Wi-Fi Admin User Manual

Table of Contents

These instructions are for IntelliRupter fault interrupters, 6800 Series Automatic Switch Controls, and IntelliCap 2000 Automatic Capacitor Controls shipped after May 1, 2020, with Wi-Fi/GPS Unit model number 005-004701-01.

May 26, 2020

Qualified Persons

⚠ WARNING

Only qualified persons who are knowledgeable in the installation, operation, and maintenance of distribution fusing equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A Qualified Person is someone who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended ONLY for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet before installing, operating or configuring a Wi-FI/GPS Unit. The latest version is available online in PDF format at **sandc.com/en/support/product-literature/**. Become familiar with the Safety Information and Safety Precautions on pages 4 and 5.

Retain this Instruction Sheet

This instruction sheet should be available for reference wherever the Wi-Fi/GPS Unit is used. Retain this instruction sheet in a location where it can be easily retrieved and referred to.

Proper Application

⚠ WARNING

The equipment in this publication is only intended for a specific application. The application must be within the ratings furnished for the equipment.

Special Warranty Provisions

The standard warranty contained in S&C's standard conditions of sale, as set forth in Price Sheets 150 and 181, applies to the Wi-Fi/GPS Unit, except that the first paragraph of the said warranty is replaced by the following:

(1) General: The seller warrants to the immediate purchaser or end user for a period of 10 years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within 10 years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, and maintained in accordance with the recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at the seller's option) by shipment of necessary replacement parts. The seller's warranty does not apply to any equipment that has been disassembled, repaired, or altered by anyone other than the seller. This limited warranty is granted only to the immediate purchaser or, if the equipment is purchased by a third party for installation in third-party equipment, the end user of the equipment. The seller's duty to perform under any warranty may be delayed, at the seller's sole option, until the seller has been paid in full for all goods purchased by the immediate purchaser. No such delay shall extend the warranty period.

Replacement parts provided by the seller or repairs performed by the seller under the warranty for the original equipment will be covered by the above special warranty provision for its duration. Replacement parts purchased separately will be covered by the above special warranty provision.

For equipment/services packages, the seller warrants for a period of one year after commissioning that the IntelliRupter fault interrupter will provide automatic fault isolation and system reconfiguration per agreed-upon service levels. The remedy shall be additional system analysis and reconfiguration of the IntelliTeam® SG Automatic Restoration System until the desired result is achieved.

Warranty of the Wi-Fi/GPS Unit is contingent upon the installation, configuration, and use of the control or software in accordance with S&C's applicable instruction sheets.

This warranty does not apply to major components not manufactured by S&C, such as batteries and communication devices. However, S&C will assign to immediate purchaser or end user all manufacturer's warranties that apply to such major components.

Warranty of equipment/services packages is contingent upon receipt of adequate information on the user's distribution system, sufficiently detailed to prepare a technical analysis. The seller is not liable if an act of nature or parties beyond S&C's control negatively impact performance of equipment/services packages; for example, new construction that impedes radio communication, or changes to the distribution system that impact protection systems, available fault currents, or system-loading characteristics.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels attached to crate, packing, and equipment. Become familiar with these types of messages and the importance of these various signal words:

⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

"WARNING" identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

"NOTICE" identifies important procedures or requirements that can result in product or property damage if instructions are not followed.

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website **sandc.com**, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

NOTICE

Read this instruction sheet thoroughly and carefully before installing your IntelliRupter fault interrupter, 6800 Series Automatic Switch Control, and IntelliCap 2000 Automatic Capacitor Control.

Replacement Instructions and Labels

If additional copies of this instruction sheet are needed, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, or S&C Headquarters.

⚠ DANGER

IntelliRupter PulseCloser Fault Interrupters operate at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

The S&C 6800 Series Automatic Switch Control and IntelliCap 2000 Automatic Capacitor Control line voltage input range is 93 to 276 Vac. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to any of the aforementioned products must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules.
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.
4. **SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels.
5. **OPERATING MECHANISM AND BASE.** IntelliRupter fault interrupters contain fast-moving parts that can severely injure fingers. Do not remove or disassemble operating mechanisms or remove access panels on the IntelliRupter fault interrupter base unless directed by S&C Electric Company.
6. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded. The integrated power module (IPM) contains components that can retain a voltage charge for many days after the IntelliRupter fault interrupter has been de-energized and can derive a static charge when in close proximity to a high-voltage source. Voltage levels can be as high as the peak line-to-ground voltage last applied to the unit. Units energized or installed near energized lines should be considered live until tested and grounded.
7. **GROUNDING.** The IntelliRupter fault interrupter base must be connected to a suitable earth ground at the base of the utility pole, or to a suitable building ground for testing, before energizing an IntelliRupter fault interrupter, and at all times when energized.

   The ground wire(s) must be bonded to the system neutral, if present. If the system neutral is not present, proper precautions must be taken to ensure the local earth ground, or building ground, cannot be severed or removed.
8. **VACUUM INTERRUPTER POSITION.** Always confirm the **Open/Close** position of each interrupter by visually observing its indicator.

   Interrupters, terminal pads, and disconnect blades on disconnect style models may be energized with the interrupters in any position.

   Interrupters, terminal pads, and disconnect blades on disconnect style models may be energized from either side of the IntelliRupter fault interrupter.
9. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

Technical Specification

Table 1. Technical Specification

Wi-Fi	IEEE 802.11 b/g/n (2.4 GHz) WPA2-PSK Security
GPS	GPS/GNSS 1 PPS synchronized to UTC time
Time management	NTP IEEE 1588 PTP
Ethernet	Two 10/100 Base-T Ethernet ports with RJ45 connectors
USB	USB 2.0 interface with Type A connector
Serial	One RS-232 Serial Port using 9 pin D-Sub connectors acting as DTE One external connector for Wi-Fi signals One external connector for GPS NMEA signals One external connector for GPS PPS signal
Networking	Configurable network interfaces assigned to LAN or WAN Ethernet IEEE 802.3, 802.1Q/VLANs IP protocols TCP, UDP, ARP, DHCP client/server, ICMP
Routing and failover	IP pass-through; NAT, NAPT with IP port forwarding and Ethernet bridging
Industrial protocols	Modbus and DNP3
IoT protocols	MQTT, CoAP, HTTPS
Security	VPN: IPSec with, IKEv2, NAT Traversal; SSL/TLS; Open VPN, PPTP, L2TP Cryptography; SHA, RSA, ECC and AES Encryption: ECC and AES up to 256-bit
Wireless interface / connectors	Wi-Fi: RPSMA GPS: SMA
Device management	SNMP
Dimension	Deep × wide × high, in inches (mm): 1.0 (25.4) × 5.0 (127) × 3.0 (76.2)
Weight	0.5 pounds (0.23 kg)
Power	8 W Max. at 10 sec. interval with IPM
Environmental	Operating Temperature: -40°C to +50°C (-40°F to +122°F) IEC 60068-2
Product warranty	Standard S&C warranty applied

Antenna Specification

The Wi-Fi/GPS Unit is professionally installed equipment. The radio frequency (RF) output power does not exceed the maximum limit allowed in the country of operation.

⚠ CAUTION

Unauthorized antennae, modifications, or attachments may damage the device and potentially violate regulations.

Note: Use only the supplied or an equivalent replacement antenna.

Note: Modifications to the device or use of unauthorized antennae as not expressly approved by S&C Electric Company is the sole responsibility of the user, configurator, or operator who must reassess the equipment in accordance with all applicable international Safety, EMC, and RF standards.

The S&C-authorized antenna specifications are noted in Tables 2 and 3.

Table 2. Wi-Fi Antenna (N-female)

Frequency	Type Avg. Gain (dBi)
2.4 GHz	3.0

Table 3. GPS

Frequency	Type Avg. Gain (dBi)
1.5 GHz	3.0

Connecting to the IntelliRupter® Fault Interrupter 6800 Switch Control or IntelliCap 2000 Capacitor Control.

Follow these steps to open the *Wi-Fi Configuration* screens in the Wi-Fi/GPS Unit (model number 005-004701-01):

STEP 1. In the Windows® 10 **Start** menu select the **Start>Programs>S&C Electric>LinkStart>LinkStart V4** option. The *LinkStart Main* screen will open. See Figure 1.

Figure 1. The *LinkStart Main* screen.

STEP 2. Enter the serial number of the IntelliRupter fault interrupter and click on the **Connect** button. See Figure 1.

The **Connect** button changes to the **Cancel** button, and connection progress is shown on the connection status bar. See Figure 2.

Figure 2. The connection progress status bar.

When connection is established, the status bar indicates "Connection Successful" and displays a solid green bar. The vertical bar graph indicates signal strength of the Wi-Fi connection. See Figure 3.

Figure 3. Successful connection to the IntelliRupter fault interrupter.

STEP 3. Open the **Tools** menu and click on the **Wi-Fi Administration** option. See Figure 4.

Figure 4. The Wi-Fi Administration entry on the Tools menu.

Login

The *Login* screen opens with a username and password challenge. See Figure 5. These screens are displayed in the Internet browser on the computer. The supported browser versions include Google Chrome and Internet Explorer. The IP address is displayed at the top of the screen and is supplied by the Wi-Fi/GPS Unit.

STEP 4. Enter your username and password and click on the **Login** button. Authentication status is displayed.

The default username and password can be requested from S&C by calling the Global Support and Monitoring Center at 888-762-1100 or by contacting S&C through the S&C Customer Portal at **sandc.com/en/support/sc-customer-portal/**.

Figure 5. The *Login* screen.

When the default username and password are entered, the *Profile* screen opens and prompts assignment of a new password entry and confirmation. See Figure 6.

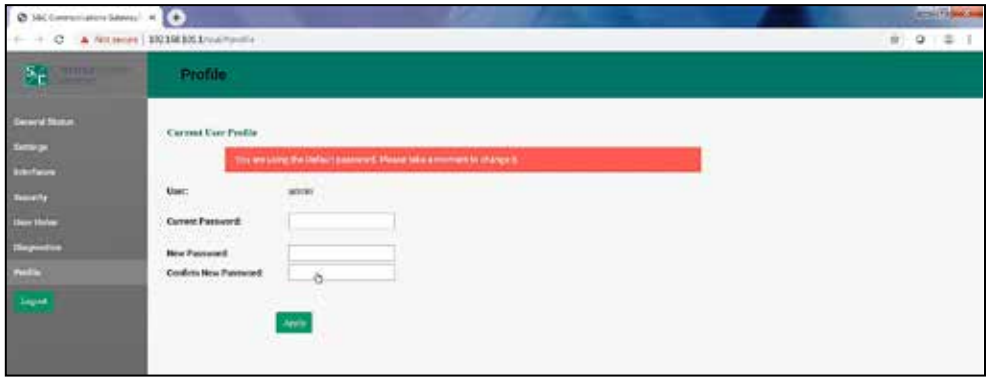


Figure 6. The *Change Password* screen.

General Status

STEP 5. To skip this screen and keep the default password setting, click on an entry in the left menu. Figures 7 and 8 on page 11 show the *General Status* screen.

The *General Status* screen is informational and only displays data; no edits are allowed. Field edits are permitted in the respective menu sections where each field is defined.

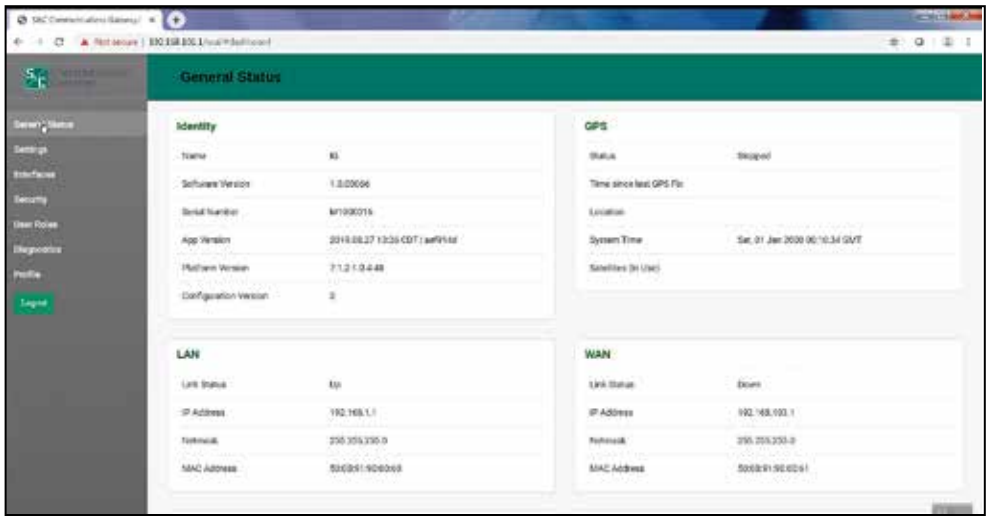


Figure 7. The top of the *General Status* screen.

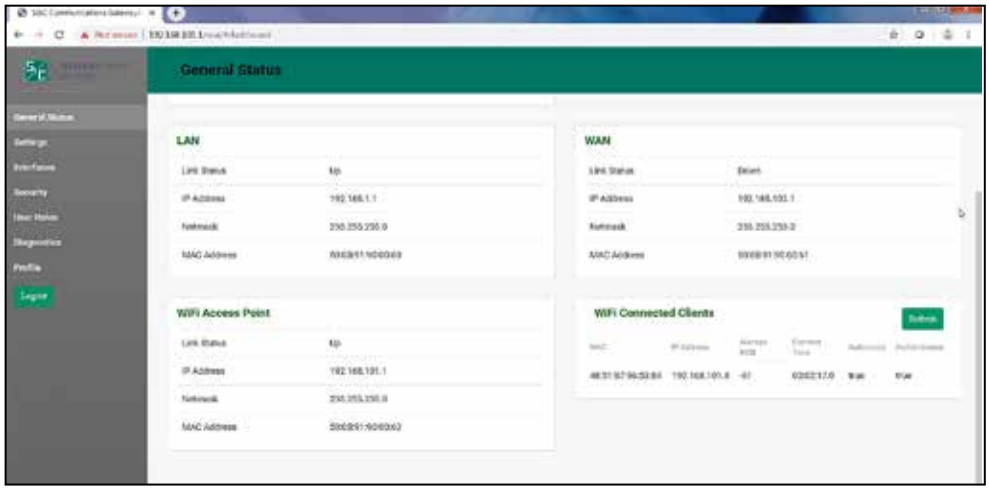


Figure 8. The bottom of the *General Status* screen.

The *General Status* screen is comprised of the Identity, GPS, LAN, WAN, Wi-Fi Access Point, and Wi-Fi Connected Clients panels. The Identity panel contains six fields: **Name**, **Software Version**, **Serial Number**, **App Version**, **Platform Version**, and **Configuration Version**. The GPS panel contains five fields: **Status**, **Time Since last GPS Fix**, **Location**, **System Time**, and **Satellites (In Use)**. The LAN and WAN panels contain four fields each: **Link Status**, **IP Address**, **Netmask**, and **MAC Address**. See Figure 7. The Wi-Fi Access Point panel contains four fields: **Link Status**, **IP Address**, **Netmask**, and **MAC Address**. The Wi-Fi Connected Clients panel contains six fields: **MAC Address**, **IP Address**, **Average RSSI**, **Connect Time**, **Authorized**, and **Authenticated**. See Figure 8.

Click on the **Refresh** button to update the information displayed on the *General Status* screens.

Settings

Click on the **Settings** entry in the left menu to open the *Settings* screen. See Figure 9.

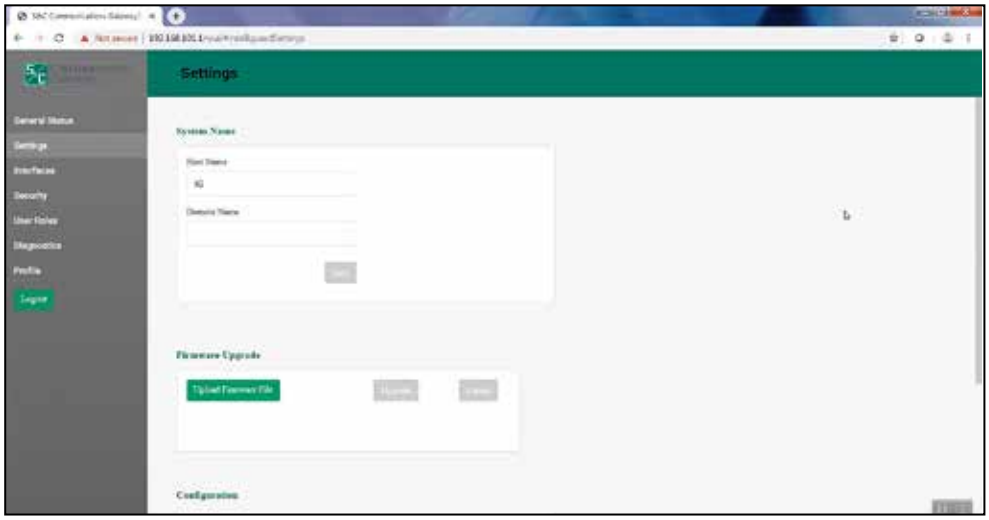


Figure 9. The System Name and Firmware Upgrade panels on the *Settings* screen.

The *Settings* screen contains the System Name, Firmware Upgrade, Configuration, and Reboot panels.

NOTICE

When a field edit is typed, the **Save** button becomes green and must be clicked for the new entry to be saved.

System Name

Enter a user-defined name for the **Host Name** setting and click on the **Save** button. The name entry is limited to 50 characters. The Host Name entry is displayed in the **Name** field on the *General Status* screen. The Domain Name entry is not used. See Figure 9.

Firmware Upgrade

This panel enables loading a firmware version onto the Wi-Fi/GPS Unit.

Follow these steps to perform a firmware upgrade:

STEP 1. Download the firmware file to the computer. The firmware files are located in the S&C Customer Portal at **sandc.com/en/support/sc-customer-portal/**.

STEP 2. Click on the **Upload Firmware File** button in the Firmware Upgrade panel.

STEP 3. A Windows dialogue box opens. Navigate to and select the required firmware file. The file will upload to the Wi-Fi/GPS Unit. When the upload has completed, the successful upload is confirmed. Then, the Wi-Fi/GPS Unit verifies the installer was securely digitally signed by S&C Electric Company.

STEP 4. After verification, a notification opens. Click on the **OK** button to dismiss the notification.

STEP 5. When the **Upgrade** button becomes active, click on it. This starts the upgrade process.

STEP 6. When the upgrade process completes, a notification opens. Click on the **OK** button. The Wi-Fi/GPS Unit will be unavailable while it reboots. The reboot takes approximately 5 minutes and the *Login* screen opens when the reboot is complete.

STEP 7. Log in and confirm the new firmware has been installed successfully by checking the *General Status* screen.

Configuration Files

The Wi-Fi/GPS Unit can perform bulk imports and exports of specific configuration data parameters. The same XML file format is used for both import and export functions. This allows a user to configure settings in one device, export those settings into an XML file (the extension is ".json"), and import the same settings into another unit. Clicking on the **Import Configuration** or **Export Configuration** button invokes a series of dialogue boxes allowing navigation on a PC to a configuration file for import or saving a file for export. See Figure 10.

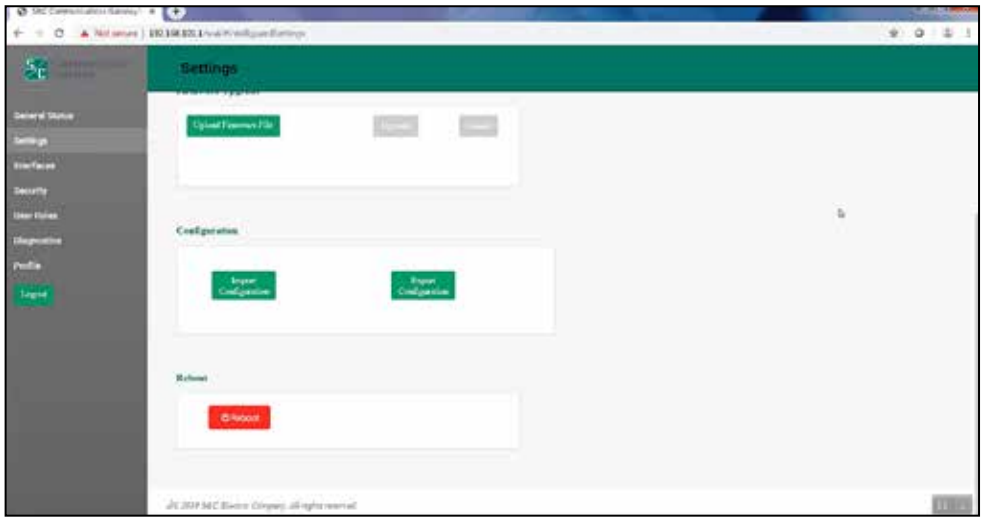


Figure 10. The Configuration and Reboot panels on the *Settings* screen.

Import Configuration

Follow these steps to complete the **Import Configuration** command:

STEP 1. In the Configuration panel, click on the **Import Configuration** button. A Web User Interface (WUI) dialogue box opens.

STEP 2. Click on the **Choose File** button, which invokes a Windows file navigation box.

STEP 3. Navigate to the file.

STEP 4. Highlight the file and click on the **Open** button. The highlighted file will be identified in the WUI dialogue box.

STEP 5. Click on the **Import** button.

STEP 6. Click on the **Save** button.

Export Configuration

Follow these steps to complete the **Export Configuration** command:

STEP 1. In the Configuration panel, click on the **Export Configuration** button. A WUI dialogue box opens with a suggested filename for the exported configuration. The default name is "textFile" but it can be changed.

STEP 2. Click on the **Export** button.

STEP 3. Wait a few seconds for the exported file to open in your browser. The file will be stored in the Downloads folder.

Reboot

The red colored **Reboot** button enables the user to restart the Wi-Fi/GPS Unit. When selected, a dialogue box appears for confirmation of the **Reboot** command. After the **OK** button is clicked, the user interface shows an Unavailable dialog box. The entire reboot process requires approximately 5 minutes before communication to the Wi-Fi/GPS Unit is re-established. When the reboot is complete, the user interface will automatically load the *Login* screen.

Interfaces

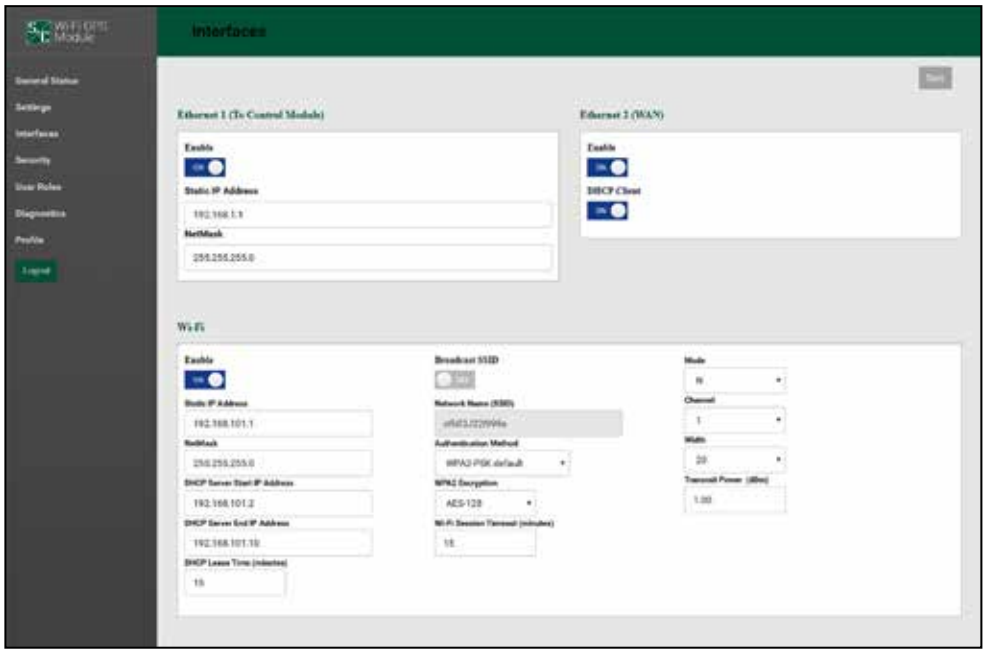


Figure 11. The default *Interfaces* screen.

Ethernet 1 (To Control Module)

In this panel, the network associated with the Wi-Fi/GPS Unit local area network (LAN) is defined for devices connecting to physical Ethernet Port 1. See Figure 11. The S&C Wi-Fi/GPS Unit ships with a default IP address of 192.168.1.1 and a Netmask equal to 255.255.255.0.

Ethernet 2 (WAN)

This panel defines the IP addressing for the Wi-Fi/GPS Unit's Ethernet Port 2 and subsequent network linkage and settings respective to the customer's legacy backhaul WAN network. The default setting is **DHCP Enabled**. See Figure 11.

Note: The use of these fields is for WANs that use Ethernet as a back-haul transport protocol. When serial back-haul networks are used or there is no WAN, this panel will not require entries.

DHCP Client State "On"

No fields require identification. A DHCP request will be initiated by the communication gateway to the WAN's DHCP server, which will assign an IP address for all data communication over the WAN.

DHCP Client State "Off"

Three fields require identification: **Static IP Address**, **Default Gateway IP Address**, and **Netmask**. The **Static IP Address** setpoint is the WAN IP address assigned to the Wi-Fi/GPS Unit. The **Default Gateway IP Address** setpoint is the address of the network device up-stream of the Wi-Fi/GPS Unit and determines the destination of DNP3 traffic sent to the SCADA master(s). See Figure 12 on page 15.

The address entries are automatically verified to be sure they function with the other values entered.

Figure 12. The *Interfaces* screen with the DHCP client disabled.

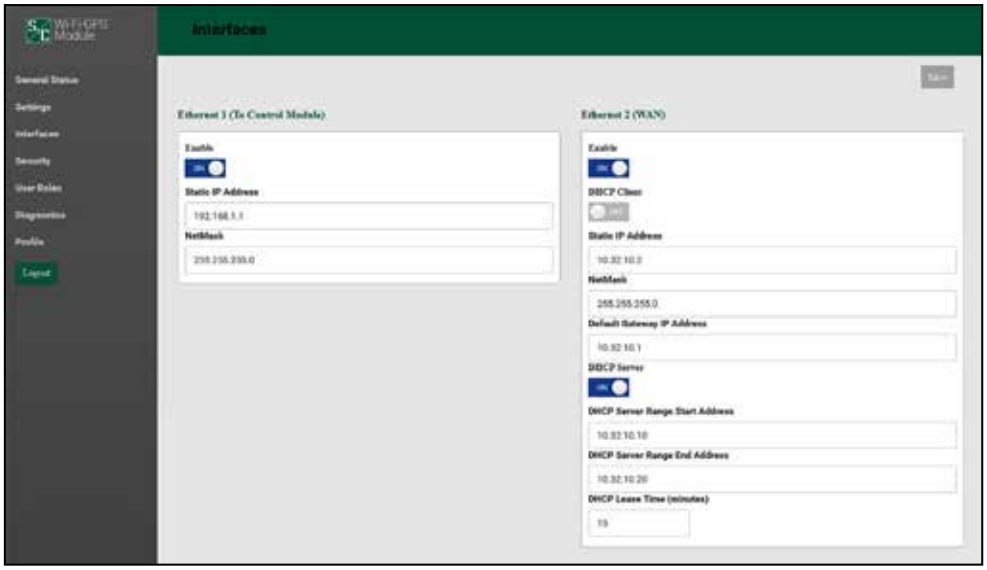


Figure 13. The Interfaces screen with the DHCP client disabled and the DHCP server enabled.

DHCP Server State "On"

When the DHCP client is disabled, the DHCP server can be enabled. This allows the Wi-Fi/GPS Unit to automatically provide an IP address to an attached device, such as a field area network radio. See Figure 13.

Wi-Fi

The Wi-Fi panel is comprised of fourteen elements: the **Enable** button, **Static IP Address**, **Netmask**, **DHCP Server Start IP Address**, **DHCP Server End IP Address**, **Broadcast SSID** button, **Network Name (SSID)**, **Authentication Method**, **WPA2 Encryption**, **WPA2 Passphrase**, **Mode**, **Channel**, **Width**, and **Transmit Power (dBm)**. See Figure 11 on page 14.

The Wi-Fi/GPS Unit ships with a default Static IP address of 192.168.101.1, a Netmask equal to 255.255.255.0, a DHCP server Start IP address of 192.168.101.2, a DHCP Server End IP address of 192.168.101.10. The Broadcast SSID is in the **Off** position. The **Network Name (SSID)** setting is factory configured with the IntelliRupter fault interrupter serial number or a number in the format of xx-xxxxxxx for 6800 Series Controls and IntelliCap 2000 Capacitor Controls. The default **Authentication Method** setpoint is WPA2-PSK default. When the **Authentication Method** setpoint is set to WPA2-PSK, an additional **WPA2 Passphrase** field displays. Enter the passphrase required to open a Wi-Fi connection with this IntelliRupter fault interrupter serial number.

The **Wi-Fi Session Timeout** field determines the time after which the session will automatically terminate activity through the connections. The **Mode** setting selects the preferred Wi-Fi transmission standard (Default: N). The **Channel** setpoint can be set to a channel with less traffic. The **Width** setpoint is the channel bandwidth in MHz. This setting is only relevant when 802.11n is chosen for the **Mode** setting. If 802.11b or 802.11g is elected it will be ignored.

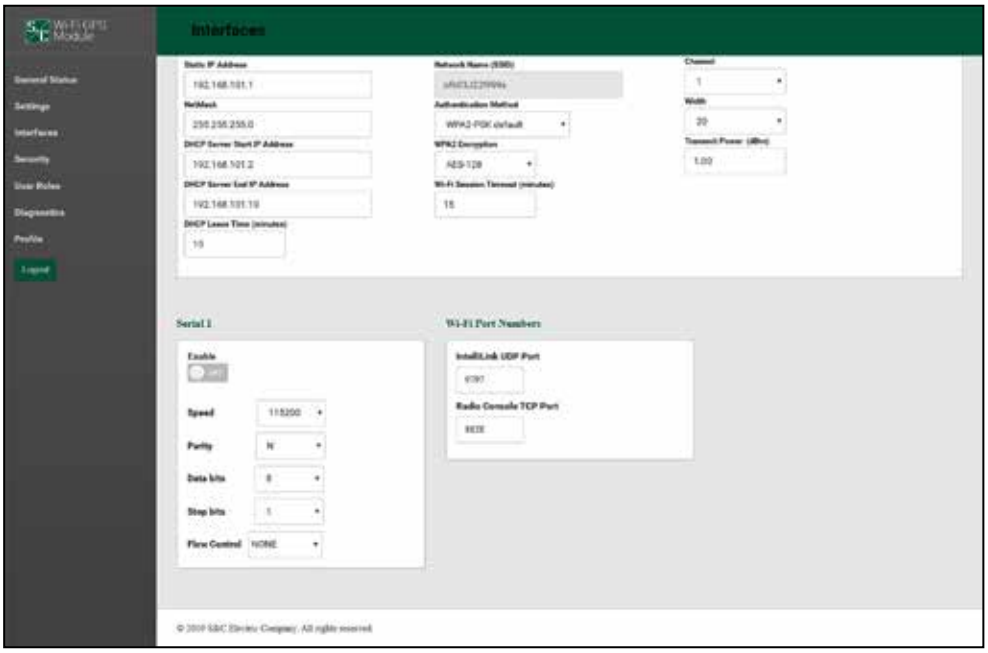


Figure 14. The default *Interfaces* screen Serial and Wi-Fi ports.

Serial 1 (DB9 Port)

This is the RS-232/DB9 port for connection to the radio's serial console port. If use of RTS/CTS is required, set the **Flow Control** setpoint to "NONE." See Figure 14.

Wi-Fi Port Numbers

Enter the IntelliLink UDP Port number and the Radio Console TCP Port number.

Security

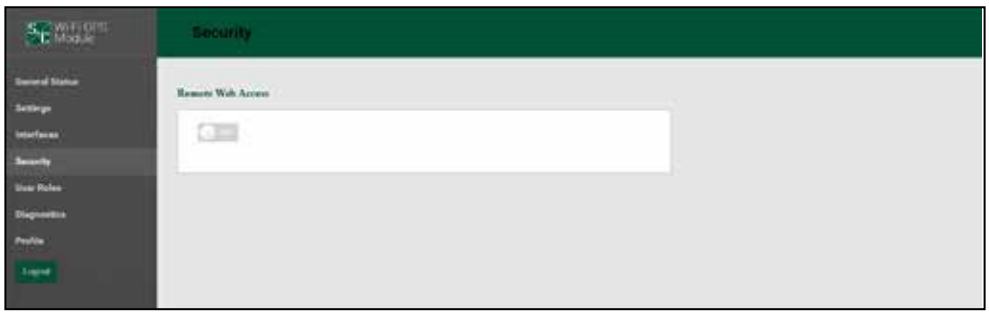


Figure 15. The *Security* screen.

Remote Web Access

To access the user interface for Wi-Fi Administration through the field area network, set the **Remote Web Access** setpoint to "on."

Note: The **Remote Web Access** setpoint is not available until the default admin password is changed and remote access requires the field area network to be routed through the Wi-Fi/GPS Unit. Refer to the "Configuration" section on page 21 for more details.

The **Remote Web Access** toggle button enables Web-user interface access via Ethernet Port 2. This configuration setting can only be updated by the admin user, and only after the admin user has changed the default password. Web access via Ethernet Port 2 is also controlled by a DNP3 binary output setpoint, which must also be enabled to allow this traffic. See Figure 15.

NOTICE

When a SpeedNet™ Radio is used for the field area network radio, the remote Web user's computer will require an additional setting to be updated to enable Web access. The user must reduce the MTU (maximum transmission unit) size to a value of 500 or lower. S&C recommends using an MTU size of 500 for optimal performance. To change the MTU size, the following command can be used on a Windows 10 machine: **netsh interface ipv4 set subinterface "Local Area Connection" mtu=500 store=persistent**.

User Roles

The *User Roles* screen permits adding and editing users and their access privileges. The types of user roles include Admin, Engineer 1, Technician 1, and Viewer. The addition of a user is initiated by clicking on the **Add User** button. A dialogue box opens with the required **User**, **Password**, and **Confirm Password** fields, and a drop-down box to select the user **Role** setpoint. Clicking on a user entry in the list opens the dialog box to edit information for that user. See Figure 16. Table 4 displays user privileges.

The Admin Role column is assigned to the system administrator, who is not included in this list, and therefore cannot be removed. The **User Roles** entry in the left menu is only available for use by the system administrator (Admin Role) and Additional Admin Role users.

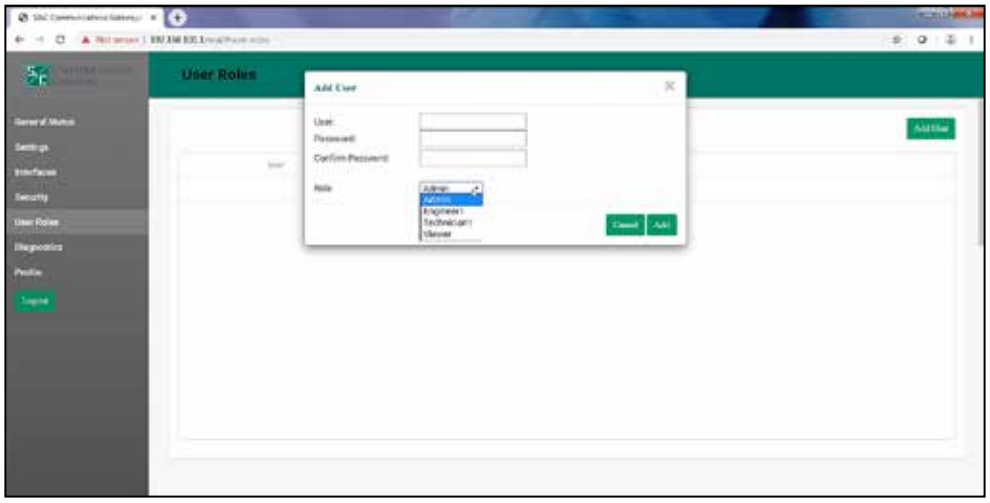


Figure 16. The *User Roles* screen.

The permissions provided to each of the user roles is summarized in Table 4.

Table 4. User Role Permissions

Screen	Element Within Page	Admin Role	Additional Admin Role	Engineer 1 Role	Technician 1 Role	Viewer Role
General Status	All	Allowed	Allowed	Allowed	Allowed	Allowed
Settings	Update Gateway Names, Import/ Export Configurations	Allowed	Allowed	Allowed	Allowed	Blocked
	Install Firmware	Allowed	Allowed	Allowed	Allowed	Blocked
Interfaces	All	Allowed	Allowed	Allowed	Blocked	Blocked
Security	Install Web Server Certificate	Allowed	Allowed	Blocked	Blocked	Blocked
	Enable Remote Web Access	Allowed	Blocked	Blocked	Blocked	Blocked
User Roles	All	Allowed	Allowed	Blocked	Blocked	Blocked
Diagnostics	All	Allowed	Allowed	Allowed	Allowed	Allowed
Profile	All	Allowed	Allowed	Allowed	Allowed	Allowed

Diagnostics

The *Diagnostics* screen initiates the retrieval of the Diagnostic and Event Log files. See Figures 17 and 18.

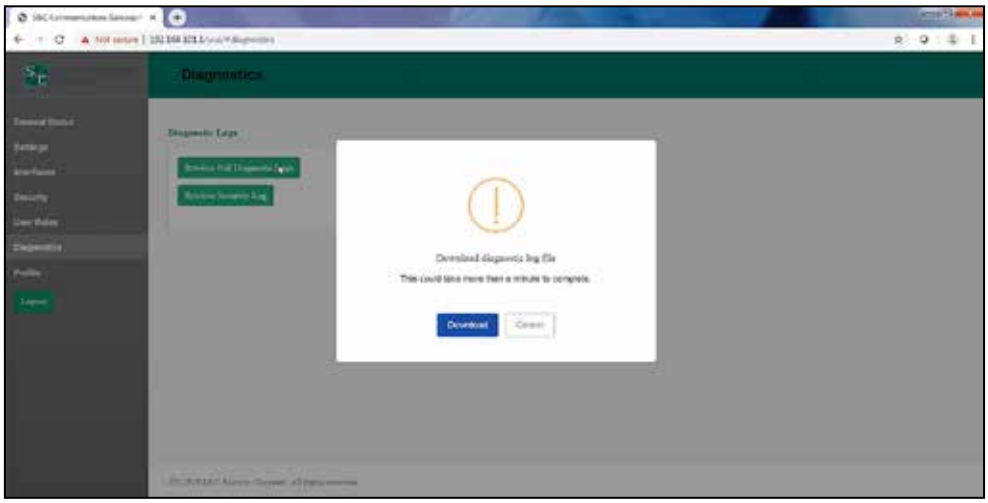


Figure 17. The Retrieve Full Diagnostics Logs button on the *Diagnostics* screen.

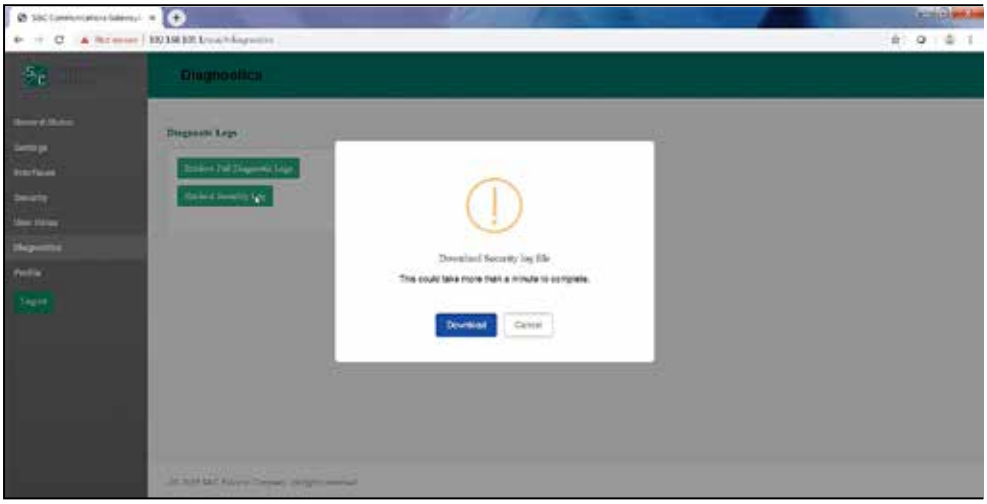


Figure 18. The Retrieve Security Log button on the *Diagnostics* screen.

Profile

The *Profile* screen enables the present user logged in to the Wi-Fi/GPS Unit to change password credentials. See Figure 19.

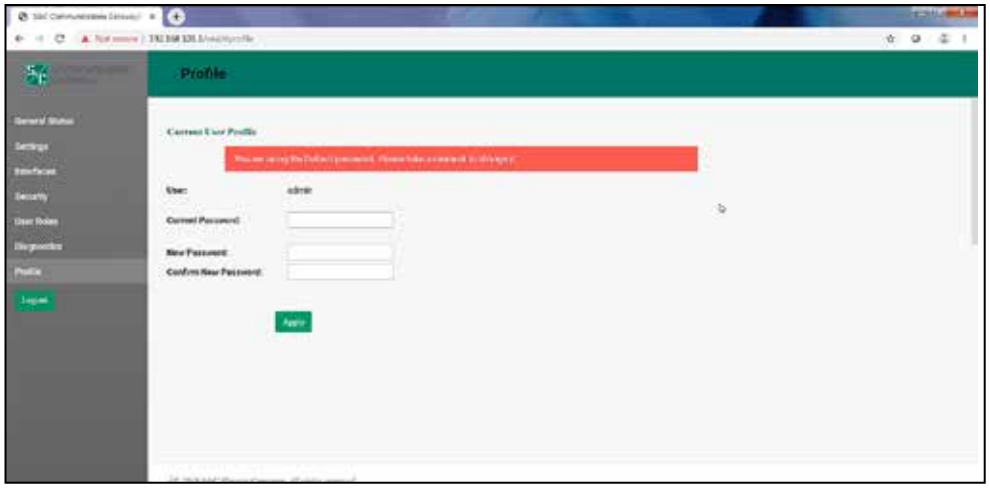


Figure 19. The *Profile* screen.

A password entry requires at least one lowercase and one uppercase character. When entries are complete, click on the **Apply** button to save the new password.

Logout Button

Clicking on the **Logout** button in the left menu closes the Wi-Fi Administration program and returns to the *LinkStart Main* screen. See Figure 1 on page 8.

Configuration

NOTICE

Proper grounding with a wrist strap connected to ground is required when touching any components within the communication module or contacts on the R3 Communication Module connector.

For the IntelliRupter fault interrupter R3 communication module, with the Wi-Fi/GPS Unit comes configured to be a direct replacement for the Wi-Fi/GPS Unit in the R0 communication module. This is the default wiring for the R3 Communication Module.

To obtain remote access to the Wi-Fi/GPS User Interface the WAN must be routed through the Wi-Fi/GPS Unit. Doing so will enable remote firmware updates and will be required for some cybersecurity features provided in future releases of the Wi-Fi/GPS firmware.

To configure the R3 Communication Module with the alternate wiring needed to route WAN traffic through the Wi-Fi/GPS, follow these steps to convert the R3 Communication Module from the default R0 Communication Module wiring to the alternate R3 Communication Module wiring:

STEP 1. Open the R3 Communication Module by unscrewing the thumb screw for the battery access panel and removing the five ⅜-inch hex bolts retaining the communication device carriage.

STEP 2. Pull the communication device carriage out from the outer shell.

STEP 3. At the communication device, unplug the RJ45 cable that runs between the communication device and the control module.

STEP 4. At the Wi-Fi/GPS Unit, plug the RJ45 cable from the control into Ethernet 1 on the Wi-Fi/GPS Unit. See Figure 20 on page 22.

STEP 5. Locate the Ethernet patch cord provided with the R3 Communication Module and plug one end into Ethernet 2 on the Wi-Fi/GPS Unit and the other into the Ethernet port on the communication device.

STEP 6. Reassemble the communication module by inserting the communication device carriage into the outer shell.

STEP 7. Insert and tighten the five ⅜-inch hex bolts retaining the communication device carriage. Then, close the R3 Communication Module by screwing in the thumb screw for the battery access panel.

STEP 8. Use the R3 Communication Module Web user interface to reassign the existing IntelliRupter Control Module **IP address** setpoint to the R3 communication module Ethernet 2 interface **Static IP address** setting. See Figure 11 on page 14.

STEP 9. Use IntelliLink Setup Software to change the IntelliRupter Control Module **IP address** setpoint to 192.168.1.2. See S&C Instruction Sheet 766-530 for information about setting the IntelliRupter fault interrupter IP address. This will be a private IP address. The R3 Communication Module performs network-address translation to hide this private address.

This allows remote access to the Wi-Fi/GPS Unit user interface and will be required for some cybersecurity features provided in future releases of the Wi-Fi/GPS firmware.

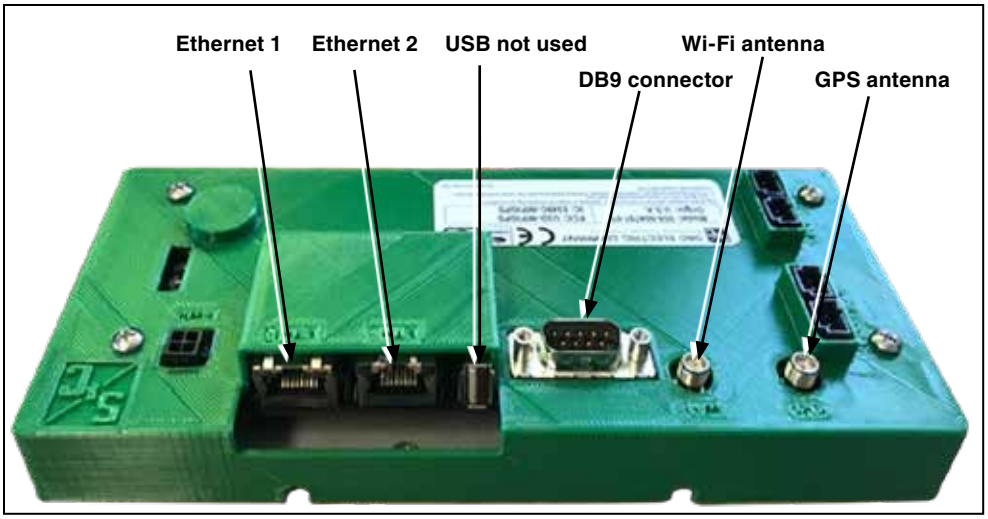
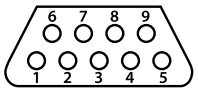


Figure 20. The Wi-Fi/GPS Unit connectors.

Interface Pinouts

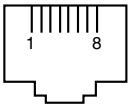
The RS-232 Radio Maintenance Port of the Wi-Fi/GPS Unit is configured as data-terminal equipment. See Figure 21.



Pin	Function	Description
1	NC	No Connection
2	RX from Radio	RS-232 Receive
3	TX to Radio	RS-232 Transmit
4	NC	No Connection
5	TX to Radio GND	Signal Ground
6	NC	No Connection
7	RTS to Radio	Request to Send
8	CTS to Radio	Clear to Send
9	NC	No Connection

Figure 21. The Wi-Fi/GPS Unit RS-232 interface pinout.

The Wi-Fi/GPS Unit Ethernet ports use RJ-45 connectors with the pinout shown in Figure 22. They are auto-sensing for assignment of transmit and receive lines (no cross-over cables required) and auto-negotiate for 10-Mbps or 100-Mbps data rates, as required by the connected device.



Pin	Function	Description
1	TXD+	Transmit
2	TXD-	Transmit
3	RXD+	Receive
4	NC	No Connection
5	NC	No Connection
6	RXD-	Receive
7	NC	No Connection
8	NC	No Connection

Figure 22. The Wi-Fi/GPS Unit RJ-45 interface pinout.

Regulatory Notices

FCC Statement

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and it also complies with Part 15 of the FCC RF Rules. This equipment must be installed and operated in accordance with provided instructions and the antennae used for this transmitter must be installed to provide a separation distance of at least 7.87 inches (20 cm) from all people and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and consider removing the no-collocation statement.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Industry Canada Statement

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 7.87 inches (20 cm) between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur.

Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

Industry Canada Radiation Exposure Statement

This radio transmitter with model: S&C Wi-Fi/GPS has been approved by Industry Canada to operate with the antenna types listed in Table 5 with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio with model: S&C Wi-Fi/GPS a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Table 5. Industry Canada-Approved Antenna Type

No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Larid	Phantom TRA24003	Omnidirectional	N-type Female	3 dB

Australia/New Zealand (ACMA)

The above-mentioned product complies with the requirements of the relevant ACMA Standards made under the Radiocommunications Act 1992 and the Telecommunications Act 1997. These Standards are referenced in notices made under section 182 of the Radiocommunications Act and 407 of the Telecommunications Act.

Contacting S&C Electric Company

For Technical Assistance, please contact S&C's Global Support and Monitoring Center (GSMC) at 1-888-762-1100 or send an email to gsmc@sandc.com.