MCS-MSTP-ROUTER

Revision History

Date	Author	Description
11-27-19	DEW	Setup

Startup Guide

MCS-MSTP-ROUTER

BAS Router (BACnet Multi-Network Router)

1.1. EQUIPMENT SETUP

1.1.1 Mounting

The MCS-MSTP-ROUTER can be mounted using the DIN rail mounting bracket on the back of the unit.
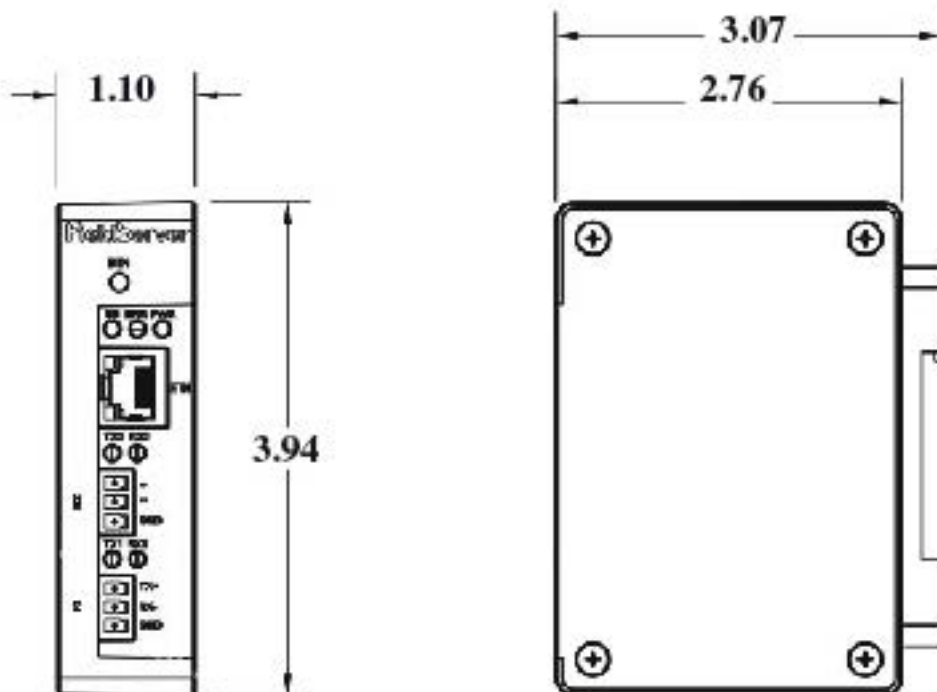

Din Rail Bracket

Figure 1: DIN Rail Bracket

Figure 2: DIN Rail Mounted

1.1.2 Dimension details

1.1.3 Connecting the R1 and R2 Ports

The R1 and R2 Ports are RS-485.

NOTE: For the R1 Port, ensure RS-485 is selected by checking that the number 4 DIP Switch is set to the left side.

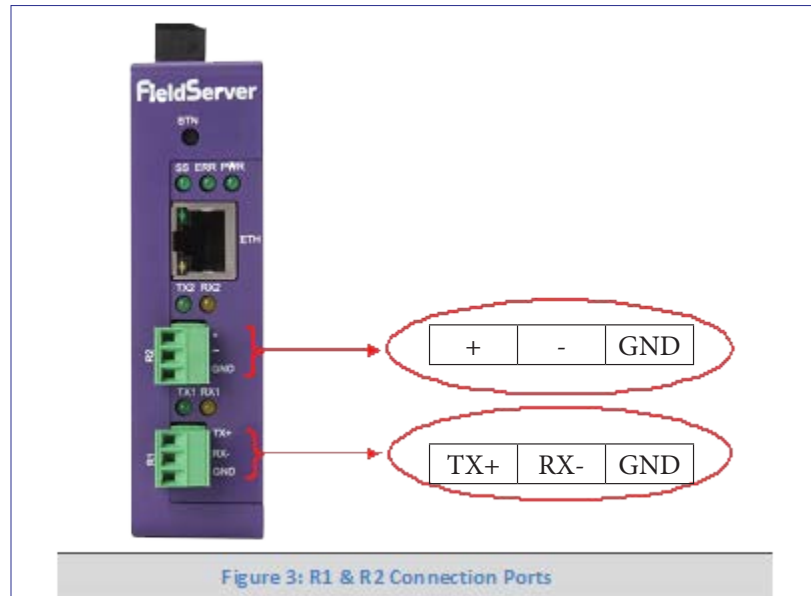Connect to the 3-pin connector(s) as shown below.

| + | - | GND |

| TX+ | RX- | GND |

Figure 3: R1 & R2 Connection Ports

The following baud rates are supported: 9600, 19200, 38400, 76800

1.2. Wiring

RS-485	
BMS RS-485 Wiring	**Gateway Pin Assignment**
RS-485 +	TX +
RS-485 -	RX -
GND	GND

NOTE: Use standard grounding principles for GND.

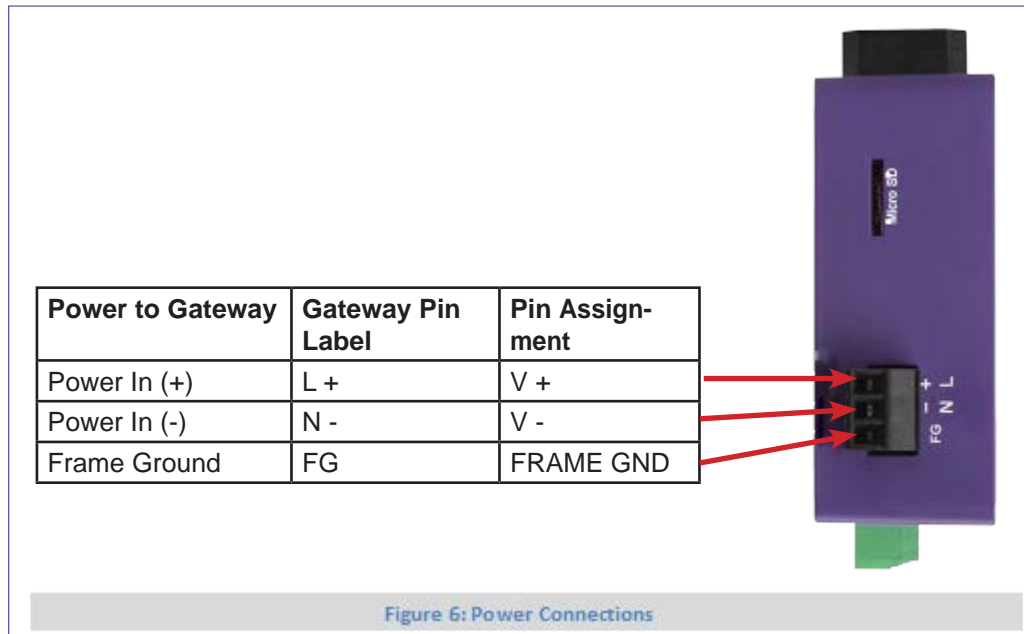## 1.3. 10/100 Ethernet Connection Port

The Ethernet Port is used both for BACnet/IP communications and for configuring the MCS-MSTP-ROUTER via the Web App. To connect the MCS-MSTP-ROUTER, either connect the PC to the Router's Ethernet port or connect the Router and PC to an Ethernet switch. Use Cat-5 cables for the connection.

NOTE: The Default IP Address of the MCS-MSTP-ROUTER is 192.168.2.101, Subnet Mask is 255.255.255.0.

1.4. POWER UP THE DEVICE

Apply power to the MCS-MSTP-ROUTER as shown below in Figure 6. Ensure that the power supply used complies with the specifications provided in Appendix B.1.

- The gateway accepts 9-30VDC or 24VAC on pins L+ and N-.
- Frame GND should be connected, except when using 24VAC.

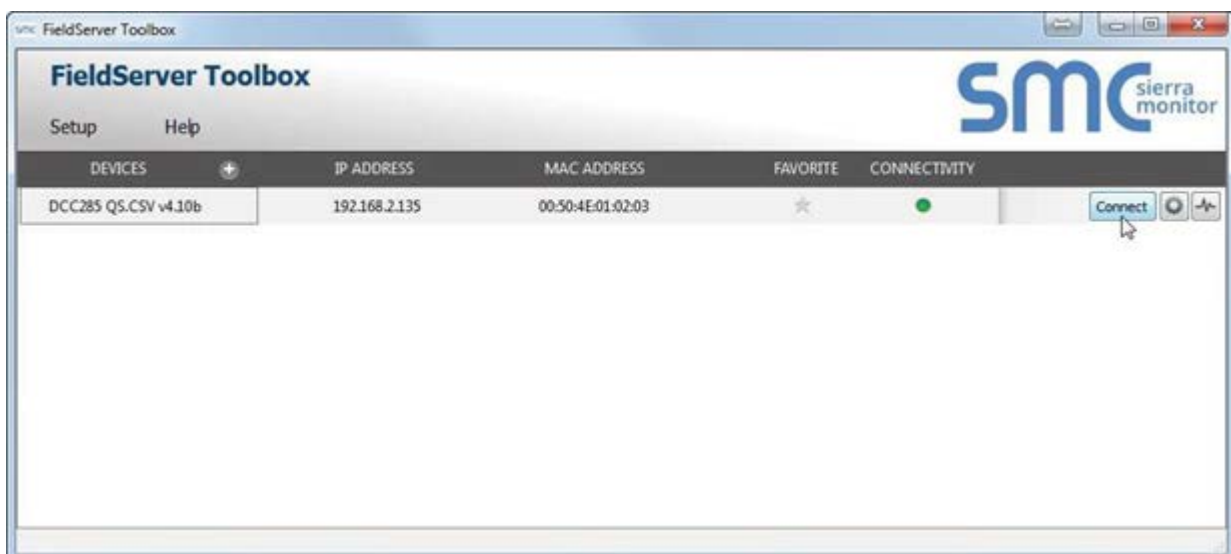| Power to Gateway	Gateway Pin Label	Pin Assignment
Power In (+)	L +	V +
Power In (-)	N -	V -
Frame Ground	FG	FRAME GND

Figure 6: Power Connections

1.5. CONNECTING TO THE MCS-MSTP-ROUTER

The FieldServer Toolbox Application can be used to discover and connect to the MCS-MSTP-ROUTER on a local area network. To connect to the MCS-MSTP-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.

1.5.1 Using the FieldServer Toolbox

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

FieldServer Toolbox

Setup   Help

DEVICES	IP ADDRESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
DCC285 QS.CSV v4.10b	192.168.2.135	00:50:4E:01:02:03	☆	●	Connect

4

1.6. Using a Web Browser Directly

- Open a Web Browser and connect to the MCS-MSTP-ROUTER's Default IP Address. The Default IP Address of the MCS-MSTP-ROUTER is 192.168.2.101, Subnet Mask is 255.255.255.0.

- If the PC and the MCS-MSTP-ROUTER are on different IP Networks, assign a Static IP Address to the PC on the 192.168.2.X network.

Figure 7: BACnet Router Settings Page
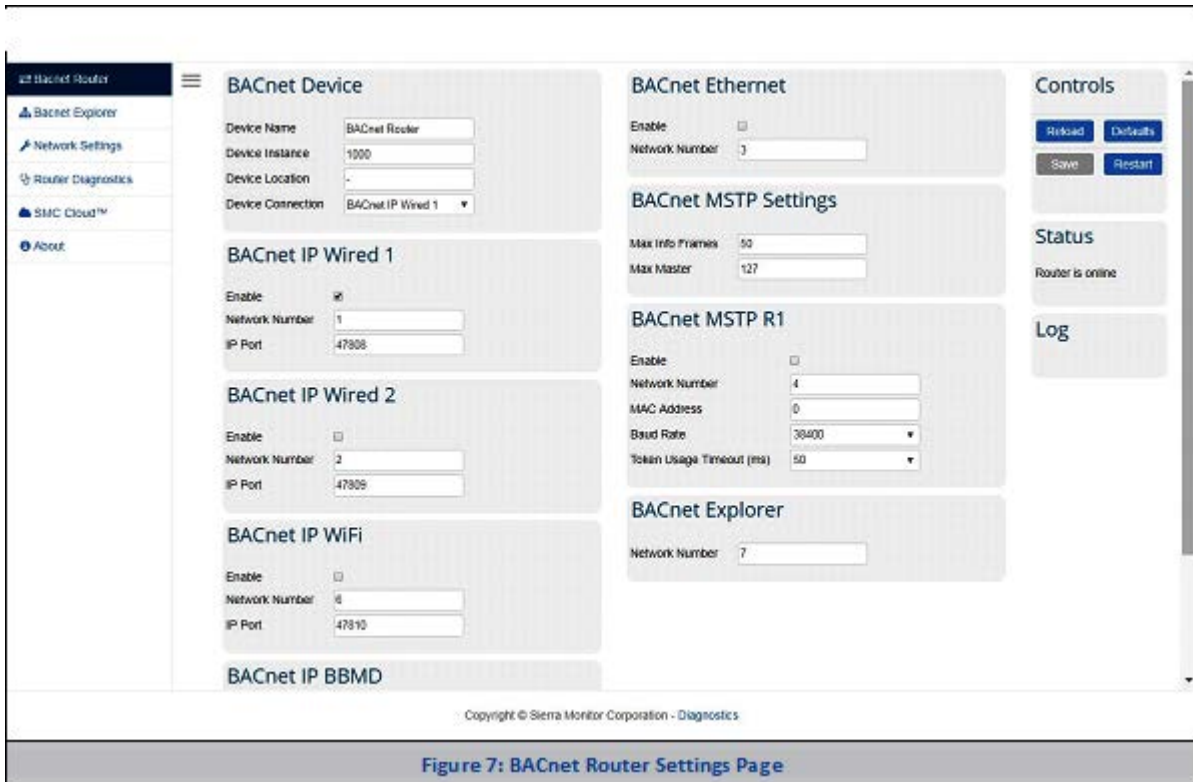
NOTE: The SMC Cloud™ tab   (see Figure 7) allows users to connect to the SMC Cloud, Sierra Monitor's device cloud solution for IIoT. The SMC Cloud enables secure remote connection to field devices through a FieldServer and its local applications for configuration, management, maintenance.

1.7. CONFIGURING THE MCS-MSTP-ROUTER

1.7.1 Settings

1.7.1.1. 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.

1.7.2   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.

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.

1.8.   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.

1.9. 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.

1.10. Network Settings

The IP Settings for the MCS-MSTP-ROUTER are used by BACnet/IP. The IP Settings can be edited in the Network Settings section as shown.

⇄ Bacnet Router
⛓ Bacnet Explorer
🔧 Network Settings
♻ Router Diagnostics
☁ SMC Cloud™
ⓘ About

IP Settings

N1 DHCP Client State ☐
N1 IP Address 192.168.3.87
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 Corporation - Diagnostics

Figure 8: Network Settings

1.11. 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.

⇄ Bacnet Router

⊕ Bacnet Explorer

✦ Network Settings

♻ Router Diagnostics

☁ SMC Cloud™

ⓘ About

N1 - BACnet IP Wired 1

Network Number	1

Info Statistics	Messages Sent	264
	Messages Received	975314
Error Statistics	Total Errors	0

Routing Table

DNET	MAC Address	Status
5	192.168.3.121:47808	Available
6	192.168.3.12:47808	Available
50	192.168.3.101:47808	Available
1100	192.168.3.222:47808	Available
1101	192.168.3.50:47808	Available
1200	192.168.3.222:47808	Available
1203	192.168.3.50:47808	Available
50003	192.168.3.107:47808	Available
60003	192.168.3.64:47808	Available

N1 - BACnet Explorer 47800

Network Number	7

Info Statistics	Messages Sent	975052
	Messages Received	0
Error Statistics	Total Errors	0

Routing Table is empty

Copyright © Sierra Monitor Corporation - Diagnostics

1.12. 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.

Figure 10: FS-GUI BACnet Explorer Button
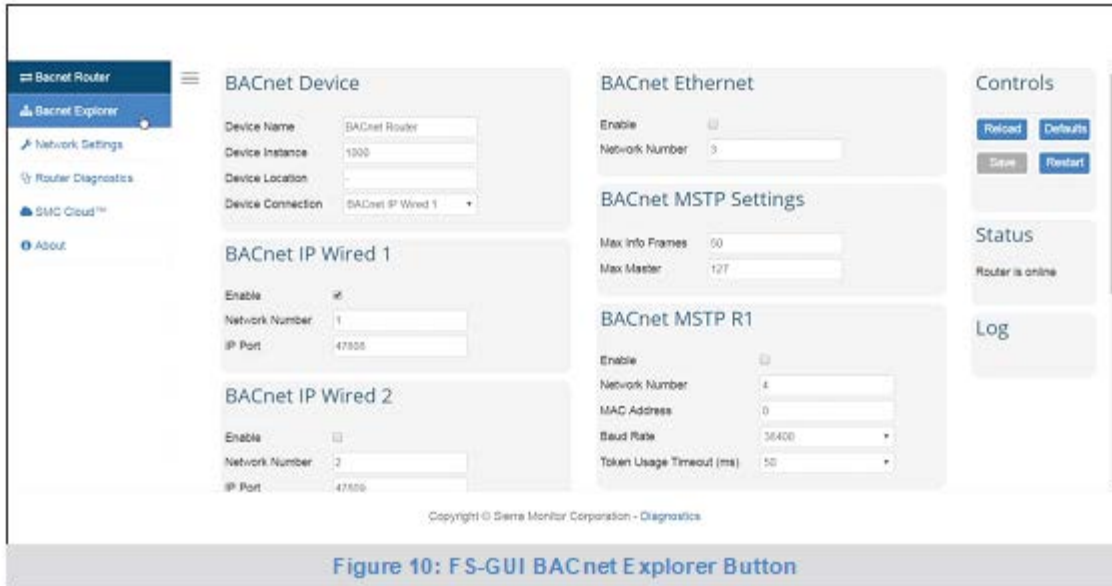
- Then login to the BACnet Explorer page using the supplied username and password.

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

Figure 11: BACnet Explorer Login Page
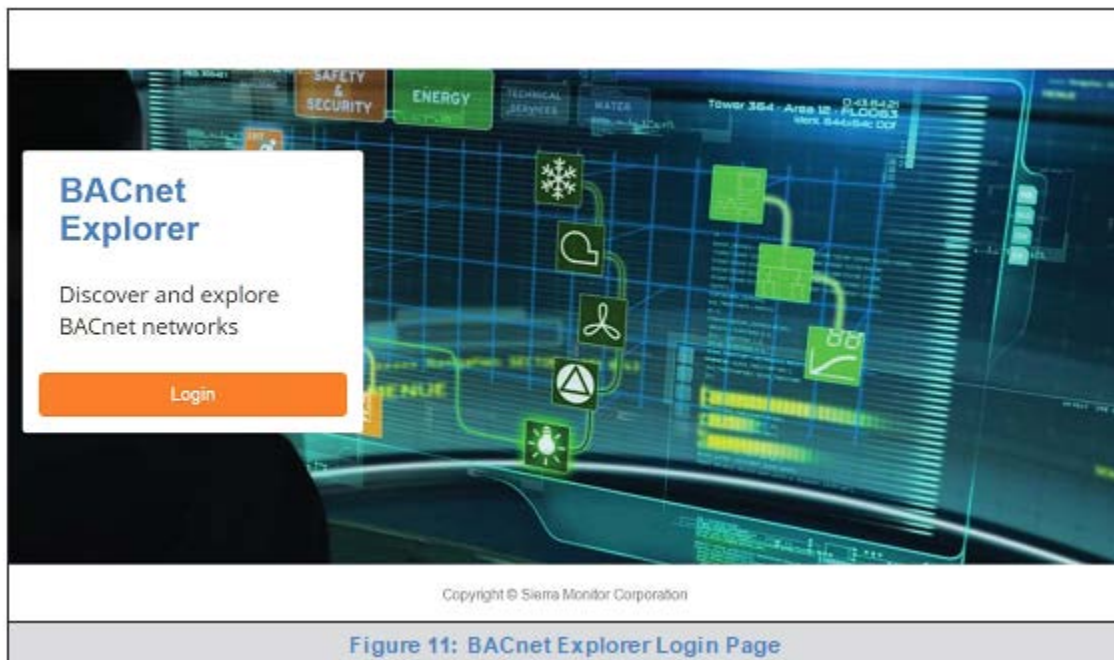
NOTE: For BACnet/IP, click on the Settings button on the left side of the landing page to ensure the BACnet Router is on the BACnet/IP network subnet or to configure BBMD.

1.13. 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.
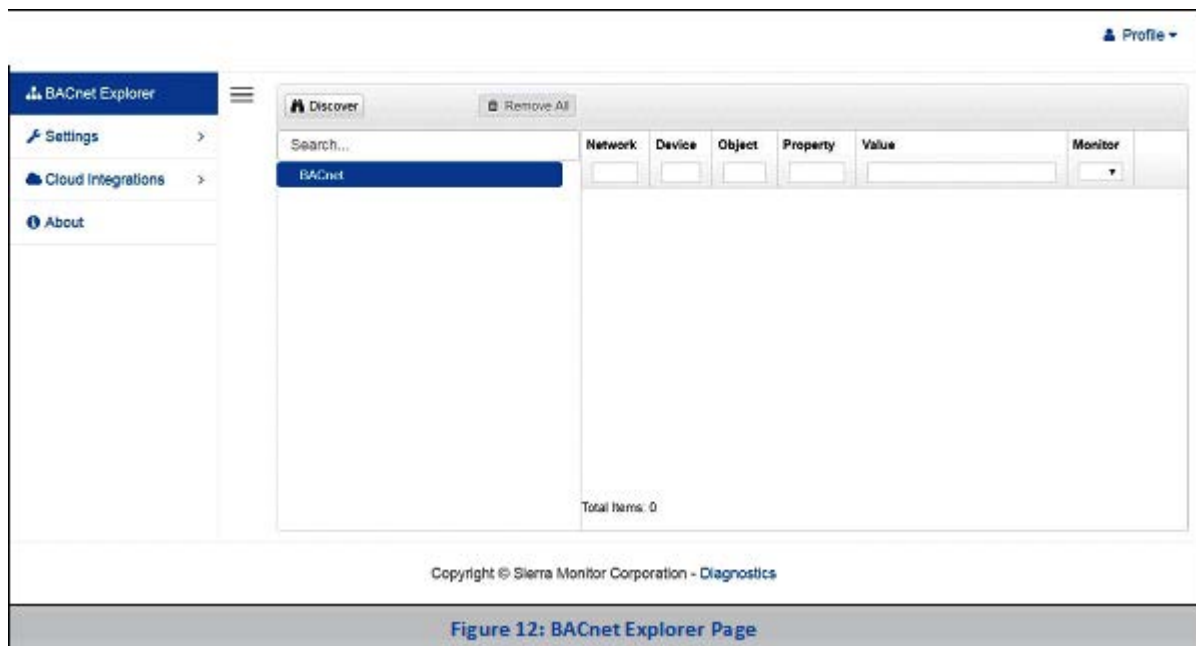
Figure 12: BACnet Explorer Page

- 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.
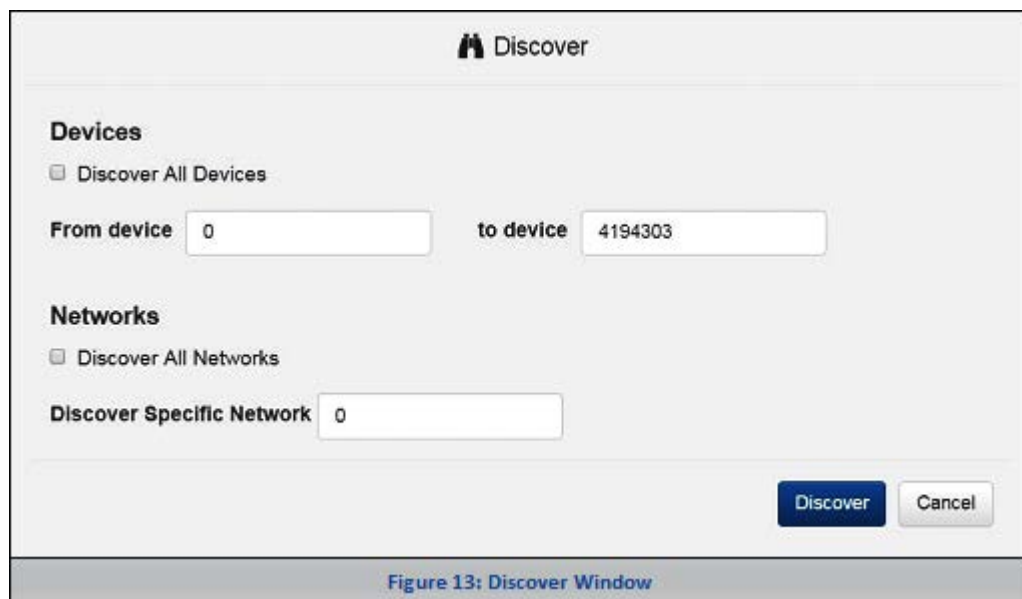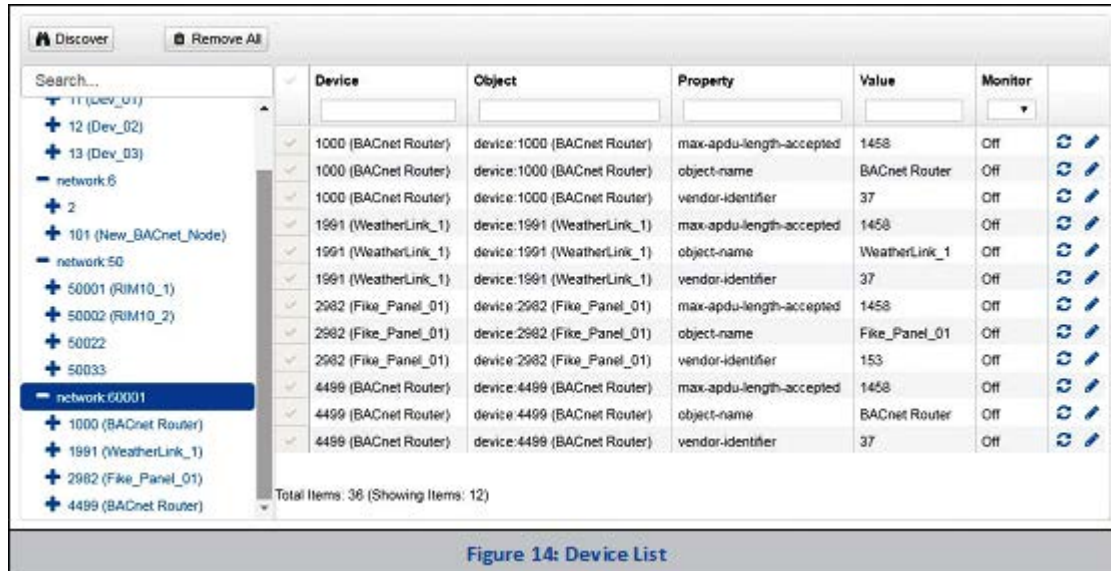
Figure 13: Discover Window

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.

Figure 14: Device List

1.14. 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.

Figure 15: Device Sub-items

- 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.
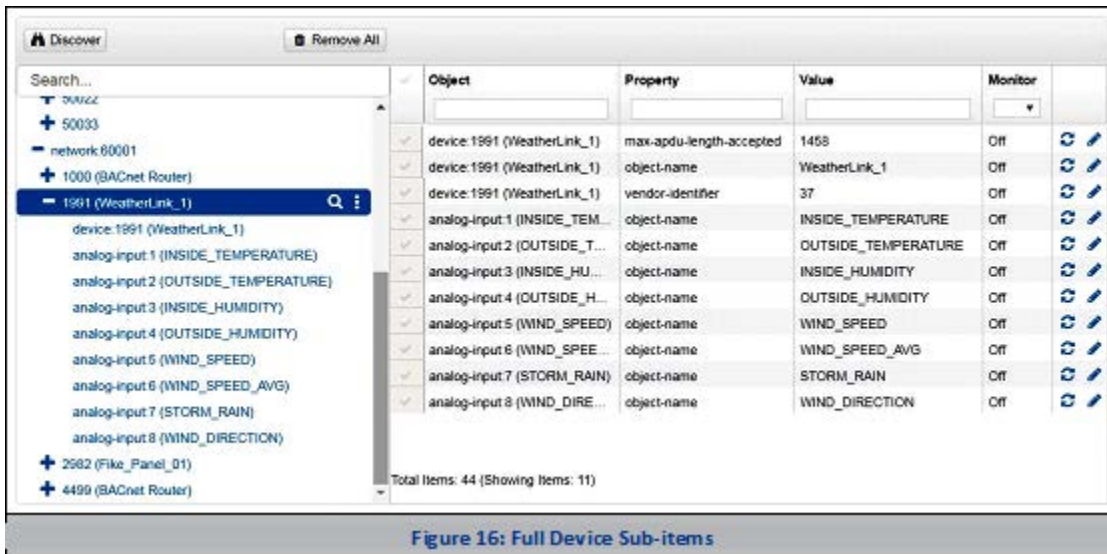

Figure 16: Full Device Sub-items

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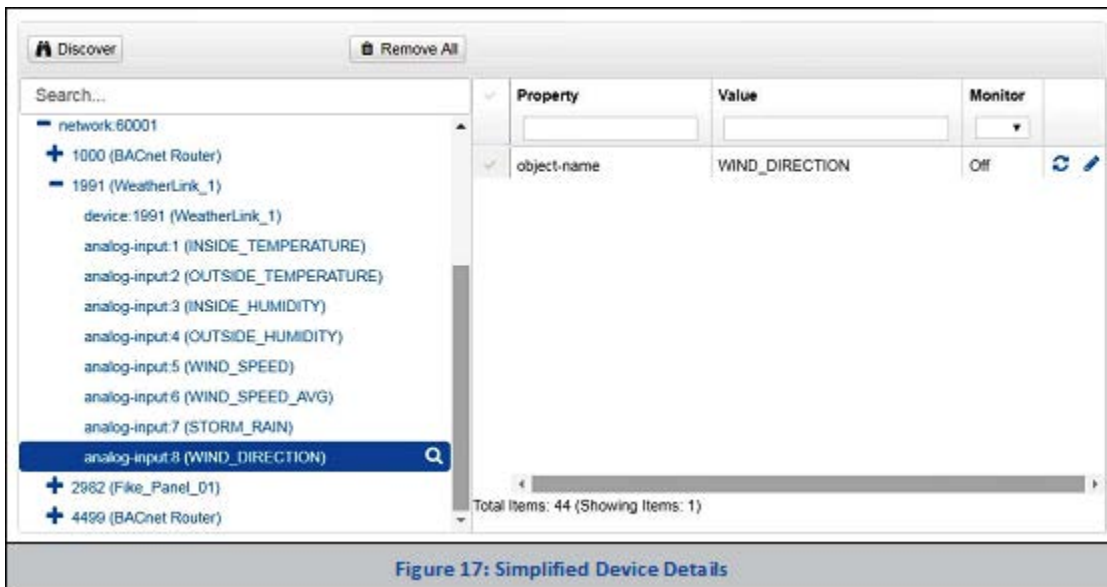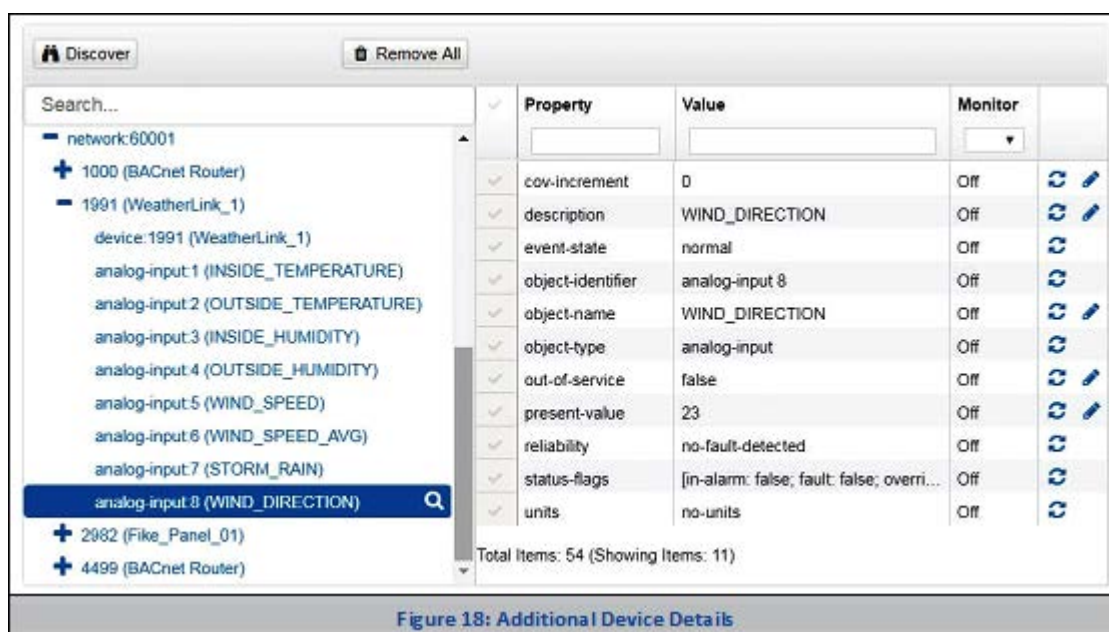- Click on one of the device details.

Figure 17: Simplified Device Details

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

Figure 18: Additional Device Details

A full list of the device details will appear o   e right side window. If changes are expected since the last

explore, simply press the Refresh button (   ) 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
  - o Device
    - ■ Device object

1.14.1   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 present value, select it in the property listings.

Figure 19: Highlighted Present Value
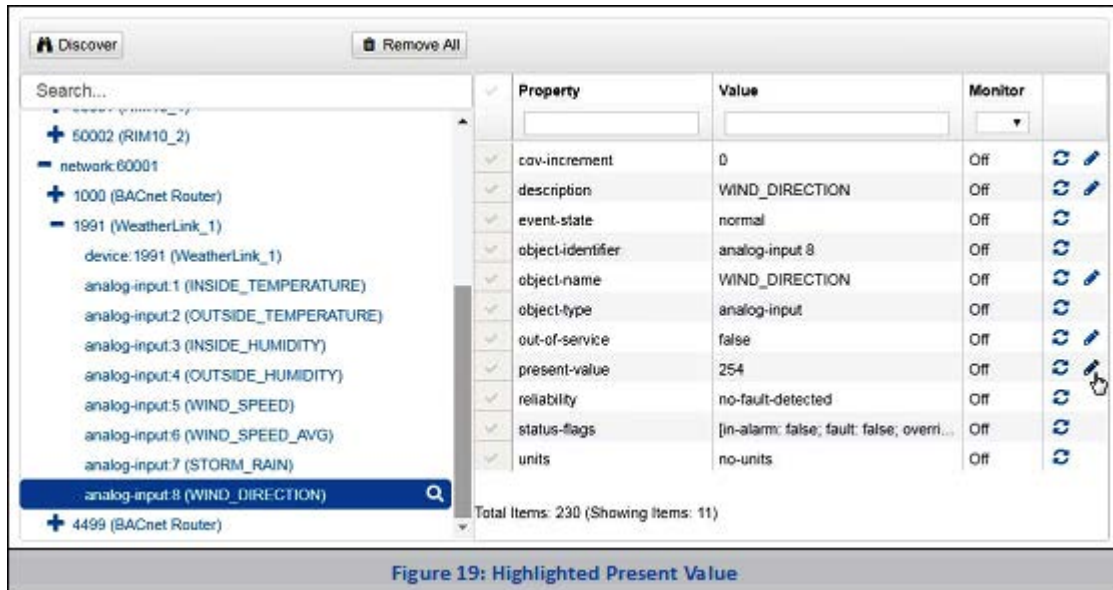
- Then click the Write button ( ) on the right of the property to bring up the Write Property window.

Figure 20: Write Property Window

14
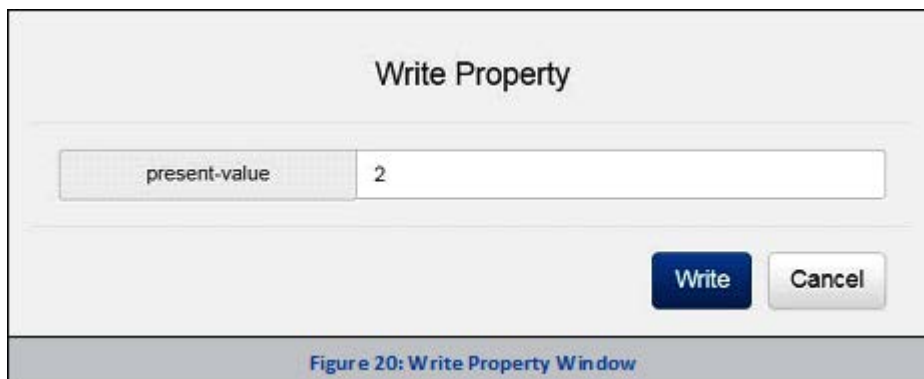
- Enter the appropriate change and click write.

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

Figure 21: Updated Present Value

Micro Control Systems

Providing HVAC/R Control Solutions Worldwide

5580 Enterprise Pkwy. Fort Myers, FL 33905

Office: (239) 694-0089

Fax: (239) 694-0031

www.mcscontrols.com