

Actuator Inspection

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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 before inspecting the TripSaver II Cutout-Mounted Recloser. Become familiar with the Safety Information on page 3 and Safety Precautions on page 4. 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 Cutout-Mounted Recloser. 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 on the nameplate affixed to the product.

Warranty

The warranty and/or obligations described in S&C's Price Sheet 150, "Standard Conditions of Sale—Immediate Purchasers in the United States," (or Price Sheet 153, "Standard Conditions of Sale—Immediate Purchasers Outside the United States"), plus any special warranty provisions, as set forth in the applicable product-line specification bulletin, are exclusive. The remedies provided in the former for breach of these warranties shall constitute the immediate purchaser's or end user's exclusive remedy and a fulfillment of the seller's entire liability. In no event shall the seller's liability to the immediate purchaser or end user exceed the price of the specific product that gives rise to the immediate purchaser's or end user's claim. All other warranties, whether express or implied or arising by operation of law, course of dealing, usage of trade or otherwise, are excluded. The only warranties are those stated in Price Sheet 150 (or Price Sheet 153), and THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY EXPRESS WARRANTY OR OTHER OBLIGATION PROVIDED IN PRICE SHEET 150 (OR PRICE SHEET 153) IS GRANTED ONLY TO THE IMMEDIATE PURCHASER AND END USER, AS DEFINED THEREIN. OTHER THAN AN END USER, NO REMOTE PURCHASER MAY RELY ON ANY AFFIRMATION OF FACT OR PROMISE THAT RELATES TO THE GOODS DESCRIBED HEREIN, ANY DESCRIPTION THAT RELATES TO THE GOODS, OR ANY REMEDIAL PROMISE INCLUDED IN PRICE SHEET 150 (OR PRICE SHEET 153).

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 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 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 installing the TripSaver II Cutout-Mounted Recloser.	

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.

Safety Precautions

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 AND TAGS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels and tags. Remove tags ONLY if instructed to do so.
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 a 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 (part number 5950R2) 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.

Though S&C does not require testing of the TripSaver II Cutout-Mounted Recloser's actuator, this document provides instructions on how to test the actuator when necessary. Become familiar with the parts of the TripSaver II Cutout-Mounted Recloser before starting and read and understand S&C Instruction Sheet 461-502 and S&C Instruction Sheet 461-504. See Figure 1.

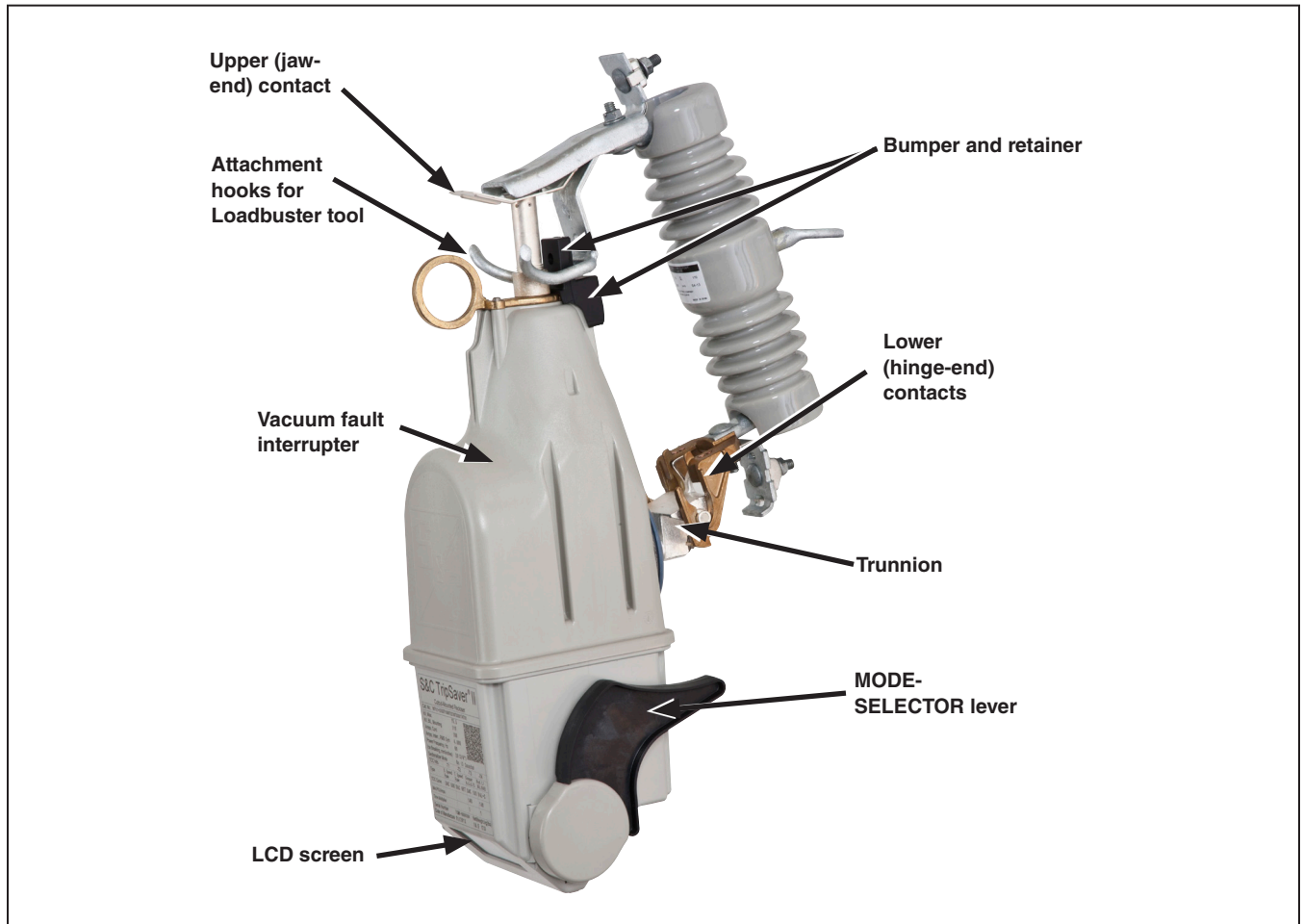


Figure 1. The TripSaver II Cutout-Mounted Recloser.

Service Center Inspection

Equipment Required:

- A power module with an ac adapter (part number TA-3280) found in the configuration kit (part number 5950R2)
- A PC laptop with the latest version of the TripSaver® II Service Center Configuration Software
- A USB transceiver (part number FDA-1868R2, found in the configuration kit, part number 5950R2)

To test the actuator, complete the following steps:

- STEP 1.** With the TripSaver II recloser positioned as shown in Figure 2, connect the power module to the base of the TripSaver II recloser as described in the “Assembling the Power Supply and Powering the TripSaver II Recloser” section in S&C Instruction Sheet 461-504. Plug the power module into 120-Vac power.
- STEP 2.** Plug a USB transceiver loaded with firmware version 2.0 into a USB A port on the personal computer. See Figure 3. Then, click on the **SCC** icon on the desktop or in the **Start** menu to launch the TripSaver II Service Center Configuration Software. Read and agree to the Warning message. For more information on launching the TripSaver II Service Center Configuration Software, refer to S&C Instruction Sheet 461-504.



Figure 2. The power module connected to the base of the TripSaver II recloser.



Figure 3. Proper placement of the TripSaver II recloser and USB transceiver for connection.

STEP 3. In the service center configuration software, select “Connection>Connect to Device” from the **Main** menu or click on the **Connect to Device** icon in the quick access toolbar. See Figure 4.

A Transceiver ID Request dialog box will open. Enter the Transceiver ID of the TripSaver II recloser to be connected and click on the **OK** button to connect. For information on obtaining the transceiver ID number, see the “Obtaining the Transceiver ID” section of S&C Instruction Sheet 461-504.

The **Auto Detect** button can be used to auto-detect the Transceiver ID. The transceiver ID is unique to each TripSaver II recloser, and it consists of a 32-digit character string in the format of “0019C900.00020000. _____ . _____.” The first 16 digits of the ID are pre-typed. Only the last 16 digits must be entered. Up to 16 previously typed valid IDs are saved under the drop-down menu. When the drop-down menu is full, the oldest ID will be replaced by a new ID.

During the connection process, a progress bar is displayed. Wait about 10 seconds for the connection process to finish.

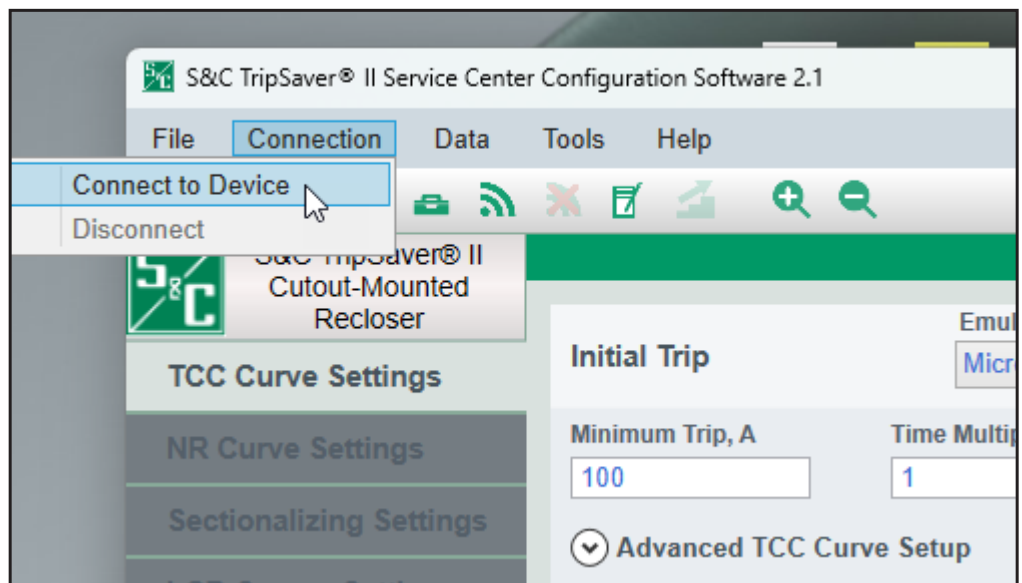


Figure 4. The Connect to Device menu item.

STEP 4. Confirm the TripSaver II recloser is connected by clicking on the **Status** menu item. The *Status* screen will populate with data from the connected recloser. When in **Connected** mode, the service center software will display a **Signal Strength** icon at the bottom left of the screen. The signal strength will also be displayed numerically. See Figure 5.

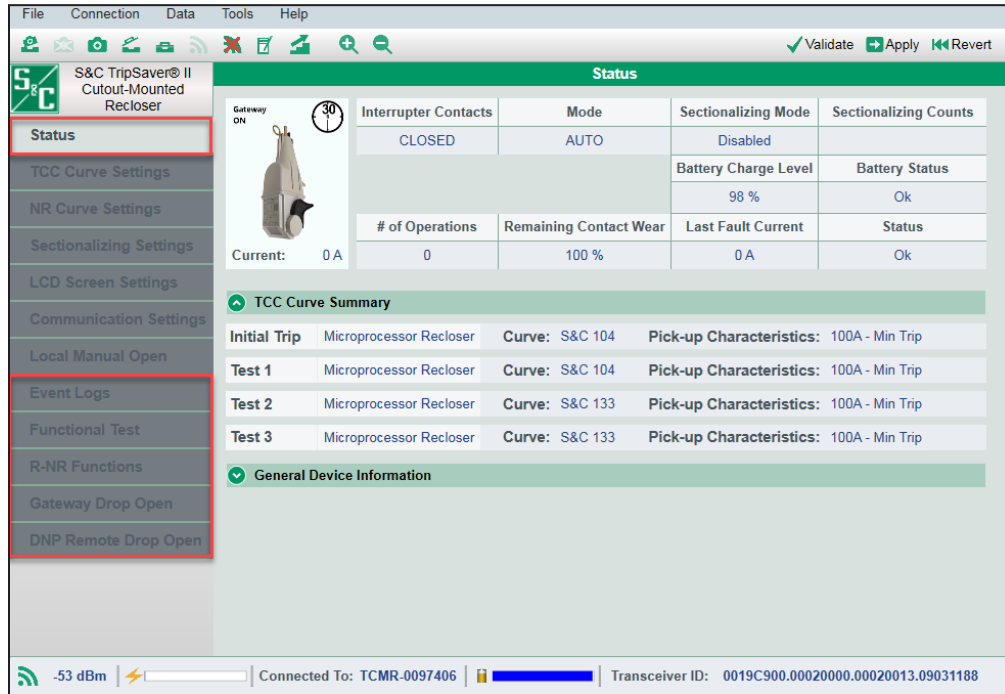


Figure 5. The Status screen in Connected mode.

STEP 5. Navigate to the *TCC Curve Settings* screen and check the **Open Interval** setting. See Figure 6.

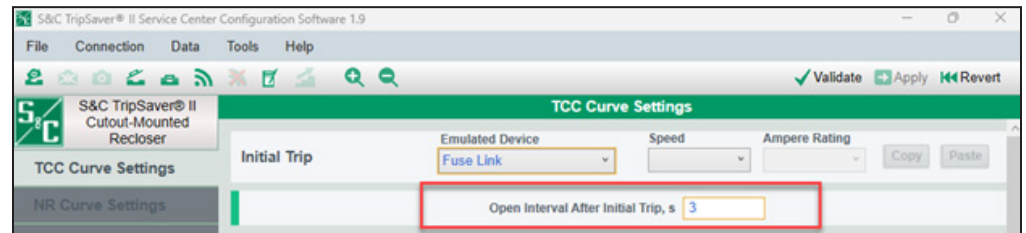


Figure 6. *TCC curve* screen showing **Open Interval** setting.

If the recloser has an Open Interval setting of 3s or less: The vacuum interrupter inside the recloser will change state faster than can be shown on screen. Navigate to the *Functional Test* screen and click on the **Simulate Permanent Fault** button. See Figure 7 on page 10. The recloser will go through its programmed reclose sequence and “drop open.” When not mounted in a cutout mounting for testing, the trunnion will become loosely movable after dropping open. Reset the recloser manually by either pulling up on the trunnion or by installing the TripSaver II recloser into a cutout mounting. The drop-open mechanism is fully reset when the trunnion is no longer loosely movable.

Note: If the recloser’s vacuum interrupter cannot open, damage to the actuator has occurred. The recloser will not drop open and will go into **Service Now** mode after five consecutive attempts at opening the vacuum interrupter. Contact the local S&C Sales Office for more information.

If the recloser has an Open Interval setting greater than 3s: Navigate to the *Functional Test* screen and click on the **Simulate Temporary Fault** button. See Figure 7 on page 10. The TripSaver II recloser’s vacuum interrupter will open with an audible click sound followed by changes in the device “Status” and “Simulation Status” entries on the software screen, as shown in Figure 8 on page 10.

Note: If the recloser’s vacuum interrupter does not open, damage to the actuator has occurred. Contact the local S&C Sales Office for more information.

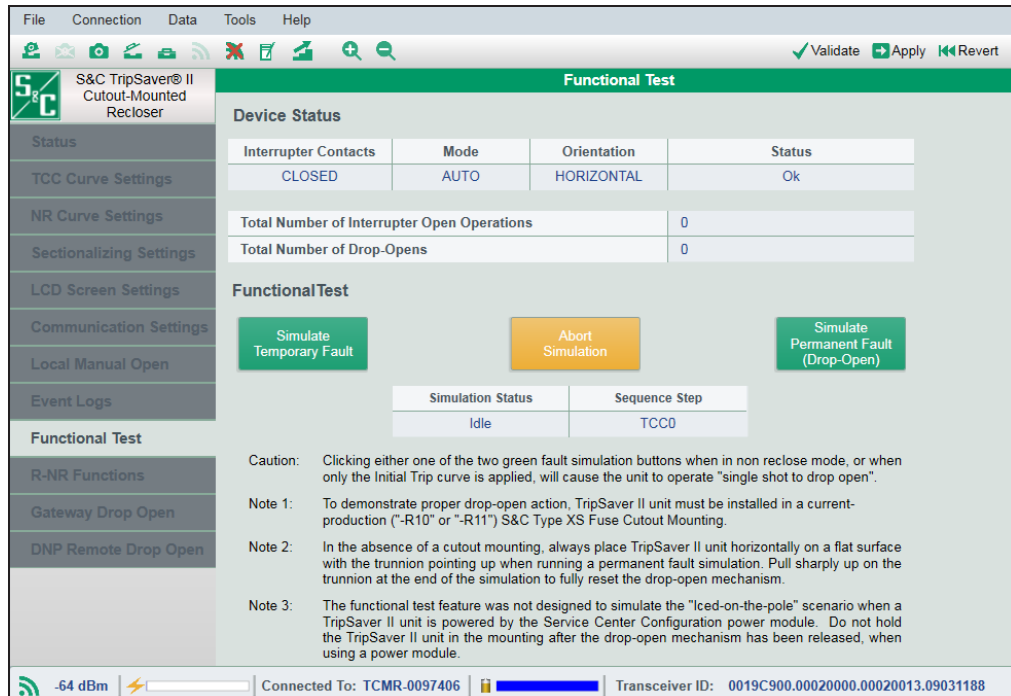


Figure 7. The *Functional Test* screen.

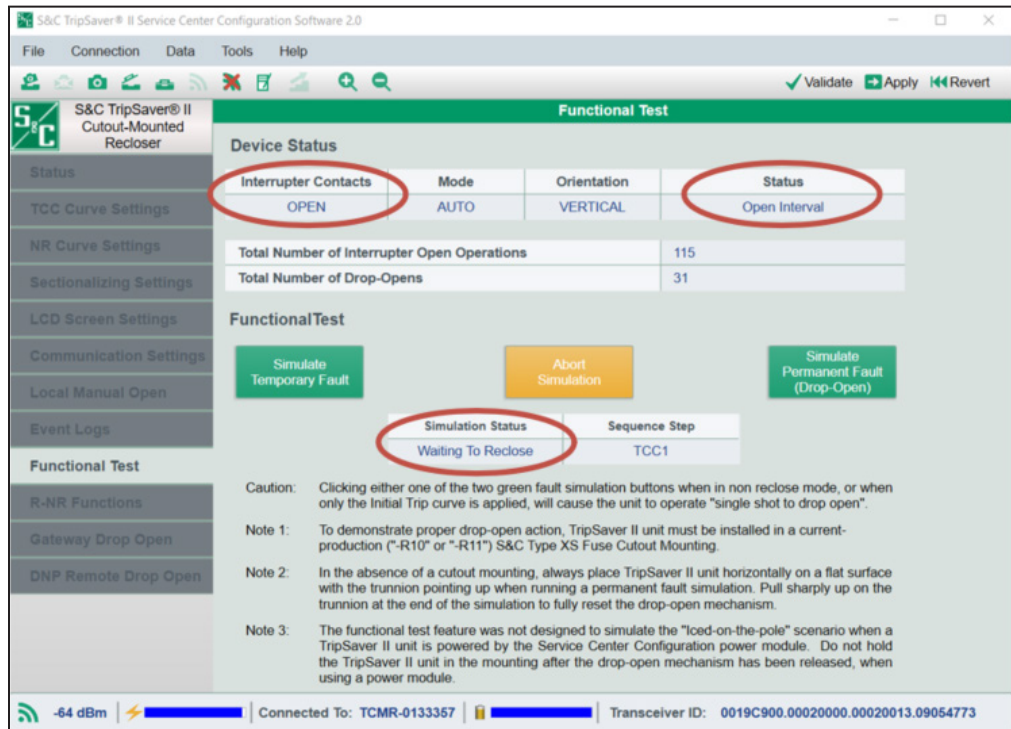


Figure 8. "Interrupter Contacts," "Status," and "Simulation Status" entries on *Functional Test* screen for actuators in good working order.

Field Inspection

Equipment Required:

- A cordless power module (part number 5954 or 5955) with a fresh lithium (L522) 9-Volt battery
- A PC laptop with the latest version of the TripSaver II Service Center Configuration Software
- A USB transceiver (part number FDA-1868R2, found in the configuration kit, part number 5950R2)

To test the actuator, complete the following steps:

- STEP 1.** With the TripSaver II recloser mounted to the utility pole, check whether the TripSaver II recloser has power by toggling the MODE SELECTOR lever once. This should cause the LCD screen to cycle through its programmed displays.

If the LCD screen does not cycle through its programmed displays:
Connect the cordless power module to the base of the TripSaver II recloser, as shown in Figure 9. For full instructions on using the cordless power module, see S&C Instruction Sheet 461-510.

NOTICE

Do not perform a firmware or settings update in the field using the cordless power module. Loss of 9-Volt battery power or loss of packets caused by weak signal strength or outdoor interference in the update process may render the recloser nonfunctional. Reclosers must be removed from the pole to perform firmware or settings updates using the service center configuration kit.

Note: The cordless power module must not be left attached unattended.

- STEP 2.** Plug a USB transceiver loaded with firmware version 2.0 into a USB A port on the personal computer. See Figure 10. Then, click on the **SCC** icon on the desktop or in the **Start** menu to launch the TripSaver II Service Center Configuration Software. Read and agree to the Warning message. For more information on launching the TripSaver II Service Center Configuration Software, refer to S&C Instruction Sheet 461-504.

Note: If the signal strength is weak because of distance and/or outdoor interference when communicating with units on the pole using the TripSaver II Service Center Configuration Software, if safe work practices allow, move the laptop computer closer to the recloser.

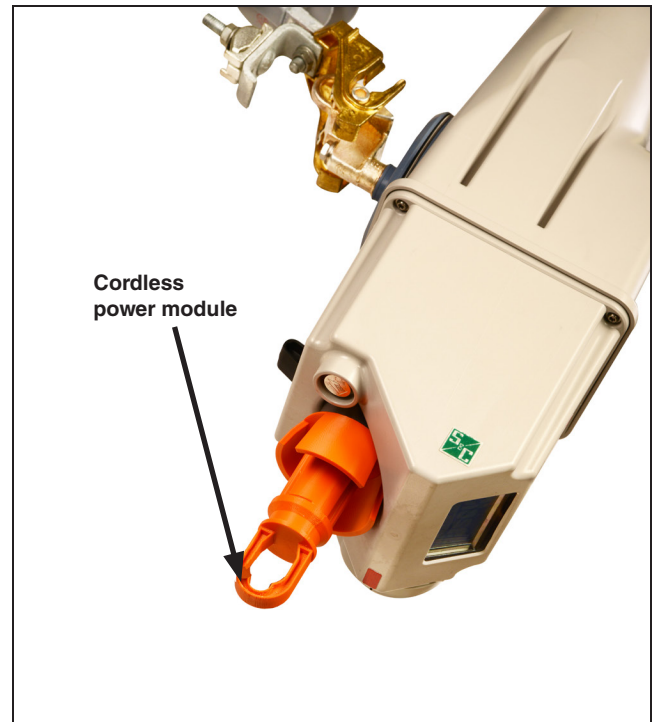


Figure 9. The cordless power module attached to the base of a TripSaver II recloser.

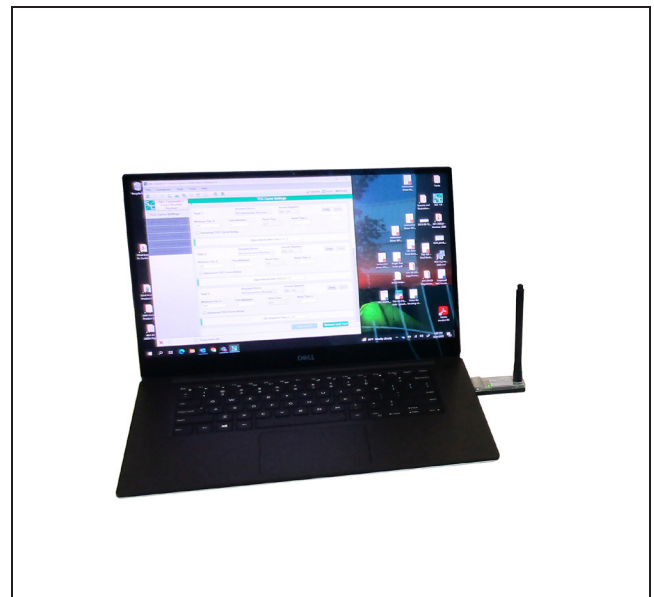


Figure 10. The USB transceiver connected to PC laptop.

STEP 3. In the service center configuration software, select “Connection>Connect to Device” from the **Main** menu or click on the **Connect to Device** icon in the quick access toolbar. See Figure 11.

A Transceiver ID Request dialog box will open. Enter the Transceiver ID of the TripSaver II recloser to be connected, and click on the **OK** button to connect. For information on obtaining the transceiver ID number, see the “Obtaining the Transceiver ID” section of S&C Instruction Sheet 461-504.

The **Auto Detect** button can be used to auto-detect the Transceiver ID. The transceiver ID is unique to each TripSaver II recloser, and it consists of a 32-digit character string in the format of “0019C900.00020000. _____” The first 16 digits of the ID are pre-typed. Only the last 16 digits must be entered. Up to 16 previously typed valid IDs are saved under the drop-down menu. When the drop-down menu is full, the oldest ID will be replaced by a new ID.

During the connection process, a progress bar is displayed. Wait about 10 seconds for the connection process to finish.

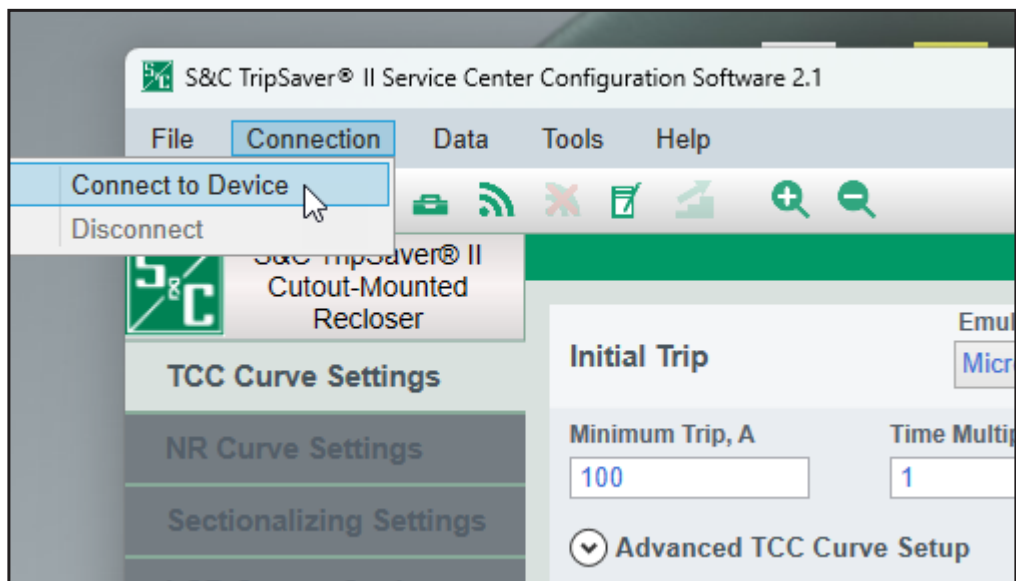


Figure 11. The Connect to Device menu item.

STEP 4. Confirm the TripSaver II recloser is connected by clicking on the **Status** menu item. The *Status* screen will populate with data from the connected recloser. When in **Connected** mode, the service center software will display a signal strength icon at the bottom left of the screen. The signal strength will also be displayed numerically. See Figure 12.

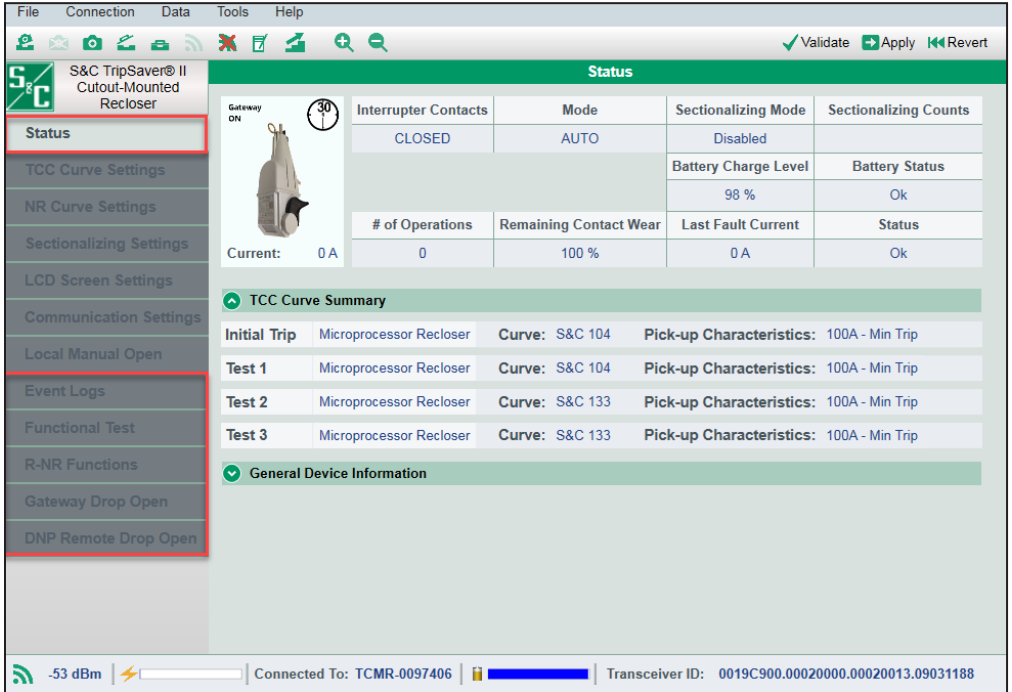


Figure 12. The Status screen in Connected mode.

STEP 5. Navigate to the *TCC Curve Settings* screen and check the **Open Interval** setting. See Figure 13.

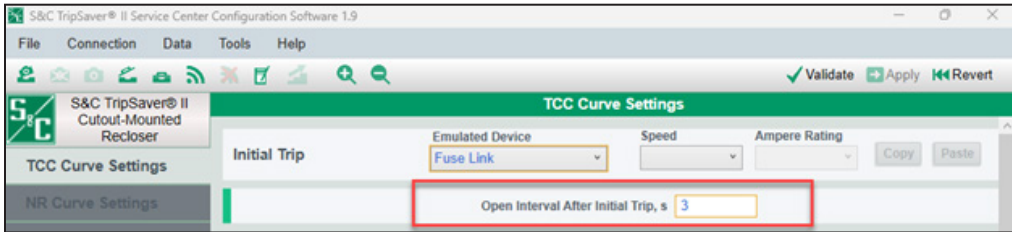


Figure 13. TCC curve screen showing Open Interval setting.

If the recloser has an Open Interval setting of 3s or less: The vacuum interrupter inside the recloser will change state faster than can be shown on screen. Navigate to the *Functional Test* screen and click on the **Simulate Permanent Fault** button. See Figure 14. The recloser will go through its programmed reclose sequence and “drop open.” When not mounted in a cutout mounting for testing, the trunnion will become loosely movable after dropping open. Reset the recloser manually by either pulling up on the trunnion or by installing the TripSaver II recloser into a cutout mounting. The drop-open mechanism is fully reset when the trunnion is no longer loosely movable.

Note: If the recloser’s vacuum interrupter cannot open, damage to the actuator has occurred. The recloser will not drop open and will go into **Service Now** mode after 5 consecutive attempts at opening the vacuum interrupter. Contact the local S&C Sales Office for more information.

If the recloser has an Open Interval setting greater than 3s: Navigate to the *Functional Test* screen and click on the **Simulate Temporary Fault** button. See Figure 14. The TripSaver II recloser’s vacuum interrupter will open with an audible click sound followed by changes in the device “Status” and “Simulation Status” entries on the software screen, as shown in Figure 15 on page 15.

Note: If the recloser’s vacuum interrupter does not open, damage to the actuator has occurred. Contact the local S&C Sales Office for more information.

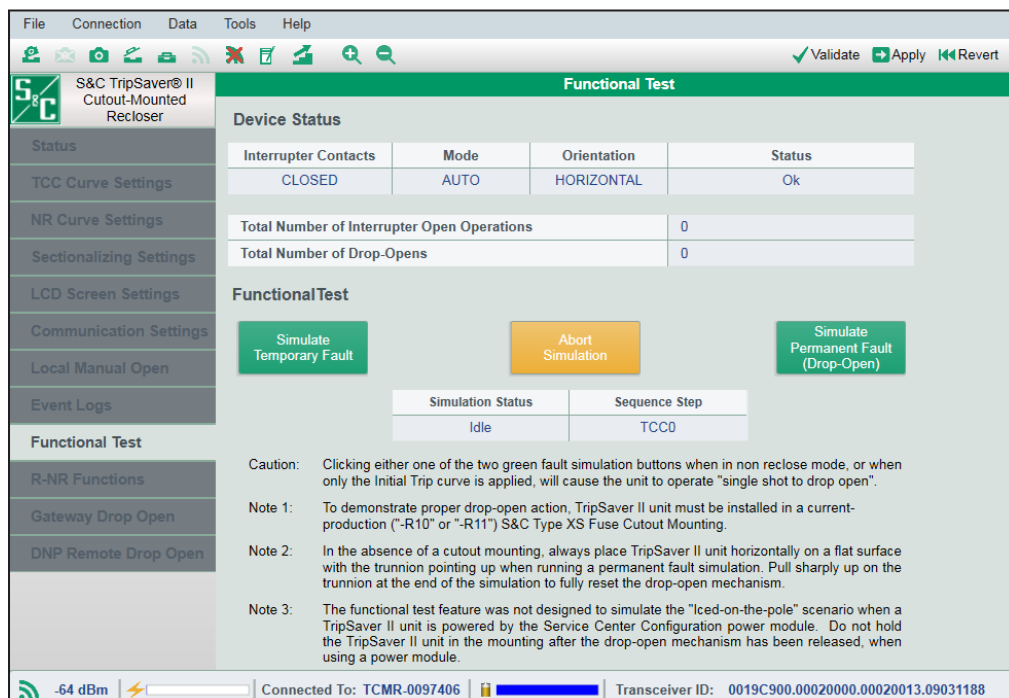


Figure 14. The *Functional Test* screen.

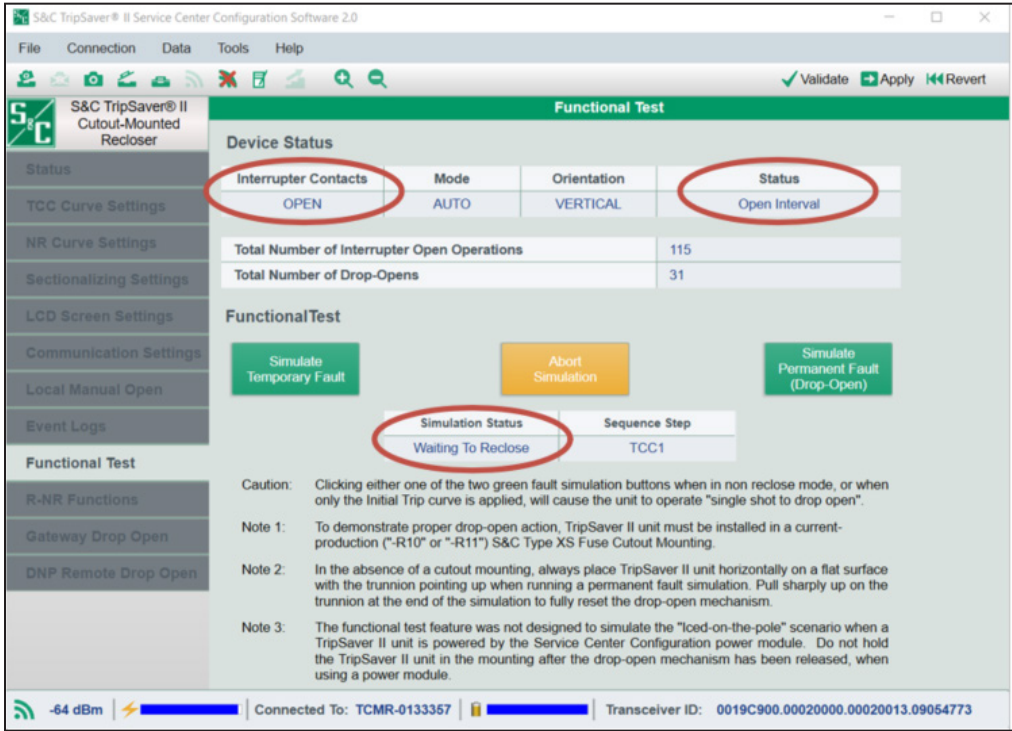


Figure 15. "Interrupter Contacts," "Status," and "Simulation Status" entries on *Functional Test* screen.

Alternate Method of Field Inspection

If it is acceptable to open the recloser, and the **Local Manual Open** (LMO) feature is enabled, the **LMO** feature can be used to test the TripSaver II recloser's actuator. For more information on the **LMO** feature, see the "Local Manual Open" section of S&C Instruction Sheet 461-502. To test the actuator:

NOTICE

When using firmware version 1.7 or 1.6, DO NOT attempt to test the TripSaver II recloser's **Local Manual Open** feature with the recloser in the horizontal or **Dropout** position. For the **Local Manual Open** feature to function properly, the recloser MUST be installed vertically in the **Closed** position in a cutout mounting. Repeated use of the **Local Manual Open** feature to open the recloser when it is in the horizontal or **Dropout** position may cause it to enter the **Service Now** state after five **Local Manual Open** operations, rendering the recloser inoperable.

- STEP 1.** *If power to the TripSaver II recloser is unavailable:* With the TripSaver II recloser mounted to the utility pole, connect the cordless power module to the base of the TripSaver II recloser, as shown in Figure 9 on page 11. For full instructions on using the cordless power module, see S&C Instruction Sheet 461-510.
- STEP 2.** When power is available, operate the MODE-SELECTOR lever X number of times within a Y-second window. X and Y depend on the programmed counts.

When the triggering condition has been met, the TripSaver II recloser starts the open **Time Delay** sequence. For the next 10 seconds, an "LMO Cancel?" prompt will appear on the LCD screen for cancellation.

The **LMO** command can be canceled by any operation of the MODE-SELECTOR lever. If the MODE-SELECTOR lever is operated during this time, an "LMO Canceled" message will briefly appear on the LCD screen to indicate the user has canceled the operation.

If the command is not canceled within 10 seconds, a "WALK AWAY" message will display on the LCD screen, indicating the start of the

20-second **Operation** timer intended to allow the operator to comply with any operating-distance requirements specified by the utility work practices.

During the walk-away period, the operator can no longer cancel the **Open** operation. At the end of the walk-away period, the TripSaver II recloser will open the vacuum-interrupter contacts to interrupt the load current and then drop open and reclose the contacts after the tilt sensor indicates a completed **Drop Open** function.

Note: If the recloser opens and drops open, the actuator is working properly.

Note: The trigger values for X (Operations count) and Y (Operation Time window) are user-configurable using the TripSaver II Service Center Configuration Software. Confirm the values of X and Y with your utility.

Optimizing Signal Strength

Having a low signal strength between the TripSaver II recloser and the USB transceiver can cause delays. Low signal quality is shown if the signal indicator on the additional information bar is yellow or red. See Figure 16 on page 18.

If experiencing low signal quality when connected to a TripSaver II recloser using the USB transceiver and the service center configuration software, move the powered TripSaver II recloser between one to 4 inches (25 to 102 mm) away from the USB transceiver, with the recloser facing down and the trunnion pointing up and with the LCD screen toward the USB transceiver at an approximate 45° angle. See Figure 3 on page 6.

If the signal strength is weak because of distance and/or outdoor interference when communicating with units on the utility pole using the TripSaver II Service Center Configuration Software, if safe work practices allow, move the laptop computer closer to the recloser. Or, use a USB Type-A extension cord to bring the antenna closer to the TripSaver II recloser.

WARNING

Keep a minimum 45-inch (114-cm) distance between an energized TripSaver II recloser and the USB transceiver or personal computer. **Failure to observe the recommended distance may cause flashover, electric shock, or death.**

Service center configuration software version 2.1x in combination with the USB transceiver with enhanced antenna (part number FDA-1868R2) significantly improves signal strength.

If a timeout message appears, it may be necessary to reduce the number of Wi-Fi and Bluetooth devices nearby. See the “If Connection Process Displays a Timeout Message” section in S&C Instruction Sheet 461-504 for more information.

Note: For more information on signal quality and the signal strength indicator, see the “Additional Information Bar” section in S&C Instruction Sheet 461-504.

S&C TripSaver® II Cutout-Mounted Recloser

Status

Interrupter Contacts	Mode	Sectionalizing Mode	Sectionalizing Counts
CLOSED	AUTO	Disabled	
		Battery Charge Level	Battery Status
		98 %	Ok
# of Operations	Remaining Contact Wear	Last Fault Current	Status
0	100 %	0A	Ok

Gateway ON Current: 0A

TCC Curve Summary

Initial Trip	Microprocessor Recloser	Curve: S&C 104	Pick-up Characteristics: 100A - Min Trip
Test 1	Microprocessor Recloser	Curve: S&C 104	Pick-up Characteristics: 100A - Min Trip
Test 2	Microprocessor Recloser	Curve: S&C 133	Pick-up Characteristics: 100A - Min Trip
Test 3	Microprocessor Recloser	Curve: S&C 133	Pick-up Characteristics: 100A - Min Trip

General Device Information

Additional Information Bar: -53 dBm | | Connected To: TCMR-0097406 | | Transceiver ID: 0019C900.00020000.00020013.09031188

Figure 16. The additional information bar showing the Green signal strength indicator.