



## FieldServer

### Modbus to BACnet Start-up Guide

#### FS-EZX-MOD-BAC



#### APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after April 2015

## **Contact Information:**

Thank you for purchasing the FieldServer.

Please call us for Technical support of the FieldServer product.

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Milpitas, CA 95035

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Website: [www.sierramonitor.com](http://www.sierramonitor.com)

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## 1 EQUIPMENT SET-UP<sup>1</sup>

EZ Gateway is a high performance, cost effective Building and Industrial Automation multi-protocol gateway providing protocol translation between serial and Ethernet, devices and networks.

## 2 CERTIFICATION

### 2.1 BTL Mark – BACnet Testing Laboratory



The BTL Mark on EZ Gateway 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 <http://www.BACnetInternational.net/btl/> for more information about the BACnet Testing Laboratory. Click here for [BACnet PIC Statement](#).

## 3 SUPPLIED EQUIPMENT

### EZ Gateway.

- Preloaded with the Modbus and BACnet drivers.
- All instruction manuals, driver manuals, configuration manuals and support utilities are available on the USB drive provided in the optional accessory kit, or on-line at <http://www.sierramonitor.com/customer-care/resource-center?filters=software-downloads>

### Accessory kit (Optional) (Part # FS-8915-36-QS) including:

- 7-ft CAT5 cable with RJ45 connectors at both ends
- Power Supply -110/220V (p/n 69196)
- DIN Rail mounting bracket
- Screwdriver for connecting to terminals
- USB Flash drive loaded with:
  - Modbus to BACnet Start-up Guide
  - FieldServer Configuration Manual
  - FieldServer Utilities Manual
  - All FieldServer Driver Manuals
  - Support Utilities
  - Any additional folders related to special files configured for a specific EZ Gateway
  - Additional components as required - See Driver Manual Supplement for details



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

## 4 MOUNTING

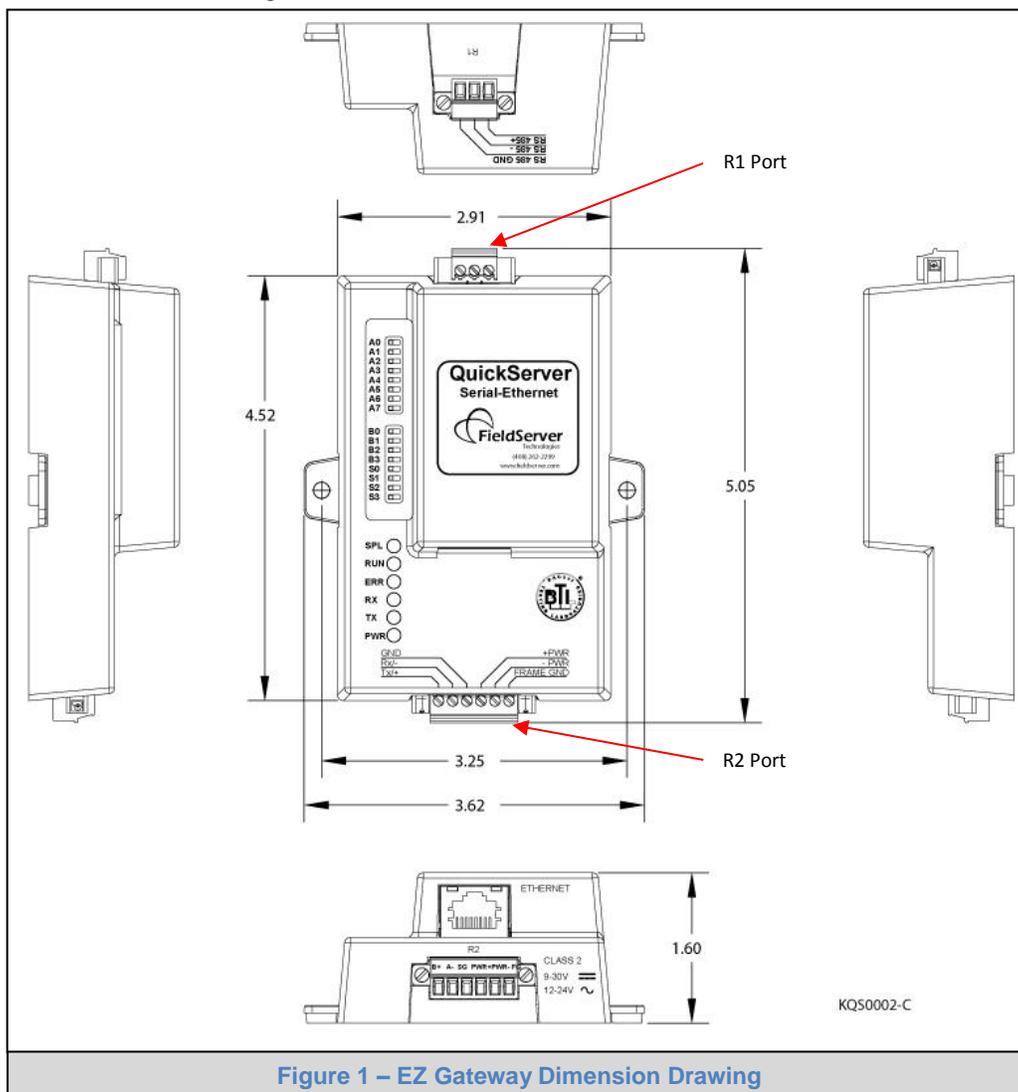
The following mounting options are available:

- Product comes with tabs for wall or surface mount. These can be snapped off if not required.
- DIN Rail Mounting Bracket - included in the Accessory Kit or ordered separately (Part # FS-8915-35-QS)



### 4.1 Dimensions

#### 4.1.1 Dimension Drawing FS-EZX-MOD-BAC



4.2 Specifications<sup>2</sup>



FS-EZX-MOD-BAC	
<b>Available Ports</b>	One 6-pin Phoenix connector with: RS-485 port (+ / - / gnd) Power port (+ / - / Frame-gnd) One 3-pin Phoenix connector with: RS-485 port (+ / - / gnd) One Ethernet 10/100 BaseT port
<b>Power Requirements</b>	Input Voltage: 9-30VDC or 12-24VAC Input Power Frequency 50/60 Hz. Power Rating: 2.5 Watts Current draw @ 12V, 150 mA
<b>Approvals</b>	TUV approved to UL 916 Standard RoHS Compliant FCC Part 15 Compliant CE Mark BTL Mark
<b>Surge Suppression</b>	
EN61000-4-2 ESD EN61000-4-3 EMC EN61000-4-4 EFT	
<b>Physical Dimensions(excluding the external power supply)</b>	
(WxDxH):	5.05 x 2.91 x 1.6 in. (12.82 x 7.39 x 4.06 cm) excluding mounting tabs
Weight:	0.4 lbs (0.2 Kg)
<b>Environment:</b>	
Operating Temperature:	-40°C to 75°C (-40°F to 167°F)
Humidity:	5 - 90% RH (non-condensing)

“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.

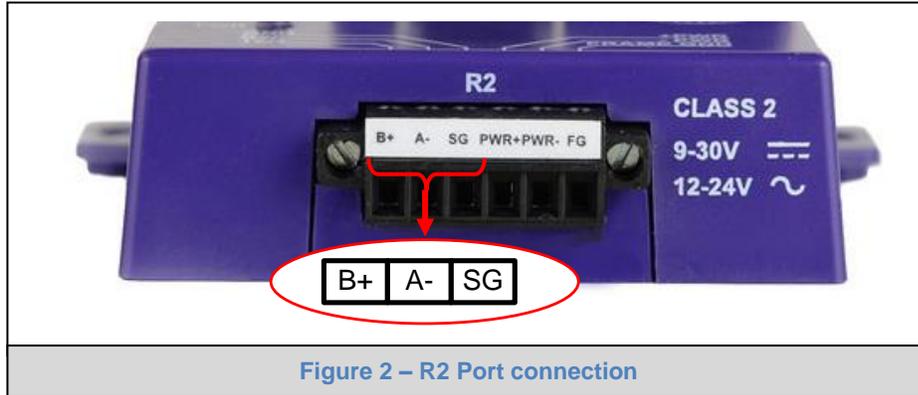
Modifications not expressly approved by Sierra Monitor could void the user's authority to operate the equipment under FCC rules”

<sup>2</sup> Specifications subject to change without notice

## 5 INSTALLING THE EZ GATEWAY

### 5.1 RS-485

#### 5.1.1 RS-485 Connection R2 port

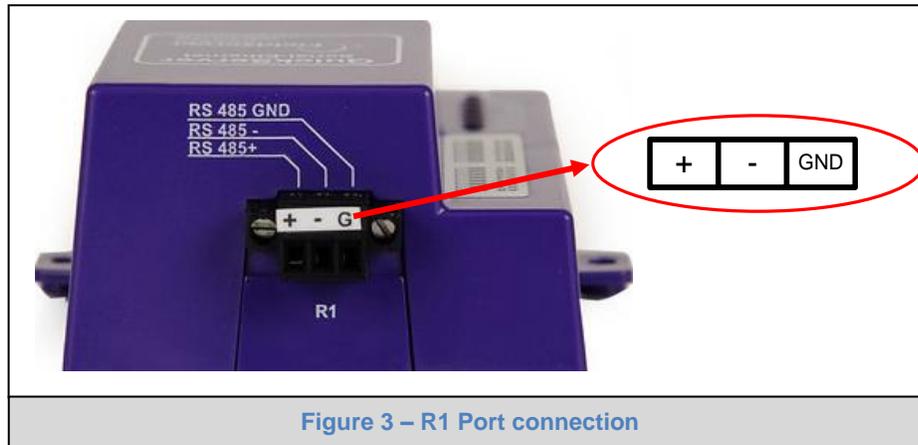


Connect to the 3 pins on the left-hand-side of the 6 pin connector as shown.

The following Baud Rates are supported on the R2 Port:  
4800, 9600, 19200, 38400, 57600, 115200

#### 5.1.2 RS-485 Connection R1 Port

Connect to the 3-pin connector as shown.

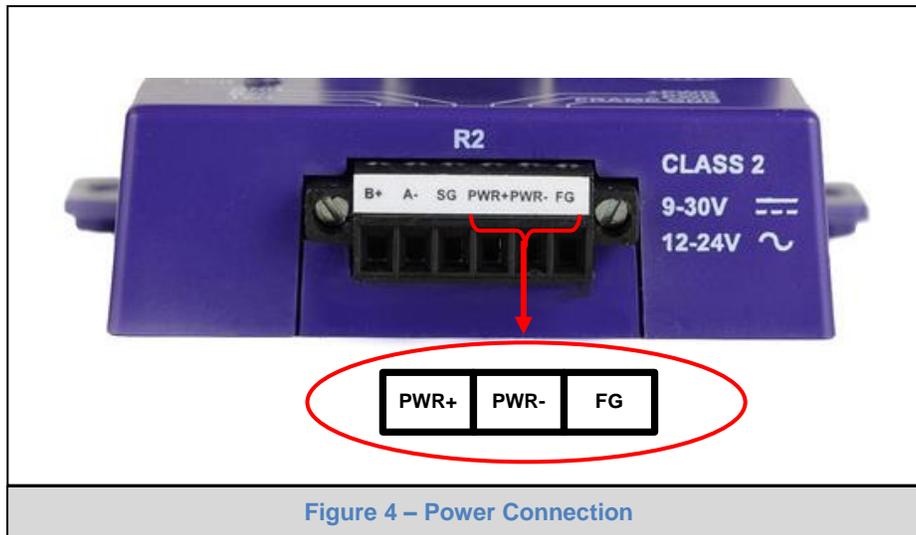


The following Baud Rates are supported on the R1 Port:  
110, 300, 600, 1200, 2400, 4800, 9600, 19200, 20833, 28800, 38400, 57600, 76800, 115200

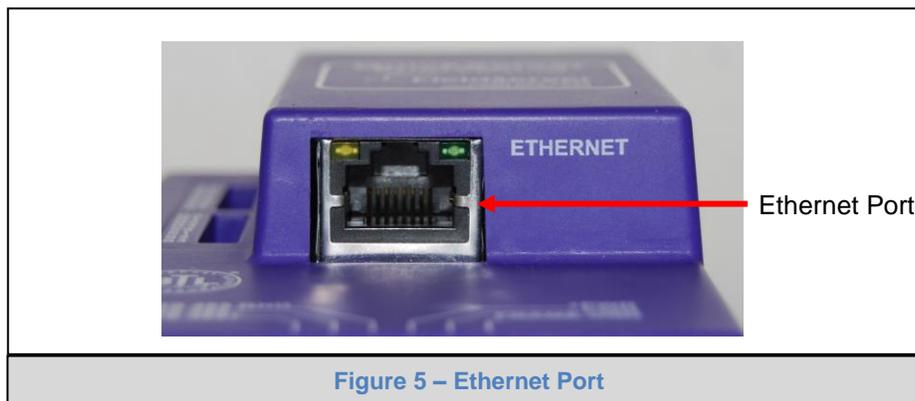
## 6 OPERATION

### 6.1 Power up the device

Apply power to the device. Ensure that the power supply used complies with the specifications provided in Section 4.2. Ensure that the cable is grounded using the “Frame GND” terminal. The EZ Gateway requires a power supply that provides 9-30VDC or 12-24VAC.



### 6.2 Connect the PC to the EZ Gateway over the Ethernet port.

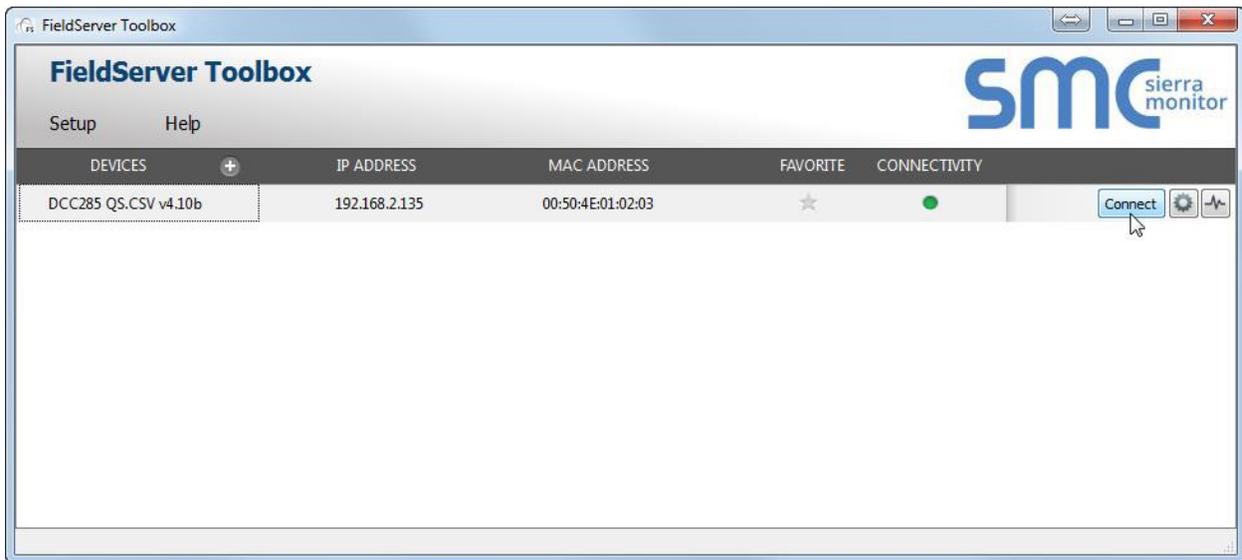


- Connect an Ethernet cable between the PC and EZ Gateway or connect the EZ Gateway and the PC to the Hub/switch using a straight Cat5 cable.
- The Default IP Address of the EZ Gateway is **192.168.2.101**, Subnet Mask is **255.255.255.0**.
- Virus protection and firewall software should temporarily be disabled if connection problems are experienced .

## 6.3 Connecting to the EZ Gateway

### 6.3.1 Using the Toolbox application to discover and connect to the EZ Gateway:

- Install the Toolbox application from the USB drive or get it from our website <http://www.sierramonitor.com/customer-care/resource-center?filters=software-downloads>
- Use the Toolbox application to find the EZ Gateway, and launch the Web GUI
- Please note: If the connect button is greyed out, the EZ Gateway's IP address must be set to be on the same network as the PC. See Section 6.3.2



### 6.3.2 Using a Web Browser directly

- Open a Web Browser and connect to the EZ Gateway'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 EZ Gateway are on different IP Networks, assign a Static IP Address to the PC on the 192.168.2.X network.

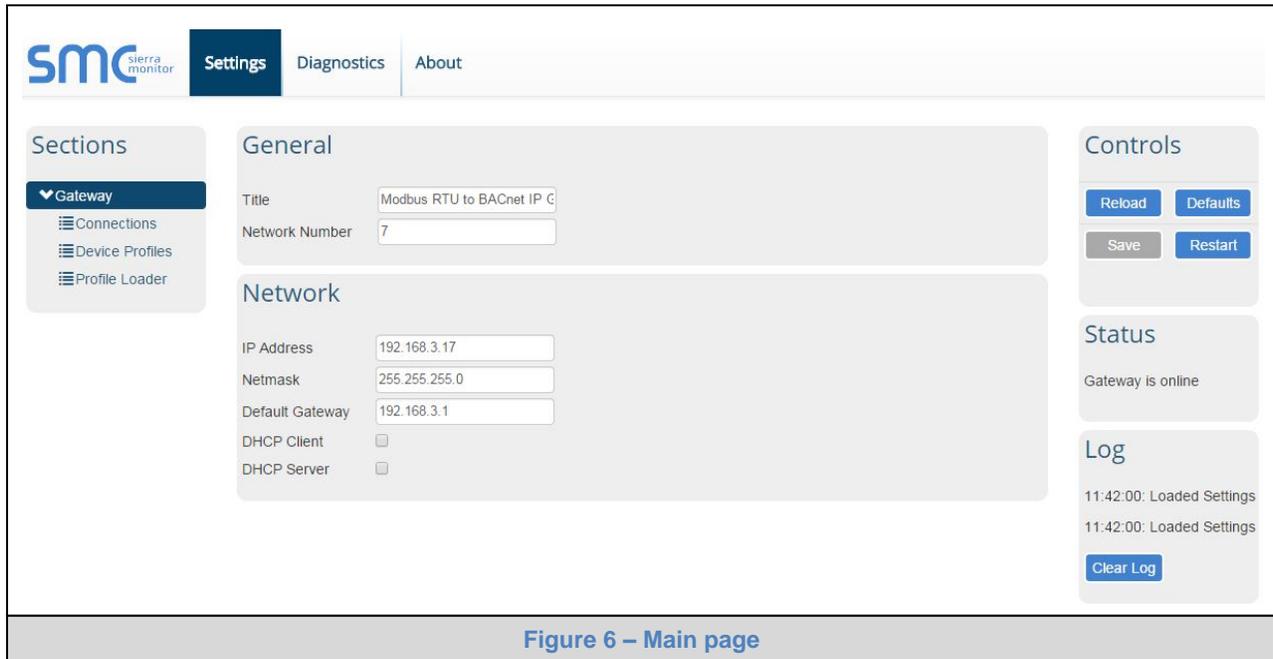
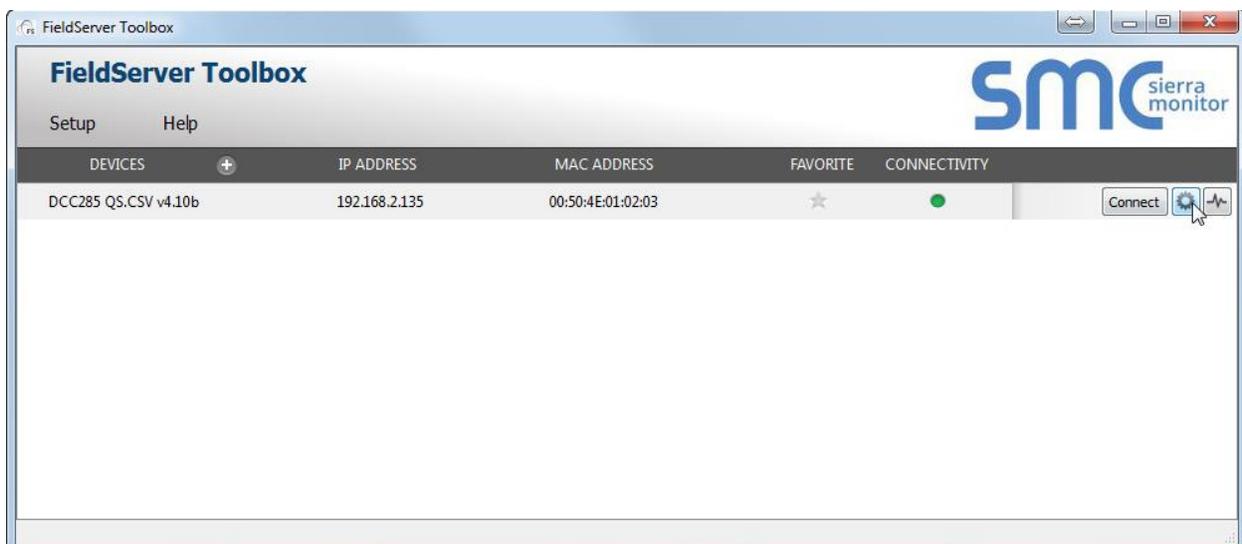


Figure 6 – Main page

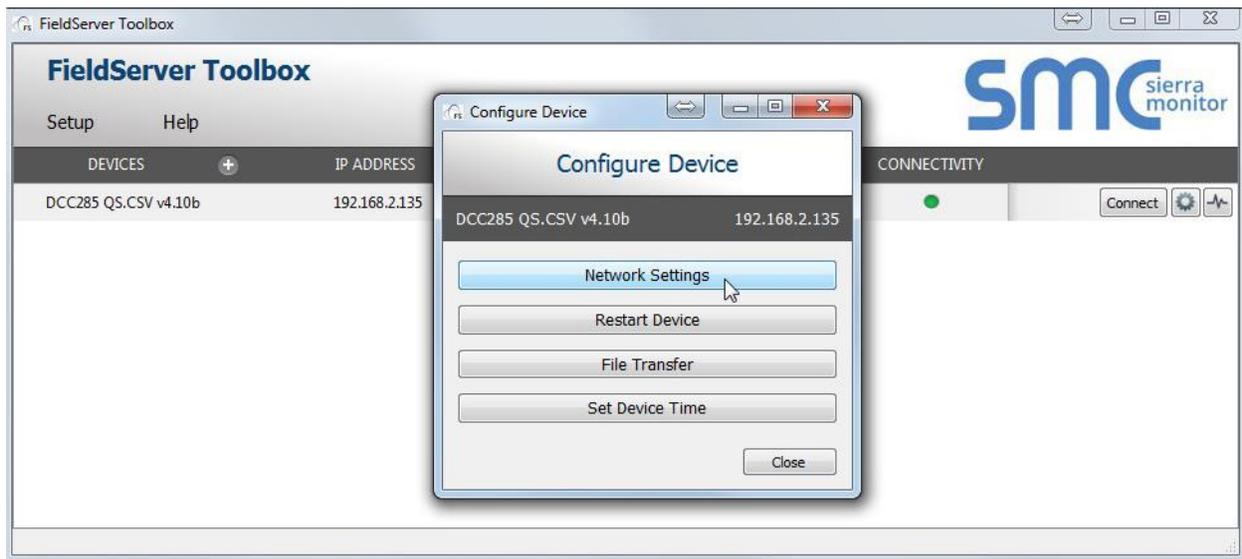
## 6.4 Set IP Address of the EZ Gateway

### 6.4.1 Using the Toolbox Application to set the IP address:

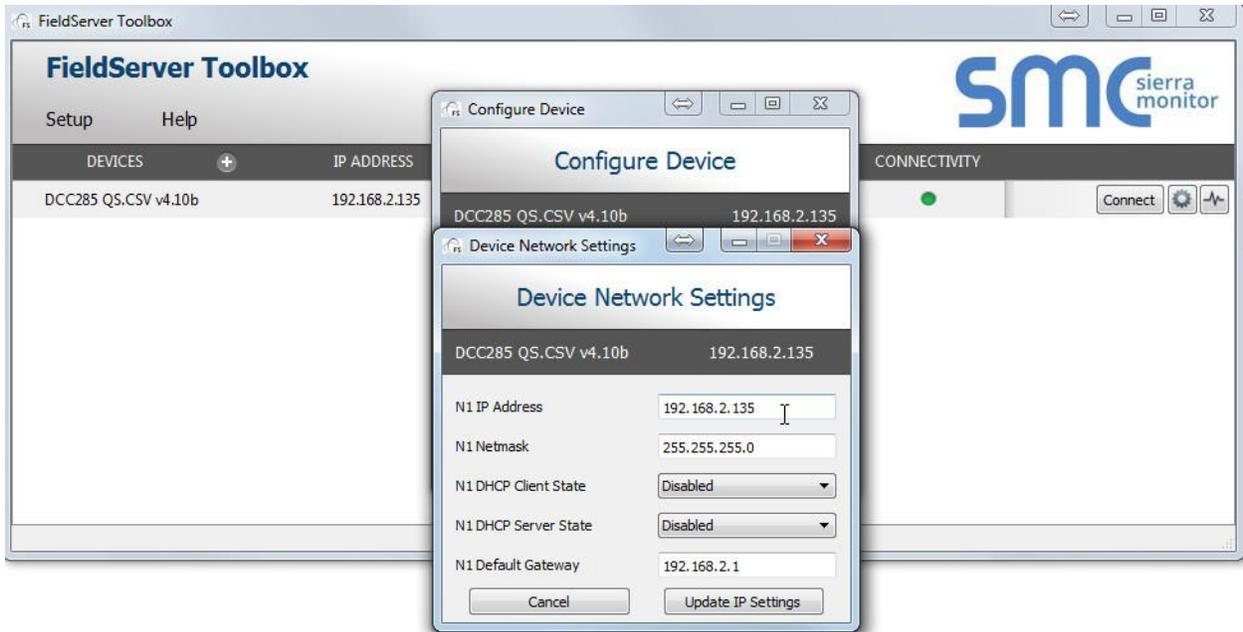
- From the Toolbox main page, click on the setup icon (the gear picture).



- Select Network Settings.



- Modify the IP address (N1 IP address field) of the EZ Gateway Ethernet port.
- If necessary, change the Netmask (N1 Netmask field).
- Type in a new Subnet Mask
- If necessary, change the IP Gateway (Default Gateway field)
- Type in a new IP Gateway
- **Note:** If the EZ Gateway is connected to a router, the IP Gateway of the EZ Gateway should be set to the IP address of the router that it is connected to.
- Click Update IP Settings, then click on the Change and Restart to restart the Gateway and activate the new IP address. Note that if the GUI was open in a browser, the browser will need to be pointed to the new IP address of the EZ Gateway before the GUI will be accessible again.



## 7 CONFIGURING THE EZ GATEWAY

### 7.1 Setting up the Connections

- The Connections page is used to setup the connection Ports & Parameters.

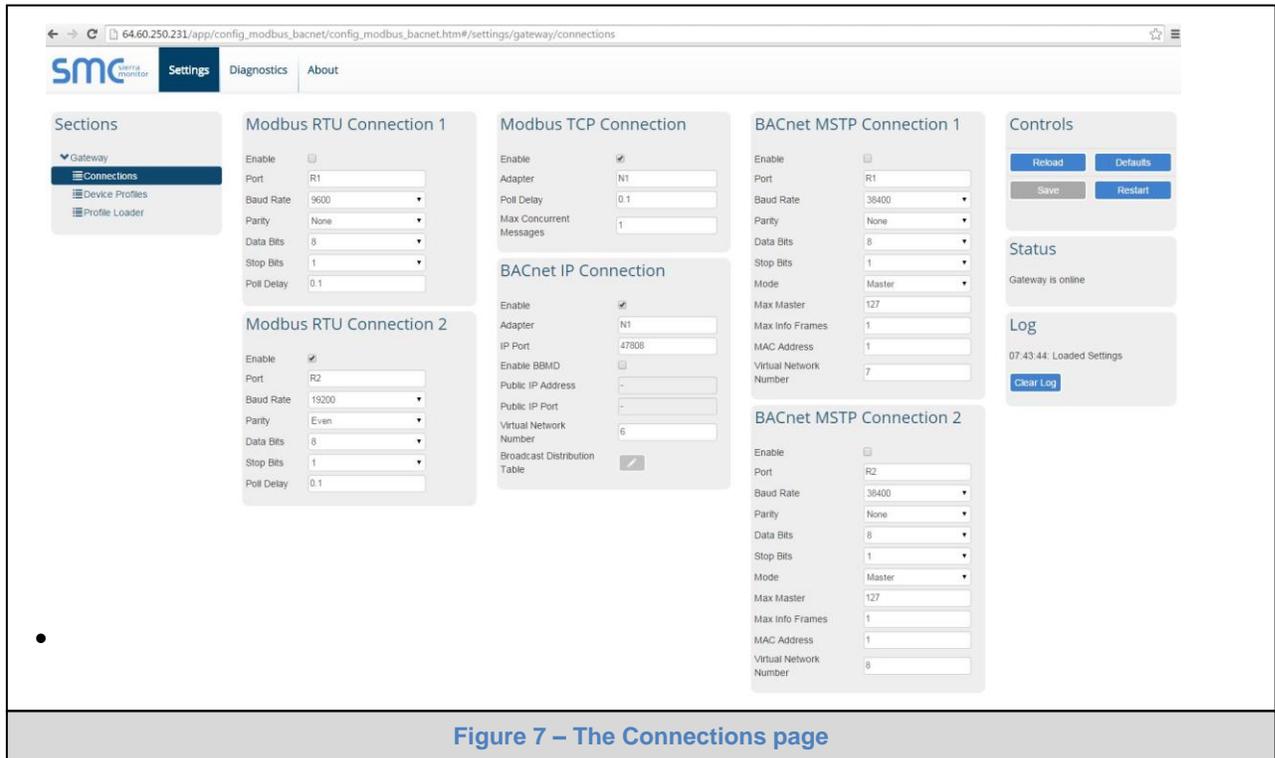


Figure 7 – The Connections page

- Click the Save button in the Controls Section once completed.

## 7.2 Creating Device Profiles

- Click on the Device Profiles and enter the name of the profile.

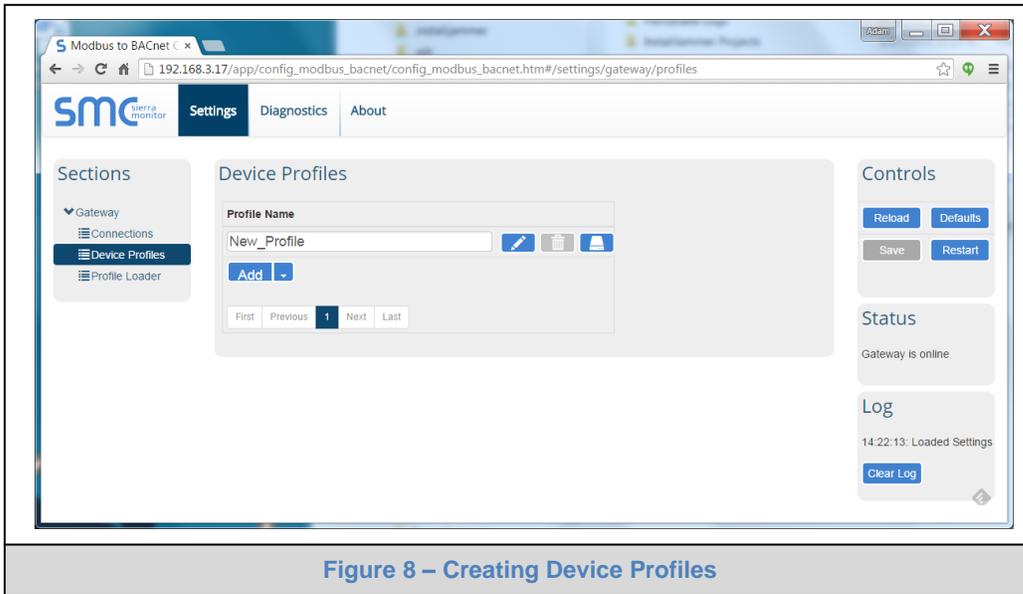


Figure 8 – Creating Device Profiles

- Click on the Edit button next to the name
- Choose the Modbus addressing parameters

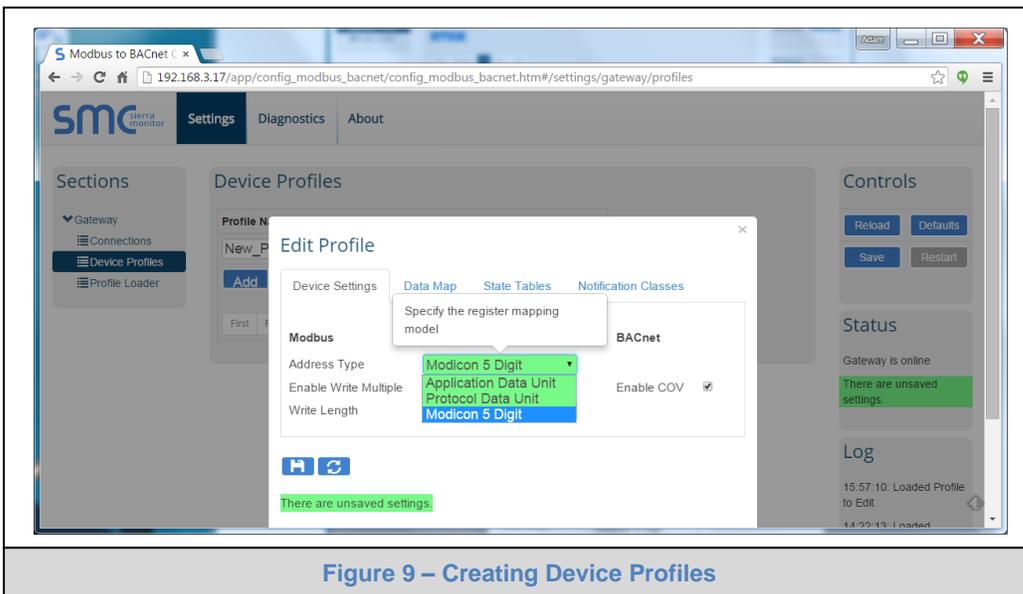


Figure 9 – Creating Device Profiles

- Click on the Data Map tab and add the first Modbus address range

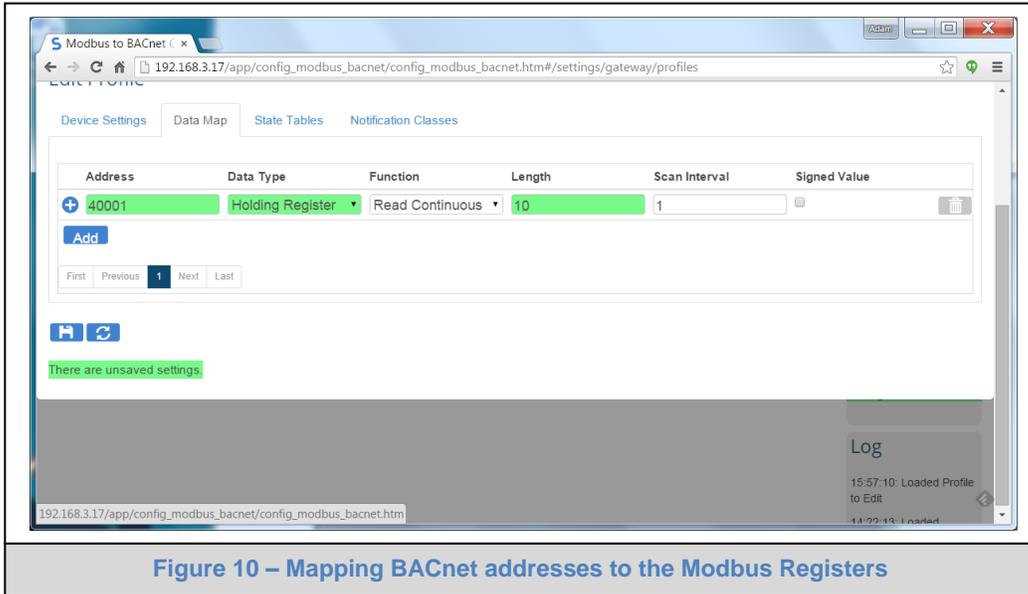


Figure 10 – Mapping BACnet addresses to the Modbus Registers

- Click on the Blue Plus next to the Address to map the BACnet Addresses to the Modbus Registers.

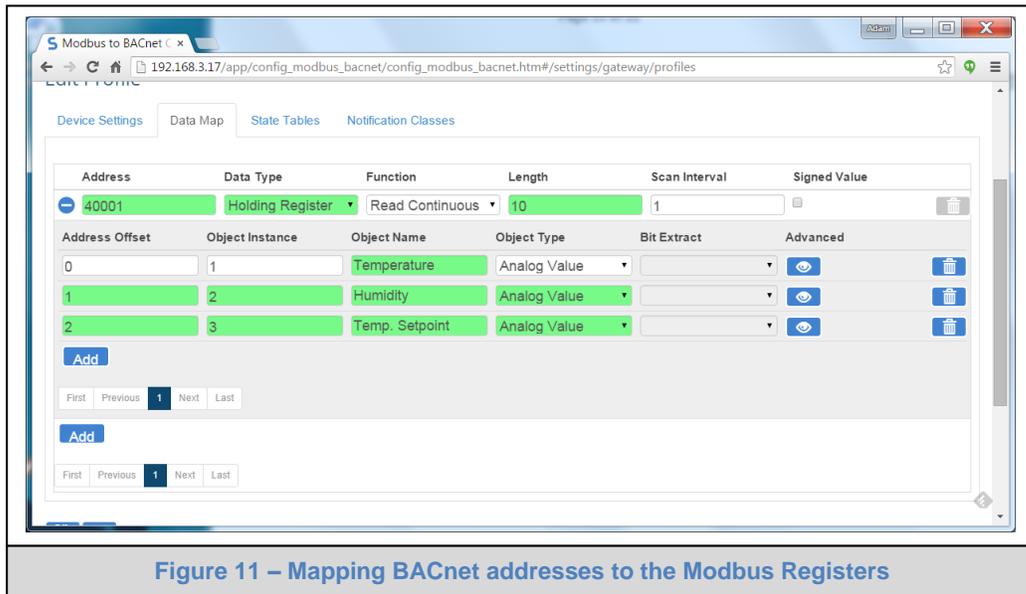


Figure 11 – Mapping BACnet addresses to the Modbus Registers

- Repeat for all of the Modbus registers
- If using a BACnet State Table, click on the "State Table" tab to define the table and its variables.

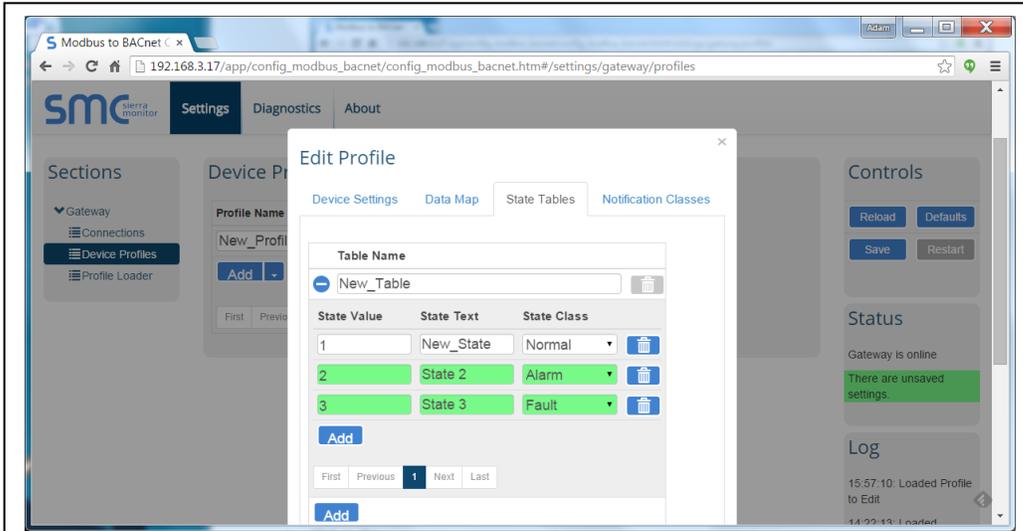


Figure 12 – Define the State Table & variables

- If you need to define a Notification Class, click the “Notification Class” tab and define the parameters of your class.

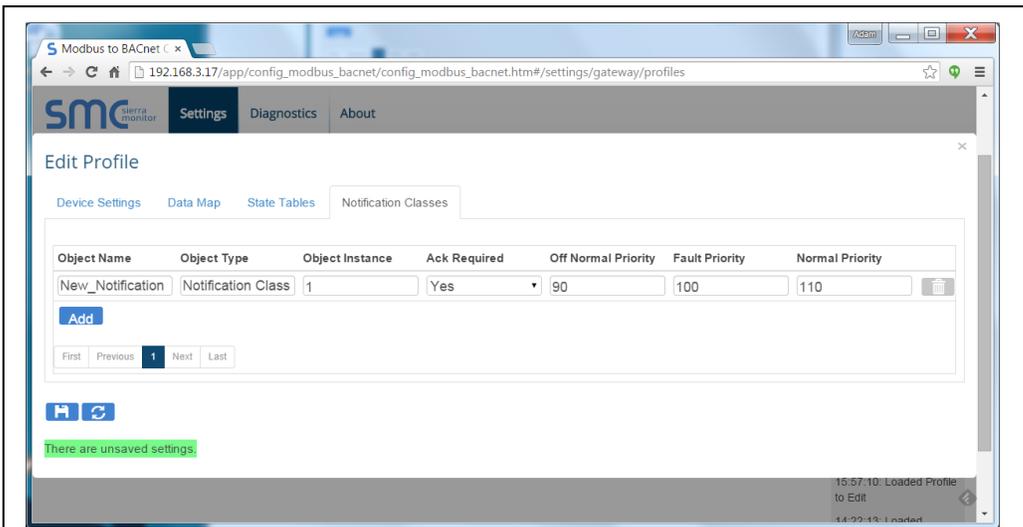


Figure 13 – Defining Parameters of Notification Class

- Once you define all of your mappings and settings, click the “Save” button to define the Profile

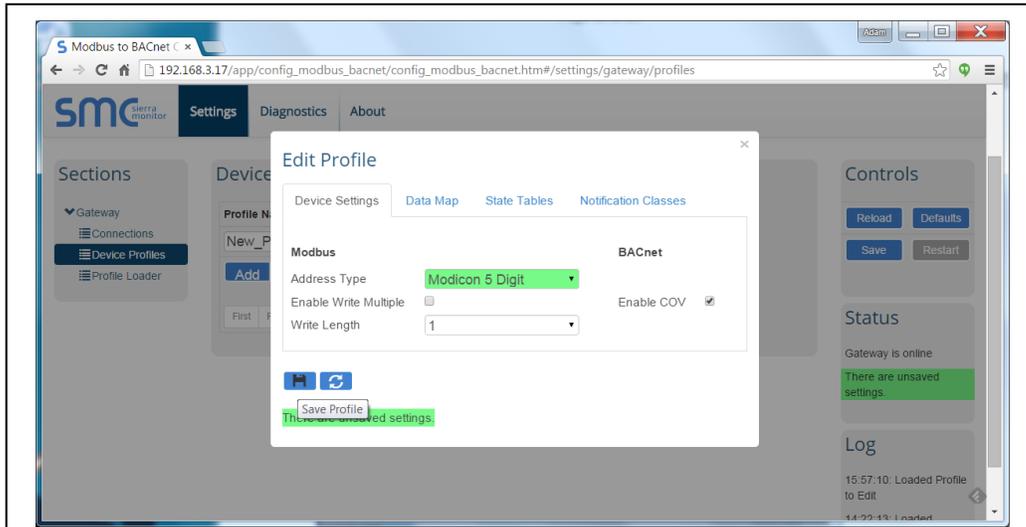


Figure 14 – Define Profiles

- Once you have defined your profile, you can then export it for backup or future use by hitting the Export Profile button.

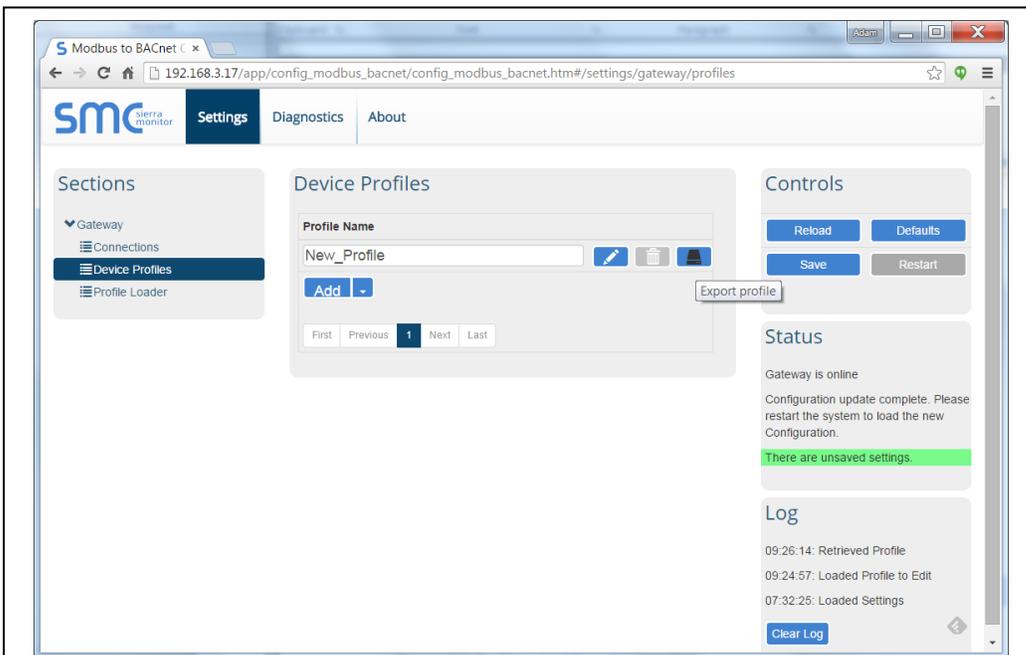


Figure 15 – Export Profile

- The profile you created will be downloaded to your computer in the format:
  - <Profile Name>.profile

### 7.3 Importing a Device Profile

- If you have an existing exported profile you can import it to the EZ Gateway by going to the Device Profiles section, and hitting the arrow to the right of the Add button

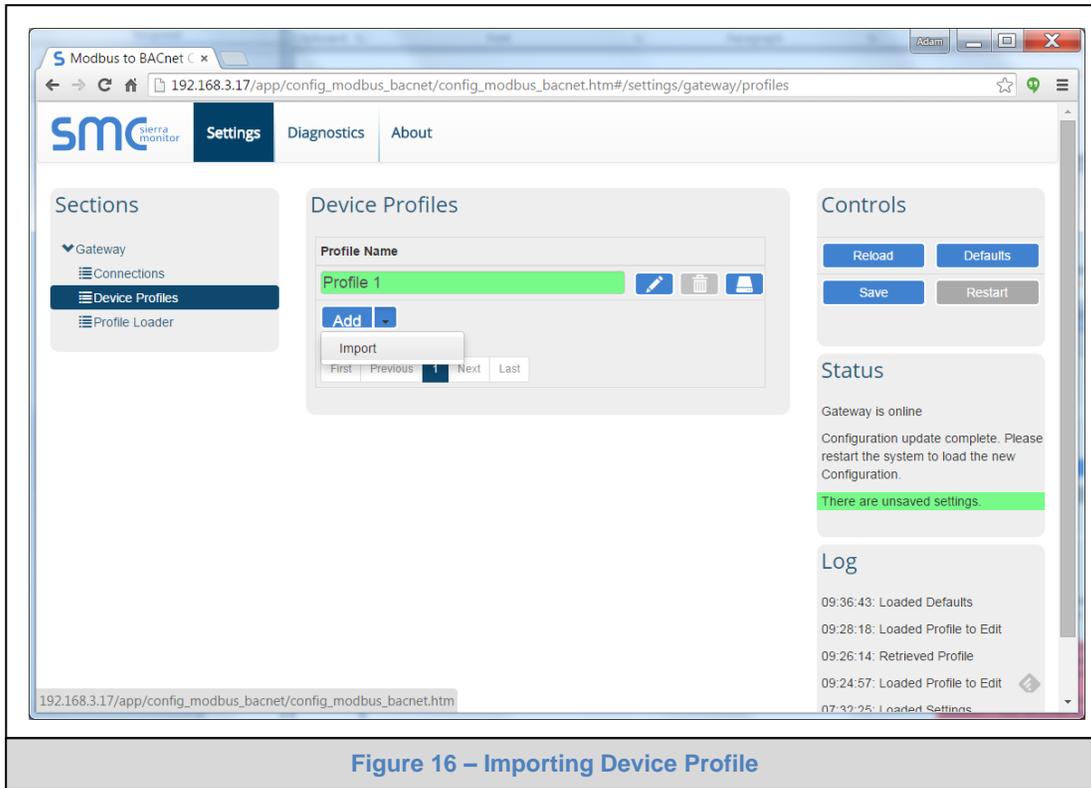


Figure 16 – Importing Device Profile

- Please note that you will need to either create or import all profiles to the EZ Gateway before proceeding.

## 7.4 Adding Device Profiles

- Click on the Profile Loader button
- Choose the Profile to load from the drop down.

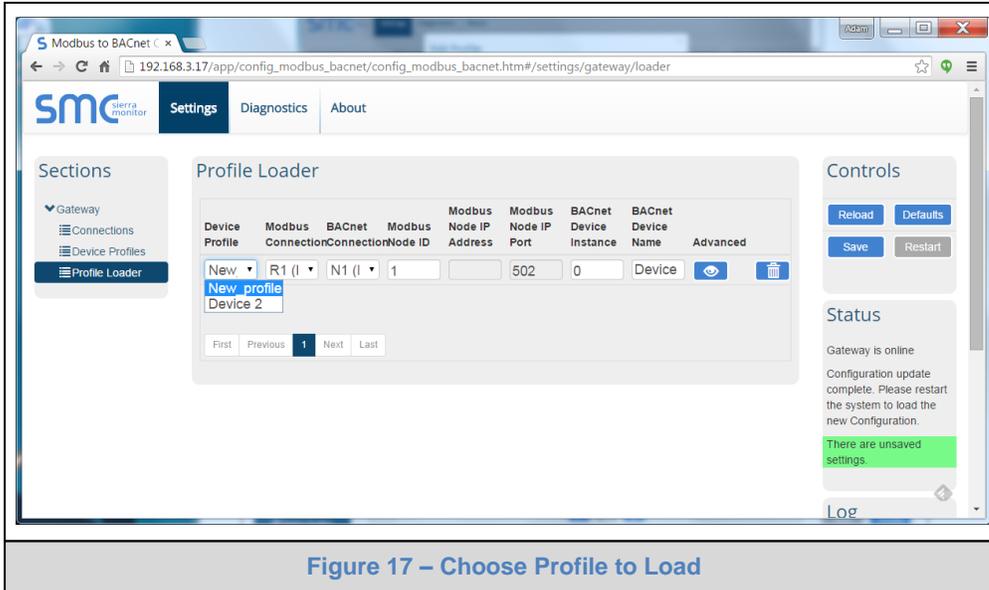


Figure 17 – Choose Profile to Load

- Choose the appropriate Connection and Node ID for both the incoming Modbus device and the mapped BACnet output.
- Click Add to include the device profile in the Configuration.
- Repeat for all Modbus Devices you plan on connecting to the EZ Gateway
- Click the Save button in the Controls Section once completed adding all device profiles.

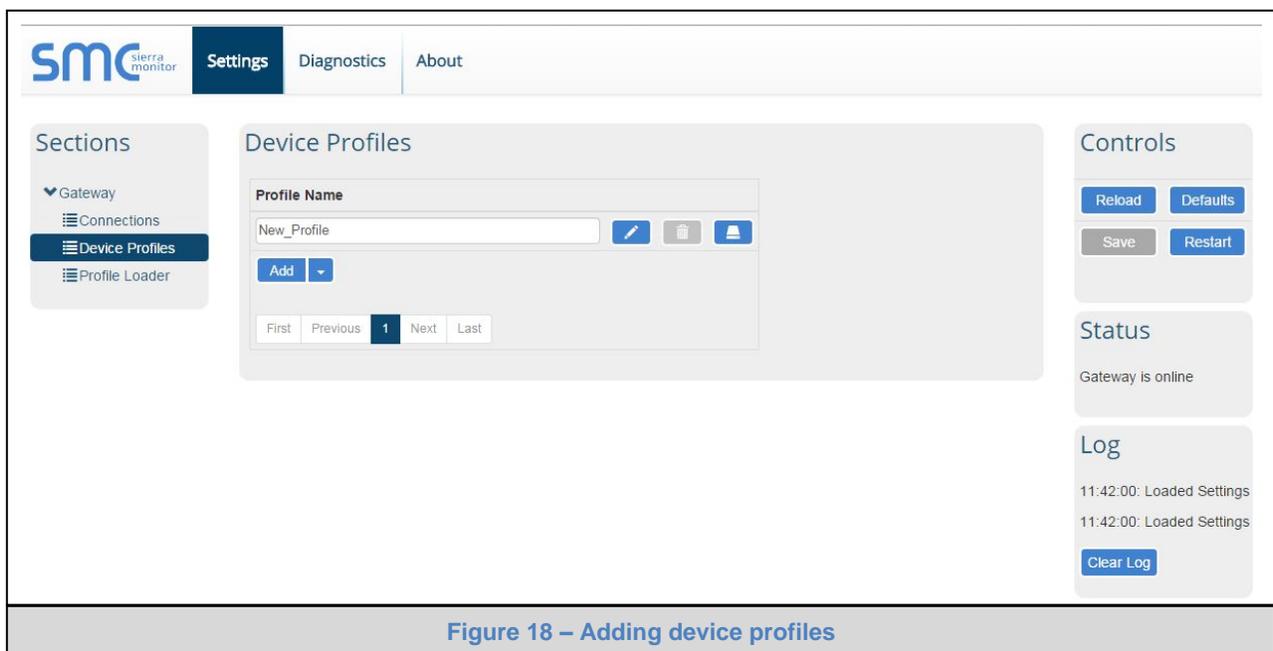


Figure 18 – Adding device profiles

## 7.5 Test and Commission the EZ Gateway

- Connect the EZ Gateway to the third party device(s), and test the application.
- Click on the Diagnostic tab to view to get to Diagnostic screen.
- From the main menu of FS-GUI click on View, Connections to see the number of messages on each protocol.

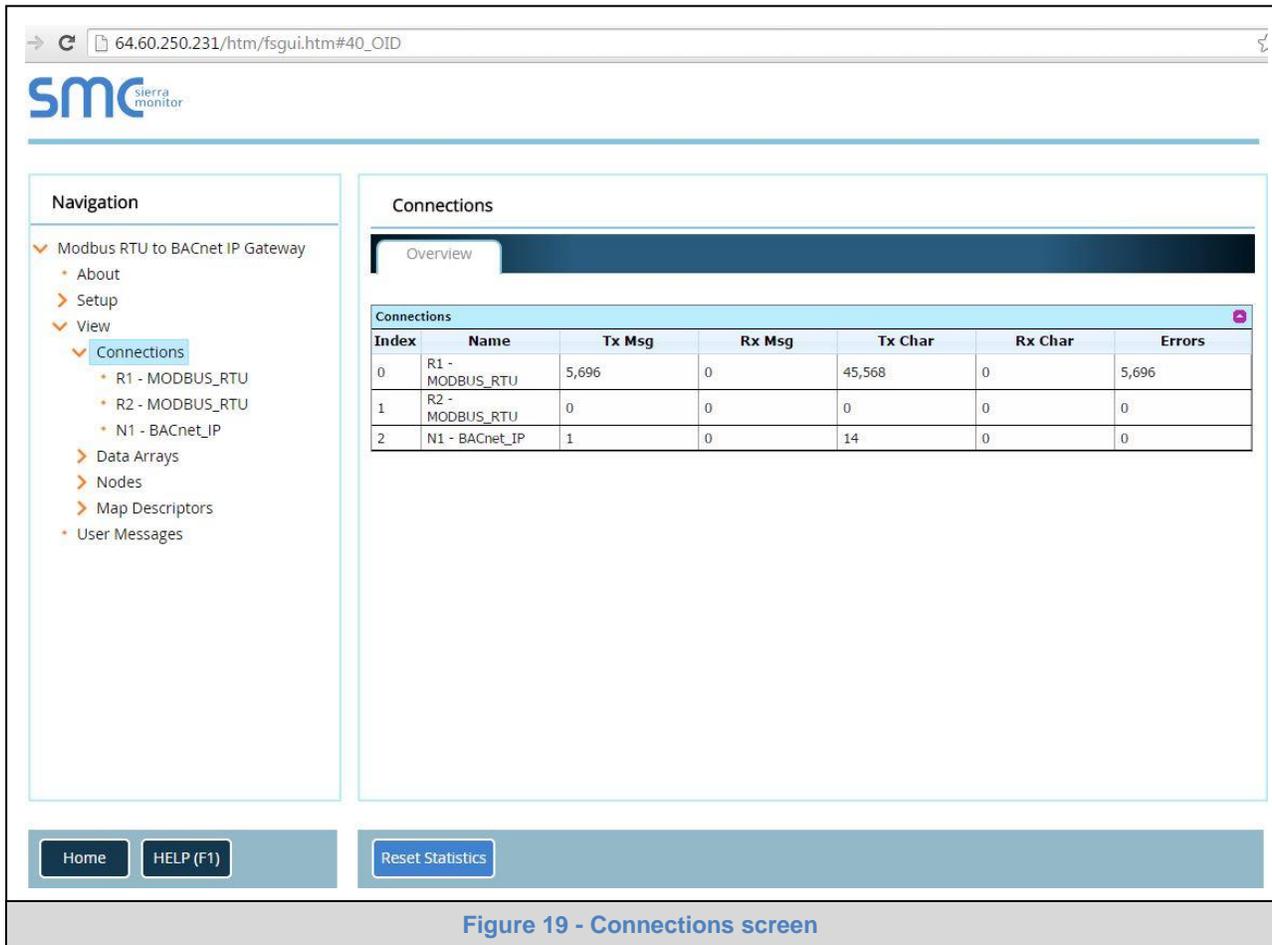


Figure 19 - Connections screen

- For troubleshooting assistance refer to Appendix A, or any of the troubleshooting Appendices in the related Driver Supplements and Configuration Manual. Sierra Monitor Corporation also offers a Technical support page on the Sierra Monitor Corporation website at [www.sierramonitor.com](http://www.sierramonitor.com), which contains a significant number of resources and documentation that may be of assistance.

## Appendix A Troubleshooting Tips

### Appendix A.1. Communicating with the EZ Gateway over the Network

- Confirm that the network cabling is correct.
- Confirm that the computer network card is operational and correctly configured.
- Confirm that there is an Ethernet adapter installed in the PC's Device Manager List, and that it is configured to run the TCP/IP protocol.
- Check that the IP netmask of the PC matches the EZ Gateway. The Default IP Address of the EZ Gateway is 192.168.2.X, Subnet Mask is 255.255.255.0.
  - Go to Start|Run
  - Type in "ipconfig"
  - The account settings should be displayed.
  - Ensure that the IP address is 102.168.2.X and the netmask 255.255.255.0
- Ensure that the PC and EZ Gateway are on the same IP Network, or assign a Static IP Address to the PC on the 192.168.2.0 network.
- If using Windows XP or later, ensure that the firewall is disabled.
- Ensure that all other Ethernet cards active on the PC, especially wireless adapters are disabled.
- Refer to the FieldServer Troubleshooting Guide which can be found at <http://www.sierramonitor.com/customer-care/resource-center?filters=software-downloads> for further information.

### Appendix A.2. Technical support

Before contacting Technical support to report an issue, take a diagnostic capture by using the FieldServer Toolbox and click on the Diagnose button to take a diagnostic capture. Send this log together with a detailed description of the problem to [support@sierramonitor.com](mailto:support@sierramonitor.com) for evaluation

Note that while all necessary documentation is shipped with the FieldServer on the USB flash drive, these documents are constantly being updated. Newer versions may be available on the web at <http://www.sierramonitor.com/customer-care/resource-center?filters=software-downloads/>

### Appendix A.3. Notes Regarding Subnets and Subnet Masks

Please Note that RFC standards allocate the IP address range of 192.0.0.0 through to 223.255.255.255 to be used in Class-C subnetting (i.e.: Subnets listed as 255.255.255.xxx, where xxx can vary based on filtering required).

Consequently, the IP stack for this product will not allow any IP addresses in this range to be allocated a subnet that does not fall within the Class C range.

Appendix B Reference

Appendix B.1. LED Functions



Figure 20 – LED allocation

Light	Description
SPL	SPL LED will be on when a configured node in the EZ Gateway is detected as being offline. See Node overview screen of the FS-GUI for further details.
RUN	RUN LED will flash 20 seconds after power up, signifying normal operation. The EZ Gateway will be able to access FS-GUI (refer to Section 6.3 for more information) once this LED starts flashing. During the first 20 seconds, the LED should be off
ERR	The ERR LED will go on solid 15 seconds after power up. It will turn off after 5 seconds. A steady red light will indicate there is a system error on the FieldServer. If this occurs, immediately report the related “system error” shown in the error screen of the FS-GUI interface to FieldServer Technologies for evaluation.
RX	On normal operation of FS-QS-10XX, the RX LED will flash when a message is received on the field port of the EZ Gateway.
TX	On normal operation of FS-QS-10XX, the TX LED will flash when a message is sent on the field port of the EZ Gateway.
PWR	This is the power light and should show steady green at all times when the EZ Gateway is powered.

## Appendix B.2. Compliance with UL Regulations

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

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

## 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.