Mark – BACnet® Testing Laboratory 6

2 Introduction 7
2.1 ProtoCessor Gateway 7

3 ProtoCessor Setup 8
3.1 Record Identification Data 8
3.2 Point Count Capacity and Registers per Device 8
3.3 Configuring Modbus Device Communications 8
3.3.1 Input COM Settings on Any Device Connected to the ProtoCessor 8

4 Interfacing ProtoCessor to Devices 9
4.1 ProtoCessor Mounted onto Board Example 9
4.2 ProtoCessor FPC-ED2 Showing Connection Ports 10
4.3 Serial Network: Wiring Field Port to RS-485 Network 11

5 Use the Web Configurator to Setup the Gateway 12
5.1 Connecting to the ProtoCessor via Ethernet 12
5.1.1 Changing the Subnet of the Connected PC 12
5.1.2 Changing the IP Address of the ProtoCessor with FieldServer Toolbox 13
5.2 Connecting to the ProtoCessor Web Configurator 14
5.3 Set the Protocol and Device Instance/Device Address 14
5.4 Ethernet Network: Setting IP Address for Field Network 15
5.5 How to Start the Installation Over: Clearing Profiles 17

6 Using the Embedded BACnet Explorer 18
6.1 Discover Device List 19
6.2 View Device Details and Explore Points/Parameters 20
6.2.1 Edit the Present Value Field 23

Appendix A Troubleshooting 25
Appendix A.1 Lost or Incorrect IP Address 25
Appendix A.2 Viewing Diagnostic Information 26
Appendix A.3 Checking Wiring and Settings 27
Appendix A.4 LED Diagnostics for Communications Between ProtoCessor and Devices 28
Appendix A.5 Taking a FieldServer Diagnostic Capture 29
Appendix A.5.1 Using the FieldServer Toolbox 29
Appendix A.5.2 Using FS-GUI 32

Appendix B Additional Information 33
Appendix B.1 Updating Firmware 33
Appendix B.2 BACnet: Setting Network_Number for More Than One ProtoNode on the Subnet 33
Appendix B.3 Securing ProtoCessor with Passwords 34

Appendix C Vendor Information – Electro Industries 35
Appendix C.1 Meter PSP Mappings to BACnet, Metasys N2, Modbus TCP/IP and Modbus RTU 35

Appendix D Reference 37
Appendix D.1 Specifications 37
Appendix D.1.1 Compliance with UL Regulations 37

Appendix E Limited 2 Year Warranty 38

LIST OF FIGURES

Figure 1: ProtoCessor Part Numbers 8
Figure 2: Supported Point Count Capacity 8
Figure 3: Registers per Device 8
Figure 4: COM Settings 8
Figure 5: Mounted ProtoCessor Example 9
Figure 6: ProtoCessor FPC-ED2 10
Figure 7: Connection from ProtoCessor to RS-485 Field Network 11
Figure 8: RS-485 EOL & Bias Resistor Switches 11
Figure 9: Ethernet Port Location 12
Figure 10: Web Configurator Parameters 14
Figure 11: Web Configurator Screen 15
Figure 12: Changing IP Address via FS-GUI 16
Figure 13: FS-GUI BACnet Explorer Button 18
Figure 14: BACnet Explorer Login Page 18
Figure 15: BACnet Explorer Page 19
Figure 16: Discover Window 19
Figure 17: Device List 20
Figure 18: Device Sub-items 20
Figure 19: Full Device Sub-items 21
Figure 20: Simplified Device Details 21
Figure 21: Additional Device Details 22
Figure 22: Highlighted Present Value 23
Figure 23: Write Property Window 23
Figure 24: Updated Present Value 24
Figure 25: Ethernet Port Location 25
Figure 26: Error Messages Screen 26
Figure 27: Diagnostic LEDs 28
Figure 28: Ethernet Port Location 29
Figure 29: Web Configurator – Network Number Field 33
Figure 30: FS-GUI Passwords Page 34
Figure 31: Password Recovery Page 34
Figure 32: Specifications 37

1 CERTIFICATION

1.1 BTL Mark – BACnet®[1] Testing Laboratory

The BTL Mark on ProtoCessor 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 www.BACnetInternational.net for more information about the BACnet Testing Laboratory. Click here for the BACnet PIC Statement.

[1] BACnet is a registered trademark of ASHRAE

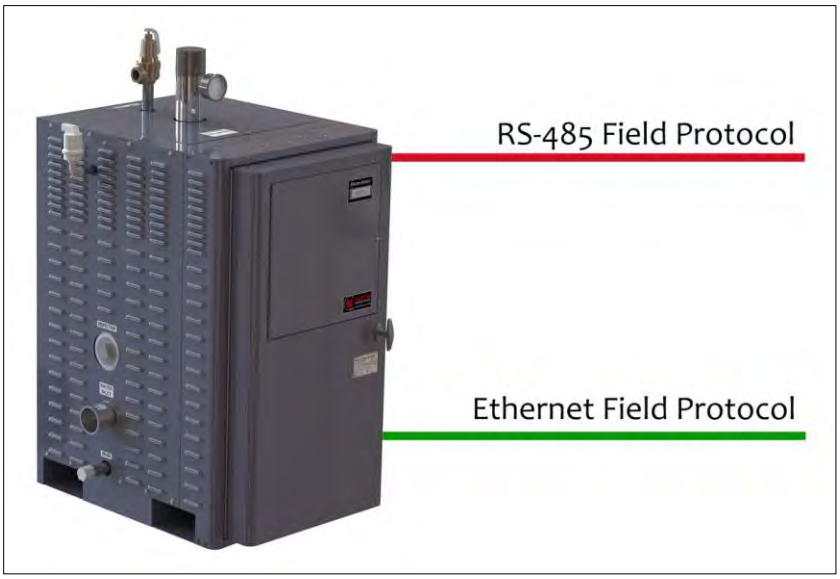
2 INTRODUCTION

2.1 ProtoCessor Gateway

The ProtoCessor is an embedded module that is designed into Electro Industries' product (hereafter simply called "device") and is preconfigured to support BACnet/IP, BACnet MS/TP, Metasys®[2] N2 by JCI, Modbus TCP/IP and Modbus RTU.

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

FPC-ED2 Connectivity Diagram:



The ProtoCessor can connect with Sierra Monitor's SMC Cloud. The SMC Cloud allows technicians, the OEM's support team and Sierra Monitor's support team to remotely connect to the ProtoCessor. The SMC Cloud provides the following capabilities for any registered devices in the field:

- Remotely monitor and control devices.
- Collect device data and view it on the SMC Cloud Dashboard and the SMC Smart Phone App.
- Create user defined device notifications (alarm, trouble and warning) via SMS and/or Email.
- Generate diagnostic captures (as needed for troubleshooting) without going to the site.

For more information about the SMC Cloud, refer to the SMC Cloud Start-up Guide.

[2] Metasys is a registered trademark of Johnson Controls Inc.

3 PROTOCESSOR SETUP

3.1 Record Identification Data

Each ProtoCessor 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
ProtoCessor	FPC-ED2-1520

Figure 1: ProtoCessor Part Numbers

- FPC-ED2 units have the following 2 ports: RS-485 + Ethernet

3.2 Point Count Capacity and Registers per Device

The total number of registers presented the device(s) attached to the ProtoCessor cannot exceed:

Part number	Total Registers
FPC-ED2-1520	1,500

Figure 2: Supported Point Count Capacity

Devices	Registers Per Device
Meter	57

Figure 3: Registers per Device

3.3 Configuring Modbus Device Communications

3.3.1 Input COM Settings on Any Device Connected to the ProtoCessor

- **Any connected serial device MUST have the same baud rate, data bits, stop bits, and parity settings as the ProtoCessor.**
- Figure 4 specifies the device serial port settings required to communicate with the ProtoCessor.

Port Setting	Device
Protocol	PSP
Baud Rate	38400
Parity	None
Data Bits	8
Stop Bits	1

Figure 4: COM Settings

4 INTERFACING PROTOCESSOR TO DEVICES

4.1 ProtoCessor Mounted onto Board Example

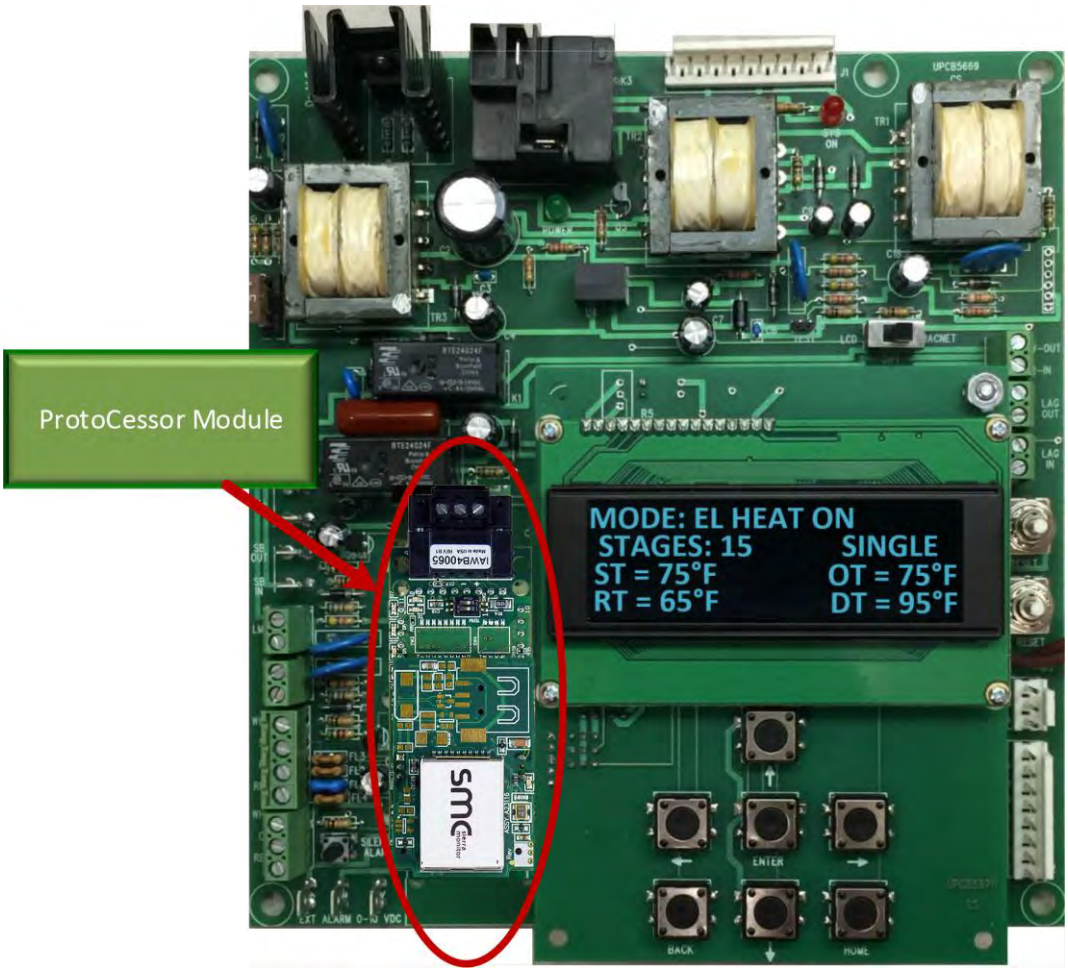


Figure 5: Mounted ProtoCessor Example

4.2 ProtoCessor FPC-ED2 Showing Connection Ports

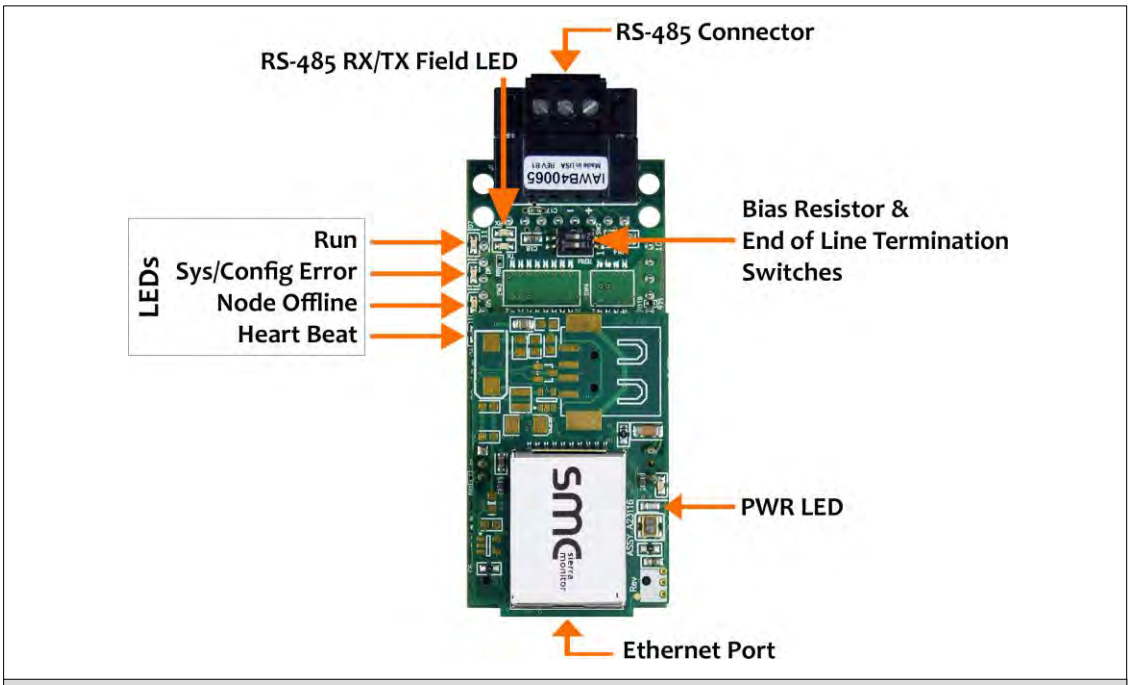


Figure 6: ProtoCessor FPC-ED2

4.3 Serial Network: Wiring Field Port to RS-485 Network

- Connect the RS-485 network wires to the 3-pin RS-485 connector on the ProtoCessor as shown below in **Figure 7**.
  - Use standard grounding principles for RS-485 GND
- See **Section 5.4** for information on connecting to an Ethernet network.

BMS Wiring	ProtoCessor Pin #	Pin Assignment
RS-485 +	Pin 1	RS-485 +
RS-485 -	Pin 2	RS-485 -
-	Pin 3	RS-485 GND

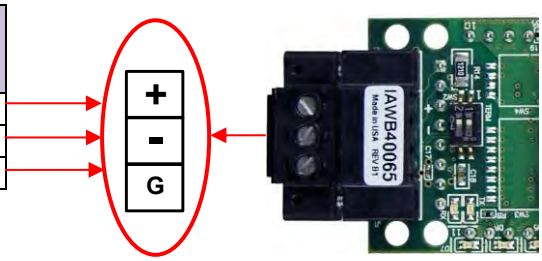


Figure 7: Connection from ProtoCessor to RS-485 Field Network

- If the ProtoCessor is the last device on the trunk, then the end of line (EOL) termination switch needs to be enabled. **See (Figure 8) for the orientation of switch positions referenced below.**
  - The default setting from the factory is OFF (switch position = right side)
  - To enable the EOL termination, turn the EOL switch ON (switch position = left side)

Figure 8: RS-485 EOL & Bias Resistor Switches

- If more than one RS-485 device is connected to the network, then the field bias resistor switch needs to be enabled to ensure proper communication. **See Figure 8 for the orientation of switch positions referenced below.**
  - The default factory setting is OFF (switch position = right side)
  - To enable biasing, turn the bias switch ON (switch position = left side)

NOTE: Biasing only needs to be enabled on one device. The ProtoCessor has 510 ohm resistors that are used to set the biasing.

5 USE THE WEB CONFIGURATOR TO SETUP THE GATEWAY

5.1 Connecting to the ProtoCessor via Ethernet

First, connect a Cat-5 Ethernet cable (straight through or cross-over) between the local PC and the ProtoCessor.

Figure 9: Ethernet Port Location

There are two methods to access the ProtoCessor via Ethernet connection, either by changing the subnet of the connected PC (Section 5.1.1) or using the FieldServer Toolbox to change the IP Address of the ProtoCessor (Section 5.1.2).

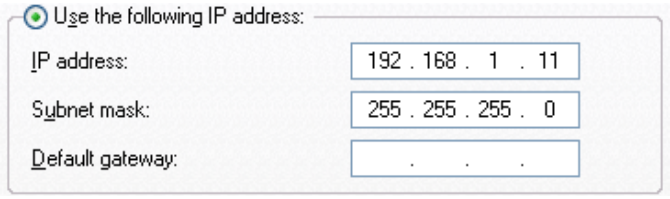
NOTE: Only perform one method or the other.

5.1.1 Changing the Subnet of the Connected PC

The default IP Address for the ProtoCessor is **192.168.1.24**, Subnet Mask is **255.255.255.0**. If the PC and ProtoCessor are on different IP networks, assign a static IP Address to the PC on the 192.168.1.xxx network.

For Windows 10:

- Find the search field in the local computer's taskbar (usually to the right of the windows icon) and type in "Control Panel".
- Click "Control Panel", click "Network and Internet" and then click "Network and Sharing Center".
- Click "Change adapter settings" on the left side of the window.
- Right-click on "Local Area Connection" and select "Properties" from the dropdown menu.
- Highlight Internet Protocol Version 4 (TCP/IPv4) and then click the Properties button.
- Select and enter a static IP Address on the same subnet. For example:

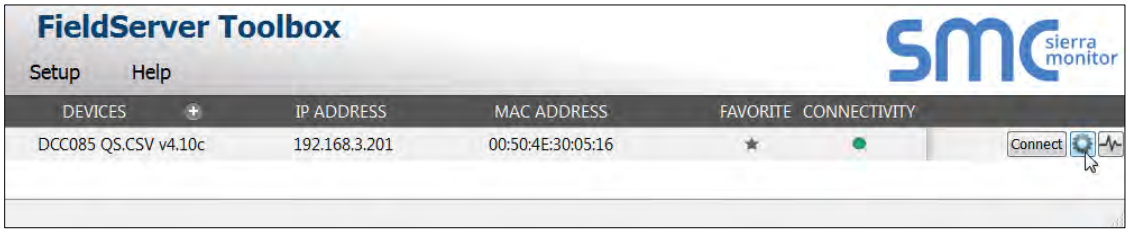


- Click the Okay button to close the Internet Protocol window and the Close button to close the Ethernet Properties window.

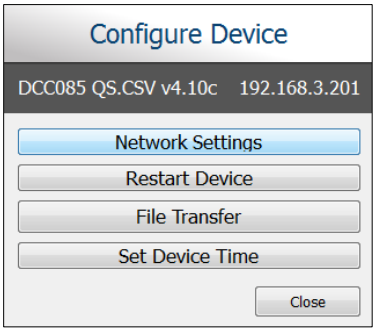
5.1.2 Changing the IP Address of the ProtoCessor with FieldServer Toolbox

- Ensure that FieldServer Toolbox is loaded onto the local PC. Otherwise, download the FieldServer-Toolbox.zip via the Sierra Monitor website's Software Downloads.
- Extract the executable file and complete the installation.
- Double click on the FS Toolbox Utility and click Discover Now on the splash page.
- Find the desired gateway and click the Configure Device button (gear icon) to the right of the gateway information.

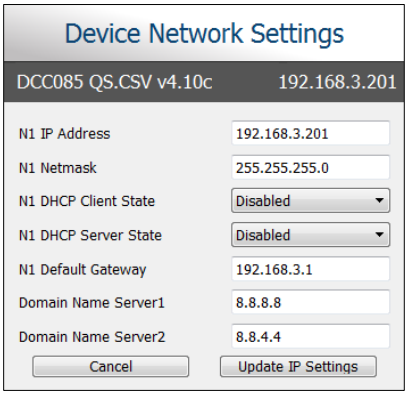
NOTE: If connectivity status is green, then the IP Address doesn't need to be changed (the ProtoCessor is already on the same subnet). Skip the rest of the section.



- Select Network Settings in the Configure Device window.



- Modify the IP Address (N1 IP Address field) of the gateway Ethernet port.
  - Change additional fields as needed



NOTE: If the gateway is connected to a router, the Default Gateway field of the gateway should be set to the IP Address of the connected router.

NOTE: Do not change the DHCP Server State (N1 DHCP Server State field).

NOTE: If DNS settings are unknown, set DNS1 to "8.8.8.8" and DNS2 to "8.8.4.4".

- Click Update IP Settings, then click the "Change and restart" button to reboot the Gateway and activate the new IP Address. See the FieldServer Toolbox and GUI Manual for more information.

5.2 Connecting to the ProtoCessor Web Configurator

- Navigate to the IP Address of the ProtoCessor on the local PC using one of two methods:
  - Open a web browser and enter the IP Address of the ProtoCessor; the default Ethernet address is 192.168.1.24
  - If using the FieldServer Toolbox (**Section 5.1.2**), click the Connect button

NOTE: If the IP Address of the ProtoCessor has been changed, the IP Address can be discovered using the FS Toolbox utility. See Appendix A.1 for instructions.

5.3 Set the Protocol and Device Instance/Device Address

- Select the field protocol by entering the appropriate number into the Protocol Selector Value and clicking the Submit button. **Wait for the system to reset as the configuration is updated.**
- Enter the Device Instance (BACnet) or Device Address (Metasys N2 or Modbus) to update the device ID. Click Submit and then click System Restart when prompted to update the ProtoCessor.

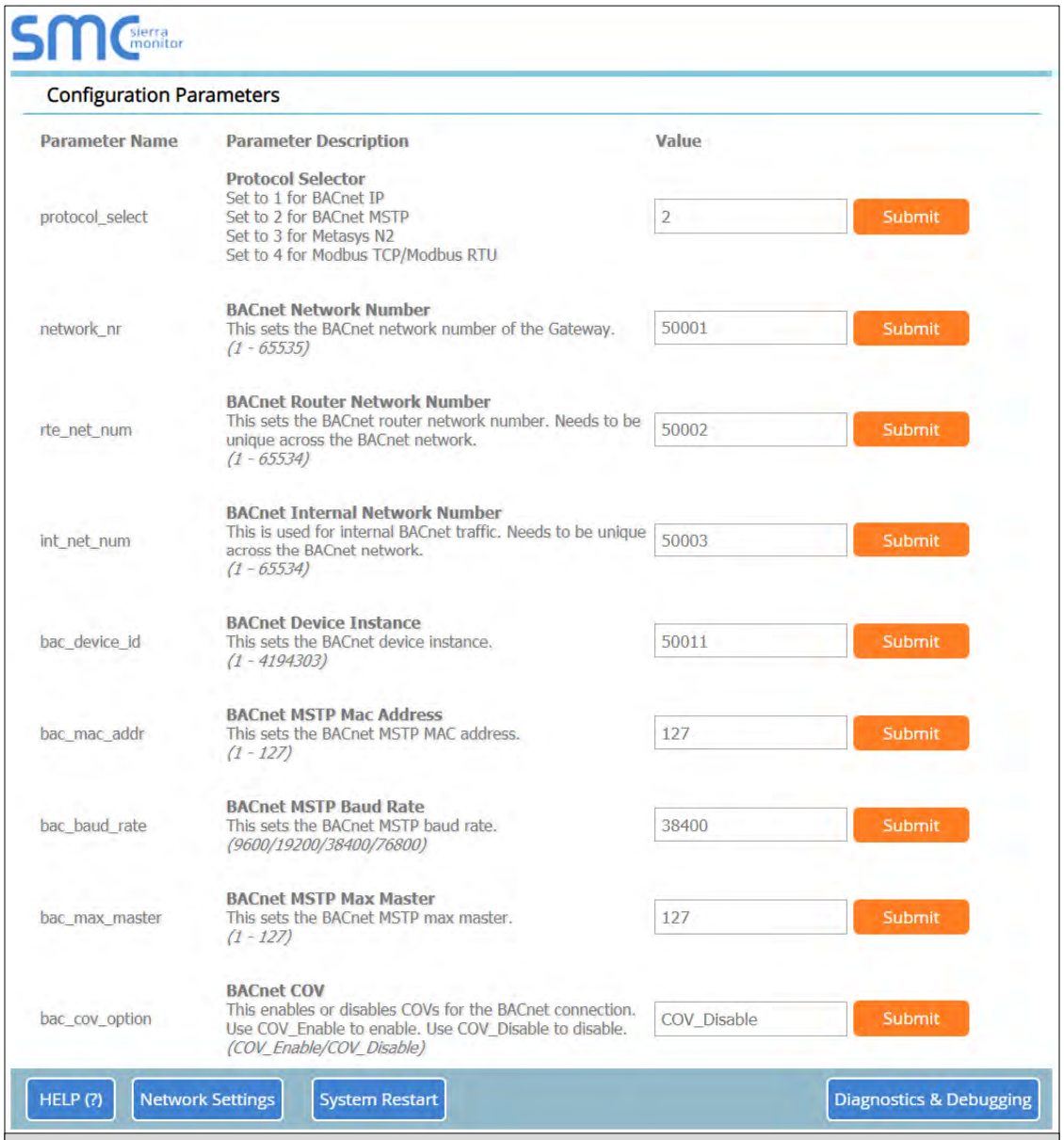


Figure 10: Web Configurator Parameters

5.4 Ethernet Network: Setting IP Address for Field Network

- After setting a local PC to the same subnet as the ProtoCessor (**Section 5.1**), open a web browser on the PC and enter the IP Address of the ProtoCessor; the default address is 192.168.1.24.
- Follow the steps outlined in **Section 5.2** to access the ProtoCessor Web Configurator.
- The Web Configurator is displayed as the landing page. (**Figure 11**)
- To access the FS-GUI, click on the "Diagnostics & Debugging" button in the bottom right side of the page.

Figure 11: Web Configurator Screen

- From the FS-GUI landing page, click on “Setup” to expand the navigation tree and then select “Network Settings” to access the IP Settings menu. (Figure 12)

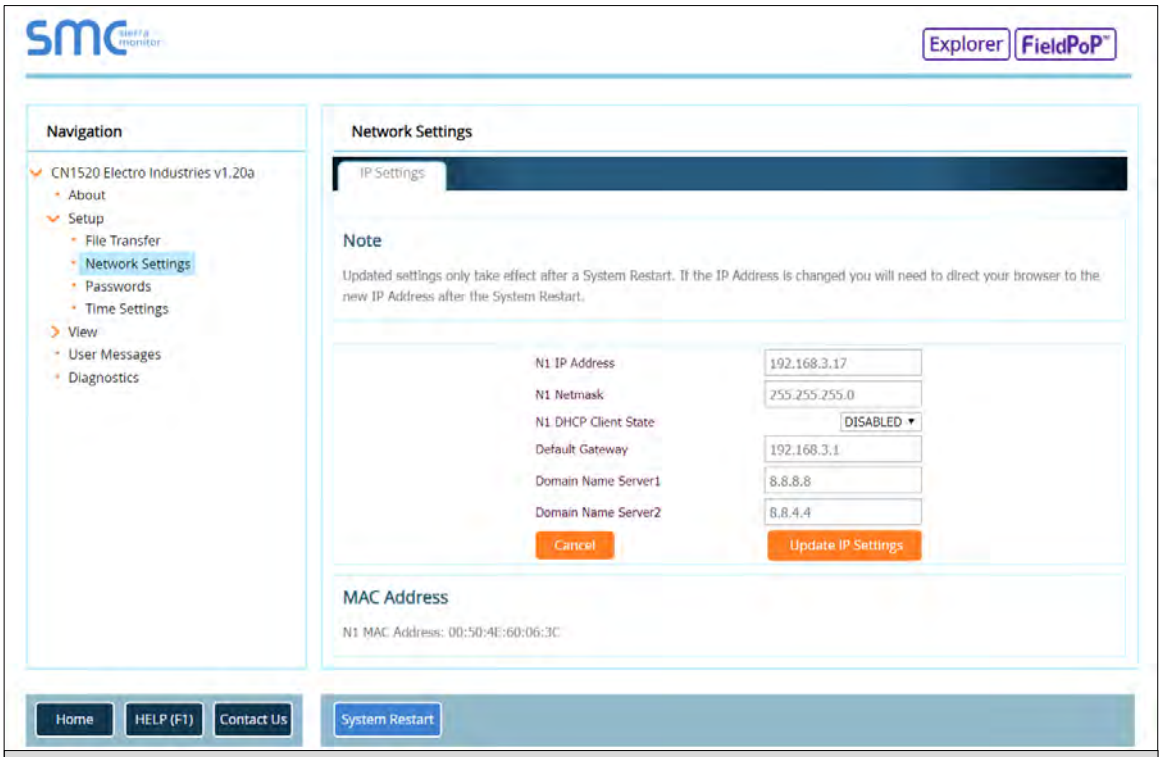


Figure 12: Changing IP Address via FS-GUI

- Modify the IP Address (N1 IP Address field) of the ProtoCessor Ethernet port.
- If necessary, change the Netmask (N1 Netmask field).
- If necessary, change the IP Gateway (Default Gateway field).

NOTE: If the ProtoCessor is connected to a managed switch/router, the IP Gateway of the ProtoCessor should be set to the IP Address of that managed switch/router.

- Click the “System Restart” button at the bottom of the page to apply changes and restart the ProtoCessor.
- Unplug Ethernet cable from PC and connect it to the network switch or router.
- Record the IP Address assigned to the ProtoCessor for future reference.

NOTE: The FieldPoP™ button FieldPoP™ (see Figure 12) allows users to connect to the SMC Cloud, Sierra Monitor’s device cloud solution for IIoT. The SMC Cloud enables secure remote connection to field devices through a FieldServer and its local applications for configuration, management, maintenance. For more information about the SMC Cloud, refer to the SMC Cloud Start-up Guide.

5.5 How to Start the Installation Over: Clearing Profiles

- Follow the steps outlined in **Section 5.2** to access the ProtoCessor Web Configurator.
- At the bottom-left of the page, click the “Clear Profiles and Restart” button.
- Once restart is complete, all past profiles discovered and/or added via Web configurator are deleted. The unit can now be reinstalled.

6 USING THE EMBEDDED BACNET EXPLORER

The embedded BACnet Explorer allows installers of the OEM product to validate that their equipment is working on BACnet without having to ask the BMS integrator to test the unit.

- To access the embedded BACnet Explorer, go to the FS-GUI page and click the Explorer button.

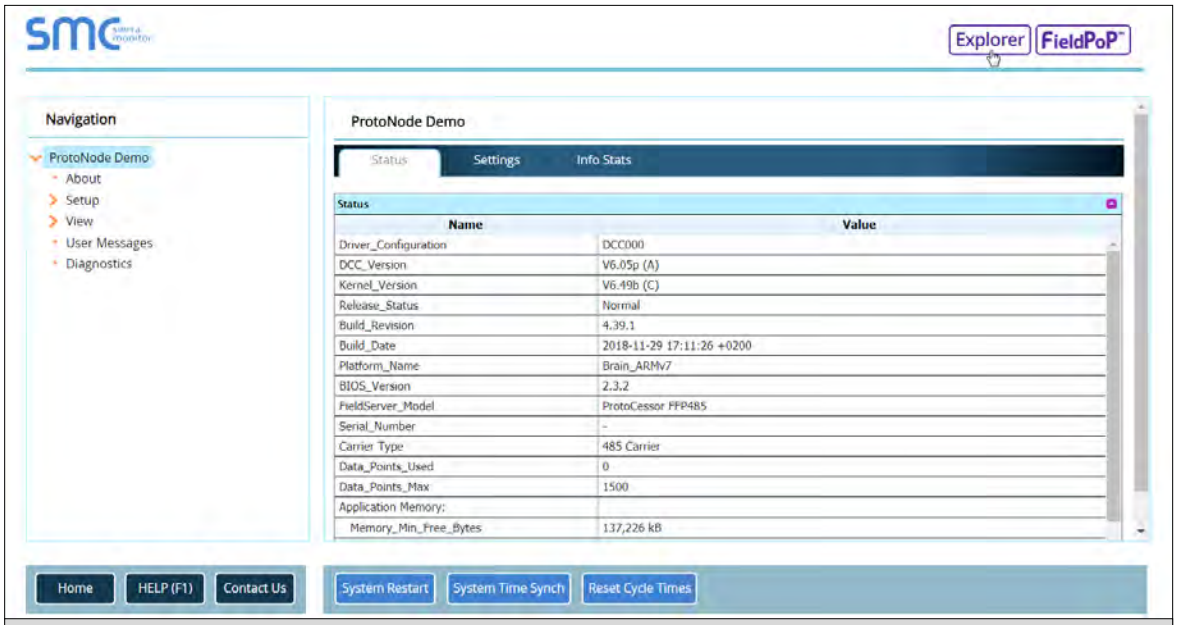


Figure 13: FS-GUI BACnet Explorer Button

- Then login to the BACnet Explorer page using the supplied username and password.

NOTE: The default user name is "admin" and the default password is "admin".

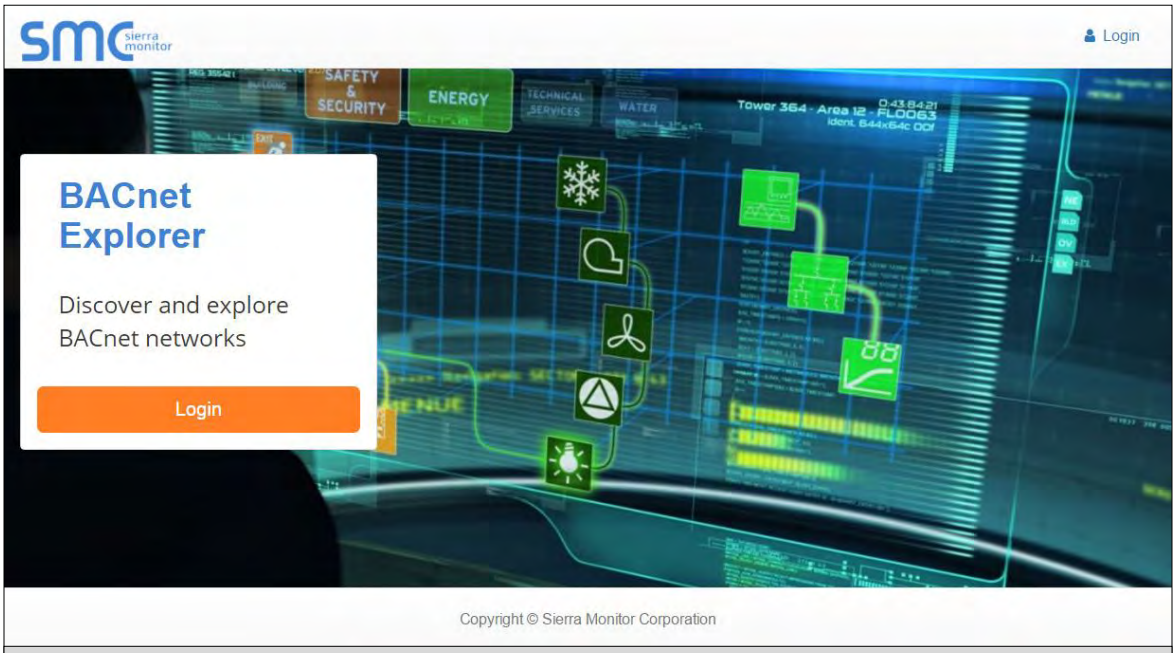


Figure 14: BACnet Explorer Login Page

NOTE: For BACnet/IP, click on the Settings button on the left side of the landing page to ensure the ProtoCessor is on the BACnet/IP network subnet or to configure BBMD.

6.1 Discover Device List

- From the BACnet Explorer landing page, click on the BACnet Explorer button on the left side of the screen to go to the BACnet Explorer page.

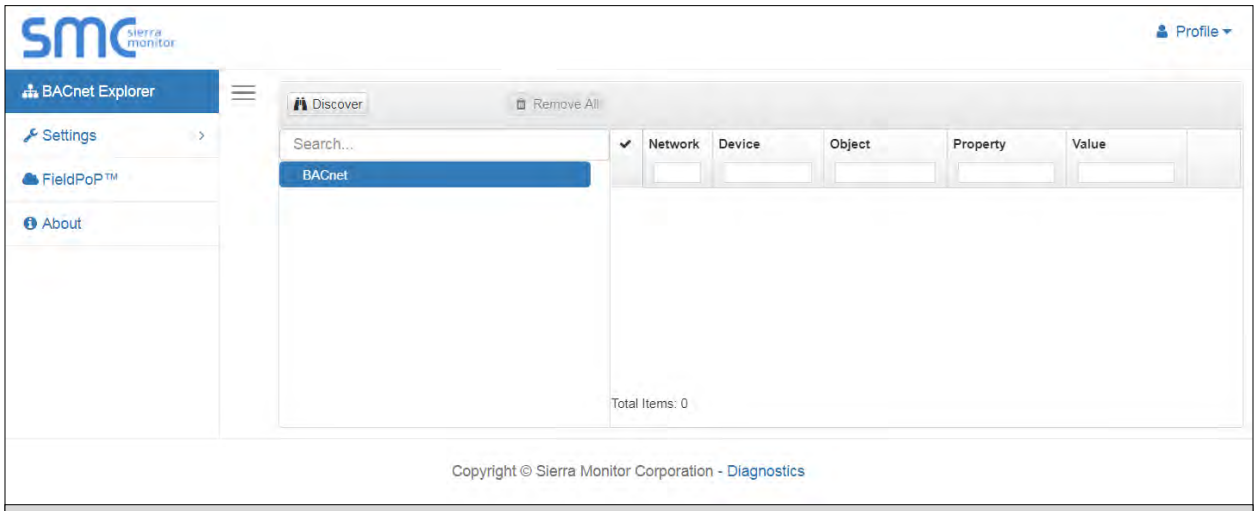


Figure 15: BACnet Explorer Page

- To discover the devices connected to the same subnet as the BACnet Explorer, click the Discover button (binocular icon).
- This will open the Discover window, click the checkboxes next to the desired search settings and click Discover to start the search.

Figure 16: Discover Window

NOTE: The "Discover All Devices" or "Discover All Networks" checkboxes must be unchecked to search for a specific device range or network.

NOTE: Allow the devices to populate before interacting with the device list for optimal performance. Any discovery or explore process will cause a green message to appear in the upper right corner of the browser to confirm that the action is complete.

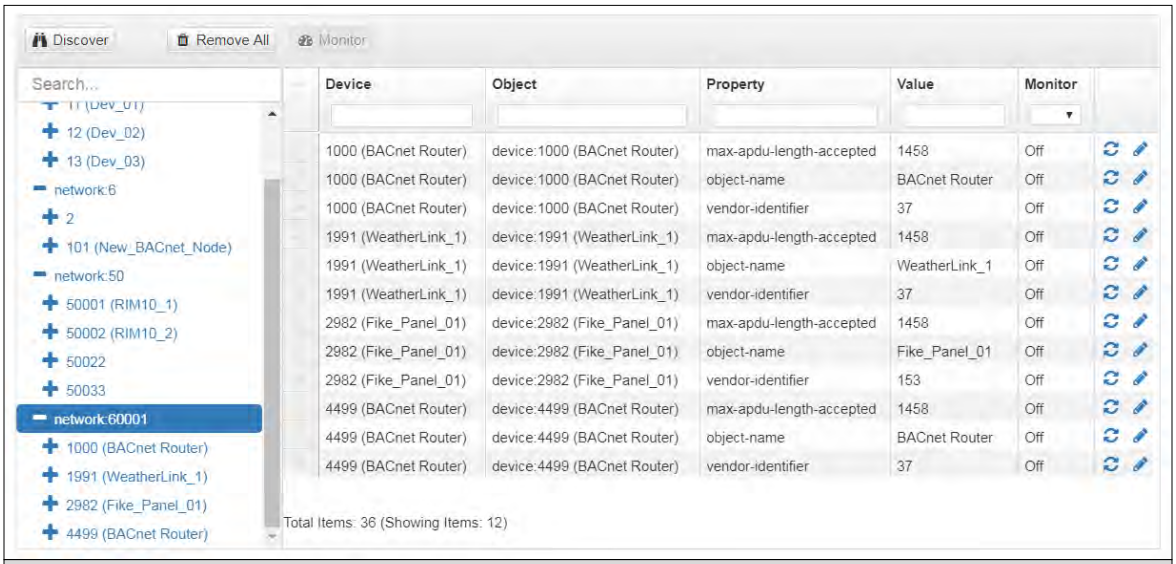


Figure 17: Device List

6.2 View Device Details and Explore Points/Parameters

- To view the device details, click the blue plus sign (+) next to the desired device in the list.
  - This will show only some of the device properties for the selected aspect of a device

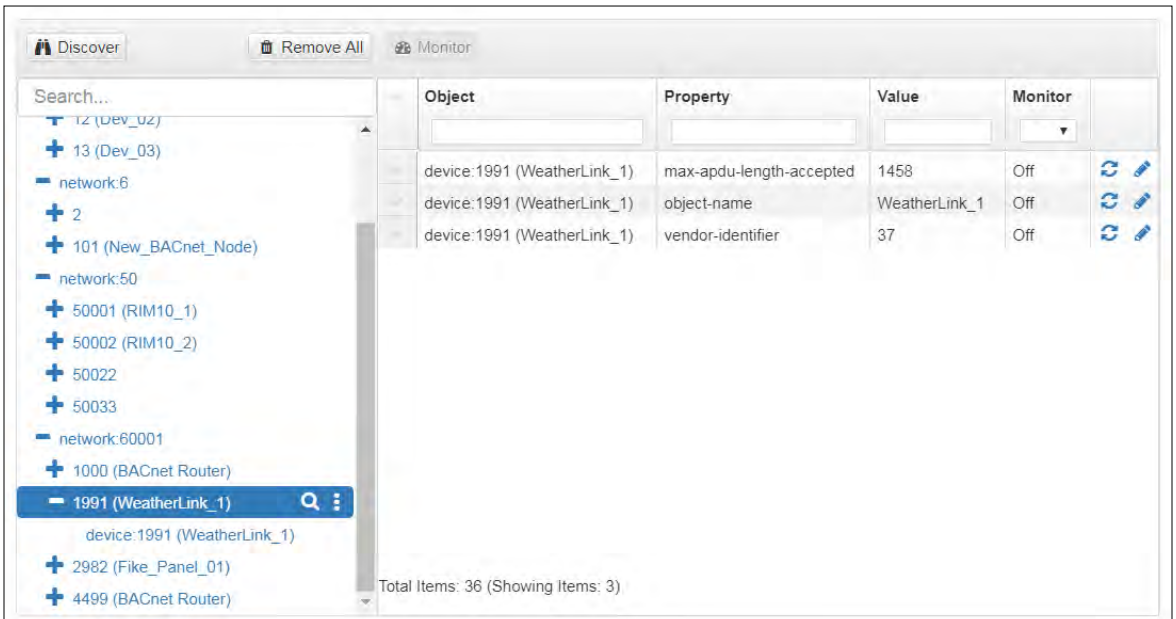


Figure 18: Device Sub-items

- To view the full details of a device, highlighting the device directly (in **Figure 19** "1991 WeatherLink_1") and click the Explore button ( ) that appears to the right of the highlighted device as a magnifying glass icon or double-click the highlighted device.

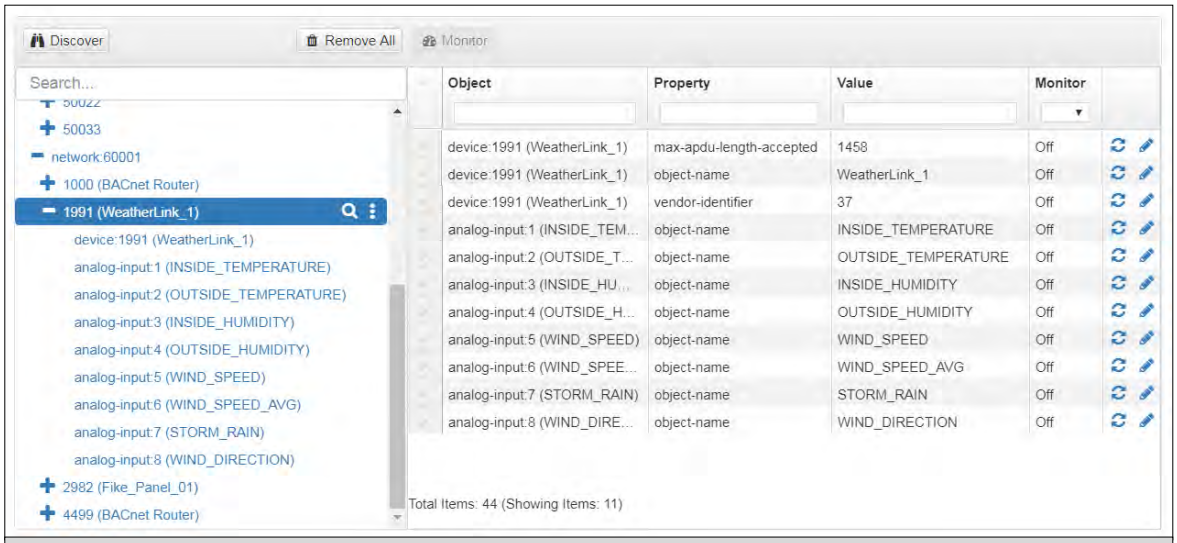


Figure 19: Full Device Sub-items

  - Now additional device details are viewable; however, the device can be explored even further

- Click on one of the device details.

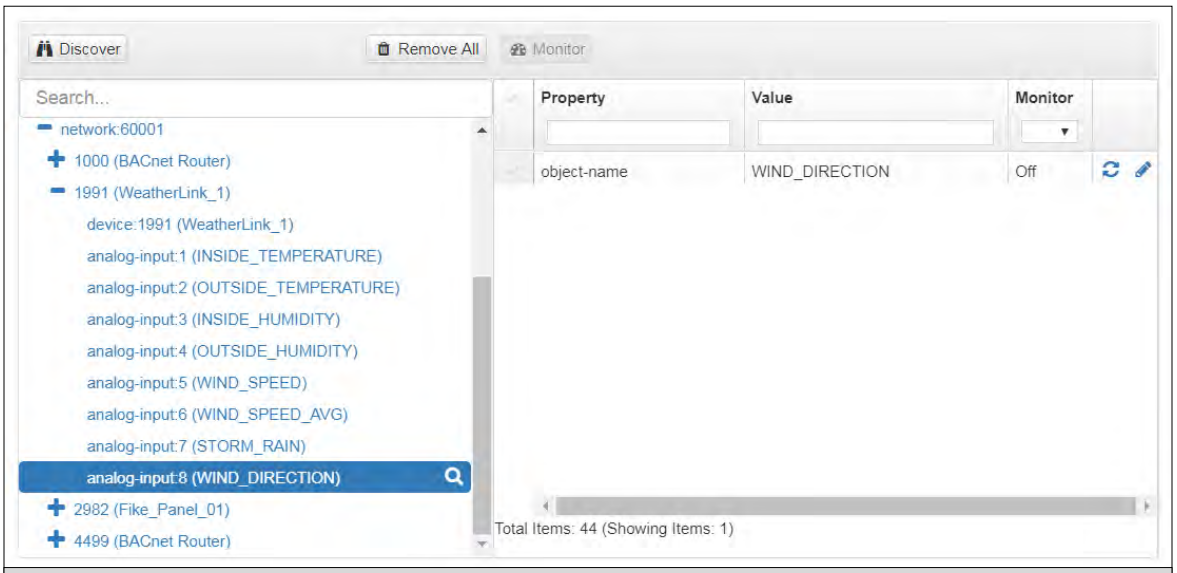


Figure 20: Simplified Device Details

- Then click on the Explore button or double-click the device object.

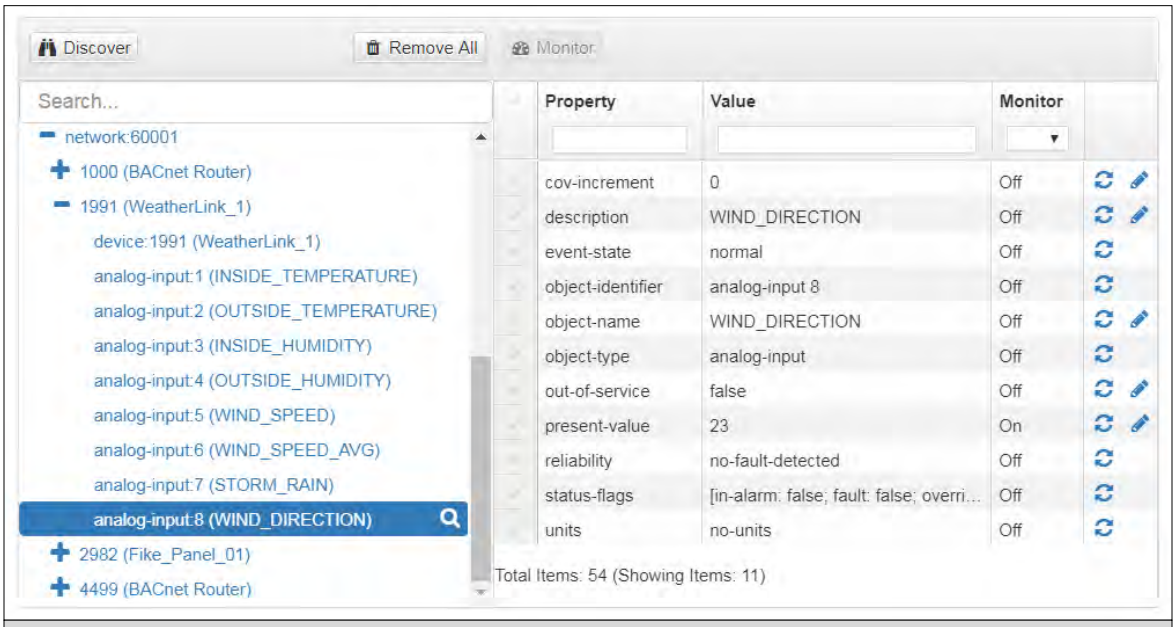


Figure 21: Additional Device Details

A full list of the device details will appear on the right side window. If changes are expected since the last explore, simply press the Refresh button ( ) that appears to right of individual properties to refresh the value.

NOTE: The Explorer Search Bar will find devices based on their Device ID.

NOTE: The Explorer Discovery Tree has 3 levels that correspond to the following.

- **Network number**
  - **Device**
    - **Device object**

6.2.1 Edit the Present Value Field

The only recommended field to edit via BACnet Explorer is the device's present value field.

NOTE: Other BACnet properties are editable (such as object name, object description, etc.); however, this is not recommended because the BACnet Explorer is a discovery tool not a Building Management System (BMS).

- To edit the present value, select it in the property listings.

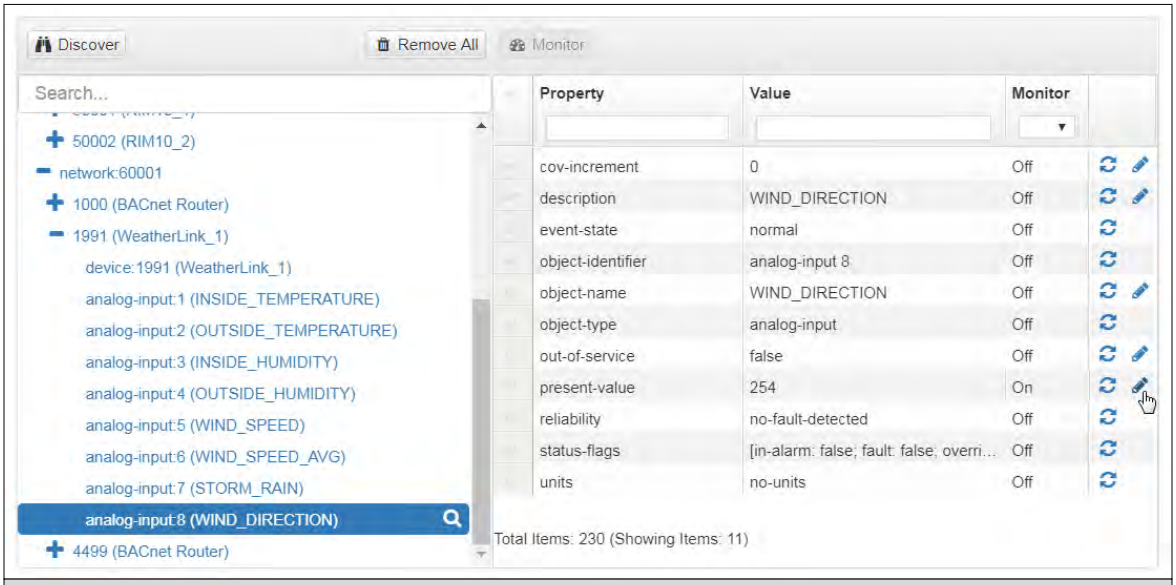


Figure 22: Highlighted Present Value

- Then click the Write button ( ) on the right of the property to bring up the Write Property window.

Figure 23: Write Property Window

- Enter the appropriate change and click the Write button.

  The window will close. When the BACnet Explorer page appears, the present value will be changed as specified.

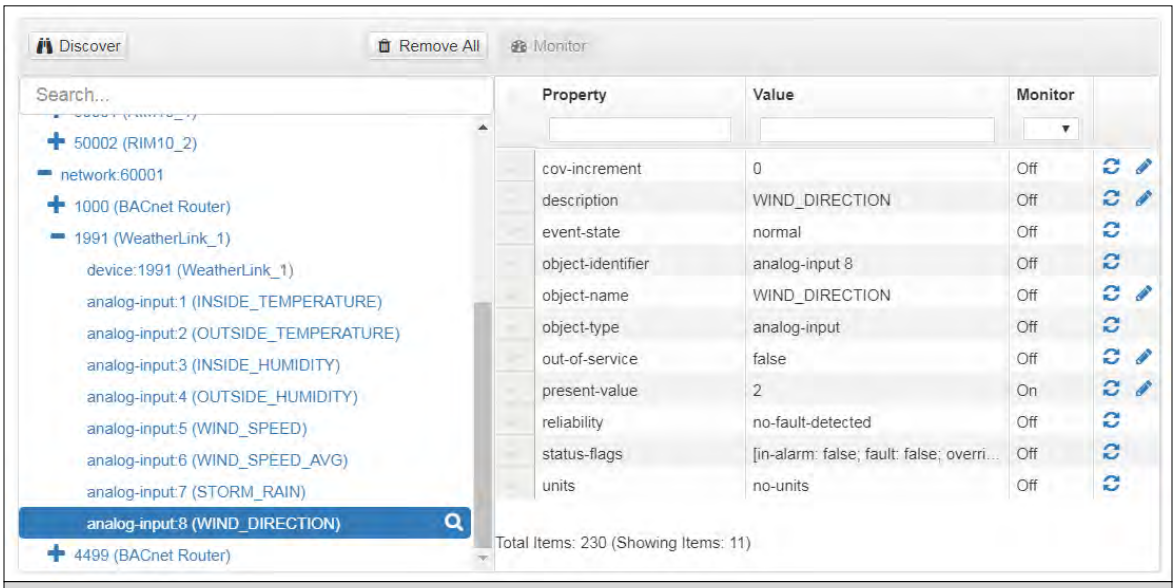


Figure 24: Updated Present Value

Appendix A Troubleshooting

Appendix A.1 Lost or Incorrect IP Address

- Ensure that FieldServer Toolbox is loaded onto the local PC. Otherwise, download the FieldServer-Toolbox.zip via the Sierra Monitor website's Software Downloads.
- Extract the executable file and complete the installation.

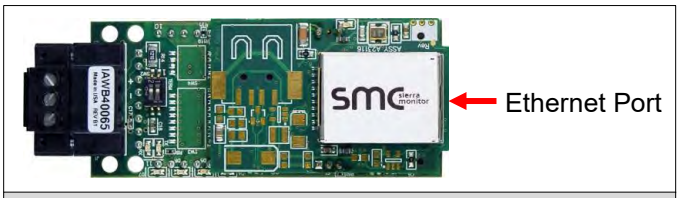
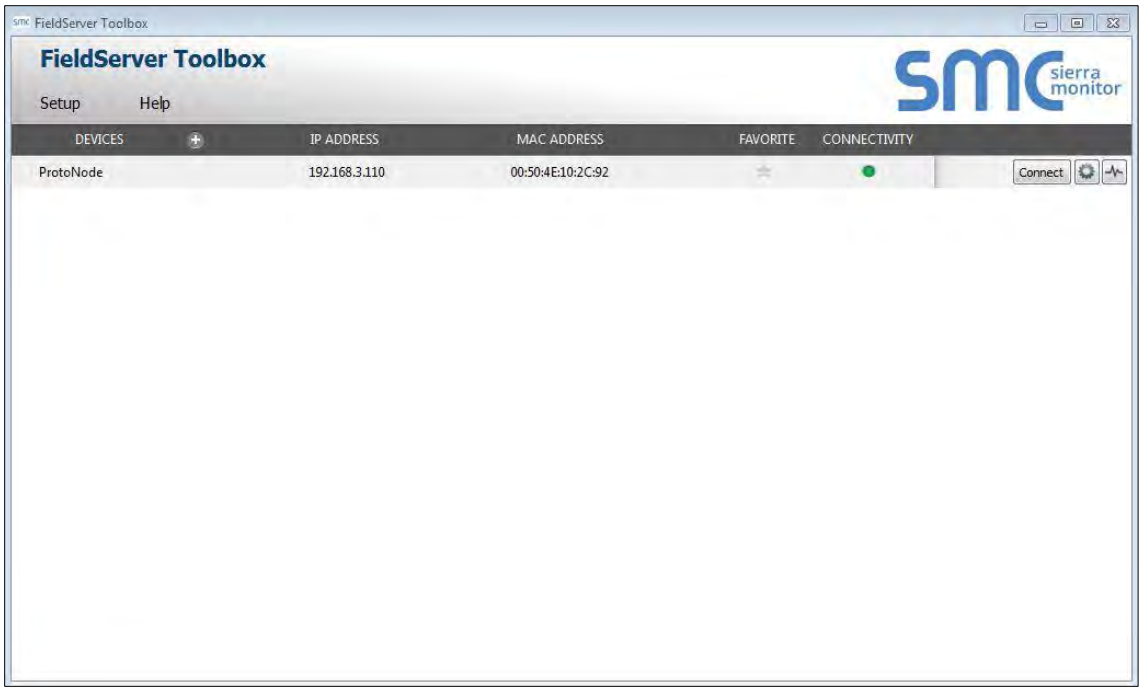


Figure 25: Ethernet Port Location

- Connect a standard Cat-5 Ethernet cable between the user's PC and ProtoCessor.
- Double click on the FS Toolbox Utility and click Discover Now on the splash page.
- Check for the IP Address of the desired gateway.



- If correcting the IP Address of the gateway: click the settings icon  on the same row as the gateway, then click Network Settings, change the IP Address and click Update IP Settings to save.

Appendix A.2 Viewing Diagnostic Information

- Type the IP Address of the ProtoCessor into the web browser or use the FieldServer Toolbox to connect to the ProtoCessor.
- Click on Diagnostics Button, then click on view, and then on connections.
- If there are any errors showing on the Connections page, refer to **Appendix A.3** to check the wiring and settings.

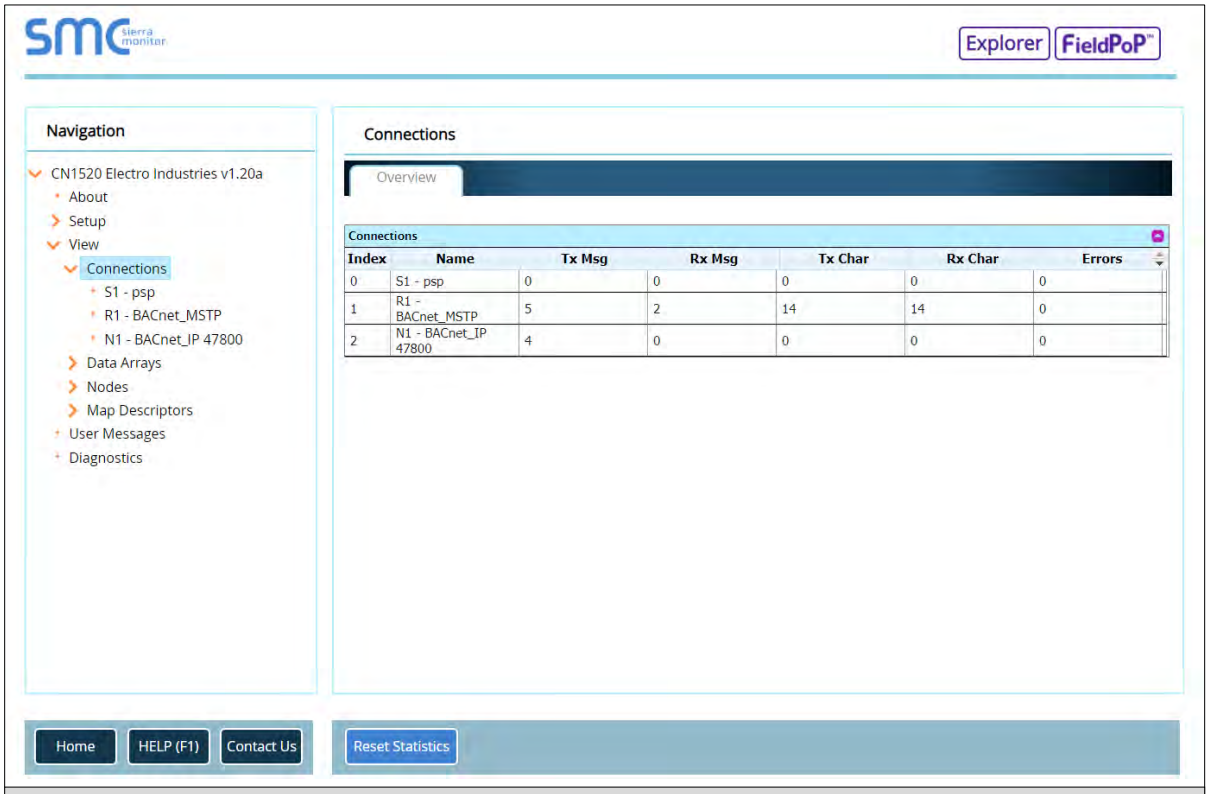


Figure 26: Error Messages Screen

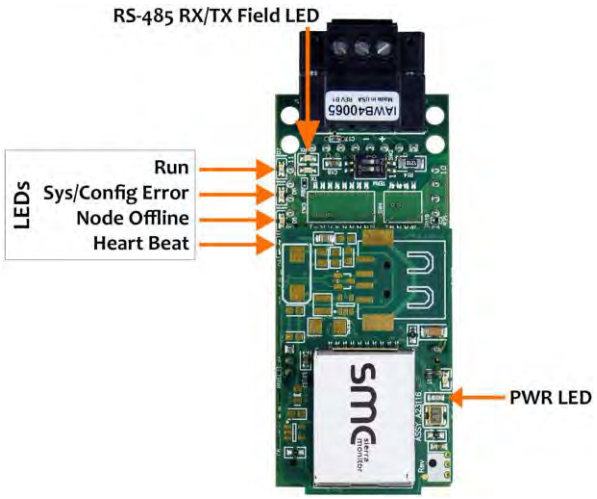
Appendix A.3 Checking Wiring and Settings

- No COMS on PSP side. If the Tx/Rx LEDs are not flashing rapidly then there is a COM issue. To fix, check the following:
  - Visual observations of LEDs on ProtoCessor (**Appendix A.4**)
  - Check baud rate, parity, data bits, stop bits
  - Check device address
  - Verify wiring
  - Verify device is connected to the same subnet as the ProtoCessor
- Field COM problems:
  - Visual observations of LEDs on the ProtoCessor (**Appendix A.4**)
  - Verify IP Address setting
  - Verify wiring

NOTE: If the problem still exists, a Diagnostic Capture needs to be taken and sent to technical support. (Appendix A.5)

Appendix A.4 LED Diagnostics for Communications Between ProtoCessor and Devices

See the diagram below for ProtoCessor FPC-ED2 LED Locations.



Tag	Description
Run	The Run LED will start flashing 20 seconds after power indicating normal operation. The **Heat Beat** LED has the same functionality but flashes more rapidly.
Sys/ Config Error	The Sys/Config Error 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 ProtoCessor. If this occurs, immediately report the related “system error” shown in the error screen of the GUI interface to Sierra Monitor Corporation for evaluation.
Node Offline	The Node Offline LED will turn on and stay solid if there is no communication with the device.
RX	The RX LED will flash when a message is received on the field port.
TX	The TX LED will flash when a message is sent on the field port.
PWR	This is the power light and should show steady green when ProtoCessor is powered.

Figure 27: Diagnostic LEDs

Appendix A.5 Taking a FieldServer Diagnostic Capture

When there is a problem on-site that cannot easily be resolved, perform a diagnostic capture before contacting support so that support can quickly solve the problem. There are two methods for taking diagnostic captures:

- **FieldServer Toolbox:**
  This method requires installation of the FS Toolbox program. A FS Toolbox diagnostic capture takes a snapshot of the loaded configuration files and a log of all the communications on the serial ports over a specified period of time. If the problem occurs over an Ethernet connection, then take a Wire Shark capture.
- **Gateway's FS-GUI Page:**
  This method doesn't require downloading software. The diagnostic capture utilities are embedded in the FS-GUI web interface. Starting a diagnostic capture takes a snapshot of the loaded configuration files and a log of all the communications over a specified period of time. This works for both serial and Ethernet connections.

NOTE: The information in the zipped files contains everything support needs to quickly resolve problems that occur on-site.

Appendix A.5.1 Using the FieldServer Toolbox

Once the Diagnostic Capture is complete, email it to technical support. The Diagnostic Capture will accelerate diagnosis of the problem.

- Ensure that FieldServer Toolbox is loaded onto the local PC. Otherwise, download the FieldServer-Toolbox.zip via the Sierra Monitor website's Software Downloads.
- Extract the executable file and complete the installation.

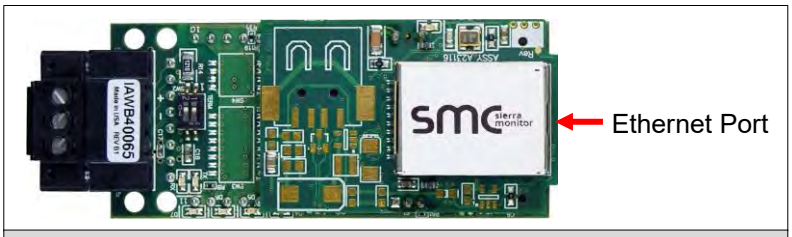
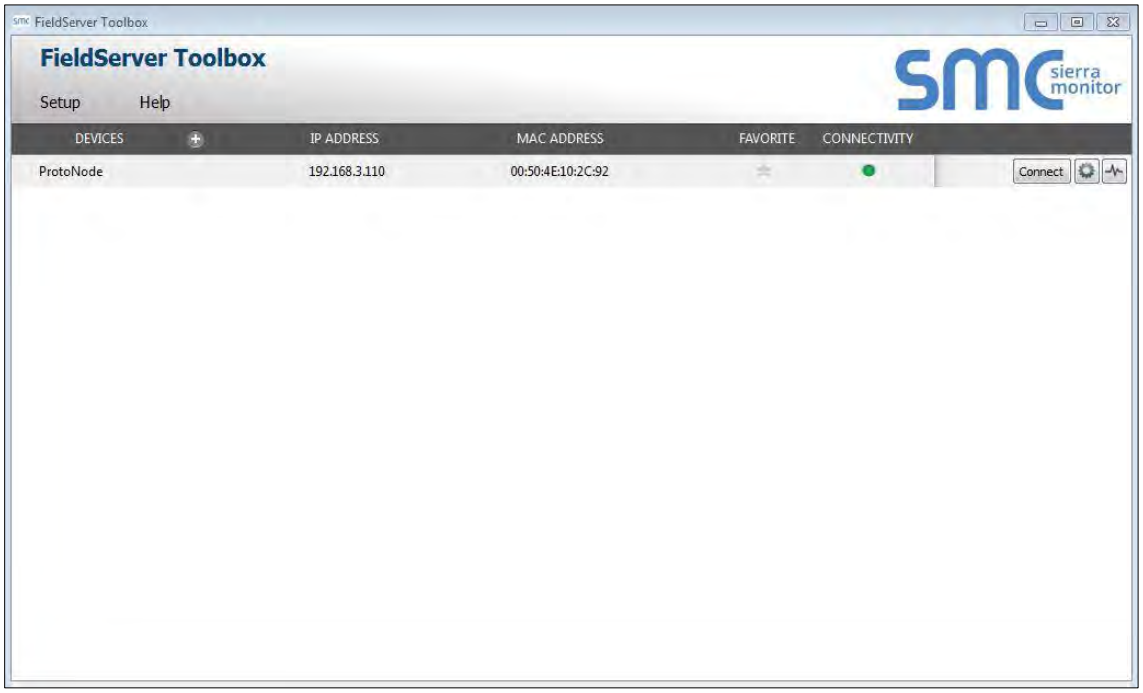


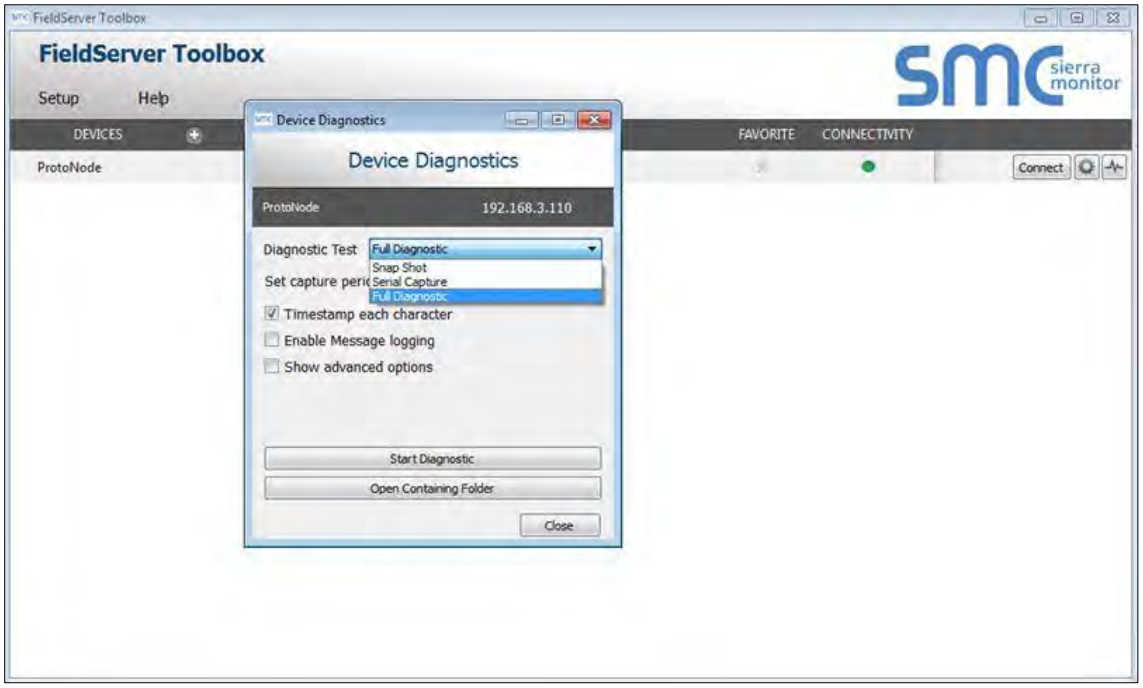
Figure 28: Ethernet Port Location

- Connect a standard Cat-5 Ethernet cable between the PC and ProtoCessor.
- Double click on the FS Toolbox Utility.

- **Step 1:** Take a Log
  - o Click on the diagnose icon  of the desired device

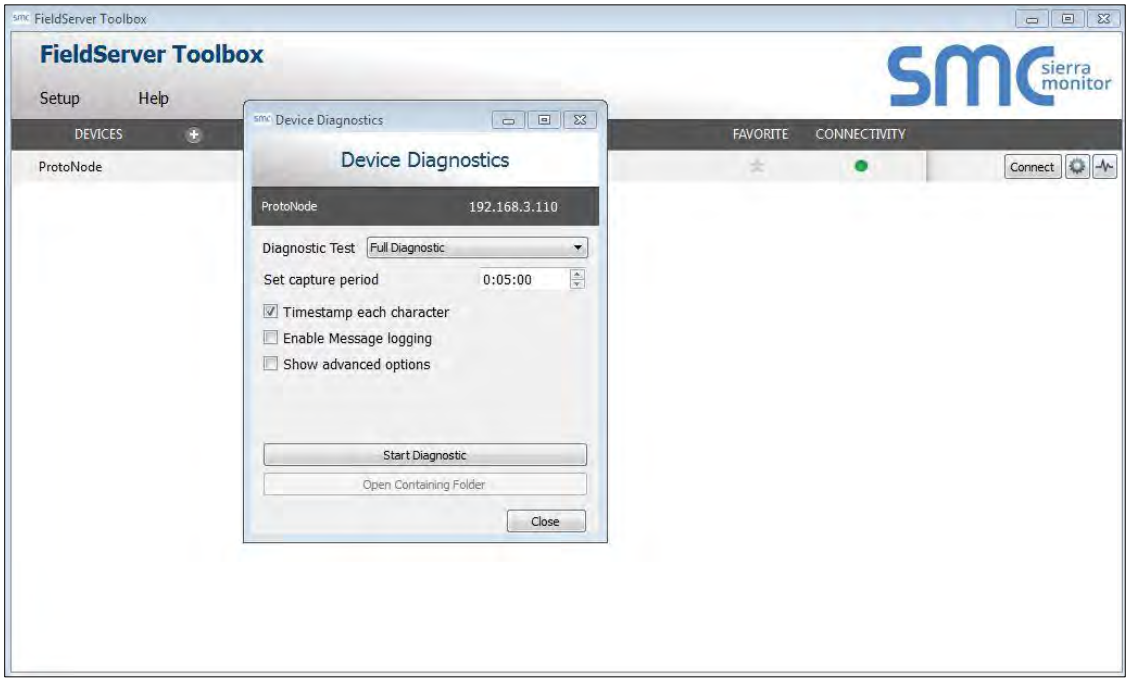


  - o Ensure “Full Diagnostic” is selected (this is the default)



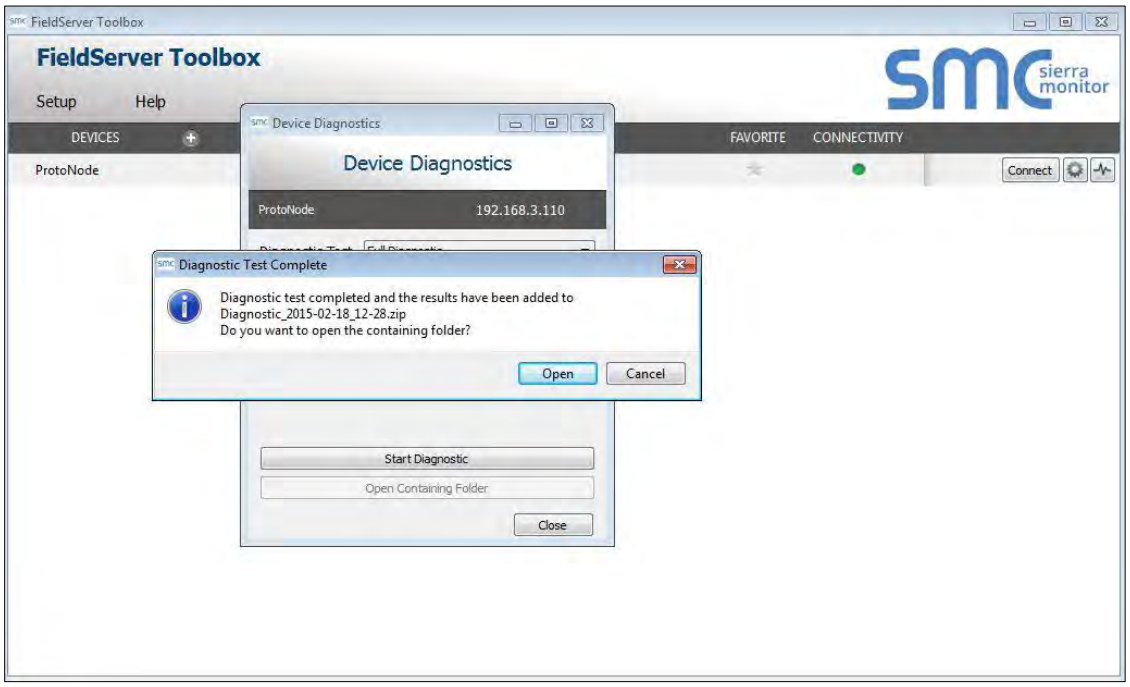
NOTE: If desired, the default capture period can be changed.

- Click on “Start Diagnostic”



- Wait for Capture period to finish, then the Diagnostic Test Complete window will appear

- **Step 2**: Send Log
  - Once the Diagnostic test is complete, a .zip file is saved on the PC



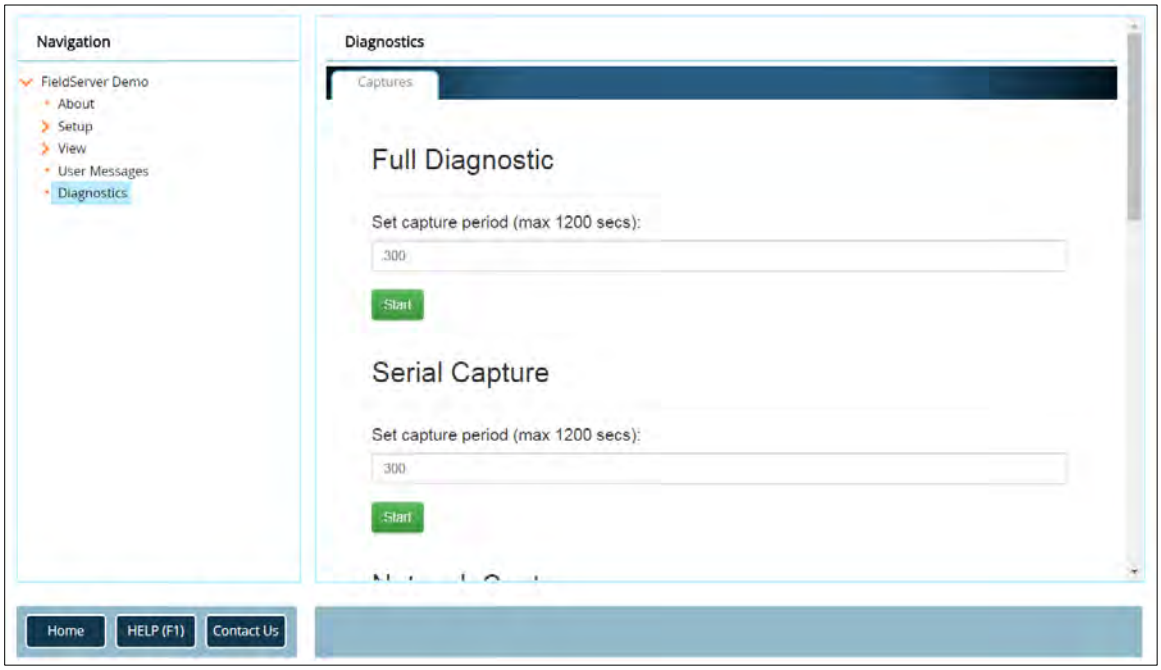
- Choose “Open” to launch explorer and have it point directly at the correct folder
- Send the Diagnostic zip file to technical support

Appendix A.5.2 Using FS-GUI

Diagnostic Capture via FS-GUI is only available on FieldServers with a bios updated/released on November 2017 or later. Completing a Diagnostic Capture through the FieldServer allows network connections (such as Ethernet and Wi-Fi) to be captured.

Once the Diagnostic Capture is complete, email it to technical support. The Diagnostic Capture will accelerate diagnosis of the problem.

- Open the FieldServer FS-GUI page.
- Click on Diagnostics in the Navigation panel.



- Go to Full Diagnostic and select the capture period.
- Click the Start button under the Full Diagnostic heading to start the capture.
  - When the capture period is finished, a Download button will appear next to the Start button

- Click Download for the capture to be downloaded to the local PC.
- Send the diagnostic zip file to technical support.

NOTE: Diagnostic captures of BACnet MS/TP communication are output in a ".PCAP" file extension which is compatible with Wireshark.

Appendix B Additional Information

Appendix B.1 Updating Firmware

To load a new version of the firmware, follow these instructions:

1. Extract and save the new file onto the local PC.
2. Open a web browser and type the IP Address of the FieldServer in the address bar.
   - Default IP Address is 192.168.1.24
   - Use the FS Toolbox utility if the IP Address is unknown (**Appendix A.1**)
3. Click on the "Diagnostics & Debugging" button.
4. In the Navigation Tree on the left-hand side, do the following:
   a. Click on "Setup"
   b. Click on "File Transfer"
   c. Click on the "General" tab
5. In the General tab, click on "Choose Files" and select the web.img file extracted in step 1.
6. Click on the orange "Submit" button.
7. When the download is complete, click on the "System Restart" button.

Appendix B.2 BACnet: Setting Network_Number for More Than One ProtoNode on the Subnet

For both BACnet MS/TP and BACnet/IP, if more than one ProtoNode is connected to the same subnet, they must be assigned unique Network_Number values.

On the main Web Configuration screen, update the BACnet Network Number field and click submit. The default value is 50001.

Figure 29: Web Configurator – Network Number Field

Appendix B.3 Securing ProtoCessor with Passwords

Access to the ProtoCessor can be restricted by enabling a password on the FS-GUI Passwords page – click Setup and then Passwords in the navigation panel. There are 2 access levels defined by 2 account names: Admin and User.

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

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 email the password recovery token to technical support to receive a temporary password from the customer support team. Access the ProtoCessor to set a new password.

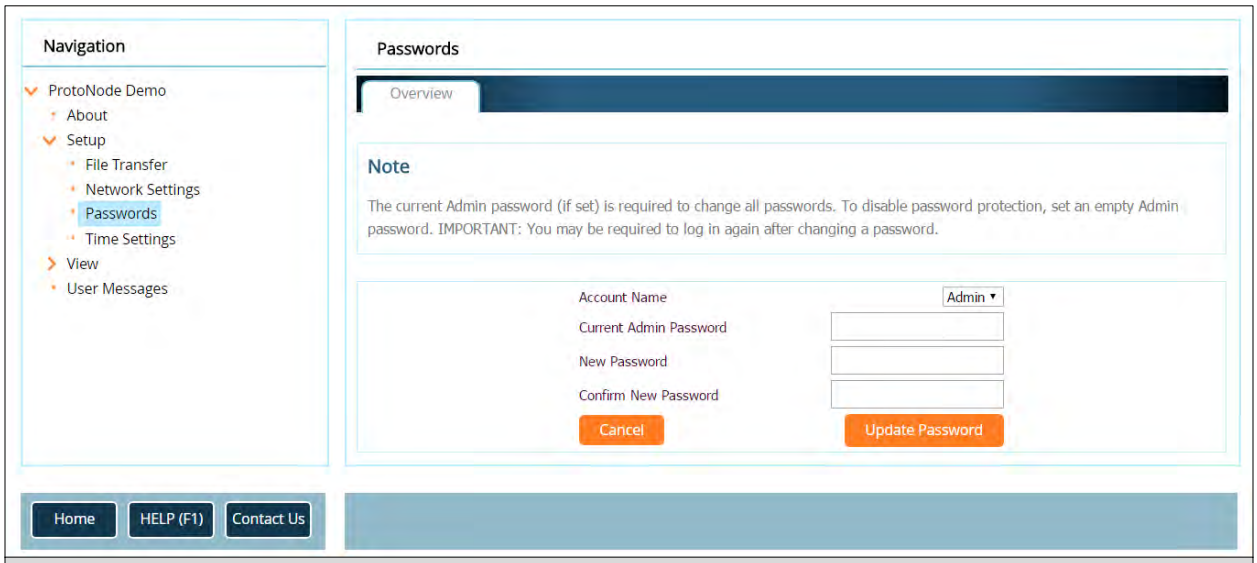


Figure 30: FS-GUI Passwords Page

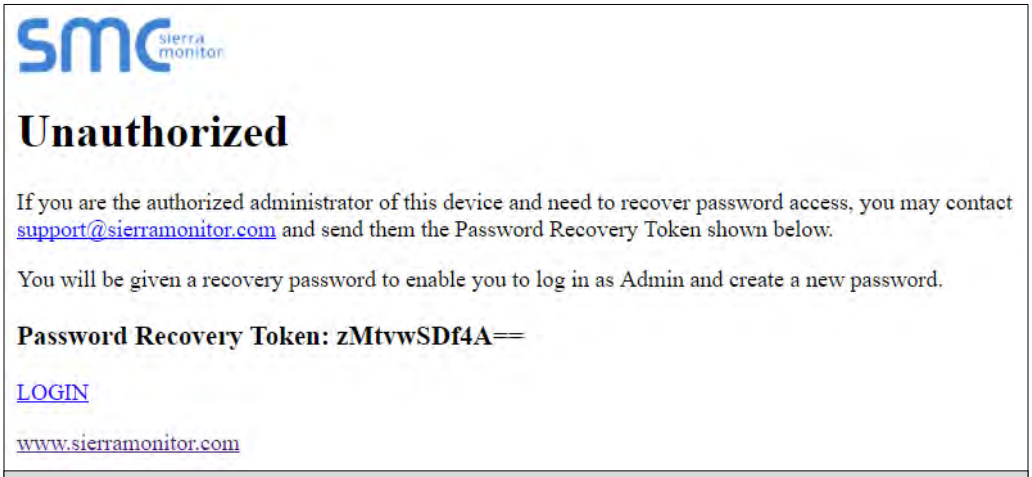


Figure 31: Password Recovery Page

Appendix C Vendor Information – Electro Industries

Appendix C.1 Meter PSP Mappings to BACnet, Metasys N2, Modbus TCP/IP and Modbus RTU

Point Name	BACnet Object Type	BACnet Object ID	N2 Data Type	N2 Address	Modbus Register
Return Temperature (RT) Deg_F	AI	1	AI	1	30001
Outdoor Temperature (OT)Deg_F	AI	2	AI	2	30002
Supply Temperature (ST) Deg_F	AI	3	AI	3	30003
Desired Temperature (DT) Deg_F	AI	4	AI	4	30004
RT Offset Deg_F	AV	5	AO	5	40001
OT Offset Deg_F	AV	6	AO	6	40002
ST Offset Deg_F	AV	7	AO	7	40003
Base Temp. High Mass (70-110F)	AV	8	AO	8	40004
Base Temp. Low Mass (120-140F)	AV	9	AO	9	40005
Set Point (40-195F)	AV	10	AO	10	40006
OT at 0 Degrees Set Point (40-195F)	AV	11	AO	11	40007
Current Stage Code	AI	12	AI	12	30101
Mode	MV	13	ADF	13	30102
Auto HL Fault Count	AI	14	AI	14	30103
Bender Fault Count	AI	15	AI	15	30104
LWCO Fault Count	AI	16	AI	16	30105
Remote Fault Count	AI	17	AI	17	30106
Manual HL Fault Count	AI	18	AI	18	30107
Freeze Fault Count	AI	19	AI	19	30108
Bad RT Fault Count	AI	20	AI	20	30109
Bad ST Fault Count	AI	21	AI	21	30110
Bad OT Fault Count	AI	22	AI	22	30111
Current Boiler Type	MV	23	ADF	23	30112
Current State	MV	24	ADF	24	30113
Maximum Stages (4-15)	AV	25	AO	25	40101
Differential Deg_F	MV	26	ADF	26	40102
Troubleshooting Stage Code	AV	27	AO	27	40103
0 to 10VDC (No or Yes)	MV	28	ADF	28	40104
Stage Seq Minutes (1-99 Minutes)	AV	29	AO	29	40105
Boiler Type	MV	30	ADF	30	40106
Lag Boiler Delay (0-999 Minutes)	AV	31	AO	31	40107
Force Troubleshooting (No or Yes)	MV	32	ADF	32	40108
Reset Fault Counts (No or Yes)	MV	33	ADF	33	40109
Micro Reset (No or Yes)	MV	34	ADF	34	40110
Factory Reset (No or Yes)	MV	35	ADF	35	11
Board Software Version	AI	36	AI	36	30201
Alarm_Remote	BI	37	DI	37	10001
Alarm_LWCO	BI	38	DI	38	10002
Alarm_Manual_HL	BI	39	DI	39	10003
Alarm_Bender	BI	40	DI	40	10004
Alarm_Auto_HL	BI	41	DI	41	10005
Alarm_Bad_RT	BI	42	DI	42	10006
Alarm_Bad_OT	BI	43	DI	43	10007
Alarm_Bad_ST	BI	44	DI	44	10008
Alarm_Freeze	BI	45	DI	45	10009
Return Temperature (RT) Deg_C	AI	101	AI	101	30301
Outdoor Temperature (OT)Deg_C	AI	102	AI	102	30302
Supply Temperature (ST) Deg_C	AI	103	AI	103	30303
Desired Temperature (DT) Deg_C	AI	104	AI	104	30304
RT Offset Deg_C	AV	105	AO	105	40201
OT Offset Deg_C	AV	106	AO	106	40202
ST Offset Deg_C	AV	107	AO	107	40203
Base Temp. High Mass (21-43C)	AV	108	AO	108	40204
Base Temp. Low Mass (48-60C)	AV	109	AO	109	40205
Set Point (4-90C)	AV	110	AO	110	40206

OT at -17 Degrees Set Point	AV	111	AO	111	40207
Differential Deg_C	MV	126	ADF	126	40302

Appendix D Reference

Appendix D.1 Specifications

	ProtoCessor FPC-ED2
Electrical Connections	One 3-pin Phoenix connector with RS-485 port (+ / - / gnd) One Ethernet 10/100 BaseT port
Approvals	CE certified; UL 916 approved; WEEE compliant; EN 60950-1, EN 50491-3 and CSA C22-2 standards; FCC Class A Part 15; DNP 3.0 conformance tested; RoHS compliant; CSA 205 approved
	BTL Marked
Power Requirements	5VDC
Physical Dimensions	6.9 x 3.0 x 2.0 cm (2.7 x 1.2 x 0.8 in.)
Weight	0.03 kg (0.07 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 32: Specifications

Appendix D.1.1 Compliance with UL Regulations

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

- 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:
  - Comply with local electrical code
  - Be suited to the expected operating temperature range
  - Meet the current and voltage rating for ProtoCessor
- Furthermore, the interconnecting power cable shall:
  - Be of length not exceeding 3.05m (118.3”)
  - 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.