Universal Gateway
ProtoAir
Instruction Manual

Contents

Appendix

Application

The Universal Gateway (ProtoAir) provides monitoring, remote setpoint, firing rate and burner on/off control to the Building Automation System/ Energy Management System/ Building Management System (EMS). The Universal Gateway ProtoAir is compatible with the following brands and models:

Burnham Commercial Models: Products using Sage Boiler Control (SBC™)

Bryan Boilers Models: BFIT, FreeFlex, boilers using following control components: RWF40, RWF55, RM7800, LMV36, LMV52, PD765, LMV2_3, YB110

Thermal Solutions Models: APEX, AMP, Evolution, Arctic

U.S. Boiler Company Models: Alpine, ASPEN, ALTA, Citadel

Velocity Boiler Works Models: Phantom-X, Raptor, Phantom II, Phantom-XL

There are two Universal Gateway options:

ProtoAir: Provides BACnet MS/TP, BACnet/IP, N2, Modbus TCP communications.

LonWorks ProtoNode: Provides LonWorks communication, refer to "Universal Gateway LonWorks ProtoNode" Instruction Manual.

Intent

This document provides the necessary information to facilitate Gateway installation. This Instruction Manual includes practical, installation and setup detailed information. The intended users are contractors and factory support personnel.

FPA-W44-1744

ProtoAir

The following term is used throughout this manual to bring attention to special instructions:

NOTICE: Indicates special instructions on installation, operation, or service which are important but not related to personal injury hazards.

NOTICE:
If Building Automation System input fails, some models and controls will revert to local start command, setpoint, and firing rate. However, building may lose heat for models without this feature (Models with application "Thermal Solutions and Bryan Boiler Control System Components" in Table 1-1).

Table of Contents

1 INTRODUCTION

1.1 ProtoAir Gateway

Universal Gateway (ProtoAir) is an external, high performance Energy Management System (EMS) multi-protocol gateway that is preconfigured to communicate between boiler devices listed in Table 1-1 and BACnet/IP, BACnet MS/TP, Modbus TCP/IP and Metasys®N2 by JCI.

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.
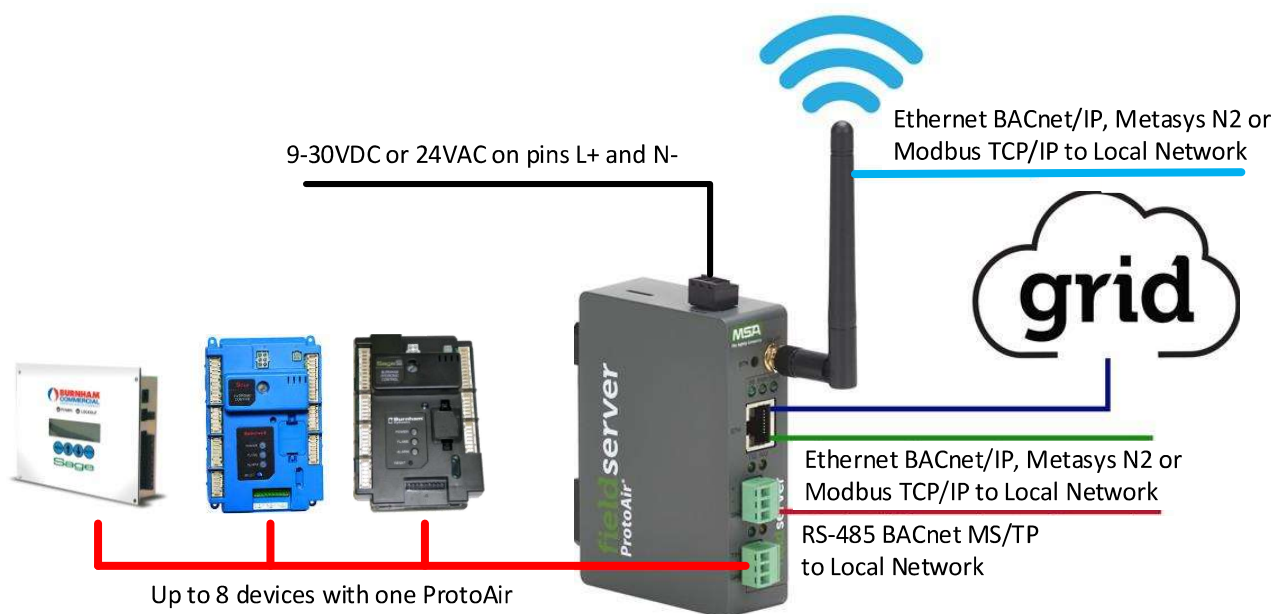
Figure 1-1: ProtoAir Connection Diagram

The ProtoAir can connect with the MSA Grid – FieldServer Manager. The FieldServer Manager allows technicians, the OEM's support team to remotely connect to the ProtoAir. The FieldServer Manager provides the following capabilities for any registered devices in the field:

- Remotely monitor and control devices.

- Generate diagnostic captures (as needed for troubleshooting) without going to the site.

For more information on the FieldServer Manager, see the **MSA Grid - FieldServer Manager Start-up Guide.**

1.2   Universal Gateway Available Configurations

The ProtoAir is shipped with the below listed configurations pre-configured and loaded. There is no need to download any configuration. The user simply selects the configuration from a list or Auto-Discovers the configuration.

Table 1-1: Universal Gateway Available Configurations

Application	Available Profiles (Example: BAC_MSTP_**4109**)	Wiring Section #	BACnet, N2 Points List Section #	Type Configuration Discovery
EVS and EVCA Boilers with Thermal Solutions Boiler Control (TSBC) or Burnham Commercial Models with Sage Boiler Control (SBC)	TSBC	3.6	12.1	Auto-Discovery
Older Apex, Alpine, ASPEN, Phantom-X or Raptor with Sage 2.1 Control and Panasonic Display (To check software, press the "i" button on home screen.)	4109 [note1]	3.7	12.2	Auto-Discovery
AMP/BFIT/Citadel/Phantom-XL 400-1000L, Apex, Alpine, ASPEN Phantom-X or Raptor Sage 2.2, 2.3 Control, Concert Control, Concert 4-inch Display or Panasonic Display	4716 [note1]	3.8	12.3	Auto-Discovery
Older Arctic or FreeFlex	4716	3.9	12.3	Web-Configurator
Arctic, FreeFlex, AMP/BFIT 1000-4000, or Citadel 1250-1500 with Concert Control & Concert 7-inch Display and **Sola**	4716	3.10	12.3	Web-Configurator
Thermal Solutions and Bryan Boiler Control System Components	RWF40	3.11	12.4	Web-Configurator
	RWF55	3.11	12.5	Web-Configurator
	RM7800	3.12	12.6	Web-Configurator
	LMV52	**Note 2**	12.7	Web-Configurator
	LMV36	**Note 2**	12.8	Web-Configurator
	PD765	**Note 2**	12.9	Web-Configurator
	LMV2_3	**Note 2**	12.10	Web-Configurator
	YB110	**Note 2**	12.11	Web-Configurator
ALTA, ALTAC, Phantom II and Phantom Combi II Control	ALTA	3.13	12.12	Web-Configurator

NOTE 1: Go to Delta or Panasonic screen home page, select information "i" button. Read software version 4109 or 4716.

NOTE 2: Refer to instruction manuals supplied with boiler and control system for wiring details.

2   BOILER SETUP

2.1   Apex, Alpine, ASPEN, Phantom-X, Raptor Boilers with Panasonic Display

On Apex Boilers with Panasonic GT02 display, using the boiler mounted display, set a unique "Boiler Address" for each boiler that will be connected to the network.

- To change "Boiler Address" on Boiler Mounted Display; go to "Adjust" menu.
- In "Adjust" menu, enter "Sequencer Slave" menu to edit "Boiler Address"

2.2   Apex, Arctic, AMP, FreeFlex, BFIT, Citadel, Phantom-XL with Concert Display

On Apex, Arctic/FreeFlex, or AMP/BFIT/Citadel/Phantom-XL boilers/water heaters with Concert Displays, assign a unique Comm HMI Station ID for each boiler connected directly to the ProtoAir.

- To change "Comm HMI Station ID" select "Menu" on Concert Display
- On the "Main Menu" select "EMS Interface" and select "Modbus Setup"
- Select "EMS Modbus Parameter" and follow on screen instructions to edit "Comm HMI Station ID"

2.3   EVS and EVCA Boilers with TSBC or Burnham Commercial Models with SBC

On EVS and EVCA Boilers with TSBC or Burnham Commercial models with SBC, from the Communication Menu set the following:

Table 2-1: TSBC/SBC Communication Settings

Parameter	Selection
Protocol	Modbus RTU
Modbus Address	Between 1 and 20
Baud Rate	38400
Parity	None

- To edit Communication Parameters, hold the "Menu" button down until the screen changes to the Main Menu of the TSBC/SBC
- Scroll through the main menu and select "COMMUNICATIONS" by pressing "Enter".
- Edit Communication Parameters as needed.

Refer to the Boiler's instruction manual for password and menu navigation instructions.

2.4 RWF40, LMV52, RM7800, LMV36, PD765, RWF55, LMV2_3 or YB110

Refer to the Boiler's instruction manual for password and menu navigation instructions to make the following settings:

Table 2-2: RWF40, LMV52, RM7800, LMV36, PD765, RWF55, LMV2_3 or YB110 Com. Settings

Model	Port Setting	Selection
RWF55, YB110	Baud Rate	38400
RWF40, RM7800, LMV36, LMV52, PD765, LMV2_3	Baud Rate	19200
All	Protocol	Modbus RTU
	Parity	None
	Data Bits	8
	Stop Bits	1

3   WIRING

3.1   ProtoAir Power

ProtoAir Power Requirements:

Table 3-1: ProtoAir Power Requirements

Power Requirements	
Input Voltage	12-24VDC or 24VAC
Current Draw	250mA @ 12VDC 125mA @ 24VAC
Max Power	3 Watts

Apply power to the ProtoAir as shown below. Ensure that the power supply used complies with the specifications provided. Wire 9-30VDC or 24VAC on pins L+ and N- and Frame GND to ground.

Power to ProtoAir	ProtoAir Pin Label	Pin Assignment
Power In (+)	L +	V +
Power In (-)	N -	V -
Frame Ground	FG	FRAME GND
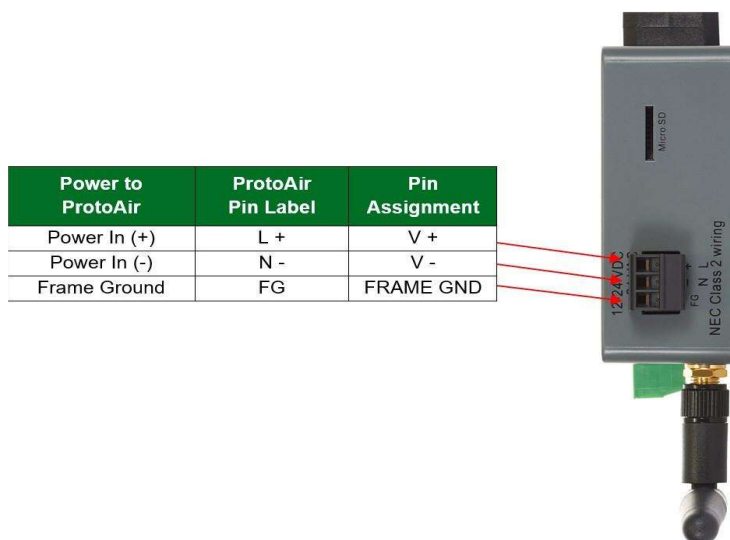
Figure 3-1: ProtoAir Power Connection

3.2   ProtoAir Modbus to Boiler

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

NOTICE: 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
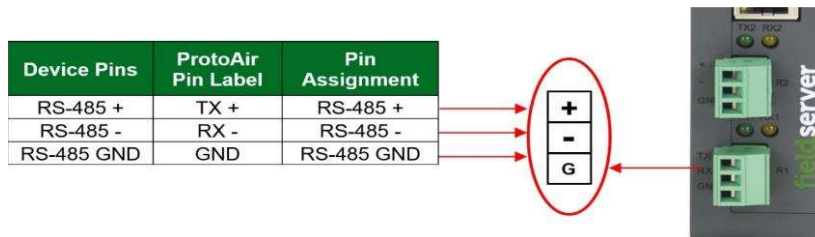
Figure 3-2: ProtoAir Modbus Connection

3.3   ProtoAir BACnet or Metasys N2

Wiring the BACnet ProtoAir to the Network (RS-485 Field Protocol)

- Connection from ProtoAir to BACnet MS/TP, and Metasys N2 network.

- The Field Protocol can be connected to the 3-pin connector on ProtoAir as shown.

- If the ProtoAir is the last device on the RS-485 trunk, then the End-of-line termination needs to be enabled. The default is off (switch position = right side).

EMS RS-485 Wiring	ProtoAir R2 Pin #	Pin Assignment
RS-485+	Pin +	RS-485+
RS485 -	Pin -	RS485 -
-	Pin GND	RS-485 GND
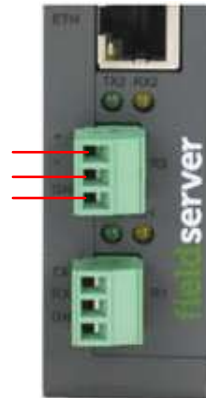
Figure 3-3: ProtoAir BACnet MSTP and Metasys N2 Connection

- Connection from BACnet ProtoAir to a BACnet IP network.

Figure 3-4: ProtoAir Ethernet TCP/IP and BACnet IP Connection

3.4   Bias Resistors
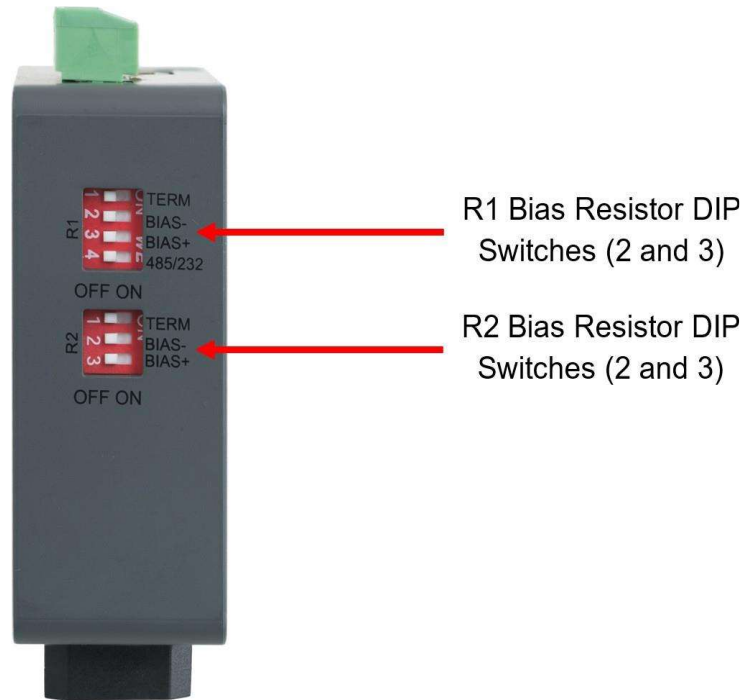
Figure 3-5: ProtoAir Bias Resistor DIP Switches

The default position for Bias Resistor DIP Switches is OFF. Bias Resistors usually do not need to be enabled on the ProtoAir as there is typically another device on the RS-485 bus that has them internally, but they can be enabled if the serial communication is intermittent or experiencing issues.

To enable Bias Resistors, move both the BIAS- and BIAS+ dip switches to the right in the orientation shown above.

The 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 where there are very weak bias resistors of 100k). Since there are no jumpers, many ProtoAirs can be put on the network without running into the bias resistor limit which is < 500 ohms.

NOTICE: See the **Termination and Bias Resistance Enote** for additional information.

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

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

3.5   Termination Resistor
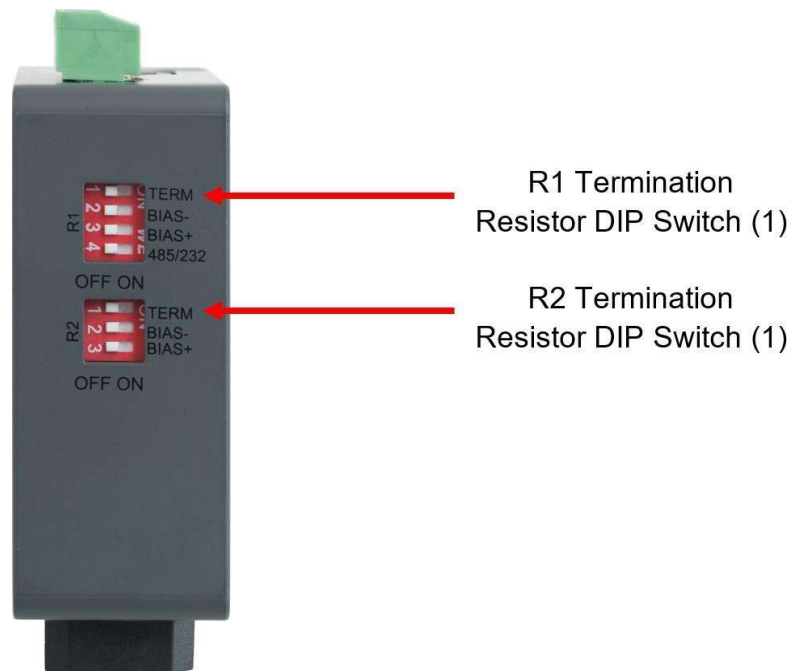
Figure 3-6: ProtoAir Termination Resistor DIP Switches

The default position for the Termination Resistor DIP Switches is OFF. These are also typically unnecessary to use for this application unless experiencing issues with serial communication or data integrity.

If the gateway is the last device on the serial trunk, then the End-Of-Line Termination Switch should be enabled. To enable the Termination Resistor, move the TERM dip switch to the right in the orientation shown above.

Termination resistors are 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.

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

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

3.6   Thermal Solutions Boiler Control (TSBC) and Sage Boiler Control (SBC)

- The Modbus communication connects to the same RJ11 port that is used by the boiler-to-boiler communication.

- Connect one end of the RJ11 cable to the TSBC/SBC and cut off the other end of the cable to access the individual wires of the RJ11 cable. Wire the RJ11 cable as shown below.
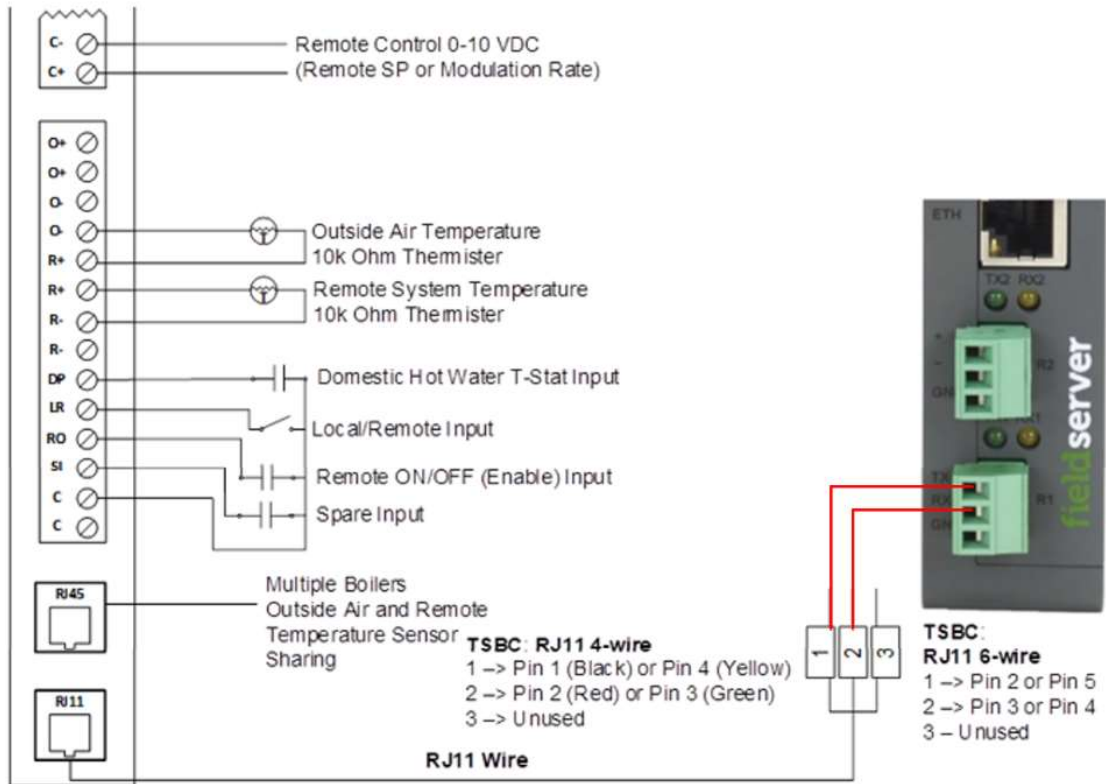
Figure 3-7: RJ11 connection, from the back, on right-hand side of TSBC/SBC Control
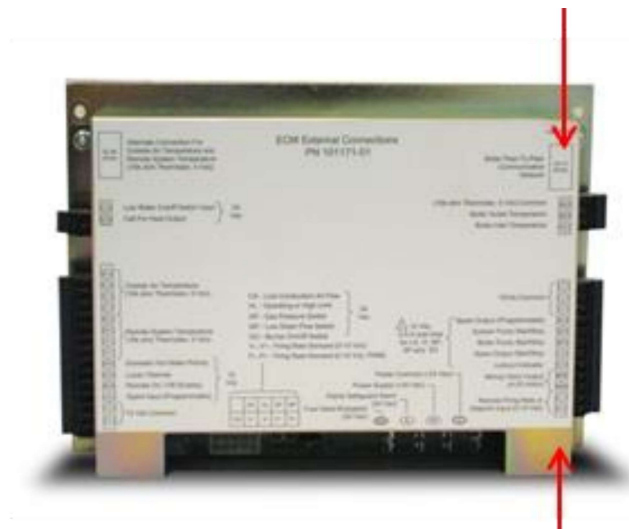
Figure 3-8: Jumper LR to C if you are writing to the boiler controls.
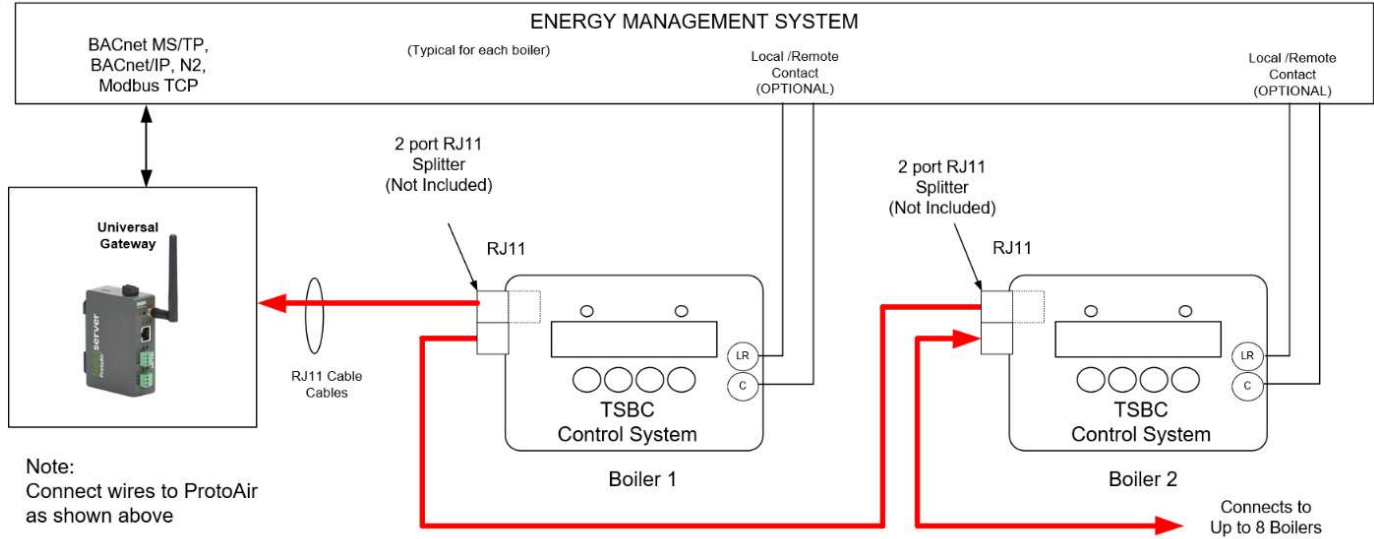
Figure 3-9: Multiple TSBC/SBC Modbus RS485 Wiring

IMPORTANT NOTES for TSBC/SBC Connections:

1. Remote On/Off Modbus Command, Register 0004 is only available when using Remote Firing Rate, not when using Remote Setpoint. EMS system must provide a contact closure to RO & C on each boiler.

2. When the EMS is connected, boiler sequencing (Multiple Boiler Lead/Lag) must be done external to the Boiler Control by other means.

3. Boiler Enable/Disable, Setpoint and Firing Rate are sent over the ProtoAir, or may be directly wired.

3.7   Apex, Alpine, ASPEN, Phantom-X or Raptor with Panasonic Display
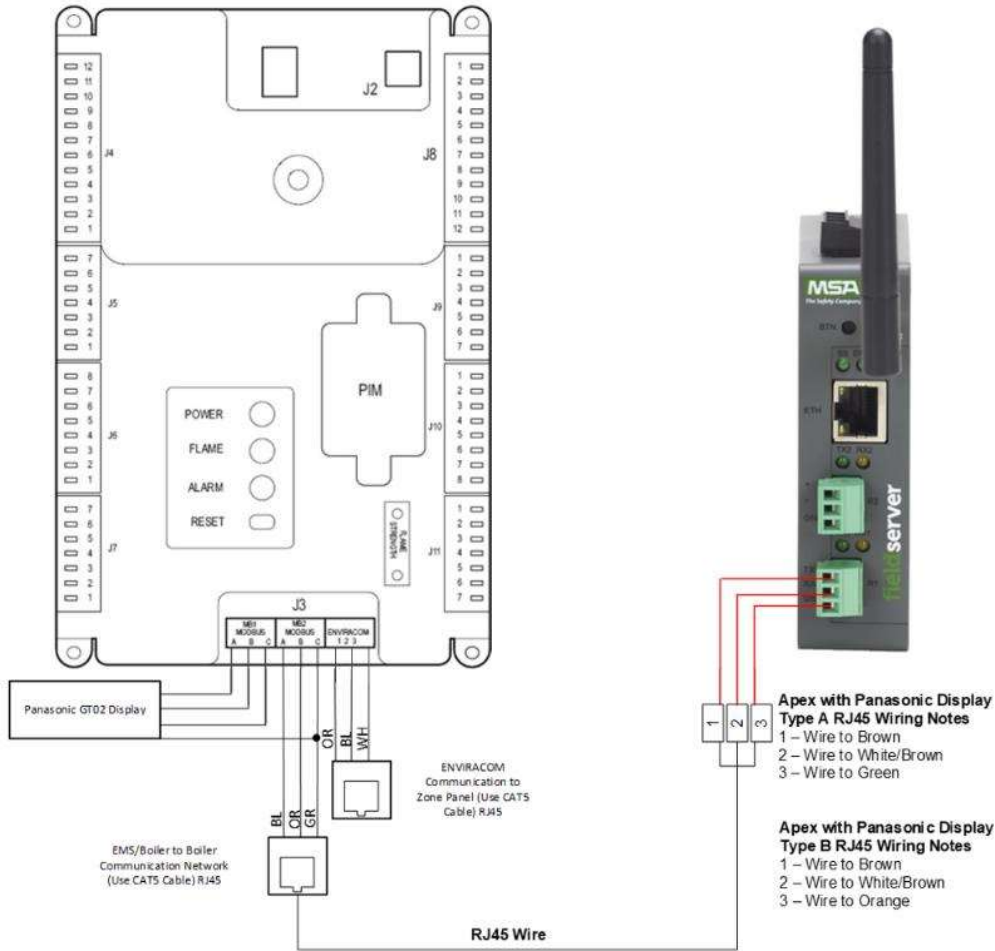
Figure 3-10: Apex, Alpine, ASPEN, Phantom-X or Raptor with Panasonic Display Modbus RS485 Wiring

The Modbus communication connects to the same RJ45 port that is used by the boiler-to-boiler communication. Connect one end of the RJ45 cable to the boiler and cut off the other end of the cable to access the individual wires of the RJ45 cable. Wire the RJ45 cable as shown above.

When wiring to Sage/Sola without the RJ45 cable make the following connections:

- Connect MB2's terminal A (RS-485+) to Pin 1 (RS-485+) on the ProtoAir R1 connector.

- Connect MB2's terminal B (RS-485-) to Pin 2 (RS-485-) on the ProtoAir R1 connector.

- Connect MB2's terminal C (ground) to Pin 3 (ground) on the ProtoAir R1 connector.

IMPORTANT NOTES for Apex with Panasonic display Connections:

1. When the Energy Management system is connected, boiler sequencing (multiple boiler lead/lag) must be done external to the boiler controls, by other means.

2. Both Enable/Disable and Remote Firing Rate must be wired to the boilers to provide boiler sequencing (multiple boiler lead/lag).

3. If only the burner on/off Modbus signal is used instead of the Enable / Disable contact input the boiler will be turned off but the system pump may remain running.

4. The Sequencer must be disabled while communicating with EMS (i.e. no Master Boilers).

3.8 Apex & AMP/BFIT/Citadel/Phantom-XL 400-1000L with Concert Display
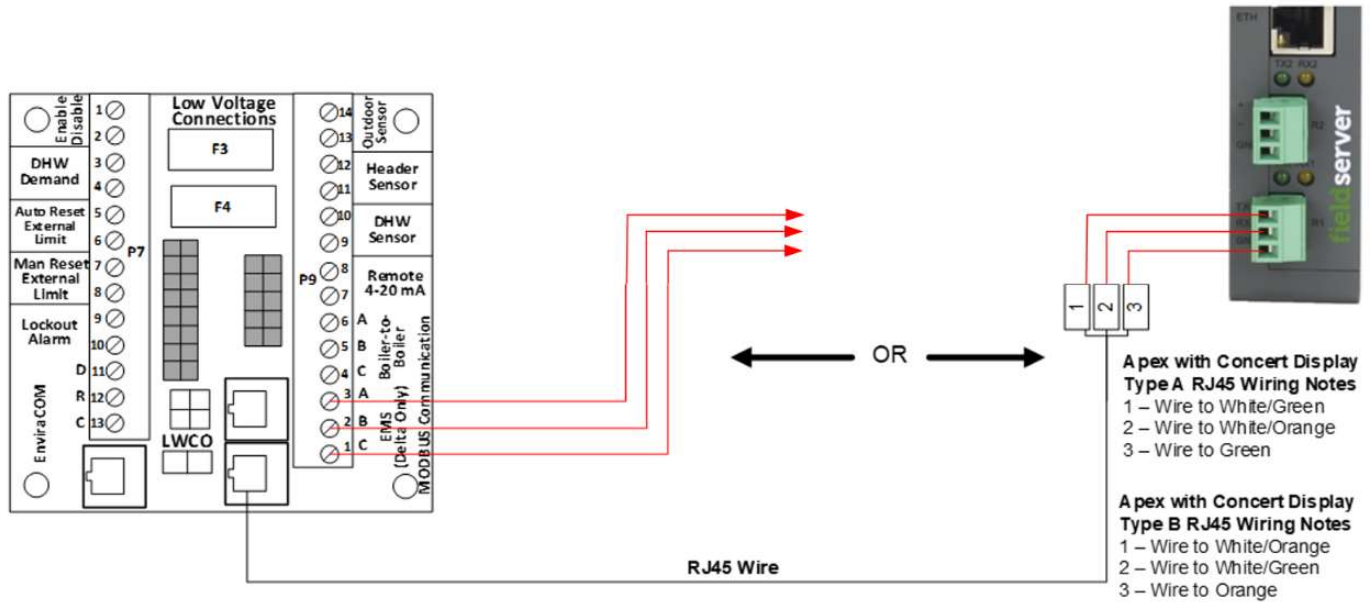
Figure 3-11: Apex and AMP/BFIT/Citadel/Phantom-XL 400-1000L with Concert Modbus RS485 Wiring

There are two options for wiring the ProtoAir to an Apex or AMP/BFIT/CTD/PHX 400-1000L with Concert Display.

1. Connect one end of an RJ45 cable to the boiler PCB and cut off the other end of the cable to access the individual wires of the RJ45 cable. Wire the RJ45 cable as shown above.

2. Wire the ProtoAir to the PCB using the EMS (Delta Only) terminals.
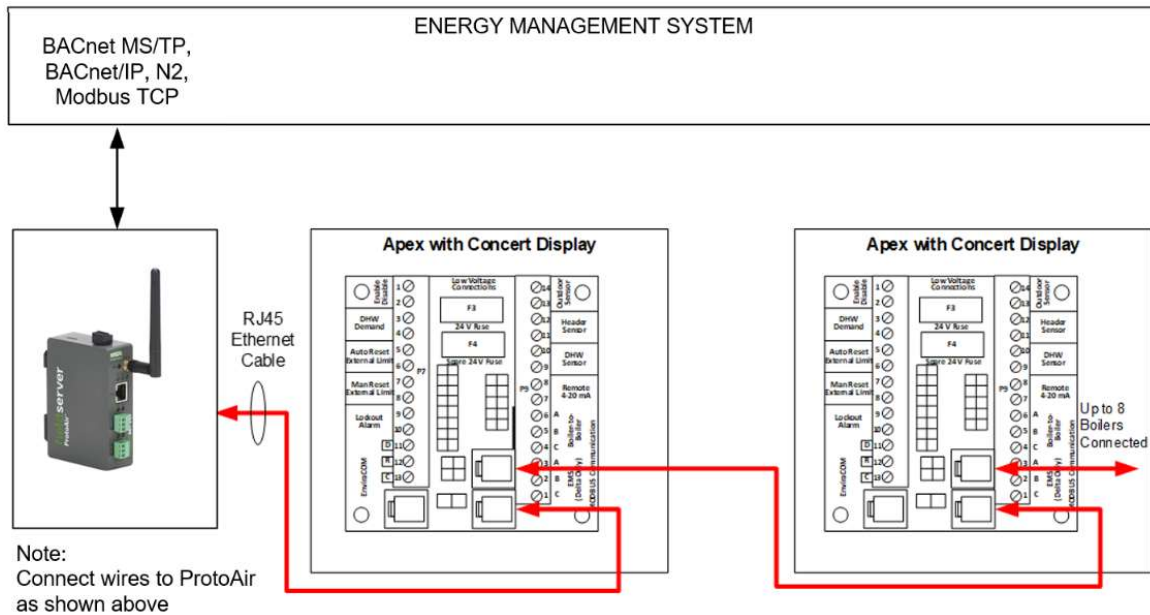
Figure 3-12: Multiple Apex and AMP/BFIT/CTD 400-1000L Modbus RS485 Wiring

NOTICE:

1. All Apex and AMP/BFIT/CTD/PHX 400-1000L with Concert Display are equipped with a PCB to easily establish communication with an EMS.
2. These models are able to do both Lead Lag (Sequencer) and EMS communication at the same time.

3.9   Older Arctic or FreeFlex 1000 with Concert Display
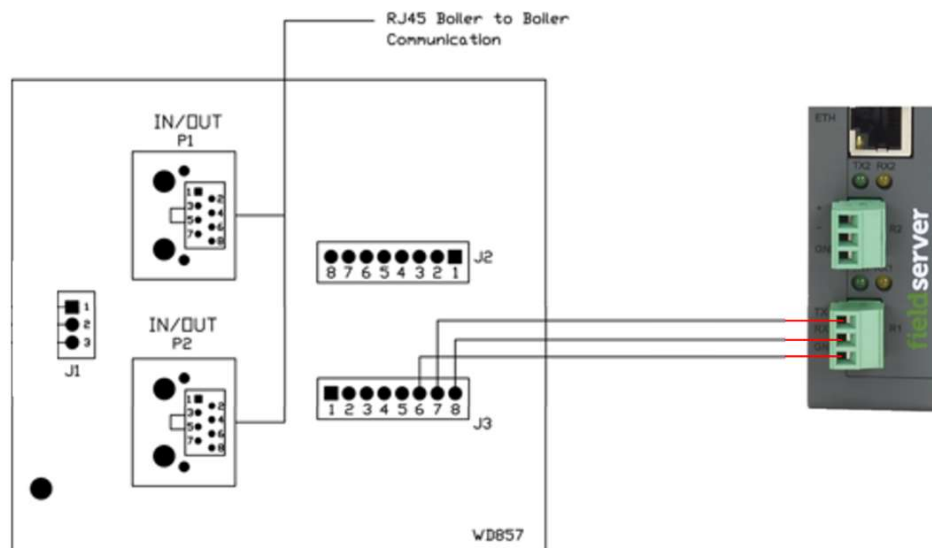
Figure 3-13: Older Arctic/FreeFlex 1000 with Concert Modbus RS485 Wiring

NOTICE:

1. Arctic or FreeFlex with Concert Display is able to do both Lead Lag (Sequencer) and EMS communication at the same time.

2. For Arctic or FreeFlex Boilers not equipped with PCBs refer 4109 Profile (Apex, Alpine or ASPEN) Wiring. .

3. Older Arctic/FreeFlex 1500 – 3000 boilers equipped with this PCB may use this wiring.

4. When connecting Arctic/FreeFlex 1000 to Arctic/FreeFlex 1500 – 3000 use the pinout table shown above to create a proper cable.

3.10 Arctic, AMP, FreeFlex, BFIT & Citadel with Concert Display
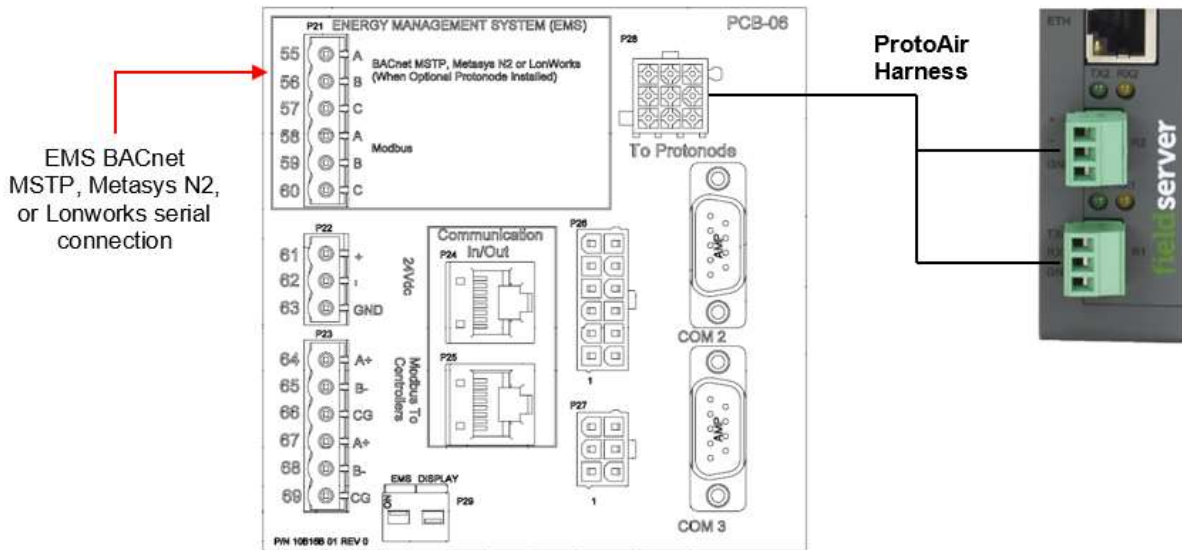
Figure 3-14: Arctic, AMP, FreeFlex, BFIT & Citadel with Concert Modbus RS485 Wiring

NOTICE:

1. Arctic/FreeFlex, AMP/BFIT 1000-4000, & Citadel 1250-1500 with Concert Displays are able to do both Lead Lag (Sequencer) and EMS communication at the same time.
2. The Gateway ProtoAir kit (P/N: 112316-01) for these units is equipped with a wire harness which connects the Sola, Communications Board (PCB-06), and ProtoAir.

3.11 RWF40 or RWF55

RWF40 Wiring
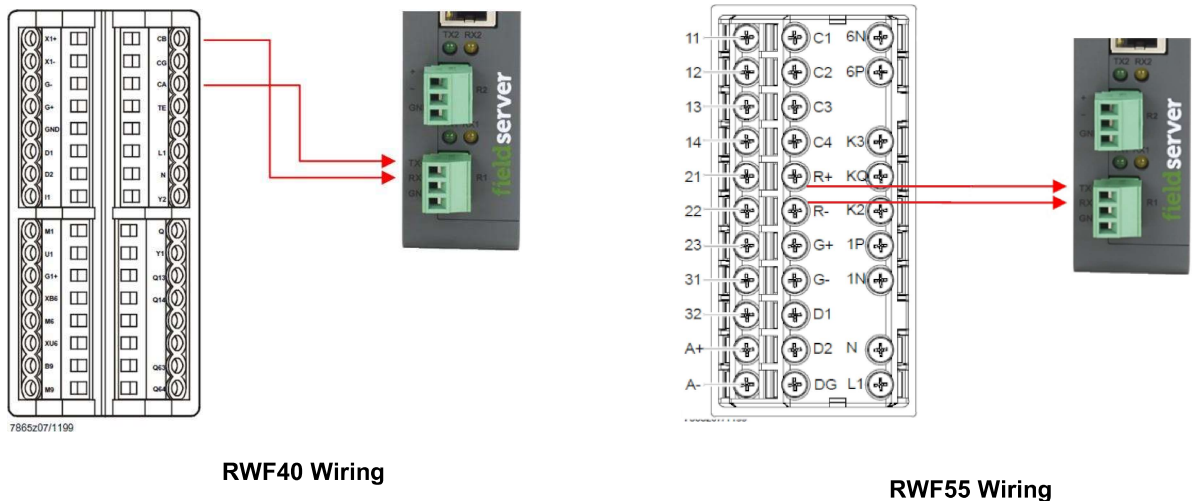
RWF55 Wiring

Figure 3-15: RWF40 and RWF55 Modbus RS485 Wiring

NOTICE:

- Connect terminal CA (RWF40) or R+ (RWF55) to Pin 1 (RS-485+) on the ProtoAir 3-pin Phoenix connector.

- Connect terminal CB (RWF40) or R- (RWF55) to Pin 2 (RS-485-) on the ProtoAir 3-pin connector.

- CG (Ground) terminal does not need to be grounded to the RS-485 Ground port of ProtoAir.

3.12   RM7800 Series
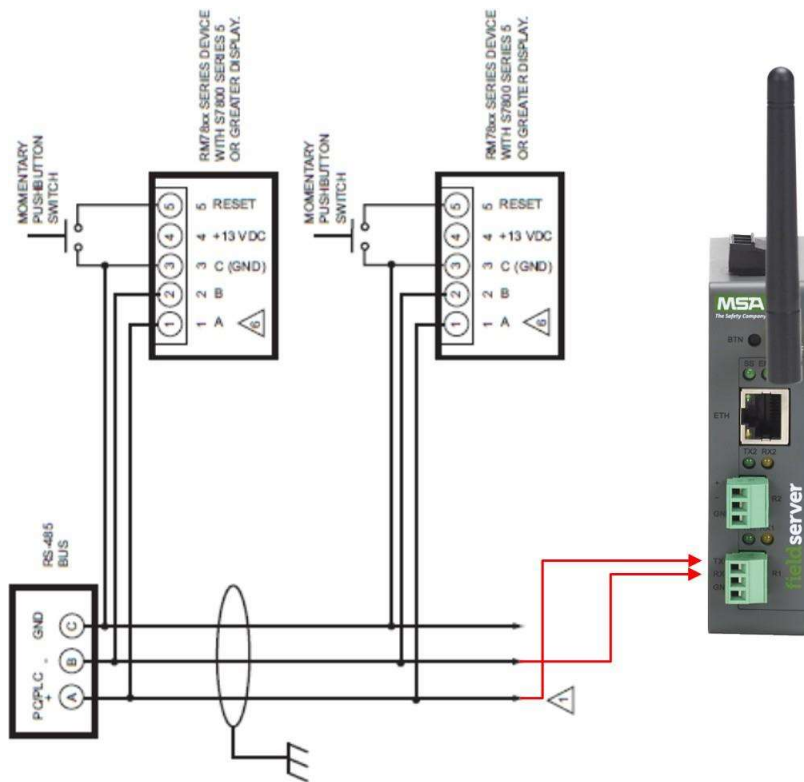
Figure 3-16: RM7800 Modbus RS485 Wiring

NOTICE:

On the RM7800 Series; connect terminal A (RS-485+) to Pin 1 (RS-485+) on the ProtoAir 3-pin Phoenix connector.

- Connect terminal CB RxD / TxD- (RS-485-) to Pin 2 (RS-485-) on the ProtoAir 3-pin Phoenix connector.

- CG Ground terminal does not need to be grounded to the RS-485 Ground port of ProtoAir.

3.13   ALTA, ALTAC, Phantom II, Phantom Combi II Control
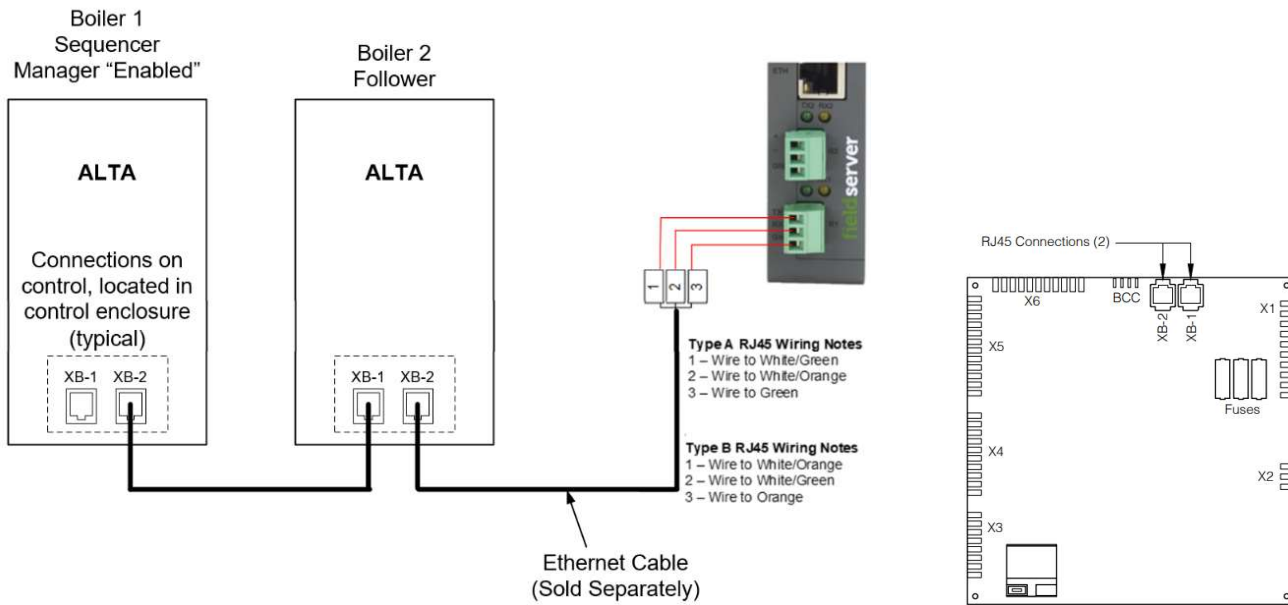
Figure 3-17: ALTA, ALTAC, Phantom II, Phantom Combi II Control Modbus RS485 Wiring

The control system has a full featured ability to interface with an Energy Management System (EMS). The control system allows remote control and monitoring via RS485 Modbus or through direct wiring. The EMS connection is separate from the Boiler-to-Boiler communication network and may be used simultaneously. Modbus communication connects to the same RJ45 port that is used by the Boiler-to-Boiler communication network. Connect one end of the ethernet cable to the control and cut off the other end of the cable to access the individual conductors. The control is a 3 wire Modbus communication, labeled as Modbus 2 (MB2) in Table 4-1 below:

Table 3-2: ALTA, ALTAC, Phantom II, Phantom Combi II Termination details

RJ45	Modbus Signal	Ethernet Type B Color	Ethernet Type A Color	Description
1	D+(A)	Orange w/ white stripe	Green w/ white stripe	Modbus 2 (MB2) Energy Management Interface
2	GND (C)	Orange	Green	
3	D-(B)	Green w/ white stripe	Orange w/ white stripe	
4	--	Blue	Blue	Not used.
5	--	Blue w/ white stripe	Blue w/ white stripe	Not used.
6	--	Green	Orange	Not used.
7	D-(B)	Brown w/ white stripe	Brown w/ white stripe	Modbus 3 (MB3) Boiler-To-Boiler Communication Network
8	D+(A)	Brown	Brown	**NOTICE:** Do not connect EMS system to pin 7 or 8.

NOTICE: If the first and second pin are orange, the cable is 568B. If the first and second pins are green, the cable is 568A.

4 INITIAL CONNECTION TO PROTOAIR

4.1 Record Identification Data

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

Table 4-1: PROTOAIR Identification Data

Model	ProtoAir
Part Number	FPA-W44-1744
Serial Number	Unique
Default Password	Unique

4.2 Connecting to the Gateway via Ethernet

Connect a Cat-5 Ethernet cable (straight through) between the local PC and ProtoAir.
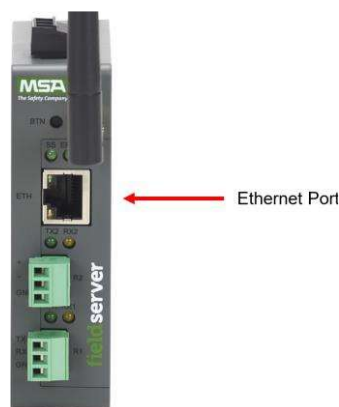
Figure 4-1: PROTOAIR Ethernet Port

4.2.1 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:

• Use the search field in the local computer's taskbar (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 exit the Ethernet Properties window.

4.2.2 Navigate to the Login Page

- Open a web browser and connect to the FieldServer's default IP Address. The default IP Address of the FieldServer for Ethernet connection is **192.168.1.24**, Subnet Mask is **255.255.255.0**.

NOTICE: If the IP Address of the ProtoAir has been changed, the IP Address can be discovered using the FS Toolbox utility. **See Section 8.1 Lost or Incorrect IP Address** for instructions.

4.3 Connecting to the Gateway via Wi-Fi Access Point

When the ProtoAir is first powered up, the Wi-Fi Access Point will be enabled allowing direct connection to the ProtoAir with Wi-Fi.

To connect to the ProtoAir Wi-Fi Access Point for Windows 10:

- Use the search field in the local computer's taskbar (to the right of the windows icon ⊞) and type in "Wi-Fi Settings".
- Click "Wi-Fi Settings" and then click "Show available networks"
- Select the desired ProtoAir and click Connect
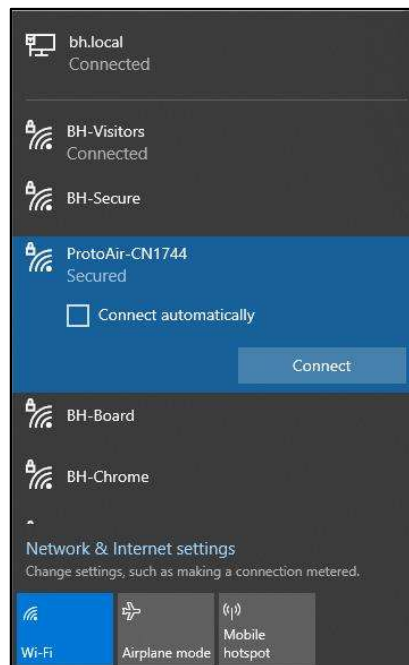
Figure 4-2: ProtoAir Wi-Fi Access Point in Computer Wi-Fi Settings

- Enter the security key. The default is **LsU##88S**.
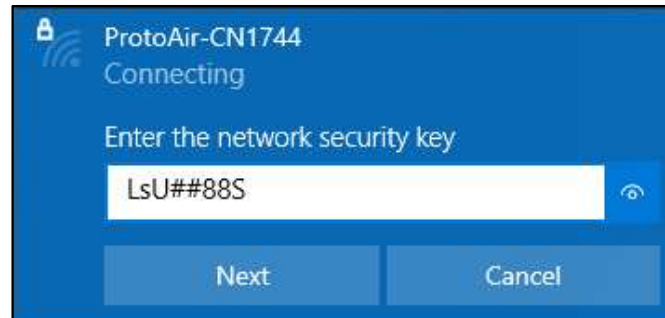
Figure 4-3: ProtoAir Wi-Fi Access Point Network Security Key

The available Wireless Network Connection menu should now show that the computer is connected to the ProtoAir.

NOTICE: Mobile devices can also be used to connect to the ProtoAir via Wi-Fi Access Point.

NOTICE: If Wi-Fi Access Point is not being used to connect to the ProtoAir, it should be disabled for security purposes. **See Section 7.6 Wi-Fi Access Point Settings** for instructions.

4.3.1 Navigate to the Login Page

- Open a web browser and connect to the FieldServer's default IP Address. The default IP Address of the FieldServer for Wi-Fi Access Point connection is **192.168.50.1**

NOTICE: If the IP Address of the ProtoAir has been changed, the IP Address can be discovered using the FS Toolbox utility. **See Section 8.1 Lost or Incorrect IP Address** for instructions.

5 SETUP WEB SERVER SECURITY

5.1 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 5-1: First Login Security Warning

- When the warning that "Your connection is not private" appears, click the advanced button on the bottom left corner of the screen.
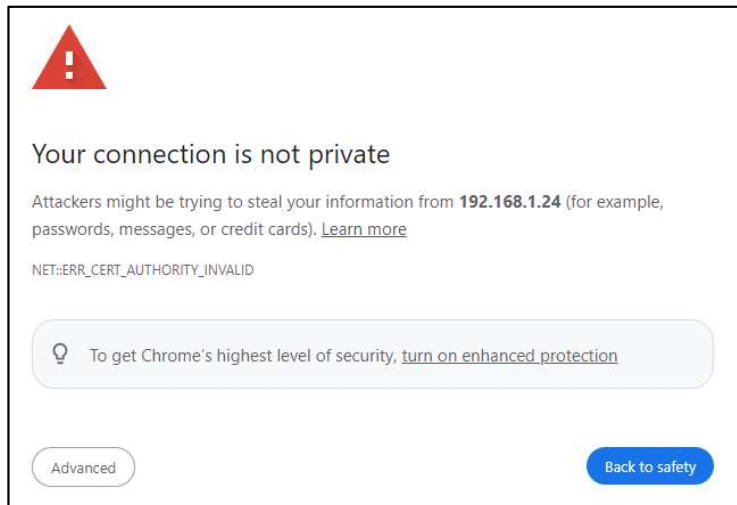
Figure 5-2: First Login Security Advanced Button

- Additional text will expand below the warning, click the underlined text to go to the IP Address. In the example below this text is "Proceed to 192.168.1.24 (unsafe)".

Figure 5-3: Proceed to 196.168.1.24 Button

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

NOTICE: There is also a QR code in the top right corner of the FieldServer label that shows the default unique password when scanned.
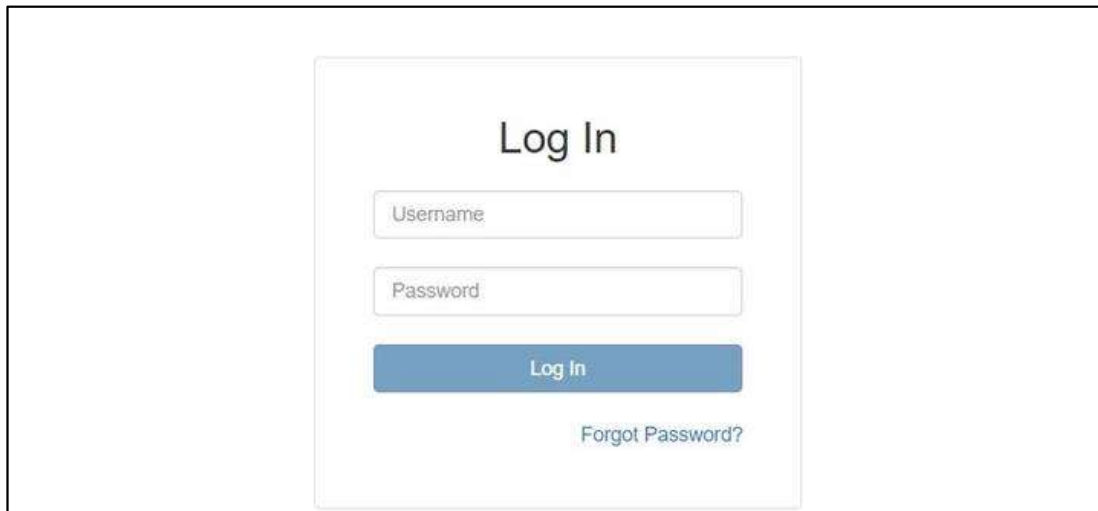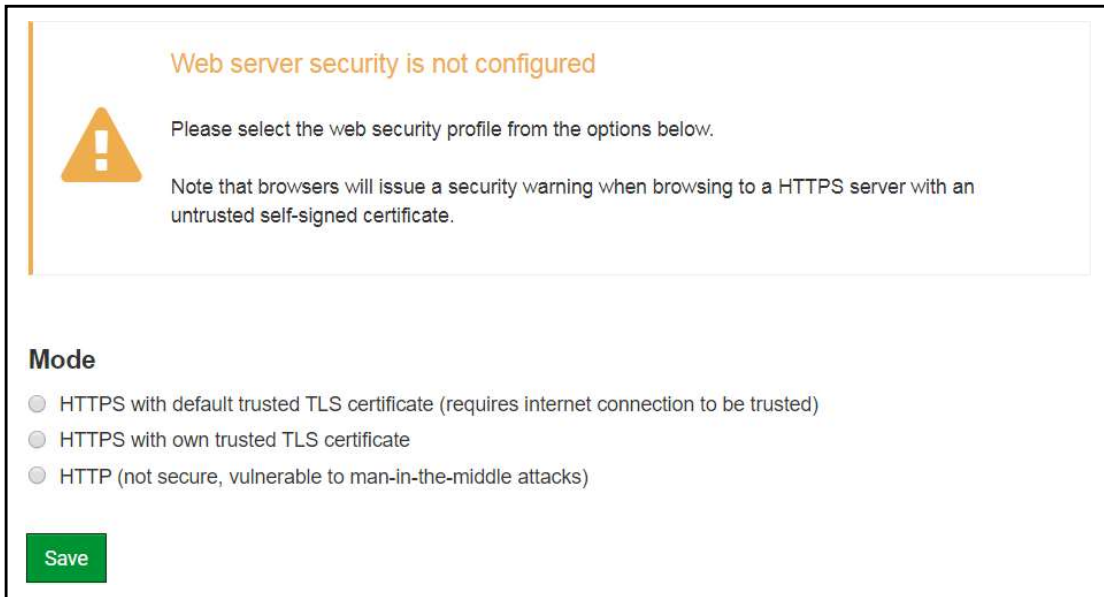
Figure 5-4: Login Page

NOTICE: 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.

NOTICE: To create individual user logins, go to **Appendix A.11 Change User Management Settings.**

5.2   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 5-5: Web Security Selection Page

NOTICE: Cookies are used for authentication.

NOTICE: To change the web server security mode after initial setup, **go to Section 9.3 Change Web Server Security Settings After Initial Setup**.

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

5.3 HTTPS with Own Trusted TLS Certificate

This is the recommended selection and the most secure. **Please contact your IT department to find out if you can obtain a TLS certificate from your company before proceeding with the Own Trusted TLS Certificate option.**

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

Figure 5-6: Certificate Page

- 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. After a short time, the FieldServer GUI will open.

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

- Select one of these options and click the Save button.

- A "Redirecting" message will appear. After a short time, the FieldServer GUI will open.

6   SETUP PROTOAIR

6.1   Navigate to the ProtoAir Web Configurator

- From the Web App Device List page, click the Settings tab and then click Configuration.

Figure 6-1: ProtoAir Web Configurator home page

- Then click the Profiles Configuration button to go to the Web Configurator page.
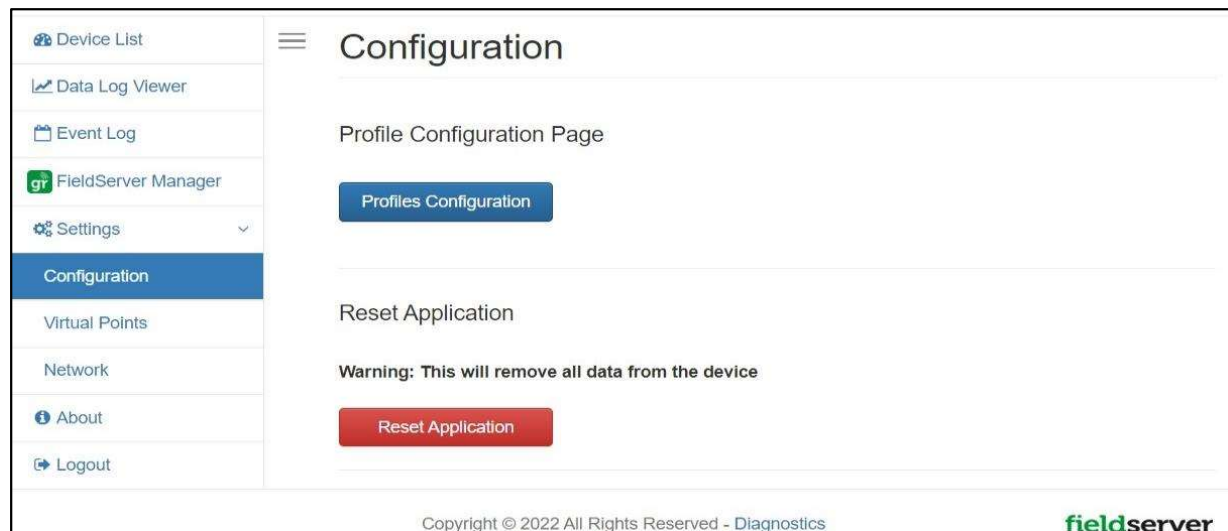
Figure 6-2: ProtoAir Web Configurator configuration page

NOTICE: For Web App instructions to the System View, Data Log Viewer, Event Logger and Virtual Points functions, see the **MSA Grid – FieldServer Manager Start-up Guide**.

6.2 Select Field Protocol and Set Configuration Parameters

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

Figure 6-3: ProtoAir Configuration Parameters

• 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.

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

NOTICE: If Modbus TCP/IP was selected and is used for the field protocol, skip **Section 6.3 Configure Devices Connected to the Gateway.** 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.

• Set Baud rate to match connected device:

Table 6-1: ProtoAir Configuration Modbus Parameters

Port Setting	Sola, 4109, TSBC, & 4716	Other Devices
Protocol	Modbus RTU	Modbus RTU
Baud Rate	38400	9600
Parity	None	None
Data Bits	8	8
Stop Bits	1	1

NOTICE: 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.

6.3   Configure Devices Connected to the Gateway

6.3.1   Use Auto-Discovery Mode

This configuration method works only with devices set as Auto-Discovery in **Section 1.2 Universal Gateway Available Configurations.**

NOTICE: Initial Auto Discovery Cycle

All boilers **MUST** be **POWERED** and **CONNECTED** to the ProtoAir before cycling power to the ProtoAir. The ProtoAir will auto discover only connected boilers. If a boiler is connected after the ProtoAir has completed auto discovery it will not "find" the new boiler.

• Click the Discovery Mode button at the bottom of the screen.
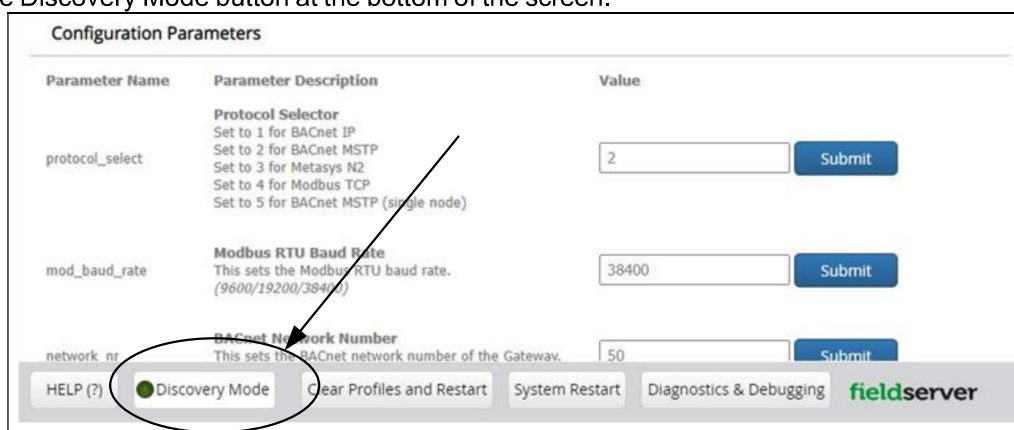
Figure 6-4: Auto Discovery Mode Button

• Click the OK button in the window that appears to discover devices and restart the device.

• Wait for the ProtoAir to restart and the Discovery in Progress window to disappear.

NOTICE: It may take about 3 minutes for all the devices to be discovered and the configuration file to be built.

• If the discovery is successful, the desired device profile should appear under the Active profiles title near the bottom of the screen.

Figure 6-5: Profile List

NOTICE: Scroll down the page if the Active profiles header is not visible.

NOTICE: **Once Auto Discovery is completed, click on Discovery Mode to turn discovery off. Failure to do so will result in ProtoAir needing to "discover" all the boilers upon each power cycle.**

6.3.2   Setting Active Profiles

This section applies to Web-Configurator devices referenced in **Section 1.2 Universal Gateway Available Configurations.**

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

Figure 6-6: Manual Profile "Add" Button

- 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.

- Once the Profile for the device has been selected from the drop-down list, set Node-ID for any 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. **See Section 6.5 Assign Specific BACnet Device Instances**

- 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 below.

Figure 6-7: Manually Added Profile List

6.4   Verify Device Communications

- If using a serial connection, check that TX and RX LEDs are rapidly flashing. **See Section 8.4 LED Functions** for information and images.

- Confirm the software shows good communications without errors. **See Section 8.2 Viewing Diagnostic Information**).

6.5   Assign Specific BACnet Device Instances

- 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
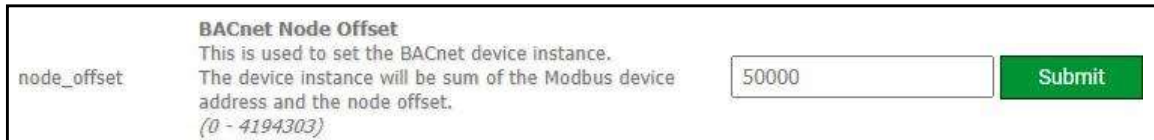
Then plug the device 1's information into the formula to find the

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 6-8: BACnet Node Offset

Figure 6-9: Node ID

6.6   How to Start the Installation Over: Clearing Profiles

- 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.

7 SETUP ENERGY MANAGEMENT SYSTEM NETWORK

7.1 Navigate to the Network Settings

- From the Web App landing page, click the Settings tab on the left side of the screen.
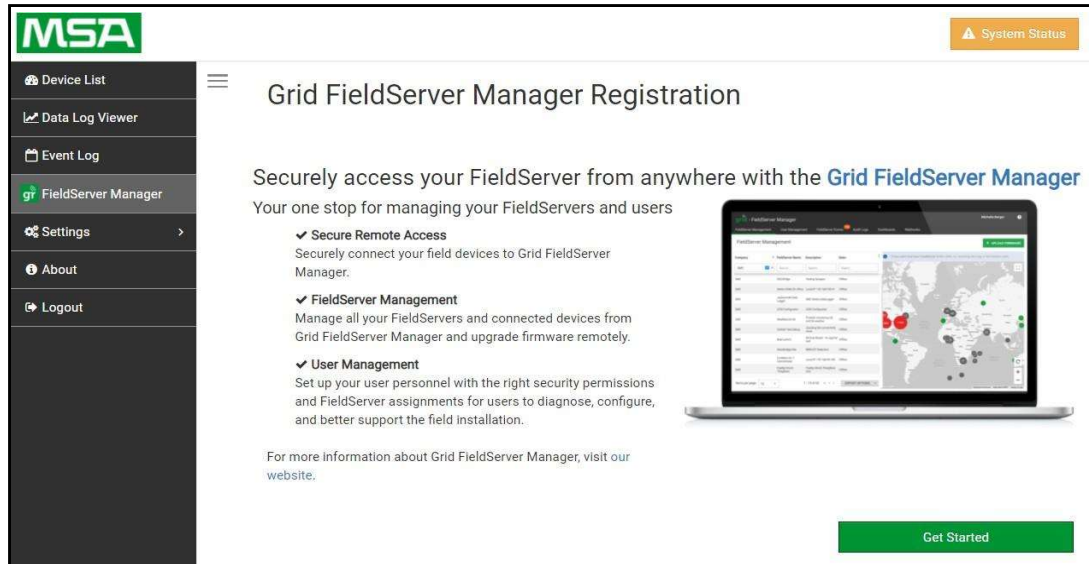
Figure 7-1: ProtoAir Web Configurator Landing Page

- Click the Network tab that appears to open the Network Settings page.
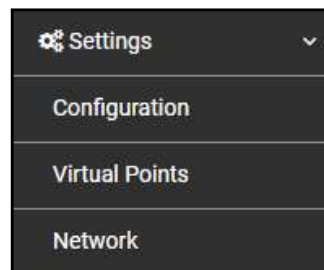
Figure 7-2: Settings Menu

- A warning message will appear when performing the first-time setup, click the Exit Registration button to continue to the Settings page.
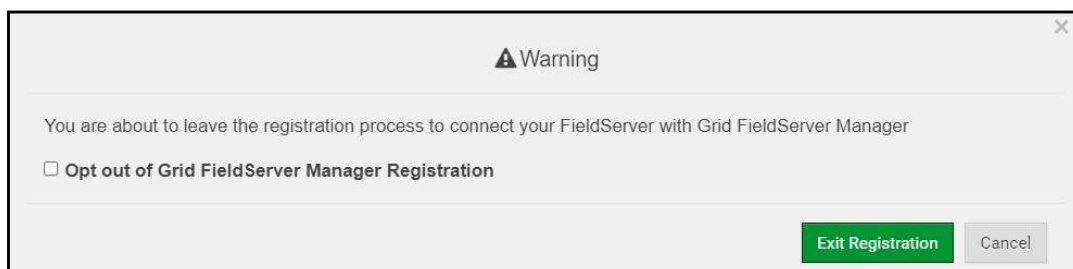
Figure 7-3: Option Out of Grid Page

7.2 Change the ProtoAir IP Address

Configure the IP settings of the ProtoAir using the following sections of the Network page:

- If using the Ethernet port to connect to the local network, scroll to "ETH 1" (**Section 7.4 Ethernet 1**).

- If using the local wireless network, scroll to "Wi-Fi Client Settings" (**Section 7.5 Wi-Fi Client Settings**).

- If using the Wi-Fi Access Point, scroll to "Wi-Fi Access Point Settings" (**Section 7.6 Wi-Fi Access Point Settings**).

7.3 Routing Settings

The Routing settings make it possible to set up the IP routing rules for the FieldServer's internet and network connections.

- Click the Add Rule button to add a new row and set a new Destination Network, Netmask and Gateway IP Address as needed.

- Set the Priority for each connection (1-255 with 1 as the highest priority and 255 as the lowest).

- Click the Save button to activate the new settings.

NOTICE: If using Wi-Fi Client and not Ethernet, make the top priority rule a Wi-Fi Client connection.

Figure 7-4: Routing Page

7.4 Ethernet 1

The ETH 1 section contains the wired network settings. To change the IP Settings, follow these instructions:

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

   NOTICE: If the FieldServer is connected to a router, the IP Gateway of the FieldServer should be set to the same IP Address of the router.

- Click Save to record and activate the new IP Address.

- Connect the FieldServer to the local network or router.

NOTICE: Write down new IP Settings. Failure to do so will cause lost time.

NOTICE: The browser will need to be pointed to the new IP Address of the FieldServer before the settings will be accessible again.

Figure 7-5: Ethernet Page

7.5 Wi-Fi Client Settings

- 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 access point.

- Enable DHCP to automatically assign all Wi-Fi Client Settings fields or modify the Settings manually, via the fields immediately below the note (IP Address, Network, etc.).

NOTICE: If connected to a router, set the IP gateway to the same IP Address as the router.
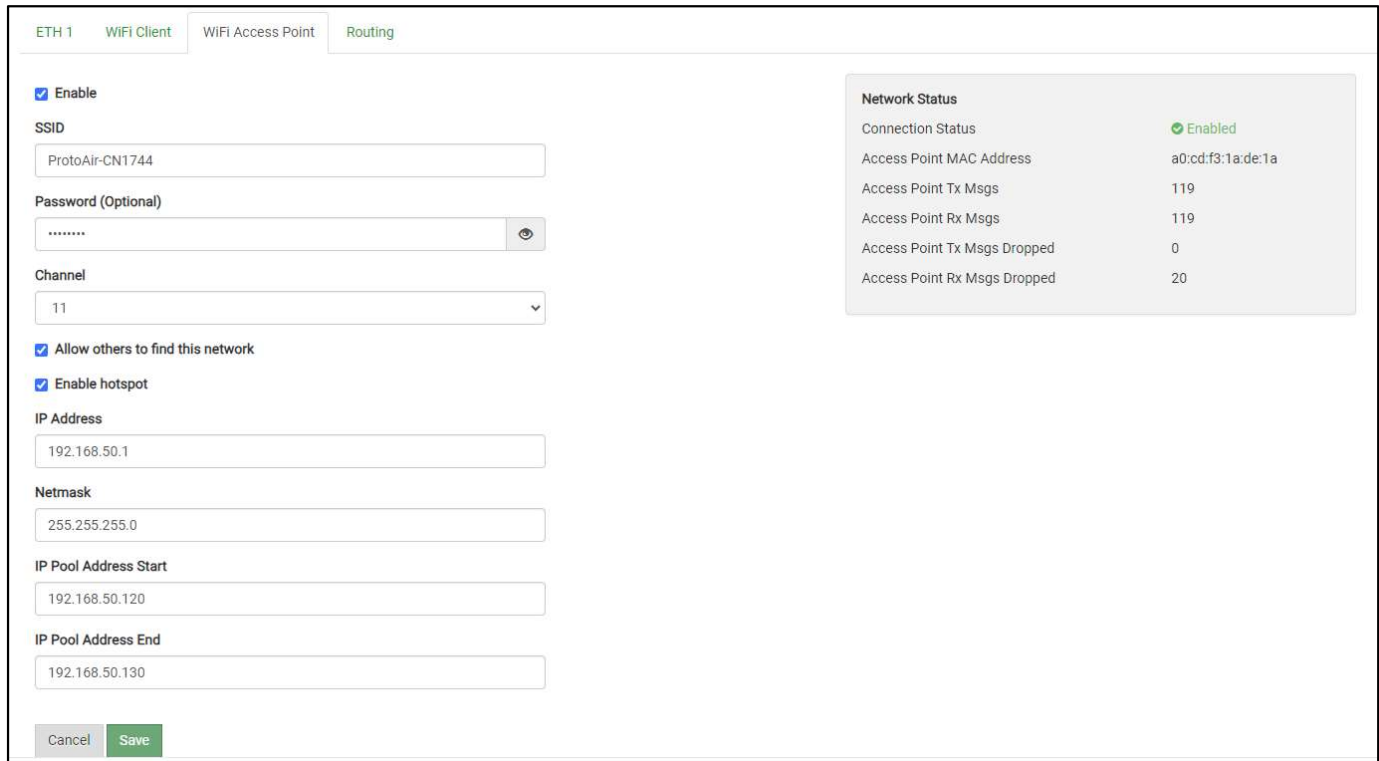
- Click the Save button to activate the new settings.

- Go to Routing (**Section 7.3 Routing Settings**) to set the default connection to Wi-Fi Client.

Figure 7-6: Wi-Fi Client Page

7.6   Wi-Fi Access Point Settings

- Uncheck the box next to "Enable" if Wi-Fi Access Point connection is not being used.

- Modify the settings manually as needed, via these fields: SSID, Password, Channel, IP Address, Netmask, IP Pool Address Start, and IP Pool Address End.

- Click Save to activate the new settings.

- Connect the FieldServer to the local network or router.

NOTICE: If the FieldServer GUI was open in a browser via the ProtoAir Wi-Fi Access Point, the local computer will need to be reconnected to the ProtoAir Wi-Fi Access Point with the new details before the FieldServer GUI will be accessible again.

Figure 7-7: Wi-Fi Access Point Page

8 TROUBLESHOOTING

8.1 Lost or Incorrect IP Address

- Ensure that FieldServer Toolbox is loaded onto the local PC. Otherwise, download the FieldServer-Toolbox.zip via the MSA Safety website.

- Extract the executable file and complete the installation.
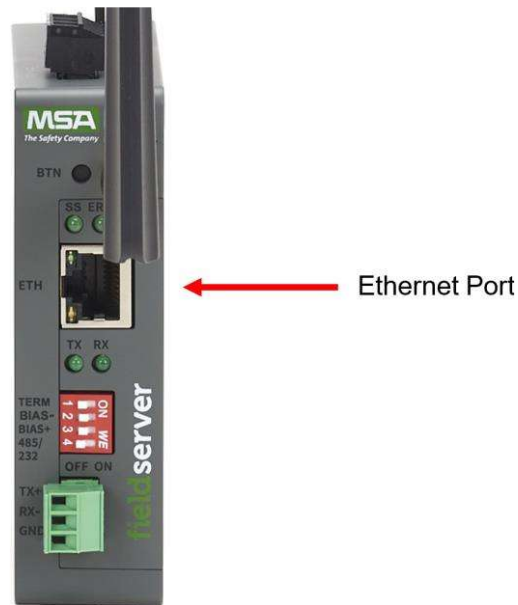
Figure 8-1: ProtoAir Ethernet Port

- 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.

Figure 8-2: Field Server Tool Box

8.2 Viewing Diagnostic Information

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

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

- If there are any errors showing on the Connection page, refer to **Section 8.3 Checking Wiring and Settings** for the relevant wiring and settings.
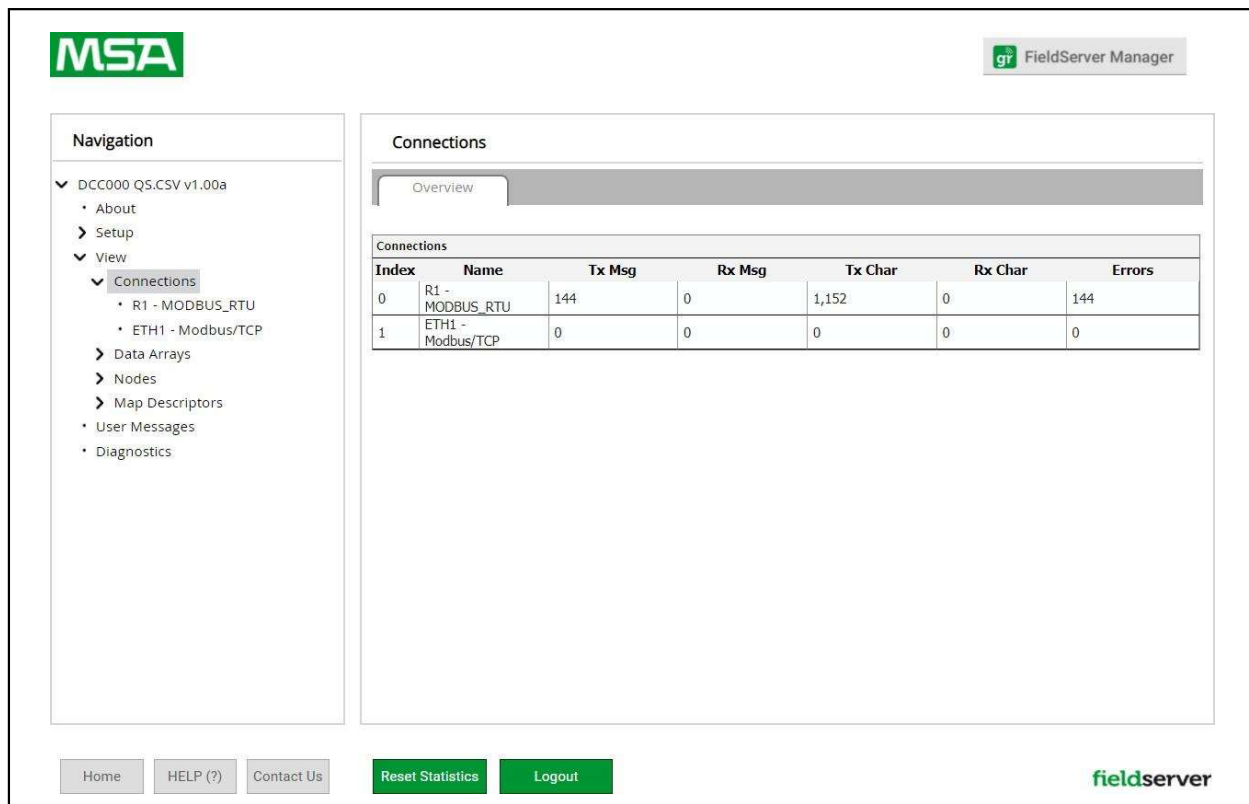
Figure 8-3: Connections Page

8.3 Checking Wiring and Settings

No COMS on the Modbus RTU side. If the Tx/Rx LEDs are not flashing rapidly then there is a COM issue. To fix this problem, check the following:

- Visual observations of LEDs on the ProtoAir. Both R1 LEDs should be flashing rapidly.

- Check baud rate, parity, data bits, stop bits.

- Check device address.

- Verify wiring.

- Verify the device was listed in the Web Configurator (**Section 6.3.2 Setting Active Profiles**). Field COM problems:

- Visual observations of LEDs on the ProtoAir. (**Section 8.4 LED Functions**)

- Verify wiring.

- Verify IP Address setting.

NOTICE: If the problem still exists, a Diagnostic Capture needs to be taken and sent to support. (Section 8.5 Taking a FieldServer Diagnostic Capture)

8.4 LED Functions
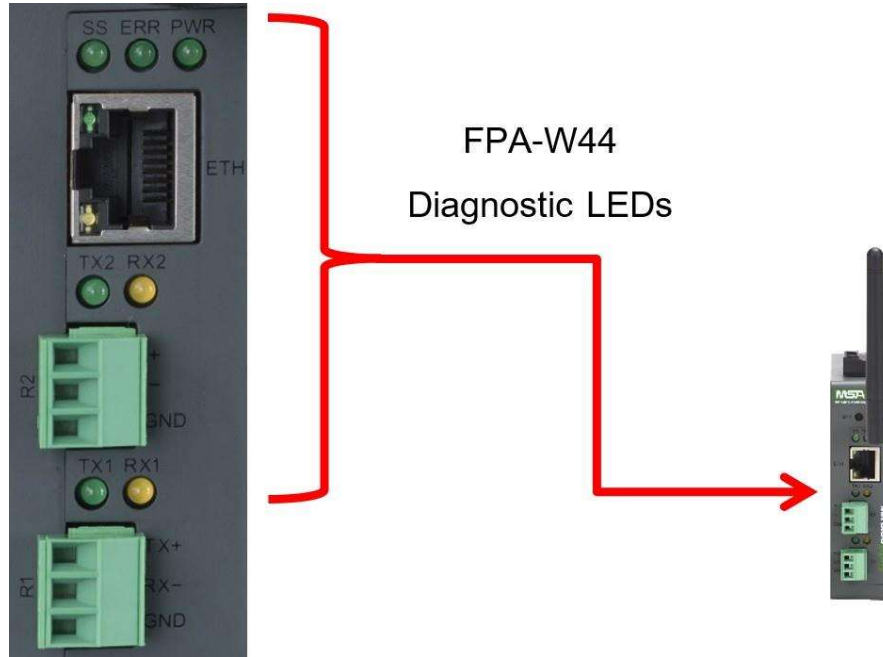
Figure 8-4: ProtoAir LEDS

Table 8-1: LED Explanations

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 be 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.

8.5 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.

• 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
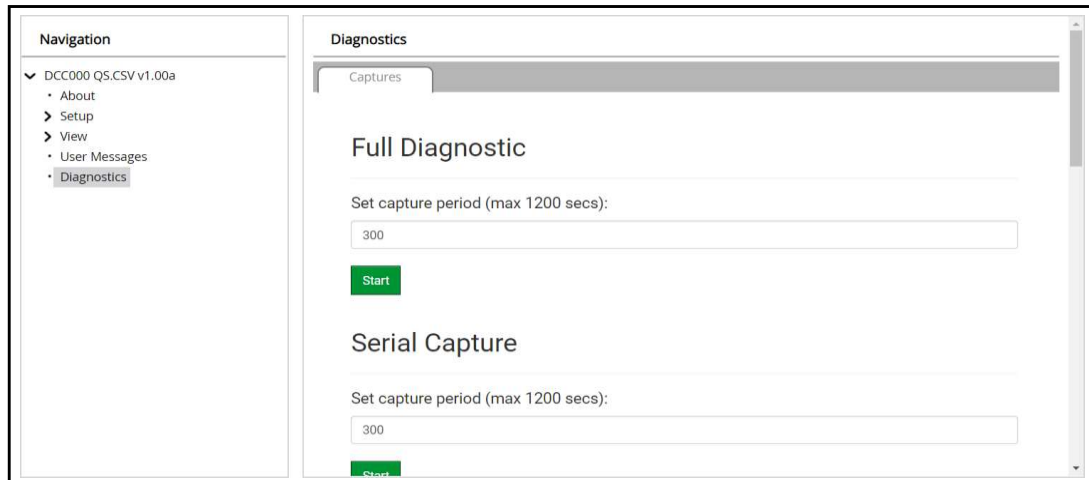
Figure 8-5: Diagnostic Capture Page

- 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
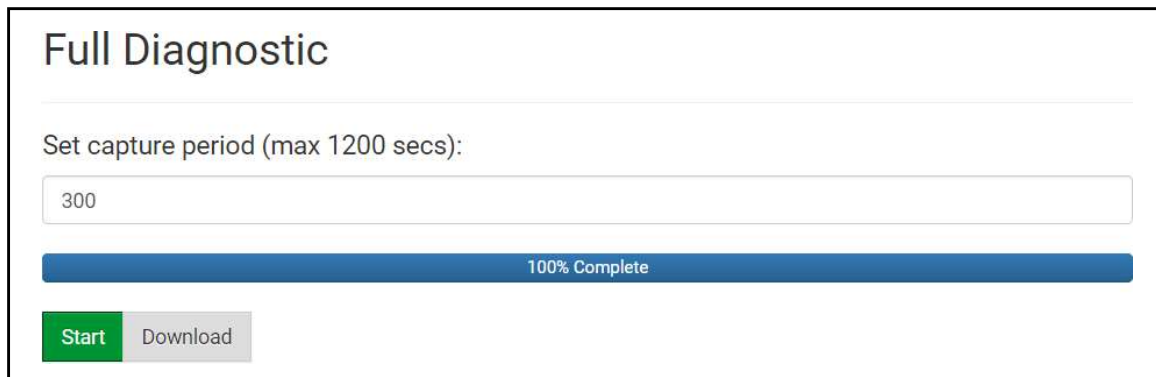
Figure 8-6: Diagnostic Complete

- Click Download for the capture to be downloaded to the local PC.

- Email the diagnostic zip file to technical support (smc-support.emea@msasafety.com).

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

8.6 Wi-Fi Signal Strength

Table 8-2: Wi-Fi Signal Strength

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

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

8.7 Factory Reset Instructions

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

8.8 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

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

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

9 ADDITIONAL INFORMATION

9.1 Update 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 (**Section 8.1 Lost or Incorrect IP Address**)

3. Navigate to Profile Configuration page by clicking "Settings" tab, then click "Configuration", then click "Profiles Configuration"

4. Click on the "Diagnostics & Debugging" button.

5. 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

6. In the General tab, click on "Choose Files" and select the .SIMG file extracted in step 1.

7. Click on the "Submit" button.

8. When the download is complete, click on the "System Restart" button.

9.2 Setting BACnet 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 9-1: BACnet Network Number

9.3 Change Web Server Security Settings After Initial Setup

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

• Click Diagnostics at bottom of page and then Setup in the Navigation panel.
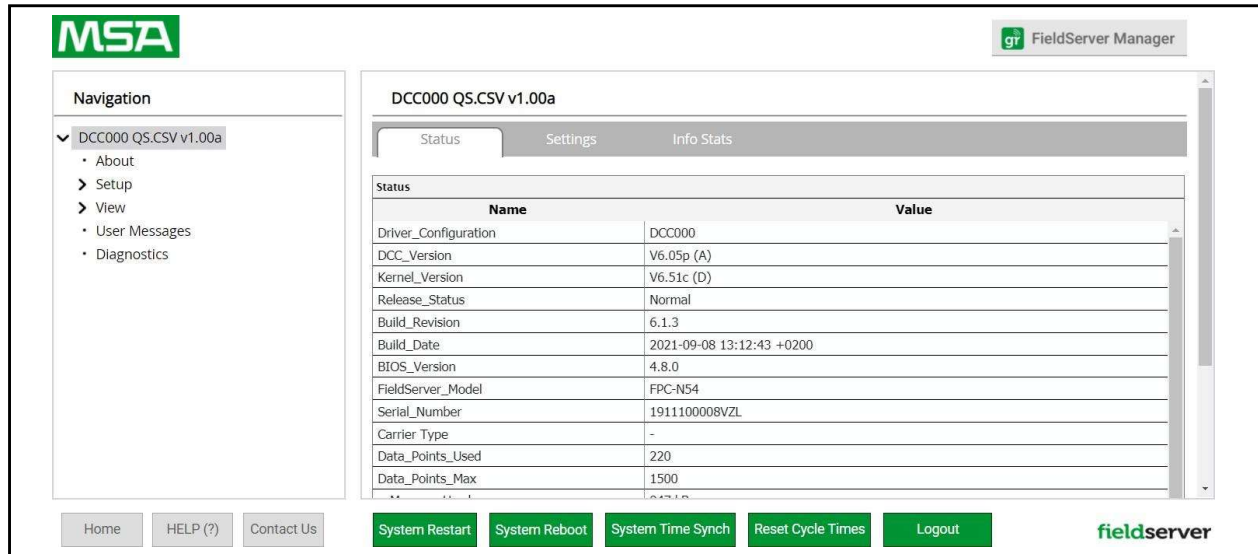
Figure 9-2: ProtoAir Diagnostics Home Page

- Click Security in the Navigation panel.
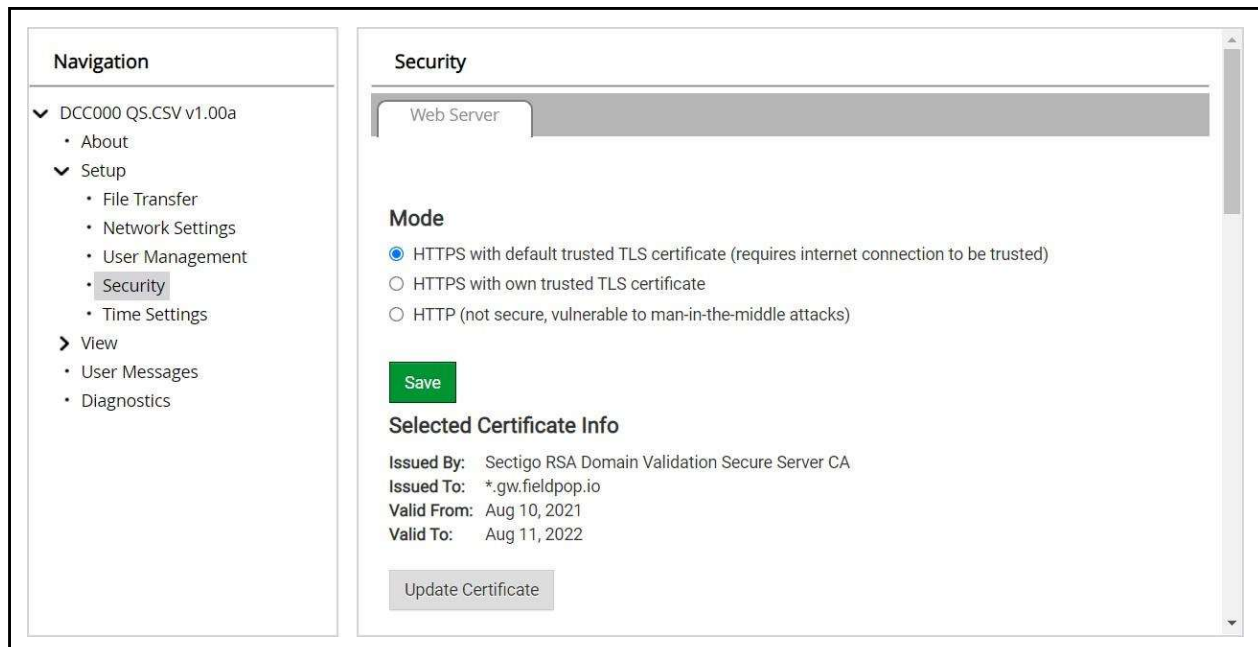
Figure 9-3: Security Selection Page

- Click the Mode desired.

  ◦ If HTTPS with own trusted TLS certificate is selected, follow instructions in **Section 5.3 HTTPS with Own Trusted TLS Certificate**

- Click the Save button.
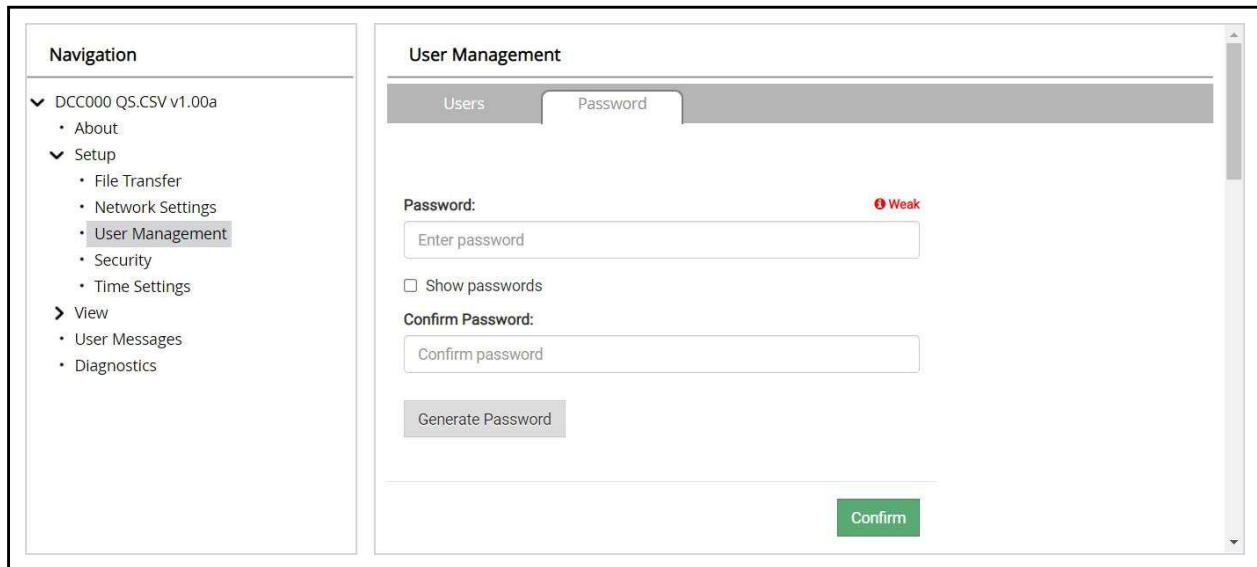
9.4 Edit the Certificate Loaded onto the FieldServer

NOTICE: 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.

- Click the Edit Certificate button to open the certificate and key fields.

- Edit the loaded certificate or key text as needed.

- Click Save.

9.5 Change FieldServer Password

- Click the Password tab.

Figure 9-4: Password Page

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

NOTICE: The password must meet the minimum complexity requirements. An algorithm automatically checks the password entered and notes the level of strength on the top right of the Password text field.

9.6 FieldServer Manager Connection Warning Message

- If a warning message appears instead of the page as shown below, follow the suggestion that appears on screen.

  ◦ If the FieldServer cannot reach the server, the following message will appear
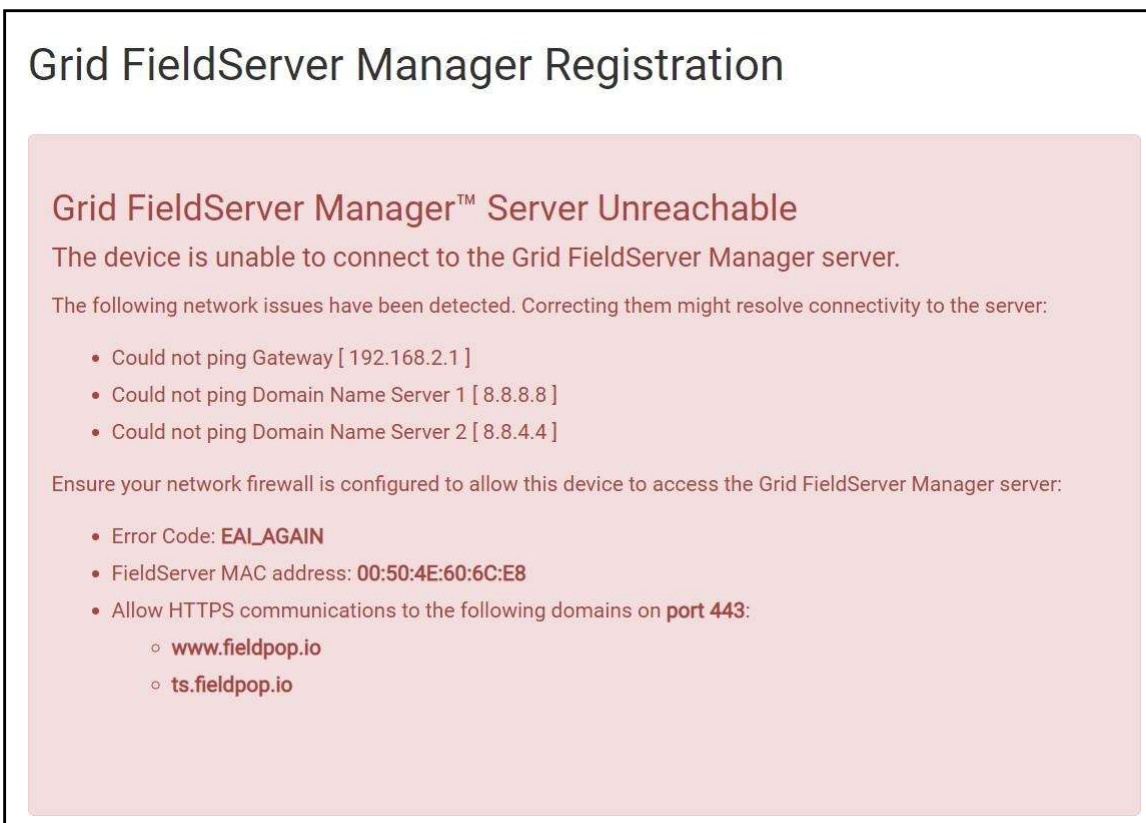
Figure 9-5: ProtoAir Lost Connection Page

- 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 FieldServer is properly connected to the Internet

NOTICE: If changes to the network settings are done, remember to click the Save button. Then power cycle the FieldServer 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.

9.7   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 aggregate of the Web App page's resource usage upon the local PC or mobile device, connectivity and device alert level.

Figure 9-6: ProtoAir Status Button

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.
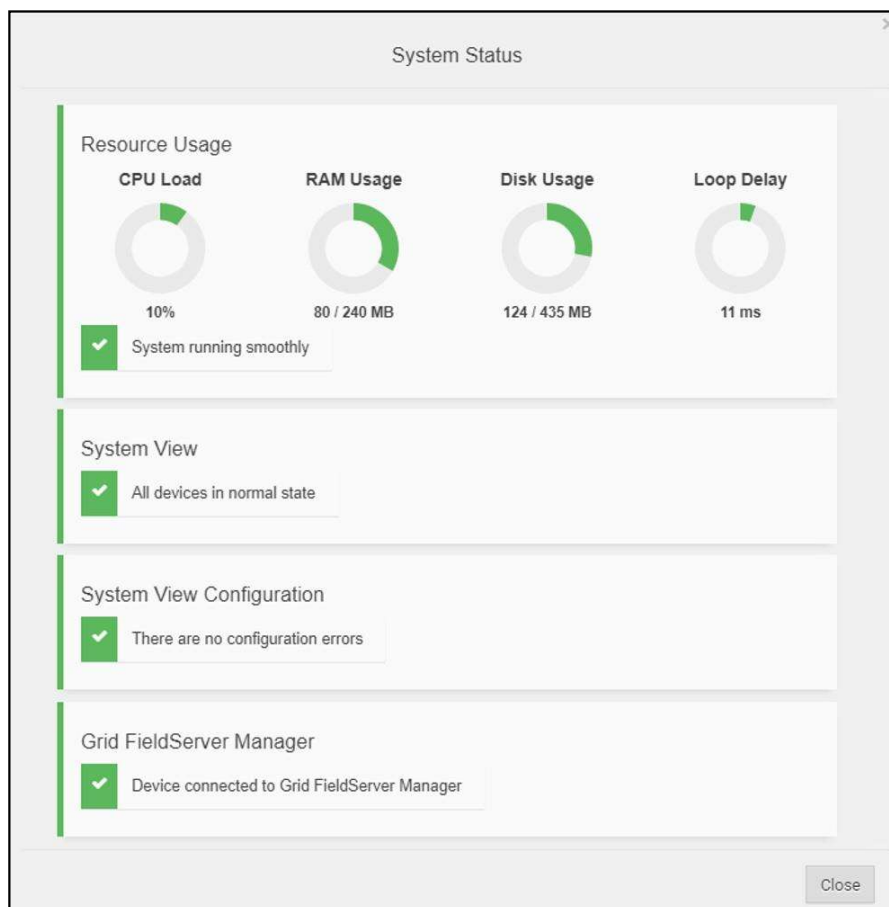
Figure 9-7: ProtoAir Status

> *NOTICE:* If it was selected to opt out of the FieldServer Manager, the Grid FieldServer Manager status will not appear in the System Status window. This means the status will show as green even if the gateway is not connected to the FieldServer Manager.

10 PROTOAIR SPECIFICATIONS

10.1 Specifications

Table 10-1: ProtoAir Specifications

	ProtoAir FPA-W44
Electrical Connections	One 3-pin Phoenix connector with: RS-485/RS-232 (Tx+ / Rx- / gnd) One 3-pin Phoenix connector with: RS-485 (+ / - / gnd) One 3-pin Phoenix connector with: Power port (+ / - / Frame-gnd) One Ethernet 10/100 BaseT port
Power Requirements	*Input Voltage:* 12-24VDC or 24VAC *Current draw:* 24VAC 0.125A *Max Power:* 3 Watts 12-24VDC 0.25A @12VDC
Approvals	CE and FCC Part 15 C, UL 60950-1 and CAN/CSA C22.2, DNP 3.0 and Modbus conformance tested, WEEE compliant, RoHS3 compliant, REACH compliant, UKCA 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

NOTICE: Specifications subject to change without notice.

10.2 Compliance with UL Regulations

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

- 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.

10.3 Ordering information

Table 10-2: ProtoAir Ordering Information

	ProtoAir BACnet	ProtoNode LonWorks
Universal Gateway (Device only)	PN: 29444-3	PN: 106418-01
Universal Gateway I&O	PN: 106417-04	PN: 106417-05
Universal Gateway Enclosure Kit (Includes device mounted inside of a plastic enclosure and I&O)	PN: 112736-01	PN: 112736-02
Universal Gateway Wiring Harness Kit (Includes device installed with AMP/BFIT 1000-4000 CTD 1250-1500 ARC/FF 1000-6000 wiring harness and I&O)	PN: 112316-01	PN: 106433-02
Universal Gateway Kit less Wiring Harness	PN: 112316-02	PN: 106433-01

10.4 Mounting

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

Figure 10-1: ProtoAir Mounting Detail

10.5 Physical Dimensions
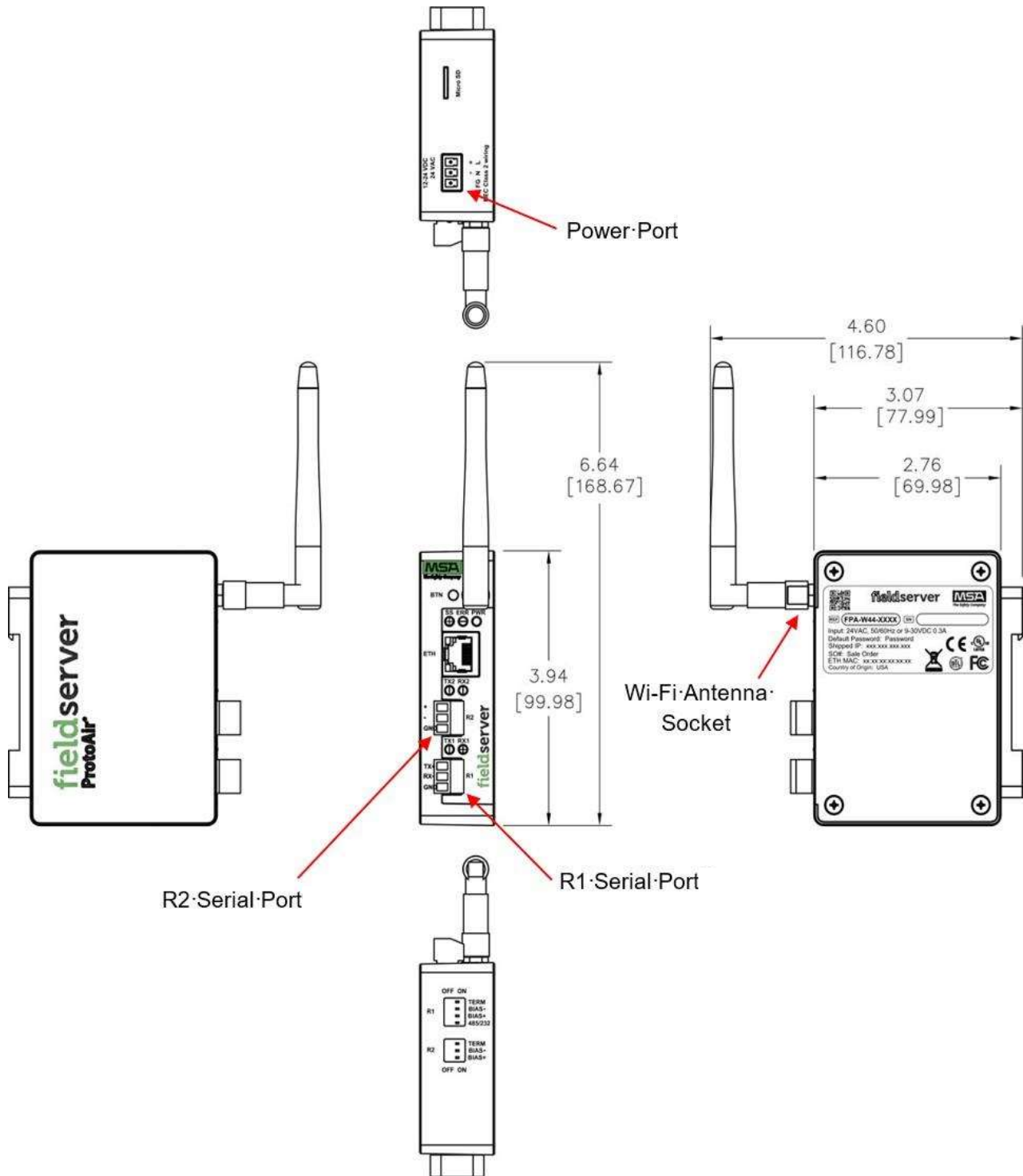
Figure 10-2: ProtoAir Mechanical Details

11 INSTALLATION DETAILS

11.1 Universal Gateway Wiring Harness Kit (PN: 112316-01)

This kit is intended for use with the following boilers: AMP/BFIT 1000-4000, CTD 1250 & 1500, Arctic/FreeFlex 1000-6000.

- Use the DIN rail, mounting bracket, and end anchor block to mount the ProtoAir inside of the boiler next to PCB-06. See Figures 11-1 and 11-2 for boiler specific mounting location. Note – On AMP/BFIT 1000 & 1250 and CTD 1250 the ProtoAir should be mounted on the low voltage control panel located on the left side of the boiler. On Arctic/FreeFlex 1000 the ProtoAir should be mounted in the rear control box.

- For instructions on connecting the ProtoAir to the boiler with the wiring harness, see **Section 3.10 Arctic, AMP, FreeFlex, BFIT & Citadel with Concert Display.**

- The wiring harness includes Modbus connection from the boiler to the ProtoAir as well as 24V power for the ProtoAir.

NOTICE: If Wi-Fi Access point or Wi-Fi Client is being used to connect to the ProtoAir, the range of the device will likely be shortened when it is mounted inside of the boiler. Use a coaxial cable with an SMA bulkhead connection to mount the antenna outside of the boiler to extend the range of the ProtoAir Wi-Fi connection.
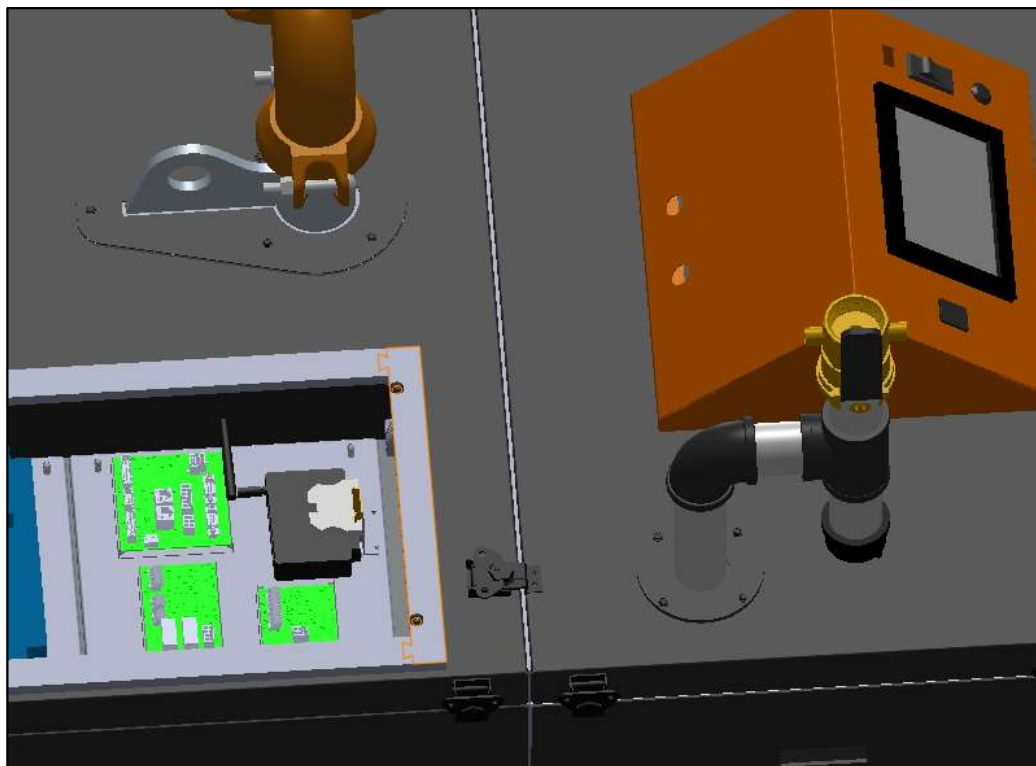
Figure 11-1: ProtoAir Mounting Location for AMP/BFIT 1500-4000, CTD 1500
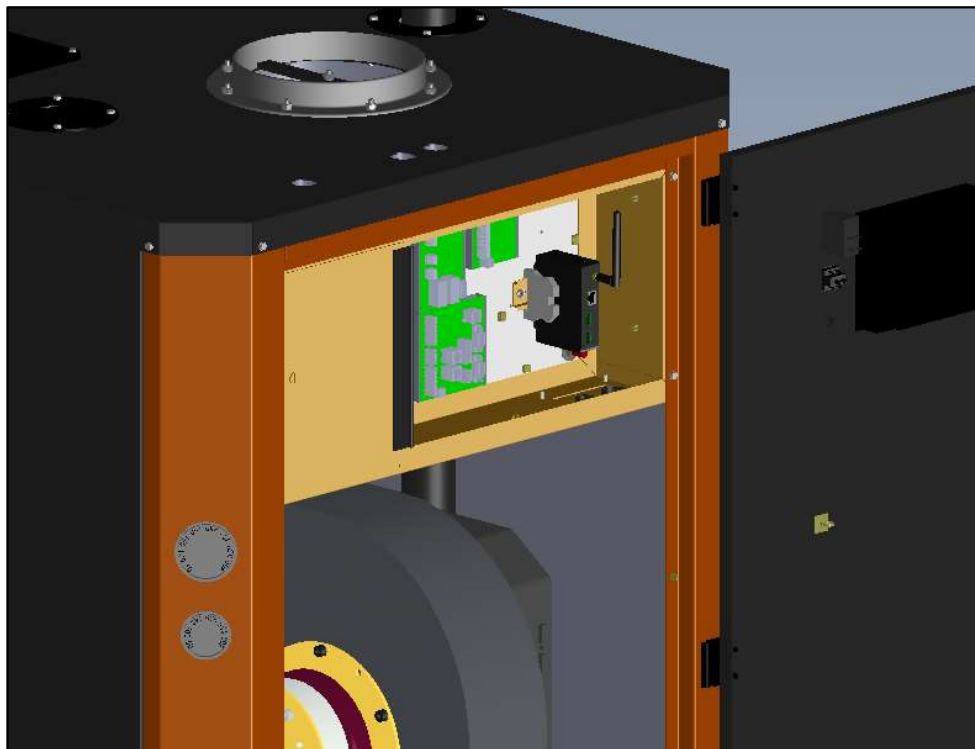
Figure 11-2: ProtoAir Mounting Location for Arctic/FreeFlex 1500-6000

11.2 Universal Gateway Enclosure Kit (PN: 112736-01)

This kit is intended for use with all other boilers and controls not included in the Universal Gateway Kit with Wiring Harness.

- Includes the ProtoAir mounted within a 14"x10"x7" plastic enclosure (see Figure 11-3), as well as mounting brackets to mount the enclosure to a wall.

- Wire power to the ProtoAir following the instructions and requirements in **Section 3.1 ProtoAir Power.**

NOTICE: Most ProtoAir compatible boilers have 24V connections that can be wired directly to the ProtoAir as the power supply. If power is not wired directly from the boiler, a 24VDC power supply, 24VAC transformer, or other means of providing the required power must be used. There is space inside of the enclosure for mounting additional electronic devices as needed.

- Wire Modbus communication from the ProtoAir to the boiler by following the relevant instructions based on model in **Section 3 Wiring (Subsections 3.6 – 3.13).** Table 1-1 lists the appropriate wiring subsection for each compatible model.

- Wire the ProtoAir to the BACnet or Metasys N2 network by following the instructions in **Section 3.3 ProtoAir BACnet or Metasys N2.**

NOTICE: When running wire from the ProtoAir to other devices, use cable glands or bulkhead connectors with all holes created in the enclosure to ensure that it maintains a waterproof and dustproof seal.
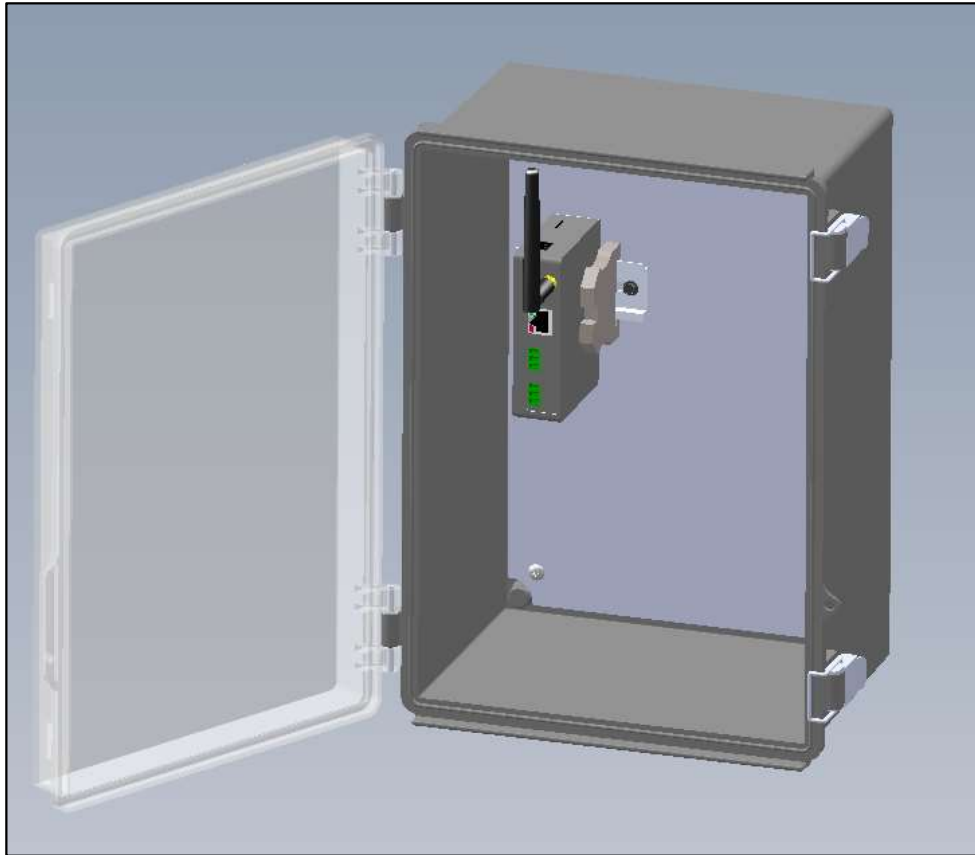
Figure 11-3: ProtoAir Kit with Plastic Enclosure

12   BACNET AND METASYS N2 POINTS LIST

12.1   Thermal Solutions Boiler Control (TSBC) & Sage Boiler Control (SBC)

Table 12-1: TSBC/SBC BACnet and Metasys N2 Points List

Point Name	coil = 0	coil = 1	Notes	Read/ Write	Modbus Register	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Pt Addr
Outdoor Air Reset Enable/Disable	Disable	Enable			00001	BI	1	DI	1
Domestic Hot Water Priority	Disable	Enable			00002	BI	2	DI	2
Local/Remote	Local	Remote			00003	BI	3	DI	3
Remote On/Off Modbus Command	Off	On	1	R/W	00004	BV	4	DO	4
Spare Input (Programmable)	Off	On			00005	BI	5	DI	5
Low Water Cutoff Switch	Off	On	2		00006	BI	6	DI	6
Burner On/Off Switch	Off	On	2		00007	BI	7	DI	7
Low Water Flow	Off	On	2		00008	BI	8	DI	8
High and Low Gas Pressure Switches	Off	On	2		00009	BI	9	DI	9
Operating or High Limit	Off	On	2		00010	BI	10	DI	10
Low Combustion Air Flow	Off	On	2		00011	BI	11	DI	11
Fuel Valve Energized	Off	On			00012	BI	12	DI	12
Flame Safeguard Alarm	Off	On			00013	BI	13	DI	13
Call For Heat (CFH)	Off	On			00014	BI	14	DI	14
General Alarm	Off	On	4		00015	BI	15	DI	15
Vent Inducer	Off	On			00016	BI	16	DI	16
Boiler Pump	Off	On			00017	BI	17	DI	17
System Pump	Off	On			00018	BI	18	DI	18
Spare Output (Programmable)	Off	On			00019	BI	19	DI	19
State Boiler Disabled	Off	On	3		00020	BI	20	DI	20
State Weather Shutdown	Off	On	3		00021	BI	21	DI	21
State Lockout	Off	On	3		00022	BI	22	DI	22
State Pump Purge	Off	On	3		00023	BI	23	DI	23
State Limit Hold	Off	On	3		00024	BI	24	DI	24
State Purge/Pilot Ign	Off	On	3		00025	BI	25	DI	25
State Low Fire/Ignition	Off	On	3		00026	BI	26	DI	26
State Main Ignition	Off	On	3		00027	BI	27	DI	27
State Low Fire Hold	Off	On	3		00028	BI	28	DI	28
State Boiler Running	Off	On	3		00029	BI	29	DI	29
State Fan Post Purge	Off	On	3		00030	BI	30	DI	30
State Pump Cool Down	Off	On	3		00031	BI	31	DI	31
State Standby	Off	On	3		00032	BI	32	DI	32
Annunciator Low Water Level	Off	On	4		00033	BI	33	DI	33
Annunciator Off Switch	Off	On	4		00034	BI	34	DI	34
Annunciator Low Water Flow	Off	On	4		00035	BI	35	DI	35
Annunciator Fuel Limit	Off	On	4		00036	BI	36	DI	36
Annunciator High Temp Limit	Off	On	4		00037	BI	37	DI	37
Annunciator Low Air Flow	Off	On	4		00038	BI	38	DI	38

Point Name	coil = 0	coil = 1	Notes	Read/ Write	Modbus Register	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Pt Addr
Annunciator FSG Lockout	Off	On	4		00039	BI	39	DI	39
Annunciator Outlet Temp Fail	Off	On	4		00040	BI	40	DI	40
Annunciator Inlet Temp Fail	Off	On	4		00041	BI	41	DI	41
Annunciator OA Temp Fail	Off	On	4		00042	BI	42	DI	42
Annunciator Remote Temp Fail	Off	On	4		00043	BI	43	DI	43
Annunciator Remote In Fail	Off	On	4		00044	BI	44	DI	44
Annunciator Comm Fail	Off	On	4		00045	BI	45	DI	45
Annunciator Low Inlet Temp	Off	On	4		00046	BI	46	DI	46
Annunciator Memory Failure	Off	On	4		00047	BI	47	DI	47
Boiler Outlet Water Temp	-50	300F			40001	AI	48	AI	48
Boiler Inlet Water Temp	-50	300F			40002	AI	49	AI	49
Outside Air Temp	-50	300F			40003	AI	50	AI	50
Boiler Actual SP	60	230F			40004	AI	51	AI	51
Remote System Temp	-50	300F			40005	AI	52	AI	52
Remote Firing Rate or Remote SP	0	100% or 300F	1	R/W	40006	AV	53	AO	53
PCB Temp Sensor	-50	300F			40007	AI	54	AI	54
Firing Rate Output to Mod Motor	0	100%			40008	AI	55	AI	55
Minimum Return Temp SP	110	180F			40009	AI	56	AI	56
Mixing Valve Output	0	100%			40010	AI	57	AI	57
Control Mode	1	7			40011	AI	58	AI	58

Notes:
1. After a Modbus communication failure, while using the Modbus connection to monitor or control the boilers, the 'Comm Failure' alarm is not cleared until a successful write to both the Remote On / Off Modbus Command (00004) and Remote Firing Rate or Remote Setpoint (40006) points have been completed, power is cycled or the 'Protocol' parameter is changed from Modbus to Peer-to-Peer and back again.
2. The limit string points (00006 - 00011) are only monitored when there is a Call For Heat. Additionally, if one of these items is 'open' items down stream are not monitored.
3. The boiler "state" points (00020 - 00032) are mutually exclusive (i.e. only one is asserted at a time). This will reflect the state of the message on the front of the boiler. Refer to page 6 for an explanation of each state.
4. The "Annunciated" points (00033 – 00046) reflect the state of the signals used to control the displayed Alarm Message. Refer to pages 36 & 37 for an explanation of each annunciator point.
5. "General Alarm" point (00015) turns "On" when the boiler is indicating any alarm condition.

To establish a Modbus network set the following parameters:
Communication Menu:
      Protocol = Modbus
      Modbus Address = Give each boiler a unique address.
      Baud Rate = Set identical to remote system.
      Parity = Set identical to remote system.

Connect all boilers using a RJ11 ended telephone cable.

Part Number 106417-04

12.2 Older Apex, Alpine/Phantom-X and ASPEN/Raptor (4109 profile)

Table 12-2: Older Apex, Alpine/Phantom-X and ASPEN/Raptor BACnet and Metasys N2 Points List

Point Name	Description	Read/Write	Modbus Register	BACnet Data Type	BACnet Data ID	N2 Data Type	N2 Pnt Addr
Burner On Off **(See Note 1)**	Enable / disable burner. 1 = on 0 = off	R/W	400,203	BV	1	DO	1
Demand Source	0 = Unknown 1 = No source demand 2 = Central heat 3 = Domestic hot water 4 = Lead Lag slave 5 = Lead Lag master 6 = Central heat frost protection 7 = Domestic frost protection 8 = No demand due to burner switch turned off 9 = Domestic hot water storage 11 = Warm weather shutdown		400,006	AI	2	AI	2
CH Setpoint **(See Note 2)**	Use this register to change the boiler setpoint. valid range 79 F (26.1 C) to 191 F (88.3 C)	R/W	410,211	AV	3	AO	3
DHW Setpoint	Use this register to change the domestic hot water setpoint. valid range 79 F (26.1 C) to 191 F (88.3 C)	R/W	410,453	AV	4	AO	4
Lead Lag Setpoint	Use this register to change the lead lag setpoint.valid range 79F (26.1C) to 191F (88.3C)	R/W	410,546	AV	5	AO	5
CH TOD Setpoint	Use this register to change the central heat 'time of day' setpoint valid range 79 F (26.1 C) to 191 F (88.3 C)	R/W	410,212	AV	6	AO	6
CH Setpoint Source	0=Unknown, 1=Normal setpoint, 2=TOD setpoint, 3=Outdoor reset, 4=Remote control (4-20mA), 7=Outdoor reset time of day		410,065	AI	7	AI	7
Active CH Setpoint	-40 F (-40°C) to 266 F (130°C) Setpoint determined by CH setpoint source (register 65).		410,016	AI	8	AI	8
DHW Setpoint Source	0=Unknown, 1=Normal setpoint, 2=TOD setpoint, 5=DHW tap setpoint, 6=DHW preheat setpoint		410,081	AI	9	AI	9
Active DHW Setpoint	-40 F (-40°C) to 266 F (130°C) Setpoint determined by DHW setpoint source (register 81).		410,017	AI	10	AI	10
LL Master Setpoint Source	0=Unknown, 1=CH setpoint, 2=CH TOD setpoint, 3=Outdoor reset, 4=Remote control (4-20mA), 5=DHW setpoint, 6=DHW TOD setpoint, 7=Outdoor reset time of day, 8=Mix setpoint		410,162	AI	11	AI	11

Point Name	Description	Read/ Write	Modbus Register	BACnet		N2	
				Data Type	Data ID	Data Type	Pnt Addr
Active LL Setpoint	-40 F (-40°C) to 266 F (130°C) Setpoint determined by LL setpoint source (register 162).		410,018	AI	12	AI	12
Supply Sensor	-40 F (-40°C) to 266 F (130°C)		410,007	AI	13	AI	13
Return Sensor	-40 F (-40°C) to 266 F (130°C)		410,011	AI	14	AI	14
Header Sensor	-40 F (-40°C) to 266 F (130°C)		410,013	AI	15	AI	15
Stack Sensor	-40 F (-40°C) to 266 F (130°C)		410,014	AI	16	AI	16
Outdoor Sensor	-40 F (-40°C) to 266 F (130°C)		410,170	AI	17	AI	17
4-20 mA Rem Control Input	mA value for S2 (J8-6) parameter selectable as (remote set point) & (remote modulation)		400,015	AI	18	AI	18
Fan Speed	Speed of the combustion air blower in rpm		400,009	AI	19	AI	19
Flame Signal	0.01V or 0.01µA precision (0.00-50.00V)		400,010	AI	20	AI	20
Burner Control State	0 Initiate 1 Standby Delay 2 Standby 3 Safe Startup 4 Prepurge - Drive to Purge Rate 5 Prepurge – Measured Purge Time 6 Prepurge – Drive to Lightoff Rate 7 Preignition Test 8 Preignition Time 9 Pilot Flame Establishing Period 10 Main Flame Establishing Period 11 Direct Burner Ignition 12 Run 13 Postpurge 14 Lockout		400,033	AI	21	AI	21
Lockout Code	Reasons for burner lockout 0 No lockout, 4 Supply high limit 5 DHW high limit 6 Stack High limit 12 Flame detected out of sequence 18 Lightoff rate proving failed 19 Purge rate proving failed 20 Invalid Safety Parameters 21 Invalid Modulation Parameter 22 Safety data verification needed 23 24VAC voltage low/high 24 Fuel Valve Error 25 Hardware Fault 26 Internal Fault 27 Ignition Failure		410,034	AI	22	AI	22
Hold Code	Reason for burner hold 0 None 1 Anti short cycle 2 Boiler Safety Limit Open 3 Boiler Safety Limit Open, (ILK Off) 7 Return sensor fault 8 Supply sensor fault 9 DHW sensor fault 10 Stack sensor fault 11 Ignition failure 13 Flame rod shorted to ground 14 Delta T inlet/outlet high 15 Return temp higher than supply 16 Supply temp has risen too quickly		410,040	AI	23	AI	23

Point Name	Description	Read/Write	Modbus Register	BACnet		N2	
				Data Type	Data ID	Data Type	Pnt Addr
	17 Fan speed not proved 23 24VAC voltage low/high 25 Hardware Fault 27 Ignition Failure						
Burner Cycle Count	0-999,999 (U32)	R/W	400,128-400,129	AV	24	AO	24
Burner Run Time	Hours (U32)	R/W	400,130-400,131	AV	25	AO	25
System Pum Cycle Count	0-999,999 (U32)	R/W	400,132-400,133	AV	26	AO	26
DHW Pump Cycle Count	0-999,999 (U32)	R/W	400,134-400,135	AV	27	AO	27
Boiler Pump Cycle Count	0-999,999 (U32)	R/W	400,138-400,139	AV	28	AO	28

NOTICE: All parameters are stored in EEPROM. Only perform writes when it is absolutely necessary to change the value of a register. Care must be taken to avoid excessive writing to parameters stored in EEPROM memory.

Note 1, If only the burner on/off Modbus signal is used instead of the Enable / Disable contact input the boiler will be turned off but the system pump may remain running.

Note 2, when writing CH Setpoint the Energy Management System is responsible for the boiler's setpoint for central heating. Disable the boiler's Outdoor Air Reset function. WARNING: All parameters are stored in EEPROM. Only perform writes when it is absolutely necessary to change the value of a register. Care must be taken to avoid excessive writing to parameters stored in EEPROM memory.

12.3 APEX, AMP/BFIT/Citadel/Phantom-XL, Alpine/Phantom-X, Arctic/Freeflex, Sola (4716 Profile)

Table 12-3: APEX, AMP/BFIT/Citadel/Phantom-XL, Alpine/Phantom-X, Arctic/Freeflex, Sola BACnet and Metasys N2 Points List

Point Name	Description	Read/Write	Modbus Register	BACnet Data Type	BACnet Data Id	N2 Data Type	N2 Pt Addr
Burner On Off	Enable / disable burner. 1 = on, 0 = off	R	400,203	BV	1	DO	1
Demand Source	0 = Unknown 1 = No source demand 2 = Central heat 3 = Domestic hot water 4 = Lead Lag slave 5 = Lead Lag master 6 = Central heat frost protection 7 = Domestic hot water frost protection 8 = No demand, burner switch turned off 9 = Domestic hot water storage 11 = Warm weather shutdown	R	400,006	AI	2	AI	2
CH Setpoint	Status of local setpoint	R	410,211	AV	3	AO	3
DHW Setpoint	Status of local setpoint	R	410,453	AV	4	AO	4
Lead Lag Setpoint	Status of local setpoint	R	410,546	AV	5	AO	5
CH TOD Setpoint	Status of local setpoint	R	410,212	AV	6	AO	6
CH Setpoint Source	0=Unknown, 1=Normal setpoint, 2=TOD setpoint, 3=Outdoor reset, 4=Remote control (4-20mA), 7=Outdoor reset time of day	R	410,065	AI	7	AI	7
Active CH Setpoint	-40 F (-40°C) to 266 F (130°C) Setpoint determined by CH setpoint source (register 65).	R	410,016	AI	8	AI	8
DHW Setpoint Source	0=Unknown, 1=Normal setpoint, 2=TOD setpoint, 5=DHW tap setpoint, 6=DHW preheat setpoint	R	410,081	AI	9	AI	9
Active DHW Setpoint	-40 F (-40°C) to 266 F (130°C) Setpoint determined by DHW setpoint source (register 81).	R	410,017	AI	10	AI	10
LL Master Setpoint Source	0=Unknown, 1=CH setpoint, 2=CH TOD setpoint, 3=Outdoor reset, 4=Remote control (4-20mA), 5=DHW setpoint, 6=DHW TOD setpoint, 7=Outdoor reset time of day, 8=Mix setpoint	R	410,162	AI	11	AI	11
Active LL Setpoint	-40 F (-40°C) to 266 F (130°C) Setpoint determined by LL setpoint source (register 162).	R	410,018	AI	12	AI	12
Supply Sensor	-40 F (-40°C) to 266 F (130°C)	R	410,007	AI	13	AI	13
Return Sensor	-40 F (-40°C) to 266 F (130°C)	R	410,011	AI	14	AI	14
Header Sensor	-40 F (-40°C) to 266 F (130°C)	R	410,013	AI	15	AI	15
Stack Sensor	-40 F (-40°C) to 266 F (130°C)	R	410,014	AI	16	AI	16
Outdoor Sensor	-40 F (-40°C) to 266 F (130°C)	R	410,170	AI	17	AI	17

Point Name	Description	Read/Write	Modbus Register	BACnet		N2	
				Data Type	Data Id	Data Type	Pt Addr
4-20 mA Rem Control Input	mA value for S2 (J8-6) parameter selectable as (remote set point) & (remote modulation)	R	400,015	AI	18	AI	18
Fan Speed Demanded	Speed of the combustion air blower in rpm	R	400,009	AI	19	AI	19
Flame Signal	0.01V or 0.01µA precision (0.00-50.00V)	R	400,010	AI	20	AI	20
Burner Control State	0 Initiate 1 Standby Delay 2 Standby 3 Safe Startup 4 Prepurge - Drive to Purge Rate 5 Prepurge – Measured Purge Time 6 Prepurge – Drive to Lightoff Rate 7 Preignition Test 8 Preignition Time 9 Pilot Flame Establishing Period 10 Main Flame Establishing Period 11 Direct Burner Ignition 12 Run 13 Postpurge 14 Lockout	R	400,033	AI	21	AI	21
Lockout Code	Reasons for burner lockout 0 No lockout 3 Burner Interlock Open (ILK OFF) low/high 4 Supply high limit 5 DHW high limit 6 Stack High limit 12 Flame detected out of sequence 14 Delta T Inlet/Outlet High 15 Return Temp Higher Than Supply 16 Supply Temp Rose Too Quickly 18 Lightoff rate proving failed 19 Purge rate proving failed 20 Invalid Safety Parameters 21 Invalid Modulation Parameter 22 Safety data verification needed 23 24VAC voltage 24 Fuel Valve Error 25 Hardware Fault 26 Internal Fault 27 Ignition Failure 31 Fan Failed 32 ILK ON 42 AC Phase Fault 46 Pilot Test Flame 47 Flame Lost 284 Memory Reset	R	410,034	AI	22	AI	22
Hold Code	Reason for burner hold 0 None 1 Anti short cycle 2 Boiler Safety Limit Open 3 Boiler Safety Limit Open, (ILK Off) 7 Return sensor fault 8 Supply sensor fault 9 DHW sensor fault 10 Stack sensor fault 11 Ignition failure 13 Flame rod shorted to ground 14 Delta T inlet/outlet high 15 Return temp higher than supply 16 Supply temp has risen too quickly 17 Fan speed not proved 23 24VAC voltage low/high 25 Hardware Fault 27 Ignition Failure	R	410,040	AI	23	AI	23
Burner Cycle Count	0-999,999 (U32)	R/W	400,128-400,129	AV	24	AO	24

Point Name	Description	Read/ Write	Modbus Register	BACnet		N2	
				Data Type	Data Id	Data Type	Pt Addr
Burner Run Time	Hours (U32)	R/W	400,130-400,131	AV	25	AO	25
System Pum Cycle Count	0-999,999 (U32)	R/W	400,132-400,133	AV	26	AO	26
DHW Pump Cycle Count	0-999,999 (U32)	R/W	400,134-400,135	AV	27	AO	27
Boiler Pump Cycle Count	0-999,999 (U32)	R/W	400,138-400,139	AV	28	AO	28
CH Modbus Stat	CH Modbus STAT 0 = no demand 1 = demand When this register is not written every "Modbus Command Time Out" parameter seconds (default 30 seconds), CH Modbus Stat is reverted to 0, no demand.	W	400,577	BV	29	DO	29
LLCH Modbus Stat	LL CH Modbus STAT 0 = no demand 1 = demand When this register is not written every "Modbus Command Time Out" parameter seconds (default 30 seconds), CH Modbus Stat is reverted to 0, no demand.	W	400,563	BV	30	DO	30
CH Modbus SP	Use this register to change the boiler setpoint. When this register is not written every "Modbus Command Time Out" parameter seconds (default 30 seconds), setpoint reverts to local setpoint. valid range 60 F to 190 F	W	410,579	AV	31	AO	31
CH Sequencer Modbus SP	Use this register to change the multiple boiler Sequencer setpoint. When this register is not written every "Modbus Command Time Out" parameter seconds (default 30 seconds), setpoint reverts to local setpoint. valid range 60 F to 190 F	W	410,562	AV	32	AO	32
Outdoor Temperature	Building Automation may send the controller the outdoor air temperature. Use this register to change the outdoor temperature. When this register is not written every "Modbus Command Time Out" parameter seconds (default 30 seconds), temperature is set to bad data quality and outdoor air reset is set back to local setpoint. valid range -40 F to 302 F	W	410,817	AV	33	AO	33
CH Modbus Rate	Use this register to drive individual boiler firing rates. This register is used when firing rate control is performed by an external Energy Management System. Firing rate reverts to local control when register is not written every "Modbus Command Time Out" parameter seconds (default 30 seconds), Range is 0 to 200 % provides 0-100% firing rate.	W	400,581	AV	34	C	34
Fan Speed Measured	Speed of the combustion air blower in rpm	R	400,008	AI	35	AI	35
Modbus command timeout	This parameter sets the amount of time the control will wait for input from the Energy Management System (EMS). If the EMS does not write to the following register	R/W	400,763	AV	36	AO	36

Point Name	Description	Read/Write	Modbus Register	BACnet		N2	
				Data Type	Data Id	Data Type	Pt Addr
	within the "Modbus Command timeout" seconds the following inputs are considered invalid: CH Modbus Stat, CH Modbus Setpoint, CH Sequencer Modbus Setpoint CH Modbus Rate range 30 – 120, Default 30 seconds Other R/W registers should only be written when a value is needed to be changed. Only the above listed registers are stored in non-volatile registers.						
CH pump status	See Pump Status Codes below	R	400,096	AI	37	AI	37
DHW pump status	See Pump Status Codes below	R	400,100	AI	38	AI	38
Boiler pump status	See Pump Status Codes below	R	400,108	AI	39	AI	39
Low Temp SP	Setpoint entered on the local user interface. valid range 79 F (26.1 C) to 191 F (88.3 C)	R	410,643	AI	40	AI	40
Low Temp SP source	0=Unknown, 1=Normal setpoint, 2=TOD setpoint, 3=Outdoor reset, 4=Remote control, 7=Outdoor reset time of day, 9=Outdoor boost	R	410,121	AI	41	AI	41
Active Low Temp SP	-40 F (-40°C) to 266 F (130°C) Setpoint determined by Low Temp setpoint source (register 121).	R	410,024	AI	42	AI	42
CH heat demand	0=Off, 1=On	W	400,066	BI	43	DI	43
DHW heat demand	0=Off, 1=On	R	400,083	BI	44	DI	44
Low Temp Loop demand	0=Off, 1=On	R	400,123	BI	45	DI	45

Table 12-4: Pump Status Codes

Status	Description
92	Forced On from manual pump control
93	Forced On due to Outlet high limit is active
94	Forced On from burner demand
95	Forced On due to Lead Lag slave has demand
96	Forced Off from local DHW priority service
97	Forced Off from Lead Lag DHW priority service
98	Forced Off from Central Heat anti-condensation
99	Forced Off from DHW anti-condensation
100	Forced Off due to DHW high limit is active
101	Forced Off from EnviraCOM DHW priority service
102	On due to local CH frost protection is active
103	On due to Lead Lag CH frost protection is active
104	On due to local DHW frost protection is active
105	On due to Lead Lag DHW frost protection is active
106	On from local Central Heat demand
107	On from Lead Lag Central Heat demand
108	On from local DHW demand
109	On from Lead Lag DHW demand
110	On from local Mix demand
111	On from Lead Lag Mix demand
112	On from local Central Heat service

Status	Description
113	On from Lead Lag Central Heat service
114	On from local DHW service
115	On from Lead Lag DHW service
116	On from local Mix service
117	On from Lead Lag Mix service
118	On from Lead Lag auxiliary pump X
119	On from Lead Lag auxiliary pump Y
120	On from Lead Lag auxiliary pump Z
121	On, but inhibited by pump start delay
122	On from pump overrun
123	Off, not needed
124	On from burner demand
125	On from exercise
126	On from local Lead Lag service
127	On from local Lead Lag pump demand

12.4   Siemens RWF40

Table 12-5: Siemens RWF40 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BI	1	DI	1
Input 1	AI	1	AI	1
Input 2	AI	2	AI	2
Input 3	AI	3	AI	3
First Setpoint	AV	4	AO	4
Second Setpoint	AV	5	AO	5
Operation Mode	AV	6	AO	6
Process Enable	BV	7	DO	7
Process Setpoint	AV	8	AO	8
Enable K1	BV	9	DO	9
Enable K2	BV	10	DO	10
Enable K3	BV	11	DO	11
Enable K6	BV	12	DO	12
Step Control	AV	13	AO	13
Modulation	AV	14	AO	14

12.5   Siemens RWF55

Table 12-6: Siemens RWF55 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BI	1	DI	1
Analog Input InP1	AI	1	AI	1
Analog Input InP2	AI	2	AI	2

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Analog Input InP3	AI	3	AI	3
Actual Setpoint	AI	4	AI	4
Setpoint 1	AV	5	AO	5
Setpoint 2	AV	6	AO	6
Analog Input InP3	AI	7	AI	7
Actual Angular Positioning	AI	8	AI	8
Burner Alarm	AI	9	AI	9
Activation Remote Operation	AV	10	AO	10
Controller Off In Remote Setpoint	AV	11	AO	11
Switch-On Threshold Remote	AV	12	AO	12
Switch-Off Threshold Down Remote	AV	13	AO	13
Switch-Off Threshold Up Remote	AV	14	AO	14
Setpoint Remote	AV	15	AO	15
Burner Release Remote Operation	AV	16	AO	16
Relay K2 Remote Operation	AV	17	AO	17
Relay K3 Remote Operation	AV	18	AO	18
Relay K6 Remote Operation	AV	19	AO	19
Step-By-Step Control Rem Operation	AV	20	AO	20
Angular Pos Output Remote Operation	AV	21	AO	21
Switch-On Threshold Remote	AV	22	AO	22
Switch-Off Threshold Down Remote	AV	23	AO	23
Switch-Off Threshold Up Remote	AV	24	AO	24

12.6 Honeywell RM7800

Table 12-7: Honeywell RM7800 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BI	1	DI	1
Flame Signal	AI	1	AI	1
Burner Cycles	AI	2	AI	2
Burner Hours	AI	3	AI	3
Burner Fault Code	AI	4	AI	4
Initiate	AI	53	AI	53
Standby	AI	54	AI	54
Purge	AI	55	AI	55
Pilot Ignition	AI	56	AI	56
Main Ignition	AI	57	AI	57

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Run	AI	58	AI	58
Postpurge	AI	59	AI	59
Pre-Ignition	AI	60	AI	60
Valve Proving	AI	61	AI	61
Alarm	AI	62	AI	62
Hold	AI	63	AI	63
Lockout	AI	64	AI	64
First Out Code *	AI	65	AI	65
Main Valve Proof of Closure *	BI	66	DI	66
Burner Switch *	BI	67	DI	67
Operating Control *	BI	68	DI	68
Auxiliary Limit 1 *	BI	69	DI	69
Auxiliary Limit 2 *	BI	70	DI	70
Low Water Cutoff *	BI	71	DI	71
High Limit *	BI	72	DI	72
Auxiliary Limit 3 *	BI	73	DI	73
Oil Select Switch *	BI	74	DI	74
High Oil Pressure *	BI	75	DI	75
Low Oil Pressure *	BI	76	DI	76
High Oil Temperature *	BI	77	DI	77
Low Oil Temperature *	BI	78	DI	78
Gas Select Switch *	BI	79	DI	79
High Gas Pressure *	BI	80	DI	80
Low Gas Pressure *	BI	81	DI	81
Air Flow Switch *	BI	82	DI	82
Auxiliary Interlock 4 *	BI	83	DI	83
Auxiliary Interlock 5 *	BI	84	DI	84

12.7 Siemens LMV52

Table 12-8: Siemens LMV52 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BI	1	DI	1
Process Value	AI	1	AI	1
Flame Signal	AI	2	AI	2
Fuel Rate Volume	AI	3	AI	3
O2 Level	AI	4	AI	4
Supply Air	AI	5	AI	5

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Flue Gas	AI	6	AI	6
Combustion Efficiency	AI	7	AI	7
Control Mode	BV	8	DO	8
Operating Mode	AV	9	AO	9
External Setpoint	AV	10	AO	10
Fuel Rate	AV	11	AO	11
Process Setpoint	AV	12	AO	12
Hours	AI	13	AI	13
Current Lockout Error code	AI	14	AI	14
Current Lockout Error diagnosis	AI	15	AI	15
Current Lockout Error class	AI	16	AI	16
Current Lockout Error phase	AI	17	AI	17
Current Lockout Fuel	AI	18	AI	18
Current Lockout Output	AI	19	AI	19
Current Lockout Date: Year	AI	20	AI	20
Current Lockout Date: Month	AI	21	AI	21
Current Lockout Date: Day	AI	22	AI	22
Current Lockout Time of day: hours	AI	23	AI	23
Current Lockout Time of day: minutes	AI	24	AI	24
Current Lockout Time of day: Seconds	AI	25	AI	25
Current Lockout Startup counter total	AI	26	AI	26
Current Lockout Hours run total	AI	27	AI	27
Lockout Error Code	AI	140	AI	140
Lockout Diagnostic Code	AI	141	AI	141
Fuel Selected	AI	142	AI	142
Firing Rate	AI	143	AI	143

12.8   Siemens LMV36

Table 12-9: Siemens LMV36 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BI	1	DI	1
Flame Signal	AI	1	AI	1
Lockout Error Code	AI	2	AI	2
Lockout Diagnostic Code	AI	3	AI	3
Control Mode	BV	4	DO	4
Operating Mode	AV	5	AO	5
Fuel Rate	AV	6	AO	6
Fuel Selected	AI	7	AI	7
Firing Rate	AI	8	AI	8

12.9 Precision Digital Trident PD765

Table 12-10: Precision Digital Trident PD765 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BI	1	DI	1
Display Value	AI	1	AI	1
Relay 1 Status	BV	2	DO	2
Relay 2 Status	BV	3	DO	3
Alarm 1 Status	BI	4	DI	4
Alarm 2 Status	BI	5	DI	5
Alarm 1 Acknowledge	BV	6	DO	6
Alarm 2 Acknowledge	BV	7	DO	7
Relay 1 Set Point	AV	8	AO	8
Relay 1 Reset Point	AV	9	AO	9
Relay 1 Turn-on Delay	AV	10	AO	10
Relay 1 Turn-off Delay	AV	11	AO	11
Relay 1 Normal/Fail-Safe	BV	12	DO	12
Relay 1 Operation	AV	13	AO	13
Relay 2 Set Point	AV	14	AO	14
Relay 2 Reset Point	AV	15	AO	15
Relay 2 Turn-on Delay	AV	16	AO	16
Relay 2 Turn-off Delay	AV	17	AO	17
Relay 2 Normal/Fail-Safe	BV	18	DO	18
Relay 2 Operation	AV	19	AO	19
4-20mA Out-Mode Output Option	BV	20	DO	20
4-20mA Out-Mode Data Source	AV	21	AO	21
4-20mA Out–Sensor Break Value	AV	22	AO	22
4-20mA Out–Overrange value	AV	23	AO	23
4-20mA Out–Underrange value	AV	24	AO	24
4-20mA Out–Max value Allowed	AV	25	AO	25
4-20mA Out–Min value Allowed	AV	26	AO	26
4-20mA Out–Display Value 1	AV	27	AO	27
4-20mA Out–Display Value 2	AV	28	AO	28
4-20mA Out–Output 1	AV	29	AO	29
4-20mA Out–Output 2	AV	30	AO	30
4-20mA Out–Data in mA or Data in bit	AV	31	AO	31

12.10 Siemens LMV2_3

Table 12-11: Siemens LMV2_3 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BV	1	DO	1
Burner control phase	AI	1	AI	1
Pos of current fuel actuator	AI	2	AI	2
Pos of air actuator	AI	3	AI	3
Manipulated variable VSD	AI	4	AI	4
Current type of fuel	AI	5	AI	5
Current output	AI	6	AI	6
Flame signal	AI	7	AI	7
Current fuel throughput	AI	8	AI	8
Startup counter total	AI	9	AI	9
Current error: Error code	AI	10	AI	10
Current error: Diagnostic code	AI	11	AI	11
Current error: Error class	AI	12	AI	12
Current error: Error phase	AI	13	AI	13
Program stop	AV	14	AO	14
Modbus mode	AV	15	AO	15
Modbus breakdown time	AV	16	AO	16
Operating mode in remote op	AV	17	AO	17
Preselect target output mod/multistg	AV	18	AO	18
Hours run fuel 0 resettable	AV	19	AO	19
Hours run fuel 1 resettable	AV	20	AO	20
Hours run unit live	AI	21	AI	21
Start counter fuel 0 resettable	AV	22	AO	22
Start counter fuel 1 resettable	AV	23	AO	23
Start counter total	AI	24	AI	24
Fuel volume fuel 0 resettable	AV	25	AO	25
Fuel volume fuel 1 resettable	AV	26	AO	26
Number of faults	AI	27	AI	27
Preselected output Fuel 0	AV	28	AO	28
Preselected output Fuel 1	AV	29	AO	29
Burner control parameter set code	AI	30	AI	30
Burner control parameter set version	AI	31	AI	31
Burner control identification number	AI	32	AI	32
SW version burner control	AI	33	AI	33
Min output fuel 0	AI	34	AI	34
Max output fuel 0	AI	35	AI	35
Min output fuel 1	AI	36	AI	36

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Max output fuel 1	AI	37	AI	37
Operation mode of burner fuel 0	AI	38	AI	38
Operation mode of burner fuel 1	AI	39	AI	39
Error History Current Error	AI	40	AI	40
Error History Diagnostic Code	AI	41	AI	41
Error History Error Class	AI	42	AI	42
Error History Error Phase	AI	43	AI	43
Error History Type of Fuel	AI	44	AI	44
Error History Output	AI	45	AI	45
Error History Start counter total	AI	46	AI	46
Inputs Word	AI	47	AI	47
Controller On/Off	BI	1	DI	1
Inputs Word 1	BI	2	DI	2
Inputs Word 2	BI	3	DI	3
Inputs Word 3	BI	4	DI	4
Inputs Word 4	BI	5	DI	5
Inputs Word 5	BI	6	DI	6
Inputs Word 6	BI	7	DI	7
Pressure Switch Valve Proving	BI	8	DI	8
Safety Loop	BI	9	DI	9
Inputs Word 9	BI	10	DI	10
Pressure Switch Min	BI	11	DI	11
Pressure Switch Max	BI	12	DI	12
Inputs Word 12	BI	13	DI	13
Air Pressure Switch	BI	14	DI	14
Inputs Word 14	BI	15	DI	15
Inputs Word 15	BI	16	DI	16
Outputs Word	AI	60	AI	60
Alarm	BI	17	DI	17
Outputs Word 1	BI	18	DI	18
Outputs Word 2	BI	19	DI	19
Outputs Word 3	BI	20	DI	20
Ignition	BI	21	DI	21
Outputs Word 5	BI	22	DI	22
Fan	BI	23	DI	23
Outputs Word 7	BI	24	DI	24
Outputs Word 8	BI	25	DI	25
Outputs Word 9	BI	26	DI	26
Outputs Word 10	BI	27	DI	27
Outputs Word 11	BI	28	DI	28

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Outputs Word 12	BI	29	DI	29
Fuel Valve 1	BI	30	DI	30
Fuel Valve 2	BI	31	DI	31
Fuel Valve 3/PV	BI	32	DI	32

12.11 Fireye YB110

Table 12-12: Fireye YB110 BACnet and Metasys N2 Points List

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Com Status	BV	1	DO	1
Safety_Relay	BI	1	DI	1
Main_Valve_In	BI	2	DI	2
Delayed_Valve_In	BI	3	DI	3
Pilot_Valve_In	BI	4	DI	4
Ignition_In	BI	5	DI	5
Blower_In	BI	6	DI	6
Op_Cntrl	BI	7	DI	7
Run_Intlck	BI	8	DI	8
Purge_Damper	BI	9	DI	9
Term_23	BI	10	DI	10
Remote_Reset	BI	11	DI	11
Start_Input	BI	12	DI	12
FVES_POC	BI	13	DI	13
Pilot_Hold	BI	14	DI	14
Low_Fire_Start	BI	15	DI	15
Ref_AC_Line	BI	16	DI	16
Ignition_Out	BI	17	DI	17
Pilot_Valve_Out	BI	18	DI	18
Blower_Out	BI	19	DI	19
Main_Valve_Out	BI	20	DI	20
Delayed_Valve_Out	BI	21	DI	21
Internal_Safety_Out	BI	22	DI	22
Low_Fire_Out	BI	23	DI	23
High_Fire_Out	BI	24	DI	24
Auto_Out	BI	25	DI	25
Alarm_Out	BI	26	DI	26
Status	AI	1	AI	1
Msgn	AI	2	AI	2

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Gstat	AI	3	AI	3
Timer	AI	4	AI	4
Flame	AI	5	AI	5
Logstat	AI	6	AI	6
Sysmins	AI	7	AI	7
Bnrmins	AI	8	AI	8
Cycles	AI	9	AI	9
Lockout_Count	AI	10	AI	10
Lockout1_Msg	AI	11	AI	11
Lockout1_Module	AI	12	AI	12
Lockout1_BnrHrs	AI	13	AI	13
Lockout1_BnrCycs	AI	14	AI	14
Lockout2_Msg	AI	15	AI	15
Lockout2_Module	AI	16	AI	16
Lockout2_BnrHrs	AI	17	AI	17
Lockout2_BnrCycs	AI	18	AI	18
Lockout3_Msg	AI	19	AI	19
Lockout3_Module	AI	20	AI	20
Lockout3_BnrHrs	AI	21	AI	21
Lockout3_BnrCycs	AI	22	AI	22
Lockout4_Msg	AI	23	AI	23
Lockout4_Module	AI	24	AI	24
Lockout4_BnrHrs	AI	25	AI	25
Lockout4_BnrCycs	AI	26	AI	26
Lockout5_Msg	AI	27	AI	27
Lockout5_Module	AI	28	AI	28
Lockout5_BnrHrs	AI	29	AI	29
Lockout5_BnrCycs	AI	30	AI	30
Lockout6_Msg	AI	31	AI	31
Lockout6_Module	AI	32	AI	32
Lockout6_BnrHrs	AI	33	AI	33
Lockout6_BnrCycs	AI	34	AI	34
Lockout7_Msg	AI	35	AI	35
Lockout7_Module	AI	36	AI	36
Lockout7_BnrHrs	AI	37	AI	37
Lockout7_BnrCycs	AI	38	AI	38
Lockout8_Msg	AI	39	AI	39
Lockout8_Module	AI	40	AI	40
Lockout8_BnrHrs	AI	41	AI	41
Lockout8_BnrCycs	AI	42	AI	42

Point Name	BACnet Data Type	BACnet Object Id	N2 Data Type	N2 Point Address
Lockout9_Msg	AI	43	AI	43
Lockout9_Module	AI	44	AI	44
Lockout9_BnrHrs	AI	45	AI	45
Lockout9_BnrCycs	AI	46	AI	46
Lockout10_Msg	AI	47	AI	47
Lockout10_Module	AI	48	AI	48
Lockout10_BnrHrs	AI	49	AI	49
Lockout10_BnrCycs	AI	50	AI	50
Op_Control	BI	27	DI	27
Aux_1	BI	28	DI	28
Aux_2	BI	29	DI	29
Aux_3	BI	30	DI	30
High_water	BI	31	DI	31
Low_Water	BI	32	DI	32
High_Oil_Temp	BI	33	DI	33
Low_Oil_Temp	BI	34	DI	34
Low_Oil_Press	BI	35	DI	35
Low_Atom_Media	BI	36	DI	36
Low_Gas_Press	BI	37	DI	37
High_Gas_Press	BI	38	DI	38
Aux_Gas	BI	39	DI	39
High_Press	BI	40	DI	40
High_Temp	BI	41	DI	41
Aux_4	BI	42	DI	42
Aux_5	BI	43	DI	43
Aux_6	BI	44	DI	44
Aux_7	BI	45	DI	45
Air_Flow	BI	46	DI	46

12.12 Alta/Phantom II Control

Table 12-13: Alta/Phantom II Control BACnet and Metasys N2 Points List

Point Name	Description	Read/ Write	Modbus Register	BACnet		N2	
				Data Type	Data ID	Data Type	Pnt Addr
Central Heat Enable/Disable	Central Heat Enable/Disable 0 = Disable 1 = Enable This register enables single boiler Central Heat 1 demand and Sequencer Master Central Heat 1 demand. This signal does not revert to 0 if not written.	W	401001	BV	001	DO	1
Demand Source	1 Unknown 2 Standby 3 Central Heat 1 4 Central Heat 2 5 Domestic Hot Water 6 Sequencer Control 7 CH Frost Protection 10 Warm Weather Shutdown	R	400100	MI	002	ADI	2
CH1 Heat Demand	0=Off, 1= On	R	400009	BI	003	DI	3
CH2 Heat Demand	0=Off, 1= On	R	400010	BI	004	DI	4
DHW Heat Demand	0=Off, 1= On	R	400003	BI	005	DI	5
Supply Temperature	-40°F (-40°C) to 320°F (160°C)	R	400016	AI	006	AI	6
Return Temperature	-40°F (-40°C) to 320°F (160°C)	R	400017	AI	007	AI	7
DHW Temperature	-40°F (-40°C) to 320°F (160°C)	R	400018	AI	008	AI	8
Stack Temperature	-40°F (-40°C) to 320°F (160°C)	R	400020	AI	009	AI	9
Header Temperature	-40°F (-40°C) to 320°F (160°C)	R	400022	AI	010	AI	10
Outdoor Temperature	-40°F (-40°C) to 320°F (160°C)	R	401728	AI	011	AI	11
Modbus Remote Outdoor Temperature	*Energy Management System may send control the outdoor air temperature. Use this register to change the outdoor temperature.	W	401000	AV	012	AO	12
CH Modbus Setpoint	CH Modbus Setpoint* This setpoint is used for local Central Heat 1 setpoint or Sequencer Master setpoint. Valid range 60°F (16°C) to 190°F (88°C)	W	401002	AV	013	AO	13

Point Name	Description	Read/Write	Modbus Register	BACnet Data Type	BACnet Data ID	N2 Data Type	N2 Pnt Addr
	Note: When "EMS Time Out Enable*" is enabled, setpoint switches to local mode if the EMS fails to write value every 30 seconds. When disabled EMS only needs to write a valid number after power up. The default setting is disabled.						
Active Setpoint	-40°F (-40°C) to 320°F (160°C)	R	400014	AI	014	AI	14
Active Sequencer Master Setpoint	-40°F (-40°C) to 320°F (160°C)	R	400015	AI	015	AI	15
CH1 Setpoint Source	1 = Unknown, 2 = Normal setpoint, 3 = Rate Based Reset setpoint, 4 = Outdoor reset Setpoint, 5 = Remote control (4-20/0-10 or Modbus), 6 = Outdoor boost	R	400034	MI	016	ADI	16
CH2 Setpoint Source	1 = Unknown, 2 = Normal setpoint, 3 = Rate Based Reset Setpoint, 4 = Outdoor Air Reset Setpoint, 5 = Remote control (4-20/0-10 or Modbus), 6 = Outdoor Boost	R	400035	MI	017	ADI	17
Sequencer Master Setpoint Source	1=Unknown, 2=Remote Modbus, 3=Remote 4-20/0-10, 4=DHW, 5=CH1, 6=CH1 Outdoor Air Reset 7=CH2, 8=CH2 Outdoor Air Reset	R	400036	MI	018	ADI	18
0-10VDC 4-20mADC input	Diagnostic tool to troubleshoot / confirm input signal. Resolution 1mV or 10uA 0-20.000 Vdc (0 - 30.00mAdc) Signal shows remote set point or remote rate, depending on selection.	R	400109	AI	019	AI	19
Lockout Code	See Table 12-14	R	400029	MI	020	ADI	20
Hold Code	See Table 12-14	R	400028	MI	021	ADI	21
CH Modbus Rate	*Use this register to drive individual boiler firing rates.	W	401003	AV	022	AO	22

Point Name	Description	Read/ Write	Modbus Register	BACnet		N2	
				Data Type	Data ID	Data Type	Pnt Addr
	This register is used when firing rate control is performed by an external building automation system. Range 0-100 % Note: When "EMS Time Out Enable*" is enabled, control switches to local mode if the EMS fails to write value every 30 seconds. When disabled, EMS only needs to write a valid number after power up. The default is disabled.						
Fan Speed Demanded	Speed of the combustion air blower in rpm	R	400103	AI	023	AI	23
Fan Speed Feedback	Speed of the combustion air blower in rpm	R	400104	AI	024	AI	24
Flame Signal	0-100%	R	400101	AI	025	AI	25
Burner Control State	1 Self Check 2 Standby 3 Waiting for Limit to close 4 Prepurge 5 Direct Burner Ignition 6 Low Fire Hold 7 Calibration 8 Rate Limit 9 Run (Modulate) 10 Postpurge 11 Pump Purge 12 Standby Delay 13 Lockout 14 Boiler Switch Off 15 Warm Wheather Shutdown	R	400013	MI	026	ADI	26
Burner Run Time Hours	Hours (U32)	R	400024 -25	AI	027	AI	27
Burner Cycle Count	0-999,999 (U32)	R	400026 -27	AI	028	AI	28
Pump A (System Pump) Cycles	0-999,999 (U32)	R	400686 -687	AI	029	AI	29
Pump B (Boiler Pump) Cycles	0-999,999 (U32)	R	400688 -689	AI	030	AI	30
Pump C (DHW Pump) Cycles	0-999,999 (U32)	R	400690 -691	AI	031	AI	31
Pump A (System Pump) Status	0 = Off, 1 = On	R	400106	BI	032	DI	32
Pump B (Boiler Pump) Status	0 = Off, 1 = On	R	400107	BI	033	DI	33

Point Name	Description	Read/ Write	Modbus Register	BACnet		N2	
				Data Type	Data ID	Data Type	Pnt Addr
Pump C (DHW Pump) Status	0 = Off, 1 = On	R	400108	BI	034	DI	34
Recirculation Temperature	-40°F (-40°C) to 320°F (160°C)	R	400038	AI	035	AI	35

Table 12-14: Alta/Phantom II Lockout / Hold List

Code	Description
1	Anti short cycle
2	Boiler Safety Limit Open
4	Supply High Limit
5	Low Boiler Water Flow
6	Stack High Limit
7	Return temp higher than supply
8	Return Sensor Fault
9	Supply Sensor Fault
10	DHW Sensor Fault
11	Flue Sensor Fault
12	Outdoor Air Sensor Fault
13	Header Sensor Fault
14	0-10/4-20 Input Warning
15	APS Defective (failed to open)
16	Low Combustion Air Flow
17	Invalid Safety Parameters
18	Invalid Application Parameters
19	Flame Signal Fault during Run
20	Flame Signal Fault during Calibration
21	Fuel Gas Fault
22	No Flame at Ignition
23	Flame Detected Out Of Sequence
24	Flame loss during Run
25	Hardware Fault
26	Calibration Fault
27	120 Vac Supply Fault
28	24 Vac Supply Fault
29	Excessive Reset Selection
30	Sequencer Fault
31	Variable Speed Pump Fault
32	Zone Panel Fault

Appendix A. Grid FieldServer Manager Setup

Appendix A.1. Choose Whether to Integrate the FieldServer Manager

When first logging onto the ProtoAir, the Web App will open on the FieldServer Manager page.

NOTICE: If a warning message appears instead, go to **Section 9.6 FieldServer Manager Connection Warning Message** to resolve the connection issue.
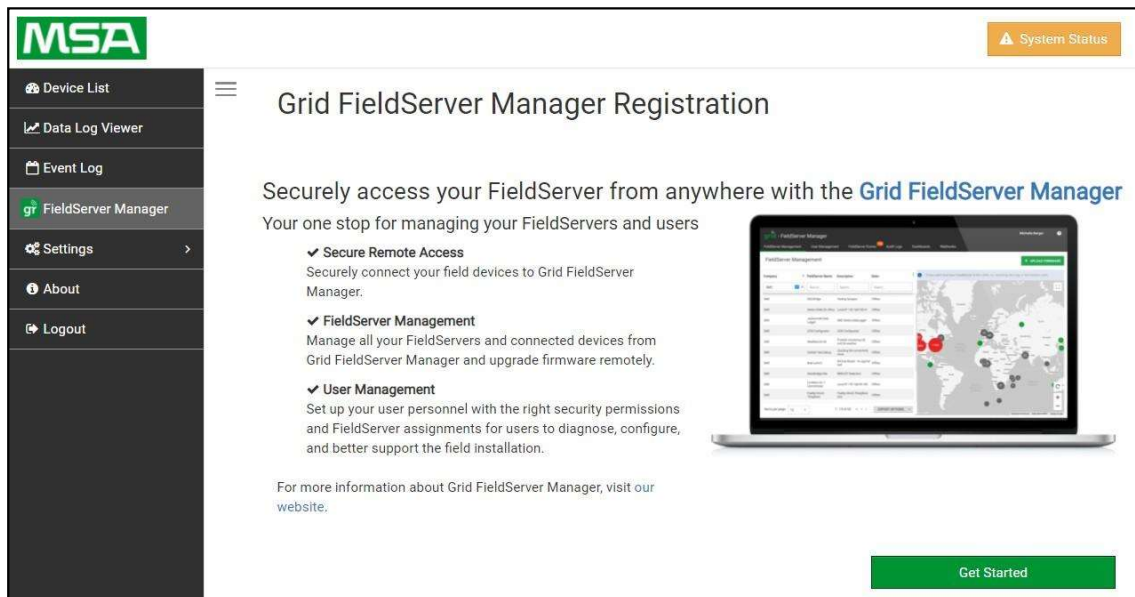
Figure Appendix A-1: ProtoAir Web Configurator Landing Page

- Either go through the FieldServer Manager setup to integrate cloud functionality to the FieldServer or opt out.
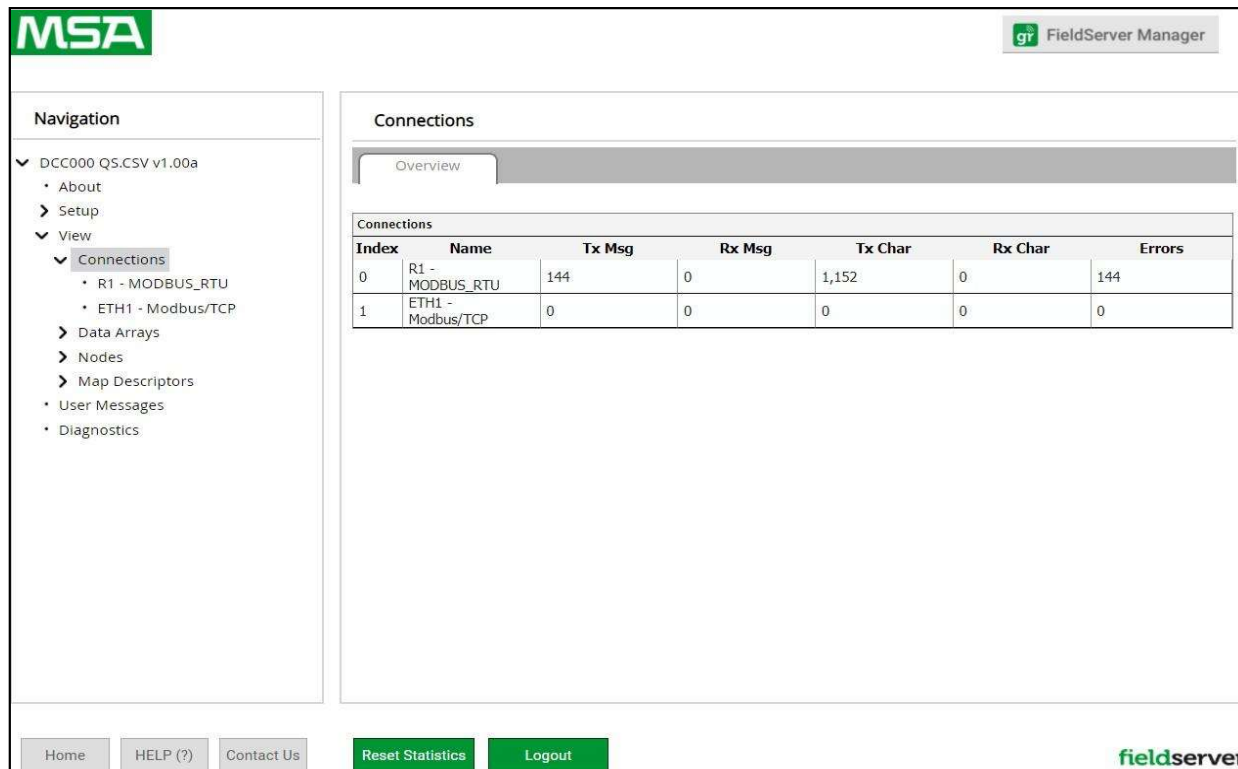
- **Figure Appendix A-2: Web Configurator Connections Page**

  ○ For FieldServer Manager setup, continue with instructions in the following sections
  ○ To opt out of the FieldServer Manager, click on a tab other than the Grid FieldServer Manger tab, click the checkbox next to "Opt out of Grid FieldServer Manager Registration" in the Warning window that appears and click the Exit Registration button
  ○ To ignore FieldServer Manager setup until the next time the Web App is opened, click a tab other than Grid FieldServer Manager and then click the Exit Registration button with the "Opt out" checkbox unchecked

NOTICE: If user setup is already complete go to Section Appendix A.3 Registration Process.

Appendix A.2. User Setup

Before the gateway can be connected to the FieldServer Manager, a user account must be created. Request an invitation to the FieldServer Manager from the manufacturer's support team. Once an invitation has been requested , follow the instructions below to set up login details:

- The "Welcome to the MSA Grid - FieldServer Manager" email will appear as shown below.
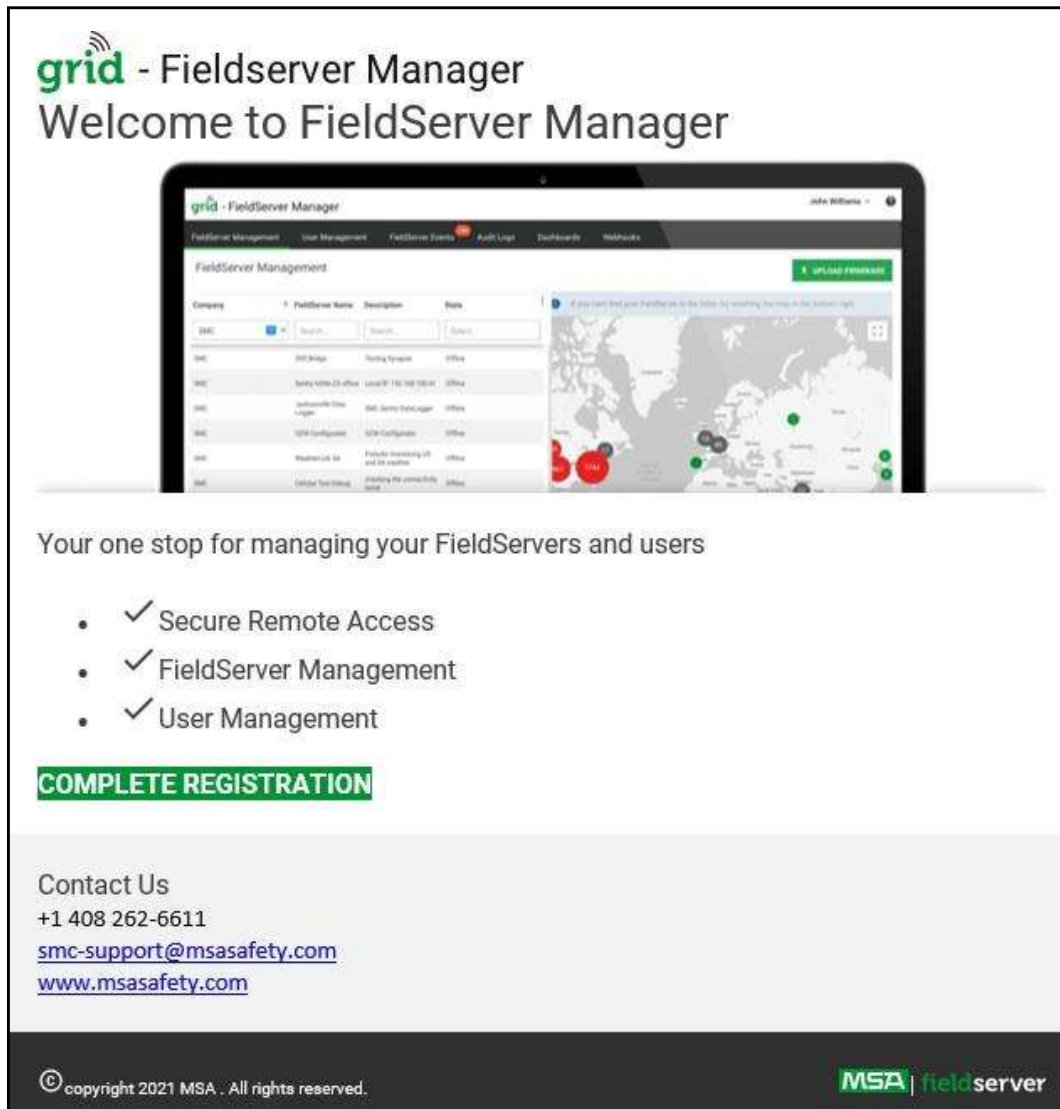
Figure Appendix A-3: Grid Welcome Page

NOTICE: If no 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 Appendix A-4: Grid Registration Page

- Fill in the name, phone number, password fields and click the checkbox to agree to the privacy policy and terms of service.

NOTICE: If access to data logs using RESTful API is needed, do not include "#" in the password.

- Click "Save" to save the user details.

- Click "OK" when the Success message appears.

- Record the email account used and password for future use.

Appendix A.3. Registration Process

Once the FieldServer Manager user credentials have been generated, the ProtoAir can be registered onto the server.

- Click the FieldServer Manager tab.

NOTICE: If a warning message appears instead, go to **Section 9.6 FieldServer Manager Connection Warning Message** to resolve the connection issue.

Figure Appendix A-5: Grid Get Started Button

- Click Get Started to view the FieldServer Manager registration page.

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

Figure Appendix A-6: Grid Account Setup Page

  - Enter the site details by entering the physical address fields or the latitude and longitude then click Next
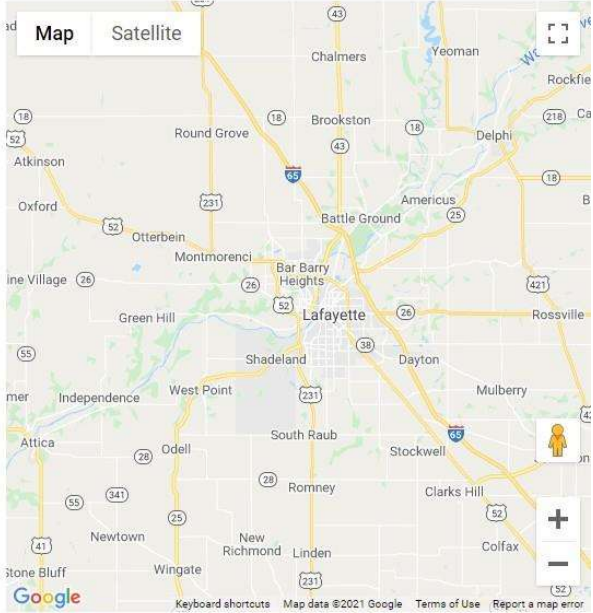
Figure Appendix A-7: Grid Site Setup

◦ Enter Name and Description (required) then click Next

Figure Appendix A-8: Grid FieldServer Details Page

◦ Click the "Create an Grid FieldServer Manager account" button and enter a valid email to send a "Welcome to MSA Grid – FieldServer Manager" invite to the email address entered

Figure Appendix A-9: Grid Account Page

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 Appendix A-10: Grid Registration Summary

NOTICE: Update these details at any time by going to the FieldServer Manager tab and clicking the Update FieldServer Details button.

Appendix A.4. Login to the FieldServer Manager

After the gateway is registered, go to www.smccloud.net and type in the appropriate login information as per registration credentials.
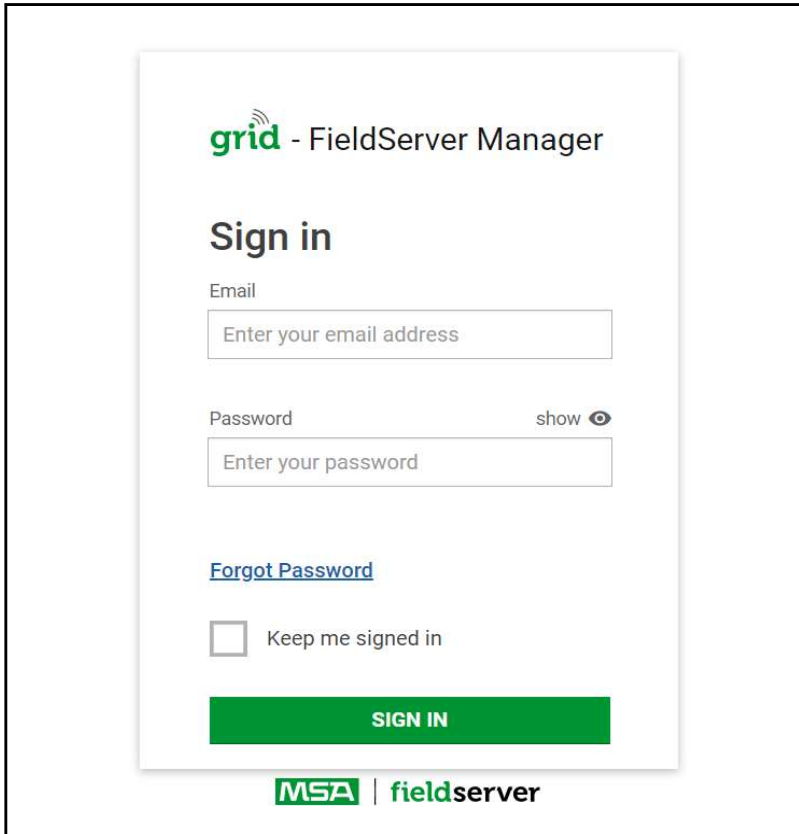
Figure Appendix A-11: Grid Sign In Page

NOTICE: If the login password is lost, see the **MSA Grid - FieldServer Manager Start-up Guide** for recovery instructions.

NOTICE: For additional FieldServer Manager instructions see the **MSA Grid - FieldServer Manager Start-up Guide**.
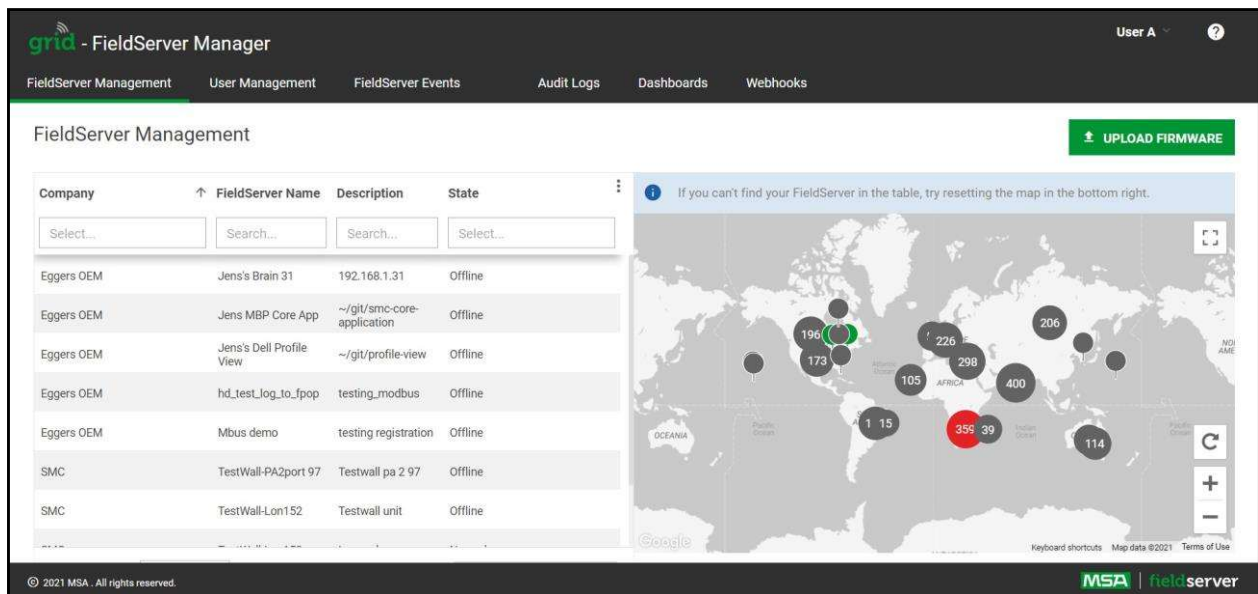
Figure Appendix A-12: Grid Map Page

Appendix A.5. Change User Management Settings

- From the FS-GUI page, click Setup in the Navigation panel.

- Click User Management in the navigation panel.

NOTICE: If the passwords are lost, the unit can be reset to factory settings to reinstate the default unique password on the label. For 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.

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

- Check that the Users tab is selected.
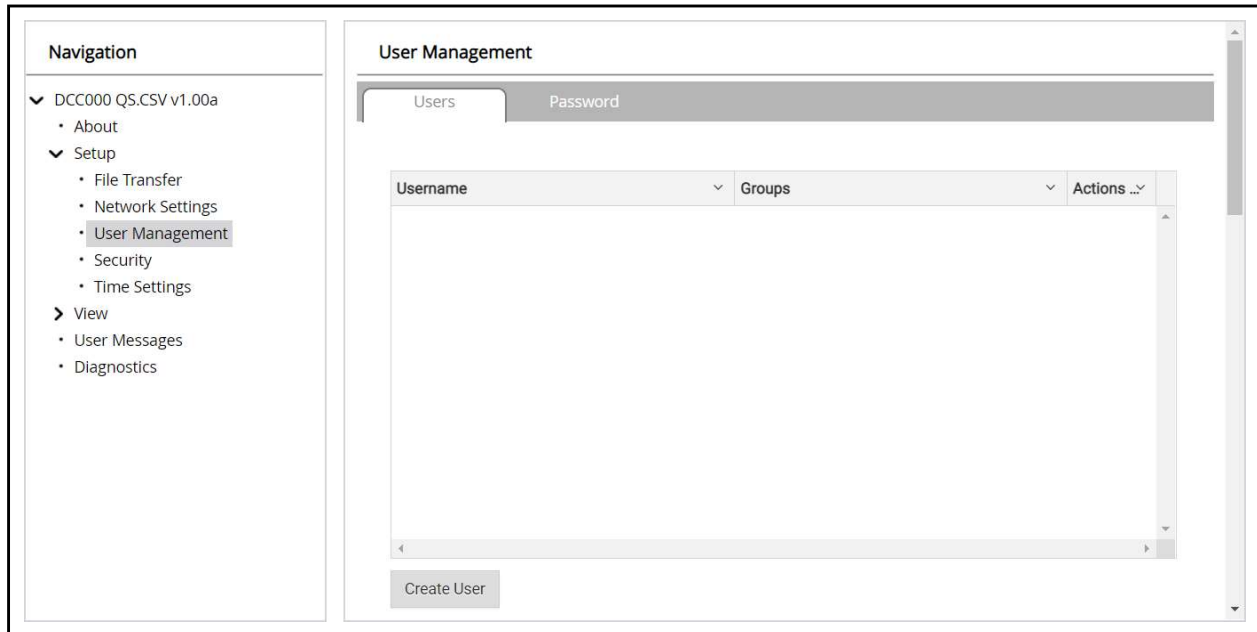
Figure Appendix A-13: Grid User Management Page

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.

Appendix A.6. Create Users

- Click the Create User button.

Figure Appendix A-14: Grid User Setup Page

- Enter the new User fields: Name, Security Group and Password.

  ◦ **User details are hashed and salted**

NOTICE: The password must meet the minimum complexity requirements. 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 A.7. Edit Users

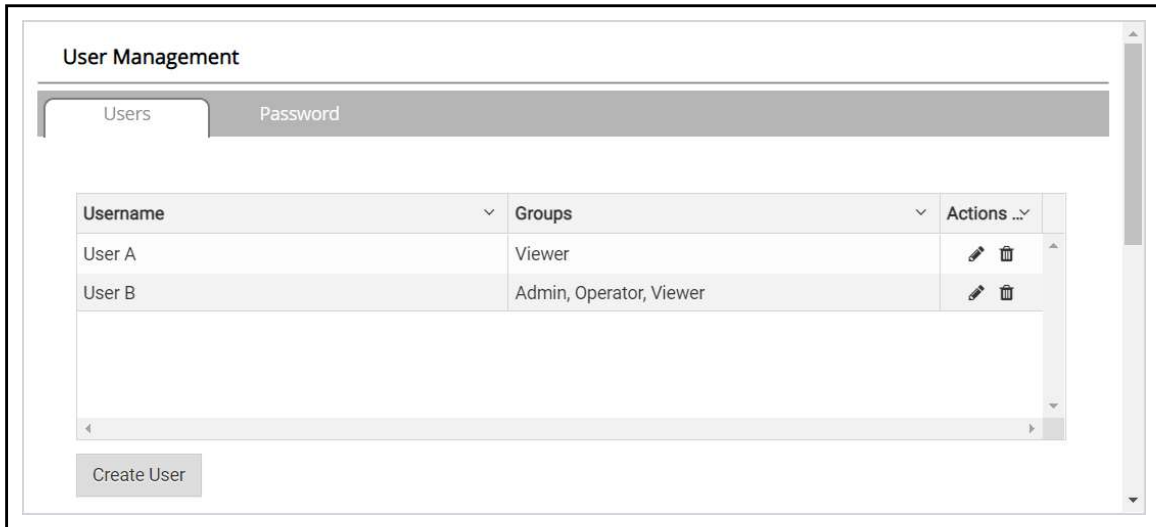- Click the pencil icon next to the desired user to open the User Edit window.

Figure Appendix A-15: Grid User Summary Page

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

Figure Appendix A-16: Grid User Setup Page

- Click Confirm.

- Once the Success message appears, click OK.

Appendix A.8. Delete Users

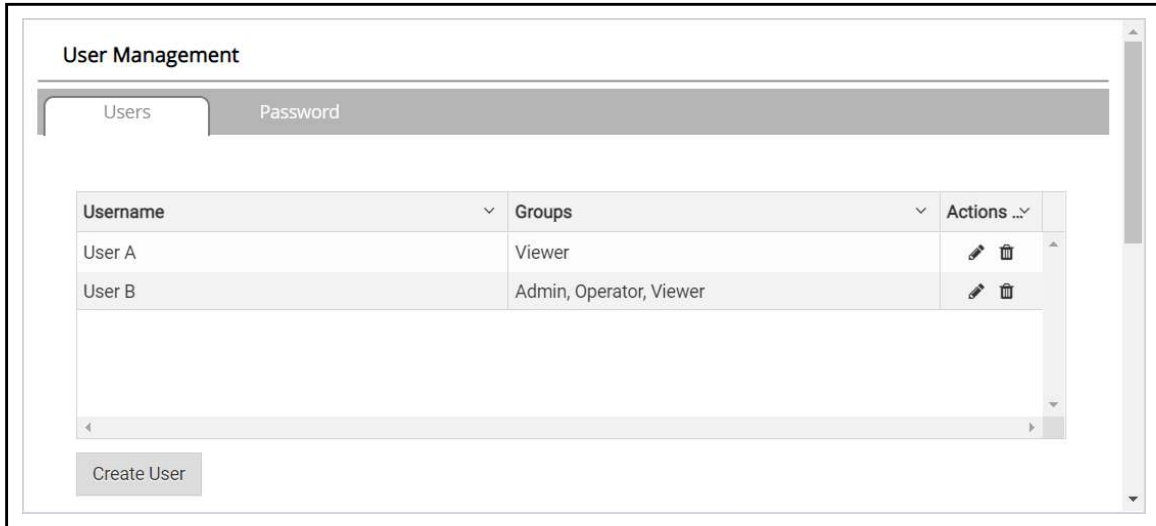- Click the trash can icon next to the desired user to delete the entry.

Figure Appendix A-17: Grid User Deletion Page

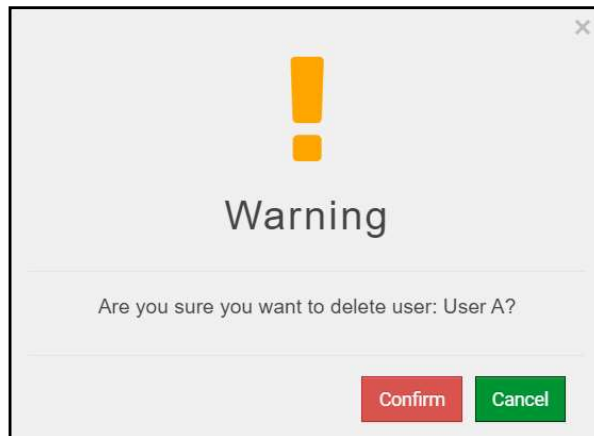- When the warning message appears, click Confirm.

Figure Appendix A-18: Grid User Deletion Warning Page

Seller Limited Warranty

Seller warrants its products to be free from defects in workmanship or material under normal use and service workmanship for a period of 12 months after the date of start-up or 18 months after the date of shipment, whichever shall be less. Seller 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 the Seller.

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 Seller' 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, the Seller'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, Seller 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 the Seller for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the product.

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