VRF Smart Gateway User's Guide

SI-VRFCBN02-0Sx

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Refer to the QuickLIT website for the most up-to-date version of this document.

VRF Smart Gateway Introduction

The Johnson Controls® VRF Smart Gateway allows the Hitachi VRF controls equipment to communicate using the BACnet®/IP protocol to most building automation systems (BAS), such as the *Metasys*® system. This User's Guide describes how to configure and use the features of the VRF Smart Gateway and how to verify that the VRF equipment is online.

The *VRF Smart Gateway Quick Start Guide (Part No. 24-10737-156)* is included with the device and contains important information to help you connect and start using the device for the first time. The guide has labels with user name and password information that is unique to your device and is used to access the device over Wi-Fi. Save the *VRF Smart Gateway Quick Start Guide*, as it contains default user name and password information that you may need to reset your VRF Smart Gateway to factory defaults.

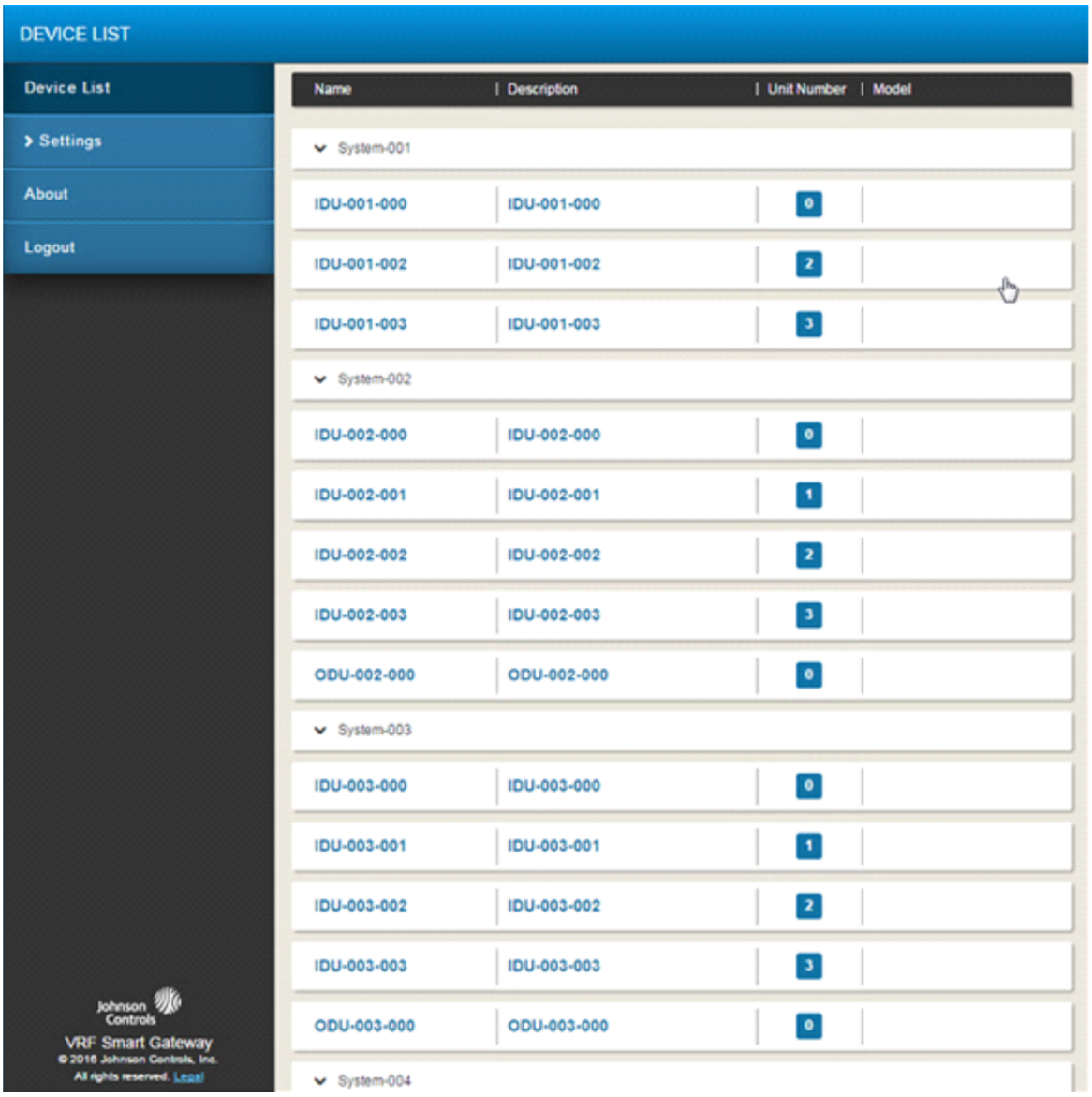
For information about network and security settings, refer to the *VRF Smart Gateway Network and IT Guidance Technical Bulletin (LIT-12012373)*. For information about installing the device, connecting communications networks, and powering up the device, refer to the *VRF Smart Gateway Installation Instructions (Part No. 24-10143-1183)* that is included with the device. The VRF Smart Gateway does not need to be connected to the VRF equipment in order to configure its settings, but the VRF Smart Gateway can detect equipment only if the equipment is commissioned and functional.

A software update may be available for your device. Visit VRFPro.com or contact your nearest Johnson Controls representative for the latest version. See *Software Updates* for instructions on applying updates.

VRF Smart Gateway UI and Navigation

The VRF Smart Gateway UI runs in a web browser on your computer or mobile device. When you first log in to the VRF Smart Gateway, you must agree to the Access Point Legal Disclaimer and VRF Smart Gateway License information. After successfully logging into the VRF Smart Gateway, the **Device List** screen displays a list of the Hitachi VRF devices detected on the network.

Figure 1: VRF Smart Gateway UI — Device List



The left-hand pane of the UI allows you to navigate the menus in order to adjust communication settings and use the various features of the VRF Smart Gateway.

The **Device List** displays the VRF devices that the VRF Smart Gateway currently detects. The **Settings** menu displays the parameters that you can adjust to make the VRF Smart Gateway function properly for your network and application.

Table 1: VRF Smart Gateway Configuration Menu

Menu Item	Description
Device List	Shows the list of VRF devices.
Settings	Shows the main menu of settings.
Wi-Fi Access Point	Shows settings for configuring Wi-Fi access to the VRF Smart Gateway UI.
Ethernet	Shows settings for configuring the Ethernet port and IP network information.
BACnet Gateway	Shows the submenu for BACnet.

Table 1: VRF Smart Gateway Configuration Menu

Menu Item	Description
Device Settings	Shows BACnet settings for the VRF Smart Gateway.
Unit Settings	Shows the unit set (either Imperial or Metric) that the VRF equipment uses to convert temperatures and other data that are provided over BACnet.
System Utilities	Shows the submenu for the System Utilities.
Backup Restore	Shows the option to save and restore the configuration of the VRF Smart Gateway.
SSL	Shows the option to add an SSL key and certificate for secure web browsing in the VRF Smart Gateway UI.
Software Updates	Shows the option to update the main software of the VRF Smart Gateway.
Diagnostics	Shows the option to download diagnostic information from the VRF Smart Gateway.
Administration	Shows the user account and password information for accessing the VRF Smart Gateway UI over Wi-Fi and Ethernet.
About	Displays version information for the software components of the VRF Smart Gateway.
Logout	Logs out of the VRF Smart Gateway UI.

Device List

When the VRF Smart Gateway is connected to the H-Link network and is powered, it begins to discover the Hitachi VRF system of devices. The Device List of the UI shows all VRF devices that the VRF Smart Gateway detects after it has been connected and powered for a few minutes. Alternatively, the Device List may show a message indicating that it is still discovering VRF devices.

When the Device List is populated, it shows the list of VRF outdoor units (ODUs) and indoor units (IDUs) organized by system number. The system number represents the refrigeration system or circuit on which the VRF units are operating, although all units are connected to the same communication network. A VRF communication network has 1 to 64 systems of VRF units. You can click on the system number line in the Device List to collapse or expand the VRF units for easier viewing.

Figure 2: System 004, Expanded

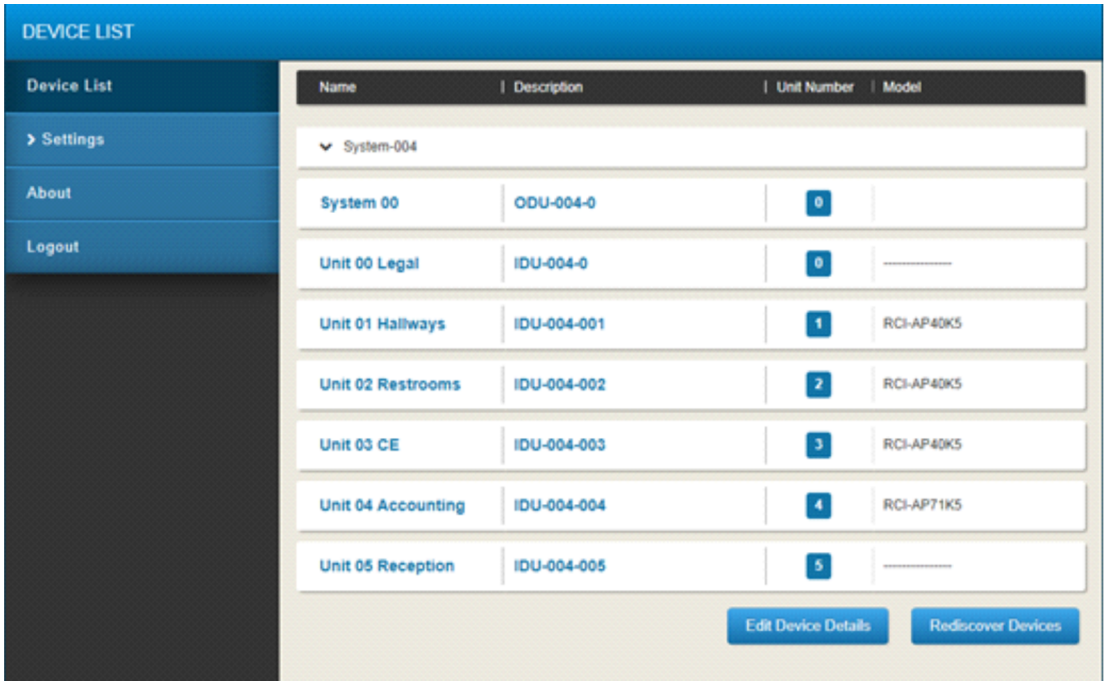
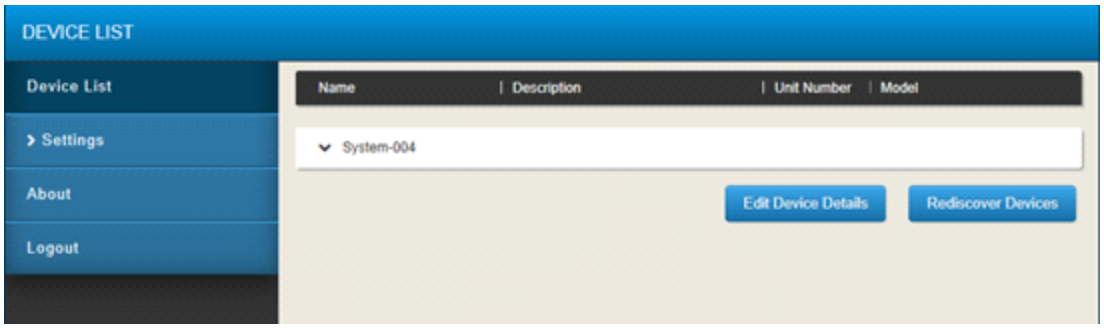
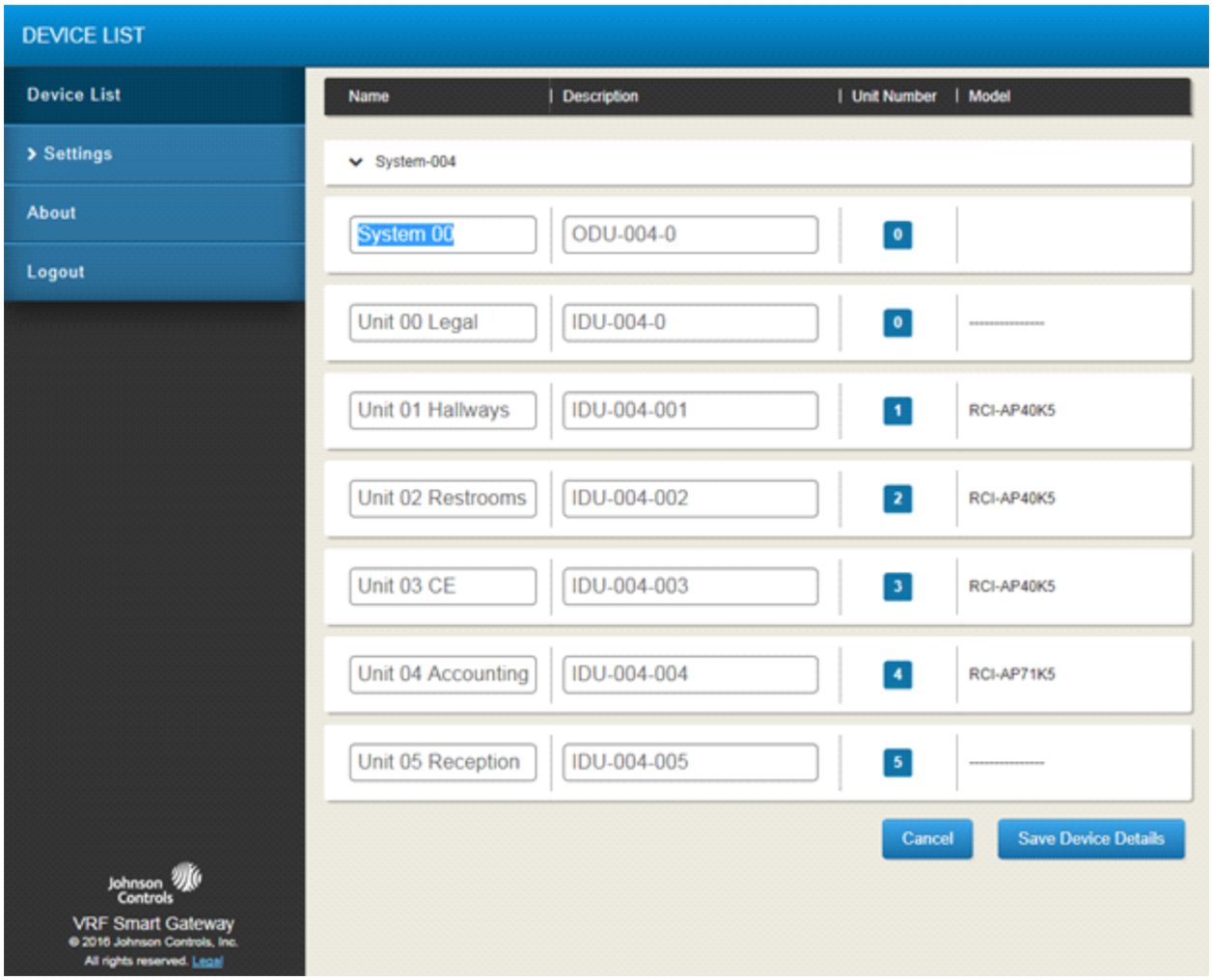


Figure 3: System 004, Collapsed



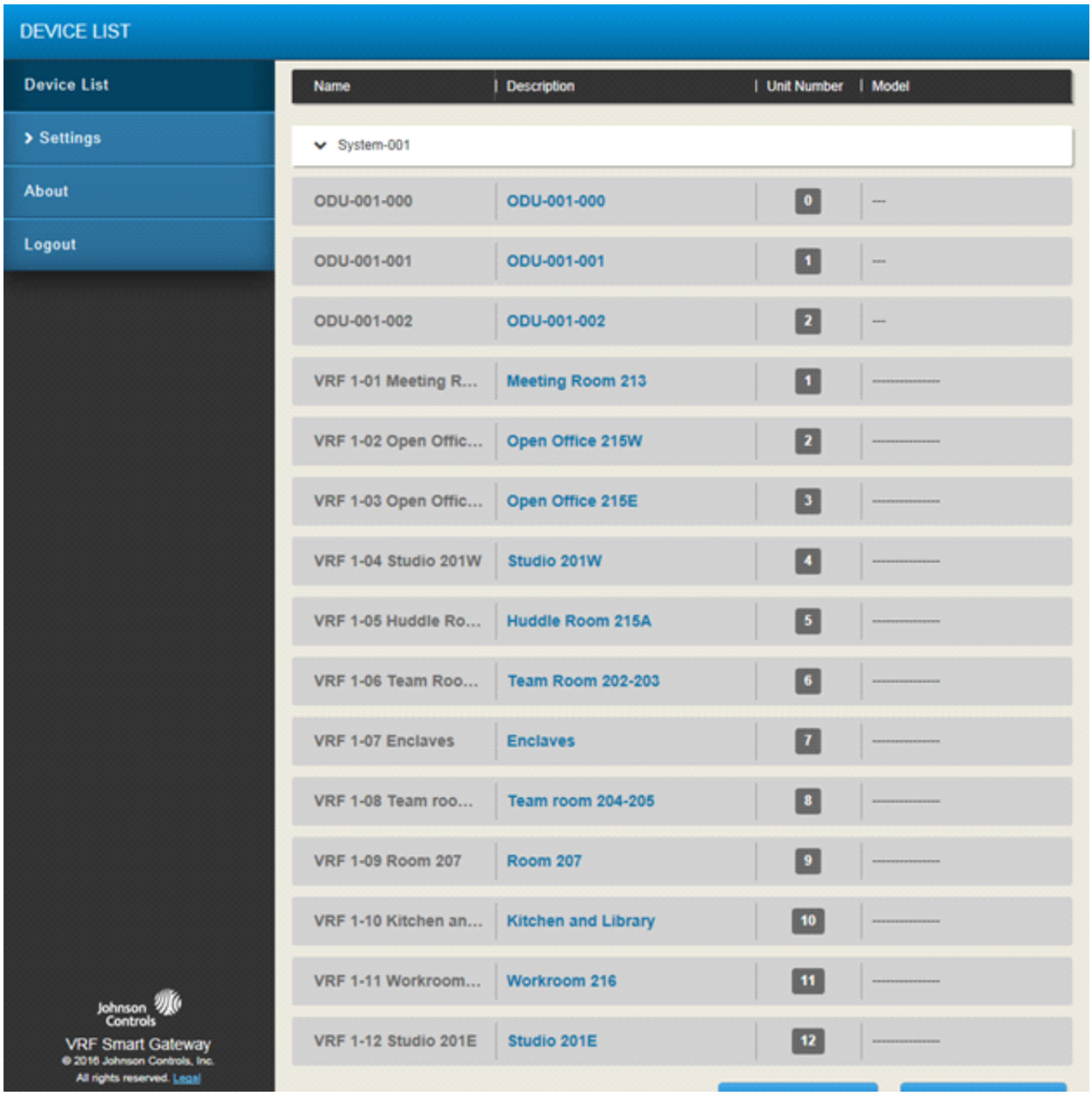
Each ODU and IDU entry in the Device List shows the device name, a description, its unit address, and its model number if available. You can edit the names and descriptions of the VRF units from this UI before integrating them with a BAS. Click **Edit Device Details** to put the Device List into edit mode. When finished, click **Save Device Details**.

Figure 4: Device List in Edit Mode



When VRF devices are online and communicating with the VRF Smart Gateway, they appear in the list against a white background. When VRF devices are offline or not communicating with the VRF Smart Gateway, they appear in the list against a dark gray background.

Figure 5: Device List Showing Offline Devices



When a VRF device is added or removed from the network, click **Rediscover Devices** below the device list. The device list takes a few minutes to refresh while the VRF Smart Gateway rediscovers the VRF devices on the network.

Settings

This section describes how you can use the settings menu of the VRF Smart Gateway UI to configure and use the various features of the VRF Smart Gateway.

Wi-Fi Access Point

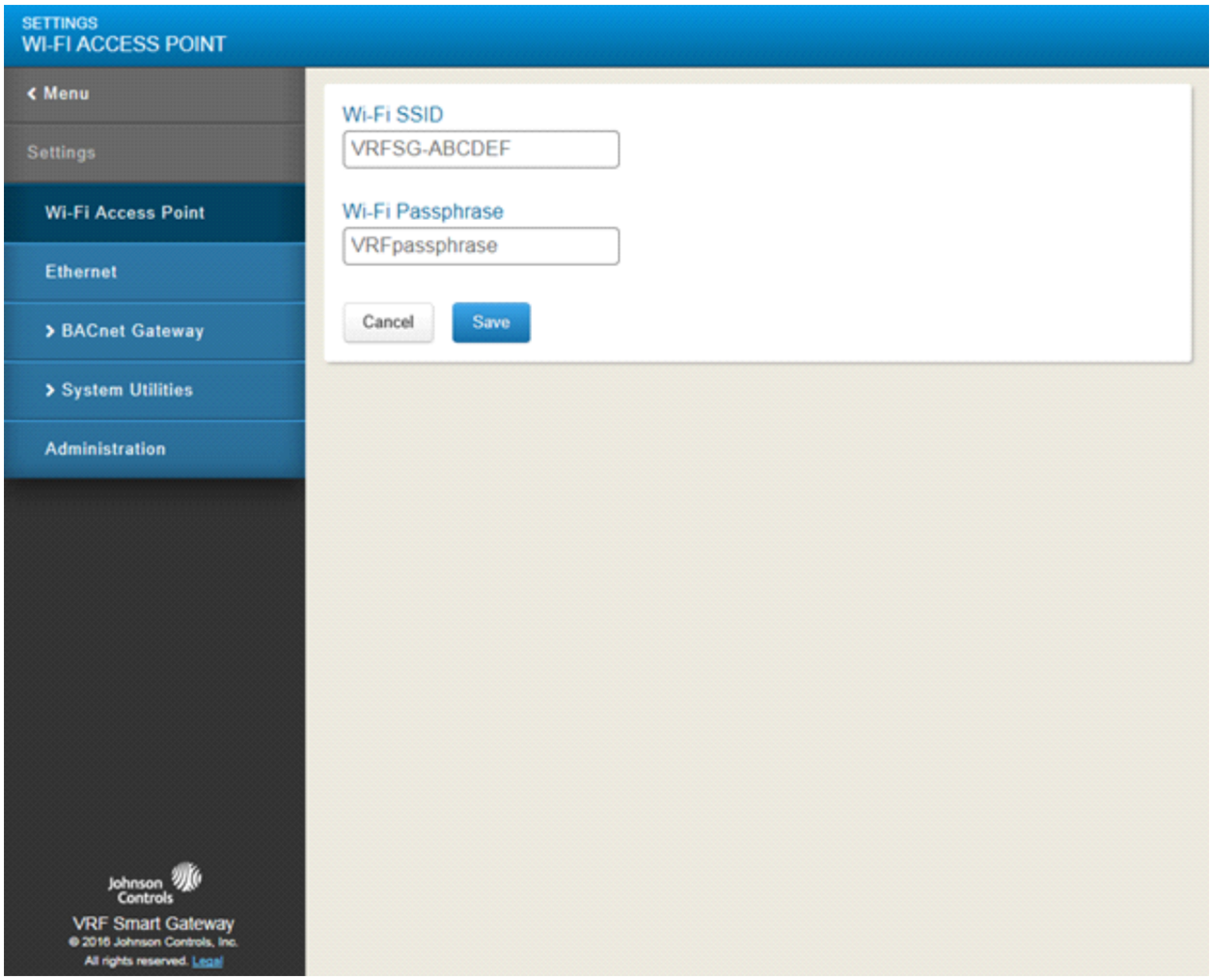
The VRF Smart Gateway acts as a Wi-Fi access point that allows you to easily view the VRF system device list, configure settings, and use the VRF Smart Gateway's features. On a Wi-Fi enabled device such as a laptop, mobile phone, or tablet, you can discover the VRF Smart Gateway's Wi-Fi access point by its Wi-Fi SSID and connect to it with the Wi-Fi passphrase. The default Wi-Fi passphrase is printed on a label on the *VRF Smart Gateway Quick Start Guide* that is included with your VRF Smart Gateway.

Table 2: Wi-Fi Access Point Settings

Setting	Default	Description
Wi-Fi SSID	Shown on a label in the *VRF Smart Gateway Quick Start Guide*	The identifier that the VRF Smart Gateway broadcasts to allow for connection to Wi-Fi capable devices.
Wi-Fi Passphrase	Shown on a label in the *VRF Smart Gateway Quick Start Guide*	The password required for connecting to the VRF Smart Gateway Wi-Fi access point from other devices.

Note: The VRF Smart Gateway must restart in order for changes to these settings to take effect. Always use the newest Wi-Fi access point settings to connect to the VRF Smart Gateway using Wi-Fi.

Figure 6: Wi-Fi Access Point



Ethernet

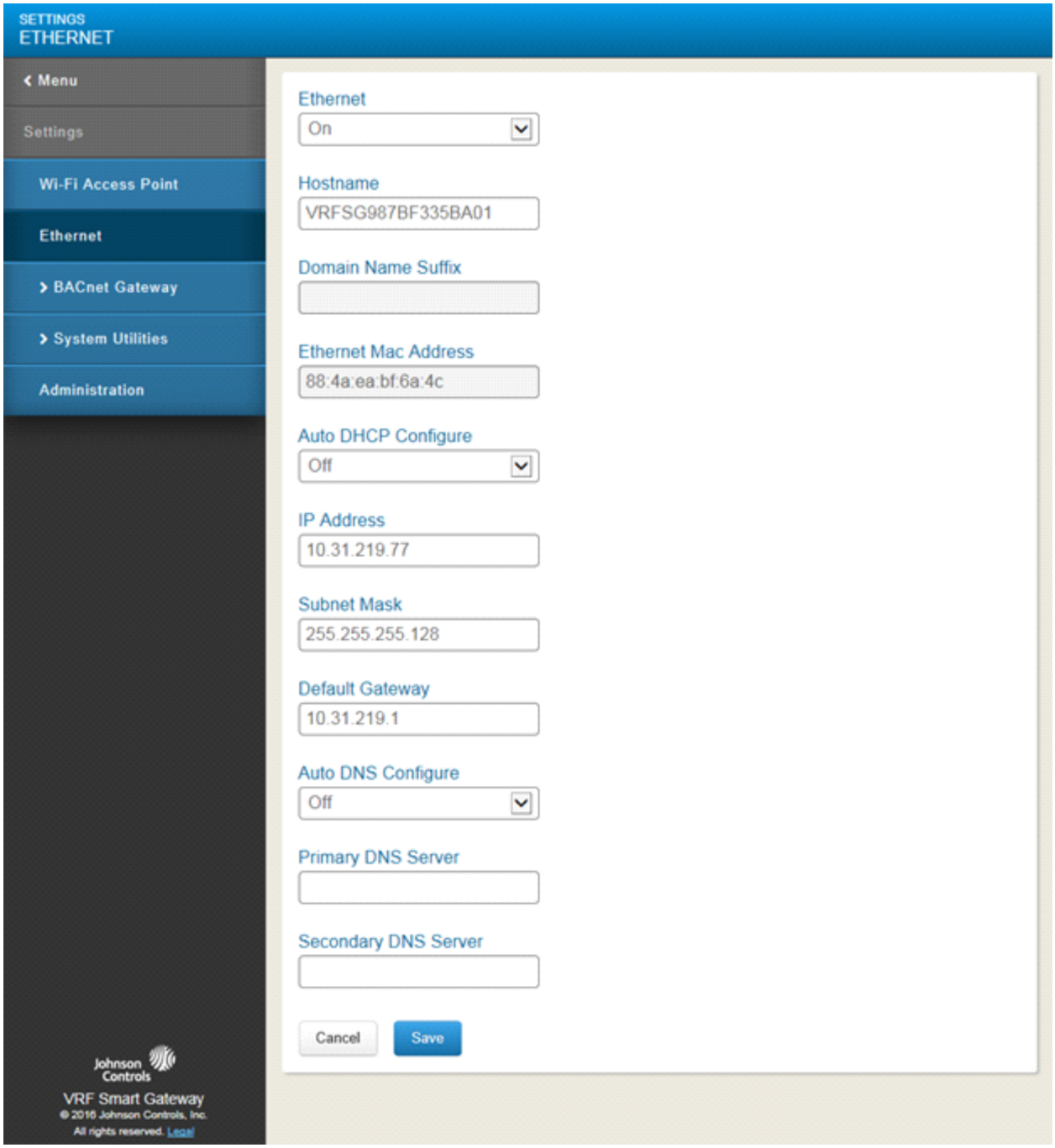
The Ethernet settings specify how the Ethernet port of the VRF Smart Gateway should function. For help setting up the Ethernet port, contact your Network Administrator or IT Department.

Table 3: Ethernet Settings

Setting	Default	Description
Ethernet	On	Can be set to On or Off to enable or disable the Ethernet port of the VRF Smart Gateway.
Hostname	**VRFSG** followed by the last six symbols of the Wi-Fi MAC address	A unique computer name that you can use to connect to the VRF Smart Gateway instead of the IP address when communicating over Ethernet.
Domain Name Suffix		Specifies the local domain of the network. Possible domain name suffixes include .com, .net, .org, and others.
Ethernet MAC Address		The unique identifier for the VRF Smart Gateway on the network.
Auto DHCP Configure	On	Set DHCP to On if your network automatically assigns IP addresses. Set DHCP to Off to specify a static IP address. To obtain necessary settings, contact your IT Department.
IP Address		If a static IP address is specified and Auto DHCP Configure is set to Off, specify the static IP address here.
Subnet Mask		If a static IP address is specified and Auto DHCP Configure is set to Off, use the Subnet Mask to specify the subnet that this gateway is on.
Default Gateway		If a static IP address is specified and Auto DHCP Configure is set to Off, specify the default gateway for the subnet here.
Auto DNS Configure	Off	If you have a Dynamic Name Server on your network, you can access the VRF Smart Gateway using its unique hostname instead of an IP address. Set Auto DNS Configure to On to enable automatic configuration of the DNS. Set Auto DNS Configure to Off to manually specify the DNS Servers. Contact your IT Department to obtain necessary DNS settings.
Primary DNS Server		If Auto DNS Configure is set to Off, specify the address of your primary DNS server, if available.
Secondary DNS Server		If Auto DNS Configure is set to Off, specify the address of your secondary DNS server, if available.

Note: The VRF Smart Gateway must restart in order for changes to these settings to take effect. Always use the newest Ethernet settings to connect to the VRF Smart Gateway using Ethernet.

Figure 7: Ethernet Settings



BACnet Gateway

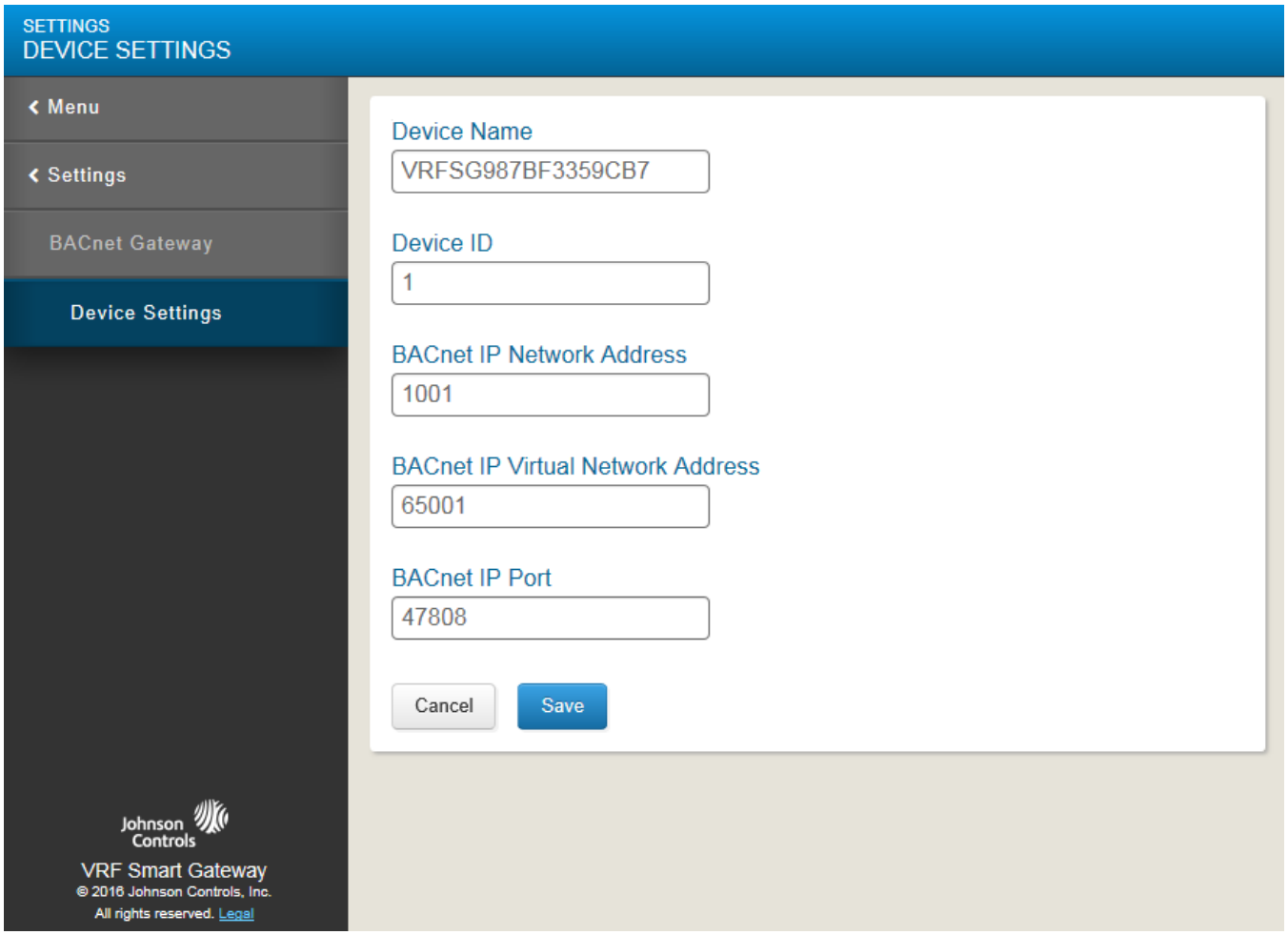
The VRF Smart Gateway is a BACnet device. Use the BACnet Gateway Device settings to specify the unique BACnet device name, BACnet identifier, and BACnet network information.

Table 4: BACnet Device Settings

Setting	Default	Description
Device Name	**VRFSG** followed by the Wi-Fi MAC address	The unique BACnet device name that identifies the VRF Smart Gateway over BACnet.
Device ID	1	The unique BACnet device identifier that identifies the VRF Smart Gateway over BACnet.
BACnet IP Network Address	1001	Specifies the BACnet network address on which the VRF Smart Gateway should communicate. This address must match the BACnet/IP network address of the BAS.
BACnet IP Virtual Network Address	65001	Specifies a unique internal address for the virtual BACnet network of VRF devices.
BACnet IP Port	47808	Specifies the UDP port that the VRF Smart Gateway should use when communicating with other devices over BACnet. This port must match the BACnet/IP port of the BAS.

Note: The VRF Smart Gateway must restart in order for changes to these settings to take effect.

Figure 8: BACnet Device Settings

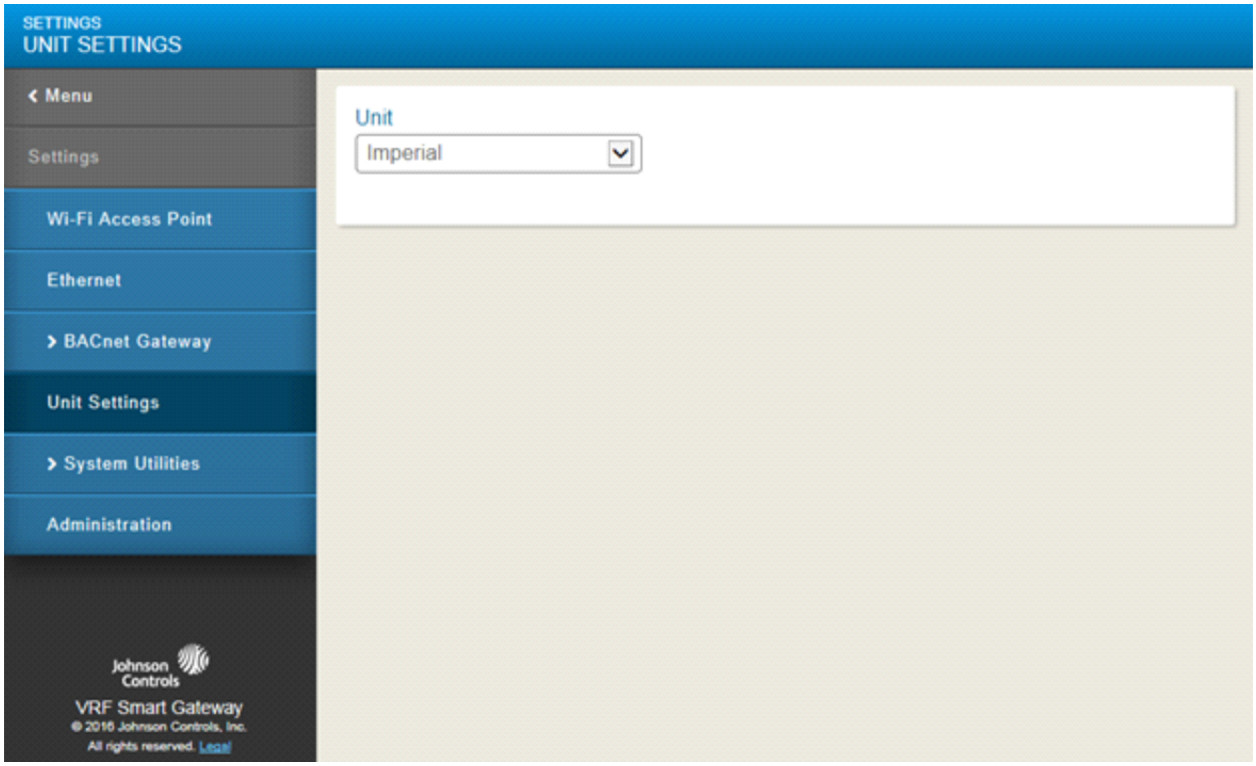


Unit Settings

Choose either Imperial or Metric for the unit setting. When temperature and other VRF equipment data are provided over BACnet, the VRF Smart Gateway converts the data to the chosen unit set.

Note: The VRF Smart Gateway must restart in order for a change to this setting to take effect.

Figure 9: Unit Setting



System Utilities

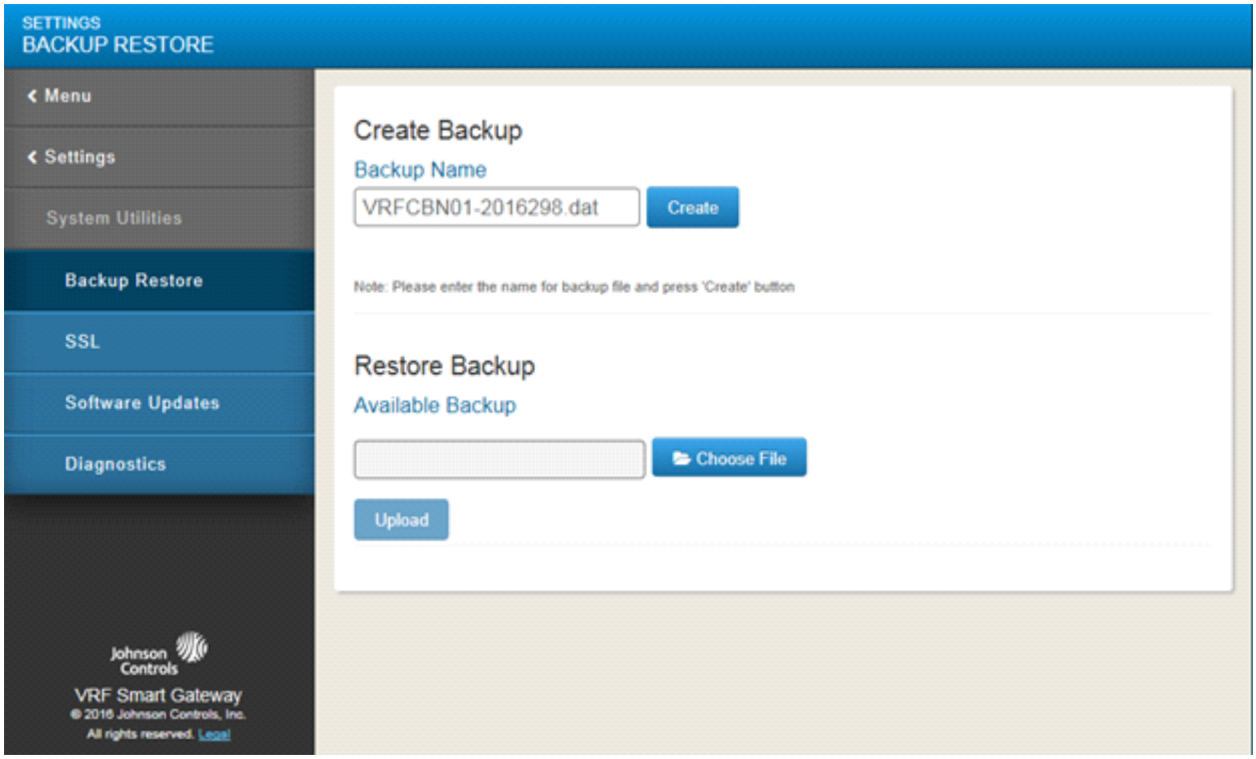
Backup Restore

Use the Backup and Restore features of the VRF Smart Gateway to save the device's configuration settings to a file on your local client device. You can restore this file at a later time if the VRF Smart Gateway is reset to factory defaults or to configure a new VRF Smart Gateway using the same settings.

Use the Create Backup option to specify the name of the file to be saved to your client device. This file contains all of the settings from the **Settings** menu screens and the customizable names and descriptions of the VRF devices on the **Device List** screen.

Use the Restore Backup option to restore the configuration settings saved to your backup file. Click **Choose File** to select your backup file, and then click **Upload**.

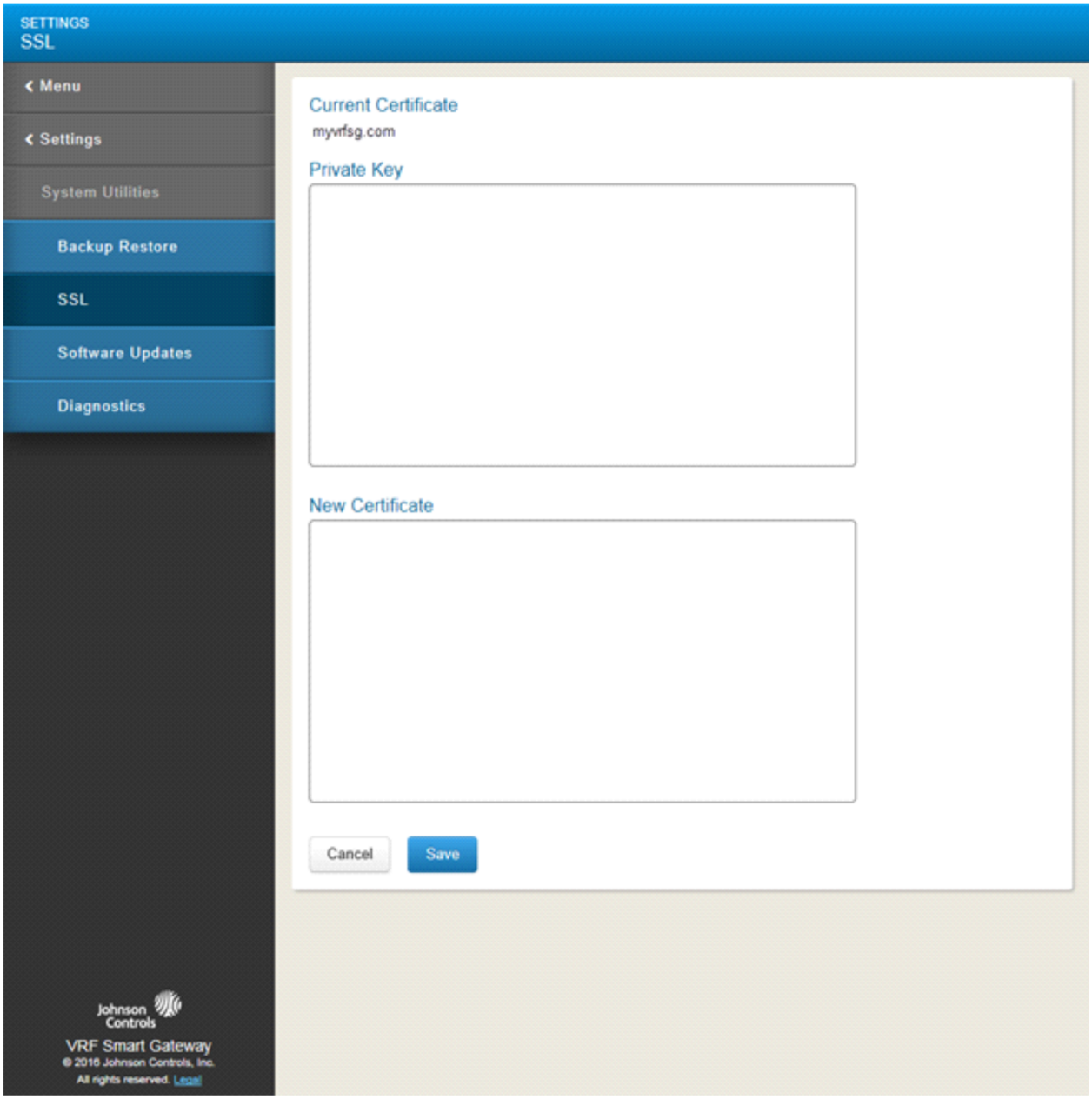
Figure 10: Backup Restore



SSL

The SSL settings screen shows the security certificate (if one is currently installed) and allows you to install both a Private Key and a new certificate. Refer to the *VRF Smart Gateway Network and IT Guidance Technical Bulletin (LIT-12012373)* for information on how to use SSL Certificates on the VRF Smart Gateway.

Figure 11: SSL Settings

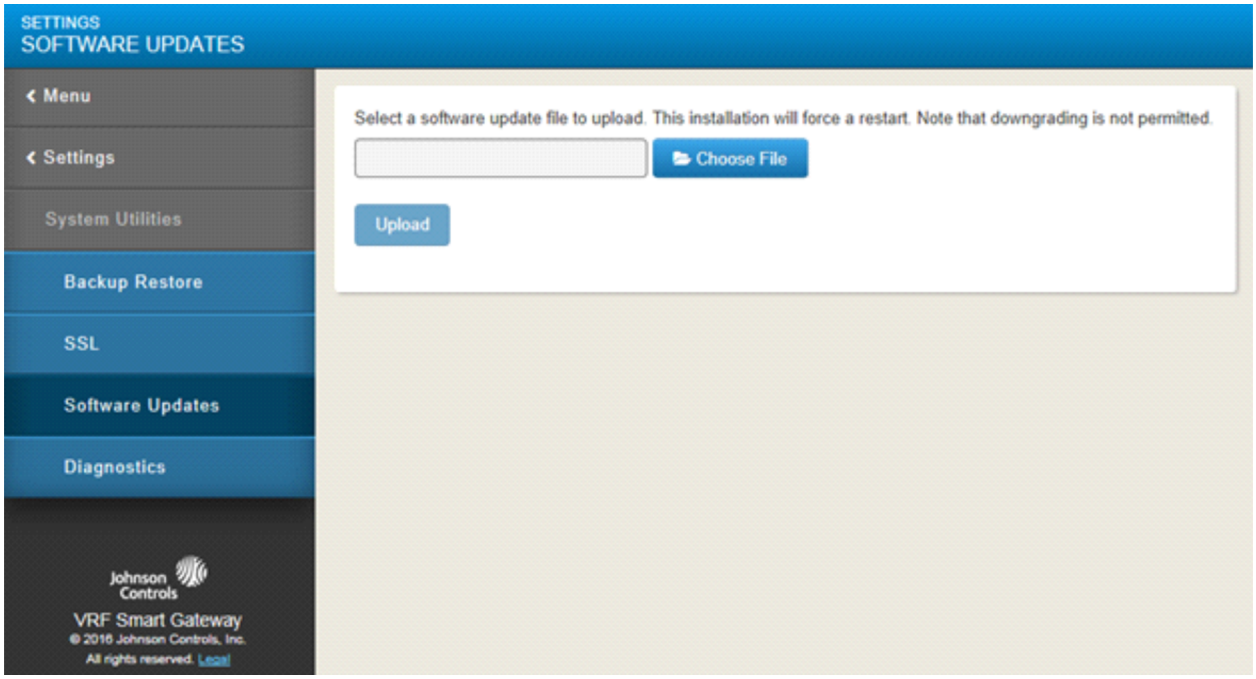


Software Updates

Perform the following procedure to update the software in the VRF Smart Gateway.

1. On the **Settings** menu, select **Software Updates** and click **Choose File** to navigate to the new software image file that is on your client device.
2. Click **Upload** to transfer the file to the VRF Smart Gateway.
3. Click **Install** for the VRF Smart Gateway to use the new file.
4. The VRF Smart Gateway goes offline temporarily while the updates are applied. You may see a **Connection Problem** message.

Figure 12: Software Update

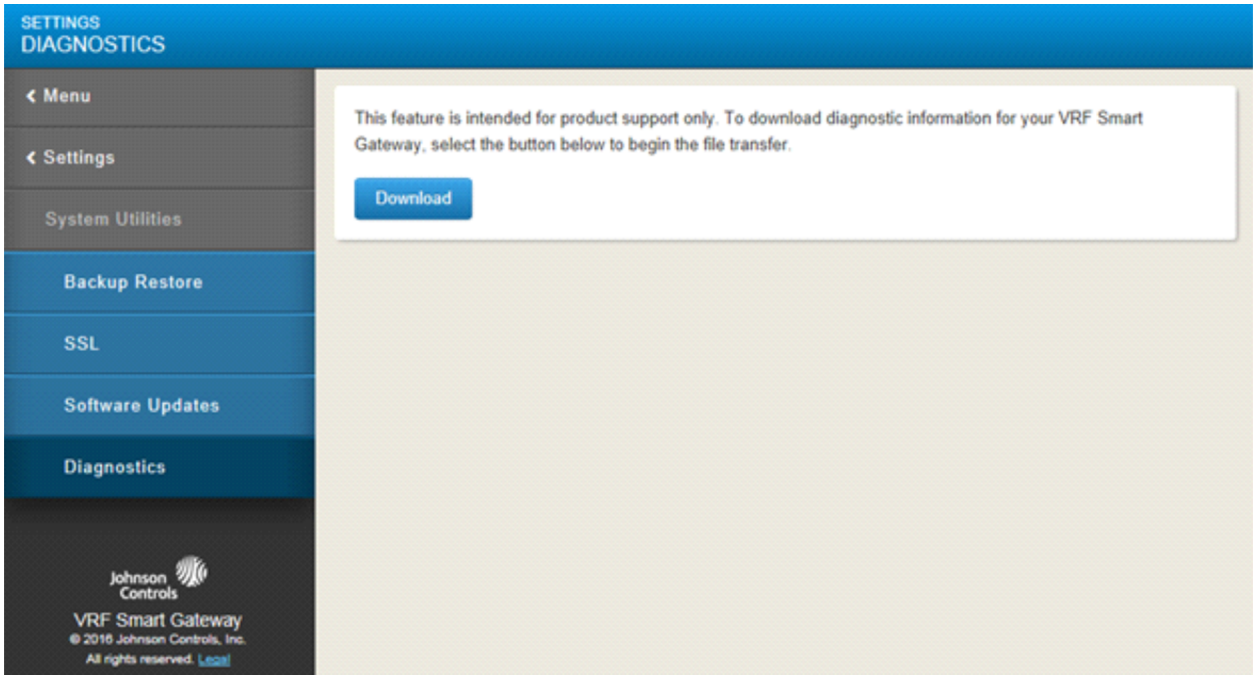


Diagnostics

The Diagnostics feature allows you to provide device diagnostic data that the product support team can use to understand the functionality of your VRF Smart Gateway if any problems occur. Use this feature only if the Johnson Controls product or field support teams instruct you to do so.

Click **Download** to download a diagnostics file to your client device.

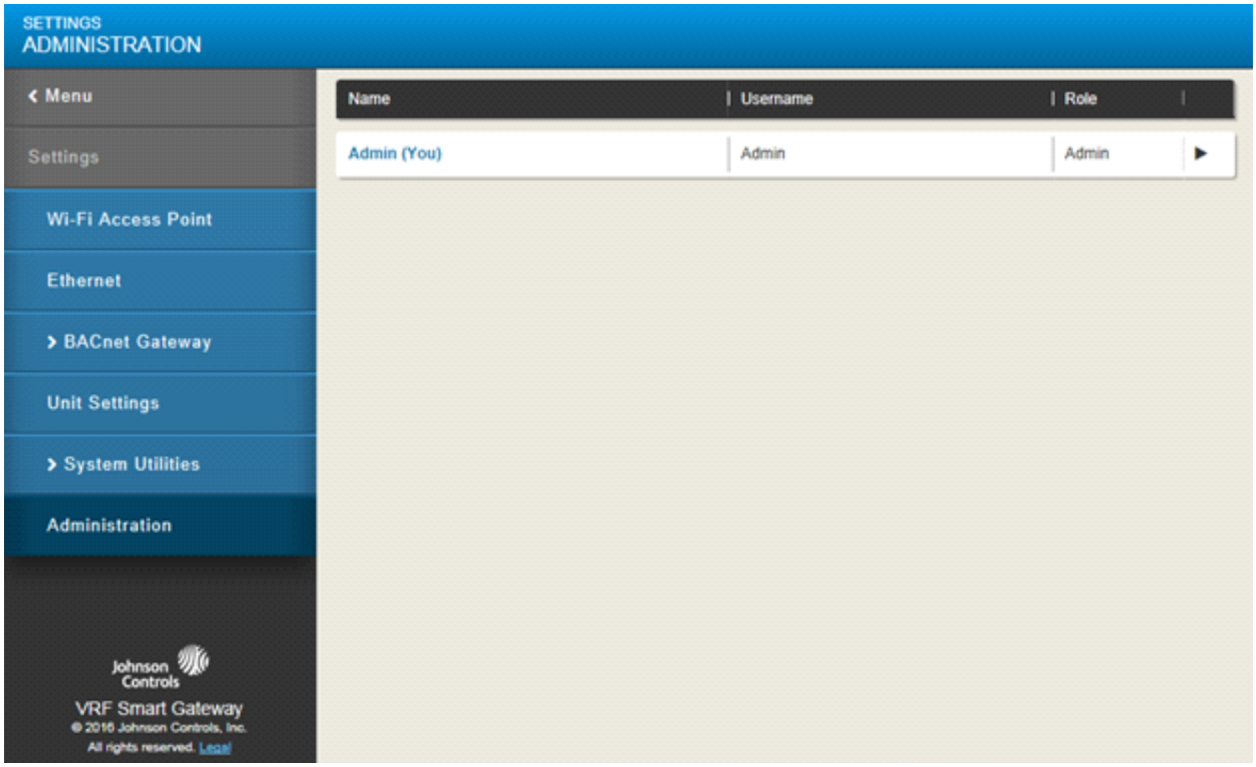
Figure 13: Diagnostics



Administration

The VRF Smart Gateway provides a single Admin user profile that allows access to the UI. You can view and modify the Admin user credentials using the **Administration** menu item. Click the Admin name to edit the credentials.

Figure 14: User Administration

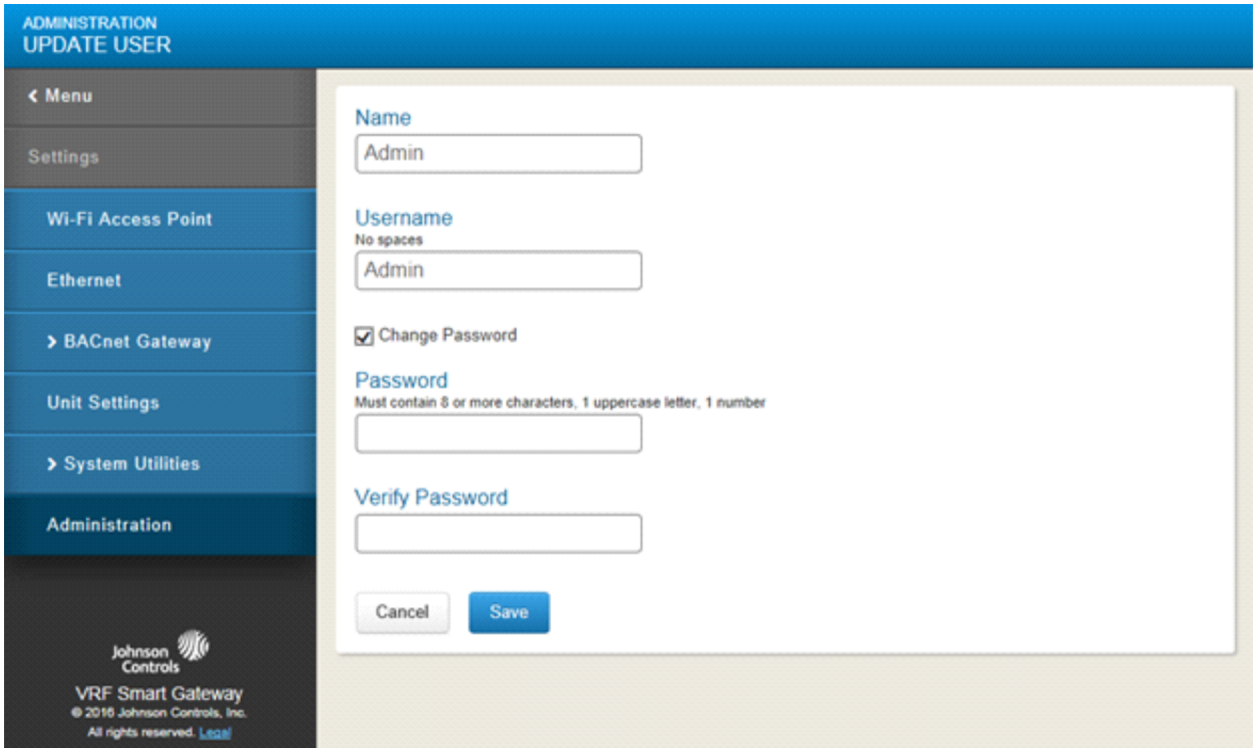


The Update User screen allows you to change the Admin user credentials.

Table 5: User Administration Settings

Setting	Default	Description
Name	Admin	The name of the Admin user profile.
Username	Admin	The username for the Admin user profile. This username is used on the Login screen.
Change Password	Unchecked	When checked, the password fields are shown.
Password		Must be at least eight characters long and include at least one uppercase letter and at least one number. This password is used on the Login screen.
Verify Password		Verifies the password in the Password field.

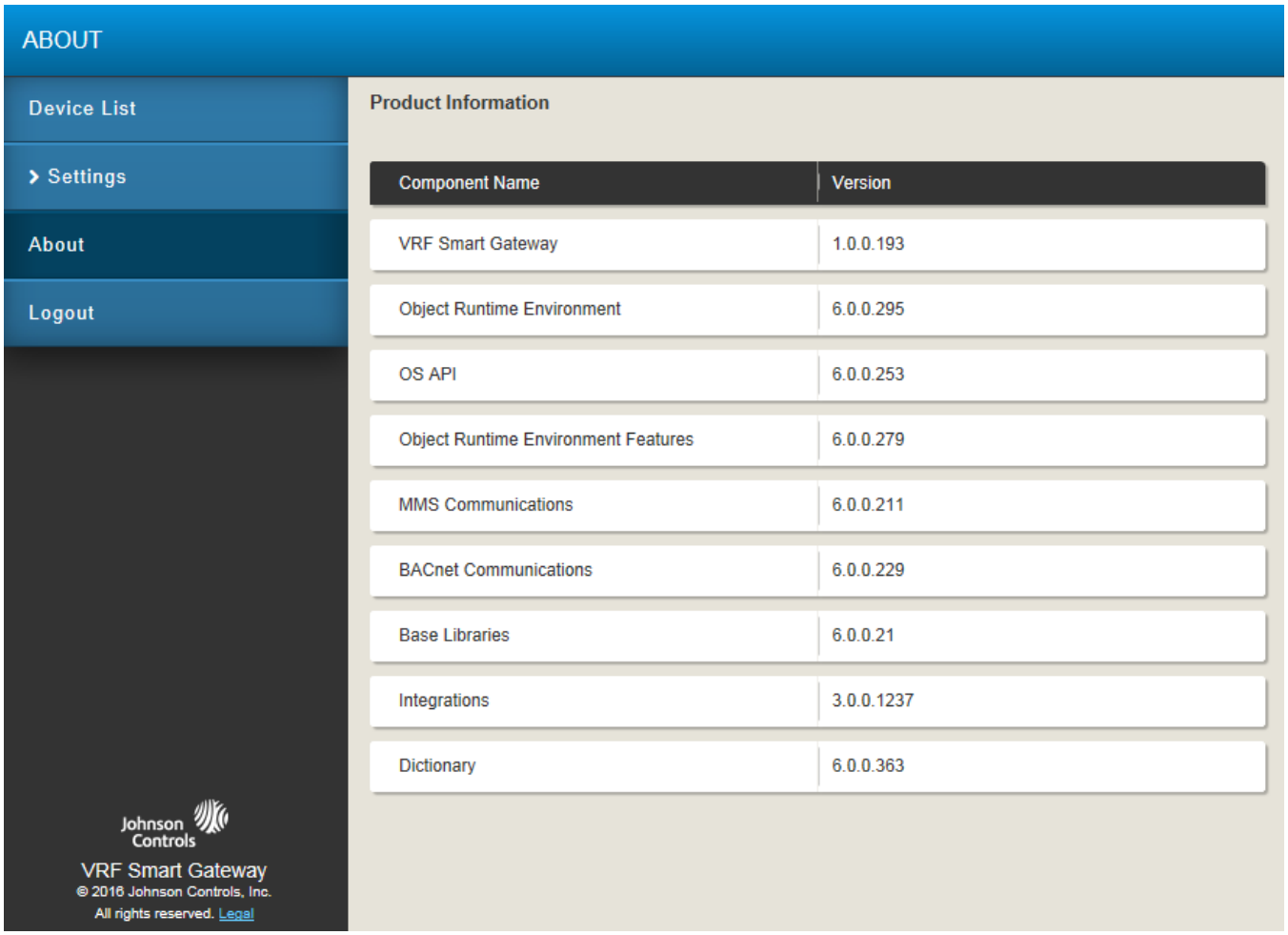
Figure 15: Update User



About

The About screen shows the versions of the various software components of the VRF Smart Gateway.

Figure 16: About Screen



Logout

Use the **Logout** option on the menu to immediately log out of the VRF Smart Gateway UI and return to the Login screen.

Security

The VRF Smart Gateway uses security certificates that authenticate it to web browsers. Refer to the *VRF Smart Gateway Network and IT Guidance Technical Bulletin (LIT-12012373)* for information on installing and using security certificates.

The first time you log in to the VRF Smart Gateway, the **Change Password and Passphrase** web page appears. You must change the Admin password and Wi-Fi passphrase. Passwords must be at least eight characters long and include at least one uppercase letter and at least one number. The Wi-Fi access point passphrase must be at least eight characters long.

Status Indication LEDs

The VRF Smart Gateway communicates status using LEDs to indicate the following functional states:

- power
- fault
- H-Link bus communication
- Ethernet communication
- Wi-Fi strength

See the following table for a comprehensive list of VRF Smart Gateway LED functional information.

VRF Smart Gateway LED Designations and Descriptions

Table 6: LED Designations and Descriptions

LED Name	Color	Normal	Descriptions/Other Conditions
Power	**Green**	On Steady (no flashing)	Off = No power On Steady = Power supplied by primary voltage
Fault	**Red**	Off	Off = No faults/normal operation On Steady = Missing hardware, missing software, operating system has not yet initialized, or reset is in progress. Slow Flicker (1 blink in a second) = Software upgrade in progress Medium Flicker (2 blinks in a second) = Startup sequence Fast Flicker (5 blinks in a second) = Fault
H-Link Bus	**Green**	Flicker	Off = No data transmitting Flicker = Discovering VRF devices On Steady = Discovery complete
Ethernet	**Green**	On Steady	Off = Communication not established On Steady = Communication established Flicker = Data transmission
Wi-Fi	**Yellow**	On Steady	Off = No Wi-Fi signal or no devices currently connected over Wi-Fi Wi-Fi strength is indicated by the number of LEDs that are lit, with one lit LED indicating weak wireless signal strength (between 1% and 49%) and three lit LEDs indicating excellent wireless signal strength (at least 75%).

LED Test Sequence at Startup

During startup, the VRF Smart Gateway automatically initiates a self-test to verify proper operation of the unit. Immediately after connecting supply power, the following LED lighting sequence occurs:

1. The Power LED turns on and stays lit.
2. The Fault LED indicator flashes for approximately 40 seconds, then turns off when the VRF Smart Gateway is fully functional.
3. The Wi-Fi LEDs light up in succession (scanning), indicating that the VRF Smart Gateway is waiting for a device to join its Wi-Fi network.

Troubleshooting

Table 7: Troubleshooting

Error Message or Condition	Cause	Remedy
Connection Problem **Attempting to Reconnect**	There is a problem communicating with the VRF Smart Gateway, either over Wi-Fi or Ethernet.	If you are using Wi-Fi, make sure that you are in range of Wi-Fi communication as the system attempts to reconnect. If the device does not reconnect within 3 minutes, refresh your browser. Alternatively, disconnect the VRF Smart Gateway, wait 30 seconds, and then reconnect.
No Devices	The VRF Smart Gateway does not detect any VRF devices.	If the VRF Smart Gateway discovers no VRF equipment within a few minutes of powering up, wait a few more minutes, then refresh the UI. If the Device List is still blank after 5 minutes, check the H-Link connections to the VRF Smart Gateway and the VRF equipment.
Error Saving SSL Settings	The SSL key or certificate is corrupted.	Reinstall the SSL key or certificate as described in the *VRF Smart Gateway Network and IT Guidance Technical Bulletin (LIT-12012373)*.

Related Documentation

Table 8: Related Documentation

For Information On:	See Document:
Getting up and running quickly with the VRF Smart Gateway	*VRF Smart Gateway Quick Start Guide (Part No. 24-10737-156)*
Installing and Wiring the VRF Smart Gateway	*VRF Smart Gateway Installation Instructions (Part No. 24-10143-1183)*
Working with Security Certificates	*VRF Smart Gateway Network and IT Guidance Technical Bulletin (LIT-12012373)*

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