



PowerAgent™ SCMini-XC Installation and Operation Manual



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1. Important Information

1.1. Important Symbols



WARNING/CAUTION: The use of WARNING indicates safety information intended to prevent serious injury or death.

The use of a CAUTION indicates safety information intended to prevent damage to the equipment.



NOTE: A NOTE provides additional information to help complete a specific task or procedure.



1.2. Safety Notes



WARNING: High currents and voltages may be present on the equipment terminals and on the interior of the equipment. Make sure you understand and observe all appropriate safety codes and regulations. Follow prudent electrical safety practices when installing or servicing the equipment. Installation, maintenance and servicing of the equipment should only be performed by qualified, trained and authorized personnel.



WARNING: Before installation, take measurements with a Volt Meter to ensure that no jar post in the system has lethal AC or DC voltages relative to earth ground.



WARNING: Except as explained in this manual, there are no user-serviceable parts inside the PBT Battery Monitoring System components. Opening the equipment could expose you to dangerous voltages and void the product warranty. All product servicing should be referred to factory-authorized personnel.



WARNING: Use only interconnection cables supplied or authorized by Phoenix Broadband Technologies. Use of user-made interconnection cable assemblies could result in damage to equipment and potential safety hazards and voiding of equipment warranties.



WARNING: Ensure that the equipment is not exposed to liquids, moisture, or explosive/corrosive vapors.



CAUTION: Do not exceed the voltage specifications of the product. Doing so may damage the product and void equipment warranties.



CAUTION: Make sure the equipment is grounded properly. Failure to do so may damage the product and void equipment warranties.



1.3. Revision History

Release	Date	Revision Description
Rev 1.0	4/29/2022	Firmware Version XP 01.0b0, PIC 1.0. SiteViewer Version: 2.1.60 BETA

1.4. Definition of Terms

- Admittance** The inverse of impedance in units of Siemens. Admittance is a measure of how easily a circuit or device will allow a current to flow. Resistance is a measure of the opposition of a circuit to the flow of a DC current, while impedance takes into account not only the resistance, but AC effects (known as reactance) as well. Likewise, admittance is not only a measure of the ease with which a DC current can flow (conductance, the inverse of resistance), but also takes in to account the AC effects of susceptance (the inverse of reactance).
- Battery** A collection of jars connected in series. A battery is sometimes referred to as a battery string or string in this document.
- Cell** A collection of plates connected to a single positive and a single negative terminal, immersed in electrolyte, in a single container. The cell may have multiple positive and negative connections, but they connect to a single set of plates. A lead acid cell produces approximately 2.1 volts.
- Jar** A collection of one or more cells connected in series in a single housing. A 12-volt jar contains six cells. A jar is commonly, and incorrectly, referred to as a battery.
- String** A collection of one or more batteries.

1.5. Contact Information

If you have any questions about the installation or use of the equipment described in this manual, contact Phoenix Broadband Technologies (PBT) at (215) 997-6007

When contacting Phoenix Broadband please have the following information available:

1. SCMini-XC model number and firmware version.
2. Battery sensor model number, hardware version and firmware version. The version numbers are shown on the SCMini-XC single jar web page.
3. The battery and string voltage.
4. The battery model number.



1.6. Reference Documents

Document	Number
PowerAgent™ Battery Sensor Installation and Operation Manual	700-000015-02
Transponder Moisture Sensor Installation Instructions	700-000005-00
Transponder Harness Upgrade Kit Current Sensor Installation Instructions	701-000004-00

1.7. What Comes in the Box

The SCMini-XC is typically shipped in a single carton and will contain the SCMini-XC controller, cables and options ordered. PBT recommends taking an inventory of all items to ensure that you received all of the components needed for your application.

A label on the front of the carton will contain the MAC address of the SCMini-XC controller.





2. System Overview

The Phoenix Broadband Technologies PowerAgent PBT-SCMini-XC (hereafter referred to as the SCMini-XC) is designed to dramatically lower cost while providing battery health and cabinet/hut facility monitoring capabilities.

The SCMini-XC provides facility or cabinet monitoring capabilities via the included battery string harness as well as optional battery sensors. The battery string harness allows for the lowest-cost solution for monitoring the battery string. Using the optional battery sensors provides additional battery measurements, including ohmic measurements as well as individual battery voltages and temperatures.

The SCMini-XC also allows for monitoring AC line voltage (optional), equipment AC load current (optional), controller internal temperature, and two monitorable digital status inputs. The SCMini-XC also includes two controllable digital alarm outputs.

The SCMini-XC typically obtains its operating power from the battery string or DC fuse panel.

The SCMini-XC connects to a network switch, router or cable\DSL\cellular modem via an Ethernet connection.

The SCMini-XC has a built-in SNMP agent, a built-in web server and a built-in SMTP mail client. The SNMP agent supports IEEE/SCTE HMS MIBs making the SCMini-XC compatible with virtually any management system. HMS traps are generated based on alarm conditions defined using the HMS Property MIB. The built-in web server allows the status of the monitored batteries to be analyzed from anywhere in the network using a common web browser. This eliminates the need for expensive client application software licenses. Near real-time monitoring and alarm provisioning are available via standard web browser or software. The built-in SMTP mail client can be set up to send alarm messages to another computer (via e-mail addresses) or to a mobile phone when an alarm occurs.

The SCMini-XC can be upgraded over the network, facilitating firmware upgrades and feature enhancements as they become available. The unit also contains a special “watchdog timer” that monitors the modem and automatically resets it in case of a modem “hang” situation.

Contact Phoenix Broadband to learn about other Phoenix Broadband options for monitoring cabinets, huts or small building battery backup.



2.1. Battery Sensor Description

The optional battery sensors are small, inexpensive units designed to mount in close mechanical, electrical and thermal proximity to the monitored jar's terminal posts. The sensor takes a very small amount of "idling" power from the monitored jar (typically less than 10 mA). Internally, a programmable microcontroller chip provides an optically isolated communications interface for the SCMini-XC. Battery sensors are connected to the SCMini-XC using a CAT5 cable daisy chain.

The battery sensor continuously monitors the voltage and temperature of the attached jar. At user-defined intervals, the microcontroller generates a digitally synthesized AC test signal of approximately 0.5 to 6.0 amps (depending on sensor type) which drives the jar's terminals for testing purposes. This test current causes a small AC voltage, proportional to jar impedance, to be superimposed on the jar's DC terminal voltage. This AC voltage is separated from the DC terminal voltage and amplified inside the sensor module. It is then fed to an analog-to-digital converter inside the microcontroller chip. The microcontroller digitally samples the AC waveform and performs a DSP (digital signal processing) algorithm that filters out noise and measures the amplitude of the AC signal. These measurements and subsequent calculations determine the jar's internal AC impedance, which is the basis for admittance measurements.

Mechanically, the sensor consists of two wires with terminal lugs that connect to the jar's positive and negative terminal posts, and an electronics assembly that contains the test signal generation and measurement circuitry.

The two wire battery sensors have the advantage of working with a wide variety of jar mechanical configurations. Each battery sensor is shipped with a 1' CAT5 cable to connect the sensor to the daisy chain. This cable is the proper length for most applications. Longer cables are available from PBT.

2.1.1. "Low Voltage" Battery Sensors

The SCMini-XC system is used in environments where string voltages are 59 Vdc and lower. Low voltage battery sensors are appropriate for use in these low voltage strings.



CAUTION! *Installing low voltage battery sensors on a high voltage string will damage the sensors and may present a shock hazard.*

Connected battery sensors are auto-discovered by the SCMini-XC. These low voltage battery sensors have the advantage that their position in the string is automatically discovered. This means the battery sensors can be connected in any order and the SCMini-XC will automatically discover which cell or jar the sensor was installed on.

Each battery sensor has a bi-color red/green LED that indicates the operational state of the sensor and its communications status with the SCMini-XC. Each battery sensor is also internally fused so that improper connection to the jar will not damage the jar, the jar cabling or the sensor. The sensors are fully optically isolated from the SCMini-XC.



2.1.2. Battery Sensor Selector Guide

The standard SCMini-XC system utilizes a harness (PBT-PAC-BATT cable) to monitor voltages. When the optional low voltage sensors are desired, order one of the four part numbers shown in the following table based on if your system has three, four, six or eight jars.

Model	Description
PBT-SCMini-XC	SCMini-XC Controller with PBT-PAC-BATT cable, no battery sensor interface cable, CAT5 cables, or battery sensors.
PBT-SCMini-XC-12-4-8	SCMini-XC Controller with PBT-PAC-BATT cable, sensor Interface cable, two CAT5-7 cables, and eight BS3B-12-4-EQ battery sensors.
PBT-SCMini-XC-12-4-6	SCMini-XC Controller with PBT-PAC-BATT cable, sensor Interface cable, two CAT5-7 cables, and six BS3B-12-4-EQ battery sensors.
PBT-SCMini-XC-12-4-4	SCMini-XC Controller with PBT-PAC-BATT cable, sensor Interface cable, one CAT5-7 cable, and four BS3B-12-4-EQ battery sensors.
PBT-SCMini-XC-12-4-3	SCMini-XC Controller with PBT-PAC-BATT cable, sensor Interface cable, one CAT5-7 cable, and three BS3B-12-4-EQ battery sensors.

BS3B-12-4-EQ Sensor



This is a universal battery sensor with two wire connections that will work with most jars. The maximum bolt size for the terminals is 5/16 inch. When the sensor is mounted to the top of the jar, and not in the direct cooling air flow, the sensor will read the approximate jar case temperature. The sensor is equipped with a self-adhesive industrial Velcro strip for fastening the sensor to the jar.



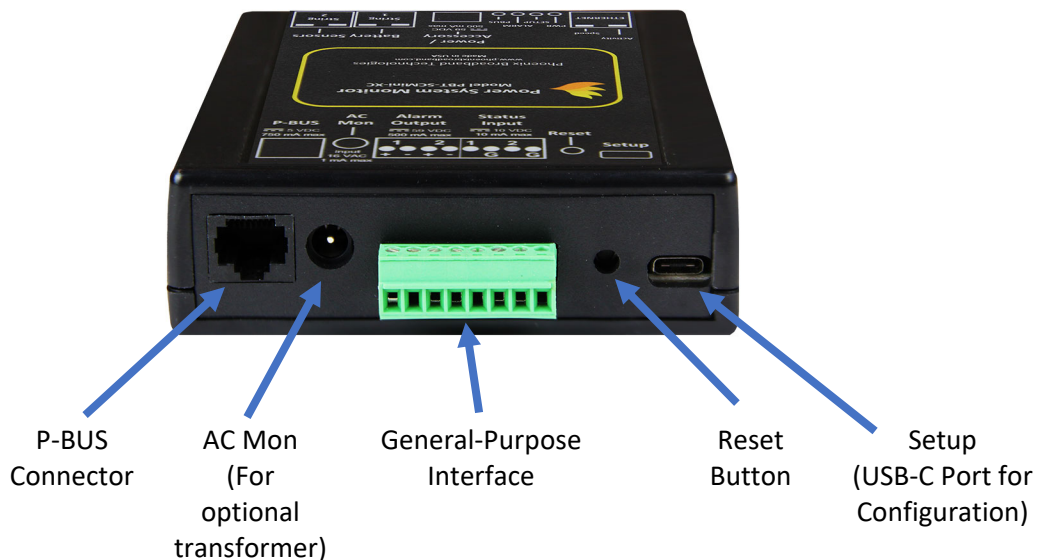
2.2. SCMini-XC Description

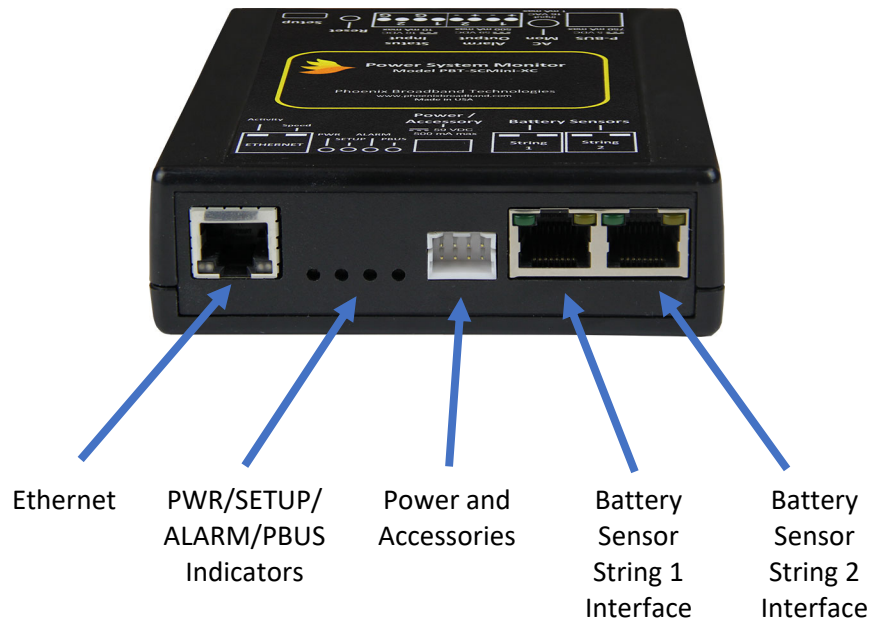
The SCMini-XC is a small, low-cost unit that monitors batteries directly using a battery wiring harness and/or optional battery sensors, and makes the data collected by them available via a local area network or the Internet. The SCMini-XC has two RJ-45 ports for connection of up to two chains of optional battery sensors, with each chain connected to three or four jars. Connections are available for optional features, including a current sensor and line voltage monitoring transformer. A General-Purpose Interface provides additional input and output capability through two general-purpose digital inputs (Status Inputs) and two general-purpose digital outputs (Alarm Outputs). A USB-C setup port allows direct connection to a PC for configuration.

The SCMini-XC is powered directly from a battery string voltage of 36-48 Vdc via the included PBT-PAC-BATT battery harness. Acceptable voltage range for providing power to the SCMini-XC is 24 to 59 Vdc. Power consumption is approximately 7 W, with current draw dependent on the input voltage and whether or not an external device is being powered from the rear panel power output connector (0.5 A typical).



The rear panel USB-C connection provides access to configure the SCMini-XC IP address and other parameters during installation. Setup can also be performed over the network connection via a PuTTY connection.





The SCMini-XC has two RJ45 connectors on the right front panel for connecting the optional battery sensors, integrating one or two strings of monitored jars.

A front panel Ethernet connection provides a TCP/IP (Internet protocol) interface to a local area network or to the Internet. A built-in web server is accessible via this interface, with no need for any software other than a common PC web browser. More sophisticated monitoring and control of the SCMini-XC can be performed remotely using any SNMP-capable network management software system. See [SNMP](#) for more details.

Upon power-up, the SCMini-XC automatically begins a search sequence to determine which of its Battery Sensor ports are attached to a string of battery sensors and discovers each connected battery sensor automatically, including its correct position in the string. (No factory programmed address is necessary.)

Once the “auto-discovery” process is finished, the SCMini-XC can individually address each sensor, collect its readings and display those readings in the hierarchical web page display. This process is ‘plug & play’. All sensor assignments and configuration information are saved in non-volatile memory, so the system automatically reconfigures itself if power is lost or if the system is turned off for maintenance.

The SCMini-XC can be mounted in any small, inconspicuous location that is available in the cabinet/enclosure.



2.3. Accessories

Various optional accessories are available to enhance the SCMini-XC system functionality.

2.3.1. Utility AC Transformer (Optional)

The SCMini-XC can monitor the utility power voltage via an optional 12 Vac wall mount transformer. This transformer can be ordered from PBT as model number WT-5. The transformer plugs into a jack on the SCMini-XC rear panel.



2.3.2. Current Sensor (Optional)

The model PBT-PA-CS-1 kit adds capability to measure the AC output current from the power supply. The kit consists of a current transformer module and a wiring harness.

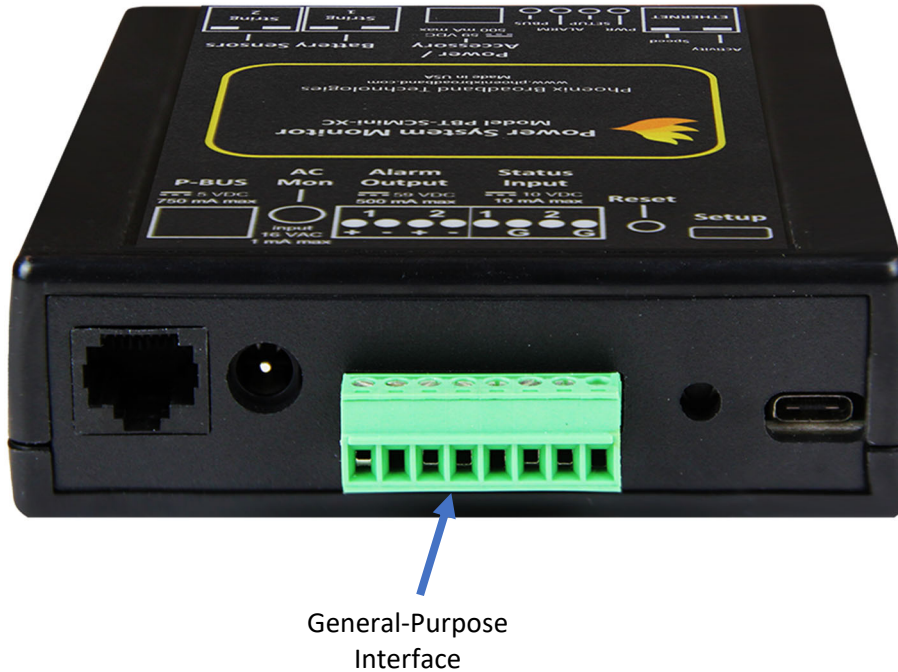


The sensor cable plugs into the Aux 1 connector on the SCMini-XC front panel.



2.3.3. Using the General-Purpose Interface

The General-Purpose Interface can be used to monitor and control auxiliary equipment if the connection between the SCMini-XC and the monitored/controlled equipment is properly implemented. Interface information for available general-purpose input and output points (via the Aux 1 connector), as well as electrical specifications for interfacing those points to the target equipment, is provided below. The picture below that shows the locations of the interface connection points on the SCMini-XC front panel.



INTERFACE TABLE

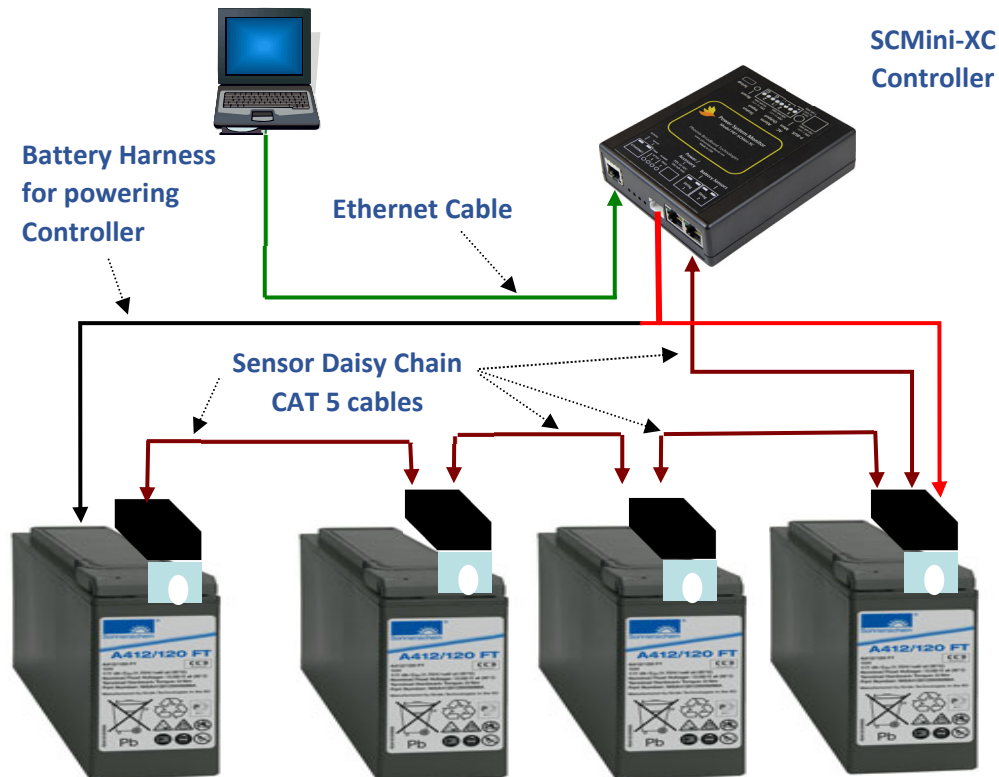
Web Description	“ON” State	“OFF” State	Vmax	Imax
“Status Input 1”	Open	GND	+10 Vdc	10 mA
“Status Input 2”	Open	GND	+10 Vdc	10 mA
“Alarm Output 1”	GND	Open	+59 Vdc	500 mA
“Alarm Output 2”	GND	Open	+59 Vdc	500 mA

A detailed schematic diagram of the I/O circuitry in the General-Purpose Interface is available from PBT or your authorized PBT re-seller.



3. Initial Bench Evaluation

If the user has no previous experience with the PowerAgent™ SCMini-XC Battery Management System, it is recommended that a small local test and evaluation of the system components be set up prior to field deployment of the equipment. This approach will allow you to verify proper operation of the SCMini-XC web server and SSH configuration without having to troubleshoot larger network issues (firewalls, router and connectivity, and so on).



The above diagram shows the SCMini-XC connected to a laptop/desktop. In this scenario, the installation steps are as follows:

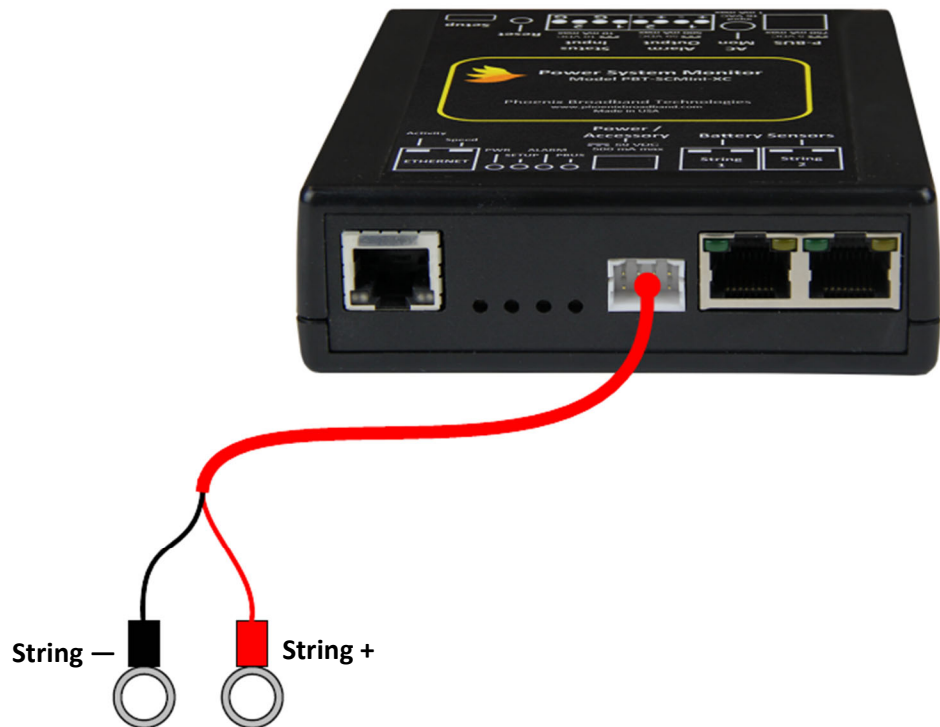
1. Power up the laptop and connect the laptop to the controller.
2. Set the laptop IP to the same IP plus one of the SCMini-XC. The SCMini-XC ships with a default, static IP address of 192.168.2.200. (So, for example, set the laptop IP address to 192.168.2.201.)





CAUTION! Lethal voltages may be present on the battery strings. If you are not fully trained to work safely around batteries and our monitoring system, leave the installation to a certified technician.

3. Battery harness - Connect the two-wire PBT-PAC-BATT harness to the battery String+ (Red) and String— (Black) terminals or power it from a DC fuse panel. Connect the other end of the harness to the Power / Accessory connector on the SCMini-XC front panel. This will power up the SCMini-XC. After a short period, the SCMini-XC PWR indicator should illuminate indicating that the modem has registered itself.





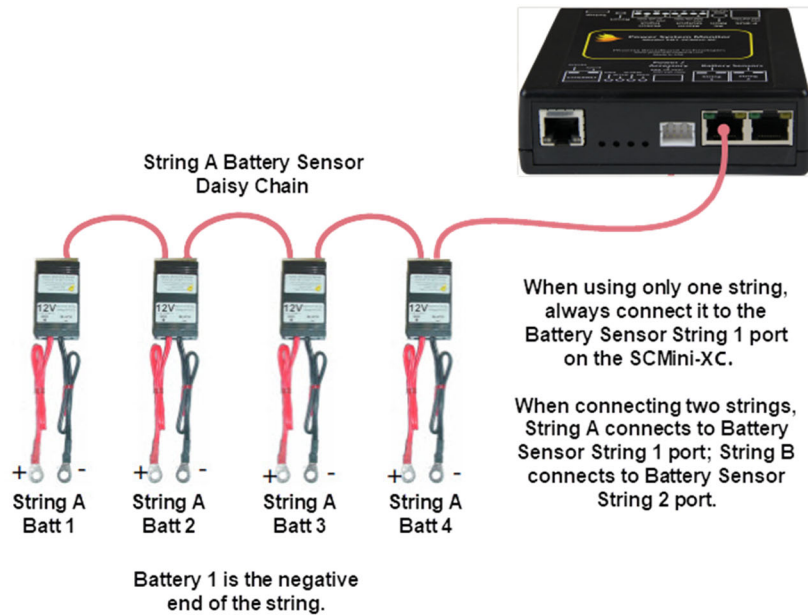
CAUTION! Lethal voltages may be present on the battery strings. If you are not fully trained to work safely around batteries and our monitoring system, leave the installation to a certified technician. Read the sensor installation instructions carefully.



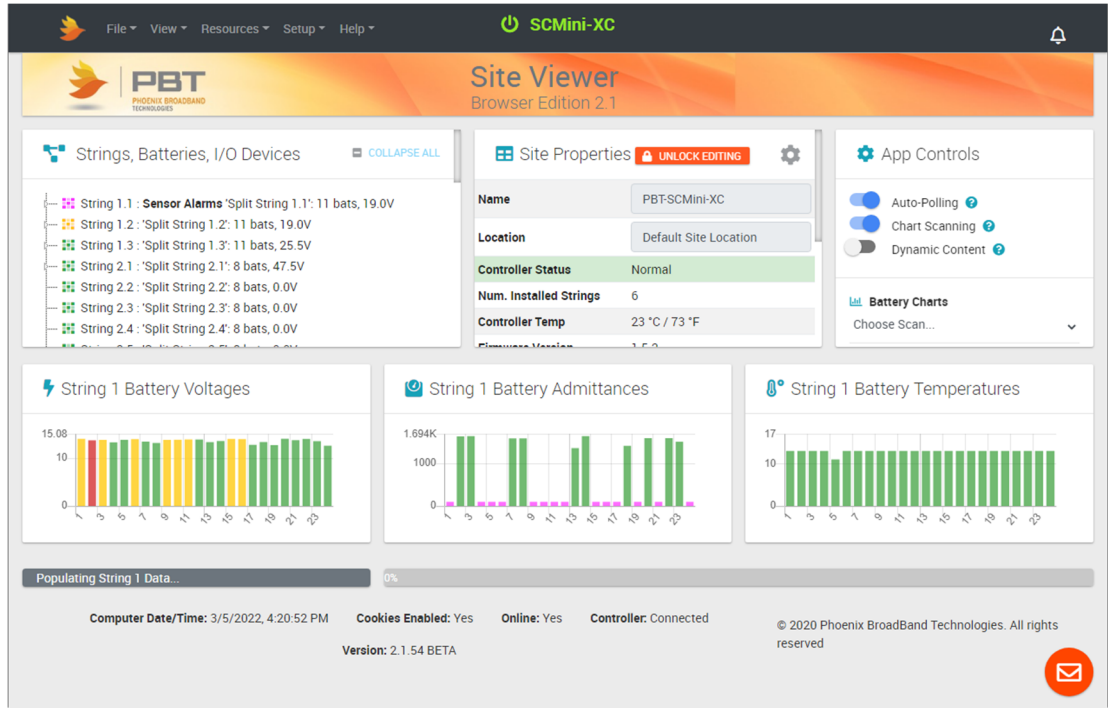
CAUTION! Be sure to disconnect the rectifier or charger before installing the battery sensors. Failure to do so could result in sensor damage.

Refer to the PowerAgent Battery Sensor Installation and Operation Manual (700-000015-00) for detailed information before installing the optional battery sensors

4. Battery Sensors (optional) – Connect the battery sensors to each battery in the string. Connect the sensors to each other (via CAT5 cables daisy-chained from sensor to sensor). Connect the last sensor in the daisy chain to the String 1 input on the front panel of the SCMini-XC.



5. Type the IP address of the controller into your laptop’s web browser and verify that the web page displays properly. Verify that all battery voltages and number of strings or optional battery sensors have been auto-discovered. Verify that the parameter information displayed in the web page appears reasonable.



6. If you are using an SNMP manager, verify proper SNMP operation (gets, sets and traps). (See [SNMP.](#))

This bench evaluation can also be performed using the free Lookout software described in the SNMP section of this manual. (See [SNMP.](#))



4. SCMini-XC Installation



NOTE: Before any battery sensor strings are connected to the SCMini-XC, connections should be made to the network (Ethernet connection) and it should be powered up and checked for network connectivity. See [Initial Bench Evaluation](#) for proper order of events.

Select a location for the SCMini-XC. The location should be central to the strings being monitored and the modem (if used) or router. It should be dry and free of corrosive or explosive vapors.

4.1. Powering

The SCMini-XC is powered by the battery string via the PBT-PAC-0BATT harness. Connect the harness to the batteries or dc fuse panel, verify correct wiring and then connect the connector end of the harness to the SCMini-XC battery string connector. The connectors are keyed and will only fit into one of the SCMini-XC female connectors. See [Initial Bench Evaluation](#) for details.

4.2. Network Connections

Connect the front panel Ethernet connector to the router (or modem) using a Cat5 cable.

Set the IP address of the SCMini-XC as described in [Setting the IP Address](#).

Verify network communications by accessing the web page.

4.3. Connecting Battery Sensors (Optional)

Refer to the PowerAgent Battery Sensor Installation and Operation Manual (700-000015-00) for detailed information before installing the optional battery sensors.



CAUTION! Lethal voltages may be present on the battery strings. If you are not fully trained to work safely around batteries and our monitoring system, leave the installation to a certified technician. Read the sensor installation instructions carefully.



CAUTION! Be sure to disconnect the rectifier or charger before installing the sensors. Failure to do so could result in sensor damage.



NOTE: We strongly recommend that you only use the cables included with the SCMini-XC for each string and not make your own sensor cables. A single improperly made cable can destroy an entire string of sensors.

Connect the cable from the string one sensor daisy-chain to the Battery Sensor / String 1 RJ-45 connector on the SCMini-XC. If two battery strings are being used, connect the cable from the string two daisy-chain to the Battery Sensor / String 2 RJ-45 connector on the SCMini-XC. See [Initial Bench Evaluation](#) for details.



The SCMini-XC will auto-discover the sensors connected in each of the daisy-chains. Once a string has been discovered, it will be visible in the web pages.

4.4. Connecting Current Sensor (Optional)

Follow the detailed instructions included with the PBT-PA-CS-1 kit. The installation process requires interrupting the output of the power supply during installation of the sensor. Plan accordingly when installing this option. The sensor measures power supply AC output current in the range of 0 - 20 A.

Connect the current sensor harness to the SCMini-XC front panel connector.

4.5. Connecting a Modbus Interface (MBI) Module

Connect the P-BUS port on SCMini-XC to one of the P-BUS ports on the MBI with a CAT5 cable as shown. Both P-BUS ports on the MBI are identical.

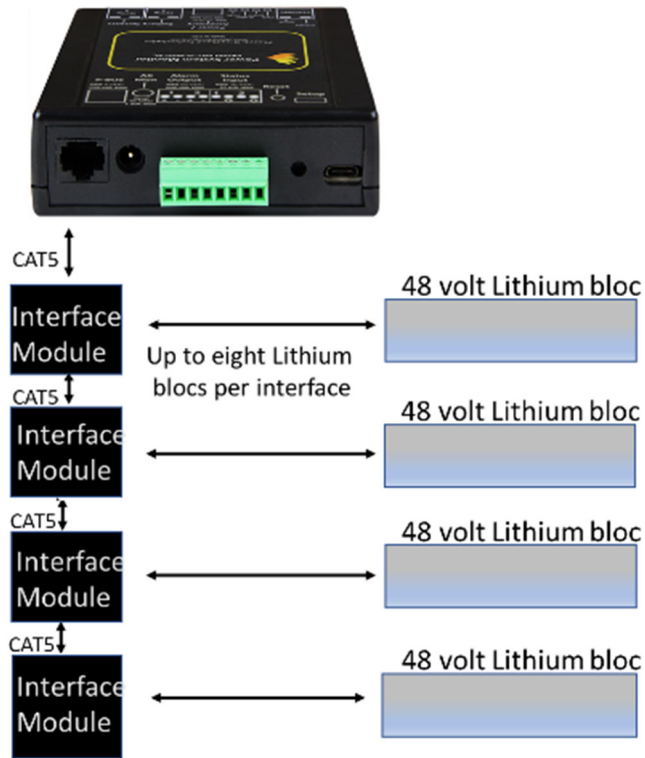


NOTE: For further information consult the PBT-MBI Modbus Module Quick Start Guide document 705-00024-00.

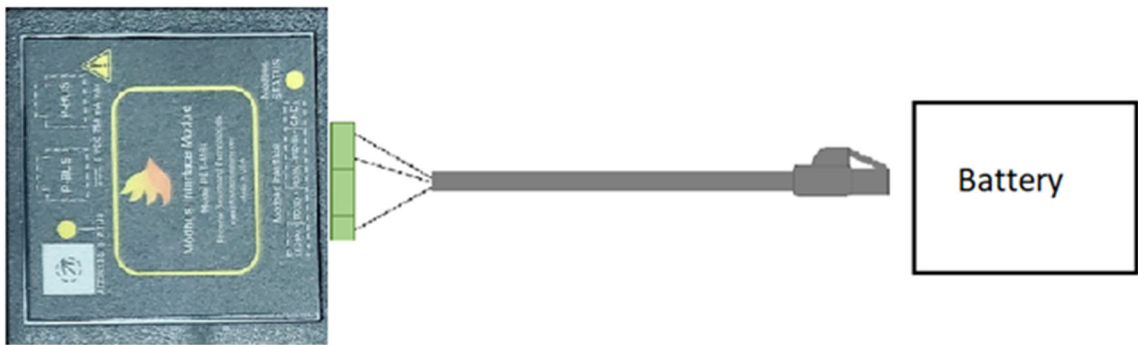


Set the address on the MBI. The default is set to address 1. Each MBI module can support up to 8 Lithium blocs. A second P-BUS port on the MBI is used to daisy chain other MBI modules. The second MBI module would be addressed as #2. Each SCMini-XC can support up to four MBI modules (addressed 1 to 4) for a total of 32 Lithium 48 volt blocs.





Connect Modbus Interface on the MBI to battery with supplied cable as shown.



See [Connecting SCMini-XC to Modbus Interface Module \(MBI\) and Lithium Battery](#) for details on provisioning lithium batteries.



4.6. Setting the IP Address

The SCMini-XC is shipped from the factory configured with a static IP address. If this has been changed, you can set it to the default static IP address by pressing and holding the SCMini-XC reset button for a minimum of 5 seconds. When all of the string port LEDs light and the SCMini-XC resets it will have a static IP address of 192.168.2.200. This IP address can be changed using the techniques described in the following sections.

There are several ways the IP address can be assigned.

- You can pre-configure your DHCP server to assign a reserved IP address to the SCMini-XC based on the SCMini-XC MAC Address. The MAC address is printed on the SCMini-XC label. This method is commonly used for field installations.
- You can let your DHCP server assign an address and then interrogate the DHCP server to determine what address was used. This technique works well in the lab environment where the DHCP server may be in a router. This method is not very practical for field installations since the IP address can change if the SCMini-XC resets or the DHCP server decides there is a reason to change the address.
- You can program a static IP address in the SCMini-XC using a temporary connection to a router with a built-in DHCP server and the SCMini-XC SSH configuration port.
- You can program a static IP address in the SCMini-XC using an Ethernet standard or crossover cable and a PC as described in the next section.

Generally, static IP addresses are used so that the network manager can associate the IP address with a physical location. Contact your network administrator or IT department to obtain a static IP address, gateway address and subnet mask that will work on your network.



Type the IP address of the controller into your laptop’s web browser and verify that the web page displays properly. Verify that all battery voltages and number of strings or optional battery sensors have been auto-discovered. Verify that the parameter information displayed in the web page appears reasonable.

The screenshot displays the SCMini-XC Site Viewer web interface. At the top, there is a navigation bar with 'File', 'View', 'Resources', 'Setup', and 'Help' menus. The main header includes the PBT logo and the title 'Site Viewer Browser Edition 2.1'. The interface is divided into several sections:

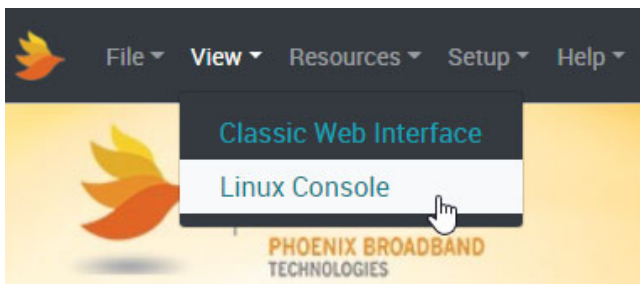
- Strings, Batteries, I/O Devices:** A list of strings with their respective battery counts and voltages. For example, 'String 1.1 : Sensor Alarms : Split String 1.1: 11 bats, 19.0V'.
- Site Properties:** A panel with fields for Name (PBT-SCMini-XC), Location (Default Site Location), Controller Status (Normal), Num. Installed Strings (6), and Controller Temp (23 °C / 73 °F).
- App Controls:** A panel with toggle switches for Auto-Polling, Chart Scanning, and Dynamic Content.
- Battery Charts:** Three charts showing 'String 1 Battery Voltages', 'String 1 Battery Admittances', and 'String 1 Battery Temperatures'.
- Progress Bar:** A bar at the bottom indicating 'Populating String 1 Data...' at 0%.
- Footer:** Information including 'Computer Date/Time: 3/5/2022, 4:20:52 PM', 'Cookies Enabled: Yes', 'Online: Yes', 'Controller: Connected', 'Version: 2.1.54 BETA', and copyright information for Phoenix BroadBand Technologies.



4.7. Configuring the SCMini-XC

To configure the SCMini-XC:

1. With the IP address confirmed and the SiteViewer displayed (see [Setting the IP Address](#)), choose **View > Linux Console** from the main menu.



The SCmini login field appears.



NOTE: By default, the username for the SCMini- is `qwerty`. The password is `Z!x2C#`.

2. Enter the **User name** and press ENTER. The Password field appears.
3. Enter the **Password** for the SCMini-XC in the corresponding field and press ENTER. A welcome message and prompt appears.
4. Type `./config` and press ENTER. The SCMini-XC Configuration Menu appears as shown below.

```

Main Menu

item #
 1 - IPv4
 2 - IPv6
 3 - SNMP
 4 - Email
 5 - Firmware Server
 6 - NTP
 8 - Change Web Page Settings
10 - Time Zone

81 - Delete the Entire Database
90 - Help and Hints
91 - Shutdown Web Only
94 - Reboot
95 - Shutdown Completely
99 - Exit this Application

Enter an item #: 
  
```

To select any option from the menu, enter the corresponding number and press ENTER.

Specific configuration information is provided below.



4.7.1. General Configuration Information

The SCMini-XC uses a Linux operating system. The configuration menus are similar to those used by the Linux operating system.

Individual menu screens are used to set parameters for specific functionality. The example below shows the configuration menu for IPv4.

```
IPv4 Configuration Menu
item #  Key    (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 - ipv4 (enable)
  2 - dhcpClient (disable)
  3 - ipv4Address (50.199.84.244)
  4 - ipv4Gateway (50.199.84.246)
  5 - ipv4Netmask (255.255.255.0)
  6 - PrimaryDNS (4.2.2.2)
  7 - SecondaryDNS (75.75.75.75)

 94 - Clone a key
 95 - Remove a Key
 96 - Add a Key
 97 - Add a value to an existing key
 98 - Exit without Saving
 99 - Save Changes and Exit this Menu

Enter an item #: 
```

Items are selected by entering the corresponding item number (item #) and then pressing ENTER.

This allows you to change the value (or values) associated with the keystring. In the example shown above, selecting item 1 allows you to change the IPv4 address.



Some keystings can accept more than one value. Where this is the case, values are entered separated by a space. For example, when changing an IP address:

1. Press the number corresponding to the item you wish to change and then press ENTER. (The image shown below shows changing the IPv4 IP Address.)

```
IPv4 Configuration Menu
item #  Key  (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 - ipv4 (enable)
  2 - dhcpClient (disable)
  3 - ipv4Address (50.199.84.244)
  4 - ipv4Gateway (50.199.84.246)
  5 - ipv4Netmask (255.255.255.0)
  6 - PrimaryDNS (4.2.2.2)
  7 - SecondaryDNS (75.75.75.75)

 94 - Clone a key
 95 - Remove a Key
 96 - Add a Key
 97 - Add a value to an existing key
 98 - Exit without Saving
 99 - Save Changes and Exit this Menu

Enter an item #: 3

menuItem = 3
Selected Key: ipv4Address
Present Values: [1]50.199.84.244
To remove a value enter a space
Enter New Value [1]:
```

2. Enter the desired value at the prompt and then press ENTER. A confirmation message appears.
3. To confirm your entry, press Y and then press ENTER. The IP v4 Menu appears. The entered value is displayed to the right of the previous value.
4. Repeat steps 1 through 3 for any other values you wish to change.



NOTE: As noted above, keystings (or keys) correspond to an item # on the menus. These item numbers may vary depending on how your SCMini-XC is configured. In all cases, use the item number displayed on the menu rather than any specific item number documented in this manual.

5. To save the changes you've made, press 99 and then press ENTER. (Pressing 98 and then ENTER exits the menu without saving any of the changes made.)



4.7.2. IPv4 Configuration

The IPv4 Menu allows you to set the IPv4 address, default gateway, and net mask. You can selectively enable/disable DHCP to allow automated IP configuration. You can also specify the primary and secondary DNS and the MTU (Maximum Transmission Unit) size.

To configure IPv4:

1. Press 1 and then ENTER on the Main Menu. The IPv4 Configuration Menu appears.

```
IPv4 Configuration Menu
item #  Key   (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 -  ipv4 (enable)
  2 -  dhcpClient (disable)
  3 -  ipv4Address (50.199.84.244)
  4 -  ipv4Gateway (50.199.84.246)
  5 -  ipv4Netmask (255.255.255.0)
  6 -  PrimaryDNS (4.2.2.2)
  7 -  SecondaryDNS (75.75.75.75)

 94 - Clone a key
 95 - Remove a Key
 96 - Add a Key
 97 - Add a value to an existing key
 98 - Exit without Saving
 99 - Save Changes and Exit this Menu

Enter an item #: 
```

2. Change any of the currently set values as desired. See [General Configuration Information](#) for details. When dhcpClient is set to enabled, other entered values (ipv4Address, ipv4Gateway, and ipv4Netmask) are ignored.
3. To save the changes you've made, press 99 and then press ENTER. (Pressing 98 and then ENTER exits the IPv4 Configuration Menu without saving any of the changes made.)



4.7.3. IPv6 Configuration

The IPv6 Menu allows you to set the IPv6 address, default gateway, and domain. You can selectively enable/disable IPv6. You can also enable/disable DHCP to allow automated IP configuration. Additionally, you can specify the primary and secondary DNS.

To configure IPv6:

1. Press 2 and then ENTER on the Main Menu. The IPv6 Configuration Menu appears.

```

IPv6 Configuration Menu
item #  Key   (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 -  ipv6 (disable)
  2 -  ipv6DhcpClient (disable)
  3 -  ipv6Address (0:0:0:0:0:0:0/64)
  4 -  ipv6Gateway (0:0:0:0:0:0:0/64)
  5 -  ipv6PrimaryDNS (0:0:0:0:0:0:0/64)
  6 -  ipv6SecondaryDNS (0:0:0:0:0:0:0/64)

 94 - Clone a key
 95 - Remove a Key
 96 - Add a Key
 97 - Add a value to an existing key
 98 - Exit without Saving
 99 - Save Changes and Exit this Menu

Enter an item #: 

```

2. Change any of the currently set values as desired. See [General Configuration Information](#) for details. When ipv6DhcpClient is set to enabled, other entered values (ipv6Address, ipv6Gateway, and ipv6Netmask) are ignored.
3. To save the changes you've made, press 99 and then press ENTER. (Pressing 98 and then ENTER exits the IPv6 Configuration Menu without saving any of the changes made.)



4.7.4. SNMP Configuration

Simple Network Management Protocol (SNMP) is an Internet-standard protocol for collecting and organizing information about managed devices on IP networks and for modifying that information to change device behavior.

SNMP configuration allows you to specify identifying information such as syslocation, syscontact, and so on. The SNMP Community Strings and Trap destinations are configured from the SNMP Configuration Menu.

In typical uses of SNMP one or more administrative computers, called managers, have the task of monitoring or managing a group of hosts or devices on a computer network. Each managed system executes, at all times, a software component called an agent which reports information via SNMP to the manager.

An SNMP-managed network consists of three key components:

- Managed device
- Agent — software which runs on managed devices
- Network management station (NMS) — software which runs on the manager

A managed device is a network node that implements an SNMP interface that allows unidirectional (read-only) or bidirectional (read and write) access to node-specific information. Managed devices exchange node-specific information with the NMSs. Sometimes called network elements, the managed devices can be any type of device, including, but not limited to, routers, access servers, switches, cable modems, bridges, hubs, IP telephones, IP video cameras, computer hosts, and printers.

An agent is a network-management software module that resides on a managed device. An agent has local knowledge of management information and translates that information to or from an SNMP-specific form.

The SCMini-XC Site Controller supports SNMP v1, SNMP v2c and SNMP v3.



4.7.4.1. SNMP Configuration - General

To setup SNMP:

1. Press 3 and then ENTER on the Main Menu. The SNMP Configuration Menu appears.

```

SNMP Configuration Menu
item #  Key      (presentValue1) (presentValue2)... -> newValue1 newValue2...
 1 - syslocation ("pbt lab")
 2 - syscontact (215-997-6007)
 3 - sysObjectID (1.3.6.1.4.1.20433.1.1.1.9.0)
 4 - sysDescr ("PBT-PA-SCmini-XC Site Controller") (Site) (Controller)
 5 - sysName (Phoenix) (Broadband) (Technologies)
 6 - trapsink (192.168.60.1) (public)
 7 - trapsink (0.0.0.0) (public)
 8 - trapsink (0.0.0.0) (public)
 9 - trap2sink (0.0.0.0) (public)
10 - trap2sink (0.0.0.0) (public)
11 - trap2sink (0.0.0.0) (public)
12 - informsink (0.0.0.0) (public)
13 - informsink (0.0.0.0) (public)
14 - informsink (0.0.0.0) (public)
15 - trapcommunity (public)
16 - authtrapsenable (1)
17 - rwuser (admin) (noauth)
18 - rouser (mike) (auth)
19 - rocommunity (public)
20 - rwcommunity (secret)
21 - agentAddress (udp:161,udp6:161)
22 - rocommunity6 (public) (default)
23 - rwcommunity6 (secret) (default)
24 - createUser (admin) (MD5) (password)
25 - createUser (public) (MD5) (password)
26 - createUser (mike) (MD5) (password)
27 - master (agentx)

94 - Clone a key
95 - Remove a Key
96 - Add a Key
97 - Add a value to an existing key
98 - Exit without Saving
99 - Save Changes and Exit this Menu

Enter an item #: 

```

2. Change any of the currently set values as desired. See [General Configuration Information](#) for details.

For more details, see:

- [SNMP v1 Configuration](#)
- [SNMP v3 Configuration](#)

3. To save the changes you've made, press 99 and then press ENTER. (Pressing 98 and then ENTER exits the SNMP Configuration Menu IPv4 setup without saving any of the changes made.)



4.7.4.2. SNMP v1 Configuration

It is assumed that customers using SNMP v1 are using IPv4. For details on setting up IPv4, see [IPv4 Configuration](#).

To configure SNMP for v1:

1. Set the trapsink strings to the desired values. (Two trapsink entries are provided. More can be added as desired.)
2. Set the trapcommunity string to the desired value.
3. Set the rocommunity and rwcommunity strings to the desired values. SNMP v1 is enabled when rocommunity, rwcommunity, or trapcommunity have values.

4.7.4.3. SNMP v3 Configuration

It is assumed that customers using SNMP v3 are using IPv6. For details on setting up IPv6, see [IPv6 Configuration](#).



4.7.5. Email Client Configuration

The Email Client will email alarm messages to a maximum of 5 email addresses.

To setup email:

1. Press 4 and then ENTER on the Main Menu. The Email Client Configuration Menu appears.

```

Email Client Configuration Menu
item #   Key      (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 - emailAlarms (enable)
  2 - SMTPserver
  3 - SMTPport (25)
  4 - authentication (enable)
  5 - serverUserId (name)
  6 - serverPassword (password)
  7 - tlsEncryption (enable)
  8 - toHeader (Alm_manager)
  9 - toAddress1
 10 - toAddress2
 11 - toAddress3
 12 - toAddress4
 13 - toAddress5
 14 - fromAddress

 94 - Clone a key
 95 - Remove a Key
 96 - Add a Key
 97 - Add a value to an existing key
 98 - Exit without Saving
 99 - Save Changes and Exit this Menu

Enter an item #: 

```

2. Change any of the currently set values as desired. See [General Configuration Information](#) for details.
 - You can selectively enable/disable emails by using option 1 from the Email Client Configuration Menu. This will open/close TCP port 25 on the Site Controller, respectively.
 - Use option 2 to specify the SMTP server. If no name (or IP address is specified, the email client is disabled. If a server name was previously entered it will be shown. The IP address of the mail server can be entered in place of the server name if desired.
 - By default, the SMTP port is set to 25. You can change this if desired.
 - You can enable/disable email authentication as required by your email server.
 - If your server requires a user ID and password, enter them in the corresponding line items. If the user ID is left blank, the Site Controller will not send the user name and password to the mail server.
 - TLS (Transport Layer Security) uses PKI (Public Key Infrastructure) to encrypt messages from mail server to mail server. This encryption makes it more difficult for hackers to



intercept and read messages. If your email server uses TLS encryption, it can be enabled via item 7 (tlsEncryption) on the Email Client Configuration Menu.

- Use item 8 to specify the toHeader. This is the email address that will show in the To header of the email message, which technically doesn't have to be the recipient of the message. It is important to distinguish between toHeader and the toAddress entries. In most business cases, these will be the same email address and therefore the same value. If you want to send an email to john@company.com, then ToEmailAddress=john@company.com and ToHeader=john@company.com, because you want the toHeader to show the same email address to which the message was sent.
- Up to 5 destination Email addresses (toAddress1 through toAddress5) may be entered, as desired.
- Specify the fromAddress. This is the "from" address that will show up in the email when it is received.



NOTE: The fromAddress should generally be set to an address that is registered on the SMTP server. Many servers use this to authenticate the outgoing Email.

3. To save the changes you've made, press 99 and then press ENTER. (Pressing 98 and then ENTER exits Email Client Configuration without saving any of the changes made.)



NOTE: If you have problems with email, ensure that the Domain Name Server (DNS) IP address is set correctly. The DNS allows the Email application to obtain the IP address of the specified server so it can send the mail. There are fields for a primary and secondary DNS. (See SCMini-XC Configuration Program for details.) The default is a commonly used DNS (4.2.2.2). Change this to your local DNS if you prefer. As long as the Site Controller can see the internet the default DNS will work. If the DNS IP addresses are set to zeros, the email functionality will be disabled.



4.7.6. Firmware Server Configuration

If the Firmware Server is enabled, the SCMini-XC Site Controller will send the Firmware Server its IP address, Date/Time stamp, MAC Address, Unit Type and Firmware Version at random times.

This feature is used in conjunction with a dedicated Firmware Server to enable automatic updates of firmware and web pages on the SCMini-XC.

The Firmware Server can be selectively enabled/disabled using the notify function. The IP address and port number can also be entered from this menu.

To setup the Firmware Server:

1. Press 5 and then ENTER on the Main Menu. The Firmware Server Configuration Menu appears.

```
Firmware Server Configuration Menu
item #  Key   (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 - notify (disabled)
  2 - serverIP (0.0.0.0)
  3 - serverPort (30705)

94 - Clone a key
95 - Remove a Key
96 - Add a Key
97 - Add a value to an existing key
98 - Exit without Saving
99 - Save Changes and Exit this Menu

Enter an item #:
```

2. Change any of the currently set values as desired. See [General Configuration Information](#) for details.
3. To save the changes you've made, press 99 and then press ENTER. (Pressing 98 and then ENTER exits Firmware Server Configuration Menu without saving any of the changes made.)



4.7.7. NTP Configuration

The Site Controller can set its internal clock from any time server that supports Simple Network Time Protocol (SNTP). There are many such servers around the world. Many of these servers are operated by government standards organizations. Most private networks also have time servers.

This is intended to be used to set the real time clock in Site Controllers that do not have access to a time server. The time is set by sending GMT from the PC to the Site Controller and applying the time offset programmed in the Site Controller as described below. This allows the time to be set in Site Controllers that are not in the same time zone as the PC. If the Site Controller is able to access a time server, the time sent from the PC will be overwritten when the time update occurs (at approximately 10 minutes past the hour).

The SCMini-XC is shipped with the NTP configuration set to get the time from two different US National Institute of Standards (NIST) time servers. The IP addresses of these servers can be changed in the NTP configuration. If the time server addresses are not configured or the SCMini-XC is unable to contact either time server, the SCMini-XC will initialize the time to 00:00:00 1/1/2008. If communication is not established with a time server, the internal clock will run from this point.



NOTE: The Site Controller is shipped with the NTP configuration set to get the time from at US National Institute of Standards (NIST) time server (time.nist.gov). The IP addresses of these servers can be changed in the NTP Configuration. If the time server addresses are not configured or the Site Controller is unable to contact either time server the Site Controller will initialize the time to 00:00:00 1/1/2008. If communication is not established with a time server the internal clock will run from this point.

To setup NTP:

1. Press 6 and then ENTER on the Main Menu. The NTP Configuration Menu appears.

```

NTP Configuration Menu
item #   Key      (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 - server (0.pool.ntp.org) (iburst)
  2 - server (1.pool.ntp.org) (iburst)
  3 - server (2.pool.ntp.org) (iburst)
  4 - server (3.pool.ntp.org) (iburst)
  5 - restrict (default) (ignore)
  6 - restrict (-6) (default) (ignore)

94 - Clone a key
95 - Remove a Key
96 - Add a Key
97 - Add a value to an existing key
98 - Exit without Saving
99 - Save Changes and Exit this Menu

Enter an item #: 

```

2. Change any of the currently set values as desired. See [General Configuration Information](#) for details.



3. The time provided by most time servers is Greenwich Mean Time (GMT). The Site Controller will convert this to Local Time using a time offset that can be entered in the DNP3 Configuration. See [DNP3 Configuration](#) for details.
4. To save the changes you've made, press 99 and then ENTER. (Pressing 98 and then ENTER exits the NTP Configuration Menu without saving any of the changes made.)

4.7.8. Password Setup

To change the Passwords used for the web page access, type "1" followed by "Enter".



NOTE: SiteViewer properties and settings are accessed using the Administrator Password (item 1). See [Unlocking the SiteViewer for Editing](#) for details. As of this writing, the User Password (item 2) is not used.

To change a password:

1. Press 8 and then ENTER on the Main Menu. The Web Page Settings Menu appears.

```

Web Page Settings Menu
item #  Key                (presentValue) -> newValue
  1 - Administrator Password (admin)
  2 - User Password (user)

98 - Exit without Saving
99 - Save Changes and Exit this Menu

Enter an item #: 

```

2. Change any of the currently set values as desired. See [General Configuration Information](#) for details.

When changing a password, type the new password followed by "Enter." To keep the present password, type "Enter". Passwords can be up to 18 characters long and are case sensitive. The default for Administrator Password 1 is "admin" and the default for User Password is "user". The password changes will immediately be saved to nonvolatile memory and become effective.

3. To save the changes you've made, press 99 and then ENTER. (Pressing 98 and then ENTER exits the Web Page Settings Menu without saving any of the changes made.)



4.7.9. Time Zone Configuration

The most common uses for the FTP functionality are to access log files and to update the SCMini-XC4 firmware. FTP functionality is factory configured for almost all purposes.

The only changes you will likely ever make to this configuration are:

- Enabling/disabling the FTP functionality via the local_enable setting.
- Changing the idle_session_timeout value (the amount of idle time before an FTP session closes).

To make changes to the FTP configuration:

1. Press 10 and then press ENTER on the Main Menu. The Time Zone Configuration Menu appears.

```
Time Zone Configuration Menu
item #   Key      (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 - timezoneFile (/usr/share/zoneinfo/posix/US/Eastern)

94 - Clone a key
95 - Remove a Key
96 - Add a Key
97 - Add a value to an existing key
98 - Exit without Saving
99 - Save Changes and Exit this Menu

Enter an item #:
```

2. Change any of the currently set timezoneFile as desired. See [General Configuration Information](#) for details.

The following is a list of valid Time Zones that can be entered, prefixed by /usr/share/zoneinfo/posix/. Note that entries are case- sensitive.

- US/Alaska
- US/Aleutian
- US/Arizona
- US/Central
- US/Eastern
- US/East-Indiana
- US/Hawaii
- US/Indiana-Starke
- US/Michigan



- US/Mountain
- US/Pacific
- US/Pacific-New
- US/Samoa

The entries are concatenations of a directory name and a file within the directory. For example, US/Eastern.



NOTE: Other time zones can be used. These can be found on the Site Controller in the /usr/share/zoneinfo/posix/ directory. (You can use PuTTY to access this directory as described in Updating Operating System and Firmware.)

3. To save the changes you've made, press 99 and then ENTER. (Pressing 98 and then ENTER exits the NTP Menu without saving any of the changes made.)



4.7.10. Deleting the Entire Database

To restore the factory default settings, press 81 and then ENTER on the Main Menu. All SNMP, e-mail, NTP and HMS values will be set to the factory defaults. The IP address will not be changed. However, the gateway and netmask settings will be set to the factory default values.



NOTE: Be careful. Changing the gateway and netmask settings could prevent communications with the SCMini-XC, requiring a site visit.

4.7.11. Helps and Hints

To get help and hints for using the Linux console, press 90 and then ENTER on the Main Menu.

4.7.12. Shutdown Web Only

This menu item should only be performed by Phoenix Broadband technicians.

4.7.13. Reboot

To reboot the SCMini-XC, press 99 and then ENTER on the Main Menu. (Rebooting the SCMini-XC does not change any database entries or settings.)

4.7.14. Shutdown Completely

This menu item should only be performed by Phoenix Broadband technicians.

4.7.15. Exit This Application

To exit the SCMini-XC Configuration Menu, press 99 and then ENTER on the Main Menu. The menu close. You can exit the console function by typing exit and then pressing ENTER.



5. Provisioning

The process of setting up all the thresholds, labels and other software-configured settings for the SCMini-XC is called “Provisioning”. Provisioning can be accomplished remotely, via the site-controller’s built-in web interface or via an SNMP-compliant application-specific software package.

While provisioning via SNMP is complex, requiring the use of specialized software, and is beyond the scope of this document, the SCMini-XC is designed to work with a variety of software packages. See [SNMP](#) for more information.

Provisioning via the site-controller’s built-in web page is comprehensive and easy. You can specify custom labels for the SCMini-XC name, the site location, the name of each string and the name or type of each jar. In addition, you can set alarm thresholds for every monitored parameter, including individual alarm thresholds for each jar. Other user-generated parameters include the interval at which batteries will be tested (with optional sensors) and an initial “reference level” for measurements and alarm generation. See [SiteViewer](#) for more information.



6. SiteViewer

The status of the batteries that are being monitored by an SCMini-XC can be viewed using any network-connected PC using a web browser. Type the IP address of the SCMini-XC in the browser's URL address space, for example "50.199.84.xxx," and then press ENTER. The controller will display the SiteViewer web page as shown in the example below.

The screenshot displays the SiteViewer web interface for a PBT SCMini-XC controller. The interface is organized into several sections:

- Navigation:** A top menu bar with options: File, View, Resources, Setup, Help.
- Header:** PBT Phoenix Broadband Technologies logo and "Site Viewer Browser Edition 2.1".
- Left Panel:** "Strings, Batteries, I/O Devices" with a "COLLAPSE ALL" button. It lists several strings with sensor alarms:
 - String 1.1: Sensor Alarms Split String 1.1: 11 bats, 19.0V
 - String 1.2: Split String 1.2: 11 bats, 19.0V
 - String 1.3: Split String 1.3: 11 bats, 25.5V
 - String 2.1: Split String 2.1: 8 bats, 47.5V
 - String 2.2: Split String 2.2: 8 bats, 0.0V
 - String 2.3: Split String 2.3: 8 bats, 0.0V
 - String 2.4: Split String 2.4: 8 bats, 0.0V
- Right Panel:** "Site Properties" (UNLOCK EDITING) and "App Controls".
 - Site Properties:** Name: PBT-SCMini-XC, Location: Default Site Location, Controller Status: Normal, Num. Installed Strings: 6, Controller Temp: 23 °C / 73 °F.
 - App Controls:** Auto-Polling (checked), Chart Scanning (checked), Dynamic Content (unchecked).
 - Battery Charts:** Choose Scan...
- Main Content Area:** Three charts for "String 1":
 - String 1 Battery Voltages:** A bar chart showing voltage levels for 16 battery cells, with values ranging from approximately 10 to 15.08.
 - String 1 Battery Admittances:** A bar chart showing admittance levels for 16 battery cells, with values ranging from 0 to 1.694K.
 - String 1 Battery Temperatures:** A bar chart showing temperature levels for 16 battery cells, with values ranging from 0 to 17.
- Footer:**
 - Computer Date/Time: 3/5/2022, 4:20:52 PM
 - Cookies Enabled: Yes
 - Online: Yes
 - Controller: Connected
 - Version: 2.1.54 BETA
 - © 2020 Phoenix BroadBand Technologies. All rights reserved

The content shown on the SiteViewer will vary depending on which options are installed (current sensor, moisture sensor, line voltage sensor, and so on).



6.1. About SiteViewer

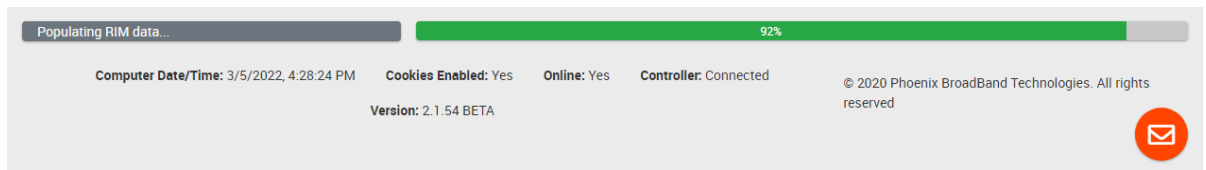
The SiteViewer menu provides access to log files on the SCMini-XC, the SCMini-XC Configuration Program, IP configuration settings, product manuals, videos, drivers, utilities, and more. See [SiteViewer Menu](#) for details.



SiteViewer displays the following details:

- Strings, Batteries, I/O Devices – provides string details (string name, number of batteries on the string, total string voltage and the float current of the string) as well as details on any I/O devices connected to the P-BUS. See [Strings, Batteries, I/O Devices](#) for details.
- Site Properties – provides details about the SCMini-XC. This includes Name, Location, Controller Status, the number of Strings attached to the controller, the internal temperature of the controller, controller firmware version, and network details for the controller. See [Site Properties](#) for details.
- App Controls – provides the ability to enable/disable automatic device polling, chart scanning and display of dynamic content. Additionally, the **Battery Charts** drop-down list box allows for focusing the charts on a single string to allow for detailed analysis. See [App Controls](#) for details.
- Battery Charts – provides string Name, individual battery voltages, admittances, and temperatures. See [Battery Charts](#) for details.

An indicator below the Battery Charts shows polling activity.















At the bottom of the SiteViewer, the computer date and time are displayed, whether cookies are enabled on the browser being used, whether the SCMini-XC is online, whether the SCMini-XC is connected, and the SCMini-XC firmware version.

An email button at the lower right side launches the default email application prefilled with Phoenix Broadband's support email address to allow for reporting any bugs encountered when using SiteViewer.







6.2. Status Indications

Each branch in the [Strings, Batteries, I/O Devices](#) tree has a color-coded icon that indicates the health/alarm status of the branch or its components:

-  String status – String and its batteries are all normal
-  String status – Minor alarm with something on or within string
-  String status – Major alarm with something on or within string
-  String status – String normal
-  String status – One or more jars on string has minor alarm
-  String status – One or more jars on string has major alarm
-  String status – String has communications problem or is in process of making measurements
-  Port status – No string connected to this port
-  Battery status – Battery normal
-  Battery status – Battery has minor alarm
-  Battery status – Battery has major alarm
-  Battery status – Battery has communications problem or is in process of making measurements

Similarly, each jar reading in the [Battery Charts](#) is color-coded to indicates the health/alarm status of the jar.

-  Battery status – Battery normal
-  Battery status – Battery has minor alarm
-  Battery status – Battery has major alarm
-  Battery status – Battery has communications problem or is in process of making measurements



6.3. Unlocking the SiteViewer for Editing

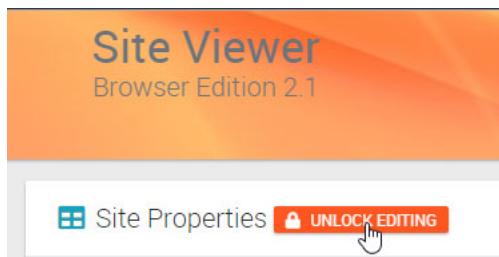
When you first access the SiteViewer, it is in a locked state. In this state, you can view all current readings as well as view all site details and alarm settings. However, you cannot change any controller settings until you unlock the SiteViewer.



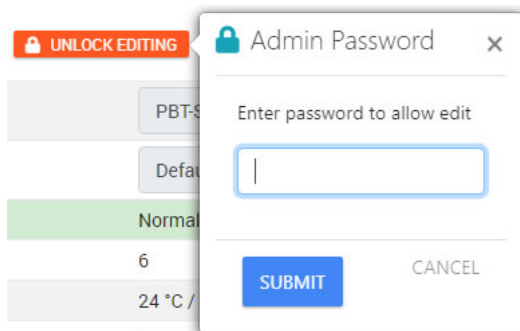
NOTE: The password will time out if there is no activity for ten minutes or if the web browser is closed or refreshed.

To unlock the SiteViewer:

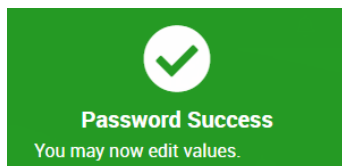
1. Click the **UNLOCK EDITING** button. This button appears in multiple locations for ease of use (the Site Properties panel, String Details popup, Jar Details popup, and so on).



The Admin Password dialog box appears.



2. Enter the Administrator Password for the controller. The default password is "admin". (Passwords are configured as part of the configuration of the controller. See [Password Setup](#) for details.)
3. Click **SUBMIT**. The Admin Password dialog box closes. A success message appears.



Controller settings can now be changed.



6.4. Changing the SCMini-XC IP Address



NOTE: The SCMini-XC IP address can also be set using the SCMini-XC Setup Menu. See [IPv4 Configuration](#) for details.

Choosing **Setup > IPv4 Configuration** from the SiteViewer menu brings up the IPv4 Configuration dialog box.

If the SiteViewer is locked, you are prompted to enter a password. See [Unlocking the SiteViewer for Editing](#) for details.

If the **DHCP Client Disabled** control is toggled, it changes to **DHCP Client Enabled**. This allows a DHCP server to dynamically assign an IP address and other network configuration parameters to the SCMini-XC and disables the data entry fields on the dialog box.

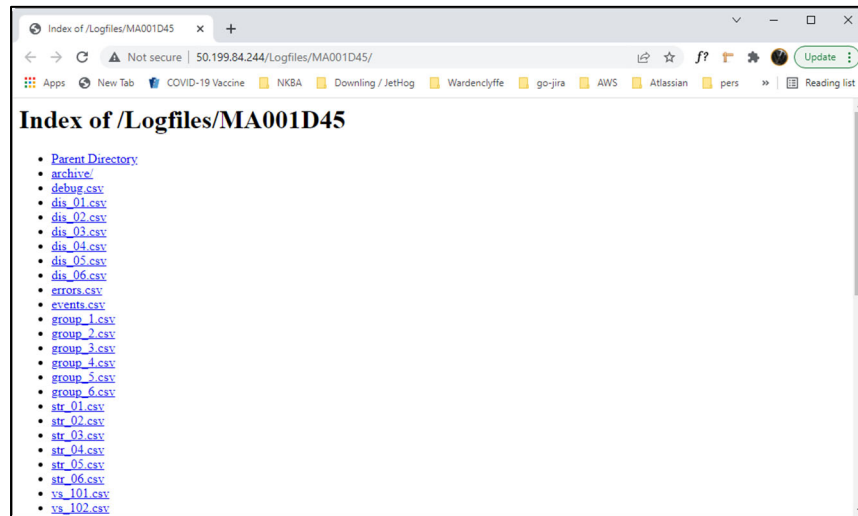
Alternately, the **IP Address**, **Gateway** and **Net Mask** can be specified in the corresponding fields.

Click **UPDATE** to close the dialog box and save any changes made.



6.5.2. File > Log Files

Choosing **File > Log files** brings up an index of the log files on the SCMini-XC in a new browser window. See [Logging](#) for more details.



6.5.3. File > SiteViewer Manual

No longer applicable



6.5.4. View > Classic Web Interface

Choosing **View > Classic Web Interface** brings up the java-based web interface for the SCMini-XC. SiteViewer is the replacement for this classic interface, but some functionality is still only available via this interface. A Java plug-in for the web browser in use is required to use this interface. The latest java plug-in is available here: <http://java.sun.com/products/plugin/downloads/index.html>

6.5.5. View > Linux Console

Choosing **View > Linux Console** brings up the login for the Linux console in a separate browser window. This allows you to access the SCMini-XC setup menu in order to perform setup tasks. See [SCMini-XC Setup Menu](#) for details.

6.5.6. Resources > Manuals (PBT Web)

Choosing **Resources > Manuals (PBT Web)** opens the PBT manuals web page in a separate browser window. This provides links to manuals for various PBT equipment for easy reference.

6.5.7. Resources > Videos (PBT Web)

Choosing **Resources > Videos (PBT Web)** opens the PBT videos web page in a separate browser window. This provides links to educational, how to, and other PBT video content.

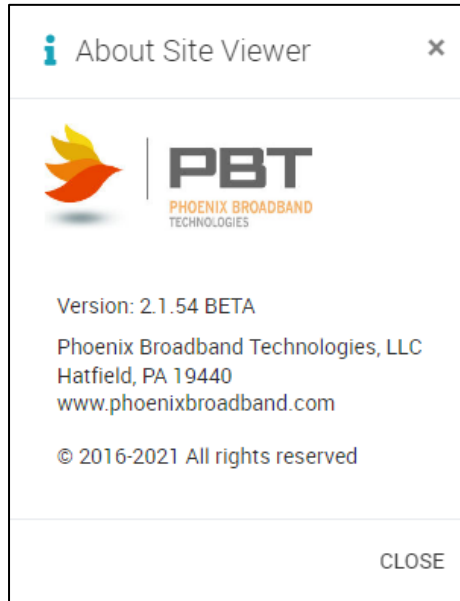
6.5.8. Setup > IPv4 Configuration

Choosing **Setup > IPv4 Configuration** allows to change the IP address of the SCMini-XC. See [Changing the SCMini-XC IP Address](#) for details.



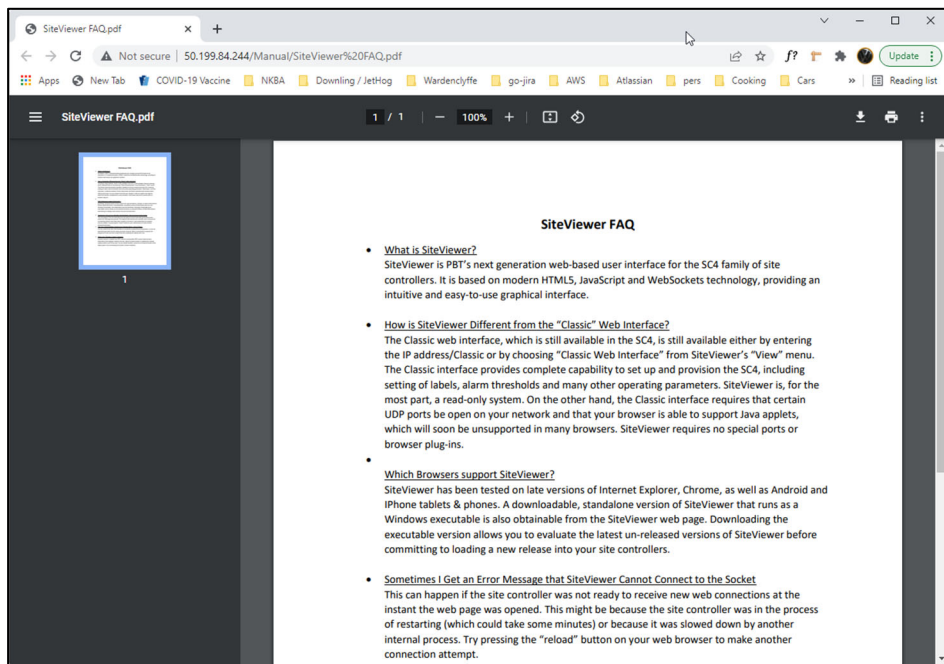
6.5.9. Help > About

Choosing Help > About brings up the About SiteViewer popup. This displays the current SiteViewer version.



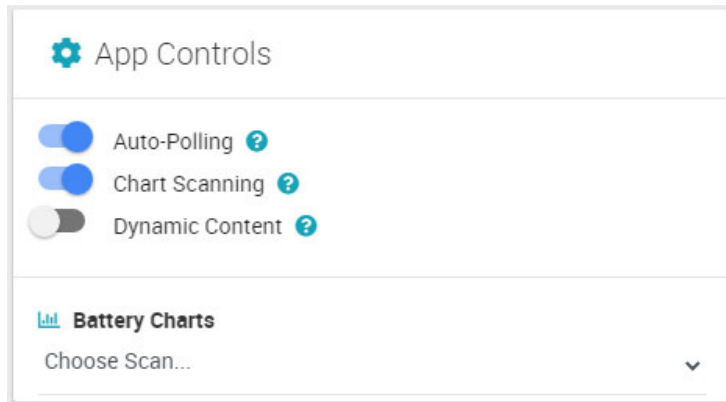
6.5.10. Help > FAQ

Choosing **Help > FAQ** brings up a Frequently Asked Questions about SiteViewer document in a new browser window.



6.6. App Controls

The App Controls provide the ability to enable/disable automatic device polling, chart scanning and display of dynamic content. Additionally, the **Battery Charts** drop-down list box allows for focusing the charts on a single string to allow for detailed analysis.

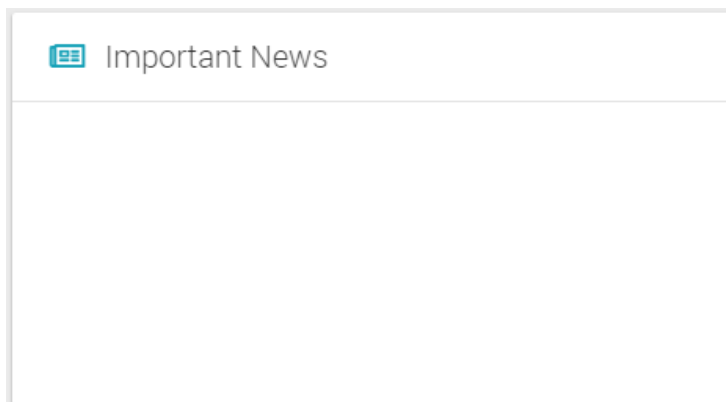


If cookies are enabled on your browser, the App Controls settings will be automatically set based on your previous session.

The **Auto-Polling** control allows you to enable/disable background automatic polling of all connected devices.

The **Chart Scanning** control allows you to enable/disable chart scanning for all connected battery strings.

The **Dynamic Content** control toggles the display of the Important News widget in SiteViewer. Content is loaded from PBT's web site to provide PBT a way to display timely information that might be useful. When **Dynamic Content** is enabled, the content updates about every 30 seconds.

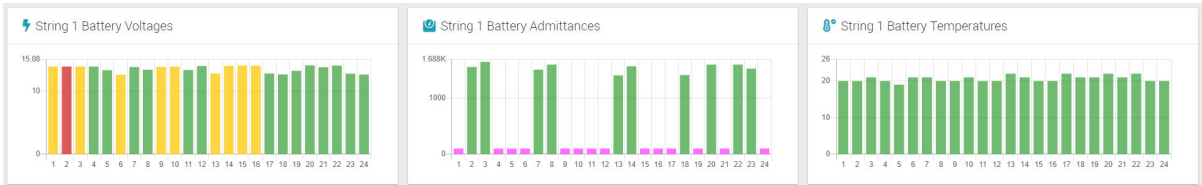


The **Battery Charts** drop-down list box allows you to select a single battery string to view in the Battery Charts. Selecting a string causes the selected string to be displayed until either a different string is selected or **Choose Scan...** is selected, which causes the Battery Charts to return to the rolling display of battery voltages, admittances and temperatures, on a string-by-string basis. (See [Battery Charts](#) for details.)

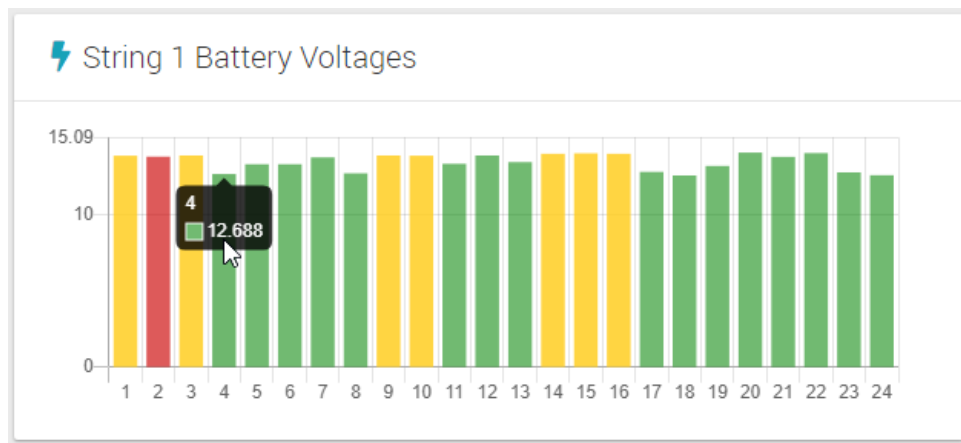


6.7. Battery Charts

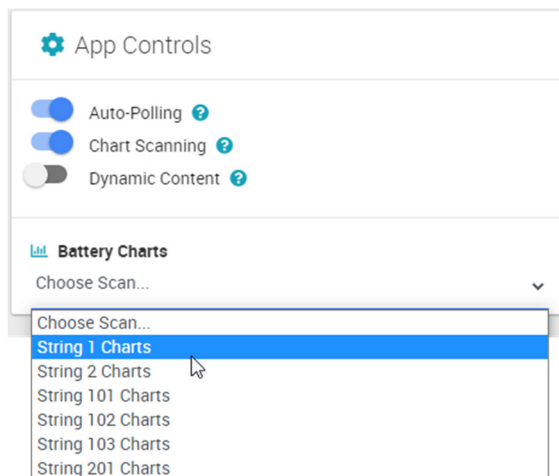
The Battery Charts provide a rolling, graphic display of individual battery voltages, admittances and temperatures, on a string-by-string basis. Readings are color coded to provide a visual indication of jar health/alarm status. See [Status Indications](#) for details.



Mousing over a reading will provide a detailed reading value along with identification of the jar (jar number). The example below shows jar 4 has a voltage reading of 12.688.



The **Battery Charts** drop-down list box under App Controls allows you to select a single battery string to view in the Battery Charts. Selecting a string causes the selected string to be displayed until either a different string is selected or **Choose Scan...** is selected, which causes the Battery Charts to return to the rolling display of battery voltages, admittances and temperatures, on a string-by-string basis.

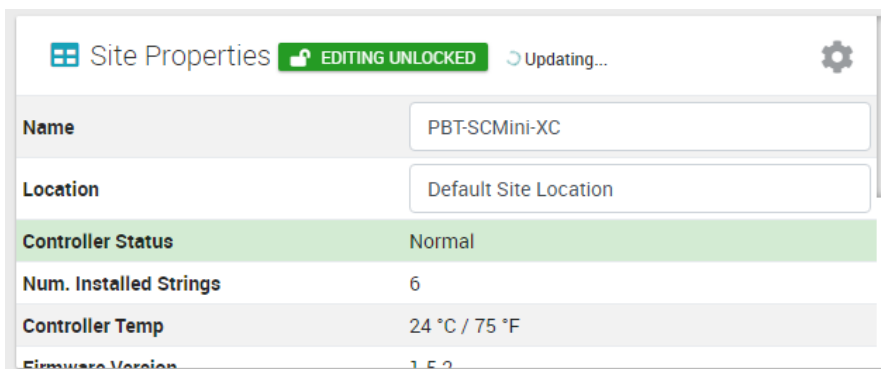


6.8. Site Properties

The Site Properties area of the SiteViewer provides site specific information and allows for configuring the SCMini-XC.

The Site Properties area of the SiteViewer shows:

- Site Name – user configurable name for the connected SCMini-XC. SiteViewer must be unlocked in order to edit this field. See [Unlocking the SiteViewer for Editing](#).
- Site Location – user configurable location for the connected SCMini-XC. SiteViewer must be unlocked in order to edit this field. See [Unlocking the SiteViewer for Editing](#).
- Controller Status
- Num. Installed Strings (number of Strings connected to the SCMini-XC)
- Controller Temp (internal Temperature of the SCMini-XC)



Specific details for the connected SCMini-XC are also displayed:

- Firmware Version
- MAC Address
- IPv4 details: IPv4 IP Address, IPv4 Gateway and IPv4 Netmask
- DHCP Status
- Up Time (time since the controller was last reset)



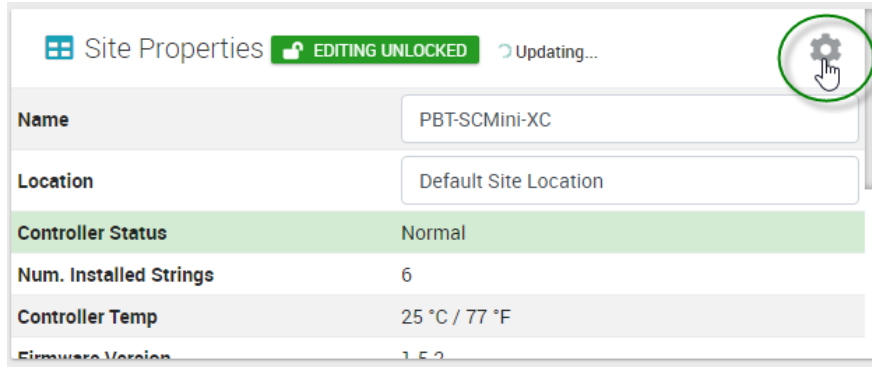
Firmware Version	1.5.2
MAC Address	D4:00:0D:00:1D:45
IPv4 IP Address	50.199.84.244
IPv4 Gateway	50.199.84.246
IPv4 Netmask	255.255.255.0
DHCP Status	Disabled
Up Time	dd:hh:mm:ss 0:0:16:58



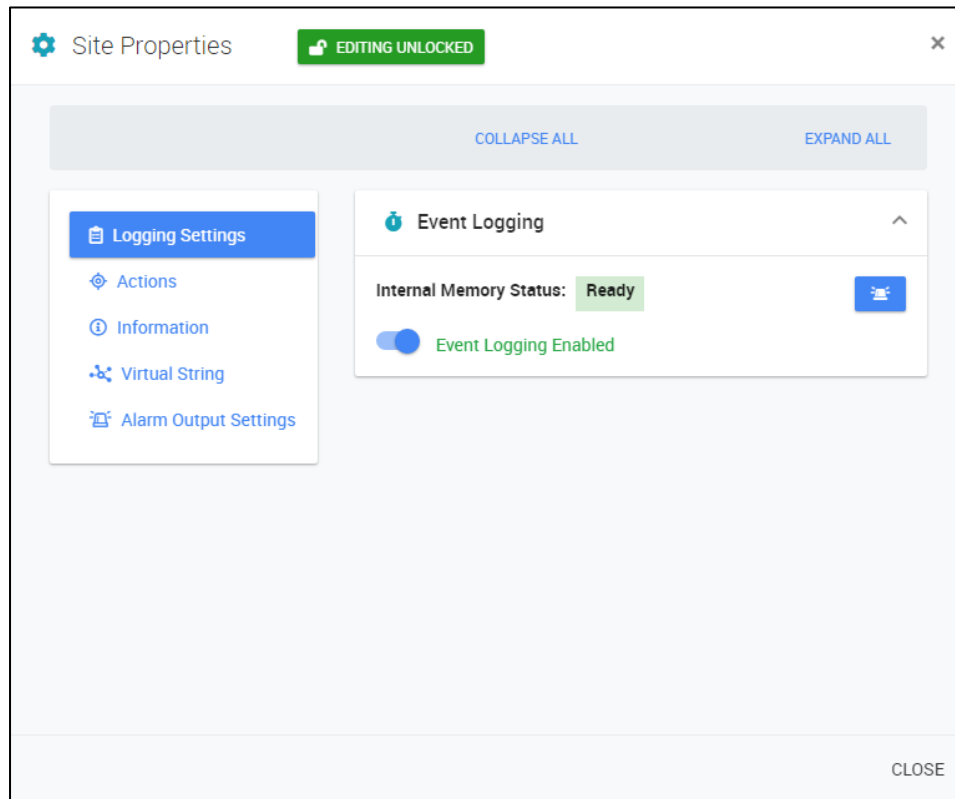
6.8.1. Configuring the Site

To configure the site:

- Click the gear icon at the upper right corner of the Site Properties area. SiteViewer must be unlocked in order to configure the site. See [Unlocking the SiteViewer for Editing](#).



The Site Properties dialog box appears.

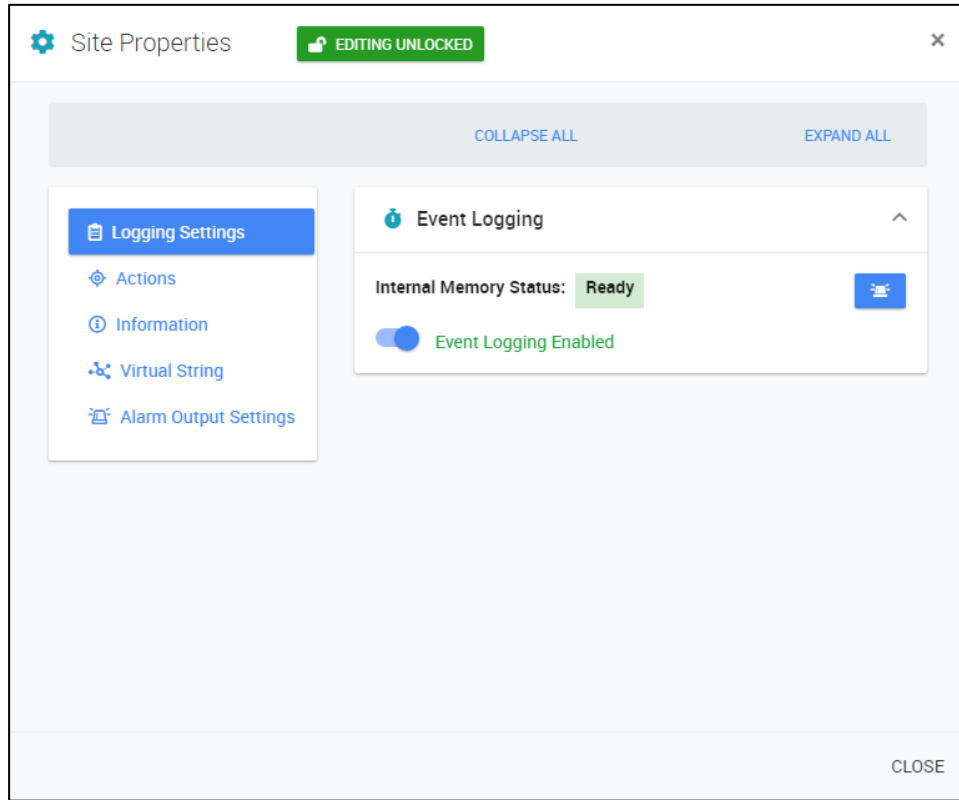


Site specific settings can be configured as described below.



6.8.2. Logging Settings

System events can be logged to internal memory. The **Event Logging Enabled** control toggles event logging on/off.

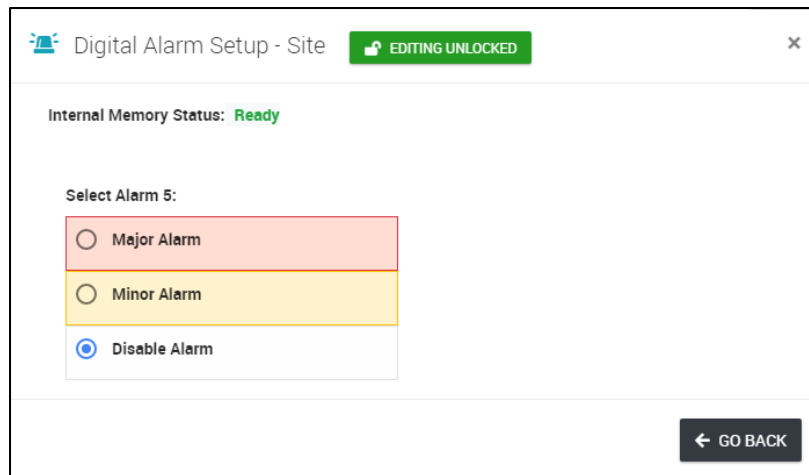


Event logging failure can generate an alarm if desired. To configure the alarms:

1. Click the alarm button.



The Digital Alarm Setup dialog box appears.



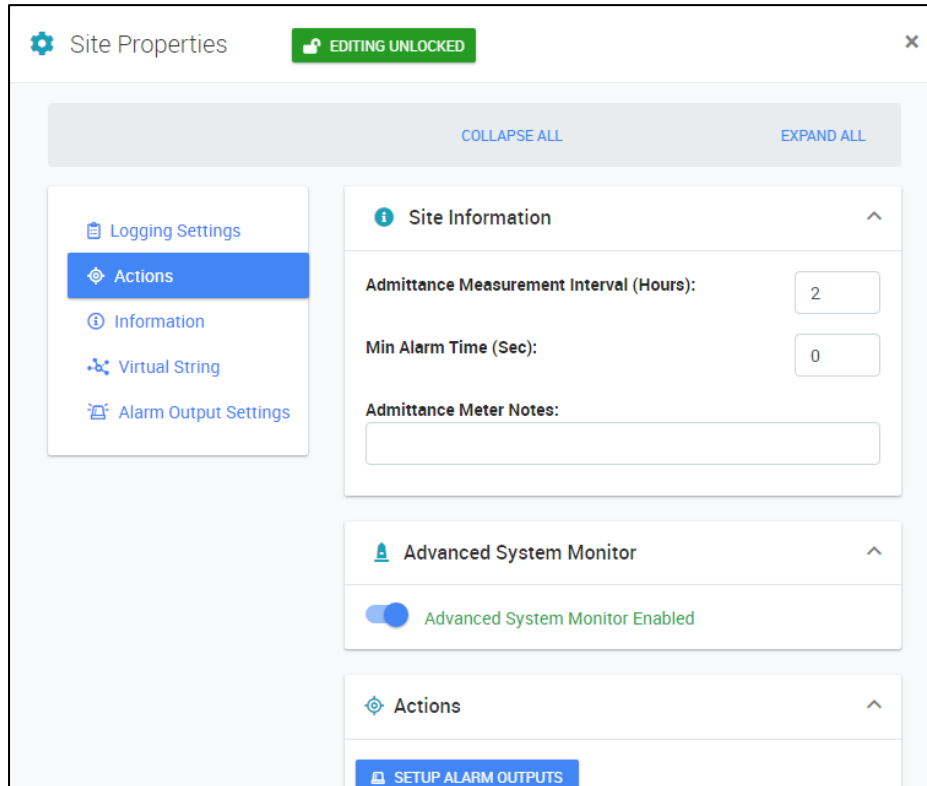
2. Choose the desired alarm type from the available radio button.
3. Click **GO BACK**.

See [Logging](#) for more information.



6.8.3. Actions

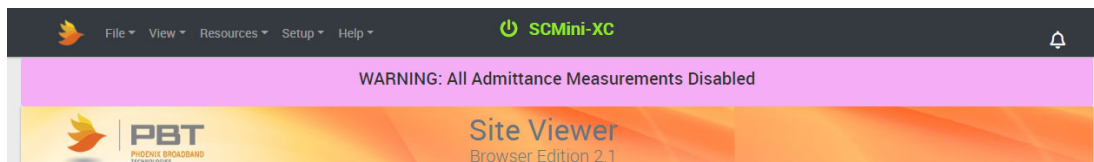
The **Actions** tab on the Site Properties dialog box allows you to view and modify SCMini-XC site information, enable the Advanced System Monitor, perform specific system functions, and logoff, which disables SiteViewer editing until you are logged in again (see [Unlocking the SiteViewer for Editing](#)).



6.8.3.1. Site Information

The Site Information area allows you to set:

- **Admittance Measurement Interval (Hours)** (the duration between admittance measurements being made by the controller). Entering a value of zero (0) in the **Admittance Interval (Hours)** field will disable admittance measurements. When admittance measurements are disabled, this is indicated by a banner across the upper portion of the SiteViewer.



- **Min Alarm Time (Sec)** (the duration tan audible alarm will sound when an alarm occurs). Entering a value of zero (0) in this field will disable audible alarms.
- **Admittance Meter Notes** (a text field to record details about the Admittance Meter).

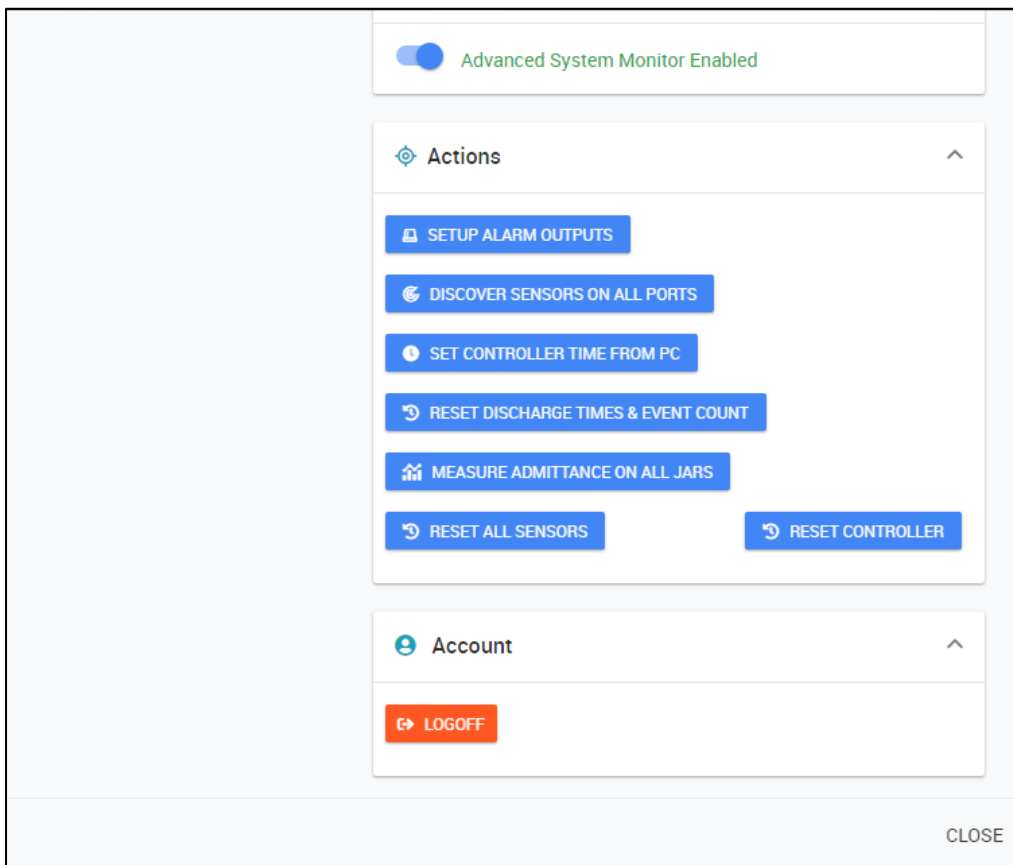
6.8.3.2. Advanced System Monitor

The Advanced System Monitor control allows you to toggle Advanced System Monitoring on/off. See [Advanced System Monitoring](#) for details.



6.8.3.3. Actions

The Actions area provides controls for performing specific system functions and setup tasks:



- Click **SETUP ALARM OUTPUTS** to modify the alarm output settings. See [Alarm Output Settings](#) for details.
- Click **DISCOVER SENSORS ON ALL PORTS** to instruct the SCMini-XC to scan all connected sensors on all ports.
- Click **SET CONTROLLER TIME FROM PC** to update the SCMini-XC clock to match the computer SiteViewer is running on.
- Click **RESET DISCHARGE TIMES & EVENT COUNT** to reset all discharge times and event counts in the SCMini-XC.
- Click **MEASURE ADMITTANCE ON ALL JARS** to initiate an admittance measurement on all connected jars the next time it is polled. The measurement may take a minute to start depending on what the SCMini-XC is doing at the time. Admittance measurements may be delayed up to five minutes to prevent over heating the sensor.



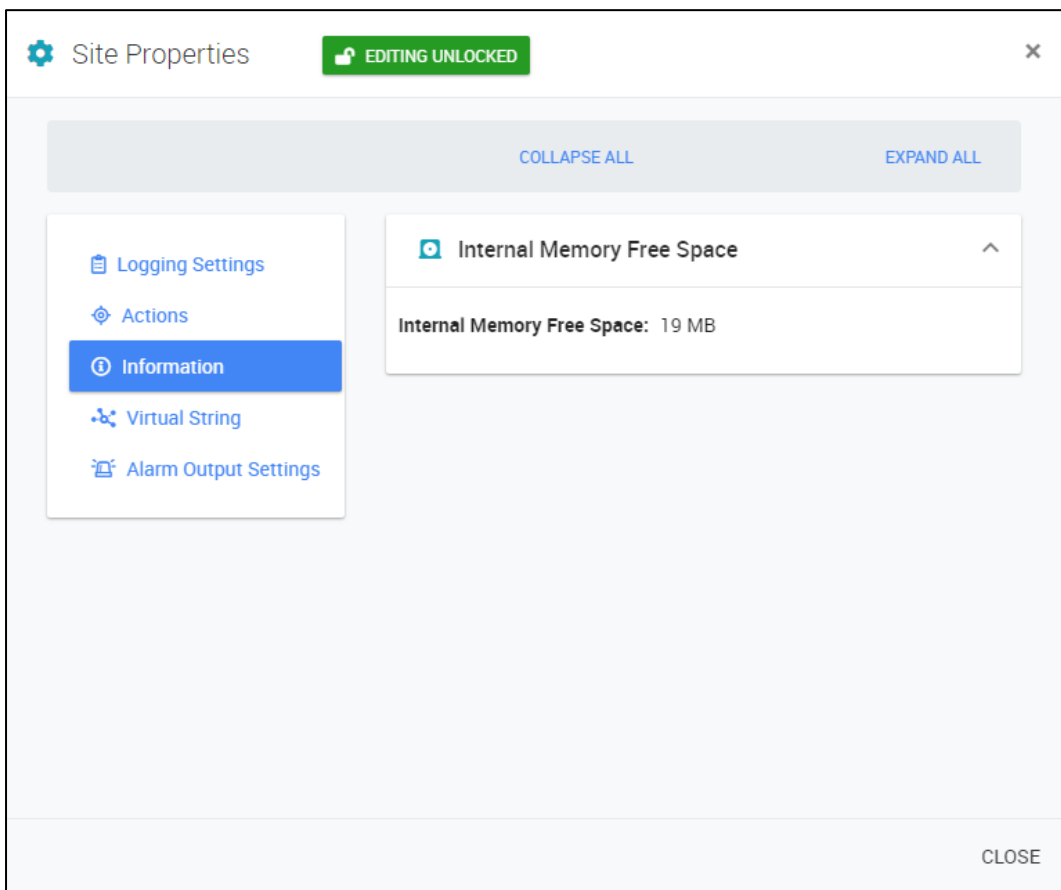
- Click **RESET ALL SENSORS** to reset all connected sensors and have them rediscovered by the SCMini-XC.
- Click **RESET CONTROLLER** to reinitialize the SCMini-XC and run through its startup procedures again.

6.8.3.4. Account

The Account area provides a **LOGOFF** control for disabling SiteViewer editing until you are logged in again. (See [Unlocking the SiteViewer for Editing.](#))

6.8.4. Information

The **Information** tab on the Site Properties dialog box displays the amount of memory available on the SCMini-XC internal memory. This memory is used to store logging events.



6.8.5. Virtual Strings

The **Virtual String** tab on the Site Properties dialog box allows you to configure virtual strings.

The SCMini-XC has a limitation of 24 battery sensors for each of the 2 inputs (48 total). Under normal operation each input is considered a separate battery string. It is possible to have more than 2 strings by splitting the sensors on one or both of the inputs. For example, if you have 10 24 volt battery strings (each string is made up of two 12 volt jars), then you can put all 20 battery sensors on the same input into the SCMini-XC, and then split them into 10 virtual strings. This allows you to apply different configurations to these virtual strings (for example, different alarm settings).



WARNING: Only use High Voltage battery sensors when splitting strings. Using Low Voltage battery sensors will damage the sensors and may present a shock hazard. Read the sensor installation instructions carefully.



NOTE: The split feature only works with High Voltage sensors. When splitting strings there is a limit of 40 virtual strings.

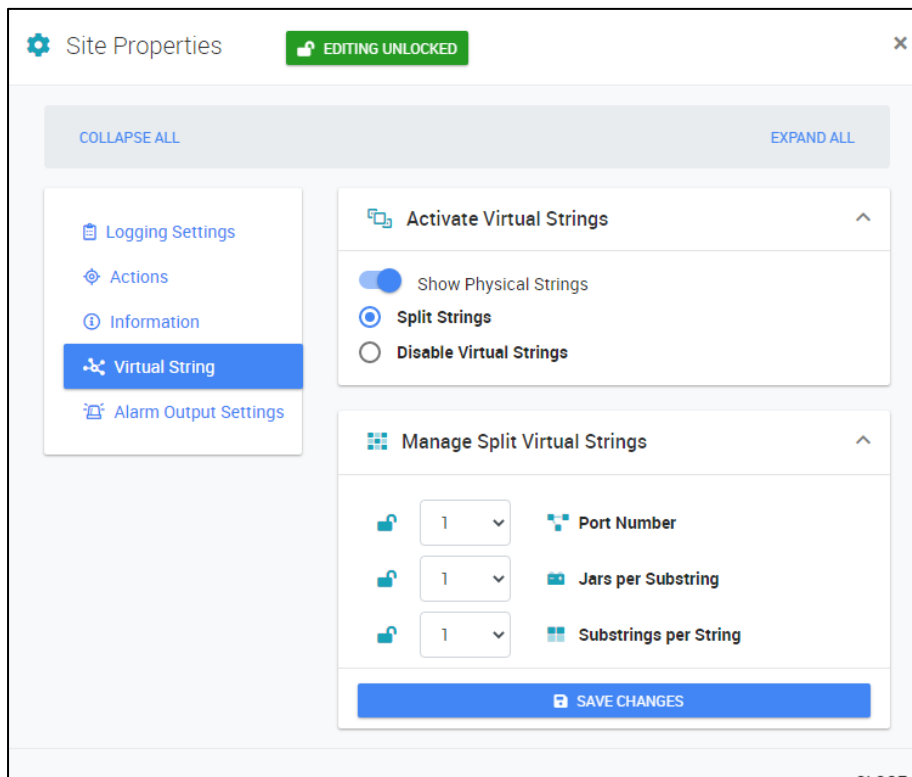


NOTE: You must reorder the sensor addresses for the jars on each physical port and reset the string before adding that string to the virtual string. This allows the SCMini-XC to appropriately allocate jars to the desired virtual strings. See [Jar Sensor Settings](#).



To configure virtual strings:

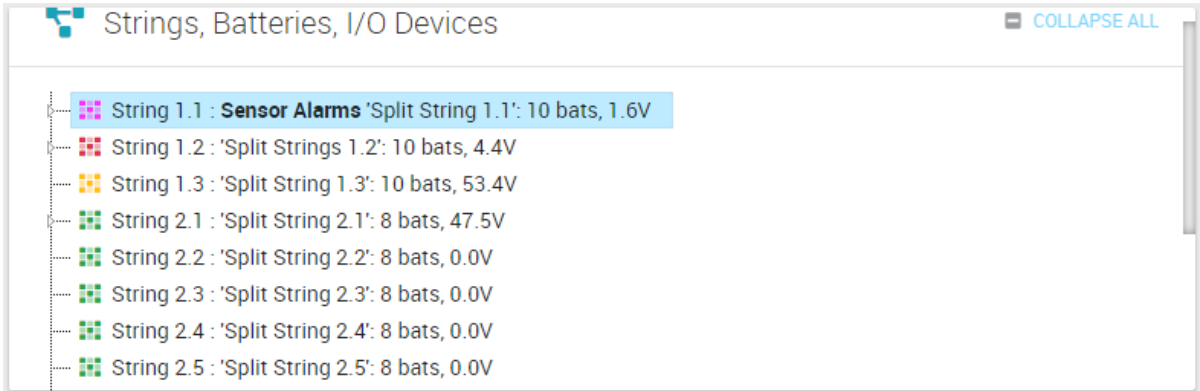
1. Click the gear icon at the upper right corner of the Site Properties area. SiteViewer must be unlocked in order to configure the site. See [Unlocking the SiteViewer for Editing](#).
2. Click **Virtual String**. The Virtual Strings settings appear.



3. Use the **Show Physical Strings** toggle to indicate if you want the actual physical strings to also appear in the Strings, Batteries, I/O Devices area. (See [Strings, Batteries, I/O Devices](#).)
4. Click **Split Strings** to enable string splitting.
5. Use the **Port Number**, **Jars per Substring** and **Substrings per String** drop-down list boxes to specify the configuration of the virtual string. Virtual strings can be created on one or both of the SCMini-XC physical ports. You can specify up to 20 jars per Substring (virtual string) and up to 40 Substrings (virtual strings) per physical string. The **Jars per Substring** and **Substrings per String values** (when multiplied) should equal the total number of jars connected to the physical string.
6. Click **SAVE CHANGES** to implement the selected configuration. The SCmini-XC reconfigures the current string and battery database, converts internal memory mappings, and sets up the proper log file system for the virtual string type. These operations may take a few minutes during which time the SCMini-XC will be unresponsive. After the conversion is complete the Site Controller will reset and rediscover any sensors as required.

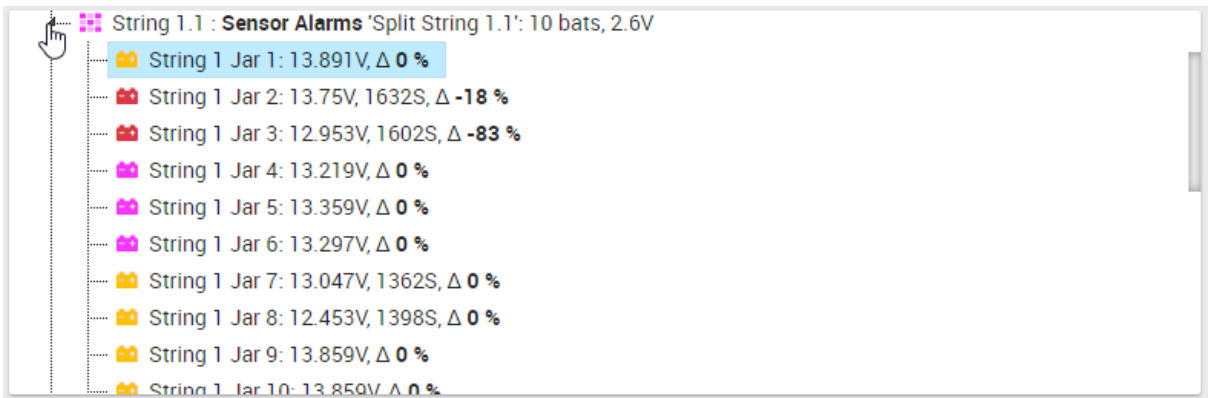


The SCMini-XC will create the virtual strings as specified and display them in the Strings, Batteries, I/O Devices area. The first jars (**Jars per Substring**) will be assigned to Virtual String 1, then the next (**Jars per Substring**) to Virtual String 2, and so on, until it reaches the total number allowed in (**Substrings in String 1**). For this reason, it is imperative that you first reorder and reset the strings as specified in step 3 above.



Once created, these virtual strings can be named and configured like physical strings. (See [Working with Strings](#) for details.) In the example shown above, physical string one has been virtualized into three strings with 10 jars per string. Physical string two has been virtualized into five strings with 8 jars per string.

The virtual strings can be expanded to allow for viewing/configuring the actual physical jars that reside beneath the virtual string. (See [Strings, Batteries, I/O Devices](#) for details.)



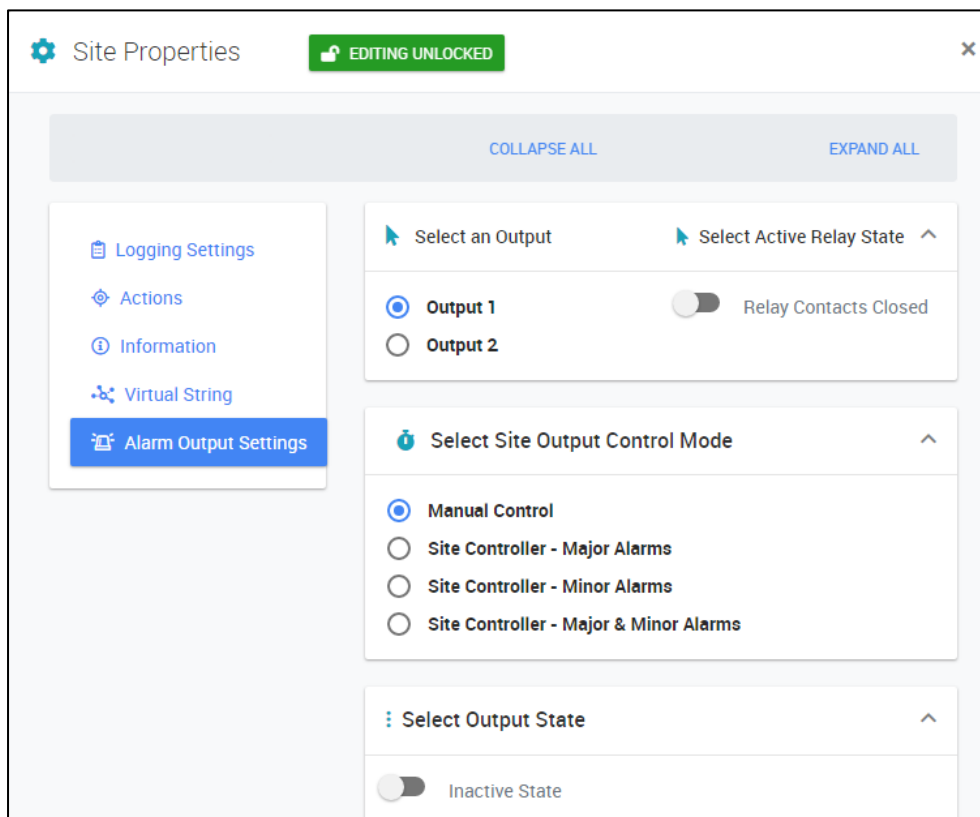
6.8.6. Alarm Output Settings

The **Alarm Output Settings** tab on the Site Properties dialog box allows you to specify whether alarms are mapped to one of the 2 built in relay outputs and/or via a connected ROM device.

The ROM can be configured to operate its outputs when specific Jar or String alarms occur.

To configure alarm outputs:

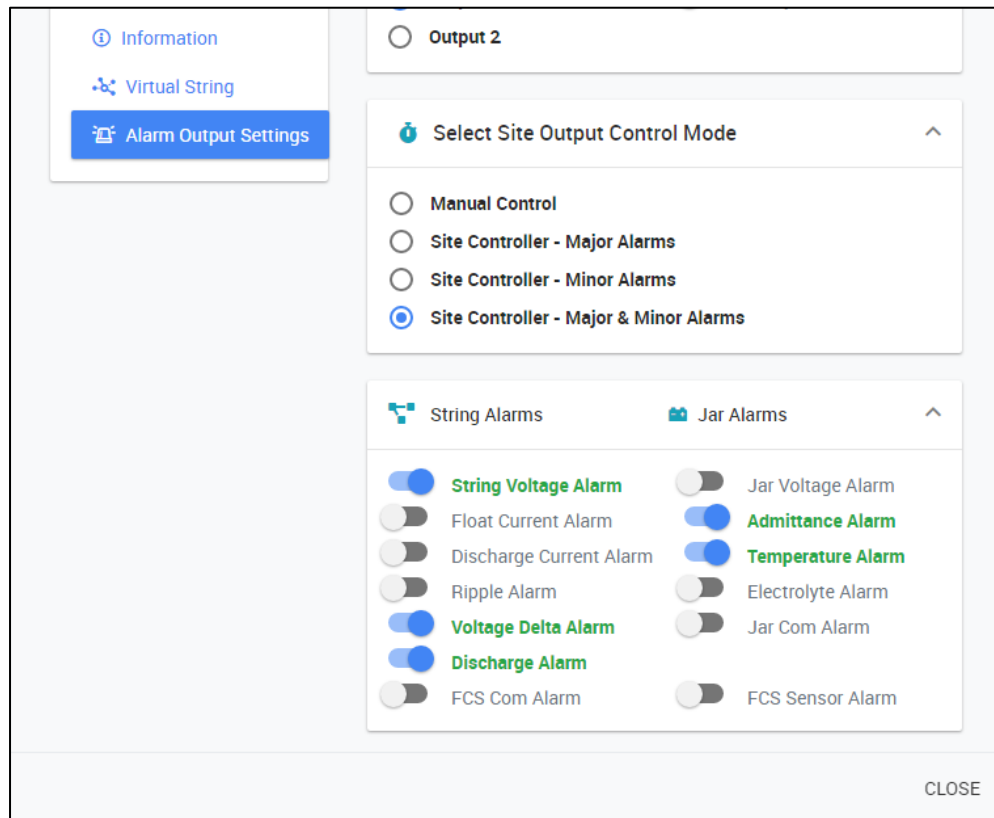
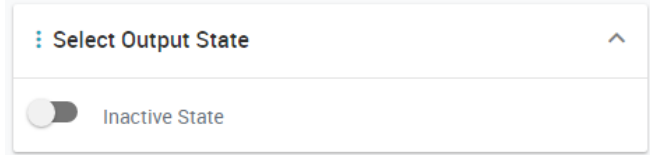
1. Click the gear icon at the upper right corner of the Site Properties area. SiteViewer must be unlocked in order to configure the site. See [Unlocking the SiteViewer for Editing](#).
2. Click **Alarm Output Settings**. The Alarm Output Settings appear.



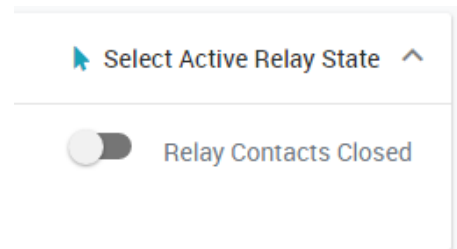
3. The SCMini-XC allows for two alarm output configurations, so that alarms can be reported by both a connected ROM device and the SCMini-XC. Select the desired output (**Output 1** or **Output 2**). Selecting **Manual Control** specifies that the SCMini-XC will report alarms, provided that the **Select Output State** toggle is set to **Active State**.
 - a. Select **Manual Control** to have the SCMini-XC control the outputs through the web page manually.
 - b. Select **Site Controller – Major Alarms** to have to have the selected output trigger on Major Alarms only.



- c. Select **Site Controller – Minor Alarms** to have the selected output trigger on Minor Alarms only.
 - d. Select **Site Controller – Major & Minor Alarms** to have the selected output trigger on major and minor alarms.
4. If **Manual Control** is selected, specify whether the **Output State** is inactive or active using the toggle control.
5. If **Site Controller – Major Alarms**, **Site Controller – Minor Alarms** or **Site Controller – Major & Minor Alarms** is selected, use the **String Alarms** and **Jar Alarms** toggles to specify which alarm types are active for the corresponding output.

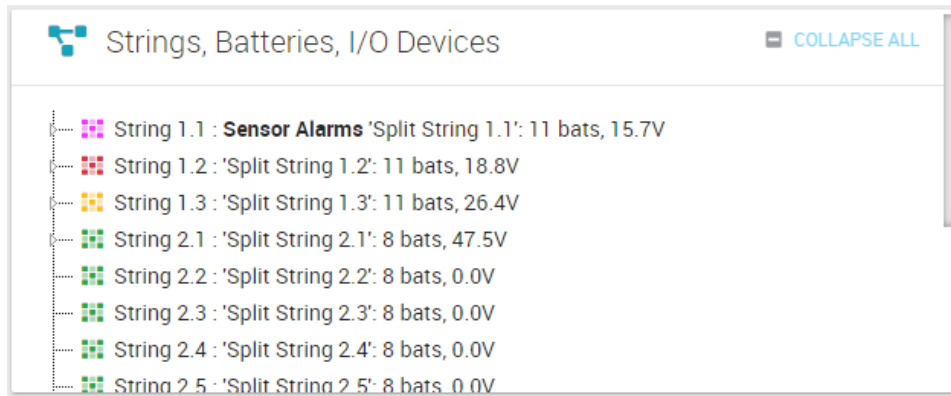


6. Use the **Select Active Relay State** toggle to specify if the relays connected to the ROM are open or closed when in an alarm state.

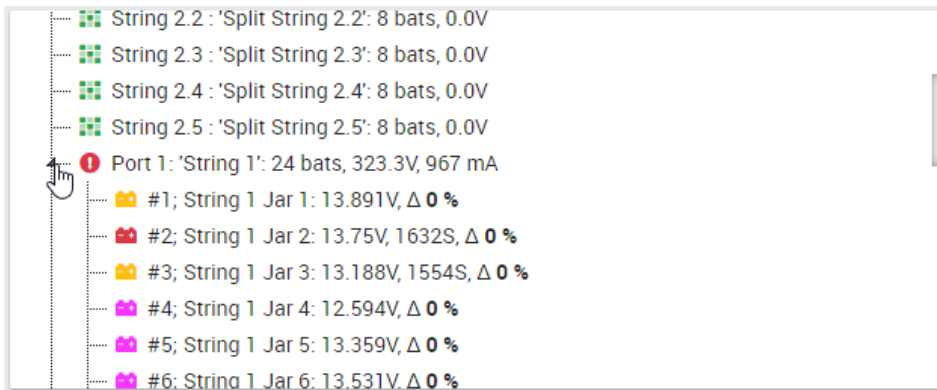


6.9. Strings, Batteries, I/O Devices

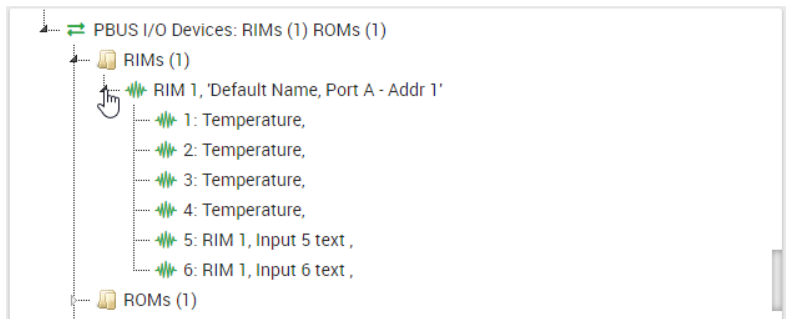
The Strings, Batteries, I/O Devices area provides a hierarchical display of all the strings, batteries and I/O devices connected to the SCMini-XC. This includes string details (string name, number of batteries on the string, total string voltage and the float current of the string) as well as details on any I/O devices connected to the P-BUS. Clicking on a tree branch toggles it folded or unfolded to display all the elements within that branch. Tree branches are color-coded and icon-coded with status information. (See [Status Indications](#) for details.)



Clicking on the arrow to the left of a battery string expands the branch to show installed devices.



Similarly, clicking on the arrow to the left of the PBUS I/O Devices branch expands the branch to show installed device types. Clicking on the arrow to the left of a device type expands the branch to show installed devices of that type.

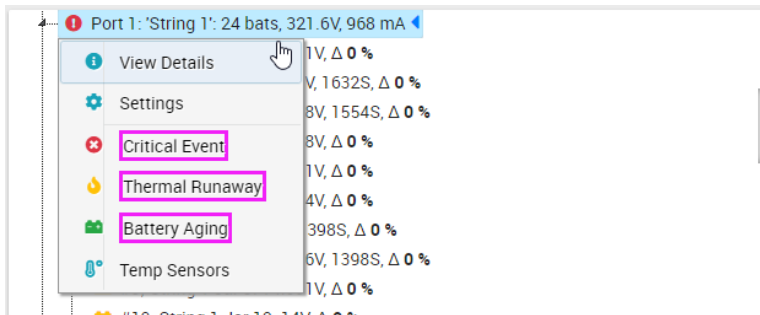


Clicking on the arrow to the left of a specific PBUS I/O Devices expands the branch, showing specific device details for the selected item.



Right clicking on a string or a specific device brings up a menu which allows you to view details and adjust settings for the selected item.

Available menu items vary depending on device type and Site Properties settings.



6.9.1. Working with Strings

6.9.1.1. Viewing and Editing String Details



NOTE: To enable editing of values, the SiteViewer must be unlocked. See [Unlocking the SiteViewer for Editing](#) for details.

Right click on the desired string in the Strings, Batteries, I/O devices window and choose View Details. The String Details view appears.

The String Details view allows you to view and edit the string:

- Name
- Battery Model
- Battery Warranty duration
- Installation Date
- Battery Manufacture Date
- Logging Interval setting (Daily, Hourly or Disabled) – Determines interval between string details being added to the log. See [Logging Settings](#) for more information.
- Battery Balancing setting (Enabled or Disabled) - Battery balancing is used to improve the available capacity of a battery pack with multiple cells (usually in series) and increase each cell's longevity.

The String Details view also displays the String Status (Normal, Alarms, and so on) and the String Type.







String 1 Details		EDITING UNLOCKED	X
← PREVIOUS STRING		NEXT STRING →	
Name	String 1		
String Status	Alarms		
Discharge Status	Normal		
String Voltage	316 V		
Voltage Delta	1.640 mV		
Float Current	968 mA		
CMI COM	Normal		
Battery Sensor COM	Normal		
Battery Model			
Battery Warranty	1 year(s)		
Installation Date	1/1/2000		
Battery Manuf Date	1/1/2000		
Logging Interval	Daily		
Battery Balancing	Disabled		
String Type	UPS(HV)		
			CLOSE



The String Details view displays string values and lets you set alarm parameters for:

- Discharge Status
- String Voltage
- Voltage Delta
- Float Current
- CMI COM status
- Battery Sensor COM status

Alarm status indications are also provided on this view where applicable. The example shown here indicates a major Voltage Delta alarm and a minor String Voltage alarm. (See [Status Indications](#) for details on color coding of alarm indications.)

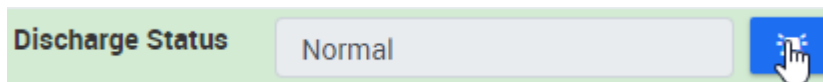
Name	String 1	
String Status	Alarms	
Discharge Status	Normal	
String Voltage	320.8 V	
Voltage Delta	1.562 mV	
Float Current	979 mA	
CMI COM	Normal	
Battery Sensor COM	Normal	



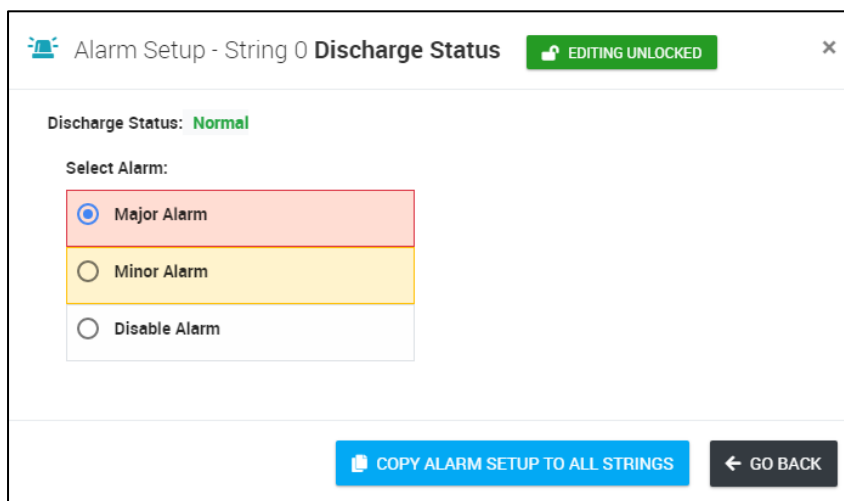
6.9.1.1.1. Setting Discharge Status Alarms

The Discharge Status view allows you to specify whether a discharge alarm is enabled as well as whether the alarm is classified as major or minor. The Discharge Status indicator displays the present state of the string: “Normal” or Discharge.” The discharge event is detected by the Float Current Sensor (if connected to the SCMini-XC) or by the discharge string voltage threshold.

1. With the [Viewing and Editing String Details](#) window displayed, click the button to the right of the Discharge Status field.



The Discharge Status view appears.



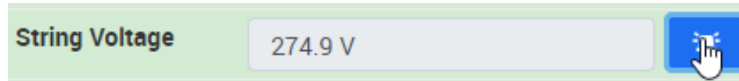
2. Choose the severity of a discharging string by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).
3. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the Discharge Status alarm settings for this string to all strings connected to the SCMini-XC.



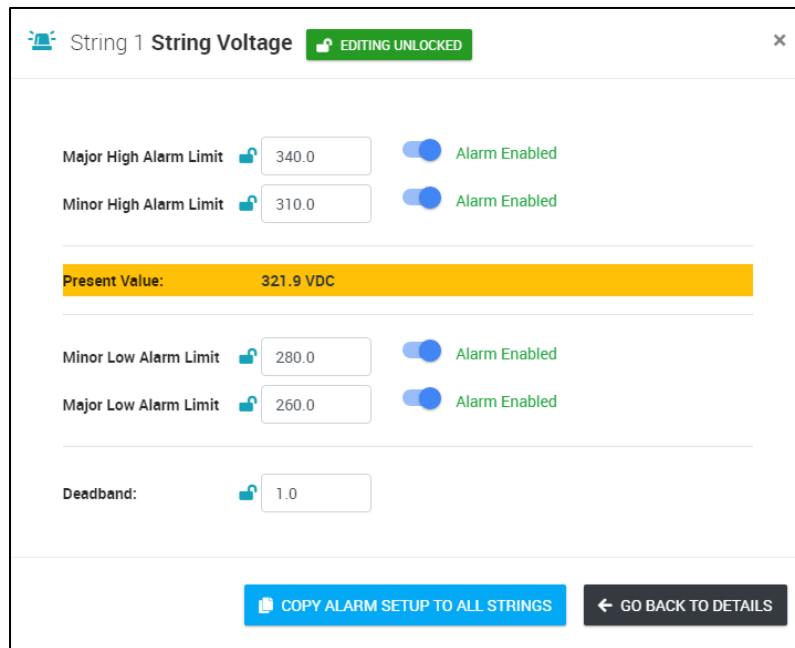
6.9.1.1.2. Setting String Voltage Alarms

The String Voltage view allows you to set alarms for the voltage across the entire string (all jar voltage outputs added together on the string).

1. With the String Details window displayed (see [Viewing and Editing String Details](#)), click the button to the right of the String Voltage field.



The String Voltage view appears.



The present string voltage is displayed in the Present Value field.

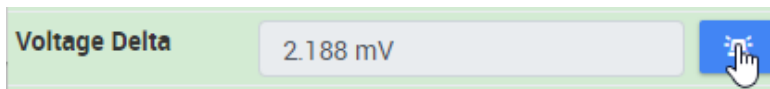
2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the threshold value to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 58.0 and the Deadband is set to 0.1, and alarm will not be triggered until the measured value reaches 58.1. The alarm will stay on until the measured value reached 57.9. This keeps the SCMini-XC from bouncing quickly between alarm statuses.
5. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the String Voltage alarm settings for this string to all strings connected to the SCMini-XC.



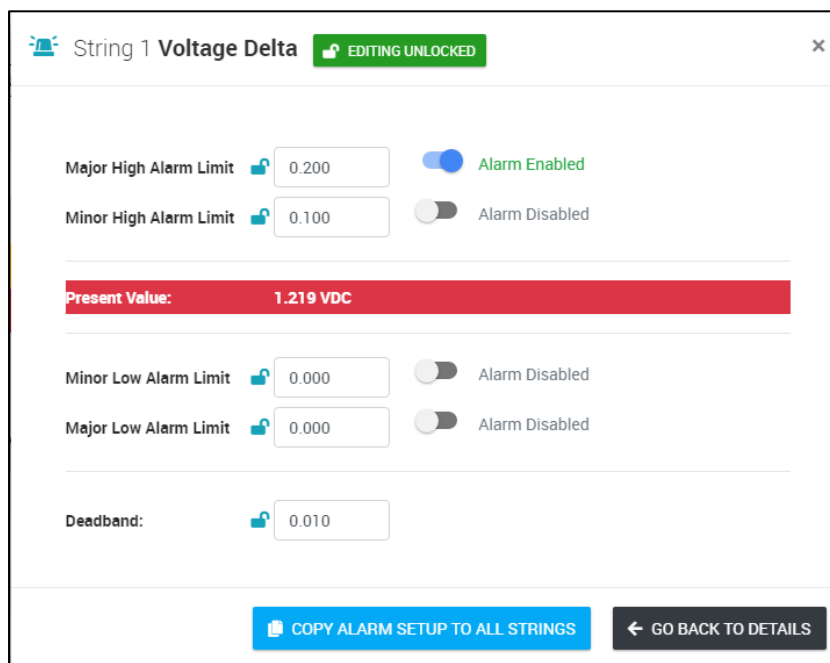
6.9.1.1.3. Setting Voltage Delta Alarms

The Voltage Delta view allows you to set alarms for the voltage differential between the jars on the string with the highest and lowest voltage readings.

1. With the [Viewing and Editing String Details](#) window displayed, click the button to the right of the Voltage Delta field.



The Voltage Delta view appears.



The present voltage delta is displayed in the Present Value field.

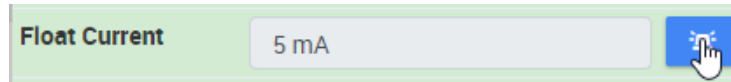
2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the value to be exceeded to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 0.200 and the Deadband is set to 0.01, and alarm will not be triggered until the measured value reaches 0.210. The alarm will stay on until the measured value reached 0.190. This keeps the SCMini-XC from bouncing quickly between alarm statuses.
5. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the Voltage Delta alarm settings for this string to all strings connected to the SCMini-XC.



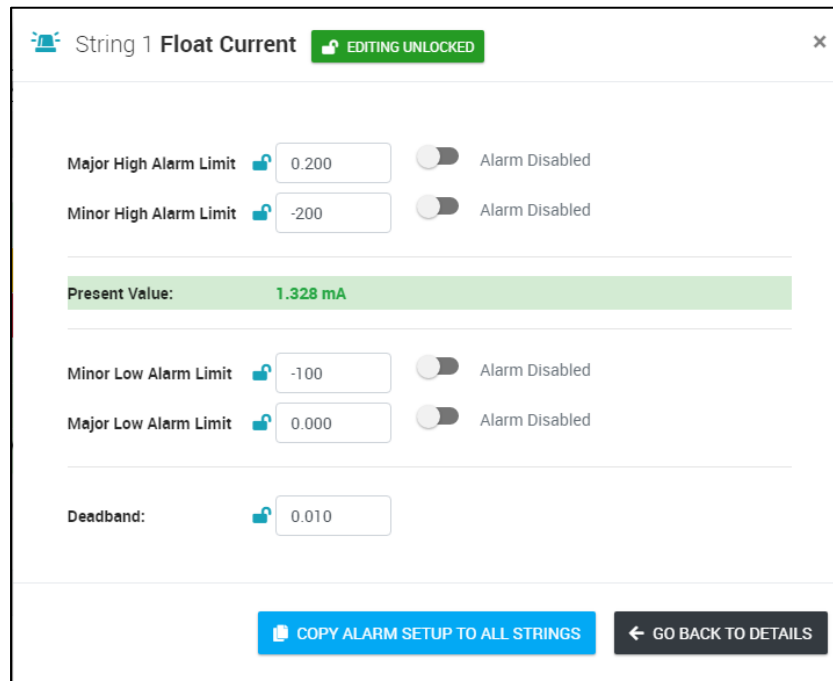
6.9.1.1.4. Setting Float Current Alarms

The Float Current view allows you to set alarms for the float current on the string when a Current Monitoring Interface is connected to the SCMini-XC. (If the sensor is not connected the reading will display “No Sensor”.)

1. With the [Viewing and Editing String Details](#) window displayed, click the button to the right of the Float Current field.



The Float Current view appears.



The present float current is displayed in the Present Value field.

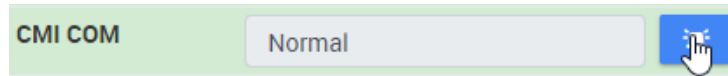
2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the value to be exceeded to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 3000 and the Deadband is set to 0.010, an alarm will not be triggered until the measured value reaches 3000.01. The alarm will stay on until the measured value reached 2999.99. This keeps the SCMini-XC from bouncing quickly between alarm statuses.
5. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the Float Current alarm settings for this string to all strings connected to the SCMini-XC.



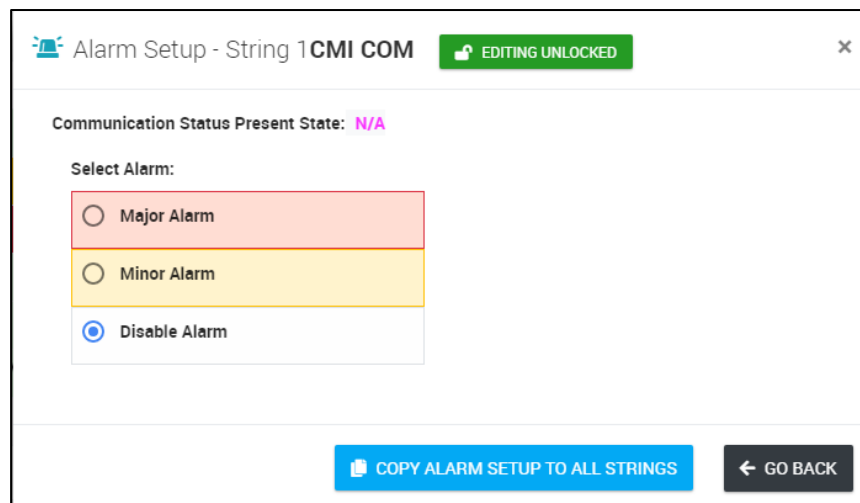
6.9.1.1.5. Setting CMI COM Alarms

The CMI COM (Current Monitoring Interface Communication) view allows you to specify whether an alarm is enabled based on CMI communication as well as whether the alarm is classified as major or minor. The Communication Status Present State indicator displays “Normal” when the SCMini-XC is communicating with the Current Monitoring Interface. “Failed” is displayed when communications with the Current Monitoring Interface have been lost.

1. With the [Viewing and Editing String Details](#) window displayed, click the button to the right of the CMI COM field.



The CMI COM view appears.



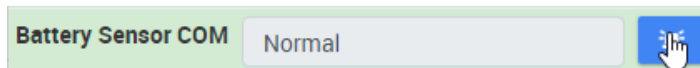
2. Choose the severity of a CMI communication error by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).
3. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the CMI COM alarm settings for this string to all strings connected to the SCMini-XC.



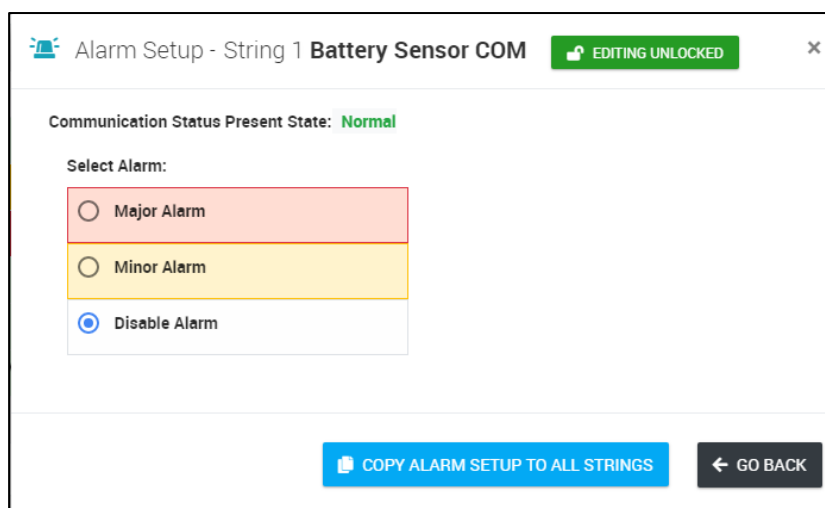
6.9.1.1.6. Setting Battery Sensor COM Alarms

The Battery Sensor COM view allows you to specify whether an alarm is enabled based on battery sensor communication as well as whether the alarm is classified as major or minor. The Communication Status Present State indicator displays “Normal” when the SCMini-XC is communicating with the Battery Sensor Interface. “Failed” is displayed when communications with the Battery Sensor Interface have been lost.

1. With the [Viewing and Editing String Details](#) window displayed, click the button to the right of the Sensor COM Status field.



The Battery Sensor COM Status view appears.



2. Choose the severity of a sensor communication error by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).
3. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the Battery Sensor COM alarm settings for this string to all strings connected to the SCMini-XC.

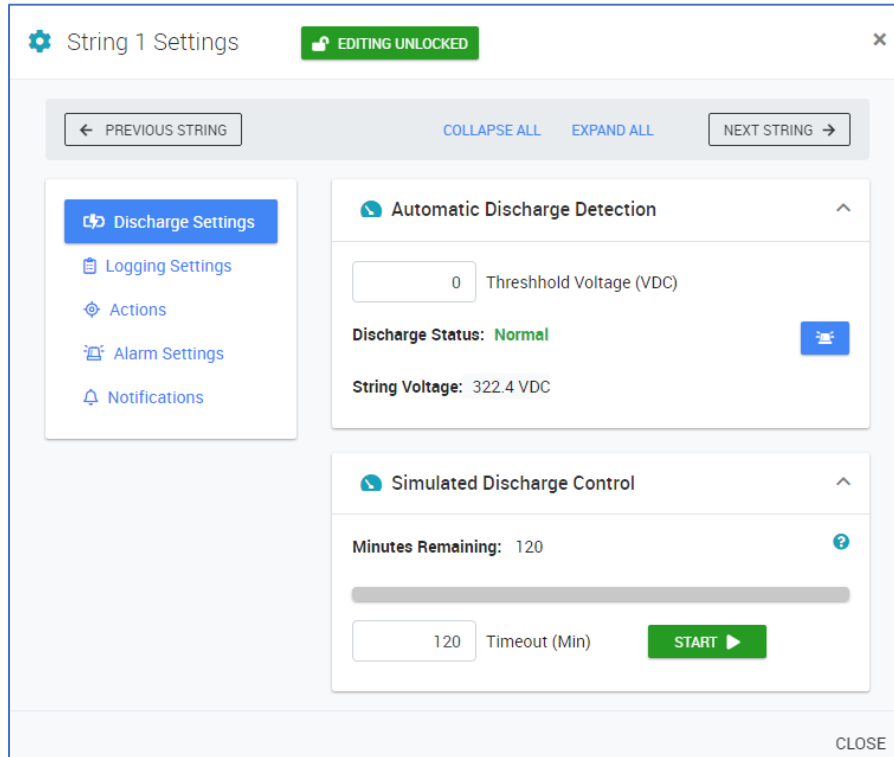


6.9.1.2. Viewing and Editing String Settings



NOTE: To enable editing of values, the SiteViewer must be unlocked. See [Unlocking the SiteViewer for Editing](#) for details.

Right click on the desired string in the Strings, Batteries, I/O devices window and choose **View Settings**. The String Settings panel appears.



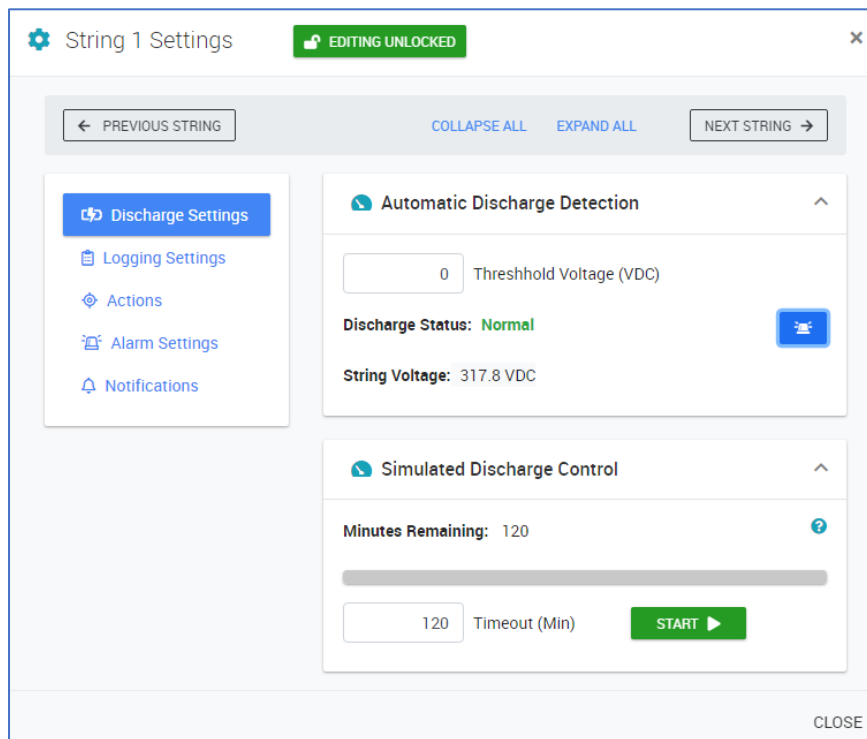
The String Settings view allows you to work with Discharge Settings, Logging Settings, and Actions related to the selected string.

Alarm Settings and Notifications contain no controls or indicators. These items are set using the String Details view. See [Viewing and Editing String Details](#) for more information.



6.9.1.2.1. String Discharge Settings

With the String Settings panel displayed (see [Viewing and Editing String Settings](#)), clicking the Discharge Settings button brings up the Discharge Settings for the selected string.



The Automatic Discharge Detection area allows you to specify the **Threshold Voltage (VDC)** which indicates a discharge event.

The Discharge Status indicator displays the present state of the string: “Normal” or “Discharge.”

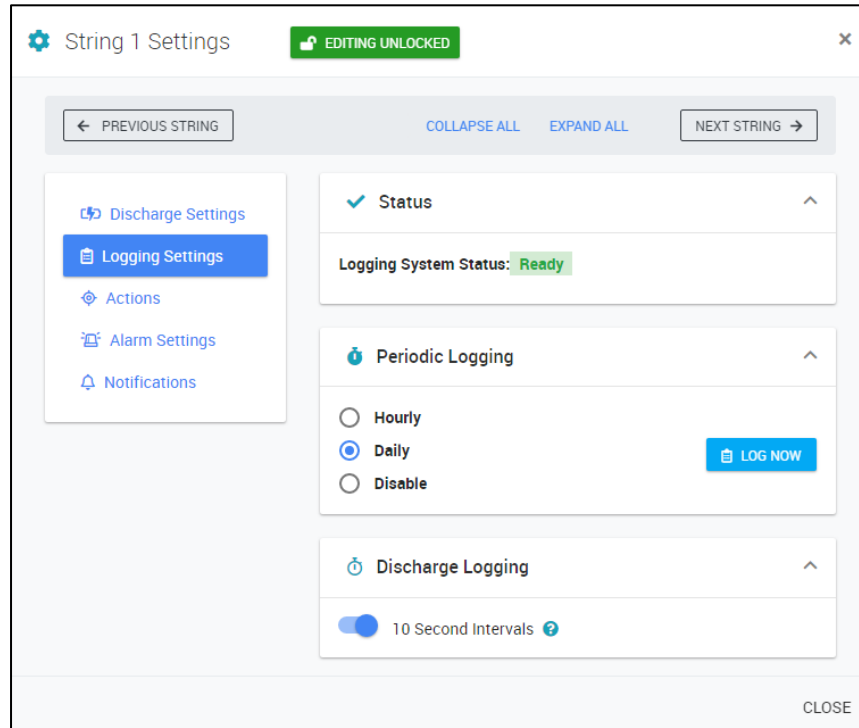
Clicking the button to the right of the Discharge Status indication allows you to set Discharge Status alarms for the string. See [Setting Discharge Status Alarms](#) for details.

The Simulated Discharge Control area allows you to manually simulate a discharge by clicking the **START** button. This instructs the SCMini-XC to generate more frequent log entries as is done in the case of real discharge events. The SCMini-XC will remain in this mode until the specified **Timeout (Min)** (in minutes) has elapsed.



6.9.1.2.2. String Logging Settings

With the String Settings panel displayed (see [Viewing and Editing String Settings](#)), clicking the Logging Settings button brings up the Logging Settings for the selected string.



The Status area shows the status of the internal flash memory used for logging.

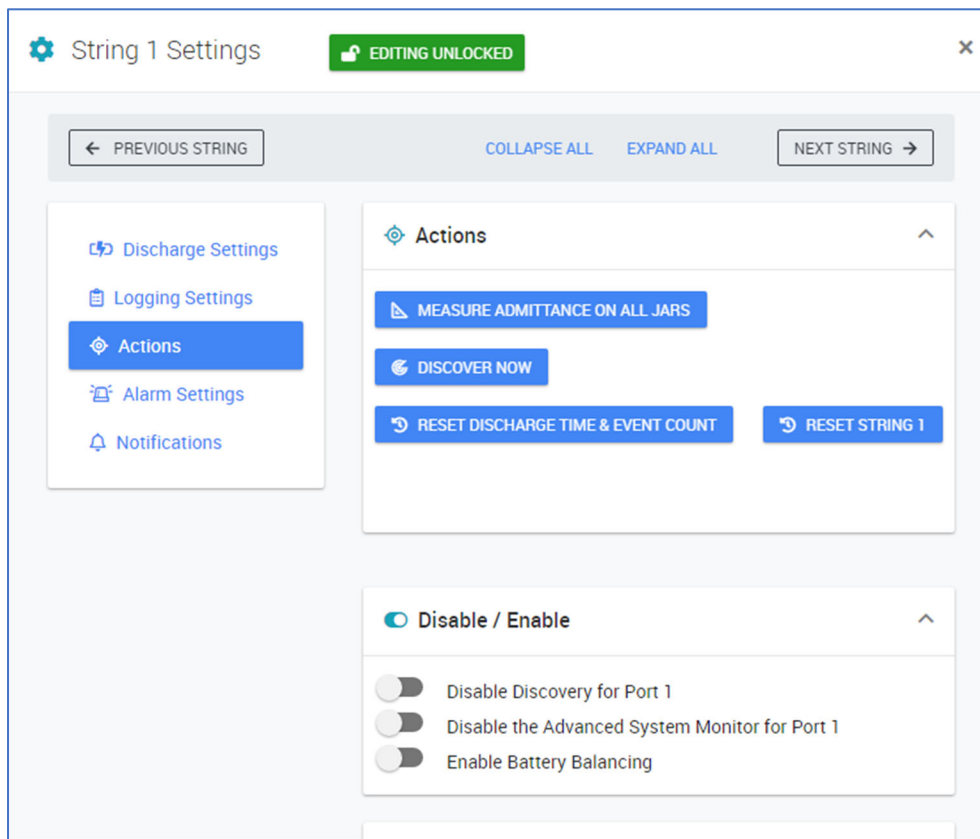
The Periodic Logging area allows you to specify the logging interval for the string. Use the radio buttons to specify either **Hourly**, **Daily** or **Disable**. Clicking the **LOG NOW** button causes the SCMini-XC to store current data for the corresponding string in the log file. For more information, see [Logging](#).

The Discharge Logging area allows you to control whether discharge logging (in 10 second intervals) is enabled/disabled.



6.9.1.2.3. String Actions

With the String Settings panel displayed (see [Viewing and Editing String Settings](#)), clicking the Actions button brings up the Action settings for the selected string.



The following Actions are available.

- Click **MEASURE ADMITTANCE ON ALL JARS** to immediately measure admittance for all jars on the string.
- Click **DISCOVER NOW** to immediately discover all devices on the current string.
- Click **RESET DISCHARGE TIME & EVENT COUNT** to initialize the discharge time and set the number of discharge events to zero.
- Click **RESET STRING 1** to initialize the string settings to the default values.

In the Disable / Enable area:

- Use the **Disable Discovery for Port x** control to toggle automatic population of devices added to this SCMini-XC port.
- Use the **Disable Advanced System Monitor for Port x** control to toggle related functions for this SCMini-XC port. See [Advanced System Monitoring](#) for details.



- Use the **Enable Battery Balancing** control to toggle battery balancing for devices connected to the corresponding port on the SCMini-XC.

Clicking **DELETE STRING** in the Delete String area to delete the current string from the SCMini-XC. If the string remains connected when this is done, the string and all connected devices will be rediscovered by the SCMini-XC.



6.9.1.3. Advanced System Monitoring

Advanced system monitoring includes the ability to monitor and generate alarms for:

- Critical Events
- Thermal Runaway
- Battery Aging
- Temperature Readings

For critical events, thermal runaway, and battery aging, tunable algorithms are used to determine when a significant event is occurring.

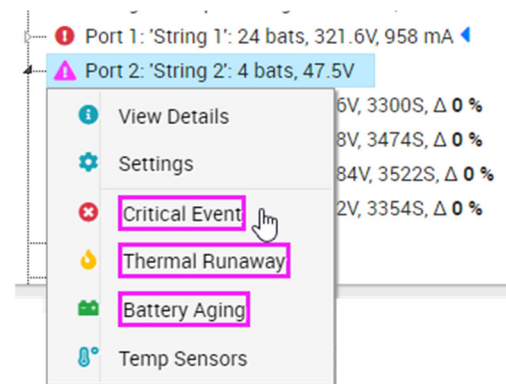
Advanced System Monitoring can be enabled/disabled for the SCMini-XC via Site Properties settings (see [Actions](#)) and enabled/disabled for individual strings when working in the Advanced System Monitor window.



NOTE: Advanced System Monitoring is available for physical strings only. Virtual strings are not supported.

When Advanced System Monitoring is enabled for the SCMini-XC (see [Actions](#)), the Advanced System Monitoring can be accessed by right clicking on a string and choosing the **Critical Event**, **Thermal Runaway**, **Battery Aging** or **Temp Sensors** menu item.

This brings up the Advanced System Monitor window with the corresponding item tab selected.



6.9.1.3.1. Critical Event Alarms

When Advanced System Monitoring is enabled for the SCMini-XC (see [Actions](#)), the Advanced System Monitoring can be accessed by right clicking on a string and choosing **Critical Event**.

The screenshot displays the 'Advanced System Monitor - Group 1' interface for 'String 1'. At the top, there is a status indicator 'Port 1 System Monitor Enabled' with a toggle switch, a 'LOG NOW' button, and an 'EDITING UNLOCKED' button. Below this, three event categories are listed: 'Critical Event', 'Thermal Runaway', and 'Battery Aging', all with green checkmarks. To the right, 'Battery Sensor Delta Included' is checked, and a 'TEMPERATURE SENSOR CONFIG' button is visible. The 'Critical Event Settings' panel is open, showing 'Trigger alarm when:' with a dropdown menu. The 'Critical Event Status' is 'Normal'. Two conditions are defined: 'Max Δ Delta Temp' is set to '-100.0 °C' and 'is greater than' a threshold of '10.0 °C', and 'Float Current' is set to '0.986 amps' and 'is greater than' a threshold of '0.002 amps'. The conditions are connected by an 'AND' operator. A 'CLOSE' button is located at the bottom right of the settings panel.

A critical event will trigger an alarm when the **Max Δ Delta Temp** is greater than the specified value AND the **Float Current** is greater than the specified value.

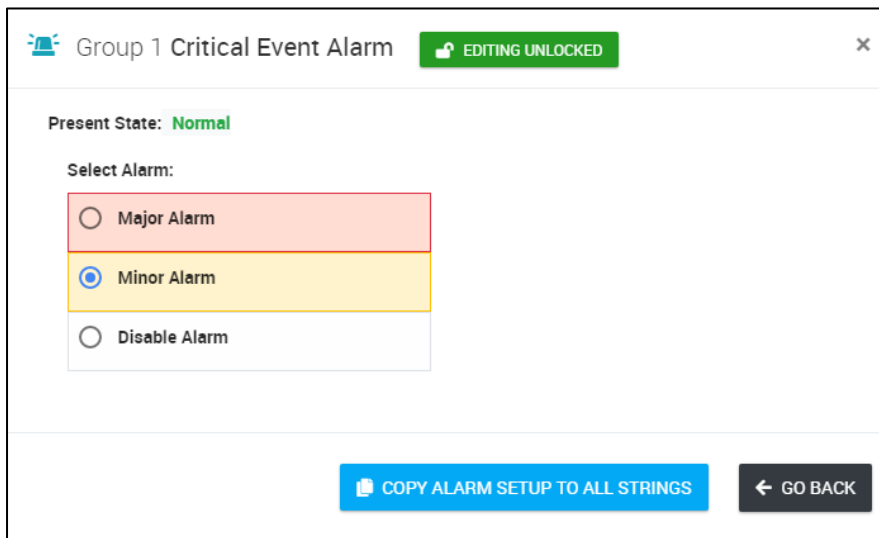


To specify the type of alarm generated when both values are exceeded, do the following:

1. Click the button to the left of the **Trigger alarm when** label.



The Critical Event Alarm view appears.



2. Choose the severity of a Critical Event Alarm by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).
3. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the Critical Event Alarm settings for this string to all strings connected to the SCMini-XC.



6.9.1.3.2. Thermal Runaway Alarms

When Advanced System Monitoring is enabled for the SCMini-XC (see [Actions](#)), the Advanced System Monitoring can be accessed by right clicking on a string and choosing **Thermal Runaway**.

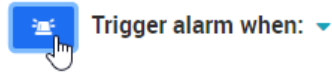
The screenshot displays the 'Advanced System Monitor - Group 1' interface for 'String 1'. At the top, it shows 'Port 1 System Monitor Enabled' with a toggle switch. Below this are buttons for 'LOG NOW' and 'EDITING UNLOCKED'. A row of alert indicators includes 'Critical Event', 'Thermal Runaway' (highlighted in pink), and 'Battery Aging'. A 'Battery Sensor Delta Included' checkbox is checked. A 'TEMPERATURE SENSOR CONFIG' button is also present. The main section is titled 'Thermal Runaway Settings' and features a 'Trigger alarm when:' dropdown menu. The current 'Thermal Runaway Status' is 'Normal'. Three conditions are listed: 'Time since discharge' (1,452 hours) is greater than or equal to 72 hours; 'Max Δ Delta Temp' (-100.0 °C) is greater than 20.0 °C; and 'Float Current' (0.986 amps) is greater than 6.000 amps. All conditions are connected by 'AND' operators. At the bottom right of the settings panel, there is a yellow 'CIRCUIT BREAKER CONTROL' button and a 'CLOSE' link.

A thermal runaway event will trigger an alarm when the **Time since discharge** is greater than or equal to the specified value AND the **Max Δ Delta Temp** is greater than the specified value AND the **Float Current** is greater than the specified value.

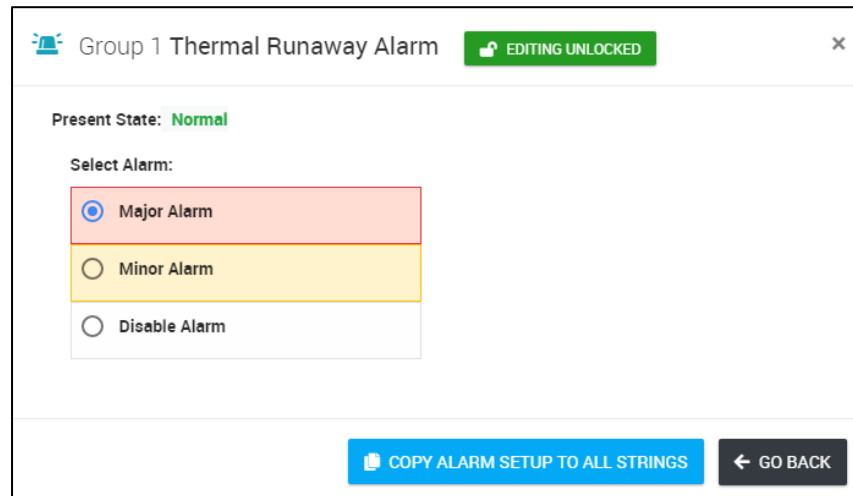


To specify the type of alarm generated when a thermal runaway event is detected based on the settings, do the following:

1. Click the button to the left of the **Trigger alarm when** label.



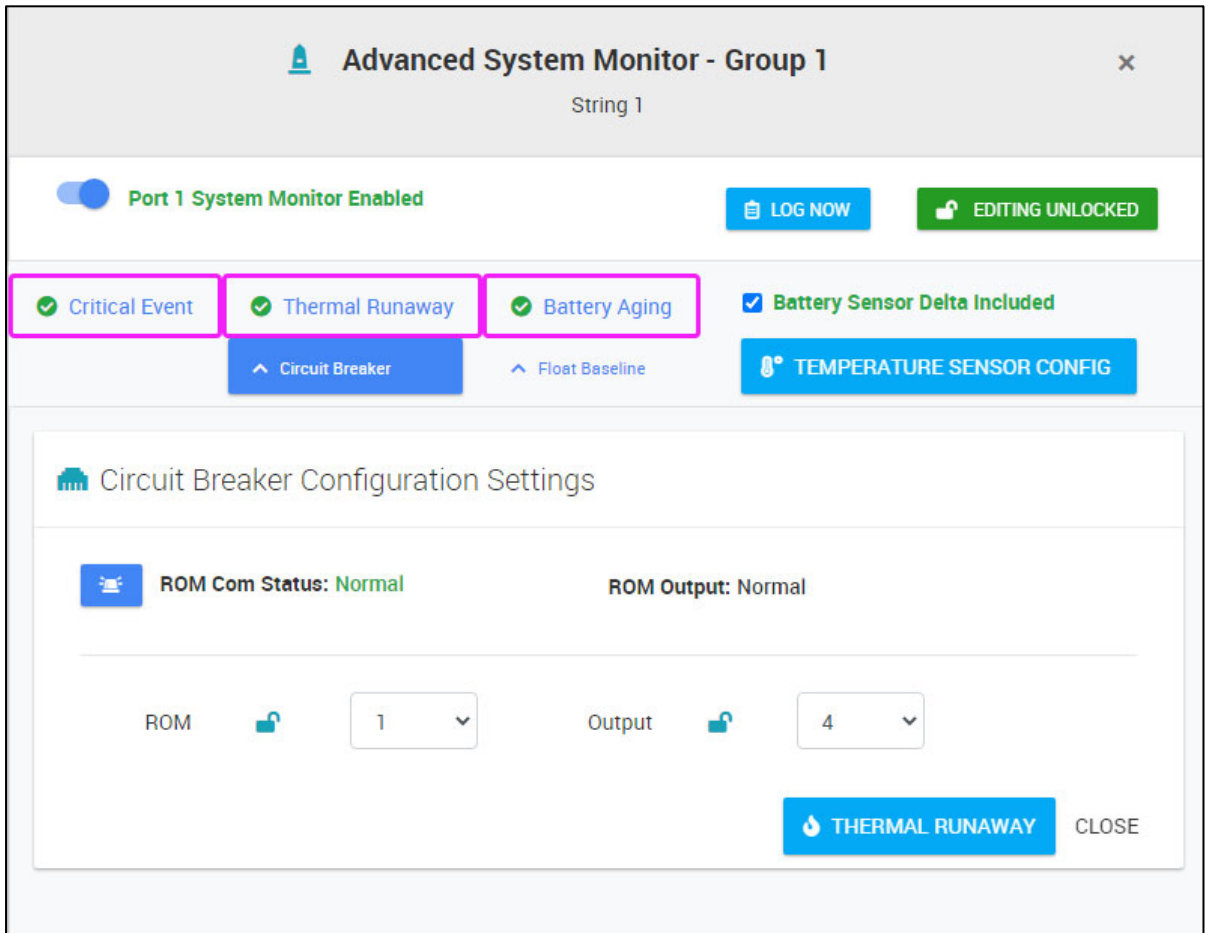
The Thermal Runaway Alarm view appears.



2. Choose the severity of a Critical Event Alarm by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).
3. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the Thermal Runaway Alarm settings for this string to all strings connected to the SCMini-XC.



When a thermal runaway event is detected, circuit breakers can be toggled as specified in the Circuit Breaker Configuration Settings. To specify these settings, click **CIRCUIT BREAKER CONTROL**. The Circuit Breaker Configuration Settings appear.

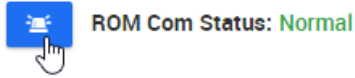


Use the **ROM** and **Output** drop-down list box to specify which circuit breaker is toggled when a thermal runaway event occurs.

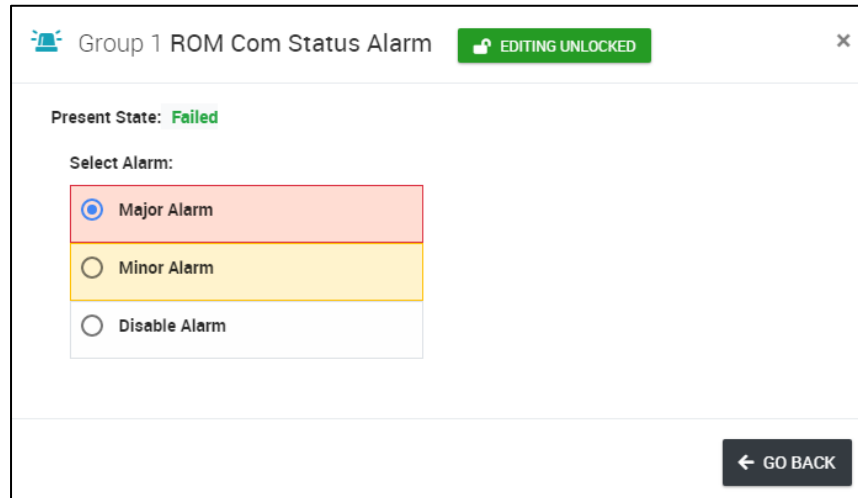


To specify the type of alarm generated when a communication failure occurs for the ROM used with the connected circuit breaker, do the following:

1. Click the button to the left of the **ROM Com Status** label.



The ROM Com Status Alarm view appears.



2. Choose the severity of a ROM Com Status Alarm by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).

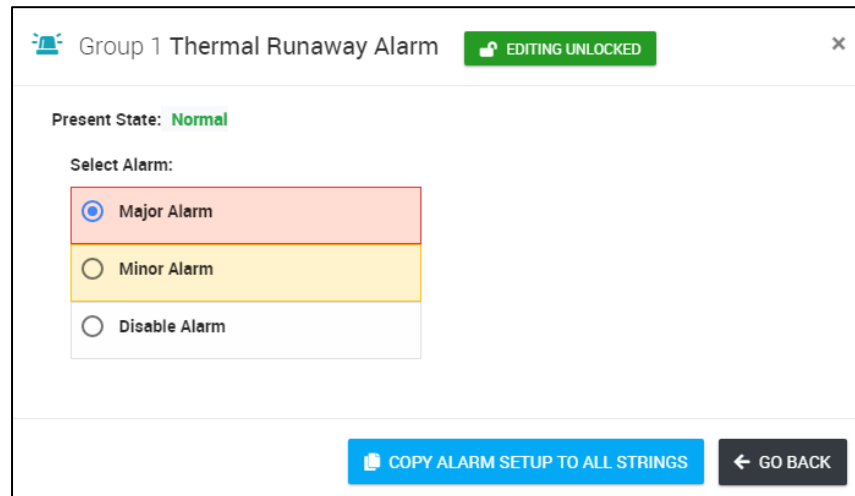


To specify the type of alarm generated when a thermal runaway event is detected based on the settings, do the following:

1. Click the button to the left of the **Trigger alarm when** label.



The Thermal Runaway Alarm view appears.



2. Choose the severity of a Critical Event Alarm by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).
3. Click **COPY ALARM SETUP TO ALL STRINGS** to copy the Thermal Runaway Alarm settings for this string to all strings connected to the SCMini-XC.



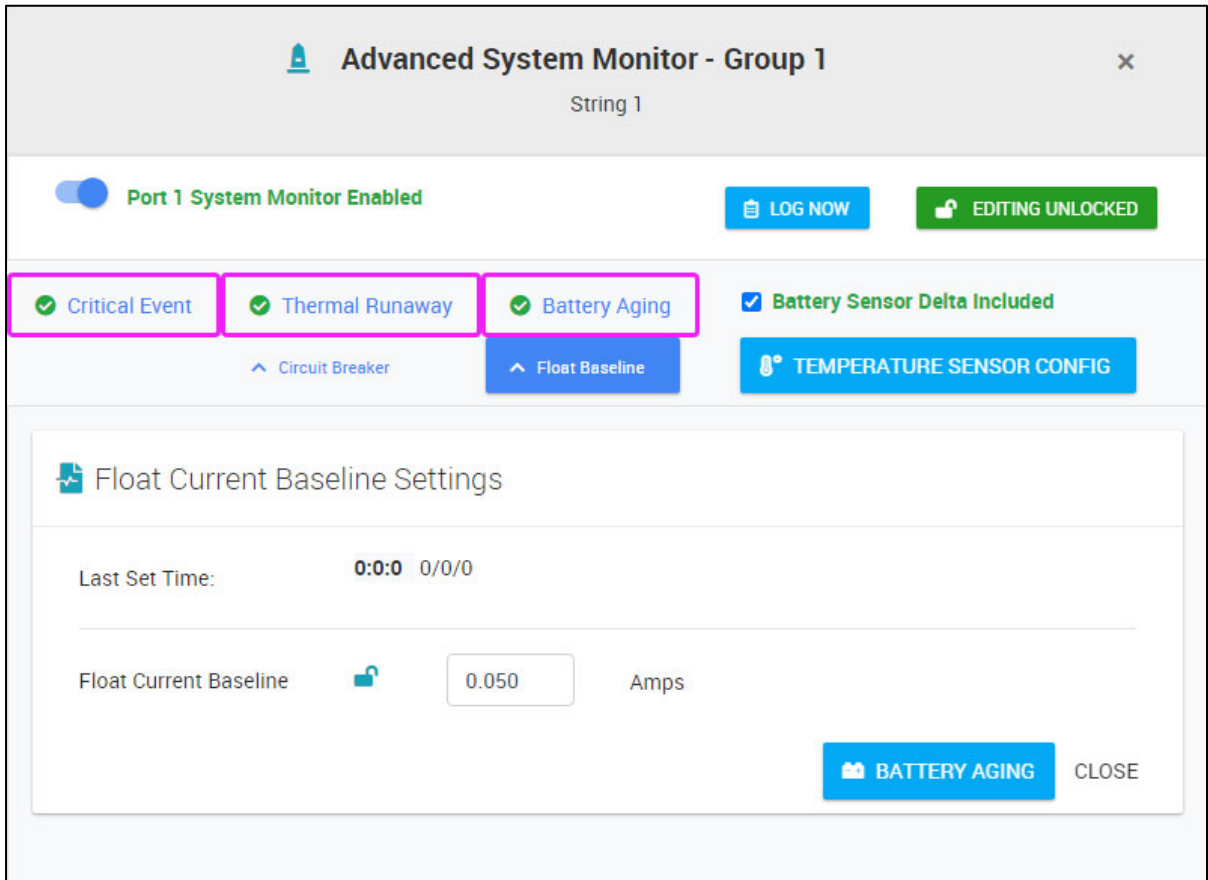
6.9.1.3.3. Battery Aging Alarms

When Advanced System Monitoring is enabled for the SCMini-XC (see [Actions](#)), the Advanced System Monitoring can be accessed by right clicking on a string and choosing **Battery Aging**.

A battery aging event will trigger an alarm when the **Time since discharge** is greater than or equal to the specified value AND the **Max Δ Delta Temp** is greater than the specified value AND the **Float Current Δ Delta** is greater than the percentage of baseline value specified.



The float current baseline can be specified. To do this, click **SET FLOAT BASELINE**. The Float Current Baseline Settings appear.



Use the **Float Current Baseline** field to specify the desired value.

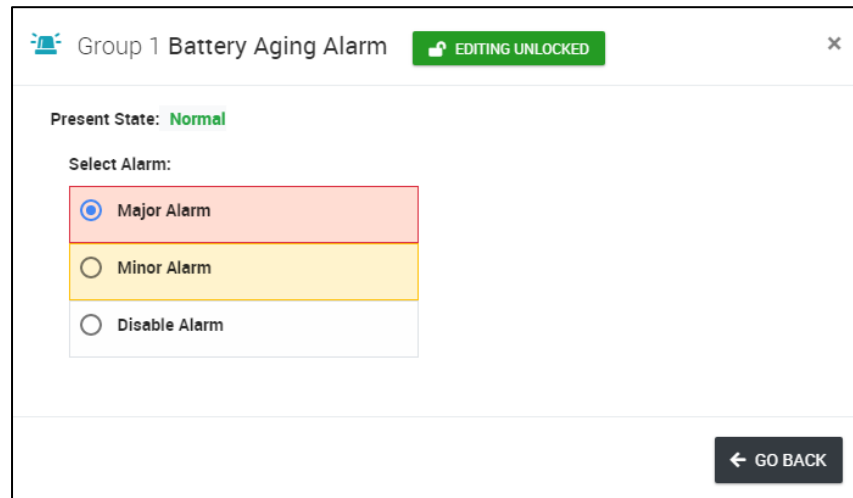


To specify the type of alarm generated when a battery aging event is detected based on the settings, do the following:

1. Click the button to the left of the **Trigger alarm when** label.



The Battery Aging Alarm view appears.



2. Choose the severity of a Battery Aging Alarm by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).



6.9.1.3.4. Temperature Sensor Settings

The SCMini-XC allows you to install and configure temperature sensors. This includes the ability to set alarms for the measured temperature as well as changes in temperature readings.

When Advanced System Monitoring is enabled for the SCMini-XC (see [Actions](#)), the Temperature Sensors settings can be accessed by right clicking on a string and choosing **Temp Sensors**.

Advanced System Monitor - Group 2
String 2

Port 2 System Monitor Enabled LOG NOW EDITING UNLOCKED

Critical Event
 Thermal Runaway
 Battery Aging
 Battery Sensor Delta Included

Circuit Breaker
 Float Baseline
 TEMPERATURE SENSOR CONFIG

Temperature Sensors

⚠ There is a problem with this string. Battery sensor temperature ignored

Measurement Type	Temperature	Δ Delta Temp.	Settings
Ambient Temperature	N/A	-100.0 °C	[Settings] [Delete]
Group 2, Measurement 1	N/A	N/A	[Settings] [Delete]
Group 2, Measurement 3	0.0 °C / 32 °F	0.0 °C	[Settings] [Delete]
Group 1, Measurement 4	N/A	0.0 °C	[Settings] [Delete]

ADD NEW TEMPERATURE SENSOR



Each individual temperature sensor is represented on a line. Alarm settings are available for measured temperature (**Temperature**) as well as change in temperature (**Δ Delta Temp**). Temperature sensors installed via RIM modules are detected automatically and can be added or removed from the list as desired.

To change the **Temperature** alarm:

1. Click the button to the right of the **Temperature**.



The Temperature Alarm Setup view appears.

Temperature Alarm Setup - Measurement 1

Major High Alarm Limit Alarm Disabled

Minor High Alarm Limit Alarm Disabled

Present Value: 0.0 °C / 32 °F

Minor Low Alarm Limit Alarm Disabled

Major Low Alarm Limit Alarm Disabled

Deadband:

← GO BACK TO TEMP SENSORS

2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the value to be exceeded to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 22.0 and the Deadband is set to 2.0, an alarm will not be triggered until the measured value reaches 24.0. The alarm will stay on until the measured value reached 20.0. This keeps the SCMini-XC from bouncing quickly between alarm statuses.

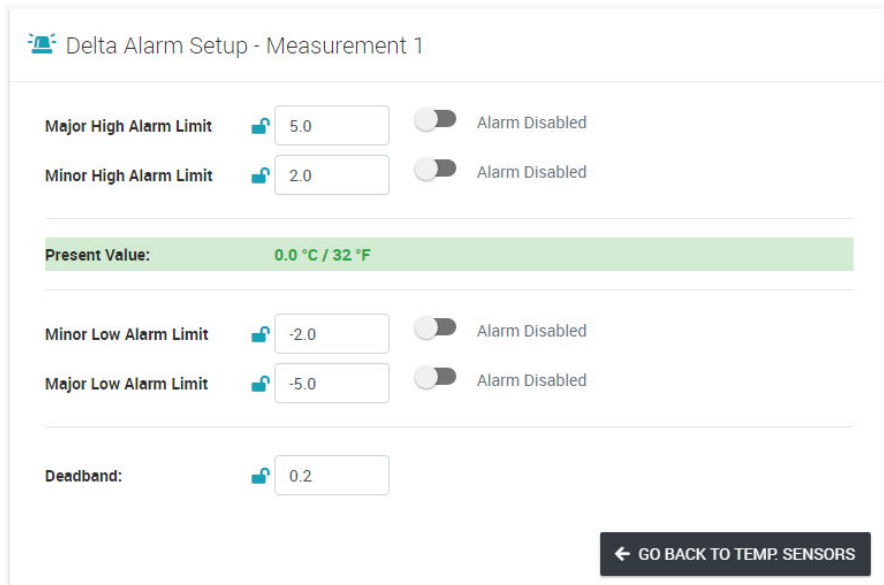


To change the **Δ Delta Temp** alarm:

1. Click the button to the right of the **Δ Delta Temp**.



The Delta Alarm Setup view appears.



2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the value to be exceeded to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 5.0 and the Deadband is set to 0.2, an alarm will not be triggered until the measured value reaches 5.2. The alarm will stay on until the measured value reached 4.8. This keeps the SCMini-XC from bouncing quickly between alarm statuses.

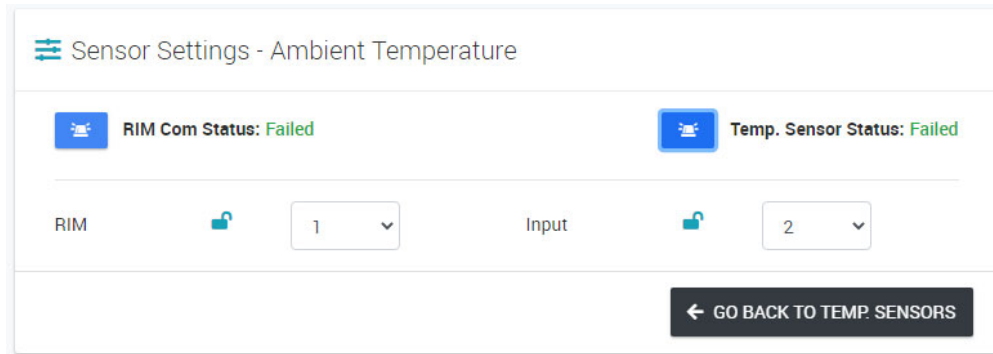


To change temperature sensor settings:

1. Click the settings button.



The Sensor Settings view appears.



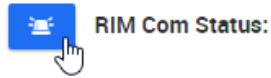
2. Use the **RIM** and **Input** drop-down list boxes to specify which RIM and Input the sensor is connected to.



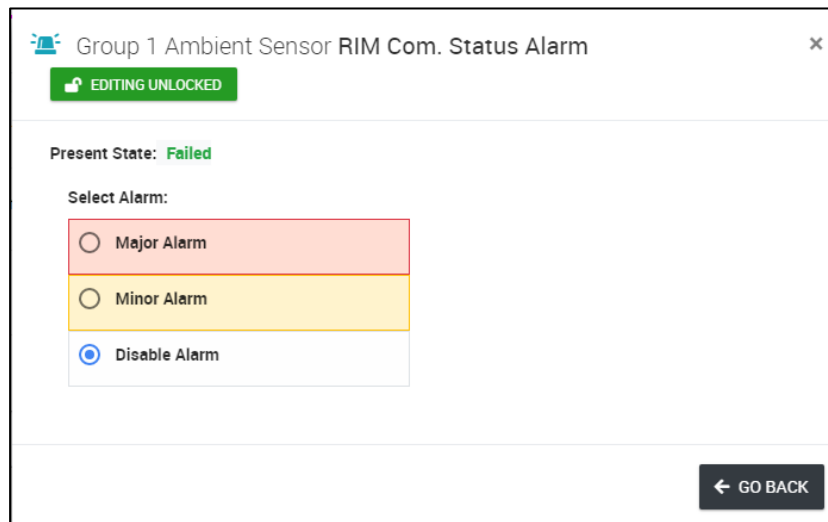
Alarms can be specified for communications with RIM connected to the temperature sensor as well as the temperature sensor status.

To specify the type of alarm generated when a communication failure occurs for the RIM used with the connected temperature sensor, do the following:

1. Click the button to the left of the **RIM Com Status** label.



The RIM Com Status Alarm view appears.

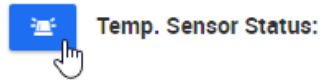


Choose the severity of a ROM Com Status Alarm by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).

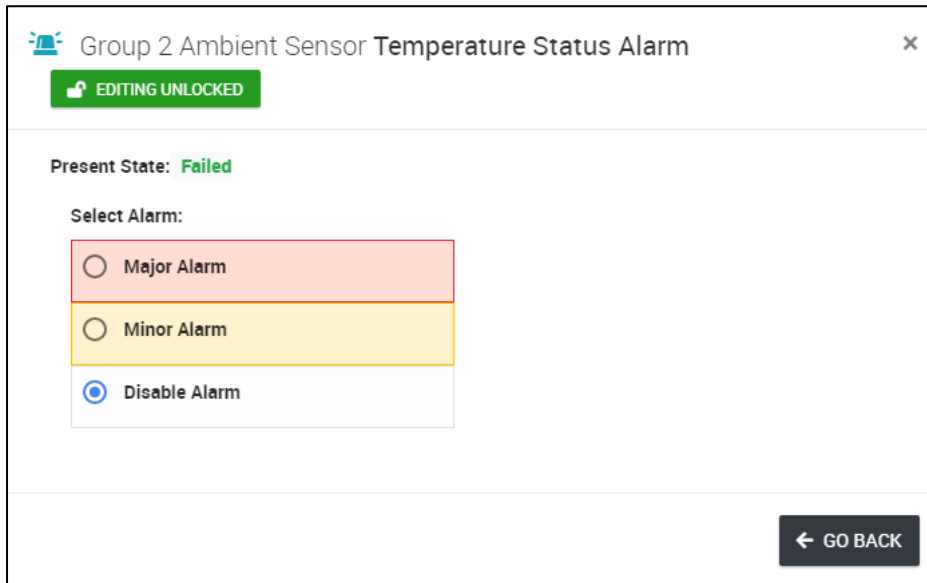


To specify the type of alarm generated when a problem occurs with the connected temperature sensor, do the following:

1. Click the button to the left of the **Temp. Sensor Status** label.



The Temperature Status Alarm view appears.



Choose the severity of a Temperature Status Alarm by choosing the corresponding radio button (**Major Alarm**, **Minor Alarm**, or **Disable Alarm**).



6.9.2. Working with Jars

6.9.2.1. Viewing and Editing Jar Details



NOTE: To enable editing of values, the SiteViewer must be unlocked. See [Unlocking the SiteViewer for Editing](#) for details.

Right click on the desired jar in the Strings, Batteries, I/O devices window and choose View Details. The Jar Details view appears.

The Jar Details view allows you to view and edit the string:

- Name
- Sensor Address

The Jar Details view also displays the Last Admittance measurement date and time and Electrolyte Level (Normal, Low, Warning, Sensor Com Failed or Not installed). Electrolyte Level measurements require an electrolyte level sensor (for example, PBT-BMS-ELS-1) connected to a battery sensor that supports an electrolyte sensor. If the battery sensor is equipped with the electrolyte level detection option, the Electrolyte Level is displayed as either “Normal”, “Low,” “Warning,” “Sensor Com Failed,” or “Not Available.” (If the sensor is not equipped with this option the Electrolyte Level will not be displayed.)

The Jar Details view displays jar values and lets you set alarm parameters for:

- Voltage
- Admittance
- Temperature

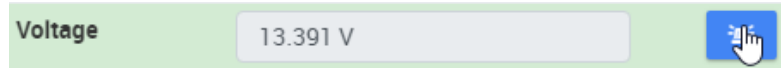
Alarm status indications are also provided on this view where applicable. The example shown here indicates a major Voltage alarm.



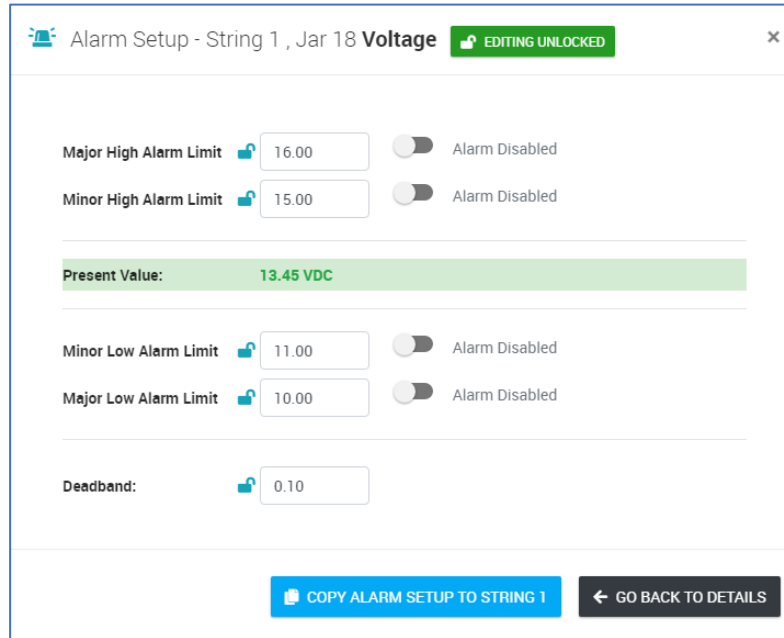
6.9.2.1.1. Setting Jar Voltage Alarms

The Jar Voltage view allows you to set alarms for the voltage of the specific jar.

1. With the Jar Details window displayed (see [Viewing and Editing Jar Details](#)), click the button to the right of the Voltage field.



The Voltage view appears.



The present voltage is displayed in the Present Value field.

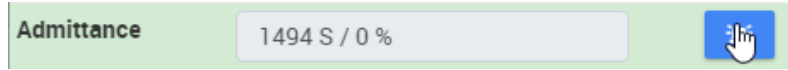
2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the threshold value to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 16.0 and the Deadband is set to 0.1, and alarm will not be triggered until the measured value reaches 16.1. The alarm will stay on until the measured value reached 15.9. This keeps the SCMini-XC from bouncing quickly between alarm statuses.
5. Clicking the **COPY ALARM SETUP TO STRING x** button will copy the specified settings to all jars on the corresponding string.



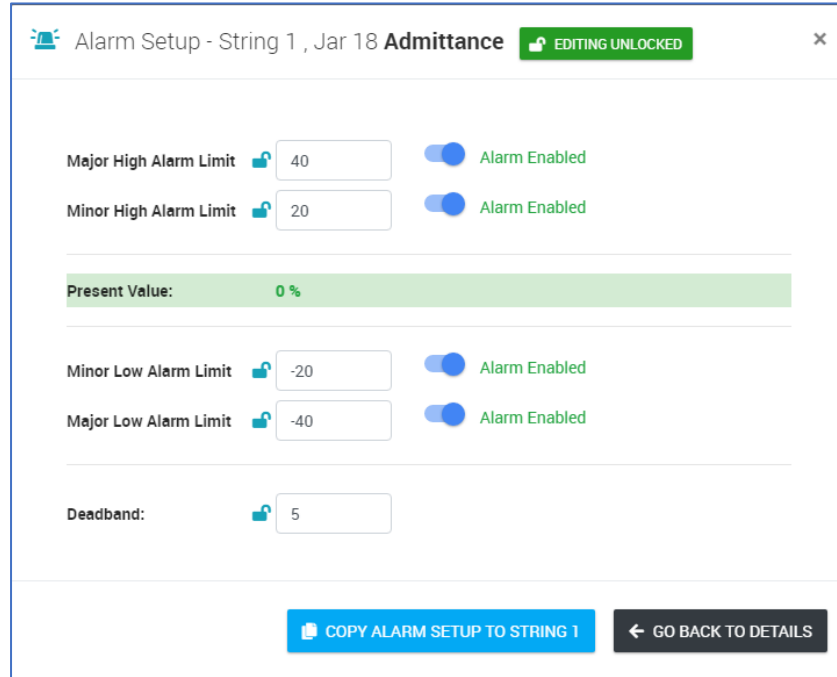
6.9.2.1.2. Setting Jar Admittance Alarms

The Jar Admittance view allows you to set alarms for the admittance for the specific jar.

1. With the Jar Details window displayed (see [Viewing and Editing Jar Details](#)), click the button to the right of the Admittance field.



The Admittance view appears.



The present admittance is displayed in the Present Value field.

2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the value to be exceeded to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 40 and the Deadband is set to 5, and alarm will not be triggered until the measured value reaches 45. The alarm will stay on until the measured value reached 35. This keeps the SCMini-XC from bouncing quickly between alarm statuses.
5. Clicking the **COPY ALARM SETUP TO STRING x** button will copy the specified settings to all jars on the corresponding string.



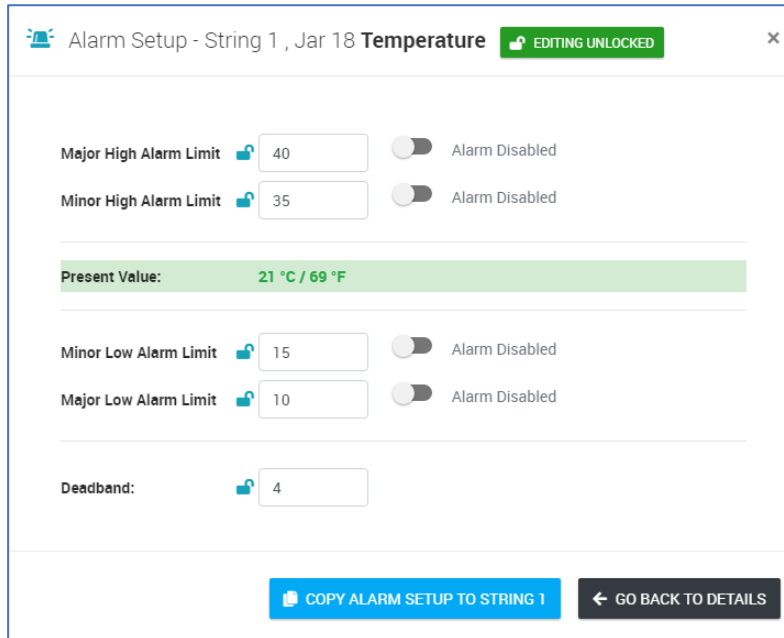
6.9.2.1.3. Setting Jar Temperature Alarms

The Jar Temperature view allows you to set alarms for the temperature of the specific jar.

1. With the Jar Details window displayed (see [Viewing and Editing Jar Details](#)), click the button to the right of the Temperature field.



The Temperature view appears.



The present temperature is displayed in the Present Value field.

2. Use the **Alarm Disabled/Alarm Enabled** controls to enable/disable individual alarm types.
3. Use the value fields for set the value to be exceeded to trigger each corresponding alarm type.
4. If desired, alter the **Deadband** value. The **Deadband** value creates a “window” in which no alarm is triggered. For example, if the Major High Alarm Limit is set to 16.0 and the Deadband is set to 0.1, and alarm will not be triggered until the measured value reaches 16.1. The alarm will stay on until the measured value reached 15.9. This keeps the SCMini-XC from bouncing quickly between alarm statuses.
5. Clicking the **COPY ALARM SETUP TO STRING x** button will copy the specified settings to all jars on the corresponding string.

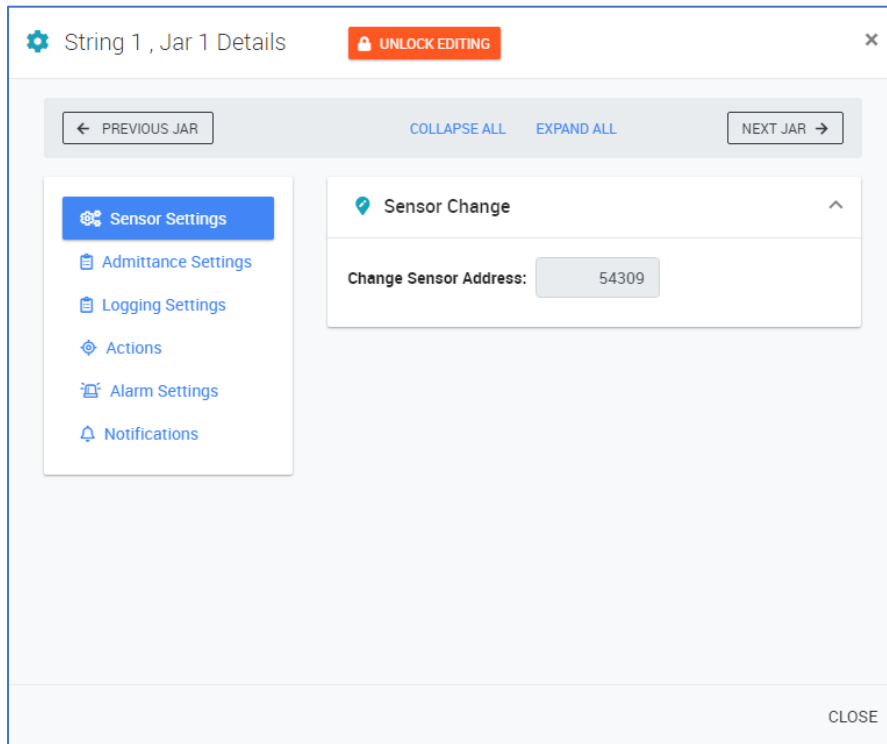


6.9.2.2. Viewing and Editing Jar Settings



NOTE: To enable editing of values, the SiteViewer must be unlocked. See [Unlocking the SiteViewer for Editing](#) for details.

Right click on the desired jar in the Strings, Batteries, I/O devices window and choose **View Settings**. The Jar Settings panel appears.



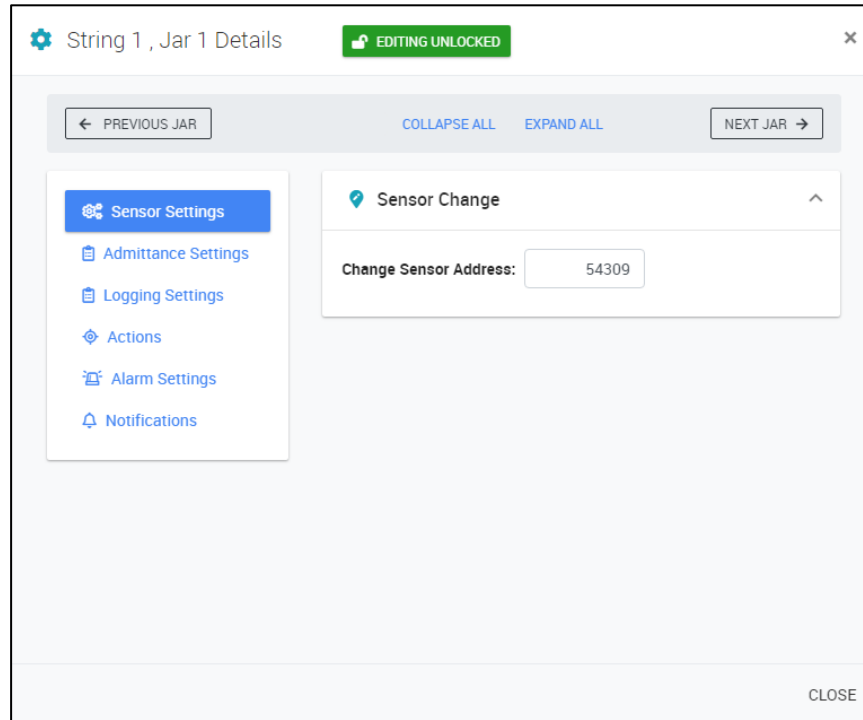
The Jar Settings view allows you to work with Sensor Settings, Admittance Settings, Logging Settings, and Actions related to the selected jar.

Alarm Settings and Notifications contain no controls or indicators. These items are set using the Jar Details view. See [Viewing and Editing Jar Details](#) for more information.



6.9.2.2.1. Jar Sensor Settings

With the Jar Settings panel displayed (see [Viewing and Editing Jar Settings](#)), clicking **Sensor Settings** brings up the Sensor Settings for the selected string.



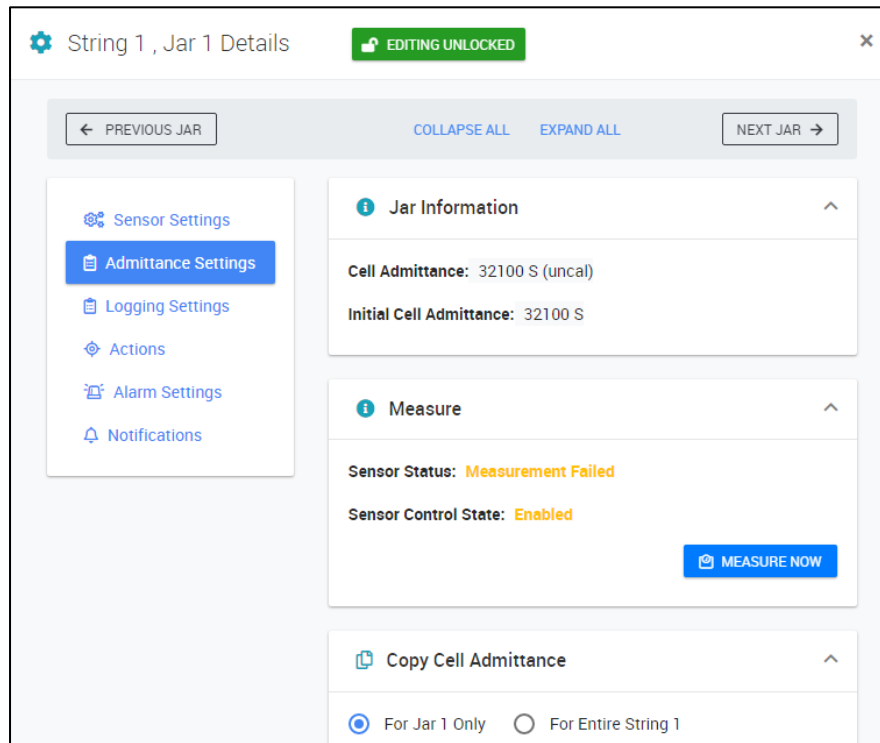
Change the address of the sensor connected to the jar by entering the address in the Change Sensor Address field.

If the value is changed to an incorrect one, communication with the sensor will be faulted until the sensor is rediscovered by the SCMini-XC.



6.9.2.2.2. Jar Admittance Settings

With the Jar Settings panel displayed (see [Viewing and Editing Jar Settings](#)), clicking **Admittance Settings** brings up the Admittance Settings for the selected string.



Jar Information is provided for the corresponding jar. This includes Cell Admittance and Initial Cell Admittance. (Admittance is the inverse of impedance in units of Siemens. Admittance is a measure of how easily a circuit or device will allow a current to flow. Resistance is a measure of the opposition of a circuit to the flow of a DC current, while impedance takes into account not only the resistance, but AC effects (known as reactance) as well. Likewise, admittance is not only a measure of the ease with which a DC current can flow (conductance, the inverse of resistance), but also takes into account the AC effects of susceptance (the inverse of reactance).)

Measure information includes current Sensor Status and Sensor Control State. Clicking the **MEASURE NOW** button instructs the SCMini-XC to perform measurements on the connected Jar.

The Copy Cell Admittance area allows you to specify the Initial Cell Admittance for the corresponding jar (by selecting the **For Jar x Only** radio button) or to all jars on the string (by selecting the **For Entire String x** radio button) by doing one of the following.

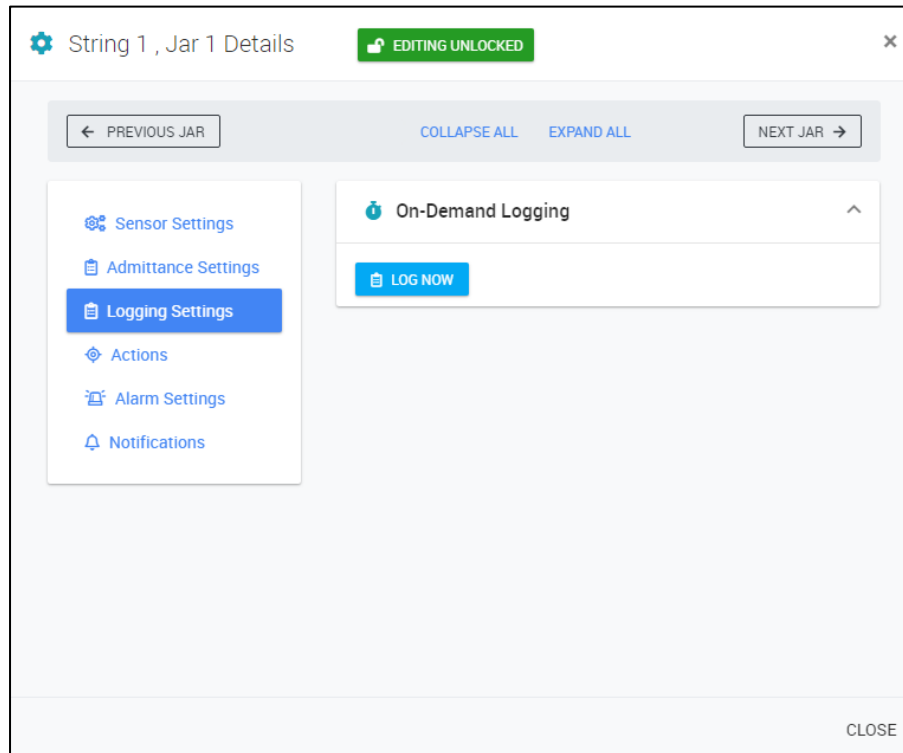
- Clicking the **COPY TO INITIAL CELL ADMITTANCE** button copies the current admittance measurement to the Initial Cell Admittance value.
- Entering a value in the data field and clicking the **SET INITIAL CELL ADMITTANCE** button copies the entered value to the Initial Cell Admittance value.



The Set Measured Cell Admittance area allows you to specify an optimized value for the Jar Cell Admittance reading. For example, if the SCMini-XC is not reading the desired value (as measured by other methods) and you want these values to match the other methods, enter the desired value in this field and click **CALIBRATE JAR x**. The SCMini-XC will then calibrate reading made for this jar to the specified value.

6.9.2.2.3. Jar Logging Settings

With the Jar Settings panel displayed (see [Viewing and Editing Jar Settings](#)), clicking **Logging Settings** brings up the Logging Settings for the selected string.

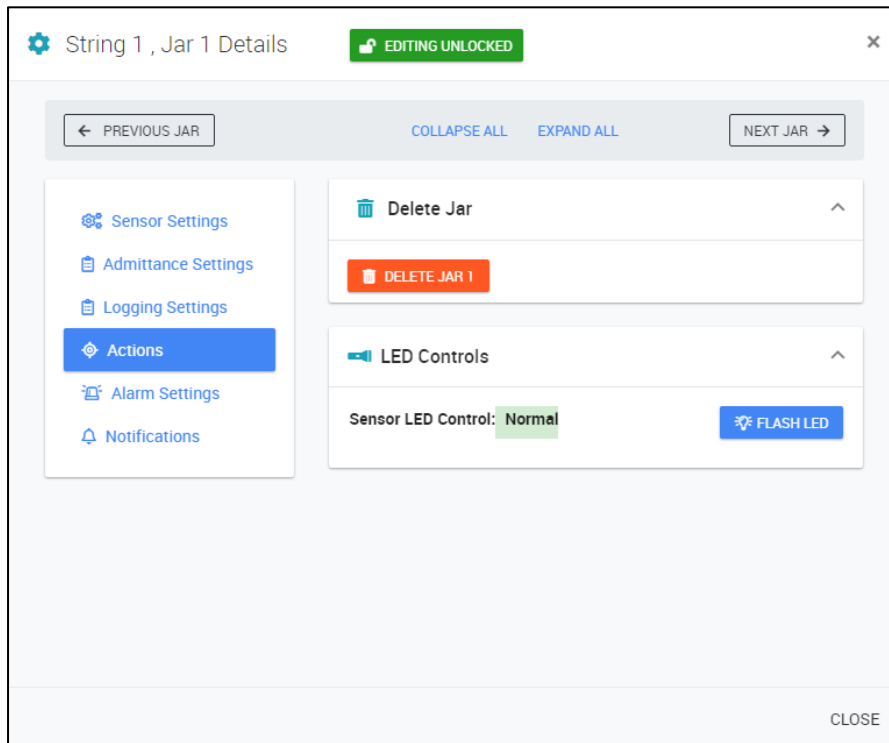


Clicking the **LOG NOW** button causes the SCMini-XC to store current data for the corresponding jar in the log file. For more information, see [Logging](#).



6.9.2.2.4. Jar Actions

With the Jar Settings panel displayed (see [Viewing and Editing Jar Settings](#)), clicking **Actions** brings up the Actions for the selected string.



The Delete Jar area allows you to delete the corresponding jar from the String. To do so, click the **DELETE JAR x** button. If the sensor remains connected when this is done, the sensor will be rediscovered by the SCMini-XC.

The LED Controls area allows you to control the LED on the sensor connected to the jar. This can be useful when trying to physically locate a specific jar in a large installation. Clicking the **FLASH LED** button causes the sensor LED to flash green and red. The button then changes to **NORMAL LED**. Clicking this button returns the sensor LED to normal operation. The current state is also displayed in the Sensor LED Control field.



6.9.3. Working with PBUS I/O Devices

The SCMini-XC supports multiple device types connected to the P-BUS port. This includes:

- Remote Output Module (ROMs)
- Remote Input Module (RIMs)
- Float Current Monitoring System (CCS)
- Unintentional Ground Monitor (UGM)
- Modbus Interface (MBI)

Each of these devices can be configured from the SCMini-XC to perform specific functions.



NOTE: Refer to the applicable manual for the connected P-BUS I/O device for details on how to configure the relevant device.

For details on the Remote Output Module (ROM), see the *ROM Installation and Operation Manual (700-000028-00)*.

For details on the Remote Input Module (RIM), see the *RIM Installation and Operation Manual (700-000012-00)*.

For details on the Unintentional Ground Monitor (UGM), see the *UGM Installation and Operation Manual (700-000020-00)*.

For details on the Modbus Interface Module (MBI), see [Connecting a Modbus Interface Module \(MBI\)](#) and [Connecting SCMini-XC to Modbus Interface Module \(MBI\) and Lithium Battery](#).

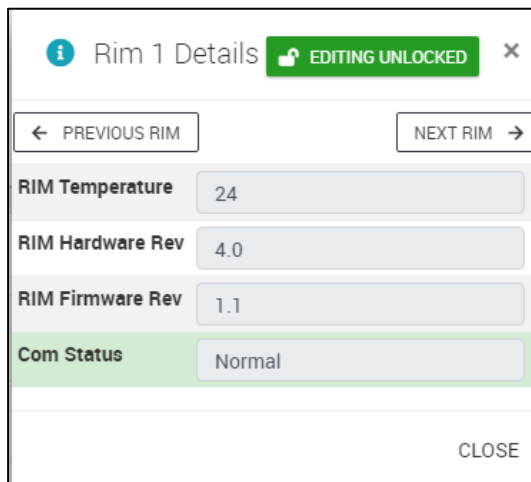
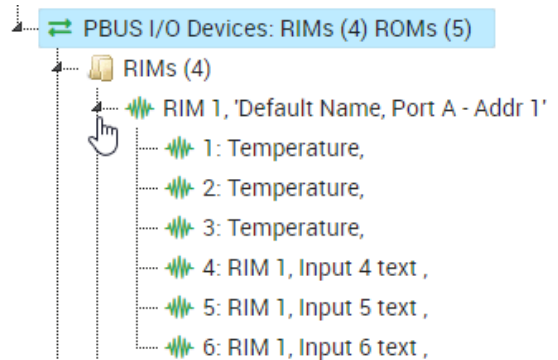
For details on the Float Current Monitoring System (CCS), see the *Float Current Monitoring System Manual (700-000029-00)*.



6.9.3.1. Viewing PBUS I/O Device Details

To view a device’s details:

1. Expand the branch of the desired device type to see the connected devices. The example shows that there are 4 RIMs (Remote Input Modules) connected to the SCMini-XC.
2. Right click on the desired device in the Strings, Batteries, I/O devices window and choose **View Details**. The Details view for the selected device appears.

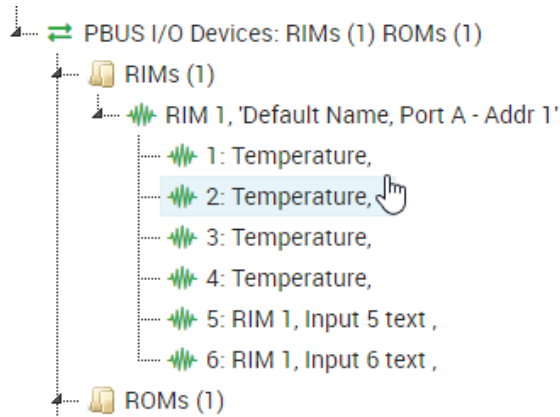


The Details view allows you to view the device:

- Temperature (for RIMs only)
- Hardware Revision
- Firmware Revision
- Communication Status

Nested beneath the device on the Strings, Batteries, I/O devices window are the devices inputs or outputs (as applicable).

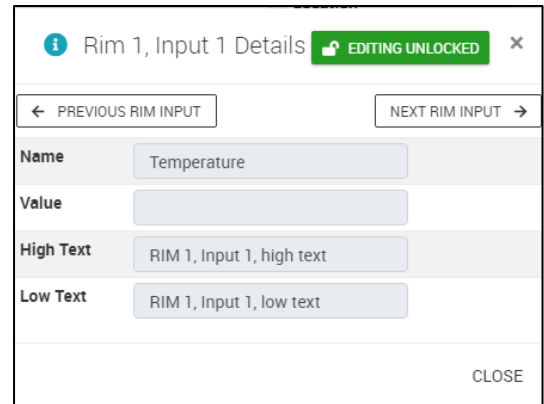




Right click on the desired input or output in the Strings, Batteries, I/O devices window and choose **View Details**. The Details view for the selected input or output appears.

The **PREVIOUS** and **NEXT** buttons can be used to rotate through the inputs or outputs (as applicable) for the currently selected device.

The displayed information varies by device type. The example here shows the details for a RIM input. (The RIM has 6 inputs that can be configured to monitor analog or digital signals. There is also a temperature, AC line voltage and optional humidity measurement.)



- Name – the name assigned to the input
- Value – the current value measured at the input
- High Text – the text displayed when the DC voltage or other measurement at the input is above the specified threshold
- Low Text – the text displayed when the DC voltage or other measurement at the input is below the specified threshold



When a ROM output is selected, the Details view for the selected output appears.

- Name – the name assigned to the output relay
- State – the current state of the output relay

The ROM has 4 form-C relay outputs (standard or latching, depending on model) that can be controlled remotely. There is also a temperature measurement and an optional humidity measurement.

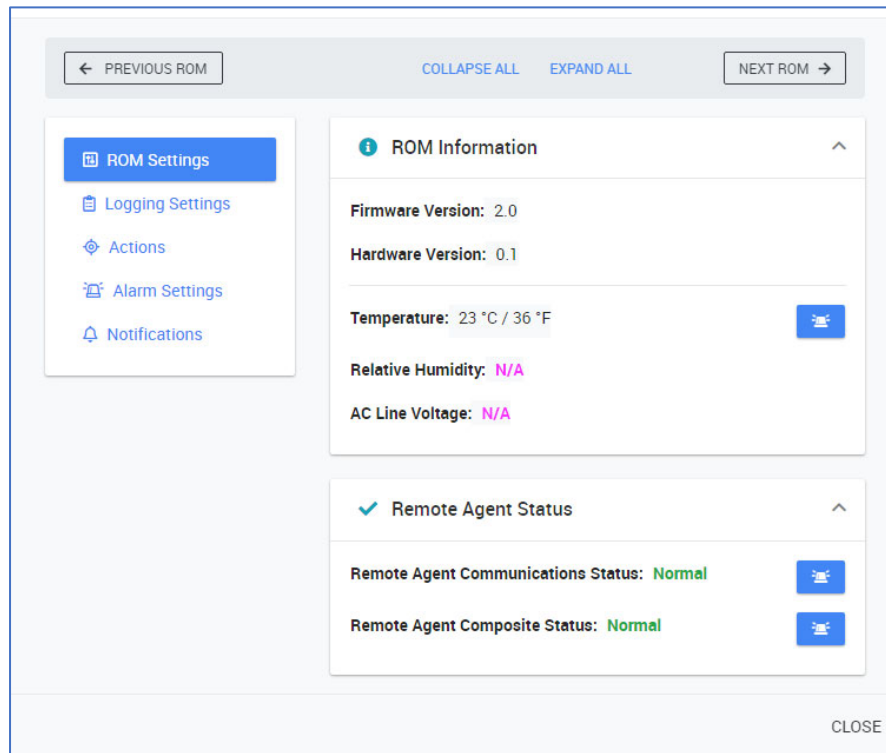


6.9.3.2. Viewing and Modifying PBUS I/O Device Settings



NOTE: To enable editing of values, the SiteViewer must be unlocked. See [Unlocking the SiteViewer for Editing](#) for details.

Right click on the desired PBUS I/O Device in the Strings, Batteries, I/O devices window and choose **View Settings**. The Settings panel for the corresponding device appears. Available settings vary depending on the device type.

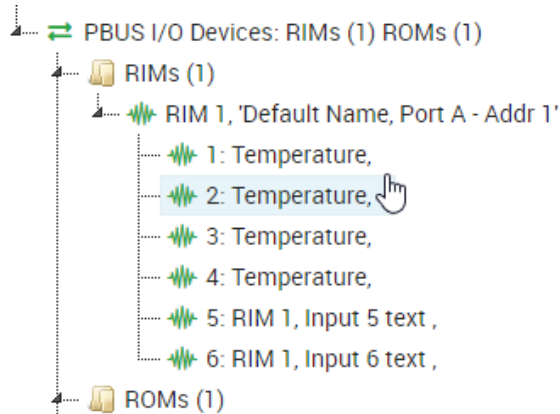


6.9.3.3. Viewing and Editing PBUS I/O Settings

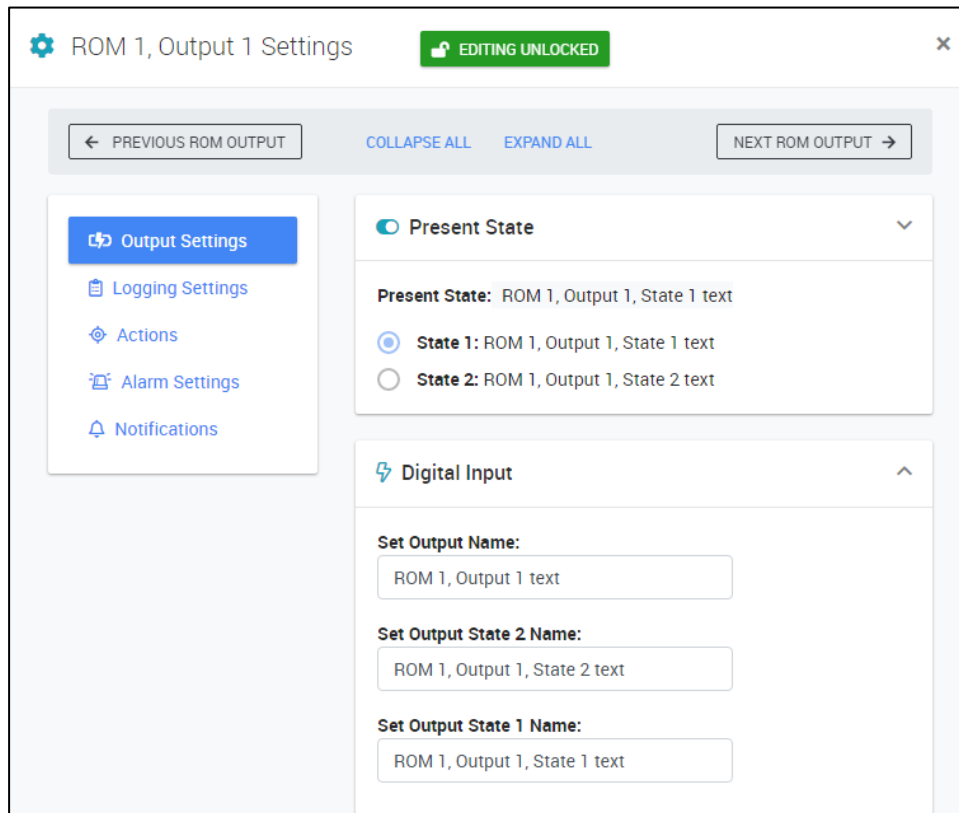


NOTE: To enable editing of values, the SiteViewer must be unlocked. See [Unlocking the SiteViewer for Editing](#) for details.

Nested beneath the device on the Strings, Batteries, I/O devices window are the devices inputs or outputs (as applicable).



1. Right click on the desired input or output in the Strings, Batteries, I/O devices window and choose **Settings**. The Settings view for the selected input or output appears.



In the example shown above, the present ROM output state is shown via the selected radio button. (These radio buttons are used for display only, to indicate the current state.)

2. Use the **Set Output Name** to specify the name of the currently selected output.
3. Use the **Set Output State 2 Name** and **Set Output State 1 Name** fields to specify the name to be displayed based on the current state.



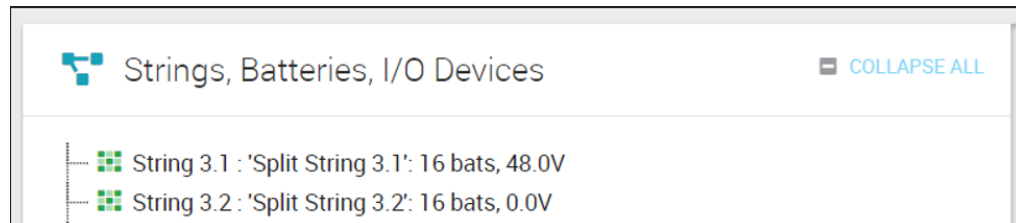
6.9.3.4. Connecting SCMini-XC to Modbus Interface Module (MBI) and Lithium Battery

The SCMini-XC can be connected to lithium batteries via PBT's Modbus interface module (MBI). See [Connecting a Modbus Interface \(MBI\) Module](#) for connection details.



NOTE: For further information consult the PBT-MBI Modbus Module Quick Start Guide document 705-000024-00.

1. Verify operation by viewing the SCMini-XC's controller web page and confirm that the Lithium bloc appears in the controller's web page. The first Lithium bloc will appear as string 3.1 and 3.2. The second string 3.2 will appear without a second battery connected but will not show any voltages. Once a second battery is connected string 3.2 will show voltages.



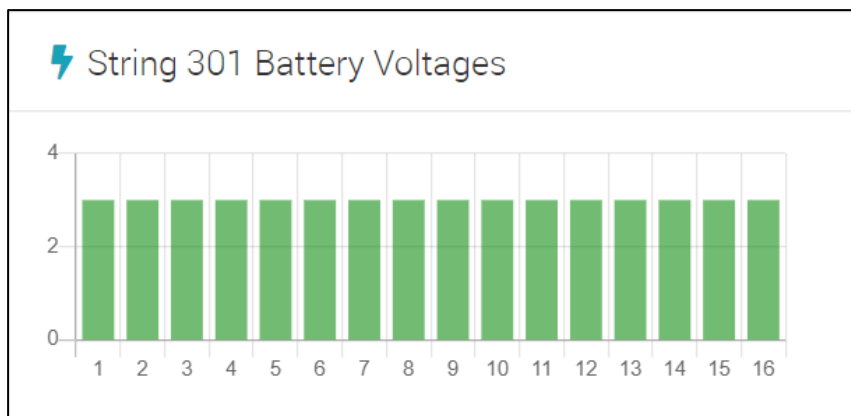
2. To add a second Lithium Battery for monitoring, connect a CAT5 from the first Lithium Battery to the next one. Make sure the addresses are set correctly on each Lithium Battery. Consult the manufacturers documentation for setting the address. Up to 8 Lithium Batteries can be connected to one MBI device. The list below shows string assignments for each Lithium Battery attached to MBI Address #1.
 - I. Shows string 3.1 and 3.2 (string 3.2 does not show voltages).
 - II. Will populate voltages for string 3.2.
 - III. Shows string 4.1 and 4.2 (string 4.2 does not show voltages).
 - IV. Will populate voltages for string 4.2.
 - V. Shows string 5.1 and 5.2 (string 5.2 does not show voltages).
 - VI. Will populate voltages for string 5.2.
 - VII. Shows string 6.1 and 6.2 (string 6.2 does not show voltages).
 - VIII. Will populate voltages for string 6.2.
3. To monitor more than 8 Lithium Batteries connect a second MBI addressed to #2 to the first MBI via CAT5 cable plugged into the P-BUS port on each one. The list below shows string assignments for each Lithium Battery attached to MBI Address #2.
 - I. Shows string 7.1 and 7.2 (string 7.2 does not show voltages).
 - II. Will populate voltages for string 7.2.
 - III. Shows string 8.1 and 8.2 (string 8.2 does not show voltages).
 - IV. Will populate voltages for string 8.2.
 - V. Shows string 9.1 and 9.2 (string 9.2 does not show voltages).
 - VI. Will populate voltages for string 9.2.
 - VII. Shows string 10.1 and 10.2 (string 10.2 does not show voltages).
 - VIII. Will populate voltages for string 10.2.



4. To monitor more than 16 Lithium Batteries connect a third MBI addressed to #3 to the second MBI via CAT5 cable plugged into the P-BUS port on each one. The list below shows string assignments for each Lithium Battery attached to MBI Address #3.
 - I. Shows string 11.1 and 11.2 (string 11.2 does not show voltages).
 - II. Will populate voltages for string 11.2.
 - III. Shows string 12.1 and 12.2 (string 12.2 does not show voltages).
 - IV. Will populate voltages for string 12.2.
 - V. Shows string 13.1 and 13.2 (string 13.2 does not show voltages).
 - VI. Will populate voltages for string 13.2.
 - VII. Shows string 14.1 and 14.2 (string 14.2 does not show voltages).
 - VIII. Will populate voltages for string 14.2.

5. To monitor more than 24 Lithium Batteries connect a fourth MBI addressed to #4 to the third MBI via CAT5 cable plugged into the P-BUS port on each one. The list below shows string assignments for each Lithium Battery attached to MBI Address #4.
 - I. Shows string 15.1 and 15.2 (string 15.2 does not show voltages).
 - II. Will populate voltages for string 15.2.
 - III. Shows string 16.1 and 16.2 (string 16.2 does not show voltages).
 - IV. Will populate voltages for string 16.2.
 - V. Shows string 17.1 and 17.2 (string 17.2 does not show voltages).
 - VI. Will populate voltages for string 17.2.
 - VII. Shows string 18.1 and 18.2 (string 18.2 does not show voltages).
 - VIII. Will populate voltages for string 18.2.

6. The names for the strings in SNMP and the web page charts have slightly different names for the strings. They will indicate string 301 for string 3.1, 302 for string 3.2, and so forth.



6.9.4. Changing the IP Address of the Controller from the Web Page



NOTE: You must be logged in to the controller to change the IP address. See [Unlocking the SiteViewer for Editing](#) for details. If you are not logged in, you will be prompted to enter the Admin Password.

The SCMini-XC ships with a preassigned static IP address. The static IP address can be changed by specifying a different static IP address.

Additionally, the SCMini-XC supports DHCP (Dynamic Host Configuration Protocol).

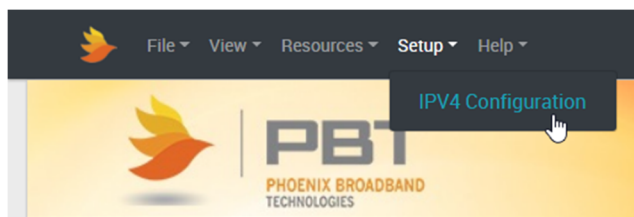
DHCP is a network management protocol used to automate the process of configuring devices on IP networks, thus allowing them to use network services such as DNS, NTP, and any communication protocol based on UDP or TCP. A DHCP server dynamically assigns an IP address and other network configuration parameters to each device on a network so they can communicate with other IP networks.

Both configuration methods are described below.

6.9.4.1. Using a Static IP Address

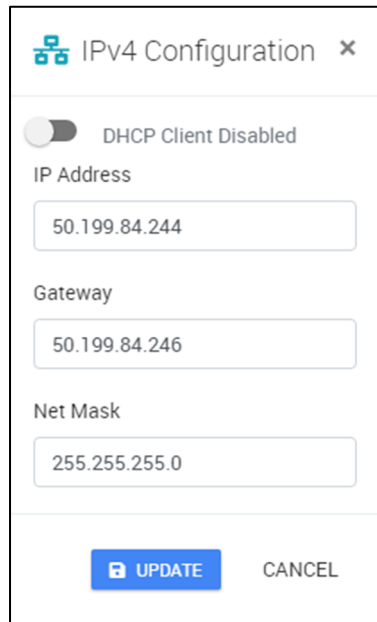
To set a static IP address:

1. Choose **IPv4 Configuration** from the **Setup** menu.



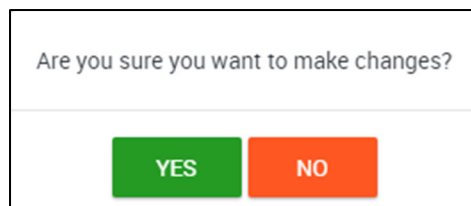
The IPv4 Configuration dialog box appears.





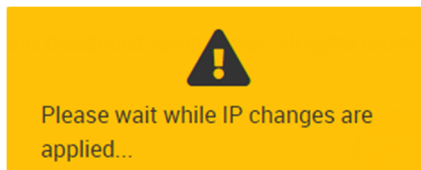
The image shows a dialog box titled "IPv4 Configuration" with a close button (X) in the top right corner. At the top, there is a toggle switch labeled "DHCP Client Disabled" which is currently turned off. Below this, there are three input fields: "IP Address" containing "50.199.84.244", "Gateway" containing "50.199.84.246", and "Net Mask" containing "255.255.255.0". At the bottom of the dialog, there are two buttons: a blue "UPDATE" button with a refresh icon and a grey "CANCEL" button.

2. Enter the desired IP Address in the field on the dialog box.
3. Enter the desired Gateway in the field on the dialog box.
4. Enter the desired Net Mask in the field on the dialog box.
5. Click **UPDATE**. The following dialog box appears.



The image shows a confirmation dialog box with the text "Are you sure you want to make changes?". At the bottom, there are two buttons: a green "YES" button and a red "NO" button.

6. Click **OK**. The following message appears.



The SCMini-XC will reset. When it initializes, it will use the specified IP address.



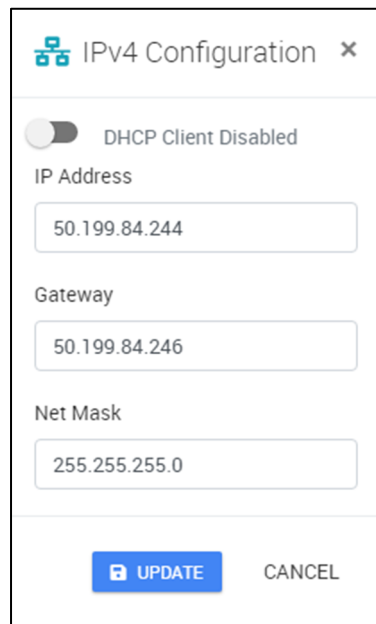
6.9.4.2. Using DHCP

To set the SCMini-XC to use DHCP:

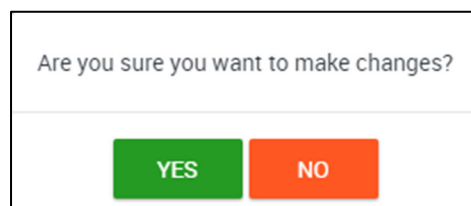
1. Choose **IPv4 Configuration** from the **Setup** menu.



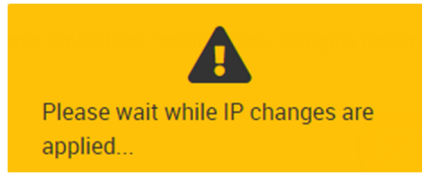
The IPv4 Configuration dialog box appears.



2. Click the **DHCP Client Disabled** toggle. The toggle changes to **DHCP Client Enabled**. The IP Address, Gateway and Net Mask are automatically set to 0.0.0.0.
3. Click **UPDATE**. The following dialog box appears.



4. Click **OK**. The following message appears.



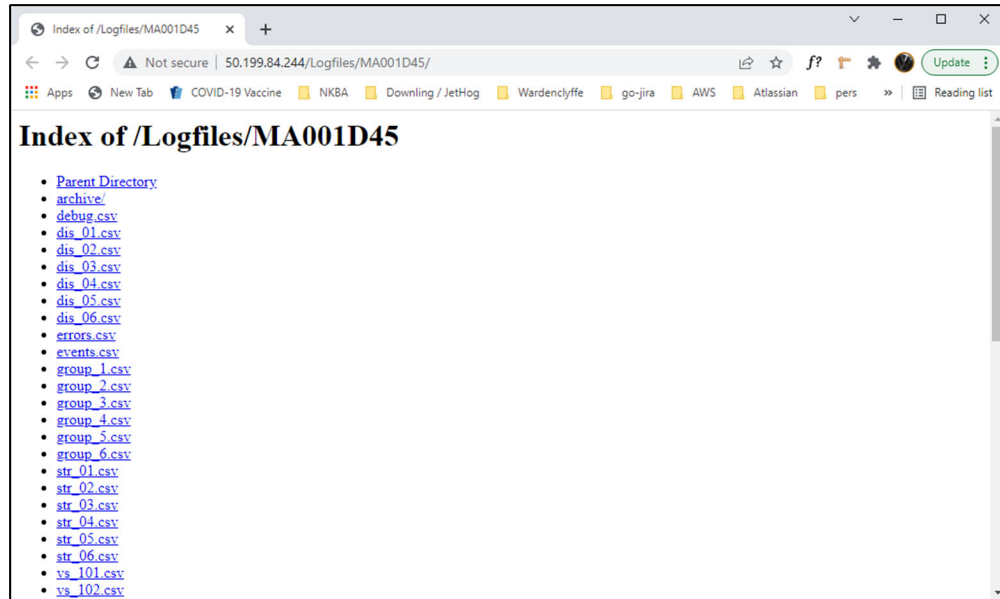
The SCMini-XC will reset. When it initializes, it will use the specified IP address.



6.10. Logging

The SCMini-XC logs system and connected device events to aid in auditing and troubleshooting.

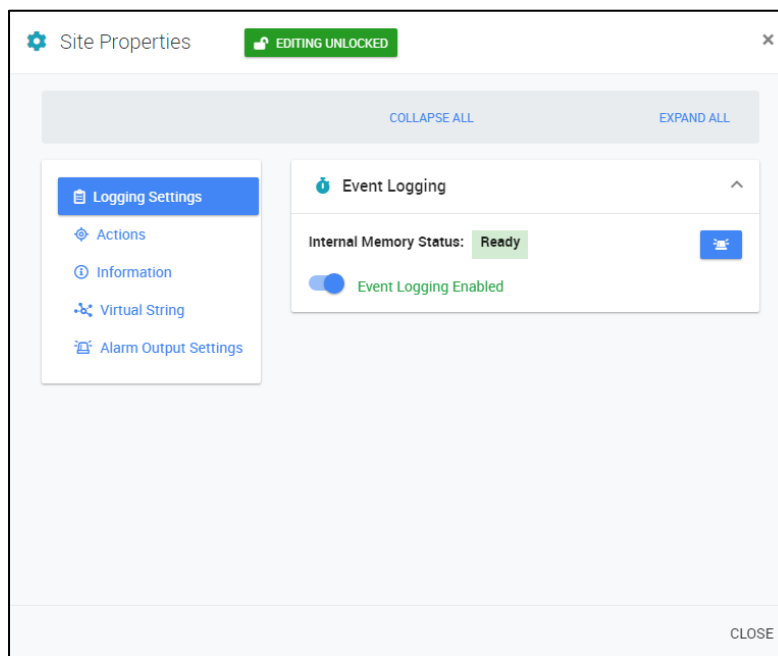
Choosing **File > Log files** brings up an index of the log files on the SCMini-XC in a new browser window.



6.10.1. Event Logging

The events log (events.csv) includes alarms that occur with devices connected to the SCMini-XC. Event logging is enabled/disabled via the Site Properties Logging function. See [Logging Settings](#) for details.

The events log file is periodically cleared after being archived to the /archive folder beneath the /Logfiles folder.



6.10.2. Debug Logging

The debug log (debug.csv) includes events related to device configuration requests, web object requests and log file tasks (such as archiving log events and overwriting existing log files).

The debug log file is periodically cleared after being archived to the /archive folder beneath the /Logfiles folder.

6.10.3. Discharge Logging

The discharge log files (dis_xx.csv) include discharge events for connected jars where xx indicates the string number.

During a discharge event, Discharge Logging will occur at 10 second intervals.

6.10.4. Error Logging

The error log files (errors.csv) includes any miscellaneous errors and version numbers for the SCMini-XC.

The errors log file is periodically cleared after being archived to the /archive folder beneath the /Logfiles folder.



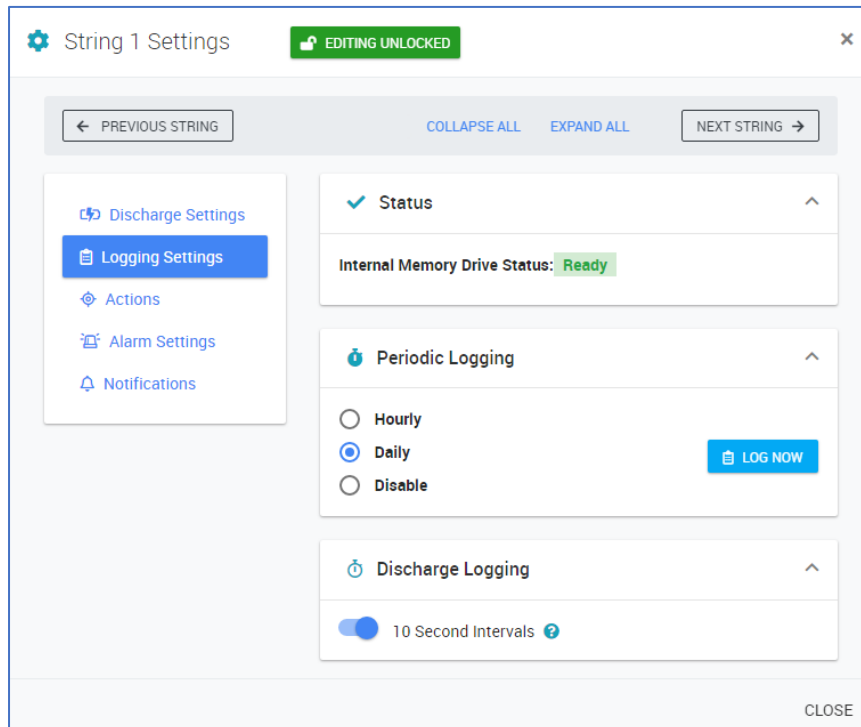
6.10.5. Group Logging

The group log files (grp_xx.csv) include data for advanced system monitoring such as string voltage, float current, ripple current, ambient temperature, max delta temperature and hours since discharge, where xx = the Group number (either 1 or 2).

6.10.6. String Logging

The string log files (str_xx.csv) include string and jar voltages, discharge status, cell admittance levels, and sensor communication status a string where xx indicates the string number.

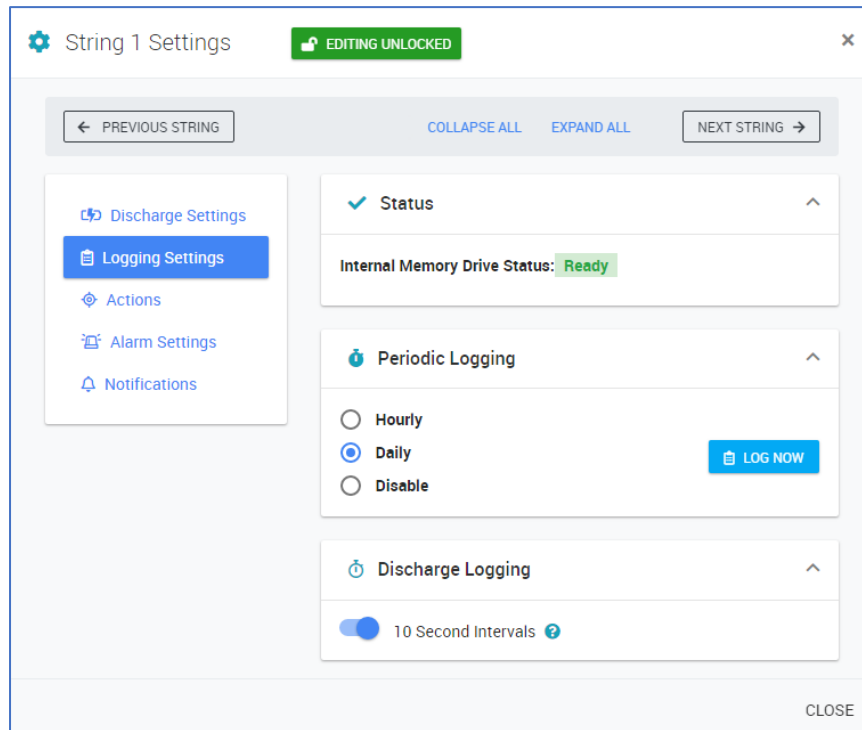
String logging is enabled/disabled on a per string basis via the String Settings Logging function. Logging can be set to occur Hourly or Daily, or be Disabled. See [String Logging Settings](#) for details.



6.10.7. VS Logging

The virtual string log files (vs_xx.csv) include string and jar voltages, discharge status, cell admittance levels, and sensor communication status a string where xx indicates the virtual string number.

Virtual string logging is enabled/disabled on a per string basis via the String Settings Logging function. Logging can be set to occur Hourly or Daily, or be Disabled. See [String Logging Settings](#) for details.



6.10.8. VSD (Virtual String Discharge) Logging

The virtual string discharge log files (vsd_xx.csv) include discharge events for connected jars on virtual strings xx indicates the virtual string number.

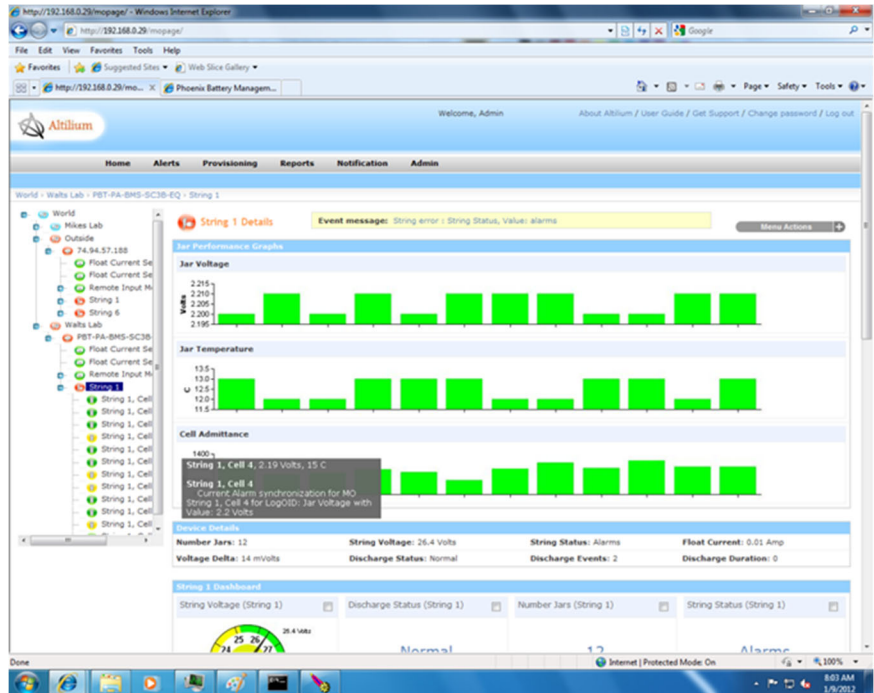
During a discharge event, Discharge Logging will occur at 10 second intervals.



7. SNMP

The Phoenix Broadband battery monitoring system provides an SNMP interface for third party software management. The advantage of our approach is that it allows operators to choose the software with which they wish to use as opposed to being locked into one software offering. Many operators will have their own SNMP management software and will want to integrate the controller into their existing network management infrastructure. SNMP is a well-known communication protocol which provides a standard interface to different management software platforms.

Phoenix Broadband offers an enterprise-class software package designed specifically for monitoring DC power plant and UPS back up batteries. The Altilium software platform is an SNMP manager which provides many features users will require, including a friendly web-based user interface, friendly controller provisioning (labels and alarms, etc.), reporting tools, flexible notification plans and administration privileges.



Other commercially available SNMP managers such as NetCool or FirmSuite could be used to manage the SCMini-XC.

Phoenix Broadband also offers a simple software tool that can be used to manage the SCMini-XC. While not an enterprise-class management system the Phoenix Lookout software provides a convenient tool to manage a small group of systems. Lookout is available at www.PhoenixBroadband.com/Lookout and is provided for free without a warranty of any kind. Refer to the Lookout manual included with the download for additional details.



7.1. MIBs

All of the information presented on the web pages and complete configuration capability is available from SNMP.

SNMP uses the standard UDP ports 161 and 162. If the device does not respond to SNMP Requests or does not appear to send traps, confirm that these ports are not blocked.

The SCMini-XC uses a combination of standard and proprietary MIBs. These MIBS can also be obtained at no charge by contacting Phoenix Broadband.

The SCMini-XC requires the following standard SNMP MIBS to compile the MIBs below:

- SNMP-FRAMEWORK-MIB
- SNMP-NOTIFICATION-MIB
- SNMP-TARGET-MIB
- SNMPv2-SMI
- SNMPv2-TC
- ENTITY-MIB

The SCMini-XC supports the following SNMP MIBS:

- SCTE 36 2002 (HMS028) Root MIB
- SCTE 37 2002 (HMS072) Tree MIB
- SCTE 38-1 (HMS026) Property MIB
- SCTE 38-11 (HMS-114) Headend Ident MIB
- SCTE 84-1 (HMS-111) HE Common MIB
- pbtRootMIB Phoenix Root MIB
- pbtBatteryAgentMIB Phoenix Battery Agent MIB
- pbtSCMini.mib
- pbtEntityStatusMIB Phoenix Extensions to the Entity MIB

These MIBs should be compiled in the order listed.

The battery agent MIB contains tables of objects for each string and jar. These tables contain name, status and control objects as well as all of the voltage admittance and temperature readings. All of the settable objects are stored in SCMini-XC nonvolatile memory.

The digital alarms are configured using the discreteAlarmEnable object in the discretePropertyTable. There are two objects for each input. The first object (.1) is used to enable alarms on the low state of the input. The second object (.2) is used to enable alarms on the high state of the input. Each alarm can be set to one of three states: Disabled(1), EnableMajor(2) or EnableMinor(3). Major Alarms appear in red on the web page, and Minor Alarms appear in yellow.

The analog alarms are configured using the objects in the property table. There are four objects to set the thresholds for each of the alarm capable object. Each alarm limit can be individually enabled or disabled.



7.2. Community Strings

The community strings are configured from the SSH interface described in the configuration section of this document. The default community strings are set to “public”.

If the device does not respond to SNMP Requests or does not appear to send traps, confirm that the community strings are set properly in the SNMP Manager.

7.3. Traps

Whenever an alarm occurs, SNMP traps are sent to up to three trap receivers. The trap destinations are configured from the SSH interface described earlier in this document. The traps are defined in the He Common MIB. Each trap includes a text field that describes the trap.

7.4. MIB Browsers

SNMP devices are normally managed by a software system containing a SNMP Manager. The simplest method of evaluating SNMP operation is with a MIB Browser. A free evaluation version of a MIB browser can be downloaded from <http://www.ndt-inc.com/SNMP/MIBrowser.html> or <http://www.mg-soft.com/download.html>.



8. Updating Firmware

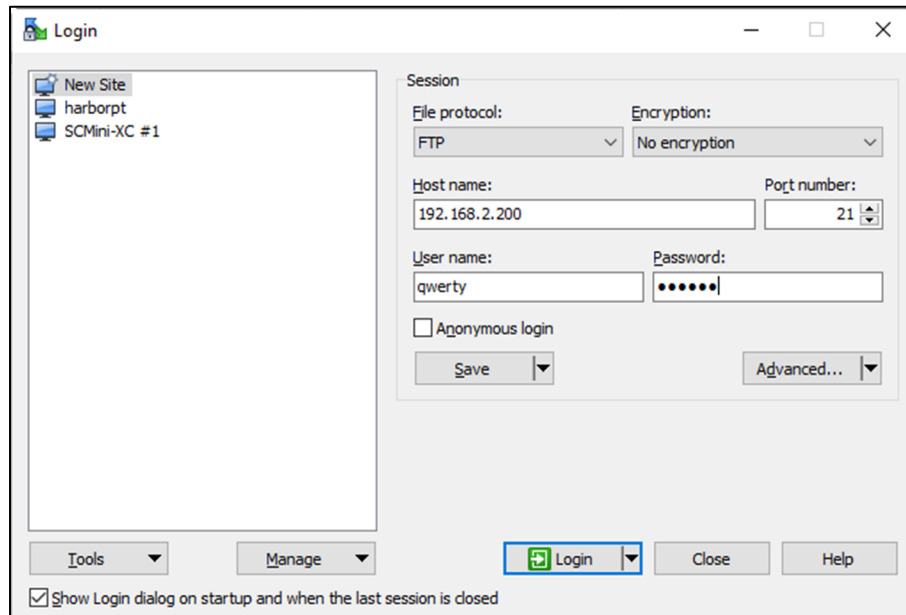
The SCMini-XC firmware can be updated remotely using FTP. To perform this update, you will need an FTP Client. PBT recommends WinSCP for this purpose.

WinSCP can be downloaded from <https://winscp.net/eng/index.php>.

Be sure to read and comply with all licensing agreements. Other free FTP clients are available on the Internet. WinSCP is used for the following example.

To connect to the SCMini-XC via FTP:

1. Before uploading firmware to a SCMini-XC, close any web browsers or SSH clients that are connected to the device.
2. Run the FTP client and connect to the SCMini-XC.



3. Set **File protocol** to FTP.
4. Set **Encryption** to No encryption.
5. Enter the IP address of the SCMini-XC in the **Host name** field.
6. Set the **Port number** to 21.
7. Enter the **User name** and **Password** for the SCMini-XC in the corresponding fields.



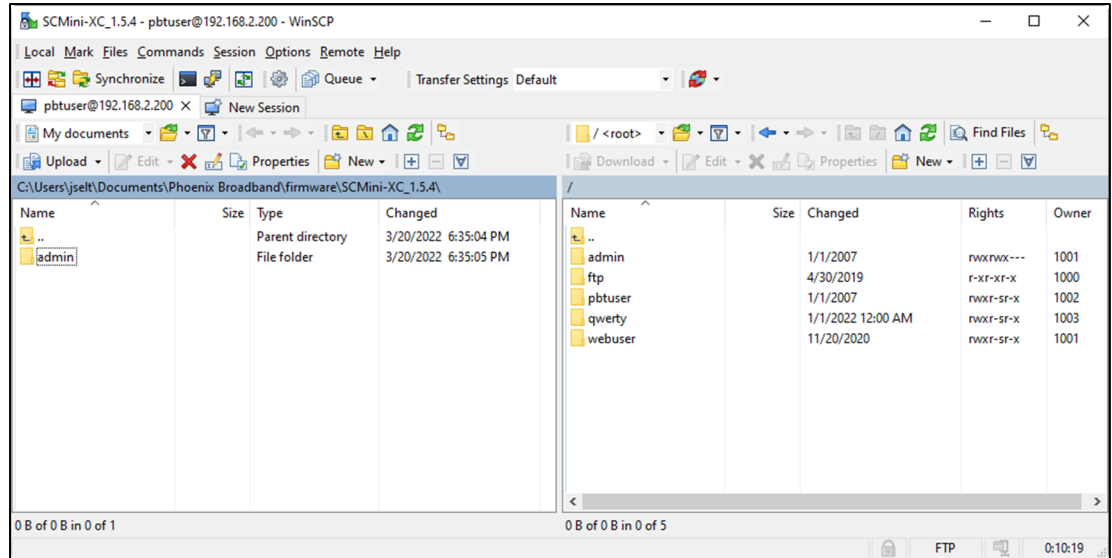
NOTE: By default, the username for the SCMini- is `qwerty`. The password is `Z!x2C#`.

8. Click **Login**. The SCMini-XC will be connected via the FTP client.

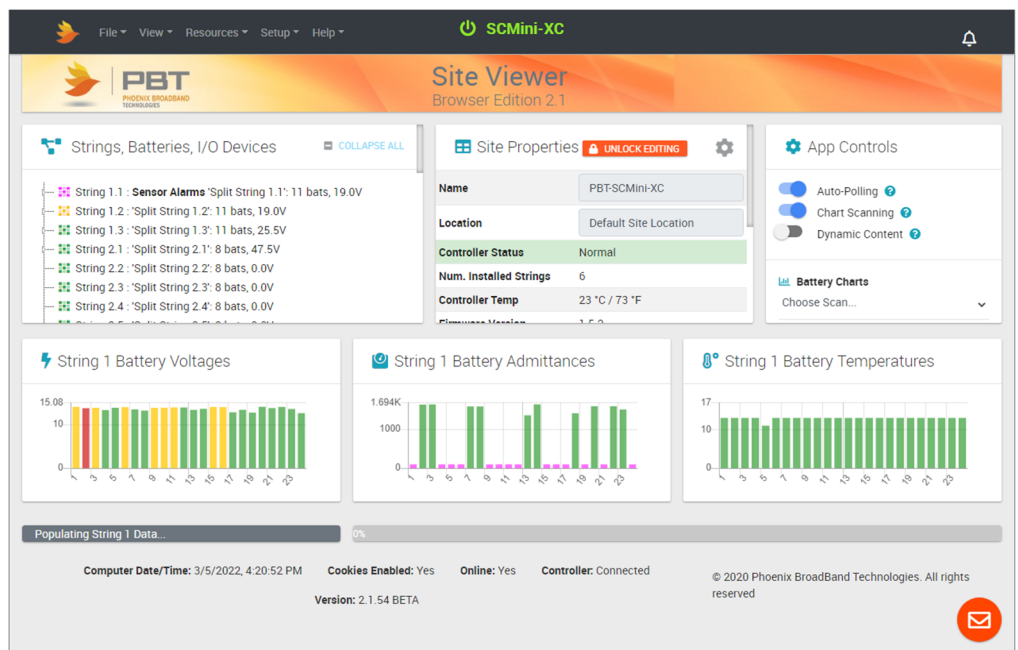


To update the SCMini-XC firmware:

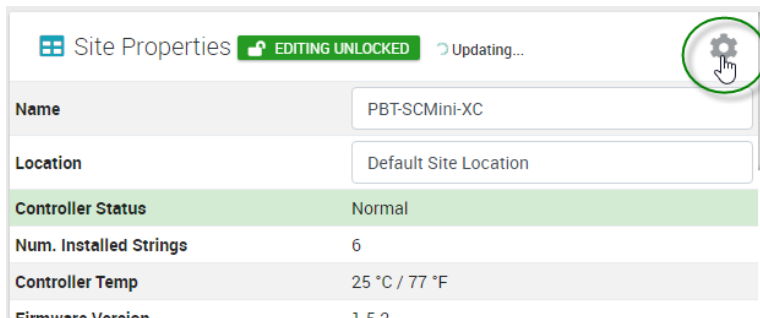
1. Browse to the location of the firmware on your local machine. (If you were supplied a zip file of the firmware, extract it to a desired location and browse to that location.)



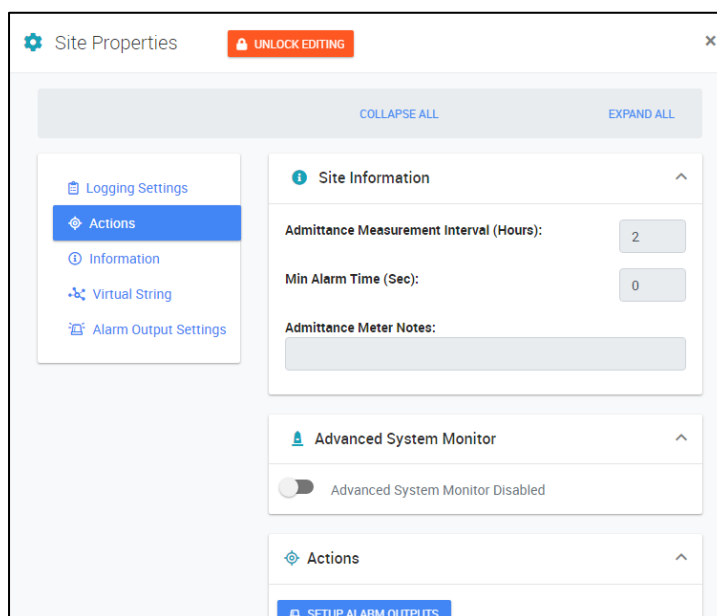
2. Copy the admin folder to the root of the SCMini-XC, overwriting the existing admin folder. You will be prompted to overwrite the existing directories.
3. Reset the SCMini-XC for firmware changes to take effect. To do this:
 - a. In a browser window, enter the IP address of the SCMini-XC. The SiteViewer for the unit will appear.



- b. Click the gear icon in the Site Properties area. The Site Properties popup appears.



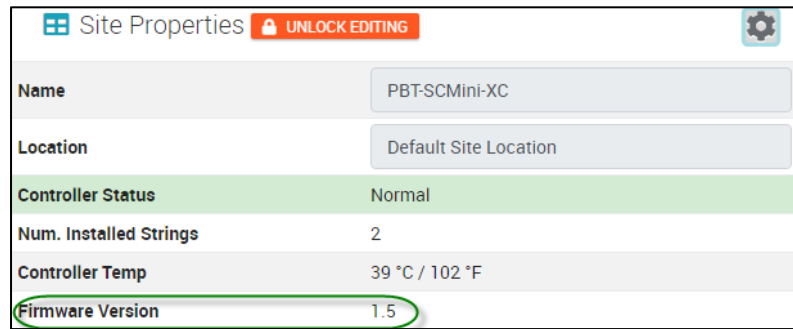
- c. Choose **Actions** from the left side tab bar. The Actions panel appears.



- d. Scroll to the bottom of the Site Properties popup and click **RESET CONTROLLER**. The SCMini-XC will reset.
- e. After a moment, refresh the browser window with the IP address of the SCMini-XC. The SiteViewer for the unit will appear.



- f. In the Site Properties area, scroll to view the **Firmware Version**.



Site Properties UNLOCK EDITING	
Name	PBT-SCMini-XC
Location	Default Site Location
Controller Status	Normal
Num. Installed Strings	2
Controller Temp	39 °C / 102 °F
Firmware Version	1.5

- g. Confirm that the **Firmware Version** matches the installed firmware.



9. Summary of Port Usage

The different features of this product use a variety of ports. The following table contains a summary of the port utilization.

Port	Protocol	Usage
21 & 20	UDP	FTP
22	SSH	SSH
23	TCP	Telnet
25	TCP	SMTP – Sending e-mail
80	TCP	HTTP – Web page
123	UDP	NTP – Time server
161	UDP	SNMP – Gets and Sets
162	UDP	SNMP - Traps
4200	TCP	Linux Console
8081	TCP	Web pages
30705	UDP	Java Applet – Web page real time data
30706	UDP	Firmware server

It may be necessary to request the network administrator to open some of these ports, in the firewall or router, for the associated feature to operate properly.



10. Resolving Common Problems

- Problem - The SCMini-XC resets approximately once an hour. Background – The SCMini-XC updates its real-time clock from a network time server approximately once per hour. If the SCMini-XC is unable to communicate with the time server, it will reset in an attempt to restore communications. Solution – First check if the SCMini-XC is obtaining the time by looking at the time display above the SSH setup menu. If the time is correct, the SCMini-XC is communicating with the time server and the time server is not the cause of the resetting. If the time is incorrect, verify that the time server IP addresses are correct and that port 123 is not being blocked by a firewall or router. Verify that the reset is being caused by no time server communications by setting the IP address of the first time server to zeros on the setup menu. This will disable the time server reset. Verify that the time server IP addresses are correct.





PBT

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