



Stored Energy Systems, LLC.



## Genset Battery Monitoring System

### **Installation and Operation Manual**

Document Number: 700-000033-00

Rev: 2.0

September 20, 2024

The information contained in this document is for informational and discussion purposes only and should not be construed as a commitment of Stored Energy Systems, LLC or of any of its subsidiaries or affiliates. While we attempt to ensure the accuracy, completeness and adequacy of this document, neither Stored Energy Systems, LLC, nor any of its subsidiaries or affiliates are responsible for any errors or will be liable for the use of, or reliance upon, this document or any of the information contained in it. The information contained in this document is subject to change without notice.

This document contains proprietary and/or confidential information of Stored Energy Systems, LLC, its subsidiaries or affiliates and is released only under the terms of the non-disclosure agreement between our respective organizations. Unauthorized use, disclosure or dissemination of this information is expressly prohibited.

The Stored Energy Systems, LLC logo is a trademark, service mark, registered trademark, or registered service mark of Stored Energy Systems, LLC or its subsidiaries or affiliates. Other trademarks contained in this presentation are the property of the respective companies with which they are associated.

Copyright © 2024 Stored Energy Systems, LLC.



## Table of Contents

<b>1. Important Information</b>	<b>1</b>
1.1 Important Symbols	1
1.2 Safety Notes	2
1.3 Glossary of Terms	3
1.4 Contact Information	4
<b>2. System Overview</b>	<b>5</b>
2.1 Sensor Description	6
2.1.1 Sensor LED Behavior	7
2.1.2 Sensor Selector Guide	7
2.2 Site Controller Description	9
<b>3. System Installation</b>	<b>10</b>
3.1 Mounting/Locating the Site Controller	10
3.1.1 Mounting Recommendations	10
3.1.2 Removing Punch-Outs / Installing Grommets	11
3.2 Powering the Genset BMS	12
3.3 Network Connection	13
3.4 Connecting Battery Sensors	14
3.4.1 Connect Battery Sensors to Battery	15
3.4.2 Connect Battery Sensors to SC4 Site Controller	17
3.5 Connecting External Temperature Sensor	18
3.6 Connecting Discharge Current Sensors	20
3.7 Connecting Float Current Sensors	22
3.8 Connecting Power to the PBT-GIM-1 (Genset Interface Module)	25
<b>4. Test Setup &amp; Network Configuration</b>	<b>26</b>
4.1 Network Connection	26
4.2 Configuring the Site Controller	27
4.2.1 Obtaining a Terminal Emulator Client	27
4.2.2 Ethernet Direct Connection Method	27
4.2.2.1 Using the SC4 Site Controller DHCP Server	28
4.2.2.2 Connecting to an SC4 via Ethernet with a Known IP Address	29
4.2.3 Direct USB Connection	29
4.3 Accessing the SC4 Configuration Program	32
4.3.1 Accessing the SC4 Configuration Program over Ethernet	32
4.3.2 Accessing the SC4 Configuration Program over USB	34
4.4 SC4 Configuration Program	36
4.4.1 IPv4 Configuration	38
4.4.2 IPv6 Configuration	39
4.4.3 SNMP Configuration	40
4.4.3.1 SNMP Configuration - General	41
4.4.3.2 SNMP v1 Configuration	42
4.4.3.3 SNMP v3 Configuration	42

4.4.4	Email Client Configuration .....	43
4.4.5	Firmware Server Configuration .....	45
4.4.6	NTP Configuration.....	46
4.4.7	FTP Configuration.....	48
4.4.8	Change Web Page Settings (Passwords).....	49
4.4.9	DNP3 Configuration .....	50
4.4.9.1	Modbus Configuration .....	50
4.4.9.2	FTP Enable/Disable .....	50
	Deleting the Entire Database .....	51
4.4.10	Shutdown Web Only .....	51
4.4.11	Reboot.....	51
4.4.12	Shutdown Completely .....	51
4.4.13	Exit This Application.....	51
4.5	Web Server .....	51
4.5.1	Accessing the Web Server.....	51
4.5.2	Ports.....	51
<b>5.</b>	<b>Site Controller Web Pages .....</b>	<b>52</b>
5.1	Accessing the Site Viewer Web Page.....	52
5.2	General .....	53
5.3	Unlocking the Site Viewer for Editing.....	54
5.4	Functional Areas .....	55
5.4.1	Banner.....	55
5.4.2	System Tree Pane .....	55
5.4.2.1	Port Information.....	56
5.4.2.2	Battery Information .....	61
5.4.3	Site Properties.....	65
5.4.3.1	Site Properties (additional settings) .....	66
5.4.4	App Controls .....	69
5.4.5	Charting Area Panes.....	70
5.5	Site Viewer Menu Bar .....	70
5.5.1	Site Viewer IP Configuration .....	71
<b>6.</b>	<b>SNMP .....</b>	<b>72</b>
6.1	MIBs .....	72
6.2	Community Strings.....	73
6.3	Traps .....	73
6.4	MIB Browsers.....	73
<b>7.</b>	<b>Retrieving Log Files.....</b>	<b>74</b>
7.1	Retrieve Log Files Manually.....	74
7.2	Retrieve Log Files Remotely Through Web Interface.....	75
7.3	Retrieve Log Files Remotely Using WinSCP .....	76
<b>8.</b>	<b>Summary of Port Usage .....</b>	<b>81</b>

# 1. Important Information

## 1.1 Important Symbols

The following symbols are used in this document.



**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. We offer installation services should you need them.



**WARNING:** Before installation, take measurements with a Voltmeter 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 Genset BMS 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 Stored Energy Systems subsidiary 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.



**WARNING:** The Site Controller produces voltages and currents which can cause harmful or fatal electric shock. To prevent accidental injury or death, these safety procedures must be strictly observed when handling or using the Site Controller



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



**CAUTION:** Where applicable, ensure the equipment is grounded properly. Failure to do so may damage the product and void equipment warranties.

## 1.3 Glossary of Terms

Term/Acronym	Definition
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 (admittance, the inverse of impedance), but also takes into account the AC effects of susceptance (the inverse of reactance).
Battery	A collection of jars or cells connected in series. A battery is sometimes referred to as a Battery String or String in this document.
Cell	A cell is a set of plates, immersed in electrolyte, within a single container. A cell includes a single positive and single negative terminal. (The cell may have multiple positive and negative connections.) 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 6 cells. A Jar is commonly, and incorrectly, referred to as a battery.
P-Bus	A Stored Energy Systems subsidiary Phoenix Broadband Technologies proprietary communications interface and protocol used to connect devices to the Site Controller for the purpose of providing additional input, output, and measurement capability.

## 1.4 Contact Information

If you have any questions about the installation or use of the equipment described in this manual, contact Phoenix Broadband Technologies, a Stored Energy Systems company, at (215) 997-6007 or [support@phoenixbroadband.com](mailto:support@phoenixbroadband.com).

When contacting us, please have the following information available:

1. Site Controller Model Number and firmware version (from the Site Controller Web Page).
2. Battery Sensor Model Number, hardware version, and firmware version. The version numbers are shown on the Site Controller Single Jar Web Page.
3. The Jar and String Voltage.
4. The Jar model number.
5. Site location and address

## 2. System Overview

The Stored Energy Systems, LLC Genset Battery Management System (hereafter referred to as the Genset BMS) is a comprehensive solution for remotely monitoring the state of health for individual cells or jars used to start generators.

The system consists of a wall mounted cabinet containing an SC4 Site Controller unit which collects readings from battery, current and temperature sensors (via direct connection and connection through a pre-wired interface module) and makes the information available for management purposes via a network connection.

The battery sensor in the Genset BMS measures its associated cell or jar's terminal voltage, case temperature, and internal cell impedance (admittance). Multiple sensors within a string of monitored jars are interconnected in a "daisy-chain" utilizing CAT-5 cabling and RJ-45 connectors. Each daisy-chain of sensors is connected via another CAT-5 cable to one of the six ports on the SC4 Site Controller. The Site Controller has extensive, user-definable set-up capabilities, including labels for every monitored jar, as well as alarm thresholds for voltage, temperature, and admittance on each individual jar.



The Site Controller has several user interface mechanisms built-in, including a configurable web server that displays site, string, and individual jar information, as well as an SNMP (Simple Network Management Protocol) interface that allows any SNMP compliant management software to collect data and perform jar tests. Other features of the Site Controller include a password protected SSH port for remotely configuring the unit, A DHCP (Dynamic Host Configuration Protocol) client that automatically obtains an IP (internet protocol) address from a DHCP server, and FTP (File Transfer Protocol) server for uploading firmware changes remotely.

Upon power-up, the Site Controller automatically begins a search sequence to determine which of its string ports are attached to battery sensors and then discovers each sensor module.

The Site Controller supports both High Voltage and Low Voltage sensors. Low Voltage sensors may only be installed on battery strings of 59V (or less) and High Voltage sensors may be installed on battery strings of any voltage level. When a string of High Voltage (HV) sensors is discovered, the controller discovers the factory-programmed address of the sensor module as part of the discovery process. The HV sensor's address is assigned to a sequential jar number in the order that it is discovered. Once the discovery process is complete; you may reconfigure the jar number assignments to designate which jar the sensor is installed on.

When a string of Low Voltage sensors is discovered, the controller automatically discovers each sensor and its correct position in the string. (No factory programmed address is necessary with low voltage sensors.)

Once the "auto-discovery" process is finished, the Site Controller can individually address each sensor, collect its readings, and display those readings in a hierarchical web page display. Except for the final user assignment of High Voltage sensors to jars, 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.

## 2.1 Sensor Description

Sensor modules 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 10ma). Internally, a programmable microcontroller chip provides an optically isolated communications interface for the Site Controller. Sensors are connected to the Site Controller using a CAT5 cable daisy chain.



Each sensor continuously monitors the voltage and temperature of the connected jar. At user-defined intervals, the sensor measures the jar admittance by generating a digitally synthesized AC test signal of approximately 0.5 to 6.0 amps, which drives the jar's terminals for testing purposes. This test current causes a small AC voltage, proportional to jar impedance. This voltage is sampled by the sensor to determine the jar's internal AC impedance, which is the basis for admittance measurements.

Mechanically, the sensor consists of a nickel-plated copper mounting bracket or wired connector which fits on the jar's negative terminal post, a short wire (terminated in a terminal lug) that connects to the jar's positive terminal post, and an electronics assembly that contains the test signal generation and measurement circuitry.

Each sensor is shipped with a 1-foot CAT5 cable to connect the sensor to the daisy chain. This cable is the proper length for most applications. Longer cables are available from Stored Energy Systems subsidiary Phoenix Broadband Technologies.

## 2.1.1 Sensor LED Behavior

Once the battery sensor is installed successfully on the jar; the green LED on the sensor will begin to blink periodically (roughly once per second). When the interconnection daisy-chain containing the sensor string is connected to the site controller, the auto discovery process begins. As each sensor is discovered by the site controller, its LED will stop the 1 second green flashing, flash red momentarily, and will then be lit solid green. Shortly after the sensor is discovered and the LED is lit solid green, the sensor will make an admittance measurement. During this measurement the LED will be switched off until the measurement is complete.



**NOTE:** The admittance measurement will only be performed automatically if measurements are enabled within the site controller's settings. By default, admittance measurements are disabled when shipped from the factory.

After this initialization sequence, the sensor's LED will stay lit green until it is polled by the site controller. Upon receiving a poll, the sensor LED flashes off briefly.

The sensor's LED will flash red if the sensor is reporting an alarm as defined by the site controller's configuration.

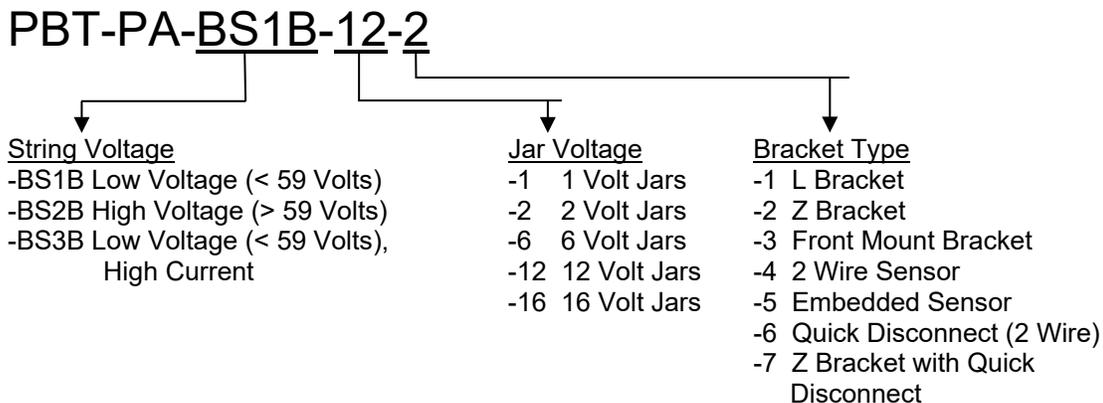
The sensor's LED will flash alternately red/green if the sensor's flash function is activated from the site controller's configuration.

Refer to *Battery Sensor Installation and Operation* (document #700-000015-01) for detailed information on the battery sensors.

## 2.1.2 Sensor Selector Guide

Selecting a sensor requires first determining if a Low or High voltage sensor is required. Then a jar voltage is selected: either 1, 2, 6, 12, or 16 volts. Finally, the mounting style is selected.

The sensor model number is constructed as shown below.



The sensors provided with the Genset BMS do not make use of brackets; they have two wired connections. This is a universal sensor that will work with most jars. This sensor does not directly measure the jar post (electrolyte) temperature. 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.

The sensor shown below (bracket type 4) is equipped with a ring-terminal for connection to the jar's post, the maximum bolt size for this connection is 5/16 inch. A sensor with bracket type 6 may be selected for varying sizes of bolts.



## 2.2 Site Controller Description

The SC4 Site Controller is a compact unit that monitors connected sensor modules and makes the data collected by them available via a network connection.



The Site Controller front panel has numerous indicators for quick assessment of power, connection status, and network connectivity.

A front panel USB connection (USB-2) allows direct connection to a PC for configuration purposes (setting the Site Controller IP address and other parameters during installation). Setup can also be performed over the network connection.

The front panel mini-USB connection (USB-3) is for factory use only. The included USB flash drive provides storage of logged data via installation in the FLASH USB port.

WiFi functionality is currently not supported. The Reset IP button and LED on the front-panel may still be used to restore the SC4 back to its default IP address (See [SC4 configuration section](#))



The rear 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 Site Controller can be performed remotely using any SNMP-capable network management software system (see [SNMP](#) for more information). Monitoring is also available via Modbus TCP and DNP3 TCP (see section 4.4 for more information).

The Site Controller has six RJ-45 PORTS on the rear panel for interfacing with up to six strings of monitored jars. Each port has a corresponding front panel indicator. The LED lights illuminate when the string connected to the port is being polled. A green LED indicates everything is normal; a red LED indicates abnormal conditions within that string.

The AUX OUT port on the rear panel provides four relay outputs. Refer to the *Aux Port Wiring Diagram* (document #705-000021-00) for details on this feature.

The two P-BUS ports (A and B) provide expansion capabilities for connection to current sensors, RIMs, and ROMs, which allows for additional inputs and outputs.

The rear panel USB port (USB-1) is for factory use only.

The Site Controller can be powered directly from a battery string voltage of 20-59VDC or by an optional 24VDC wall adapter (Model # PBT-WT-3). The supported voltage range is 20 to 59VDC. Power consumption is approximately 5 watts (dependent on the input voltage). Power is supplied to the unit via a rear-panel terminal block. The power supply input is floating. The terminal block also provides a chassis ground connection.

## 3. System Installation

Genset BMS installation consists of the following tasks:

- Mounting/Locating the Genset BMS cabinet
- Providing Power to the Site Controller in the Genset BMS
- Establishing a Network Connection to the Site Controller in the Genset BMS
- Installing and Connecting Battery Sensors
- Installing and Connecting Ambient Temperature Probes
- Installing and Connecting Discharge Current Sensors
- Installing and Connecting Float Current Sensors
- Connect the 12VDC Power Source from the Controller to the PBT-GIM-1 module only after connecting the Discharge Current Sensors

Each of these tasks is described below.

### 3.1 Mounting/Locating the Site Controller

Select a location for the Genset BMS. The location should be central to the strings being monitored. It should be dry and free of corrosive or explosive vapors.

The maximum cable length between the SC4 Site Controller and the Battery String is 300 feet.

The maximum cable length between the SC4 Site Controller and the discharge current sensors is 300 feet when using 18AWG copper wire.

#### 3.1.1 Mounting Recommendations

Determine the best location for the Genset BMS, considering factors such as accessibility, ventilation, and proximity to jars, network connection, and so on. See [Mounting Height Recommendations](#) for more information.

Ensure the wall is strong enough to support the weight of the Genset BMS (the cabinet weight does not exceed 30 lbs).

The included mounting hardware kit allows for mounting the cabinet to drywall without the use of studs. However, studs typically provide the most secure mounting points. The height at which the Genset BMS should be installed depends on several factors, including accessibility, ergonomic considerations, and specific use cases. Here are some guidelines to help determine the appropriate height:

- **User Accessibility:** Ensure that the Genset BMS cabinet is easily accessible for the person who will be using or maintaining the equipment. Typically, the bottom of the cabinet should be at a height that allows for comfortable access without the need for a ladder or excessive bending.
- **Ergonomics:** For ergonomic purposes, the middle of the cabinet should be at approximately eye level for the average user, which is typically around 60 to 65 inches (about 152 to 165 cm) from the floor.
- **Safety and Clearance:** Ensure there is enough clearance around the cabinet for safe and easy access to equipment and cabling. Avoid mounting the cabinet too high, as this could make it difficult to access equipment safely.

- **Power and Cable Management:** Ensure that all cabling can reach the necessary equipment without strain. The cabinet should be close enough to these connections to avoid excessive cabling, which can be a tripping hazard or create clutter.

### 3.1.2 Removing Punch-Outs / Installing Grommets

The Genset BMS cabinet provides four 2-inch punch-outs on the cabinet bottom and four 2-inch punch-outs on the cabinet top. Rubberized grommets are provided for these punch-outs to protect cables running through them if conduit clamps are not being used.

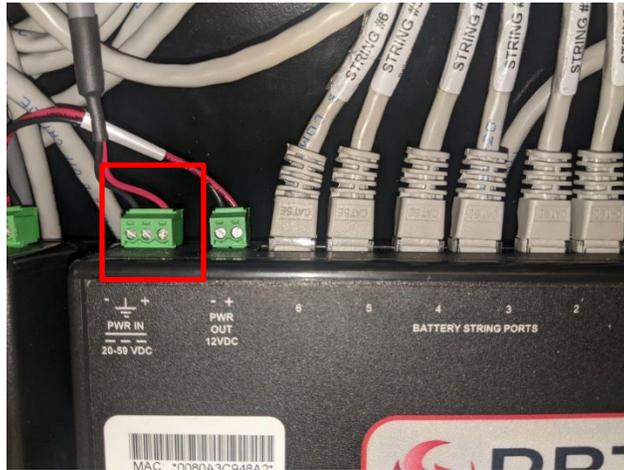


### 3.2 Powering the Genset BMS

The SC4 Site Controller in the Genset BMS is powered via the PWR IN connector on its rear panel.

The Genset BMS includes a PBT-PAC-SC-PWR fused wire assembly for powering the SC4.

The SC4 requires a nominal source of 20 to 59 VDC applied to the PWR IN connector on its rear panel.

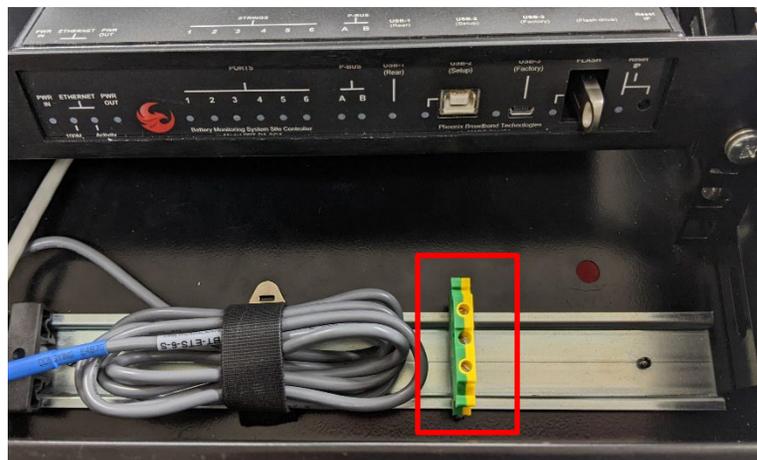


PWR IN Connector – Shown with SC4 Installed in Genset BMS



PWR IN Connector – Shown from Rear Panel of SC4

The power supply input is floating on the SC4. To ground the Site Controller, connect the center ground pin on the power connector to an earth ground. A ground block (shown below) is available on the cabinet's DIN rail to provide a grounding point for the cabinet.



### 3.3 Network Connection

The SC4 Site Controller communicates with your network via the rear panel ETHERNET connector.



The Genset BMS ships with a 25-foot CAT5 cable (PBT-PAC-CAT5-25) connected to this port and spooled inside the cabinet.



Unspool the cable and route it out of the cabinet and to your network connection.

Network infrastructure varies from site to site. Your SC4 will generally be connected to your network via a hub or switch. On a managed switch, make sure that the corresponding switch port has been enabled.

The IP address of your Site Controller is set to a factory default which is indicated on the label affixed to the top of the unit. If this IP address needs to be changed, do one of the following:

- Run the Site Controller Configuration Program (refer to [Configuring the Site Controller](#) for details).
- Use the Site Viewer IP Configuration function (refer to [Site Viewer IP Configuration](#) for details).

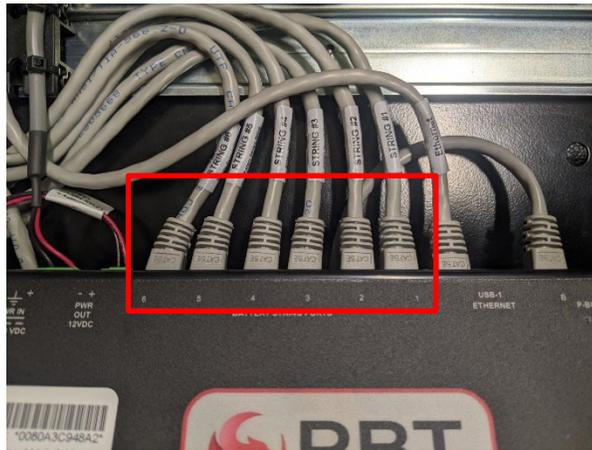
Once your IP address is set as desired, verify network communications by accessing the Site Controller web pages over the network. Refer to [Web Server](#) for details.

### 3.4 Connecting Battery Sensors

The Genset BMS can be ordered with battery sensors to support up to six 24V VRLA battery strings. Each string uses two battery sensors, one for each 12V jar. The two sensors are daisy chained together using a supplied 1-foot CAT5 cable.



One of the two sensors is then connected to one of the ports on the rear of the SC4 Site Controller in the Genset BMS cabinet. The Genset BMS ships with a 25-foot CAT5 cable (PBT-PAC-CAT5-25) spooled inside the cabinet for each battery string connected to the SC4.



### 3.4.1 Connect Battery Sensors to Battery



**WARNING:** 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.

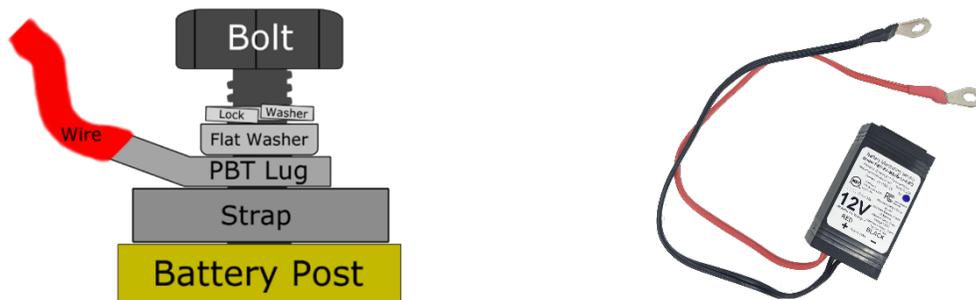


**NOTE:** In order to obtain consistent admittance readings, it is recommended that the sensor lugs be located in the same position on each jar. Generally, the sensor should be installed on top of the existing strap or lug and under the washer.



**NOTE:** Avoid putting the sensor in the current path by maintaining the connection between the cable/strap and the jar's terminal.

1. Remove the negative terminal bolt on the first jar which will have a sensor installed.
2. Remove the black plastic insulating cap that covers the lug at the end of the black wire on the sensor.
3. Place the sensor's black wire/lug between the washer and the negative cable or strap.



4. Tighten the connections to the manufacturer's recommended torque.



**CAUTION:** Failure to tighten the connections to the manufacturer's recommended torque can result in jar failure during a power outage, damage to the terminal, or inconsistent admittance measurements.

5. Remove the positive terminal bolt on the same jar.
6. Remove the red plastic insulating cap that covers the lug at the end of the red wire on the sensor.
7. Place the lug between the washer and the positive cable or strap on the positive jar terminal.
8. Ensure that the positive and negative terminals are on the same jar. Sometimes this can be very confusing. Connecting the sensor across two or more jars may damage the sensor. Once connected to both terminals of the jar, the green LED on the battery sensor will flash approximately once per second. If the LED is not flashing confirm that the sensor's connection polarity is correct.
9. Perform steps 1 through 8 for the second jar on the battery string.

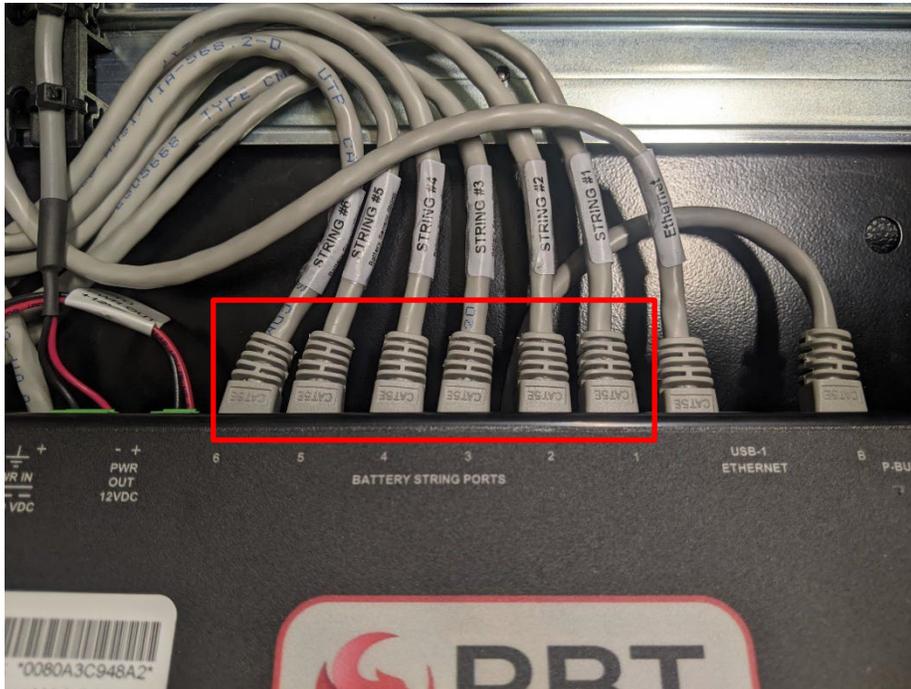
10. Install the sensor daisy chain cable between the two battery sensors on the string. The sensors can be connected to the daisy chain in any order. Choose an order that is aesthetically pleasing and minimizes the cable clutter.
11. If desired, secure each battery sensor to its jar using the double-sided tape/Velcro on the rear of each battery sensor.
12. Record the jar number and address of each sensor.

### 3.4.2 Connect Battery Sensors to SC4 Site Controller

Connect one of the two battery sensors on the string to the SC4 Site Controller using the desired cable which is spooled within the cabinet.



**CAUTION:** We strongly recommend that you use the provided Cables for each string and not make your own sensor cables. A single improperly made cable can destroy an entire string of sensors



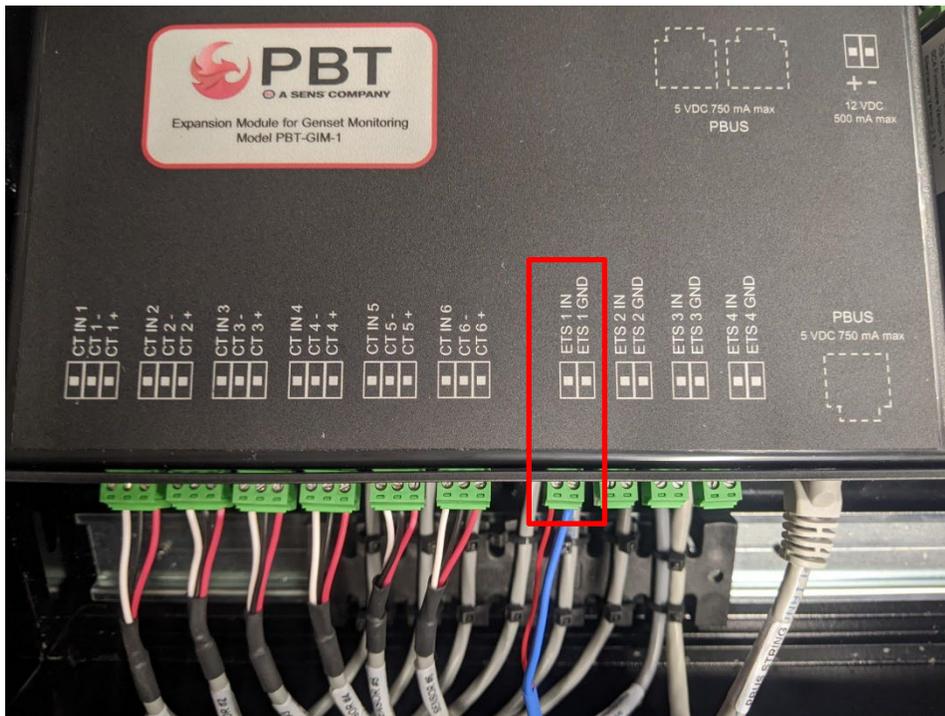
Each Sensor has a unique factory-programmed address. At installation and system initialization time, the SC4 Site Controller 'discovers' each sensor module's factory address and assigns the Sensor to a jar. The specific jar that the Sensor gets assigned to depends on the order in which the Sensors were discovered, but you can change the assignments after the discovery process is complete. Refer to [Site Controller Web Pages](#) to see how this is done.

### 3.5 Connecting External Temperature Sensor

The Genset BMS ships with an External Temperature Sensor (PBT-ETS-6S).



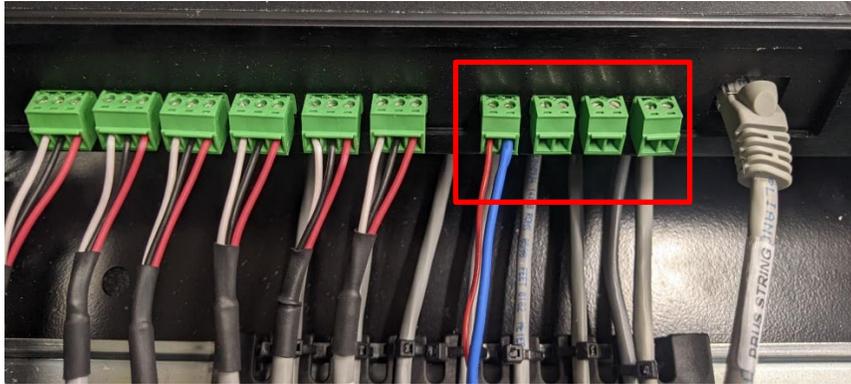
This sensor is supplied connected to the PBT-GIM-1 (Genset Interface Module), spooled within the cabinet.



1. Unspool the temperature sensor cable and fish the cable from the cabinet, dressing it through the wall cabinet wire track. Ensure the connector is properly seated to the PBT-GIM-1
2. Mount the temperature sensor so that it will report the ambient temperature of the room. The sensor must be mounted out of the direction of any airflow and out of direct contact with any batteries or other heat-producing objects in the room.

Additional temperature sensors may be installed as follows:

1. Mount additional temperature sensors appropriate to the additional temperatures you need to read (ex. For battery temperatures, you would mount the probe directly to the battery).
2. Unspool the temperature sensors cable and fish the cable from its mounting location and into the Genset BMS cabinet.
3. Dressing the cable through the wall cabinet wire track.



4. Insert the red wire to the “ETS# IN” port of the terminal block and turn the terminal block’s screw to secure the wire.
5. Insert the black or blue wire to the “ETS# GND” port of the terminal block and turn the terminal block’s screw to secure the wire.



6. Lightly tug the leads to ensure that they are locked in and installed properly.

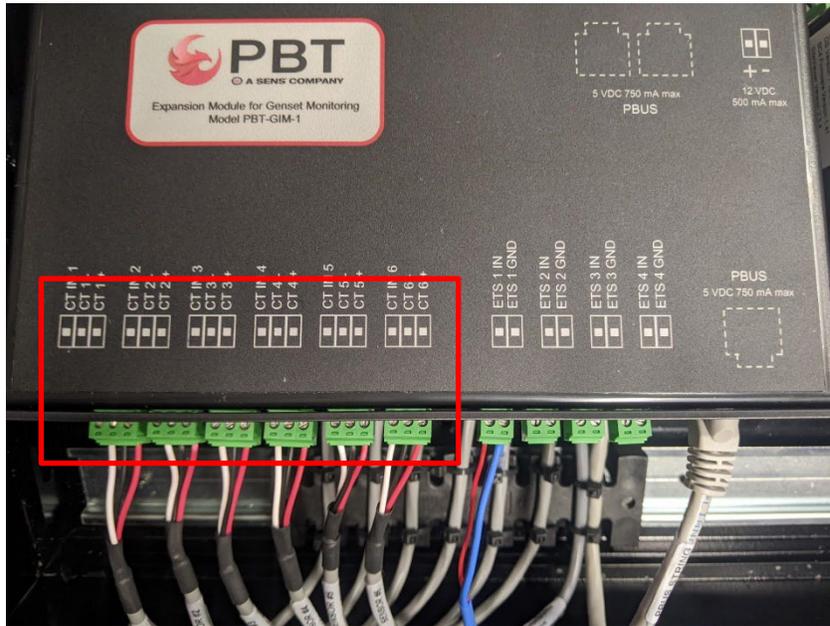
After hardware installation is complete, and after the Genset BMS is connected to your network, you can setup the Site Controller’s configuration to display the ambient room temperature and alarms for each Temperature Sensor. See [Site Controller Web Pages](#) for details.

### 3.6 Connecting Discharge Current Sensors

The Genset BMS is supplied with discharge sensors (PBT-PA-DIS-600) to support up to six 24V VRLA battery strings. Each string uses one sensor.



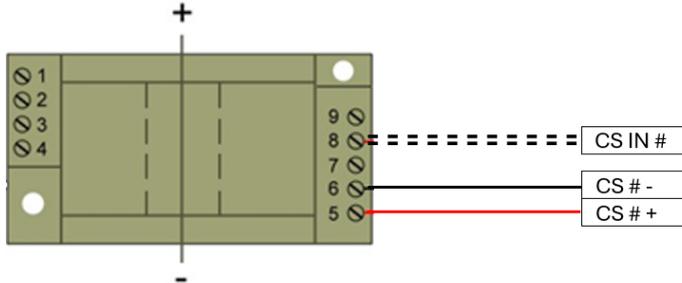
Wiring for each supplied sensor is pre-connected to the PBT-GIM-1 (Genset Interface Module), spooled within the cabinet.



1. Verify the 12VDC Supply from the SC4 to the PBT-GIM-1 module is disconnected before installing the discharge sensors. This will avoid shorting the SC4 power supply while the wires are being dressed.
2. Install the discharge current sensor around the wire or wires to be monitored. The positive marking on the sensor should always face the positive terminal on the jar.



3. Unspool one of the current sensor cables from the PBT-GIM-1 and fish the cable from the cabinet.
4. Connect the Discharge Current Sensor to the cable using the shielded 18AWG wires as shown below.



After hardware installation is complete, and after the Genset BMS is connected to your network, you can setup the Site Controller's configuration to display the discharge current sensors and alarms for each Temperature Sensor. See [Site Controller Web Pages](#) for details.

Specifically:

- Set the Input Name to describe the Genset current to be measured.
- Set the Input Mode to “Analog DC”. Set the Analog Units to “A”.
- Set the Displayed Value Decimal Places to “1”.
- Set the Analog Slope to 6.0 A/Volt (for the PBT-PA-DIS-600 Sensor).
- Calibrate the Discharge Current Sensor for it to read zero with no current. This adjustment should be made with the current sensor connected and operating, without any current flowing in the monitored conductor. To calculate the required Analog Offset to zero the reading; divide the Displayed Value on the web page (with zero current in the sensor), by the decimal adjust: value shown in the formula on the web page. This step may only be performed after the power is supplied to the Discharge Sensor as described in in section 3.8 of this manual, note that it is not recommended to supply power at this time.

### 3.7 Connecting Float Current Sensors

The Genset BMS is supplied with float current sensors (PBT-PA-CCS-1) to support up to six 24V VRLA battery strings. Each string uses one sensor set. The float current sensor consists of a current sensor ring (Toroid) and a CMI (Current Monitoring Interface) module.

Up to 6 float current sensors can be daisy-chained and connected to the Genset BMS via a single, standard CAT5 cable.

Each float current sensor corresponds to a specific battery string. The sensors are manually set to a unique address, from 1 to 6, on the CMI module. The Addresses correspond to the 6 ports. For example; current measurements made on CMI address 2 are displayed with string 2. Refer to the *CCS Installation and Operation Manual (document x700-000029-00)* for information on configuring and using the float current sensors.

1. Pass the positive side of the battery charging cable through the Current Sensor for each group of batteries to be monitored. There is an arrow on the float current sensor. This arrow should point toward the positive jar terminal - in the direction of the float current (not the load current), which is from the positive post towards the negative post.



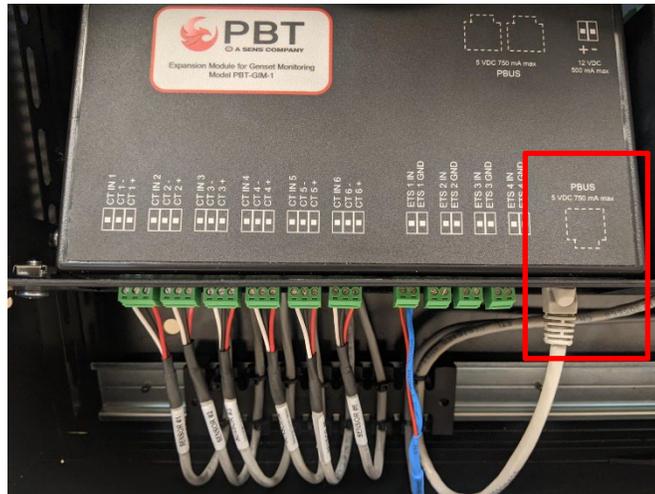
2. Verify the address of the CMI module. There is a blue and white switch on the side of the CMI to set addresses from 0-9. Depending on which Genset String the Current Sensor is being connected to, verify the CMI is set to the correct address to match the port on the Site Controller the Sensors are connected to. For example, set the address to 1 for String 1.



3. Connect the 2.5mm jack from the current sensor to the Float Sensor jack on the CMI module.



- Repeat steps 1 through 3 for each battery string.
- Unspool the CAT5 cable running from the PBUS port on the front panel of the PBT-GIM-1 in the Genset BMS cabinet and fish the cable from the cabinet, dressing it through the wall cabinet wire track.



- Connect the cable to the nearest CMI module and daisy-chain to other CMI modules if present.

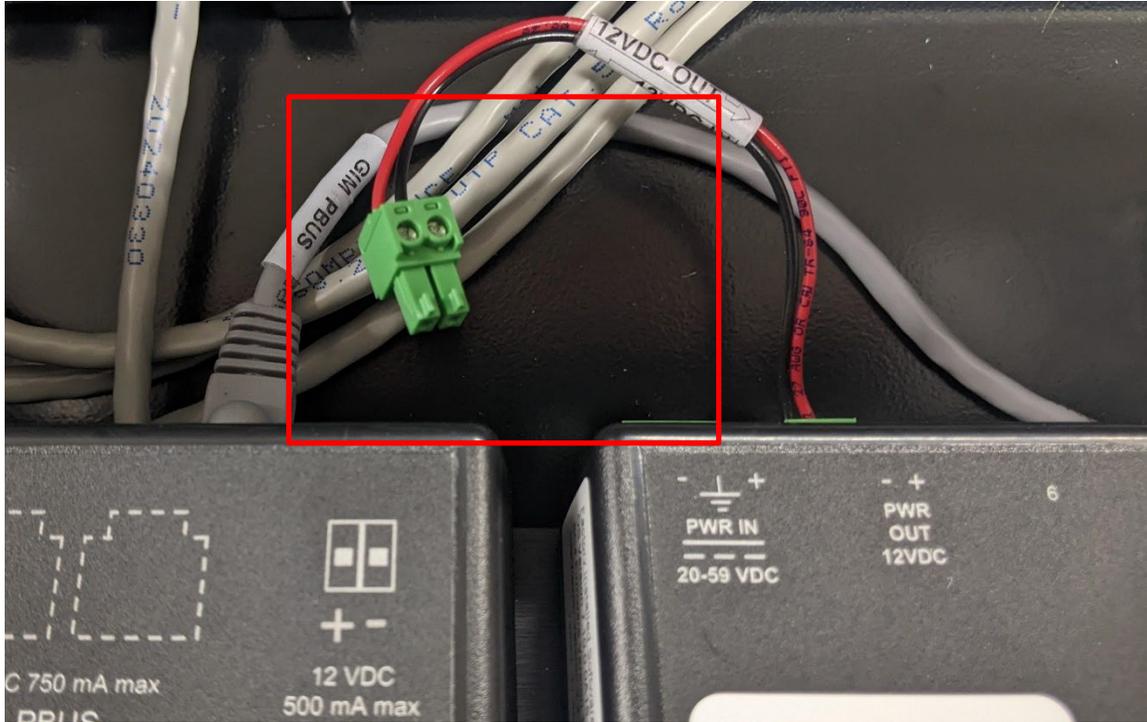


- Connect additional float current sensors by CAT5 daisy-chain from the PBT-CMI connected to the PBT-GIM-1.
- Confirm that the addresses of each CMI is set to match the String it is monitoring.

After hardware installation is complete, and after the Genset BMS is connected to your network, you can setup the Site Controller's configuration to display the float current sensors and alarms for each sensor. See [Site Controller Web Pages](#) for details.

### 3.8 Connecting Power to the PBT-GIM-1 (Genset Interface Module)

The Genset BMS ships with the power connection disconnected from the PBT-GIM-1 (Genset Interface Module). This is to protect components while making initial connections.



Connect the power cable to the 12 VDC connector on the rear panel of the PBT-GIM-1.

## 4. Test Setup & Network Configuration

If you have no previous experience with a PBT 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 can save a significant amount of time by helping you understand the system prior to connecting to a much larger network. It will allow you to verify proper operation of the Site Controller's web server; SSH configuration, and DHCP client without having to troubleshoot larger network issues (such as firewall, router, and connectivity issues, and so on).

It is recommended that you read and understand the remainder of this manual prior to performing a test evaluation.



### 4.1 Network Connection

The SC4 Site Controller communicates with your network via the rear panel ETHERNET connector. (Network infrastructure varies from site to site. Your SC4 will generally be connected to your network via a hub or switch. On a managed switch, make sure that the corresponding switch port has been enabled.)

The IP address of your Site Controller is set to a factory default which is indicated on the label affixed to the top of the unit. If this IP address needs to be changed, do one of the following:

- Run the Site Controller Configuration Program (see [Configuring the Site Controller](#) for details).
- Use the Site Viewer IP Configuration function (see [Site Viewer IP Configuration](#) for details).

Once your IP address is set as desired, verify network communications by accessing the Site Controller web pages over the network. See [Web Server](#) for details.

## 4.2 Configuring the Site Controller

The Site Controller can be configured via a direct Ethernet cable connection from a PC, over a network, or through a USB connection from a PC. In all cases, configuration is performed via a terminal emulator or other similar program (such as PuTTY).

1. Obtain a Terminal Emulator Client. See [Obtaining a Terminal Emulator Client](#) for details.
2. Once you've obtained and setup your Terminal Emulator Client, determine and implement the method of connection to be used:
3. [Ethernet Direct Connection Method](#)
4. [Direct USB Connection](#)
5. Once you're connected, proceed with [Accessing the SC4 Configuration Program](#).

### 4.2.1 Obtaining a Terminal Emulator Client

Whichever method you use to connect to the Site Controller for Site Configuration, a terminal emulator client is required.

If you're using the [Direct USB Connection](#) method, you'll need a terminal emulator like PuTTY.



**NOTE:** PuTTY can be downloaded for free from <http://www.putty.org/>. Be sure to comply with all licensing requirements.

### 4.2.2 Ethernet Direct Connection Method

In order to communicate via a direct Ethernet connection, or over the network, the Site Controller must be assigned an IP address.

The Site Controller is shipped from the factory configured with a static IP Address of 192.168.2.200.

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.



**NOTE:** If the IP address of the SC4 is unknown, you can force the SC4 to revert to the factory configuration by using a pen or small tool to press and hold the Reset IP button on the front-panel of the SC4. Hold the button down until the corresponding Reset IP indicator lights. The unit will be set back to the default IP Address of 192.168.2.200 and the unit will reset.

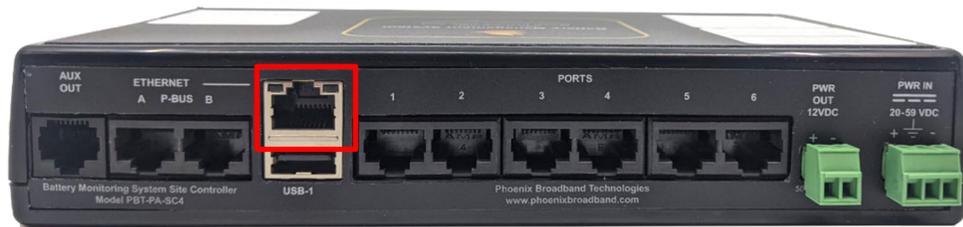
### 4.2.2.1 Using the SC4 Site Controller DHCP Server

This method can be used when the Site Controller is set on its factory default IP Address of 192.168.2.200. When powered up on the default IP Address the Site Controller runs a DHCP Server and will assign an IP Address to the computer connected to its Ethernet port.



**NOTE:** In order to receive an IP Address from the SC4, DHCP must be enabled for the network adapter in your computer. Dynamic Host Configuration Protocol (DHCP) allows your computer to automatically acquire an IP address from the SC4 Site Controller. Refer to your computer's documentation or operating system documentation for details on enabling DHCP.

1. Power up your computer.
1. Power up your SC4.
2. Connect the SC4 to the computer using a CAT5 cable (via the ETHERNET connection on the rear panel).



3. Use a pen or small tool to press and hold the Reset IP button on the front panel of the SC4. Hold the button down until the corresponding Reset IP indicator lights.



4. Use your computer's operating system to verify that an IP address has been acquired from the SC4.
5. By default, the SC4 will use an IP address of 192.168.2.200. If, for some reason, you cannot ping this IP address from your computer, do the following:
  - a. Connect to the SC4 using a USB connection. (See [Accessing the SC4 Configuration Program over USB.](#))
  - b. Use the SC4 configuration program to determine the SC4 IP address. (See [IPv4 Configuration.](#))

### 4.2.2.2 Connecting to an SC4 via Ethernet with a Known IP Address

This method can be used when the Site Controller IP address is set to a known, static IP address. To use this method, do the following:

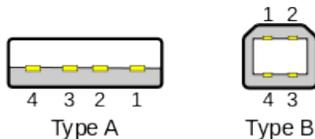
1. Connect an Ethernet (straight-through or crossover) cable between the PC and the ETHERNET connector on the rear panel of the Site Controller.
2. Set your PC IP address to the same network as the Site Controller address. For example, if the Site Controller IP address is set to 192.168.2.200, you can set your PC network adapter to 192.168.2.201.
3. Set the PC subnet mask to the same subnet mask as the Site Controller.
4. Set the PC default gateway of the same default gateway as the Site Controller.
5. Ping the SC4 IP address. If, for some reason, you cannot ping this IP address from your computer, do the following:
  - a. Connect to the SC4 using a USB connection. (See [Accessing the SC4 Configuration Program over USB.](#))
  - b. Use the SC4 configuration program to determine the SC4 IP address. (See [IPv4 Configuration.](#))

### 4.2.3 Direct USB Connection

Connecting a PC to the Site Controller via a USB cable is required when provisioning the Site Controller from a non-network connected PC, or, if the controller has been programmed with an unknown, static IP Address.

A serial communications program such as Tera Term or Putty is required. See [Obtaining a Terminal Emulator Client](#) for details.

A USB cable is provided with the Site Controller. This is a Type A/Type B cable.



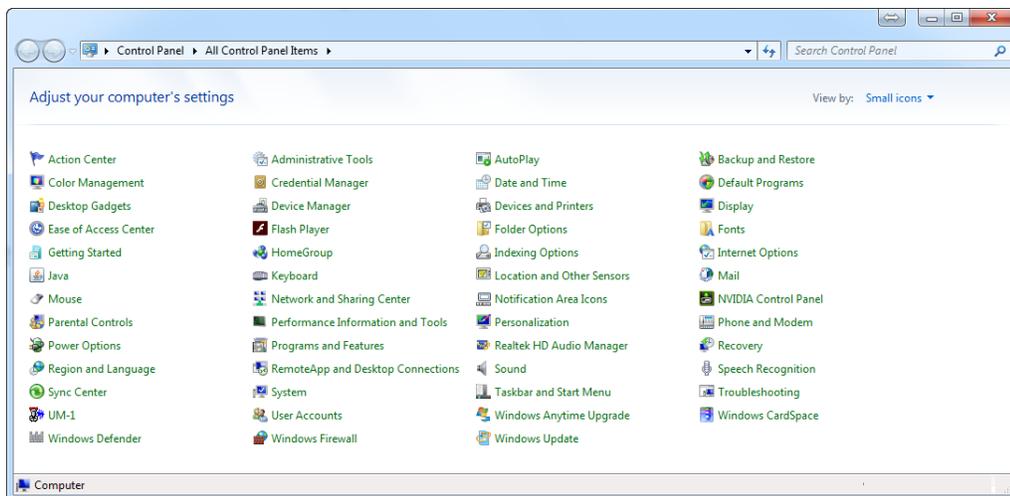
Complete the USB Connection as follows:

1. Connect the Type A connector to an available USB port on your computer.
2. Connect the Type B connector to the USB-2 (Setup) port on the front panel of the Site Controller.

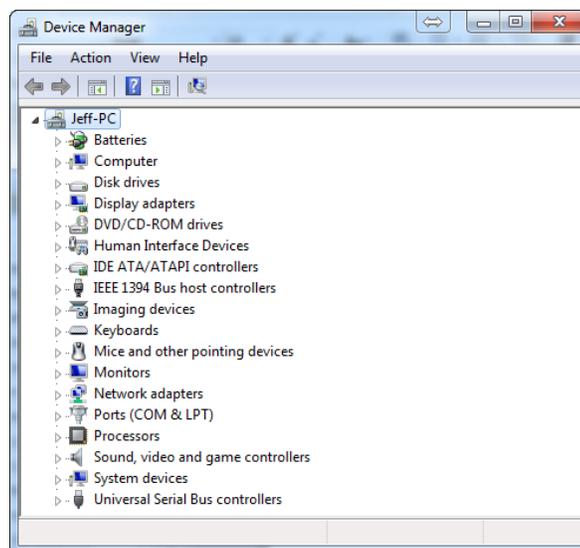


**NOTE:** You must use the USB-2 (Setup) port for all direct USB connection related tasks. Ports USB-1 (Rear) and USB-3 (Factory) are for factory use only.

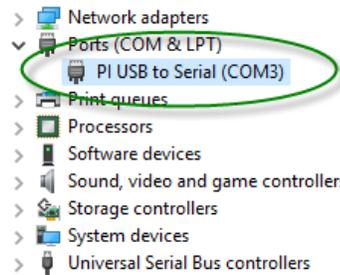
3. To connect to the Site Controller with your serial communications program you will need to identify which COM port is being used for the USB serial communications. To do this, do the following:
  - a. From the **Start** menu, choose **Control Panel**. The Control Panel window appears.



- b. Access **Device Manager**. The Device Manager window appears.



- c. Navigate down the tree of devices and select “Ports (COM & LPT). (The naming and location of the Site Controller may vary, depending on which operating system you’re using.)



- d. In the example shown above, the Site Controller is labeled “PI USB to Serial (COM3).” (The text shown in your COM Port may differ.) The COM Port that the Site Controller is installed on is shown in parenthesis (COM3 in the example). When configuring your Serial Communications program, use this identified COM port number.

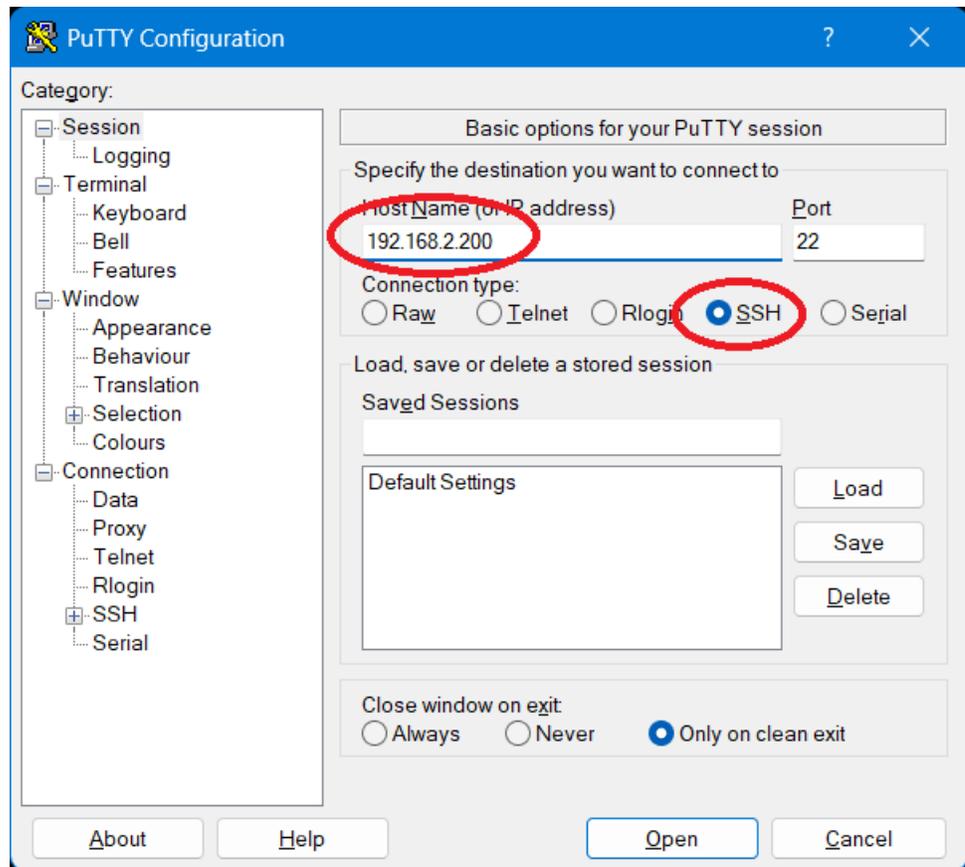
## 4.3 Accessing the SC4 Configuration Program

Once you've connected to the Site Controller (see [Configuring the Site Controller](#)), you can use a terminal emulator client to access the SC4 Configuration Program. Instructions are given below for using PuTTY.

### 4.3.1 Accessing the SC4 Configuration Program over Ethernet

These instructions make use of PuTTY, although any Telnet client will work. (See [Obtaining a Terminal Emulator Client](#) for details.)

1. Launch PuTTY. The PuTTY Configuration dialog box appears.

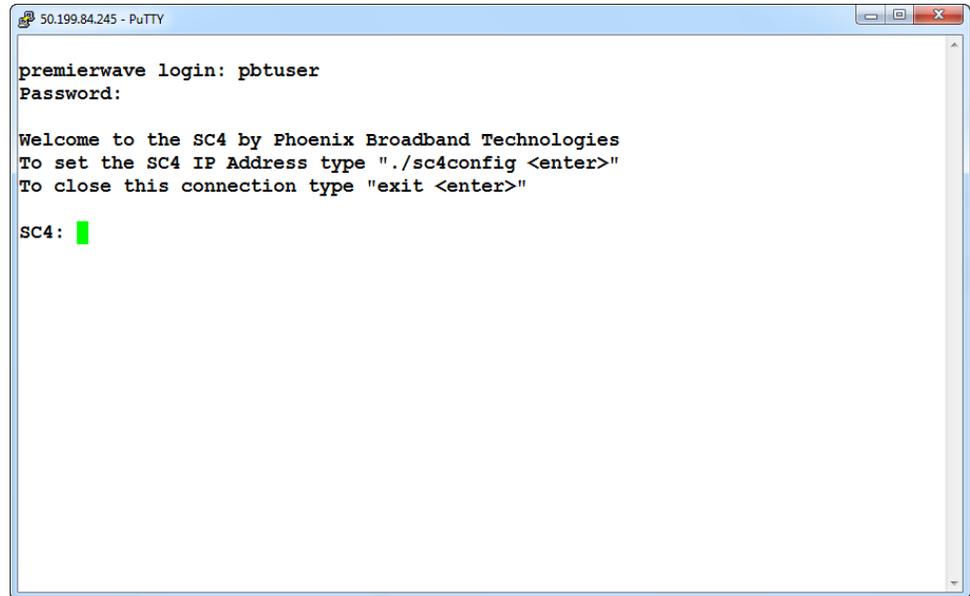


2. Enter the IP address of the Site Controller in the Host Name (or IP address) field.
3. In the Connection type area, choose **SSH**.
4. Select **Open**. The PuTTY Configuration dialog box closes. The PuTTY window is displayed. You are prompted for your login.



**NOTE:** The default username/password combination is pbtuser/pbtpassword.

5. Enter your username and press ENTER. You are prompted for your password.
6. Enter your password and press ENTER. The command prompt is displayed on the PuTTY window.
7. The command prompt is displayed on the window.



```
50.199.84.245 - PuTTY

premierwave login: pbtuser
Password:

Welcome to the SC4 by Phoenix Broadband Technologies
To set the SC4 IP Address type "./sc4config <enter>"
To close this connection type "exit <enter>"

SC4: █
```

8. Launch the SC4 Configuration Program by typing: `./sc4config` and then pressing ENTER. The SC4 Configuration Program appears. See [SC4 Configuration Program](#) for details.

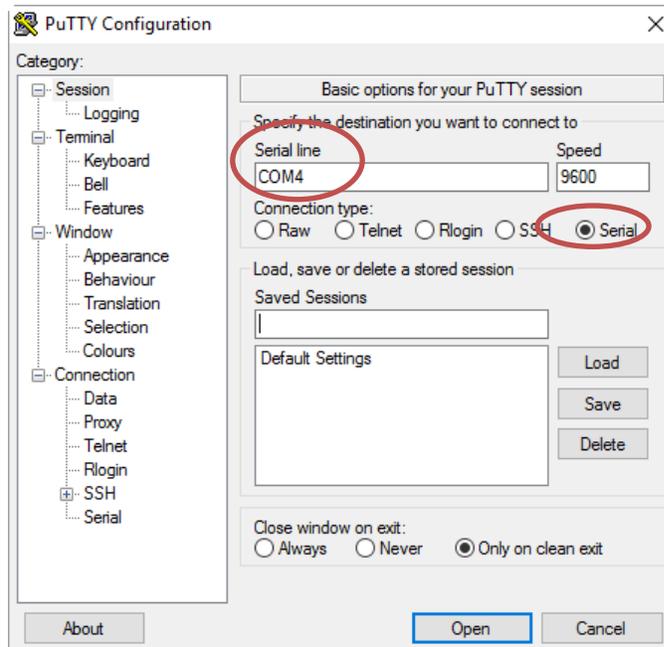
### 4.3.2 Accessing the SC4 Configuration Program over USB

These instructions make use of PuTTY, although any serial terminal emulator should work. (See [Obtaining a Terminal Emulator Client](#) for details.)



**NOTE:** The default settings for Tera Term should work properly. If they have been changed, ensure that the settings are: Baud rate: 9600, 8 data bits, one stop bit, no parity, and no flow control.

1. Launch PuTTY. The PuTTY Configuration dialog box appears.

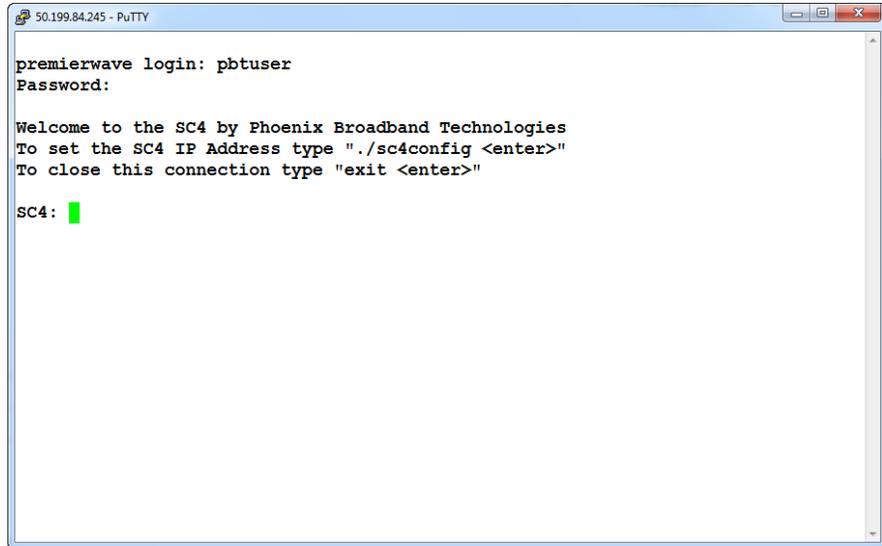


2. Ensure that the Site Controller COM port is selected. (See [Direct USB Connection](#) for details.)
3. Choose the **Serial** radio button.
4. Click **Open**. The dialog box closes. The PuTTY window is displayed. You are prompted for your login.



**NOTE:** The default username/password combination is pbtuser/pbtpassword.

5. Enter your username and press ENTER. You are prompted for your password.
6. Enter your password and press ENTER. The command prompt is displayed on the PuTTY window.



```
50.199.84.245 - PuTTY
premierwave login: pbtuser
Password:

Welcome to the SC4 by Phoenix Broadband Technologies
To set the SC4 IP Address type "./sc4config <enter>"
To close this connection type "exit <enter>"

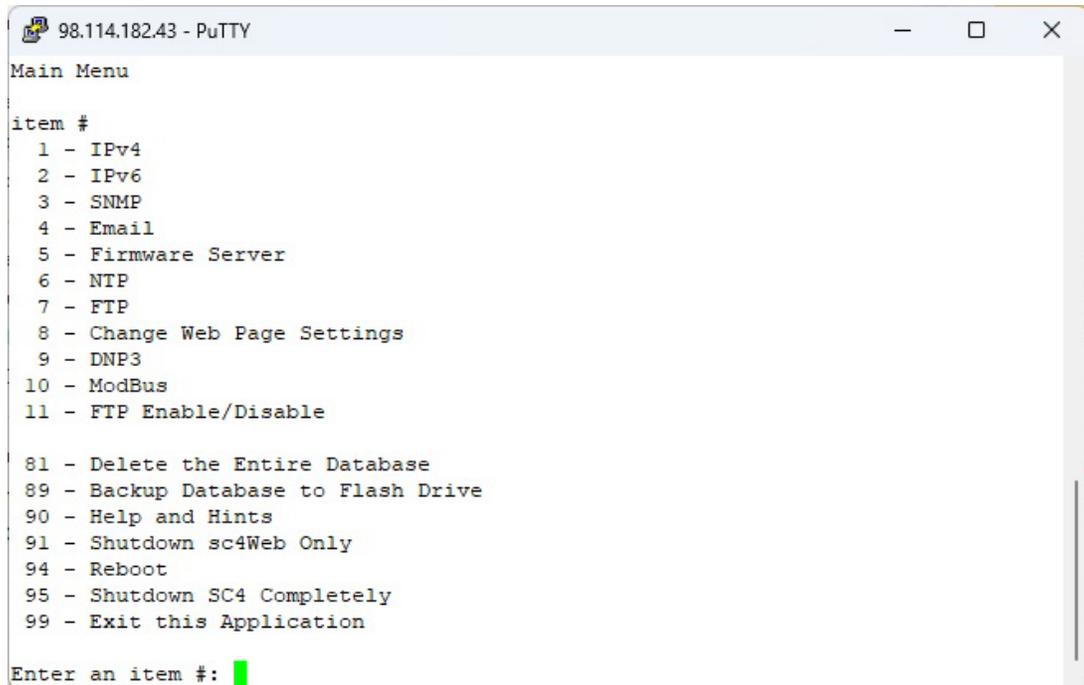
SC4: █
```

7. Launch the SC4 Configuration Program by typing: `./sc4config` and then pressing ENTER. The SC4 Configuration Program appears. See [SC4 Configuration Program](#) for details.

## 4.4 SC4 Configuration Program

The SC4 uses a Linux operating system and 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 SC4 Configuration Program menu is displayed as shown below. (See [Accessing the SC4 Configuration Program](#).) These screenshots were made with a PuTTY client, but they will appear virtually the same in any serial terminal emulator.

A screenshot of a PuTTY terminal window titled "98.114.182.43 - PuTTY". The terminal displays the "Main Menu" of the SC4 Configuration Program. The menu items are listed as follows:

```
Main Menu
item #
 1 - IPv4
 2 - IPv6
 3 - SNMP
 4 - Email
 5 - Firmware Server
 6 - NTP
 7 - FTP
 8 - Change Web Page Settings
 9 - DNP3
10 - ModBus
11 - FTP Enable/Disable

81 - Delete the Entire Database
89 - Backup Database to Flash Drive
90 - Help and Hints
91 - Shutdown sc4Web Only
94 - Reboot
95 - Shutdown SC4 Completely
99 - Exit this Application

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 keystrings 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.)

```
50.199.84.245 - PuTTY
item #
 1 - Change Address (50.199.84.245)
 2 - Change Gateway Address (50.199.84.246)
 3 - Change Net Mask (255.255.255.248)
 4 - Change the DHCP setting (disable)
 5 - Change Primary DNS (75.75.75.75)
 6 - Change Secondary DNS (4.2.2.2)
 7 - Change the MTU (1500 bytes)
 8 - Change the Device Long Name (Phoenix Broadband Site Controller)
 9 - Change the Device Short Name (PBT-PA-SC4)

98 - Return to Main Menu
99 - Return to Main Menu

Enter an item #: 1
Enter an IP Address (50.199.84.245): █
```

2. Enter the desired value at the prompt and then press ENTER. A confirmation message appears.

```
50.199.84.245 - PuTTY
item #
 1 - Change Address (50.199.84.245)
 2 - Change Gateway Address (50.199.84.246)
 3 - Change Net Mask (255.255.255.248)
 4 - Change the DHCP setting (disable)
 5 - Change Primary DNS (75.75.75.75)
 6 - Change Secondary DNS (4.2.2.2)
 7 - Change the MTU (1500 bytes)
 8 - Change the Device Long Name (Phoenix Broadband Site Controller)
 9 - Change the Device Short Name (PBT-PA-SC4)

98 - Return to Main Menu
99 - Return to Main Menu

Enter an item #: 1
Enter an IP Address (50.199.84.245): 50.199.84.246
Entered: 50.199.84.246 Are you sure (y/n <enter>)? █
```

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.

```
50.199.84.245 - PuTTY
IPv4 Menu
item #
 1 - Change Address (50.199.84.245) -> 50.199.84.246
 2 - Change Gateway Address (50.199.84.246)
 3 - Change Net Mask (255.255.255.248)
 4 - Change the DHCP setting (disable)
 5 - Change Primary DNS (75.75.75.75)
 6 - Change Secondary DNS (4.2.2.2)
 7 - Change the MTU (1500 bytes)
 8 - Change the Device Long Name (Phoenix Broadband Site Controller)
 9 - Change the Device Short Name (PBT-PA-SC4)

98 - Abandon Changes and Return to Main Menu
99 - Save Changes and Return to Main Menu

Enter an item #: Enter an item #: █
```

- 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 SC4 is configured. In all cases, use the item number displayed on the menu rather than any specific item number documented in this manual.

- 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.)

### 4.4.1 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:

- Press 1 and then ENTER on the [SC4 Configuration Program Main Menu](#). The IPv4 Menu appears.

```

50.199.84.245 - PuTTY

IPv4 Menu

item #
 1 - Change Address (50.199.84.245)
 2 - Change Gateway Address (50.199.84.246)
 3 - Change Net Mask (255.255.255.248)
 4 - Change the DHCP setting (disable)
 5 - Change Primary DNS (75.75.75.75)
 6 - Change Secondary DNS (4.2.2.2)
 7 - Change the MTU (1500 bytes)
 8 - Change the Device Long Name (Phoenix Broadband Site Controller)
 9 - Change the Device Short Name (PBT-PA-SC4)

98 - Return to Main Menu
99 - Return to Main Menu

Enter an item #: █
    
```

- Change any of the currently set values as desired. See [General Configuration Information](#) for details.
- To save the changes you've made, press 99 and then press ENTER. (Pressing 98 and then ENTER exits IPv4 setup without saving any of the changes made.)

## 4.4.2 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.



**NOTE:** As of this writing, there is a known issue with IPv6 configuration. When IPv6 is enabled, the Site Controller is forced to use an IPv6 time server. This may cause an issue if you do not have access to an IPv6 time server. The Site Controller uses Simple Network Time Protocol (SNTP) to communicate with an external time server. See [NTP Configuration](#) for details.

To configure IPv6:

1. Press 2 and then ENTER on the [SC4 Configuration Program Main Menu](#). The IPv6 Menu appears.

```

50.199.84.245 - PuTTY

IPv6 Menu

item #
 1 - Enable or Disable IPv6 (disable)
 2 - Enable or Disable IPv6 DHCP (disable)
 3 - Change Address (2002:32c7:54f2:0:280:a3ff:fe9a:236b/64)
 4 - Change Default Gateway (&#60;None&#62;)
 5 - Change Domain ()
 6 - Change Primary DNS (&#60;None&#62;)
 7 - Change Secondary DNS (&#60;None&#62;)

98 - Return to Main Menu
99 - Return to Main 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 IPv6 setup without saving any of the changes made.)

### 4.4.3 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 SC4 Site Controller supports SNMP v1, SNMP v2c and SNMP v3.

### 4.4.3.1 SNMP Configuration - General

To setup SNMP:

1. Press 3 and then ENTER on the [SC4 Configuration Program Main Menu](#). The SNMP Configuration Menu appears.

```

50.199.84.245 - PuTTY
SNMP Configuration Menu
item #   Key      (presentValue1) (presentValue2)... -> newValue1 newValue2...
 1 - syslocation ("pbt labsc4")
 2 - syscontact (215-997-6007)
 3 - sysObjectID (1.3.6.1.4.1.20433.1.1.1.8.0)
 4 - sysDescr ("PBT-PA-SC4 Site Controller") (Site) (Controller)
 5 - sysName (Phoenix) (Broadband) (Technologies)
 6 - trapsink (192.168.0.2) (public)
 7 - trapsink (192.168.0.23) (public)
 8 - trap2sink (192.168.0.2) (public)
 9 - trap2sink (192.168.0.2) (public)
10 - informsink (192.168.0.2) (public)
11 - informsink (192.168.0.2) (public)
12 - trapcommunity (public)
13 - authtrapenable (1)
14 - rwuser (admin) (noauth)
15 - rouser (mike) (auth)
16 - rocommunity (public)
17 - rwcommunity (secret)
18 - agentAddress (udp:161,udp6:161)
19 - rocommunity6 (public) (default)
20 - rwcommunity6 (secret) (default)
21 - createUser (admin) (MD5) (password)
22 - createUser (public) (MD5) (password)
23 - createUser (mike) (MD5) (password)
24 - 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 IPv4 setup without saving any of the changes made.)

#### 4.4.3.2 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.

#### 4.4.3.3 SNMP v3 Configuration

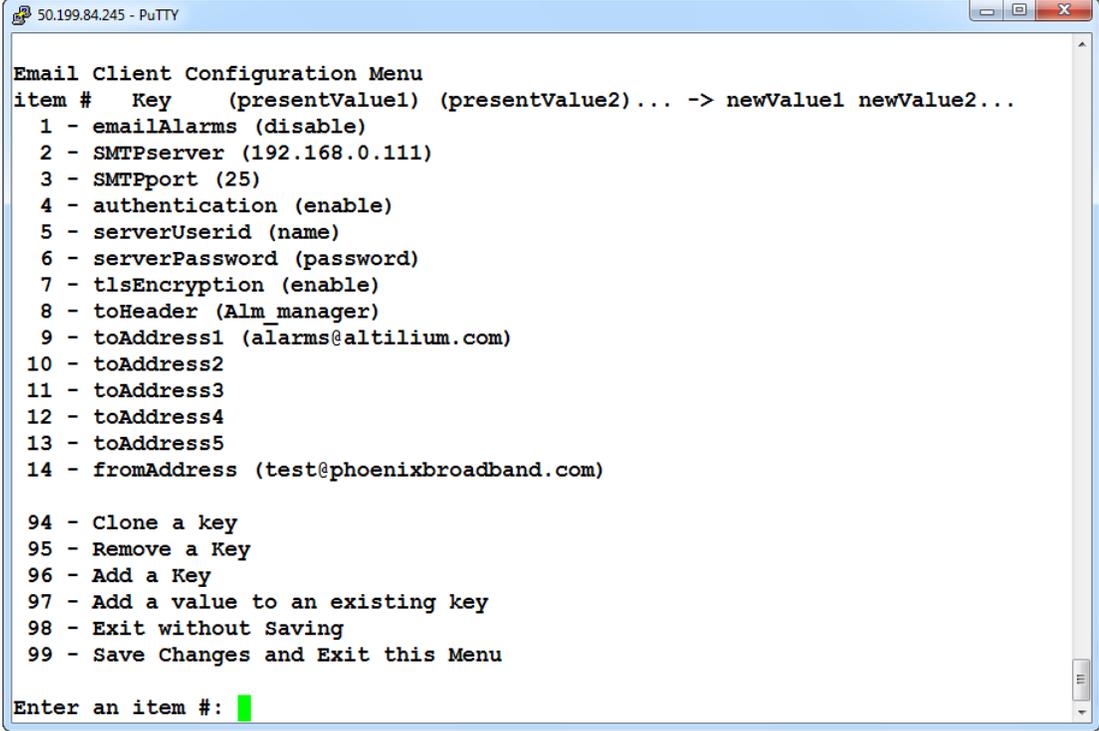
It is assumed that customers using SNMP v3 are using IPv6. For details on setting up IPv6, see [IPv6 Configuration](#).

## 4.4.4 Email Client Configuration

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

To setup email:

1. Press 8 and then ENTER on the [SC4 Configuration Program Main Menu](#). The Email Client Configuration Menu appears.



```

50.199.84.245 - PuTTY
Email Client Configuration Menu
item #   Key   (presentValue1) (presentValue2)... -> newValue1 newValue2...
 1 - emailAlarms (disable)
 2 - SMTPserver (192.168.0.111)
 3 - SMTPport (25)
 4 - authentication (enable)
 5 - serverUserid (name)
 6 - serverPassword (password)
 7 - tlsEncryption (enable)
 8 - toHeader (Alm_manager)
 9 - toAddress1 (alarms@altilium.com)
10 - toAddress2
11 - toAddress3
12 - toAddress4
13 - toAddress5
14 - fromAddress (test@phoenixbroadband.com)

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 username 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 [SC4 Configuration Program](#) for details.) The default is a commonly used DNS. 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.

## 4.4.5 Firmware Server Configuration

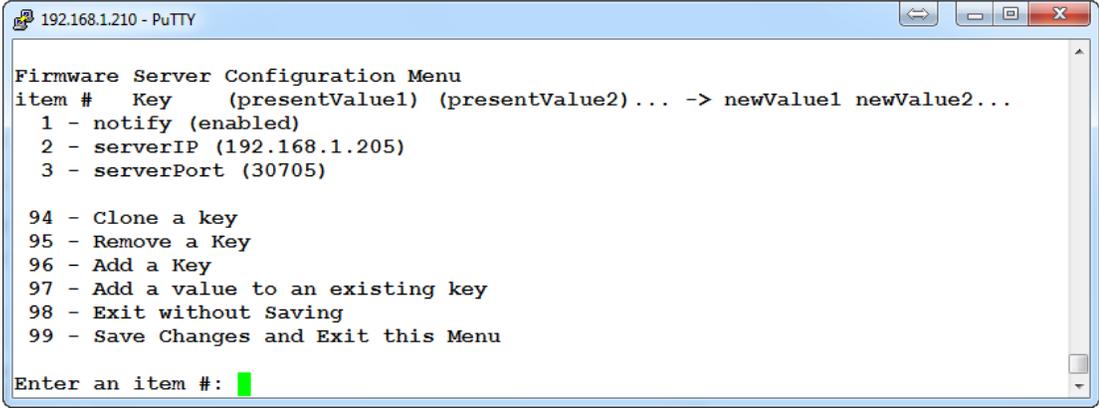
If the Firmware Server is enabled, the SC4 Site Controller will send the Firmware Server its IP address, Date/Time stamp, MAC Address, Unit Type and Firmware Version at random times.

This feature is used in conjunction with a dedicated Firmware Server to enable automatic updates of firmware and web pages on the SC4.

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

To setup the Firmware Server:

1. Press 4 and then ENTER on the [SC4 Configuration Program Main Menu](#). The Firmware Server Configuration Menu appears.

A screenshot of a PuTTY terminal window titled "192.168.1.210 - PuTTY". The terminal displays the "Firmware Server Configuration Menu" with the following text:

```
Firmware Server Configuration Menu
item #  Key    (presentValue1) (presentValue2)... -> newValue1 newValue2...
  1 - notify (enabled)
  2 - serverIP (192.168.1.205)
  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 Email Client Configuration without saving any of the changes made.)

## 4.4.6 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.



**NOTE:** The Site Controller can be configured to use the local PC time. See [Site Setup](#) for details.

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).

To setup NTP:

1. Press 6 and then ENTER on the [SC4 Configuration Program Main Menu](#). The NTP Menu appears.

```

50.199.84.245 - PuTTY
NTP Menu

item #
 1 - Enable or Disable NTP (SNTP)
 2 - Edit the NTP Server Name (time.nist.gov)
 3 - Change Time Zone (US/Eastern)
 4 - Change Time Offset (-0400)

98 - Return to Main Menu
99 - Return to Main Menu

Enter an item #: █

```

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



**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.

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 NTP Configuration.

Enter either a Time Zone or an Offset. You do not need to enter both.

If you choose to use offset rather than a Time Zone, DST (Daylight Savings Time) is not applied to the time setting of the Site Controller.

The following is a list of valid Time Zones that can be entered. 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



**NOTE:** Other time zones can be used. If your time zone is not listed above, [contact technical support](#).

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

Note that entries are case-sensitive.

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.)

## 4.4.7 FTP Configuration

The most common uses for the FTP functionality are to access log files and to update the SC4 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 3 and then ENTER on the [SC4 Configuration Program Main Menu](#). The FTP Configuration Menu appears.

```

192.168.1.210 - PuTTY
FTP Configuration Menu
item #  Key      (presentValue1) (presentValue2)... -> newValue1 newValue2...
 1 - local_enable (YES)
 2 - dirmesssage_enable (YES)
 3 - xferlog_enable (YES)
 4 - connect_from_port_20 (YES)
 5 - idle_session_timeout (3600)
 6 - ftp_username (admin)
 7 - userlist_enable (No)
 8 - userlist_deny (YES)
 9 - userlist_file (/etc/vsftpd/user_list)
10 - local_root (//)
11 - chroot_local_user (NO)
12 - write_enable (YES)

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 ENTER. (Pressing 98 and then ENTER exits the NTP Menu without saving any of the changes made.)

## 4.4.8 Change Web Page Settings (Passwords)

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, hit ENTER without typing anything. 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.)

## 4.4.9 DNP3 Configuration

DNP3 (Distributed Network Protocol 3) is a communications protocol utilized by the controller (if configured and enabled) to communicate changes in an object’s alarm status upon command from a master device.

This protocol is not an applicable feature for the Genset BMS. For more information on this feature, please contact Phoenix Broadband Technologies.

### 4.4.9.1 Modbus Configuration

Refer to document 700-000031-00 (Controller Modbus Interface User Guide) for detailed information

To enable Modbus:

1. Press 10 and then ENTER on the Main Menu. The Modbus Menu options will appear.
2. Select menu option 1 and enter “e” to enable Modbus.
3. Enter “99” to save changes.
4. Reboot the SC4, Modbus will be enabled when the SC4 returns from reboot.

```

192.168.0.145 - PuTTY
ModBus Configuration Menu
item #   Key           (presentValue) -> newValue
 1 - ModBus Enable/Disable (Disable)
 2 - ModBus TCP Port (502)
 3 - ModBus Unit ID (5)

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

A reset is required for any changes to take effect

1
Enable or Disable (Disable) [e/d <enter>]? e

item #   Key           (presentValue) -> newValue
 1 - ModBus Enable/Disable (Disable) -> Enable
 2 - ModBus TCP Port (502)
 3 - ModBus Unit ID (5)

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

A reset is required for any changes to take effect

99
    
```

### 4.4.9.2 FTP Enable/Disable

In some network configurations, it may be required to disable FTP functionality. FTP is enabled in the controller by default.

To disable FTP:

1. Press 11 and then ENTER on the Main Menu. The FTP Menu options will appear.
2. Select menu option 1 and enter “d” to disable FTP.
3. Enter “99” to save changes and return to the main menu.

```

FTP Menu
item #
 1 - Enable or Disable FTP (enable)

98 - Return to Main Menu

Enter an item #: 1
Enable or Disable (enable) [e/d <enter>]? d
    
```

### 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 Site Controller, requiring a site visit.

### 4.4.10 Shutdown Web Only

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

### 4.4.11 Reboot

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

### 4.4.12 Shutdown Completely

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

### 4.4.13 Exit This Application

To exit the Site Controller 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.

## 4.5 Web Server

The Site Controller contains a Web Server that provides a complete set of web pages to observe and configure the monitoring system from a web browser.

Currently supported browsers are:

- Google Chrome
- Microsoft Internet Explorer
- Mozilla Firefox

### 4.5.1 Accessing the Web Server

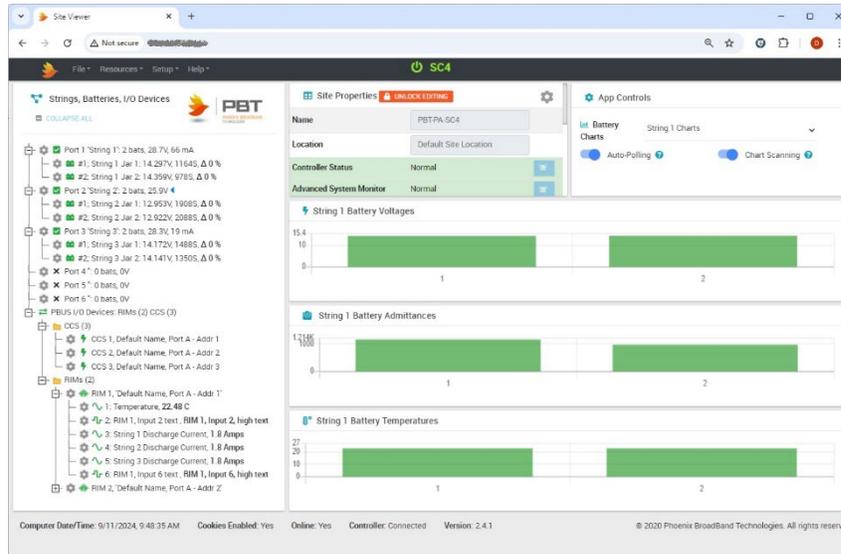
See [Site Controller Web Pages](#) for details on accessing the Site Controller web pages.

### 4.5.2 Ports

The Site Controller web server uses Ports 80 to receive requests from the PC. The ports on the PC are selected automatically. Port 80 is the normal HTTP port. Port 80 is used for web sockets to get data from the Site Controller for real time screen updates.

## 5. Site Controller Web Pages

Site Viewer is a web-based viewer for information collected by the SC4 Site Control Unit. The Site Viewer web interface is a fully featured application that provides complete capability to view and change most of the important aspects of the SC4's configuration and provisioning.



Site Viewer uses HTML5 “WebSockets” to provide a communications interface between your PC and the SC4. This eliminates any special network configuration or requirement for any plug-ins on your PC. HTML5 and WebSockets are also supported by many modern pocket and tablet devices.

When the Site Controller starts, the previous string configuration is loaded from the database. This configuration is updated as new strings or jars are discovered. During the Site Controller initialization, a message “Site Controller Initializing” will appear. While this message is present, the Site Controller checks for new sensors and collects data for all sensors.



**NOTE:** Alarm checking SNMP, Modbus, and DNP3 communications are disabled until initialization is complete and the Site Controller Initializing message disappears. This prevents alarming or the reporting of erroneous readings.

### 5.1 Accessing the Site Viewer Web Page

To access the Site Viewer web page, do the following:

1. Launch your internet browser.
2. Type the IP address of the Site Controller in the browser's URL address space, prefixed with `http://`.  
For example:

`http://192.168.0.18`

The Site Viewer page appears.

The Site Viewer web page provides up to date status information for all connected strings, batteries, and I/O devices. Site properties are displayed along with application control settings. Graphs are provided to indicate battery string voltages, admittances, and temperatures.

When Site Viewer starts, it immediately displays the Site Viewer graphic page and begins collecting data about the site and all the strings and batteries connected to the SC4. If there is no obvious sign of activity or data after the connection to the SC4 is made, try refreshing the web page. If there is still no obvious sign that Site Viewer is collecting data, check for the correct IP address, verify network connectivity, and/or confirm that your PC has a compatible version of the web browser.

## 5.2 General

These links/controls/indications appear on one or more web pages on the Site Controller GUI.

### Menu Bar

The menu bar provides access to specific functions and resources such as log file access, links to documentation, IP configuration, and so on.

### Web Page

The Site Viewer web page provides current status information for all connected strings, batteries and I/O devices. Site properties are displayed along with application control settings. Graphs are provided to indicate battery string voltages, admittances, and temperatures.

### Page Footer

Site Controller status is displayed on the left side of the page footer. This display generally toggles between “Populating String x Data” and “Populating site Variables” among other things. This indicates normal operation. If you see the message “Connection Error” you may have problems with a firewall or router blocking port 80. If this persists, contact your IT department for assistance.

### 5.3 Unlocking the Site Viewer for Editing

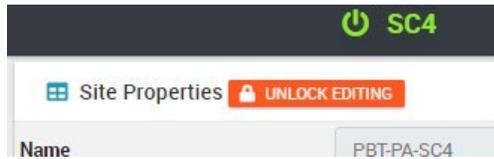
When you first access the Site Viewer, it is in a locked state. In this state, you can view all current readings as well as view all site details and alarm settings. However, you cannot change any controller settings until you unlock the SiteViewer.



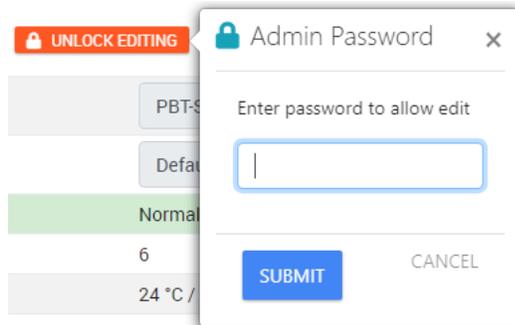
**NOTE:** The password will time out if there is no activity for ten minutes or if the web browser is closed or refreshed.

To unlock the Site Viewer:

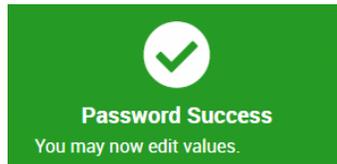
1. Click the **UNLOCK EDITING** button. This button appears in multiple locations for ease of use (the Site Properties panel, String Details popup, Jar Details popup, and so on).



The Admin Password dialog box appears.



2. Enter the Administrator Password for the controller. The default password is `admin`.
3. Click **SUBMIT**. The Admin Password dialog box closes. A success message appears.



Controller settings can now be changed.

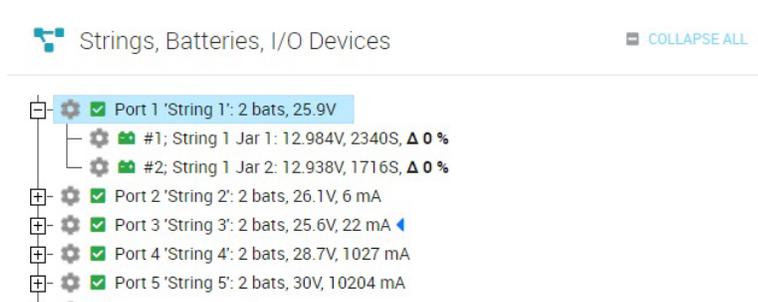
## 5.4 Functional Areas

### 5.4.1 Banner

The Site Viewer logo banner contains the product logo, including a display of the version of Site Viewer currently loaded.

### 5.4.2 System Tree Pane

The system tree contains a hierarchical display of all the strings, batteries and I/O devices connected to the SCU. Selecting a tree branch will display all the elements within that branch. Tree branches are color-coded and icon-coded with status information. This includes each of the physical PORTS on the SC4 as well as the PBUS ports.



Double-clicking or clicking the plus sign on any of the active data connections expands it to display all subsidiary devices.

Right-click on any entry to bring up a popup which contains additional information about the selected item.



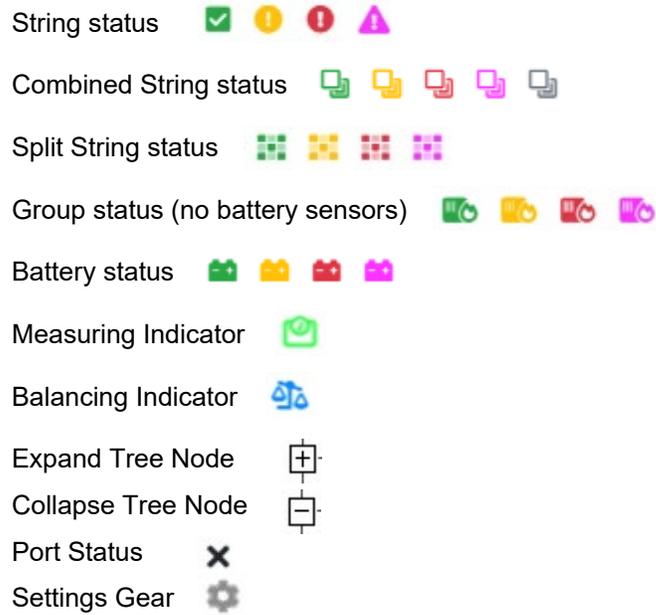
Double-clicking or clicking the minus sign on the active data connection again contracts the display to the top level only.

Data updates can be disabled using the [App Controls](#) pane.

Each branch in the Site Viewer tree has a color-coded icon that indicates the alarm status of the branch or its components:

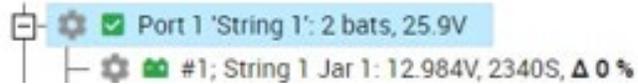
- Green = Everything is normal.
- Bright Green = Taking Admittance Measurement
- Yellow = Minor alarm with something on or within String or Group.
- Red = Major alarm with something on or within String or Group.

- Magenta = Warning condition.
- Grey = Node Disabled.



### 5.4.2.1 Port Information

Each port shown in the Tree View shows the port number, port name (user configurable), alarms (if any), how many sensors are attached (bats), the string voltage and float current (if available).



### 5.4.2.1.1 Port or Group Details

Right-clicking on the port and selecting “View Details” or left-clicking on the Gear Icon next to the port (if available) will bring up the port or group Details. The following fields are listed below.

The screenshot shows the 'String 1 Details' window with the following data:

Parameter	Value	Action
Name	String 1	Copy
String Status	Normal	
Discharge Status	Normal	Refresh
String Voltage	25.9 VDC	Refresh
Voltage Delta	0.031 V	Refresh
Float Current	-0.066 Amp	Refresh
Ripple Current	0.0 AC Amp	Refresh
Ripple Voltage	0.000 mV AC	
Discharge Current	0 DC Amp	Refresh
CMI COM	Normal	Refresh
Float Sensor COM	Normal	Refresh
Battery Sensor COM	Normal	Refresh
Battery Model		

Navigation: PREVIOUS STRING | NEXT STRING

Buttons: Details, Settings, UNLOCK EDITING, Runtime Estimator (highlighted), Advanced System Monitor

Close button: CLOSE

**Name** – User configurable (must unlock editing first – see [Unlocking the Site Viewer for Editing](#)).

**String Status** – Displays the present string status which is a summary of the sensor status as described below.

String Status	Description
<b>Normal</b>	The status of all sensors on this string are Normal
<b>Disabled</b>	The string is disabled through SNMP
<b>Shorted</b>	The Site Controller output is shorted somewhere in the sensor daisy chain
<b>MissingSensors</b>	More sensors were expected
<b>TooManySensors</b>	More sensors are present than the string can handle
<b>SensorFault</b>	One or more sensors are not communicating
<b>Alarms</b>	One or more sensors have alarms
<b>Initializing</b>	The string is initializing
<b>SensorDisabled</b>	One or more sensors are disabled through SNMP
<b>StringDisconnected</b>	Nothing is connected to the Site Controller string port
<b>NoSensorCom</b>	Something is connected to the port, but no sensors are communicating

**Discharge Status** – Displays the present state of the string: “Normal” or “Discharge”. A count of the Discharge Events and the duration of the Present (or Previous) Event are available in the Settings tab under Discharge Settings. A digital alarm (major or minor) can be set for Discharge Status by clicking the corresponding alarm button.

**String Voltage** – Displays the total string voltage measured by the sensors. For a Low Voltage string this voltage is measured directly by the sensor on the most negative jar. For a High Voltage string this voltage is the sum of the individual jar voltages. Analog alarms (major and/or minor) can be set by clicking the corresponding alarm button.

**Voltage Delta** – Displays the difference between the highest and lowest jar voltage within the string. Too much variation in jar voltages could be an indication that there are problems with some jars. Analog alarms (major and/or minor) can be set by clicking the corresponding alarm button.

**Float Current & Ripple Current** – Displays the float & ripple current when there is a Current Monitoring Interface (CMI) connected to the Site Controller P-Bus A port (with its address set to the correct string number) and when the Float Sensor (toroid) is connected to the CMI. When both are connected, the Float & Ripple Current readings are displayed. If either one is not connected, the Float & Ripple Current readings will display “N/A”. Analog alarms (major and/or minor) can be set by clicking the corresponding alarm button.

**Ripple Voltage** – Displays the value calculated based off the Ripple Current. If either the CMI or the Float Sensor is not connected, the reading will display “N/A”.

**Discharge Current** – Displays the level of discharge current as it measured by the discharge current sensor. If either the RIM or the Discharge Sensor is not connected, the reading will display “N/A”.

**CMI COM** – Displays “Normal” when the Site Controller is communicating with the Current Monitoring Interface. “Failed” is displayed when the Site Controller has lost communications with the Current Monitoring Interface. “Not Installed” is displayed if the port never had a CMI associated with it. A digital alarm (major or minor) can be set by clicking the corresponding alarm button.

**Float Sensor COM** – Displays the status of the Float Sensor, either N/A, Normal or Failed. A digital alarm (major or minor) can be set by clicking the corresponding alarm button.

**Battery Sensor COM** – Displays the status of battery sensor communications and will show “Normal” when the Site Controller is communicating with all the battery sensors in the string and will show “Failed” when the Site Controller has lost communications with one or more battery sensors. A digital alarm (major or minor) can be set by clicking the corresponding alarm button.

**Battery Model** – User configurable to enter in the battery model (must unlock editing first – see [Unlocking the Site Viewer for Editing](#)). If a battery model number is selected in the Runtime Estimator, it will override this field.

**Battery Warranty** – User can select from 0 to 20 years.

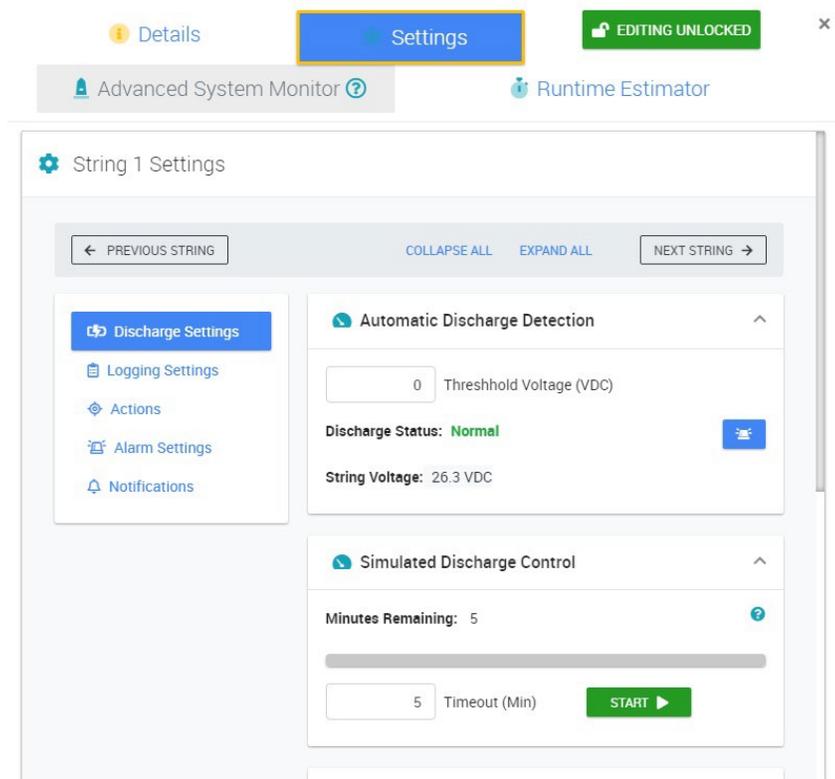
**Installation Date** – User can enter in date of installation.

**Battery Manufacture Date** – User can enter in date of manufacture.

**String Type** – Displays the type sensors connected to the port either DCP(LV) or UPS(HV). LV refers to Low Voltage type sensors and HV refers to High Voltage type sensors. (See [Sensor Selector Guide](#) for details.)

### 5.4.2.1.2 Port or Group Settings

Left-clicking on the Gear Icon next to the port (if available) will bring up the port or group Details and from there you can click on the Settings tab or you may right-click on the port and selecting “Settings” The following fields are listed below.



#### Discharge Settings

**Automatic Discharge Detection** – The Automatic Discharge Detection area allows you to specify a discharge threshold. When set to a value other than 0, if the string voltage measurement for that port is below the specified threshold identified the SC4 will recognize the string in discharge. A digital alarm (major or minor) can be set by clicking the corresponding alarm button.

**Simulated Discharge Control** – The Simulated Discharge Control area allows you to manually simulate a discharge by clicking the **START** button. This instructs the SC4 to generate more frequent log entries

as is done in the case of real discharge events. The SC4 will remain in this mode until the specified Timeout (Min) (in minutes) has elapsed or until you manually stop the simulated discharge.

**Select Discharge Current Source** – If equipped with a discharge sensor (optional) you can select the RIM number and Input number associated with the discharge sensor and assign it to this port. When the string goes into discharge the values returned from the discharge sensor will be recorded in the discharge log file for that string.

**Discharge Statistics** – The discharge event is detected by the Float Current Sensor or by the discharge string voltage threshold. A count of the Discharge Events and the duration of the Present (or Previous) Event and the Total Time (total discharge time) are also displayed. Users can also reset all values by pressing RESET DISCHARGE TIME & EVENT COUNT button.



**NOTE:** Admittance measurements and Battery Balancing are automatically disabled on all strings when a discharge event is detected on any string.

**Logging Settings**

**Status** – Displays the USB Flash Drive Status

USB Flash Drive Status	Description
Removed	USB drive has been removed
Trouble	Read-only or corrupt file system
Failed	Inoperative
Full	No more free space left on drive
Ready	Normal mode ready to read or write
In Use	Reading or writing to drive

**Periodic Logging** – User can select Daily (default), Hourly, or Disabled (not recommended). Pressing the LOG NOW button writes the data associated with the string into the String log file (`str_x.csv`) on the flash drive.

**Discharge Logging** – The SC4 will display a discharge logging interval of 10 or 20 seconds depending on how many sensors are attached to the SC4. Discharge logging can be disabled with the slider button (not recommended).

## Actions

### Actions:

- Measure Admittance on all Jars – This button forces each sensor on the string to take a new admittance measurement.
- Discover Now – This button forces the SC4 into discovery mode for this port.
- Reset String X – This button sends a global reset command down to all sensors on this port. After resetting the string will reinitialize.

### Disable / Enable Sliders:

- **Disable Discovery for Port X** – If disabled the SC4 will skip this port during discovery.
- **Disable the Advanced System Monitor for Port X** – When the Advanced System Monitor is enabled in Site Properties, this slider gives you the option to turn off Advanced System Monitor for individual ports.
- **Enable Battery Balancing** – This slider allows you to enable battery balancing. Battery Balancing is a patent pending process that equally distributes the charge voltage throughout the battery string.

**Ripple Current Measurement** – Displays the present Ripple Current reading and the Date/Time of the measurement. Measurements are taken once per hour. User can force a new measurement by pressing the MEASURE NOW button.

**Delete String** – Pressing the DELETE STRING X button will delete all string information including all alarm settings for the port.

## Alarm Settings

**Aggregate Admittance Alarm** – User configurable to generate an alarm when more than x blocs have an admittance change greater than x %. To generate an alarm both fields must have nonzero entries. A digital alarm (major or minor) can be set by clicking the corresponding alarm button. 

**Notifications** – Not used at this time.

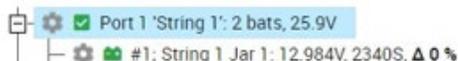
### 5.4.2.1.3 Port or Group Advanced System Monitor

The Advanced System Monitor continuously monitors float charging current, ambient temperature and battery temperatures at multiple points. If any battery temperature rises above the ambient temperature by an amount that exceeds user-defined thresholds, an alarm condition is generated if an alarm is set on delta temperature. . If any float current exceeds user-defined thresholds, an alarm is also generated in a similar manner.

The Advanced System Monitor is not an applicable feature for the Genset BMS. For more information on this feature, please contact Phoenix Broadband Technologies.

### 5.4.2.2 Battery Information

Expanding the port will show the individual jars / cells. The information shown will be the jar / cell name (user configurable), the jar / cell voltage, the jar / cell admittance and the jar / cell admittance change in a delta percentage as compared to the initial admittance set.



### 5.4.2.2.1 Battery Details

Right-clicking on the individual cell / jar and selecting “View Details” or left-clicking on the Gear Icon next to the cell / jar (if available) will bring up the cell / jar Details. The following fields are listed below.

The screenshot shows a 'String 1, Jar 1 Details' window with the following data:

Parameter	Value	Actions
Name	String 1 Jar 1	Copy
Voltage	12.891 VDC	Alarm
Initial Admittance	2150 S	
Jar Admittance	352 S	
Cell Admittance	2112 S	
Admittance Change From Baseline	-1 %	Alarm
Admit. Measurement Time	6/17/2024 15:46:55	Measure Now
Temperature (Hold)	24 °C; 75 °F	Alarm
Temp. Measurement Time	6/17/2024 15:46:43	
Ripple Voltage	N/A	
Software Version	1.10	
Hardware Version	7.3	
Electrolyte Level	Not installed	Alarm

**Name** – User configurable (must unlock editing first – see [Unlocking the Site Viewer for Editing](#)).

**Voltage** – Displays the present voltage to three decimal places. Measurements are made and reported each time the sensor is polled. Analog alarms (major and/or minor) can be set by clicking the corresponding alarm button.

**Admittance Change** – Displays the current admittance reading in Siemens along with the admittance change delta percentage as compared to the initial admittance. Analog alarms (major and/or minor) can be set by clicking the corresponding alarm button. The Cell Admittance Change indicates the difference between the present Cell Admittance and the user specified Initial Cell Admittance expressed as a percentage. The Cell Admittance Change provides an indication of how the jar has changed over time. (If no Initial Cell Admittance has been set, this indication will read “N/A.” The date and time of the admittance measurement and the initial admittance setting add a time perspective to the change.

**Last Admittance** – Displays the date and time the last admittance reading was taken.

**Temperature** – Displays the current temperature. Measurements are made and reported each time the sensor is polled. Analog alarms (major and/or minor) can be set by clicking the corresponding alarm button. 

**Temperature (hold)** – Activating Battery Balancing and taking Admittance Measurements can heat up the sensor. When this happens the Site Controller will put a hold on taking a temperature measurement and allow the sensor to cool back down to jar temperature.

**Temp. Measurement Time** – Displays the date and time the last temperature measurement was taken.

**Ripple Voltage** – Displays the current ripple voltage.

**Software Version** – Displays the battery sensor firmware version.

**Hardware Version** – Displays the battery sensor hardware version.

**Electrolyte Level** – Displays the status of electrolyte level. 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 Installed.”

**Sensor Address** – Displays the sensor address programmed into the sensor from the factory for high voltage sensors. For low voltage sensors it will display zero.

**Physical Port, Jar** – Displays the physical port number the battery sensor daisy chain is connected to on the rear of the SC4 along with the assigned jar number.

### 5.4.2.2.2 Battery Settings

Right-clicking on the individual cell / jar and selecting “Settings” or left-clicking on the Gear Icon next to the port (if available) will bring up the cell / jar Details and from there you can click on the Settings tab. Pressing the PREVIOUS JAR / NEXT JAR will cycle through all the jars.

**Sensor Address** – Displays the current sensor address (zero for low voltage sensors). Each High Voltage sensor has a factory programmed address. These addresses are recorded during the discovery process. The sensors are discovered in a random order and assigned sequentially to the jars. This results in the random ordering of the jars shown on the web page. To correct this ordering problem, start with jar 1 and enter the address of the sensor recorded during installation in the Change Sensor Address field. When all addresses have been changed reset the String to reinitialize the sensors with the correct jar numbers. This should be done before entering any jar specific information such as alarm limits or initial admittance.

#### Admittance Settings

**Jar Information** – Displays the current cell admittance, initial admittance (if set), and calculated cell impedance. If the initial admittance has not been set the initial admittance field will display zero.

**Measure** – Displays the sensor status (see table below) and sensor control state. The Sensor Control State indicates whether monitoring of the sensor is Enabled or Disabled. (Control state can be set via [SNMP](#).) To force an admittance measurement, press the MEASURE NOW button.

Sensor Status	Description
<b>Normal</b>	This sensor is operating normally
<b>Fault</b>	There is no communications with this sensor
<b>Measuring</b>	This sensor is making an admittance measurement
<b>Sensor Disabled</b>	This sensor was disabled through SNMP
<b>String Disabled</b>	This string was disabled through SNMP
<b>Missing</b>	This sensor was expected based on the string voltage, but is not present
<b>Measurement Failed</b>	The last admittance measurement failed

**Set Initial Cell Admittance** – Users can set an admittance baseline for the individual cell /jar or the entire string. There are two options, setting a baseline based on the present admittance reading and setting a baseline based on a specification. For either option you can apply this to the current jar only or to the entire string by selecting the appropriate radio button.

- To set a baseline based on the present admittance reading press the COPY PRESENT CELL ADMITTANCE TO INITIAL CELL ADMITTANCE button. The present cell admittance value will be copied to the initial cell admittance value and the Cell Admittance Change delta percentage will be updated to show the difference between the Cell Admittance and the Initial Cell Admittance. The date and time will be recorded in the Initial Admittance Time field.
- To set a baseline based on a specification, enter the baseline admittance reading into the Set Initial Cell Admittance field and press the INITIAL CELL ADMITTANCE button. The value will appear in the Initial Cell Admittance field and the Cell Admittance delta percentage will be updated to show the difference between the Cell Admittance and the Initial Cell Admittance. The date and time will be recorded in the Initial Admittance Time field.

**Logging Settings**

**On-Demand Logging** – Press the LOG NOW button to create a manual entry in the string log file (str\_x.csv).

**Actions**

**Delete Jar** – Press the DELETE JARX button to delete the current jar. This will remove the jar from the string and any associated alarm settings.

**LED Controls** – Displays the Sensor LED Control (“Normal” or “Flash Green/Red”). Clicking the FLASH LED button commands the battery sensor to flash its LED alternating between Red and Green. The flashing LED can help onsite personnel locate a jar in a large deployment. Depending on what the Site Controller is doing it may take a minute for the LED to start or stop flashing when the button is clicked.

Additional LED states can be set when using SNMP Manager. (See [SNMP](#) for details.).

### Alarm Settings

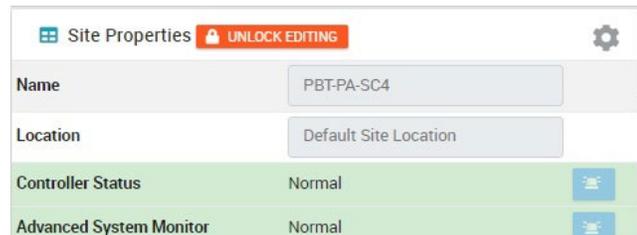
This section is not used currently.

### Notifications

This section is not used currently.

## 5.4.3 Site Properties

The Site Properties pane displays site specific information for the SC4. This includes the SC4 location, name, number of installed strings, string mode, overall status, unit temperature, software version, and IP configuration details.



Site Properties contain user configurable fields Name and Location (must unlock editing first – see [Unlocking the Site Viewer for Editing](#)).

Other status fields in Site Properties that cannot be edited are:

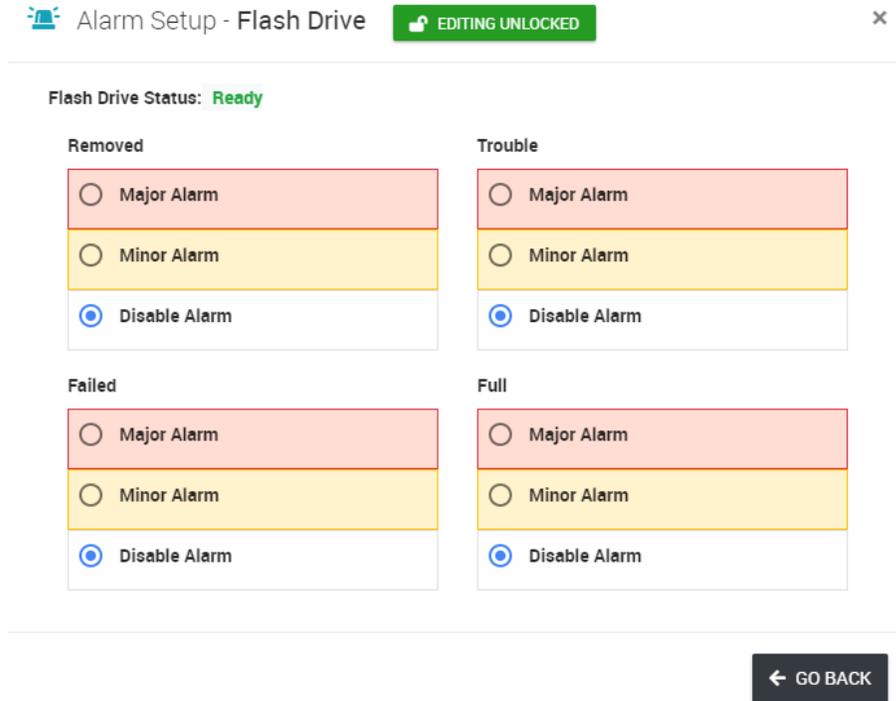
- **Controller Status** – Indicates status of Normal, Minor Alarms, Major Alarms or if any Port is in Discharge.
- **Advanced System Monitor** – Indicates Status of Disabled, Normal, Minor Alarms, Major Alarms, Failed, or Trouble.
- **Number of Strings Installed** – Shows number of ports that have battery sensors attached.
- **Controller Temperature** – Shows the internal temperature within the SC4.
- **Firmware Version** – Shows the currently loaded firmware version.
- **Linux Version** – Shows the currently loaded OS version.
- **MAC Address** - Shows the Site Controller Media Access Control (MAC) address. The MAC address is a unique identifier assigned to network interfaces for communications on the physical network segment. MAC addresses are used as a network address for most IEEE 802 network technologies, including Ethernet and WiFi.
- **IPv4 IP Address** – Shows the current IP Address.
- **IPv4 Gateway** – Shows the current gateway address.
- **IPv4 Netmask** – Shows the current netmask.
- **DHCP Status** – Shows either Enabled or Disabled.
- **Up Time** - Shows the time the Site Controller has been running since the last reset.
- **System Time** – Shows the current SC4 time and date.

### 5.4.3.1 Site Properties (additional settings)

Clicking on the Gear Icon in Site Properties will bring up a dialog with additional settings.

#### Logging Settings

Event Logging – Displays the Flash Drive Status and Free Space in MB. To disable event logging move the slider to the left (not recommended). Digital alarms (major and/or minor) can be set by clicking the corresponding alarm button.  Individual alarms can be set on the four different parameters shown below.



Alarm Setup - Flash Drive EDITING UNLOCKED

Flash Drive Status: Ready

Removed	Trouble
<input type="radio"/> Major Alarm	<input type="radio"/> Major Alarm
<input type="radio"/> Minor Alarm	<input type="radio"/> Minor Alarm
<input checked="" type="radio"/> Disable Alarm	<input checked="" type="radio"/> Disable Alarm

Failed	Full
<input type="radio"/> Major Alarm	<input type="radio"/> Major Alarm
<input type="radio"/> Minor Alarm	<input type="radio"/> Minor Alarm
<input checked="" type="radio"/> Disable Alarm	<input checked="" type="radio"/> Disable Alarm

← GO BACK

#### Actions

**Site Information** – Displays the Admittance Measurement Interval, Min Alarm Time, and Admittance Meter Notes.

- To change the Admittance Measurement Interval for the Site Controller, enter the desired interval, in hours, in the Change Admittance Measurement Interval (Hours) field. Setting this field to zero will disable all admittance measurements.
- The Minimum Alarm Time (Sec) field allows you to specify how long an alarm condition exists (in seconds) before it triggers an alarm.
- The Admittance Meter Notes field provides a location to note the type and serial number of the meter used to make the reference measurements. (This is useful since there is substantial variation in the measurements made by different model meters.) This field is limited to 32 characters.

**Maintenance Mode** – Maintenance mode is used for suppressing alarms for a specified amount of time. Enter in the amount of anticipated time in minutes and move the slider to the right to enable Maintenance

Mode. When activated, alarm processing will be suspended until the timer runs out or the slider is moved back to the left.

### **Actions**

Setup Alarm Outputs – Pressing the SETUP ALARM OUTPUTS allows you to setup up to four built-in alarm outputs on the Site Controller. The configuration of these outputs is identical to the ROM configuration. These outputs can be wired from the Aux port on the Site Controller to external devices that accept contact closure inputs. Refer to the *SC4 AUX Port Wiring Diagram (705-000021-00)* for more information.

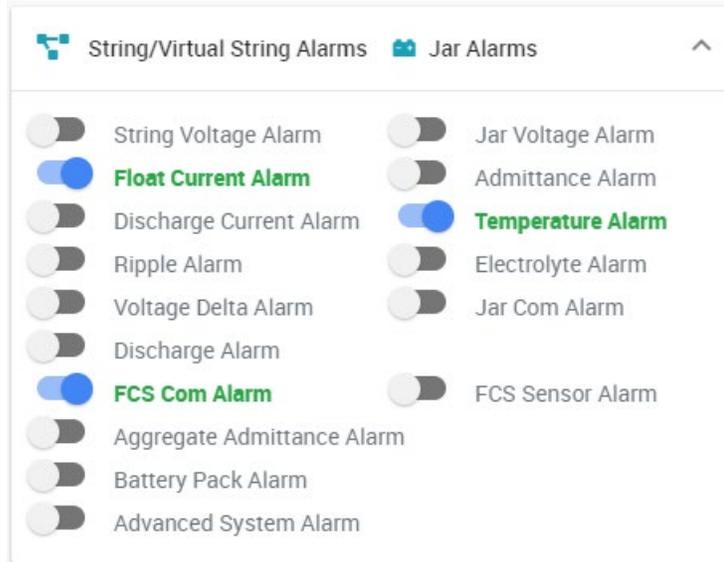
The image shows two screenshots of a web interface for configuring alarm outputs. The first screenshot, titled "Select Site Output", features four radio buttons labeled "Output 1", "Output 2", "Output 3", and "Output 4". "Output 1" is selected. To the right of the radio buttons is a toggle switch labeled "Relay Contacts Closed", which is currently in the "off" position. The second screenshot, titled "Select Site Output 1 Control Mode", shows four radio buttons: "Manual Control", "Site Controller - Major Alarms", "Site Controller - Minor Alarms", and "Site Controller - Major & Minor Alarms". "Manual Control" is selected.

**Select Site Output** – Select one of the 4 built in outputs using the radio buttons. When selected each output will show what the active state of the output will be (ie, “Relay Contacts Closed”). Change the active relay state with the slider button.

**Select Site Output X Control Mode** – With one of the outputs selected in Select Site Output, select one of the 4 modes.

- **Manual Control** – change the state of the relay only through the web page.
- **Site Controller – Major Alarms** – Relay state will change with only major alarms in the selected categories (see category list below).
- **Site Controller – Minor Alarms** – Relay state will change with only minor alarms in the selected categories (see category list below).
- **Site Controller – Major & Minor Alarms** – Relay state will change with major or minor alarms in the selected categories (see category list below).

To select a category, move the slider to the right. Multiple categories can be selected.



If any alarm is generated within the category and the severity is also selected in Output Control Mode, it will set the relay to the active state. Once the alarm clears it will set the relay back to the inactive state. If multiple categories are selected, one or more alarms will activate the relay but all selected categories / severities must be cleared in order to set the relay back to the inactive state.

**Discover All Sensors On All Ports** – Pressing this button will force the SC4 into discovery mode to identify any new sensors that have been connected. The Site Controller will periodically discover new sensors, but clicking the button initiates the discovery process immediately.

**Set Controller Time From PC** – Pressing this button sets the real time clock in the Site Controller to the local machine (PC) time. 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. This may not result in the Site Controller time being the same as the PC time, allowing 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). (See [NTP Configuration](#) for details.)

**RESET DISCHARGE TIME & EVENT COUNT** – Pressing this button resets all discharge time and event counters in the SC4 to zero.

**FLASH MODEM POWER** – Pressing this button will interrupt the 12Vdc output from the Site Controller. (This is useful for cycling the power of a connected component, such as a modem.)

**MEASURE ADMITTANCE ON ALL JARS** – Pressing this button will force an admittance measurement on all jars connected to the SC4.

**RESET ALL SENSORS** – Pressing this button sends a reset command to every battery sensor on every string. The database is unaffected. The sensors will be rediscovered during the next polling cycle.

**RESET CONTROLLER** – Pressing this button will reboot the SC4. The database is unaffected.

**Account**

**LOG OFF** – Pressing this button will log you off and editing will be locked until you log in again.

**Advanced System Features**

**Advanced System Monitor** – To enable Advanced System Monitor, slide the button to the right, do disable slide to the left.

**Alarm Annunciator** – When enabled any alarm within the controller will constantly cycle the power on the 12 VDC output of the SC4. Users can attach a 12 volt bulb to have a local flashing indicator that there is an alarm.

**Information**

**File System Free Space** – Displays the File System Status and Free Space available in MB.

**Virtual String**

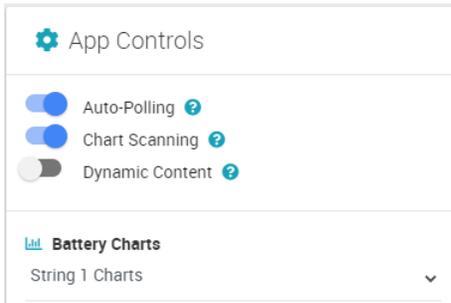
**Activate Virtual Strings** – There are 3 radio buttons, Combined Strings, Split Strings, and Disable Virtual Strings (default). There are two different types of virtual strings. The Site Controller can:

- Combine separate port inputs to create a virtual string.
- Split the sensors on one port input into several virtual strings.

This feature is not applicable for the Genset BMS. For more information on this feature, please contact Phoenix Broadband Technologies.

## 5.4.4 App Controls

The “App Controls” pane contains options that can be selected to modify the operation of the app. It also contains information about the status of the app. Some controls are “persistent”, meaning their setting will be preserved even if Site Viewer is shut down and restarted.



## 5.4.5 Charting Area Panes

The Charting Area panes provide graphs illustrating the current string voltages, admittances and temperatures cycled for each populated port, unless you have a single port selected in the App Controls pane. Hovering your mouse over any of the graph items provides the actual numeric value associated with the corresponding item. The graphs are color coded with status information, like the tree color coding.



Chart scanning can be disabled using the [App Controls](#) pane.

## 5.5 Site Viewer Menu Bar

The menu bar provides access to specific functions and resources such as log file access, links to documentation, IP configuration, and so on. Each menu item is described below.

### File Menu

- **File > Print Screen** - Prints the presently viewed screen to the default printer. For best results, use a color printer.
- **File > Log Files** - Displays the list of log files for the SC4. These are .csv files which are readable, viewable, and graphable in any csv compatible spreadsheet program. Clicking on a file, downloads it to your browser's "Downloads" folder.
- **File > Manuals, Drivers & Utilities** - Displays a list of documents and utility programs stored on the SC4's flash drive. Clicking on an item, downloads it to your browser's "Downloads" folder.
- **File > Site Viewer Manual** – Launches the Site Viewer manual in a separate browser window.
- **File > Report Generator** – Generates and exports reports based on user selected strings/filters.

### Resources Menu

This provides access to manuals and videos from our web site. These will be the most up-to-date versions available. Requires internet access from your PC.

### Setup Menu

This is a password protected area that allows you to change the IP address of the SC4. Contact your system administrator for access.



**NOTE:** By default, the unit password is: `admin`

See [SC4 Configuration Program](#) for details on configuring the Site Controller password.

### Help Menu

This provides access to the Site Viewer FAQ as well as the version of Site Viewer currently running.

### 5.5.1 Site Viewer IP Configuration

Choosing **Setup > IP Configuration** from the Site Viewer menu bar allows you to configure the IP settings of the connected SC4.

1. Choose **Setup > IP Configuration** from the Site Viewer menu bar. The Admin Password dialog box appears.



**NOTE:** By default, the unit password is:

admin

See [SC4 Configuration Program](#) for details on configuring the Site Controller password.

2. Enter the administrative password for the SC4 in the field on the dialog box and then click e. The IPv4 Configuration dialog box appears.

IPv4 Configuration

DHCP Client Disabled

IP Address  
192.168.0.140

Gateway  
192.168.0.1

Net Mask  
255.255.255.0

UPDATE CANCEL

3. Change the IP settings as desired.
4. Click ENTER. The SC4 will reboot and restart with the selected settings in place.

## 6. SNMP

The Genset BMS provides an SNMP interface for third party software management. 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.

### 6.1 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 or disabled in the setup of the Site Controller. See [SC4 Configuration Program](#) for details on configuring the Site Controller ports.

These MIBs can be obtained at no charge by contacting Phoenix Broadband.

The Site Controller 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 Site Controller 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
- pbtRemoteAgentMIB Phoenix Remote Agent 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 configurable objects are stored in Site Controller 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 3

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 `propertyTable`. There are 4 objects to set the thresholds for each of the alarm capable object. Each alarm limit can be individually enabled or disabled.

## 6.2 Community Strings

The community strings are configured from the console 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 and that UDP ports 161 and 162 are not blocked.

## 6.3 Traps

Whenever an alarm occurs SNMP Traps are sent to up to 3 trap receivers. The Trap Destinations are configured from the console interface described earlier in this document. The traps are defined in the `theCommonMIB`. Each trap includes a text field that describes the trap.

## 6.4 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/MIBBrowser.html> or <http://www.mg-soft.com/download.html>.

## 7. Retrieving Log Files

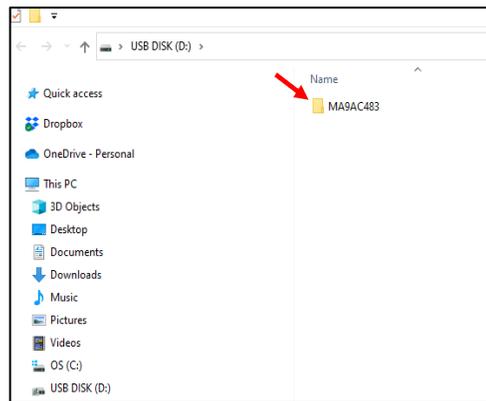
When using Site Viewer (see [Site Viewer Web Page](#)), there are three ways of retrieving files:

- Manually
- Remotely through web interface
- Remotely using WinSCP

### 7.1 Retrieve Log Files Manually

Remove the flash drive from the controller and insert into USB slot on computer and copy the “MA” folder as shown below. The log files will be in a folder named as in the example below.

Ex: MA9AC483 (MA plus the last 6 characters of the MAC address of the unit which can be found on a label on top of the controller as shown below on right).



**NOTE: DO NOT** remove flash drive while the LED to the left of the flash drive is **red** (Files are being written when LED is Red). Wait until the LED is **green**. Replace flash drive when finished copying.

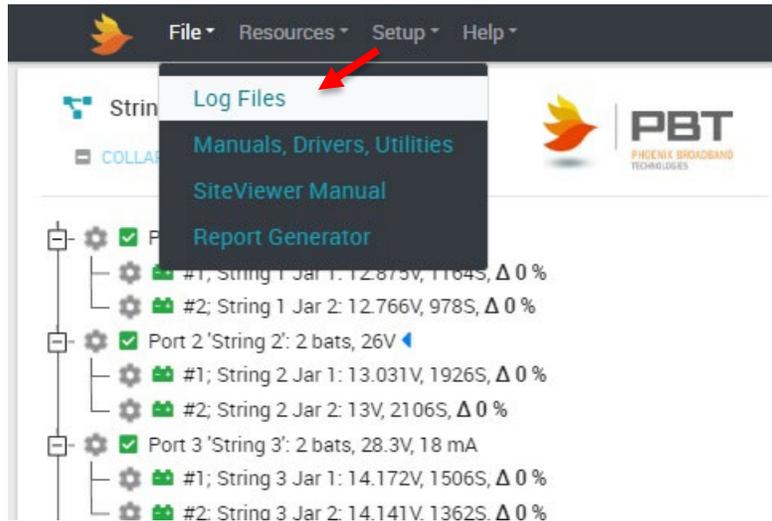
## 7.2 Retrieve Log Files Remotely Through Web Interface

1. Type the IP address of the SC4 in the browser's URL address space, for example 50.199.84.xxx, and press the ENTER key. The controller will display the Site Viewer web page as shown in the example below.



**NOTE:** When SiteViewer starts, it immediately begins collecting data about the site and all the strings and batteries connected to the SC4.

2. Click on File, then Log Files.



3. This will bring up the Log Files directory of the SC4 in a separate browser window. There are several types of log files:

### Index of /Logfiles/sdb1/MA9AC483

- [Parent Directory](#)
- [debug.csv](#)
- [dis\\_01.csv](#)
- [dis\\_02.csv](#)
- [dis\\_03.csv](#)
- [dis\\_04.csv](#)
- [dis\\_05.csv](#)
- [dis\\_06.csv](#)
- [errors.csv](#)
- [events.csv](#)
- [group\\_1.csv](#)
- [group\\_2.csv](#)
- [group\\_3.csv](#)
- [group\\_4.csv](#)
- [group\\_5.csv](#)
- [group\\_6.csv](#)
- [str\\_01.csv](#)
- [str\\_02.csv](#)
- [str\\_03.csv](#)
- [str\\_04.csv](#)
- [str\\_05.csv](#)
- [str\\_06.csv](#)

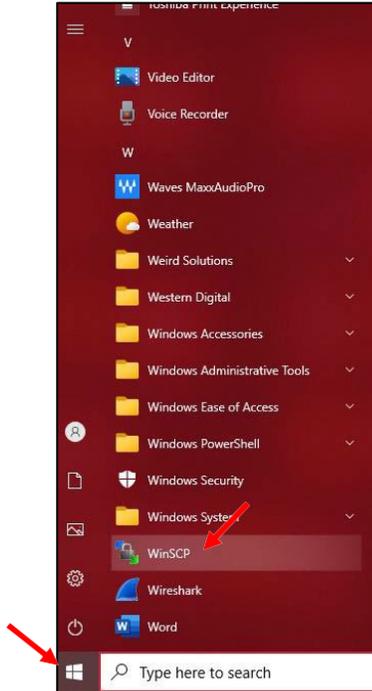
- debug.csv: logs debugging info to assist in troubleshooting
- dis\_###.csv: logs discharge events
- errors.csv: logs network and file system errors for the SC4.
- events.csv: logs any system events (analog alarms, discrete alarms, and so on)
- group\_#.csv: provides CellMetrix data for given group.
- str\_###.csv: provides a daily listing of details for connected strings

4. Clicking on any of the log file entries causes the selected file to be downloaded to your Downloads folder on your computer.

## 7.3 Retrieve Log Files Remotely Using WinSCP

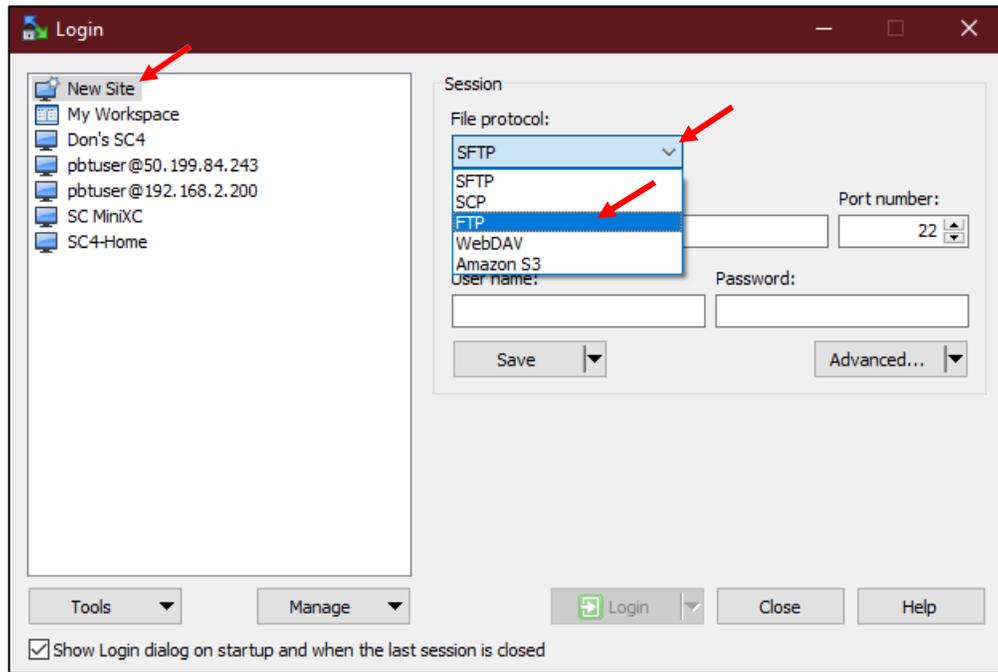
WinSCP is an open source free SFTP client, FTP client, WebDAV client, S3 client and SCP client for Windows. Its main function is file transfer between a local and a remote computer.

1. Click on the link to download WinSCP if needed: <https://winscp.net/eng/download.php>
2. Click on the Windows icon on bottom left of your screen shown below and scroll to WinSCP as shown. Click on WinSCP.

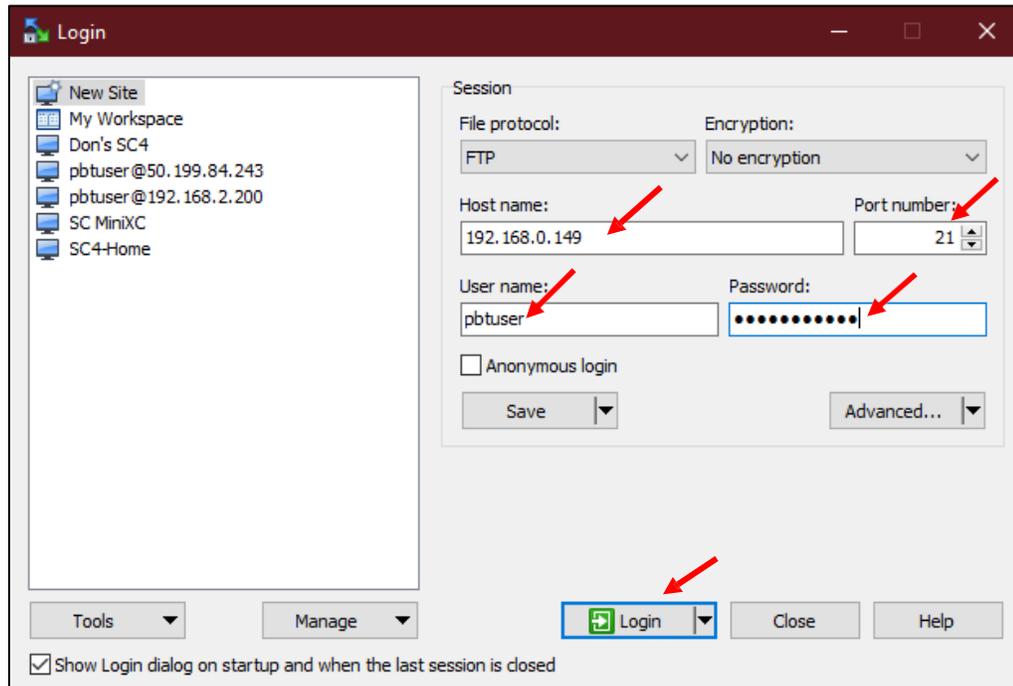


WinSCP should open with a window as shown below.

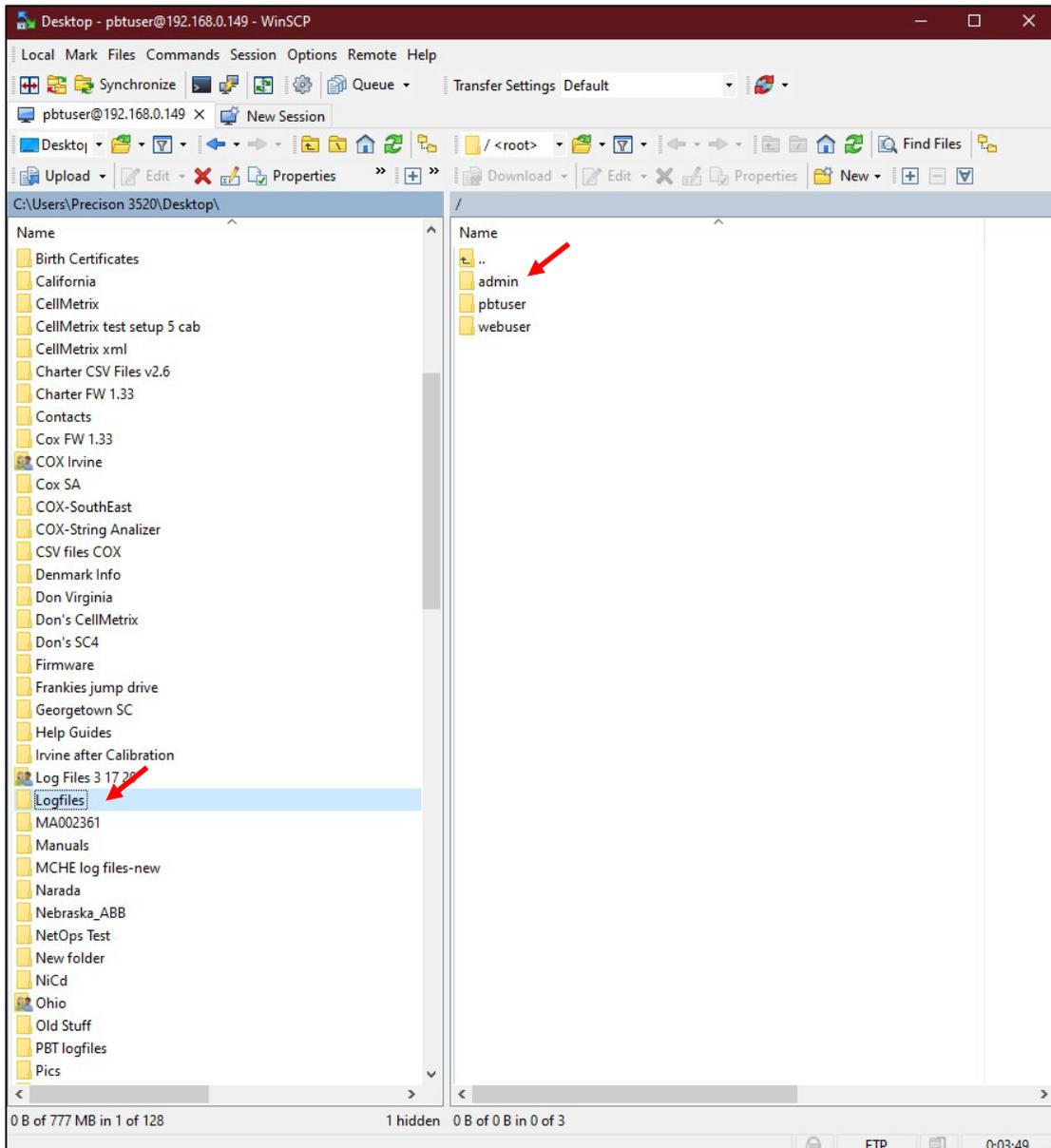
3. Click New Site, then click on the dropdown arrow as shown and choose FTP as shown below.



4. On the next window shown below, type the IP address of the PBT-SC4 Controller under Host name and Port number should be 21 as shown. Enter pbtuser and pbtpassword (lower case) then click **Login** as shown.

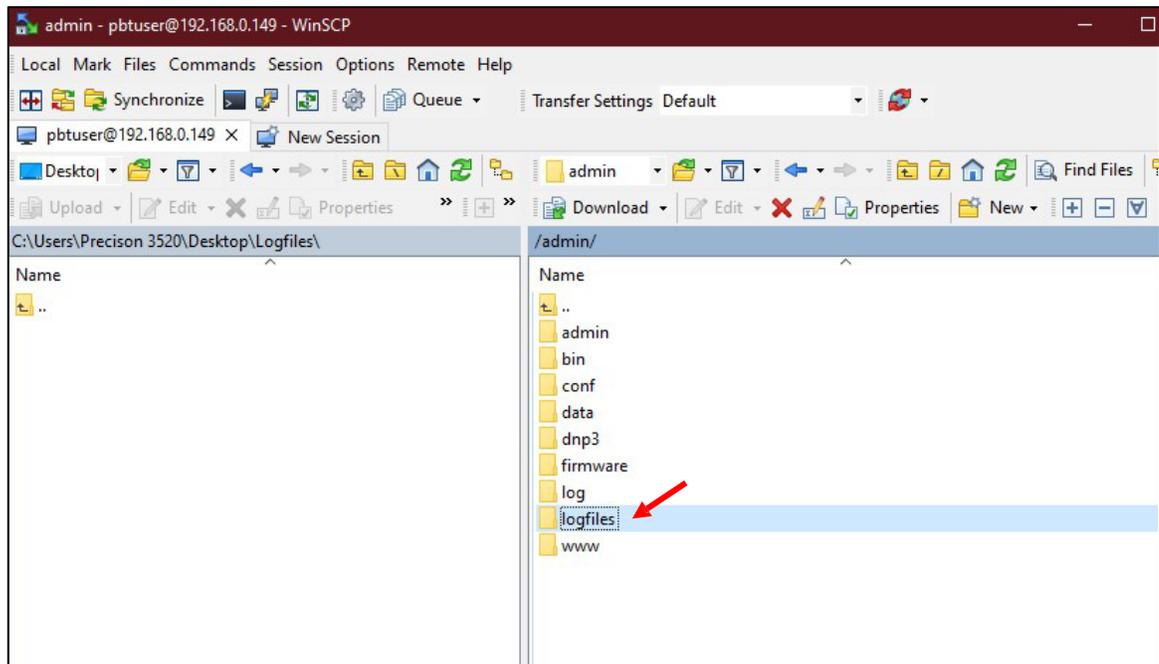


5. The window will now display files from your computer on the left side, files in the SC4 on the right side. On the left side, choose a location you would like to copy the log files into as shown. On the right side, double-click on the “admin” folder as shown below.

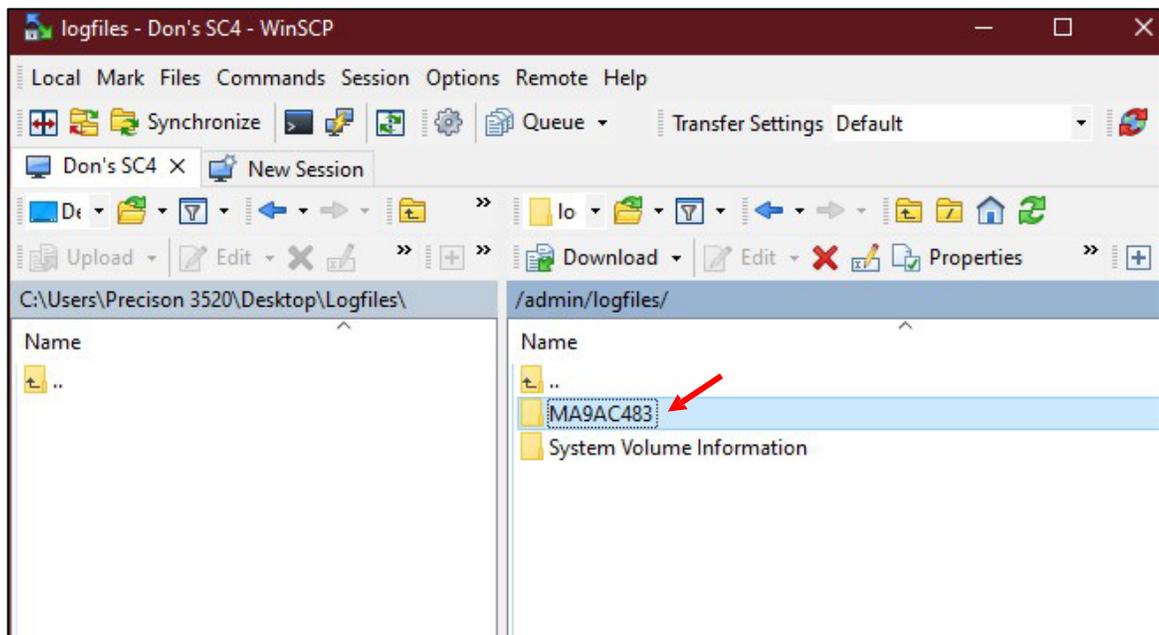


## Genset BMS - Installation and Operation Manual Retrieving Log Files

6. You should now see a logfiles folder. Double click on the logfiles folder on the right side to open the folder.



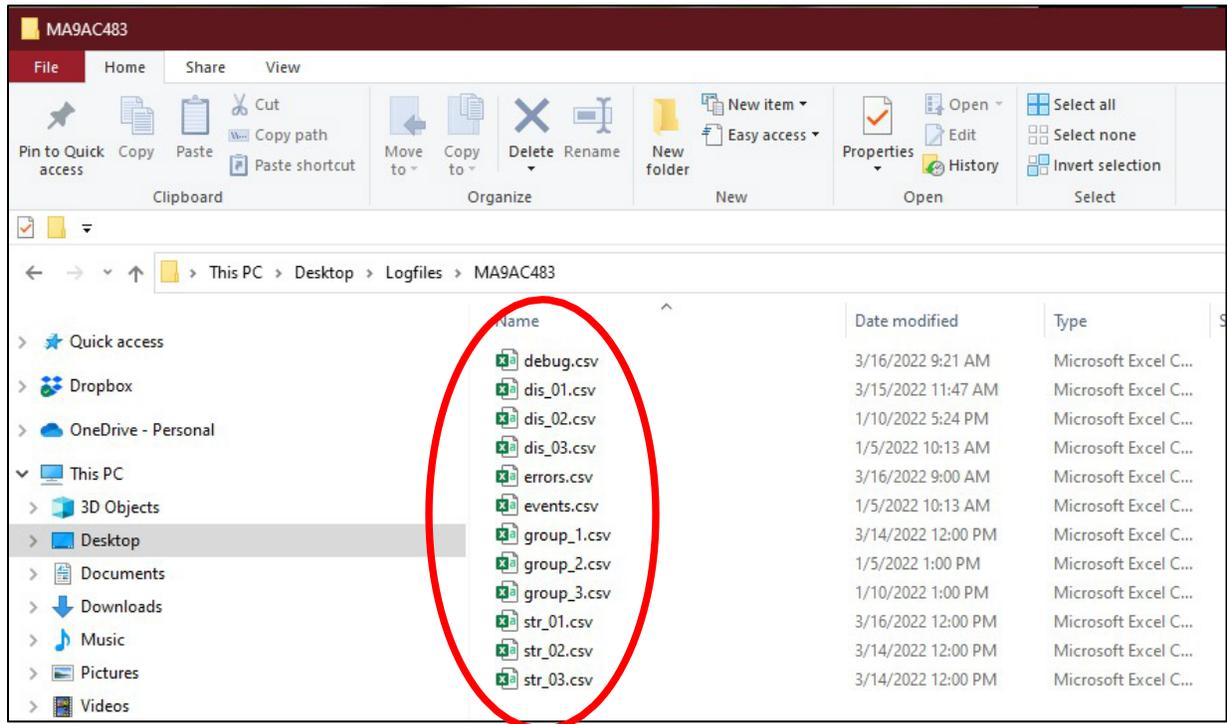
7. You will now see a folder starting with the letters "MA". See example below.  
ex. **MA9AC483** (MA plus the last 6 characters of the MAC address of the unit).



8. Click on the **“MA”** folder to highlight it, then while holding down the mouse key, drag the **“MA”** folder to the **Left** side of the screen. The **“MA”** folder will now be copied into the destination folder you chose.



**NOTE:** Open log files from your destination folder.



9. When you open the **“MA”** folder, you will notice there are several types of log files:
  - debug.csv—logs debugging info to assist in troubleshooting
  - dis\_###.csv – logs discharge events
  - errors.csv – logs network and file system errors for the SC4.
  - events.csv – logs any system events (analog alarms, discrete alarms, and so on)
  - group\_#.csv – provides CellMetrix data for given group.
  - str\_###.csv – provides a daily listing of details for connected strings

## 8. 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	UDP	FTP
22	SSH	SSH
25	TCP	SMTP – Sending email
80	TCP	HTTP – Web page
502	TCP	ModBus
20000	TCP	DNP3
123	UDP	NTP – Time server
161	UDP	SNMP – Gets and Sets
162	UDP	SNMP - Traps
30705	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.