



## ProtoAir FPA-W44 Start-up Guide

## **For Interfacing Chromalox Products**

**To Building Automation Systems:** 

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

## **APPLICABILITY & EFFECTIVITY**

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



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



## **Technical Support**

Thank you for purchasing the ProtoAir for Chromalox.

Please call Chromalox for technical support of the ProtoAir product.

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

Support Contact Information: Chromalox 1347 Heil Quaker Blvd. Lavergne, TN 37086

Customer Service: 1-800-443-2640

Email: <a href="mailto:sales@chromalox.com">sales@chromalox.com</a>

Website: www.chromalox.com



## **Quick Start Guide**

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



## TABLE OF CONTENTS

1	Certification	7		
_	1.1 BIL Mark – BACnet <sup>®</sup> Testing Laboratory			
2	Introduction	8		
	2.1 ProtoAir Gateway	ð Q		
~				
3	ProtoAir Setup	10		
	3.2 Point Count Canacity and Registers per Device	10		
	3.3 Configuring Device Communications	11		
	3.3.1 Confirm the Device and ProtoAir COM Settings Match	11		
	3.3.2 Set Node-ID for Any Device Attached to the ProtoAir	11		
	3.3.3 Set IP Address for Any Ethernet Device Connected to the ProtoAir	.11		
	3.4 Attaching the Antenna	11		
4	Interfacing ProtoAir to Devices	.12		
	4.1 Device Connections to ProtoAir	12		
	4.2 Willing Fleid Poll to RS-465 Selial Network	12		
	4.4 Termination Resistor	14		
	4.5 Power-Up ProtoAir	15		
5	Connect the PC to the ProtoAir	16		
	5.1 Connecting to the ProtoAir via Ethernet	16		
	5.1.1 Changing the Subnet of the Connected PC	16		
6	Network Settings	17		
	6.1 Navigate to the FS-GUI Network Settings	17		
	6.2 Change the ProtoAir IP Address	19		
	6.2.1 Update Wired Network Settings	20		
	6.2.2 Opdate WI-FI Clefit Settings	22		
7	Access the Brote Air Web App	22		
1	7.1 Navigate Back to the Web App Landing Screen	23		
	<ul> <li>7.2 Logging into the ProtoAir Web App</li> </ul>	24		
8	SMC Cloud User Setup, Registration and Login	26		
Ŭ	8.1 User Setup	26		
	8.2 Registration Process	28		
	8.3 Login to SMC Cloud	32		
9	Configure the ProtoAir	34		
	9.1 Navigate to the ProtoAir Web Configurator	34		
	9.2 Select Field Protocol and Set Configuration Parameters	35		
	9.3 Setting the ProtoAlr Active Profiles	30		
	9.5 BACnet: Setting Node, Offset to Assign Specific Device Instances	38		
	9.6 How to Start the Installation Over: Clearing Profiles	39		
Α	ppendix A Troubleshooting	40		
	Appendix A.1 Lost or Incorrect IP Address	40		
	Appendix A.2 Viewing Diagnostic Information	41		
	Appendix A. 2. Checking Wiring and Cattings	10		
	Appendix A.5 Checking wining and Settings	42		
	Appendix A.5 Checking Willing and Settings	42		
	Appendix A.5 Checking Willing and Settings Appendix A.4 LED Diagnostics for Communications Between ProtoAir and Devices Appendix A.5 Taking a FieldServer Diagnostic Capture Appendix A 5.1 Using the FieldServer Toolbox	42 43 44 44		
	Appendix A.5 Checking Willing and Settings Appendix A.4 LED Diagnostics for Communications Between ProtoAir and Devices Appendix A.5 Taking a FieldServer Diagnostic Capture Appendix A.5.1 Using the FieldServer Toolbox Appendix A.5.2 Using FS-GUI	42 43 44 44 44		
	Appendix A.5 Checking Willing and Settings Appendix A.4 LED Diagnostics for Communications Between ProtoAir and Devices Appendix A.5 Taking a FieldServer Diagnostic Capture Appendix A.5.1 Using the FieldServer Toolbox Appendix A.5.2 Using FS-GUI Appendix A.6 Wi-Fi Signal Strength	42 43 44 44 47 48		
	Appendix A.3 Checking Willing and Settings Appendix A.4 LED Diagnostics for Communications Between ProtoAir and Devices Appendix A.5 Taking a FieldServer Diagnostic Capture Appendix A.5.1 Using the FieldServer Toolbox Appendix A.5.2 Using FS-GUI Appendix A.6 Wi-Fi Signal Strength Appendix A.7 Factory Reset Instructions	42 43 44 44 47 48 48		



Appendix B Additional Information	49
Appendix B.1 Updating Firmware	49
Appendix B.2 BACnet: Setting Network_Number for More Than One ProtoAir on the Subnet	49
Appendix B.3 Securing ProtoAir with Passwords	50
Appendix B.4 Wi-Fi Access Point Network Settings	51
Appendix B.5 Mounting	52
Appendix B.6 Physical Dimension Drawing	53
Appendix B.7 SMC Cloud Connection Warning Message	54
Appendix B.8 System Status Button	55
Appendix C Vendor Information – Chromalox	56
Appendix D Reference	57
Appendix D.1 Specifications	57
Appendix D.1.1 Compliance with UL Regulations	57
Appendix E Limited 2 Year Warranty	58



## LIST OF FIGURES

Figure 1: Method of Configuration per Device	9
Figure 2: ProtoAir Part Numbers	.10
Figure 3: Supported Point Count Capacity	.10
Figure 4: Registers per Device	.10
Figure 5: COM Settings	.11
Figure 6: RS-485 Connections from Devices to the ProtoAir	.12
Figure 7: Connection from ProtoAir to RS-485 Field Network	.12
Figure 8: Bias Resistor DIP Switches	.13
Figure 9: Termination Resistor DIP Switch	.14
Figure 10: Required Current Draw for the ProtoAir	.15
Figure 11: Power Connections	.15
Figure 12: Ethernet Port Location	.16
Figure 13: Web App Landing Page	.17
Figure 14: FS-GUI Landing Page	.18
Figure 15: Generic FS-GUI Navigation Panel – Network Settings	.18
Figure 16: FS-GUI Ethernet Port Network Settings	.20
Figure 17: FS-GUI Wi-Fi Client Network Settings	.21
Figure 18: FS-GUI Common Network Settings	.22
Figure 19: ES-GUI Status Screen	23
Figure 20: Web App Login	24
Figure 21: Login Window	24
Figure 22: Generic Web App Page – First Login	25
Figure 23: SMC Cloud Ont Out Warning Window	25
Figure 24: Welcome to SMC Cloud Email	26
Figure 25: Setting User Details	.20
Figure 26: SMC Cloud Registration Message	28
Figure 27: SMC Cloud Registration – Installer Details	20
Figure 28: SMC Cloud Registration Site Details	.23
Figure 20: SMC Cloud Registration – Site Details	.29 30
Figure 20: SMC Cloud Registration – SMC Cloud Account	20
Figure 30: SMC Cloud Registration – SMC Cloud Account	21
Figure 31. Device Registered for SNIC Cloud	.ວາ ວາ
Figure 32: SMC Cloud Drivoov Doliov	. JZ
Figure 35. SMC Cloud Landing Daga	. ວ∠ ວວ
Figure 34. SMC Cloud Landing Page	. JJ
Figure 35. New Web App Landing Page	.34
Figure 36: Configuration Tab	.34
Figure 37: Web Configurator Snowing Protocol Selector Parameter	.35
Figure 38: Web Conligurator Snowing no Active Promes	.30
Figure 39: Profile Selection Menu	.37
Figure 40: Web Configurator Snowing Active Profile Additions	.37
Figure 41: Web Configurator Node Offset Field	.38
Figure 42: Active Profiles	.38
Figure 43: Ethernet Port Location	.40
Figure 44: Error Messages Screen	.41
Figure 45: Diagnostic LEDs	.43
Figure 46: Ethernet Port Location	.44
Figure 47: WI-Fi Signal Strength Listing	.48
Figure 48: web Configurator – Network Number Field	.49
Figure 49: FS-GUI Passwords Page	.50
Figure 50: Password Recovery Page	.50
Figure 51: FS-GUI Wi-Fi AP Network Settings	.51
Figure 52: DIN Rail	.52
Figure 53: ProtoAir FPA-W44 Dimensions	.53
Figure 54: SMC Cloud Connection Problems Message	.54
Figure 55: Specifications	. 57



## **1 CERTIFICATION**

#### 1.1 BTL Mark – BACnet<sup>®1</sup> Testing Laboratory



The BTL Mark on ProtoAir is a symbol that indicates that a product has passed a series of rigorous tests conducted by an independent laboratory which verifies that the product correctly implements the BACnet features claimed in the listing. The mark is a symbol of a high-quality BACnet product.

Go to <u>www.BACnetInternational.net</u> for more information about the BACnet Testing Laboratory. Click <u>here</u> for the BACnet PIC Statement.

<sup>&</sup>lt;sup>1</sup> BACnet is a registered trademark of ASHRAE





## 2 INTRODUCTION

### 2.1 ProtoAir Gateway

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

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



#### FPA-W44 Connectivity Diagram:

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

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

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

<sup>&</sup>lt;sup>2</sup> Metasys is a registered trademark of Johnson Controls Inc.



## 2.2 Methods of Configuration

Devices	Communication		
ITC1	Modbus RTU & Modbus TCP/IP		
ITC2	Modbus RTU & Modbus TCP/IP		
ITLS4	Modbus RTU & Modbus TCP/IP		
ITLS6	Modbus RTU & Modbus TCP/IP		
ITLS_2016	Modbus RTU & Modbus TCP/IP		
CFW	Modbus RTU & Modbus TCP/IP		
CFW_400_600A	Modbus RTU & Modbus TCP/IP		
C4	Modbus RTU & Modbus TCP/IP		
C4IR	Modbus RTU & Modbus TCP/IP		
CTF	Modbus RTU & Modbus TCP/IP		
MaxPac	Modbus RTU & Modbus TCP/IP		
40 Series	Modbus RTU & Modbus TCP/IP		
50 Series	Modbus RTU & Modbus TCP/IP		
6060	Modbus RTU & Modbus TCP/IP		
4081_4082	Modbus RTU & Modbus TCP/IP		
3340	Modbus RTU & Modbus TCP/IP		
3380	Modbus RTU & Modbus TCP/IP		
6020	Modbus RTU & Modbus TCP/IP		
1020	Modbus RTU & Modbus TCP/IP		
1040	Modbus RTU & Modbus TCP/IP		
WM30-WM40	Modbus RTU & Modbus TCP/IP		
1030	Modbus RTU & Modbus TCP/IP		
Figure 1: Method of Configuration per Device			

## **3 PROTOAIR SETUP**

#### 3.1 Record Identification Data

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

Model	Part Number	
ProtoAir	FPA-W44-1853	
Figure 2: ProtoAir Part Numbers		

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

#### 3.2 Point Count Capacity and Registers per Device

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

Part number	Total Registers	
FPA-W44-1853	5,000	
Figure 3: Supported Point Count Capacity		

Devices	Registers Per Device	
ITC1	29	
ITC2	57	
ITLS4	230	
ITLS6 – ITLS72	152 – 1802	
ITLS_2016	434	
CFW	669	
CFW_400_600A	542	
C4	512	
C4IR	584	
CTF	174	
MaxPac	79	
40 Series	45	
50 Series	27	
6060	103	
4081_4082	105	
3340	133	
3380	201	
6020	84	
1020	118	
1040	310	
WM30-WM40	33	
1030	118	
Figure 4: Registers per Device		



#### 3.3 Configuring Device Communications

3.3.1 Confirm the Device and ProtoAir COM Settings Match

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

Port Setting	Device	
Protocol	Modbus RTU	
Baud Rate	19200	
Parity	Even	
Data Bits	8	
Stop Bits	1	
Figure 5: COM Settings		

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

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

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

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

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

NOTE: This information is required for Section 9.2.

#### 3.4 Attaching the Antenna

#### Wi-Fi Antenna:

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

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



## 4 INTERFACING PROTOAIR TO DEVICES

#### 4.1 Device Connections to ProtoAir

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

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

RS-485 +         TX+         RS-485 +           RS-485 -         RX-         RS-485 -           RS-485 GND         GND         RS-485 GND
RS-485 -         RX-         RS-485 -           RS-485 GND         GND         RS-485 GND
RS-485 GND GND RS-485 GND

#### 4.2 Wiring Field Port to RS-485 Serial Network

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





#### 4.3 Bias Resistors



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

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

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

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

- NOTE: The R1 and R2 DIP Switches apply settings to the respective serial port.
- NOTE: If the gateway is already powered on, DIP switch settings will not take effect unless the unit is power cycled.



#### 4.4 Termination Resistor



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

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

- NOTE: The R1 and R2 DIP Switches apply settings to the respective serial port.
- NOTE: If the gateway is already powered on, DIP switch settings will not take effect unless the unit is power cycled.

#### 4.5 Power-Up ProtoAir

Check power requirements in the table below:

Power Requirement for ProtoAir External Gateway				
Current Draw Type				
ProtoAir Family 12VDC 24VDC/AC				
FPA – W44 (Typical)	250mA	125mA		
NOTE: These values are 'nominal' and a safety margin should be added to the power supply of the host system. A safety margin of 25% is recommended.				
Figure 10: Required Current Draw for the ProtoAir				

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

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





#### CONNECT THE PC TO THE PROTOAIR 5

#### 5.1 Connecting to the ProtoAir via Ethernet

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



#### 5.1.1 Changing the Subnet of the Connected PC

The default IP Address for the ProtoAir is 192.168.1.24, Subnet Mask is 255.255.255.0. If the PC and ProtoAir are on different IP networks, assign a static IP Address to the PC on the 192.168.1.xxx network. For Windows 10:

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

Ose the following IP address: —	
<u>I</u> P address:	192.168.1.11
S <u>u</u> bnet mask:	255 . 255 . 255 . 0
Default gateway:	

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



## 6 NETWORK SETTINGS

#### 6.1 Navigate to the FS-GUI Network Settings

- Navigate to the IP Address of the ProtoAir on the local PC by opening a web browser and entering the IP Address of the ProtoAir; the default Ethernet address is 192.168.1.24.
- NOTE: If the IP Address of the ProtoAir has been changed, the IP Address can be discovered using the FS Toolbox utility. See Appendix A.1 for instructions.
  - From the Web App landing page, click the word "Diagnostics" found in blue at the bottom of the screen to open the FS-GUI page.





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

SMC		(		
Navigation	CN1853 Chromalox v9.00a			
<ul> <li>CN1853 Chromalox v9.00a</li> <li>About</li> </ul>	Status Settings	Info Stats		
> Setup	Status		0	
> View	Name	Value		
<ul> <li>User Messages</li> </ul>	Driver_Configuration	DCC000		
Diagnostics	DCC_Version	V6.05p (A)		
	Kernel_Version	V6.51b (B)		
	Release_Status	Normal		
	Build_Revision	4.43.4		
	Build_Date	2019-08-19 15:39:48 +0200		
	Platform_Name	ProtoAir_2RS485_ARMv7		
	BIOS_Version	4.1.0		
	FieldServer_Model	FPC-N54		
	Serial_Number	19102TB001PCR		
	Carrier Type	-		
	Data_Points_Used	0		
	Data_Points_Max	1500		
	Application Memory:			
	Protocol_Engine_Memory_Used	1.42%		
Home HELP (F1) Contact Us	System Restart System Reboot	System Time Synch Reset Cycle Times		
Figure 14: FS-GUI Landing Page				

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





### 6.2 Change the ProtoAir IP Address

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

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

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



#### 6.2.1 Update Wired Network Settings

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

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

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

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

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

IP Settings	WiFi Client	WiFi AP	Cellular	Common	
ote					
odated settings will t Idress.	ake effect immed	diately. If the IP Add	dress is changed y	ou will need to direct your browser	to the new IP
	N1 IP	Address	19	2.168.3.28	
	N1 Ne	tmask	25	5.255.255.0	
	N1 DH	CP Client State		DISABLED V	
	Defaul	t Gateway	19	02.168.3.1	
	Domai	n Name Server1	10	).5.4.226	
	Domai	n Name Server2	10	).5.4.227	
	Ca	ncel		Update IP Settings	
	Conne	ction Status	C	onnected	
	Etherr	et MAC Address	00	):50:4E:60:00:0E	
	Ethern	et Tx Msgs	11	1601	
	Etherr	iet Rx Msgs	25	54289	
	Etherr	et Tx Msgs Dropped	i 0		
	Ethern	et Rx Msgs Dropped	1 O		

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



### 6.2.2 Update Wi-Fi Client Settings

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

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

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

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

IP Settings	WiFi Client WiFi AP	Cellular	Common	
Note				
Jpdated settings wil Address.	II take effect immediately. If the IP	Address is changed yo	u will need to direct your browser to th	e new IP
	WiFi Status		ENABLED V	
	WiFi SSID	SM	C_WLAN	
	WiFi Password	S1	Brr@M0n1tor	
	WiFi DHCP Client State		ENABLED V	
	WiFi IP Address	10	5.5.76	
	WiFi Netmask	25	5.255.254.0	
	WiFi Default Gateway	10	5.4.203	
	WiFi Domain Name Ser	ver1 10	5.4.226	
	WiFi Domain Name Ser	ver2 10	5.4.227	
	Cancel	Up	date WiFi Settings	
	Connection Status	Co	nnected	
	WiFi MAC Address	a4	08:ea:4e:54:62	
	WiFi BSSID	92	2a:a8:c7:38:1a	
	WiFi Channel	24	37	
	WiFi Tx Msgs	12	)	
	WiFi Rx Msgs	37	7	
	WiFi Tx Msgs Dropped	0		
	WiFi Rx Msgs Dropped	0		
	WiFi Pairwise Cipher	cc	MP	
	WiFi Group Cipher	cc	MP	
	WiFi Key Mgmt	w	'A2-PSK	
	WiFi Link	72	2 MBit/s MCS 7 short	
		12		

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

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



#### 6.2.3 Common Settings

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

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

#### NOTE: The default is Primary Connection is Ethernet.

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

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

Ŭ	WiFi Client	WiFi AP	Cellular	Common
Note				
Jpdated settings v	vill take effect immed	diately. Common settir	ngs will be applied	d to WiFi Client, WiFi AP and Cellular if supported. T
primary connection Ethernet or WiFi w	h will be the connecti hen active	on which has internet	access. Cellular	will take preference, as the primary connection, ove
	Primar	y Connection		Ethernet V
		ncel	Undate	Common Settings
	Ca		opulate	common settings
	Ca			
	Active	Primary Connection	Et	iernet
	Active	Primary Connection Default Gateway	Eth 19	ernet
	Active Active Active	Primary Connection Default Gateway Domain Name Server1	Ett 192	ernet

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



## 7 ACCESS THE PROTOAIR WEB APP

### 7.1 Navigate Back to the Web App Landing Screen

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

SMC			
Navigation	CN1853 Chromalox v9.00a		
<ul> <li>CN1853 Chromalox v9.00a</li> <li>About</li> </ul>	Status Settings	Info Stats	
> Setup	Status		0
> View	Name	Value	<u>_</u>
<ul> <li>User Messages</li> </ul>	Driver_Configuration	DCC000	
Diagnostics	DCC_Version	V6.05p (A)	
	Kernel_Version	V6.51b (B)	
	Release_Status	Normal	
	Build_Revision	4.43.4	
	Build_Date	2019-08-19 15:39:48 +0200	
	Platform_Name	ProtoAir_2RS485_ARMv7	
	BIOS_Version	4.1.0	
	FieldServer_Model	FPC-N54	
	Serial_Number	19102TB001PCR	
	Carrier Type	-	
	Data_Points_Used	0	
	Data_Points_Max	1500	
	Application Memory:		
	Protocol_Engine_Memory_Used	1.42%	
Home HELP (F1) Contact U:	s System Restart System Reboot	System Time Synch Reset Cycle Times	
	Figure 19: FS-	GUI Status Screen	

• The Web App Landing Page will appear



## 7.2 Logging into the ProtoAir Web App

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



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

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

Authentication http://192.168.3.24	Required 4 requires a username and password.	×
User Name: Password:		
Figu	Log In Cancel Ire 21: Login Window	



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

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

	▲ System Status ▲ Pro
Device List	$\equiv$ Register this FieldServer on SMC Cloud
Z Data Log Viewer	
1 Event Log	Securely access your FieldServer from envythere
SMC Cloud™	with the SMC Cloud device cloud
Settings >	BC
About	<ul> <li>Your One Stop for Managing Your Devices and Users</li> <li>Secure Remote Access Becurely connect your field devices to SMC Cloud</li> <li>Device Manage all your Field secures and connected devices from SMC Cloud and upgrade firmware remotely</li> <li>User Management Set up your user personnel with the right security permissions and device assignments for users to diagnose, configure, and better support the field installation.</li> <li>For more information about SMC Cloud, visit our website.</li> </ul>
	Get Started

- Either go through the SMC Cloud setup to integrate SMC Cloud functionality to the FieldServer or optout of SMC Cloud setup.
  - For SMC Cloud setup, follow instructions in Section 8
  - To opt out of SMC Cloud, click on a tab other than the SMC Cloud<sup>™</sup> tab SMC Cloud<sup>™</sup>, click the checkbox next to "Opt out of SMC Cloud Registration" in the Warning window that appears and click the Exit Registration button (skip to Section 9 to continue FieldServer configuration)
  - To ignore SMC Cloud setup until the next time the FieldServer Web App is opened, click a tab other than SMC Cloud<sup>™</sup> and then click the Exit Registration button with the "Opt out" checkbox unchecked (skip to Section 9 to continue FieldServer configuration)

▲ Warning	×
You are about to leave the registration process to cloud connect your device with SMC Cloud	
Opt out of SMC Cloud Registration	
Exit Registration Cancel	
Figure 23: SMC Cloud Opt Out Warning Window	



## 8 SMC CLOUD USER SETUP, REGISTRATION AND LOGIN

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

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

#### 8.1 User Setup

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

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

notifications@fieldpop.io to me	2:20 PM (16 minutes ago) 🔶 🔸
SMGsierra	
Please complete SMC Cloud regist	ration
Hello from Sierra Monitor,	
You're one step closer to IloT-empowering cloud for remote connectivity.	g your devices with the SMC Cloud device
Click the link below to complete SMC Clou	d registration.
Complete	Registration
Sincerely, Sierra Monitor Corporation	
Copyright © Sierra Monitor Corporation +1 408 262-6611 www.sierramonitor.com	Follow us: in f e & D
This amplitude southan hereits	undirected that you would like to register to SMC Cloud with this

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



• Click the "Complete Registration" button and fill in user details accordingly.

Complete Your Registration	
Email Address	
user@gmail.com	
First Name	
First Name	*
Last Name	
Last Name	*
Phone Number	
<b>•</b> (201) 555-5555	*
New Password	
password	•
Confirm Password	
password	•
By registering my account with SMC, I understand that I am agreeing to the SMC Cloud Terms of Service and Privacy Policy	*
• • •	landatory Fields
Save Cancel	
Figure 25: Setting User Details	

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



#### 8.2 Registration Process

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

• When first logging onto the ProtoAir, the Web App will open on the SMC Cloud<sup>™</sup> page.

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

	🛦 System Status 🗳 Profile 🕶
Device List	$\equiv$ Register this FieldServer on SMC Cloud
Z Data Log Viewer	Ŭ
🛗 Event Log	Converte vour Field Converting an autom
SMC Cloud™	with the SMC Cloud device cloud
<b>¢</b> <sup>e</sup> s Settings →	
About	Your One Stop for Managing Your Devices and Users <ul> <li>Secure Remote Access</li> <li>Securely connect your field devices to SMC Cloud</li> </ul>
	Device Management Manage all your FieldServers and connected devices from SMC Cloud and upgrade firmware remotely
	User Management Set up your user personnel with the right security permissions and device assignments for users to diagnose, configure, and better support the field installation.
	For more information about SMC Cloud, visit our website.
	Get Started
	Figure 26: SMC Cloud Registration Message

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

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



• To register, fill in the user details, site details, gateway details and SMC Cloud account credentials.

	•	\$	
Installer Details			
Installer Name			
Company			
Telephone			
Email			
Installation Date	21-November-2019		
			Previous Next
	Figure 27: SMC Cloud Re	egistration – Installer Details	

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

Installation Site I	Details	
Street Address	Enter place here	Map Satellite
Building		bon Edwards
Suburb		Bay National Wildlife
City		C37 C37
State		View Joseph +
ZIP Code		Cupertino To County Pa -
Country		Map data ©2019 Google Terms of Use Report a map error
Latitude	37.4323341	
Longitude	-121.8995741	
		Previous Next
	Figure 28: SMC Clo	oud Registration – Site Details

 $\circ$   $\,$  Enter user details and click Next



	•		
Gateway Details			
Name			
Description			
Info	Optionally specify any other information relating to the device i.e., calibration, commissioning or other notes		
Device Information			
Product Name: Sys Product Version: 2. Platform Name: Ga Product BIOS: 4.1.0 Serial Number: 191	tem View 2.5-beta teway 0 02TB001PCR		
			Previous Next
	Figure 29: SMC Cloud Reg	istration – Gateway Deta	ails

### o Enter Name and Description (required) then click Next

## • Enter user credentials and click Register Device

<b>1</b>	
New Users	
If you do not have SMC Cloud credentials, you can create a new SMC Cloud account now	Create an SMC Cloud account
Existing Users - Enter device registration details	
User Credentials	
Username	
Password	
	Previous Register Device
Figure 30: SMC Cloud Registration – SMC Cloud Acc	ount



• 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.

Device Registered					
Gateway Details	Installer Details	Site Installation Details			
Name: FieldServer Description: Gateway Device Info: MAC Address: 00:50:4E:60:06:3C Tunnel Server URL: tunnel.fieldpop.io Device ID: daffodilsentry_ylb4Xr5bQ Product Name: CN1853-System View Product Version: 2.2.5-beta	Installer Name: User Company: Sierra Monitor Corp Telephone: Email: Installation Date: Nov 21, 2019	Street Address: 1991 Tarob Court Building Info: SMC Build #1 City: Milpitas Suburb: Milpitas State: CA Country: United States ZIP Code: 95035			
Update Device Details					
Figure 31: Device Registered for SMC Cloud					

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





## 8.3 Login to SMC Cloud

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

$\leftarrow$ $\rightarrow$ C $\triangleq$ Secure   https://www.fieldpop.io/fieldpo	p_user_mgr/#/login	야 ☆ :
	SMC cloud	
	Email address	
	admin@sierramonitor.com	
	Password	
	••••••	
	Keep me logged in Forgot Password?	
	Sign in	
	Copyright © 2018 Sierra Monitor Corporation	
Fig	gure 32: SMC Cloud Login Page	

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

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

Privacy Policy
We've updated our Terms of Service and Privacy Policy. Please read it carefully and accept below to continue.
Continue
Figure 33: SMC Cloud Privacy Policy





### NOTE: For additional SMC Cloud instructions see the <u>SMC Cloud Start-up Guide</u>.



### 9 CONFIGURE THE PROTOAIR

#### 9.1 Navigate to the ProtoAir Web Configurator

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

	System Status Status		
🚯 Device List	$\equiv$ System View		
🛃 Data Log Viewer			
🛗 Event Log			
SMC Cloud™			
Ø₿ Settings >			
(1) About			
Copyright © Chromalox 2019 All Rights Reserved - Diagnostics			
Figure 35: New Web App Landing Page			

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

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

CHROMALOX Areaer Thermal Technologies			✓ System Status	🛔 Profile 🔻
🙆 Device List	$\equiv$	Configuration		
🛃 Data Log Viewer				
🛱 Event Log		Profile Configuration Page		
SMC Cloud™		Profiles Configuration		
✿\$ Settings ∽		- Come Complete		
Configuration				
Virtual Points		Reset Application		
Network		Warning: This will remove all data from the device		
About		Reset Application		
Copyright © Chromalox 2019 All Rights Reserved - Diagnostics				
		Figure 36: Configuration Tab		

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



#### 9.2 Select Field Protocol and Set Configuration Parameters

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

SMG <sup>ierra</sup>				
Configuration Pa	rameters			
Parameter Name	Parameter Description	Value		
protocol_select	Protocol Selector Set to 1 for BACnet IP/Modbus TCP Set to 2 for BACnet MSTP Set to 3 for Metasys N2 Set to 4 for BACnet MSTP (single node) Set to 5 for Ethernet IP	1 Submit		
mod_baud_rate	Modbus RTU Baud Rate This sets the Modbus RTU baud rate. (9600/19200/38400/57600)	19200 Submit		
Modbus RTU Parity mod parity     Modbus RTU parity.     Even     Submit       HELP (?)     Network Settings     Clear Profiles and Restart     System Restart     Diagnostics & Debugging				
Figure 37: Web Configurator Showing Protocol Selector Parameter				

- Select the field protocol by entering the appropriate number into the Protocol Selector Value. Click the Submit button. Click the System Restart button to save the updated configuration.
- NOTE: Protocol specific parameters are only visible when the associated protocol is selected.
- NOTE: If Modbus TCP/IP was selected and is used for the field protocol, skip Section 9.3. Device profiles are NOT used for Modbus TCP/IP.
  - Ensure that all parameters are entered for successful operation of the gateway. Find the legal value options for each parameter under the Parameter Description in parentheses.
- NOTE: If multiple devices are connected to the ProtoAir, set the BACnet Virtual Server Nodes field to "Yes"; otherwise leave the field on the default "No" setting.





## 9.3 Setting the ProtoAir Active Profiles

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

Configuration Barameters				
configuration a				
Parameter Name	Parameter Description	Value		
	Protocol Selector Set to 1 for BACnet IP/Modbus TCP			
protocol_select	Set to 2 for BACnet MSTP Set to 3 for Metasys N2	1	Submit	
	Set to 4 for BACnet MSTP (single node) Set to 5 for Ethernet IP			
	Set & S for Enemeral			
mod baud rate	Modbus RTU Baud Rate This sets the Modbus RTU baud rate.	19200	Submit	
mod_budd_ruce	(9600/19200/38400/57600)			
	Modbus RTU Parity			
mod_parity	This sets the Modbus RTU parity.	Even	Submit	
	(non) then out			
mod data bits	Modbus RTU Data Bits This sets the Modbus RTU data bits.	8	Submit	
	(7 or 8)			
	Modbus RTU Stop Bits			
mod_stop_bits	This sets the Modbus RTU stop bits.	1	Submit	
network nr	BACnet Network Number This sets the BACnet network number of the Gateway.	50	Submit	
	(1 - 65535)			
	BACnet Node Offset			
node offset	This is used to set the BACnet device instance. The device instance will be sum of the Modbus device	50000	Submit	
_	address and the node offset. (0 - 4194303)			
	(* 12.665)			
	BACnet IP Port This sets the BACnet IP port of the Gateway.			
bac_ip_port	The default is 47808.	47808	Submit	
	(1 0000)			
	BACnet COV This enables or disables COVs for the BACnet connection.			
bac_cov_option	Use COV_Enable to enable. Use COV_Disable to disable.	COV_Disable	Submit	
	[coenougleos_enougle]			
	BACnet BBMD This enables BBMD on the BACnet IP connection			
bac_bbmd_option	Use BBMD to enable. Use - to disable.	-	Submit	
	(BBMD/-)			
	RACnet Virtual Server Nodes			
bac_virt_nodes	Set to NO if the unit is only converting 1 device to BACnet.	No	Submit	
	(No/Yes)	L		
Active profiles				
Nr Node ID Current profile Parameters				
Add				
HELP (?) Networ	k Settings Clear Profiles and Restart System Rest	art	Diagnostics & Debuggi	



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

BACnet Virtual Server N bac_virt_nodes MOD_RTU_to_BAC_IP_ITC1 MOD_RTU_to_BAC_IP_ITC2 MOD_RTU_to_BAC_IP_ITL54 MOD_RTU_to_BAC_IP_ITL56	lodes converting 1 device to BACnet. No rerting multiple devices.	Submit		
Active profil MOD_RTU_to_BAC_IP_ITLS_2016 MOD_TCP_to_BAC_IP_ITLS_2016 MOD_TCP_to_BAC_IP_ITC1 MOD_TCP_to_BAC_IP_ITC2 MOD_TCP_to_BAC_IP_ITLS4 MOD_TCP_to_BAC_IP_ITLS4 MOD_TCP_to_BAC_IP_ITLS_2016 MOD RTU to BAC_IP_ITC1	Parameters	Submit		
MOD_RTU_to_BAC_IP_ITC1       Cancel         HELP (?)       Network Settings       Clear Profiles and Restart       System Restart       Diagnostics & Debugging         Figure 39: Profile Selection Menu				

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

Active profiles							
Nr	Node ID	Current profile	Parameters				
1	1	MOD_TCP_to_BAC_IP_ITC1	ip_address tcp_id	: 192.168.1.1 : 1	Remove		
2	22	MOD_RTU_to_BAC_IP_ITLS6			Remove		
3	33	MOD_RTU_to_BAC_IP_ITLS_2016			Remove		
Add							
HELP (?)     Network Settings     Clear Profiles and Restart     System Restart     Diagnostics & Debugging							
Figure 40: Web Configurator Showing Active Profile Additions							

#### 9.4 Verify Device Communications

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



#### 9.5 BACnet: Setting Node\_Offset to Assign Specific Device Instances

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

#### Device Instance (desired) = Node\_Offset + Node\_ID

For example, if the desired Device Instance for the device 1 is 50,001 and the following is true:

- Device 1 has a Node-ID of 1
- Device 2 has a Node-ID of 22
- Device 3 has a Node-ID of 33

Then plug the device 1's information into the formula to find the desired Node\_Offset:

- $50,001 = Node_Offset + 1$
- ➢ 50,000 = Node\_Offset

Once the Node\_Offset value is input, it will be applied as shown below:

- Device 1 Instance = 50,000 + Node\_ID = 50,000 + 1 = 50,001
- Device 2 Instance = 50,000 + Node\_ID = 50,000 + 22 = 50,022
- Device 3 Instance = 50,000 + Node\_ID = 50,000 + 33 = 50,033
- Click "Submit" once the desired value is entered.

	BACnet Node Offset		
node_offset	The device instance will be sum of the node id and the	50000	Submit
	node offset		
	Figure 41: Web Configurator Node Off	set Field	

Active profiles							
Nr	Node ID	Current profile	Parameters				
L	1	MOD_TCP_to_BAC_IP_ITC1	ip_address tcp_id	: 192.168.1.1 : 1	Remove		
2	22	MOD_RTU_to_BAC_IP_ITLS6			Remove		
3	33	MOD_RTU_to_BAC_IP_ITLS_2016			Remove		
Add							
HEL	P (?)	letwork Settings Clear Profiles and Restart	System Restar	t	Diagnostics & Debugging		
Figure 42: Active Profiles							



#### 9.6 How to Start the Installation Over: Clearing Profiles

- Follow the steps outlined in Section 9.1 to access the ProtoAir Web Configurator.
- At the bottom-left of the page, click the "Clear Profiles and Restart" button.
- Once restart is complete, all past profiles discovered and/or added via Web configurator are deleted. The unit can now be reinstalled.

#### **Appendix A Troubleshooting**

#### Appendix A.1 Lost or Incorrect IP Address

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



- 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.

FieldServer Toolbox						
FieldServe	e <b>r Toolbo</b> : elp	x			S	Sierra monitor
DEVICES	÷	IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
ProtoNode		192.168.3.110	00:50:4E:10:2C:92	*	•	Connect
					-te	

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



#### Appendix A.2 Viewing Diagnostic Information

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

Navigation	Cor	nections					
CN1853 Chromalox v9.00a • About	0	verview					
> Setup	Connec	tions					
Connections	Index	Name	Tx Msg	Rx Msg	Tx Char	Rx Char	Errors
<ul> <li>R1 - MODBUS_RTU</li> </ul>	0	R1 - MODBUS RTU	0	0	0	0	0
<ul> <li>N1 - Modbus/TCP</li> </ul>	1	N1 - Modbus/TCP	0	0	0	0	0
<ul> <li>N1 - BACnet_IP</li> </ul>	2	N1 - BACnet_IP	0	0	0	0	0
<ul> <li>Nodes</li> <li>Map Descriptors</li> </ul>							
User Messages							
<ul> <li>Diagnostics</li> </ul>							
<ul> <li>Diagnostics</li> </ul>							
• Diagnostics							
Diagnostics							
<ul> <li>Diagnostics</li> </ul>							
<sup>,</sup> Diagnostics							
<ul> <li>Diagnostics</li> </ul>							
Diagnostics							
• Diagnostics							
Diagnostics							



#### Appendix A.3 Checking Wiring and Settings

- No COMS on Modbus RTU side. If the Tx/Rx LEDs are not flashing rapidly then there is a COM issue. To fix this, check the following:
  - Visual observations of LEDs on ProtoAir (Appendix A.4)
  - o Check baud rate, parity, data bits, stop bits
  - Check Detector ID matches the correct device
  - Verify wiring
  - Verify the device was listed under the Web Configurator Active Profiles (Section 9.3)
- No COMS on Modbus TCP/IP side. To fix, check the following:
  - Visual observations of LEDs on ProtoAir (Appendix A.4)
  - Check device address
  - Verify wiring
  - Verify device is connected to the same subnet as the ProtoAir
  - Verify all the Modbus TCP/IP devices were discovered in Web Configurator (Section 9.3)
- Field COM problems:
  - Visual observations of LEDs on the ProtoAir (Appendix A.4)
  - Verify IP Address setting
  - Verify wiring
- NOTE: If the problem still exists, a Diagnostic Capture needs to be taken and sent to technical support. (Appendix A.5)



#### Appendix A.4 LED Diagnostics for Communications Between ProtoAir and Devices

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





#### Appendix A.5 Taking a FieldServer Diagnostic Capture

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

#### • FieldServer Toolbox:

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

#### • Gateway's FS-GUI Page:

This method doesn't require downloading software. The diagnostic capture utilities are embedded in the FS-GUI web interface. Starting a diagnostic capture takes a snapshot of the loaded configuration files and a log of all the communications over a specified period of time. This works for both serial and Ethernet connections.

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

#### Appendix A.5.1 Using the FieldServer Toolbox

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

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



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



• Step 1: Take a Log

• Click on the diagnose icon

of the desired device

smo	FieldServer Tool	lbox					
	FieldSei	rver Toolbo	x			5	<b>M</b> sierra monitor
	Setup	Help					
	DEVICES	Ð	IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
	ProtoNode		192.168.3.110	00:50:4E:10:2C:92	*	•	Connect

• Ensure "Full Diagnostic" is selected (this is the default)

FieldServer Tool	xoo	SMGierra
Setup Help DEVICES	Device Diagnostics	
	ProtoNode     192.168.3.110       Diagnostic Test     Full Diagnostic.       Snap Shot     Star Shot       Set capture peril Serial Capture     Full Diagnostic.       If Timestamp each character     Enable Message logging       Show advanced options	
	Start Diagnostic Open Containing Folder Close	

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



### o Click on "Start Diagnostic"

<sup>smc</sup> FieldServer Toolbox		
FieldServer Tool	xoo	SMGierra
DEVICES +	Sime Device Diagnostics	EAVORITE CONNECTIVITY
ProtoNode	Device Diagnostics	* Connect
	ProtoNode 192.168.3.110	
	Diagnostic Test Full Diagnostic   Set capture period  Timestamp each character  Enable Message logging  Show advanced options	
	Start Diagnostic Open Containing Folder Close	

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

FieldServer Toolbox		
FieldServe	er Toolbox	SM
Setup H	str Device Diagnostics	
DEVICES	Device Diagnostics	FAVORITE CONNECTIVITY
FIOLONOUE		Connect
	ProtoNode 192.168.3.110	
	Smc Diagnostic Test Complete	
	Diagnostic 2015-02-18 J2-28.zip Do you want to open the containing folder?	Cancel
	Start Diagnostic Open Containing Folder	
	COL	

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

Diagnostic_2014-07-17_20-15.zip	2014/07/17 20:16	zip Archive	676 KB



#### Appendix A.5.2 Using FS-GUI

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

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

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

Navigation	Diagnostics
<ul> <li>FieldServer Demo</li> <li>About</li> </ul>	Captures
Setup     View     User Messages	Full Diagnostic
Diagnostics	Set capture period (max 1200 secs):
	300 Start
	Serial Capture
	Set capture period (max 1200 secs):
	300 Start
Home HELP (F1) Contact Us	

- 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

Full Diagnostic	
Set capture period (max 1200 secs):	
300	
100% Complete	
Start Download	

- Click Download for the capture to be downloaded to the local PC.
- Send the diagnostic zip file to technical support (sales@chromalox.com).
- NOTE: Diagnostic captures of BACnet MS/TP communication are output in a ".PCAP" file extension which is compatible with Wireshark.

#### Appendix A.6 Wi-Fi Signal Strength

Wi-Fi		
<60dBm – Excellent		
<70dBm – Very good		
<80dBm – Good		
>80dBm – Weak		
Figure 47: Wi-Fi Signal Strength Listing		

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

Appendix A.7 Factory Reset Instructions

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

Appendix A.8 Internet Browsers Not Supported

• Internet Explorer 11 and prior versions

#### Appendix B Additional Information

#### Appendix B.1 Updating Firmware

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

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

Appendix B.2 BACnet: Setting Network\_Number for More Than One ProtoAir on the Subnet

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

On the main Web Configuration screen, update the BACnet Network Number field and click submit. The default value is 50.

network_nr	<b>BACnet Network Number</b> This sets the BACnet network number of the Gateway. (1 - 65535)	50	Submit	
Figure 48: Web Configurator – Network Number Field				



#### Appendix B.3 Securing ProtoAir with Passwords

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

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

The password needs to be a minimum of eight characters and is case sensitive.

If the password is lost, click cancel on the password authentication popup window, and email the password recovery token to technical support to receive a temporary password from the customer support team. Access the ProtoAir to set a new password.

Navigation	Passwords		
ProtoNode Demo     About	Overview		
<ul> <li>Setup</li> <li>File Transfer</li> <li>Network Settings</li> <li>Passwords</li> <li>Time Settings</li> <li>Manual Settings</li> </ul>	Note The current Admin password (if set) is required to change all passwords. To disable password protection, set an empty Admin password. IMPORTANT: You may be required to log in again after changing a password.		
<ul> <li>View</li> <li>User Messages</li> </ul>	Account Name     Admin       Current Admin Password		
Home HELP (F1) Contact Us			
Figure 49: FS-GUI Passwords Page			





#### Appendix B.4 Wi-Fi Access Point Network Settings

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

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

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

- Click Update Wi-Fi Settings, then click on the System Restart to restart the Gateway and activate the Wi-Fi settings.
- NOTE: If the FS-GUI was open in a browser via Wi-Fi, the browser will need to be updated with the new Wi-Fi details before the ProtoAir FS-GUI will be accessible again.

IP Settings	WiFi Client WiFi AP Cell	ular Common
lote		
Ipdated settings will ta	ke effect immediately. If SSID broadcast is o	isabled you will not be able to discover the access point.
	Access Point Status	ENABLED V
	Access Point SSID	ProtoAir-60000E
	Access Point Password	12345678
	SSID Broadcast	ENABLED V
	Channel	11 🔻
	Access Point IP Address	192.168.50.1
	Access Point Netmask	255.255.255.0
	Access Point IP Pool Address Start	192.168.50.120
	Access Point IP Pool Address End	192.168.50.130
	Cancel	Update WiFi Settings
	Connection Status	Enabled
	Access Point MAC Address	a4:08:ea:4e:54:62
	Access Point Tx Msgs	0
	Access Point Rx Msgs	0
	Access Point Tx Msgs Dropped	0

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



## Appendix B.5 Mounting

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





### Appendix B.6 Physical Dimension Drawing





#### Appendix B.7 SMC Cloud Connection Warning Message

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



- Follow the directions presented in the warning message.
  - Go to the network settings by clicking the Settings tab and then click the Network tab
  - o Check with the site's IT support that the DNS settings are setup correctly
  - Ensure that the ProtoAir is properly connected to the Internet
- NOTE: If changes to the network settings are done, remember to click the Save button. Then power cycle the ProtoAir by clicking on the Confirm button in the window and click on the bolded "Restart" text in the yellow pop-up box that appears in the upper right corner of the screen.



#### Appendix B.8 System Status Button

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

	System Status Profile -
Device List	$\equiv$ System View
Z Data Log Viewer	
🛱 Event Log	
SMC Cloud <sup>TM</sup>	
Q <sup>e</sup> Settings >	
A About	

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.

	System Status		
Resource Usage			
CPU Load	RAM Usage	Disk Usage	
	0		
19%	136 / 254 MB	130 / 456 MB	
<ul> <li>System running smoothly</li> </ul>			
SMC Cloud Device is not registered on SM	1C Cloud		
System View			
<ul> <li>All devices in normal state</li> </ul>			
			Close

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



### Appendix C Vendor Information – Chromalox

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



#### Appendix D Reference

#### Appendix D.1 Specifications



	ProtoAir FPA-W44 <sup>3</sup>		
Electrical Connections	One 3-pin Phoenix connector with: One 3-pin Phoenix connector with: One 3-pin Phoenix connector with: One Ethernet 10/100 BaseT port	RS-485/RS-232 port (TX+/RX-/gnd) RS-485 (Tx+/Rx-/gnd) Power port (+/-/Frame-gnd)	
Power Requirements	ts Input Voltage: 9-30VDC or 24VAC Current draw: 24VAC 0.12 Max Power: 3 Watts 9-30VDC 0.25A @ 12V		
Approvals	Is CE and FCC Class B & C Part 15, UL 60950, WEEE compliant, IC Canada, RoHS compliant		
Physical Dimensions	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 Antenna Type: SMA	Channels: 1 to 11 (inclusive) Encryption: TKIP, WPA & AES	
Figure 55: Specifications			

#### Appendix D.1.1 Compliance with UL Regulations

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

- The units shall be powered by listed LPS or Class 2 power supply suited to the expected operating temperature range.
- The interconnecting power connector and power cable shall:
  - Comply with local electrical code
  - Be suited to the expected operating temperature range
  - Meet the current and voltage rating for ProtoAir
- Furthermore, the interconnecting power cable shall:
  - Be of length not exceeding 3.05m (118.3")
  - Be constructed of materials rated VW-1, FT-1 or better
- If the unit is to be installed in an operating environment with a temperature above 65 °C, it should be installed in a Restricted Access Area requiring a key or a special tool to gain access.
- This device must not be connected to a LAN segment with outdoor wiring.

<sup>&</sup>lt;sup>3</sup> Specifications subject to change without notice.

#### Appendix E Limited 2 Year Warranty

Sierra Monitor Corporation warrants its products to be free from defects in workmanship or material under normal use and service for two years after date of shipment. Sierra Monitor Corporation will repair or replace any equipment found to be defective during the warranty period. Final determination of the nature and responsibility for defective or damaged equipment will be made by Sierra Monitor Corporation personnel.

All warranties hereunder are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without Sierra Monitor Corporation's approval or which have been subjected to accident, improper maintenance, installation or application, or on which original identification marks have been removed or altered. This Limited Warranty also will not apply to interconnecting cables or wires, consumables or to any damage resulting from battery leakage.

In all cases Sierra Monitor Corporation's responsibility and liability under this warranty shall be limited to the cost of the equipment. The purchaser must obtain shipping instructions for the prepaid return of any item under this warranty provision and compliance with such instruction shall be a condition of this warranty.

Except for the express warranty stated above, Sierra Monitor Corporation disclaims all warranties with regard to the products sold hereunder including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of Sierra Monitor Corporation for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the product.