

ProtoCessor FPC-ED4 Start-up Guide

**For Interfacing Electro Industries Products:
Meter**

**To Building Automation Systems:
LonWorks and SMC Cloud**

APPLICABILITY & EFFECTIVITY

Explains ProtoCessor hardware and how to install it.
The instructions are effective for the above as of July 2019.

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 2 pin LonWorks port to the field protocol cabling. (**Section 4.3**)
4. Connect a PC to the ProtoCessor via Ethernet cable. (**Section 5.1**)
5. Ethernet Network: Use a browser to access the ProtoCessor FS-GUI to change the IP Address. No changes to the configuration are necessary. (**Section 5.3**)
6. The ProtoCessor must be commissioned on the LonWorks network. This must be done by a LonWorks administrator using a LonWorks commissioning tool. (**Section 6**)

TABLE OF CONTENTS

- 1 Certification 6**
 - 1.1 LonMark Certification 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-ED4 Showing Connection Ports 10
 - 4.3 Wiring Field Port to LonWorks Network 10
- 5 Use the ProtoCessor FS-GUI to Setup the Gateway 11**
 - 5.1 Connecting to the ProtoCessor via Ethernet 11
 - 5.1.1 Changing the Subnet of the Connected PC 11
 - 5.1.2 Changing the IP Address of the ProtoCessor with FieldServer Toolbox 12
 - 5.2 Connecting to the ProtoCessor FS-GUI 13
 - 5.3 Ethernet Network: Setting IP Address for the Field Network 13
- 6 Commissioning ProtoCessor on a LonWorks Network 15**
 - 6.1 Commissioning ProtoCessor FPC-ED4 on a LonWorks Network 15
 - 6.1.1 Instructions to Upload XIF File from ProtoCessor Using Browser 15
- Appendix A Troubleshooting 17**
 - Appendix A.1 Lost or Incorrect IP Address 17
 - Appendix A.2 Viewing Diagnostic Information 18
 - Appendix A.3 Checking Wiring and Settings 19
 - Appendix A.4 LED Diagnostics for Communications Between ProtoCessor and Devices 20
 - Appendix A.5 Taking a FieldServer Diagnostic Capture 21
 - Appendix A.5.1 Using the FieldServer Toolbox 21
 - Appendix A.5.2 Using FS-GUI 24
- Appendix B Additional Information 25**
 - Appendix B.1 Updating Firmware 25
 - Appendix B.2 Securing ProtoCessor with Passwords 26
- Appendix C Vendor Information – Electro Industries 27**
 - Appendix C.1 Meter PSP Mappings to LonWorks 27
 - Appendix C.2 Additional Notes 29
 - Appendix C.2.1 Communications (LON) 29
- Appendix D Reference 31**
 - Appendix D.1 Specifications 31
 - Appendix D.1.1 Compliance with UL Regulations 31
- Appendix E Limited 2 Year Warranty 32**

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-ED4 10

Figure 7: LonWorks Terminal Connector 10

Figure 8: Ethernet Port Location 11

Figure 9: FS-GUI Landing Page 13

Figure 10: Changing IP Address via FS-GUI 14

Figure 11: LonWorks Service Pin Location 15

Figure 12: Sample of Fserver.XIF File Generated 16

Figure 13: Ethernet Port Location 17

Figure 14: Error Messages Screen 18

Figure 15: Diagnostic LEDs 20

Figure 16: Ethernet Port Location 21

Figure 17: FS-GUI Passwords Page..... 26

Figure 18: Password Recovery Page 26

Figure 19: Specifications 31

1 CERTIFICATION

1.1 LonMark Certification



LonMark International is the recognized authority for certification, education, and promotion of interoperability standards for the benefit of manufacturers, integrators and end users. LonMark International has developed extensive product certification standards and tests to provide the integrator and user with confidence that products from multiple manufacturers utilizing LonMark devices work together. Sierra Monitor has more LonMark Certified gateways than any other gateway manufacturer, including the ProtoCessor, ProtoCarrier and ProtoCessor for OEM applications and the full featured, configurable gateways.

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 LonWorks®¹.

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-ED4 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](#).

¹ LonWorks is a registered trademark of Echelon Corporation

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-ED4-1564

Figure 1: ProtoCessor Part Numbers

- FPC-ED4 units have the following 2 ports: LonWorks + 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-ED4-1564	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

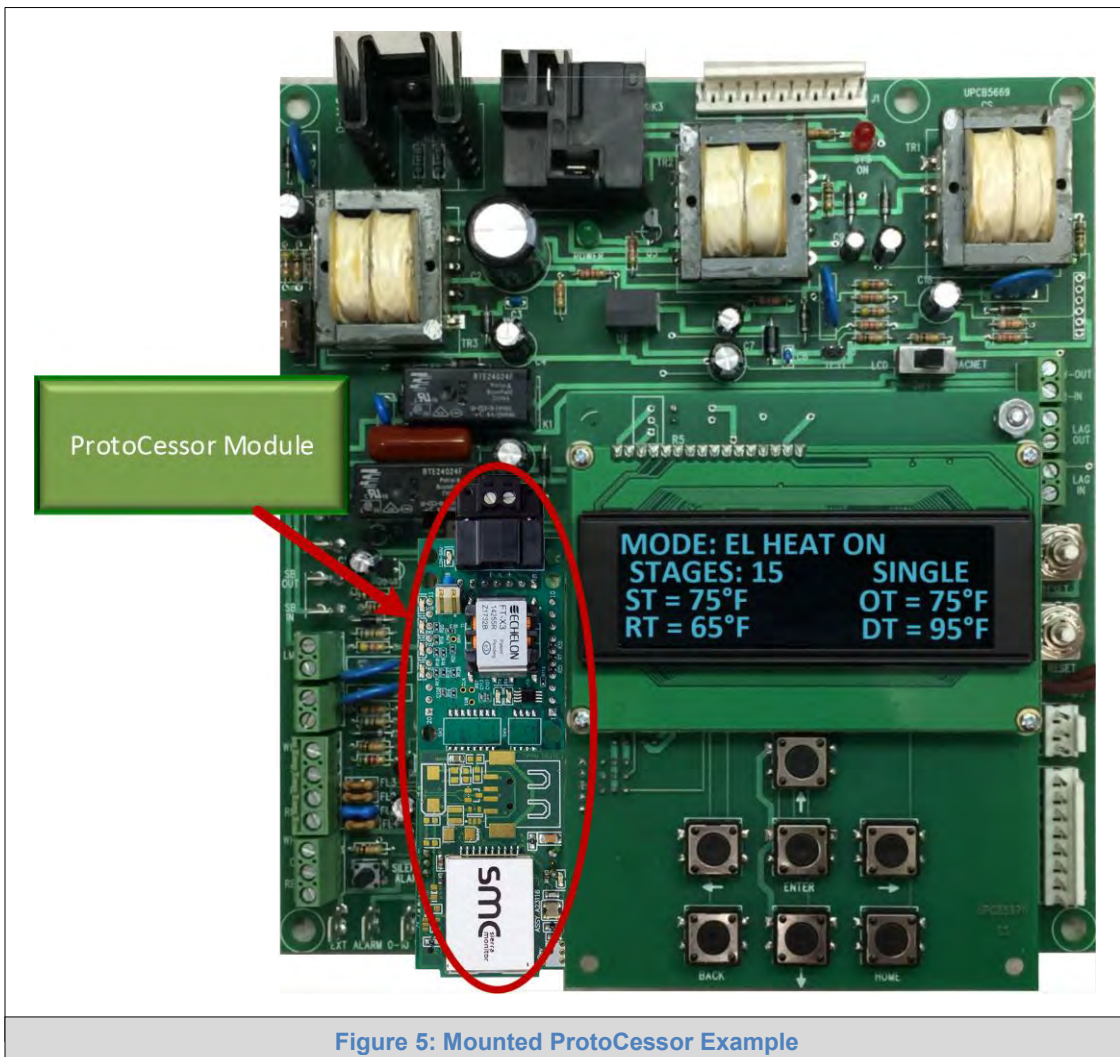
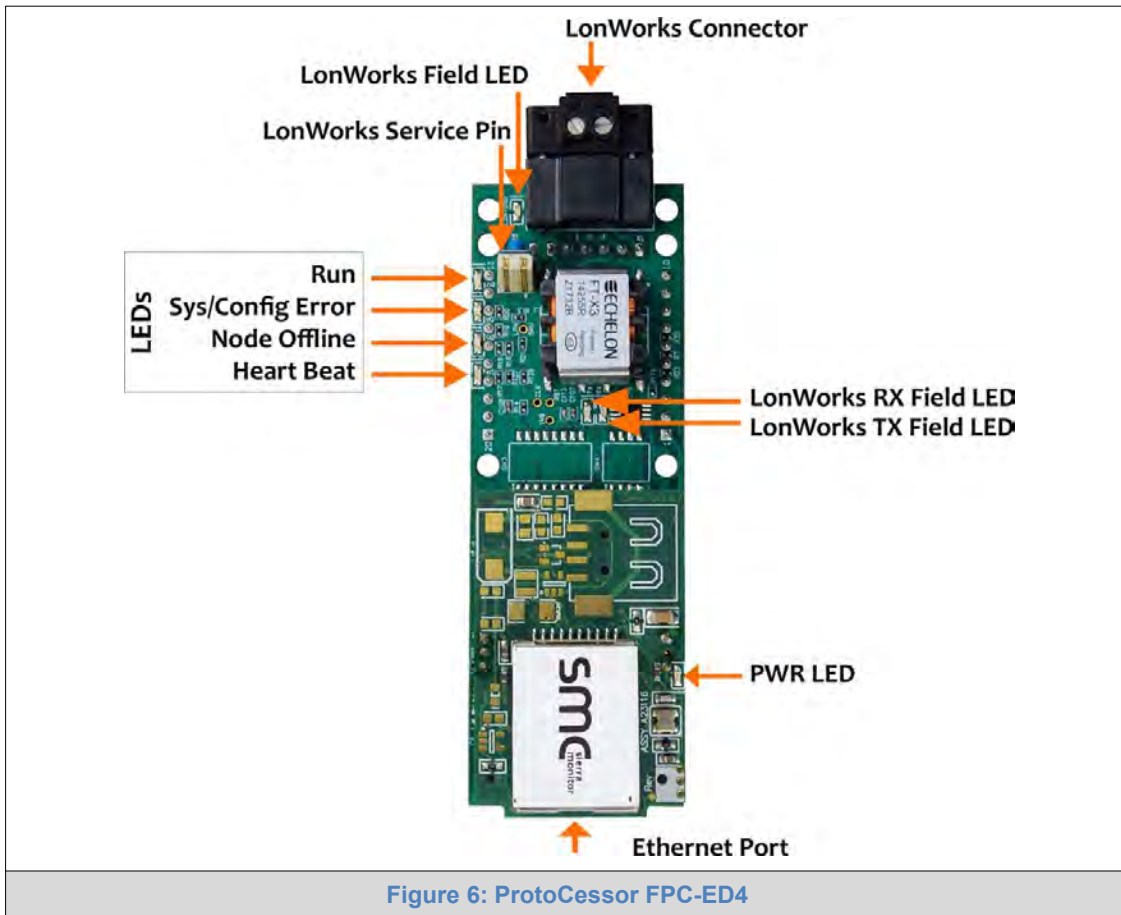


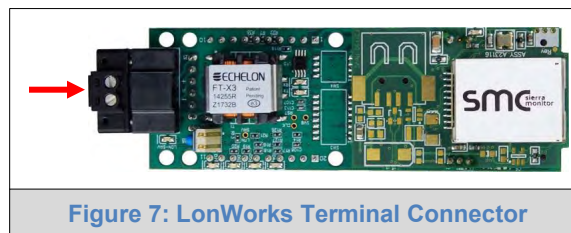
Figure 5: Mounted ProtoCessor Example

4.2 ProtoCessor FPC-ED4 Showing Connection Ports



4.3 Wiring Field Port to LonWorks Network

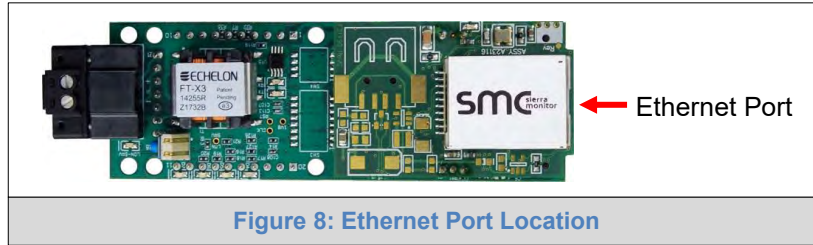
- Wire the LonWorks device network to the ProtoCessor LonWorks Terminal.
 - Use approved cable per the FT-10 installation guidelines
- LonWorks has no polarity.



5 USE THE PROTOCESSOR FS-GUI 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.




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:

Use the following IP address:

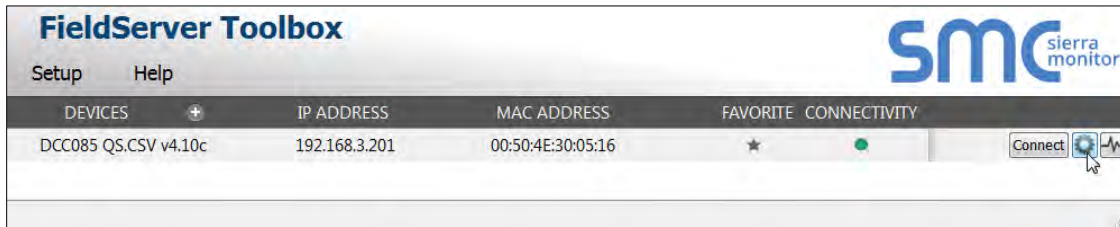
IP address:	192 . 168 . 1 . 11
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	. . .

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

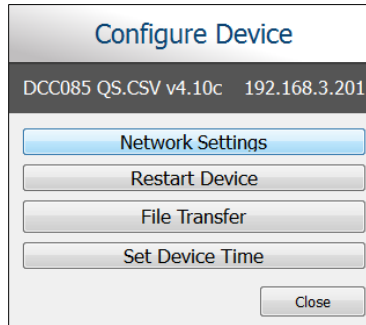
5.1.2 Changing the IP Address of the ProtoCessor with FieldServer Toolbox

- 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.

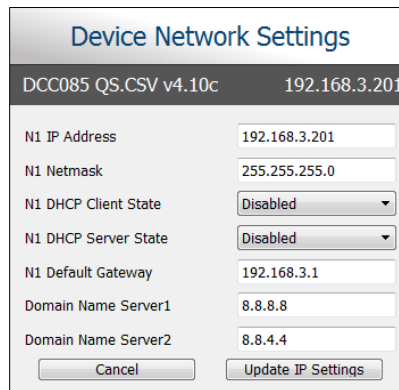
NOTE: If connectivity status is green, then the IP Address doesn't need to be changed (the ProtoCessor is already on the same subnet). Skip the rest of the section.



- 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 FS-GUI

- 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 Ethernet Network: Setting IP Address for the Field Network

- The FS-GUI is displayed as the landing page.

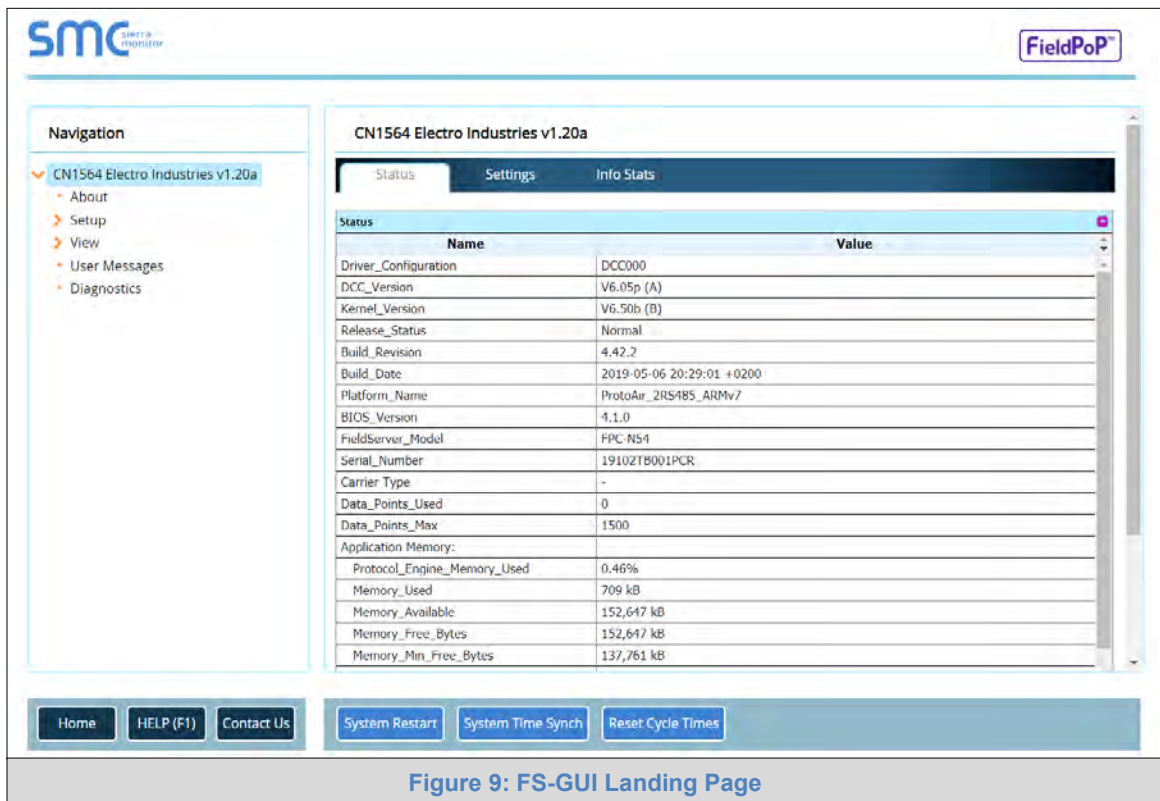


Figure 9: FS-GUI Landing Page

- Click on “Setup” to expand the navigation tree and then select “Network Settings” to access the IP Settings menu. (Figure 10)

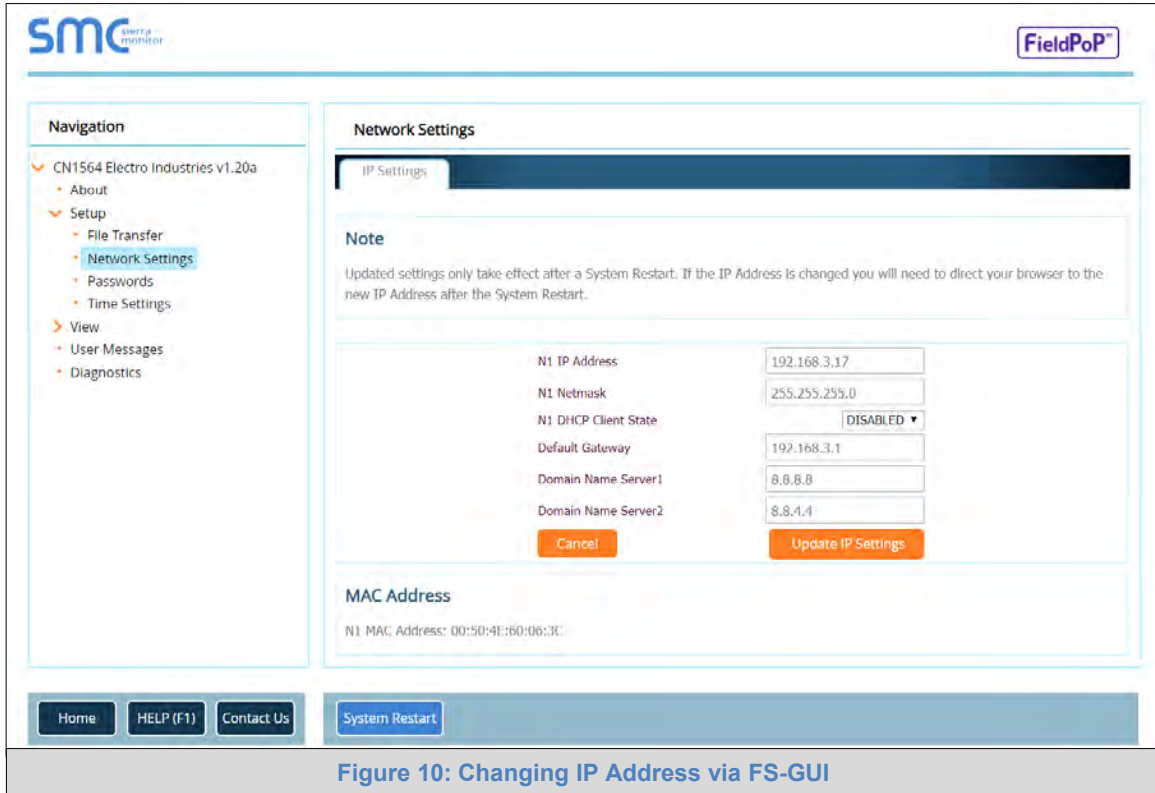



Figure 10: Changing IP Address via FS-GUI

- 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  (see Figure 10) 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](#).

6 COMMISSIONING PROTOCESSOR ON A LONWORKS NETWORK

Commissioning may only be performed by the LonWorks administrator.

6.1 Commissioning ProtoCessor FPC-ED4 on a LonWorks Network

During the commissioning process, the LonWorks administrator may prompt the user to hit the service pin on the ProtoCessor FPC-ED4 at a specific point (this step occurs at different points of the commissioning process for each LonWorks network management tool).

- If an XIF file is required, see steps in **Section 6.1.1** to generate XIF.

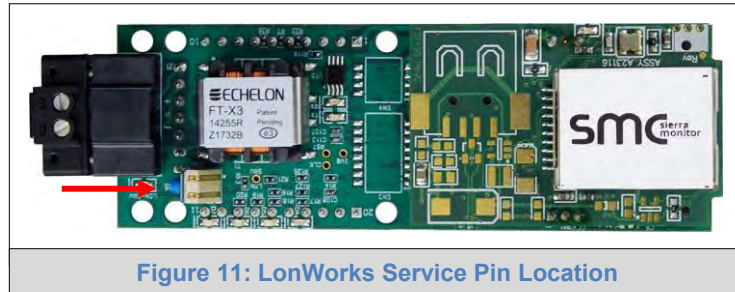


Figure 11: LonWorks Service Pin Location

6.1.1 Instructions to Upload XIF File from ProtoCessor Using Browser

- Connect a Cat-5 Ethernet cable (straight through or cross-over) between the PC and ProtoCessor.
- 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:

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

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

- Open a web browser and go to the following address: [IP Address of ProtoCessor]/fserver.xif
 - Example: 192.168.1.24/fserver.xif
- If the web browser prompts to save the file, save the file onto the PC. If the web browser displays the xif file as a web page, save the file onto the local PC as “fserver.xif”.

```

File: fserver.xif generated by LonDriver Revision 1.30(d), XIF Version 4.0
Copyright (c) 2000-2012 by FieldServer Technologies
All Rights Reserved. Run on Thu Jan 1 00:00:00 1970

90:00:95:47:1E:02:04:7C
2 15 1 4 0 14 11 3 3 12 14 11 11 11 11 3 0 16 63 0 1 11 4
32 5 19 13 28 0 0 15 5 3 109 63
1 7 1 0 4 4 4 15 200 0
78125 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 1 5 8 5 12 14 15
*
"FFP-Lon Demo

VAR nviAnalog_01 0 0 0 0
0 1 63 0 0 0 0 0 0 0 0 0 0
*
51 * 1
4 0 4 0 0
VAR nvoAnalog_01 1 0 0 0
0 1 63 1 0 0 0 0 0 0 0 0
*
51 * 1
4 0 4 0 0
VAR nviBinary_01 2 0 0 0
0 1 63 0 0 0 0 0 0 0 0 0
*
95 * 2
1 0 0 0 0
1 0 0 1 0
VAR nvoBinary_01 3 0 0 0
0 1 63 1 0 0 0 0 0 0 0 0
*
95 * 2
1 0 0 0 0
1 0 0 1 0

```

Figure 12: Sample of Fserver.XIF File Generated

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.

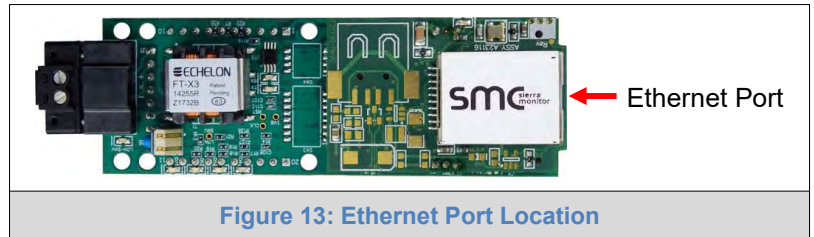
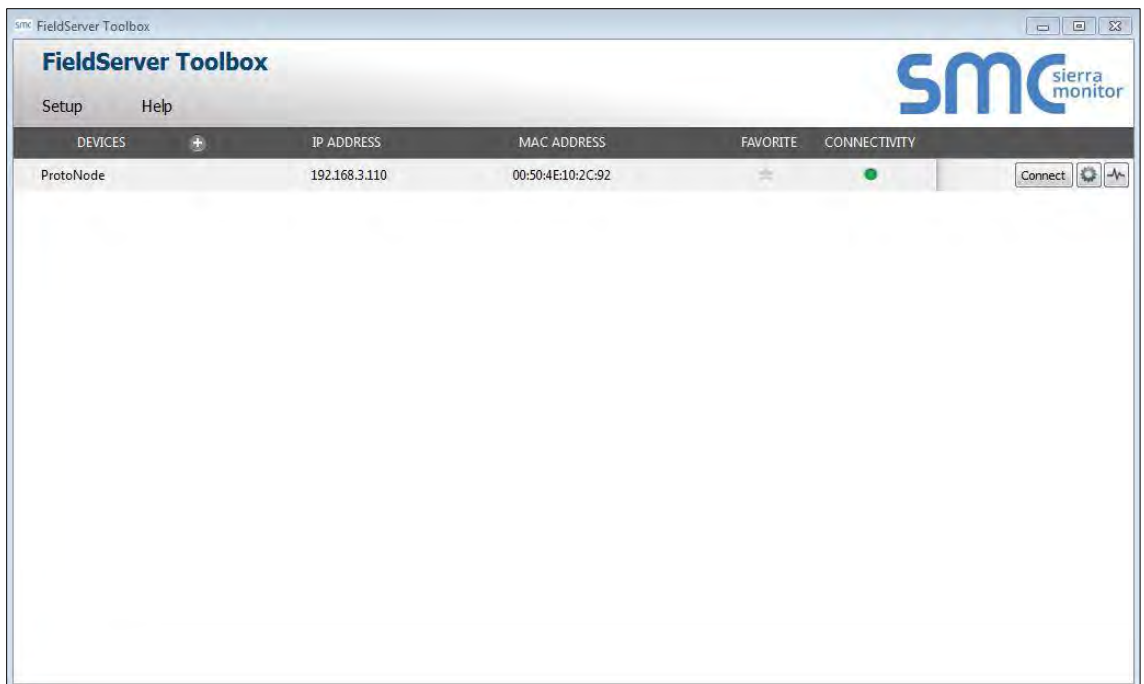



Figure 13: Ethernet Port Location

- 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.

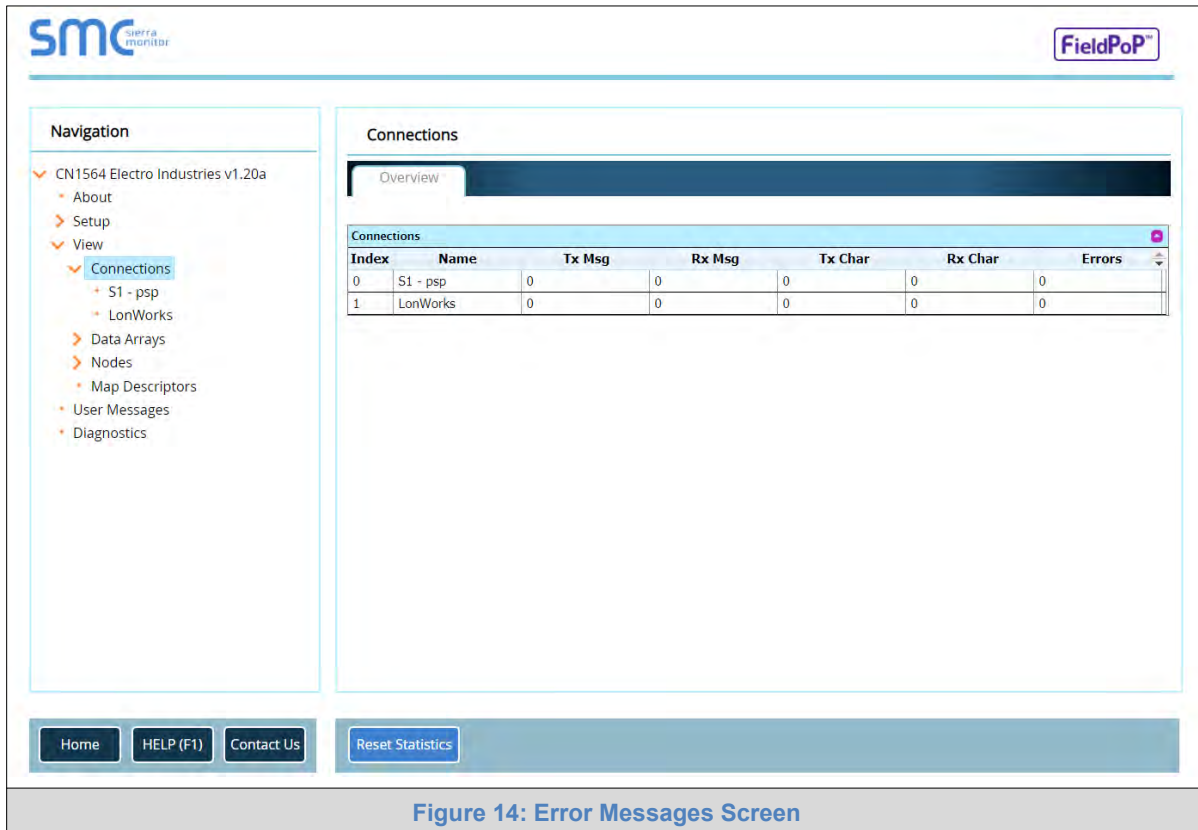


Figure 14: Error Messages Screen

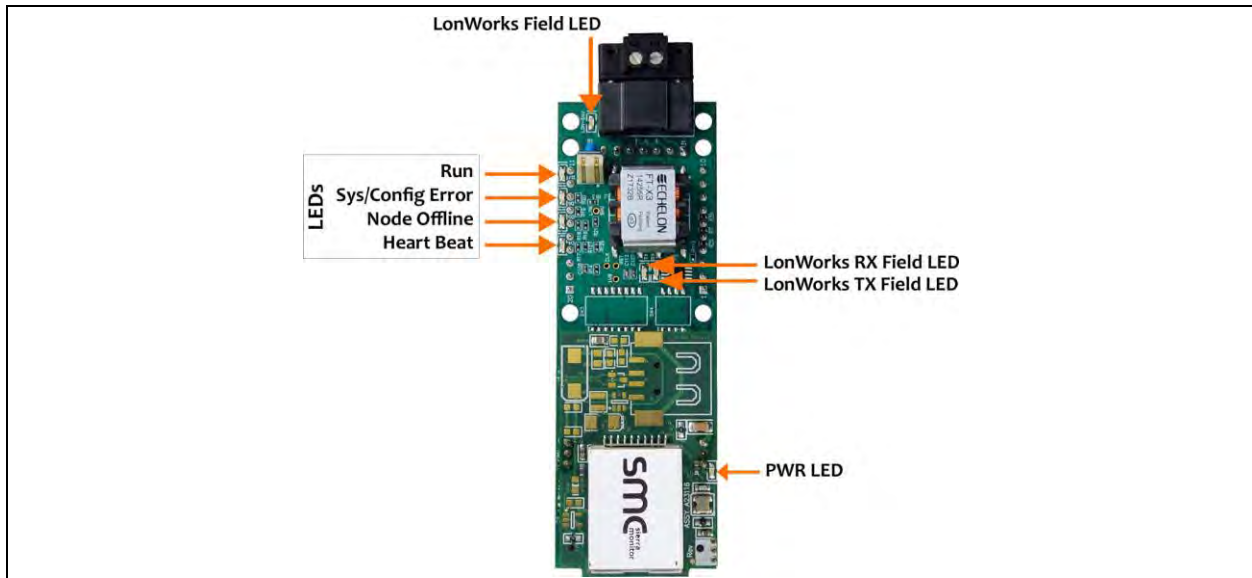
Appendix A.3 Checking Wiring and Settings

- 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 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-ED4 LED Locations.



Tag	Description
Run	The Run LED will start flashing 20 seconds after power indicating normal operation. The Heart 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 15: 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:

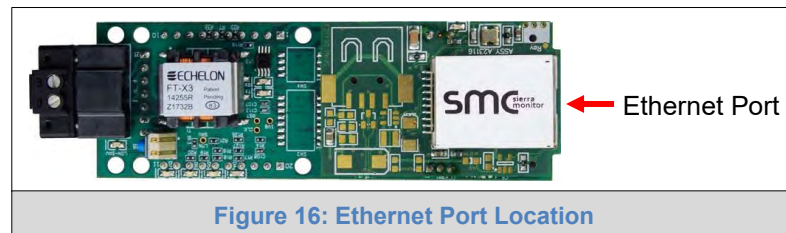
- FieldServer Toolbox:**
 This method requires installation of the FS Toolbox program. A FS Toolbox diagnostic capture takes a snapshot of the loaded configuration files and a log of all the communications on the serial ports over a specified period of time. If the problem occurs over an Ethernet connection, 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.

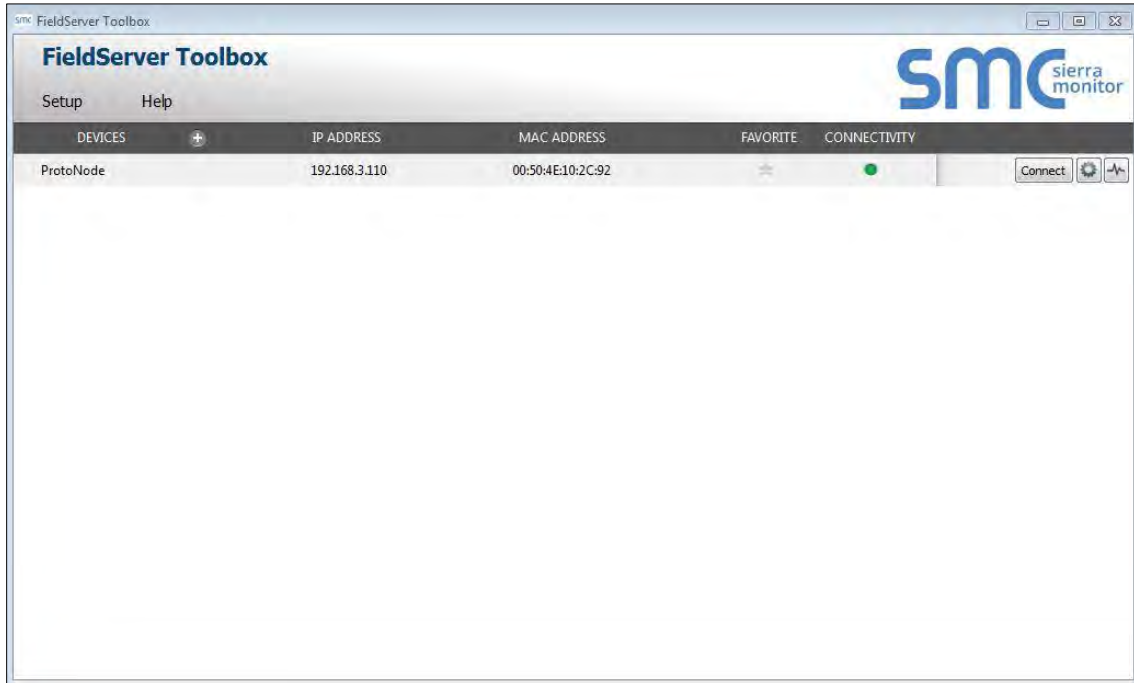
- Ensure that FieldServer Toolbox is loaded onto the local PC. Otherwise, download the FieldServer-Toolbox.zip via the Sierra Monitor website's [Software Downloads](#).
- Extract the executable file and complete the installation.



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

- **Step 1: Take a Log**

- Click on the diagnose icon  of the desired device

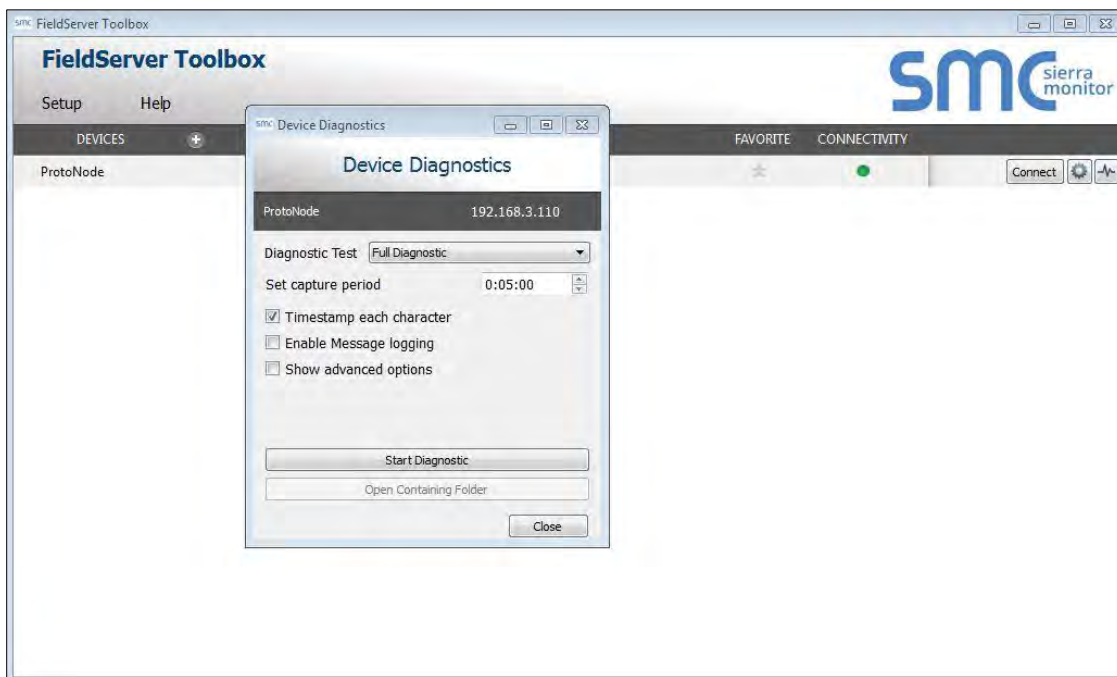


- Ensure “Full Diagnostic” is selected (this is the default)

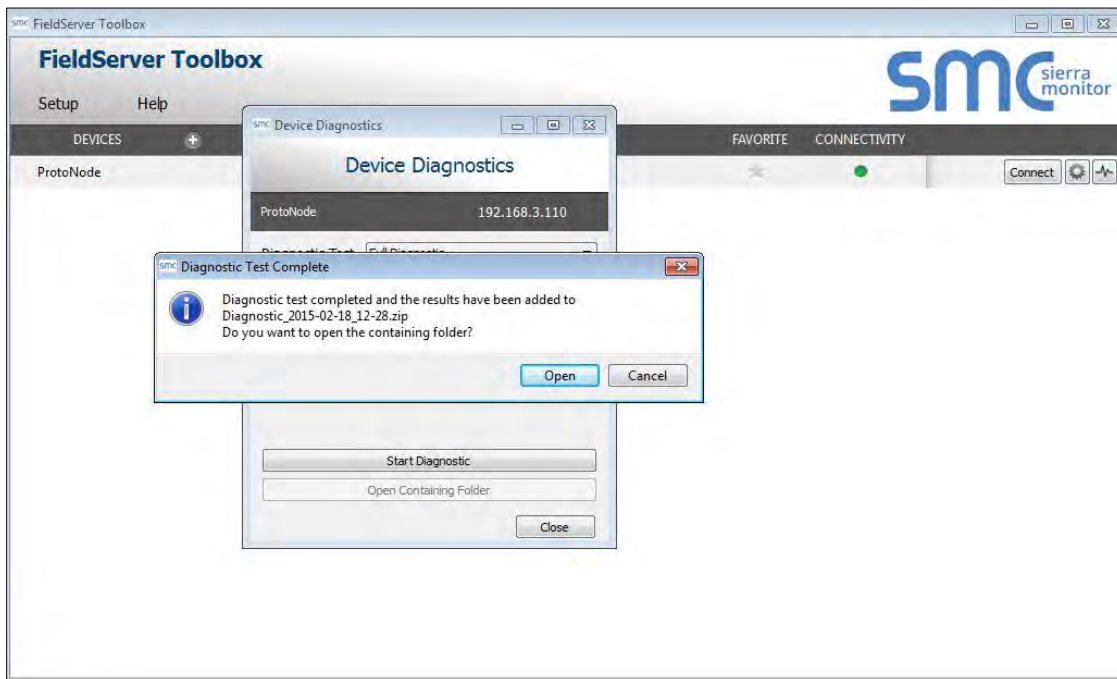


NOTE: If desired, the default capture period can be changed.

- o Click on “Start Diagnostic”



- o Wait for Capture period to finish, then the Diagnostic Test Complete window will appear
- **Step 2: Send Log**
 - o Once the Diagnostic test is complete, a .zip file is saved on the PC



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

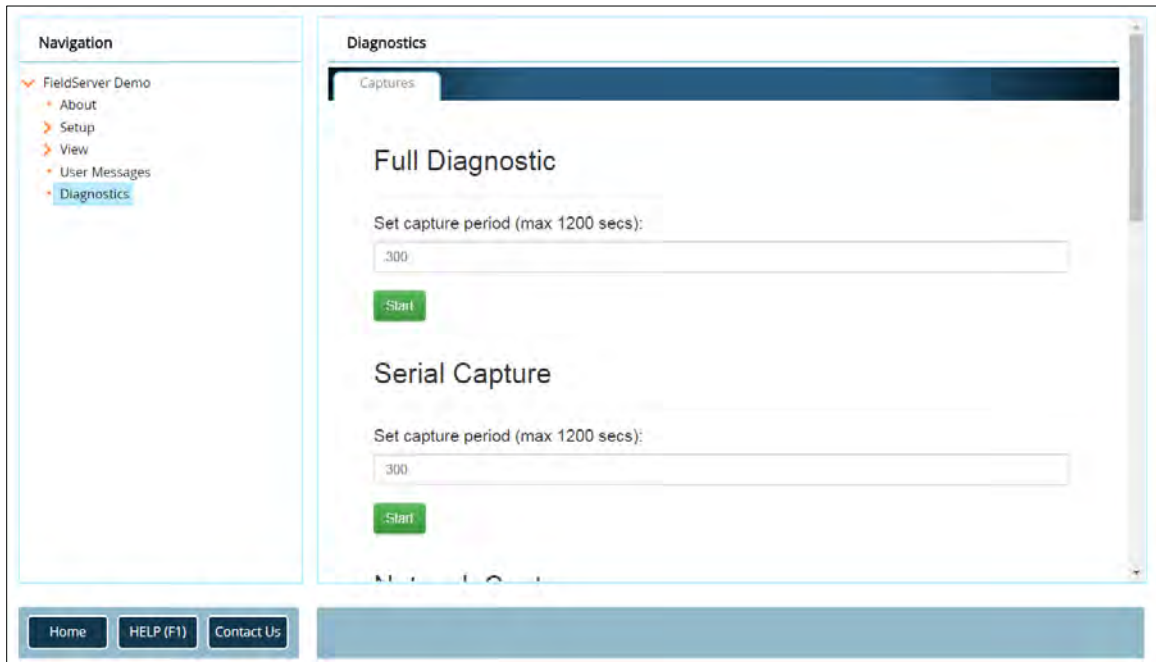


Appendix A.5.2 Using FS-GUI

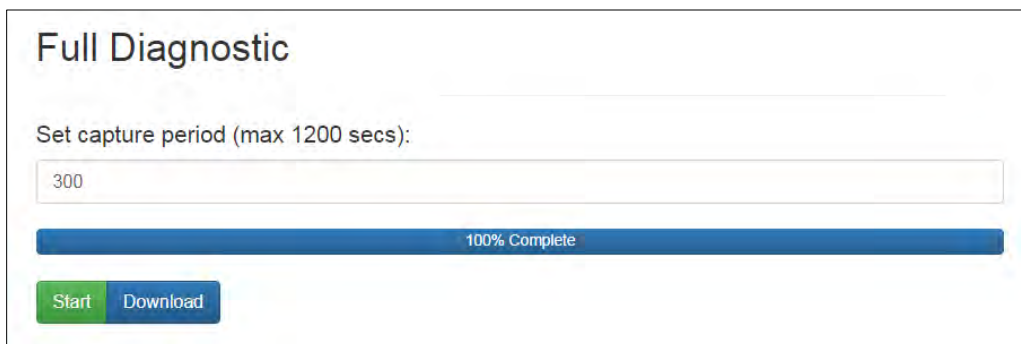
Diagnostic Capture via FS-GUI is only available on FieldServers with a bios updated/released on November 2017 or later. Completing a Diagnostic Capture through the FieldServer allows network connections (such as Ethernet and Wi-Fi) to be captured.

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.

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.
 - o Default IP Address is 192.168.1.24
 - o 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 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.

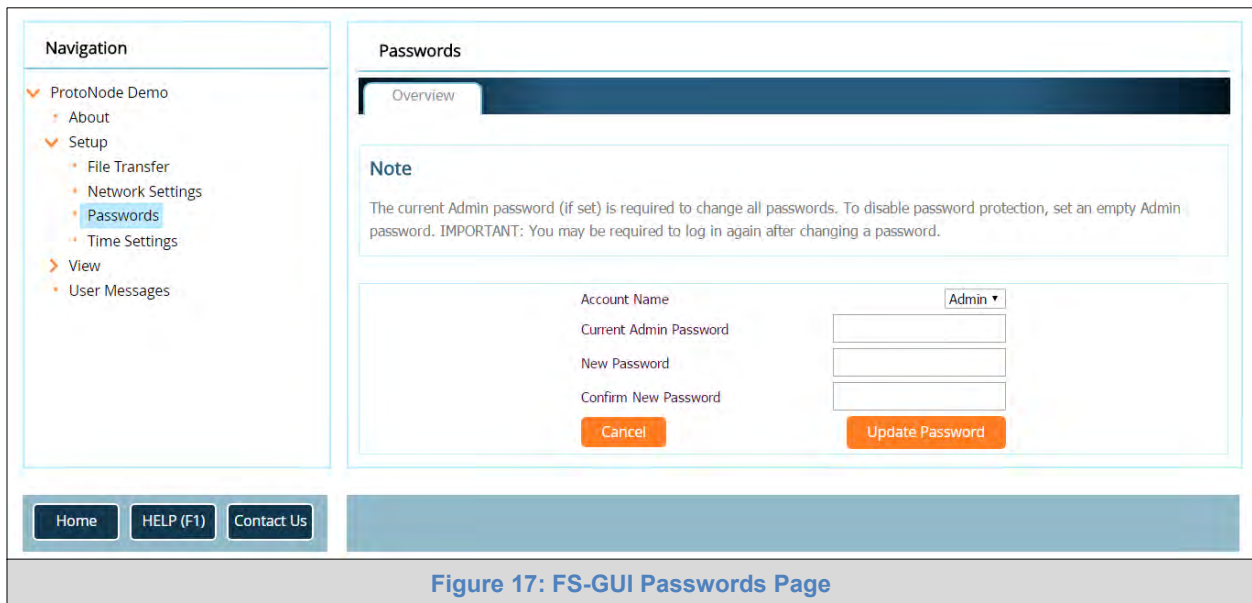


Figure 17: FS-GUI Passwords Page

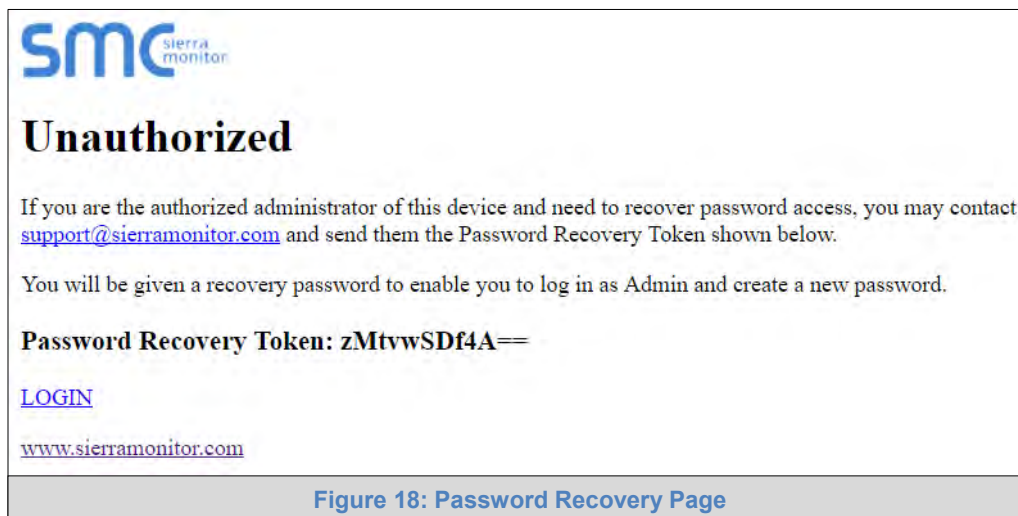


Figure 18: Password Recovery Page

Appendix C Vendor Information – Electro Industries

Appendix C.1 Meter PSP Mappings to LonWorks

Point Name	LonWorks Name	LonWorks SNVT
Return Temperature (RT) Deg_F	nvoReturnTempF	SNVT_temp_p
Outdoor Temperature (OT) Deg_F	nvoOutdoorTempF	SNVT_temp_p
Supply Temperature (ST) Deg_F	nvoSupplyTempF	SNVT_temp_p
Desired Temperature (DT) Deg_F	nvoDesiredTempF	SNVT_temp_p
RT Offset Deg_F	nvi/nvoRTOffsetF	SNVT_temp_p
OT Offset Deg_F	nvi/nvoOTOffsetF	SNVT_temp_p
ST Offset Deg_F	nvi/nvoSTOffsetF	SNVT_temp_p
Base Temp. High Mass (70-110F)	nvi/nvoBaseTmphHiMassF	SNVT_temp_p
Base Temp. Low Mass (120-140F)	nvi/nvoBaseTmploMassF	SNVT_temp_p
Set Point (40-195F)	nvi/nvoSetPointF	SNVT_temp_p
OT at 0 Degrees Set Point (40-195F)	nvi/nvoOTat0DegSPF	SNVT_temp_p
Current Stage Code	nvoCurrStgCode	SNVT_count_f
Mode	nvoMode	SNVT_count_f
Auto HL Fault Count	nvoAutoHLFltCnt	SNVT_count_f
Bender Fault Count	nvoBenderFltCnt	SNVT_count_f
LWCO Fault Count	nvoLWCOFltCnt	SNVT_count_f
Remote Fault Count	nvoRemFltCnt	SNVT_count_f
Manual HL Fault Count	nvoManHLFltCnt	SNVT_count_f
Freeze Fault Count	nvoFrzFltCnt	SNVT_count_f
Bad RT Fault Count	nvoBadRTFltCnt	SNVT_count_f
Bad ST Fault Count	nvoBadSTFltCnt	SNVT_count_f
Bad OT Fault Count	nvoBadOTFltCnt	SNVT_count_f
Current Boiler Type	nvoCurrBlrType	SNVT_count_f
Current State	nvoCurrState	SNVT_count_f
Maximum Stages (4-15)	nvi/nvoMaxStgs	SNVT_count_f
Differential Deg_F	nvi/nvoDifferentialF	SNVT_count_f
Troubleshooting Stage Code	nvi/nvoTrblshtStgCde	SNVT_count_f
0 to 10VDC (No or Yes)	nvi/nvo0to10VDC	SNVT_count_f
Stage Seq Minutes (1-99 Minutes)	nvi/nvoStgSeqMin	SNVT_time_min
Boiler Type	nvi/nvoBlrType	SNVT_count_f
Lag Boiler Delay (0-999 Minutes)	nvi/nvoLagBlrDelay	SNVT_time_min
Force Troubleshooting (No or Yes)	nvi/nvoForceTrblsht	SNVT_count_f
Reset Fault Counts (No or Yes)	nvi/nvoResetFltCnts	SNVT_count_f
Micro Reset (No or Yes)	nvi/nvoMicroReset	SNVT_count_f
Factory Reset (No or Yes)	nvi/nvoFactoryReset	SNVT_count_f
Board Software Version	nvoBoardSwVer	SNVT_count_f
Alarm_Remote	nvoAlarm_Rem	SNVT_switch
Alarm_LWCO	nvoAlarm_LWCO	SNVT_switch
Alarm_Manual_HL	nvoAlarm_Man_HL	SNVT_switch
Alarm_Bender	nvoAlarm_Bender	SNVT_switch
Alarm_Auto_HL	nvoAlarm_Auto_HL	SNVT_switch
Alarm_Bad_RT	nvoAlarm_Bad_RT	SNVT_switch
Alarm_Bad_OT	nvoAlarm_Bad_OT	SNVT_switch
Alarm_Bad_ST	nvoAlarm_Bad_ST	SNVT_switch
Alarm_Freeze	nvoAlarm_Frz	SNVT_switch
Return Temperature (RT) Deg_C	nvoReturnTempC	SNVT_temp_p
Outdoor Temperature (OT) Deg_C	nvoOutdoorTempC	SNVT_temp_p
Supply Temperature (ST) Deg_C	nvoSupplyTempC	SNVT_temp_p
Desired Temperature (DT) Deg_C	nvoDesiredTempC	SNVT_temp_p
RT Offset Deg_C	nvi/nvoRTOffsetC	SNVT_temp_p
OT Offset Deg_C	nvi/nvoOTOffsetC	SNVT_temp_p
ST Offset Deg_C	nvi/nvoSTOffsetC	SNVT_temp_p
Base Temp. High Mass (21-43C)	nvi/nvoBaseTmphHiMassC	SNVT_temp_p
Base Temp. Low Mass (48-60C)	nvi/nvoBaseTmploMassC	SNVT_temp_p
Set Point (4-90C)	nvi/nvoSetPointC	SNVT_temp_p
OT at -17 Degrees Set Point	nvi/nvoOTatN17DegSPC	SNVT_temp_p

Differential Deg_C	nvi/nvoDifferentialC	SNVT_count_f
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Appendix C.2 Additional Notes

NOTE: A value of 255 indicates either a faulty sensor in an inapplicable value based on the setup of the main controller.

Appendix C.2.1 Communications (LON)

READ ONLY:

RT - Return Temperature (°F)

OT - Outdoor Temperature (°F)

ST - Supply Temperature (°F)

Current Stage Code:

Number of stages currently ON.

Mode:

- 1) Setpoint
- 2) TS & A Reset
- 3) 0 -> 10 VDC Input
- 4) Troubleshooting

Fault Counts (0-9999):

- 1) Auto HL
- 2) Bender
- 3) LWCO
- 4) Remote
- 5) Manual HL
- 6) Freeze
- 7) Bad RT
- 8) Bad ST
- 9) Bad OT

Current Boiler Type:

- 1) Single
- 2) Lead
- 3) Lag

Current State:

- 1) Off
- 2) SB Heat On
- 3) EL Heat On
- 4) Fault

Software Version

Alarms:

- 1) Remote
- 2) LWCO
- 3) Manual HL
- 4) Bender
- 5) Auto HL
- 6) Bad RT
- 7) Bad OT
- 8) Bad ST
- 9) Freeze (If ST < 45°F)

READ/WRITE:

RT Offset ($\pm^{\circ}\text{F}$, Default = 0)
 OT Offset ($\pm^{\circ}\text{F}$, Default = 0)
 ST Offset ($\pm^{\circ}\text{F}$, Default = 0)
 Base Temp. High Mass (70-110 $^{\circ}\text{F}$, Default = 90 $^{\circ}\text{F}$)
 Base Temp. Low Mass (120-140 $^{\circ}\text{F}$, Default = 120 $^{\circ}\text{F}$)
 Set Point (40-195 $^{\circ}\text{F}$, Default = 155 $^{\circ}\text{F}$)
 OT at 0 Degrees Set Point (40-195 $^{\circ}\text{F}$, Default = 155 $^{\circ}\text{F}$)
 Maximum Stages (4-15, Default = 15)
 Differential:
 1) 10 $^{\circ}\text{F}$ (Default)
 2) 15 $^{\circ}\text{F}$
 3) 20 $^{\circ}\text{F}$
 Troubleshooting Stage Code (0-15, Default = 0)
 0 -> 10VDC (YES/NO, Default = NO)
 Stage Sequence Minutes (0-99 minutes, Default = 1)
 Boiler Type:
 1) Single (Default)
 2) Lead
 3) Lag
 Lag Boiler Delay (0-999 minutes, Default = 15)
 Force Troubleshooting (YES/NO, Default = NO)
 Reset Fault Counts (YES/NO)
 Micro Reset (YES/NO)
 Factory Reset (YES/NO)

Must reset (cycle power) if any of the following are changed:

- 1) Troubleshooting enabled or disabled (Force Stages YES/NO)
- 2) 0 -> 10VDC enabled or disabled (YES/NO)
- 3) OT sensor removed or added
- 4) Dsply/BACnet switch (SW4) changed
- 5) Boiler type changed (Single, Lead or Lag)

Appendix D Reference

Appendix D.1 Specifications



ProtoCessor FPC-ED4	
Electrical Connections	One 2-pin Phoenix connector with one FTT-10 LonWorks port 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 LonMark Certified
Power Requirements	5VDC
Physical Dimensions	8.5 x 3.0 x 2.0 cm (3.3 x 1.2 x .08 in.)
Weight	0.03 kg (0.07 lbs)
Operating Temperature	-40°C to 75°C (-40°F to 167°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 19: 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.