Programming

Table of Contents

Qualified Persons

⚠ WARNING

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of underground electric power distribution equipment, vault-mounted switchgear, and switchgear installed in metal enclosures, along with all associated hazards. 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, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment.
- The principles of selective coordination and system protection.

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 S&C Instruction Handbook before installing or operating your S&C Vista Overcurrent Control. Familiarize yourself with the Safety Information on pages 4 and 5 and the Safety Precautions on page 6.

Video

A video of this instruction sheet is available at **www.sandc.com/videos/install-occ**. The video is supplementary to this instruction sheet and should in no way be considered a replacement for the written instructions.

Retain this Instruction Sheet

This instruction sheet is a permanent part of the S&C Vista Underground Distribution Switchgear. Designate a location where you can easily retrieve and refer to this publication. A copy of these instructions should be stored in the instruction manual holder, if present. The latest version is available online in PDF format at **sandc.com/en/support/product-literature.**

Proper Application

⚠ WARNING

The equipment in this publication is only intended for use with S&C Vista Underground Distribution Switchgear. The switchgear must be installed according to its applicable instruction sheet. The application must be within the ratings furnished for the equipment. Ratings for the Vista Underground Distribution Switchgear are listed on the ratings table in Specification Bulletin 681-31 for Manual Vista Underground Distribution Switchgear, Specification Bulletin 682-31 for Remote Supervisory Vista Underground Distribution Switchgear, and Specification Bulletin 683-31 for Source-Transfer Vista Underground Distribution Switchgear. The ratings are also on the S&C Nameplate affixed to the product.

Special Warranty Provisions

The standard warranty contained in seller's standard conditions of sale, as set forth in Price Sheets 150 and 181, applies to Vista Underground Distribution Switchgear and its associated options. The Vista Overcurrent Control 2.0 has the following warranty: the first and second paragraphs of Price Sheet 150 warranty are replaced with 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, and maintained in accordance with 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 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.

The seller further warrants to the immediate purchaser or end user that for a period of two years from the date of shipment the software will perform substantially in accordance with the then-current release of specifications if properly used in accordance with the procedures described in seller's instructions. The seller's liability regarding any of the software is expressly limited to exercising its reasonable efforts in supplying or replacing any media found to be physically defective or in correcting defects in the software during the warranty period. The seller does not warrant the use of the software will be uninterrupted or error-free.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels attached to the S&C Overcurrent Control. Familiarize yourself 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 or 1-773-338-1000 outside the U.S.

NOTICE

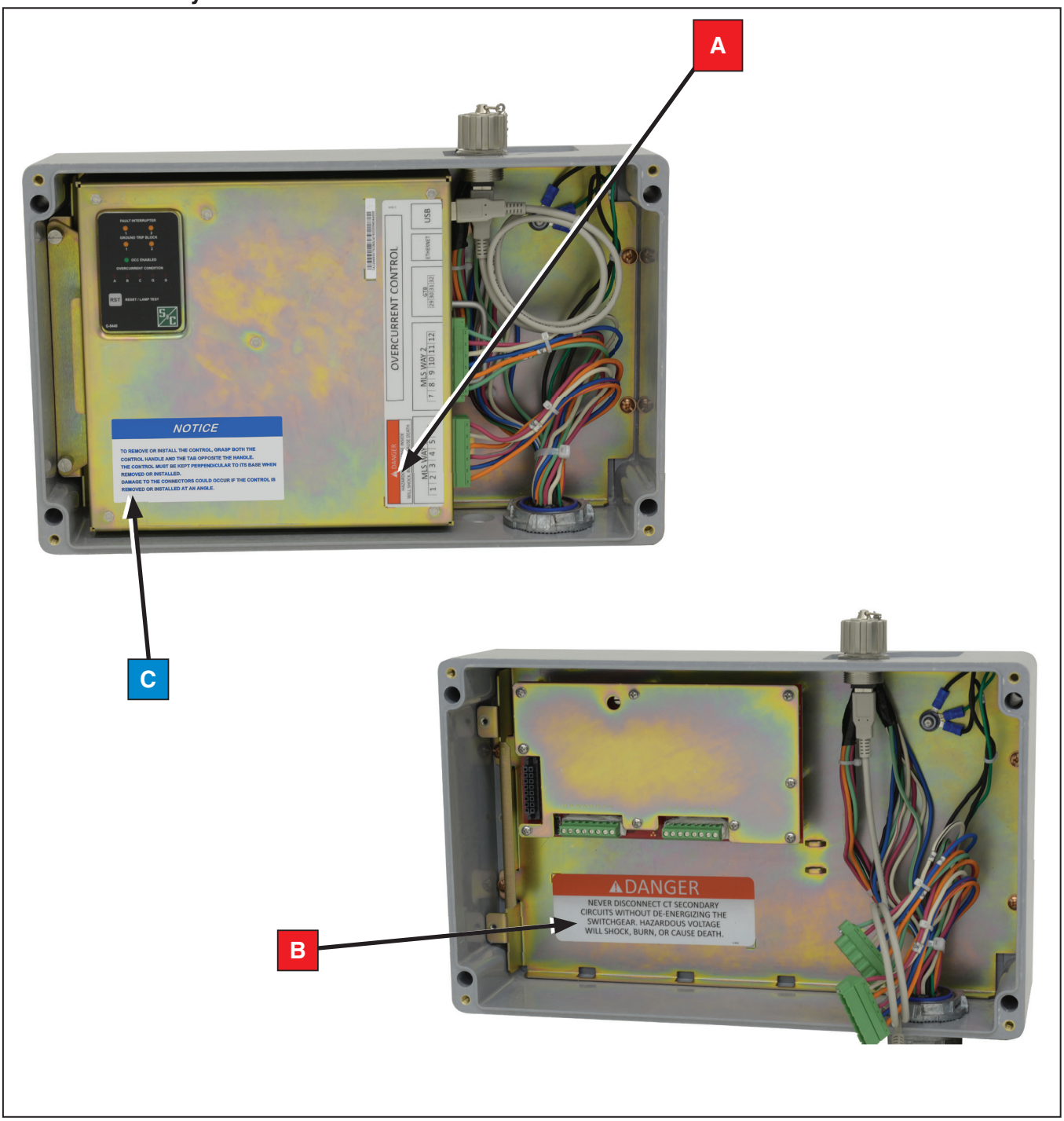
Read this instruction sheet thoroughly and carefully before installing and programming your S&C Vista Overcurrent Control.

Replacement Instructions and Labels

If you need additional copies of this instruction sheet, 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, S&C Headquarters, or S&C Electric Canada Ltd.

Location of Safety Labels



Reorder Information for Safety Information

Location	Safety Alert Message	Description	Part Number
A	⚠ DANGER	Hazardous voltage inside. Will shock, burn, or cause death . . .	G-9636
B	⚠ DANGER	Never disconnect CT secondary circuits without de-energizing the switchgear. Hazardous voltage will shock, burn, or cause death . . .	G-9635
C	*NOTICE*	To remove or install the control, grasp both the control handle and the tab opposite the handle . . .	G-9688

⚠ DANGER

The Vista Underground Distribution Switchgear protected by this overcurrent control 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 the Vista overcurrent control must be restricted only to qualified persons.
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules. Always maintain proper clearance from energized components.
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and arc-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 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. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

Inspection

Examine the shipment for external evidence of damage as soon after receipt as possible, preferably before the carrier departs. Check the bill of lading to make sure the listed shipping packages are present.

If there is visible loss and/or damage:

1. Notify the delivering carrier immediately.
2. Ask for a carrier inspection.
3. Note condition of shipment on all copies of the delivery receipt.
4. File a claim with the carrier.

If concealed damaged is discovered:

1. Notify the delivering carrier within 15 days of receipt of shipment.
2. Ask for a carrier inspection.
3. File a claim with the carrier.

Notify S&C Electric Company in all instances of loss and/or damage.

Packing

The overcurrent control for your S&C Vista Underground Distribution System is housed in an enclosure mounted on the operation side of the switchgear. For UnderCover™ Style and Wet-Vault Mounted-Style Vista Underground Distribution Switchgear, the enclosure is fully submersible. The overcurrent control electronics module is removable for bench programming.

Handling

⚠ DANGER

Never disconnect the current transformer secondary circuits without de-energizing the switchgear. Hazardous voltage is present and will shock, burn, or cause death.

NOTICE

Handle the overcurrent control's electronics module carefully when removing it from the enclosure. DO NOT drop the overcurrent control or subject the control to moisture or any undue stress. After the overcurrent control has been configured, return it to the enclosure on the Vista Underground Distribution Switchgear.

The overcurrent control is programmed using a personal computer connected to the control via a USB cable. The control features a variety of time-current characteristic (TCC) curves and definite time settings listed in the "Overcurrent Control Settings" section starting on page 56. Each overcurrent control can control up to two fault interrupters.

Current transformers inside the tank provide primary current sensing for the switchgear. The overcurrent control is capable of sensing and responding to phase overcurrents, ground overcurrents, negative sequence, and sensitive earth faults.

Power derived from the current transformers is used to operate the control and to charge the trip capacitors that discharge into magnetic latching solenoids to trip the fault interrupters during a fault. No external power is required for operation of the control in the field.

Without power from the current transformers, the overcurrent control will draw its power from the connected personal computer via the USB connection.

Time-Current Characteristics and Settings

The overcurrent control features time-current characteristic (TCC) curves consisting of phase-overcurrent curves and ground-overcurrent curves. The families of curves are as follows:

- IEEE (ANSI. U.S.) curves per IEEE Standard C37.112-1996 and IEC curves per IEC 60255-3: U1, U2, U3, U4, U5, C1, C2, C3, C4, and C5
- S&C standard speed curves (for use in place of conventional “E”-rated power fuses)
- S&C “K”-speed curves (for use in place of conventional “K”-rated power fuses)
- S&C “T”-speed curves (for use in place of conventional “T”-rated power fuses)
- Tap fault interrupter curves
- Main fault interrupter curves

The TCC curves can be customized into hundreds of different curves using a variety of definite-time delay settings. For even more specialized shapes, there are two definite-time settings that can be programmed. The definite-time settings can be programmed with a minimum time value of 0 seconds, which is used to create an instantaneous overcurrent response. **Ground Protection**, **Negative Sequence**, and **Sensitive Earth Fault** protection elements are also available. The factory default settings for the overcurrent control are shown in the “Factory Default Protective Settings” section on page 44.

On switchgear configured for **Single-Phase Trip/Single-Phase Lockout** trip mode, **Ground Protection**, **Negative Sequence**, and **Sensitive Earth Fault** settings are disabled and are not selectable.

A choice of 50- or 60-Hertz operation is also offered.

Trip Mode

Three-phase fault interrupters are designed for three-phase tripping. Single-phase tripping is not possible with three-phase fault interrupters.

With single-phase fault interrupters, the overcurrent control can be programmed for either single-phase trip/single-phase lockout or single-phase trip/three-phase lockout. When set for single-phase trip/single-phase lockout the control will trip only the phase experiencing an overcurrent condition. **Ground**, **Negative Sequence**, and **Sensitive Earth Fault** settings cannot be used in this trip mode.

When configured for single-phase trip/three phase lockout, the control will trip all three phases when one phase experiences a fault. Only one set of phase overcurrent settings can be selected. **Ground**, **Negative Sequence**, and **Sensitive Earth Fault** settings can be selected.

User Access and Privileges

The overcurrent control has three levels of access. All access levels can view the status page, which includes the status of the control, load currents, settings, and firmware version.

Table 1. Access Levels

Access Level	Description
admin	Can access the Time Overcurrent Phase Protection menus of Interrupter 1 and Interrupter 2 and make settings changes. Can access all Control Settings and make changes. Can change admin password and user password. Can clear Diagnostic and Trip Event Logs. Can perform a trip test. Can upgrade firmware. Can perform a factory default reset.
user	Can access the protective settings menus of Interrupter 1 and Interrupter 2 and make changes. Can change only the user password. Can clear Diagnostic and Trip Event Logs.
View button	Can view and clear Diagnostic and Trip Event Logs.

Hardware and Software

These are required to access the overcurrent control:

- USB driver from **www.sandc.com/vistaocc**
- Administrative privileges to install software on the personal computer for USB driver installation
- A computer with a USB 2.0 (or newer) Type A USB receptacle
- A computer running Microsoft Windows (7 through Windows 10), with Microsoft Internet Explorer 8.0 or later or Mozilla Firefox 34.0.5 or later recommended (Google Chrome and Microsoft Edge can be used, contact S&C Technical Support for a list of known issues using non-recommended browsers.)
- A USB 2.0 Type A-to-Type A cable (A 2-meter (6.6-foot) long cable is available from S&C Electric Company, part number TR-11887.)

Installing the USB Driver

NOTICE

DO NOT connect to the Vista Overcurrent Control 2.0 before installing the USB driver available from S&C Electric Company. Connecting to the device before installing the proper driver may prompt Microsoft Windows to install the incorrect driver.

A Vista Overcurrent Control USB driver is required to access and program the control via USB. The latest Vista overcurrent control USB driver software release for your version of Microsoft Windows is posted at **http://www.sandc.com/vistaocc.**

To install the driver:

STEP 1. There are two versions of the driver—one for Microsoft Windows 10, and one for earlier versions of Microsoft Windows. Download the driver file for the version of Microsoft Windows and move it from the Downloads folder to your desktop. Double-click and follow the prompts to unzip the file.

STEP 2. After downloading the driver, disconnect from all network and Internet connections by disabling Wi-Fi and Ethernet. As an administrator, open a command prompt to the folder where the driver is located. To open a command prompt:

(a) Open the **Start** menu in windows.

(b) In the Search Programs and Files dialog box, type "cmd.exe."

(c) Right click on cmd.exe, and select "Run as Administrator." Type in your admin credentials if prompted.

(d) Using the command prompt "cd" for change directory, navigate to the directory where the USB driver files are located. In this example, the folder is located on the desktop. The command prompt "cd" is used to change the directory.

For example, the directory might be cd\users\<your username>\desktop\scelectric-20140311. See Figure 1.

NOTICE

The version of the driver may have a different folder name than the one shown in Figure 1.

(e) Run "setup.bat" from the command prompt, and follow the driver-installation dialogs to complete the installation.

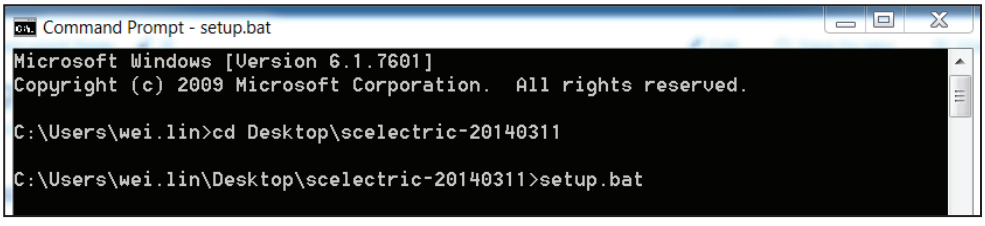


Figure 1. Run "setup.bat" from the Command Prompt.

NOTICE

S&C does not recommend removing the submersible S&C Overcurrent Control used in UnderCover Style and Wet-Vault Mounted Style Vista switchgear from its enclosure for workbench programming. Opening the submersible enclosure may damage the sealing gasket. Contact your local S&C Sales Office or the S&C Global Support and Monitoring Center at 1-888-762-1100 (or 1-773-338-1000 outside the U.S.) for more information.

The control can be removed from a non-submersible enclosure for programming. To remove the module:

STEP 1. Loosen the captive screws that secure the cover of the control enclosure and remove the cover. See Figure 2.

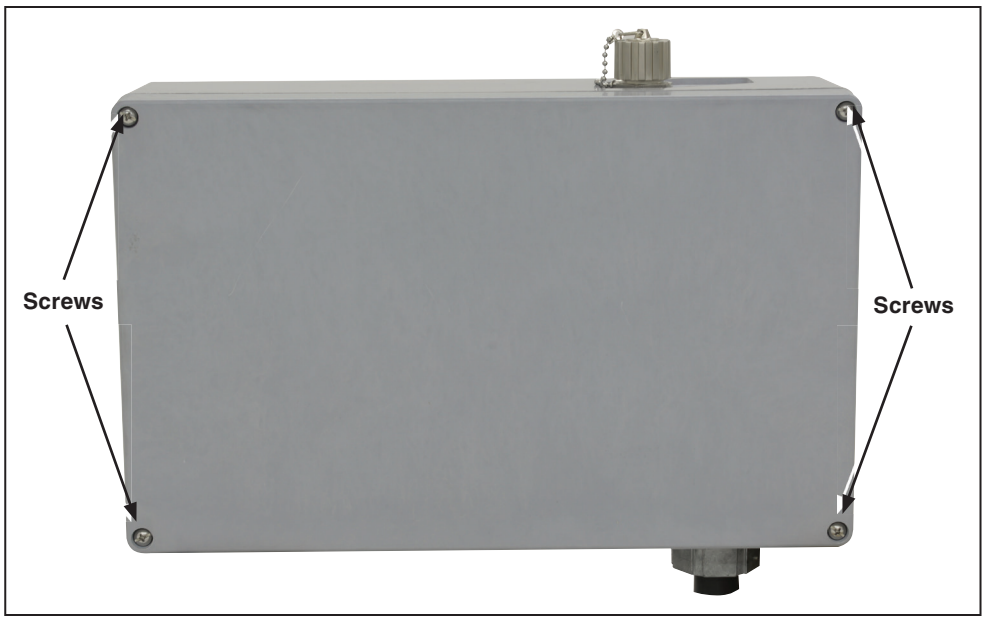


Figure 2. Remove the overcurrent control enclosure cover.

NOTICE

Always disconnect the trip connectors from the electronics module before removing the module from its base plate. Failure to follow this precaution may result in the unexpected operation of a fault interrupter.

STEP 2. Loosen the screws holding the two trip connectors in place. Disconnect the trip connectors and USB connector from the front of the electronics module. See Figure 3.

Figure 3. Disconnect the trip connectors and the USB connector.

STEP 3. Loosen the four captive screws that secure the electronics module to the base plate. See Figure 4.

Figure 4. Loosen the four screws securing the electronics module to the base plate.

STEP 4. Grasp the electronics module by the lifting handle and the rear lifting tab, and lift it straight up from the base plate to raise the stand-off attached to the inside of the cover of the electronics module. This allows the current transformer shorting clip to connect with the power current transformer secondaries and short circuit the secondaries. See Figure 5. After the current transformer secondaries are short circuited, the connection between the electronics module and the burden-board module will break.

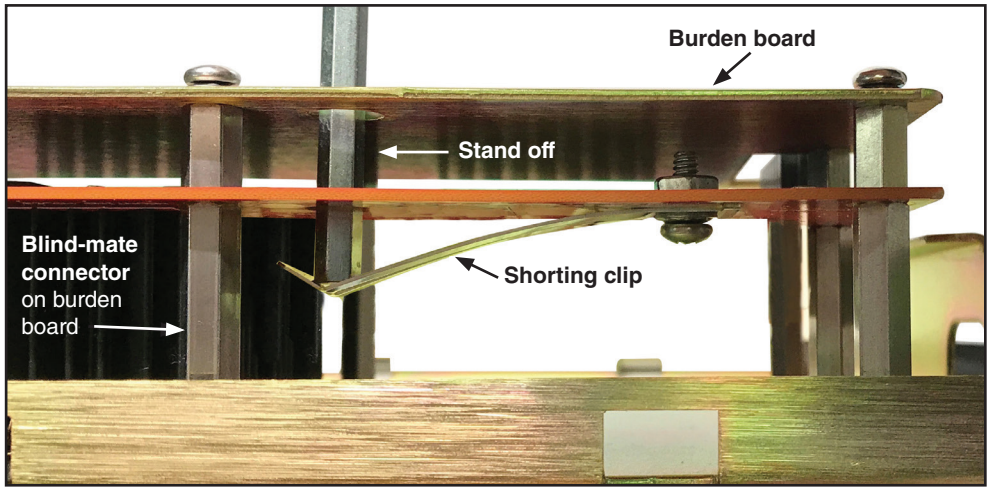


Figure 5. Lift the electronics module by the lifting handle and rear lifting tab to raise the stand-off inside of the electronics module and short circuit the secondaries.

STEP 5. Lift the module straight up and remove it from the base plate. See Figure 6.

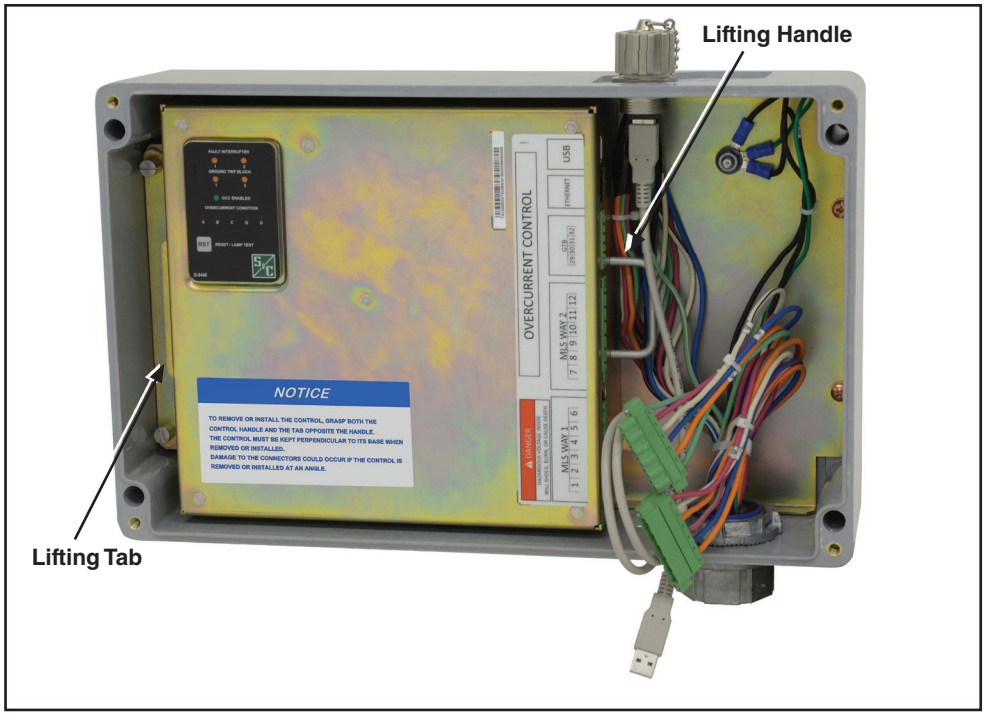


Figure 6. Grasp both the lifting tab and the lifting handle and lift the module up to remove it from the base plate.

STEP 1. Hold the electronics module by the handle at the front of the module and the tab at the rear of the module. See Figure 6 on page 13.

NOTICE

To remove and install the control, grasp the control handle and the tab opposite the handle. The control must be kept perpendicular to the base when removed or installed.

Damage to the connectors could occur if the control is removed or installed at an angle.

STEP 2. Align the captive screws of the electronics module with the holes in the base plate of the burden-board and push straight down gently. See Figure 7. This connects the electronics module to the burden-board module. It also lowers the stand-off, which pushes the current transformer shorting clip away from the burden board, removing the short circuit from the power current transformer secondaries. The control will power up if sufficient current is flowing through the Vista switchgear. See Figure 8 on page 15.

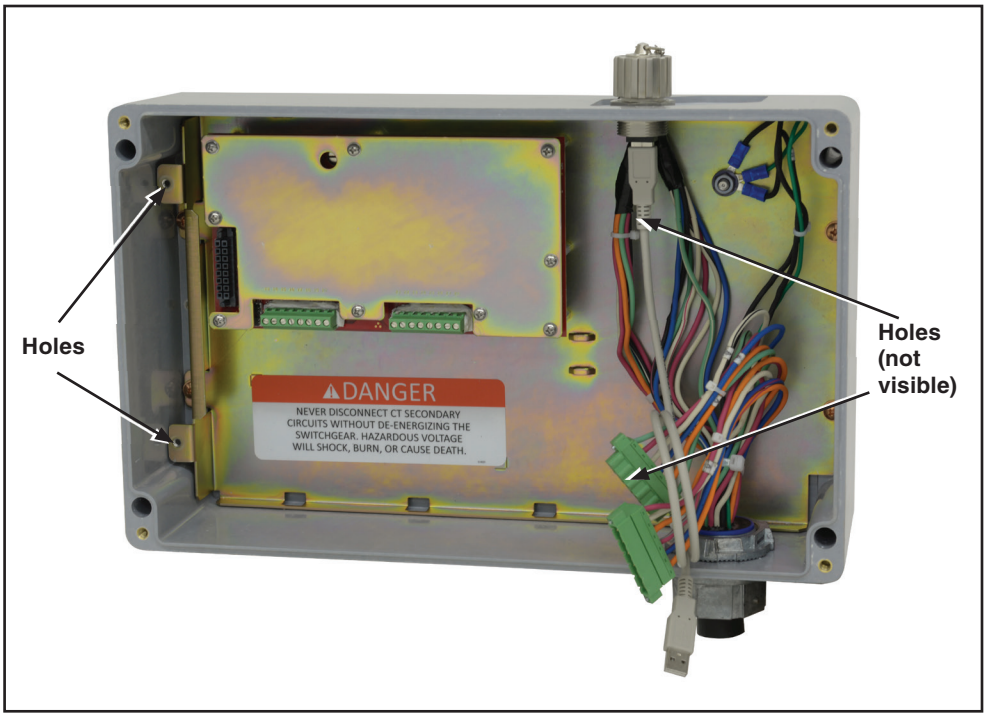


Figure 7. Align the captive screws of the electronics module with the holes in the burden board and push down.

Figure 8. Lower the electronics module onto the base plate and tighten the four captive screws.

STEP 3. Tighten the four captive screws that secure the electronics module to the base plate. Start tightening the screws by hand to avoid cross threading. See Figure 8.

STEP 4. Connect the two trip connectors to the front of the electronics module. The trip connectors are keyed and cannot be swapped or installed incorrectly. Connect the USB connector to the USB port on the electronics module. See Figure 9.

Figure 9. Reconnect the trip connectors and the USB connector to the electronics module and screw them in securely.

STEP 5. Place the cover on the control enclosure and tighten the captive screws that secure the cover in place. See Figure 10.

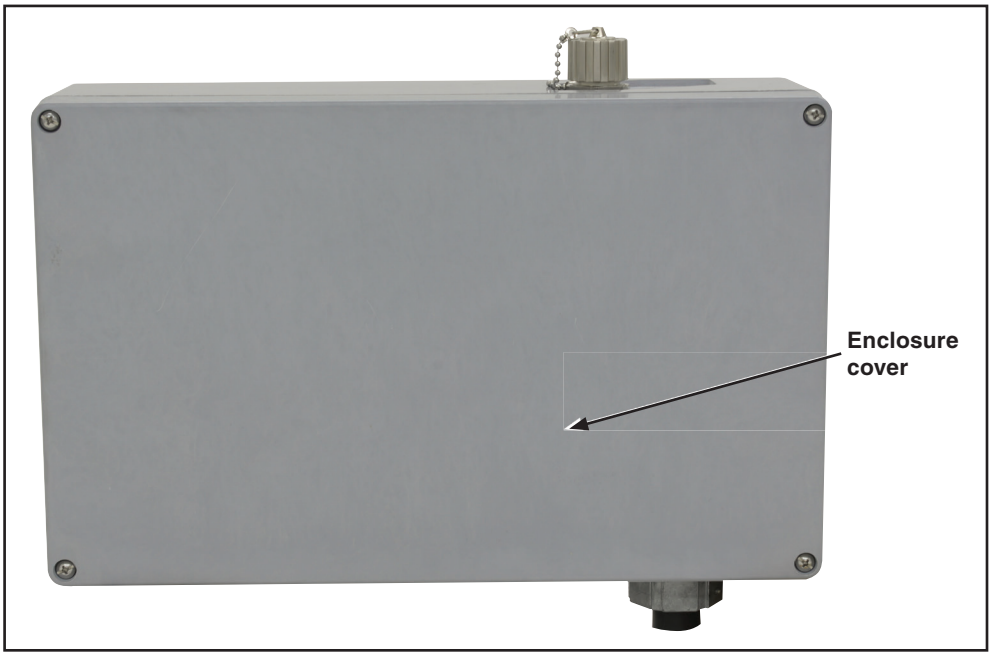


Figure 10. Secure the enclosure cover.

Connecting to the Overcurrent Control Using USB

To connect to the overcurrent control :

STEP 1. Make sure the USB driver has been installed on the computer per the instructions in the "Installing the USB Driver" section on page 10.

STEP 2. Remove the USB data-port cap. Plug the A-male end of a USB cable, no longer than three meters, into the USB receptacle on the side of the overcurrent control. See Figure 11. This cable should have a minimum conductor size of 24AWG. Plug the opposite end of the USB cable into an open USB receptacle on the PC. Windows OS will detect the overcurrent control as a USB device.

STEP 3. When finished programming the overcurrent control, make sure to replace the data-port cap.

NOTICE

Make sure the data-port cover is secure after programming the control. Failure to secure the data-port cap may result in damage to the data port. A control with a damaged data port cannot be accessed via personal computer through the port.

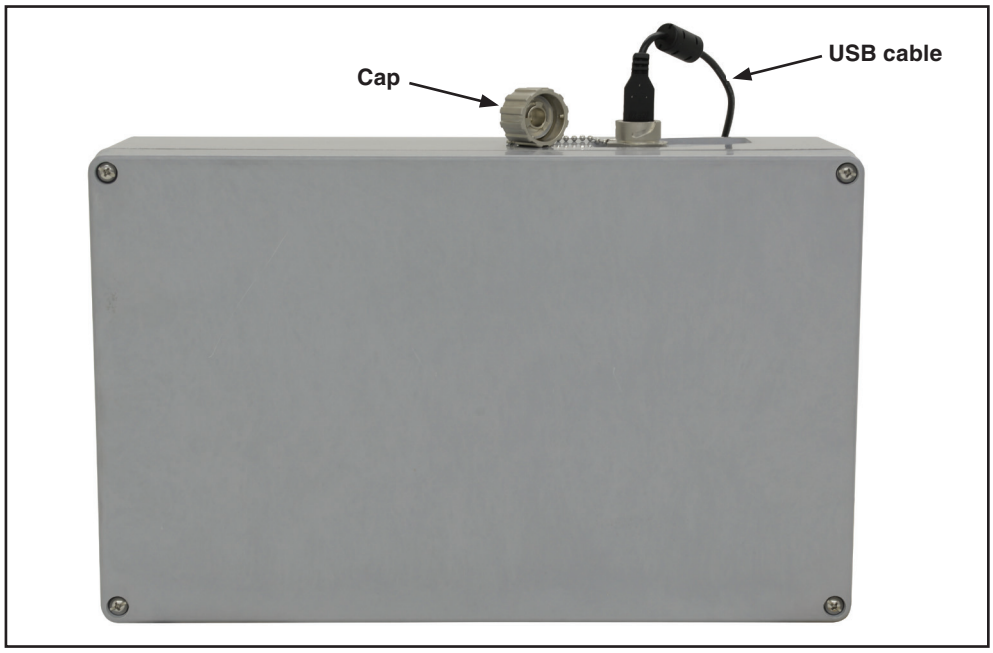


Figure 11. Remove the data-port cap and plug a USB cable into the control. Plug the opposite end of the cable into a PC.

The software for the overcurrent control is resident on the control and can be accessed using a Web browser. (See the "Computer Requirements" section on page 10 for compatible Web browsers and operating systems.) After connecting to the control by connecting to the USB port, access the control by opening the Web browser.

Compatibility Mode and Microsoft Internet Explorer

Microsoft Internet Explorer may perform better when running in **Compatibility** mode. If encountering unexpected behavior with Internet Explorer version 8 through 11, please change to **Compatibility** mode or contact S&C Technical Support.

STEP 1. Click on the Gear icon. (Or the **Tools** menu in Microsoft 8 through 10.) From the drop down menu, click on the Compatibility View settings item. See Figure 12.

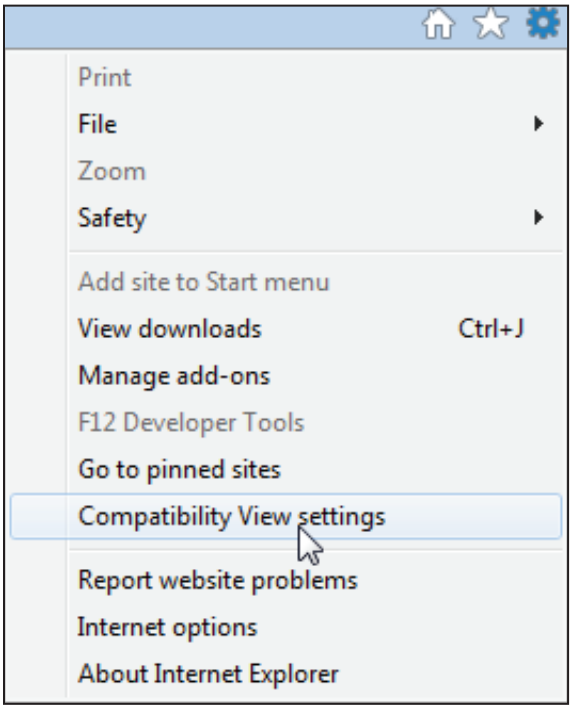


Figure 12. Choose "Compatibility View settings" from the Gear menu. (Microsoft Explorer 11 shown.)

STEP 2. From the Compatibility View Settings menu, uncheck the box next to "Display intranet sites in Compatibility View." See Figure 13.

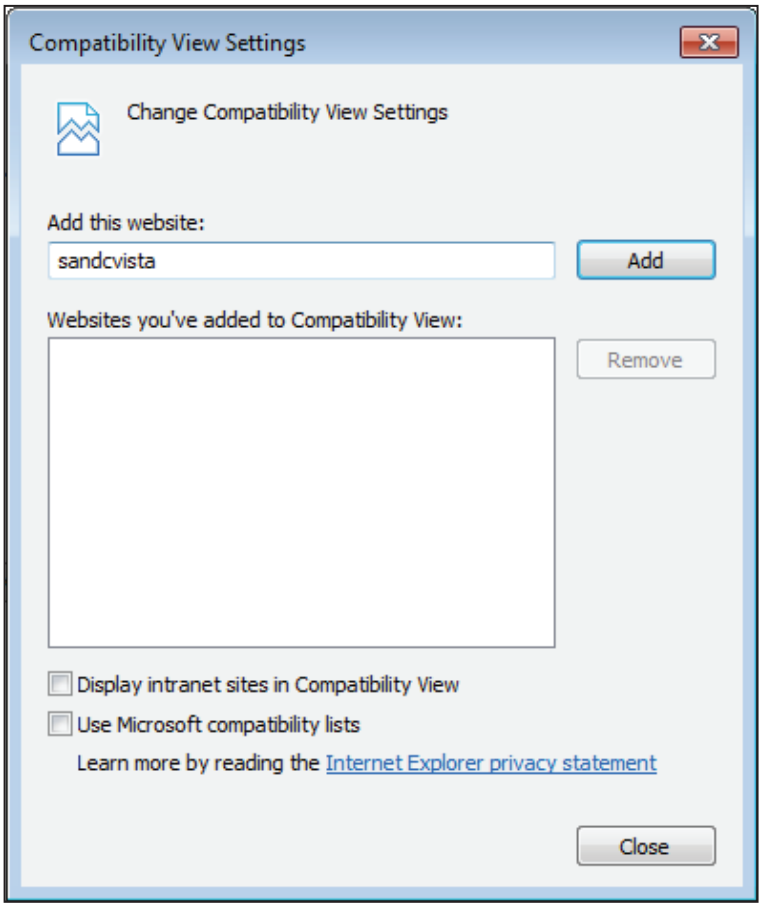


Figure 13. Uncheck "Display intranet sites in Compatibility View" from the Compatibility View Settings menu. (Microsoft Explorer 11 shown.)

Logging in to the Control

To get to the *Login* screen, open a compatible Web browser and enter the address: **http://sandcvista**. If an error is encountered, enter the IP address: **http://10.1.11.58**.

This will open the *Login* screen. See Figure 14.

There are three types of login:

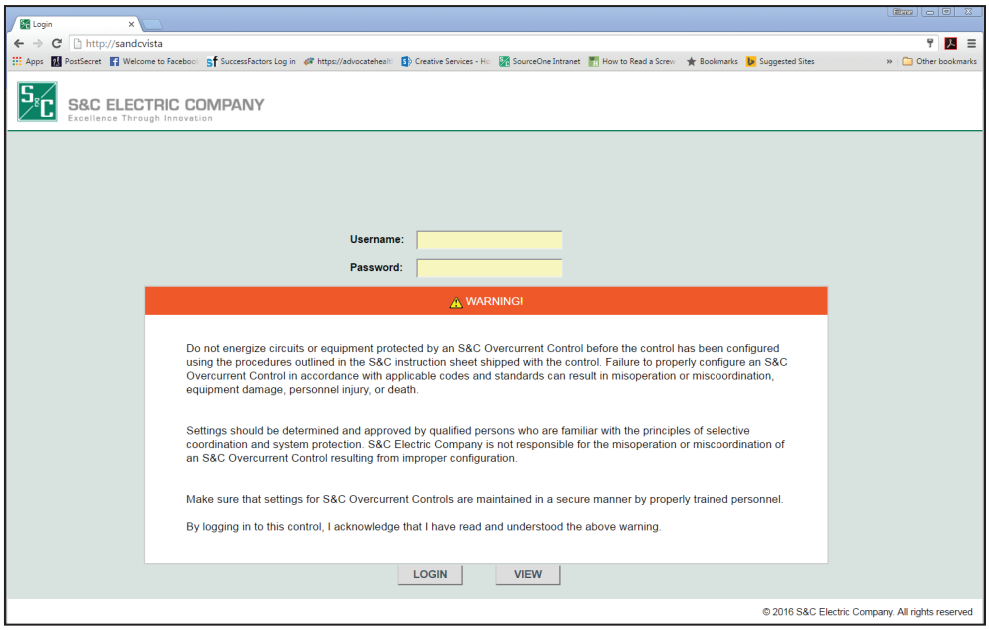


Figure 14. The Vista Overcurrent Control *Login* screen.

- **admin** – The admin login should ONLY be used when initially setting up the control or as directed by S&C, such as for installing a firmware update.
- **user** – The user login should be used for general access to the control when changes to the protective settings must be made.
- **View**– The **View** mode should be the primary means of accessing the control. The **View** button allows the user to view the status of the control, load currents, protective settings, firmware revision, and to view and clear event logs. No changes to the protective settings or control settings can be made.

For more information on the types of login privileges, see the "User Access and Privileges" section on page 9.

To log in to the control using the admin or user login, enter the appropriate login name and password in the **Username** and **Password** fields. Then click on the **Login** button.

To log in to the control using the **View** mode, click on the **View** button.

See the "Logging In for the First Time" section on page 21 for more information on setting the admin and user passwords.

Default Passwords

NOTICE

DO NOT lose the admin password. For security reasons, there is no password-retrieval system built in to the overcurrent control. If the admin password is lost, the control must be returned to S&C Electric Company to restore access to the control.

The overcurrent control comes with two default passwords, one for the "admin" login and one for the "user" login. (See the "User access and privileges" section on page 9 for details on the access levels of the two logins.) S&C strongly recommends changing admin and user login passwords from the default setting when first logging in to the control. You will be prompted to change the user login password at the first login under this username.

The default passwords are:

Username	Password
admin	4731
user	6601

Changing the Admin Password

NOTICE

After changing the password, S&C recommends logging in to the "admin" login ONLY when directed to do so by S&C Electric Company. Use the "user" login when general changes need to be made to the Overcurrent Control settings. Use the **View** button for regular access to the overcurrent control.

To change the admin password:

STEP 1. At the *Login* screen, enter in the default admin username and password. See Figure 15.

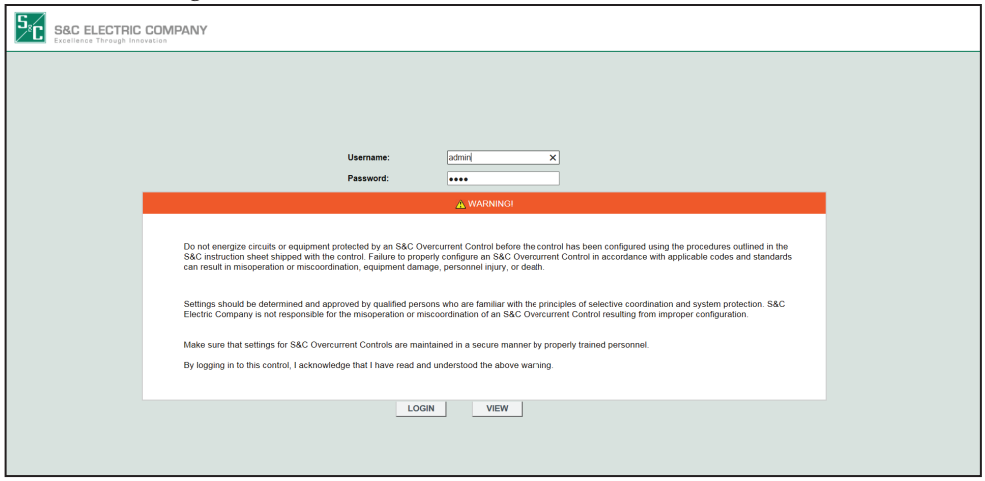


Figure 15. Enter the default admin username and password.

STEP 2. Click on the **Control Settings** tab on the side menu. Then navigate to the "Change Admin Password" section of the *Control Settings* screen. See Figure 16.

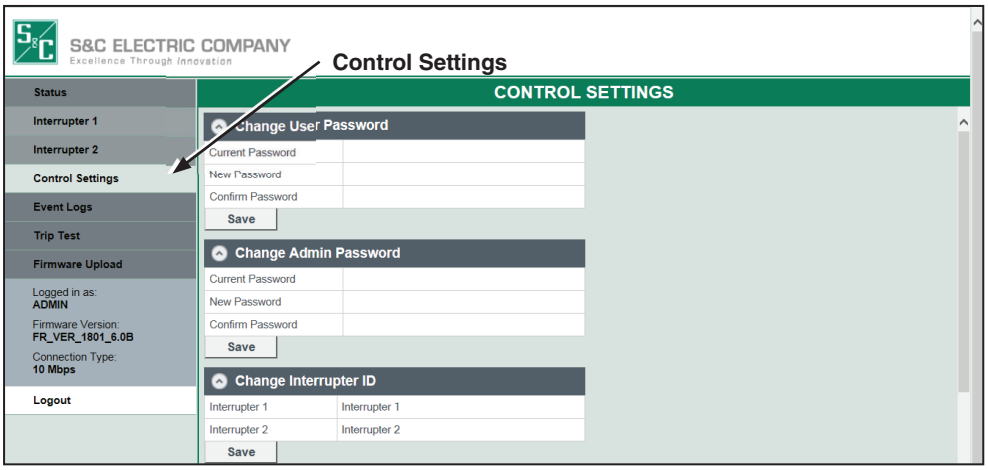


Figure 16. The Change Admin Password menu.

STEP 3. If desired, click on the Eye icon on the right side of the **Current Password** field to reveal the text of the password. See Figure 17.

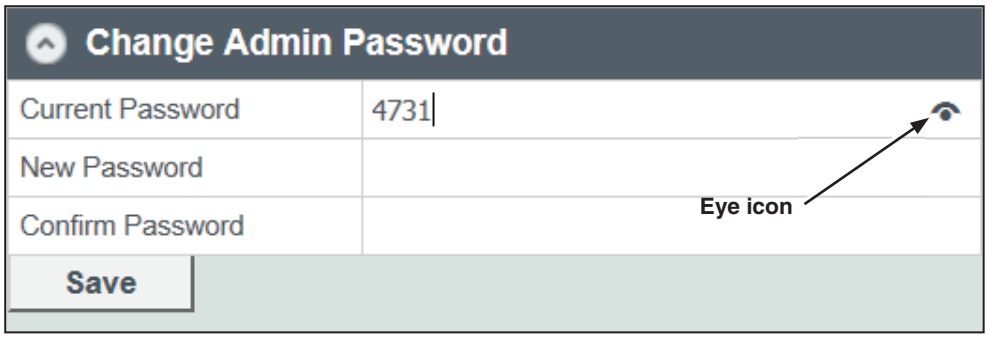


Figure 17. Click on the Eye icon to reveal the password.

STEP 4. Enter a new password, an alpha-numeric sequence of a minimum of 4 characters and a maximum of 12 characters with at least one letter, one number and one special character: !, #, $, *, _ or – into the **New Password** field. Passwords are case sensitive. Re-enter the new password in the **Confirm Password** field.

STEP 5. Click on the **Save** button directly under the "Change Admin Password" section. A message that the password has been saved successfully will open. See Figure 18.

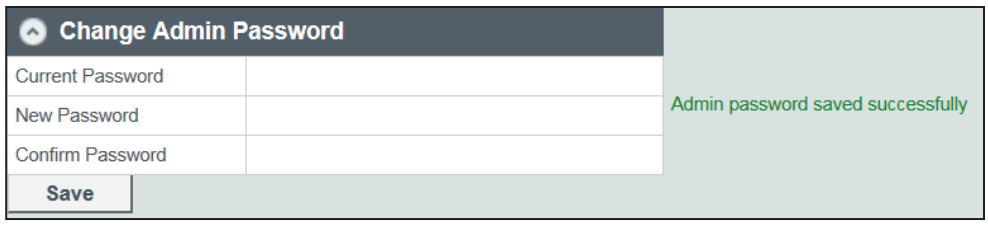


Figure 18. Click on the Save button. A confirmation message will display.

Changing the User Password

To change the User password:

STEP 1. At the *Login* screen, enter the user username and password. See Figure 19.

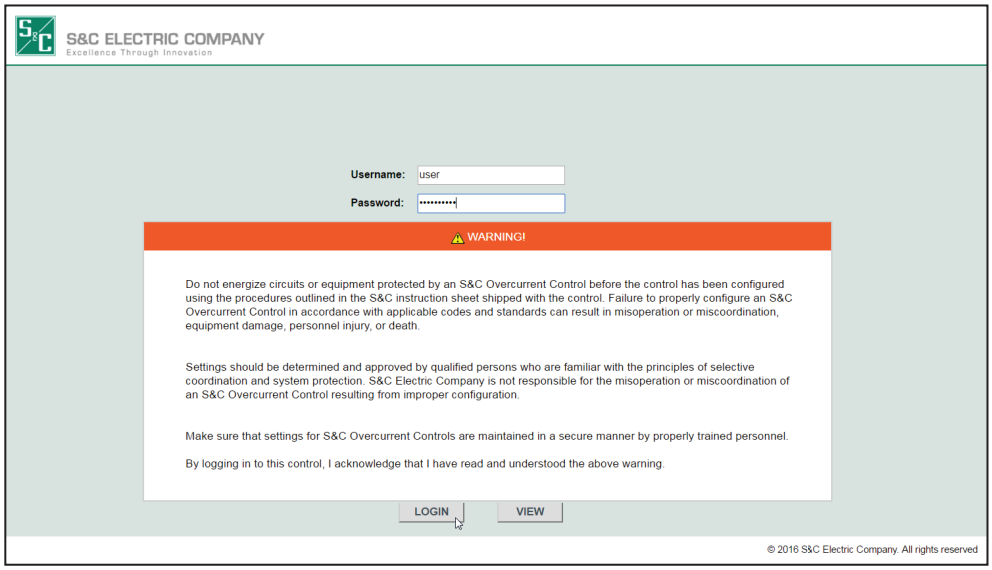


Figure 19. Enter the username and password.

When logging in with the user login for the first time, a prompt to change the password will open in the **Control Settings** menu.

STEP 2. Enter the default user password "6601". See Figure 20.

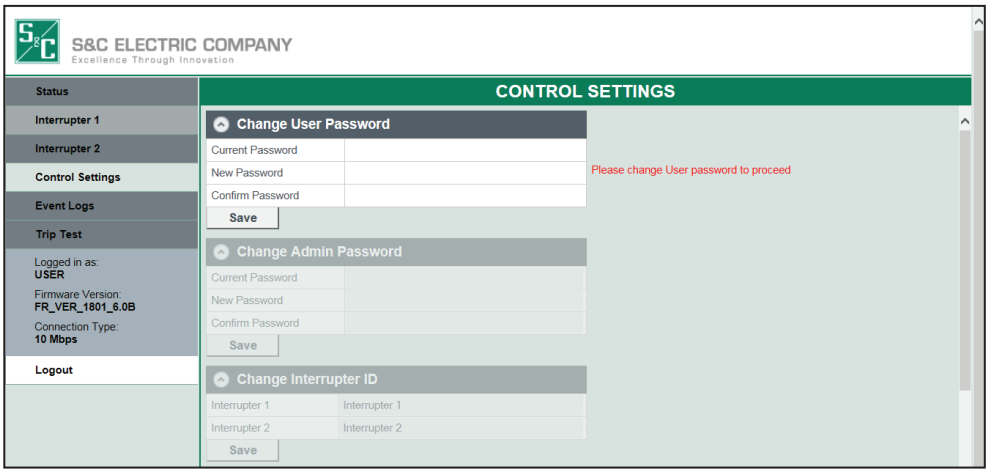


Figure 20. The Change User Password menu.

STEP 3. If desired, click on the Eye icon to on the right side of the **Current Password** field to reveal the text of the password. See Figure 21.

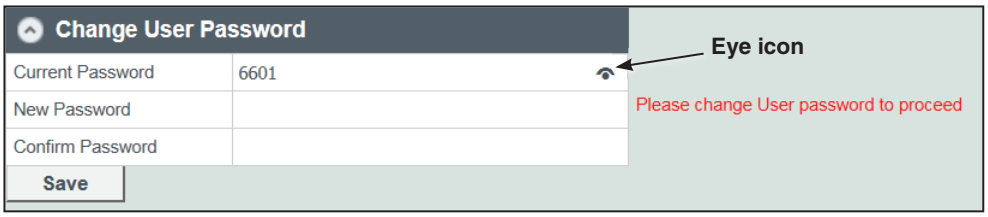


Figure 21. Click on the Eye icon to reveal the password.

STEP 4. Enter a new password, an alpha-numeric sequence of a minimum of 4 characters and a maximum of 12 characters with at least 1 letter, 1 number and 1 special character: !, #, $, *, _ or – into the **New Password** field. Passwords are case sensitive. Re-enter the new password in the **Confirm Password** field.

STEP 5. Click on the **Save** button. A message that the password has been saved successfully will open. See Figure 22.

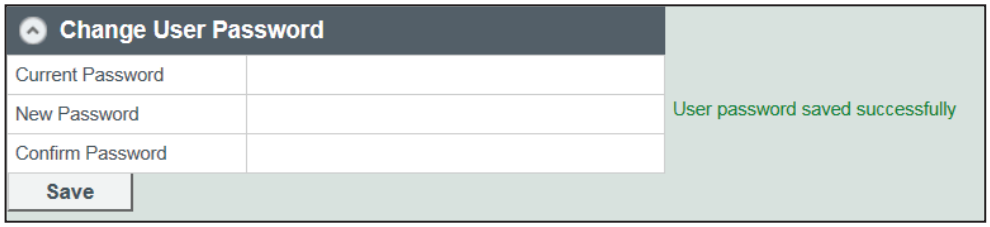


Figure 22. Click on the Save button. A confirmation message will display.

NOTICE

The overcurrent control will logout the user after five minutes of inactivity. Any settings not saved before the inactivity logout will be lost.

The *Status* screen and menus provide a summary of the status of the overcurrent control, measurement of the load current of the associated fault interrupters, and the control settings. It also provides a summary of the login status, the overcurrent control serial number and MAC address, and the firmware installed on the control. This page can be viewed from admin and user logins and when using the **View** button.

The overcurrent control has a physical LED status display located on the outside of the electronics module that is visible when the overcurrent control is removed from its enclosure. An on-screen replica of this status display can be viewed when a computer is connected to the control. See Figure 23. See Table 2 for the LED key.

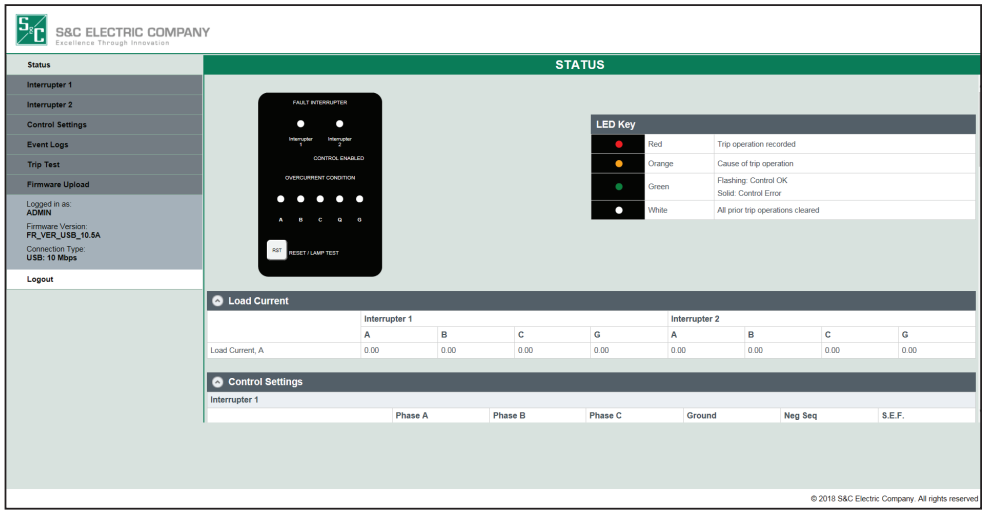


Figure 23. The *Status* screen.

Table 2. Status Display LED Key

LED Key	Description
Orange	Trip operation recorded
Red	Element initiated trip
Green	Flashing: Control OK
	Solid: Control Error
White	All prior trip operations cleared

Status Display "Black Box"

The FAULT INTERRUPTER 1 and FAULT INTERRUPTER 2 orange LED displays indicate whether a fault interrupter has experienced a **Trip** event initiated by the overcurrent control. If more than one fault interrupter has responded to a fault, both LED displays light. See Figure 23 on page 25.

During a **Trip** event, the FAULT INTERRUPTER LED blinks after passing the minimum pickup level. If the current goes below the fault level and the control resets without initiating a trip operation, the FAULT INTERRUPTER LED turns white again. If the fault interrupter trips, the LED glows solid orange. The appropriate events (pickup, timing, trip, or reset) are logged in the event log.

The CONTROL ENABLED indicator LED flashes green when the overcurrent control is powered. When the control is operating normally, the indicator blinks. If the control is in an error state, or a firmware update is being performed, the CONTROL ENABLED indicator LED glows a solid green. If the control is displaying solid green when the firmware is NOT being updated, contact your local S&C Sales Office or the S&C Global Support and Monitoring Center at 1-888-762-1100 (or 1-773-338-1000 outside the U.S.) for support.

The OVERCURRENT CONDITION A, B, and C indicator LEDs show the phase involved with a **Phase Overcurrent Trip** event, if one has occurred. If more than one phase is involved in a **Trip** event, more than one lamp may be lit. The Q and G indicators shows whether there was a control-initiated **Trip** event in response to a **Negative-Sequence** "Q" or **Ground** "G" protective setting. If more than one fault interrupter has responded to a fault, more than one lamp lights. See Table 3 for a key to the overcurrent conditions:

Table 3. Overcurrent Conditions

Key	Description
A	A Phase fault
B	B Phase fault
C	C Phase fault
Q	Negative-Sequence trip
G	Ground

The RESET/LAMP TEST button is used on both the status screen replica and on the physical control to test the physical LED lights and to clear the fault indication LED lights.

To test the LED lights:

Click on and hold the **RST** (**Reset/Lamp Test**) button on screen; or press and hold the RST RESET/LAMP TEST button on the physical control. All LEDs light, and the **Control Status** display shows the most current status of the control.

To clear the OVERCURRENT CONDITION indicators after an **Overcurrent** event:

Click on and hold the **RST** button on the screen or press and hold the RESET/LAMP TEST button on the control until all LEDs (except for the OCC ENABLED LED, which remains blinking) show a solid color.

Load Current Menu

The **Load Current** menu shows a snapshot of the load current going through the two fault interrupters or through ground. When the control is removed from its enclosure for service center programming, the load current will be zero in all interrupting ways and to ground.

Control Settings Menu

The **Control Settings** menu shows the **Overcurrent Protection** settings for the control. The overcurrent control settings cannot be edited on this menu.

About Menu

The **About** menu shows the login status of the control, the control name, the MAC address of the control, and the firmware version.

The user and admin passwords are changed on the **Control Settings** selection tab. It's also where the Interrupter ID can be modified, where the global settings can be modified, and where the control can be reset back to factory defaults. This is also where the **USB Network** settings can be viewed. **USB Network** settings are not editable.

With the exception of changing the user password, only the admin login can make changes to the **Control Settings** menu.

Some of the control settings are programmed by S&C at the factory. The interrupter IDs are programmed to match the "way" designation of the Vista switchgear. S&C also programs the following Global Settings: **Continuous Current Rating**, **Fault Interrupting Rating**, and **Trip Mode**.

Before energizing the Vista switchgear, make sure to:

- Change the User and Admin passwords from their factory default settings
- Confirm the system frequency (60 Hz is the default setting)
- Confirm the continuous current rating matches the ratings of the Vista switchgear, as listed on the nameplate
- Confirm the fault-interrupting rating matches the rating of the Vista switchgear as listed on the nameplate
- Check that the **Trip Mode** setting matches the capabilities of the switchgear and the application. Note that single-phase fault interrupters can be configured for either the **Single-Phase Trip/Single-Phase Lockout** or **Single-Phase Trip/Three-Phase Lockout** setting. Three-phase trip/three-phase lockout fault interrupters cannot be set to the **Single-Phase Trip** setting or the switchgear may not respond properly to faults.

Changing the Admin and User Password

NOTICE

The overcurrent control will logout the user after five minutes of inactivity. Any settings not saved before the inactivity logout will be lost.

To change the admin or user password:

STEP 1. Click on the **Control Settings** tab in the Selection menu. Scroll down to the **Change Admin** or **Change User Password** tab. Enter the present password. When changing the admin password for the first time, enter the default password noted in the "Logging In for the First Time" section on page 21. See Figure 24.

STEP 2. Enter a new password, an alpha-numeric sequence of a minimum of four characters and a maximum of 12 characters with at least one letter, one number, and one special character: !, #, $, *, _ or – into the **New Password** field. Passwords are case sensitive. Re-enter the new password in the **Confirm Password** field.

STEP 3. Click on the **Save** button directly under the Change Admin Password section. A message that the password has been saved successfully will display.

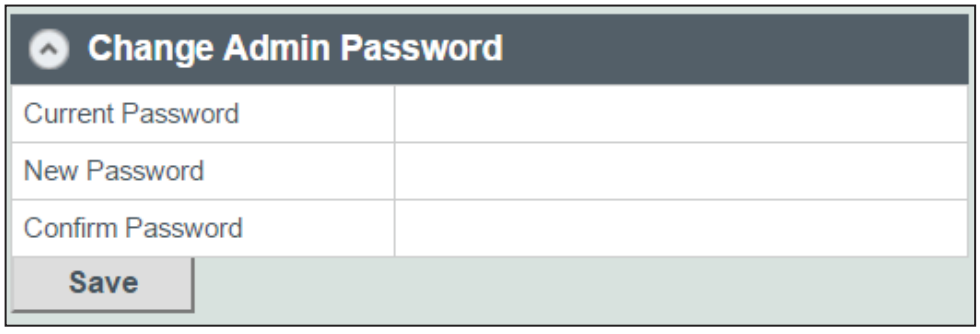


Figure 24. The Change Admin Password menu.

Changing the Interrupter ID

At the factory, S&C Electric Company renames the fault interrupter to match its way designation depending on the switchgear configuration. (i.e. if the fault interrupter is on Way 4, the fault interrupter will be named "Way 4.")

The fault interrupter IDs can be changed to match the application.

To change the names:

STEP 1. Select the appropriate interrupter field and type in the desired name. See Figure 25. Interrupter names can be up to 16 characters excluding special characters such as "/, &, #, $, and :". This name will be propagated throughout the **Overcurrent Control** settings and will change the name in the **Selection** menu, Event logs, *Trip test* screen, and *Status* screen.

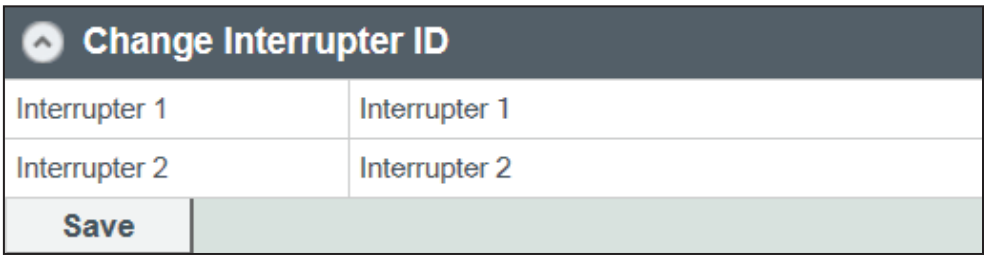


Figure 25. The Change Interrupter ID menu.

STEP 2. Click on the **Save** button. A message that the setting has been saved will display.

Changing the Global Settings

The global settings are programmed at the factory to match the Vista switchgear model. Recheck all settings to make sure they are accurate before energizing the switchgear. If **Single-Pole Trip/Three-Phase Lockout** settings are required, they should be selected under the **Trip Mode** menu. If the switchgear is applied at 50 Hz, select 50 Hz under the **Global Settings** menu.

NOTICE

If problems are encountered trying to change the Global Settings while running Microsoft Internet Explorer in compatibility mode, disable compatibility mode or try again using a different web browser.

NOTICE

The overcurrent control will logout the user after five minutes of inactivity. Any settings not saved before the inactivity logout will be lost.

Nominal Frequency

The **Nominal Frequency** setting configures the overcurrent control for the operating frequency of the switchgear. To change the switchgear frequency:

STEP 1. From the **Global Settings** menu, select the frequency setting to match the system operating frequency. See Figure 26.

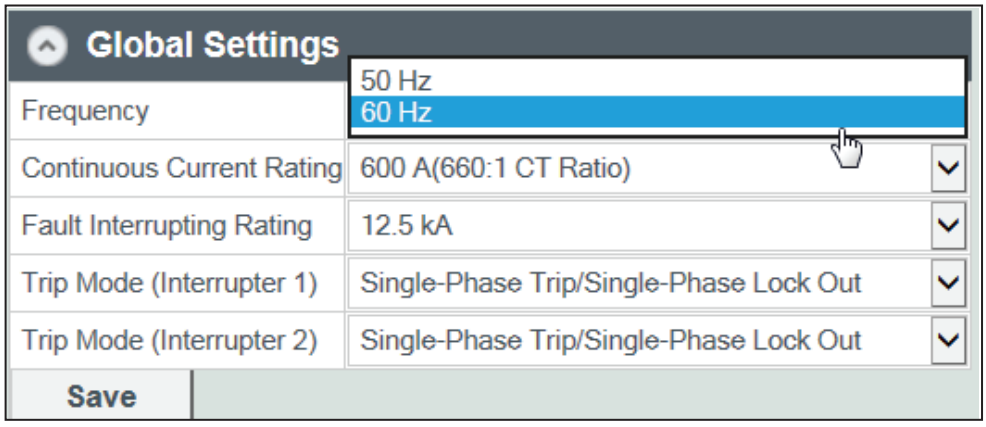


Figure 26. Select the nominal frequency from the Global Settings menu.

STEP 2. Click on the **Save** button. A message will display showing that the setting has been saved.

Continuous Current

The **Continuous Current** setting configures the overcurrent control for the turns ratio of the switchgear's current transformers. The turns ratio depends on the continuous current rating of the switchgear:

Continuous Current, A	Turns Ratio
600	660:1
900/1200	1320:1

To change the **Continuous Current** setting:

STEP 1. From the **Global Settings** menu, select the continuous current setting to match the continuous current listed on the switchgear nameplate. See Figure 27.

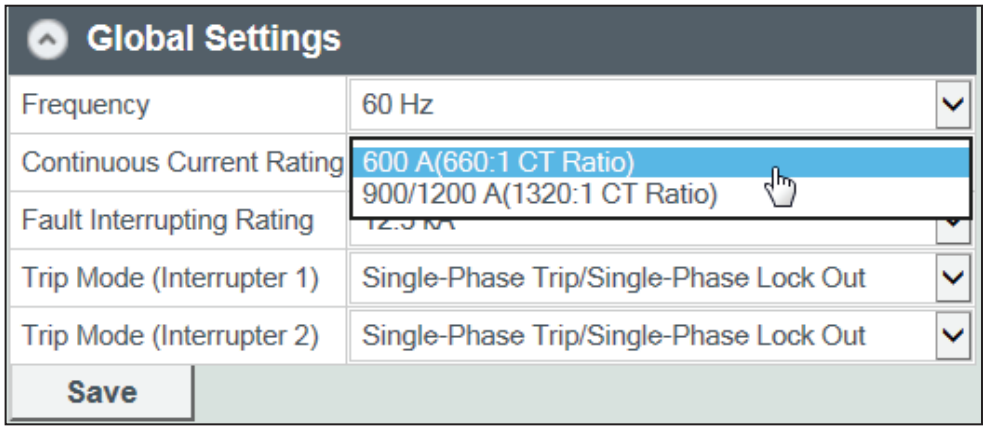


Figure 27. Select the continuous current from the Global Settings menu.

STEP 2. Click on the **Save** button. A message will display showing that the setting has been saved.

Interrupter Rating

NOTICE

Make sure to select the correct interrupting rating for the switchgear. These ratings will set the upper limit of the **Definite Time Current**, **Low-Current Cutoff**, and **Minimum Trip Current** values.

The **Interrupter Rating** setting configures the overcurrent control for the interrupting rating of the switchgear. There are three interrupter rating settings:

12.5 kA

16 kA

25 kA

To change the **Interrupter Rating** setting:

STEP 1. From the **Global Settings** menu, select the **Interrupter Rating** setting to match the interrupting rating listed on the switchgear nameplate. See Figure 28.

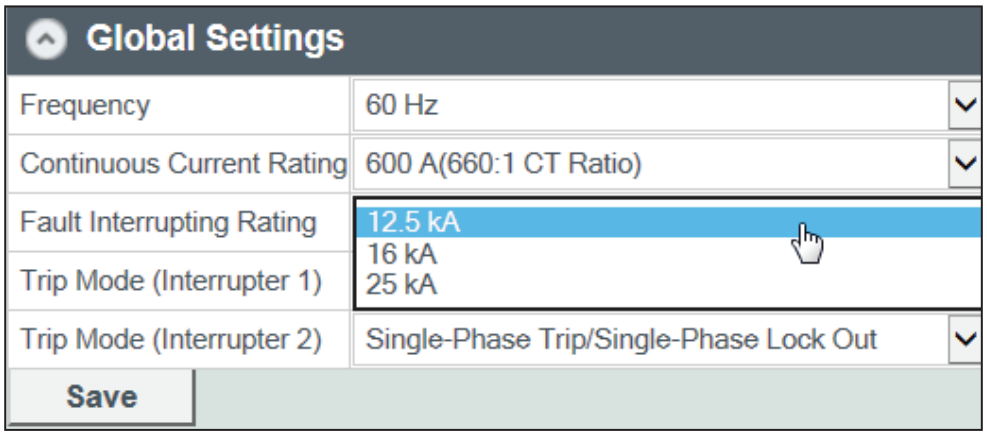


Figure 28. Select the Fault-Interrupter Rating from the Global Settings menu.

STEP 2. Click on the **Save** button. A message will display showing that the setting has been saved.

Trip Mode, Interrupter 1 and Interrupter 2

The **Trip Mode** setting configures the interrupting setting for the available interrupting ways (Interrupter 1 and Interrupter 2) of the overcurrent control. There are three trip modes available for Vista Underground Distribution Switchgear:

- **Single-Phase Trip/Single-Phase Lockout**
- **Single-Phase Trip/Three-Phase Lockout**
- **Three-Phase Trip/Three-Phase Lockout**

STEP 1. Select a **Trip Mode** setting from the **Trip Mode** menu:

(a) Select the **Single-Phase Trip/Single-Phase Lockout** mode if the interrupting way is equipped with single-pole fault interrupters. See Figure 29. When the **Single-Phase Trip/Single-Phase Lockout setting** is set, phase A, B, and C can be configured independently, and only the affected phase will trip and lockout in response to an event.

(b) Select the **Single-Phase Trip/Three-Phase Lockout** mode if the interrupting way is equipped with single-pole fault interrupters. See Figure 29. When the **Single-Phase Trip/Three Phase Lockout** setting is set, the **Time Overcurrent Phase Protection** settings on the interrupter page are configured using the settings listed under Phase A. All three phases will trip and lockout in response to an event.

(c) Select the **Three-Phase Trip/Three-Phase Lockout** mode if the interrupting way is equipped with three-pole fault interrupters. See Figure 29. When the **Three-Phase Trip/Three-Phase Lockout** setting is selected, the **Time Overcurrent Phase Protection** settings in the interrupter page are configured using the settings listed under Phase B. All three gang-operated phases will trip and lockout in response to an event.

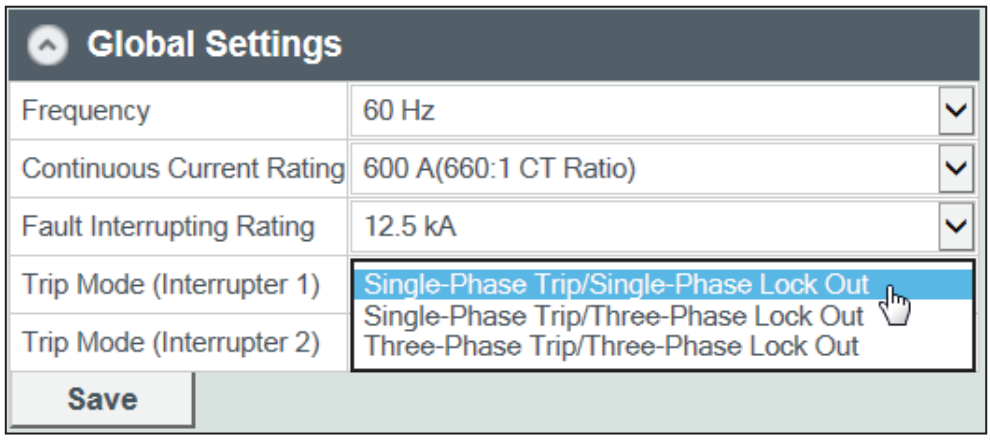


Figure 29. Select the Trip Mode setting for Interrupter 1 and Interrupter 2 from the Global Settings Menu.

STEP 2. Click on the **Save** button and check for success confirmation message.

USB Network Settings

The **USB network** settings are not user-editable. Refer to the "Installing the USB Driver" section on page 10 for information on installing the USB driver. The factory default USB settings are:

USB Network	Settings
MAC Address	xx:xx:xx:xx:xx:xx (Set at Factory)
IP Address	10.1.11.58

The Overcurrent Protection Settings Available for Each Trip Mode

Single-Phase Trip/Single-Phase Lockout

An interrupter in **Single-Phase Trip/Single-Phase Lockout** mode is equipped with single-pole fault interrupters. Phases A, B, and C of the interrupting way can be configured independently, and only the affected phase will trip and lock out in response to a Trip event. **Ground Protection**, **Negative Sequence**, and **Sensitive Earth Fault** settings are disabled. **Single-Phase Trip/Single-Phase Lockout** mode is only available on 12.5-kA and 16-kA models of Vista Underground Distribution Switchgear.

Single-Phase Trip/Three-Phase Lockout

An interrupter in **Single-Phase Trip/Three-Phase Lockout** mode is equipped with single-pole fault interrupters. Phase A, B, and C are all configured with the same protective settings, selected under Phase A. All three phases will trip and lock out in response to a Trip event. **Ground Protection**, **Negative Sequence**, and **Sensitive Earth Fault** protection settings are available for switchgear in this **Trip Mode** setting. **Single-Phase Trip/Three-Phase Lockout** mode is only available on 12.5-kA and 16-kA Vista switchgear models.

Three-Phase Trip/Three-Phase Lockout

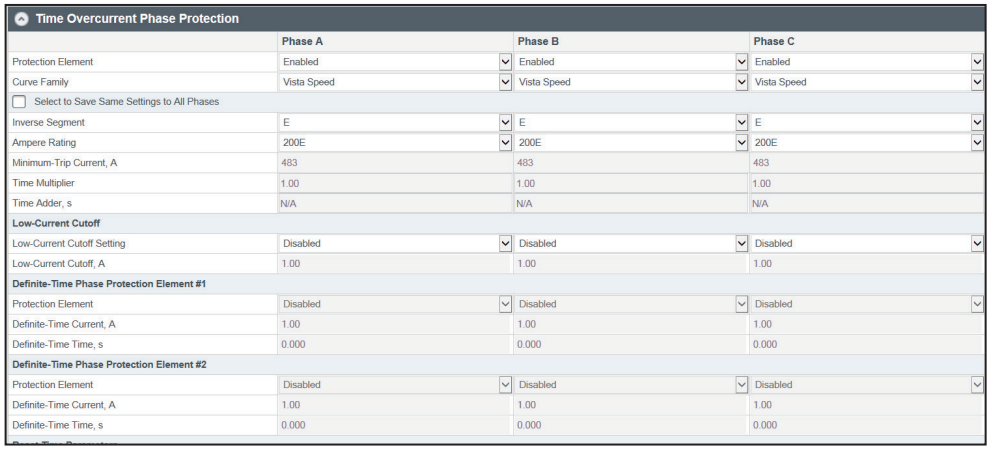
An interrupting way in **Three-Phase Trip/Three-Phase Lockout** mode is equipped with three-pole fault interrupters. Phase B is used to configure the settings for the three-pole fault interrupter. All three phases will trip and lockout in response to a Trip event. **Ground Protection**, **Negative Sequence**, and **Sensitive Earth Fault** protection settings are available for switchgear in this **Trip Mode** setting.

Programming Interrupter 1 and Interrupter 2

Each overcurrent control is capable of operating up to two fault interrupters. To differentiate between the two fault interrupters, they are called Interrupter 1 and Interrupter 2 in this instruction sheet, though they will be renamed at the factory according to their "Way" designation. These interrupters may be renamed by the user. See the "Changing the Interrupter ID" section on page 29.

On switchgear with only one fault-interrupting way, only Interrupter 1 is used in the control. On switchgear with more than two fault-interrupting ways, there will be more than one overcurrent control. The fault interrupters controlled by the overcurrent control will be named according to their "Way" designation and will be clearly labeled on the outside of the overcurrent control enclosure.

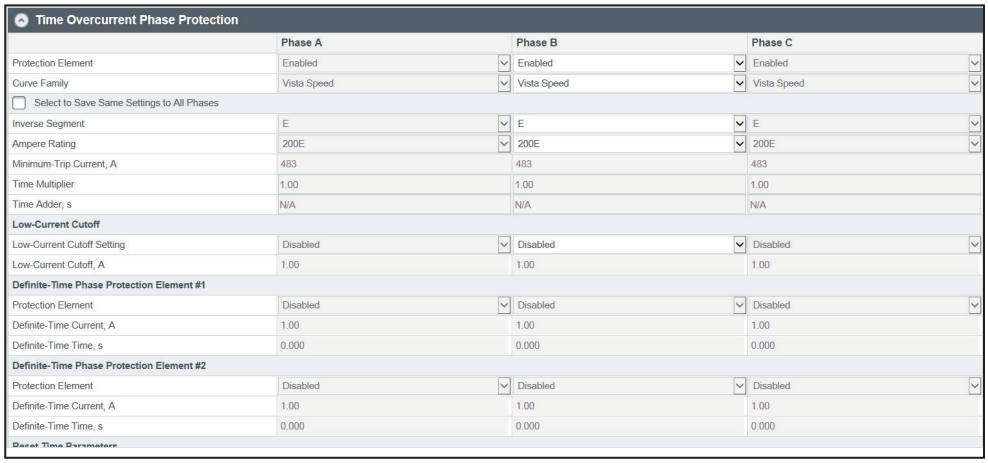
The **Interrupter 1** and **Interrupter 2** menus allow the user to change the protective settings for the selected fault interrupter. See Figures 30 and 31 on page 35.



Time Overcurrent Phase Protection

	Phase A	Phase B	Phase C
Protection Element	Enabled	Enabled	Enabled
Curve Family	Vista Speed	Vista Speed	Vista Speed
Select to Save Same Settings to All Phases			
Inverse Segment	E	E	E
Ampere Rating	200E	200E	200E
Minimum-Trip Current, A	483	483	483
Time Multiplier	1.00	1.00	1.00
Time Adder, s	N/A	N/A	N/A
Low-Current Cutoff			
Low-Current Cutoff Setting	Disabled	Disabled	Disabled
Low-Current Cutoff, A	1.00	1.00	1.00
Definite-Time Phase Protection Element #1			
Protection Element	Disabled	Disabled	Disabled
Definite-Time Current, A	1.00	1.00	1.00
Definite-Time Time, s	0.000	0.000	0.000
Definite-Time Phase Protection Element #2			
Protection Element	Disabled	Disabled	Disabled
Definite-Time Current, A	1.00	1.00	1.00
Definite-Time Time, s	0.000	0.000	0.000

Figure 30. The Time Overcurrent Phase Protection menu, single-phase trip/single-phase lockout.



Time Overcurrent Phase Protection

	Phase A	Phase B	Phase C
Protection Element	Enabled	Enabled	Enabled
Curve Family	Vista Speed	Vista Speed	Vista Speed
Select to Save Same Settings to All Phases			
Inverse Segment	E	E	E
Ampere Rating	200E	200E	200E
Minimum-Trip Current, A	483	483	483
Time Multiplier	1.00	1.00	1.00
Time Adder, s	N/A	N/A	N/A
Low-Current Cutoff			
Low-Current Cutoff Setting	Disabled	Disabled	Disabled
Low-Current Cutoff, A	1.00	1.00	1.00
Definite-Time Phase Protection Element #1			
Protection Element	Disabled	Disabled	Disabled
Definite-Time Current, A	1.00	1.00	1.00
Definite-Time Time, s	0.000	0.000	0.000
Definite-Time Phase Protection Element #2			
Protection Element	Disabled	Disabled	Disabled
Definite-Time Current, A	1.00	1.00	1.00
Definite-Time Time, s	0.000	0.000	0.000

Figure 31. The Time Overcurrent Phase Protection menu, three-phase trip/three-phase lockout.

Different TCC families have different setting selections and editable fields. Fields that are not editable will be grey. Selections that are invalid will prompt an error message, and any cell with an invalid value will be highlighted in yellow after clicking on the **Save** button. An error message will also appear at the top of the screen in red text describing the error. See the "Warnings Messages" section on page 62 for more information on warning and error messages.

Select protective settings as follows:

STEP 1. Select the **Interrupter 1** or **Interrupter 2** option from the **Selection** menu.

STEP 2. Select the desired **Time Overcurrent Phase Protection** settings. Definitions for the **Time Overcurrent Phase Protection**, **Low-Current Cutoff**, **Definite Time 1 and 2**, **Ground Protection, Negative Sequence**, and **Sensitive Earth Fault** settings are available in the "Overcurrent Protection Setting Definitions" section on page 38. A listing of the available **Time Overcurrent Phase Protection** settings can be found in the "Overcurrent Control Settings" section on page 56.

For fault interrupters configured for **Three-Phase Tripping** or **Single-Phase Trip/Three-Phase Lockout** mode, the **Time Overcurrent Ground**, **Negative Sequence**, and **Sensitive Earth Fault** protection settings can be enabled if required. These features are disabled by default when shipped from the factory. See Figure 32.

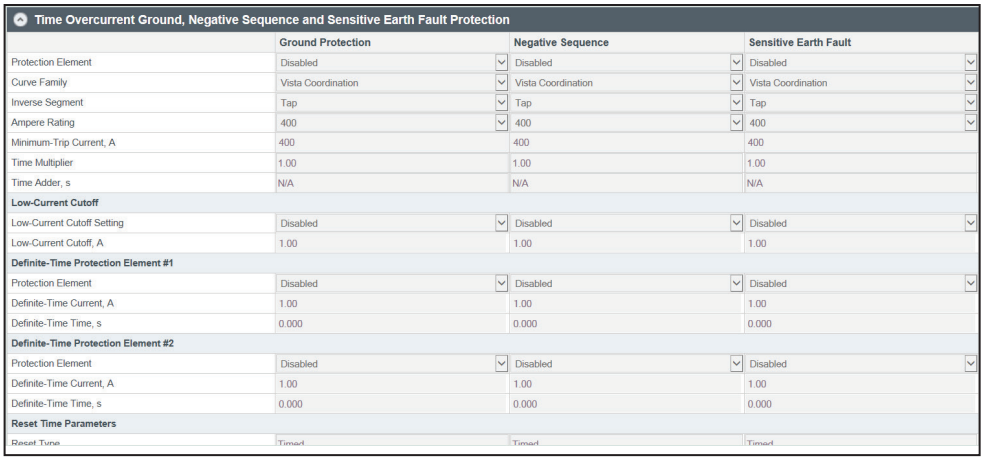


Figure 32. The Time Overcurrent Ground, Negative Sequence, and Sensitive Earth Fault Protection menu.

STEP 3. After entering the **Overcurrent Protection** settings, click on the **Save** button. A confirmation message will be displayed. See Figure 33.

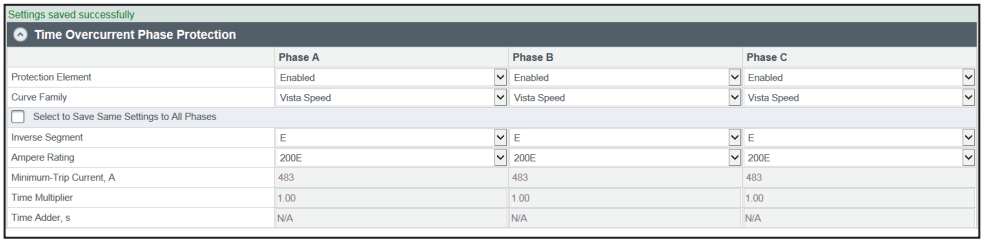


Figure 33. A Time Overcurrent Phase Protection confirmation message.

If the coordination settings selections are invalid, or contradictory, an error message explaining the problem will appear, and any cell with an invalid value will be highlighted in yellow after clicking on the **Save** button. Please note that selections will not be saved until the error is fixed. See Figure 34.

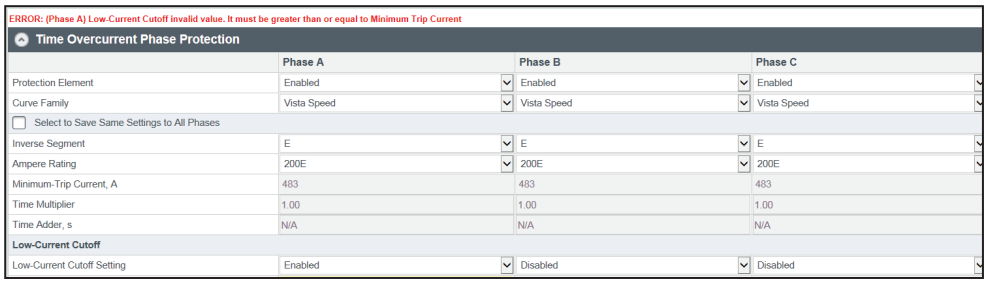


Figure 34. A Time Overcurrent Phase Protection Error message.

STEP 4. When programming the overcurrent control is completed, make sure to replace the data-port cover and ensure it is secure. S&C recommends re-checking the control settings on the *Status* screen before leaving the overcurrent control.

NOTICE

Make sure the data-port cover is secure after programming the control. Failure to secure the data-port cap may result in damage to the data port. A control with a damaged data port cannot be accessed via personal computer.

Time Overcurrent Phase Protection

A list of the **Overcurrent Protection** settings and their definitions follows:

(Time Overcurrent Phase Protection) Protection Element – Select to enable or disable phase protection settings for the selected interrupter. This element trips the fault interrupter when current on one or more phases exceeds the pickup value. When disabled, only the **Definite Time** settings and/or **Ground, Negative Sequence**, and **Sensitive Earth Fault** settings are used.

Curve Family – Select the TCC Curve Family: IEC, IEEE, Vista Coordination, or Vista Speed. For more details on the curve families, see the "Overcurrent Control Settings" section on page 56 for the curve families available. The TCC curves available can also be found in S&C Information Bulletin 680-211, "Time-Current Characteristic Curves."

Inverse Segment – Select the desired segment from the drop-down list of curves.

Ampere Rating – Select the desired ampere rating from the drop-down menu for the Vista Coordination and Vista Speed curve families. The IEEE and IEC curves do not use the **Ampere Rating** field.

Minimum-Trip Current, A – This is the current at which the inverse curve begins timing. When using Vista Coordination or Vista Speed curves, the minimum-trip current is set automatically according to the ampere rating selected. For IEEE and IEC curves, enter the minimum trip current value in increments of 1 ampere. The value should always be equal to or lower than the low-current cutoff.

Time Multiplier – This is the time multiplier for the inverse curve. The time multiplier is only used with IEEE and IEC curves.

Time Adder, s – This is the time adder for the inverse curve. The time adder is only used with IEEE and IEC curves.

Low-Current Cutoff (Time Overcurrent Phase Protection)

Low-Current Cutoff – Select to enable or disable the low-current cutoff. It is not possible to enable the **Low-Current Cutoff** setting if the associated **Time Overcurrent Protection** element is disabled.

Low-Current Cutoff, A – This is the current at which the TCC curve begins timing. This value must be equal to or greater than the lowest pickup value of the inverse curve.

Definite-Time Phase Protection (Time Overcurrent Phase Protection)

Definite-Time Phase Protection (Element #1 and Element #2) Select to enable or disable protection settings for the selected way. Definite Time selection is available if a IEC, IEEE, or Vista coordination phase TCC curve is selected or if no TCC curve is specified for phase protection. **Definite-Time Phase Protection** settings will trip the fault interrupter if the selected current exceeds the setting value for the specified time setting.

The **Definite Time Phase Protection #1** element must be enabled for the **Definite Time Phase Protection #2** element to be enabled. When programming both the **Definite Time #1** element and the **Definite Time #2** element, the **Definite Time #2** element must be set at a higher current and a faster speed than the **Definite Time #1** element or an error will occur. The **Definite Time #1 and #2** elements also must be greater than the **Low-Current Cutoff** setting and the minimum trip current. The time must be faster than the time-overcurrent protection curve.

Definite-Time Current, A – This is the current at which the **Definite Time Current** element picks up.

Definite-Time Time, s – This is the time delay after the **Definite-Time Current** value is exceeded at which the **Definite Time** element initiates a trip.

Reset Time Parameters (Time Overcurrent Phase Protection)

Reset Type – The Reset parameter is a definite time reset method and the **Type** field is always set to **Timed** mode.

Reset Time, s – Enter the time delay for the definite time reset, if desired. Accumulated value will reset to zero after **Reset Time** setting has elapsed.

Ground Protection

(Ground Protection) Protection Element – Select to enable or disable protection settings for the selected way. The **Ground Protection** element trips the fault interrupter when the computed residual of the three-phase current exceeds the minimum trip current for the time value set by the **Inverse Curve** or **Definite Time** settings.

Curve Family – Select the TCC Curve Family: IEC, IEEE, or Vista Coordination curve. For more details on the curve families, see the "Overcurrent Control Settings" section on page 56 for the curve families available. The TCC curves available can also be found in S&C Information Bulletin 680-211, "Time-Current Characteristic Curves."

Inverse Segment – Select the desired segment from the drop-down list of curves.

Ampere Rating – Select the ampere rating from the drop down menu for Vista Coordination TCCs. The IEEE and IEC curves do not use the **Ampere Rating** field.

Minimum-Trip Current, A – This is the current at which the inverse curve begins timing. When using Vista coordination curves, the minimum-trip current is set automatically according to the ampere rating selected. For IEEE and IEC curves, enter the **Minimum Trip Current** value in increments of 1 ampere. The value should always be equal to or lower than the low-current cutoff.

Time Multiplier – This is the time multiplier for the inverse curve. The time multiplier is only used with IEEE and IEC curves.

Time Adder, s – This is the time adder for the inverse curve. The time adder is only used with IEEE and IEC curves.

Low-Current Cutoff (Ground Protection)

Low-Current Cutoff – Select to enable or disable the low-current cutoff. It is not possible to enable the low-current cutoff setting if the associated **Time-Overcurrent Protection** element is disabled. The **Low-Current Cutoff** setting will not change automatically when a different curve family is selected. This value will only change when modified by the user.

Low-Current Cutoff, A – This is the current at which the TCC curve begins timing. This value must be equal to or greater than the lowest pickup value of the inverse curve.

Definite-Time Phase Protection (Ground Protection)

Definite-Time Protection Elements (Element #1 and Element #2) Select to enable or disable protection settings for the selected way. Definite Time selection is available if a IEC, IEEE, or Vista coordination phase TCC curve is selected or if no TCC curve is specified for phase protection. **Definite-Time Phase Protection** settings will trip the fault interrupter if the selected current exceeds the setting value for the specified time setting.

The **Definite Time Phase Protection #1** element must be enabled for the **Definite Time Phase Protection #2** element to be enabled. When programming both the **Definite Time #1** element and the **Definite Time #2** element, the **Definite Time #2** element must be set at a higher current and a faster speed than the **Definite Time #1** element or an error will occur. The **Definite Time #1** and **Definite Time #2** elements also must be greater than the **Low-Current Cutoff** setting and the minimum trip current. The time must be faster than the time-overcurrent protection curve.

Definite-Time Current, A – This is the current at which the **Definite Time** element picks up.

Definite-Time Time, s – This is the time delay at which the **Definite Time Current** element picks up.

Reset Time Parameters (Ground Protection)

Reset Type – The Reset parameter is a definite time reset method and the **Type** field is always set to **Timed** mode.

Reset Time, s – Enter the time delay for the definite time reset. Accumulated value will reset to zero after the **Reset Time** setting has elapsed.

Negative Sequence

(Negative Sequence) Protection Element – Select to enable or disable protection settings for the selected way. The **Negative Sequence** element trips the fault interrupter when the negative-sequence component of the three-phase currents exceeds the pickup value for the time value set by the **Inverse Curve** or the **Definite Time** settings.

Curve Family – Select the TCC curve family: IEC, IEEE, or Vista Coordination. For more details on the curve families, see the "Overcurrent Control Settings" section on page 56 for the curve families available. The TCC curves available can also be found in S&C Information Bulletin 680-211, "Time-Current Characteristic Curves."

Inverse Segment – Select the desired segment from the drop-down list of curves.

Ampere Rating – Select the ampere rating from the drop down menu for Vista Coordination TCC curves. The IEEE and IEC curves do not use the ampere rating field.

Minimum-Trip Current, A – This is the current at which the inverse curve begins timing. When using Vista Coordination curves, the minimum-trip current is set automatically according to the ampere rating selected. For IEEE and IEC curves, enter the **Minimum Trip Current** value in increments of 1 ampere. The value should always be equal to or lower than the low-current cutoff.

Time Multiplier – This is the time multiplier for the inverse curve. The time multiplier is only used with IEEE and IEC curves.

Time Adder, s – This is the time adder for the inverse curve. The time adder is only used with IEEE and IEC curves.

Low-Current Cutoff (Negative Sequence)

Low-Current Cutoff - Select to enable or disable the low-current cutoff. It is not possible to enable the **Low-Current Cutoff** setting if the associated **Time-Overcurrent Protection** element is disabled. The **Low-Current Cutoff** setting will not change automatically when a different curve family is selected. This value will only change when modified by the user.

Low-Current Cutoff, A – This is the current at which the TCC curve begins timing. This value must be equal to or greater than the lowest pickup value of the inverse curve.

Definite-Time Phase Protection (Negative Sequence)

Definite-Time Protection Elements (Element #1 and Element #2) Select to enable or disable protection settings for the selected way. Definite Time selection is available if a IEC, IEEE, or Vista coordination phase TCC curve is selected or if no TCC curve is specified for phase protection. **Definite-Time Phase Protection** settings will trip the fault interrupter if the selected current exceeds the setting value for the specified time setting.

The **Definite Time Phase Protection #1** element must be enabled for the **Definite Time Phase Protection #2** element to be enabled. When programming both the **Definite Time #1** element and the **Definite Time #2** element, the **Definite Time #2** element must be set at a higher current and a faster speed than the **Definite Time #1** element or an error will occur. The **Definite Time #1** and **Definite Time #2** elements also must be greater than the **Low-Current Cutoff** setting and the minimum trip current. The time must be faster than the time-overcurrent protection curve.

Definite-Time Current, A – This is the current at which the **Definite Time** element picks up. (Definite-Time Element 1 or Element 2.)

Definite-Time Time, s – This is the time delay at which the **Definite Time Current** element picks up. (Definite-Time Element 1 or Element 2.)

Reset Time Parameters (Negative Sequence)

Reset Type – The Reset parameter is a definite time reset method and the **Type** field is always set to **Timed** mode.

Reset Time, s – Enter the time delay for the definite time reset, if desired. Accumulated value will reset to zero after reset time has elapsed.

Sensitive Earth Fault

(Sensitive Earth Fault) Protection Element – Select to enable or disable protection settings for the selected way. The **Sensitive Earth Fault** element trips the fault interrupter when the computed residual of the three-phase currents exceeds the pickup value for the time value set by the **Inverse Curve** or **Definite-Time** settings.

Curve Family – Select the TCC curve family: IEC, IEEE, or Vista Coordination desired. For more details on the curve families, see the "Overcurrent Control Settings" section on page 56 for the curve families available. The TCC curves available can also be found in S&C Information Bulletin 680-211, "Time-Current Characteristic Curves."

Inverse Segment – Select the desired segment from the drop-down list of curves.

Ampere Rating – Select the ampere rating from the drop down menu for Vista Coordination TCC curves. The IEEE and IEC curves do not use the ampere rating field.

Minimum-Trip Current, A – This is the current at which the inverse curve begins timing.

When using Vista Coordination curves, the minimum-trip current is set automatically according to the ampere rating selected. For IEEE and IEC curves, enter the **Minimum Trip Current** value in increments of 1 ampere. The value should always be equal to or lower than the low-current cutoff.

Time Multiplier – This is the time multiplier for the inverse curve. The time multiplier is only used with IEEE and IEC curves.

Time Adder, s – This is the time adder for the inverse curve. The time adder is only used with IEEE and IEC curves.

Low-Current Cutoff (Sensitive Earth Fault)

Low-Current Cutoff – Select to enable or disable the low-current cutoff. It is not possible to enable the low-current cutoff setting if the associated **Time-Overcurrent Protection** element is disabled. The **Low-Current Cutoff** setting will not change automatically when a different curve family is selected. This value will only change when modified by the user.

Low-Current Cutoff, A – This is the current at which the TCC curve begins timing. This value must be equal to or greater than the lowest pickup value of the inverse curve.

Definite-Time Phase Protection (Sensitive Earth Fault)

Definite-Time Protection Elements (Element #1 and Element #2) Select to enable or disable protection settings for the selected way. Definite Time selection is available if a IEC, IEEE, or Vista coordination phase TCC curve is selected or if no TCC curve is specified for phase protection. **Definite-Time Phase Protection** settings will trip the fault interrupter if the selected current exceeds the setting value for the specified time setting.

The **Definite Time Phase Protection #1** element must be enabled for the **Definite Time Phase Protection #2** element to be enabled. When programming both the **Definite Time #1** element and the **Definite Time #2** element, the **Definite Time #2** element must be set at a higher current and a faster speed than the **Definite Time #1** element or an error will occur. The **Definite Time #1** and **Definite Time #2** elements also must be greater than the **Low-Current Cutoff** setting and the minimum trip current. The time must be faster than the time-overcurrent protection curve.

Definite-Time Current, A – This is the current at which the **Definite Time** element picks up.

Definite-Time Time, s – This is the time delay at which the **Definite Time Current** element picks up.

Reset Time Parameters (Sensitive Earth Fault)

Reset Type – The Reset parameter is a definite time reset method and the **Type** field is always set to **Timed** mode.

Reset Time, s – Enter the time delay for the definite time reset. Accumulated value will reset to zero after the reset time has elapsed.

Factory Default Protective Settings

If a factory-default reset is initiated, the overcurrent control is provided with the factory-default protective settings shown in Table 4 for both Interrupter 1 and Interrupter 2:

Table 4. Factory Default Protective Settings

	Phase A	Phase B	Phase C	Ground	Negative Sequence	Sensitive Earth Fault
Time Overcurrent Phase Protection Element						
Protection Element	ENABLED	ENABLED	ENABLED	DISABLED	DISABLED	DISABLED
Curve Family	Vista Speed	Vista Speed	Vista Speed	Vista Coord.	Vista Coord.	Vista Coord.
Inverse Segment	E	E	E	Tap	Tap	Tap
Ampere Rating	200E	200E	200E	400	400	400
Minimum-Trip Current, A	483	483	483	400	400	400
Time Multiplier	1.00	1.00	1.00	1.00	1.00	1.00
Time Adder, s	N/A	N/A	N/A	N/A	N/A	N/A
Low-Current Cutoff						
Low-Current Cutoff	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED
Low-Current Cutoff, A	1.00	1.00	1.00	1.00	1.00	1.00
Definite Time Phase Protection Element #1						
Protection Element	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED
Definite-Time Current, A	1.00	1.00	1.00	1.00	1.00	1.00
Definite-Time Time, s	0.000	0.000	0.000	0.000	0.000	0.000
Definite Time Phase Protection Element #2						
Protection Element	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED	DISABLED
Definite-Time Current, A	1.00	1.00	1.00	1.00	1.00	1.00
Definite-Time Time, s	0.000	0.000	0.000	0.000	0.000	0.000
Reset Time Parameters						
Reset Type	Timed	Timed	Timed	Timed	Timed	Timed
Reset Time, s	0.000	0.000	0.000	0.000	0.000	0.000

Factory Default Reset

NOTICE

S&C Electric Company programs the Global Settings (**Nominal Frequency, Continuous Current**, **Interrupting Rating**, and **Trip Mode**) at the factory to match the configuration of the Vista switchgear. The **Factory Default Reset** setting will restore the settings back to the overcurrent control pre-programmed state. **You MUST reprogram the Global Settings for the overcurrent control after performing a factory reset to match the configuration of the Vista switchgear that the overcurrent control is monitoring and controlling. Improper operation of the control and/or switchgear may result if global settings do not match the Vista Switchgear model.** See "Programming the Control Settings" on page 28 for instructions on how to reprogram the Global Settings.

The **Factory Default Reset** setting, which is available under the **Control Settings** tab, will restore the control to its pre-programmed state. When a **Factory Default Reset** command is initiated, the following settings will be restored:

- Global Settings:
  - **Continuous Current**: 600 A
  - **Fault Interrupting Rating**: 12.5 kA
  - **Trip Mode**: Single-phase trip/single-phase lockout
- All protective settings under the Interrupter 1 and Interrupter 2 menus (These will be restored to the "Factory Default Protective Settings." See Figure 4.
- Both the admin and user passwords will be reset to the factory-default values.

- The Interrupter ID for both ways will be reset to Interrupter 1 and Interrupter 2.

After initiating a reset to factory-default settings, make sure to follow the procedure described in the "After Resetting Factory Default Settings" section below.

To restore the overcurrent control to the default settings:

STEP 1. Log in to the control as "admin." (See the "Accessing the Overcurrent Control with a Web Browser" section on Page 18.) From the **Control Settings** tab, go to the **Factory Default** menu.

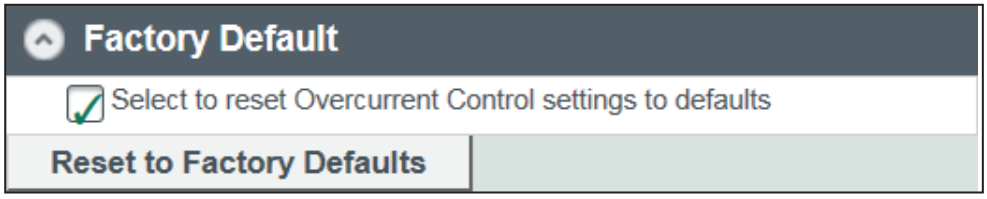


Figure 35. The Factory Default reset menu.

STEP 2. Under the Factory Default menu, click the Select to reset Overcurrent Control settings to defaults checkbox. See Figure 35.

STEP 3. A confirmation window will open asking to confirm resetting of the overcurrent control. Click on the **OK** button to reset the overcurrent control. See Figure 36.

When the factory reset is complete, a confirmation message will appear. See Figure 37.

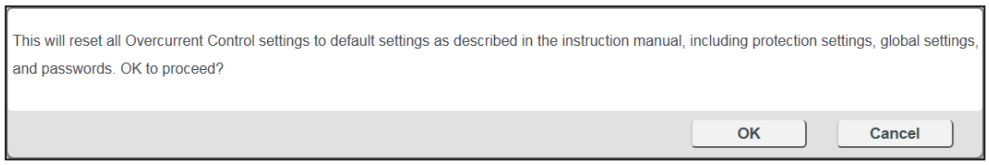


Figure 36. Click on the OK button to confirm resetting the overcurrent control to the factory-default.

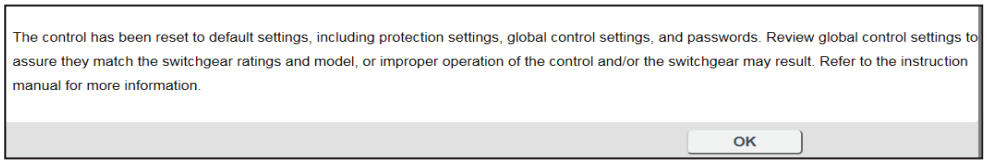


Figure 37. The factory reset confirmation message.

After Resetting Factory Default Settings

The following steps must be completed after resetting the factory default settings:

STEP 1. Change the overcurrent control passwords as explained in the "Logging in for the First Time" section on page 21.

STEP 2. Make sure the Global Settings (**Frequency**, C**ontinuous Current**, **Fault Interrupting Rating**, and **Trip Mode**) match the configuration of the system and the Vista Underground Distribution Switchgear as stated on the switchgear nameplate as explained in the "Changing the Global Settings" section on page 29.

STEP 3. Update the Interrupter IDs to match the way designations on the Vista switchgear, or change to the user's preferred naming convention.

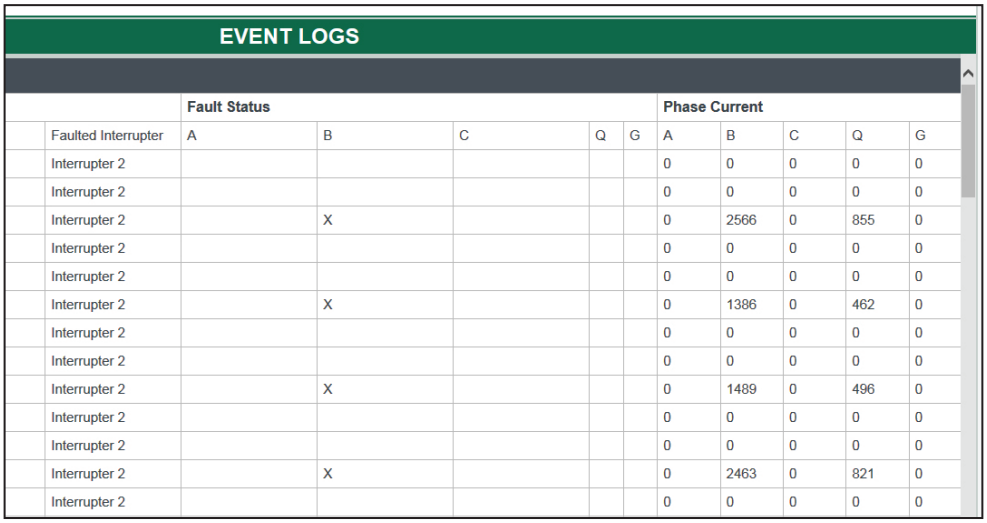
STEP 4. Reprogram the Overcurrent Protection Settings as explained in the "Programming the Overcurrent Protection Settings" section on page 34.

Trip Event Log

The Trip Event Log displays the last 64 events recorded by the overcurrent control.

The Trip Event Log records seven messages in the order the event occurs, with the most recent event on top. Trip events remain recorded even if the control loses power and will only be removed if more than 64 events are recorded (the oldest event will be overwritten) or if the log is cleared manually. The Event Cause column shows the cause of the event that occurred, and the Event Type column displays which element initiated the trip operation. The interrupter the event occurred on will be displayed under Faulted Interrupter, and the Time-Overcurrent phase or element that initiated the trip will show in the Fault Status column. The phase current at the time of the event is also shown. A key to the Trip Event Log is listed in Table 5.

A sample trip event log might look like Figure 38.



EVENT LOGS

	Fault Status					Phase Current				
Faulted Interrupter	A	B	C	Q	G	A	B	C	Q	G
Interrupter 2						0	0	0	0	0
Interrupter 2						0	0	0	0	0
Interrupter 2		X				0	2566	0	855	0
Interrupter 2						0	0	0	0	0
Interrupter 2						0	0	0	0	0
Interrupter 2		X				0	1386	0	462	0
Interrupter 2						0	0	0	0	0
Interrupter 2						0	0	0	0	0
Interrupter 2		X				0	1489	0	496	0
Interrupter 2						0	0	0	0	0
Interrupter 2						0	0	0	0	0
Interrupter 2		X				0	2463	0	821	0
Interrupter 2						0	0	0	0	0

Figure 38. The Trip Event Log.

Table 5. Trip Event Log Descriptions

Event Cause	Description
Timing	The minimum pickup/trip current of a given element has been exceeded and the control begins timing.
Trip	The time and current thresholds have been exceeded for a given element and a trip operation is initiated.
Resetting	The current drops below the pickup value, and does not initiate a trip after the control has started timing. Control is timing down, but not reset.
Reset	The control has reset.
Event Types	**Description**
TOC	Time-Overcurrent Fault (for any event involving the inverse segment for a given element)
DT#1	Definite-Time Fault against DT#1
DT#2	Definite-Time Fault against DT#2
TCP	Thermal Characteristic Protection
Reset	Reset element
Fault Status	**Description**
A	A Phase
B	B Phase
C	C Phase
Q	Negative-Sequence
G	Ground

Diagnostic Event Log

The Diagnostic Event Log records event messages in a first-in-first out basis with the most recent events on top. Diagnostic events will remain recorded even if the control loses power and will only be removed if more than 12 events are recorded (the oldest event will be overwritten) or if the log is cleared manually. The Diagnostic Event log reports on the condition of the control. A key can be found in Table 6. The Diagnostic Event log will be used mainly by S&C Electric Company to help troubleshoot any problems with the overcurrent control.

The Diagnostic Event Log shows the last 12 tracked diagnostic events recorded by the overcurrent control.

	Event Category	Observed Value	Expected Value/Range	Elapsed Time, mins
	POWERUP	0.0	0.0	0
BPHASE	BPHASE	5673.5	0.0	979
BPHASE	BPHASE	761.7	0.0	877
BPHASE	BPHASE	3802.3	0.0	875
BPHASE	BPHASE	931.8	0.0	872

Figure 39. The Diagnostic Event Log.

Report any ERROR messages to S&C Electric Company. (Contact your local S&C Sales Office or the S&C Global Support and Monitoring Center at 1-888-762-1100 or 1-773-338-1000 outside the U.S.) See Figure 39.

Table 6. Diagnostic Event Log Description

Event Cause	Description
Elapsed-Time Counter	Shows the start time for the elapsed-time counter.
ADC – Interrupter 1 – A Phase	Status of the analog to digital converter. An ADC error could prevent the overcurrent control from tripping in response to an event.
ADC – Interrupter 2 – A Phase	
ADC – Interrupter 1 – B Phase	
ADC – Interrupter 2 – B Phase	
ADC – Interrupter 1 – C Phase	
ADC – Interrupter 2 – C Phase	
Power Supply 3.3 V	State of the onboard power supply. Expected value range 41.6 V - 61.6 V
POWER_12 V	The expected control power for the Overcurrent Control is 12 V. When power of less than 11 V or more than 13 V is received, the POWER_12 V event will display.
Flash Memory Test	State of the microprocessor flash memory
FRAM Memory Test	State of the microprocessor FRAM memory
Stack Overflow	State of the microprocessor memory capacity. A stack overflow means there is no more room in memory to store data.
CTR_OVERFLOW	The elapsed time counter overflows. The elapsed time counter provides a relative time between events logged in the diagnostic and trip log.
POWERUP	The control powers up. The elapsed time counter restarts at “0” after a POWERUP and counts in minutes.
Code Memory Log	Flash memory is corrupted.
Config. Fail	Protection settings are corrupted.

Event Category Legend:

OK = Operating within normal parameters

ERROR = Operating outside of normal parameters (The control requires immediate servicing. Contact the local S&C Sales Office.)

TRIP = Shows the Magnetic Latching Solenoid (MLS) voltage upon trip

POWERUP = Shows when the overcurrent control was powered on

The overcurrent control tests vital subsystems at power up and periodically thereafter to ensure the control is working properly. The Control Self-Test Report displays the present status of every testable hardware and software component. It can be run on demand by refreshing the Control Self-Test Report.

Control Self-Test Report

The Control Self-Test Report will be used mainly by S&C Electric Company to help troubleshoot any problems with the overcurrent control. If any parameter records an ERROR, the control will be in an error state and the **Control Enabled** indicator on the *Status* screen will be solid green, indicating the primary functions of the control are inhibited. Report any ERROR messages to S&C Electric Company. (Contact your local S&C Sales Office or the S&C Global Support and Monitoring Center at 1-888-762-1100 or 1-773-338-1000 outside the U.S. for details.)

To view the self-test report, open the **Control Self-Test Report** menu under the **Event Log** tab. To refresh the data in the Control Self-Test Report, click on the **Refresh** button at the bottom of the Control Self-Test Report Event log. See Table 7 on page 50 and Figure 40 on page 49.●

● **Known Issue**: When configured for three-phase trip/three-phase lockout, the MLS voltage readings will show an observed value of zero for Phase A and C, which is outside of the expected range and below the expected value, but the status will still show "OK." This is not indicative of an issue with the control. If an issue outside the normal range is noted for Phase B, notify S&C Electric Company.

Control Self-Test Report

Item	Observed Value	Expected Value/Range	Units	Status
Elapsed-Time Counter	325	-	min	OK
MLS Voltage- Interrupter 1- A Phase	48.8	[41.6 - 61.6]	V	OK
MLS Voltage- Interrupter 2 - A Phase	48.9	[41.6 - 61.6]	V	OK
MLS Voltage- Interrupter 1- B Phase	48.8	[41.6 - 61.6]	V	OK
MLS Voltage- Interrupter 2 - B Phase	49.1	[41.6 - 61.6]	V	OK
MLS Voltage- Interrupter 1 - C Phase	49.1	[41.6 - 61.6]	V	OK
MLS Voltage- Interrupter 2 - C Phase	48.8	[41.6 - 61.6]	V	OK
ADC Interrupter 1 - A Phase	-	-	-	OK
ADC Interrupter 2 - A Phase	-	-	-	OK
ADC Interrupter 1 - B Phase	-	-	-	OK
ADC Interrupter 2 - B Phase	-	-	-	OK
ADC Interrupter 1 - C Phase	-	-	-	OK
ADC Interrupter 2 - C Phase	-	-	-	OK
Power Supply 3.3V	3.3	[3.2 - 3.4]	V	OK
Power Supply 13V	13.2	[10.6 - 21.4]	V	OK
Flash memory Test	-	-	-	OK
FRAM memory test	-	-	-	OK
Stack Overflow	-	-	-	OK

Figure 40. A Control Self-Test Report.

NOTICE

If a control error is registered on the Control Self-Test report, notify S&C Electric Company. A control in an error state may not operate as expected.

Table 7. Control Self-Test Report Description

Self-Test Item	Description
Elapsed Time Counter	The amount of time the control has been powered.
MLS Voltage- Interrupter1 - A Phase	Magnetic Latching Solenoid (MLS) trip capacitor voltage
MLS Voltage- Interrupter2 - A Phase	
MLS Voltage- Interrupter1 - B Phase	
MLS Voltage- Interrupter2 - B Phase	
MLS Voltage- Interrupter1 - C Phase	
MLS Voltage- Interrupter2 - C Phase	
ADC Interrupter1 – A Phase	Status of the analog-to-digital converter
ADC Interrupter2 – A Phase	
ADC Interrupter1 – B Phase	
ADC Interrupter2 – B Phase	
ADC Interrupter1 – C Phase	
ADC Interrupter2 – C Phase	
Power Supply 3.3 V	Status of the on-board power supplies
Power Supply 12 V	
Flash memory Test	Status of key microprocessor systems
FRAM memory test	
Stack Overflow	

Status Legend:

OK – Operating within normal parameters

ERROR – Operating outside of normal parameters (The control requires immediate servicing. Contact the local S&C Sales Office.)

TRIP – Will display under MLS voltage measurements only

Trip tests can only be performed with the Admin login to the overcurrent control. When a Trip test is performed, the overcurrent control will send a signal to actuate the trip solenoids in the switchgear, tripping the fault interrupters and opening the circuit.

NOTICE

Test tripping the overcurrent control will open the fault interrupter and may cause unplanned loss of load.

The **Test Trip** menu contains eight trip modes:

Trip Mode: Three-Phase, Interrupter 1, All Phases
Trip Mode: Three-Phase, Interrupter 2, All Phases
Trip Mode: Single-Phase, Interrupter 1, Phase A
Trip Mode: Single-Phase, Interrupter 1, Phase B
Trip Mode: Single-Phase, Interrupter 1, Phase C
Trip Mode: Single-Phase, Interrupter 2, Phase A
Trip Mode: Single-Phase, Interrupter 2, Phase B
Trip Mode: Single-Phase, Interrupter 2, Phase C

To test trip the Vista Underground Distribution Switchgear:

STEP 1. Click on the **Test Trip** tab and select the **Test Trip** menu. From the drop-down menu, select the **Trip** mode desired for the switchgear configuration. Only three-phase test trips are available for three-pole fault interrupters and only single-phase test trips are available for single-pole fault interrupters. See Figure 41. A confirmation menu will appear asking "Test Trip Command to be Issued. OK to continue?"

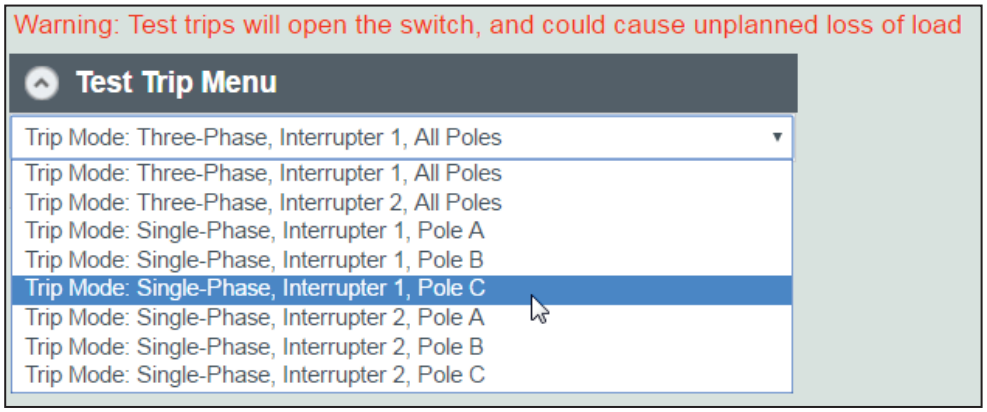


Figure 41. The Test Trip Menu.

STEP 2. Click on the **Execute** button to proceed with the Trip test. Click on the **Cancel** button to return to the **Test Trip** menu.

Firmware updates should only be done at the direction of S&C Electric Company.

To update the overcurrent control firmware:

STEP 1. Log in to the S&C Automation Customer Support Portal and open the "Vista Overcurrent Control" workspace. Download the latest firmware file, as directed by S&C Electric Company, and move it from the Downloads folder to the desktop.

STEP 2. Log in to the control as "admin." (See the "Accessing the Overcurrent Control with a Web Browser" section on page 18.) Click on the **Choose File** button. Navigate to the file on the desktop and select it, then click on the **Open** button. The firmware file name will appear in the "Upload" field. See Figure 42.

Figure 42. The Firmware Upgrade dialog box.

STEP 3. Click on the **Upload** button. A pop-up screen will display a progress timer. When the firmware update is complete, the green light on the overcurrent control electronics module will turn solid green while the software loads and will then start flashing when the firmware is finished loading. A "firmware upload is complete" message will display when the firmware update is finished. You will need to log in to the control again.

If the firmware upload is interrupted at any point during the update process, the overcurrent control will revert back to the previous version of the firmware.

Trip Outputs

This section describes each of the external connections to the control. Included in the following tables are terminal numbers, terminal names, and mating-connector part numbers (where applicable.) Terminal numbers are identified by labels on the electronics module or terminal block.

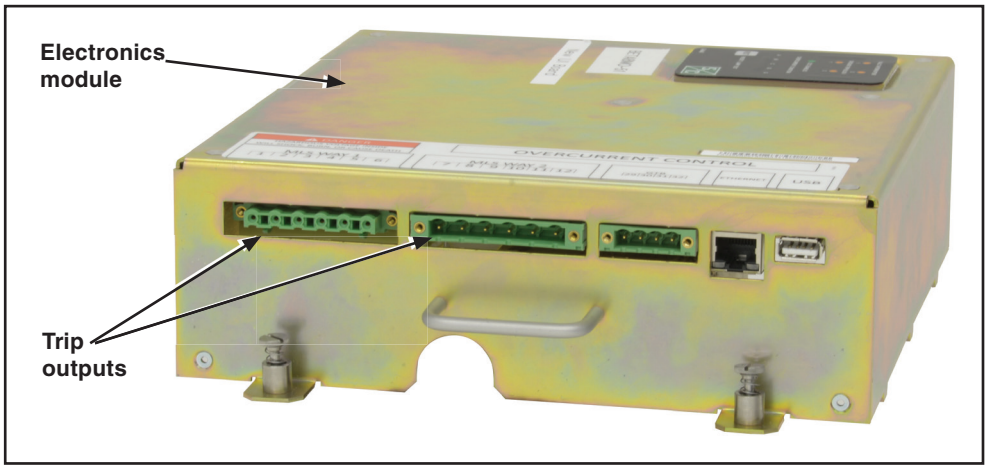


Figure 43. The Trip outputs.

Table 8. Trip Outputs●

Terminal Number (1,2)	Pole	Mating-Connector Part Number
1, 2	Fault Interrupter 1, Phase A	Phoenix 1783999
3, 4	Fault Interrupter 1, Phase B	
5, 6	Fault Interrupter 1, Phase C	
7, 8	Fault Interrupter 2, Phase A	Phoenix 1876194
9, 10	Fault Interrupter 2, Phase B	
11, 12	Fault Interrupter 2, Phase C	

● Trip contacts are polarized.

Signal Inputs

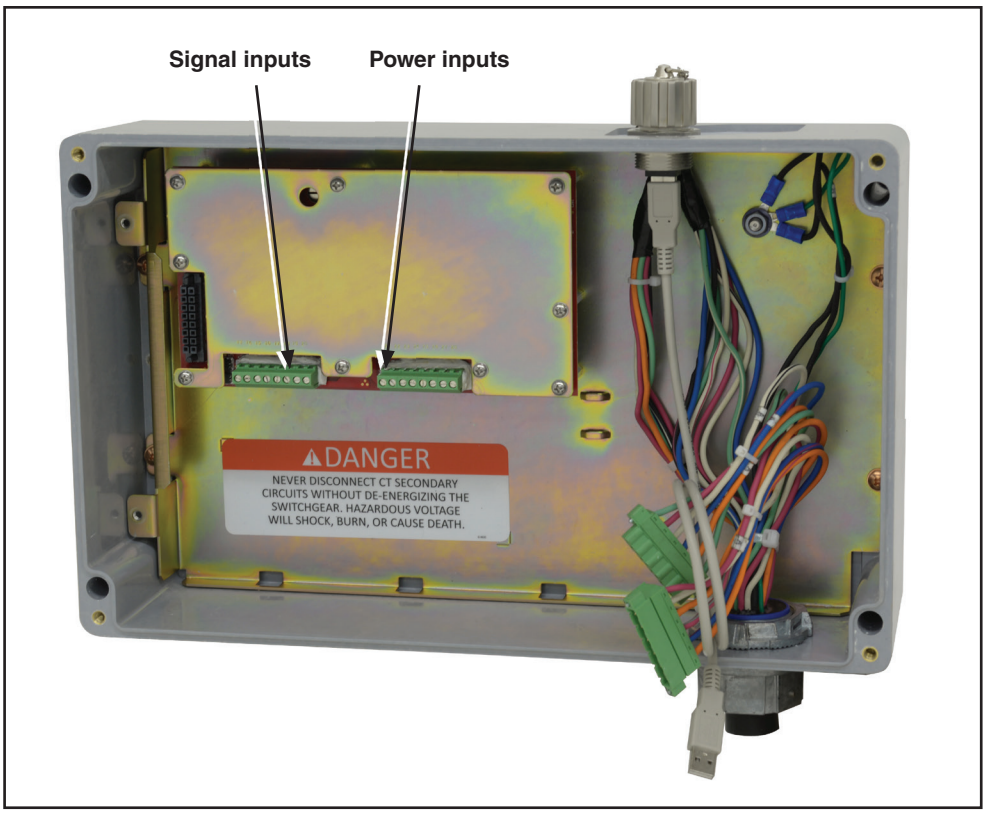


Figure 44. Signal and power inputs.

Table 9. Signal Inputs

Terminal Number	Signal Pole
13	Fault Interrupter 1, Phase A
14	Fault Interrupter 1, Phase B
15	Fault Interrupter 1, Phase C
16	Fault Interrupter 1, Residual
17	Fault Interrupter 2, Phase A
18	Fault Interrupter 2, Phase B
19	Fault Interrupter 2, Phase C
20	Fault Interrupter 2, Residual

Power Inputs

Table 10. Power Inputs

Terminal Number	Power Pole
21	Fault Interrupter 1, Phase A
22	Fault Interrupter 1, Phase B
23	Fault Interrupter 1, Phase C
24	Fault Interrupter 1, Residual
25	Fault Interrupter 2, Phase A
26	Fault Interrupter 2, Phase B
27	Fault Interrupter 2, Phase C
28	Fault Interrupter 2, Residual

Table 11. Specifications

USB Power	Type A to Type A USB cable	2.5 W
CT Power	600-A models	14 A RMS in all three phases, or 42 A RMS in a single phase
	900-A models	28 A RMS in all three phases, or 84 A RMS in a single phase.
	Maximum measured current All models	25 kA

The Vista Overcurrent Control can be programmed to provide a wide variety of settings combinations. Listed below are the setting ranges that are available to the overcurrent control.

Table 12. IEC Curves

Time Overcurrent Phase Protection				
Inverse Segment	Standard Inverse (C1)			
	Very Inverse (C2)			
	Extremely Inverse (C3)			
	Long-Time Inverse (C4)			
	Short-Time Inverse (C5)			
	Continuous Current			
	600		**900**	
	Short Circuit, RMS Sym.		**Short Circuit, RMS Sym.**	
	12.5 and 16 kA	**25 kA**	**12.5 and 16 kA**	**25 kA**
Minimum Trip Current, A	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Low-Current Cutoff, A●	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Time Multiplier	0.05 to 1 in steps of 0.01			
Time Adder, s	0 to 1000 in steps of 0.01			
Definite-Time Phase Protection Element #1				
Definite-Time Current, A■	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s	0 – 1000 in steps of 0.001			
Definite-Time Phase Protection Element #2				
Definite-Time Current, A▲	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s◆	0 – 1000 in steps of 0.001			
Reset Time Parameters				
Reset Type	TIMED			
Reset Time, s▼	0 to 1000 in steps of 0.001			

● Low-current cutoff must be equal to or greater than the minimum trip current.

■ Definite time current must be greater than or equal to low-current cutoff and/or the minimum trip current.

▲ Definite Time Current 2 should be greater than or equal to Definite Time Current 1.

◆ Time should be less than Definite-Time 1.

▼ Accumulated value will reset to zero after the reset time has elapsed.

Table 13. IEEE Curves

Time Overcurrent Phase Protection				
Inverse Segment	Standard Inverse (U1)			
	Very Inverse (U2)			
	Extremely Inverse (U3)			
	Long-Time Inverse (U4)			
	Short-Time Inverse (U5)			
	Continuous Current			
	600		**900/1200**	
	Short Circuit, RMS Sym.		**Short Circuit, RMS Sym.**	
	12.5 and 16 kA	**25 kA**	**12.5 and 16 kA**	**25 kA**
Minimum Trip Current, A	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Low-Current Cutoff, A●	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Time Multiplier	0.5 to 15 in steps of 0.01			
Time Adder, s	0 to 1000 in steps of 0.01			
Definite-Time Phase Protection Element #1				
Definite-Time Current, A■	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s	0 – 1000 in steps of 0.001			
Definite-Time Phase Protection Element #2				
Definite-Time Current, A▲	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s◆	0 – 1000 in steps of 0.001			
Reset Time Parameters				
Reset Type	TIMED			
Reset Time, s▼	0 to 1000 in steps of 0.001			

● Low-current cutoff must be equal to or greater than the minimum trip current.

■ Definite time current must be greater than or equal to low-current cutoff and/or the minimum trip current.

▲ Definite Time Current 2 should be greater than or equal to Definite Time Current 1.

◆ Time should be less than Definite-Time 1.

▼ Accumulated value will reset to zero after Reset Time has elapsed.

Table 14. Vista Speed - E Speed Curves

Time Overcurrent Phase Protection				
Inverse Segment	E			
	Continuous Current			
	600		**900/1200**	
Ampere Rating	7E, 10E, 13E, 15E, 20E, 25E, 30E, 40E, 50E, 65E, 80E, 100E, 125E, 150E, 175E, 200E, 250E, 300E, 400E		15E, 20E, 25E, 30E, 40E, 50E, 65E, 80E, 100E, 125E, 150E, 175E, 200E, 250E, 300E, 400E	
	Short Circuit, RMS Sym.		**Short Circuit, RMS Sym.**	
	12.5 and 16 kA	**25 kA**	**12.5 and 16 kA**	**25 kA**
Low-Current Cutoff, A●	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Time Multiplier	FIXED = 1			
Time Adder, s	N/A			
Reset Type	TIMED			
Reset Time, s	0 to 1000 in steps of 0.001			

● Low-Current Cutoff must be equal to or greater than the minimum trip current of the selected curve.

Table 15. Vista Speed - K Speed Curves

Time Overcurrent Phase Protection				
Inverse Segment	K			
	Continuous Current			
	600		**900/1200**	
Ampere Rating	8K, 10K, 12K, 15K, 20K, 25K, 30K, 40K, 50K, 65K, 80K, 100K, 125K, 150K, 175K, 200K		15K, 20K, 25K, 30K, 40K, 50K, 65K, 80K, 100K, 125K, 150K, 175K, 200K	
	Short Circuit, RMS Sym.		**Short Circuit, RMS Sym.**	
	12.5 and 16 kA	**25 kA**	**12.5 and 16 kA**	**25 kA**
Low-Current Cutoff, A●	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Time Multiplier	FIXED = 1			
Time Adder, s	N/A			
Reset Type	TIMED			
Reset Time, s	0 to 1000 in steps of 0.001			

● Low-Current Cutoff must be equal to or greater than the minimum trip current of the selected curve.

Table 16. Vista Speed - T Speed Curves

Time Overcurrent Phase Protection				
Inverse Segment	T			
	Continuous Current			
	600		**900/1200**	
Ampere Rating	8T, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T, 140T, 200T		15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T, 140T, 200T	
	Short Circuit, RMS Sym.		**Short Circuit, RMS Sym.**	
	12.5 and 16 kA	**25 kA**	**12.5 and 16 kA**	**25 kA**
Low-Current Cutoff, A●	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Time Multiplier	FIXED = 1			
Time Adder, s	N/A			
Reset Type	TIMED			
Reset Time, s	0 to 1000 in steps of 0.001			

● Low-Current Cutoff must be equal to or greater than the minimum trip current of the selected curve.

Table 17. Vista Coordination - Tap

Time Overcurrent Phase Protection				
Inverse Segment	Tap			
Ampere Rating	**600**		**900/1200**	
	15, 20, 25, 30, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400		30, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400	
	Continuous Current			
	600		**900/1200**	
	Short Circuit, RMS Sym.		**Short Circuit, RMS Sym.**	
	12.5 and 16 kA	**25 kA**	**12.5 and 16 kA**	**25 kA**
Low-Current Cutoff, A●	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Time Multiplier	Fixed = 1			
Time Adder, s	N/A			
Definite-Time Phase Protection Element #1				
Definite-Time Current, A■	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s	0 – 1000 in steps of 0.001			
Definite-Time Phase Protection Element #2				
Definite-Time Current, A▲	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s◆	0 – 1000 in steps of 0.001			
Reset Time Parameters				
Reset Type	TIMED			
Reset Time, s▼	0 to 1000 in steps of 0.01			

● Low-Current Cutoff must be equal to or greater than the ampere rating.

■ Definite time current must be greater than or equal to low-current cutoff and/or the minimum trip current.

▲ Definite Time Current 2 should be greater than or equal to Definite Time Current 1.

◆ Time should be less than Definite-Time 1.

▼ Accumulated value will reset to zero after the reset time has elapsed.

Table 18. Vista Coordination - Main

Time Overcurrent Phase Protection				
Inverse Segment	Main			
Ampere Rating	**600**		**900/1200**	
	25, 30, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800		30, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	
	Continuous Current			
	600		**900/1200**	
	Short Circuit, RMS Sym.		**Short Circuit, RMS Sym.**	
	12.5 and 16 kA	**25 kA**	**12.5 and 16 kA**	**25 kA**
Low-Current Cutoff, A●	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Time Multiplier	Fixed = 1			
Time Adder, s	N/A			
Definite-Time Phase Protection Element #1				
Definite-Time Current, A■	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s	0 – 1000 in steps of 0.001			
Definite-Time Phase Protection Element #2				
Definite-Time Current, A▲	14 to 12500 in steps of 0.01	14 to 13200 in steps of 0.01	28 to 12500 in steps of 0.01	28 to 13200 in steps of 0.01
Definite-Time Time, s◆	0 – 1000 in steps of 0.001			
Reset Time Parameters				
Reset Type	TIMED■			
Reset Time, s▼	0 to 1000 in steps of 0.01			

● Low-Current Cutoff must be equal to or greater than the ampere rating.

■ Definite time current must be greater than or equal to low-current cutoff and/or the minimum trip current.

▲ Definite Time Current 2 should be greater than or equal to Definite Time Current 1.

◆ Time should be less than Definite-Time 1.

▼ Accumulated value will reset to zero after the reset time has elapsed.

One final consideration in the selection of ANSI/US and IEC curve families to achieve proper power system coordination is the Thermal Characteristic Protection of the Vista Overcurrent Control. The control will self-protect its internal power supply and current-sensing circuitry when a pickup setting (in amperes) and/or a time setting exceeds the thermal limits of the electronic circuitry (in both the electronics module and burden board assemblies). The control will implement a definite-time response characteristic of 3 seconds at 16 kA for 16-kA units and 3 seconds at 25 kA for 25-kA units. This matches the performance ratings of the control listed in the "Specifications" section on page 55.

Table 19. Warning Messages

Type of Message	Message Text	Active When	Action
WARNING	(Interrupter 1 and Interrupter 2) The selected protection element settings may allow for a response time greater than 3 seconds for faults above 16 kA. The response time will be truncated to 1 second. Please refer to the Vista Overcurrent Control instruction sheet for more information.	When using IEEE or IEC curves with too high a minimum-trip current and/or too high a time multiplier.	Only applies to IEEE and IEC curves. Select a lower time multiplier or a lower minimum-trip current. See the “Thermal Characteristic Protection” section on page 61.
WARNING	(Test Trip) Test trips will open the switch and could cause unplanned loss of load.	When performing a test trip.	Performing a test trip will trip the switchgear according to the **Trip** mode selected. There is no provision to test Vista Underground Distribution Switchgear without operating the switchgear.