





ProtoAir FPA-W44 Start-up Guide

For Interfacing Chiltrix Products:

Chiller, Fan_Coils, Fan_Coils_Prior

To Building Automation Systems:

BACnet MS/TP, BACnet/IP, Modbus TCP/IP, Modbus RTU and Cloud

APPLICABILITY & EFFECTIVITY

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

> Document Revision: 1.C Web Configurator Template Revision: 3

Technical Support

Thank you for purchasing the ProtoAir for Chiltrix.

Please call or email us for technical support of the ProtoAir product.

Support Contact Information:

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Customer Service:

(757) 410-8640

Email: info@chiltrix.com

Website: <u>www.chiltrix.com</u> www.hotspotenergy.com

Synopsis

The ProtoAir Gateway ships with device profiles pre-programed. It is set up as a Wi-Fi Access Point (AP) so it can be found with a Wi-Fi enabled Laptop to get the registration process started.

The first step is the physical layer. Once the unit is wired to your Chiller and any other Modbus Enabled products, perhaps, even a Psychrologix controller, then power can be applied to the system. The power LED should glow. The Psychrologix Controller should function as normal, passing all communications traffic through the ProtoAir Gateway to the Chiller(s) and any other Modbus enabled items. At this point one should see much activity in the Transmit and Receive LEDs on the unit and the SS LED should blink about once every second.

The next step is to connect the laptop (pc) to the gateway though the unit's Wi-Fi Access Point (AP). Once this connection is made, the profile(s) loaded aboard the gateway can be activated. At this point, your chiller can be monitored and to a large degree, controlled by your laptop.

The third step is to setup the Network configurations to permit the gateway to gain direct access to your Wi-Fi router making it a Wi-Fi client, capable of its own communication thought your network and out to the internet, without the laptop, providing remote control and monitoring of you system.

Using the Cloud, one can monitor, graph and analyze your system's function and to trouble shoot any issues. Alarms can be set. Control commands can be issued and all systems can be monitored from anywhere in the world or from a BAS via BACnet-iP or BACnet-MSTP.

Quick Start Guide

- 1. Record the information about the unit. (Section 3.1)
- 2. Configure COM settings for the device to connect to the ProtoAir. (Section 3.3)
- 3. Connect the ProtoAir 3 pin RS-485 R1 port to the RS-485 network connected to each of the devices. (Section 4.1)
- 4. 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 or by the ProtoAir's Wi-Fi Access Point. (Section 5)
- 7. 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 6)

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1 CERTIFICATION

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



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

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

¹ BACnet is a registered trademark of ASHRAE

2 INTRODUCTION

2.1 ProtoAir Gateway

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

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 the Cloud. The Cloud allows technicians, the OEM's support team and the Chiltrix support team to remotely connect to the ProtoAir. The 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 Cloud Dashboard and the 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.

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-W44-1841		
Figure 1: ProtoA	ir Part Numbers		

• FPA-W44 units have the following 3 ports: RS-485 + Ethernet + RS-485

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-W44-1841	5,000	
Figure 2: Supported Point Count Capacity		

Devices	Registers Per Device
Chiller	203
Fan_Coils	37
Fan_Coils_Prior	29
Figure 3: Regis	ters per Device

3.3 Configuring Modbus Device Communications

- 3.3.1 Input COM Settings on Any Device Connected to the ProtoAir
 - Any connected serial device MUST have the same baud rate, data bits, stop bits, and parity settings as the ProtoAir.
 - Figure 4 specifies the device serial port settings required to communicate with the ProtoAir.

Port Setting	Device	
Protocol	Modbus RTU	
Baud Rate	9600	
Parity	None	
Data Bits	8	
Stop Bits	1	
Figure 4: C	OM 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 6.3)
- NOTE: The Modbus TCP/IP field protocol Node-IDs are automatically set to be the same value as the Node-ID of the device.

3.4 Attaching the Antenna

Wi-Fi Antenna:

Screw in the Wi-Fi antenna to the front of the unit as shown in Figure 46.

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. This port is for the CX-34(s) (A="+" and B="-" terminals), V-18 controller (if applicable), or any other Modbus slave devices.

NOTE: Use standard grounding principles for 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 6). This port connects to the Psychrologix controller's A+/B- terminals (if applicable).
 - Use standard grounding principles for RS-485 GND
- See **Section 5** for information on connecting to an Ethernet network.



NOTE: The ProtoAir will act as a Modbus master and connect to the Modbus RTU slave devices on the R1 port. If there is an additional Modbus master, such as the Psychrologix Controller, this master will connect to the R2 port of the ProtoAir and can poll all of the Modbus RTU slave devices through the ProtoAir.

4.3 Bias Resistors



To enable Bias Resistors, move both the BIAS- and BIAS+ dip switches to the right as shown in Figure 7.

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 8.

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	24V DC/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 9: Required Current Draw for the ProtoAir			

Apply power to the ProtoAir as shown below in **Figure 10. Note:** the power supply that comes with the unit has hash marks on one of the wires, this indicated "Negative (-).



Ensure that the power supply used complies with the specifications provided in Appendix D.1.

- The ProtoAir accepts 12-24VDC or 24VAC on pins L+ and N-.
- Frame GND should be connected.

			ds only
Power to ProtoAir	ProtoAir Pin Label	Pin Assignment	
Power In (+)	L+	V +	
Power In (-)	N -	V -	+
Frame Ground	FG	FRAME GND	
	Figure 10	Power Connection	ons

5 **CONNECT THE PC TO THE PROTOAIR**

There are two ways to connect the PC to the ProtoAir, either by Ethernet cable (Section 5.1) or Wi-Fi Access Point (Section 5.2).

5.1 Connecting to the ProtoAir via Ethernet (skip this section if your PC has Wi-Fi)

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



5.1.1 Enable Access Through the Local Browser

There are two methods to enable access to the ProtoAir in the local browser, either by changing the subnet of the connected PC (Section 5.1.1.1) or using the FieldServer Toolbox to change the IP Address of the ProtoAir (Section 5.1.1.2).

NOTE: Only perform one method or the other.

5.1.1.1 Changing the Subnet of the Connected PC

The default IP Address for the ProtoAir is 192.168.1.24, Subnet Mask is 255.255.255.00. 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 [1]) 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.

5.1.1.2 Changing the IP Address of the ProtoAir with FieldServer Toolbox

- Ensure that FieldServer Toolbox is loaded onto the local PC. Otherwise, download the FieldServer-Toolbox.zip via the Chiltrix website.
- Extract the executable file and complete the installation.
- Double click on the FS Toolbox Utility and click Discover Now on the splash page.
- Find the desired gateway and click the Configure Device button (gear icon) to the right of the gateway information.

NOTE: If connectivity status is green, then the IP Address doesn't need to be changed (the ProtoAir is already on the same subnet). Skip the rest of the section and go to Section 6.

I ICIUSCI V	er To	olbox				
Setup Help						
DEVICES	۲	IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
DCC085 QS.CSV v4	1.10c	192.168.3.201	00:50:4E:30:05:16	*	•	Connect Q

• Select Network Settings in the Configure Device window.

Configure Device					
DCC085 QS.CSV v4.10c 192.168.3.201					
Network Settings					
Restart Device					
File Transfer					
Set Device Time					
Close					

- Modify the IP Address (N1 IP Address field) of the gateway Ethernet port.
 - Change additional fields as needed

Device Network Settings			
DCC085 QS.CSV v4.10c	192.168.3.201		
N1 IP Address	192.168.3.201		
N1 Netmask	255.255.255.0		
N1 DHCP Client State	Disabled 🔹		
N1 DHCP Server State	Disabled 💌		
N1 Default Gateway	192.168.3.1		
Domain Name Server1	8.8.8.8		
Domain Name Server2	8.8.4.4		
Cancel	Update IP Settings		

- NOTE: If the gateway is connected to a router, the Default Gateway field of the gateway should be set to the IP Address of the connected router.
- NOTE: Do not change the DHCP Server State (N1 DHCP Server State field).
- NOTE: If DNS settings are unknown, set DNS1 to "8.8.8.8" and DNS2 to "8.8.4.4".
 - Click Update IP Settings, then click the "Change and restart" button to reboot the Gateway and activate the new IP Address. See the <u>FieldServer Toolbox and GUI Manual</u> for more information.

5.2 Connecting to the ProtoAir Over Wi-Fi Access Point (Preferred Method)

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:

- Click the fill icon (found in the bottom-right corner of the computer screen) to open the available Wireless Network Connections.
- Select the desired ProtoAir and click Connect.

Wireless Network Connection	
SMC_WLAN	Connected
FieldSVR	llter
ProtoAir-600025	llte
Connect automaticall	y <u>C</u> onnect
SMC_Guest	llter
ProtoAir-6000B0	llter
DIRECT-74-HP M452 Las	erJet

• Enter the Security key. The default is 12345678.

🝄 Connect to a Net	work		
Type the netwo	ork security key		
Security key:	12345678		
	<u>H</u> ide characters		
		OK Cancel	

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

Currently connected to:	43
ProtoAir-60001B No Internet access	
Wireless Network Connection	^
ProtoAir-60001B Connected	للده
SMC_WLAN	ألاده
ProtoAir-600032	أللده
SMC_Guest	للاه

6 CONFIGURE THE PROTOAIR

6.1 Accessing the ProtoAir Web Configurator

- Navigate to the IP Address of the ProtoAir on the local PC using one of two methods:
 - Open a web browser and enter the IP Address of the ProtoAir; the default Ethernet address is 192.168.1.24, the default Wi-Fi Access Point address is 192.168.50.1
 - If using the FieldServer Toolbox (Section 5.1.1.2), click the Connect button
- 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.



• 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 Required http://192.168.3.244 requires a username and password.				
User Name: Password:				
Log In Cancel Figure 13: Login Window				

• From the Web App landing page (Figure 14), click the Settings tab and then click Configuration.

Chiltrix	💄 Profile 🔻		
Device List	\equiv System View		
🛃 Data Log Viewer			
🛗 Event Log			
■ SMC Cloud™			
©₿ Settings >			
About			
Copyright © Chiltrix 2019 All Rights Reserved - Diagnostics			
Figure 14: Web App Landing Page			

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

Chiltrix	🔒 Profile	•	
🙆 Device List	■ Configuration		
🗠 Data Log Viewer			
🖰 Event Log	Profile Configuration Page		
SMC Cloud™	Profiles Configuration		
Q ⁸ ₈ Settings ∨			
Configuration			
Virtual Points	Reset Application		
Network	Warning: This will remove all data from the device		
About	Reset Application		
Copyright © Chiltrix 2019 All Rights Reserved - Diagnostics			
Figure 15: Configuration Tab			

- This opens up a new tab in your browser named "Gateway Profile Configuration".
- NOTE: The Cloud tab see Figure 15) allows users to connect to the Cloud which enables secure remote connection to field devices through a FieldServer and its local applications for configuration, management, maintenance.

6.2 Setting ProtoAir Configuration Parameters

Select the field protocol by entering the appropriate number into the Protocol Selector Value and clicking the Submit button. Wait for the system to reset as the configuration is updated.

Configuration Pa	rameters		
arameter Name	Parameter Description	Value	
rotocol_select	Protocol Selector Set to 1 for BACnet IP/Modbus TCP/Modbus RTU Set to 2 for BACnet MSTP	2	Submit
od_baud_rate	Modbus RTU Baud Rate This sets the Modbus RTU baud rate. (9600/19200/38400/57600)	9600	Submit
od_parity	Modbus RTU Parity This sets the Modbus RTU parity. (None/Even/Odd)	None	Submit
od_data_bits	Modbus RTU Data Bits This sets the Modbus RTU data bits. (7 or 8)	8	Submit
od_stop_bits	Modbus RTU Stop Bits This sets the Modbus RTU stop bits. (1 or 2)	1	Submit
etwork_nr	BACnet Network Number This sets the BACnet network number of the Gateway. (1 - 65535)	50	Submit
ode_offset	BACnet Node Offset This is used to set the BACnet device instance. The device instance will be sum of the Modbus device address and the node offset. (0 - 4194303)	50000	Submit
ac_mac_addr	BACnet MSTP Mac Address This sets the BACnet MSTP MAC address. (1 - 127)	127	Submit
ac_baud_rate	BACnet MSTP Baud Rate This sets the BACnet MSTP baud rate. (9600/19200/38400/76800)	38400	Submit
ac_max_master	BACnet MSTP Max Master This sets the BACnet MSTP max master. (1 - 127)	127	Submit
ac_cov_option	BACnet COV This enables or disables COVs for the BACnet connection. Use COV_Enable to enable. Use COV_Disable to disable. (COV_Enable/COV_Disable)	COV_Disable	Submit
ic_virt_nodes	BACnet Virtual Server Nodes Set to NO if the unit is only converting 1 device to BACnet. Set to YES if the unit is converting multiple devices. <i>(No/Yes)</i>	No	Submit
Active profiles			
Node ID Curre	nt profile Parameters		
ELP (?) Networ	k Settings Clear Profiles and Restart System Rest	art	Diagnostics & Debug

NOTE:

- 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 16)
- 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, enter the value of the device's Node-ID which was assigned in **Section 3.3.2**. For a single Chiltrix Chiller, this Node-ID is the units Modbus RTU address, usually "1". If more than one (up to three total) then the addresses would be "1, 2 and 3", for example, related with multiple copies of the desired profile.

Nr Node ID Current profile Parameters BAC_MSTP_Chiller Submit BAC_MSTP_Chiller Cancel BAC_MSTP_Fan_Coils BAC_MSTP_Fan_Coils Diagnostics & Debuggin HELP (?) Network Sector (get) System Restart	Active profiles			
BAC_MSTP_Chiller Submit BAC_MSTP_Chiller Cancel BAC_MSTP_Fan_Coils Cancel HELP (?) Network sectorings System Restart Diagnostics & Debugging	Nr Node ID Currer	nt profile Par	rameters	
	BAC_N BAC_N BAC_N BAC_N BAC_N	MSTP_Chiller MSTP_Chiller MSTP_Fan_Coils MSTP_Fan_Coils_Prior offiles and Restart	System Restart	Submit Cancel
Figure 17: Profile Selection Monu		Eiguro 17: Pro	file Selection Monu	

- 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 18.

Ac	Active profiles				
Nr	Node ID	Current profile	Parameters		
1	1	BAC_MSTP_Chiller		Remove	
2	22	BAC_MSTP_Fan_Coils		Remove	
3	33	BAC_MSTP_Fan_Coils_Prior		Remove	
Ad	Add				
HEL	HELP (?) Network Settings Clear Profiles and Restart System Restart Diagnostics & Debugging				
	Figure 18: Web Configurator Showing Active Profile Additions				

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.

 At this point, if you return to the "System View" tab on your browser, you will now see your Chiller and some of its parameters. Clicking on the Chiller Name opens up all the available Data Registers and all available live data can be viewed, and some data can be changed effectively giving you direct access to control of your system.

6.2.1 Verify Device Communications

- 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.

6.3 BACnet: Setting Node_Offset to Assign Specific Device Instances

- Follow the steps outlined in Section 6.1 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 to all devices 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 This is used to set the BACnet device instance	0		
node_offset	The device instance will be sum of the node id and the node offset. (0 - 4194303)	50000	Submit	
Figure 19: Web Configurator Node Offset Field				

Ac	Active profiles				
Nr	Node ID	Current profile	Parameters		
1	1	BAC_MSTP_Chiller		Remove	
2	22	BAC_MSTP_Fan_Coils		Remove	
3	33	BAC_MSTP_Fan_Coils_Prior		Remove	
Ac	Add				
HEI	HELP (?) Network Settings Clear Profiles and Restart System Restart Diagnostics & Debugging				
	Figure 20: Active Profiles				

6.4 How to Start the Installation Over: Clearing Profiles

- Follow the steps outlined in **Section 6.1** 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.
- Note: This will not remove the profiles loaded on the gateway itself; it only removes access to these profiles from the browser and GUI. These profiles can be reactivated at any time and reassigned to the active list.

7 NETWORK SETTINGS

7.1 Navigate to the FS-GUI Network Settings

- Open the FS-GUI page.
 - From the Web App landing page, click the word "Diagnostics" found in blue at the bottom of the screen



• From the Web Configurator page, click on the blue "Diagnostics & Debugging" button in the bottom right corner of the screen



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

avigation	CN1841 Chiltrix Inc. v1.00a		
CN1841 Chiltrix Inc. v1.00a	Status Settings	Info Stats	
About	·		
> Setup	Status		
> View	Name	Value	
 User Messages 	Driver_Configuration	DCC000	
 Diagnostics 	DCC_Version	V6.05p (A)	
	Kernel_Version	V6.49d (A)	
	Release_Status	Normal	
	Build_Revision	4.40.7	
	Build_Date	2019-02-27 13:20:49 +0200	
	Platform_Name	*	
	BIOS_Version	2.2.0	
	FieldServer_Model	ProtoAir-Cellular	
	Serial_Number		
	Carrier Type		
	Data_Points_Used	122	
	Data_Points_Max	10000	
	Application Memory:		

- 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.

	5									
✓ Gateway										
•	About									
~	Setup									
	 File Transfer 									
	 Network Settings 									
	 Passwords 									
	 Time Settings 									
>	View									
•	User Messages									
•	Diagnostics									

7.2 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 7.2.1).
- When connecting the ProtoAir to a local wireless access point, configure the Wi-Fi Client Settings in the ProtoAir (Section 7.2.2).

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

7.2.1 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	
lote					
Ipdated settings w .ddress.	rill take effect immed	diately. If the IP Ac	ldress is changed y	ou will need to direct your br	owser to the new IP
	N1 IP	Address	1	92.168.3.28	
	N1 Ne	tmask	2	55.255.255.0	
	N1 DH	CP Client State	L	DISABLED V	
	Defaul	t Gateway	1	92.168.3.1	
	Domai	n Name Server1	1	0.5.4.226	
	Domai	n Name Server2	1	0.5.4.227	
	Ca	ncel		Update IP Settings	
	Conne	ction Status	C	onnected	
	Etherr	et MAC Address	0	0:50:4E:60:00:0E	
	Etherr	iet Tx Msgs	1	11601	
	Etherr	iet Rx Msgs	2	54289	
	Ethern	et Tx Msgs Droppe	d 0		
	Etherr	iet Rx Msgs Droppe	ed 0		

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

7.2.2 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 access point.
- 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 7.2.3) to set the Primary Connection to Wi-Fi Client.

IP Settings	WiFi Client WiFi AP	Cellular	Common	
lote				
pdated settings wil ddress.	II take effect immediately. If the I	IP Address is changed ye	ou will need to direct your browser to th	e new IP
	WiFi Status		ENABLED V	
	WiFi SSID	SI	IC_WLAN	
	WiFi Password	SI	3rr@M0n1tor	
	WiFi DHCP Client Sta	ite	ENABLED V	
	WiFi IP Address	10	.5.5.76	
	WiFi Netmask	25	5.255.254.0	
	WiFi Default Gateway	y 10	.5.4.203	
	WiFi Domain Name S	Server1 10	.5.4.226	
	WiFi Domain Name S	Server2 10	.5.4.227	
	Cancel	U	odate WiFi Settings	
	Connection Status	Co	onnected	
	WiFi MAC Address	a	:08:ea:4e:54:62	
	WiFi BSSID	92	:2a:a8:c7:38:1a	
	WiFi Channel	24	37	
	WiFi Tx Msgs	12	0	
	WiFi Rx Msgs	37	7	
	WiFi Tx Msgs Droppe	ed 0		
	WiFi Rx Msgs Droppe	ed 0		
	WiFi Pairwise Cipher		CMP	
	WiFi Group Cipher	C	CMP	
	WiFi Key Mgmt	w	PA2-PSK	
	WiFi Link	73	.2 MBit/s MCS 7 short	
		-		

Figure 26: 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)

7.2.3 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 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.

	WiFi Client	WiFi AP	Cellular	Common	
lote					
Ipdated settings w rimary connection thernet or WiFi w	ill take effect immec will be the connecti nen active	liately. Common setting on which has internet a	s will be applied ccess. Cellular v	d to WiFi Client, WiF vill take preference,	i AP and Cellular if supported. The as the primary connection, over
	Primar Cat	y Connection ncel	Update	Ethernet Common Settings	
	Active	Primary Connection	Eth	ernet	
	Active	Default Gateway	192	2.168.3.1	
	Active	Domain Name Server1	10.	5.4.226	
		Domain Name Server?	10	5.4.227	
	Active	Domain Name Server2	201		

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.

8 CLOUD USER SETUP, REGISTRATION AND LOGIN

8.1 User Setup

Request an invitation to Cloud from the manufacturer's support team and follow the instructions below to set up login details: Request from <u>info@chiltrix.com</u>

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

notifications@fieldp	op.io	2:20 PM (16 minutes ago)
to me 💌		
Please co	omplete SMC Cloud registr	ation
Hello from	Sierra Monitor,	
You're one cloud for r	e step closer to IIoT-empowering emote connectivity.	your devices with the SMC Cloud device
Click the li	nk below to complete SMC Cloud	d registration.
	Complete I	Registration
Sincerely,		

NOTE: If no 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 the email cannot be 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	
= - (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	*
* M:	andatory Fields
Save Cancel	
Figure 28: 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" on when the Success message appears.
- Record the email account used and password for future use.

8.2 Registration Process

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

• Click on the Cloud tab on the left-hand side of the screen.

Chiltrix											♣ Profile ▼
Device List	\equiv	System View									
🗠 Data Log Viewer											
🛱 Event Log		Chiller									
SMC Cloud™		Name	Address	Location	Description	Usage Side Water Flow Volume	Compressor Frequency	Compressor Total Running Time	DHW Current Temp	AC Heating Current Temp	AC Cooling Current Temp
O ^o Settings		BAC_MSTP_Chiller_1_	1	TBD	TBD	0	0	0	0	0	0
Configuration											
Virtual Points		Fan Coils									
Network		Name		Address	Location	Description	Room Terr	np Coil Ten	np Curr	rent Fan Speed	Pulse Flow Of Fan
About		BAC_MSTP_Fan_Coils_2	2_	22	TBD	TBD	0	0	0		0
		Fan Coils Prior									
		Name		Address	Location	Description	Cooling Set Temp	Heating Set Temp	Room Temp	Coil Temp	Fan Revolution
		BAC_MSTP_Fan_Coils_P	rior_33_	33	TBD	TBD	0	0	0	0	0
				Copyrigh	t © Chiltrix 2019 All F	Rights Reserved - D	iagnostics				
			Figur	e 29: Web	App Lan	ding Pag	je – Clou	Id Tab			

• The following informational splash page will appear, click Close to view the registration page.



- If a warning message appears instead of the splash page, follow the suggestion that appears on screen.
- If the ProtoAir cannot reach the Cloud server, the following message will appear.



• Follow the directions presented in the warning message and check that the DNS settings are set up with the following Domain Name Server (DNS) settings:

DNS1=8.8.8.8

DNS2=8.8.4.4

- Ensure that the ProtoAir is properly connected to the Internet
- NOTE: If changes to the network settings are done, remember to click "Update IP Settings" and then power cycle the ProtoAir.

• On the registration page, fill in user credentials and all other device information fields for registration of each individual ProtoAir in the field.

Register this FieldServer on FieldPoP™						
New Users						
If you do not have FieldPoP credenti	als, you can create a new FieldPoP account now Create a FieldPoP account					
Existing Users - Enter device registration de	tails					
User Credentials						
Username						
Password	Invalid value : Please enter a username Invalid value : Please enter a password					
Device Details						
Device Name	Test Bridge					
Device Description	OEM FieldPoP test bridge					
Device Location						
Automatically get current location Get Current Location Enter the address and get device location Enter place here Latitude: Longitude:	on					
	Register Device					
Fig	ure 32: Cloud Registration Page					

- To input the device location, do one of the following:
 - o Enter the address in the address field
 - Click the "Get Current Location" button to auto-populate
- NOTE: This button will only work if location services have been enabled on the local browser. If using the Chrome browser and connected via LAN, this method will not work.
 - Drop a location directly on the Google map
 - Enter the latitude and longitude manually
 - Click Register Device.
 - Once the device has successfully been registered, the following screen will appear listing the device details and additional information auto-populated by the ProtoAir.

Register this device on FieldPoP™

Device Registered

Device Name: Winterfell Group

Device Description: Demo - Winterfell Group

Device Location: 56.185263, -4.050275

MAC Address: 00:50:4E:11:1B:4A

Tunnel Server URL: tunnel.fieldpop.io

Device ID: pepperminthawk_V1IFzf-6I

Product Name: test

Product Version: 0.0.5

Update Device Details

8.3 Login to Cloud

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

÷	e c	Secure https://www.fieldpop.io/	fieldpop_user_mgr/#/login	o+ ☆ :
			Email address	
			admin@sierramonitor.com	
			Password	
			Keep me logged in Forgot Password?	
			Figure 33: Cloud Login Page	

Be sure to check the "Keep me logged in" box.

NOTE: If the login password is lost, contact Chiltrix 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 Cloud.

Privacy Policy	
We've updated our Terms of Service and Privacy Policy. Please read it carefully and accept below to continue.	
Continue	
Figure 34: Cloud Privacy Policy	

Figure 35: Cloud Landing Page



Appendix A Troubleshooting

Appendix A.1 Lost or Incorrect IP Address

- Ensure that FieldServer Toolbox is loaded onto the local PC.
- 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						68
FieldServe	r Toolbox					
Setup He	lp .					
DEVICES	۲	IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
ProtoNode		192.168.3.110	00:50:4E:10:2C:92	*	•	Connect O 4-

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

Appendix A.2 Viewing Diagnostic Information

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

						FieldPoP [*]
Navigation CN1841 Chiltrix Inc. v1.00a About Setup	Connections Overview					
 View Connections R1 - MODBUS_RTU Data Arrays Nodes Map Descriptors User Messages Diagnostics 	0 R1 - MODBUS_RTU	Tx Msg 39	Rx Msg 0	Tx Char 312	Rx Char 0	Errors 39
	Figure 3	7: Error Mess	ages Scree	en		

Appendix A.3 Checking Wiring and Settings

- No COMS on Modbus RTU side. If the Tx/Rx LEDs are not flashing rapidly then there is a COM issue. To fix this, check the following:
 - Visual observations of LEDs on ProtoAir (Appendix A.4)
 - Check baud rate, parity, data bits, stop bits
 - Check Detector ID matches the correct device
 - Verify wiring
 - Verify the device was listed under the Web Configurator Active Profiles (**Section 6.2**)
- 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.
- 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 ٠
 - Click on the diagnose icon
 of the desired device

FieldServer Toolt	box					
FieldSer	ver Toolbox					
Setup	Help					
DEVICES		IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
ProtoNode		192.168.3.110	00:50:4E:10:2C:92	*	•	Connect O 4
FieldServer Toolt	boe					G 8 8
FieldServer Toolt	ver Toolbox					0 0 3
FieldServer Toolt	ver Toolbox					
FieldServer Toolt FieldSer Setup	ver Toolbox Heb	IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	0 D 8
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	ver Toolbox Heb T	IP ADDRESS 19216633110	MAC ADDRESS 00:50:4E10:2C92	FAVORITE	CONNECTIVITY	Correct 0 4
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	ver Toolbox Heb (*	P ADDRESS 1921683310	MAC ADDRESS 00:50:4E:10-2C:92	Favorite	CONNECTIVITY	Correct O 4
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	Heb •	IP ADDRESS 1921683110	MAC ADDRESS 00504E10-2C-92	Favorite *	CONNECTIVITY	Correct 0 4
FieldServer Toolt FieldSer Setup OBVCES ProtoNode	ver Toolbox Heb (*	IP ADDRESS 1921683110	MAC ADDRESS 00:50:4E:10:2C:92	FANORITE	CONNECTIVITY	Correct O 4
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	Heb Toolbox	JP ADDRESS 192.168.3.110	MAC ADDRESS 00:50:4E10:2C:92	FAVORITE	CONNECTIVITY	Correct 04
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	нер •		MAC ADDRESS 00:50:4E10-2C-92	FAVORITE	CONNECTIVITY	Correct 🖉 🏕
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	нер •	IP ADDRESS 192.168.3.110	MAC ADDRESS 00:50:4E10:2C92	favorite *	CONNECTIVITY	Connect O 4
FieldServer Toolt FieldSer Setup DEV/CES ProtoNode	Heb •	IP ADDRESS 1921683110	MAC ADDRESS 00:50:4E10:2C:92	Favorite	CONNECTIVITY	Correct 0 4
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	box ver Toolbox Heb (*	IP ADDRESS 192168.3.110	MAC ADDRESS 00:50:4E10-2C:92	FAVORITE	CONNECTIMITY	Connect O 4
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	Heb •	JP ADDRESS 1921683110	MAC ADDRESS 00:50:4E10:2C92	FAVORITE	CONNECTIVITY	Correct 04
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	Heb Teb	IP ADDRESS 192168-3110	MAC ADDRESS 00:50:4E10:2C92	FAVORITE	CONNECTIVITY	Correct O A
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	Heb Toolbox Heb	JP ADDRESS 192.168.3.110	MAC ADDRESS 00:50:4E:10:2C:92	FAVORITE	CONNECTIVITY	Cornect O 4
FieldServer Toolt FieldSer Setup DEV/CES ProtoNode	Heb *	IP ADDRESS 1921683110	MAC ADDRESS 00:50:4E10:2C:92	FAVORITE	CONNECTIVITY	Correct 04
FieldServer Toolt FieldSer Setup DEVICES ProtoNode	Heb Toolbox Heb	IP ADORESS 192.168.3.110	MAC ADDRESS 00:50:4E10:2C92	FAVORITE	CONNECTIMITY	Connect O 4

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

FieldServer Toolbox Setup Help DEVICES FAVORITE CONNECTIVITY Device Diagnostics Connect ProtoNode PotoNide 192.168.3.110 Diagnostic Test Full Diagnostic Set capture peri Centa Capture Set capture peri Centa Capture Set Capture peri Centa Capture Set Capture peri Centa Capture Set Diagnostic Timestamp each character Enable Message logging Show advanced options Start Diagnostic Open Containing Folder Open Containing Folder Open Containing Folder	ieldServer Toolbox			
Setup Hep DEVICES Connect ProtoNode ProtoNide ProtoNide 192.168.3.110 Diagnostic Test Ful Diagnostic Set capture perificand periods Ful Diagnostic Image: Timestamp each character Enable Message logging Show advanced options Start Diagnostic	FieldServer Tool	box		
ProtoNode	DEVICES +	Device Diagnostics	FAVORITE CONNECTIVITY	
ProtoNiode 192.168.3.110 Diagnostic Test Full Diagnostic Set capture peric Serial Capture Full Diagnostic Image Timestamp each character Enable Message logging Show advanced options Show advanced options Start Diagnostic Open Containing Folder	ProtoNode	Device Diagnostics	* •	Connect
Diagnostic Test Full Diagnostic Snap Shot Set capture perit Serial Capture Full Diagnostic Timestamp each character Enable Message logging Show advanced options Start Diagnostic Open Containing Folder		ProtoNode 192.168.3.110		
Start Diagnostic Open Containing Folder		Diagnostic Test Full Diagnostic Stap Shot Set capture perk Serial Capture Full Diagnostic Timestamp each character Enable Message logging Show advanced options		
Open Containing Folder		Start Diagnostic		
		Open Containing Folder		
Close		Close		

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

• Click on "Start Diagnostic"

smc FieldServer Toolbox			
FieldServer Toolb	xoo		
Setup Help	Smc Device Diagnostics		E.
ProtoNode	Device Diagnostics	* •	Connect
	ProtoNode 192.168.3.110 Diagnostic Test Full Diagnostic Set capture period 0:05:00 Image: Timestamp each character Enable Message logging Show advanced options Start Diagnostic Open Containing Folder Close		

- 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

M FieldServer Toolbox						
FieldServe	er Toolb	ox				
Setup H	lelp					t.
DEVICES	÷	^{smc} Device Diagnostics		FAVORITE	CONNECTIVITY	
ProtoNode		Device D	Diagnostics	*	•	Connect
		ProtoNode	192.168.3.110			
		Discoundia Tarta Eul Discou				
	smc Diagnost	ic Test Complete				
		iagnostic test completed and the iagnostic_2015-02-18_12-28.zip o you want to open the containin	g folder?	Cancel		
		Start D Open Cont	iagnostic			

- \circ $\,$ Choose "Open" to launch explorer and have it point directly at the correct folder
- Send the Diagnostic zip file to technical support (info@chiltrix.com)

Z Diagnostic_2014-07-17_20-15.zip	2014/07/17 20:16	zip Archive	676 KB
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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
 FieldServer Demo About Seturn 	Captures
 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.
 - o 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 (<u>info@chiltrix.com</u>).

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 40: 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, contact Chiltrix

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	BACnet Network Number This sets the BACnet network number of the Gateway. (1 - 65535)	50	Submit		
Figure 41: 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 Setup 	Overview	
 File Transfer Network Settings Passwords Time Settings View 	Note The current Admin password (if set) is required to change all p password. IMPORTANT: You may be required to log in again a	basswords. To disable password protection, set an empty Admin after changing a password.
• User Messages	Account Name	Admin •
	Current Admin Password	
	New Password	
	Confirm New Password	
	Cancel	Update Password
Home HELP (F1) Contact	Us	
	Figure 42: 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.

- 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	Cellular	Common	
lote					
pdated settings will	take effect immedia	ately. If SSID broad	lcast is disabled y	rou will not be able to d	iscover the access point.
	Access F	Point Status		ENABLED V	
	Access F	Point SSID	P	rotoAir-60000E	
	Access F	Point Password	1	2345678	
	SSID Bro Channel	padcast		ENABLED V	
	Access F	Point IP Address	1	92.168.50.1	
	Access F	Point Netmask	2	55.255.255.0	
	Access F	Point IP Pool Addre	ss Start	92.168.50.120	
	Access F	Point IP Pool Addre	ss End	92.168.50.130	
	Cano	cel	U	pdate WiFi Settings	
	Connect	ion Status	E	nabled	
	Access F	Point MAC Address	a	4:08:ea:4e:54:62	
	Access F	Point Tx Msgs	0		
	Access F	Point Rx Msgs	0		
	Access F	Point Tx Msgs Drop	ped 0		
	Access F	Point Rx Msgs Drop	ped 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 C Vendor Information – Chiltrix

NOTE: All field Modbus TCP/IP or Modbus RTU registers are the same as the Modbus RTU registers for the serial device. If this point list is needed, contact technical support. The Modbus node address of the device is also the same as the Modbus RTU node address.

Appendix C.1 Chiller Modbus RTU Mappings to BACnet/IP and BACnet MS/TP

Point Name	BACnet Object Type	BACnet Object ID
Power-Down Recovery Function	BV	1
Single / Three Phase Selection	BV	2
Power Frequency	AV	3
Heat Source Selection	BV	4
Heating Temp Control Method	BV	5
Defrost Method Selections	BV	6
Freecooling Validation	BV	7
Frequency Control Method	BV	8
DHW Validation	BV	9
Air Cond And Heating Validation	BV	10
Air Cond And Cooling Validation	BV	11
DHW Hot Water Temp Hysteresis	AV	12
AC Temp Hysteresis	AV	13
Fan Motor Category	AV	14
Maximum Speed Of The Fan	AV	15
Heating Fan Speed Control Temp Diff	AV	16
Cooling Fan Speed Control Temp Diff	AV	17
Defrost Method	BV	18
Defrost Starting Temp	AV	19
Defrost Interval Time Multiple Rate	AV	20
The First Defrost Interval	AV	21
Defrost Exist Temp	AV	22
Hot Water Frequency Limitation	AV	23
AC Heating Au Mode Highest Temp	AV	24
AC Heating Au Mode Offset Temp	AV	25
Solenoid Valve Function Parameters	BV	26
C4 Water Pump Type Selection	BV	27
Water Pump Working Mode	MV	28
EC Water Pump C4 Minimum Speed	AV	29
C5 Water Pump Type Selection	BV	30
DHW E-Heater Activated Ambient Temp	AV	31
Electric Heating Function	BV	32
AC E-Heater Activated Ambient Temp	AV	33
2nd Heat Source Starting Air Temp	AV	34
AC Anti-Freezing Temp	AV	35
Virus Killing Interval Days	AV	36
Start Virus Killing Time	AV	37
Virus Killing Holding Time	AV	38
Target Temp Of Virus Killing	AV	39
AC Water Flow Switch Type Selection	BV	40
AC Minimum Water Flow	AV	41
Water Src Water Flow Switch Type Sel	BV	42
Lowest Water Flow Of Water Source	AV	43
Air Src Heat Pump Freecooling Func	AV	44
Air Src Freecooling Function	AV	45
Cooling Maximum Set Temp	AV	46
Heating Maximum Set Temp	AV	47
DHW The Highest Set Temp	AV	48
Debugging Fixed Operating Frequency	AV	49
Run Setting Frequency	BV	50
EEV Manually Open Degree (Heating)	AV	51
EEV Manually Open Degree (Cooling)	AV	52
LEV Control Mode	MV	53
Target Overheat Degree (Heating)	AV	54
Larget Overneat Degree (Cooling)	AV	55
Night Mode Validation	AV	56
Night Mode Starting Point	AV	5/
INIGHT Mode Ending Point	AV	58
	AV	59
Use High And Low Pressure Transmitter	AV	60
Tremp Diff to Ctri C4 water Pump Speed	AV	10

Compressor Manufacturar	۸۱/	62
	AV	02
Forced Sterilization	BV	63
System Parameter Recovery	BV	64
Compressor Manufacturer 2	AV	65
Virus Killing Function Validation	BV	66
EEV/ Max Manual Open		67
	AV	67
Defrosting EEV Manual Open	AV	68
AC Electric Heater Power W	AV	69
C Or F Degree	BV	70
Heat Recovery Function Validation	BV	71
AC Roted Voltage		70
	AV	12
AC Heat Transfer Coefficient	AV	/3
AC Voltage Compensation	AV	74
Cooling Inlet Target Temp Range	BV	75
AC Heating Minimum Frequency	AV	76
Own 495 Address		77
Own 465 Address	AV	70
Error Recovery	AV	/8
Switch On/Off	BV	79
Operating Mode	MV	80
AC Cooling Target Temp	AV	81
AC beating Target Temp	۵\/	82
Hot Water Torget Temp		02
	AV	83
AC Heating Au Mode	BV	84
Hot Water Au Mode	BV	85
Out Pipe Temp	AI	86
Compressor Discharge Temp	AI	87
Ambient Temp	A1	00
	Al	00
Suction Temp	AI	89
Plate Heat Exchanger Inlet Temp	AI	90
AC Outlet Water Temp	AI	91
Solar Temp	AI	92
Compressor Current Value	ΔΙ	03
Upage Side Water Flow Volume		04
	AI	94
P03 Status	BI	95
P04 Status	AI	96
P05 Status	AI	97
P06 Status	AI	98
P07 Status	AI	99
P08 Status	A1	100
Poo Status		100
PU9 Status	BI	101
P10 Status	BI	102
High Pressure Switch Status	BI	103
Low Pressure Switch Status	BI	104
Second High Pressure Switch Status	BI	105
Inner Water Flow Switch	BI	106
		100
	AI	107
Overheat Switch Status	BI	108
Outdoor Fan Motor	BI	109
Electrical Valve 1	BI	110
Electrical Valve 2	BI	111
Electrical Valve 3		112
Electrical Valve 4		112
		113
C4Water Pump	BI	114
C5Water Pump	BI	115
C6Water Pump	BI	116
Accum Days After Last Virus Killing	AI	117
Outdoor Modular Temp	ΔΙ	118
Expansion Value 1 Opening Degree	ΛΙ	110
	Al	119
Expansion valve 2 Opening Degree	AI	120
Inner Pipe Temp Display	AI	121
Heating Method 2 Target Temp	AI	122
Run Returning Lubrication Oil Func	BI	123
Fan Type	BI	124
EC Ean Motor 1 Speed	۸I	105
	AI	120
EC Fan Wotor 2 Speed	AI	126
Water Pump Types	BI	127
Water Pump1 Speed	AI	128
Water Pump2 Speed	AI	129
Inductor AC Current Value	AI	130
Driver Working Status Value	ΔΙ	121
		400
Compressor Shut Down Code	AI	132

Driver Allowed Highest Frequency	AI	133
Reduce Frequency Temp Setting	AI	134
Input AC Voltage Value	AI	135
Input AC Current Value	AI	136
Compressor Phase Current Value	AI	137
Bus Line Voltage	AI	138
Fan Shutdown Code	AI	139
Ipm Temp	AI	140
Compressor Total Running Time	AI	141
E-Heater Compensation Power	AI	142
Din6 Ac Heating Mode Switch	BI	143
Din7 AC Cooling Mode Switch	BI	144
DHW Current Temp	AI	145
AC Heating Current Temp	AI	146
AC Cooling Current Temp	AI	147
Error Unit1 Err1	AI	148
Error Unit2 Err2	AI	149
Error Unit3 Err3	AI	150
Error Unit4 Err4	AI	151
Error Unit5 Err5	AI	152
Error Unit5 Err6	AI	153
Comp Discharge High Temp Protection	BI	154
Outdoor Air Temp Sen Error	BI	155
Outer Coil Pipe Temp Sen Error	BI	156
Pipe Returned Gas Sen Error	BI	157
Indoor Refrigerant Pipe Temp Sen Err	BI	158
Coil High Temp Protection	BI	159
Solar Water Temp Sen Error	BI	160
AC Inlet Water Temp Sen Error	BI	161
AC Outlet Water Temp Sen Error	BI	162
DHW Temp Sen Error	BI	163
Indoor Ambient Sen Error	BI	164
Water Src Inlet Water Temp Sen Error	BI	165
Water Src Outlet Temp Sen	BI	166
System Anti Freeze Twice	BI	167
DHW Anti Freeze Twice	BI	168
Discharge Probe Error	BI	169
High Pressure Protection	BI	170
Low Pressure Protection	BI	171
Comp Overheat Protection	BI	172
Over Current Protection	BI	173
Indoor Unit Water Flow Error	BI	174
Outdoor Water Flow Error	BI	175
Miss Phase	BI	176
Wrong Phase	BI	177
Com Error	BI	178
Water Src Anti Freeze	BI	179
Water Src Water Flow Not Enough	BI	180
Voltage Protection	BI	181
Ipm Fault	BI	182
Comp Drive Fault	BI	183
	BI	184
ERR3.0	BI	185
Ipm Overneat	BI	180
PFC Fault	BI	187
DC Bus Overvollage	BI	100
AC Input Over Or Under Veltere	BI	109
AC Input Over Of Under Voltage	BI	190
Tomporature Son, Foult		191
DSO And Mainboard Com Fault		192
Control Roard And Invorter Com Foult		193
Inlet/Outlet Wtr Temp Diff Is Too Big	וט	104
		190
		190
ERR3 13	RI	108
Ctrl Panel Param Are Not Initialized	RI	100
FRR3 15	RI	200
EC. Fan 1 Fault	RI	200
EC Esp 2 Fault	RI	201
Heat Recovery Warning	BI	202
		200

Point Name	BACnet Object Type	BACnet Object ID
Start/Stop	BV	1
On/Off	BV	1
Mode	AV	2
Fanspeed	AV	3
Key Lock	AV	4
Sleep	AV	5
Timer Off	AV	6
Timer On	AV	7
Max Set Temp	AV	8
Min Set Temp	AV	9
Cooling Set Temp	AV	10
Heating Set Temp	AV	11
Cooling Set Temp At Auto Mode	AV	12
Heating Set Temp At Auto Mode	AV	13
Anti-Cooling Wind Setting Temp	AV	14
Start Anti-Hot Wind Function	BV	15
Min Fan Speed Setpoint	AV	16
Use Valve	BV	17
Use Floor Heating	BV	18
Use Fahrenheit	BV	19
Master/Slave	BV	20
Unit Address	AV	21
Start Keyboard Lock Function	BV	22
Start RC Func When Keyboard Locked	BV	23
Input Password When Keyboard Locked	BV	24
Keyboard Lock Password	AV	25
Reconfirm Keyboard Lock Password	AV	26
Working Fan Status	MV	27
Room Temp	AI	28
Coil Temp	AI	29
Current Fan Speed	AI	30
Pulse Flow Of Fan	AI	31
Electromagnetic Valve	BI	32
Remote On/Off	BI	33
Simulation Signal	AI	34
Fan Speed Signal Feedback Fault	BI	35
Room Temp Sensor Fault	BI	36
Coil Temp Sensor Fault	BI	37

Appendix C.2 Fan_Coils Modbus RTU Mappings to BACnet/IP and BACnet MS/TP

Appendix C.3 Fan_Coils_Prior Modbus RTU Mappings to BACnet/IP and BACnet MS/TP

Point Name	BACnet Object Type	BACnet Object ID
Start/Stop	BV	1
On/Off	BV	1
Mode	MV	2
Fanspeed	MV	3
Timer Off	AV	4
Timer Off	AV	5
Max Set Temp	AV	6
Min Set Temp	AV	7
Cooling Set Temp	AV	8
Heating Set Temp	AV	9
Cooling Set Temp At Auto Mode	AV	10
Heating Set Temp At Auto Mode	AV	11
Anti-Cooling Wind Setting Temp	AV	12
Start Anti-Hot Wind Function	BV	13
Start Ultra-Low Wind Function	BV	14
Use Vavle	BV	15
Use Floor Heating	BV	16
Use Fahrenheit	BV	17
Master/Slave	BV	18
Unit Address	AV	19
Room Temp	AI	20
Coil Temp	AI	21
Current Fan Speed	MI	22
Fan Revolution	AI	23

Electromagnetic Valve	BI	24
Remote On/Off	BI	25
Simulation Signal	AI	26
Fan Speed Signal Feedback Fault	BI	27
Room Temp Sensor Fault	BI	28
Coil Temp Sensor Fault	BI	29

Appendix D Reference

Appendix D.1 Specifications







	ProtoAir FPA-W44 ²		
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	Input Voltage: 12-24VDC or 24VAC Max Power: 3 Watts	Current draw: 24VAC 125mA 12-24VDC 250mA @12VDC	
Approvals	CE and FCC Class B & C Part 15, U IC Canada, RoHS compliant	IL 60950, WEEE 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 Antenna Type: SMA	<i>Channels:</i> 1 to 11 (inclusive) <i>Encryption:</i> TKIP, WPA & AES	
Figure 47: 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 0
 - Meet the current and voltage rating for ProtoAir 0
- Furthermore, the interconnecting power cable shall: •
 - Be of length not exceeding 3.05m (118.3") 0
 - Be constructed of materials rated VW-1, FT-1 or better 0
- 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. •

² Specifications subject to change without notice.

Appendix E Limited 2 Year Warranty

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