

FieldServer

BACnet Router Wi-Fi FS-ROUTER-BACW

Start-up Guide

BAS Router (BACnet Multi-Network Router)



APPLICABILITY & EFFECTIVITY

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

Document Revision: 1.C T18621



Technical Support

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1 BACNET ROUTER DESCRIPTION

The BACnet Router provides stand-alone routing between BACnet networks such as BACnet/IP, BACnet Ethernet, and BACnet MS/TP – thereby allowing the system integrator to mix BACnet network technologies within a single BACnet internetwork. There are three physical communication ports on the BAS Router. One is a 10/100 Mbps Ethernet port and the other two are RS-485 MS/TP ports. Configuration is accomplished via a web page.

The BACnet Router with Wi-Fi (FS-ROUTER-BACW) model has one RS-485 port, one Ethernet 10/100 port and supports Wi-Fi network connection. Additionally, the Router acts as a Wi-Fi access point for modern web based configuration and remote access from any mobile device without user restrictions.

The BACnet Router is cloud ready and connects with Sierra Monitor's SMC Cloud.

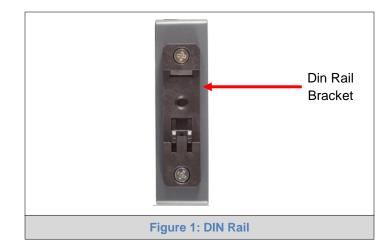
- NOTE: A cellular version of the BACnet Router is not available.
- NOTE: For SMC Cloud information, refer to the SMC Cloud Start-up Guide online.
- NOTE: The latest versions of instruction manuals, driver manuals, configuration manuals and support utilities are available online at the <u>Sierra Monitor website</u>.



2 EQUIPMENT SETUP

2.1 Mounting

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



NOTE: For dimension details see Appendix B.2.

2.2 Attaching the Wi-Fi Antenna

Screw in the Wi-Fi antenna to the front of the unit as shown in Appendix B.2.



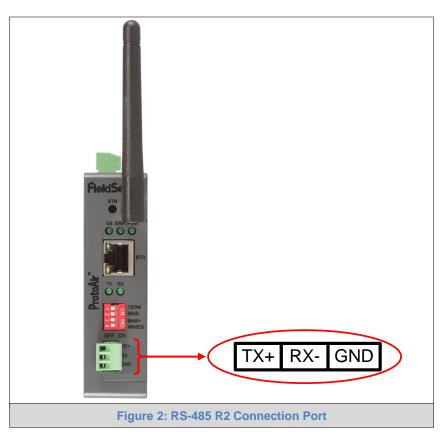
3 INSTALLING THE BACNET ROUTER

3.1 RS-485

3.1.1 Connection P1 Port

NOTE: Ensure RS-485 is selected by checking that the number 4 DIP Switch is set to the left side.

Connect to the 3-pin connector as shown below.

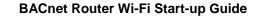


The following baud rates are supported on the P1 Port: 9600, 19200, 38400, 76800

3.1.1.1 Wiring

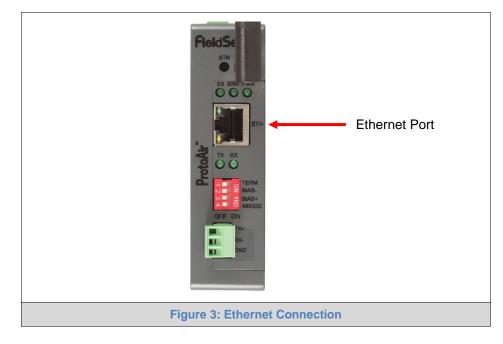
RS-485			
BMS RS-485 Wiring	BACnet Router Pin Assignment		
RS-485 +	TX +		
RS-485 -	RX -		
GND	GND		

NOTE: Use standard grounding principles for GND.





3.2 10/100 Ethernet Connection Port



The Ethernet Port is used both for BACnet/IP communications and for configuring the BACnet Router via the Web App. To connect the BACnet Router, either connect the PC to the Router's Ethernet port or connect the Router and PC to an Ethernet switch. Use CAT5 cables for the connection.

NOTE: The Default IP Address of the BACnet Router is 192.168.1.24, Subnet Mask is 255.255.255.0.



4 OPERATION

4.1 Power Up the Device

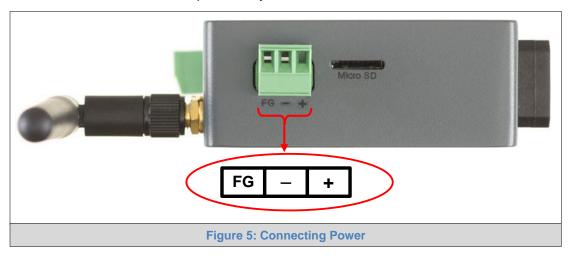
Check power requirements in the table below:

Power Requirement for BACnet Router External Gateway			
Current Draw Type			
BACnet Router Family	12V DC	24V DC	
FS-ROUTER-BACW (Typical)	170mA	100mA	
FS-ROUTER-BACW (Maximum)	240mA	140mA	
FS-ROUTER-BACW (Maximum) 240mA 140mA			

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 4: Required Current Draw for the BACnet Router

Apply power to the device as show below in **Figure 5**. Ensure that the power supply used complies with the specifications provided in **Appendix B.1**. Ensure that the cable is grounded using the FG or "Frame GND" terminal. The BACnet Router is powered by 12-24V DC.





5 CONNECTING TO THE BACNET ROUTER

The FieldServer Toolbox Application can be used to discover and connect to the BACnet Router on a local area network. To connect to the BACnet Router over the Internet using Toolbox, add the Internet exposed IP Address of the Router by clicking on the 🕒 button, or alternatively enter the Internet exposed IP Address in a web browser directly.

5.1 Using the FieldServer Toolbox

- Install the FS Toolbox application from the USB drive or download it from the <u>Sierra Monitor</u> website.
- Use the FS Toolbox application to find the BACnet Router, change the IP Address details (if required) and launch the Web App (by clicking the Connect button).

FieldServer Toolbox					
FieldServer Toolb	ox			S	M Gierra monitor
DEVICES 🕀	IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
DCC285 QS.CSV v4.10b	192.168.2.135	00:50:4E:01:02:03	*	•	Connect Connect





5.2 Using a Web Browser Directly

- Open a Web Browser and connect to the BACnet Router's Default IP Address. The Default IP Address of the BACnet Router is 192.168.2.101, Subnet Mask is 255.255.255.0
- If the PC and the BACnet Router are on different IP Networks, assign a Static IP Address to the PC on the 192.168.2.X network.

SMG					
	≡	BACnet Device Device Name BACnet Router	BACnet Ethernet	Controls	
✓ Network Settings V: Router Diagnostics FieldPop™		Device Instance 1000 Device Location - Device Connection BACnet IP Wired 1 ▼	Network Number 3 BACnet MSTP Settings	Save Restart	
About		BACnet IP Wired 1	Max Info Frames50Max Master127	Status Router is online	
		Network Number 1 IP Port 47808	BACnet MSTP R1	Log	
		BACnet IP Wired 2	Network Number 4 MAC Address 0 Baud Rate 33400 •		
		Network Number 2 IP Port 47809	Token Usage Timeout (ms) 50 • BACnet Explorer		
		BACnet IP WiFi Enable Network Number 6	Network Number 7	- 1	
		IP Port 47810			
		BACnet IP BBMD Copyright © Sierra Monitor	Corporation - Diagnostics	•	
Figure 6: BACnet Router Settings Page					

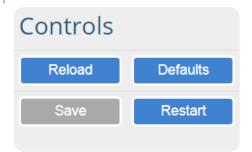
NOTE: The FieldPoP[™] tab FieldPoP[™] (see Figure 6) allows users to connect to the SMC Cloud, Sierra Monitor's device cloud solution for IIoT. The SMC Cloud enables secure remote connection to field devices through a FieldServer and its local applications for configuration, management, maintenance. For more information about the SMC Cloud, refer to the <u>SMC Cloud Start-up Guide</u>.



6 CONFIGURING THE BACNET ROUTER

6.1 Settings

6.1.1 Button Functions



- **Save** write the currently displayed settings to the device. A restart will be required to apply the updated settings.
- **Reload** discard the currently displayed settings and reload the settings stored on the device. This will undo any unsaved edits.
- **Defaults** discard the currently displayed settings and load default settings. This must still be saved and the device must be restarted for the default settings to be applied.
- Restart restarts the device.

6.1.2 Multiple Connections

- **Network Number** set up the BACnet network number for the connection. Legal values are 1-65534. Each network number must be unique across the entire BACnet internetwork.
- **Enable** enable or disable the connection; note that BACnet/IP Primary is always enabled.

6.1.3 BACnet Device

BACnet Device

Device Name	BACnet Router
Device Instance	1000
Device Location	-
Device Connection	BACnet IP Wired 1

- Device Instance and Device Name a BACnet Router must provide a Device Object. Configure its name and Instance Number here. Take care to select a Device Instance Number that is unique across the entire BACnet internetwork.
- **Device Location** enter a location for the Device. The location may not contain any commas.
- **Device Connection** select which connection to bond the BACnet device settings.



6.1.4 BACnet/IP

BACnet IP Wired 1

Enable	
Network Number	1
IP Port	47808

BACnet IP Wired 2

Enable	
Network Number	2
IP Port	47809

BACnet IP WiFi

Enable	
Network Number	6
IP Port	47810

BACnet IP BBMD

Enable	
BBMD Connection	BACnet IP Wired 2 •
Public IP Address	-
Public IP Port	-
	Edit BDT

- **IP Port** the BACnet/IP default is 47808 (0xBAC0), but a different port number may be specified here.
- **IP Port** this MUST be different to the IP Port used on the BACnet/IP Primary connection. Default is 47809 (0xBAC1).
- **BBMD Connection** select which connection to bond the BACnet/IP BBMD settings.
- Public IP Address and Port if the BBMD is being accessed across a NAT Router, then these values must be configured with the public IP Address and Port by which the BBMD can be reached from across the NAT Router. The Public IP Address and Port would also be used in the BDT of remote BBMD's that need to reach this BBMD across the NAT Router. If no NAT Router is being used, these fields can be left blank. For example, type into a Google browser "my IP Address" to see the local PC's Public IP Address.



6.1.5 BACnet MS/TP, BACnet Ethernet and BACnet Explorer

BACnet Ethernet

Enable		
Network Number	3	

BACnet MSTP Settings

Max Info Frames	50	
Max Master	127	

BACnet MSTP R1

Enable	
Network Number	4
MAC Address	0
Baud Rate	38400 🔻
Token Usage Timeout (ms)	50 💌

BACnet Explorer

Network Number 7

- Max Info Frames the number of transactions the Router may initiate while it has the MS/TP token. Default is 50.
- Max Master the highest MAC address to scan for other MS/TP master devices. The default of 127 is guaranteed to discover all other MS/TP master devices on the network.
- MAC Address legal values are 0 to 127, must be unique on the physical network.
- **Baud Rate** the serial baud rate used on the network.
- Token Usage Timeout (ms) the number of milliseconds the router will wait before deciding that another master has dropped the MS/TP token. This value must be between 20ms and 100ms. Choose a larger value to improve reliability when working with slow MS/TP devices that may not be able to meet strict timing specifications.



6.2 Network Settings

The IP Settings for the BACnet Router are used by BACnet/IP. The IP Settings can be edited in the Network Settings section as shown.

SM ^{Gierra} ^{monitor}				
≓ Bacnet Router	\equiv	Common Settings		A
击 Bacnet Explorer			Ethernet	
Network Settings		Primary Connection		
양 Router Diagnostics			Save	Refresh
▲ FieldPoP™		IP Settings		
1 About		N1 DHCP Client State		
		N1 IP Address	192.168.3.160	
		N1 Netmask	255.255.255.0	
		Default Gateway	192.168.3.1	
		Domain Name Server 1	8.8.8.8	
		Domain Name Server 2	8.8.4.4	
			Save	Refresh
		Copyright © Sierra Monitor Cor	poration - Diagnostics	
		Figure 7: Network Settin	ngs – IP Settings	

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



Scroll down to view and edit the Wi-Fi Client or Wi-Fi Access Point Settings.

WiFi Client Settings	· · · · · · · · · · · · · · · · · · ·
Enabled	
WiFi SSID	
	Invalid value
WiFi Password	
WiFi DHCP Client State	
WiFi IP Address	
WiFi Netmask	
WiFi Default Gateway	
WiFi Domain Name Server1	
WiFi Domain Name Server2	
WiFi Access Point Settings	Save Refresh There are invalid settings.
Enabled	×
Access Point SSID	ProtoAir-600032
Access Point Password	12345678
SSID Broadcast	۲.
Channel	T1 •
Access Point Hotspot	
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
Figure 8: Network Setting	Save Refresh



6.3 Router Diagnostics

By clicking on the Router Diagnostics tab all the connection communication details can be viewed to ensure the BACnet Router is working correctly.

SMC				
≓ Bacnet Router	\equiv	N1 - BACnet IP Wi	red 1	
🚠 Bacnet Explorer		Network Number	1	
Network Settings		Info Statistics	Messages Sent	35674
양 Router Diagnostics			Messages Received	58253281
▲ FieldPoP™		Error Statistics	Total Errors	2
About			BACnet NL RX Reject Msg	2
		Routing Table is empty		
		N1 - BACnet Explo	rer 47800	
		Network Number	7	
		Info Statistics	Messages Sent	58247504
			Messages Received	25127
		Error Statistics	Total Errors	0
		Routing Table is empty		
		Copyright © Sierra Monit	or Corporation - Diagnostics	
		Figure 9: BACnet Ro	outer Diagnostics Page	





7 BACNET EXPLORER

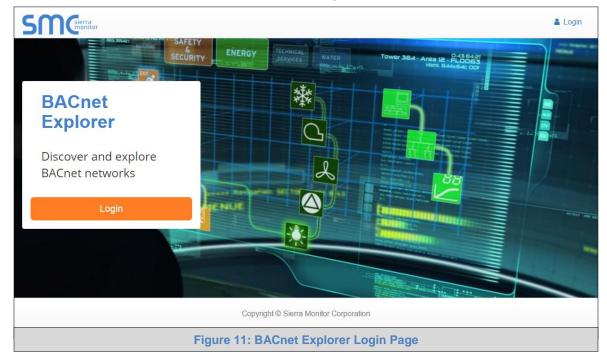
The Bacnet Explorer tab allows installers to validate that their equipment is working on Bacnet without having to ask the BMS integrator to test the unit.

• To access the embedded BACnet Explorer click the BACnet Explorer tab.

SMC								
≓ Bacnet Router	≡	BACnet Dev	rice		BACnet Etherne	t		Controls
🚓 Bacnet Explorer		Device Name	BACnet Router		Enable			
Network Settings		Device Instance	1000		Network Number 3			Reload Defaults Save Restart
양 Router Diagnostics		Device Location						Save
▲ FieldPoP™		Device Connection	BACnet IP Wired 1		BACnet MSTP Se	ettings		
About		BACnet IP V	Vired 1		Max Info Frames 50 Max Master 127			Status Router is online
		Enable	•					
		Network Number	47808		BACnet MSTP R	1		Log
		II TOIL	41000		Enable			
		BACnet IP V	Vired 2		Network Number MAC Address	4		
		Enable			Baud Rate	38400	¥	
		Network Number	2		Token Usage Timeout (ms)	50	¥	
		IP Port	47809					*
			Copyright © Sie	erra Monitor Cor	poration - Diagnostics			
			Figure 10: FS-Gl	JI BACr	net Explorer Bu	utton		

• Then login to the BACnet Explorer page using the supplied username and password.

NOTE: The default user name is "admin" and default password is "admin".



NOTE: For BACnet/IP, click on the Settings button on the left side of the landing page to ensure the BACnet Router is on the BACnet/IP network subnet or to configure BBMD.



7.1 Discover Device List

• From the BACnet Explorer landing page, click on the BACnet Explorer button on the left side of the screen to go to the BACnet Explorer page.

SMC									≜ P	Profile 🔻
ABACnet Explorer	\equiv	n Discover	â Remove All							
		Search		Network	Device	Object	Property	Value	Monitor	
♣ FieldPoP™		BACnet							•	
About										
				Total Items:	0					
			Copyright © Sierra Mo	nitor Corpo	ration - D	Diagnostics	6			
			Figure 12: BAC	Cnet E	xplore	er Pag	е			

- To discover the devices connected to the same subnet as the BACnet Explorer, click the Discover button (binocular icon).
- This will open the Discover window, click the checkboxes next to the desired search settings and click Discover to start the search.

		n Discove	r	
Devices Discover All	Devices			
From device	0	to device	4194303	
Networks	Networks			
Discover Spe	cific Network 0			
			Dis	cover Cancel
		Figure 13: Discover	Window	

NOTE: The "Discover All Devices" or "Discover All Networks" checkboxes must be unchecked to search for a specific device range or network.



NOTE: Allow the devices to populate before interacting with the device list for optimal performance. Any discovery or explore process will cause a green message to appear in the upper right corner of the browser to confirm that the action is complete.

Search	~	Device	Object	Property	Value	Monitor	
	•					•	
		1000 (BACnet Router)	device:1000 (BACnet Router)	max-apdu-length-accepted	1458	Off	2 .
network:6	× .	1000 (BACnet Router)	device:1000 (BACnet Router)	object-name	BACnet Router	Off	2 4
+ 2	- v	1000 (BACnet Router)	device:1000 (BACnet Router)	vendor-identifier	37	Off	2 4
101 (New BACnet Node)	~	1991 (WeatherLink_1)	device:1991 (WeatherLink_1)	max-apdu-length-accepted	1458	Off	C 4
network:50	× .	1991 (WeatherLink_1)	device:1991 (WeatherLink_1)	object-name	WeatherLink_1	Off	2 4
+ 50001 (RIM10 1)	- v	1991 (WeatherLink_1)	device:1991 (WeatherLink_1)	vendor-identifier	37	Off	2 .
★ 50002 (RIM10_1)	- V	2982 (Fike_Panel_01)	device:2982 (Fike_Panel_01)	max-apdu-length-accepted	1458	Off	C 4
• 50022	×.	2982 (Fike_Panel_01)	device:2982 (Fike_Panel_01)	object-name	Fike_Panel_01	Off	C 4
+ 50033	×.	2982 (Fike_Panel_01)	device:2982 (Fike_Panel_01)	vendor-identifier	153	Off	C 4
network:60001	× 1	4499 (BACnet Router)	device:4499 (BACnet Router)	max-apdu-length-accepted	1458	Off	C 4
1000 (BACnet Router)	×.	4499 (BACnet Router)	device:4499 (BACnet Router)	object-name	BACnet Router	Off	C 4
 1991 (WeatherLink 1) 	×.	4499 (BACnet Router)	device:4499 (BACnet Router)	vendor-identifier	37	Off	C 4
	Total	Items: 36 (Showing Items	: 12)				

7.2 View Device Details and Explore Points/Parameters

- To view the device details, click the blue plus sign (+) next to the desired device in the list.
 - o This will show only some of the device properties for the selected aspect of a device

Search	~	Object	Property	Value	Monitor		
12 (Dev_02)	•				T		
+ 13 (Dev_03)		device:1991 (WeatherLink_1)	max-apdu-length-accepted	1458	Off	C	
network:6		device:1991 (WeatherLink_1)	object-name	WeatherLink 1	Off	0	
+ 2		device:1991 (WeatherLink_1)	vendor-identifier	37	Off	0	
101 (New_BACnet_Node)		device.1331 (weatherElling_1)	vendor-identilier	51	01	~	
network:50							
+ 50002 (RIM10_2)							
+ 50022							
↑ 50022↑ 50033							
+ 50033	Ŀ						
+ 50033	L						
+ 50033 network:60001							
 50033 network:60001 1000 (BACnet Router) 							

To view the full details of a device, go back to highlighting the device directly (in Figure 16 "1991 WeatherLink_1") and click the Explore button (
 that appears to the right of the highlited device as a magnifying glass icon or double-click the highlighted device.

Search	~	Object	Property	Value	Monitor		
50022	•				•		
+ 50033		device:1991 (WeatherLink_1)	max-apdu-length-accepted	1458	Off	C	
network:60001						0	
+ 1000 (BACnet Router)		device:1991 (WeatherLink_1)	object-name	WeatherLink_1	Off		
- 1991 (WeatherLink_1) Q :		device:1991 (WeatherLink_1)	vendor-identifier	37	Off	0	
device:1991 (WeatherLink_1)		analog-input:1 (INSIDE_TEM	object-name	INSIDE_TEMPERATURE	Off	0	
analog-input:1 (INSIDE_TEMPERATURE)		analog-input:2 (OUTSIDE_T	object-name	OUTSIDE_TEMPERATURE	Off	C	
analog-input:2 (OUTSIDE TEMPERATURE)		analog-input:3 (INSIDE_HU	object-name	INSIDE_HUMIDITY	Off	C	
analog-input:3 (INSIDE_HUMIDITY)		analog-input:4 (OUTSIDE_H	object-name	OUTSIDE_HUMIDITY	Off	C	
analog-input:4 (OUTSIDE_HUMIDITY)		analog-input:5 (WIND_SPEED)	object-name	WIND_SPEED	Off	C	
		analog-input:6 (WIND_SPEE	object-name	WIND_SPEED_AVG	Off	C	
analog-input:5 (WIND_SPEED)		analog-input:7 (STORM_RAIN)	object-name	STORM_RAIN	Off	C	
analog-input:6 (WIND_SPEED_AVG)		analog-input:8 (WIND_DIRE	object-name	WIND DIRECTION	Off	C	
analog-input:7 (STORM_RAIN)			-				
analog-input:8 (WIND_DIRECTION)							
	Tot	al Items: 44 (Showing Items: 11)					
+ 4499 (BACnet Router)	-	ai items. 44 (Showing items. 11)					

- o Now additional device details are viewable; however, the device can be explored even further
- Click on one of the device details.

sierra monitor

		Property	Value	Monitor	
network:60001				•	
+ 1000 (BACnet Router)		object-name	WIND DIRECTION	Off	C
 1991 (WeatherLink_1) 		object name		0.1	~
device:1991 (WeatherLink_1)					
analog-input:1 (INSIDE_TEMPERATURE)					
analog-input:2 (OUTSIDE_TEMPERATURE)					
analog-input:3 (INSIDE_HUMIDITY)					
analog-input:4 (OUTSIDE_HUMIDITY)					
analog-input:5 (WIND_SPEED)					
analog-input:6 (WIND_SPEED_AVG)					
analog-input:6 (WIND_SPEED_AVG) analog-input:7 (STORM_RAIN)					
	Q				
analog-input:7 (STORM_RAIN)		Items: 44 (Showing Iter			



• Then click on the Explore button or double-click the device object.

Search	~	Property	Value	Monitor		
network:60001	•			T		
1000 (BACnet Router)		cov-increment	0	Off	C	
1991 (WeatherLink_1)		description	WIND DIRECTION	Off	C	6
device:1991 (WeatherLink_1)		event-state	normal	Off	C	
analog-input:1 (INSIDE_TEMPERATURE)		object-identifier	analog-input 8	Off	C	
analog-input:2 (OUTSIDE_TEMPERATURE)		object-name	WIND DIRECTION	Off	C	6
analog-input:3 (INSIDE_HUMIDITY)	~	object-type	analog-input	Off	C	
analog-input:4 (OUTSIDE_HUMIDITY)		out-of-service	false	Off	C	6
analog-input:5 (WIND_SPEED)		present-value	23	Off	C	6
analog-input:6 (WIND_SPEED_AVG)		reliability	no-fault-detected	Off	C	
analog-input:7 (STORM_RAIN)		status-flags	[in-alarm: false; fault: false; overri	Off	C	
analog-input:8 (WIND_DIRECTION) Q		units	no-units	Off	C	
+ 2982 (Fike_Panel_01)	T (
4499 (BACnet Router)	lota	l Items: 54 (Showing	Items: 11)			

A full list of the device details will appear on the right side window. If changes are expected since the last explore, simply press the Refresh button (\Im) that appears to right of individual properties to refresh the value.

NOTE: The Explorer Search Bar will find devices based on their Device ID.

NOTE: The Explorer Discovery Tree has 3 levels that correspond to the following.

- Network number
 - \circ Device
 - Device object



7.2.1 Edit the Present Value Field

The only recommended field to edit via BACnet Explorer is the device's present value field.

NOTE: Other BACnet properties are editable (such as object name, object description, etc.); however, this is not recommended because the BACnet Explorer is a discovery tool not a Building Management System (BMS).

•	To edit the prese	ent value, select	t it in the prope	erty listings.
---	-------------------	-------------------	-------------------	----------------

Search	~	Property	Value	Monitor	
★ 50002 (RIM10_2)	•			•	
network:60001		cov-increment	0	Off	С.
1000 (BACnet Router)		description	WIND_DIRECTION	Off	2 4
1991 (WeatherLink_1)		event-state	normal	Off	C
device:1991 (WeatherLink_1)		object-identifier	analog-input 8	Off	C
analog-input:1 (INSIDE_TEMPERATURE)	· ·	object-name	WIND_DIRECTION	Off	2
analog-input:2 (OUTSIDE_TEMPERATURE)		object-type	analog-input	Off	C
analog-input:3 (INSIDE_HUMIDITY)	· · ·	out-of-service	false	Off	С.
analog-input:4 (OUTSIDE_HUMIDITY)		present-value	254	Off	2 6
analog-input:5 (WIND_SPEED)	· · · ·	reliability	no-fault-detected	Off	C
analog-input:6 (WIND_SPEED_AVG)		status-flags	[in-alarm: false; fault: false; overri	Off	C
analog-input:7 (STORM_RAIN)		units	no-units	Off	C
analog-input:8 (WIND_DIRECTION)	Q				
4499 (BACnet Router)	Tota	al Items: 230 (Showing Ite	ems: 11)		

 Then click the Write button () on the right of the property to bring up the Write Property window.

	Write Property
present-value	2
	Write Cancel
Figure	20: Write Property Window



• Enter the appropriate change and click write.

The window will close. When the BACnet Explorer page appears, the present value will be changed as specified.

Search			Property	Value	Monitor		
	•				•		
network:60001		~	cov-increment	0	Off	C	6
1000 (BACnet Router)		~	description	WIND_DIRECTION	Off	C	6
1991 (WeatherLink_1)		~	event-state	normal	Off	C	
device:1991 (WeatherLink_1)		~	object-identifier	analog-input 8	Off	C	
analog-input:1 (INSIDE_TEMPERATURE)		~	object-name	WIND_DIRECTION	Off	C	đ
analog-input:2 (OUTSIDE_TEMPERATURE)		~	object-type	analog-input	Off	C	
analog-input:3 (INSIDE_HUMIDITY)		~	out-of-service	false	Off	C	6
analog-input:4 (OUTSIDE_HUMIDITY)		~	present-value	2	Off	C	6
analog-input:5 (WIND_SPEED)	-	~	reliability	no-fault-detected	Off	C	
analog-input:6 (WIND_SPEED_AVG)		~	status-flags	[in-alarm: false; fault: false; overri	Off	C	
analog-input:7 (STORM_RAIN)		× 1	units	no-units	Off	C	
analog-input:8 (WIND_DIRECTION)	۹						
4499 (BACnet Router)		otal It	tems: 230 (Showing Ite	ms: 11)			



APPENDIX A USEFUL FEATURES

Appendix A.1. Tooltips

Tooltips appear when the mouse pointer hovers over the corresponding settings field. A balloon will appear giving a description of that input field. This applies to all input fields.

S	M Csierra monitor			
	BACnet De	evice	BACnet Eth	nernet
	Device Hume =	nter a location for the Device. The cation may not contain any commas.	Enable Network Number	3
	Device Connection	n BACnet IP Wired 1	BACnet MS	STP Settings
	BACnet IP	Wired 1	Max Info Frames Max Master	50 127
	Enable			
	Network Number	1 47808	BACnet MS	STP R1
			Enable	
	BACnet IP	Wired 2	Network Number	4
		Figure 22: Setting	gs Tooltips	



Appendix A.2. Before Contacting Technical Support Take a 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.

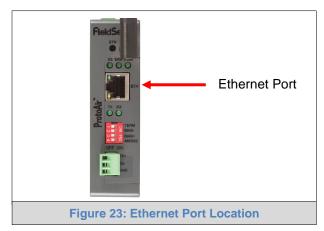
NOTE: The information in the zipped files contains everything support needs to quickly resolve problems that occur on-site.

Appendix A.2.1. Using the FieldServer Toolbox

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

NOTE: While all necessary documentation is shipped with the FieldServer on the USB flash drive, these documents are updated regularly. New versions may be available on <u>SMC's website</u>.

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



- Connect a standard CAT5 Ethernet cable between the PC and QuickServer.
- Double click on the FS Toolbox Utility.



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

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

Strik FieldServer Toolbox		
FieldServer Tool	box	SMGierra
DEVICES 🕒	Conce Diagnostics	FAVORITE CONNECTIVITY
ProtoNode	Device Diagnostics	× • Connect O 4
	ProtoNode 192.168.3.110 Diagnostic Test Snap Shot Set capture perice Full Diagnostic If Timestamp each character Full Diagnostic If Timestamp each character Show advanced options	

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



o Click on "Start Diagnostic"

smc FieldServer Toolbox		
FieldServer Toolt	xoo	SMGsierra
DEVICES +	Sime Device Diagnostics	FAVORITE 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 $\;$ When the capture period is finished, the "Diagnostic Test Complete" window will appear
- Step 2: Send Log
 - o Once the diagnostic test is complete, a .zip file will be saved on the PC

™ FieldServer Toolbox				
FieldServer Toolt	xox		C	Sierra
Setup Help	smc Device Diagnostics	FAVORITE		
DEVICES 🛨	Device Diagnostics	AVORITE		Connect 💭 🦺
	ProtoNode 192.168.3.110			
Ser Disease	tic Test Complete	x		
	Viagnostic test completed and the results have been added to Viagnostic_2015-02-18_12-28.zip Io you want to open the containing folder?	el		
	Start Diagnostic Open Containing Folder			
	Close			

- Click "Open" to launch explorer and have it point directly at the correct folder
- Email the diagnostic zip file to support@sierramonitor.com

🗳 Diagnostic_2014-07-17_20-15.zip	2014/07/17 20:16	zip Archive	676 KB
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Appendix A.2.2. Using FS-GUI

Diagnostic Capture with 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 Setup 	Captures
 View User Messages Diagnostics 	Full Diagnostic
	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 support@sierramonitor.com.
- NOTE: Diagnostic captures of BACnet MS/TP communication are output in a ".PCAP" file extension which is compatible with Wireshark.



APPENDIX B REFERENCE

Appendix B.1. Specifications

	нь СЕ	C. Brits American CU	C	X
	FS-ROUTER-BACW ¹			
Available Ports	One RS-485 +/- ground port One Ethernet 10/100 BaseT port	One power +/- frame ground port		
Power Requirements	Input Voltage: 12-24V DC Power Rating: 2.5 Watts	Current draw: @ 12V, 240 mA		
Approvals	CE and FCC Class B & C Part 15, TUV approved to UL 60950, IC Canada, RoHS compliant, WEEE compliant, PTCRB and CTIA			
Dimensions (WxDxH)	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 to 70°C (-4 to 158°F)			
Humidity	10-95% RH non-condensing			
Wi-Fi 802.11 b/g/n	Frequency: 2.4 GHz Antenna Type: SMA		: 1 to 11 (inclu <i>n:</i> TKIP, WPA	
Figure 24: Specifications				

"This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation.

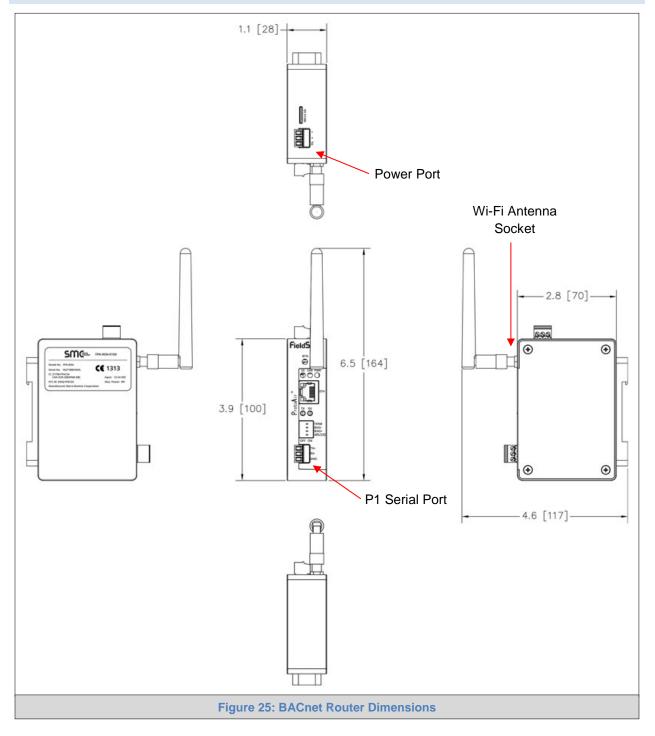
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.

Modifications not expressly approved by FieldServer could void the user's authority to operate the equipment under FCC rules."

¹ Specifications subject to change without notice.



Appendix B.2. FS-ROUTER-BACW Dimension Drawing





APPENDIX C 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.