

Operation and Battery Replacement

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★ Only applicable to some models of source-transfer Vista Under-
ground Distribution Switchgear. Contact the local S&C Sales Office
for details.



Introduction

Qualified Persons

WARNING

Only qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone 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

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

Read this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before installing or operating the Vista battery charger. Become familiar with the Safety Information and Safety Precautions on pages 3 and 4. The latest version of this publication is available online in PDF format at sandc.com/en/support/product-literature/.

Retain this Instruction Sheet

This instruction sheet is a permanent part of the Vista battery charger. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

WARNING

The equipment in this publication is only intended for application in remote supervisory Vista Underground Distribution Switchgear, remote supervisory Vista Green Underground Distribution Switchgear and some models of source-transfer Vista Underground Distribution Switchgear and source-transfer Vista Green Underground Distribution Switchgear.

Warranty

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

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the Vista battery charger. Become familiar with these types of messages and the importance of these various signal words:

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

Following Safety Instructions

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

NOTICE

Read this instruction sheet thoroughly and carefully before operating the Vista battery charger.



Replacement Instructions and Labels

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

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

⚠ DANGER



Remote supervisory Vista Underground Distribution Switchgear and source-transfer Vista Underground Distribution Switchgear 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 Vista Underground Distribution Switchgear must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules.
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.
4. **SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels.
5. **DOORS.** High-voltage compartment doors must be securely closed and latched, with padlocks in place at all times unless work is being performed inside the enclosure.
6. **KEY INTERLOCKS.** Optional key interlocks, if furnished, must be in place. Check the operating sequence of key interlocks to verify proper sequencing. After the switchgear is installed, destroy all duplicate keys or make them accessible only to authorized persons so that the key-interlock scheme will not be compromised.
7. **OPENING DOORS.** Do not apply any undue force when attempting to open a door. The use of undue force may damage the door-latching mechanism.
8. **ENERGIZED BUSHINGS.** Always assume the bushings are energized unless proven otherwise by test, by visual evidence of an open-circuit condition at the load-interrupter switch or fault interrupter, or by observing that the load-interrupter switch or fault interrupter is grounded.
9. **BACKFEED.** Bushings, cables, load-interrupter switches and fault interrupters may be energized by backfeed.
10. **GROUNDING.** Vista Switchgear must be connected to a suitable earth ground before energizing and at all times when energized. The ground wire(s) must be bonded to the system neutral, if present. If the system neutral is not present, proper precautions must be taken to ensure the local earth ground cannot be severed or removed. After the switchgear has been completely disconnected from all sources of power and tested for voltage, properly ground the load-interrupter switches and fault interrupters before touching any bushings or components that are to be inspected, replaced, serviced, or repaired.
11. **LOAD-INTERRUPTER SWITCH OR FAULT-INTERRUPTER POSITION.** Always confirm the **Open/Closed** position of the load-interrupter switch or fault interrupter by visually observing the position of the isolating disconnect. The load-interrupter switch or fault interrupter may be energized by backfeed. The load-interrupter switch or fault interrupter may be energized in any position.
12. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

Inspection and Packing

The Vista battery charger comes pre-installed inside the remote supervisory Vista or Vista Green Underground Distribution Switchgear or source-transfer Vista or Vista Green Underground Distribution Switchgear's low-voltage enclosure. Check the shipment per the applicable S&C Instruction Sheet:

- Instruction Sheet 682-505, "Remote Supervisory Vista® Underground Distribution Switchgear and Remote Supervisory Vista® Green Underground Distribution Switchgear: *Installation*."
- Instruction Sheet 683-505, "Source-Transfer Vista® Underground Distribution Switchgear and Source-Transfer Vista® Green Underground Distribution Switchgear: *Installation*."

The Vista battery charger is used on remote supervisory Vista Underground Distribution Switchgear and on some models of source-transfer Vista Underground Distribution Switchgear to provide power to perform switching when ac control power is lost. Control power for the motor operators is provided by the battery. The battery charger and battery pack is located within a low-voltage compartment/enclosure. For specifications on the battery pack, see the “Battery Specifications and Operating Time” section on page 29.

The Vista battery charger ships from the factory with the batteries disconnected and without the internal clock set. The procedure for commissioning the battery charger is described in the “Vista Battery Charger Initial Setup” section on page 9.

When replacing existing batteries, follow the instructions outlined in the “Replacing the Battery Pack” section on page 33.

In July 2022, a redesign of the battery charger (part number TA-3409) was released that includes a COMM PORT receptacle to allow connection to a PC for battery charger configuration and retrieval of the initial set-up and performance logs. Specifications for the new Vista battery charger are contained in this publication. Specifications for the pre-2022 battery charger (part number TA-2646, identifiable by number G-4875 on front panel) and the battery pack are described in S&C Data Bulletin 682-97.

Battery Self-Test Feature

The Vista battery charger automatically self-tests the battery once every two hours upon initial connection for a period of 24 hours. Then, the battery charger will self-test once every 24 hours at midnight. At midnight on the 28th day of the month, the battery test results will be noted in the monthly logs.

Note: The Vista battery charger’s self-test time depends on the correct setup of the charger’s internal clock. See the **Date/Time** field on the **Settings** tab on page 19 for more details on setting the time.

Test results are viewable and exportable from the **Test History** tab of the S&C Battery Charger application when connected to the Vista battery charger with a PC.

Note: See the “Disconnecting the Serial-to-USB Cable from the Battery Charger” section on page 15 for information on disconnecting a PC from the Vista battery charger.

Indicator Lights



Figure 1. Vista battery charger front panel - CHECK BATTERY and AC ON indicators illuminated.

CHECK BATTERY - (Red) Indicates a battery test is in progress. This indicator will illuminate if the battery is tested using the BATTERY TEST pushbutton or if the battery test has been initiated by a command from the S&C Battery Charger application's graphical user interface (GUI). After the battery is tested, the OVER VOLTAGE or UNDER VOLTAGE indicator will illuminate depending on the condition of the battery.

OVER VOLTAGE - (Red) Indicates the connected battery voltage is higher than the maximum battery voltage for the battery type (24 V or 36 V) set at the factory. When an overvoltage event occurs, the battery charger will disconnect the battery pack from the charger. For more information on this indicator, see the "Understanding an Overvoltage Event" section on page 31. **Note:** Under this condition, if ac power to the battery charger is present the power supply to external devices will remain uninterrupted.

UNDER VOLTAGE - (Red) Indicates the connected battery pack is experiencing sustained low voltage. See the "Understanding an Undervoltage Event" section on page 32 for what to do in the event of an undervoltage.

AC ON - (Green) Indicates that ac power is connected to the battery charger.

Manual Controls



Figure 2. Vista battery charger front panel - AC ON indicator illuminated.

ALARM RESET pushbutton - Resets the OVER VOLTAGE and UNDER VOLTAGE indicator lights. Push and hold the pushbutton in for three seconds.

BATTERY TEST pushbutton - Conducts a battery test which takes approximately 1 minute. If an overvoltage or an undervoltage state is detected, the appropriate indicator light will illuminate. If both the UNDER VOLTAGE and OVER VOLTAGE indicator lights illuminate, it means the battery pack is disconnected or in a “BAD” or end of life condition. More details on the battery’s exact state can be retrieved from the test logs using the S&C Battery Charger application. S&C recommends only performing a battery test when the battery charger is connected to ac power.

BATTERY RECONNECT pushbutton – This pushbutton is used to turn on the charger when ac power is not present.

POWER toggle switch – Toggles power to the battery charger on and off. **Note:** If ac power is not present, press the BATTERY RECONNECT pushbutton to turn the charger back on.

COMM PORT connector – A RS-232 (DB9 Serial) to USB cable can be used to connect the battery charger to a PC running the S&C Battery Charger application. The application can be downloaded from the S&C Customer Portal at: <https://www.sandc.com/en/contact-us/sc-customer-portal/>.

Follow these steps for initial setup of the Vista battery charger:

- STEP 1.** Locate the Vista battery charger inside the low-voltage enclosure. Make sure the POWER toggle switch is in the **Off** position.
- STEP 2.** ***If AC power is present:*** Turn on the charger by toggling the POWER toggle switch on the front panel of the battery charger to the **On** position.
If AC power is not present: Turn on the charger by toggling the POWER toggle switch to the **On** position. Then, press the BATTERY RECONNECT pushbutton to turn the charger on.
- STEP 3.** Connect the Vista battery charger to a PC using a RS-232 (DB9 Serial)-to-USB 2.0 Type A cable. Log in to the Vista battery charger as described in the “Using the S&C Battery Charger Application” section on page 14.
- STEP 4.** Navigate to the **Settings** tab and set the time. S&C recommends setting the time using the **Synch to PC** button, but if another time setting is desired, set the time manually. Setting the time will prompt the charger to perform an initial battery test, providing a logged baseline value for the battery pack.

Installing the S&C Battery Charger Application

Hardware Requirements

The equipment required to access the Vista battery charger via PC includes:

- A PC computer running Microsoft Windows 7 or later with a USB 2.0 (or newer) Type A USB receptacle
- A RS-232 (DB9 Serial)-to-USB 2.0 Type A cable (S&C recommends Schweitzer Engineering Laboratories' USB Serial Cable SEL-C662.)

Installing the Application

Follow these steps to connect to the Vista battery charger via the S&C Battery Charger application:

STEP 1. Download the S&C Battery Charger application from the S&C Customer Portal at <https://www.sandc.com/en/contact-us/sc-customer-portal/>. Install the application on a PC.

Note: Administrative rights are not required to install the application. The S&C Customer Portal will also list a “Three Phase Battery Charger” application. Be sure to be in the Vista workspace in the portal when downloading the S&C Battery Charger Application.

STEP 2. Double-click on the installer executable (.exe) file. Click on the **Next** button. See Figure 3.



Figure 3. The S&C Battery Charger Application Installer screen.

STEP 3. Specify the directory where the S&C Battery Charger application will be installed. See Figure 4.

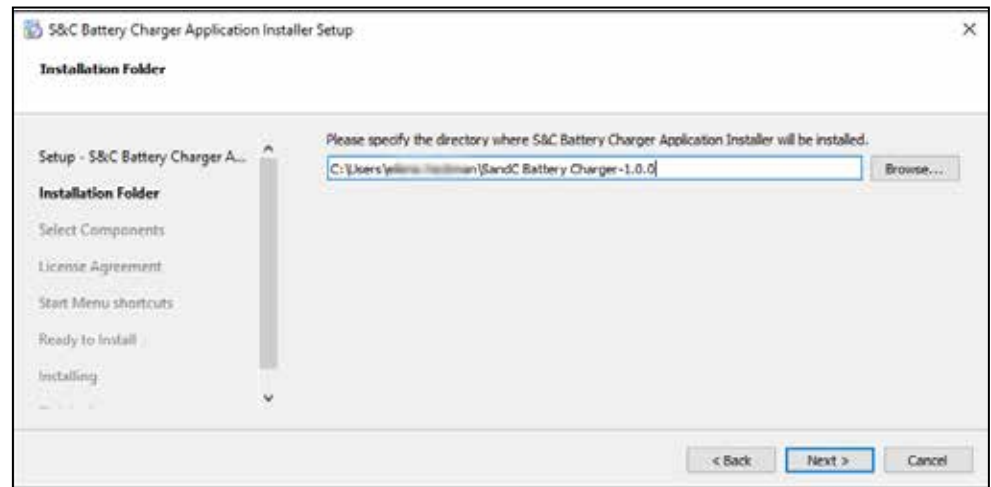


Figure 4. S&C Battery Charger application *Installation Folder* screen.

STEP 4. Click on the S&C Battery Charger menu item in the **Select Components** menu. See Figure 5. Then, click on the **Next** button.



Figure 5. Selecting the components to install.

Installing the S&C Battery Charger Application

STEP 5. Read through the End User License Agreement and accept the license by clicking on the “I accept the license” checkbox. See Figure 6. Then, click on the **Next** button.

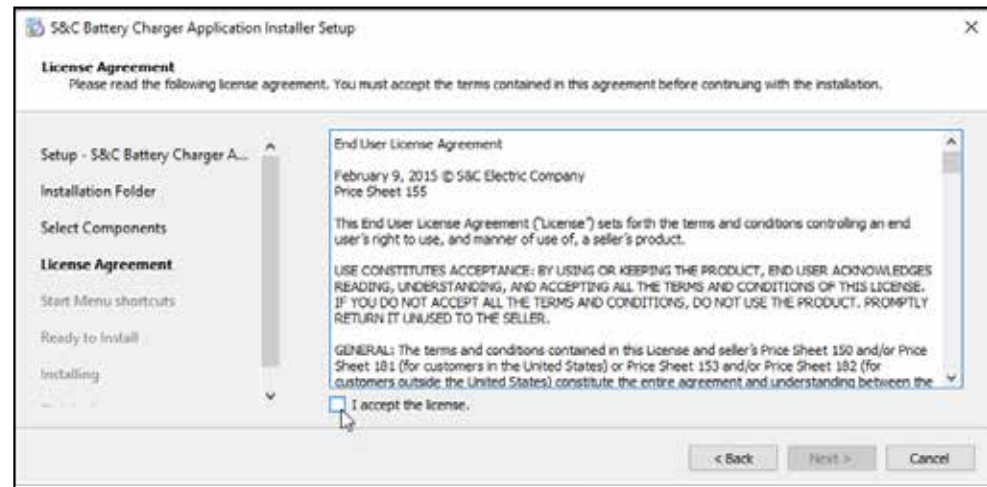


Figure 6. The end-user license agreement.

STEP 6. Select the **Start** menu in which you would like to create the program’s shortcuts. The **S&C Electric** menu is selected by default and will keep the S&C Battery Charger Application organized with any other S&C applications on the PC. See Figure 7. When finished selecting a location for the shortcuts, click on the **Next** button.

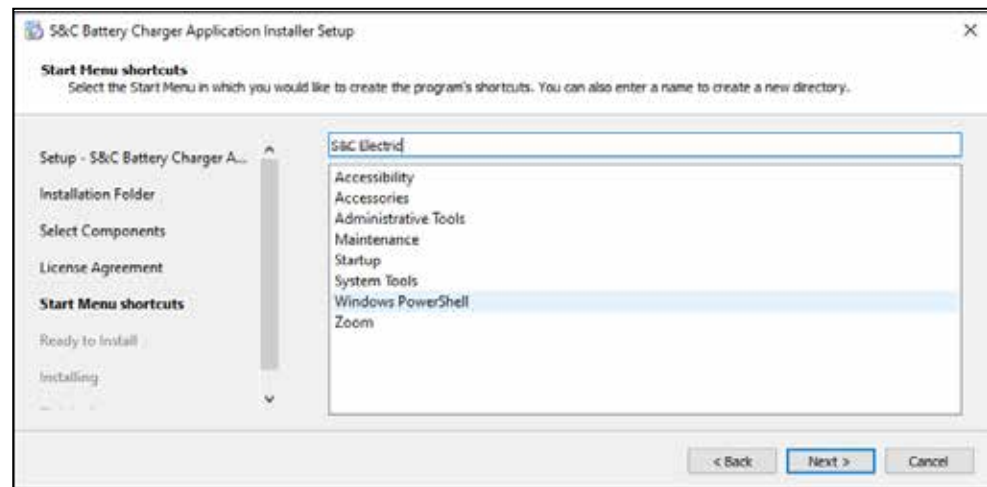


Figure 7. The *Start Menu shortcuts* screen

Installing the S&C Battery Charger Application

STEP 7. Click on the **Install** button. See Figure 8. During installation, a dialog box will appear giving the option to add a shortcut to the S&C Battery Charger application to the desktop. Click on the **Yes** or **No** button as desired to continue the installation.

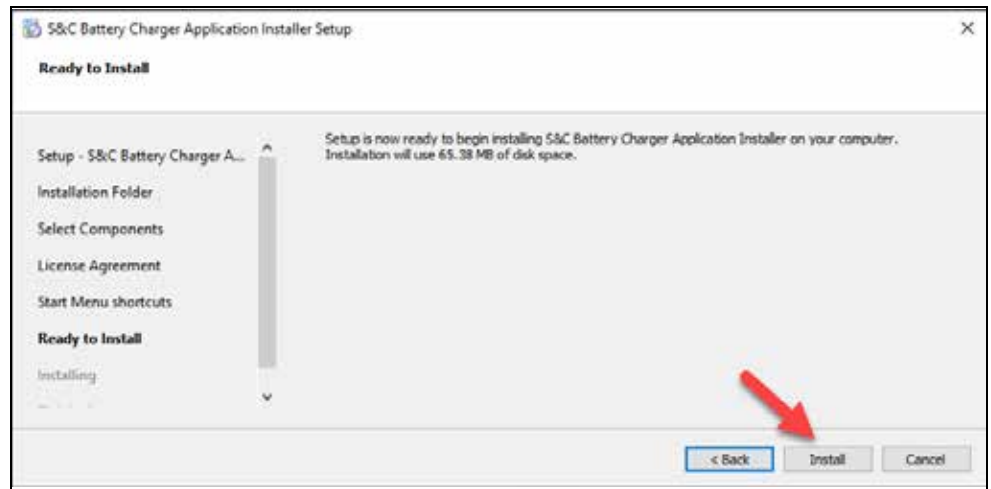


Figure 8. The *Ready to Install* screen.

STEP 8. Click on the **Finish** button to exit the installer. See Figure 9.

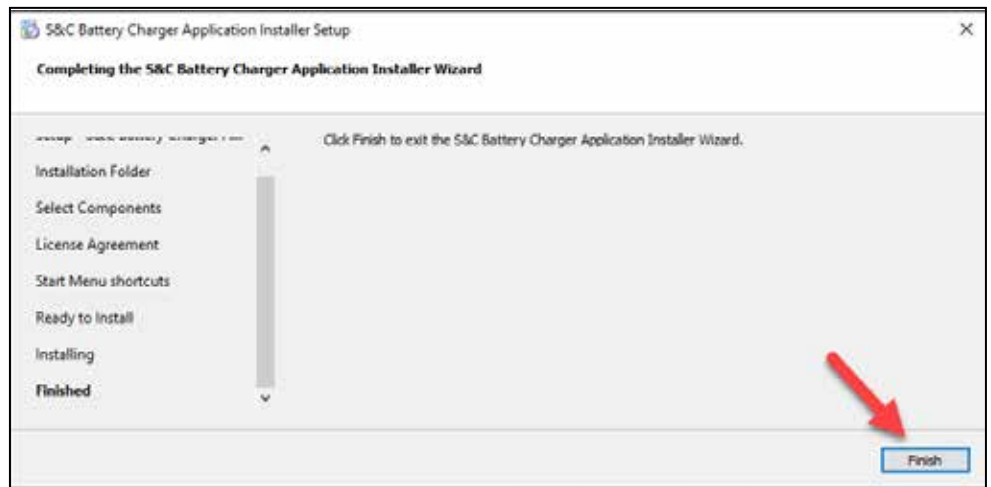


Figure 9. A completed S&C Battery Charger Application installation.

Using the S&C Battery Charger Application

Application Startup

To launch the application and connect to the Vista battery charger, complete the following steps:

- STEP 1.** Using an RS-232 (DB9 serial) to Type A USB cable, connect the PC to the serial port on the front of the Vista battery charger. See Figure 10.



Figure 10. A USB cable connected between a PC and the Vista battery charger.

STEP 2. Launch the application by double-clicking on it. The launch window will open showing the **Available Ports** menu. If multiple COM ports are available on the computer, hover over each COM port entry in the **Available Ports** menu. Identify the cable being used to connect between the Vista battery charger and the PC. An example is shown in Figure 11. Click on the appropriate COM port selection in the menu.

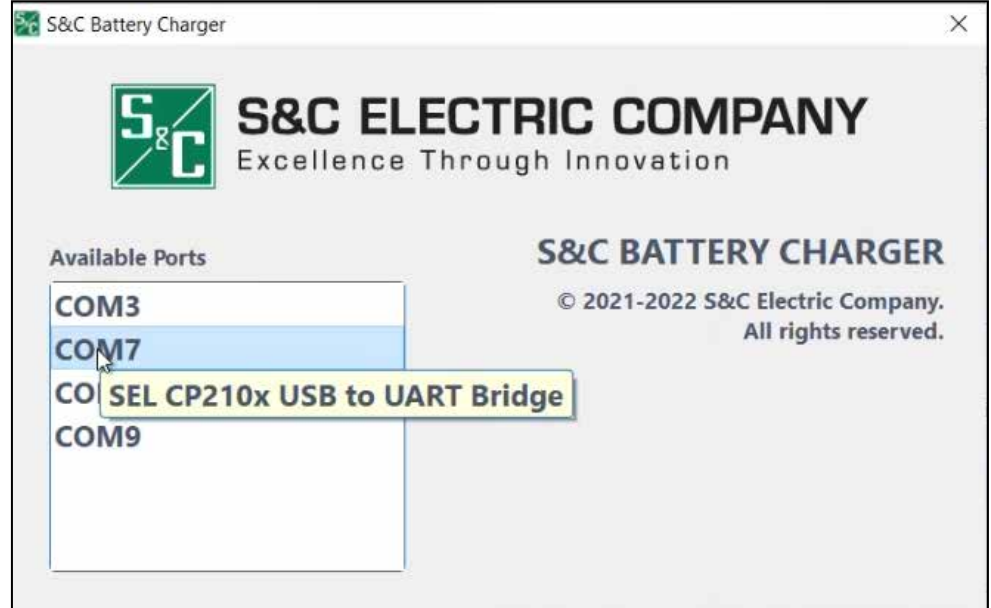


Figure 11. The *S&C Battery Charger Launch* screen showing the **Available Ports** menu.

Disconnecting the Serial-to-USB Cable from the Battery Charger

When finished connecting to the Vista battery charger with the S&C Battery Charger application, S&C recommends closing the application on the PC before disconnecting the DB9 serial-to-USB cable.

Note: If the DB9 serial-to-USB cable is disconnected during use, the connection will behave differently depending on which end of the cable was disconnected. If the DB9 serial end of the cable is disconnected and then reconnected, the running software session will continue undisturbed. If the USB end of the cable is disconnected and then reconnected, the software session will need to be restarted to display accurate information on the status of the battery charger.

Information Column

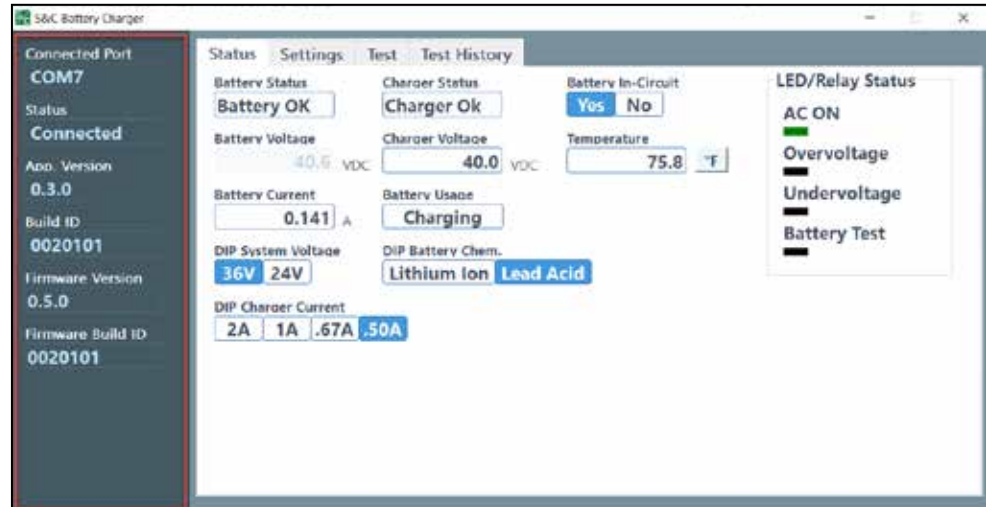


Figure 12. The S&C Battery Charger application information column.

The blue-gray information column shown in Figure 12 is informational only and contains six fields:

Connected Port – Shows the COM port number to which the Vista battery charger is connected

Status – Shows the status of the Vista battery charger (Values are shown in Table 1.)

Table 1. Information Column Status Values

Value	Description	Recommended Action
Connected	Charger responding to requests	None
Disconnected	Timeout waiting for response from charger	Connect to a Vista battery charger using the serial-to-USB cable
Error	Unable to communicate, USB disconnected	Restart application after correcting communication port issue

App. Version – Displays the version number of the S&C Battery Charger application

Build ID – Application Build ID

Firmware Version – Firmware of Vista battery charger

Firmware Build ID – Vista battery charger firmware Build ID

Status Tab

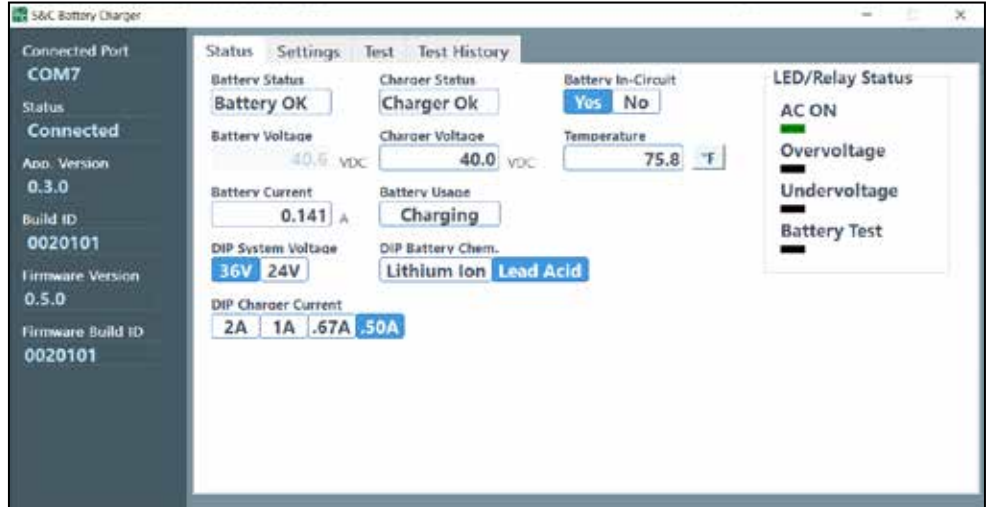


Figure 13. The S&C Battery Charger Application Status tab.

The **Status** tab shown in Figure 13 contains 11 fields and an LED/Relay Status display:
Battery Status – Shows the real-time status of the battery (See the explanation of the **Battery Self-Test** feature in the “Overview” section on page 6. Values are shown in Table 2.)

Table 2. Battery Status Values

Value	Description	Recommended Action
Battery OK	Battery voltage in valid range, battery test has passed	None
Batt Mismatch	Battery voltage does not match DIP switch setting	Check Battery Voltage and DIP System Voltage settings
No Battery	No battery voltage detected, presume disconnected	Connect battery and press the ALARM RESET pushbutton for 3 seconds
Batt Low	Ac input voltage not present and battery voltage is low	Reconnect ac power to the battery charger
Batt UV	Battery voltage under load low during battery test	Monitor battery. Replace battery if undervoltage condition is happening when ac power is present for more than one hour
Batt Bad	Battery voltage under load too low, or battery impedance too high as measured during battery test	Replace battery
Charger Bad	Battery impedance measured during battery test is invalid, possible issue with charger electronics	Attempt battery test again. Replace battery charger if same result received
Battery Test	Battery test is active; This status will be shown both during the periodic and user-initiated battery tests	None
No Result	Battery test has not been executed since powerup	None

Battery Voltage – Shows the real-time battery voltage

Battery Current – Shows the real-time battery current

DIP System Voltage - Shows the state of the system voltage dipswitch internal to the battery charger (Possible values are **36 V** and **24 V**. The battery system voltage is set at the factory. If the system voltage must be changed in the field, contact the local S&C Sales Office for details.)

DIP Charger Current – Shows the state of the current setting dipswitch internal to the battery charger (Possible values are **2 A**, **1 A**, **0.67 A**, and **0.50 A**. The charger current is set at the factory. If the charger current must be changed in the field, contact the local S&C Sales Office for details.)

Charger Status – Shows the real-time status of the Vista battery charger (Values in Table 3.)

Table 3. Charger Status Values

Value	Description	Recommended Action
Charger OK	Charger output voltage within valid range	None
Overvoltage	Charger output voltage too high	Re-cycle power. If same result received, replace charger
Undervoltage	Charger output voltage too low	Re-cycle power. If same result received, replace charger
NO AC	Ac input voltage not present or too low	If no ac is connected, no action needed. If ac power is connected, replace charger

Charger Voltage – Shows the voltage of the Vista battery charger (This value will closely match the **DIP System Voltage** value.)

Battery Usage – Shows the current battery activity (Values are shown in Table 4.)

Table 4. Battery Usage Values

Value	Description
Charging	Battery is being charged. Ac power is supplying power to the connected electronics (radio, motor operators, etc.)
Discharging	Battery is being discharged. Battery is supplying power to the connected electronics (radio, motor operators, etc.)

DIP Battery Chem. – Shows the state of the battery chemistry dipswitch internal to the battery charger (Possible values are **Lithium Ion** and **Lead Acid**. The battery chemistry is set at the factory. If the battery chemistry must be changed in the field, contact the local S&C Sales Office for details.)

Battery In-Circuit – Shows whether a battery is connected to the Vista battery charger. (Values are **Yes** and **No**.) **Note:** After battery replacement, the ALARM RESET pushbutton must be pressed for the Vista battery charger to show the battery is in-circuit.

Temperature – Gives the ambient temperature inside the low-voltage enclosure (The **Unit** button next to the field allows toggling between Fahrenheit and Celsius.)

LED/Relay Status – This status display mirrors the LEDs on the front panel. The **LED/Relay Status** fields are:

- **AC ON** - (GREEN) Indicates ac power is connected to the battery charger
- **Overvoltage** - (RED) Indicates the connected battery pack has experienced an over-voltage event (See the “Understanding an Overvoltage Event” section on page 31.)
- **Undervoltage** - (RED) Indicates the connected battery pack is experiencing low voltage event (See the “Understanding an Undervoltage Event” section on page 32.)
- **Battery Test** – (RED) Indicates that a battery test is in progress (This indicator will light if the battery is tested using the BATTERY TEST pushbutton or if the battery test has been initiated by a command from the S&C Battery Charger application’s graphical user interface (GUI). After the battery is tested, the OVER VOLTAGE or UNDER VOLTAGE indicator on the front panel will light depending on the condition of the battery. The LED/Relay Status indicator will mirror the front panel LED lights.)

Settings Tab

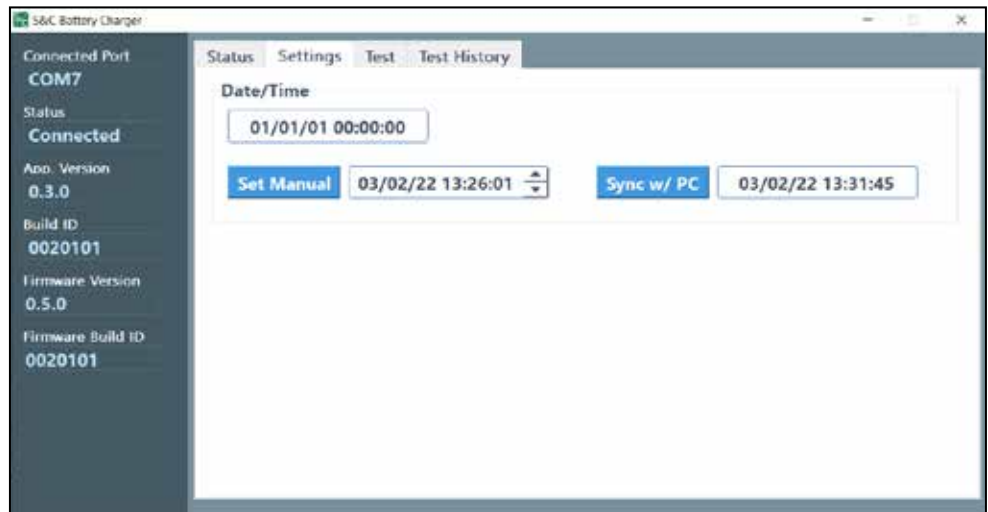


Figure 14. The S&C Battery Charger application Settings tab.

The **Settings** tab shown in Figure 14 has one display field and two settings fields:

Date/Time – The **Date/Time** field displays the date and time setting for the Vista battery charger. The **Test History** tab uses the date and time information from this field. This is the only setting the user needs to make to the battery charger during commissioning, if desired. **Note:** The Vista battery charger has a simple 24-hour clock and does not automatically reset for Daylight Savings Time where applicable.

Set Manual – The **Set Manual** field allows setting the date and time manually. Enter the date and time by either clicking into the field and typing the appropriate values or by clicking on the up/down arrows to scroll through the date and time settings.

Using the S&C Battery Charger Application

Sync w/ PC – Pressing the blue **Sync w/ PC** button will prompt the Vista battery charger to synchronize its date and time settings with the date and time settings from the connected PC. See Figure 15.

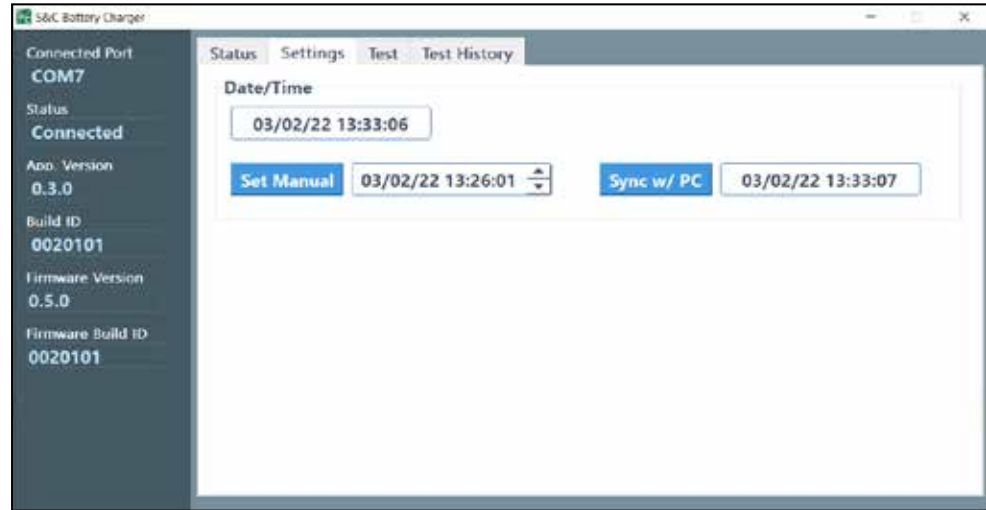


Figure 15. The S&C Battery Charger application Settings tab after Sync w/ PC.

Test Tab

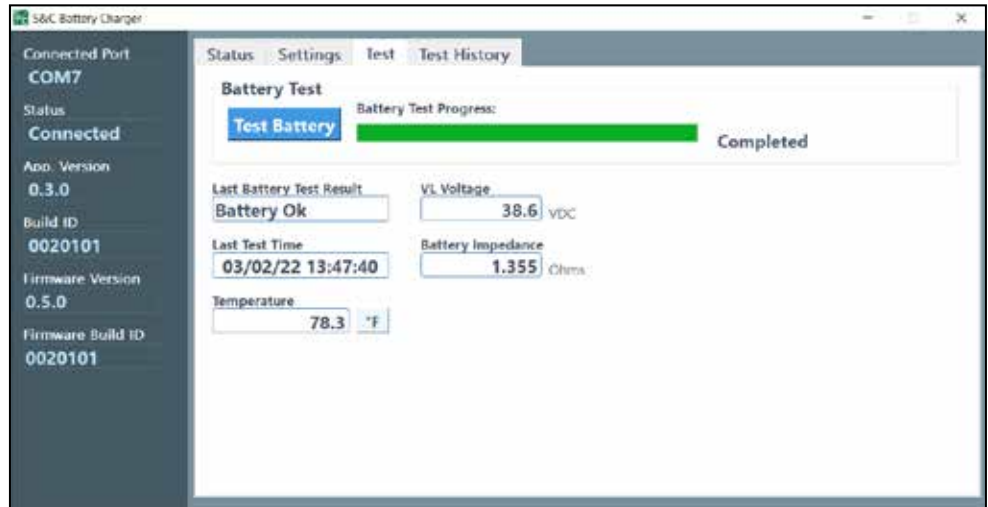


Figure 16. The S&C Battery Charger application Test tab.

The **Test** tab shown in Figure 16 contains one button with a progress bar and five display fields:

Test Battery button– Conducts a battery test which takes approximately one minute (The Battery Test progress bar will show the progress of the battery test. If an **Overvoltage** or an **Undervoltage** state is detected, the appropriate indicator light on the front panel will illuminate as will the status indicators on the **Status** tab. More details on the battery’s exact state can be retrieved from the test logs on the **Test History** tab. S&C recommends only performing a battery test when the battery charger is connected to ac power.) **Note:** When a battery test is initiated from the BATTERY TEST pushbutton on the front panel of the Vista battery charger, the application’s progress bar does not follow the progress of the battery test.

Last Battery Test Result – Shows the result of the last battery test (See Table 5 on page 23 for a list of the result values.)

Last Test Time – Shows the time of the last battery test performed **Note:** This time is taken from the Vista battery charger’s clock, which can be set under the **Settings** tab.

Temperature – Shows the ambient temperature inside the low-voltage enclosure during the last test (The **Unit** button next to the field allows toggling between Fahrenheit and Celsius.)

VL Voltage, VDC - Shows the loaded battery voltage of the last battery test conducted

Battery Impedance, Ohms – Shows the battery impedance in ohms of the last battery test conducted

Using the S&C Battery Charger Application

Test History Tab

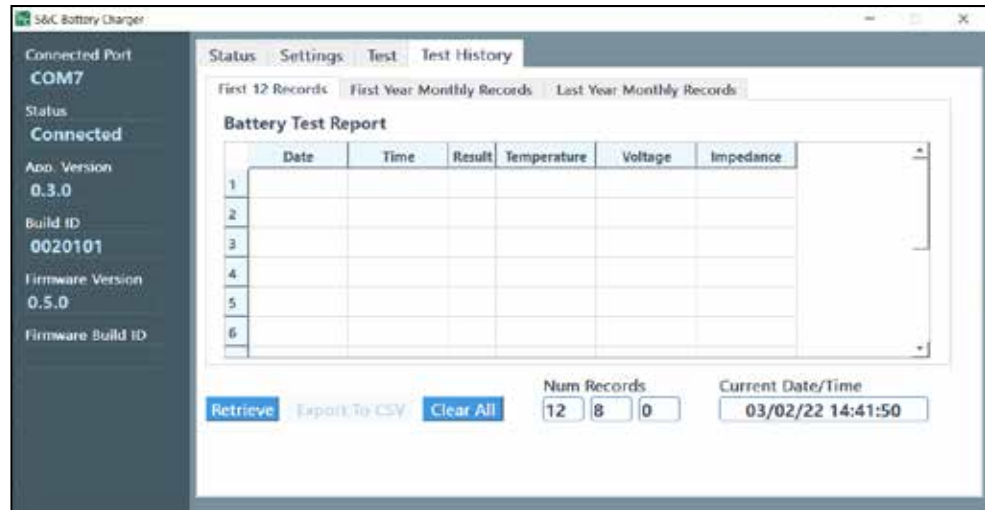


Figure 17. S&C Battery Charger application Test History tab before retrieving history.



Figure 18. The S&C Battery Charger application Test History tab after retrieving Test History.

The **Test History** tab shown in Figures 17 and 18 contain three sub-tabs:

First 12 Records

This tab shows the battery test report for the battery's first 12 records after the battery is connected to the Vista battery charger. Upon energization, the Vista battery charger will test the battery, as explained in the "Battery Self-Test Feature" section on page 6. **Note:** This information will NOT reset during battery replacement when the BATTERY RECONNECT pushbutton is pressed. The First 12 Records log must be cleared by clicking on the **Clear All** button.

First Year Monthly Records

This tab shows the battery test reports for the monthly tests conducted by the Vista battery charger for the first year of the battery pack's operational life.

Last Year Monthly Records

This tab shows the battery test reports for the monthly tests conducted by the Vista battery charger for the last 12 months of the battery pack's operational life. **Note:** During the first year of the battery's life, this record won't contain any entries. After the first-year monthly records have finished recording, this log will begin to populate with data from the monthly tests.

Battery Test Report Fields

Each of these tabs shares a similar report that shows the date, time, result, temperature, voltage, and impedance for each battery test. Possible values for the **Result** field are:

Table 5. Battery Test Report Values

Value	Description	Recommended Action
Battery OK	Battery voltage in valid range, battery test has passed	None
Batt Mismatch	Battery voltage does not match DIP switch setting	Check Battery Voltage and DIP System Voltage settings
No Battery	No battery voltage detected, presume disconnected	Connect battery and press the ALARM RESET pushbutton for 3 seconds
Batt Low	Ac input voltage not present and battery voltage is low	Reconnect ac power to the battery charger
Batt UV	Battery voltage under load low during battery test	Monitor battery. Replace battery if undervoltage condition happens when ac power is present.
Batt Bad	Battery voltage under load too low, or battery impedance too high as measured during battery test	Replace battery
Charger Bad	Battery impedance measured during battery test is invalid, possible issue with charger electronics	Attempt battery test again. Replace battery charger if same result received
Battery Test	Battery test is active. This status will be shown both during the periodic and user-initiated battery tests	None
No Result	Battery test has not been executed yet, since powerup	None

Retrieve button – Retrieves the test history for the presently selected tab from the presently connected Vista battery charger. **Note:** If the same PC is being used to connect to multiple Vista battery chargers, for example, if connecting to several different Vista battery chargers during a workday, the **Retrieve** button will clear data from the last battery charger connected to the S&C Battery Charger application in favor of the presently connected Vista battery charger. S&C recommends when performing work on multiple Vista battery chargers to close and reopen the S&C Battery Charger application between connecting to each battery charger.

Export To CSV button – Exports the present sub-tab to a Microsoft Excel readable .csv file

Using the S&C Battery Charger Application

Clear All button – Clears all test data for the tab selected (This should be done after battery replacement.)

Num Records field –Shows the number of records recorded for each sub-tab (The three number fields correspond to the **First 12 Records**, **First Year Monthly Records**, **Last Year Monthly Records** sub-tabs.)

Current Date/Time – Displays the present date and time as set on the **Settings** tab.

Performing a Battery Test Using the BATTERY TEST Pushbutton



Figure 19. Vista battery charger front panel with the CHECK BATTERY and AC ON indicators illuminated.

Complete the following steps to perform a battery test using the BATTERY TEST pushbutton:

- STEP 1.** Make sure ac power is connected to the battery charger by observing the green AC ON indicator on the front panel. S&C recommends only testing the battery when ac power is connected.
- STEP 2.** Push and hold the BATTERY TEST pushbutton for three seconds. The CHECK BATTERY indicator light will illuminate.
- STEP 3.** Wait for the CHECK BATTERY indicator light to go out. If the battery is overvoltage or undervoltage, the appropriate indicator light on the front panel will illuminate. If the battery is OK, the CHECK BATTERY indicator will go out and no other indicator will illuminate.
- STEP 4.** After performing the required battery maintenance, if necessary push the ALARM RESET pushbutton to clear the OVER VOLTAGE or UNDER VOLTAGE indicator light.

Note: When performing a battery test using the BATTERY TEST pushbutton while connected to the Vista battery charger via a computer, the progress bar on the **Test** tab will not indicate a battery test in progress. The progress bar only indicates an in-progress test when initiated by the S&C Battery Charger application.

Performing a Battery Test

Performing a Battery Test Using the S&C Battery Charger Application

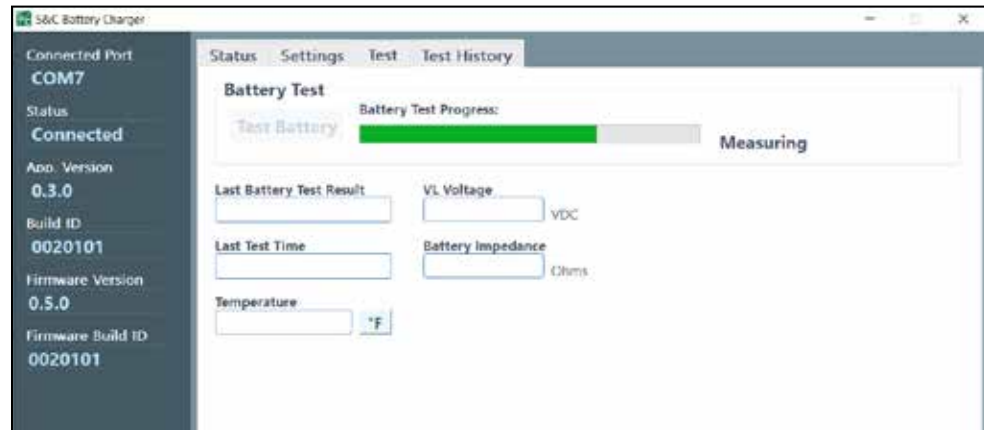


Figure 20. The Test tab during battery test.

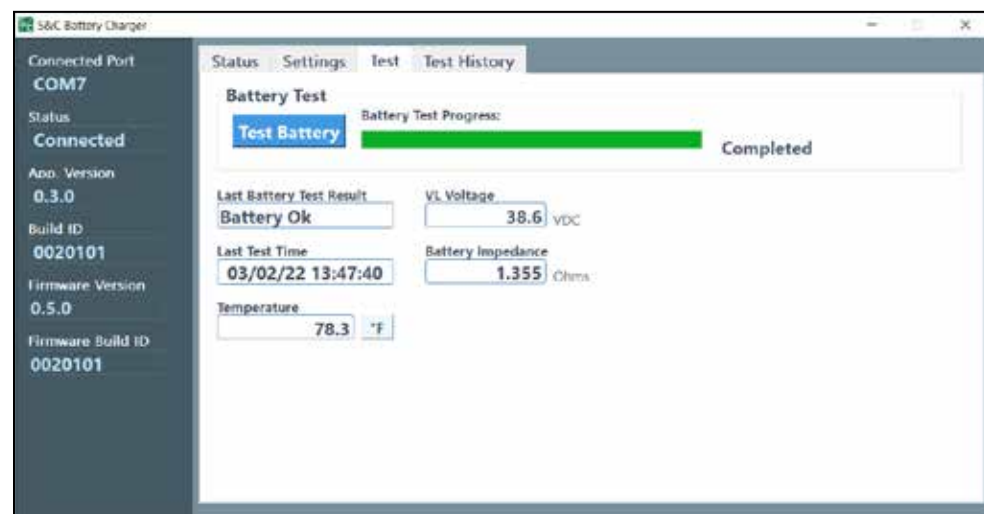


Figure 21. The Test tab after a completed battery test.

Complete the following steps when performing a battery test using the S&C Battery Charger application:

- STEP 1.** Make sure ac power is connected to the battery charger by observing the green AC ON indicator on the front panel. S&C recommends only testing the battery when ac power is connected.
- STEP 2.** Log in to the Vista battery charger as described in the “Using the S&C Battery Charger Application” section on page 14.
- STEP 3.** Navigate to the **Test** tab. Click on the **Test Battery** button. The Battery Test Progress bar will show the progress of the battery test. See Figures 20 and 21. If an **Overvoltage** or an **Undervoltage** state is detected, the appropriate indicator light on the front panel will illuminate, as will the status indicators on the **Status** tab. The possible test results are listed in Table 5 on page 23.

Performing a Battery Test Using SCADA

Contacts are available inside the battery charger for connection to a relay, such as a 751 relay, that can instigate and monitor a battery test. For more information on setting up the Vista battery charger for use with a SCADA system, contact the local S&C Sales Office.

Complete the following steps to perform a battery test using SCADA:

- STEP 1.** Make sure ac power is connected to the battery charger by observing the AC contact status. S&C recommends only testing the battery when ac power is connected.
- STEP 2.** Send a Battery Test signal to the battery charger via SCADA. The CHECK BATTERY indicator light will illuminate on the front panel of the Vista battery charger.
- STEP 3.** Wait for the battery test status to clear. If the battery is overvoltage or undervoltage, the appropriate indicator light on the front panel will illuminate and an overvoltage or undervoltage signal will be sent to the signaling relay.
- STEP 4.** After performing the required battery maintenance, push the ALARM RESET pushbutton at the Vista battery charger to clear the OVER VOLTAGE or UNDER VOLTAGE indicator light.

Exporting Test Logs

Complete the following steps to retrieve battery test logs:

- STEP 1.** Make sure ac power is connected to the battery charger by observing the green AC ON indicator on the front panel. Although connection to the Vista battery charger via PC is possible on battery power, S&C recommends only connecting when ac power is available to the battery charger.
- STEP 2.** Log in to the Vista battery charger as described in the “Using the S&C Battery Charger Application” section on page 14.
- STEP 3.** Navigate to the **Test History** tab. Select the sub-tab, **First 12 Records**, **First Year Monthly**, or **Last Year Monthly**, desired. Click on the **Retrieve** button. This will retrieve the selected log from the Vista battery charger.
- STEP 4.** Click on the **Export to CSV** button. See Figure 22. A dialog box will appear showing the save location. The default location is in the computer’s **Documents** folder. See Figure 23.

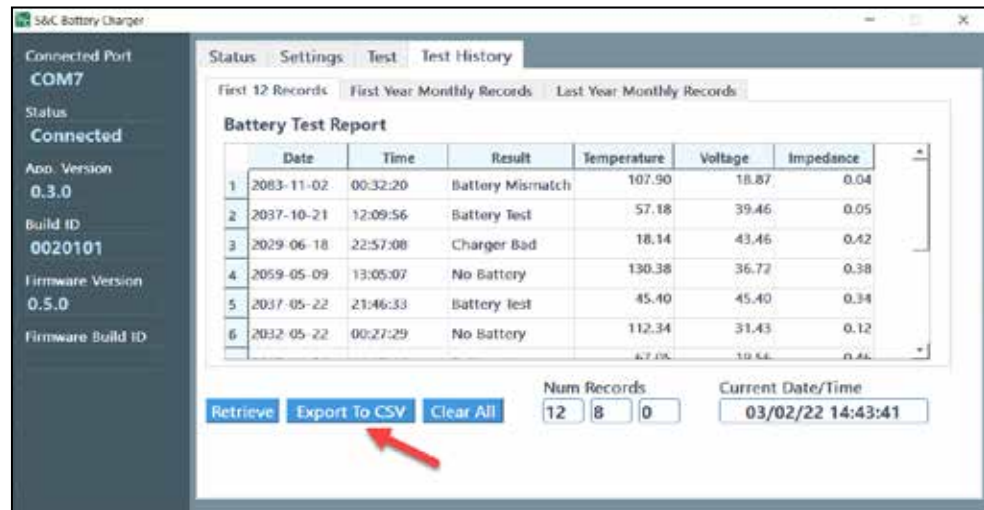


Figure 22. The Test History tab when exporting a CSV file.

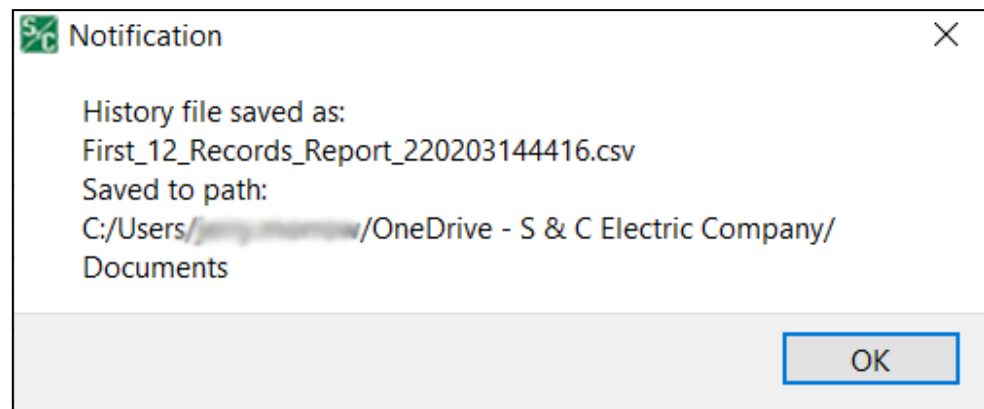


Figure 23. The History File Saved As: dialog box.

Battery Specifications and Operating Time

Table 6. Battery Specifications - Part No. 0800-0190^①

Description	Specification
Manufacturer	Hawker Energy Products, Inc.
Battery type	Rechargeable, sealed-lead, starved-electrolyte
Nominal voltage, each of three battery packs	12 V dc at 25°C (77°F)
Rated capacity (10-hour rate)	5 ampere-hour at 25°C (77°F)
Operating temperature Range	-40°C (-40°F) to +40°C (+104°F)
Maximum interval between charge	6 months
Deep discharge limit	32.4 V (three batteries connected in series)
Maximum storage temperature	+40°C (+104°F)
Life expectancy ^②	2 – 6 years

^① Three required.

^② Dependent on storage conditions, charger settings, temperature, and type of load.

Table 7. Battery Specifications - Part No. 591-000190-02^①

Description	Specification
Manufacturer	Hawker Energy Products, Inc.
Battery type	Rechargeable, sealed-lead, starved-electrolyte
Nominal voltage, each of three battery packs	12 V dc at 25°C (77°F)
Rated capacity (10-hour rate)	8 ampere-hour at 25°C (77°F)
Operating temperature Range	-40°C (-40°F) to +40°C (+104°F)
Maximum interval between charge	6 months
Deep discharge limit	32.4 V (three batteries connected in series)
Maximum storage temperature	+40°C (+104°F)
Life expectancy ^②	2 – 6 years

^① Three required.

^② Dependent on storage conditions, charger settings, temperature, and type of load.

Table 8. Operating Time When Disconnected from Ac Source- Part No. 0800-0190^①

Load	Time
For 1-Watt radio at -40°C (-40°F)	7 hours
For 1-Watt radio at +25°C (+77°F)	13 hours
For 5-Watt radio at -40°C (-40°F)	4 hours
For 5-Watt radio at +25°C (+77°F)	9 hours

^① The values shown represent the approximate length of time remote supervisory Vista switchgear will function before the low-voltage load-disconnect circuit in the battery charger operates to prevent deep discharge of the battery pack. These time values are based on continuous operation of the remote terminal unit drawing 3 Watts and occasional operation of the switch operating mechanism.

Table 9. Operating Time When Disconnected from Ac Source- Part No. 591-000190-02^①

Load	Time
For 1-Watt radio at -40°C (-40°F)	11 hours
For 1-Watt radio at +25°C (+77°F)	20 hours
For 5-Watt radio at -40°C (-40°F)	6 hours
For 5-Watt radio at +25°C (+77°F)	14 hours

^① The values shown represent the approximate length of time remote supervisory Vista switchgear will function before the low-voltage load-disconnect circuit in the battery charger operates to prevent deep discharge of the battery pack. These time values are based on continuous operation of the remote terminal unit drawing 3 Watts and occasional operation of the switch operating mechanism.

Understanding an Overvoltage Event



Figure 24. A battery charger with OVER VOLTAGE indicator illuminated.

An overvoltage event occurs when the voltage of the connected battery pack exceeds 45.9 V for a 36-V battery and 30.6 V for a 24-V battery. See Figure 24.

Overvoltage events can occur if the wrong battery voltage is connected to the charger, for example if a 36-V battery is connected to a 24-V system. Overvoltage events can also have other causes. Contact the local S&C Sales Office for more details.

When an overvoltage event occurs, the OVER VOLTAGE indicator on the front panel will illuminate, and if connected via SCADA a battery overvoltage signal will be sent. When connected to the Vista battery charger via a computer, the **LED/Relay Status** display on the **Status** tab will show a red OVERVOLTAGE indicator. The actual voltage status will also be shown in the **Battery Voltage** field.

In the event of an overvoltage, follow these steps:

- STEP 1.** Travel to the Vista battery charger as soon as possible and log in to the S&C Battery Charger application using a computer as described in “Using the S&C Battery Charger Application” section on page 14. On the **Settings** tab, make sure the batteries connected to the charger match the factory-set voltage shown in the **DIP System Voltage** field.
- STEP 2.** *If the installed battery pack voltage doesn't match the DIP System Voltage field setting:* The battery pack will need to be replaced with a pack of the correct voltage. Replace the batteries per the instructions in the “Replacing the Battery Pack” section on page 33.
If the installed battery pack voltage does match the DIP System Voltage field setting: The most likely reason for an **Overvoltage** alarm is a problem with the battery pack. Replace the batteries per the instructions in the “Replacing the Battery Pack” section on page 33. Make sure to replace the battery pack with a pack of the same voltage. Contact the local S&C Sales Office for details.
- STEP 3.** Conduct a battery test. If changing the battery pack solves the problem, the OVER VOLTAGE indicator light will be cleared.
- STEP 4.** If the OVER VOLTAGE indicator remains lit after a successful battery replacement, the Vista battery charger may require replacement. Contact the local S&C Sales Office for details.

Understanding an Undervoltage Event



Figure 25. A battery charger with UNDER VOLTAGE indicator illuminated.

An undervoltage event occurs when the voltage of the batteries drops below 36.5 V for a 36-V battery and below 24.3 V for a 24-V battery. See Figure 25.

Undervoltage events can occur when ac power to the Vista battery charger has been out for an extended period and the battery is reaching its full discharge level. They can also occur when the battery pack is reaching its end of life. **Undervoltage** events can also have other causes. Contact the local S&C Sales Office for more details.

When an undervoltage event occurs, the UNDER VOLTAGE indicator will illuminate, and if connected via SCADA, a battery undervoltage signal will be sent. When connected to the Vista battery charger via PC, the **LED/Relay Status** display on the **Status** tab will show a red UNDERVOLTAGE indicator. The actual voltage status will also be shown in the **Battery Voltage** field.

In the event of an undervoltage, follow these steps:

STEP 1. *If an ac control voltage outage has occurred:* Restore power to the Vista battery charger. The UNDER VOLTAGE indicator light will go out when the battery has charged enough to reach the appropriate voltage: above 36.5 V for a 36-V battery and above 24.3 V for a 24-V battery.

If an undervoltage event has occurred and there was no loss of ac power: The battery pack should be replaced. See the “Replacing the Battery Pack” section on page 33. Make sure to replace the battery pack with pack of the same voltage.

STEP 2. Conduct a battery test. If changing the battery pack solves the problem, the UNDER VOLTAGE indicator light will be cleared.

STEP 3. If the UNDER VOLTAGE indicator remains lit after a successful battery replacement, the Vista battery charger may require replacement. Contact the local S&C Sales Office for details.

Replacing the Battery Pack

⚠ CAUTION

DO NOT touch the end of the battery connector leading from the battery charger until de-energized by running a battery test.

Use caution when unplugging the connectors. There are 36 Volts running from the battery charger to the connector leading to the battery pack. As an additional safety feature, it is possible to force the Vista battery charger to disconnect power to the connecting cable leading from the charger to the battery pack by following the procedure to perform battery pack replacement without disconnecting ac control power to the Vista battery charger.

Failure to use sufficient caution when handling the connector may cause minor electric shock.

⚠ CAUTION

Use care when handling a battery pack that has not been fully discharged. To avoid minor electric shock, DO NOT touch the live end of the connector leading from the battery pack to the charger.

Complete the following steps to perform a battery pack replacement without disconnecting control power to the Vista battery charger:

- STEP 1.** In the low-voltage enclosure, locate the connector leading from the Vista battery charger to the battery pack. Unplug the connector, taking care not to touch the energized end of the connector. See Figure 26.

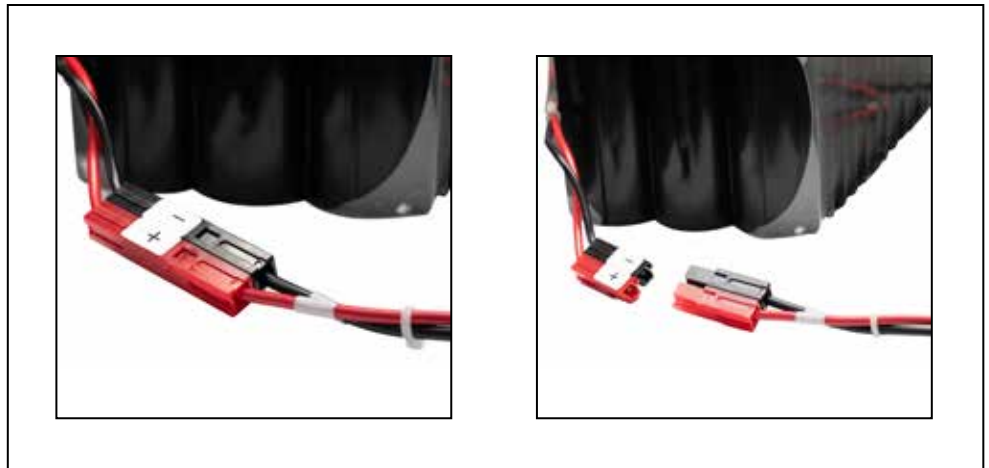


Figure 26. The battery connector.

Battery Specifications, Error Events, and Battery Replacement

- STEP 2.** Disconnect power to the connector leading from the battery charger by performing a battery test. Perform a battery test by either depressing the BATTERY TEST pushbutton or by clicking on the **Test Battery** button in the S&C Battery Charger application with no battery connected. When the charger senses no battery, it will stop sending power through the connector.
- STEP 3.** Uninstall the battery pack. Used battery packs should be properly disposed of in a manner safe for lead-acid batteries, or they can be returned to S&C Electric Company for recycling. Contact the local S&C Sales Office for more information.
- STEP 4.** Connect the red and black connector from the Vista battery charger to the connector on the new battery pack.
- STEP 5.** Push the ALARM RESET pushbutton. This reconnects dc power from the Vista battery charger to the cable connecting to the battery pack.
- STEP 6.** Log in to the Vista battery charger as described in the “Using the S&C Battery Charger Application” section on page 14. Navigate to the **First 12 Records** sub-tab under the **Test History** tab. Click on the **Clear All** button. Then, navigate to the **Settings** tab and reset the clock time by clicking on the blue **Synch w/ PC** button. This will initiate an initial battery test and provide a baseline log for the new battery pack.
- STEP 7.** While logged in to the Vista battery charger, conduct a battery test. Verify the results of the battery test are good. See the “Performing a Battery Test” section on page 25 for the instructions for performing a battery test.

Complete the following steps to perform a battery pack replacement if control power to the Vista battery charger can be disconnected:

- STEP 1.** Switch the Vista battery charger power off using the POWER toggle switch.
- STEP 2.** The battery pack is located inside the low-voltage enclosure. See Figure 26. Disconnect the red and black cable connecting the battery pack to the Vista battery charger. To avoid minor electric shock, use care when handling the battery end of the connecting cable when the batteries are not fully discharged. Remove the battery pack. Used battery packs should be properly disposed of in a manner safe for lead-acid batteries, or they can be returned to S&C Electric Company for recycling. Contact the local S&C Sales Office for more information.
- STEP 3.** Connect the red and black connector from the Vista battery charger to the connector on the new battery pack.
- STEP 4.** Restore power to the battery charger by toggling the POWER toggle switch to the **On** position.
- STEP 5.** Log in to the Vista battery charger as described in the “Using the S&C Battery Charger Application” section on page 14. Navigate to the **First 12 Records** sub-tab under the **Test History** tab. Click on the **Clear All** button. Then, navigate to the **Settings** tab and reset the clock time by clicking on the blue **Synch w/ PC** button. This will instigate an initial battery test and provide a baseline log for the new battery pack.
- STEP 6.** While logged in to the Vista battery charger, conduct a battery test. Verify the results of the battery test are good. See the “Performing a Battery Test” section on page 25 for the instructions for performing a battery test.