

Pairing Guide

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Introduction

Qualified Persons

WARNING

Only qualified persons knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone 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, insulated 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 and all materials included in the product's instruction handbook, including S&C Instruction Sheet 461-504 and S&C Instruction Sheet 461-509, before pairing a TripSaver II Cutout-Mounted Recloser and TripSaver® II Communications Gateway. Become familiar with the Safety Information on pages 3 through 4 and Safety Precautions on page 5. The latest version of this publication is available online in PDF format at sandc.com/en/contact-us/product-literature/.

Retain this Instruction Sheet

This instruction sheet is a permanent part of the TripSaver II Communications Gateway. Designate a location where users can easily retrieve and refer to this publication.

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. Ratings for the TripSaver II Cutout-Mounted Recloser are listed in the ratings table in Specification Bulletin 461-33. The ratings are also laser etched on the product.)

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the product. Become familiar with these types of messages and the importance of these 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 any portion of this instruction sheet is unclear and assistance is needed, contact the 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 pairing the TripSaver II Cutout-Mounted Recloser with the TripSaver II Communications Gateway.

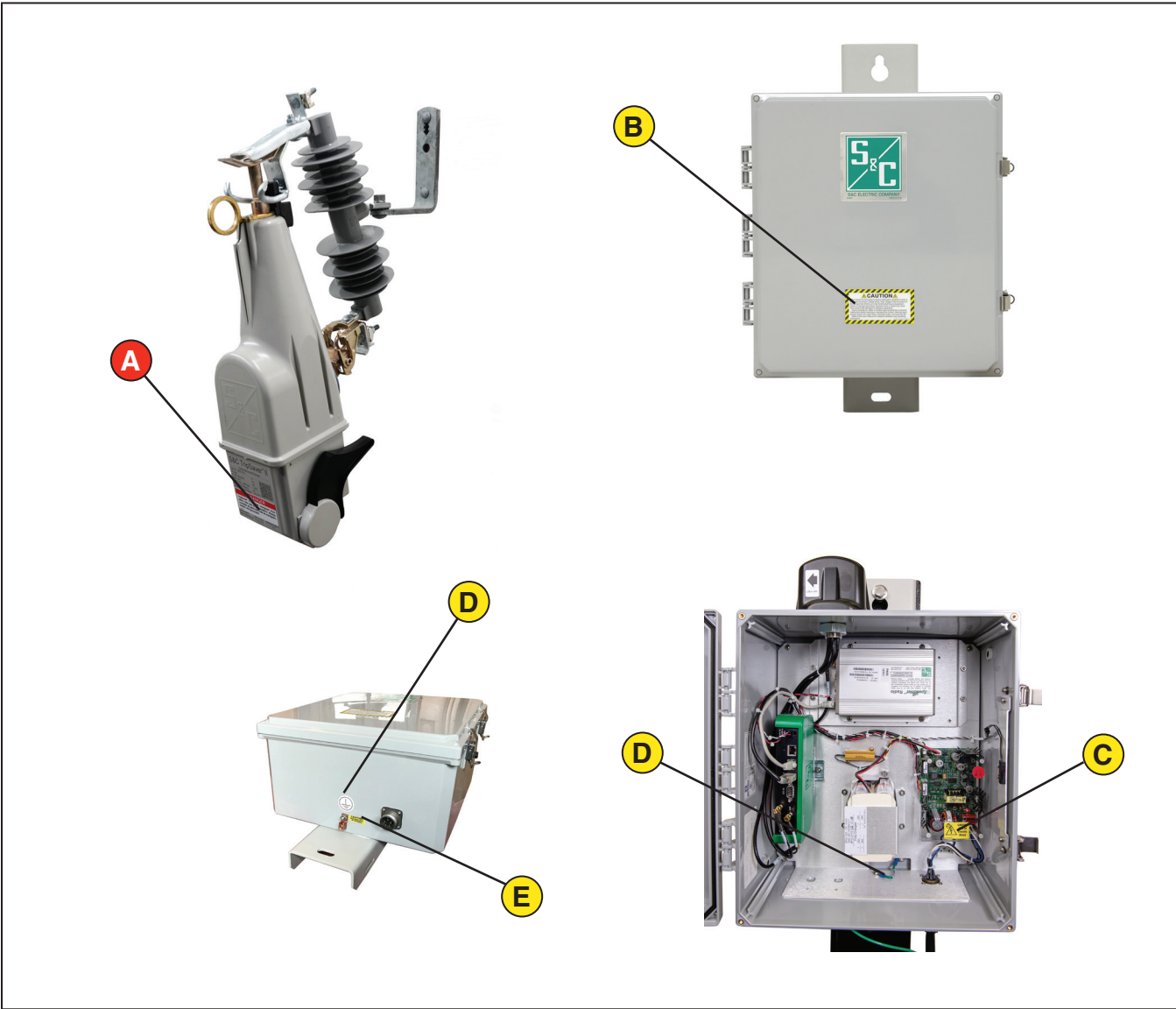


Replacement Instructions and Labels






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

Location of Safety Labels



Reorder Information for Safety Labels

| Location | Safety Alert Message | Description | Part Number |
|----------|--|--|------------------------|
| A |  DANGER | TripSaver® II may be energized from either side and in any position... | G-9473-E |
| B |  CAUTION | This control is connected to electrical distribution equipment... | 180-000070-00 Rev A |
| C |  CAUTION | Risk of electric shock . . | 180-002533-01 |
| D |  CAUTION | Earth Ground | 180-002577-01 |
| E |  CAUTION | Enclosure must be grounded.... | 180-000710-01 |

⚠ DANGER



The TripSaver II Cutout-Mounted Recloser operates at high voltage. 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 TripSaver II Cutout-Mounted Reclosers 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. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded.
6. **OPERATING TOOLS.** To close a TripSaver II Cutout-Mounted Recloser, use a conventional insulated hotstick or S&C Universal Pole and Pole Extension fitted with an S&C Talon™ Handling Tool or distribution prong. An extendo stick also can be used after proper training and practice. The TripSaver II Cutout-Mounted Recloser can be opened using Loadbuster®—The S&C Loadbreak Tool attached to a conventional insulated hotstick or S&C Universal Pole.
7. **MAINTAINING PROPER CLEARANCE.** Always maintain the proper clearance from energized components.

⚠ WARNING

DO NOT disassemble a TripSaver II recloser. The control module inside the TripSaver II recloser housing is only intended for use inside the TripSaver II recloser and has not been approved for any other use. There are no customer-serviceable parts inside the recloser, and disassembling the recloser voids the warranty. If you do disassemble a TripSaver II recloser, NEVER power it with the power module included with the Service Center Configuration Kit when the inside of the recloser is exposed. **Unsafe high voltage can be present on the connectors on the outside of the internal control box assembly, resulting in serious injury or death.**

⚠ WARNING

The TripSaver II Cutout-Mounted Recloser **MUST** be de-energized and removed from the utility pole before attaching the "corded" power module (power module with ac adapter and extension cord) to the base of the TripSaver II recloser. The corded power module is **ONLY** intended to be used for set-up and data collection when the TripSaver II recloser is de-energized and removed from the utility pole. (To provide power to a TripSaver II recloser while it is mounted to the pole, use the cordless power module, S&C catalog number 5954.) **Failure to remove the TripSaver II recloser from the utility pole before connecting the corded power module may cause arcing, burns, electric shock, and death.**

Overview

The TripSaver II Cutout-Mounted Recloser provides superior protection for overhead lateral circuit protection. Pairing a TripSaver II recloser with the TripSaver® II Communications Gateway allows remote access to that recloser via DNP3 protocol or IEC 60870-5-104 protocol messaging delivered by the customer's communications network. The data provided by the communications gateway enables faster and more efficient responses to power system outages and can help optimize maintenance scheduling and momentary outage and permanent outage management.

One communications gateway can be paired with up to four TripSaver II reclosers using encrypted IEEE 802.15.4 wireless communications. The communications gateway should be mounted ideally no more than 30 feet (9.1 m) below the TripSaver II reclosers to which it will be paired. There should be an unobstructed line of sight between the gateway antenna and the LCD screen of each TripSaver II recloser. S&C recommends mounting the communications gateway directly beneath and on the same side of the pole as the reclosers to which it will be paired. Do not mount the gateway perpendicular to the TripSaver II reclosers or on the opposite side of the pole. The reclosers must also be furnished with the **Extended Open Interval** option, which allows up to a 30-second open interval between **Reclose** operations and have **Gateway** mode enabled using the service center configuration software.

To perform the procedures detailed in this instruction sheet, you will need:

- A TripSaver II Cutout-Mounted Recloser with the Extended Open Interval (“-O”) option
- A TripSaver II Communications Gateway with battery backup
- The TripSaver II Service Center Configuration Software installed on a PC
- The TripSaver II Service Center Configuration Kit including the power module, ac cord, and USB transceiver
- The S&C Magnet Tool (or equivalent strong magnet)
- An Ethernet cable

Placing a TripSaver II Recloser in Gateway Mode

Before pairing a TripSaver II Cutout-Mounted Recloser with a TripSaver II Communications Gateway, it must be placed in **Gateway** mode at the service center. To enable **Gateway** mode:

STEP 1. Connect to the TripSaver II recloser using the service center configuration software and the service center configuration kit. (USB transceiver, corded power module, and ac adapter.) Detailed instructions for connecting a TripSaver II recloser using the service center configuration software can be found in S&C Instruction Sheet 461-504.

STEP 2. Navigate to the **Communication Settings** menu and click on the Communication Mode dropdown box. Change the **Communication** mode to “Gateway Mode.”

STEP 3. Click on the **Apply Communication Mode** button.

Note: The **Apply Communication Mode** button will not apply any changes made on any other menu screens. If changes have been made to another menu screen, such as the *TCC Curve Settings* screen, click on the **Apply** button, see Figure 1 on page 7.

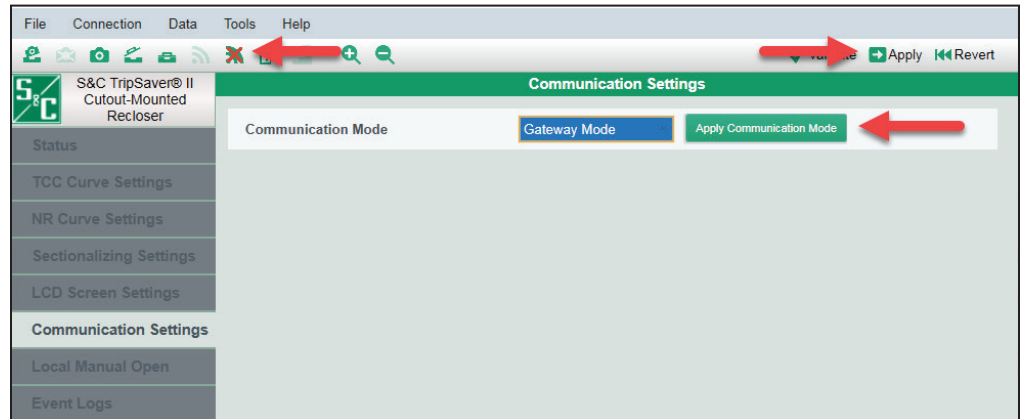


Figure 1. Enabling Gateway Mode in the TripSaver II recloser.

STEP 4. The TripSaver II recloser is now in **Gateway** mode and can be paired with a TripSaver II Communications Gateway. Disconnect the TripSaver II recloser from the TripSaver II Service Center Configuration Software by clicking on the **Disconnect** button and then unplugging the power module and USB transceiver.

Connecting to a TripSaver II Communications Gateway with a PC

After a communications gateway is powered, either on the utility pole or in the service center, it can be connected to and programmed using a PC. To connect to the communications gateway with a PC:

STEP 1. Connect a CAT5 Ethernet cable to the Ethernet port on the PC. Connect the other end of the Ethernet cable to Ethernet Port 1 on the green gateway controller module inside the communications gateway cabinet, see Figure 2.

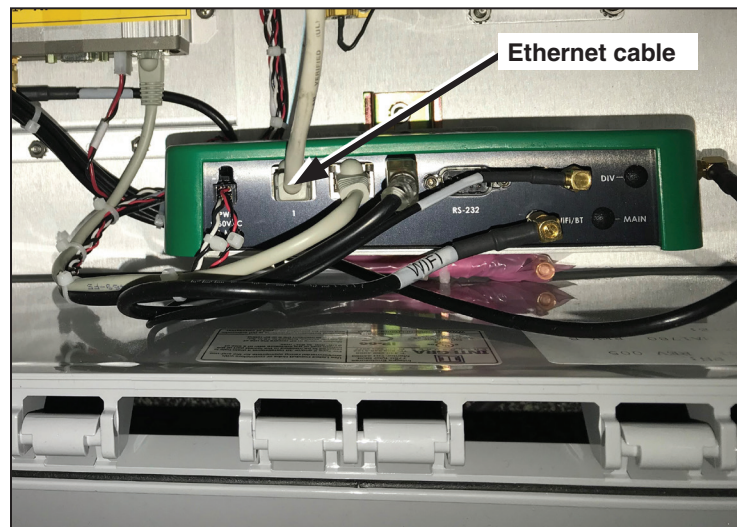


Figure 2. Connect an Ethernet cable to the gateway controller module.

STEP 2. The communications gateway is accessed using a web browser interface. The default configuration of the communications gateway's IP gateway is 192.168.1.1 with DHCP set to **On**. To join the communications gateway network, set the PC's network address to "Obtain an IP Address Automatically" and "Obtain DNS Server Address Automatically" under the PC's LAN address settings to enable a network connection to the communications gateway. Alternately, a static IP address within the 192.168.1.x network may be used. See Figure 3.

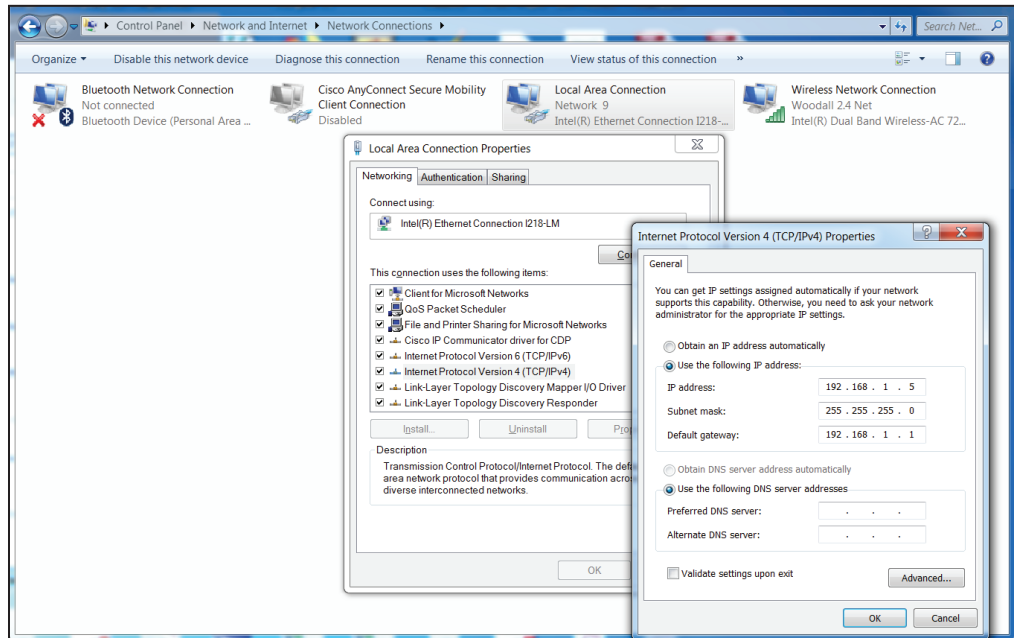


Figure 3. Setting a static IP address on a PC to connect to the communications gateway.

STEP 3. After allowing approximately 3 minutes for the communications gateway to boot, a confirmation the PC has successfully joined the communications gateway network may be observed by launching an MSDOS command window and running 'ipconfig /all' at the command prompt. An output showing all the IP interfaces for the host system will be displayed. Identify the Ethernet interface that has the cabled connection to communications gateway Ethernet Port 1 and examine the output for that interface. Screen information for the interface supporting a successful connection when using DHCP will resemble Figure 4 on page 9.

Note: If the interface indicates "media disconnected," this is an indication the Ethernet connection between the host PC and the communications gateway is not functional, and it should be investigated.

NOTICE

Because the end user can change the IP address range, or even disable DHCP completely and change the communications gateway to a static IP, it is important to make a note of any IP settings changes. When relocating or setting up a communications gateway that has had its IP settings changed, look for the IP setting configured by your service or IT department when running ipconfig/all from the MSDOS command line.


```
Command Prompt
DNS Servers . . . . . : 10.20.17.232
                        10.20.16.232
NetBIOS over Tcpi. . . . . : Enabled

Ethernet adapter Ethernet 3:

    Connection-specific DNS Suffix  . : 
    Description . . . . . : Realtek USB GbE Family Controller #2
    Physical Address. . . . . : 54-BF-64-1A-D1-E2
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    IPv4 Address. . . . . : 192.168.1.20(Preferred)
    Subnet Mask . . . . . : 255.255.255.0
    Lease Obtained. . . . . : Thursday, March 12, 2020 9:04:25 AM
    Lease Expires . . . . . : Thursday, March 12, 2020 11:34:24 AM
    Default Gateway . . . . . : 192.168.1.1
    DHCP Server . . . . . : 192.168.1.1
    DNS Servers . . . . . : 192.168.1.1
    NetBIOS over Tcpi. . . . . : Enabled

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
```

Figure 4. A successful ipconfig/all reply from the command prompt.

STEP 4. With the CAT5 cable attached to communications gateway Ethernet Port 1, launch a Web browser on the PC. Within the URL address line, type in the communications gateway default IP address of 192.168.1.1 and press the <Return> key. (Browser versions supported include Google Chrome and Microsoft Edge.) The *Login* screen will open with a username and password challenge. See Figure 5. When logging in for the first time, users will be sent to the *Profile* screen and be prompted to change the default password.

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

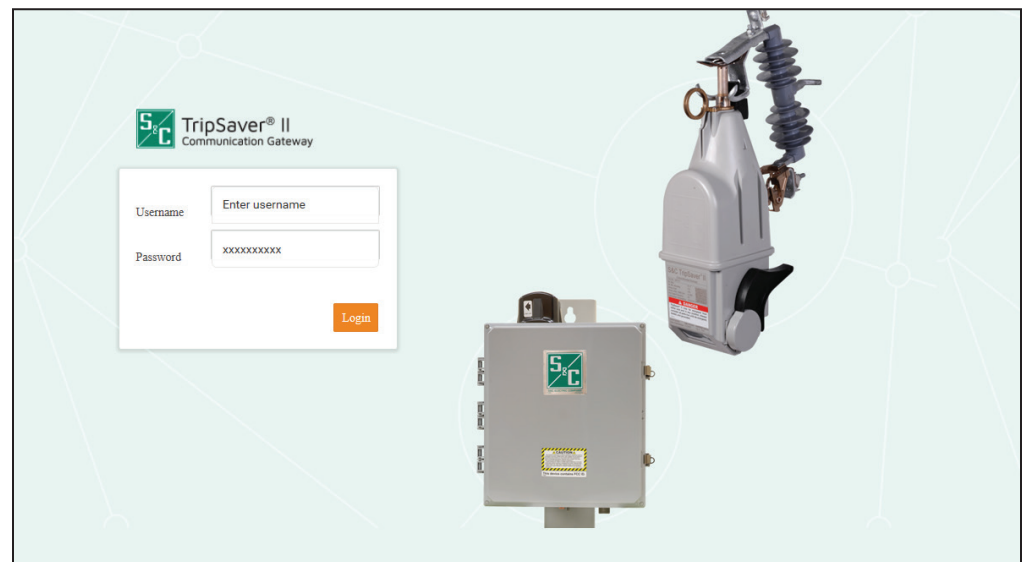
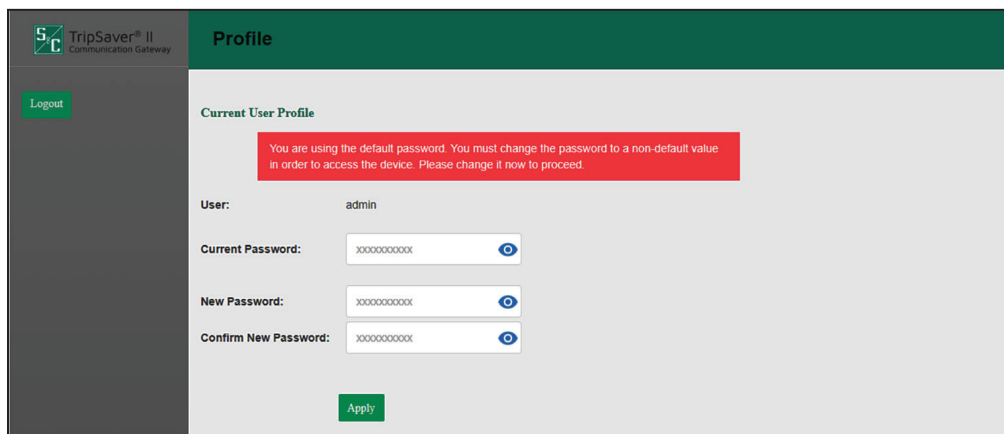


Figure 5. The Communications Gateway *Login* screen.

NOTICE

With communications gateway firmware version 3.1 and later, the default password for the Admin user must be changed before proceeding. See Figure 6. The new non-default password must be at least 8 characters with at least one uppercase and one lowercase character. Numbers and special characters are also allowed but not required. <Space>, <Tab>, <&> characters are not allowed.



The screenshot shows the 'Profile' screen of the TripSaver II Communication Gateway. On the left is a dark sidebar with a 'Logout' button. The main area has a green header with the 'Profile' title. Below the header, the 'Current User Profile' section shows the user 'admin'. A red warning box states: 'You are using the default password. You must change the password to a non-default value in order to access the device. Please change it now to proceed.' Below this, there are three password input fields: 'Current Password', 'New Password', and 'Confirm New Password'. Each field has a toggle icon to the right. At the bottom of the form is a green 'Apply' button.

Figure 6. The Profile screen for changing the password.

- STEP 5.** After a successful login, the browser will open to the communications gateway *General Status* screen with an application navigation menu on the left side of the screen. The navigation menu will remain visible for all subordinate menu interface screens.

Pairing a TripSaver II Recloser with a Communications Gateway

There are two methods for pairing a TripSaver II recloser to work with a communications gateway that depend on the firmware version of the TripSaver II recloser. The first is service center programming at the customer's facility before taking the TripSaver II reclosers to the installation site. The second is on-site programming, accomplished after the TripSaver II reclosers and communications gateway have been installed in the field.

In both cases, S&C recommends pairing TripSaver II reclosers one at a time. This will ensure each device is fully and securely connected before pairing the next device. When paired, the TripSaver II recloser will only communicate with its paired communications gateway using a secure, encrypted protocol. The security keys used to encrypt the communications are unique to the pair and cannot be transferred between TripSaver II reclosers or communications gateways.

Field Pairing a Communications Gateway with a TripSaver II Recloser Loaded with Firmware Version 1.6, 1.7 or later Installed on the Utility Pole and Powered by Line Current

For TripSaver II reclosers furnished with firmware version 1.6 or 1.7, pairing can only be performed with the TripSaver II recloser powered by line current or an external power source not supplied by S&C. For details on the specifications for an external power source, contact your local S&C Sales Office. Use this procedure for pairing a TripSaver II recloser installed on a utility pole and powered by line current:

- STEP 1.** Place the TripSaver II recloser in **Gateway** mode, as described in "Placing a TripSaver II Recloser in Gateway Mode" on page 6. Install the TripSaver II recloser on the utility pole, as described in S&C Instruction Sheet 461-502, and power the TripSaver II recloser with line current. Power the communications gateway by connecting it to ac power. Make sure any nearby USB transceiver is unplugged.
- STEP 2.** With the communications gateway installed no more than 100 feet (30.5 meters) from the TripSaver II recloser to be paired, connect to the communications gateway with a PC, as described in "Connecting to a TripSaver II Communications Gateway with a PC" on page 7. (A 25 to 30 foot (7.6 to 9 meter) distance is more common depending on pole height and local construction practices.)
- STEP 3.** Navigate to the *Device Management* screen. See Figure 7.

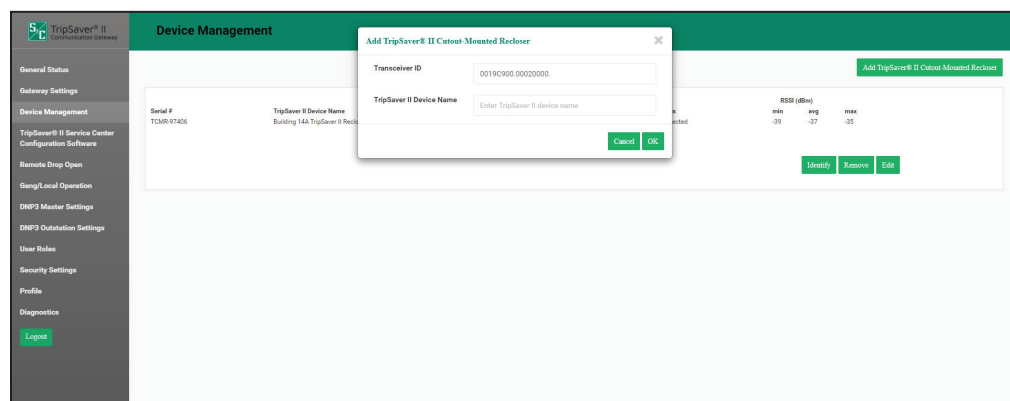


Figure 7. The *Device Management* screen.

- STEP 4.
- Click on the **Add TripSaver II Cutout-Mounted Recloser** button. A pop-up menu will open.
- STEP 5.
- Enter the TripSaver II recloser’s transceiver ID and device name.
Note: The device name can be anything but is usually a description of where the TripSaver II recloser is installed.
- STEP 6.
- Click on the **OK** button. The communications gateway will connect to the TripSaver II recloser and it will display as “Connected” in the *Device Management* screen. See Figure 8.

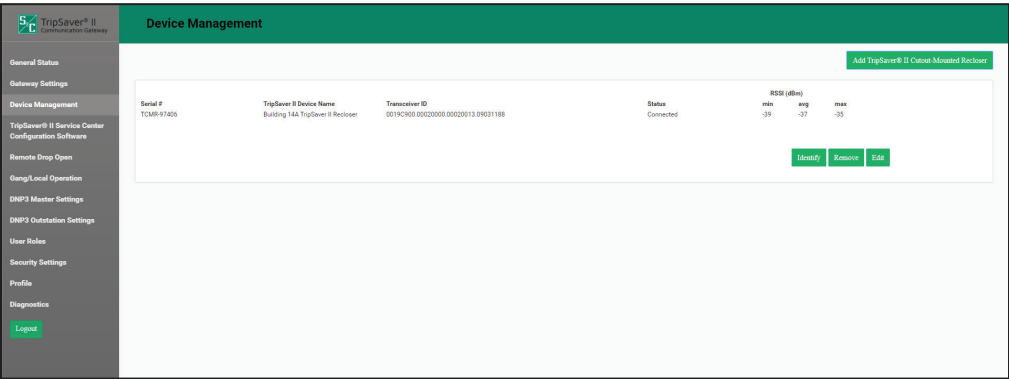


Figure 8. The *Device Management* screen after pairing a TripSaver II recloser.

Note: The pairing process should take approximately 5 minutes. It could take up to 15 minutes. Refresh the browser after 5 minutes to make the paired TripSaver II recloser in the *Device Management* screen show its “Connected” status. If the TripSaver II recloser does not show “Connected” after waiting 15 minutes, follow the “Pairing Process Takes Longer Than Expected” instructions on page 16.

Service Center Pairing a Communications Gateway with the TripSaver II Recloser Furnished with Firmware Version 1.8 or Later

With the introduction of TripSaver II recloser firmware version 1.8, the recloser and communications gateway can now be easily paired in the service center without the requirement of line current or an external power source using the corded power module and ac adapter from the service center configuration kit.

Note: This method can also be used at the installation site on TripSaver II reclosers furnished with firmware version 1.8 or later, installed on the utility pole and NOT powered by line current by using the cordless power module to supply power to the recloser and then applying the magnet tool. In no case should the corded power module be used at the installation site with the TripSaver II recloser installed on the utility pole.

- STEP 1.** Place the TripSaver II recloser in **Gateway** mode, as described on page 6. Power the communications gateway by connecting it to an ac power source. Connect to the communications gateway with a PC, as described on page 7. Make sure any nearby USB transceiver is unplugged.
- STEP 2.** Power the TripSaver II recloser to be paired with the corded power module. Instructions for using the power module can be found in S&C Instruction Sheet 461-504.
- STEP 3.** Attach the S&C Magnet Tool (or other strong magnet) to the side of the TripSaver II recloser with the green S&C logo. See Figure 9. This will turn on communications inside the TripSaver II recloser allowing it to be paired with the communications gateway.



Figure 9. Attach the magnet tool to the green logo.

- STEP 4.** Navigate to the *Device Management* screen. See Figure 10.
- STEP 5.** Click on the **Add TripSaver II Cutout-Mounted Recloser** button. A pop-up menu will open.

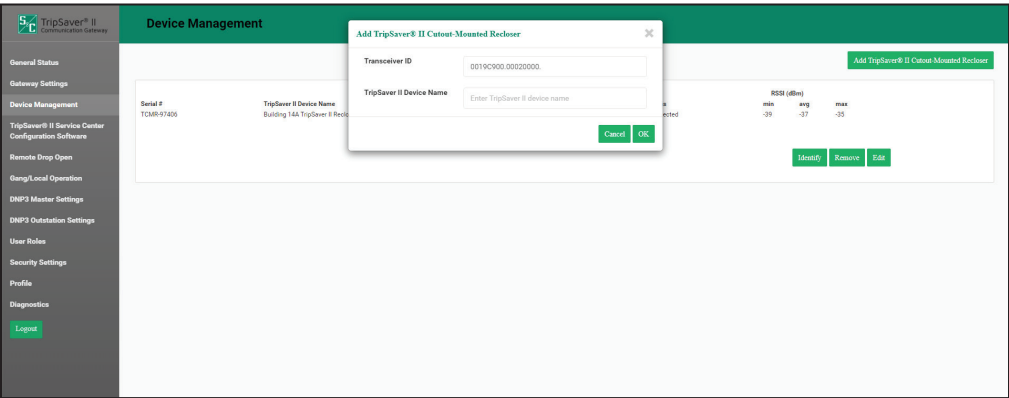


Figure 10. The *Device Management* screen.

- STEP 6.** Enter the TripSaver II recloser’s transceiver ID and device name.
Note: The device name can be anything but is usually a description of where the TripSaver II recloser is installed.
- STEP 7.** Click on the **OK** button. It will take between one and 5 minutes for the communications gateway to connect to the TripSaver II recloser. The recloser will appear on the *Device Management* screen after the screen is refreshed using the browser’s **Refresh** button. See Figure 11.

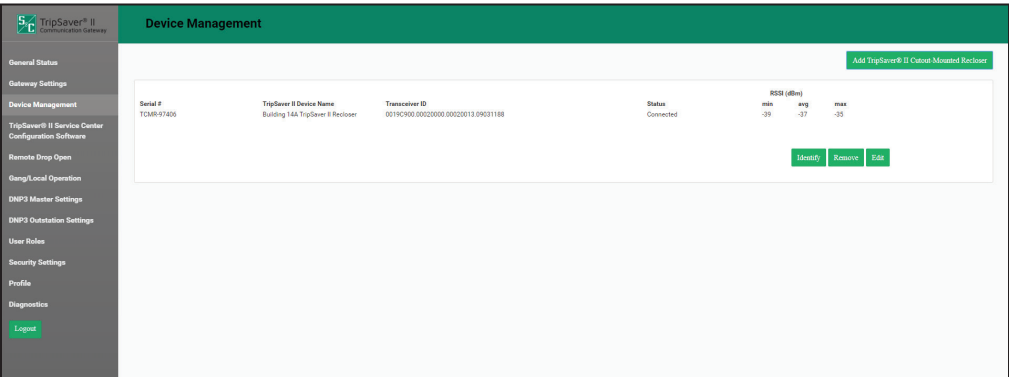


Figure 11. The *Device Management* screen after pairing a TripSaver II recloser.

Note: The pairing process should take approximately 5 minutes. It could take up to 15 minutes. Refresh the browser after 5 minutes to make the paired TripSaver II recloser on the *Device Management* screen show its “**Connected**” status. If the TripSaver II recloser does not show “Connected” after waiting 15 minutes, follow the “Pairing Process Takes Longer Than Expected” instructions in the Troubleshooting section on page 16.

Signal Interference

Difficulties in pairing a TripSaver II recloser with a communications gateway are usually caused by signal interference. Remember, the communications gateway should be no more than 100 feet (30.5 m) away from the TripSaver II recloser and should have an unobstructed view of the recloser. The communications gateway antenna is directional, and the TripSaver II reclosers must be installed above the communications gateway, ideally on the same pole. Also, the heavy use of Bluetooth devices, cellular devices, or Wi-Fi can cause radio interference.

If radio traffic is heavy, S&C recommends moving the recloser and communications gateway closer to each other.

For optimal performance, install the TripSaver II recloser no more than 30 feet (9.1 m) away from the communications gateway and in direct line of sight on the same side of the pole. Do not mount the gateway perpendicular to the TripSaver II reclosers or on the opposite side of the pole.

Pairing a Previously Paired TripSaver II Recloser with a New Communications Gateway

Pairing a TripSaver II recloser creates a link between both the communications gateway, and the recloser. Before pairing a TripSaver II recloser with a new (different) communications gateway, the recloser should have **Gateway** mode disabled, and then re-enabled.

To pair a recloser with a new communications gateway:

- STEP 1.** Connect to the communications gateway as described in “Connecting to a TripSaver II Communications Gateway with a PC” on page 7. Delete the TripSaver II recloser’s entry on the *Device Management* screen.
- STEP 2.** With the recloser removed from the utility pole, connect to the TripSaver II recloser using the service center configuration software and the service center configuration kit (USB transceiver, corded power module, and ac adapter). Detailed instructions for connecting a TripSaver II recloser using the service center configuration software can be found in S&C Instruction Sheet 461-504.
- STEP 3.** Navigate to the **Communication Settings** menu and click on the Communication Mode dropdown box. Change the **Communication** mode to “Non-Gateway Mode.”
- STEP 4.** Click on the **Apply Communication Mode** button.
Note: The **Apply Communication Mode** button will not apply any changes that have been made on any other menu screens. If changes have been made to another menu screen, such as the TCC Curve Settings screen, click on the **Apply** button. See Figure 1 on page 7.
- STEP 5.** The TripSaver II recloser is now in **Non-Gateway** mode. Then, while still connected to the recloser, set it to **Gateway** mode. Click on the **Apply Communication Mode** button. Disconnect the TripSaver II recloser from the service center configuration software by clicking on the **Disconnect** button.
- STEP 6.** Pair the TripSaver II recloser with the new communications gateway using the instructions in “Pairing a TripSaver II Recloser with a Communications Gateway” on page 11.

Pairing Process Takes Longer Than Expected

Pairing a TripSaver II recloser should take approximately 5 minutes. In some cases, it may take up to 15 minutes. If after waiting for 15 minutes the gateway (after refreshing the browser) does not register as paired, complete the following procedure:

- STEP 1.** Mitigate any signal interference using the techniques in “Signal Interference” on page 15.
- STEP 2.** Connect to the communications gateway as described in “Connecting to a TripSaver II Communications Gateway with a PC” on page 7. Delete the TripSaver II recloser’s entry on the *Device Management* screen.
- STEP 3.** With the recloser removed from the utility pole, connect to the TripSaver II recloser using the service center configuration software and the service center configuration kit (USB transceiver, corded power module, and ac adapter). Detailed instructions for connecting to a TripSaver II recloser using the service center configuration software can be found in S&C Instruction Sheet 461-504.
- STEP 4.** Navigate to the **Communication Settings** menu and click on the Communication Mode dropdown box. Change the **Communication** mode to “Non-Gateway Mode.”
- STEP 5.** Click on the **Apply Communication Mode** button.
Note: the **Apply Communication Mode** button will not apply any changes made on any other menu screens. If changes have been made to another menu screen, such as the *TCC Curve Settings* screen, click on the **Apply** button.
- STEP 6.** The TripSaver II recloser is now in **Non-Gateway** mode. Select **Gateway** mode from the dropdown menu. Click on the **Apply Communication Mode** button to place the recloser back in **Gateway** mode. Disconnect the TripSaver II recloser from the service center configuration software by clicking on the **Disconnect** button.
- STEP 7.** Pair the TripSaver II recloser with the new communications gateway using the instructions in “Pairing a TripSaver II Recloser with a Communications Gateway” on page 11.