CHROMALOX
Advanced Thermal Technologies

ProtoAir FPA-W44
Start-up Guide

For Interfacing Chromalox Products

To Building Automation Systems:

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

APPLICABILITY & EFFECTIVITY

Explains ProtoAir hardware and how to install it.

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

sierra monitor

Document Revision: 9.C
Web Configurator
Template Revision: 4

Technical Support

Thank you for purchasing the ProtoAir for Chromalox.

Please call Chromalox for technical support of the ProtoAir product.

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

Support Contact Information:

Chromalox
1347 Heil Quaker Blvd.
Lavergne, TN 37086

Customer Service:
1-800-443-2640

Email: sales@chromalox.com

Website: www.chromalox.com

Quick Start Guide

1. Record the information about the unit. (**Section** 3.1)
2. Check that the ProtoAir and customer device COM settings match. (**Section** 3.3)
3. Connect the ProtoAir 3 pin RS-485 R1 port to the RS-485 network connected to each of the devices. (**Section** 4.1)
4. **If using a serial field protocol:**
   Connect the ProtoAir 3 pin RS-485 R2 port to the field protocol cabling. (**Section** 4.2)
5. Connect power to the ProtoAir 3 pin power port. (**Section** 4.5)
6. Connect a PC to the ProtoAir via Ethernet cable. (**Section** 5)
7. Configure ProtoAir to connect to the local network. (**Section** 6)
8. Integrate the ProtoAir with SMC Cloud or opt out. (**Section** 7.2 & 8)
9. Use a web browser to access the ProtoAir Web Configurator page to select the profile of the device attached to the ProtoAir and enter any necessary device information. Once the device is selected, the ProtoAir automatically builds and loads the appropriate configuration. (**Section** 9)

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1 CERTIFICATION

1.1 BTL Mark – BACnet®[1] Testing Laboratory

The BTL Mark on ProtoAir 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

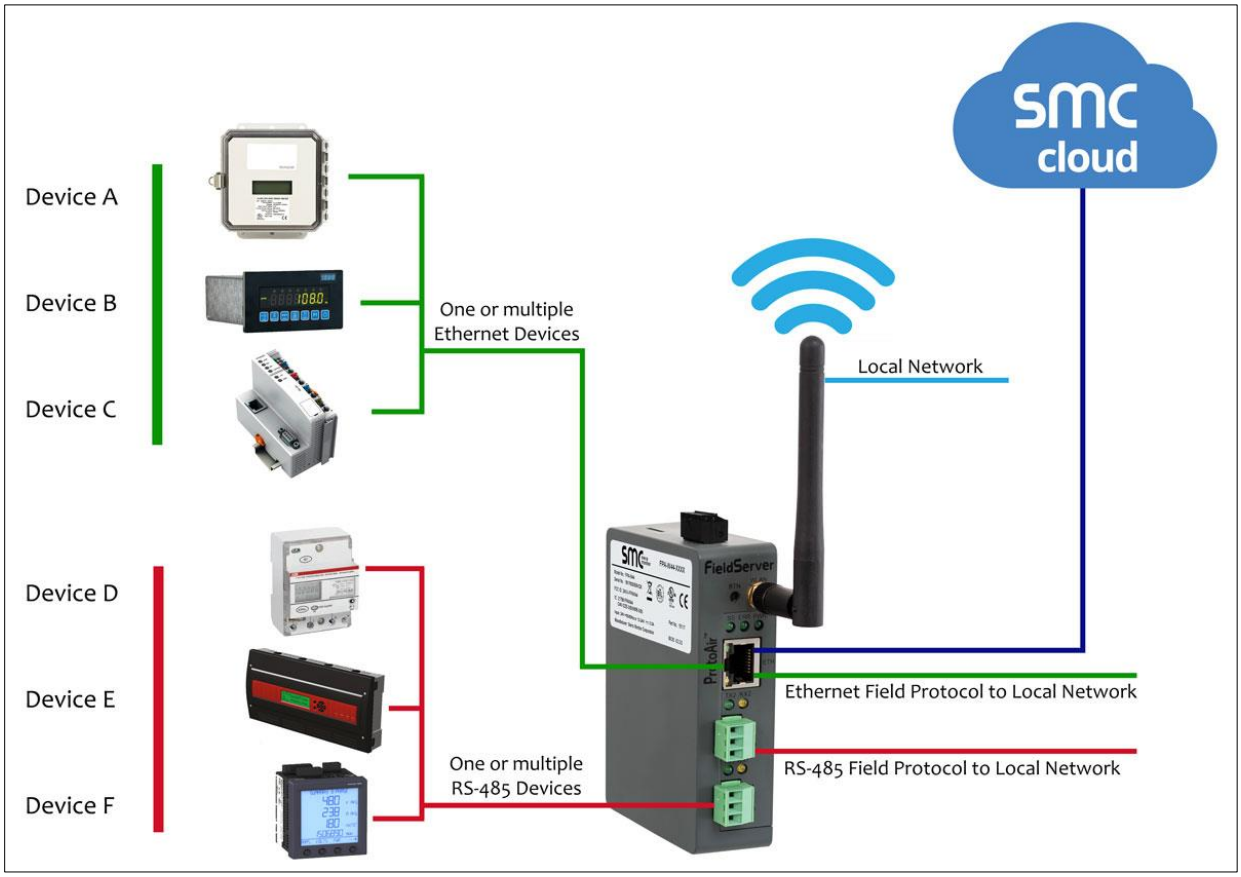
2 INTRODUCTION

2.1 ProtoAir Gateway

The ProtoAir wireless gateway is an external, high performance **building automation multi-protocol gateway** that is preconfigured to automatically communicate between Chromalox's devices (hereafter simply called "device") connected to the ProtoAir and automatically configures them for BACnet/IP, BACnet MS/TP, Modbus TCP/IP, EtherNet/IP and Metasys®[2] N2.

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

FPA-W44 Connectivity Diagram:



The ProtoAir 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 ProtoAir. 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.

2.2 Methods of Configuration

Devices	Communication
ITC1	Modbus RTU & Modbus TCP/IP
ITC2	Modbus RTU & Modbus TCP/IP
ITLS4	Modbus RTU & Modbus TCP/IP
ITLS6	Modbus RTU & Modbus TCP/IP
ITLS_2016	Modbus RTU & Modbus TCP/IP
CFW	Modbus RTU & Modbus TCP/IP
CFW_400_600A	Modbus RTU & Modbus TCP/IP
C4	Modbus RTU & Modbus TCP/IP
C4IR	Modbus RTU & Modbus TCP/IP
CTF	Modbus RTU & Modbus TCP/IP
MaxPac	Modbus RTU & Modbus TCP/IP
40 Series	Modbus RTU & Modbus TCP/IP
50 Series	Modbus RTU & Modbus TCP/IP
6060	Modbus RTU & Modbus TCP/IP
4081_4082	Modbus RTU & Modbus TCP/IP
3340	Modbus RTU & Modbus TCP/IP
3380	Modbus RTU & Modbus TCP/IP
6020	Modbus RTU & Modbus TCP/IP
1020	Modbus RTU & Modbus TCP/IP
1040	Modbus RTU & Modbus TCP/IP
WM30-WM40	Modbus RTU & Modbus TCP/IP
1030	Modbus RTU & Modbus TCP/IP

Figure 1: Method of Configuration per Device

3 PROTOAIR SETUP

3.1 Record Identification Data

Each ProtoAir 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
ProtoAir	FPA-W44-1853

Figure 2: ProtoAir Part Numbers

- FPA-W44 units have the following 4 ports: Ethernet + Wi-Fi + RS-485 + RS-485/RS-232

3.2 Point Count Capacity and Registers per Device

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

Part number	Total Registers
FPA-W44-1853	5,000

Figure 3: Supported Point Count Capacity

Devices	Registers Per Device
ITC1	29
ITC2	57
ITLS4	230
ITLS6 – ITLS72	152 – 1802
ITLS_2016	434
CFW	669
CFW_400_600A	542
C4	512
C4IR	584
CTF	174
MaxPac	79
40 Series	45
50 Series	27
6060	103
4081_4082	105
3340	133
3380	201
6020	84
1020	118
1040	310
WM30-WM40	33
1030	118

Figure 4: Registers per Device

3.3 Configuring Device Communications

3.3.1 Confirm the Device and ProtoAir COM Settings Match

- **Any connected serial device MUST have the same baud rate, data bits, stop bits, and parity settings as the ProtoAir.**
- Figure 5 specifies the device serial port settings required to communicate with the ProtoAir.

Port Setting	Device
Protocol	Modbus RTU
Baud Rate	19200
Parity	Even
Data Bits	8
Stop Bits	1

Figure 5: COM Settings

3.3.2 Set Node-ID for Any Device Attached to the ProtoAir

- Set Node-ID for the device attached to ProtoAir. The Node-ID needs to be uniquely assigned between 1 and 255.
- Document the Node-ID that is assigned. The Node-ID assigned is used for deriving the Device Instance for BACnet/IP and BACnet MS/TP. (**Section 9.5**)

NOTE: The Metasys N2 and Modbus TCP/IP field protocol Node-IDs are automatically set to be the same value as the Node-ID of the device.

3.3.3 Set IP Address for Any Ethernet Device Connected to the ProtoAir

- **Ensure any device is set to Modbus TCP/IP to communicate with the ProtoAir.**
- The device needs to be on the same IP subnet as the ProtoAir and the configuration PC.
- Record the following device information to start the setup:
  - IP Address
  - IP port
  - Node-ID

NOTE: This information is required for Section 9.2.

3.4 Attaching the Antenna

Wi-Fi Antenna:

Screw in the Wi-Fi antenna to the front of the unit as shown in Figure 53.

NOTE: Using an external antenna is also an option. An external antenna can be plugged into the SMA connector. The best antenna for the job depends on the range, topography and obstacles between the two radios.

4 INTERFACING PROTOAIR TO DEVICES

4.1 Device Connections to ProtoAir

The ProtoAir has a 3-pin Phoenix connector for connecting RS-485 devices on the R1 port.

NOTE: Use standard grounding principles for RS-485 GND.

Device Pins	ProtoAir Pin Label	Pin Assignment
RS-485 +	TX+	RS-485 +
RS-485 -	RX-	RS-485 -
RS-485 GND	GND	RS-485 GND

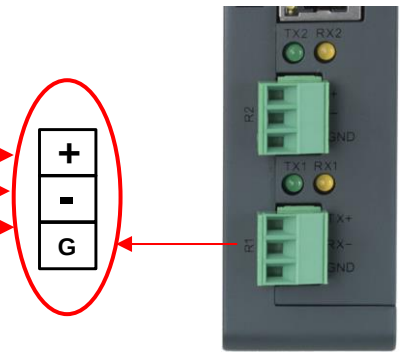


Figure 6: RS-485 Connections from Devices to the ProtoAir

4.2 Wiring Field Port to RS-485 Serial Network

- Connect the RS-485 network wires to the 3-pin RS-485 connector on the R2 port. (Figure 7)
  - Use standard grounding principles for RS-485 GND
- See **Section** 5 for information on connecting to an Ethernet network.

BMS Wiring	ProtoAir Pin Label	Pin Assignment
RS-485 +	+	RS-485 +
RS-485 -	-	RS-485 -
-	GND	RS-485 GND

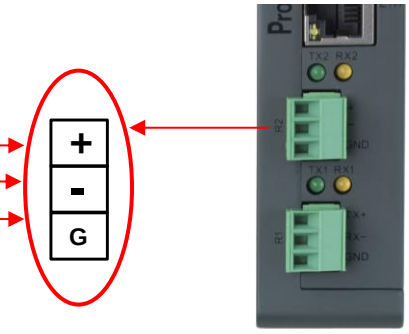


Figure 7: Connection from ProtoAir to RS-485 Field Network

4.3 Bias Resistors

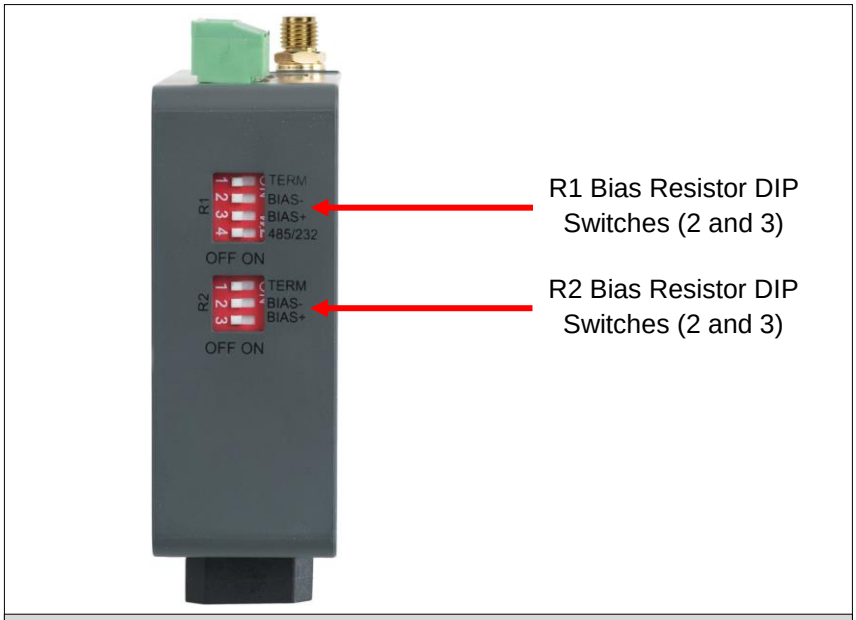


Figure 8: Bias Resistor DIP Switches

To enable Bias Resistors, move both the BIAS- and BIAS+ dip switches to the right as shown in Figure 8.

The ProtoAir bias resistors are used to keep the RS-485 bus to a known state, when there is no transmission on the line (bus is idling), to help prevent false bits of data from being detected. The bias resistors typically pull one line high and the other low - far away from the decision point of the logic.

The bias resistor is 510 ohms which is in line with the BACnet spec. It should only be enabled at one point on the bus (for example, on the field port were there are very weak bias resistors of 100k). Since there are no jumpers, many gateways can be put on the network without running into the bias resistor limit which is < 500 ohms.

NOTE: See www.ni.com/support/serial/resinfo.htm for additional pictures and notes.

NOTE: The R1 and R2 DIP Switches apply settings to the respective serial port.

NOTE: If the gateway is already powered on, DIP switch settings will not take effect unless the unit is power cycled.

4.4 Termination Resistor

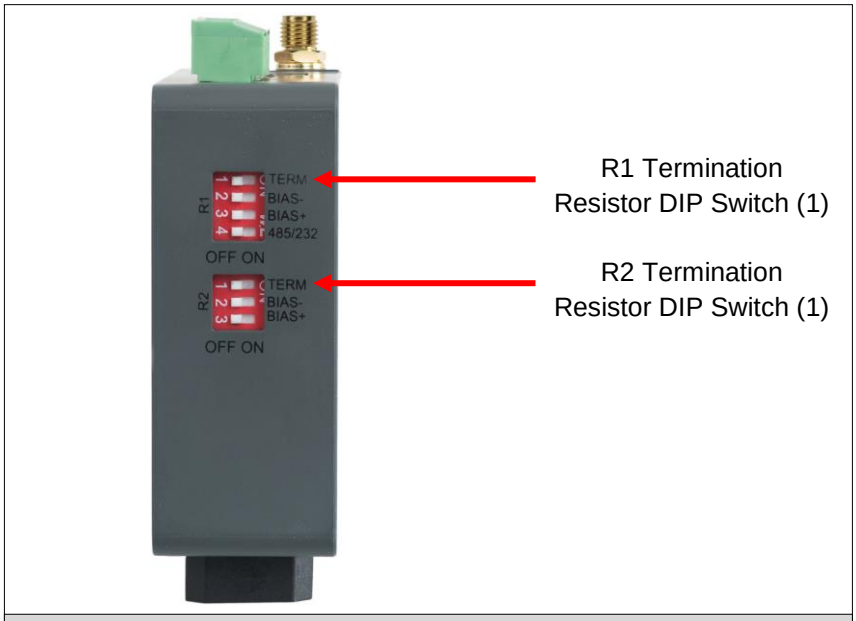


Figure 9: Termination Resistor DIP Switch

If the ProtoAir is the last device on the serial trunk, then the End-Of-Line Termination Switch needs to be enabled. **To enable the Termination Resistor, move the TERM dip switch to the right as shown in Figure 9.**

Termination resistor is also used to reduce noise. It pulls the two lines of an idle bus together. However, the resistor would override the effect of any bias resistors if connected.

NOTE: The R1 and R2 DIP Switches apply settings to the respective serial port.

NOTE: If the gateway is already powered on, DIP switch settings will not take effect unless the unit is power cycled.

4.5 Power-Up ProtoAir

Check power requirements in the table below:

Power Requirement for ProtoAir External Gateway		
	Current Draw Type	
ProtoAir Family	12VDC	24VDC/AC
FPA – W44 (Typical)	250mA	125mA
NOTE: These values are 'nominal' and a safety margin should be added to the power supply of the host system. A safety margin of 25% is recommended.		

Figure 10: Required Current Draw for the ProtoAir

Apply power to the ProtoAir as shown below in **Figure 11.** Ensure that the power supply used complies with the specifications provided in **Appendix D.1**.

- The ProtoAir accepts 9-30VDC or 24VAC on pins L+ and N-.
- Frame GND should be connected.

Power to ProtoAir	ProtoAir Pin Label	Pin Assignment
Power In (+)	L+	V +
Power In (-)	N-	V -
Frame Ground	FG	FRAME GND

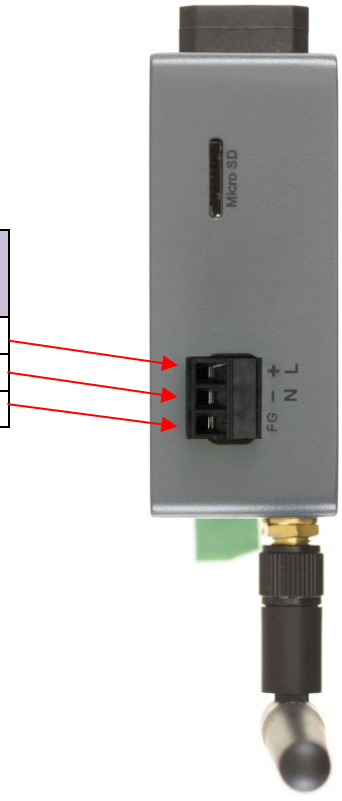


Figure 11: Power Connections

5 CONNECT THE PC TO THE PROTOAIR

5.1 Connecting to the ProtoAir via Ethernet

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

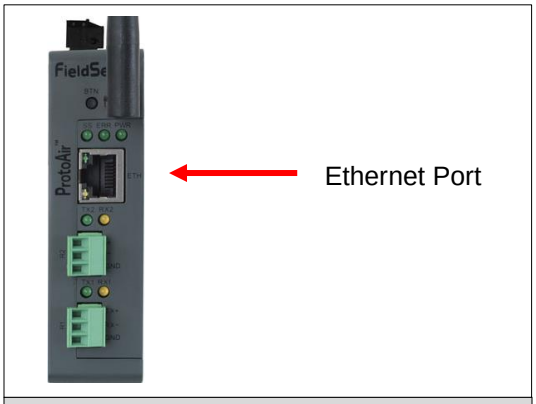


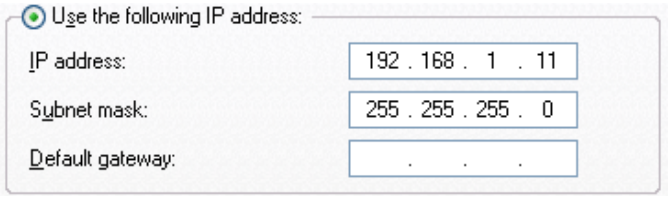
Figure 12: Ethernet Port Location

5.1.1 Changing the Subnet of the Connected PC

The default IP Address for the ProtoAir is **192.168.1.24**, Subnet Mask is **255.255.255.0**. If the PC and ProtoAir 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.

6 NETWORK SETTINGS

6.1 Navigate to the FS-GUI Network Settings

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

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

- From the Web App landing page, click the word “Diagnostics” found in blue at the bottom of the screen to open the FS-GUI page.

Figure 13: Web App Landing Page

- Find the Navigation tree on the left side of the screen.

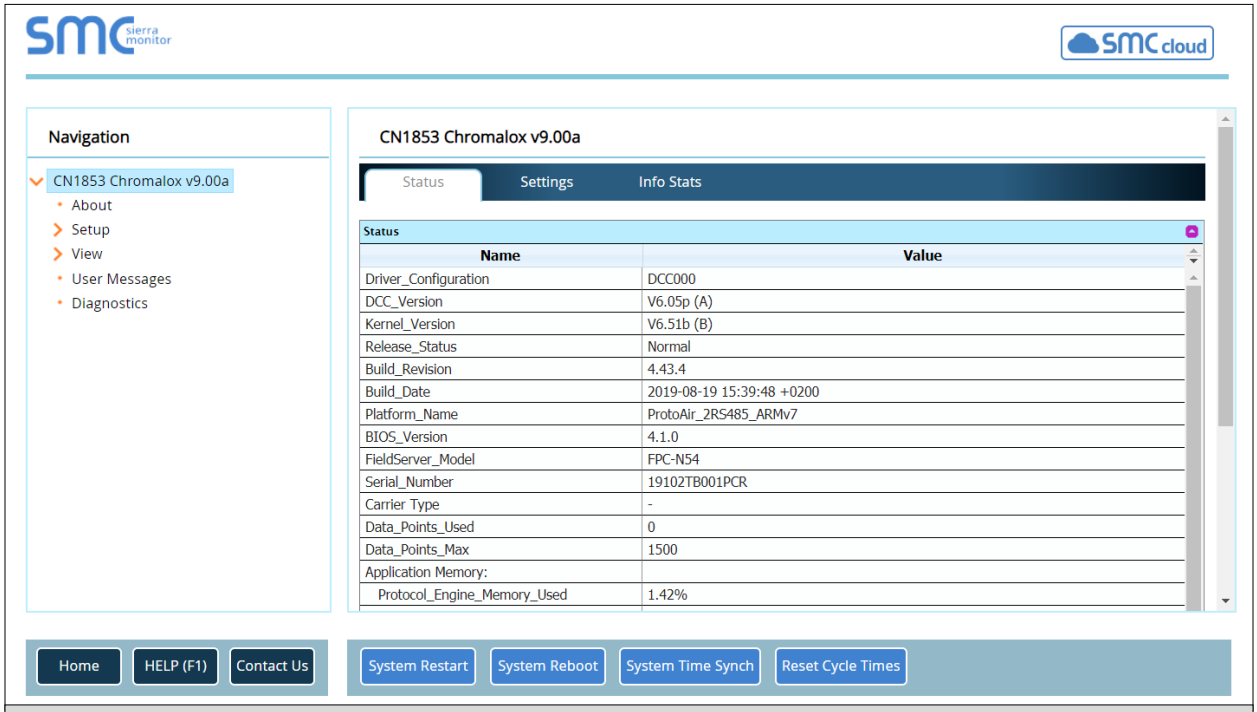


Figure 14: FS-GUI Landing Page

- Click the orange arrow next to the ProtoAir CN number and title to expand the tree.
- Click on the orange arrow next to Setup to expand the tree.
- Click on Network Settings.

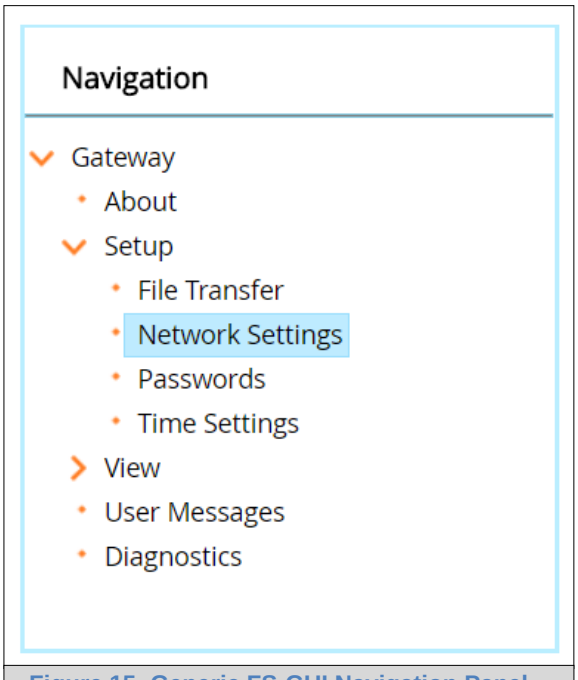


Figure 15: Generic FS-GUI Navigation Panel – Network Settings

6.2 Change the ProtoAir IP Address

Configure the IP settings of the ProtoAir using the following methods:

- When using the Ethernet port to connect to the local network (**Section 6.2.1**).
- When connecting the ProtoAir to a local wireless network, configure the Wi-Fi Client Settings in the ProtoAir (**Section 6.2.2**).

NOTE: For Wi-Fi Access Point network information see Appendix B.4.

6.2.1 Update Wired Network Settings

IP Settings tab is the landing page when selecting Network Settings on the navigation tree. To change the IP settings, follow these instructions:

- Enable DHCP Client State to automatically assign IP Settings or modify the settings manually as needed, via these fields: IP Address, Netmask, Default Gateway and Domain Name Server1/2.

NOTE: If connected to a router, set the Default Gateway to the same IP Address as the router.

- Click Update IP Settings, then click on System Restart to restart the Gateway and activate the new IP Address.
- Connect the ProtoAir to the local network or router.

NOTE: If the FS-GUI was open in a browser, the browser will need to be pointed to the new IP Address of the ProtoAir before the FS-GUI will be accessible again.

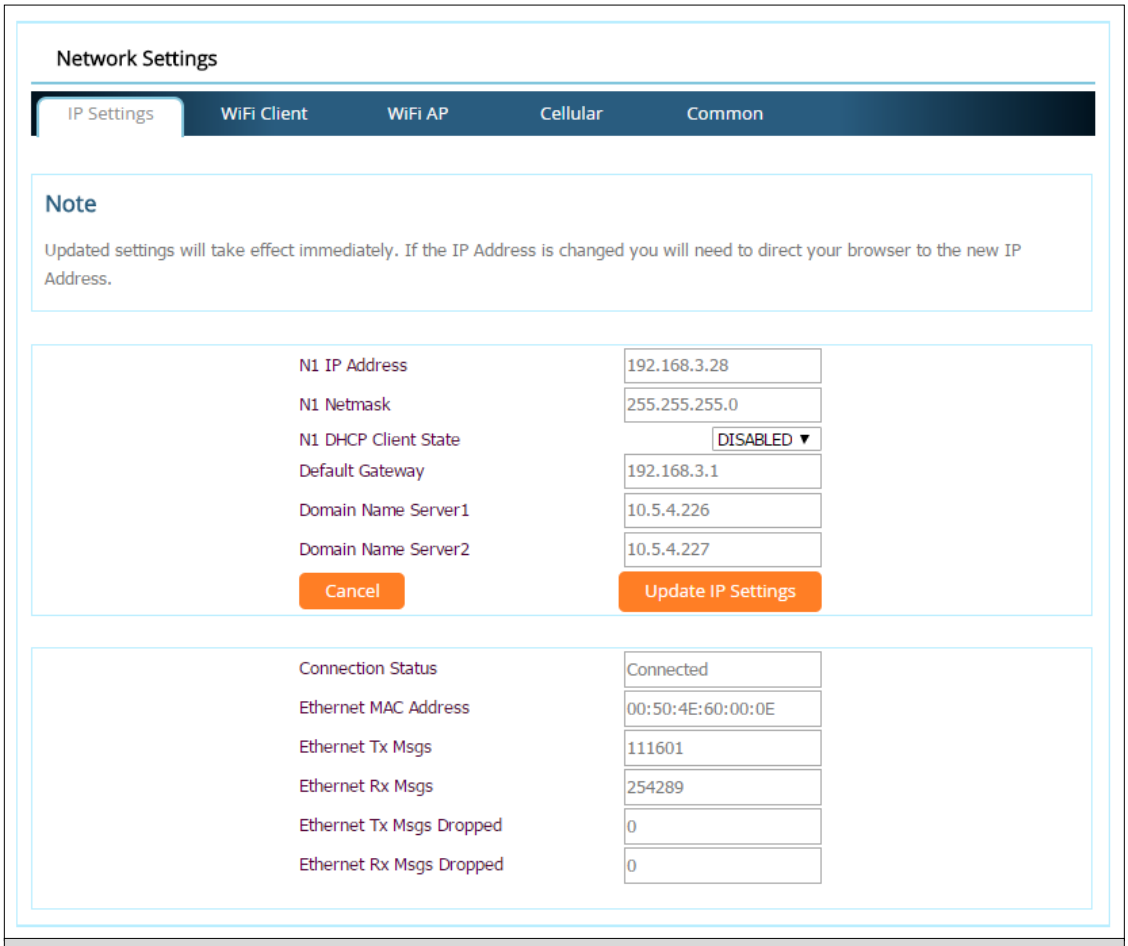


Figure 16: FS-GUI Ethernet Port Network Settings

IP Setting Fields	Definition
Connection Status	Status of connection
MAC Address	Ethernet MAC Address
Tx/Rx Msgs	Number of transmitted and received messages
Tx/Rx Msgs Dropped	Number of unanswered Tx or Rx messages

6.2.2 Update Wi-Fi Client Settings

From the FS-GUI Network Settings landing page, click on the Wi-Fi Client tab. To change the Wi-Fi client settings, follow these instructions:

- Set the Wi-Fi Status to ENABLED for the ProtoAir to communicate with other devices via Wi-Fi.
- Enter the Wi-Fi SSID and Wi-Fi Password for the local wireless network.
- Enable DHCP to automatically assign all Wi-Fi Client network settings or manually modify the setting using the fields immediately below (IP Address, Network, etc.).

NOTE: If connected to a router, set the IP gateway to the same IP Address as the router.

- Click Update Wi-Fi Settings, then click on System Restart to restart the gateway and activate Wi-Fi Client settings.
- **Go to Common settings (Section 6.2.3) to set the Primary Connection to Wi-Fi Client.**

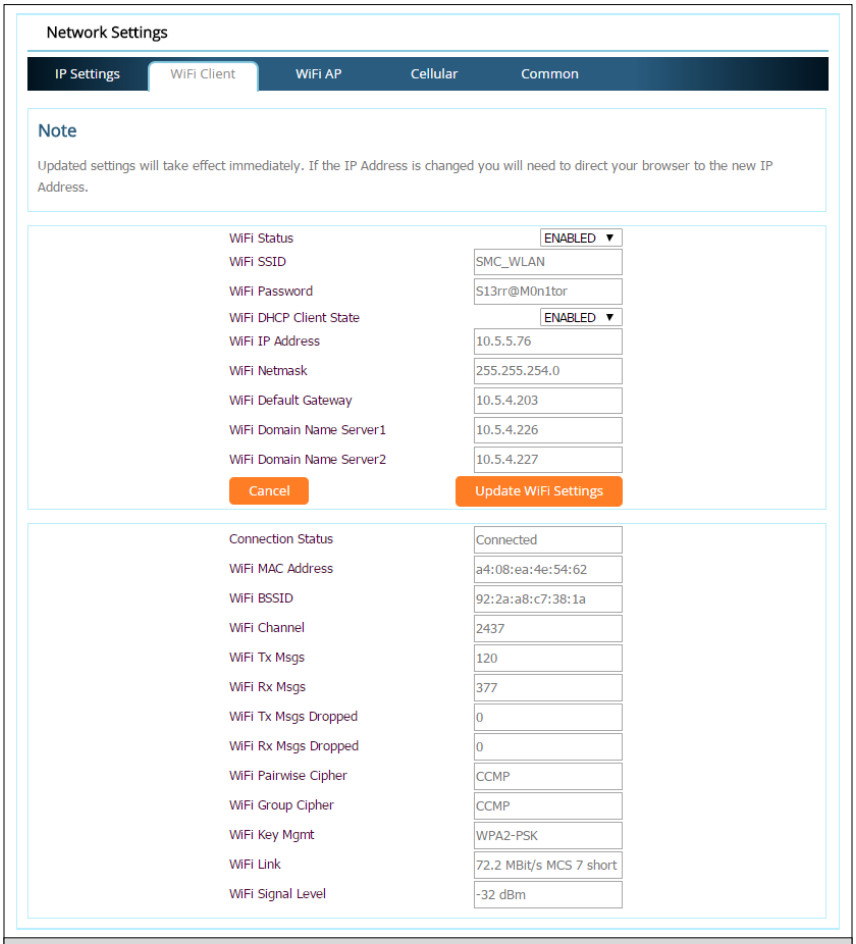


Figure 17: FS-GUI Wi-Fi Client Network Settings

Wi-Fi Client Fields	Definition
Connection Status	Status of connection
MAC Address, BSSID, Channel	Wi-Fi Client MAC Address, BSSID, and Channel
Tx/Rx Msgs	Number of transmitted and received messages
Tx/Rx Msgs Dropped	Number of unanswered Tx or Rx messages
Pairwise Cipher	Type of encryption used for unicast traffic
Group Cipher	Identifies the type of encryption used for multicast / broadcast traffic
Key Mgmt	Encryption type
Link	Connection speed
Signal Level	Signal level in dBm (see Appendix A.6)

6.2.3 Common Settings

The Common Settings make it possible to choose the primary connection when both Ethernet and Wi-Fi Client connections are available.

- From the FS-GUI Network Settings landing page, click on the Common tab.

NOTE: The default is Primary Connection is Ethernet.

- Select the desired option from the drop-down menu on the right.
- Click Update Common Settings, then click on System Restart to restart the gateway and activate the new settings.

NOTE: If using Wi-Fi Client and not Ethernet, change Primary Connection to Wi-Fi.

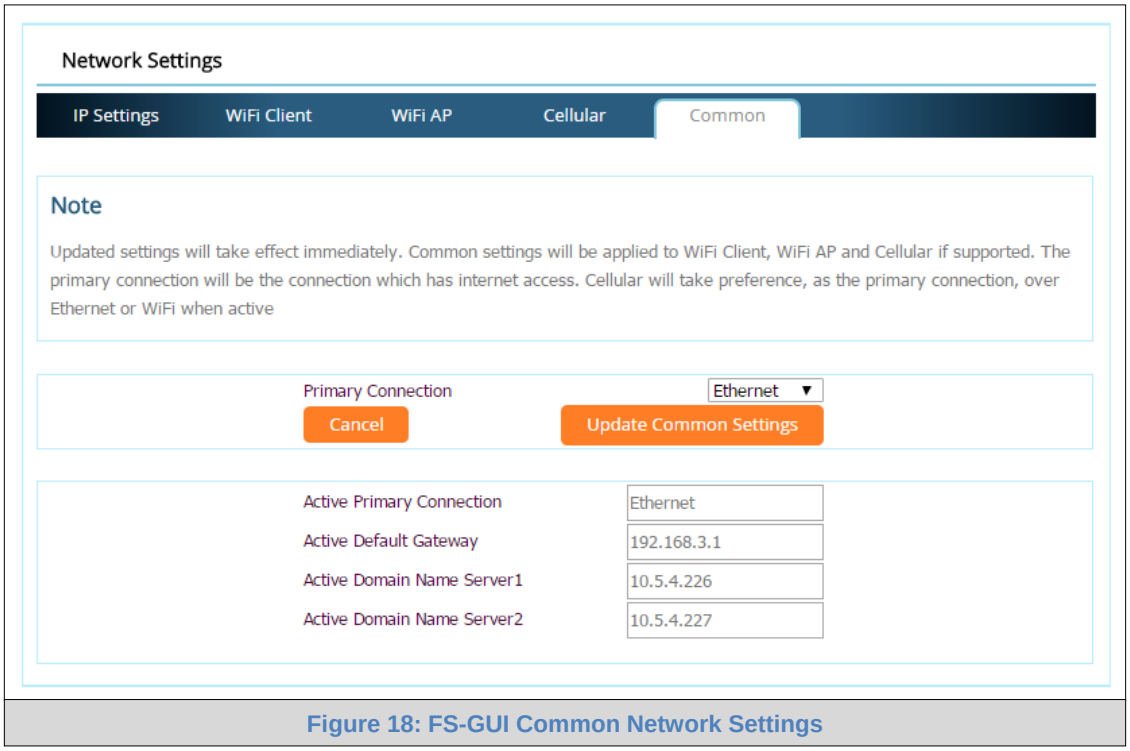


Figure 18: FS-GUI Common Network Settings

NOTE: The fields below the update button show the settings as they were set in the IP Settings or Wi-Fi Client pages. They are not editable on the Common page.

7 ACCESS THE PROTOAIR WEB APP

7.1 Navigate Back to the Web App Landing Screen

- Beneath the FS-GUI navigation panel, find and click the Home button.

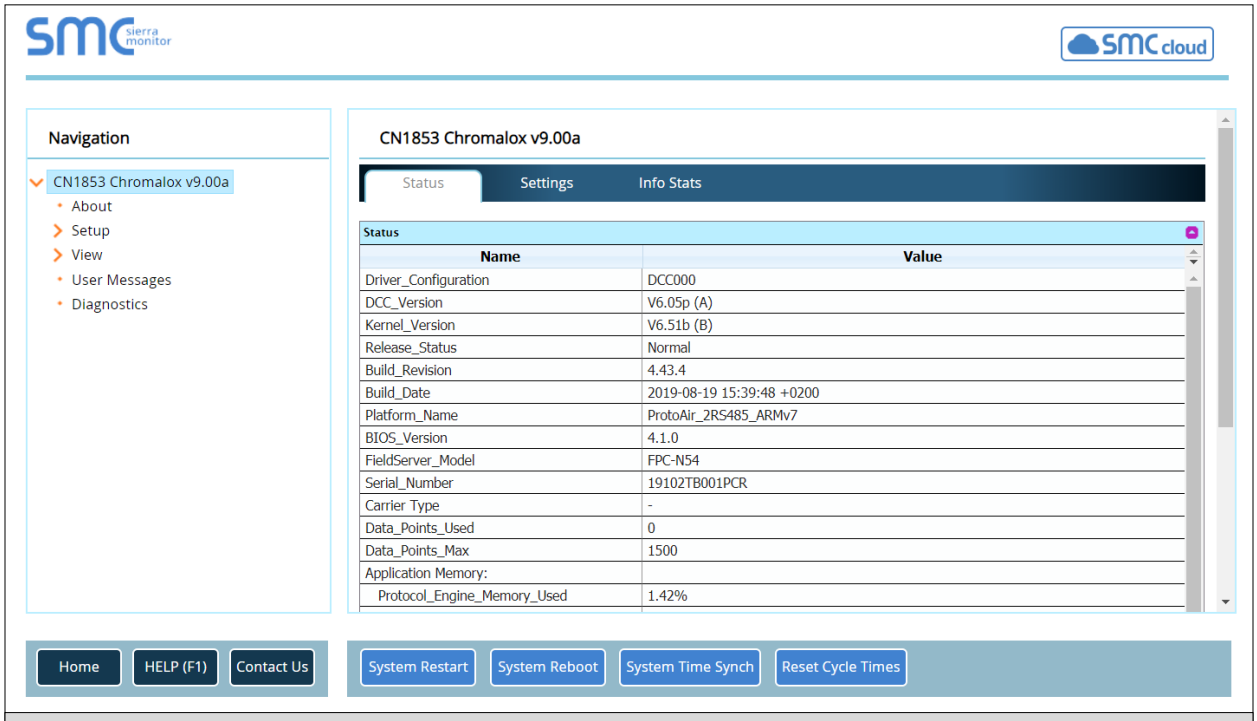


Figure 19: FS-GUI Status Screen

- The Web App Landing Page will appear

7.2 Logging into the ProtoAir Web App

- Once at the Web App splash page, click the Login button.

Figure 20: Web App Login

- Enter the previously set up or default username and password.

NOTE: The default username is "admin". The default password is "admin".

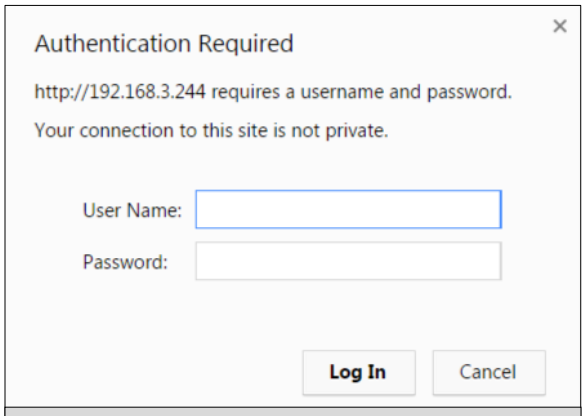


Figure 21: Login Window

When first logging onto the ProtoAir, the Web App will open on the SMC Cloud™ page.

NOTE: If a warning message appears instead, go to Appendix B.7 to resolve the connecton issue.

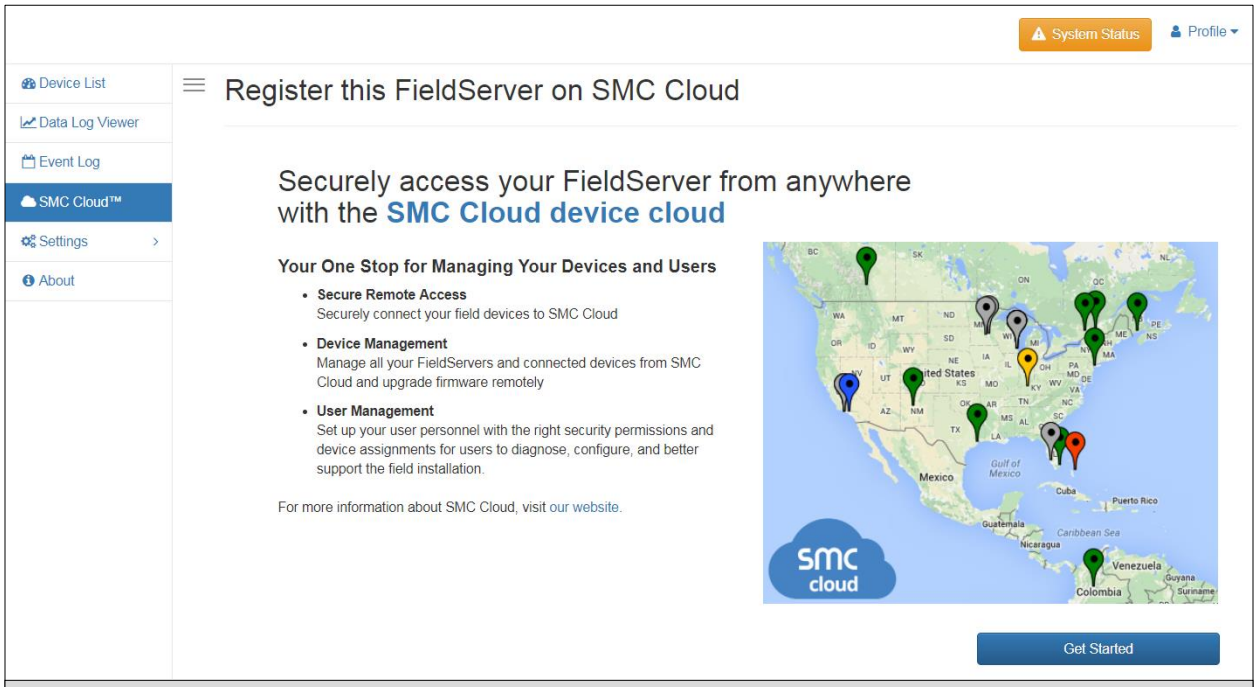


Figure 22: Generic Web App Page – First Login

- Either go through the SMC Cloud setup to integrate SMC Cloud functionality to the FieldServer or optout of SMC Cloud setup.
  - For SMC Cloud setup, follow instructions in **Section 8**
  - To opt out of SMC Cloud, click on a tab other than the SMC Cloud™ tab 

, click the checkbox next to “Opt out of SMC Cloud Registration” in the Warning window that appears and click the Exit Registration button (skip to **Section 9** to continue FieldServer configuration)
  - To ignore SMC Cloud setup until the next time the FieldServer Web App is opened, click a tab other than SMC Cloud™ and then click the Exit Registration button with the “Opt out” checkbox unchecked (skip to **Section 9** to continue FieldServer configuration)

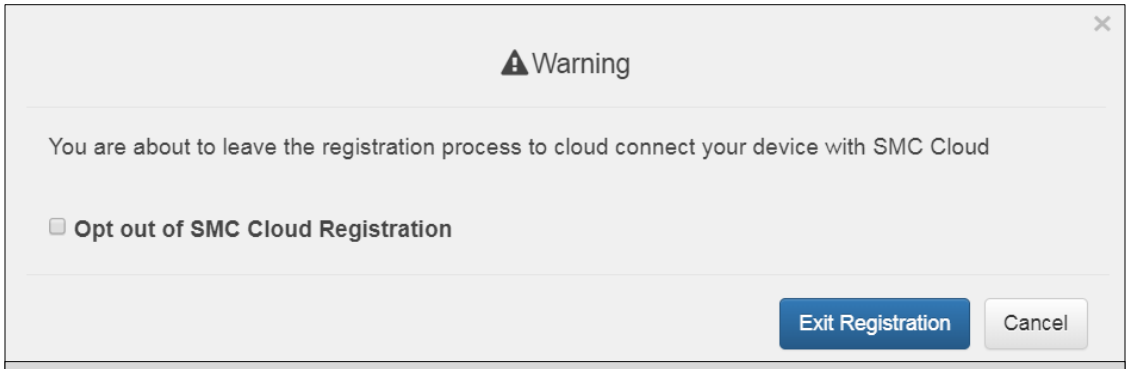


Figure 23: SMC Cloud Opt Out Warning Window

8 SMC CLOUD USER SETUP, REGISTRATION AND LOGIN

The SMC Cloud is Sierra Monitor's device cloud solution for IIoT. Integration with the SMC Cloud enables a secure remote connection to field devices through a FieldServer and hosts local applications for device configuration, management, as well as maintenance. For more information about the SMC Cloud, refer to the SMC Cloud Start-up Guide.

NOTE: If SMC Cloud integration with the ProtoAir is not desired, skip to Section 9 to continue gateway setup. If user setup is already complete go to Section 8.2.

8.1 User Setup

Before the gateway can be connected to SMC Cloud a user account must be created. Request an invitation to SMC Cloud from the manufacturer's support team and follow the instructions below to set up login details:

- The "Welcome to SMC Cloud" email will appear as shown below.

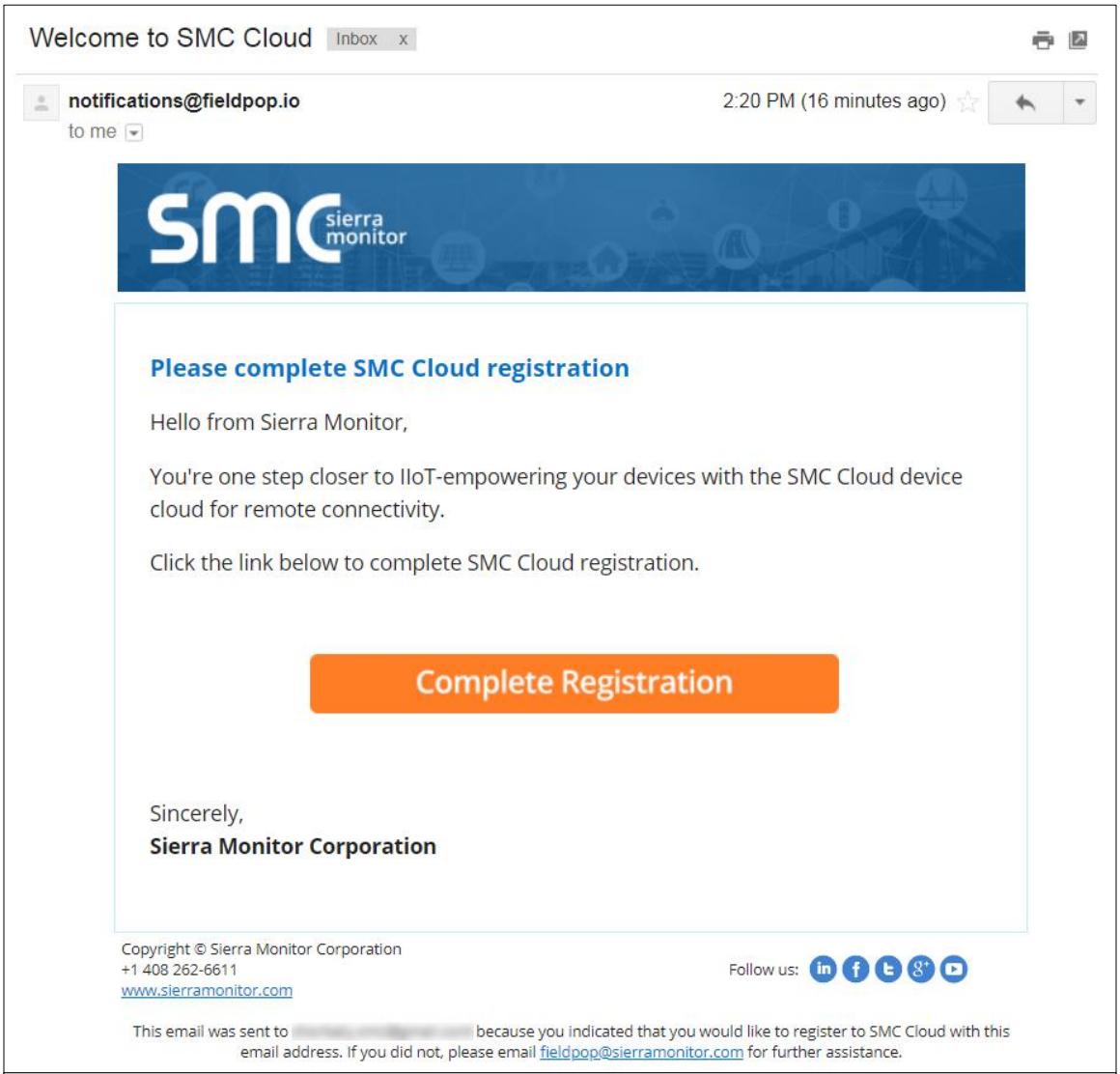


Figure 24: Welcome to SMC Cloud Email

NOTE: If no SMC Cloud email was received, check the spam/junk folder for an email from notification@fieldpop.io. Contact the manufacturer's support team if no email is found.

- Click the “Complete Registration” button and fill in user details accordingly.

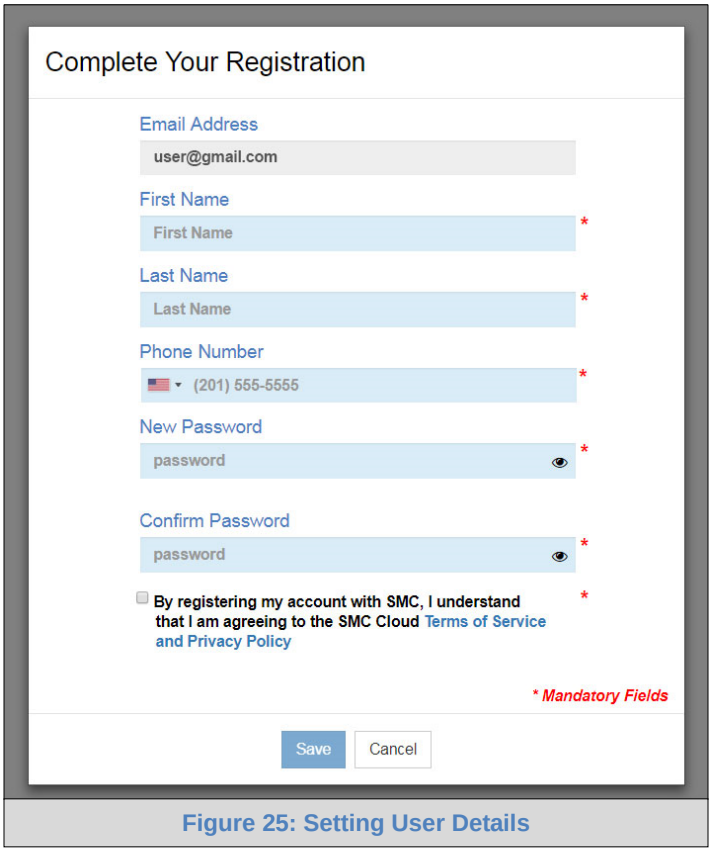


Figure 25: Setting User Details

- Fill in the name, phone number, password fields and click the checkbox to agree to the privacy policy and terms of service.
- Click “Save” to save the user details.
- Click “OK” when the Success message appears.
- Record the email account used and password for future use.

8.2 Registration Process

Once SMC Cloud user credentials have been generated, the ProtoAir can be registered onto the SMC Cloud server.

- When first logging onto the ProtoAir, the Web App will open on the SMC Cloud™ page.

NOTE: If a warning message appears instead, go to Appendix B.7 to resolve the connecton issue.

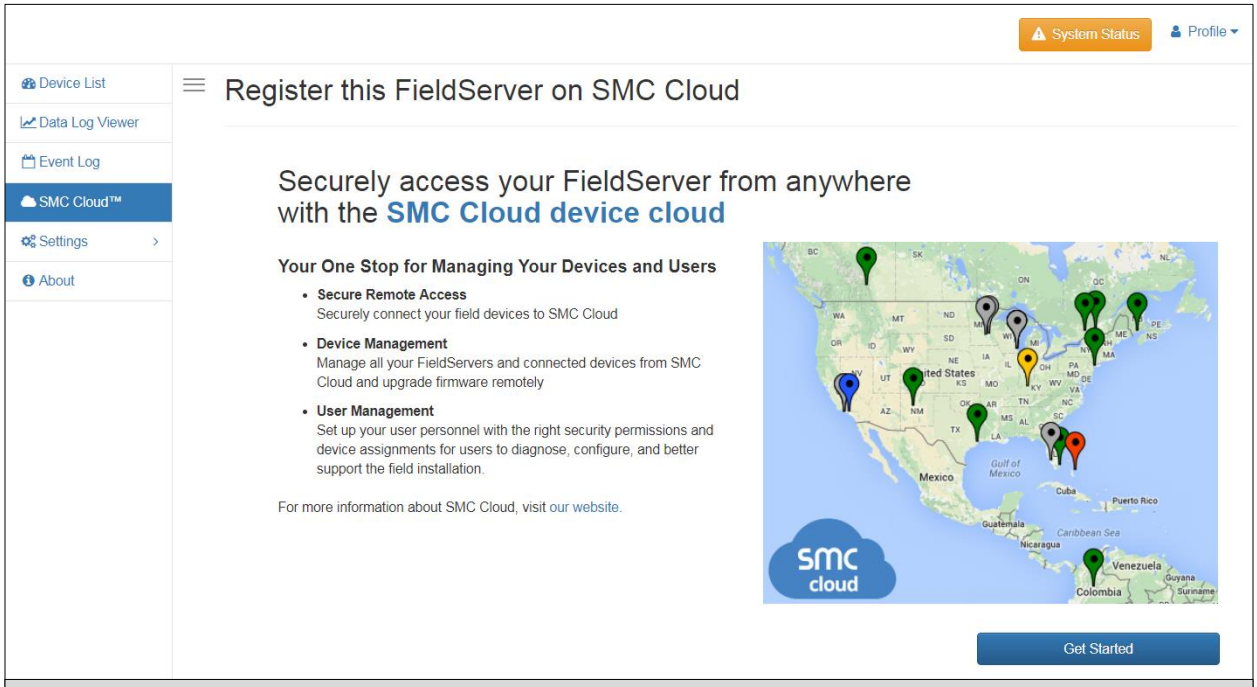


Figure 26: SMC Cloud Registration Message

- Click Get Started to view the SMC Cloud registration page.

NOTE: For information on the System Status button, go to Appendix B.8.

- To register, fill in the user details, site details, gateway details and SMC Cloud account credentials.
  - Enter user details and click Next

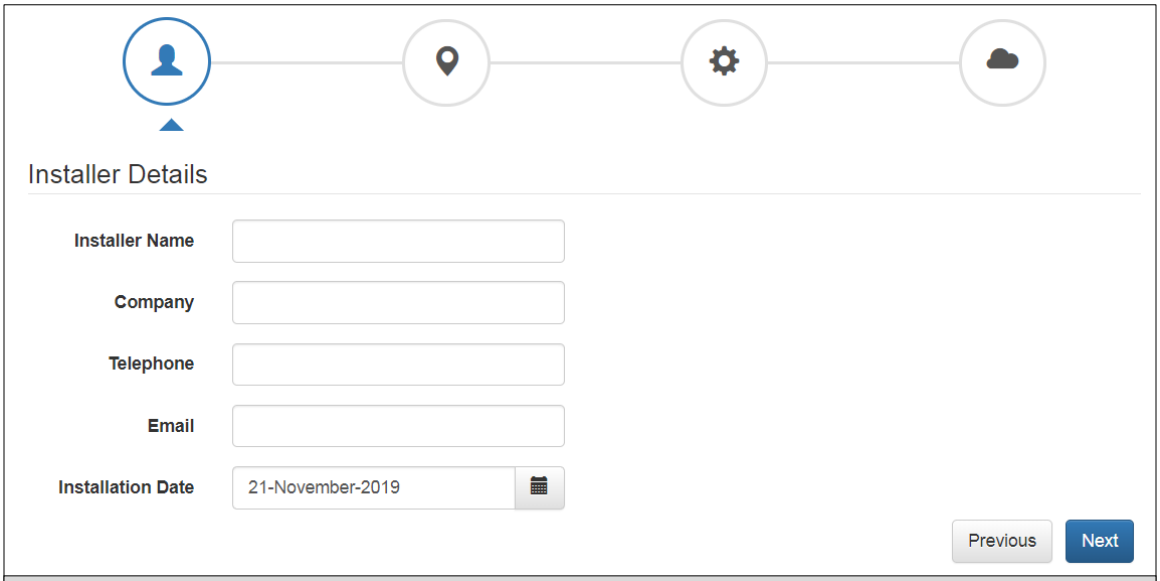


Figure 27: SMC Cloud Registration – Installer Details

  - Enter the site details by entering the physical address fields or the latitude and longitude then click Next

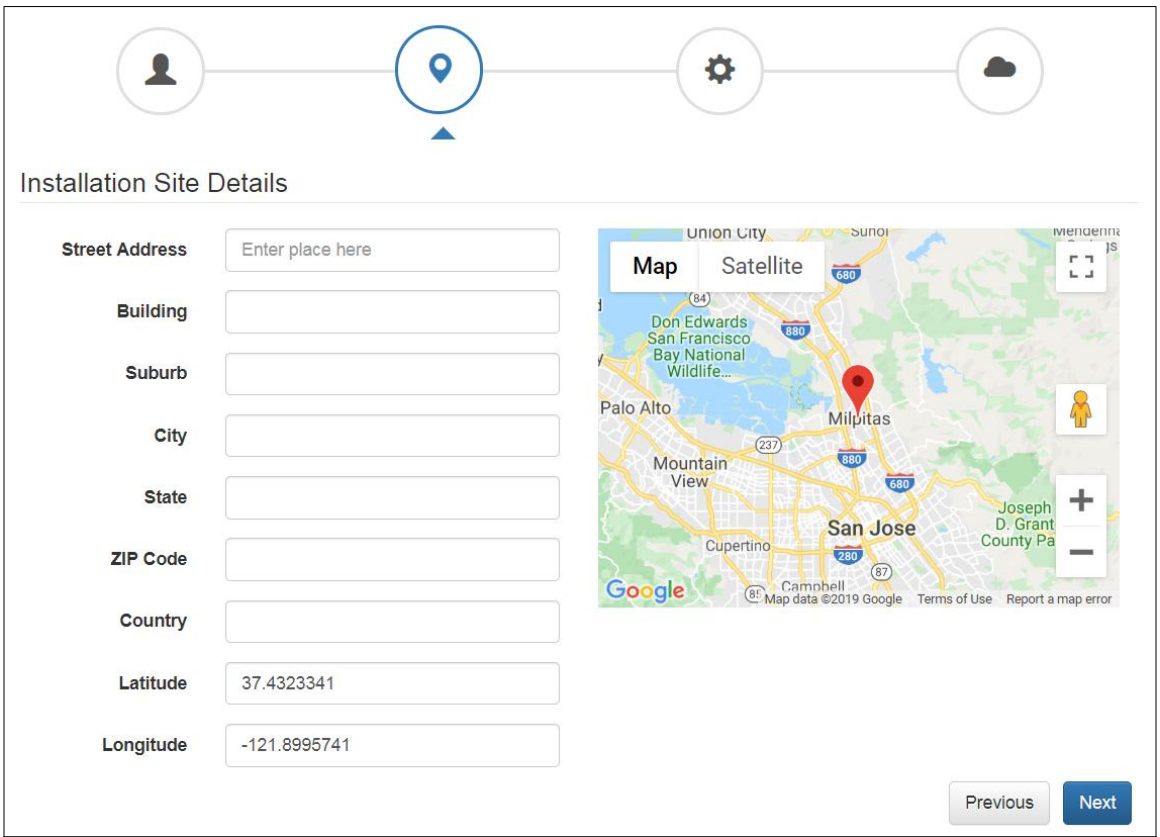


Figure 28: SMC Cloud Registration – Site Details

- Enter Name and Description (required) then click Next

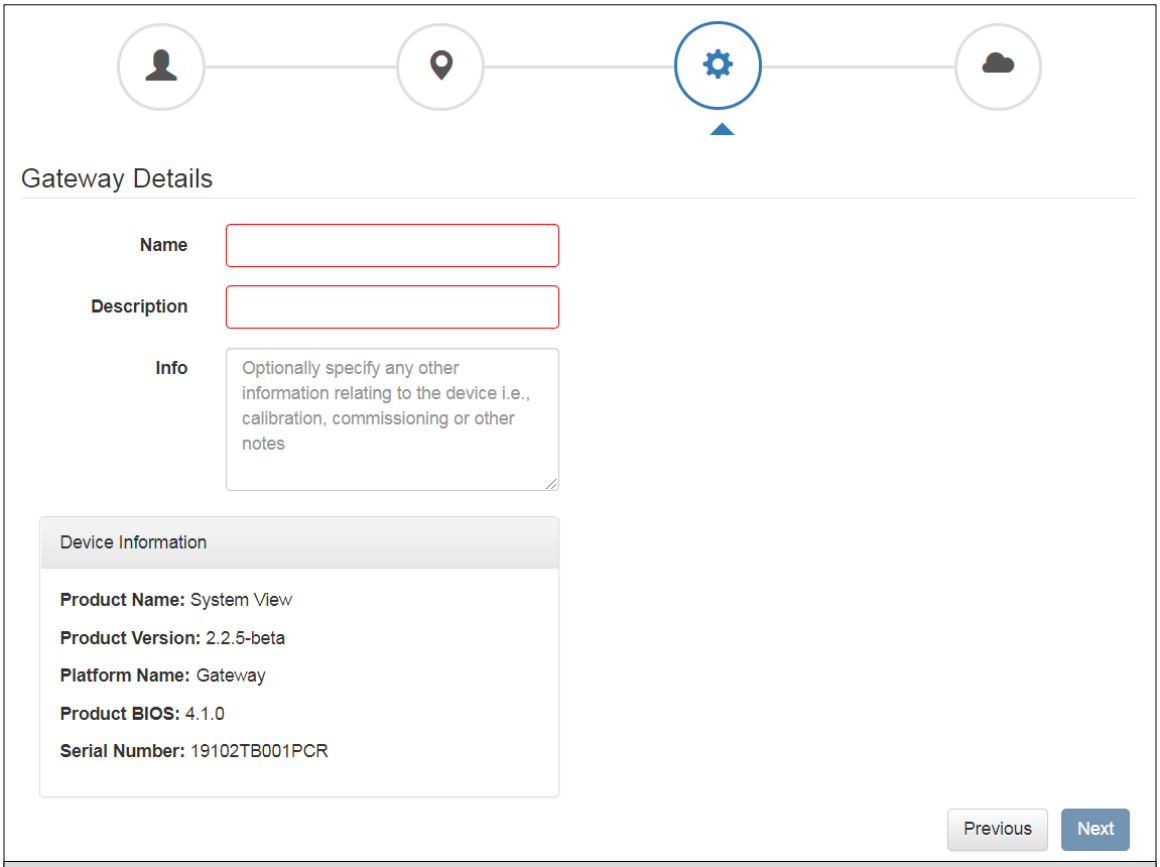


Figure 29: SMC Cloud Registration – Gateway Details

- Enter user credentials and click Register Device

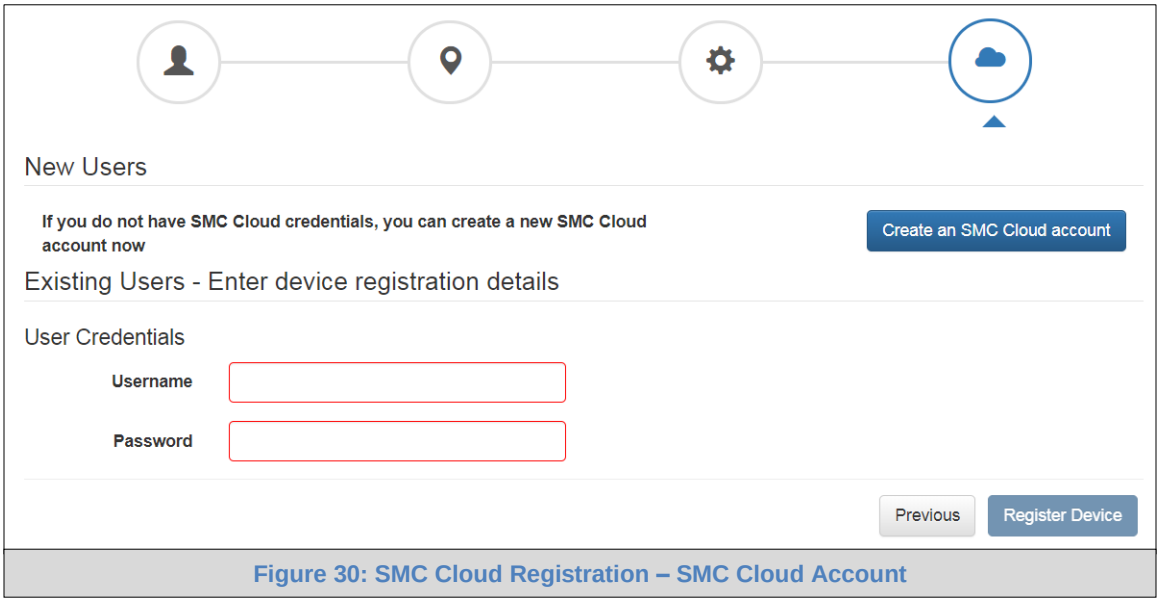


Figure 30: SMC Cloud Registration – SMC Cloud Account

- Once the device has successfully been registered, a confirmation window will appear. Click the Close button and the following screen will appear listing the device details and additional information auto-populated by the ProtoAir.

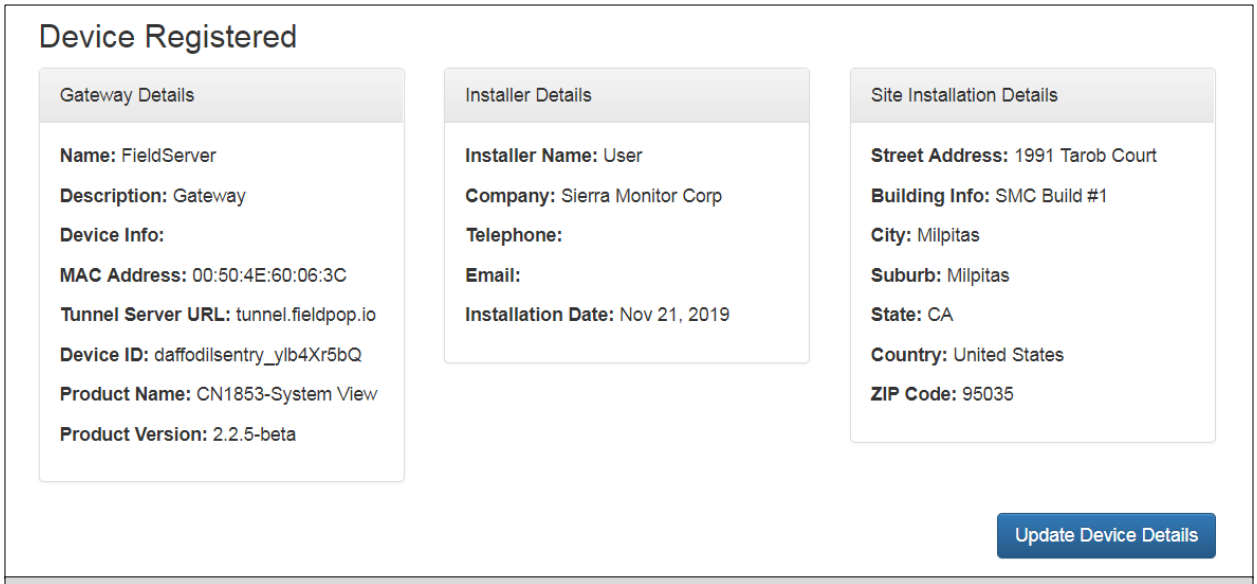


Figure 31: Device Registered for SMC Cloud

NOTE: Update these details at any time by going to the SMC Cloud™ tab and clicking the Update Device Details button.

8.3 Login to SMC Cloud

After the ProtoAir is registered, go to www.smccloud.net and type in the appropriate login information as per registration credentials.

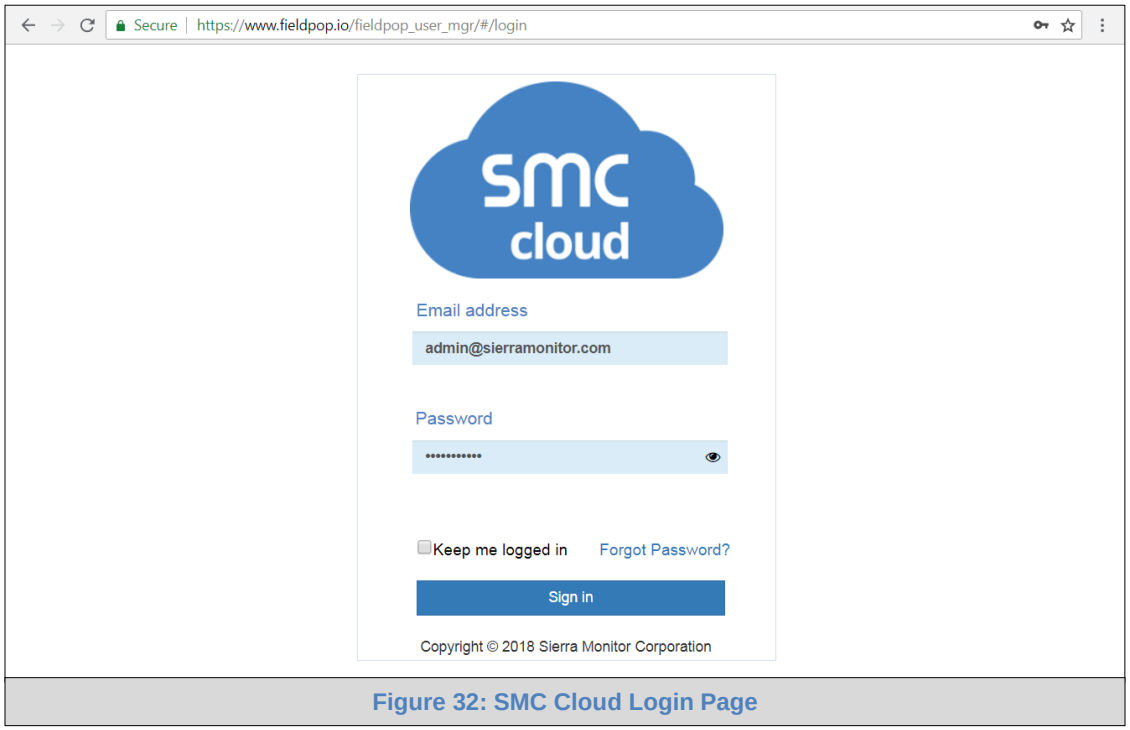


Figure 32: SMC Cloud Login Page

NOTE: If the login password is lost, see the SMC Cloud Start-up Guide for recovery instructions.

On first login, the Privacy Policy window will appear. Read the Terms of Service, click the checkbox to accept the terms and then click the Continue button to access SMC Cloud.

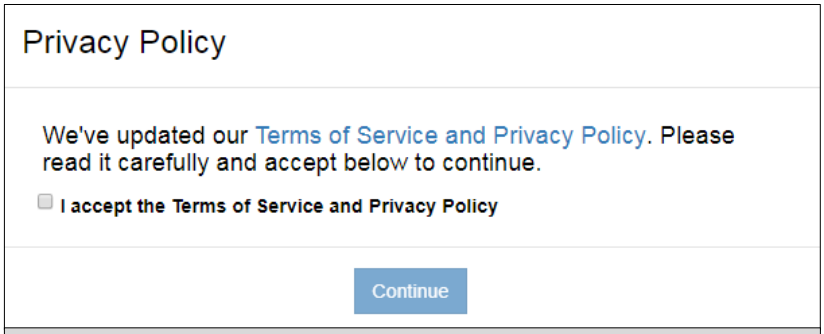


Figure 33: SMC Cloud Privacy Policy

NOTE: For additional SMC Cloud instructions see the SMC Cloud Start-up Guide.

Figure 34: SMC Cloud Landing Page

9 CONFIGURE THE PROTOAIR

9.1 Navigate to the ProtoAir Web Configurator

- From the new Web App landing page (**Figure 35**), click the Settings tab and then click Configuration.

Figure 35: New Web App Landing Page

NOTE: For information on the System Status button, go to Appendix B.8.

- Then click the Profiles Configuration button to go to the Web Configurator page.

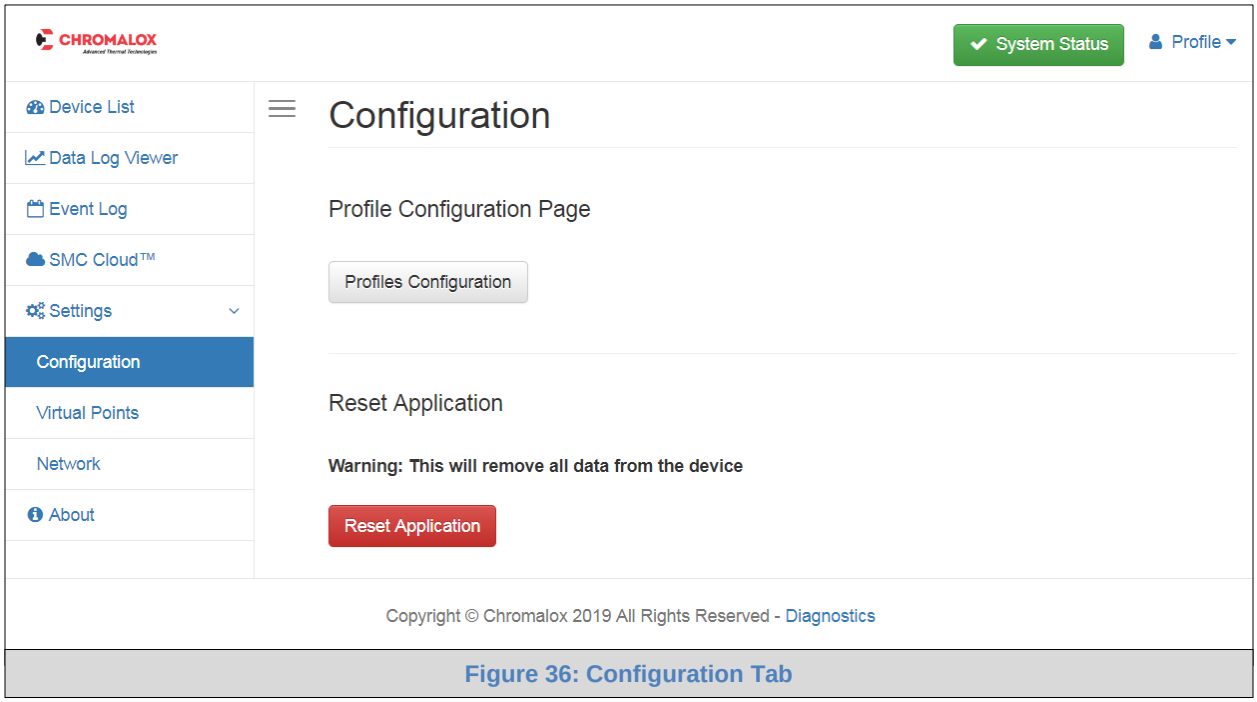


Figure 36: Configuration Tab

NOTE: For Web App instructions to the System View, Historian, Event Logger and Virtual Points functions, see the SMC Cloud Start-up Guide.

9.2 Select Field Protocol and Set Configuration Parameters

- On the Web Configurator page, the first configuration parameter is the Protocol Selector.

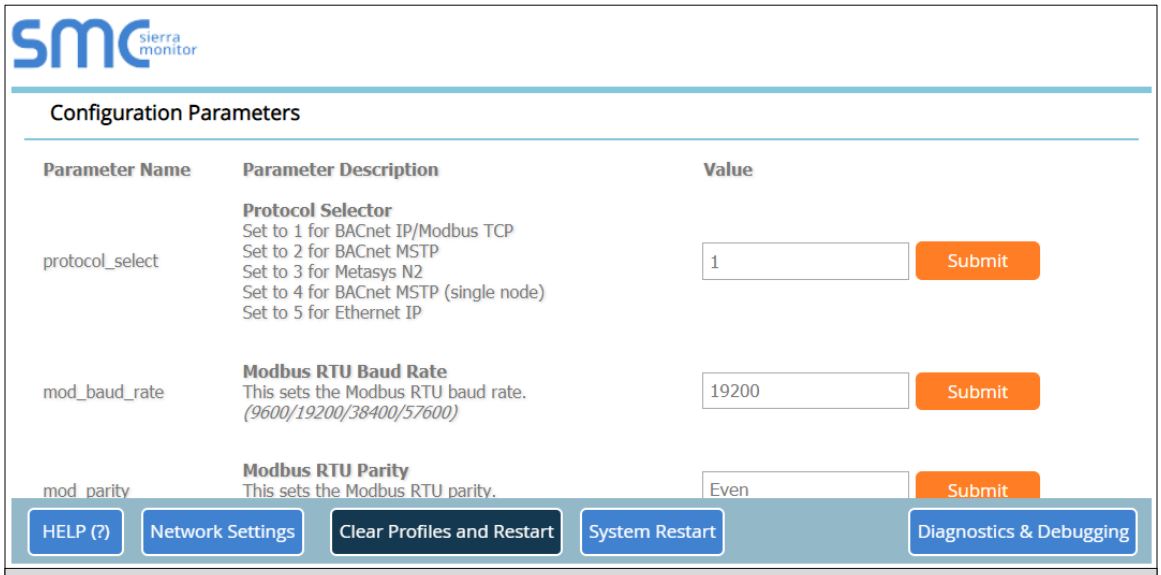


Figure 37: Web Configurator Showing Protocol Selector Parameter

- Select the field protocol by entering the appropriate number into the Protocol Selector Value. Click the Submit button. Click the System Restart button to save the updated configuration.

NOTE: Protocol specific parameters are only visible when the associated protocol is selected.

NOTE: If Modbus TCP/IP was selected and is used for the field protocol, skip Section 9.3. Device profiles are NOT used for Modbus TCP/IP.

- 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.

NOTE: If multiple devices are connected to the ProtoAir, set the BACnet Virtual Server Nodes field to "Yes"; otherwise leave the field on the default "No" setting.

9.3 Setting the ProtoAir Active Profiles

- In the Web Configurator, the Active Profiles are shown below the configuration parameters. The Active Profiles section lists the currently active device profiles, including previous Web Configurator additions. This list is empty for new installations, or after clearing all configurations. (**Figure 38**)

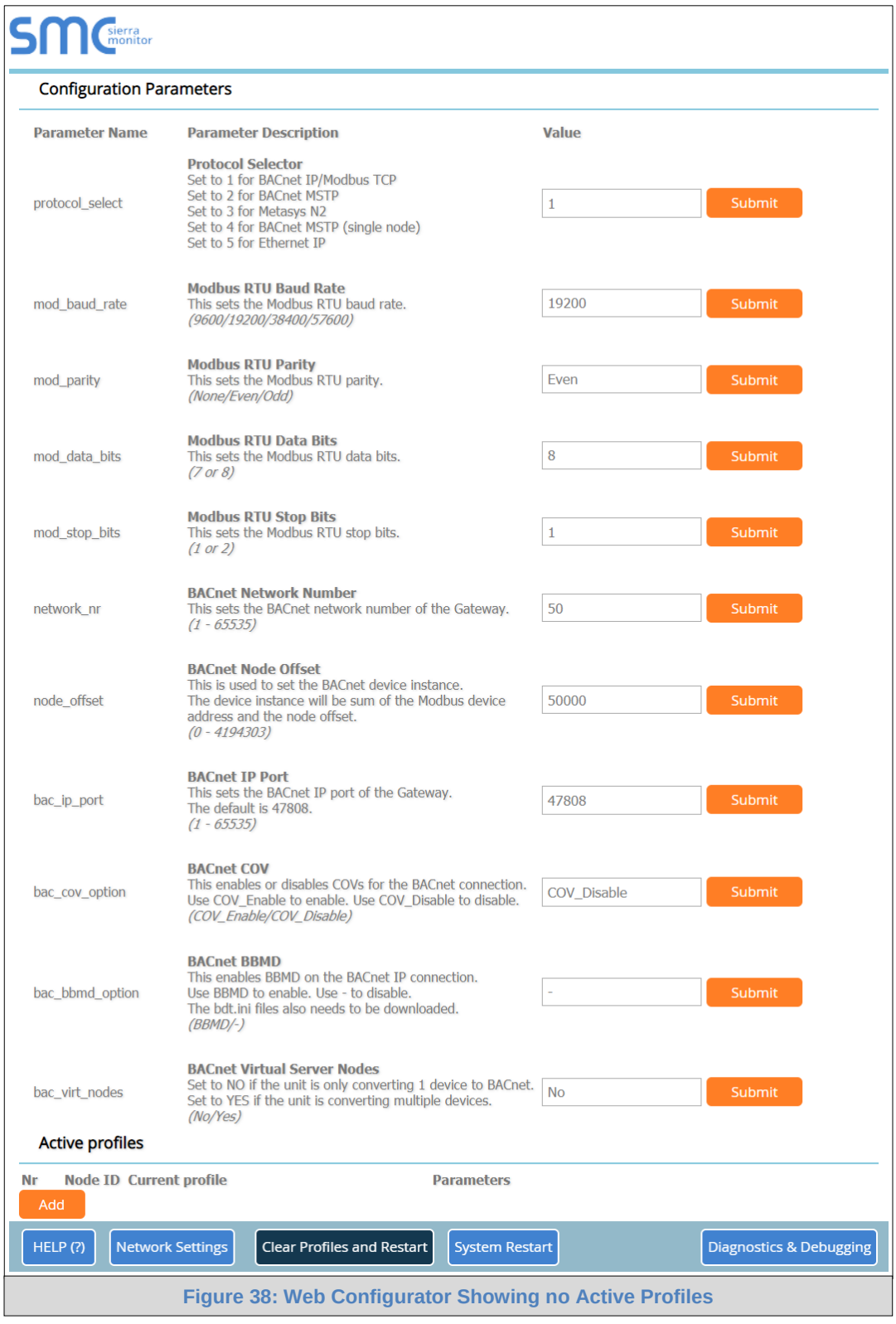


Figure 38: Web Configurator Showing no Active Profiles

- To add an active profile to support a device, click the Add button under the Active Profiles heading. This will present a drop-down menu underneath the Current profile column that lists all the available profiles.
- Once the Profile for the device has been selected from the drop-down list, enter the value of the device's Node-ID which was assigned in **Section** 3.3.2.

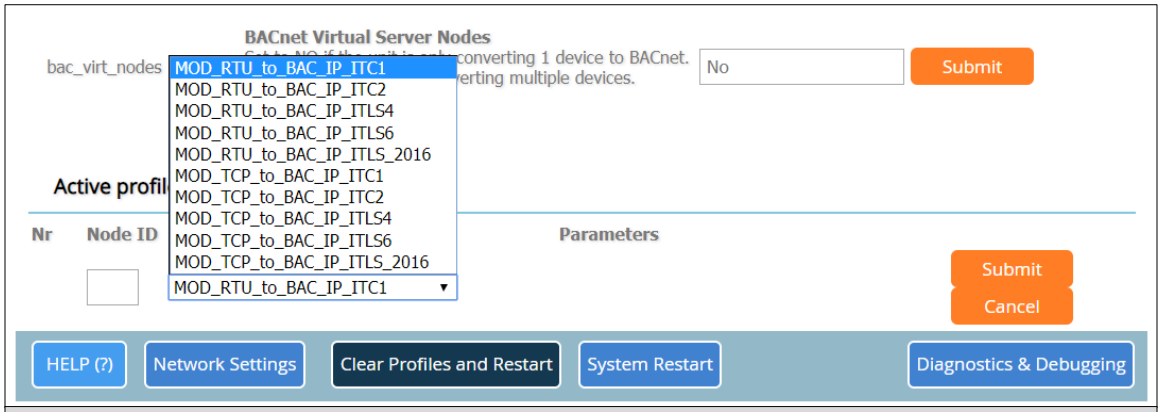


Figure 39: Profile Selection Menu

- If the device is connected via Modbus TCP/IP, the "ip_address" and "tcp_id" under the Parameters heading must be gathered from settings on the device. These correspond to the device IP Address and Node-ID. (**Section** 3.3.3)
- Then press the "Submit" button to add the Profile to the list of devices to be configured.
- Repeat this process until all the devices have been added.
- Completed additions are listed under "Active profiles" as shown in Figure 40.

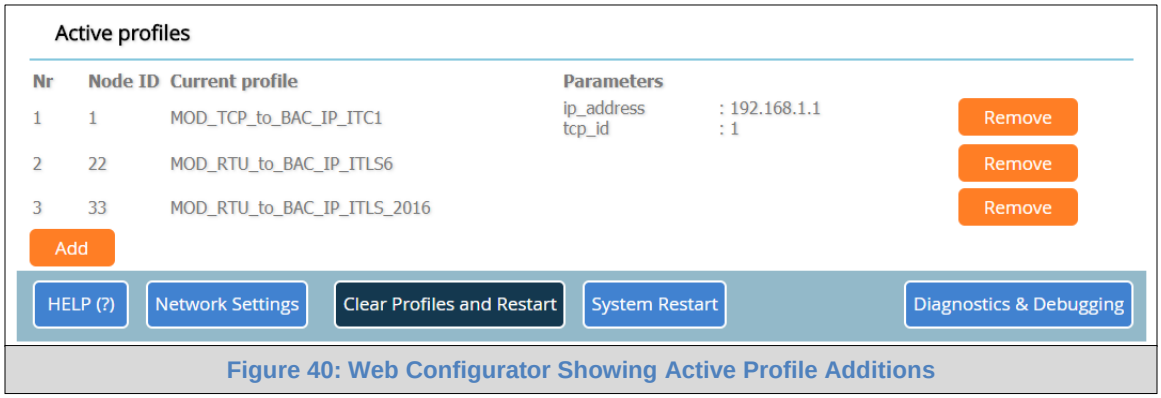


Figure 40: Web Configurator Showing Active Profile Additions

9.4 Verify Device Communications

- **If serial devices are connected, check that the port R1 TX1 and RX1 LEDs are rapidly flashing**. See Appendix A.4 for additional information and images.
- Confirm the software shows communication without errors. Go to Appendix A.2 for instructions.

9.5 BACnet: Setting Node_Offset to Assign Specific Device Instances

- Follow the steps outlined in **Section** 9.1 to access the ProtoAir Web Configurator.
- The Node_Offset field shows the current value (default = 50,000).
  - The values allowed for a BACnet Device Instance can range from 1 to 4,194,303
- To assign a specific Device Instance (or range); change the Node_Offset value as needed using the calculation below:

  Device Instance (desired) = Node_Offset + Node_ID

  For example, if the desired Device Instance for the device 1 is 50,001 and the following is true:
  - Device 1 has a Node-ID of 1
  - Device 2 has a Node-ID of 22
  - Device 3 has a Node-ID of 33

  Then plug the device 1's information into the formula to find the desired Node_Offset:

  50,001 = Node_Offset + 1

  ➢ **50,000 = Node_Offset**

  Once the Node_Offset value is input, it will be applied as shown below:
  - Device 1 Instance = 50,000 + Node_ID = 50,000 + 1 = 50,001
  - Device 2 Instance = 50,000 + Node_ID = 50,000 + 22 = 50,022
  - Device 3 Instance = 50,000 + Node_ID = 50,000 + 33 = 50,033
- Click "Submit" once the desired value is entered.

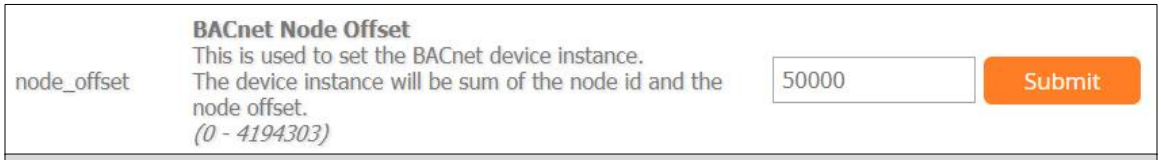


Figure 41: Web Configurator Node Offset Field

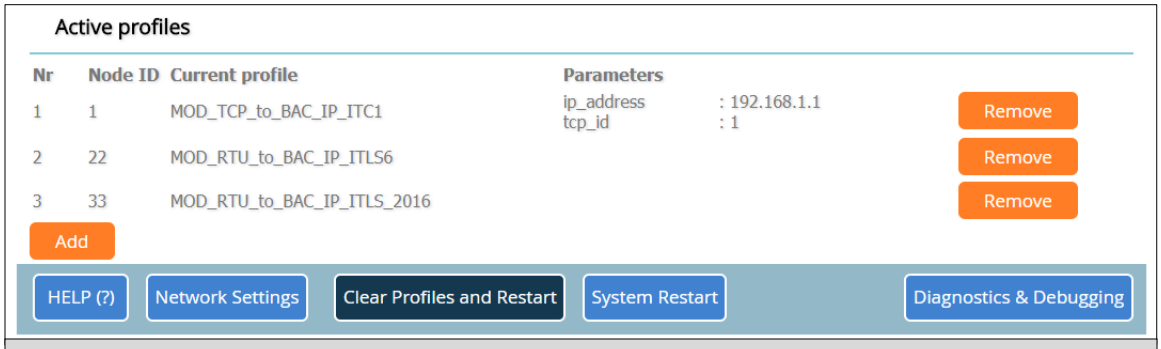


Figure 42: Active Profiles

9.6 How to Start the Installation Over: Clearing Profiles

- Follow the steps outlined in **Section 9.1** to access the ProtoAir 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.

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.

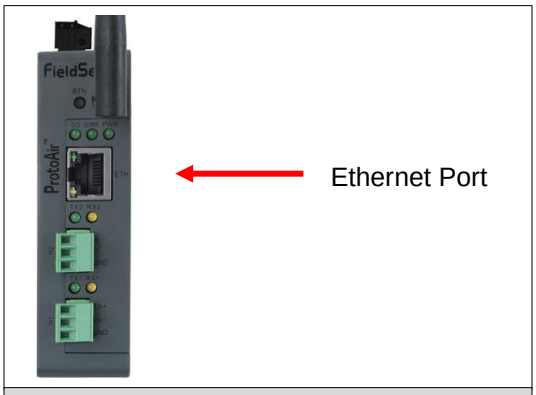
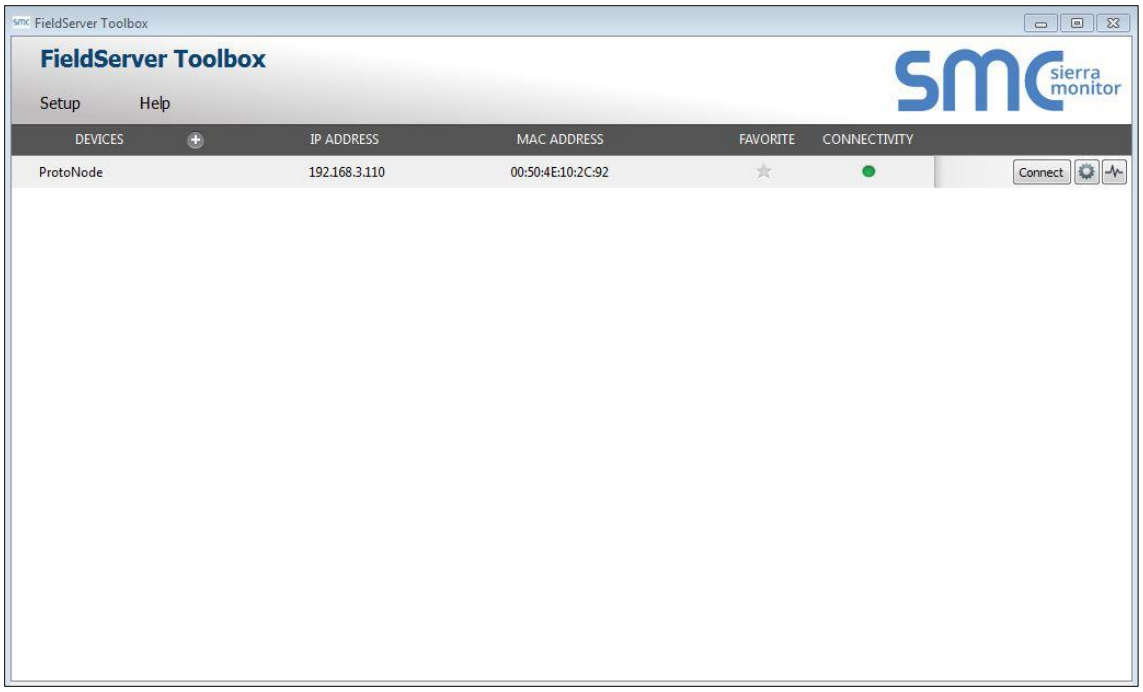


Figure 43: Ethernet Port Location

- Connect a standard Cat-5 Ethernet cable between the user's PC and ProtoAir.
- 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 ProtoAir into the web browser or use the FieldServer Toolbox to connect to the ProtoAir.
- 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.

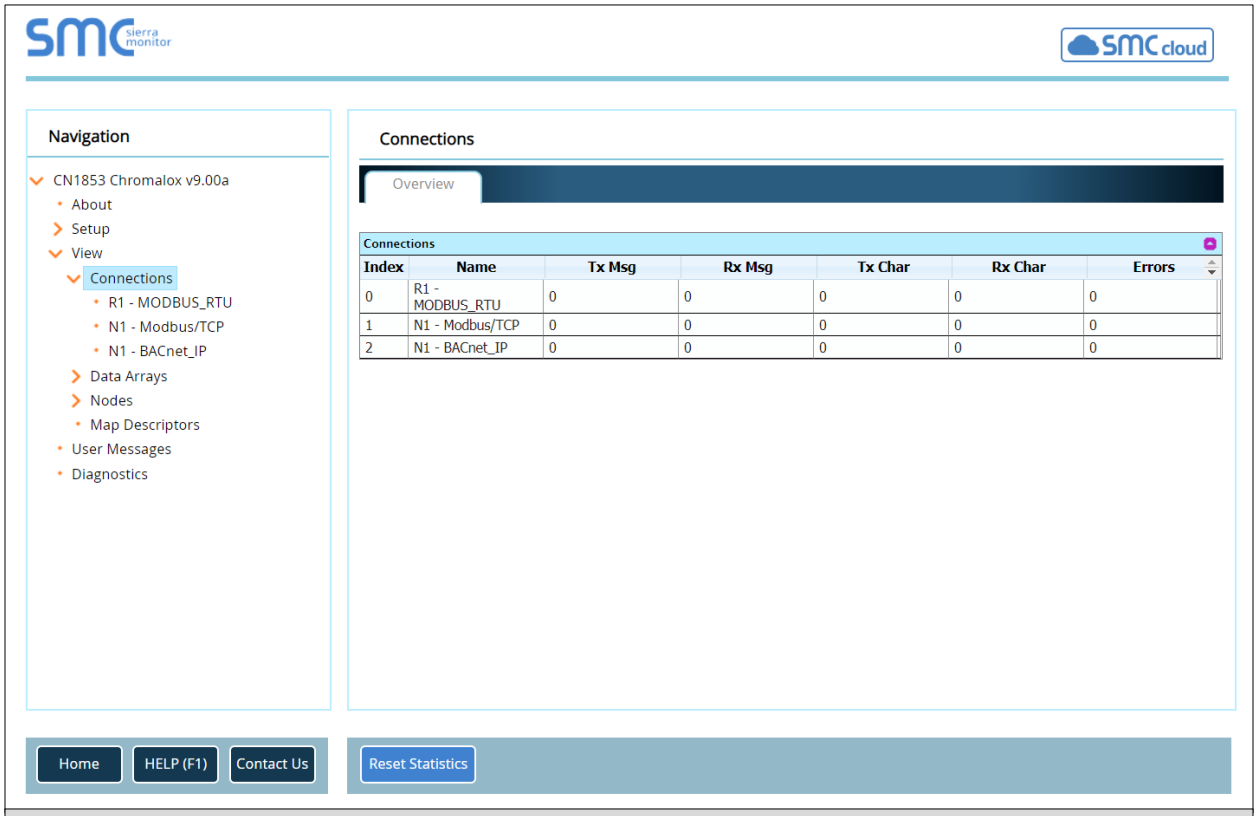


Figure 44: Error Messages Screen

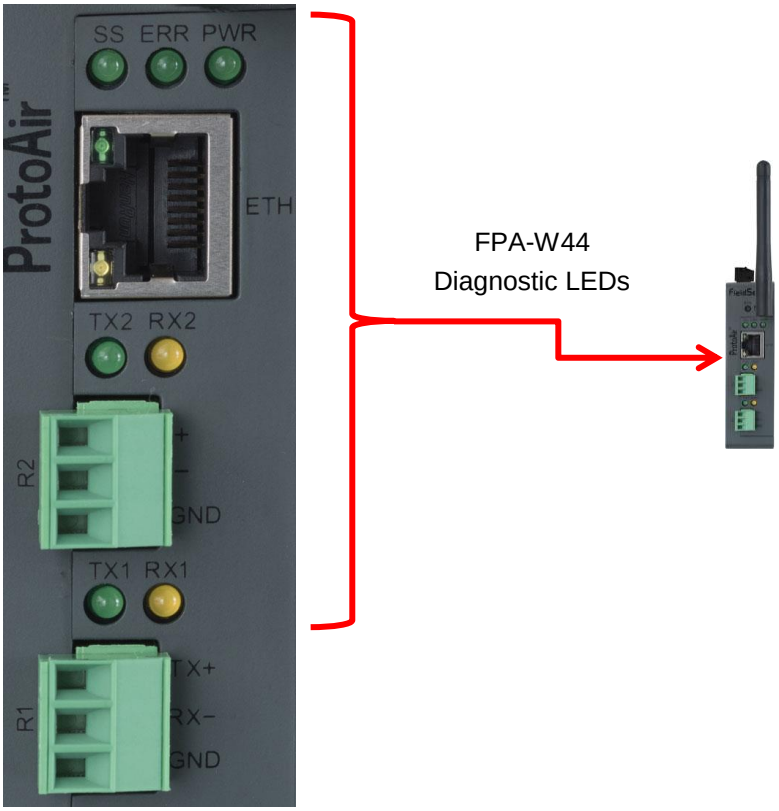
Appendix A.3 Checking Wiring and Settings

- No COMS on Modbus RTU side. If the Tx/Rx LEDs are not flashing rapidly then there is a COM issue. To fix this, check the following:
  - Visual observations of LEDs on ProtoAir (**Appendix A.4**)
  - Check baud rate, parity, data bits, stop bits
  - Check Detector ID matches the correct device
  - Verify wiring
  - Verify the device was listed under the Web Configurator Active Profiles (**Section 9.3**)
- No COMS on Modbus TCP/IP side. To fix, check the following:
  - Visual observations of LEDs on ProtoAir (**Appendix A.4**)
  - Check device address
  - Verify wiring
  - Verify device is connected to the same subnet as the ProtoAir
  - Verify all the Modbus TCP/IP devices were discovered in Web Configurator (**Section 9.3**)
- Field COM problems:
  - Visual observations of LEDs on the ProtoAir (**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 ProtoAir and Devices

See the diagram below for ProtoAir FPA-W44 LED Locations.



Tag	Description
SS	The SS LED will flash once a second to indicate that the bridge is in operation.
ERR	The SYS ERR LED will go on solid indicating there is a system error. If this occurs, immediately report the related “system error” shown in the error screen of the FS-GUI interface to support for evaluation.
PWR	This is the power light and should always show steady green when the unit is powered.
RX	The RX LED will flash when a message is received on the serial port on the 3-pin connector. **If the serial port is not used, this LED is non-operational.** RX1 applies to the R1 connection while RX2 applies to the R2 connection.
TX	The TX LED will flash when a message is sent on the serial port on the 3-pin connector. **If the serial port is not used, this LED is non-operational.** TX1 applies to the R1 connection while TX2 applies to the R2 connection.

Figure 45: 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.

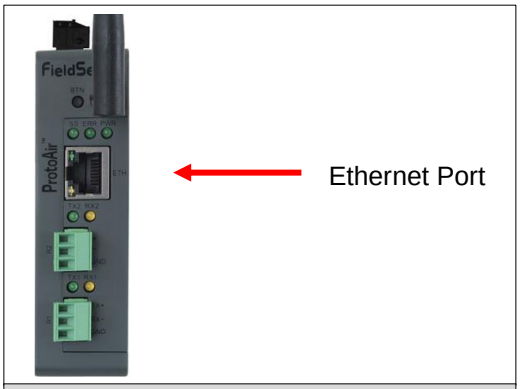
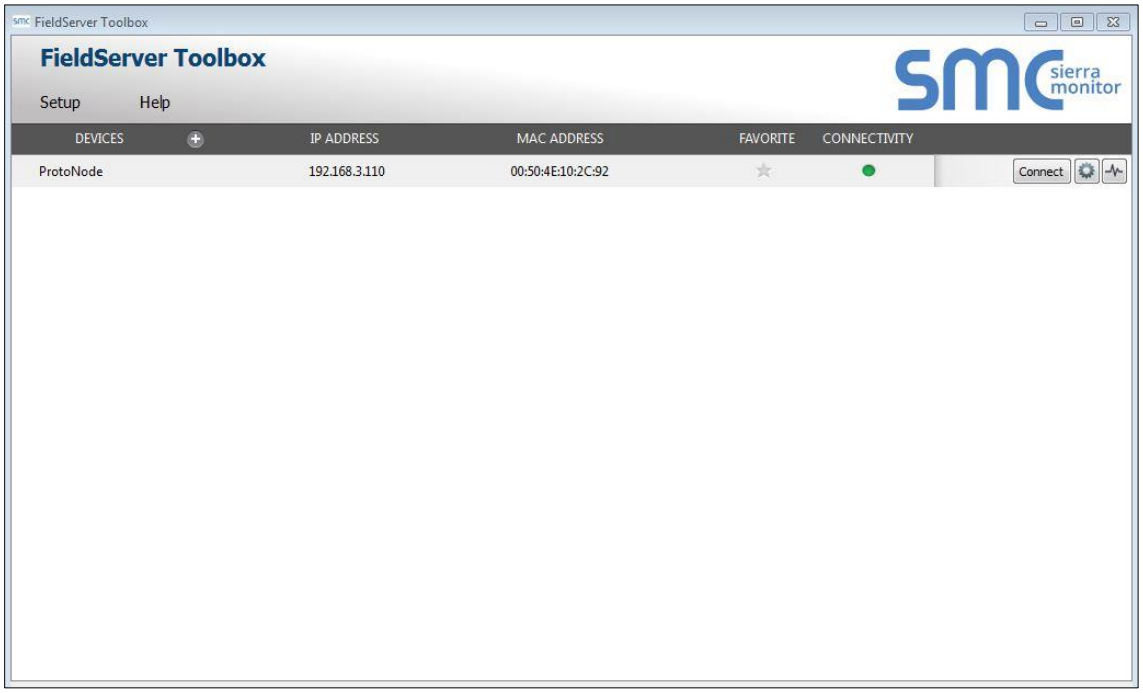


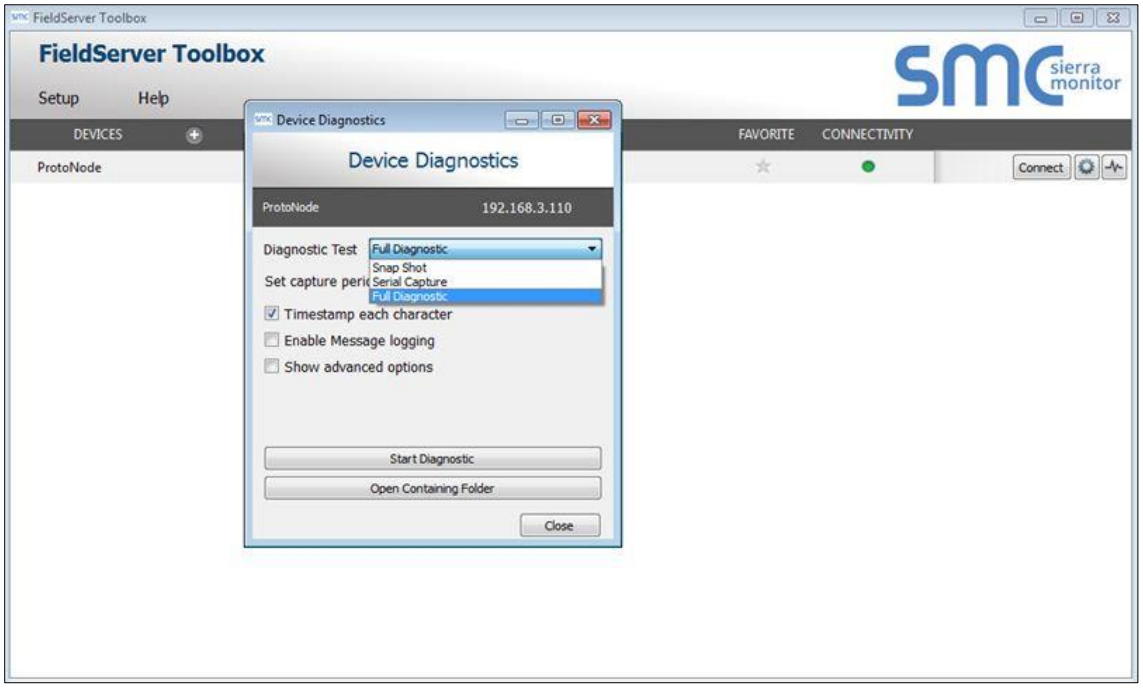
Figure 46: Ethernet Port Location

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

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

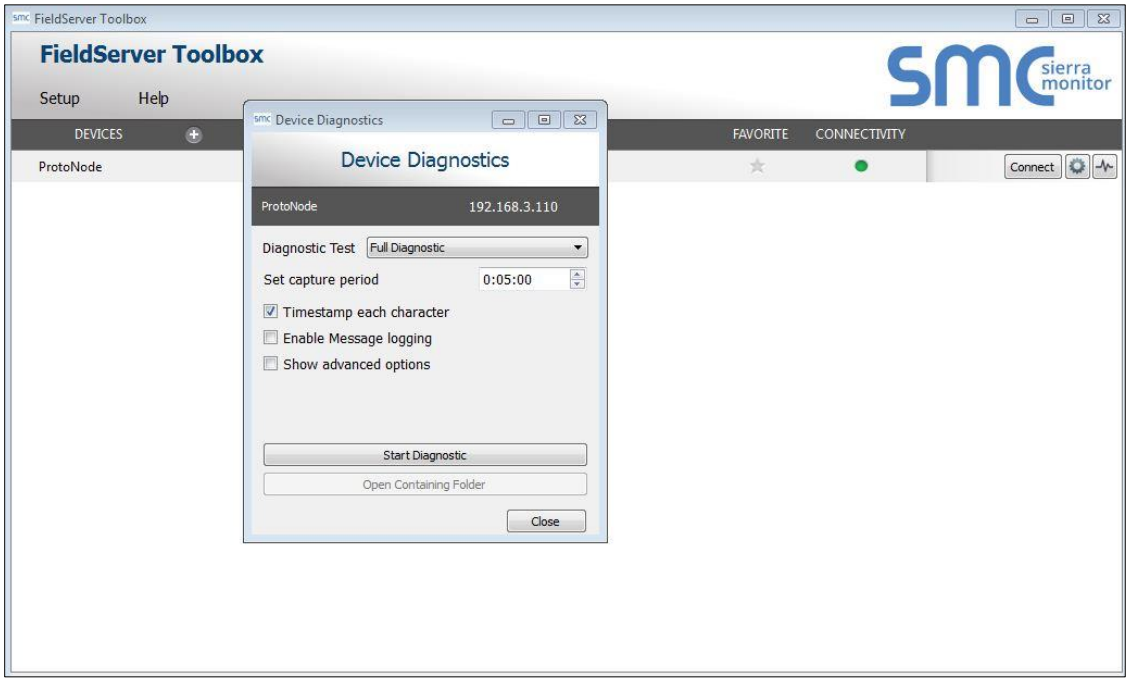


  - Ensure “Full Diagnostic” is selected (this is the default)



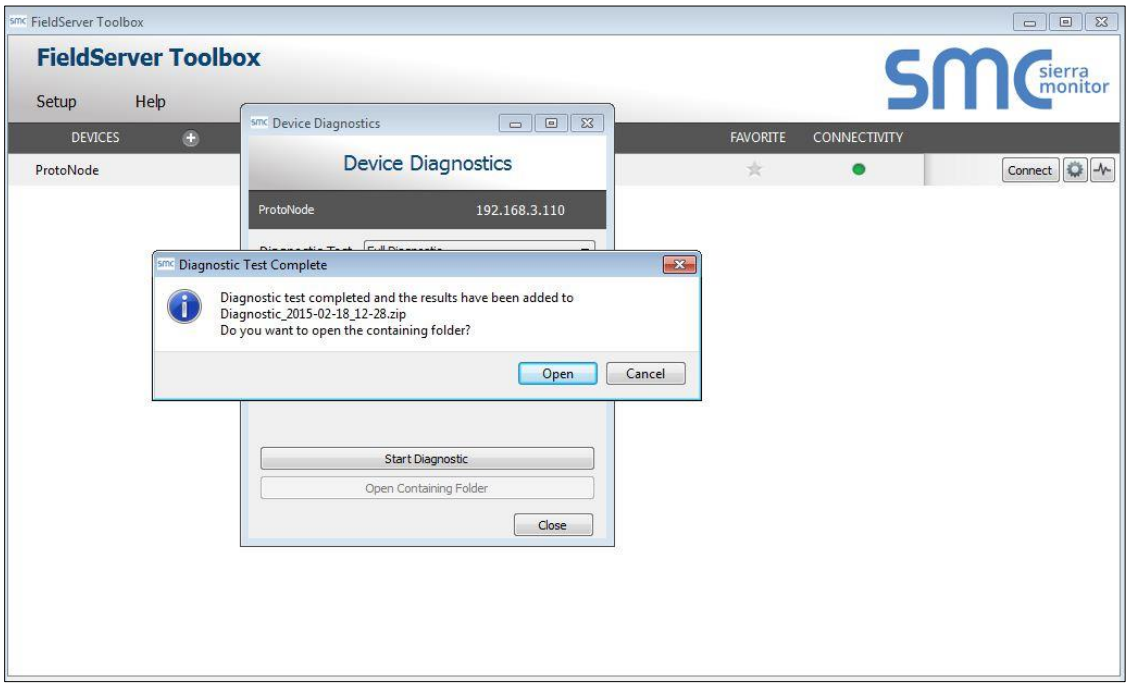
NOTE: If desired, the default capture period can be changed.

- 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



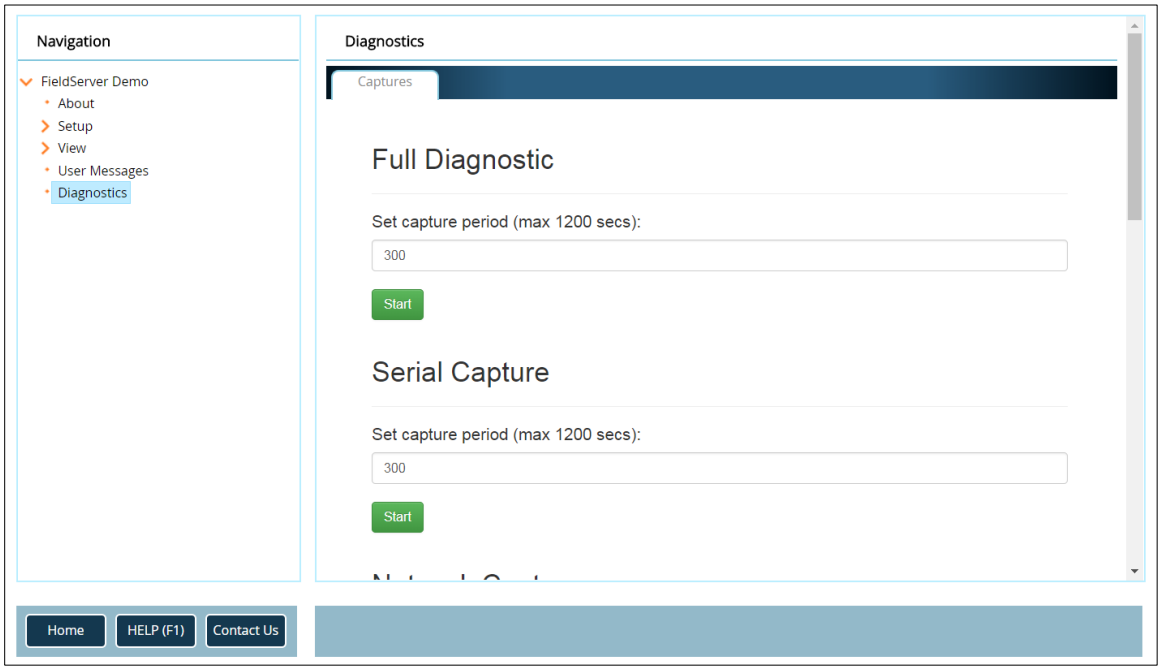
  - Choose “Open” to launch explorer and have it point directly at the correct folder
  - Send the Diagnostic zip file to technical support (sales@chromalox.com)

Appendix A.5.2 Using FS-GUI

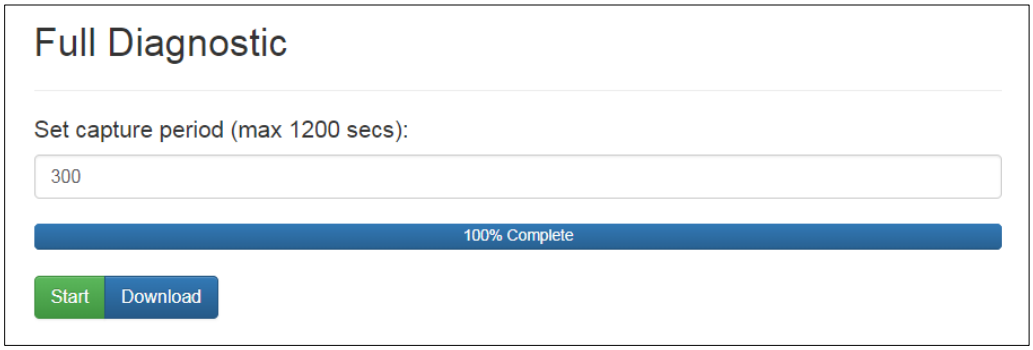
Diagnostic Capture via FS-GUI is only available on FieldServers with a bios updated/released on November 2017 or later. Completing a Diagnostic Capture through the FieldServer allows network connections (such as Ethernet and Wi-Fi) to be captured.

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 (sales@chromalox.com).

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

Appendix A.6 Wi-Fi Signal Strength

Wi-Fi
<60dBm – Excellent
<70dBm – Very good
<80dBm – Good
>80dBm – Weak

Figure 47: Wi-Fi Signal Strength Listing

NOTE: If the signal is weak or spotty, try to improve the signal strength by checking the antenna and the ProtoAir position.

Appendix A.7 Factory Reset Instructions

For instructions on how to reset a FieldServer back to its factory released state, see ENOTE - FieldServer Next Gen Recovery.

Appendix A.8 Internet Browsers Not Supported

- Internet Explorer 11 and prior versions

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 ProtoAir on the Subnet

For both BACnet MS/TP and BACnet/IP, if more than one ProtoAir 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 50.

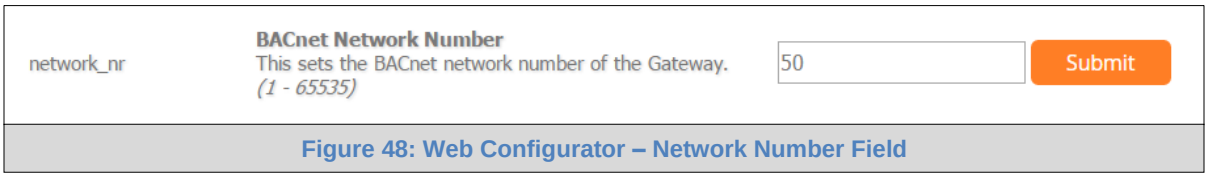


Figure 48: Web Configurator – Network Number Field

Appendix B.3 Securing ProtoAir with Passwords

Access to the ProtoAir 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 ProtoAir.
- The User account can view any ProtoAir information but cannot make any changes or restart the ProtoAir.

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 ProtoAir to set a new password.

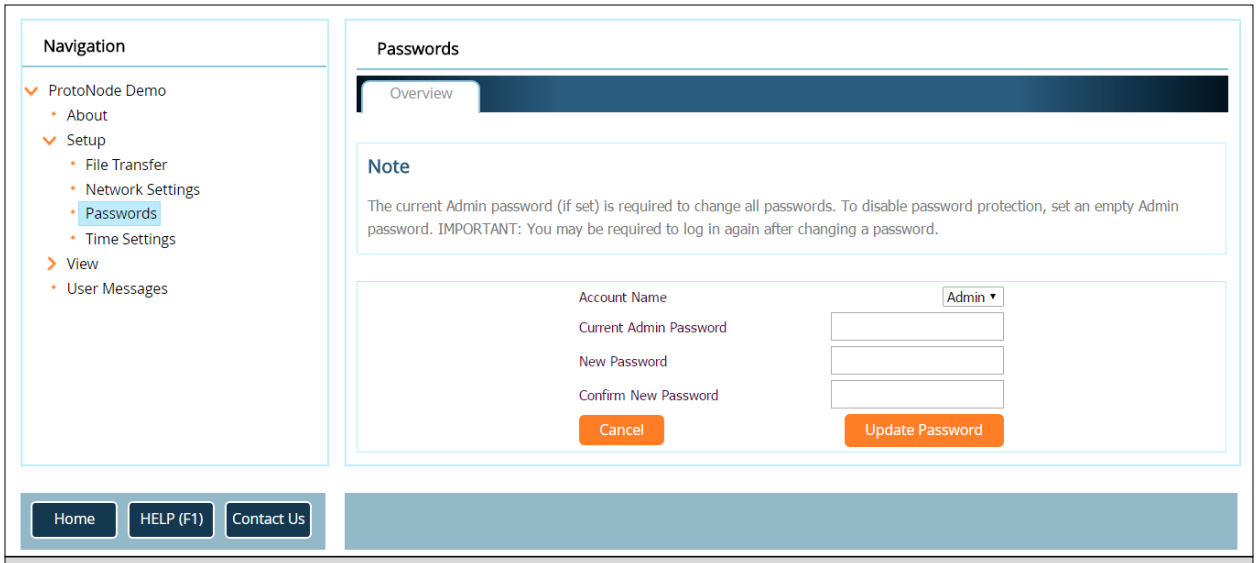


Figure 49: FS-GUI Passwords Page

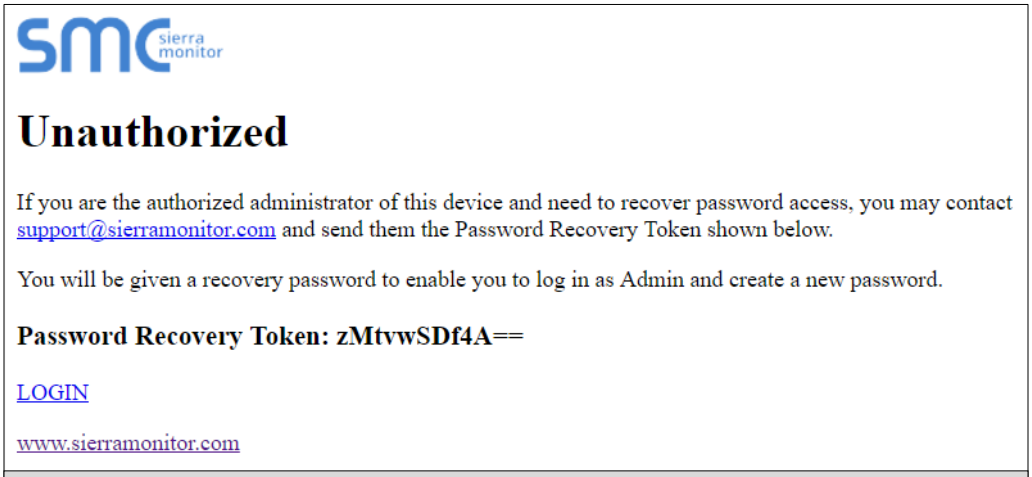


Figure 50: Password Recovery Page

Appendix B.4 Wi-Fi Access Point Network Settings

From the FS-GUI Network Settings landing page, click on the Wi-Fi AP tab. To change the Wi-Fi AP settings, follow these instructions:

- The Access Point Status Field must be ENABLED to allow connecting to the ProtoAir via Wi-Fi.
- Modify the Settings manually as needed, via these fields: Access Point SSID, Access Point Password, SSID Broadcast, and Channel.

NOTE: The default channel is 11. The default IP Address is 192.168.50.1.

- Click Update Wi-Fi Settings, then click on the System Restart to restart the Gateway and activate the Wi-Fi settings.

NOTE: If the FS-GUI was open in a browser via Wi-Fi, the browser will need to be updated with the new Wi-Fi details before the ProtoAir FS-GUI will be accessible again.

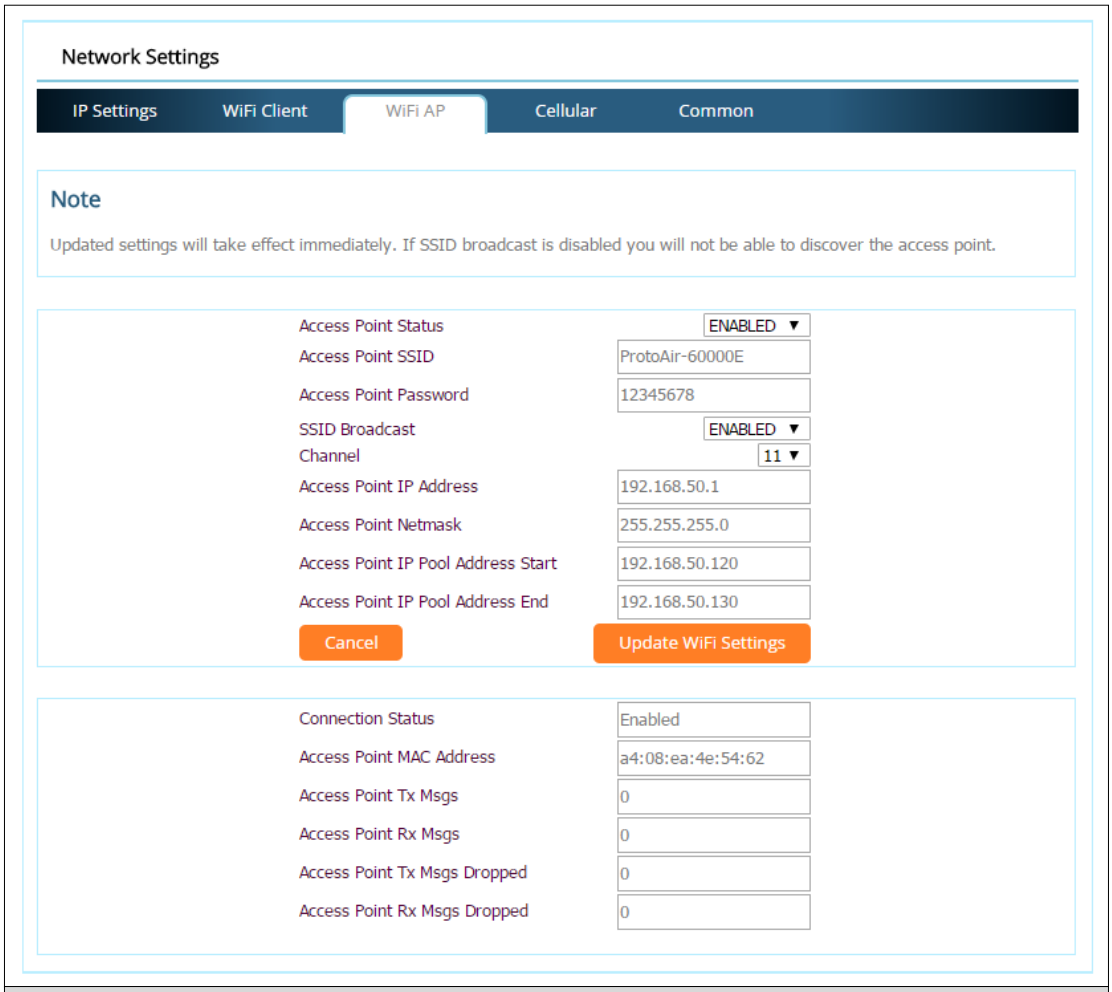


Figure 51: FS-GUI Wi-Fi AP Network Settings

Wi-Fi AP Fields	Definition
Connection Status	Status of connection
MAC Address	Access point's MAC Address
Tx/Rx Msgs	Number of transmitted and received messages
Tx/Rx Msgs Dropped	Number of unanswered Tx or Rx messages

Appendix B.5 Mounting

The ProtoAir can be mounted using the DIN rail mounting bracket on the back of the unit.

Figure 52: DIN Rail

Appendix B.6 Physical Dimension Drawing

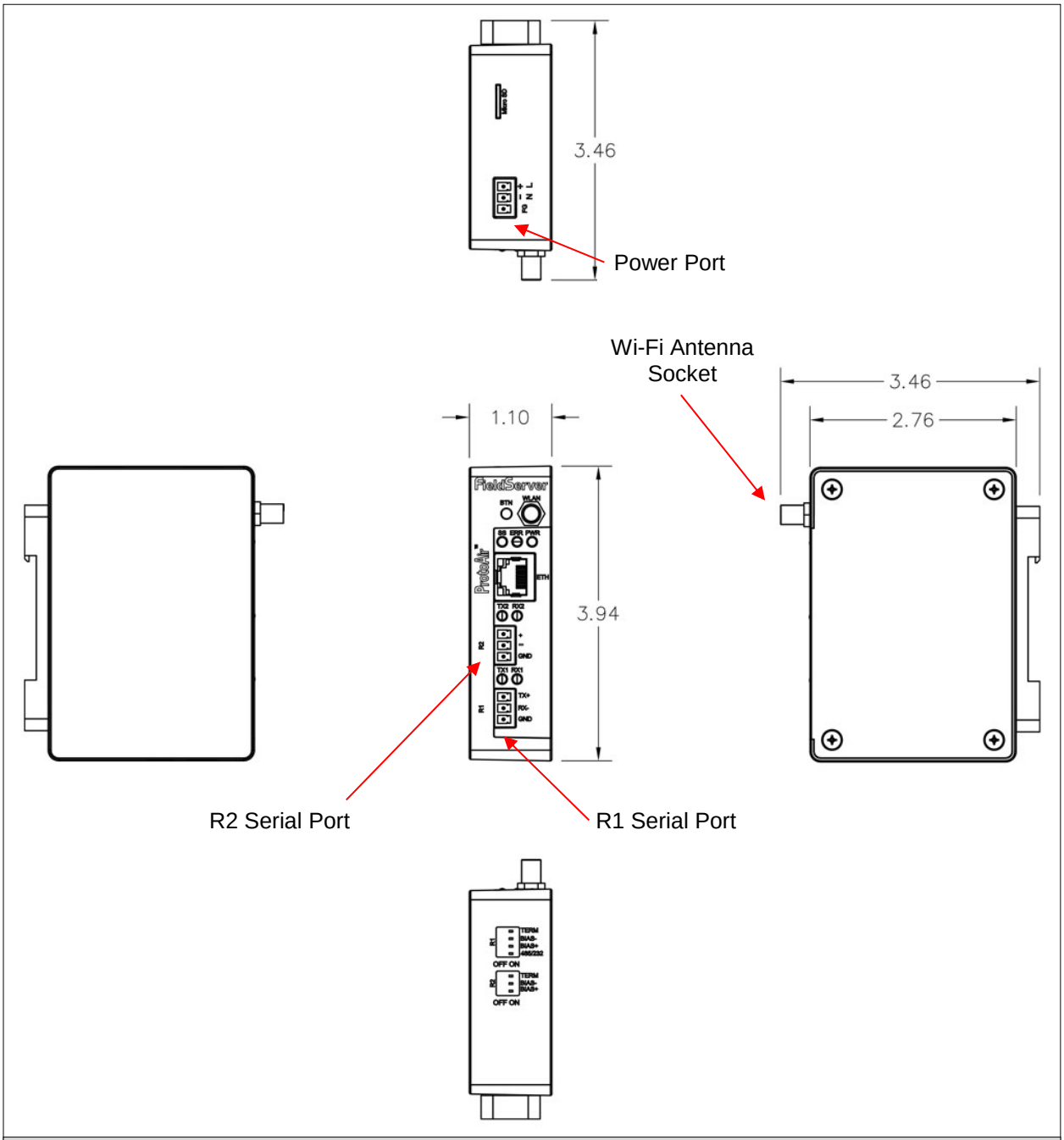


Figure 53: ProtoAir FPA-W44 Dimensions

Appendix B.7 SMC Cloud Connection Warning Message

- If a warning message appears instead of the page as shown in **Figure 26**, follow the suggestion that appears on screen.
    - If the ProtoAir cannot reach the SMC Cloud server, the following message will appear

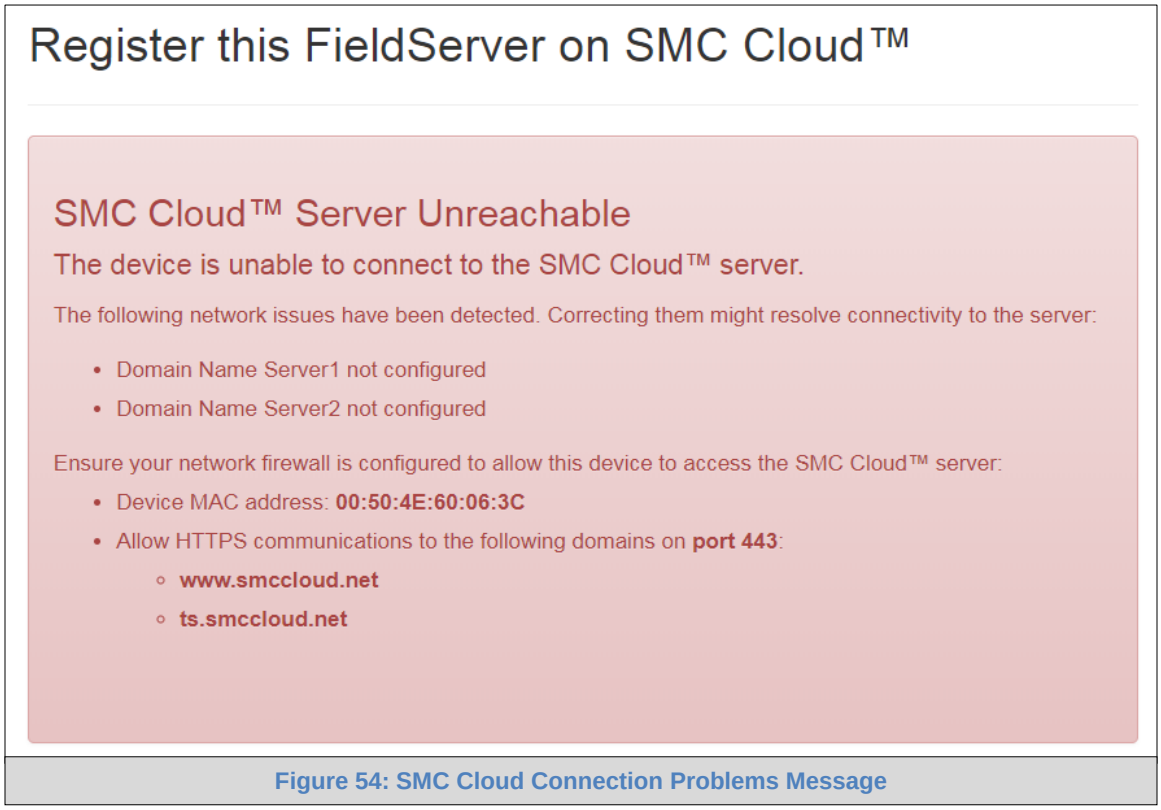


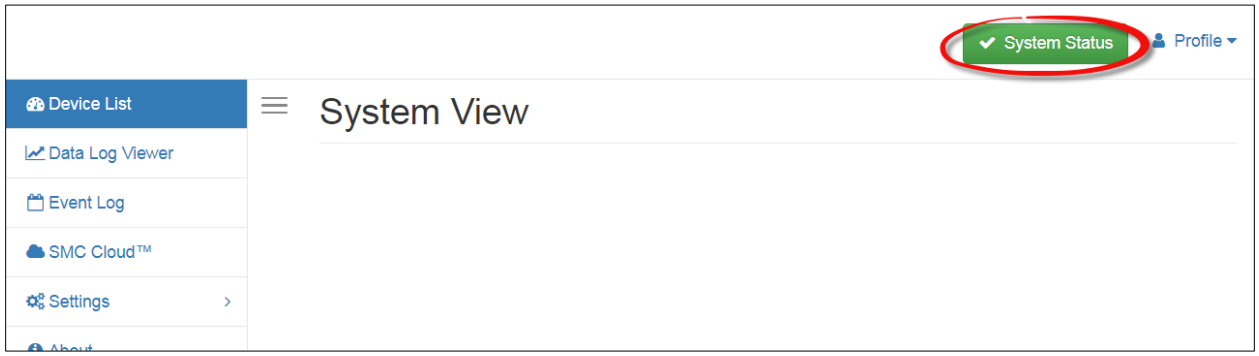
Figure 54: SMC Cloud Connection Problems Message

- Follow the directions presented in the warning message.
    - Go to the network settings by clicking the Settings tab and then click the Network tab
    - Check with the site's IT support that the DNS settings are setup correctly
    - Ensure that the ProtoAir is properly connected to the Internet

NOTE: If changes to the network settings are done, remember to click the Save button. Then power cycle the ProtoAir by clicking on the Confirm button in the window and click on the bolded "Restart" text in the yellow pop-up box that appears in the upper right corner of the screen.

Appendix B.8 System Status Button

The System Status Button can be found on any page of the web apps. This shows the level of alert/functionality for the customer device. This is an agragate of the Web App page's resource usage upon the local PC or mobile device, SMC Cloud connectivity and device alert level.



The color of the button represents the status of one to all three systems:

Green – Normal status

Yellow – Warning status

Red – Alarm status

Click on the System Status Button to open the System Status window, showing more details on the status of each system.

NOTE: If it was selected to opt out of SMC Cloud (Figure 23), the SMC Cloud status will not show in the System Status window. This means the status will show as green even if the gateway is not connected to SMC Cloud.

Appendix C Vendor Information – Chromalox

See the document “Chromalox Vendor Mappings” for the complete point list for all the Chromalox devices referenced in this manual. Only the protocols listed as supported for this FieldServer are supported (see **Section** 2.1). Ignore all points referring to unsupported protocols when using this FieldServer.

Appendix D Reference

Appendix D.1 Specifications

	ProtoAir FPA-W44[3]
Electrical Connections	One 3-pin Phoenix connector with: RS-485/RS-232 port (TX+/RX-/gnd) One 3-pin Phoenix connector with: RS-485 (Tx+/Rx-/gnd) One 3-pin Phoenix connector with: Power port (+/-/Frame-gnd) One Ethernet 10/100 BaseT port
Power Requirements	*Input Voltage:* 9-30VDC or 24VAC *Current draw:* 24VAC 0.125A *Max Power:* 3 Watts 9-30VDC 0.25A @12VDC
Approvals	CE and FCC Class B & C Part 15, UL 60950, WEEE compliant, IC Canada, RoHS compliant
Physical Dimensions	4 x 1.1 x 2.7 in (10.16 x 2.8 x 6.8 cm)
Weight	0.4 lbs (0.2 Kg)
Operating Temperature	-20°C to 70°C (-4°F to158°F)
Humidity	10-95% RH non-condensing
Wi-Fi 802.11 b/g/n	*Frequency:* 2.4 GHz *Channels:* 1 to 11 (inclusive) *Antenna Type:* SMA *Encryption:* TKIP, WPA & AES

Figure 55: Specifications

Appendix D.1.1 Compliance with UL Regulations

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

- 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 ProtoAir
- 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.

[3] Specifications subject to change without notice.

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.