Monitoring

FDS-Wi

Wireless Gateway

User Guide

Version 2.5

Firmware Version 5.2.10

Falcon

RLE Technologies

Copyright and Trademark Notices

Revision History

Rev. No.	Date
2.0	June 2010
2.1	September 2010
2.2	November 2010
2.3	March 2011
2.4	October 2011
2.5	May 2012

Note: As necessary, blank pages are added to make the page count even.

Product Registration

Product registration helps RLE Technologies inform owners of:

- Product upgrades
- Firmware enhancements
- New products and technologies
- Special offers available only to registered users

Any information provided to RLE Technologies through the registration form will be regarded as confidential. RLE will not sell or distribute any of the information to third parties. To read our Privacy Policy and registre your product, please visit our website: rletech.com.

Technical Support

Personal assistance is available Monday through Friday, from 8:00 a.m. to 5:00 p.m. MST.

A request for assistance may be sent to support@rletech.com.

Otherwise, please call us directly at: **800.518.1519**.

The following information is located on the bottom of each Wireless Gateway unit. Please have this information available whenever a technical support call is placed:

Product Model Number _____

Product Serial Number _____

Product Manufacture Date _____

RLE Product Warranty

Seller warrants to the Ultimate Purchaser (the purchaser who buys for use and not for resale) that all products furnished under this order and which are manufactured by Seller will conform to final specifications, drawings, samples and other written descriptions approved in writing by Seller, and will be free from defects in materials and workmanship. These warranties shall remain in effect for a period of twelve (12) months after shipment. If the Seller installs the equipment or supplies technical direction of installation by contract, said one year shall run from the completion of installation, provided installation is not unreasonably delayed by Ultimate Purchaser. Parts replaced or repaired in the warranty period shall carry the unexpired portion of the original warranty. A unit placed with the purchaser on consignment and then later purchased will be warranted for twelve (12) months from the time the Seller receives notification of the Purchaser's intent to purchase said consigned item. The foregoing is in its entirety is subject to the provision that in no case will the total warranty period extend beyond 18 months from date Seller ships equipment from point of manufacture.

Products are NOT life and safety certified. In no event shall the Seller be liable for loss, damage, or expense directly or indirectly arising from the use of the units, or from any other cause, except as expressly stated in this warranty. Seller makes no warranties, express or implied, including any warranty as to merchantability or fitness for a particular purpose or use. Seller is not liable for and Purchaser waives any right of action it has or may have against Seller for any consequential or special damages arising out of any breach of warranty, and for any damages Purchaser may claim for damage to any property or injury or death to any person arising out of its purchase or the use, operation, or maintenance of the product. Seller will not be liable for any labor subcontracted or performed by Purchaser for preparation of warranted item for return to Seller's factory or for preparation work for field repair or replacement. Invoicing of Seller for labor either performed or subcontracted by Purchaser will not be considered as a liability by the Seller.

The liability of Seller hereunder is limited to replacing or repairing at Seller's factory or on the job site at Seller's option, any part or parts which have been returned to the Seller and which are defective or do not conform to such specifications, drawings or other written descriptions; provided that such part or parts are returned by the Ultimate Purchaser within ninety (90) days after such defect is discovered. The Seller shall have the sole right to determine if the parts are to be repaired at the job site or whether they are to be returned to the factory for repair or replacement. All items returned to Seller for repair or replacement must be sent freight, prepaid to its factory. Purchaser must obtain Seller's Return Goods Authorization prior to returning items. The above conditions must be met if warranty is to be valid. Seller will not be liable for any damage done by unauthorized repair work, unauthorized replacement parts, from any misapplication of the item, or for damage due to accident, abuse, or act of God.

This warranty shall be exclusive of any and all other warranties express or implied and may be modified only by writing signed by any officer of the Seller. This warranty shall extend to the Ultimate Purchaser but to no one else. Accessories supplied by Seller but manufactured by others carry any warranty the manufacturers have made to Seller and which can be passed on to the Ultimate Purchaser.

Seller makes no warranty with respect to whether the products sold hereunder infringe any patent, U.S. or foreign, and Purchaser represents that any specially ordered products do not infringe any patent. Purchaser agrees to indemnify and hold Seller harmless from any liability by virtue of any patent claims where Purchaser has ordered a product conforming to Purchaser's specifications, or conforming to Purchaser's specific design.

Purchaser has not relied and shall not rely on any oral representation regarding the Product sold hereunder and any oral representation shall not bind Seller and shall not be part of any warranty.

Contents

Figures

Tables

CHAPTER

1

SYSTEM OVERVIEW

1.1. Product Description

The Wireless Gateway is a wireless acquisition appliance that helps monitor remote facilities. The Wireless Gateway receives 418 and 900 MHZ signals from wireless devices and relays them to facilities monitoring systems as SNMP, Modbus TCP/IP, Modbus RTU, BACnet/IP, and BACnet MS/TP signals.

The Wireless Gateway's wireless sensors can receive signals from products providing dry contact, analog (0-20mA), 0-5VDC, or 0-10VDC signals. Commonly used sensors include, but are not limited to, temperature/humidity, temperature, door counters, thermistors, motion sensors, power monitors, and more.

1.2. Rear Panel Indicators

The back of the Wireless Gateway has two status indicators to show when data is being transmitted and when data is being received through the EIA-485 port. When data is either being transmitted or received the status lights will blink. If no information is being communicated, the lights are off.

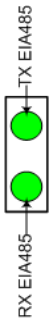
Status	Indicator	Figure
EIA-485 TX	Data is being transmitted.	
EIA-485 RX	Data is being received.	

Table 1.1 EIA-485 TX and EIA-485-RX

1.3. Terminal Block Designations

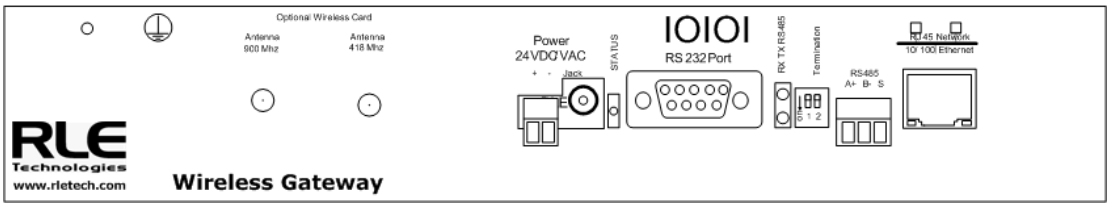


Figure 1.1 Terminal Block Locations

Item	Description
Antenna 916 MHz	RP-SMA connector
Antenna 418 MHz	RP-SMA connector
Power 24 VDC/VAC	Power terminal block
Jack	Wall wart adapter connector
Status	Status LED
RS232 Port	DB9 female connector
RX TX RS485 LED	Receive/Transmit status LED
RS485 Termination switch	1 (unused); 2 100 ohm termination
RS485 port	EIA-485 circuit connector
RJ45 Ethernet port	10/100 BASE-T connector

Table 1.2 Terminal Block Designations

1.4. SW1 Switch Settings

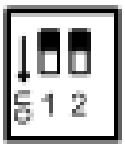
Status	Indicator	Figure
SW1-1	Not used	
SW1-2	EIA-485 Termination (On=100 ohm termination)	

Table 1.3 SW1 Switch Settings

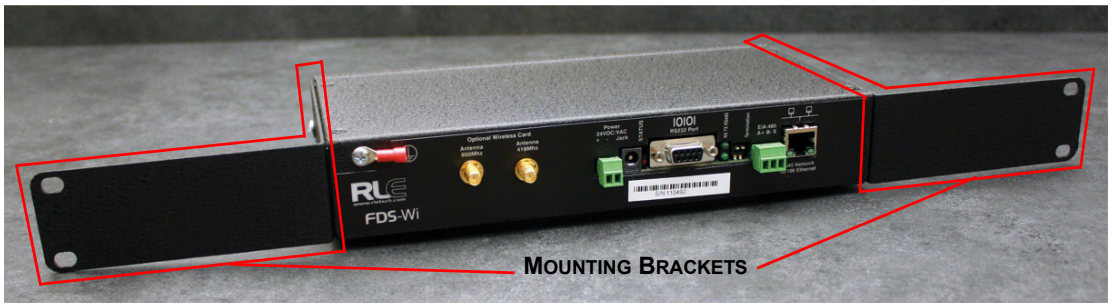
CHAPTER

2

GETTING STARTED

2.1. Installation

The Wireless Gateway comes with two brackets that, when attached to the device, allow it to be mounted in a 19-inch rack. Remove the screws from the side of the device, put the brackets in place, and reapply the screws. Mount the device in a rack. Use the proper anchoring method to mount the unit securely.



2.2. Wiring

2.2.1 Power Supply and Ground Connections

RLE Technologies recommends powering the Wireless Gateway from a UPS supply so the device can send alarm notifications during a power outage. Connect an 18AWG ground wire from the ground terminal to a suitable earth ground. Plug the wall adapter into P1 and a UPS outlet. The wall adapter has a five foot (1.524m) power cord.

Connect 24VDC to the unit through either the jack input or terminal block.

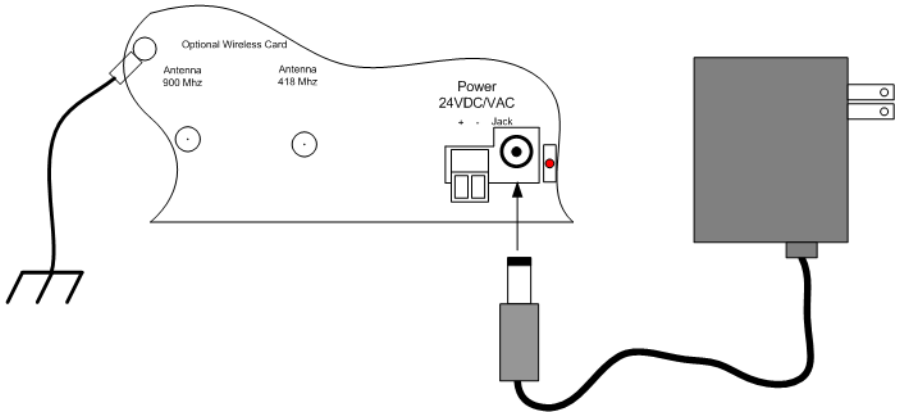


Figure 2.1 24VDC Power Supply Connection

If the EIA-485 port will be used for Modbus RTU communication, RLE Technologies recommends an 18AWG shielded twisted pair stranded copper wire for the connection, using no more than 2000 feet (609.6m) of wire at this specification. If longer runs are needed, please contact RLE Technologies.

The Wireless Gateway is shipped with a 418 MHz, 6-foot cable antenna and a 916 MHz, 6-foot cable antenna. The 418 MHz antenna has longer shafts; the 900 MHz antenna has shorter shafts. Plug each antenna into its appropriate jack on the front of the Wireless Gateway.

Figure 2.2 Wireless Gateway Antennae

2.3. Connectivity

2.3.1 RJ45 Ethernet Connection

The Wireless Gateway has an internal 10/100BASE-T Ethernet port that is used for configuration. The Ethernet port supports Web browser access, email (SMTP), BACnet slave, Modbus slave, and SNMP. The device can connect directly to a PC with a crossover cable (provided), or it can connect to a PC through a hub or switch, with CAT5 cables.

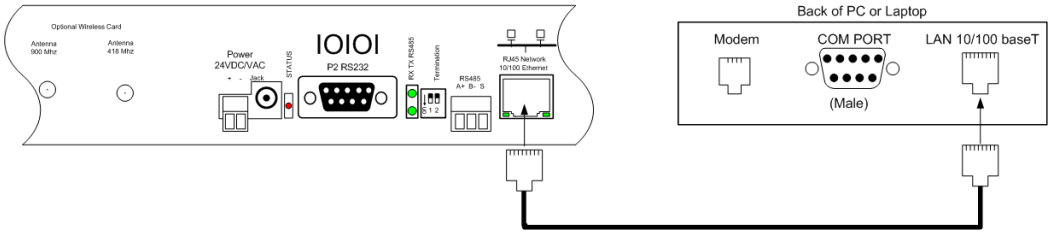


Figure 2.3 Ethernet Connection to a PC Using a Crossover Cable

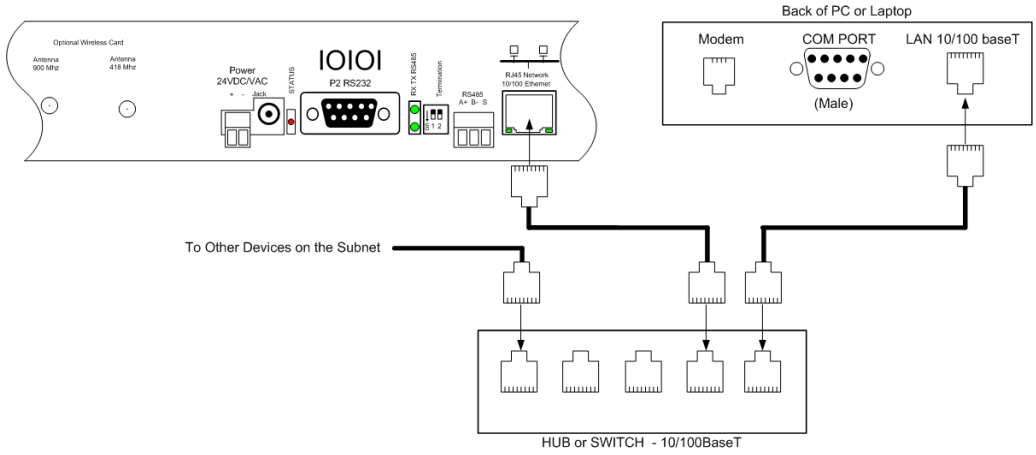


Figure 2.4 Ethernet Connection to a PC on a Subnet, Using a Hub/Switch and CAT5 Cables

2.3.2 EIA-232 COM Connection

The Wireless Gateway can be connected directly to a PC through its EIA-232 port. This is useful for IP configuration, firmware downloads, and troubleshooting. The EIA-232 connection is only used as a temporary connection. Connect the straight through, 9-pin serial cable as shown in Figure 2.5.

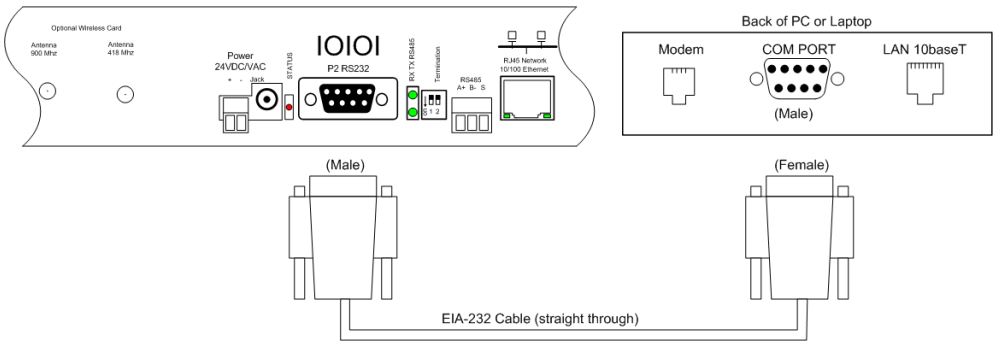


Figure 2.5 EIA-232 COM Connection

2.3.3 Modbus EIA-485 Connections

The Wireless Gateway can function as a Modbus Slave over an EIA-485, 2-wire hardware connection, as shown in Figure 2.6.

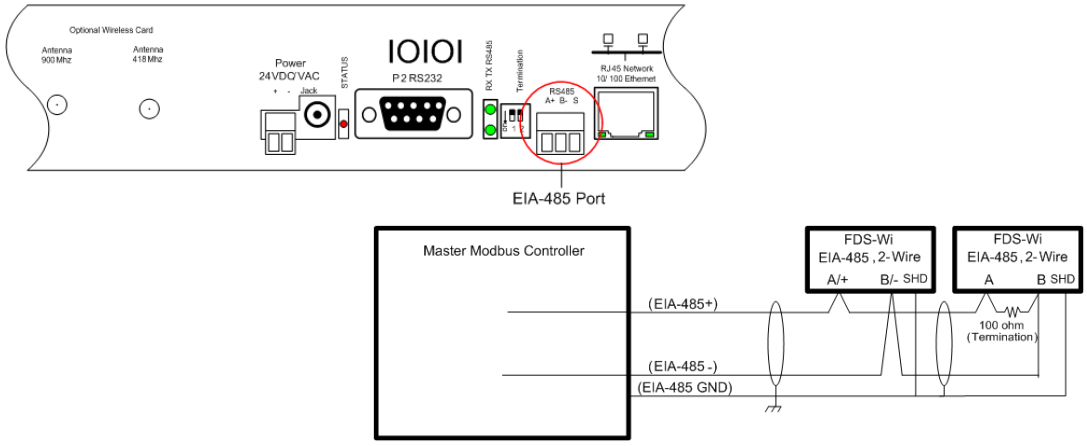


Figure 2.6 EIA-485 Connection

2.4. Communication: Set the IP Address

The Wireless Gateway will not communicate over a user's network the first time it is connected. This is because the manufacturer programs the device with a default IP address: `10.0.0.188`, Subnet Mask: `255.255.255.0`. This default address must be changed to an IP address that corresponds with the user's network before the Wireless Gateway can communicate over the network. There are two ways to set the Wireless Gateway's IP address:

- Via the Web browser
- Via the EIA-232 interface

2.4.1 Set the IP Address Using a Web Browser

Attention: If you have not set an IP address before, consult your IT Department for support.

Note **The default IP address for the Wireless Gateway is `10.0.0.188`**

The default Subnet Mask is `255.255.255.0`

The default user name is `fds` (all lowercase)

There is no default password—leave the password field empty.

1. Contact your IT Department to obtain an available IP address, Subnet Mask, and default Gateway.
2. Plug a crossover network cable (provided) into the laptop or workstation that will be used to configure the Wireless Gateway.
3. You'll need to change the IP address and Subnet Mask of your computer so it can communicate with the Wireless Gateway in its factory-configured state. Before you change anything, write down the original IP address and Subnet Mask of your computer - you'll need to revert back to these original settings once the Wireless Gateway is configured.
4. Change the IP address and Subnet Mask of the computer from its existing address to one that will allow it to communicate with the Wireless Gateway, such as `10.0.0.189`. It may be beneficial to set the IP address to one that is one number different from the Wireless Gateway IP address (`10.0.0.188`).
5. Connect the other end of the crossover cable to the Ethernet port on the back of the Wireless Gateway.
6. Access the Wireless Gateway through a Web browser — type the Wireless Gateway's IP address (`10.0.0.188`) into the location bar. When prompted, enter the Wireless Gateway user name, which is `fds`. There is no default password, leave it blank.
7. Select the **Configuration Menu** link, then change the IP address, Subnet Mask, and default Gateway to the one provided by your IT Department. Press the **Submit Changes** button. The Wireless Gateway will save the new IP address, Subnet Mask and default Gateway and reboot.
8. Change the IP address of the computer back to its original IP address. If the computer was configured as DHCP (the network domain controller assigns an IP address) return it to this state. This may require assistance from your IT Department, or you may need to consult the computer's manual.

9 The computer and the Wireless Gateway are now both configured to communicate on the network. Both should be accessible via the network. Connect the PC and the Wireless Gateway to the network. From the PC web browser, type in the new IP address of the Wireless Gateway. Enter the user name and password as stated above to verify network access to the device.

2.4.2 Set the Wireless Gateway IP Address using an EIA-232 Connection

To use the EIA-232 interface:

1 Contact your IT Department to obtain an available IP address, Subnet Mask, and default Gateway.

2 Use a 9-pin male-female straight through serial cable to connect the EIA-232 port on the Wireless Gateway to a terminal or PC running terminal emulation software (HyperTerminal).

3 Set the appropriate communication port to **9600 baud**, **NO parity**, **8 data bits**, **1 stop bit**, **(9600/N/8/1)**, and **no software or hardware flow command**.

4 Once the terminal emulation software starts, press **Enter** on the keyboard and the Wireless Gateway boot prompt should appear, (FDS_WI>). If the boot prompt does not appear, check the communication settings and make sure the unit is powered on.

5 From the boot prompt type `IP` then type one space and type the IP address your IT Department provided for the unit. Press the enter key. For example, `IP 192.168.103.211` The Wireless Gateway will reboot after the IP address is changed.

6 From the boot prompt type `NM` then type one space and type the Subnet Mask address your IT Department provided for the unit. Press the enter key. For example, `NM 255.255.255.0` The Wireless Gateway will reboot after the Subnet Mask is changed.

7 From the boot prompt type `DG` then type one space and type the Default Gateway address your IT Department provided for the unit. Press the enter key. For example, `DG 192.168.103.1` The Wireless Gateway will reboot after the Default Gateway is changed.

8 The IP address is now set and the Wireless Gateway can be accessed through a Web browser using the new IP address. The default user name is `fds` and there is no password. Leave the password field blank.

2.5. Sensor Discovery

The Wireless Gateway is equipped with a sensor discovery feature. The device will discover available wireless sensor inputs and enter them into the Sensor Summary page. To configure sensors to use with the Wireless Gateway, follow these steps:

1 In the Wireless Gateway's user interface, go to the Configuration>FDS-Wi page. If it is not already enabled, click the Enabled radio button for Sensor Discovery.

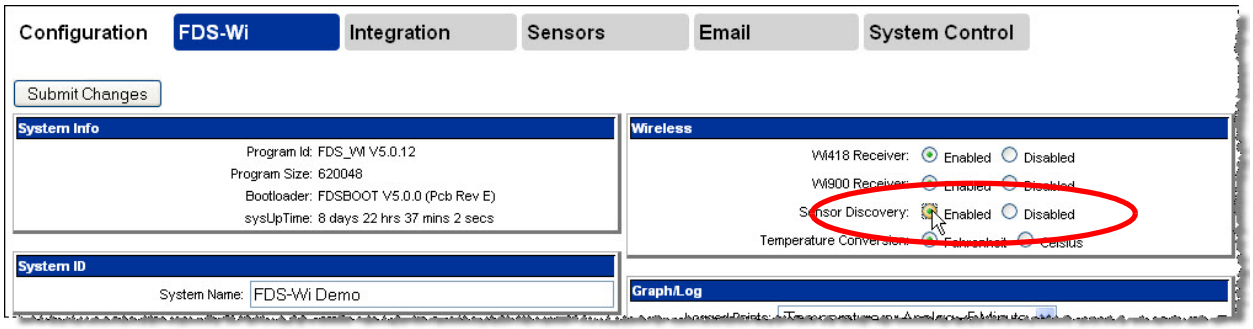


Figure 2.7 Enabling Sensor Discovery

2 Take off the sensor's lid by pinching on the outer corners of the lid.

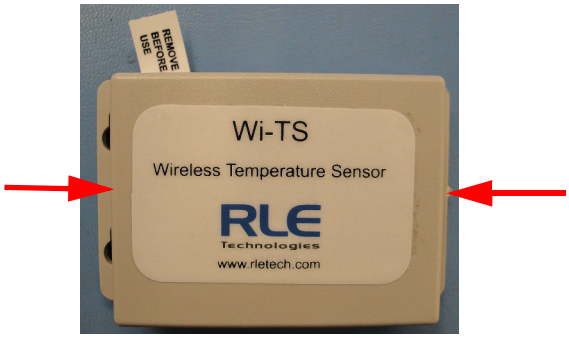


Figure 2.8 Remove the Sensors's Lid

3 With the lid off, remove the polyester tab from the battery. Replace the lid.

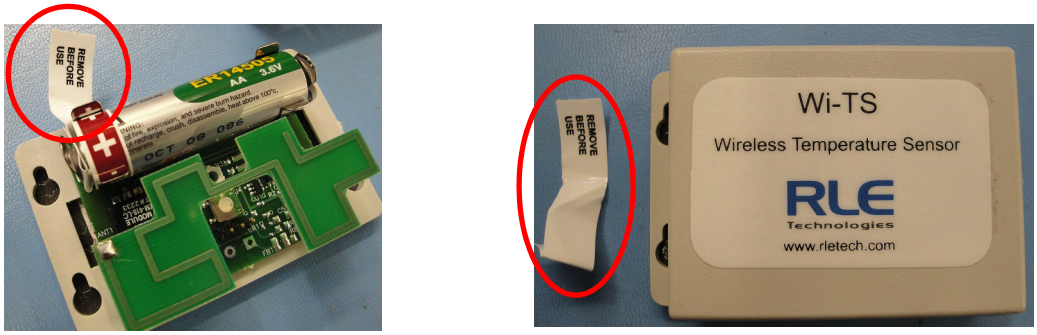


Figure 2.9 Remove the Battery's Protective Tab

4 Turn the sensor over to show the product label on the bottom. This label contains the serial number of the sensor. The serial number is unique to each sensor, and appears in the table on the Configuration>Sensors page once the sensor has been discovered by the Wireless Gateway.

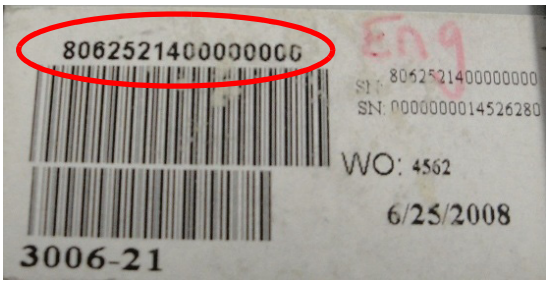


Figure 2.10 Sensor's Serial Number on Product Label

5 Go to the Configuration>Sensors page of the Wireless Gateway's user interface and confirm the placement in the sensor discovery list.

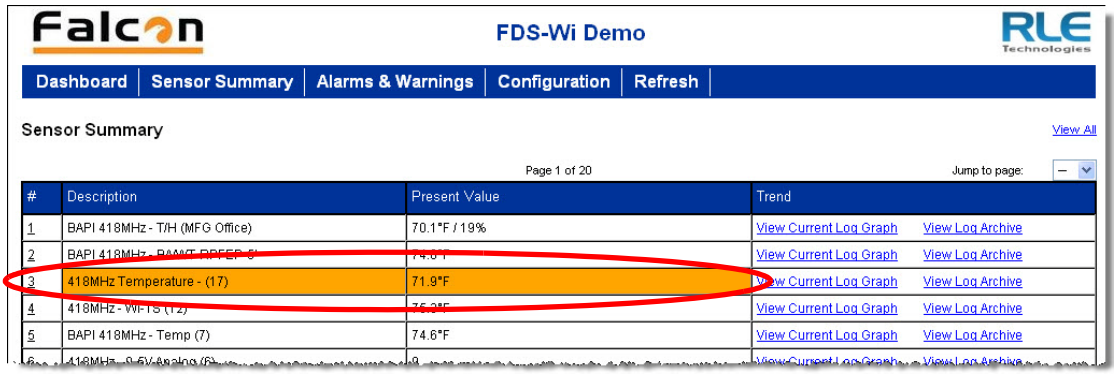


Figure 2.11 Verifying a Sensor's Discovery

6 Place a label or other marking on the sensor to show its index number.

Figure 2.12 Label the Sensor

7 Once the sensors have been discovered, **turn off** the Sensor Discovery option in the Configuration>FDS-Wi page of the Wireless Gateway's user interface. If you do not turn off the sensor discovery feature, the Wireless Gateway will continue to attempt to find new sensors. This could cause a device malfunction, or contaminate your list of active sensors with additional sensors that do not actually exist.

8 Note each sensor's index number and location. Reference Chapter 3, "Web Interface – Standard Version" on page 23 to learn how to enter the location and any other necessary identifying information in each sensor's configuration information.

9 Once you have configured the Wireless Gateway, save a copy of the system configuration.

2.6. Sensor Mounting Tips

The electronics in a wireless sensor are water-resistant, but not waterproof. Wireless sensors need to be mounted in a safe location, where the chance of them becoming submerged in a liquid are minimal. Sensors can be mounted with double-faced tape or adhesive velcro. To mount a sensor on a metallic surface, purchase adhesive-backed magnetic tape and adhere it to the back of the sensor. Use magnetic tape that is 0.5 inch (1.27cm) wide. The magnetic tape will not disturb the electronics, and when placed correctly, the tape allows the sensor's label to remain visible. The serial number on this label is unique to each sensor, and you will need to refer to this number throughout the life span of the sensor.

Figure 2.13 Magnetic Strips Used to Mount a Sensor

To mount sensors using magnetic tape:

1 For each sensor, cut two 1.5-inch (3.81cm) strips of tape.

Figure 2.14 Recommended Length of 0.5 Inch for Magnetic Strip

2. Make sure the back of the sensor is clean. If necessary, use isopropyl alcohol to clean the sensor.
3. Remove the protective film from the adhesive side of the magnetic tape and place the tape on the sensor.
4. Place the sensor in the desired location.

CHAPTER

3

WEB INTERFACE – STANDARD VERSION

The Wireless Gateway allows users to view data points and configure the unit/points via the Web. To access the Web interfaces, users must first setup the Wireless Gateway to communicate via the Internet. To set the IP address, see section 2.4., “Communication: Set the IP Address” on page 17.

Note See Chapter 4, “Web Interface – Integration Version” on page 45 for information about the integrator version of the web interface.

3.1. The Dashboard

The Dashboard provides a quick view of a portion of the information accessible through the web interface. The Dashboard is fully configurable, so the information most critical to a site’s operations can be monitored at a glance.

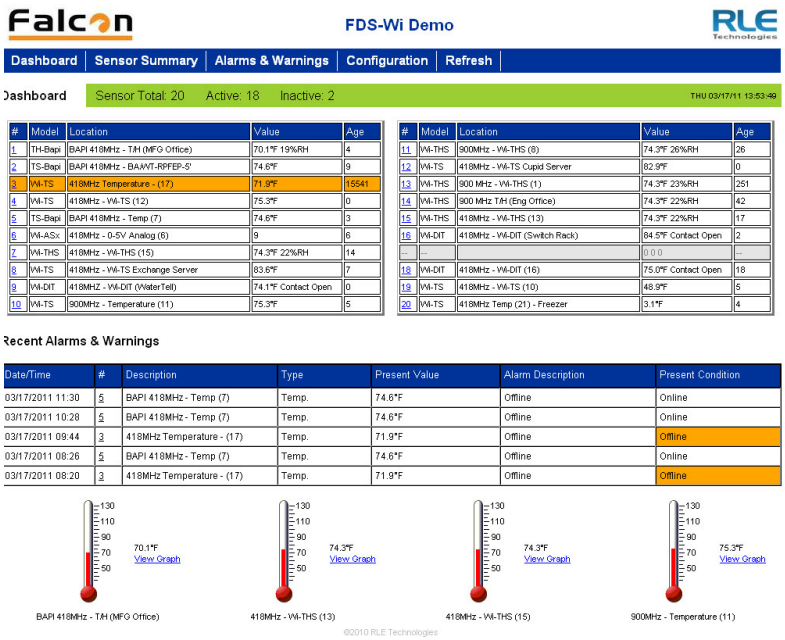


Figure 3.1 Wireless Gateway Dashboard

Sensors on the Dashboard are color coded to help notify users of alarm conditions.

Color	Indication
No Color	Sensor is registering properly—sensor is communicating properly
Red	Sensor is registering properly—sensor has an analog/digital alarm
Yellow	Sensor is registering properly—sensor has an analog warning
Orange	Sensor is offline—problems with the communications

Table 3.1 Dashboard Alarm Color Codes

From the homepage, users can also navigate to the Configuration page, edit individual sensor proprieties, refresh the Wireless Gateway signal, and navigate to the Help page.

3.2. Sensor Summary Page

The Sensor Summary page allows users to view all the sensors accessible through the Wireless Gateway. Up to twenty sensors can be displayed per page, and there are twenty pages available. The page displays a # link, description, present value and trending information. Click the number link to access the configuration information for that particular sensor. To learn more about sensor configuration, reference section 3.6., “Configuration Page - Sensors Tab” on page 36.

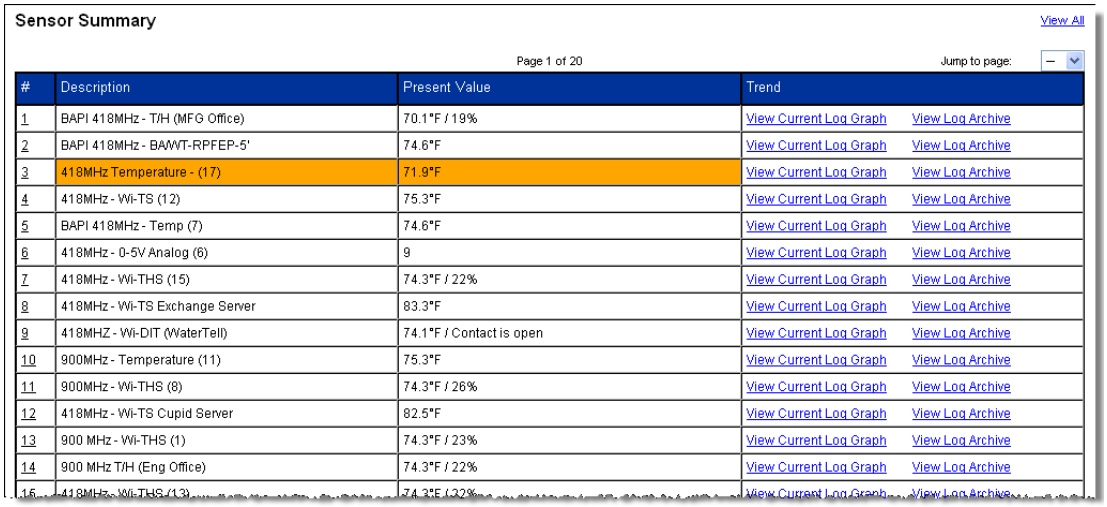


Figure 3.2 Sensor Summary Sample Menu

Option	Description
# Link	Click on the sensor number to go to the sensor’s configuration page.
Description	A label describing the sensor type and/or location.
Present Value	Displays the current sensor reading.
Trend	Click the links to view either a graph or a log showing the sensor’s data record from the last 24 hours.

Table 3.2 Sensor Summary Menu Options

The Current Log Graph link

Figure 3.3 Current Log Graphs and Log Archive

3.3. Alarms and Warnings Page

This page displays the 40 most recent events from all monitored sensors. If a sensor was in an alarm state that has since returned to normal, "Return" is noted in the Present Condition field. If the sensor is still in an alarm state, the alarm will be noted in the Present Condition field.

If the Wireless Gateway's power is cycled, all entries on this page will be cleared.

Alarms & Warnings

Page 1 of 1

Date/Time	#	Description	Type	Present Value	Alarm Description	Present Condition
09/23/2011 06:38	6	900MHz Counter/Temp	Temp./Counter	7.4°F / Contact is open	Offline	Online
09/22/2011 10:57	3	418MHz Temperature - (17)	Temp.	70.8°F	Offline	Offline
09/22/2011 10:54	42	Wi-LD	Wi-LD	28 uA	Leak Detected	Alarm!
09/20/2011 14:21	11	900MHz - Wi-THS - High Temp T	Temp./Humid.	100.4°F / 25%	Offline	Online
09/20/2011 06:58	11	900MHz - Wi-THS - High Temp T	Temp./Humid.	100.4°F / 25%	Offline	Online
09/17/2011 22:41	11	900MHz - Wi-THS - High Temp T	Temp./Humid.	100.4°F / 25%	Offline	Online
09/17/2011 07:27	18	418MHz - Wi-DIT (16)	Temp./DIT	68.1°F / Contact is open	Contact closure	Return
09/16/2011 17:12	11	900MHz - Wi-THS - High Temp T	Temp./Humid.	100.4°F / 25%	Offline	Online
09/15/2011 00:42	18	418MHz - Wi-DIT (16)	Temp./DIT	68.1°F / Contact is open	Contact closure	Return
09/12/2011 17:26	9	418MHZ - Wi-DIT (WaterTell)	Temp./DIT	70.7°F / Contact is open	Offline	Online
09/12/2011 08:47	17	BAPI 418MHz - T/H (MFG Office)	Bapi-?	0 0 0	Offline	Offline
09/12/2011 08:37	41	Sensors 41	--	0 0 0	High temp. exceeded 4	Return

Figure 3.4 Alarm and Warnings Page

3.4. Configuration Page - FDS-Wi Tab

The Configuration Page allows users to view and edit a variety of configuration options.

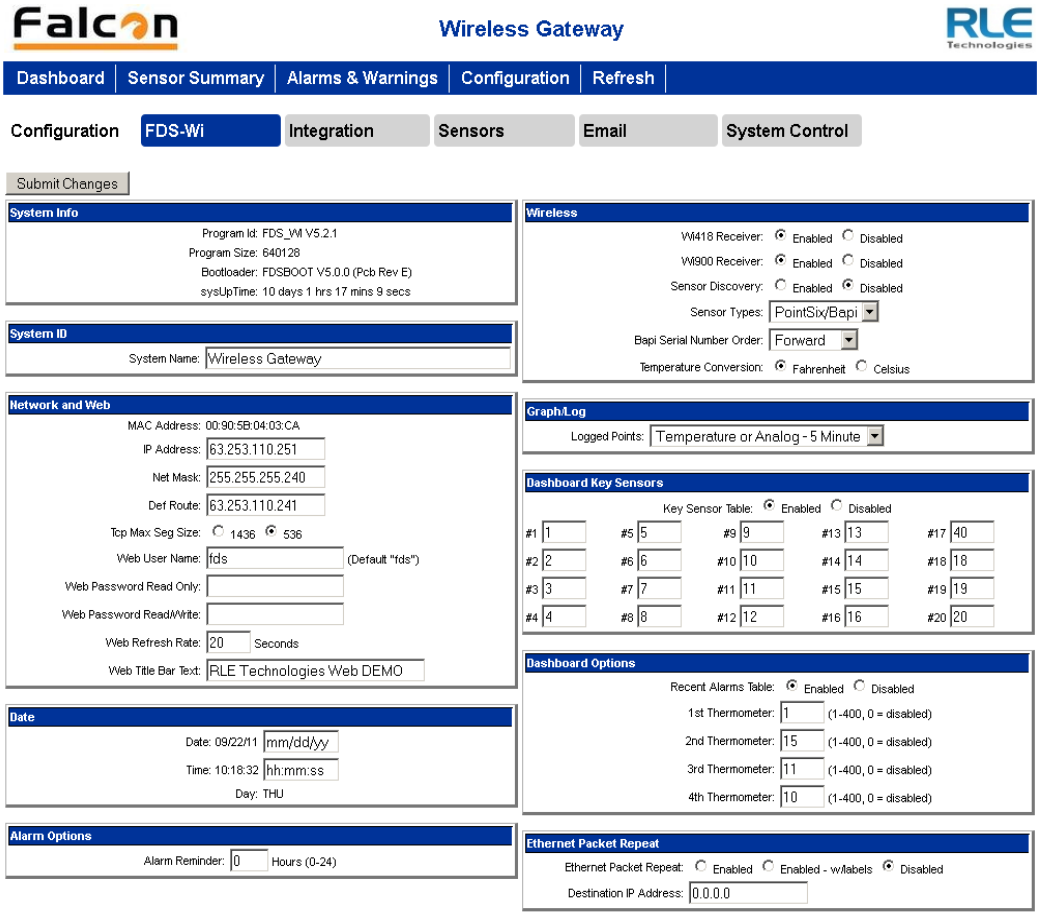


Figure 3.5 Configuration Page

Editable system preferences include:

- System Info
- System ID
- Network and Web
- Date
- Alarm Options
- Wireless
- Graph/Log
- Dashboard Key Sensors
- Dashboard Options
- Ethernet Packet Repeat

NOTE **If any of these fields are edited, be sure to click the Submit Changes button to save the changes. If you edit the fields and do not click the Submit Changes button, all edits will be lost.**

3.4.1 System Info

The System Info section displays detailed information about the system, including the Program Id (firmware version), Program Size (size of the firmware file), Bootloader Version, and sysUp Time, or how long the system has been running since power was applied.

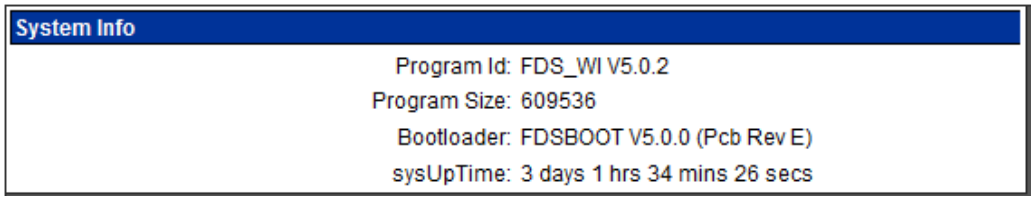


Figure 3.6 System Info Section

3.4.2 System ID

Provide the Wireless Gateway with a unique identifier.

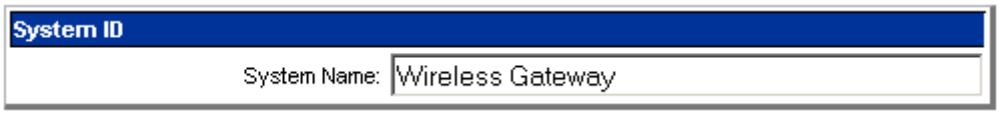


Figure 3.7 System ID Section

3.4.3 Network and Web

The Network and Web section displays the assigned MAC Address and allows users configure common network information.

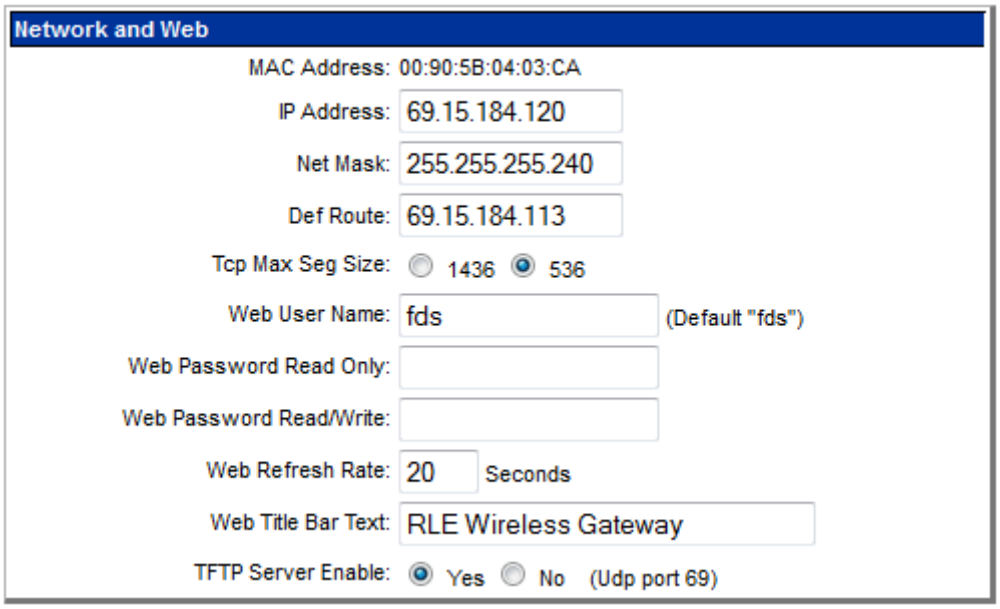


Figure 3.8 Network and Web Section

Edit the following fields as necessary:

Option	Description
IP Address	The Wireless Gateway is shipped with a default IP Address of 10.0.0.188. Contact your IT Department for an appropriate IP address, if you wish to change this field.
Net Mask	The Wireless Gateway is shipped with a default Subnet Mask of 255.255.255.0.
Default Route	The Wireless Gateway comes with a default Gateway Route of 10.0.0.1. Contact your IT Department for help with this setting.
TCP Max Seg Size	The Wireless Gateway defaults to 1436 packet size for web page data. Users may select 536 for limited bandwidth or VPN applications.
Web User Name	If this field is left blank, the Wireless Gateway's default user name is `fds` (all lower case). Users can enter a user name up to 18 characters, either alpha, numeric, or a combination of the two. The Wireless Gateway user name is case sensitive.
Web Password Read Only	Two separate passwords can be established on the Wireless Gateway. The Read Only password allows users to access the Wireless Gateway Web interface and view the conditions of the sensors, but does not allow users to make changes to the Wireless Gateway configuration.
Web Password Read/Write	The second configurable password on the Wireless Gateway provides users with expanded access. The Read/Write password allows users to view the condition of the sensors and make changes to the Wireless Gateway configuration.
Web Refresh Rate	The Web Refresh Rate is the amount of time the system waits until it updates the Web interface with current data. To change the rate, click in the field and type in the desired amount of time (in seconds). **The minimum recommended refresh rate is five seconds; otherwise, errors may occur that prevent the system from functioning properly**. The default refresh rate is set to 0 - the Wireless Gateway will not refresh at all. Users must set a refresh rate in order for the system to automatically update.
Web Title Bar Text	The text that's displayed in the title bar of the web browser.
TFTP Server Enable	Decide whether the TFTP server capabilities are enabled or not.

Table 3.3 Network and Web Section Options

3.4.4 Date

The Date section allows users to set the current date and time for the system and displays the first three letters of the day of the week.

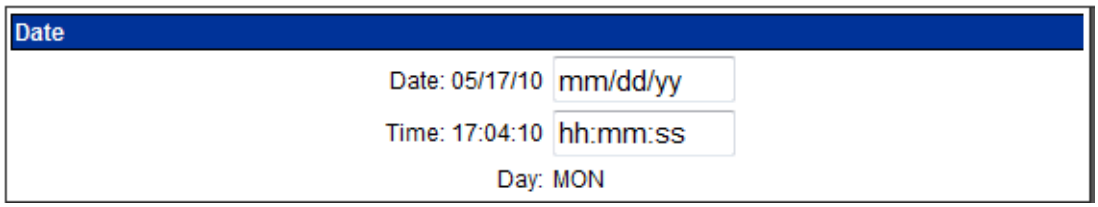


Figure 3.9 Date Section

Option	Description
Date	Enter the date in mm/dd/yy format.
Time	Entered the current time in hh:mm:ss format, where the hour is a two digit number between 01 and 24.

Table 3.4 Date Section Options

3.4.5 Alarm Options

Use the Alarm Options setting to set the Wireless Gateway re-alarm function. The device will re-send an alarm after a point has been in alarm for a certain number of hours.

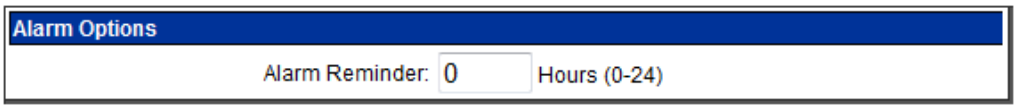


Figure 3.10 Alarm Options Section

Option	Description
Alarm Option	Select a re-alarm time from 1–24 hours. Set the re-alarm time to 0 to disable the feature.

Table 3.5 Alarm Section Option

3.4.6 Wireless

Use this menu to configure wireless options on the Wireless Gateway.

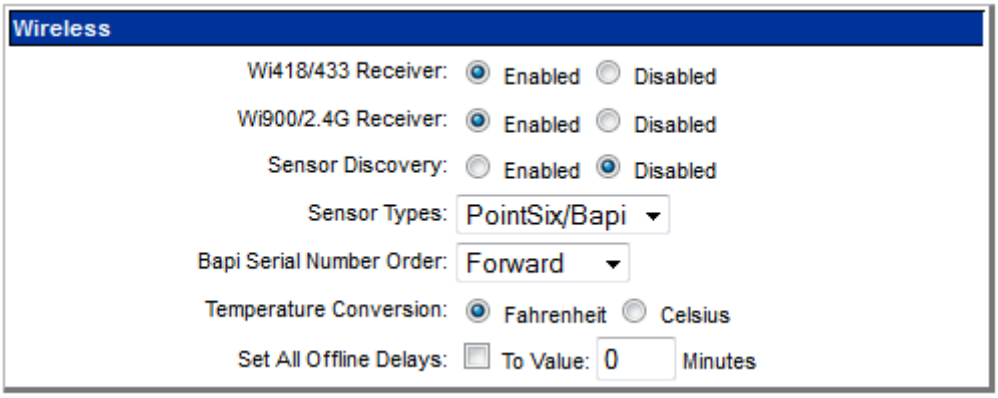


Figure 3.11 Wireless Section

Option	Description
Wi418/433 Receiver **Wi900/2.4G Receiver**	Enabled: Turns on the Wireless Gateway's 418/433 MHz and 900MHz/2.4GHz antennas. This allows the FDS-Wi to communicate with devices on the respective wavelengths. Disable: Turns the antennas off and prohibits the Wireless Gateway from communicating with devices on the respective wavelengths.
Sensor Discovery	Enabled: This is the Wireless Gateway's default setting. When sensor discovery is enabled, the Wireless Gateway automatically discovers new sensors transmitting to it. The Wi loads the newly detected sensor's type and serial number in its next available sensor number. Disabled: **Once you're done with the sensor discovery process, set this option to disabled.** This prevents the Wireless Gateway from seeing transmissions from new sensors, and keeps your system from logging sensors that may not actually exist. Set Sensory Discovery to Disabled and click on the submit changes button.
Sensor Types	Designate whether your system uses only Bapi Sensors, only Point Six Sensors, or a combination of the two.
Bapi Serial Number Order	If your system uses Bapi sensors, indicate whether the serial numbers should be read forward or backward by the Wireless Gateway. In most instances, the serial numbers should be read forwards. If the Bapi sensors are an older generation, the serial number may need to be read backward.
Temperature Conversation	Select whether the temperature on the main page displays as celsius or Fahrenheit.
Set All Offline Delays	Users can designate how many minutes must pass before the FDS-Wi considers the sensor offline. Typical transmission time is 10-20 seconds for 418MHz sensors and 3-5 minutes for 900MHz sensors.

Table 3.6 Wireless Section Options

3.4.7 Graph/Log

Use this option to determine how frequently the sensors are sampled - every 5 or 10 minutes - for graphing and logging purposes.

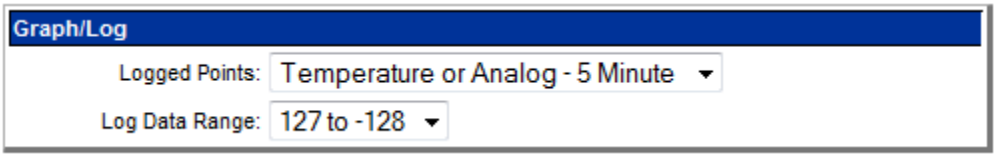


Figure 3.12 Graph/Log Section

Option	Description
Graph/Log	Select the 5 minute or 10 minute option.
Log Data Range	The FDS-Wi will log temperature readings that falls within a designated range. Select the range that best suits your application.

Table 3.7 Graph/Log Section Option

3.4.8 Dashboard Key Sensors

Use this section to enable or disable the sensor display on the Dashboard, and designate which 20 sensors are displayed on the Dashboard. By default, this feature is disabled.

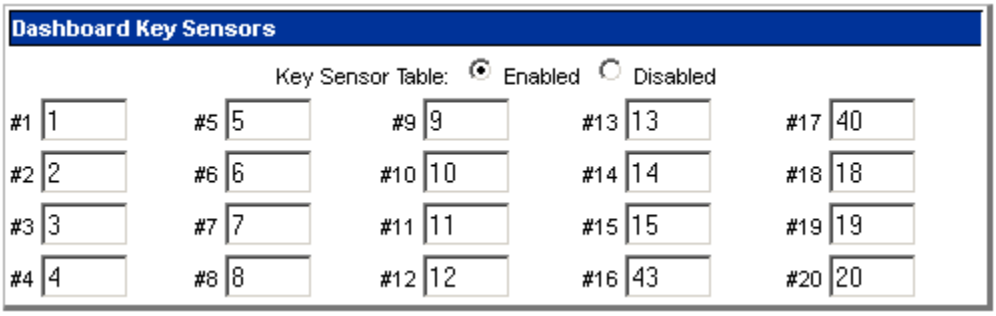


Figure 3.13 Dashboard Key Sensors Section

Option	Description
Dashboard Key Sensors	Enable or diable the sensor display. Select up to 20 different sensors to be displayed on the Dashboard.

Table 3.8 Dashboard Key Sensors Section Option

3.4.9 Dashboard Options

Use this section to enable or disable the recent alarm table and thermometer displays on the Dashboard. Designate which thermometers are displayed.

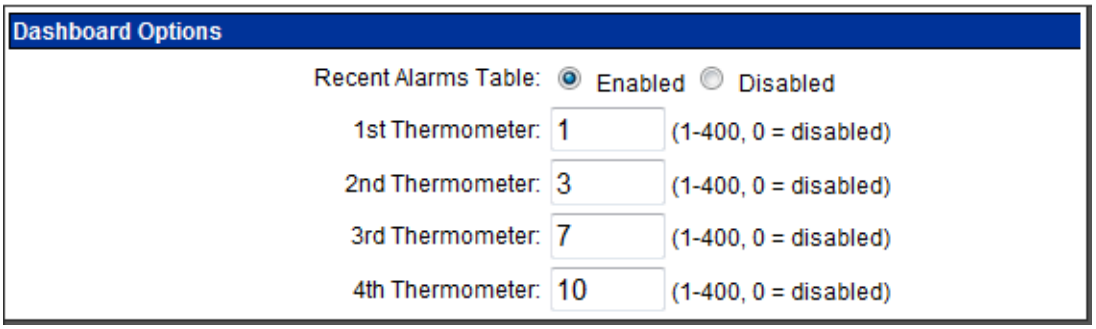


Figure 3.14 Dashboard Options Section

Option	Description
Dashboard Option	Enable or disable the recent alarm table and thermometer display. Designate which temperature sensors are displayed on the Dashboard.

Table 3.9 Dashboard Option Section Options

3.4.10 Ethernet Packet Repeat

Use this feature to allow the Wireless Gateway to transmit sensor information over the network (via port 6767) to another Wireless Gateway.

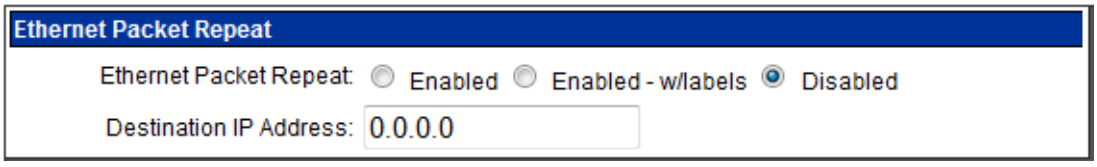


Figure 3.15 Ethernet Packet Repeat Section

Option	Description
Ethernet Packet Repeat	Enable or disable this option. Select enabled or enabled with labels and enter the IP address of the Wireless Gateway to which you wish to send the sensor information.

Table 3.10 Ethernet Packet Repeat Section Options

3.5. Configuration Page - Integration Tab

The Integration tab is made up of four configurable sections, which allow users to edit the following options:

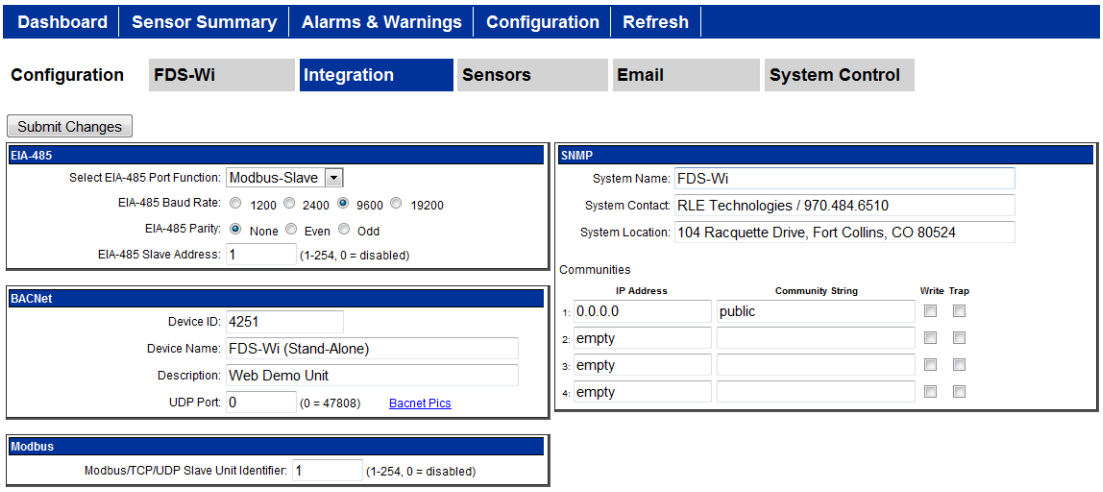


Figure 3.16 Configuration Page, Integration Tab

Use the interface to edit the following fields, taking care to click the **Submit Changes** button to save any changes you may have made.

3.5.1 EIA-485

Use this section to configure the system's EIA-485 port settings.

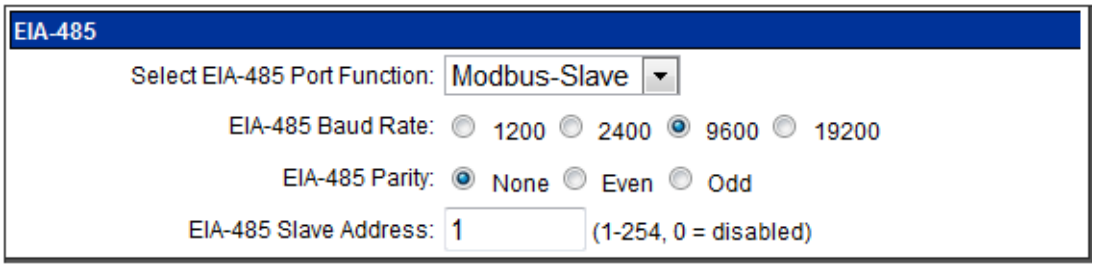


Figure 3.17 EIA-485 Section

Option	Description'
EIA-485 Port Function	Set the output type for the EIA-485 port to either Modbus-Slave or Bacnet-MS/TP.
EIA-485 Baud Rate	Select 1200, 2400, 9600(default) or 19200.
EIA-485 Parity	Select None (default), Even or Odd.
EIA-485 Slave Address	Set a RTU address from 1–254. If the field is left at 0, there is no transmission on the EIA-485 port.

Table 3.11 EIA-485 Section Options

3.5.2 BACnet/IP

The BACnet/IP configuration section allows users to configure several settings.

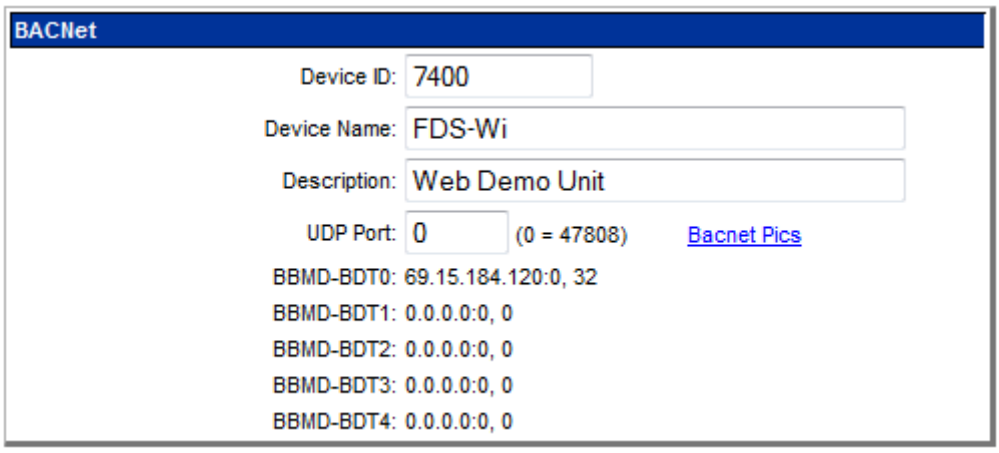


Figure 3.18 BACnet Section

Option	Description
Device ID	Assign a name to uniquely identify each BACnet device on the network.
Device Name	Assign a name - up to 40 characters - to the unit for BACnet discovery/integration.
Description	Add any additional details about the device. 40 characters, maximum.
UDP Port	The default port is 0=47808. If a you would like to use a specific port for security reasons, enter a new port number in this field.
BBMD Data	The values in the broadcast distribution table represent IP addresses and masks. Shown here for reference, the values are editable via BACnet.

Table 3.12 BACnet Section Options

The **BACnet pics** link displays general BACnet capabilities of the device (e.g., what LAN options are available).

```
BACnet interoperability building blocks supported (Annex K):
Data Sharing - ReadProperty-B DS-RP-B WriteProperty-B

Bacnet Objects:
Analog Input
 AI:101 Sensor #1 Data #1
 AI:102 Sensor #1 Data #2
 AI:103 Sensor #1 Data #3
 ..
 AI:40001 Sensor #400 Data #1
 AI:40002 Sensor #400 Data #2
 AI:40003 Sensor #400 Data #3

Property Identifers Supported:
BACnet_Present_Value          BACnet_Object_Identifier   BACnet_Object_Name            BACnet_Object_Type
BACnet_Out_Of_Service         BACnet_Units               BACnet_Status_Flags           BACnet_Event_State
BACnet_Update_Interval        BACnet_Time_Delay(write)

Bacnet Device Objects:
BACnet_Object_Identifier      BACnet_Object_Name         BACnet_Object_Type            BACnet_System_Status
BACnet_Vendor_Name            BACnet_Vendor_Id           BACnet_Model_Name             BACnet_Firmware_Revision
BACnet_App_Software_Revision BACnet_Location             BACnet_Description            BACnet_Protcol_Version
BACnet_Conformance_Class      BACnet_Services_Supported  BACnet_Object_Types_Supported BACnet_Object_List
BACnet_Max_APDU               BACnet_Segment_Supported   BACnet_Segment_Timeout        BACnet_APDU_Timeout
BACnet_APDU_Retries           BACnet_Bindings

Data Link Layer options:
BACnet IP, (Annex J)          MS/TP slave, baud rate up to 19200 bps

Character sets supported:
ANSI X3.4
```

Figure 3.19 General BACnet Capabilities of the Device

3.5.3 Modbus

The Modbus section allows users to configure the Modbus settings for the system.

Figure 3.20 Modbus Section

Option	Description
Modbus/TCP/UDP Slave Unit Identifier	The default slave unit identifier is 0, which disables this feature. To enable this option, enter a TCP/UDP slave address from 1-254 in this field. In most instances, the identifier is typically set at 1.

Table 3.13 Modbus Section Option

3.5.4 SNMP

The SNMP configuration section also allows users to setup communities that allow multiple SNMP systems to access the Wireless Gateway. To setup communities, you must know the IP address of the SNMP Management system and the Community String. Contact your IT Department to obtain the IP Address and Community String. To configure communities, enter

the IP address and the community string in the designated fields. Each text field accommodates up to 64 characters.

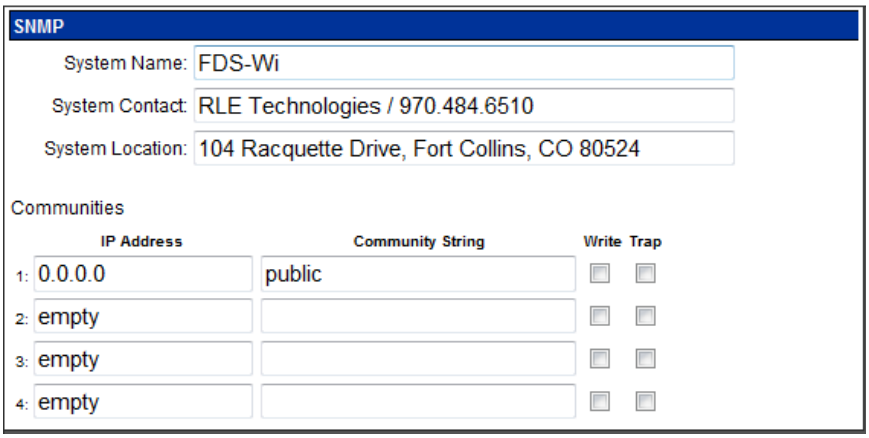


Figure 3.21 SNMP Section

Option	Description
System Name	Name assigned to the Wireless Gateway for SNMP system integration.
System Contact	System Contact responsible for the Wireless Gateway.
System Location	Description of the Wireless Gateway location.
Communities: IP Address	IP address used by the SNMP server to poll data from the Wireless Gateway.
Community String	Name or type of password used by the SNMP server for communications.
Write	Allows the SNMP server to write back the Wireless Gateway.
Trap	Allows the Wireless Gateway to send a message to the SNMP Management System, telling the system to initiate an alarm.

Table 3.14 SNMP Section Options

3.6. Configuration Page - Sensors Tab

For each sensor, you can edit all fields in gray. All other fields are for reference. To the right of the Value field is the corresponding Modbus Register for slave data output from that sensor. To the right of that is the BACnet Instance number for slave interface to a Building Management System.

All fields in the following table will not be available for each sensor. Only the configurable options that apply to each sensor are displayed in that sensor's configuration menu.

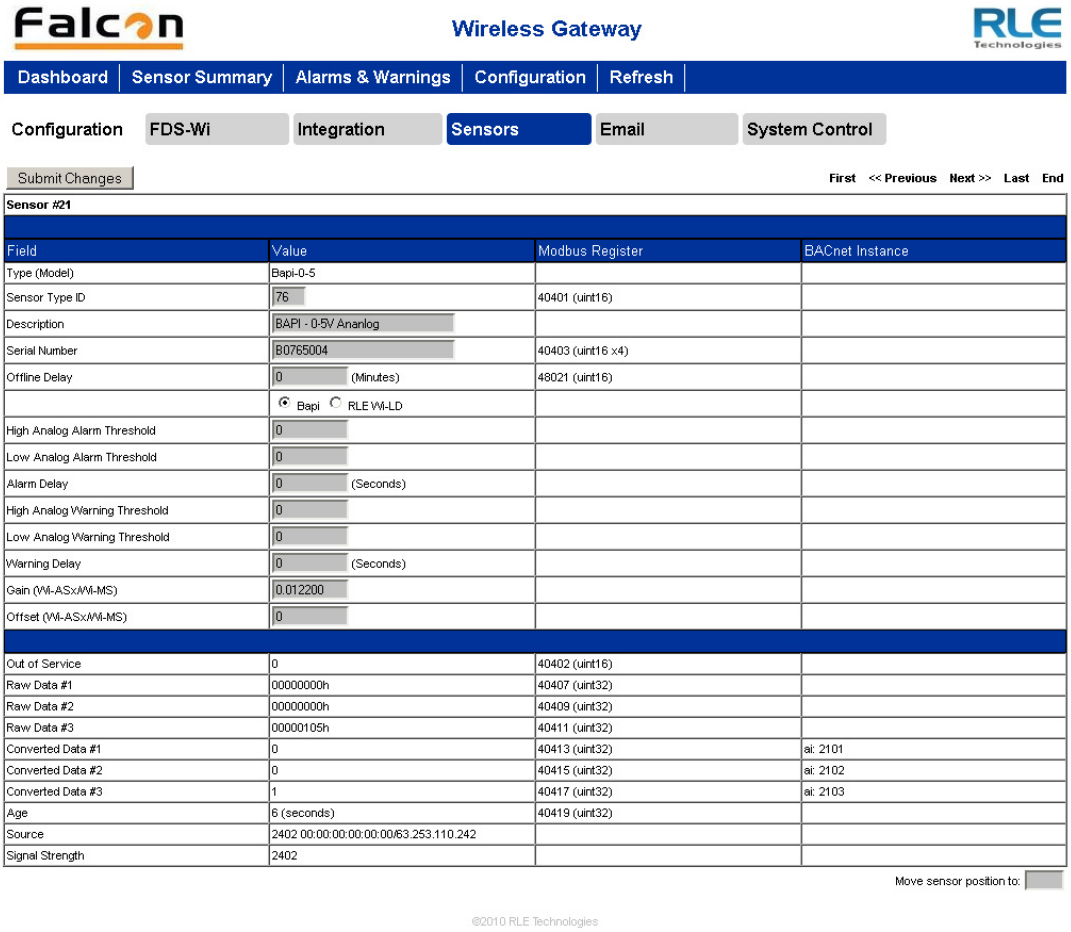


Figure 3.22 Sensors Tab

Editable options are as follows:

Option	Description
Sensor Type ID	This number is used by the Wireless Gateway to identify what kind of sensor is being read in to the system. The possible values are: BAPI 76 Counter 11 SetPointOverride 5B Thermistor 57 Wi-ASx/Wi-MS 41 Wi-DIT 61 Wi-LD 76 Wi-TC9 74 Wi-TH2 52 Wi_THS 48 Wi-TS 54
Description	Enter a label up to 30 characters to describe the sensor and its location.
Serial Number	This is the unique number broadcasted from the sensor to the Wireless Gateway for identification. Each sensor has a unique serial number. Enter the appropriate serial number, listed on the bottom of the sensor, in the provided text field.
Offline Delay	Users can designate how many minutes must pass before the Wireless Gateway considers the sensor offline. Typical transmission time is 10-20 seconds for 418MHz sensors and 3-5 minutes for 900MHz sensors.
Bapi / RLE Wi-LD Radio Buttons	Bapi sensors and RLE's Wi-LD sensor have the same sensor type ID - 76. If this field is available in your interface, this means the sensor you're configuring has a sensor type ID of 76. Designate whether this sensor is a Bapi sensor or RLE's Wi-LD.
High Analog Alarm Threshold	Enter a high alarm threshold - if the value rises above this number, an alarm is generated for this sensor.
Low Analog Alarm Threshold	Enter a low alarm threshold - if the value drops below this number, an alarm is generated for this sensor.
High Temperature Alarm Threshold	Enter a high temperature alarm threshold - if the temperature rises above this value, a high temperature alarm is generated.
Low Temperature Alarm Threshold	Enter a low temperature alarm threshold - if the temperature drops below this value, a low temperature alarm is generated.
High Humidity Alarm Threshold	Enter a high humidity alarm threshold - if the humidity rises above this value, a high humidity alarm is generated.
Low Humidity Alarm Threshold	Enter a low humidity alarm threshold - if the humidity drops below this value, a low humidity alarm is generated.
Alarm Delay	The number of seconds that pass between the time the system goes into alarm and the time that alarm is annunciated.
High Temperature Warning Threshold	Enter a high temperature warning threshold - if the temperature rises above this value, a high temperature warning is generated.

Table 3.15 Sensors Tab Configuration Options

Option	Description
Low Temperature Warning Threshold	Enter a low temperature warning threshold - if the temperature drops below this value, a low temperature warning is generated.
High Humidity Warning Threshold	Enter a high humidity warning threshold - if the humidity rises above this value, a high humidity warning is generated.
Low Humidity Warning Threshold	Enter a low humidity warning threshold - if the humidity drops below this value, a low humidity warning is generated.
Warning Delay	The number of seconds that pass between the time the system goes into a warning state and the time that warning is annunciated.
Gain (Wi-ASx/Wi-MS) **and** **Offset (Wi-ASx/Wi-MS)**	Gain and offset values should be entered for Bapi sensors and other analog sensors. Gain and offset values for sensors are as follows: 0-5V Sensor (Bapi) – Gain: 0.012200 – Offset: 0 0-10V Sensor (Bapi) – Gain: 0.024400 – Offset: 0 4-20mA Sensor (Bapi) – Gain: 0.003906 – Offset: 4
Move senor position to	Reorder the sensors by typing the appropriate number in this box.

Table 3.15 Sensors Tab Configuration Options (continued)

NOTE **When the desired edits have been made, click the Submit Changes button to save the changes. If the Submit Changes button is not selected, the new configuration will not be updated and saved.**

Several fields on this screen are read-only - you can view the data but not edit it. These fields include:

Option	Description
Type (Model)	This label is derived from the value entered into the Sensor Type ID field.
Out Of Service	A binary number used to determine if the senor is online or offline.
Raw Data #1-3	This is the uncalculated data received from the wireless sensor. This data is then processed by the Wireless Gateway to a calculated value.

Table 3.16 Sensors Tab Read-only Data

Option	Description
Converted Data #1-3	This is the calculated data processed from the raw data. This data is then displayed on the main page of the Wireless Gateway and used for Modbus, SNMP and BACnet output.
Age	The amount of time that has passed since the last received transmission from this particular wireless sensor.
Source	Displays to the user where the signal is coming from. 418 is broadcasted from the common sensor 418MHz Point Six Wireless sensor. A 900 means it is being broadcasted from a Point Repeater (Wi-PR) or a 900MHz Point Six Wireless sensor. A 2402 means it is being received from another Wireless Gateway using the Ethernet Packet Repeater feature. The MAC address and IP address will be displayed after the 2402.
Signal Strength	Displays the quality of the signal from the sensor. 418MHz sensors display between 0-100.
Move senor position to	This allows users to enter a new sensor number location

Table 3.16 Sensors Tab Read-only Data

Navigate to the previous or next sensor in the list of sensors by selecting “Prev” or “Next” on the upper-right of the webpage. To go to the first sensor on the list, select “First”. To go to the last connected sensor, click “Last”. If you want to go to the end of the sensor list regardless of whether a sensor is connected, click “End”. To navigate to individual sensor pages, select the appropriate page number (1-5) in the upper-right corner.

3.7. Configuration Page - Email Tab

The Email tab allows users to configure the email communications options. Email can be sent to an exchange server using a distribution list, an individual email account, or a cell phone.

The Wireless Gateway can also communicate via SMTP (Authenticated) to mail servers requiring a login in name and password.

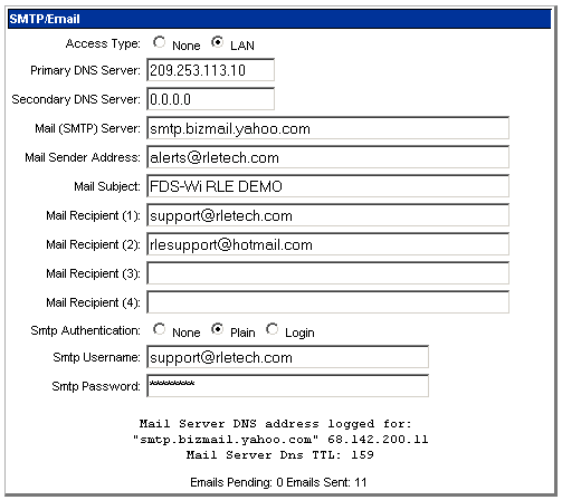


Figure 3.23 Email Tab

Option	Description
Access Type	None: Email is not used or is temporarily disabled LAN: Enable the email notification.
Primary DNS Server	First IP address used to communicate to a DNS server.
Secondary DNS Server	Second IP address used to communicate to a DNS server.
Mail(SMTP)Server	IP address or mail server host name used by the FDS-Wi
Mail Sender Address	Email address used by the Wireless Gateway.
Mail Subject	Description to be displayed on the email notification subject line.
Mail Recipient(1-4)	Address for an email account, cell phone or distribution list.
SMTP Authentication	None: no username or password. Plain: standard Username and password authentication. Login is used for certain mail servers. Do not use this unless instructed by your IT department.
Smtp Username	Username for SMTP Authentication
Smtp Password	Password for SMTP Authentication

Table 3.17 SMTP/Email Configuration Options

3.8. Configuration Page - System Control Tab

The System Control tab allows users execute a variety of system commands. The messages shown in the screen shots below may vary, depending on the web browser you're using.

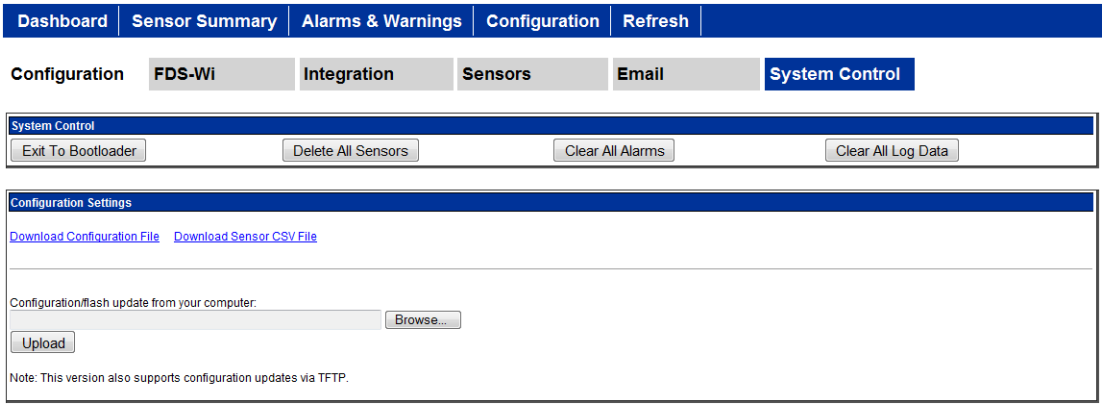


Figure 3.24 System Control Tab

3.8.1 Exit to Bootloader Button

Allows users to upload new versions of the firmware. This action erases the current firmware in order to upload the new firmware. A warning will pop up asking you if you are sure.

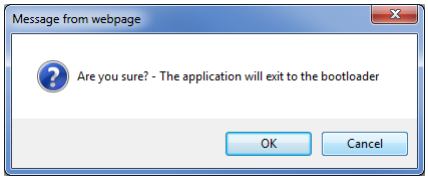


Figure 3.25 Exit to Bootloader Message

3.8.2 Delete All Sensors Button

This command erases all the information about the sensors the Wireless Gateway is currently reading. Users will have to reinstall sensor information after this command has been performed or rediscover sensors already deployed.

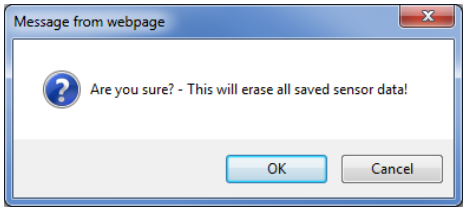


Figure 3.26 Delete All Sensors Message

3.8.3 Clear All Alarms Button

This command clears all alarms recorded in the Alarms and Warning page.

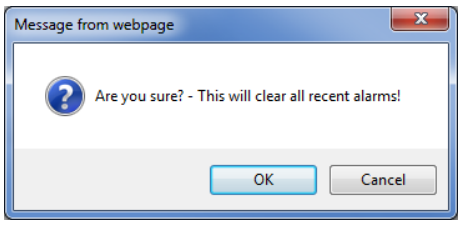


Figure 3.27 Clear All Alarms Message

3.8.4 Clear All Log Data Button

This command erases all logging data stored on the Wireless Gateway.

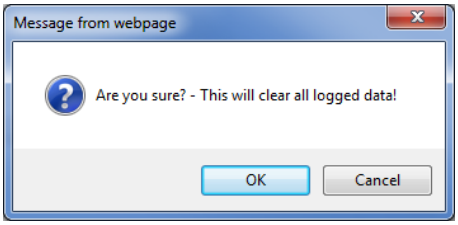


Figure 3.28 Clear All Log Data Message

3.8.5 Download Configuration File Link

This allows users to download a backup file of the current Wireless Gateway configuration.

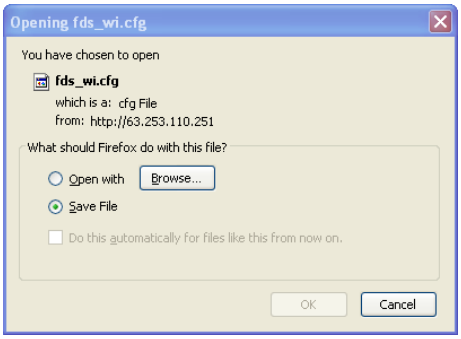
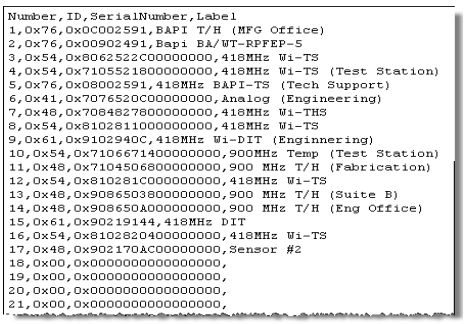


Figure 3.29 Download Configuration File Message

3.8.6 Download Sensor CSV File Link

Allows users to download a CSV file showing the sensors configured in the Wireless Gateway.



```
Number,ID,SerialNumber,Label
1,0x76,0x0C002591,BAPI T/H (MFG Office)
2,0x76,0x00902491,Bapi BA/WT-RPFEP-5
3,0x54,0x8062522C00000000,418MHz Wi-TS
4,0x54,0x7105521800000000,418MHz Wi-TS (Test Station)
5,0x76,0x08002591,418MHz BAPI-TS (Tech Support)
6,0x41,0x7076520C00000000,Analog (Engineering)
7,0x48,0x7084827800000000,418MHz Wi-THS
8,0x54,0x8102811000000000,418MHz Wi-TS
9,0x61,0x9102940C,418MHz Wi-DIT (Enginnering)
10,0x54,0x7106671400000000,900MHz Temp (Test Station)
11,0x48,0x7104506800000000,900 MHz T/H (Fabrication)
12,0x54,0x810281C000000000,418MHz Wi-TS
13,0x48,0x9086503800000000,900 MHz T/H (Suite B)
14,0x48,0x908650A000000000,900 MHz T/H (Eng Office)
15,0x61,0x90219144,418MHz DIT
16,0x54,0x8102820400000000,418MHz Wi-TS
17,0x48,0x902170AC00000000,Sensor #2
18,0x00,0x0000000000000000,
19,0x00,0x0000000000000000,
20,0x00,0x0000000000000000,
21,0x00,0x0000000000000000,
```

Figure 3.30 Download Sensor CSV File Message

3.8.7 Configuration/Flash Upload

This feature allows users to upload a CSV file, unit configuration (.cfg) file or application firmware.

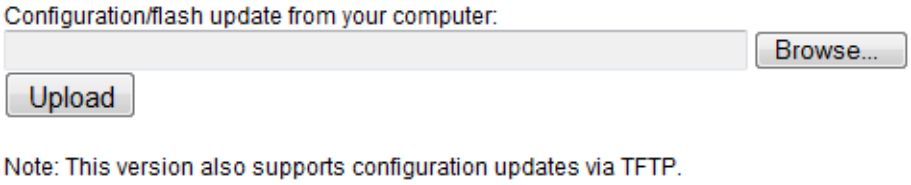


Figure 3.31 Upload Message

3.9. Refresh Link

Clicking the Refresh link allows users to manually check for status updates. The Refresh link is especially helpful if the system's refresh rate is set for a long period of time, or when connecting new units and sensors. Instead of having to wait for the system to refresh, click the refresh button to update the system.

To set the Refresh rate, go to the Configuration page and type in the refresh time (in seconds) in the appropriate field underneath the Network and Web section.

CHAPTER

4

WEB INTERFACE – INTEGRATION VERSION

The Wireless Gateway allows users to view data points and configure the unit/points via the Web. To access the Web interfaces, users must first setup the Wireless Gateway to communicate via the Internet. To set the IP address, see section 2.4., “Communication: Set the IP Address” on page 17.

The integration version of the web interface is designed for operators and installers who use the Wireless Gateway not as a standalone tool, but as a component of a larger system. To display this integration version of the web interface:

1 In your Web browser, type `/logocfg.htm` after the IP address for the FMS. For example:

```
http://10.0.0.123/logocfg.htm
```

2 Press Enter.

The Logo Configuration page displays.

Figure 4.1 Logo Configuration Page (For Displaying “Classic” View)

3 Type `classic` in the Logo Code field and click the Submit Changes button.

4 Depending on your browser, you might need to close and reopen it to get the FMS classic view to display.

Once you log back in, the FMS classic view displays (see “The Homepage” on page 46).

5 To switch back to the standard view, repeat these steps and type `standard` in the Logo Configuration field.

4.1. The Homepage

The homepage allows users to view the first 40 sensors outputting signals to the Wireless Gateway. Each sensor is color coded to help notify users of alarms.

Figure 4.2 Wireless Gateway Homepage

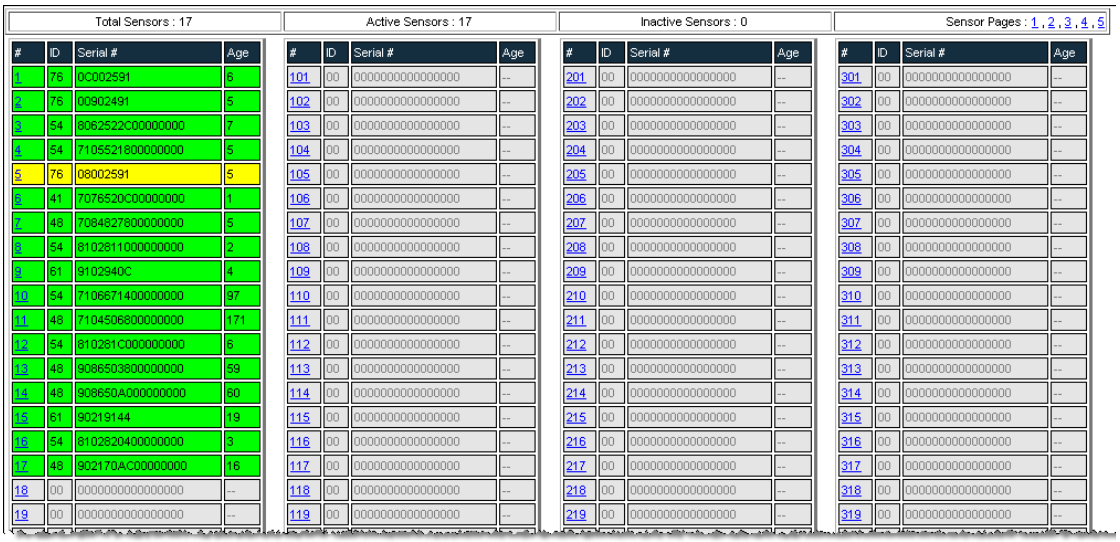
Color	Meaning
Green	Sensor is registering properly—sensor is communicating properly
Red	Sensor is registering properly—sensor has an analog/digital alarm
Yellow	Sensor is registering properly—sensor has an analog warning
Orange	Sensor is offline—problems with the communications

Table 4.1 Color Codes for Homepage

The “Sensor Pages” links at the top right corner of the screen allow you to scroll through all the sensors monitored by the Wireless Gateway. Each page displays 40 sensors. Click the appropriate page link to view your sensors.

4.1.1 View All Sensor IDs

For a single-screen view of all sensors connected to they system, click the “View All Sensor IDs” link located in the bottom left corner of the screen.



Total Sensors : 17 | Active Sensors : 17 | Inactive Sensors : 0 | Sensor Pages : 1 , 2 , 3 , 4 , 5

#	ID	Serial #	Age
1	76	0C002591	6
2	76	00902491	5
3	54	8062522C00000000	7
4	54	7105521800000000	5
5	76	08002591	5
6	41	7076520C00000000	1
7	48	7084827800000000	5
8	54	8102811000000000	2
9	61	9102940C	4
10	54	7106671400000000	97
11	48	7104506800000000	171
12	54	810281C000000000	6
13	48	9086503800000000	59
14	48	908650A000000000	60
15	61	90219144	19
16	54	8102820400000000	3
17	48	902170AC00000000	16
18	00	0000000000000000	--
19	00	0000000000000000	--

#	ID	Serial #	Age
101	00	0000000000000000	--
102	00	0000000000000000	--
103	00	0000000000000000	--
104	00	0000000000000000	--
105	00	0000000000000000	--
106	00	0000000000000000	--
107	00	0000000000000000	--
108	00	0000000000000000	--
109	00	0000000000000000	--
110	00	0000000000000000	--
111	00	0000000000000000	--
112	00	0000000000000000	--
113	00	0000000000000000	--
114	00	0000000000000000	--
115	00	0000000000000000	--
116	00	0000000000000000	--
117	00	0000000000000000	--
118	00	0000000000000000	--
119	00	0000000000000000	--

#	ID	Serial #	Age
201	00	0000000000000000	--
202	00	0000000000000000	--
203	00	0000000000000000	--
204	00	0000000000000000	--
205	00	0000000000000000	--
206	00	0000000000000000	--
207	00	0000000000000000	--
208	00	0000000000000000	--
209	00	0000000000000000	--
210	00	0000000000000000	--
211	00	0000000000000000	--
212	00	0000000000000000	--
213	00	0000000000000000	--
214	00	0000000000000000	--
215	00	0000000000000000	--
216	00	0000000000000000	--
217	00	0000000000000000	--
218	00	0000000000000000	--
219	00	0000000000000000	--

#	ID	Serial #	Age
301	00	0000000000000000	--
302	00	0000000000000000	--
303	00	0000000000000000	--
304	00	0000000000000000	--
305	00	0000000000000000	--
306	00	0000000000000000	--
307	00	0000000000000000	--
308	00	0000000000000000	--
309	00	0000000000000000	--
310	00	0000000000000000	--
311	00	0000000000000000	--
312	00	0000000000000000	--
313	00	0000000000000000	--
314	00	0000000000000000	--
315	00	0000000000000000	--
316	00	0000000000000000	--
317	00	0000000000000000	--
318	00	0000000000000000	--
319	00	0000000000000000	--

Figure 4.3 View All Sensors Page

Use the scroll bar to view sensors towards the bottom of the list. Each row is numbered and contains three pieces of information. The number on the left displays the system number (identifier) assigned to the sensor. The middle column displays the serial number of the sensor and the right number displays the age of the data on the sensor, or how long it has been running, in seconds, since the last measurement was read.

The top of the page displays the total sensors connected to the Wireless Gateway, the active sensors that are currently communicating with the Wireless Gateway, and the total inactive sensors that are not currently communicating with the Wireless Gateway. To navigate to individual sensor pages, select the appropriate page number (1-5) in the upper-right corner.

4.1.2 Individual Sensor Configuration

Whether you’re viewing the sensors through the Sensor Pages or the View All option, note that each sensor’s system number (identifier) is a clickable number link. Click this link to access the sensor’s configuration page.

Each sensor has its own configuration page which allows users to edit a wide variety of sensor information. The Wireless Gateway’s sensor discovery feature automatically checks and updates the serial numbers of sensors once they are connected to the system. Therefore, if the sensor discovery feature is enabled (4.2.1, “Wireless” on page 53), sensors communicating with the system should automatically be connected to the Wireless Gateway.

If a serial number is not automatically updated and needs to be entered manually, the serial number should be entered from left to right. Point Six sensors have two serial numbers on the sensors, one that reads from left to right and one that reads from right to left. The serial number should be entered starting with a number (not zero) or an alpha character.

If a sensor needs to be edited or manually entered, click the sensor's system number (identifier) # link—displayed in blue and underlined to the left of each sensor row.

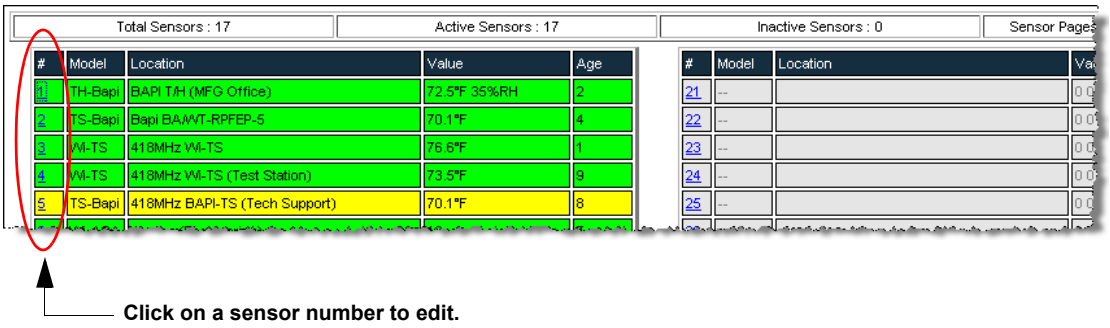


Figure 4.4 Editing Sensor Properties

Click the number in the left side of the sensor row to edit individual sensor properties.

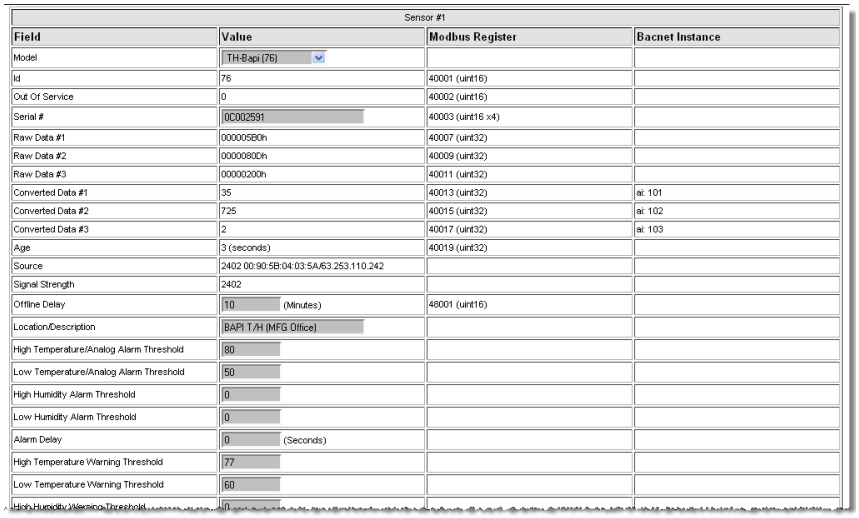


Figure 4.5 Wireless Sensor Configuration

For each sensor, you can edit all fields in gray. All other fields are for reference. To the right of the Value field is the corresponding Modbus Register for slave data output from that sensor. To the right of that is the BACnet Instance number for slave interface to a Building Management System.

All fields in the following table will not be available for each sensor. Only the configurable options that apply to each sensor are displayed in that sensor's configuration menu. Editable options are as follows:

Option	Description
Model	To edit the sensor model, select the type of model from the drop-down list by clicking on the down arrow to the direct right of the sensor model field. This number is used by the Wireless Gateway to identify what kind of sensor is being read in to the system. The possible values are: BAPI 76 Counter 11 SetPointOverride 5B Thermistor 57 Wi-ASx/Wi-MS 41 Wi-DIT 61 Wi-LD 76 Wi-TC9 74 Wi-TH2 52 Wi_THS 48 Wi-TS 54
Serial Number	This is the unique number broadcasted from the sensor to the Wireless Gateway for identification. Each sensor has a unique serial number. Enter the appropriate serial number, listed on the bottom of the sensor, in the provided text field.
Offline Delay	Users can designate how many minutes must pass before the Wireless Gateway considers the sensor offline. Typical transmission time is 10-20 seconds for 418MHz sensors and 3-5 minutes for 900MHz sensors.
Location/ Description	Enter a label up to 30 characters to describe the sensor and its location.
High Temperature/ Analog Alarm Threshold	Enter a high alarm threshold - if the value rises above this number, an alarm is generated for this sensor.
Low Temperature/ Analog Alarm Threshold	Enter a low alarm threshold - if the value drops below this number, an alarm is generated for this sensor.
High Temperature Alarm Threshold	Enter a high temperature alarm threshold - if the temperature rises above this value, a high temperature alarm is generated.
Low Temperature Alarm Threshold	Enter a low temperature alarm threshold - if the temperature drops below this value, a low temperature alarm is generated.
High Humidity Alarm Threshold	Enter a high humidity alarm threshold - if the humidity rises above this value, a high humidity alarm is generated.
Low Humidity Alarm Threshold	Enter a low humidity alarm threshold - if the humidity drops below this value, a low humidity alarm is generated.
Alarm Delay	The number of seconds that pass between the time the system goes into alarm and the time that alarm is annunciated.

Table 4.2 Wireless Sensor Configuration Options

Option	Description
High Temperature Warning Threshold	Enter a high temperature warning threshold - if the temperature rises above this value, a high temperature warning is generated.
Low Temperature Warning Threshold	Enter a low temperature warning threshold - if the temperature drops below this value, a low temperature warning is generated.
High Humidity Warning Threshold	Enter a high humidity warning threshold - if the humidity rises above this value, a high humidity warning is generated.
Low Humidity Warning Threshold	Enter a low humidity warning threshold - if the humidity drops below this value, a low humidity warning is generated.
Warning Delay	The number of seconds that pass between the time the system goes into a warning state and the time that warning is annunciated.
Gain (Wi-ASx/Wi-MS) **and** **Offset (Wi-ASx/Wi-MS)**	Gain and offset values should be entered for Bapi sensors and other analog sensors. Gain and offset values for sensors are as follows: 0-5V Sensor (Bapi) – Gain: 0.012200 – Offset: 0 0-10V Sensor (Bapi) – Gain: 0.024400 – Offset: 0 4-20mA Sensor (Bapi) – Gain: 0.003906 – Offset: 4
Contact Alarm (Wi-DIT/Wi-TC9/Bapi-WDI)	Select One: Normally Open / Normally Closed Select One: Alarm / Status
Move senor position to	Reorder the sensors by typing the appropriate number in this box.

Table 4.2 Wireless Sensor Configuration Options (continued)

NOTE **When the desired edits have been made, click the Submit Changes button to save the changes. If the Submit Changes button is not selected, the new configuration will not be updated and saved.**

Several fields on this screen are read-only - you can view the data but not edit it. These fields include:

Option	Description
ID	Specified in the Model field, this number is used by the Wireless Gateway to identify what kind of sensor is being read in to the system.
Out Of Service	A binary number used to determine if the senor is online or offline.
Raw Data #1-3	This is the uncalculated data received from the wireless sensor. This data is then processed by the Wireless Gateway to a calculated value.
Converted Data #1-3	This is the calculated data processed from the raw data. This data is then displayed on the main page of the Wireless Gateway and used for Modbus, SNMP and BACnet output.
Age	The amount of time that has passed since the last received transmission from this particular wireless sensor.
Source	Displays to the user where the signal is coming from. 418 is broadcasted from the common sensor 418MHz Point Six Wireless sensor. A 900 means it is being broadcasted from a Point Repeater (Wi-PR) or a 900MHz Point Six Wireless sensor. A 2402 means it is being received from another Wireless Gateway using the Ethernet Packet Repeater feature. The MAC address and IP address will be displayed after the 2402.
Signal Strength	Displays the quality of the signal from the sensor. 418MHz sensors display between 0-100.

Navigate to the previous or next sensor in the list of sensors by selecting “Prev” or “Next” on the upper-right of the web page. To go to the first sensor on the list, select “First”. To go to the last connected sensor, click “Last”. If you want to go to the end of the sensor list regardless of whether a sensor is connected, click “End”. To navigate to individual sensor pages, select the appropriate page number (1-5) in the upper-right corner.

4.2. Configuration Page

The configuration page allows users to set the system preferences.

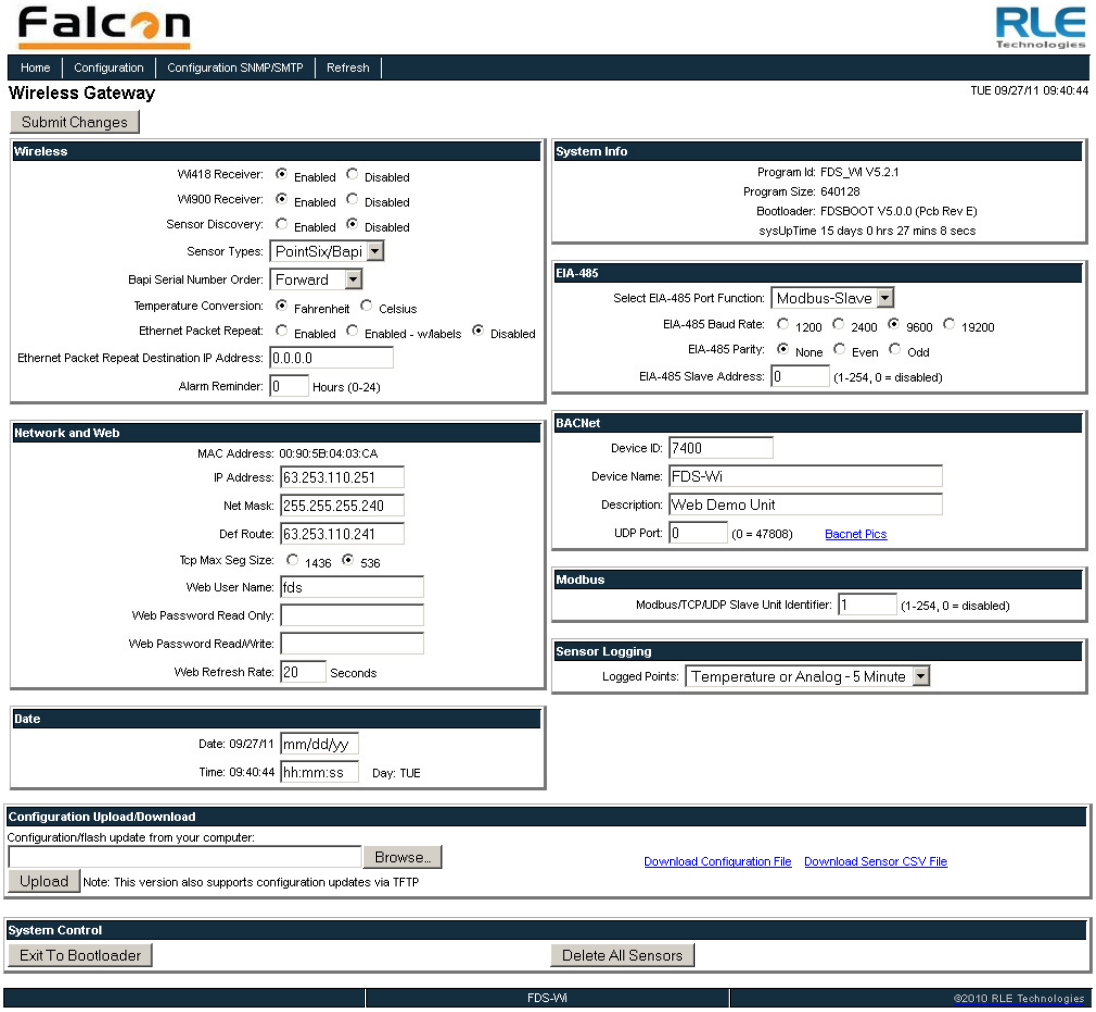


Figure 4.6 Configuration Page

Editable system preferences include:

- Wireless
- Network and Web
- Date
- Configuration Upload/ Download
- System Control
- System Info
- EIA-485
- BACNet
- Modbus
- Sensor Logging

NOTE **If any of these fields are edited, be sure to click the Submit Changes button to save the changes. If you edit the fields and do not click the Submit Changes button, all edits will be lost.**

4.2.1 Wireless

Use this menu to configure wireless options on the Wireless Gateway.

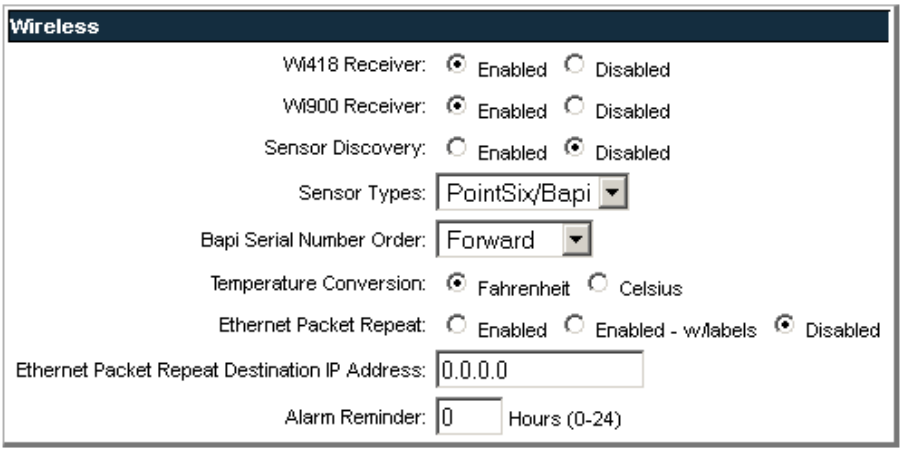


Figure 4.7 Wireless Section

Option	Description
Wi418/Wi900 Receiver	Enabled: Turns on the Wireless Gateway's 418 and 900 MHz antennas. This allows it to communicate with devices on the respective wavelengths. Disable: Turns the antennas off and prohibits the Wireless Gateway from communicating with devices on the respective wavelengths.
Sensor Discovery	Enabled: This is the Wireless Gateway's default setting. When sensor discovery is enabled, the Wireless Gateway automatically discovers new sensors transmitting to it. The Wi loads the newly detected sensor's type and serial number in its next available sensor number. Disabled: **Once you're done with the sensor discovery process, set this option to disabled.** This prevents the Wireless Gateway from seeing transmissions from new sensors, and keeps your system from logging sensors that may not actually exist. Set Sensory Discovery to Disabled and click on the submit changes button.
Sensor Types	Designate whether your system uses only Bapi Sensors, only Point Six Sensors, or a combination of the two.
Bapi Serial Number Order	If your system uses Bapi sensors, indicate whether the serial numbers should be read forward or backward by the Wireless Gateway. In most instances, the serial numbers should be read forwards. If the Bapi sensors are an older generation, the serial number may need to be read backward.
Temperature Conversation	Select whether the temperature on the main page displays as celsius or Fahrenheit.

Table 4.3 Wireless Section Options

Option	Description
Ethernet Packet Repeat	Use this feature to allow the Wireless Gateway to transmit sensor information over the network (via port 6767) to another Wireless Gateway. Enable or disable this option. Select enabled or enabled with labels and enter the IP address of the Wireless Gateway to which you wish to send the sensor information.
Alarm Reminder	Use the Alarm Options setting to set the Wireless Gateway re-alarm function. The device will re-send an alarm after a point has been in alarm for a certain number of hours. Select a re-alarm time from 1–24 hours. Set the re-alarm time to 0 to disable the feature.

Table 4.3 Wireless Section Options (continued)

4.2.2 Network and Web

The Network and Web section displays the MAC Address and allows users configure common network information

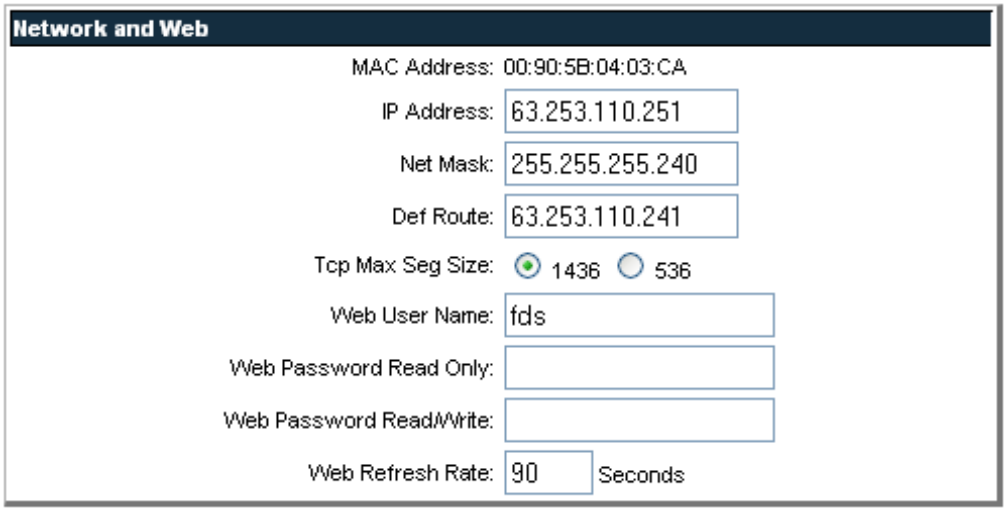


Figure 4.8 Network and Web Section

Option	Description
IP Address	The Wireless Gateway is shipped with a default IP Address of 10.0.0.188. Contact your IT Department for an appropriate IP address, if you wish to change this field.
Subnet Mask	The Wireless Gateway is shipped with a default Subnet Mask of 255.255.255.0
Default Route	The Wireless Gateway comes with a default Gateway Route of 10.0.0.1. Contact your IT Department for help with this setting.

Table 4.4 Network and Web Section Options

Option	Description
TCP Max Seg Size	The Wireless Gateway is defaulted to 1436 packet size for web page data. Users may select 536 for limited bandwidth or VPN applications.
Web User Name	If this field is left blank, the Wireless Gateway's default user name is `fds` (all lower case). Users can enter a user name up to 18 characters, either alpha, numeric, or a combination of the two. The Wireless Gateway user name is case sensitive.
Web Password Read Only	Two separate passwords can be established on the Wireless Gateway. The Read Only password allows users to access the Wireless Gateway Web interface and view the conditions of the sensors, but does not allow users to make changes to the Wireless Gateway configuration.
Web Password Read/Write	The second configurable password on the Wireless Gateway provides users with expanded access. The Read/Write password allows users to view the condition of the sensors and make changes to the Wireless Gateway configuration.
Web Refresh Rate	The Web Refresh Rate is the amount of time the system waits until it updates the Web interface with current data. To change the rate, click in the field and type in the desired amount of time (in seconds). **The minimum recommended refresh rate is five seconds; otherwise, errors may occur that prevent the system from functioning properly**. The default refresh rate is set to 0 - the Wireless Gateway will not refresh at all. Users must set a refresh rate in order for the system to automatically update.

Table 4.4 Network and Web Section Options (continued)

4.2.3 Date

The Date section allows users to set the current date and time for the system and displays the first three letters of the day of the week.

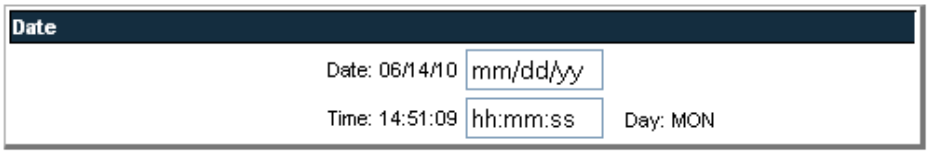


Figure 4.9 Date Section

Option	Description
Date	Enter the date in mm/dd/yy format.
Time	Entered the current time in hh:mm:ss format, where the hour is a two digit number between 01 and 24.

Table 4.5 Date Section Options

4.2.4 System Info

The System Info section displays detailed information about the system, including the Program Id (firmware version), Program Size (size of the firmware file), Bootloader Version, and sysUp Time, or how long the system has been running since power was applied.

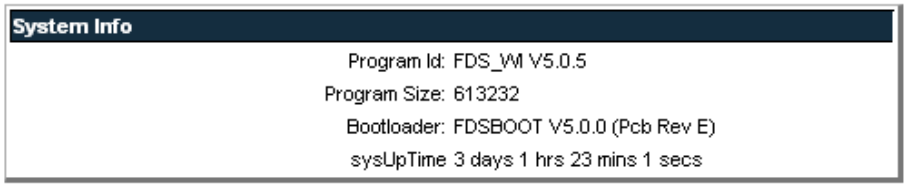


Figure 4.10 System Info Section

4.2.5 EIA-485

Use this section to configure the system's EIA-485 port settings.

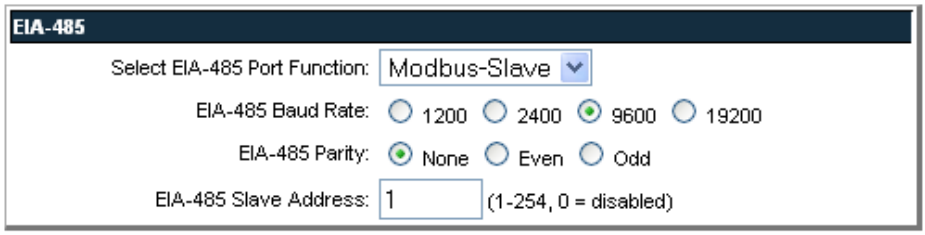


Figure 4.11 EIA-485 Section

Option	Description
EIA-485 Port Function	Set the output type for the EIA-485 port to either Modbus-Slave or Bacnet-MS/TP.
EIA-485 Baud Rate	Select 1200, 2400, 9600(default) or 19200.
EIA-485 Parity	Select None (default), Even or Odd.
EIA-485 Slave Address	Set a RTU address from 1–254. If the field is left at 0, there is no transmission on the EIA-485 port.

Table 4.6 EIA-485 Section

4.2.6 BACNet

The BACNet configuration section allows users to configure several settings.

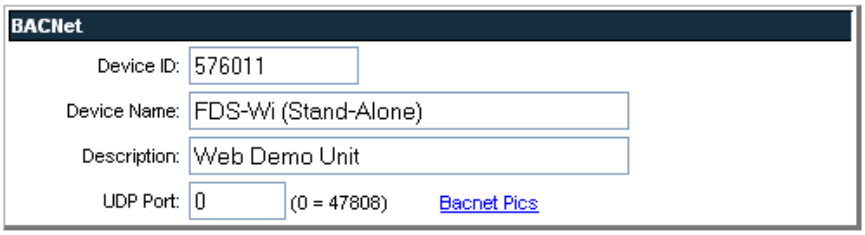


Figure 4.12 BACNet Section

Option	Description
Device ID	Assign a name to uniquely identify each BACnet device on the network.
Device Name	Assign a name - up to 40 characters - to the unit for BACnet discovery/integration.
Description	Add any additional details about the device. 40 characters, maximum.
UDP Port	The default port is 0=47808. If a you would like to use a specific port for security reasons, enter a new port number in this field.

Table 4.7 BACNet Section Options

The **BACnet pics** link displays general BACnet capabilities of the device (e.g., what LAN options are available).

4.2.7 Modbus

The Modbus section allows users to configure the Modbus settings for the system.

Figure 4.13 Modbus Section

Option	Description
Modbus/TCP/UDP Slave Unit Identifier	The default slave unit identifier is 0, which disables this feature. To enable this option, enter a TCP/UDP slave address from 1-254 in this field. In most instances, the identifier is typically set at 1.

Table 4.8 Modbus Section Option

4.2.8 Sensor Logging

Use this option to determine how frequently the sensors are sampled - every 5 or 10 minutes - for graphing and logging purposes.

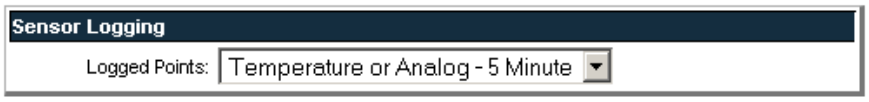


Figure 4.14 Sensor Logging Section

Option	Description
Graph/Log	Select the 5 minute or 10 minute option.

Table 4.9 Sensor Logging Section Option

4.2.9 Configuration Upload/Download

This feature allows users to upload a CSV file, unit configuration (.cfg) file or application firmware. The messages shown in the screen shots below may vary, depending on the web browser you're using.

Figure 4.15 Configuration Upload/Download Section

Download Configuration File: This allows users to download a back up file of the current Wireless Gateway configuration.

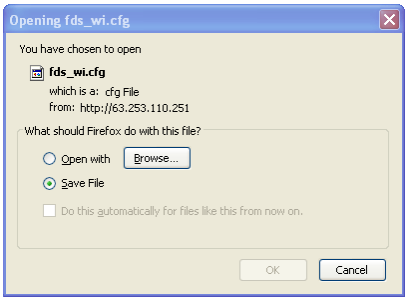


Figure 4.16 Download Configuration File

Download Sensor CSV File: This allows users to download a CSV file showing the sensors configured in the Wireless Gateway.

```
Number,ID,SerialNumber,Label
1,0x76,0x0C002591,BAPI T/H (MFG Office)
2,0x76,0x00902491,Bapi BA/WT-RPFEP-5
3,0x54,0x8062522C00000000,418MHz Wi-TS
4,0x54,0x7105521800000000,418MHz Wi-TS (Test Station)
5,0x76,0x08002591,418MHz BAPI-TS (Tech Support)
6,0x41,0x7076520C00000000,Analog (Engineering)
7,0x48,0x7084827800000000,418MHz Wi-THS
8,0x54,0x8102811000000000,418MHz Wi-TS
9,0x61,0x9102940C,418MHz Wi-DIT (Enginnering)
10,0x54,0x7106671400000000,900MHz Temp (Test Station)
11,0x48,0x7104506800000000,900 MHz T/H (Fabrication)
12,0x54,0x810281C000000000,418MHz Wi-TS
13,0x48,0x9086503800000000,900 MHz T/H (Suite B)
14,0x48,0x908650A000000000,900 MHz T/H (Eng Office)
15,0x61,0x90219144,418MHz DIT
16,0x54,0x8102820400000000,418MHz Wi-TS
17,0x48,0x902170AC00000000,Sensor #2
18,0x00,0x0000000000000000,
19,0x00,0x0000000000000000,
20,0x00,0x0000000000000000,
21,0x00,0x0000000000000000,
22,0x00,0x0000000000000000,
```

Figure 4.17 Download Sensor CSV File

4.2.10 System Control

This section allows users to exit to bootloader and delete all sensor information associated with the Wireless Gateway.

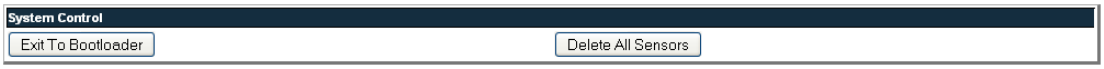


Figure 4.18 System Control

Exit to Bootloader: This allows users to upload new versions of firmware. This action erases the current firmware in order to upload the new firmware. A warning will pop up asking you if you are sure.

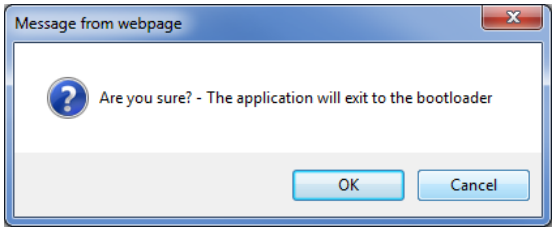


Figure 4.19 Exit to Bootloader

Delete All Sensors: This command erases all the information about the current sensors the Wireless Gateway is reading. Users will have to reinstall sensor information after this command has been performed or rediscover sensors already deployed.

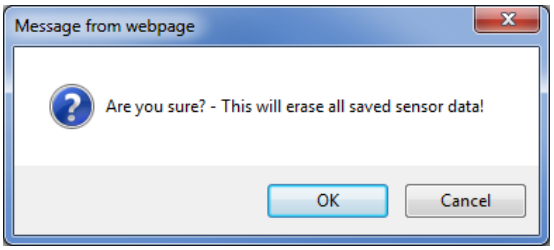


Figure 4.20 Delete All Sensors

4.3. Configuration SNMP/SMTP Page

The SNMP section allows users to configure the email communications options. Email can be sent to an exchange server using a distribution list, an individual email account, or a cell phone.

The Wireless Gateway can also communicate via SMTP (Authenticated) to mail servers requiring a login in name and password.

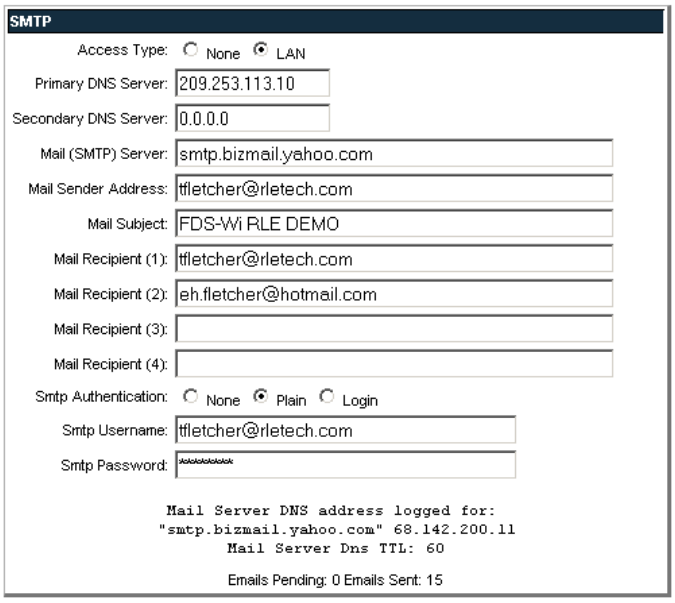


Figure 4.21 SMTP Configuration Section

Option	Description
Access Type	None: Email is not used or is temporarily disabled LAN: Enable the email notification.
Primary DNS Server	First IP address used to communicate to a DNS server.
Secondary DNS Server	Second IP address used to communicate to a DNS server.
Mail(SMTP)Server	IP address or host name to the mail server used by the Wireless Gateway.
Mail Sender Address	Email address used by the Wireless Gateway.
Mail Subject	Description to be displayed on the email notification subject line.
Mail Recipient(1-4)	Address for an email account, cell phone or distribution list.
SMTP Authentication	None: no username or password. Plain: standard Username and password authentication. Login is used for certain mail servers. Do not use this unless instructed by your IT department.
Smtp Username	Username for SMTP Authentication
Smtp Password	Password for SMTP Authentication

Table 4.10 SNMP Configuration Section Options

The SNMP configuration section also allows users to setup communities that allow multiple SNMP systems to access the Wireless Gateway. To setup communities, you must know the IP address of the SNMP Management system and the Community String. Contact your IT Department to obtain the IP Address and Community String. To configure communities, enter the IP address and the community string in the designated fields. Each text field accommodates up to 64 characters.

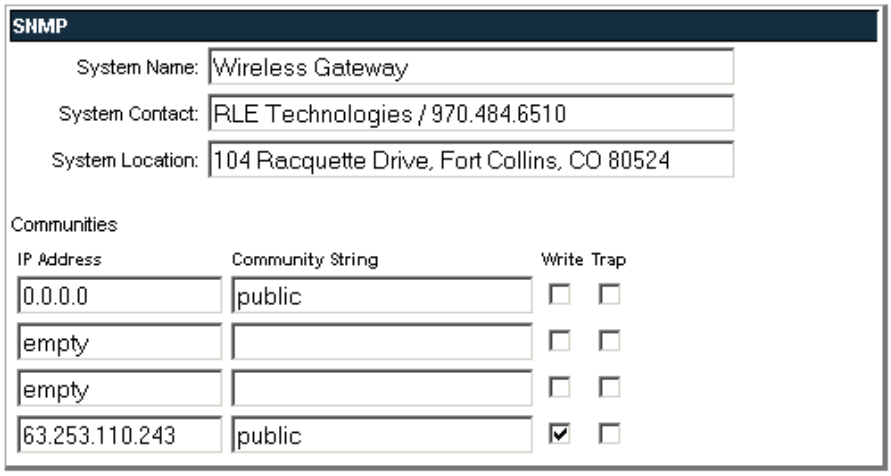


Figure 4.22 SNMP Configuration Section

Option	Description
System Name	Name assigned to the Wireless Gateway for SNMP system integration.
System Contact	System Contact responsible for the Wireless Gateway.
System Location	Description of the Wireless Gateway location.
Communities: IP Address	IP address used by the SNMP server to poll data from the Wireless Gateway.
Community String	Name or type of password used by the SNMP server for communications.
Write	Allows the SNMP server to write back the Wireless Gateway.
Trap	Allows the Wireless Gateway to send a message to the SNMP Management Server, telling the system to initiate an alarm.

Table 4.11 SNMP Configuration Section Options

4.4. Refresh Link

Clicking the Refresh link allows users to manually check for status updates. The Refresh link is especially helpful if the system's refresh rate is set for a long period of time, or when connecting new units and sensors. Instead of having to wait for the system to refresh, click the refresh button to update the system.

To set the Refresh rate, go to the Configuration page and type in the refresh time (in seconds) in the appropriate field underneath the Network and Web section.

CHAPTER

5

UPDATE FIRMWARE

Firmware updates are available on the RLE Web site at www.rletech.com. Download appropriate firmware to an accessible location.

5.1. Load the Application Firmware Using MIME

The Wireless Gateway has a MIME (Multipurpose Internet Mail Extensions) built into the web page interface. A user can download the latest version of firmware from rletech.com to their local drive, then navigate to the file using the browse button, and then click on upload for the unit to take the file. This process takes about 60 seconds to complete. The MIME feature can also be used to upload the unit configuration file.

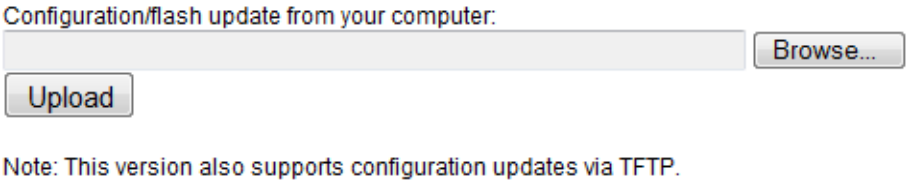


Figure 5.1 MIME Sample

5.2. Load the Flash Firmware Using TFTP

Before updating the firmware, the firmware flash application must be exited and then erased. To do this, navigate to the Wireless Gateway configuration menu. Once here, click on the "Exit to Bootloader" button. Once exited, you will get a bootloader web page at the IP address of the unit. Next, click on the "Erase Flash" button. The Flash application will be erased.

Note To erase the flash, a special username and password are required. The username is **fds** (all lowercase), and the password is **rle2tech** (all lowercase).

1. Uploading firmware via TFTP requires a TFTP Client. It may be possible to download a free license TFTP Client from the internet. Consult your IT department to determine a compatible client program.
2. Verify that your PC and the Wireless Gateway are on the same subnet (LAN).
3. Open your TFTP client. Configure the client as follows.
   a. **Host** = Wireless Gateway IP Address
   b. **Port** = 69
   c. **Block Size** = 64, 128, 256, 512, or 1024

Note The file must be sent in BINARY (not ASCII).

4. Send or PUT the firmware file to the Wireless Gateway. It may take ~10 seconds for the firmware upload to begin. This will put the new firmware into effect.
5. After one minute, refresh the Wireless Gateway web page. Notice that the Flash field now contains the latest firmware. Click the "Start Application" button to reboot the unit.

APPENDIX

A

MODBUS COMMUNICATIONS

A.1. Implementation Basics

The Wireless Gateway is capable of communicating via the half-duplex EIA-485 serial communication standard. The Wireless Gateway is configured to act as a slave device on a common network. The EIA-485 medium allows for multiple devices on a multi-drop network. The Wireless Gateway is a slave only device and will never initiate a communications sequence.

A.1.1 Modes of Transmission

The Modbus protocol uses ASCII and RTU modes of transmission. The Wireless Gateway supports only the RTU mode of transmission, with 8 data bits, no parity and one stop bit. Every Modbus packet consists of four fields:

- Slave Address Field
- Function Field
- Data Field
- Error Check Field (Checksum)

A.1.1.1 Slave Address Field

The slave address field is one byte in length and identifies the slave device involved in the transaction. A valid address range is between 1 and 254. The slave address is set from the **Modbus/EIA-485 Configuration** webpage.

A.1.1.2 Function Field

The function field is one byte in length and tells the Wireless Gateway which function to perform. The supported functions are 03 (Read 4xxxx output registers).

A.1.1.3 Data Field

The data field of the request is a variable length depending on the function. The data fields for the Wireless Gateway are 16-bit registers, transmitted high order byte first (big-endian)

A.1.1.4 Error Check (Checksum) Field

The checksum field lets the receiving device determine if the packet has transmission errors. The Wireless Gateway RTU mode uses a 16-bit cyclic redundancy check (CRC-16).

A.1.2 Exception Responses

If a Modbus master sends an invalid command to the Wireless Gateway or attempts to read an invalid register, an exception response is generated. The response packet will have the high order bit of the function code set to one. The data field of the exception response contains the exception error code.

Code	Name	Description
01	Illegal Function	The function code is not supported
02	Illegal Data Address	Attempt to access an invalid address
03	Illegal Data Value	Attempt to set a variable to an invalid value

Table A.1 Exception Codes

A.2. Packet Communications for the Wireless Gateway

This section outlines the registers with the name and a brief description of each.

A.2.1 Function 03: Read Output Registers

To read the Wireless Gateway parameter values, the master must send a Read Output Registers request packet.

The Read Output Registers request packet specifies a start register and the number of registers to read. The start register is numbered from zero (40001 = zero, 40002 = one, etc.).

Read Registers Request Packet	Read Registers Response Packet
Slave Address (1 byte)	Slave Address (1 byte)
03 (Function code) (1 byte)	03 (Function code) (1 byte)
Start Register (2 bytes)	Byte count (1 byte)
# of registers to read (2 bytes)	First register (2 bytes)
Crc Checksum (2 bytes)	Second register (2 bytes)
	…
	Crc Checksum (2 bytes)

Table A.2 Read Output Registers Packet Structure

Register	Name	Description	Units	Range
40001	Id	Sensor Identification number	uint16	0-65535
40002	Out Of Service	Shows when the sensor is in maintenance mode or offline	uint16	0-65535
40003	Serial #	Wireless sensor serial number	uint16x4	0-65535
40007	Raw Data #1	First data value displayed by sensor	Unsigned 32 bit integer	0-4294967295
40009	Raw Data #2	Second data value displayed by sensor	Unsigned 32 bit integer	0-4294967295
40011	Raw Data #3	Third data value displayed by sensor	Unsigned 32 bit integer	0-4294967295
40013	Converted Data #1	First data value converted by the Wireless Gateway	Unsigned 32 bit integer	0-4294967295
40015	Converted Data #2	Second data value converted by the Wireless Gateway	Unsigned 32 bit integer	0-4294967295
40017	Converted Data #3	Third data value converted by the Wireless Gateway	Unsigned 32 bit integer	0-4294967295
40019	Age	Time since last transmission received	Unsigned 32 bit integer	0-4294967295
48001	Offline Delay	Time till the sensor reads offline	uint16	0-65535

Table A.3 Output Registers

A.3. RTU Framing

The example below shows a typical Query/Response from an Wireless Gateway.

Slave Address	Function Code	Count Bytes of Data	Register Data Msb	Lsb	Register Data Msb	Lsb	Register Data Msb	Lsb	CRC 16 “Lsb”	CRC 16 “Msb”
02	04	06	00	00	00	00	00	01	B5	A3

Table A.4 Response Sample

Slave address 2 responds to Function Code 4 with six bytes of hexadecimal data and ends with CRC16 checksum.

Register Values:

40001 = 0000 (hex)
40002 = 0000 (hex)
40003 = 0001 (hex)

APPENDIX

B

TROUBLESHOOTING

Below you'll find troubleshooting tips for a variety of situations you may encounter with the Wireless Gateway. Please use these suggestions to troubleshoot your appliance.

If these troubleshooting tips do not resolve your isues, RLE Technologies offers personalized support for all our products. If you require customer support for your Wireless Gateway, please contact RLE Technologies directly:

- Email: support@rletech.com
- Phone: 800.518.1519

The Wireless Gateway will not power up.

1. Use a digital volt meter (DVM) to check for AC or DC input power on the lower left hand terminal block on the Wireless Gateway. If no voltage is present at terminal block, check the circuit breaker or power supply that powers the Wireless Gateway. If voltage is present at the power supply, continue to step 2.
2. Contact RLE Technologies for further troubleshooting.

You cannot view the Wireless Gateway's home page.

1. Verify that the Wireless Gateway is powered up and running. You will see lights on the RJ45 (Ethernet) port illuminated and flashing. If no lights are illuminated on the unit, the unit may not be powered. If lights are illuminated and flashing, continue to step 2.
2. Connect a computer to the Wireless Gateway via a serial cable and the console port. Once connected with a terminal emulation program running on the PC:
   a. Type **`ip`** and press enter. This displays the current IP address set to the Wireless Gateway. Verify it is the correct IP address.
   b. Type **`nm`** and press enter. This displays the Net Mask. Verify it is the correct Net Mask.
   c. Type **`dg`** and press enter. This displays the Default Gateway. Verify it is the correct Default Gateway.

d Correct any information that is wrong. If the information is correct, go to step 3.

3 With the serial cable connected and your terminal emulation program running, you can enter an address to have the Wireless Gateway ping to.

a Obtain a known good IP address.

b In the terminal emulation program, type **`ping <one space> ip address`** and then press enter. *Example: ping 192.168.1.1*

c If a ping response is not established, contact your IT department and make sure the patch cord your using is not faulty. Have the network switch port checked to make sure it is activated.

♦ If a ping response is established, contact your local sales representative or RLE Technologies.

Sensors do not display on the Wireless Gateway's home page.

1 The transmission range of a wireless sensor depends on the distance between the sensor and the Wireless Gateway, and the number of obstacles between the two. The more obstructions between the devices, the weaker the signal becomes.

2 Do not install a wireless sensor inside a solid metal cabinet. This can interfere with its transmission.

3 If the sensor is not visible on the Wireless Gateway's home page, remove the cover from the sensor and see if the red "heartbeat" LED is flashing once every ten seconds. If you do not see a flash, check the sensor's batteries. If you do see it flash, continue to step 2.

4 Bring the sensor closer to the FSD-Wi and push the reset button on the top of the unit. If the sensor does not show on the home page when it is close to the Wireless Gateway, contact your local sales representative or RLE Technologies. If the sensor does show on the home page, move the sensor back to its original location.

5 418 MHz sensors have a limited range and may loose signal quality due to distance or physical obstructions. If moving the sensor to its original location causes the signal to be lost again, you have several options.

a Move the sensor to another acceptable location, where it can be "seen" by the Wireless Gateway.

b Switch out the 418 MHz sensor for a 900MHz sensor. The 900 MHz sensor will have a greater range.

c Use a point repeater to improve the signal quality.

Sensors that you have NOT installed appear on the Wireless Gateway's home page.

This issue may occur when wireless sensors are used in conjunction with an Wireless Gateway. When you installed your sensors, the automatic Sensor Discovery feature on the Wireless Gateway was enabled. Initially everything configured correctly, but when you check the Wireless Gateway several days later, it reports far more sensors than you have installed, and some of the reported data is very old.

When you configured your system, you left the Sensor Discovery feature on the Wireless Gateway enabled. The sensors sometimes transmit messages with garbled data packets, and the Wireless Gateway has interpreted the garbled data as new sensors. The "new" sensors have been added to the interface.

To avoid this problem, you must disable the Sensor Discovery feature in the Wireless Gateway once the initial configuration is complete and the Wireless Gateway has discovered all the sensors.

To fix this issue once it's occurred:

1. Turn OFF the Sensor discovery feature in the Wireless Gateway.
2. Use the Wireless Gateway interface to delete the "ghost" sensors. Click the Sensor Summary link at the top of the page. You'll see a list of all the sensors the Wireless Gateway is monitoring.
3. Click on the number of the sensor you wish to delete. You'll be taken to the configuration page for that sensor.
4. Delete the information in the Sensor Type ID field, the Description field, and the Serial Number field. Click the Submit Changes button.
5. Repeat the process for each sensor you need to delete.
6. Once the "ghost" sensors are all deleted, there may be gaps in your list of sensors - if you needed to delete the sensors in spots 4, 7, and 9, these sensor numbers are now blank. You can renumber the existing sensors to fill in these gaps.
7. To renumber your sensors, return to the Sensor Summary page. Click the number of the sensor you wish to renumber.
8. Scroll to the bottom of the page, and type the new number in the Move sensor position to: box. Click the Submit Changes button. You'll be returned to the Sensor Summary page, and the sensor will appear in its new location in the list. Repeat this process for each sensor you wish to renumber.

APPENDIX

C

TECHNICAL SPECIFICATIONS

Power		24VAC @ 600mA max, 50/60Hz, 24VDC @ 600mA max.
Communications Ports		
	Ethernet	10/100 BASE-T, RJ45 connector; 500VAC RMS isolation
	EIA-232	DB9 female connector; 9600 baud; No parity, 8 data bits, 1 stop bit
	EIA-485	1200, 2400, 9600 or 19200 baud (selectable); Parity: none, even or odd, 8 data bits, 1 stop bit
Protocols		
	TCP/IP, HTML, TFTP, SNMP	V1: V2C MIB-2 compliant; NMS Manageable with Get
	Modbus (EIA-485)	Modbus Slave; RTU mode; Supports function codes 03
	Modus TCP/IP UDP/IP	Modbus Slave; TCP/IP transmission protocol
	BACnet/IP	ASHRAE STD 135-2004 Annex J
	BACnet MS/TP	EIA-485
	Terminal Emulation	VT100 compatible
Login Security		
	Web Browser Access (Ethernet)	1 Web password Read Only; 1 Web password Read/Write
	Terminal Emulation Access	None
Maximum Number of Wireless Points		400 with repeaters; 100 without repeaters
Wireless Interface		916MHZ and 418MHZ transceiver. RP/SMA connectors for Antenna
Indicators		
	Network	2 Green Active & Speed
	Status	1 Red LED
	EIA-485 Status	2 Green Transmit & Receive

Table C.1 Technical Specifications

Operating Environment		
	Temperature	32ºF to 122ºF (0ºC to 50ºC)
	Humidity	5% to 95% RH (non-condensing)
	Altitude	15,000ft (4572m) max.
Storage Temperature		–4ºF to 185ºF (–20ºC to 85ºC)
Mounting		19" Rack Mount (48.26cm)
Dimensions		9.75"W x 1.69"H x 4.88"D (24.77cmW x 4.29cmH x 12.383cmD)
Weight		2.32.lb (1.05kg) without optional rack ears

Table C.1 Technical Specifications (continued)