

ProtoCessor FPC-ED2 and LL-ABG-IP Start-up Guide

**For Interfacing Intelligent Lighting Controls Products:
LightLEEDer and LightLEEDer EVO Network Panels**

**To Building Automation Systems:
BACnet/IP**

APPLICABILITY & EFFECTIVITY

Explains ProtoCessor hardware and how to install it.

The instructions are effective for the above as of November 2020.



Document Revision: 1.C
Auto-Selector
Template Revision: 4
ILC Revision F, TBo618

Technical Support

Thank you for purchasing the ProtoCessor for Intelligent Lighting Controls.

Please call Intelligent Lighting Controls for technical support of the ProtoCessor product.

MSA Safety does not provide direct support. If Intelligent Lighting Controls needs to escalate the concern, they will contact MSA Safety for assistance.

Support Contact Information:

Intelligent Lighting Controls, Inc.
5229 Edina Industrial Blvd
Edina, MN 55439

Customer Service:

952.829.1900

For online support fill out the form at <https://www.ilc-usa.com/contact-us>.

Website: www.ilc-usa.com

Quick Start Guide

1. Record the information about the unit. (**Section 3.1**)
2. Recording the Device Name and address. (**Section 3.2**)
3. ProtoCessor FPC-ED2 Showing Connection Ports. (**Section 4.2**)
4. Connect a PC to the ProtoCessor via Ethernet cable. (**Section 5.1**)
5. Setup Web Server Security and login via web browser. (**Section 6**)
6. 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 7.1**)
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1 CERTIFICATION

1.1 BTL Mark – BACnet^{®1} Testing Laboratory



BACnet is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of their products to requirements of ASHRAE Standard 135 is the responsibility of the BACnet International. BTL is a registered trademark of the BACnet International.

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.

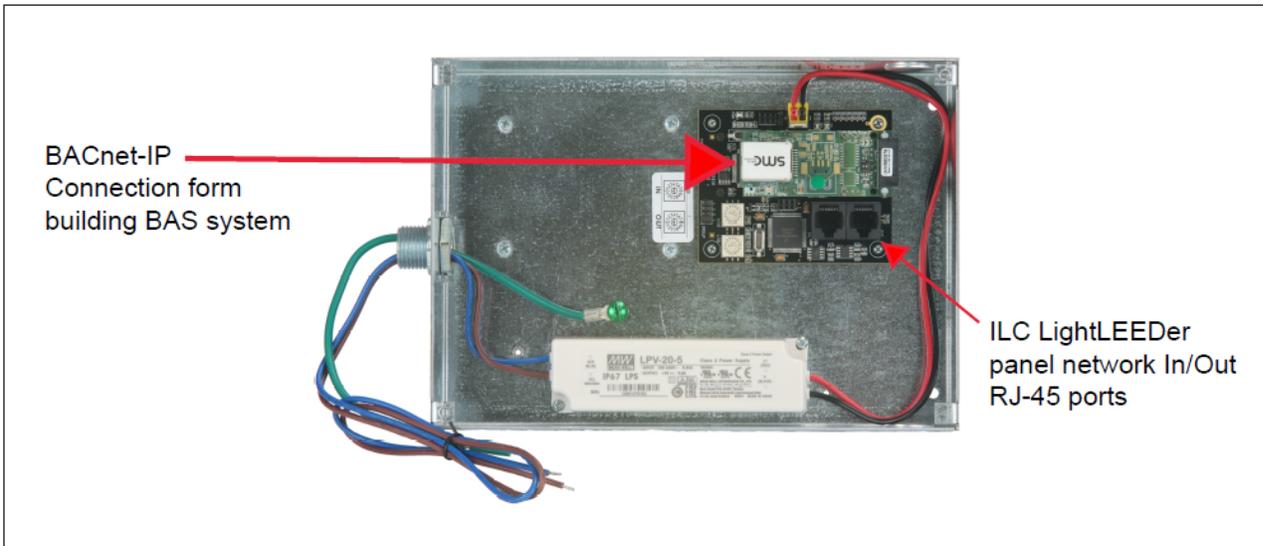
2 INTRODUCTION

2.1 ProtoCessor Gateway

The ProtoCessor is an embedded module that is designed into Intelligent Lighting Controls' product (hereafter simply called "device") and is preconfigured to support BACnet/IP.

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 ILC LightLEEDer Advanced BACnet-IP Gateway will allow a BACnet TCP-IP Connection from a BAS system. This device will support 4 ILC panel Groups each with:

- Read/Write Operation for Relay outputs, 1 to 20 per panel.
- Read/Write Operation for Dimmer outputs, 1 to 20 per panel.
- Read status of LightSync Inputs, LS:01 to LS:10, 8 maintained closures each, per panel.
- Read status of LightSync photo sensors, dimmer switches and VDI inputs, LS:01 to LS: 10 as 8-bit registry.
- Read/Write Operation for relay Groups 1 to 64.
- Read/Write Operation for relay Presets 1 to 64.
- Read/Write Operation for dimmer Scene 1 to 48 per panel.
- Write Operation for Global Scene 1-64.

Refer to the document "Intelligent Lighting Controls Vendor Mappings" for the complete point list

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	FPC-ED2-1963

Figure 1: ProtoCessor Part Numbers

- FPC-ED2 units have one customer port Ethernet for BACnet-IP

3.2 Record ILC device name, part number, and Panel address

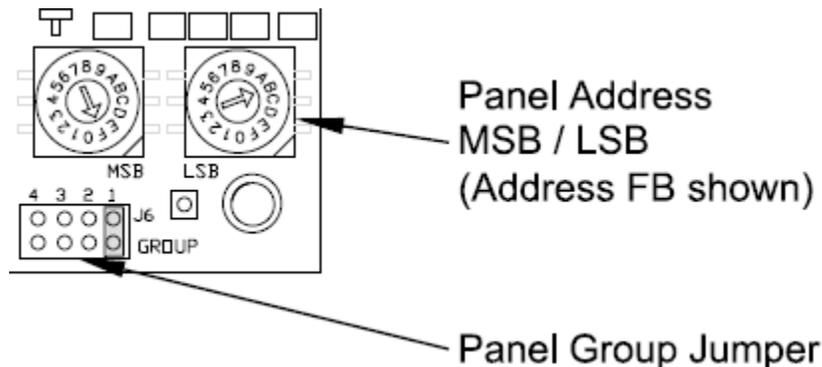
3.2.1 LL-ABG address

- The LL-ABG will be set with its own distinct panel address.
- Figure 2 shows the 4 pre-programmed panel sets the device will support and the part numbers.

Devices	Part #
LL-ABG-x(1, 2, 3, 4)-P	9205817x(1, 2, 3, 4)-Panel
LL-ABG-x(1, 2, 3, 4)-R	9200317x(1, 2, 3, 4)-emote

Figure 2: ILC Device

- Set the Jumper for the panel group that matches the program file

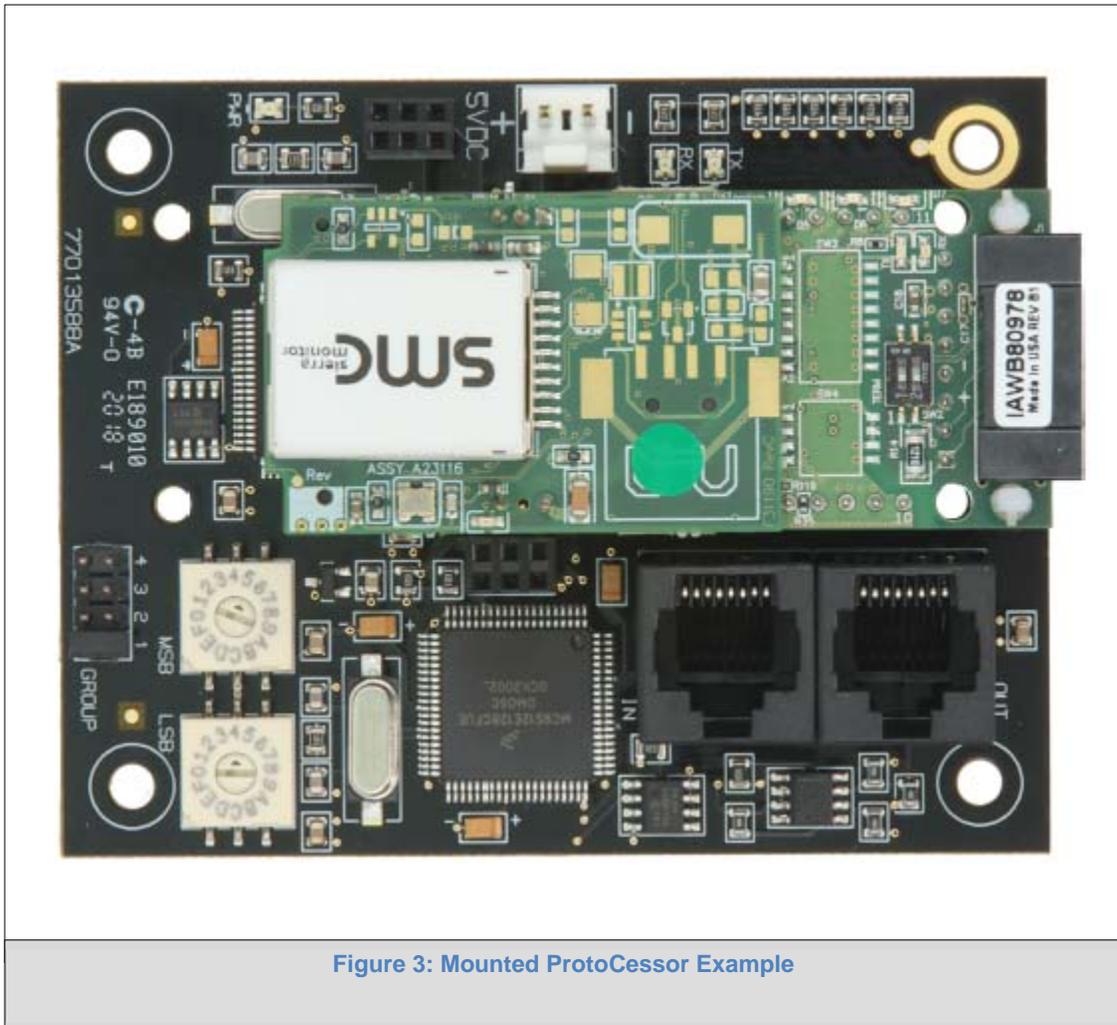


Set the jumper for the panel group of 64 nodes controlled per gateway as shown below.

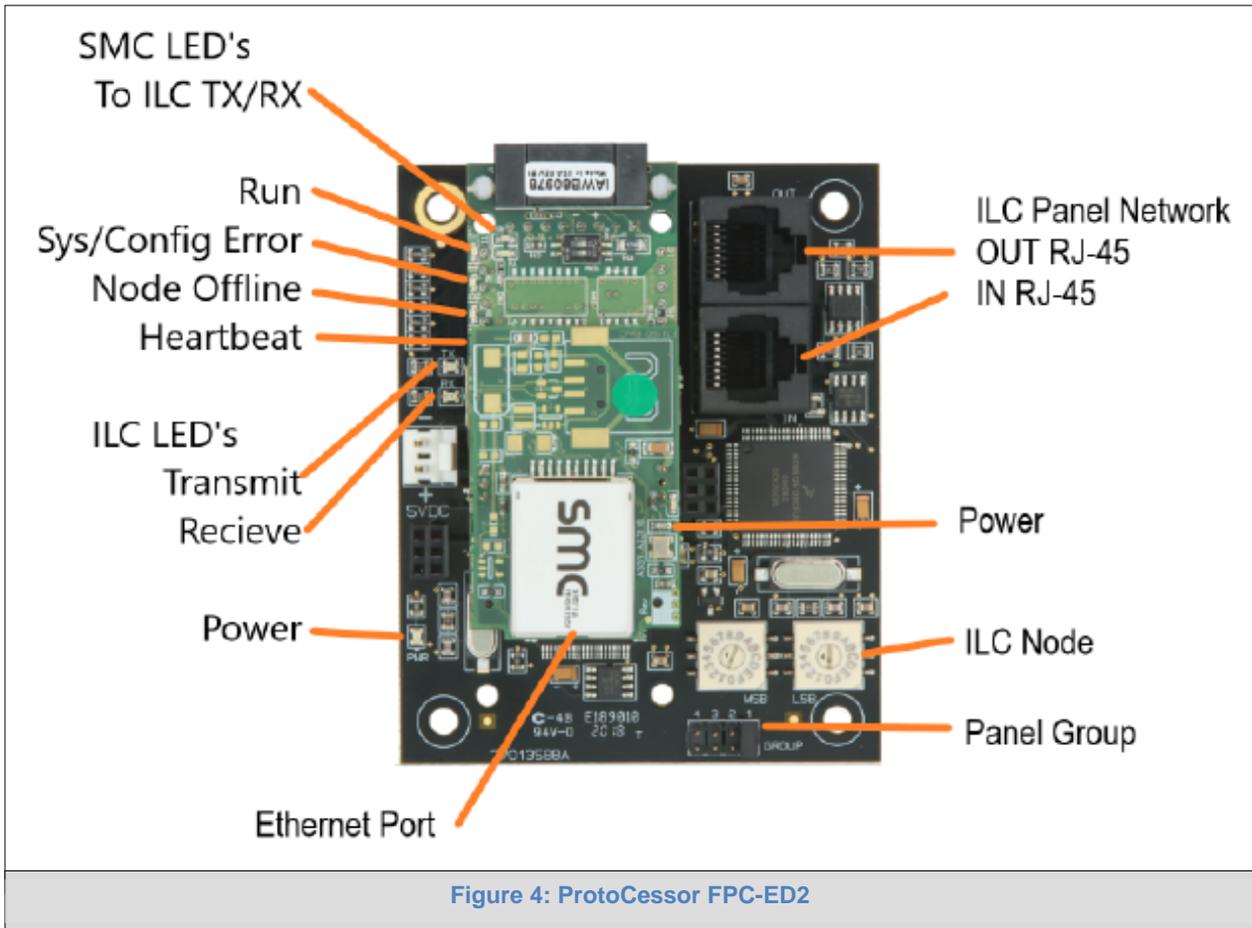
Jumper setting	Group	Panel Nodes
	1	01 to 40
	2	41 to 80
	3	81 to C0
	4	C1 to FE

4 INTERFACING PROTOCESSOR TO DEVICES

4.1 ProtoCessor Mounted on the Advanced Gateway Board



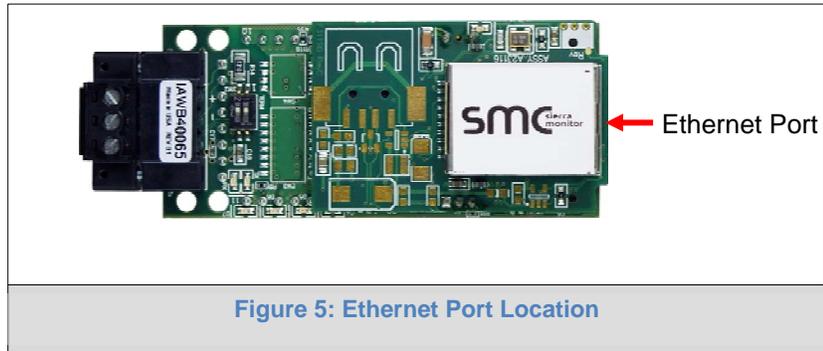
4.2 ProtoCessor FPC-ED2 Showing Connection Ports



5 USE THE WEB CONFIGURATOR TO SETUP THE GATEWAY

5.1 Connecting to the ProtoCessor via Ethernet

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



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.

6 SETUP WEB SERVER SECURITY

Navigate to the IP Address of the ProtoCessor on the local PC by opening a web browser and entering the IP Address of the ProtoCessor; the default Ethernet address is 192.168.1.24.

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

6.1 Login to the FieldServer

The first time the FieldServer GUI is opened in a browser, the IP Address for the gateway will appear as untrusted. This will cause the following pop-up windows to appear.

- When the Web Server Security Unconfigured window appears, read the text and choose whether to move forward with HTTPS or HTTP.

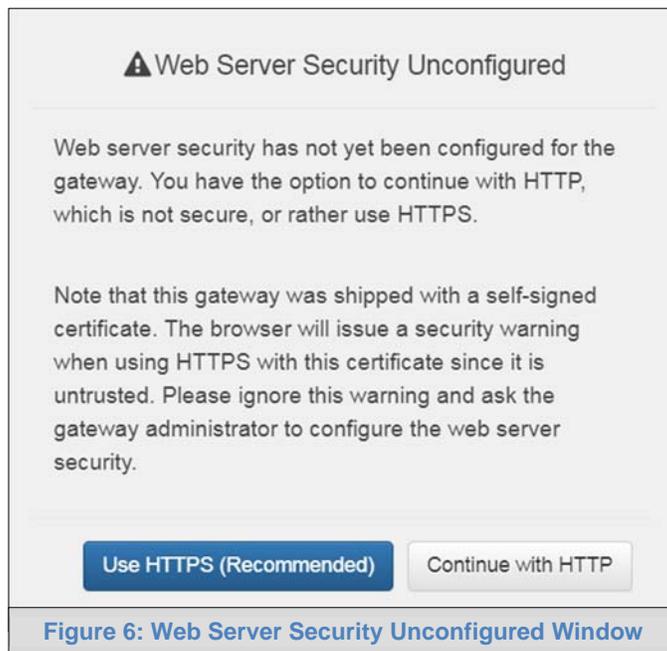


Figure 6: Web Server Security Unconfigured Window

- When the warning that “Your connection is not private” appears, click the advanced button on the bottom left corner of the screen.

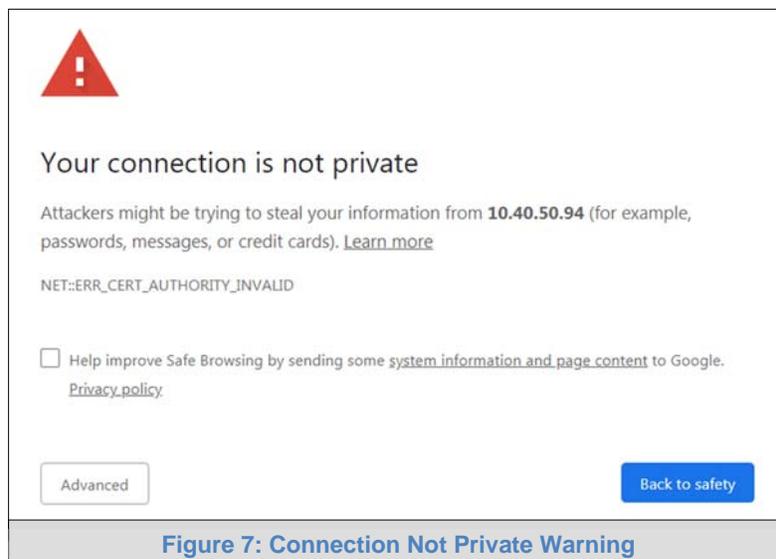


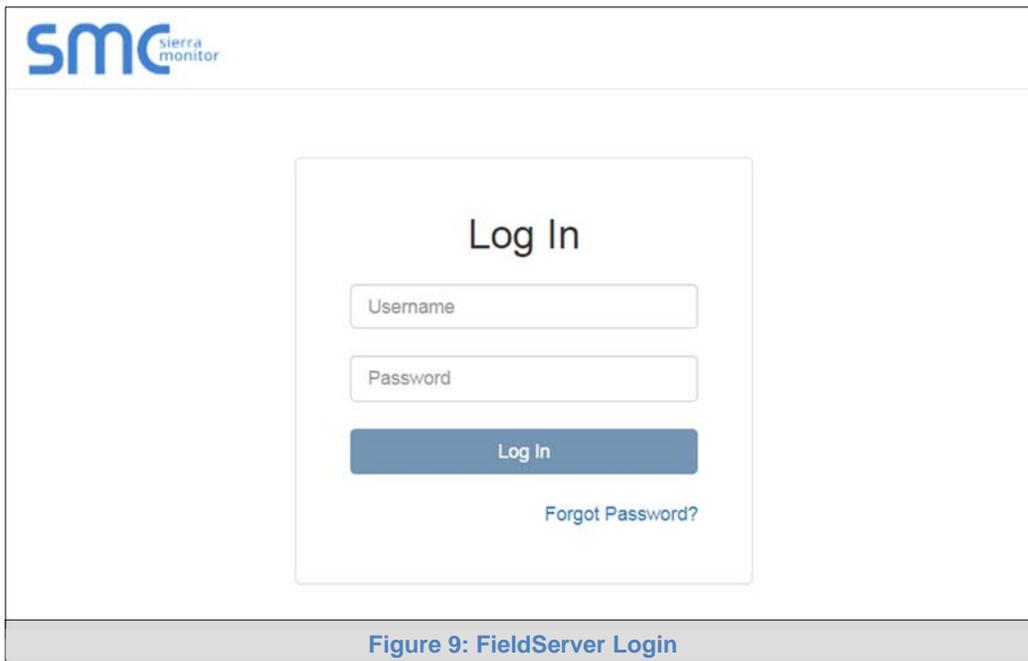
Figure 7: Connection Not Private Warning

- Additional text will expand below the warning, click the underlined text to go to the IP Address. In the **Figure** example this text is “[Proceed to 10.40.50.94 \(unsafe\)](#)”.



- When the login screen appears, put in the Username (default is “admin”) and the Password (found on the label of the FieldServer).

NOTE: There is also a QR code in the top right corner of the FieldServer label that shows the default unique password when scanned.



NOTE: A user has 5 attempts to login then there will be a 10-minute lockout. There is no timeout on the FieldServer to enter a password.

NOTE: To create individual user logins, go to [Appendix B.5](#).

6.2 Select the Security Mode

- On the first login to the FieldServer, the following screen will appear that allows the user to select which mode the FieldServer should use.

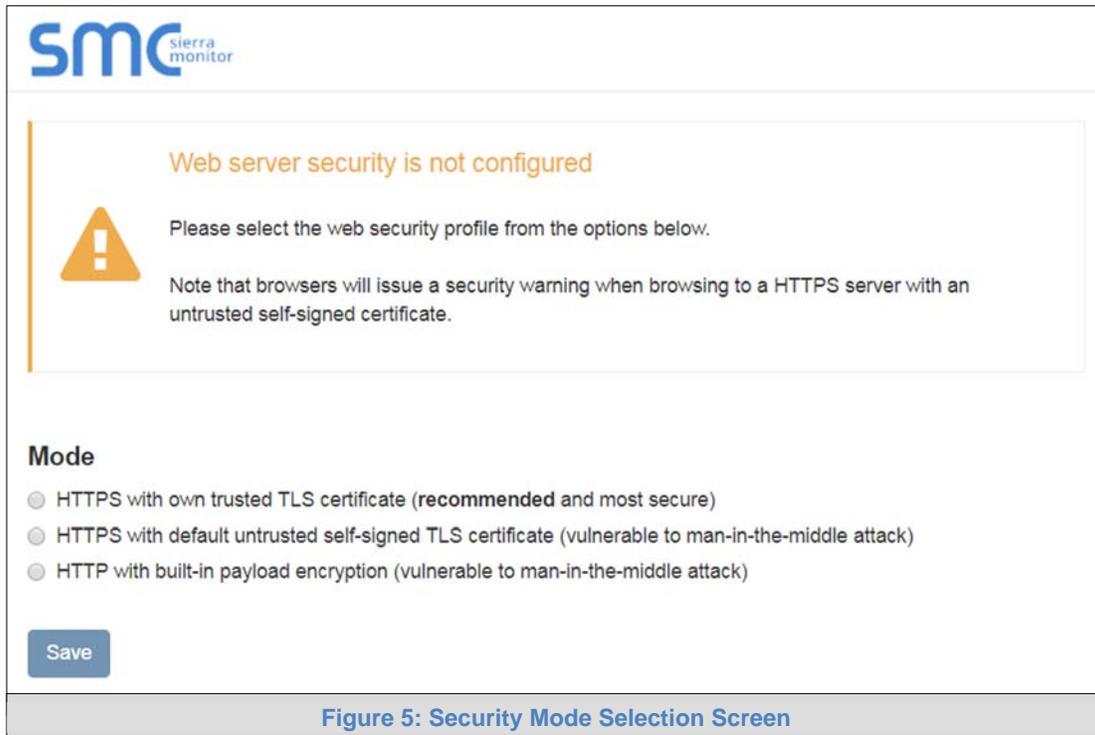


Figure 5: Security Mode Selection Screen

NOTE: Cookies are used for authentication.

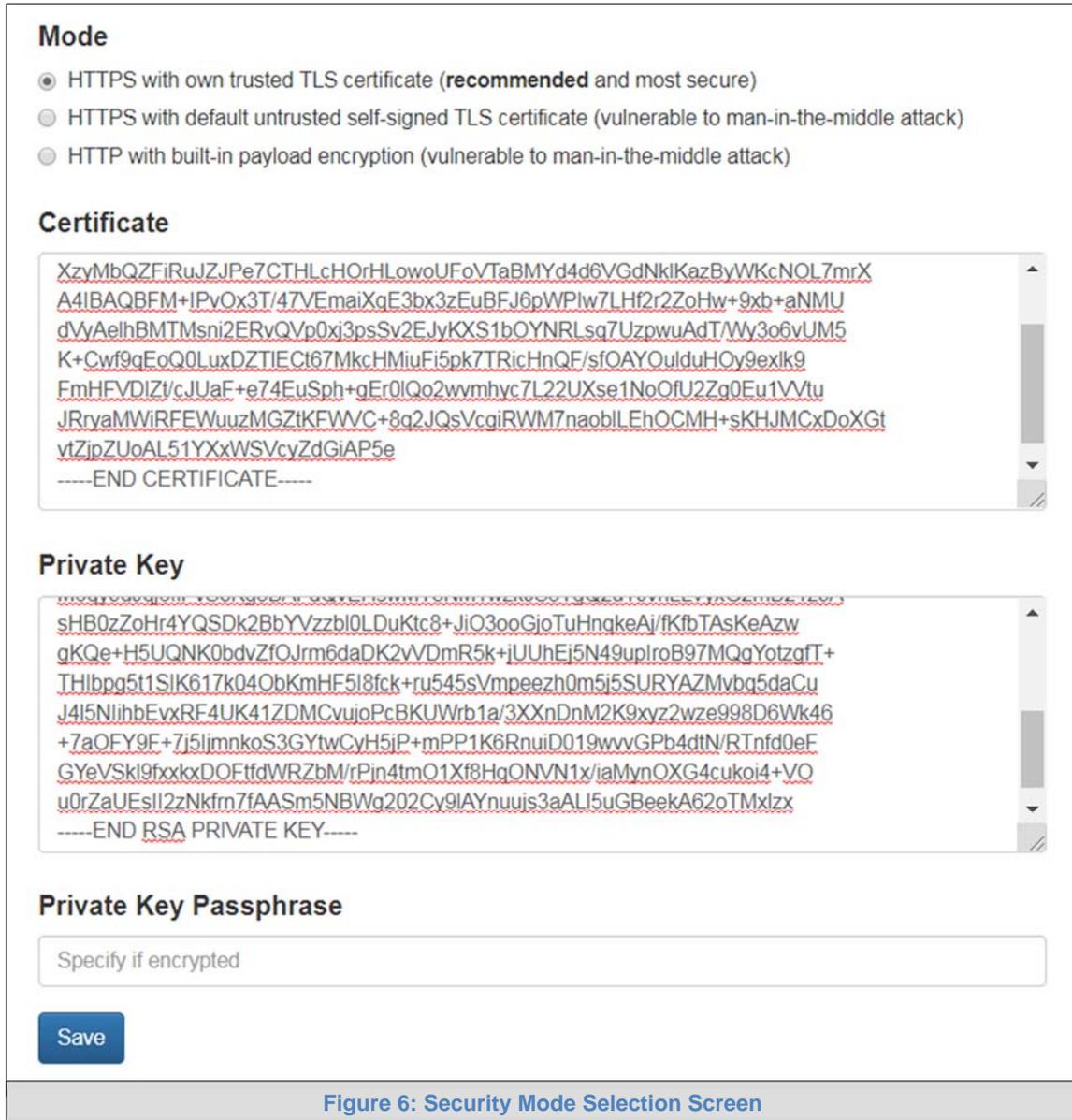
NOTE: To change the web server security mode after initial setup, go to [Appendix B.4](#).

The sections that follow include instructions for assigning the different security modes.

6.2.1 HTTPS with Own Trusted TLS Certificate

This is the recommended selection and the most secure.

- Once this option is selected, the Certificate, Private Key and Private Key Passphrase fields will appear under the mode selection.



- Copy and paste the Certificate and Private Key text into their respective fields. If the Private Key is encrypted type in the associated Passphrase.
- Click Save.
- A “Redirecting” message will appear and after a short period of time the FieldServer GUI will open.

6.2.2 HTTPS with Default Untrusted Self-Signed TLS Certificate or HTTP with Built-in Payload Encryption

- Simply select one of these options and click the Save button.
- A “Redirecting” message will appear and after a short period of time the FieldServer GUI will open.

7 CONFIGURE THE PROTOCESSOR

7.1 Set Configuration Parameters

- On the Web Configurator page, the configuration parameters are present.

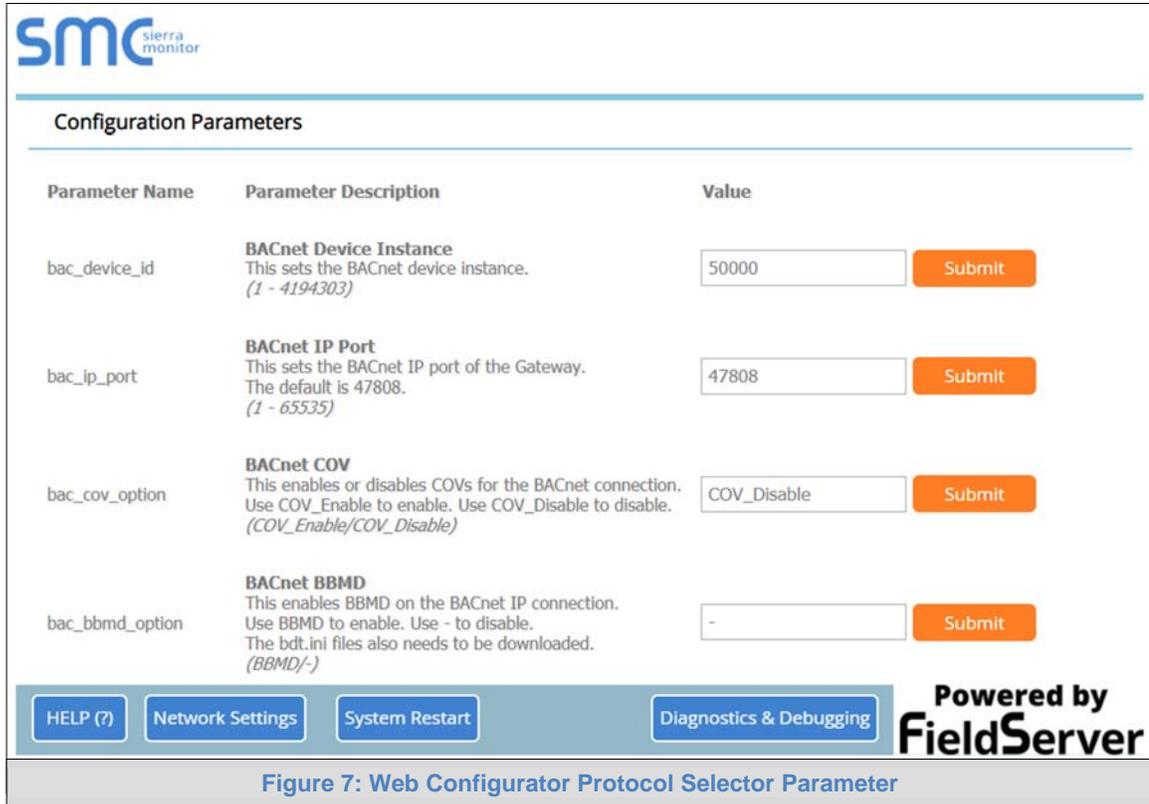


Figure 7: Web Configurator Protocol Selector Parameter

- Ensure that all parameters are entered for successful operation of the gateway. Find the legal value options for each parameter under the Parameter Description in parentheses.

7.2 Verify Device Communications

- Check that the TX and RX LEDs are rapidly flashing.** See [Appendix A.4](#) for information and images.
- Confirm the software shows communication without errors ([Appendix A.2](#)).

7.3 Ethernet Network: Setting IP Address for Field Network

- To access the FS-GUI, click on the “Diagnostics & Debugging” button in the bottom right side of the page.

The screenshot shows the SMC web configurator interface. At the top left is the SMC Sierra Monitor logo. Below it is a section titled "Configuration Parameters" which contains a table of settings. Each row in the table has a parameter name, a description, a value input field, and a "Submit" button. The parameters are: bac_device_id (value: 50000), bac_ip_port (value: 47808), bac_cov_option (value: COV_Disable), and bac_bbmd_option (value: -). At the bottom of the screen is a navigation bar with buttons for "HELP (?)", "Network Settings", "System Restart", and "Diagnostics & Debugging". On the right side of the navigation bar, it says "Powered by FieldServer".

Parameter Name	Parameter Description	Value
bac_device_id	BACnet Device Instance This sets the BACnet device instance. (1 - 4194303)	50000 <input type="button" value="Submit"/>
bac_ip_port	BACnet IP Port This sets the BACnet IP port of the Gateway. The default is 47808. (1 - 65535)	47808 <input type="button" value="Submit"/>
bac_cov_option	BACnet COV This enables or disables COVs for the BACnet connection. Use COV_Enable to enable. Use COV_Disable to disable. (COV_Enable/COV_Disable)	COV_Disable <input type="button" value="Submit"/>
bac_bbmd_option	BACnet BBMD This enables BBMD on the BACnet IP connection. Use BBMD to enable. Use - to disable. The bdt.ini files also needs to be downloaded. (BBMD/-)	- <input type="button" value="Submit"/>

Navigation bar: **Powered by FieldServer**

Figure 8: 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 9)

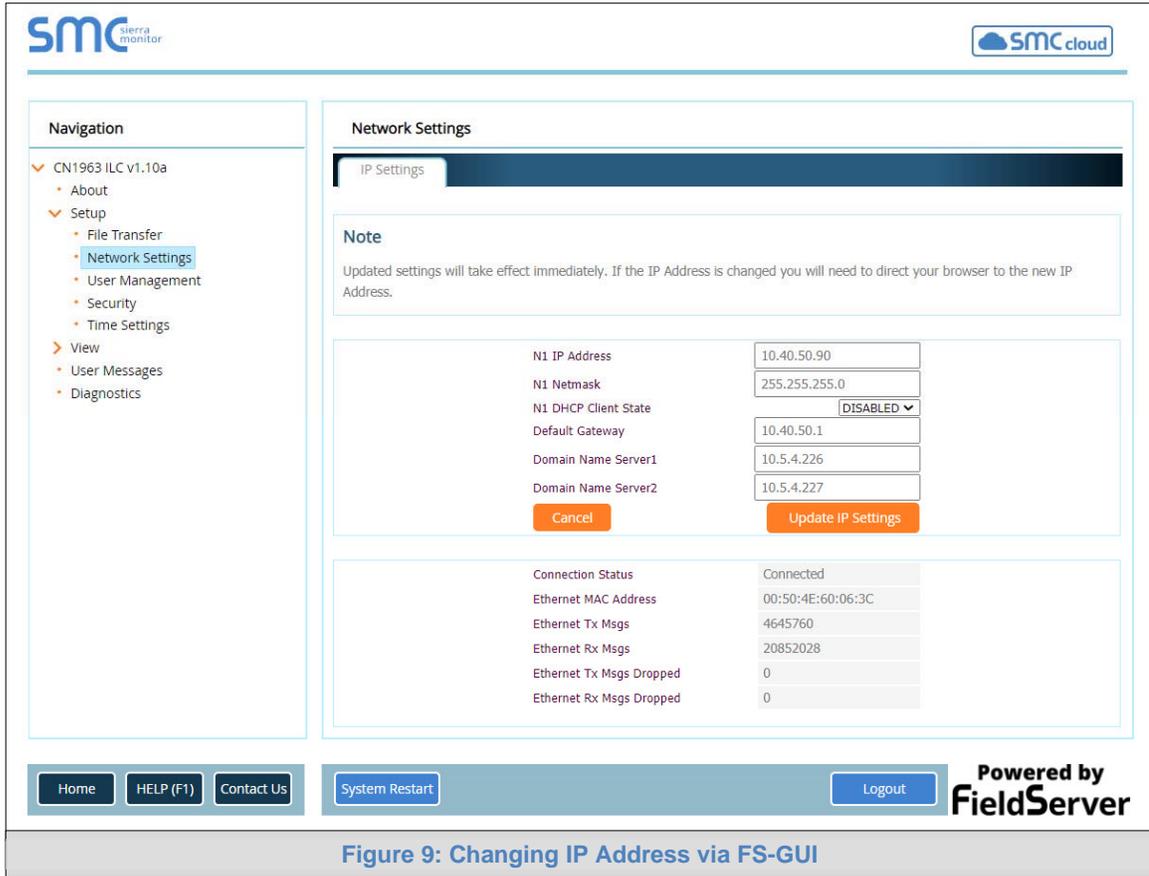


Figure 9: Changing IP Address via FS-GUI

- 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.

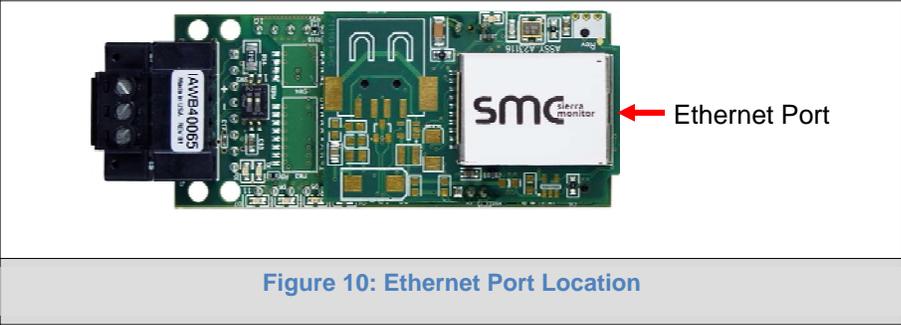
- Click the “System Restart” button at the bottom of the page to apply changes and restart the ProtoCessor.
- Unplug Ethernet cable from PC and connect it to the network switch or router.
- Record the IP Address assigned to the ProtoCessor for future reference.

NOTE: The SMC Cloud button  (see Figure 9) allows users to connect to the SMC Cloud, MSA Safety’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](#).

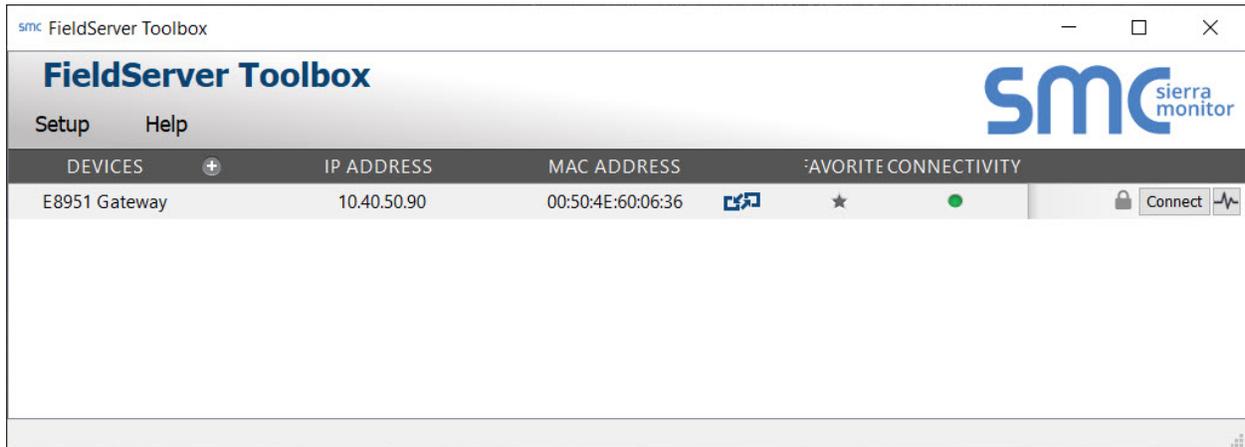
Appendix A Troubleshooting

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.



- 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.

The screenshot shows the SMC web interface. On the left is a navigation menu with options like 'About', 'Setup', 'View', 'Connections', 'Data Arrays', 'Nodes', 'Map Descriptors', 'User Messages', and 'Diagnostics'. The main area is titled 'Connections' and contains a table with the following data:

Index	Name	Tx Msg	Rx Msg	Tx Char	Rx Char	Errors
0	S1 - Modbus_ASCII	0	0	0	0	0
1	R1 - Modbus_ASCII	0	0	0	0	0
2	N1 - BACnet_IP	1	3,765	15	42,670	0

The footer contains buttons for 'Home', 'HELP (F1)', 'Contact Us', 'Reset Statistics', and 'Logout', along with the text 'Powered by FieldServer'.

Figure 11: Error Messages Screen

NOTE:

The LL-ABG and the ProtoCessor module are communicating on two channels "S1" Serial port and "R1" RS-485 port, these connections are between module using the board headers.

The External RS-485 port is **not** used for field connections.

Only the "N1" RJ-45 Ethernet port is active for a BAS system connection using BACnet-IP

Appendix A.3 Checking Wiring and Settings

- No COMS on MBASCII 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 the ProtoCessor ([Appendix A.4](#))
 - Check baud rate, parity, data bits, stop bits
 - Check Header connection

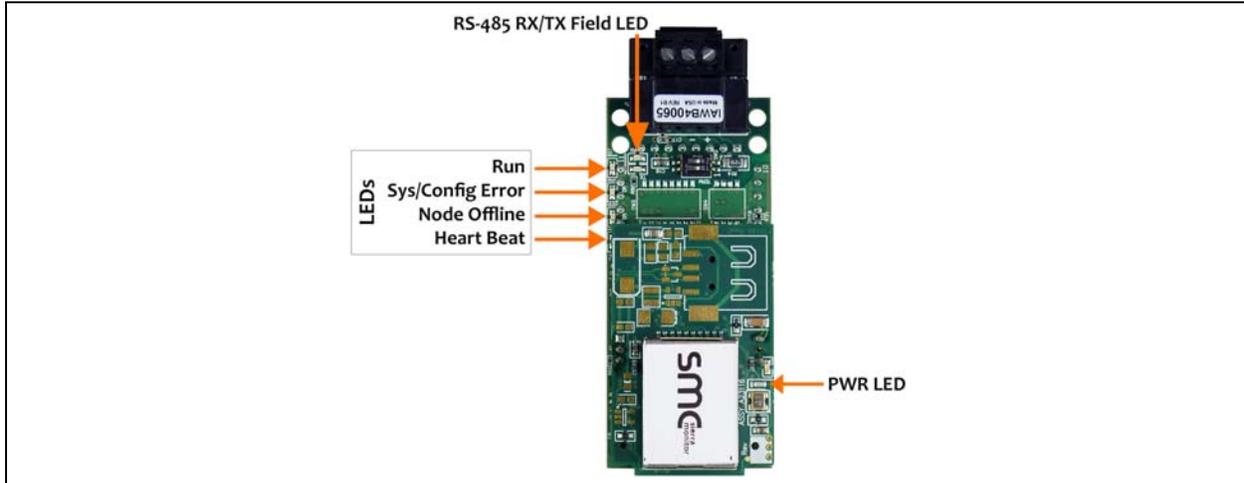
Note: This is a ProtoCessor to ILC connection only

- 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 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 FS-GUI interface to support 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 internally from ILC device (485 port).
TX	The TX LED will flash when a message is sent internally to ILC device (485 port).
PWR	The power light should show steady green when connected to a functioning power source.

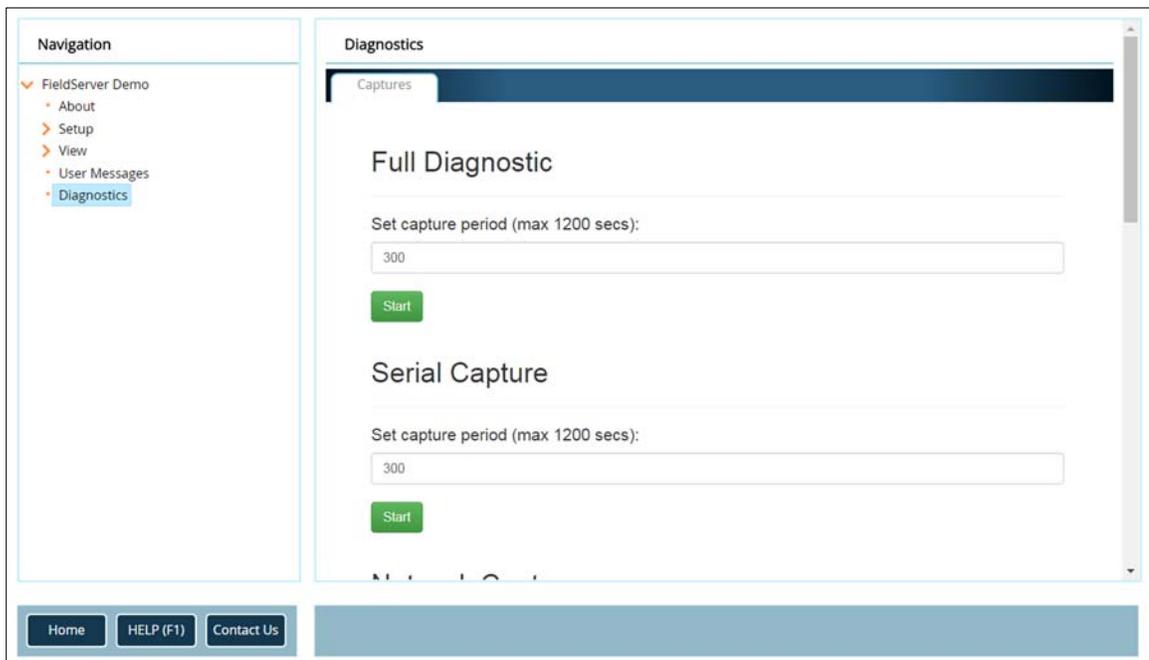
Figure 12: Diagnostic LEDs

Appendix A.5 Taking a FieldServer Diagnostic Capture

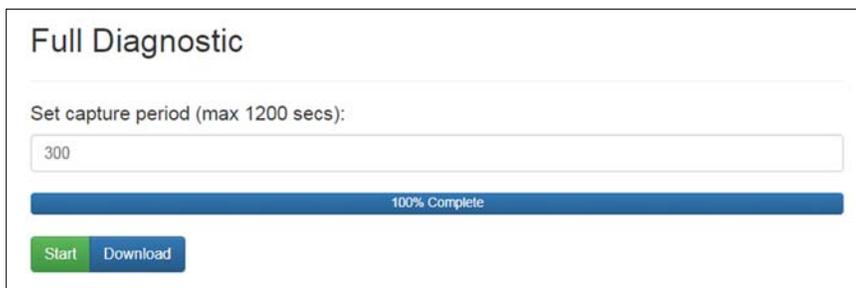
When there is a problem on-site that cannot easily be resolved, perform a Diagnostic Capture before contacting support. Once the Diagnostic Capture is complete, email it to technical support. The Diagnostic Capture will accelerate diagnosis of the problem.

If the FieldServer bios is updated/released on November 2017 or later then the Diagnostic Capture is performed via the gateway's on-board system.

- Access the FieldServer Diagnostics page via one of the following methods:
 - Open the FieldServer FS-GUI page and click on Diagnostics in the Navigation panel
 - Open the FieldServer Toolbox software and click the diagnose icon  of the desired device



- 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 A.5.1 Taking a Capture with Older Firmware

If the FieldServer firmware is from before November 2017, the Diagnostic Capture can be done by downloading the FieldServer Toolbox software but network connections (such as Ethernet and Wi-Fi) cannot be captured (if a network diagnostic is needed take a Wire Shark capture).

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.

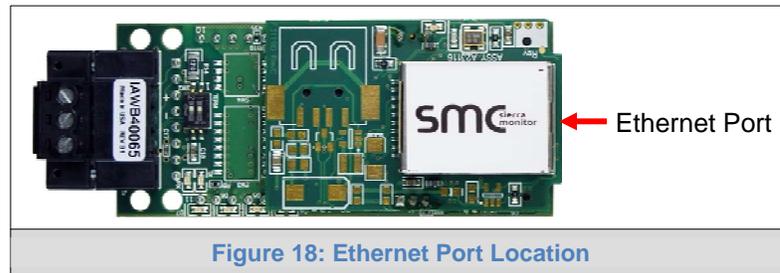
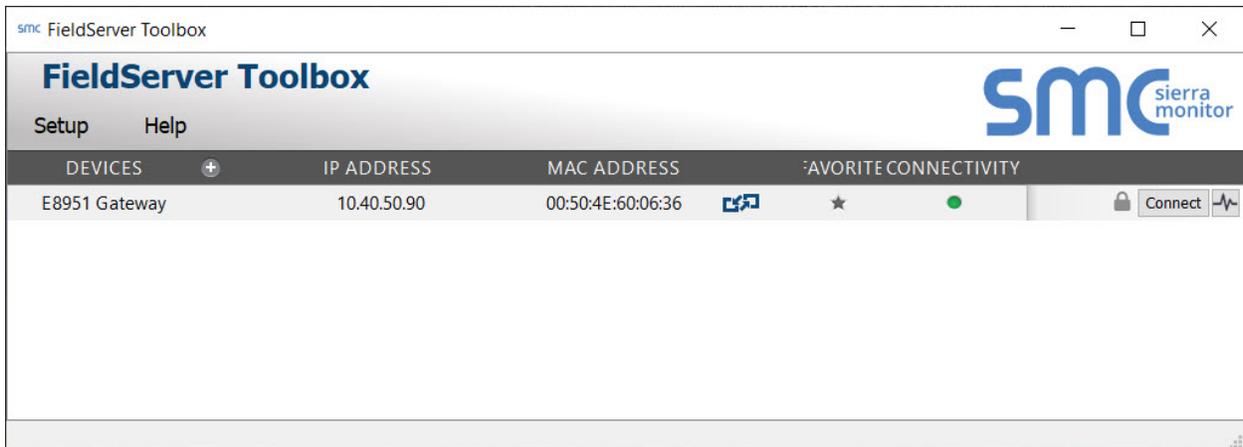


Figure 18: Ethernet Port Location

- Connect a standard Cat-5 Ethernet cable between the PC and ProtoNode.
- Double click on the FS Toolbox Utility.
- **Step 1: Take a Log**
 - Click on the diagnose icon  of the desired device



- o Select "Full Diagnostic" from the drop down menu



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

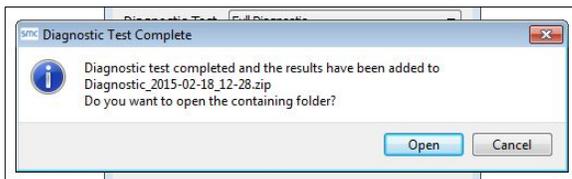
- o Click on the Start Diagnostic button



- o Wait for the capture period to finish and 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 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 Internet Browser Software Support

The following web browsers are supported:

- Chrome Rev. 57 and higher
- Firefox Rev. 35 and higher
- Microsoft Edge Rev. 41 and higher
- Safari Rev. 3 and higher

NOTE: Internet Explorer is no longer supported as recommended by Microsoft.

NOTE: Computer and network firewalls must be opened for Port 80 to allow FieldServer GUI to function.

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.

NOTE: If a gateway in the field is updated to a secure gateway, the password will change to “admin”. This change will still occur if the gateway was already setup with a unique password that was loaded in the factory and printed on the label.

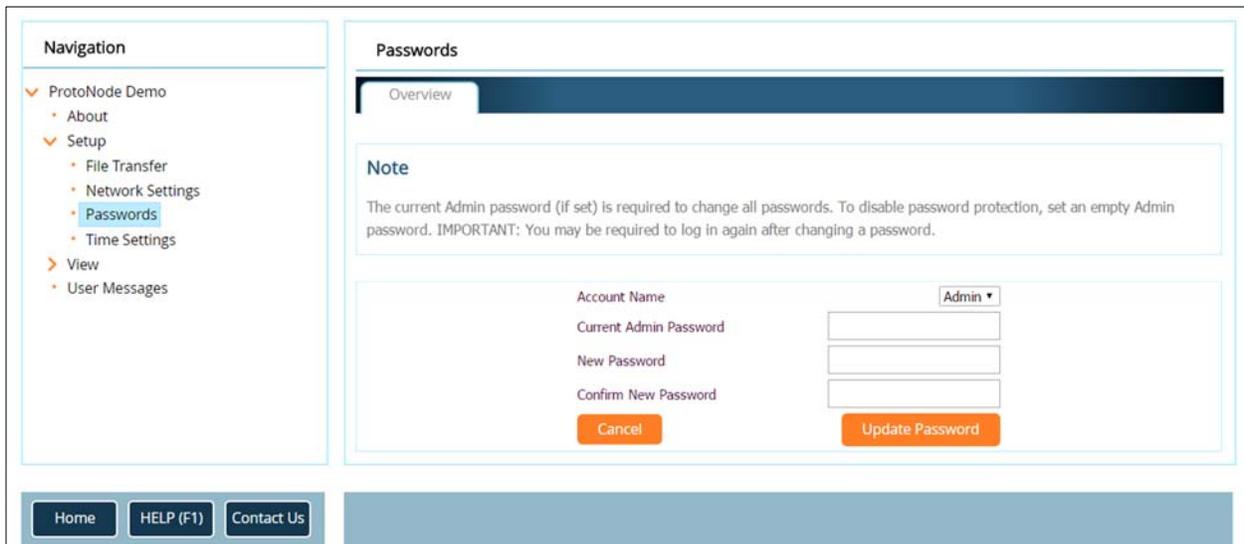


Figure 19: FS-GUI Passwords Page

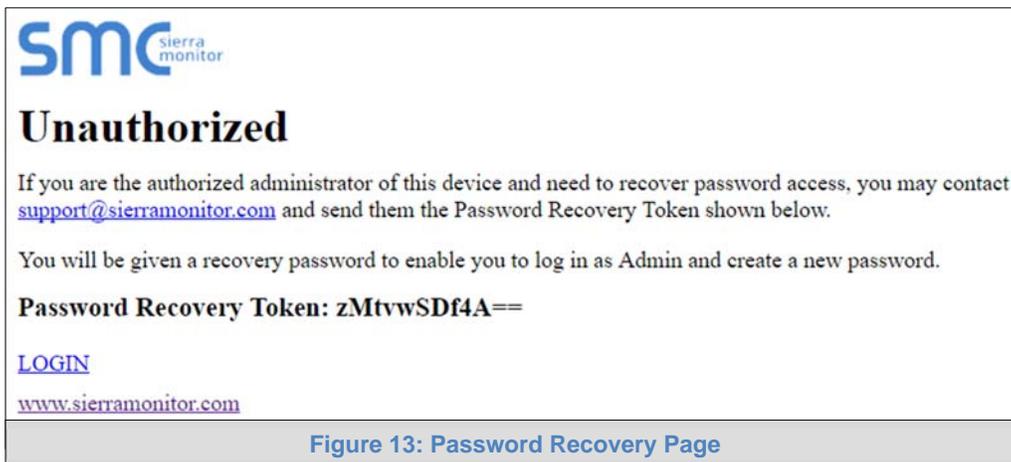


Figure 13: Password Recovery Page

Appendix B.4 Change Web Server Security Settings After Initial Setup

NOTE: Any changes will require a FieldServer reboot to take effect.

- Type the IP Address of the ProtoCessor into the web browser or use the FieldServer Toolbox to connect to the ProtoCessor, then login to the FieldServer.
- Click on the Diagnostics tab at the top of the screen, then click on View in the navigation panel, and then on Connections.
- Click Setup in the Navigation panel.

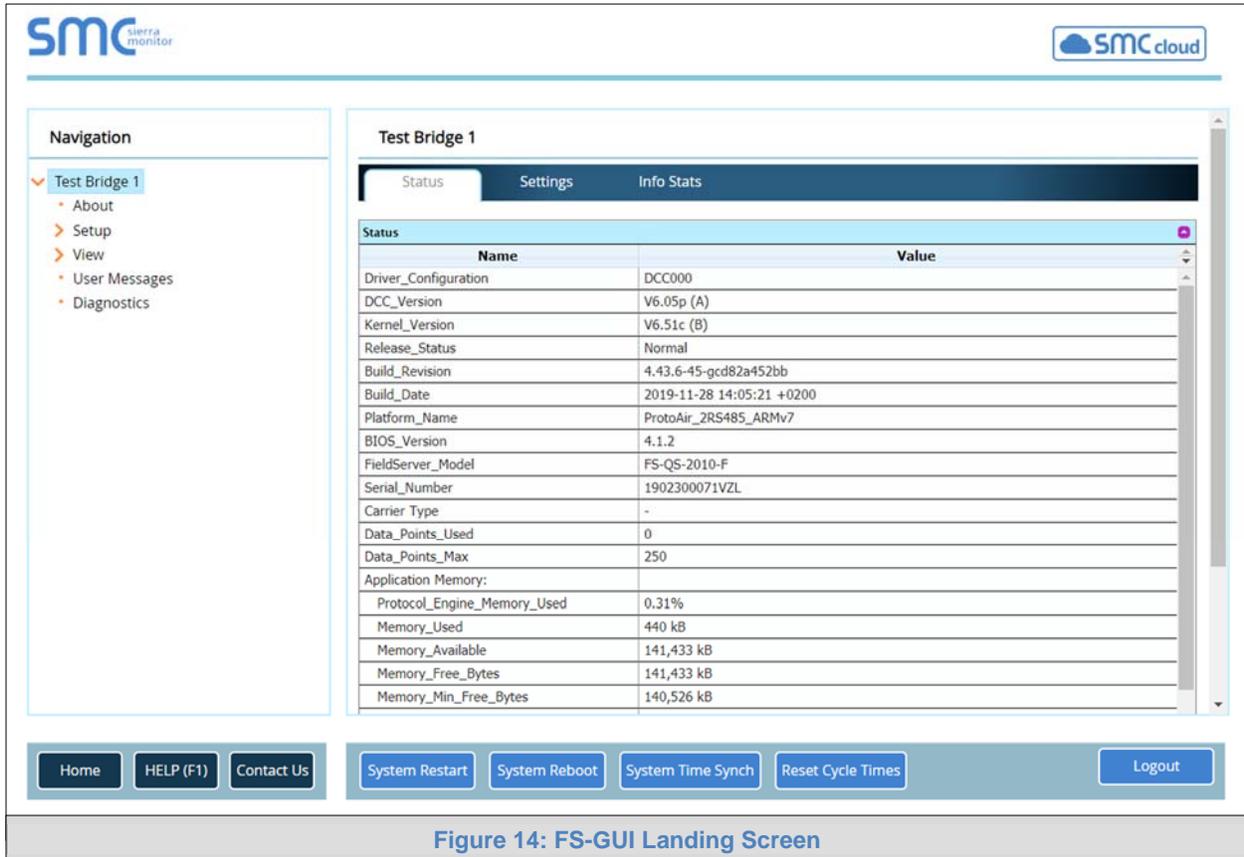


Figure 14: FS-GUI Landing Screen

Appendix B.4.1 Change Security Mode

- Click Security in the Navigation panel.

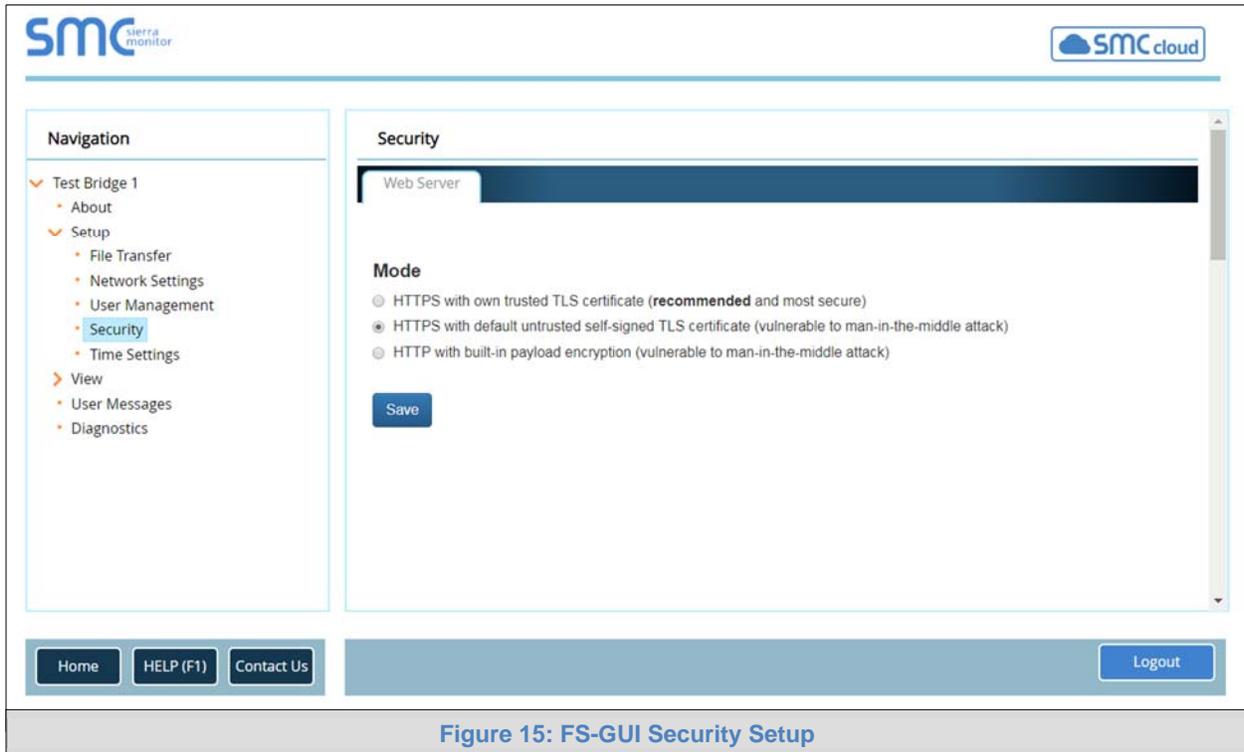


Figure 15: FS-GUI Security Setup

- Click the Mode desired.
 - If HTTPS with own trusted TLS certificate is selected, follow instructions in **Section 6.2.1**
- Click the Save button.

Appendix B.4.2 Edit the Certificate Loaded onto the FieldServer

NOTE: A loaded certificate will only be available if the security mode was previously setup as HTTPS with own trusted TLS certificate.

- Click Security in the Navigation panel.

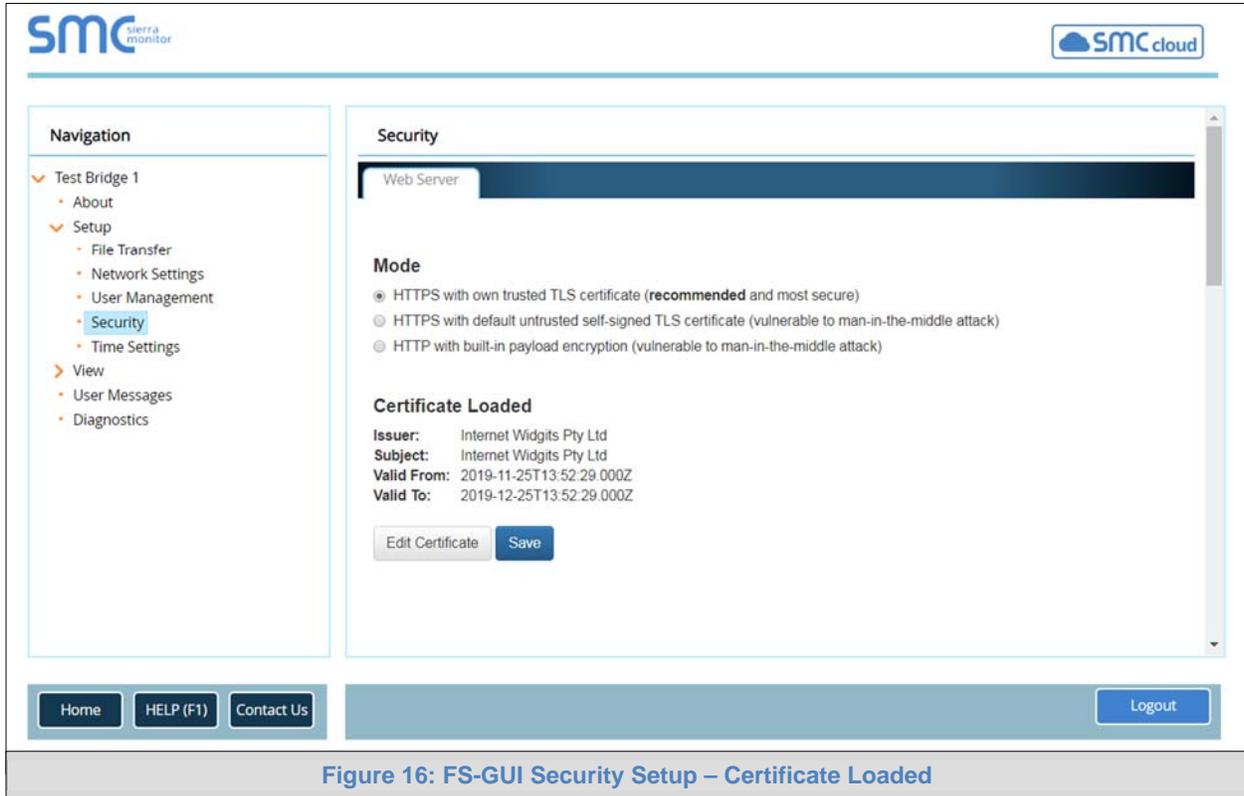


Figure 16: FS-GUI Security Setup – Certificate Loaded

- Click the Edit Certificate button to open the certificate and key fields.
- Edit the loaded certificate or key text as needed.
- Click Save.

Appendix B.5 Create and Manage Individual Users

NOTE: Any changes will require a FieldServer reboot to take effect.

- Type the IP Address of the ProtoCessor into the web browser or use the FieldServer Toolbox to connect to the ProtoCessor, then login to the FieldServer.
- Click on the Diagnostics tab at the top of the screen, then click on View in the navigation panel, and then on Connections.
- Click Setup in the Navigation panel.
- Click User Management in the navigation panel.
- Check that the Users tab is selected.

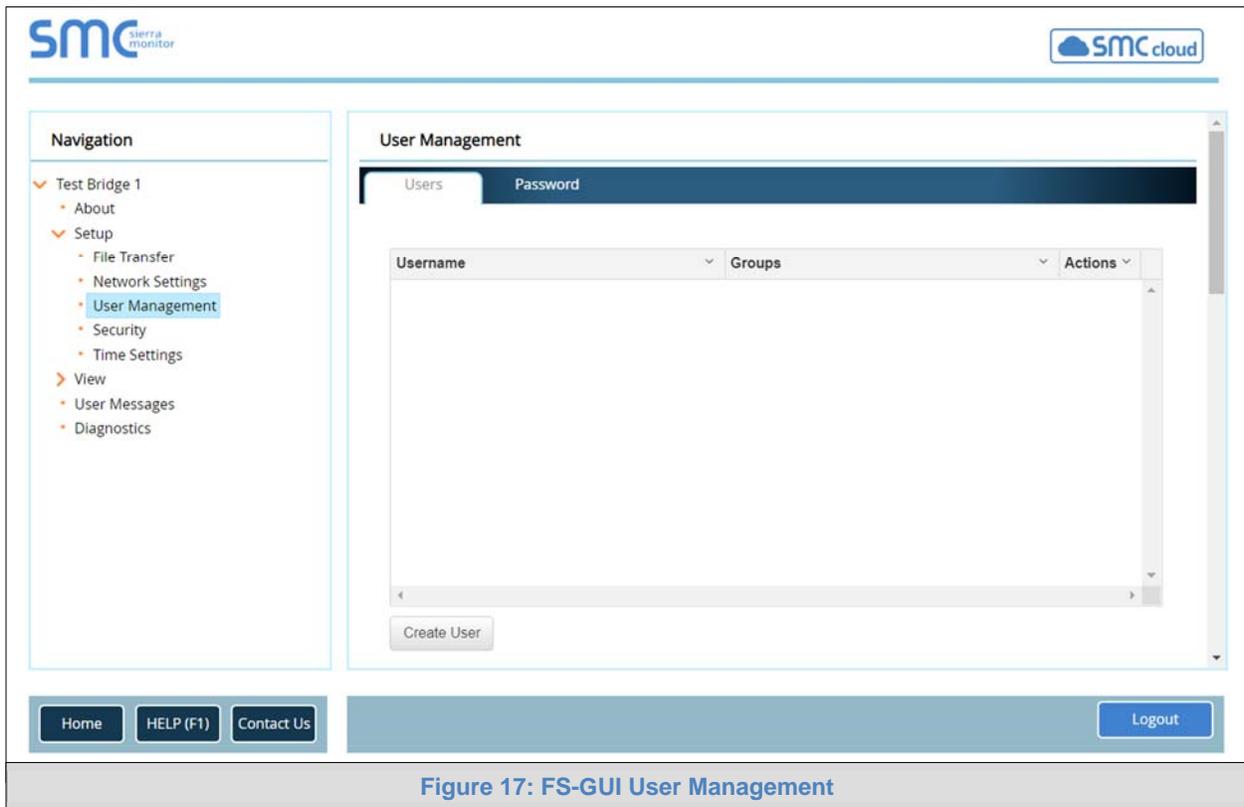


Figure 17: FS-GUI User Management

User Types:

Admin – Can modify and view any settings on the FieldServer.

Operator – Can modify and view any data in the FieldServer array(s).

Viewer – Can only view settings/readings on the FieldServer.

NOTE: If the passwords are lost, the unit can be reset to factory settings to reinstate the default unique password on the label. For ProtoNode, ProtoCessor or ProtoCarrier recovery instructions, see the [FieldServer Recovery Instructions document](#). For ProtoAir recovery instructions, see the [FieldServer Next Gen Recovery document](#). If the default unique password is lost then the unit must be mailed back to the factory.

Appendix B.5.1 Create Users

- Click the Create User button.

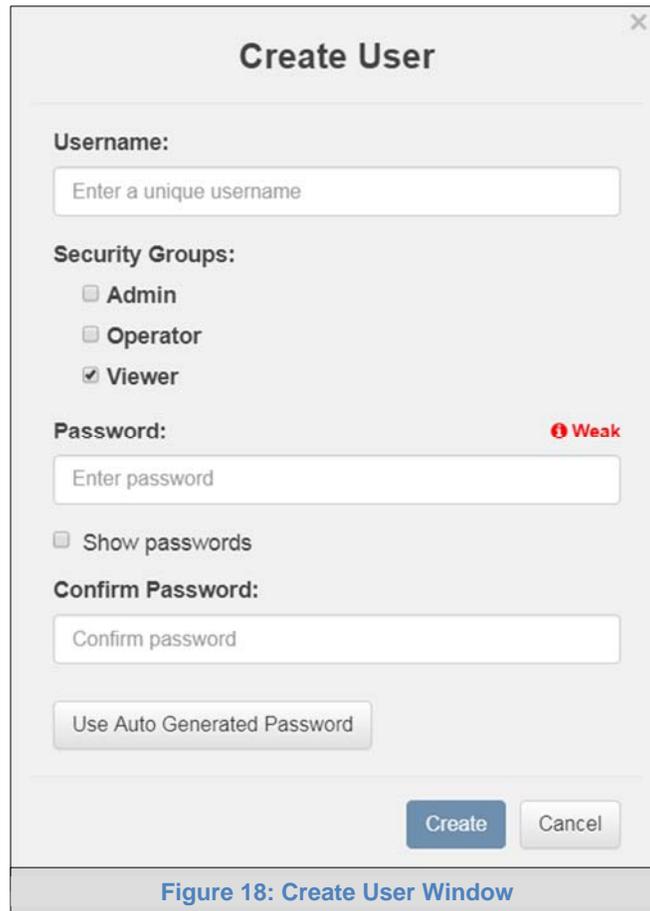


Figure 18: Create User Window

- Enter the new User fields: Name, Security Group and Password.
 - **User details are hashed and salted.**

NOTE: Passwords must be at least 10 characters long. An algorithm automatically checks the password entered and notes the level of strength on the top right of the Password text field.

- Click the Create button.
- Once the Success message appears, click OK.

Appendix B.5.2 Edit Users

- Click the pencil icon next to the desired user to open the User Edit window.



Figure 19: Setup Users

- Once the User Edit window opens, change the User Security Group and Password as needed.

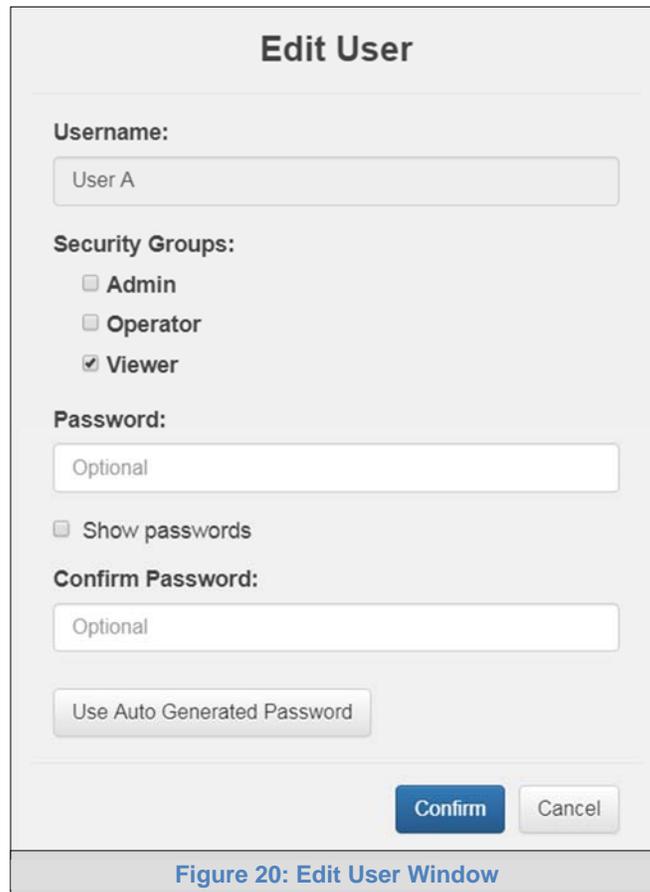


Figure 20: Edit User Window

- Click Confirm.
- Once the Success message appears, click OK.

Appendix B.5.3 Delete Users

- Click the trash can icon next to the desired user to delete the entry.

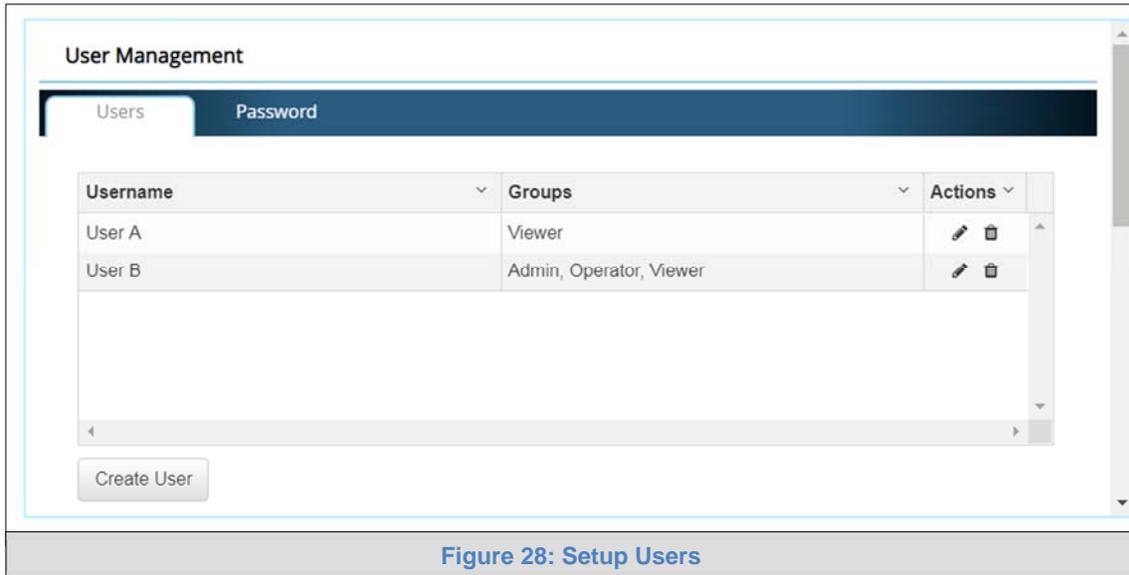


Figure 28: Setup Users

- When the warning message appears, click Confirm.

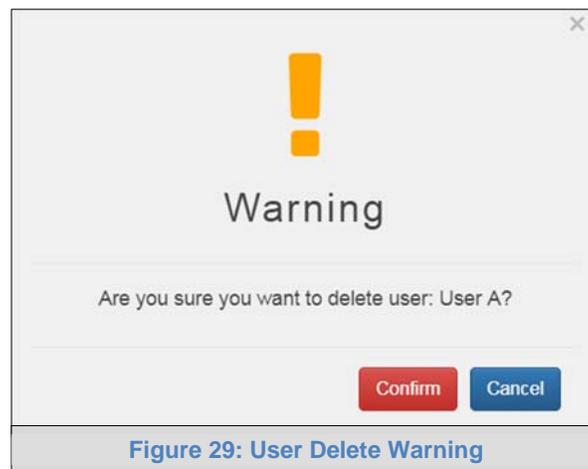


Figure 29: User Delete Warning

Appendix B.6 Change FieldServer Password

NOTE: Any changes will require a FieldServer reboot to take effect.

- Type the IP Address of the ProtoCessor into the web browser or use the FieldServer Toolbox to connect to the ProtoCessor, then login to the FieldServer.
- Click on the Diagnostics tab at the top of the screen, then click on View in the navigation panel, and then on Connections.
- Click Setup in the Navigation panel.
- Click User Management in the navigation panel.
- Click the Password tab.

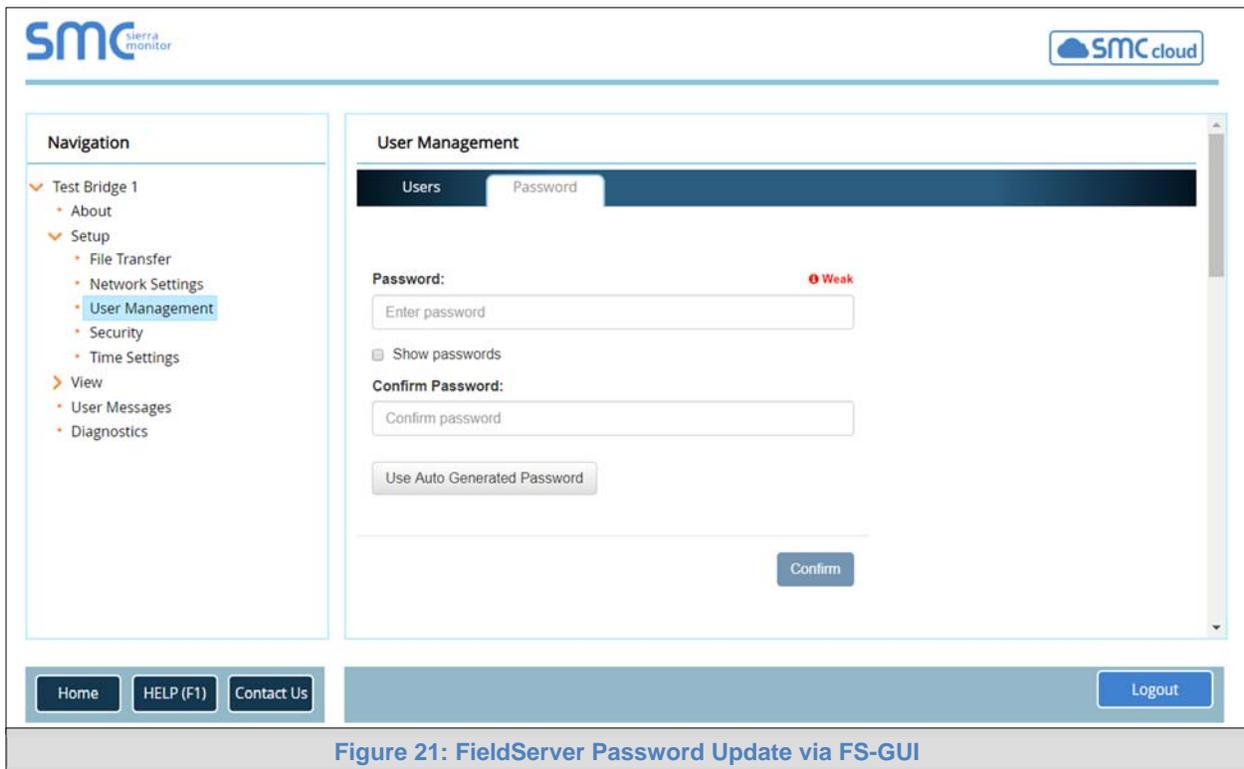


Figure 21: FieldServer Password Update via FS-GUI

- Change the general login password for the FieldServer as needed.

NOTE: Passwords must be at least 10 characters long. An algorithm automatically checks the password entered and notes the level of strength on the top right of the Password text field.

Appendix C Vendor Information – Intelligent Lighting Controls

See the document “Intelligent Lighting Controls Vendor Mappings” for the complete point list for all the Intelligent Lighting Controls devices referenced in this manual.

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; REACH compliant; EN 50491-3 and CSA C22-2 standards; FCC Class A Part 15; DNP 3.0 conformance tested; RoHS3 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 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 22: 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

MSA Safety warrants its products to be free from defects in workmanship or material under normal use and service for two years after date of shipment. MSA Safety 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 MSA Safety 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 MSA Safety'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 MSA Safety'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, MSA Safety 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 MSA Safety for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the product.