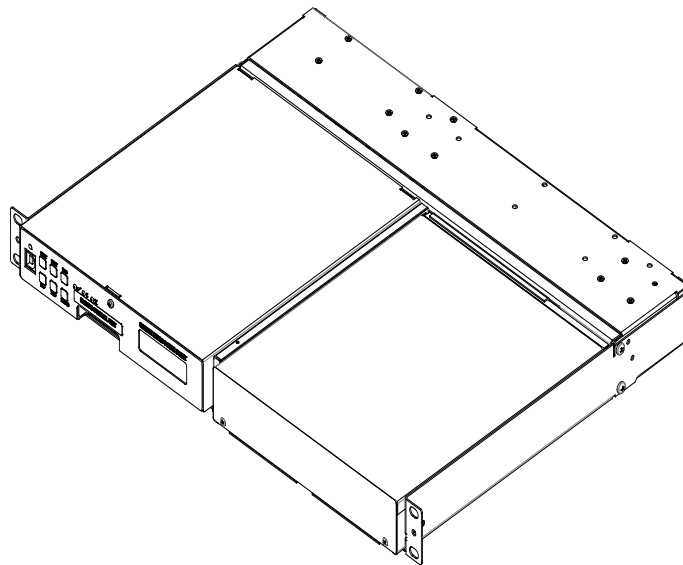




# SAGEON

## Sageon Shield Standalone Battery Monitor

### Installation/Setup Guide For 103-4023-01





## **RECEIVING INSTRUCTIONS & GENERAL EQUIPMENT INFORMATION**

*Please Note: For your protection, the following information and the product manual should be read and thoroughly understood before unpacking, installing, or using the equipment.*

UNIPOWER, LLC presents all equipment to the delivering carrier securely packed and in perfect condition. Upon acceptance of the package from us, the delivering carrier assumed responsibility for its safe arrival to you. Once you receive the equipment, it is your responsibility to document any damage the carrier may have inflicted, and to file your claim promptly and accurately.

### **1. PACKAGE INSPECTION**

- 1.1** Examine the shipping crate or carton for any visible damage: punctures, dents, and any other signs of possible internal damage.
- 1.2** Describe any damage or shortage on the receiving documents, and have the carrier sign their full name.
- 1.3** If your receiving freight bill notes that a Tip-N-Tell is attached to your freight, locate it. If the Tip-N-Tell arrow has turned even partially blue, this means the freight has been tipped in transport. Make sure the carrier notes this on your receipt before you sign for the freight.

### **2. EQUIPMENT INSPECTION**

- 2.1** Within fifteen days, open the crate and inspect the contents for damages. While unpacking, be careful not to discard any equipment, parts, or manuals. If any damage is detected, call the delivering carrier to determine appropriate action. They may require an inspection.

**\*SAVE ALL SHIPPING MATERIAL FOR THE INSPECTOR TO SEE!**

- 2.2** After the inspection has been made, call UNIPOWER. We will determine if the equipment should be returned to our plant for repair, or if some other method would be more expeditious. If it is determined that the equipment should be returned to UNIPOWER, ask the delivering carrier to send the packages back to UNIPOWER at the delivering carrier's expense.
- 2.3** If repair is necessary, we will invoice you for the repair so that you may submit the bill to the delivering carrier with your claim form.
- 2.4** It is your responsibility to file a claim with the delivering carrier. Failure to properly file a claim for shipping damages may void warranty service for any physical damages later reported for repair.

### **3. HANDLING**

Equipment can be universally heavy or top-heavy. Use adequate humanpower or equipment for handling. Until the equipment is securely mounted, be careful to prevent the equipment from being accidentally tipped over.

**4. NAMEPLATE**

Each piece of UNIPOWER equipment is identified by a part number on the nameplate. Please refer to this number in all correspondence with UNIPOWER.

**5. INITIAL SETTINGS**

All equipment is shipped from our production area *fully checked and adjusted*. Do not make any adjustments until you have referred to the technical reference or product manual.

**6. SPARE PARTS**

To minimize downtime during installation or operation, we suggest you purchase spare fuses, circuit boards and other recommended components as listed on the Recommended Spare Parts List in the back of the product manual. If nothing else, we strongly recommend stocking spare fuses for all systems.

**ISSUE HISTORY**

ISSUE	PAGE (S) ALTERED	DESCRIPTION OF CHANGE	ISSUED BY /DATE
4	ALL	Updated UNIPOWER logo & contact information. See PCO# 44465	WD 6/29/17

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Throughout the remainder of this manual, “UNIPOWER” will mean “UNIPOWER, LLC.”

**PERSONNEL REQUIREMENTS**

Installation, setup, operation, and servicing of this equipment should be performed by qualified persons thoroughly familiar with this Product Manual and Applicable Local and National Codes. A copy of this manual is included with the equipment shipment.

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## 1. INTRODUCTION

The Sageon Shield Standalone Battery Monitor is a complete solution for monitoring the status of a 48V battery string. The Sageon Shield Battery Monitor will monitor individual cell voltage, ambient and pilot cell temperature, and battery string charge/discharge current (optional). Using UNIPOWER's Sageview software the user can obtain a snapshot view of the present state of the batteries remotely via the integral Web/SNMP interface card, or locally at the unit via the front panel USB connection. Alarming is provided via five user configurable relays that can be triggered on a variety of battery conditions; by default, these relays will "trip" on high battery cell voltage, low battery cell voltage, high cell voltage deviation, low cell voltage deviation, and high ambient or battery temperature.

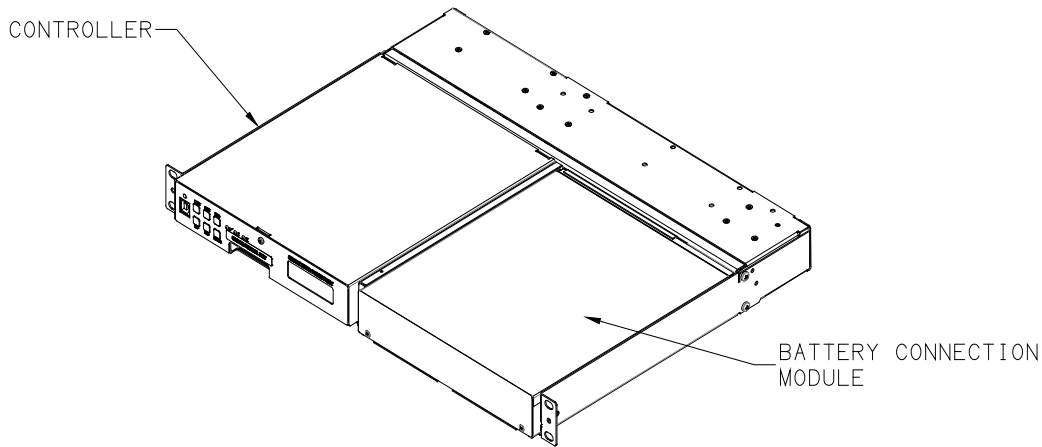


Figure 1. Sageon Shield Standalone Battery Monitor

## 2. INSTALLATION

### 2.1. MOUNTING THE POWER SHELF

The battery monitor is mounted into a standard 19" rack using 12-24 screws. A minimum of four screws are required to secure the Power shelf into the rack. It is recommended to initially install the Power shelf into the rack without the Controller in place. 23" mounting brackets are available; consult factory for part numbers.

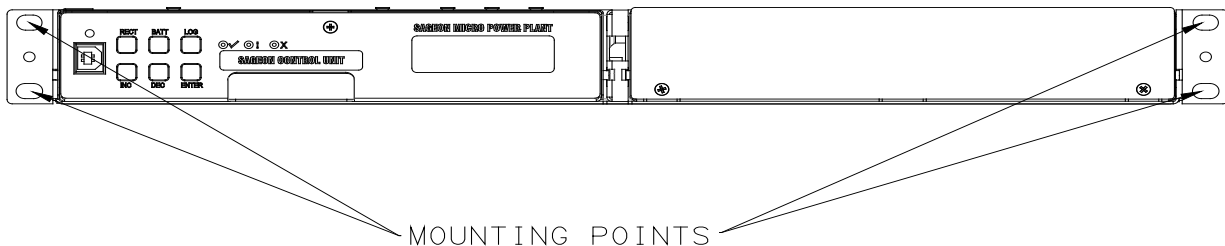


Figure 2. Mount points for securing battery monitor in a rack

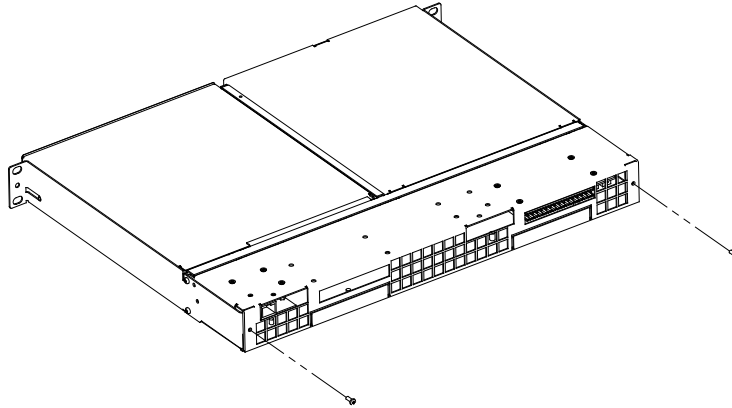
Wiring for the standard Power shelf is rear access only.

#### 2.1.1. Tools Required for Installation

- No. 2 Phillips-screwdriver (for tightening rack bolts)
- No. 1 Phillips-screwdriver (for removing back panel screws)
- 3/32" Slotted-screwdriver (for tightening terminal block connections)

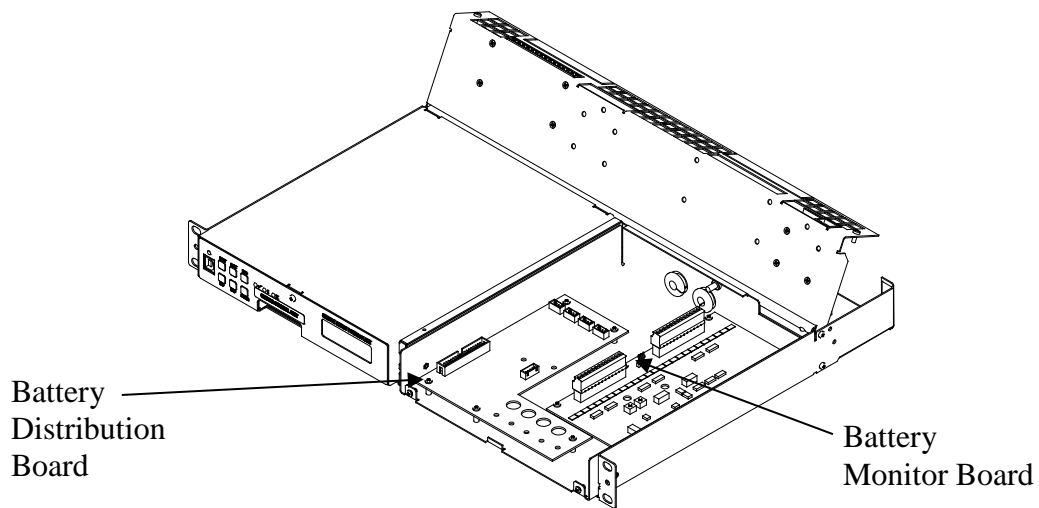
### 2.1.2. Gaining Access to Wiring

**WARNING:** Access to the rear wiring should be limited to qualified service personnel. It is recommended to remove the power before gaining access to the rear wiring due to the safety hazard present inside the electrical enclosure. Similarly, the energy hazard associated with wiring connected to the batteries bus must be addressed through the use of appropriately insulated tools and other measures to prevent accidental short circuits to the DC bus.



*Figure 3. Opening top rear cover to access wiring*

All connections to the Sageon Shield Standalone Battery Monitor are made at the rear of the unit and within the battery connection module. To open the top rear cover, remove the two rear M3 screws securing the cover to the back. The top cover will then hinge up to provide access to the wiring. To gain access to the boards in the battery connection module remove the (2) 4-40 screws from the front panel and slide the cover forward.



*Figure 4. Sageon Battery monitor internal PCBs*



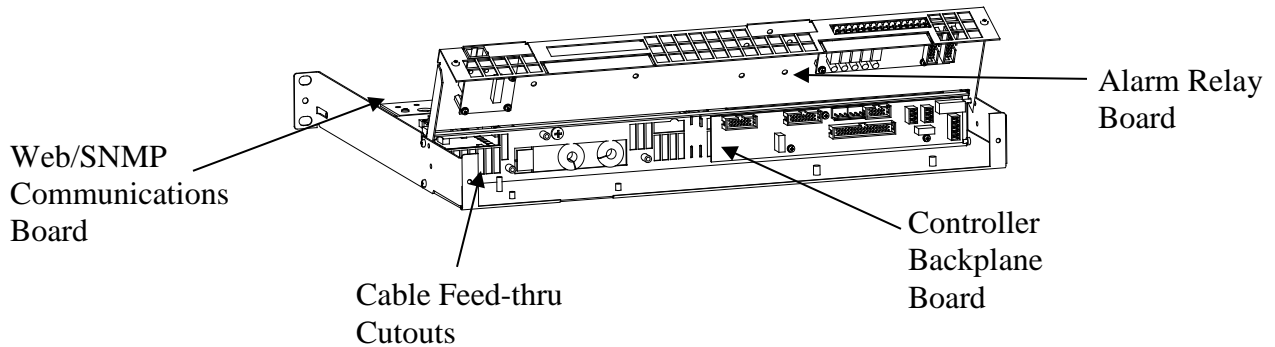


Figure 5. Sageon Shield Battery monitor rear view

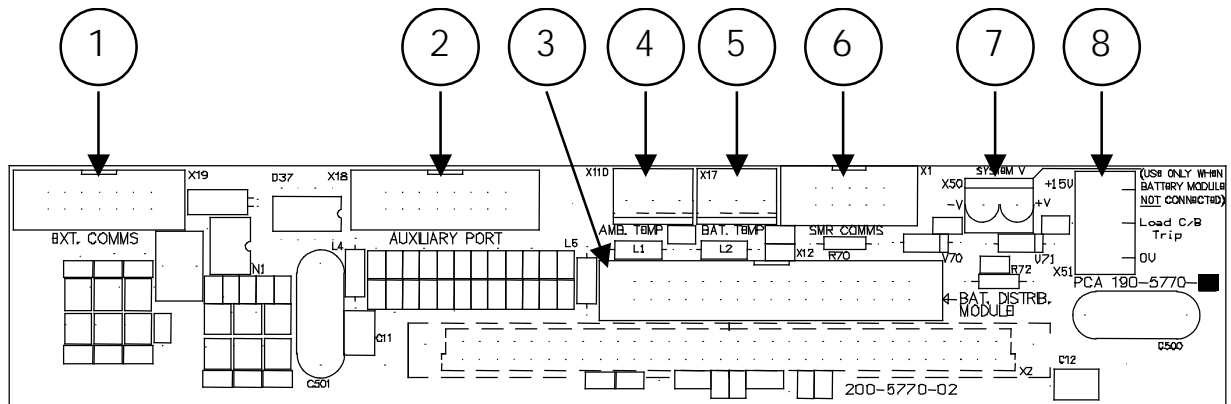


Figure 6. Connections on Controller backplane

- (1) Remote communications module connection (14-way ribbon)
- (2) Auxiliary peripheral module (relays, battery cell monitor, etc) connection (16-way ribbon)\*
- (3) Battery (& load) distribution module connection (34-way ribbon)
- (4) Ambient temperature sensor connection (sensor P/N 385-5941-03)
- (5) Battery temperature sensor connection (sensor P/N 385-5941-03)
- (6) Rectifier isolated communications connection (10-way ribbon)\*
- (7) Standalone system voltage connection (Controller power and voltage sensing) – special use only - No connection
- (8) Load circuit breaker trip detection circuitry connection

Notes:

\* Devices and cable connections are pre-wired as part of the supplied and tested battery monitor

### 2.2. TEMPERATURE SENSORS

The optional sensors for measuring ambient and battery temperature are the same device (Part No. 385-5941-03). The system auto-detects if the sensor is plugged into one of the positions (4) or (5) shown in Figure 6. If no sensor is installed, the Controller will show “Not Available” in the menu items for the temperature measurements. Locate the ambient sensor on a large thermal mass, such as the equipment rack; this will prevent large swings in temperature readings. Locate the battery sensor on a battery block in the middle shelf of the battery bank (likely hot zone). The battery temperature sensors are connected directly to the battery posts using the integral lug of the temperature sensor. The temperature sensors are galvanically isolated from the lug.

**NOTE:** Up to four battery temperature sensors can be connected to the Sageon Shield Standalone Battery Monitor; however, only the highest battery temperature will be displayed at the front panel or via SageView.

### 2.3. ALARM RELAY CONNECTIONS

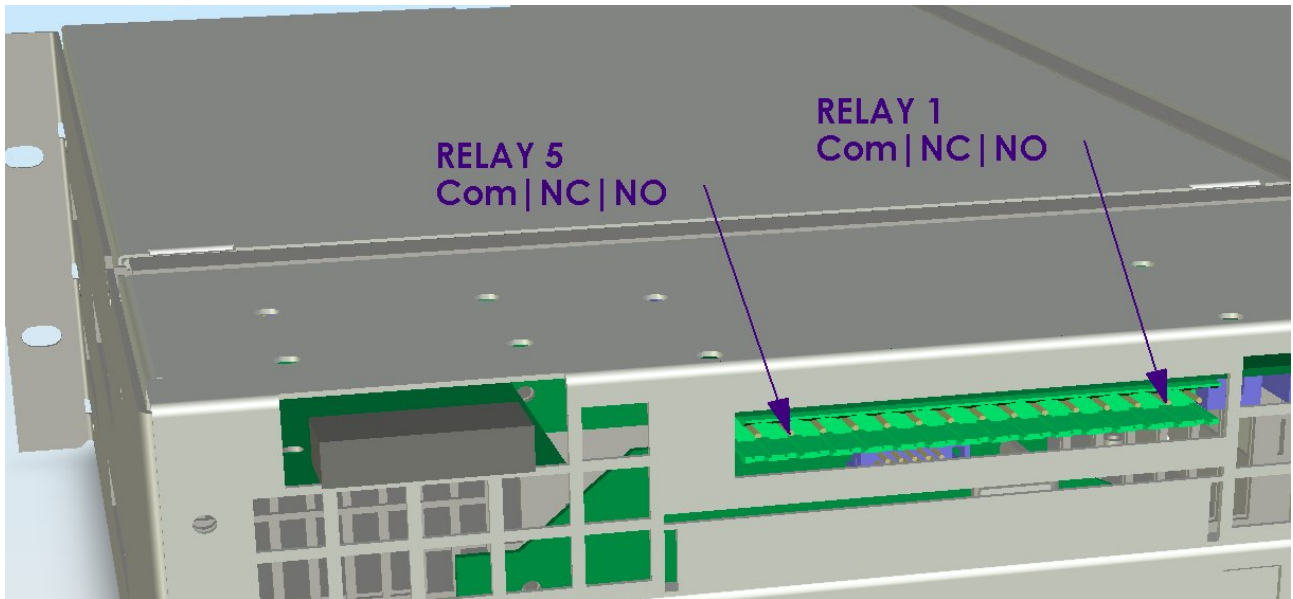


Figure 7. Alarm relay connections (right) and remote communications module location (left)

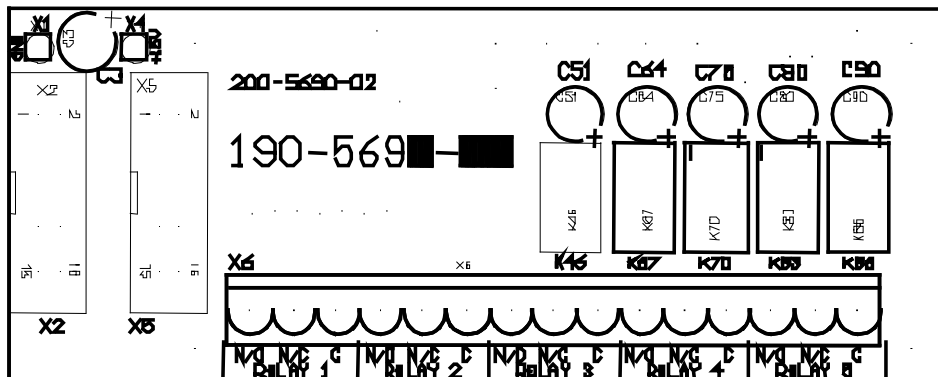


Figure 8. Alarm relay board connections

The alarm relay board is inverted when installed in the rear cover lid such that Relay 5 is on the left when viewed from the rear of the metalwork. The connections are labeled again on the rear cover. Each alarm is user programmable through the Controller using the SageView PC software.

The user configurable auxiliary relays contacts are shown above. The contacts are rated for 1A 250VAC or 1A 32VDC and have >1kV isolation to the coils. The pin configuration is pin 1 at the right as seen in Figure 7.

Relay #	Pin #	Pin function
1	1	N.O. (normally open)
	2	N.C. (normally closed)
	3	C (common)
2	4	N.O.
	5	N.C.
	6	C
3	7	N.O.
	8	N.C.
	9	C
4	10	N.O.
	11	N.C.
	12	C
5	13	N.O.
	14	N.C.
	15	C

The relays, being user configurable, can be arranged to activate for multiple alarm conditions or a single alarm only. The logic can be inverted for individual relays so that one becomes a controller failure indicator (use the normally closed contact as this will also indicate if the relay power has failed).

#### 2.4. CONTROLLER POWER CONNECTIONS

Power for the Controller and its peripherals is derived from the DC bus or the charged battery. The Battery connection module has reverse polarity protection circuit; however, a reversed connection will fail to power the controller. There is one connection to the (+) terminal and one connection to the (-) battery terminal.

Remove the top cover of the Sageon shield to view the power connections to the Battery Distribution Module (BDM). The red wire should be connected to the BATTERY POS(+) terminal, X16. The black wire should be connected to the BUS (-) and LVDS COMMON terminals, X2 and X9, respectively. Connect the black wire to the battery (-) terminal and the red wire to the battery (+) terminal to complete the power connections to the Sageon Shield.

The system voltage is sensed solely on the connections to the battery. No additional user connections are required to power the Controller.

#### 2.5. FRONT PANEL USB COMMUNICATIONS CONNECTION

The front USB port on the Controller is configured as USB-slave and has a B-type connector. A standard USB A-to-B cable is required. The Controller can only communicate via the USB port to a PC running the SageView software.

The USB connection requires that a USB driver be installed on the PC. The first time the Controller is plugged into the PC via the USB port, a Microsoft® Windows dialogue box will appear asking the user to install the Controller USB Interface drivers. The Microsoft® Windows operating system should be able to find the drivers automatically on the Sageview CD-ROM, assuming it is in the CD-ROM drive of the PC.

If SageView is running when the unit is plugged in, a Windows dialogue box will appear asking the user if they wish to connect to the unit immediately. Otherwise, the user will need to select the Controller from the available controller USB devices in USB section in the Connection Setup.

#### 2.6. REMOTE COMMUNICATION CONNECTION

The SageNET/SNMP remote communications module is located to the left of the alarm relay header when viewed from the rear. The SageNET module is capable of delivering plant information via an ethernet connection to

remote workstation running the SageView software. For more information on SageView operation, refer to TG990-4262-00 on the documentation CD. Additionally, remote monitoring of the Sageon Shield Standalone Battery Monitor can be accomplished via SNMP. Refer to the SageNET setup and configuration guide on the documentation CD for more information.

### 3. CELL MONITORING BOARD

The Sageon Battery Monitor (SBM) PCB is located under the sheet metal cover of the Battery Distribution Module (BDM). It is used to monitor individual cells of a battery during float or equalization operation, or during a discharge. Each SBM unit is capable of monitoring up to 24 cells or monoblocks. An additional three external SBM units (up to four SBM units total) can be used to monitor up to four battery strings of 24 cells or monoblocks each.

The cell voltages can be viewed in real time when the SCU is connected to a PC. The SageView software that is running on the PC can display the cell voltage data in various convenient formats to ascertain the state of health of batteries. In addition to the real time representation of the data on the SageView, the cell voltages can also be observed in real time on the SCU display locally.

A number of pre-programmed parameter levels are used to generate alarms that are annunciated on the SCU front panel by a LED and screen message and remotely via voltage free contacts, or via the USB port, which can connect directly to a PC locally, or remotely via SNMP and an Ethernet connection.

#### 3.1. MAIN FEATURES OF THE SBM BOARD

- Up to 24 cells can be monitored by a single SBM module. Cell voltage setting can be 2V, 4V, 6V, and 12V.
- Up to four SBM boards can be connected to a single SCU.
- Individual cell voltages of a battery can be viewed on the SCU display in real time. The cell voltage rounded to the nearest 5mV (applies only to 2V range) is displayed together with the cell number and its percentage deviation from the average cell voltage of the battery.
- All the cell voltages can be displayed in a “Histogram” format locally or remotely on a PC using Sageview software for a very convenient and rapid visual indication of normal and deviant cells.
- As the SBM is permanently connected to the batteries, daily or weekly viewing of the steady state cell voltages for the different batteries in a system to a remote monitoring PC can be very useful for anticipating the state of health of the batteries.

### 4. SPECIFICATIONS

**Battery configuration options (48V systems):** 24Cell x 2V, 12Cell x 4V, 8Cell x 6V, 4Cell x 12V

**Battery configuration options (24V systems):** 12Cell x 2V, 6Cell x 4V, 4Cell x 6V, 2Cells x 12V (note: 24V systems are specially configured and require a different controller model; contact the factory for more information)

**Maximum battery voltage:** 75Vdc

**Number of cells:** 24 maximum per SBM

**Number of strings per SBM:** 1, 2, 3, or 4 depending on configuration (See section 3.3).

**Cell Voltage selection (DIP switch setting on the board):**

2V (max input: 3.33V)

4V (max input: 6.66V)

6V (max input: 10V)

12V (max input: 20V)

Note: "Cell" can mean either a single battery cell or monoblock.

**Accuracy:**  $\pm 0.5\%$  of measurement.

**Drift for 1 year:**  $\pm 10\text{mV}$  at  $0^{\circ}\text{C}$  to  $40^{\circ}\text{C}$

**Resolution:** 5mV per cell (2V, 4V, 6V range), 10mV per cell (12V range)

**Power supply:** from SCU ( $\pm 15\text{V}$ )

**Maximum distance from SCU:** 30 ft. combined cable length from SCU for all SBM's. If an SSM (Sageon Site Monitor) is used, it should have its communication cable terminated at the SCU interface board and not connected to any SBM.

## 5. INSTALLATION OF SAGEON BATTERY MONITOR BOARD

### 5.1. PREPARING THE BATTERY FOR CONNECTION TO THE SBM

SBM Battery Sense Leads are supplied with an internal  $56\Omega/\text{PR}02$  resistor, as shown in Figure 9. In the event of a short circuit, this resistor will act like a current limiting device/fuse, protecting the SBM and batteries from damage.

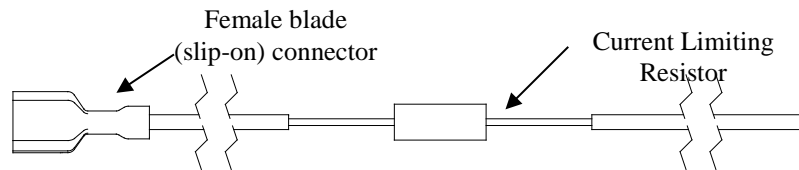


Figure 9. Battery sense wire and current limiting protection (heat-shrink not shown).



Figure 10. Battery terminal adapter.

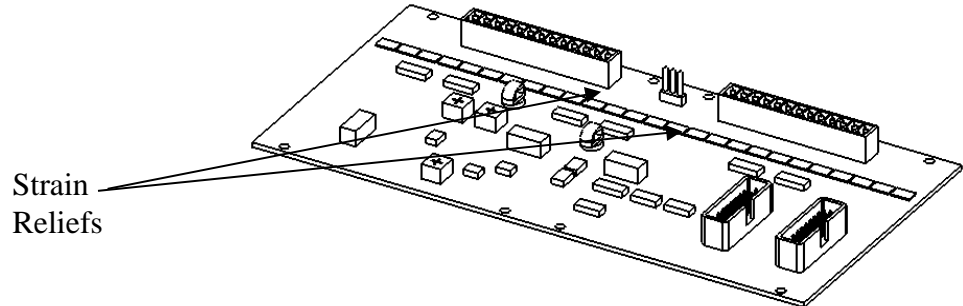
To connect the sense leads to the SBM and to the battery cells:

**CAUTION: DO NOT** proceed if the battery string is being charged or discharged at a high rate. Continue only when the battery string is at float or disconnected from the charging system.

1. Note the battery configuration and select the appropriate figure from section 4.2 of this manual.
2. Pay particular attention to the polarity of the connections and insertion/removal of the J9 link.
3. Refer to the selected figure and measure the length of wire needed to reach from a terminal on an SBM terminal block to the indicated battery cell.
4. Select a battery sense lead and cut the wire to length. Strip the un-terminated end  $3/16"$ .
5. Feed the stripped end of the wire through one of the large grommets under the rear panel of the standalone battery monitor.
6. Connect the stripped lead to the appropriate SBM board screw terminal on J2 or J3.
7. Connect the supplied battery adaptor post (ring-lug terminal) to the appropriate battery cell terminal; make certain to re-torque the battery cell terminal bolt to the manufacturers specified torque requirements.
8. Connect the battery adaptor post to the battery sense wire using the integral slip-on connectors.
9. Repeat until the battery cells are wired to the SBM terminal block(s).
10. Repeat the above steps for each battery string.

11. Secure the wires to the PC Board's strain relief components using wire-ties. See Figure 2.

**Note:** The default ring lug size is 5/16". Other battery post adaptor sizes are available; contact factory for more information.



*Figure 11. Battery monitor PCB.*

## 5.2. BATTERY CELL LEAD CONNECTION TO THE SBM

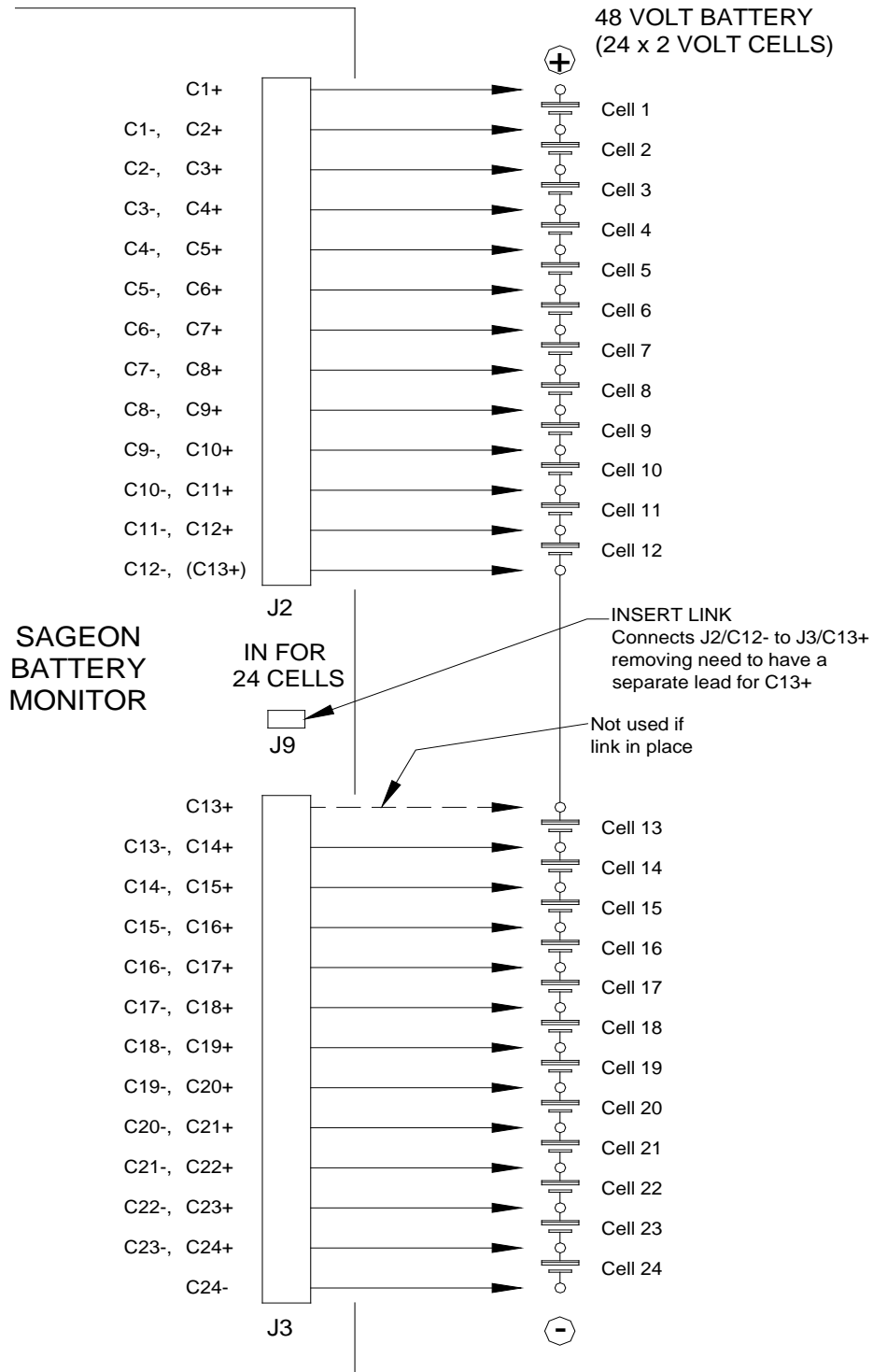
The battery cell sensing leads are terminated with the 13 position female terminal blocks. This plugs onto the connectors on the SBM board. How the cell voltage sense leads connect to the SBM board depends on the battery configuration. The following figures show the connection between the battery and the SBM board for different configurations of the battery. If more than two batteries are used in a particular configuration, simply repeat the connection method for batteries 3 and 4.

**WARNING:** Sense leads, which are connected to the battery string, pose a short circuit hazard. Each connection to the SBM should be made BEFORE connecting sense wire to the ring lug terminals at the battery post. Cut and dress the supplied sense leads during installation. A wire label card is shipped with each SBM; use these labels to label the wires at the terminal end as well as the SBM end.

When connecting the battery sense leads, the lead should be dressed to the battery terminal BUT NOT CONNECTED TO THE TERMINAL YET. Next, the SBM end of the lead should be cut, stripped, and inserted into the pluggable terminal block receptacle. Only after the terminal block end has been terminated should the ring terminal be attached to the battery bolt.

The battery bolt should be re-torqued to manufacturer's recommended torque when re-installing bolt.

NO-OX-ID is recommended on the battery sense lead ring lugs to minimize corrosion.



**Figure 12. SBM connections to a 48V (24 cell) battery string.**

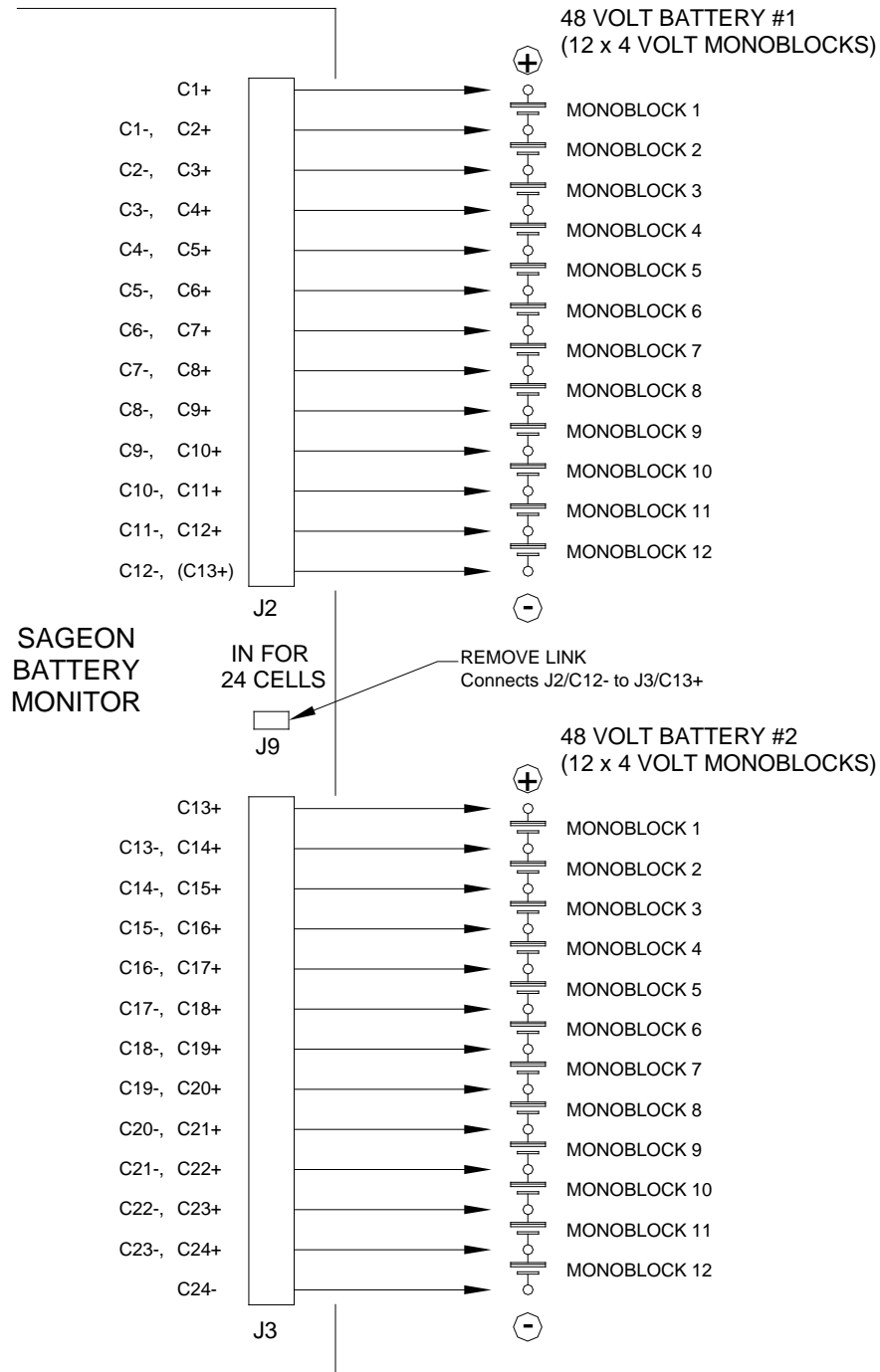


Figure 13. SBM connections to two 48V (12 monoblock) battery string.



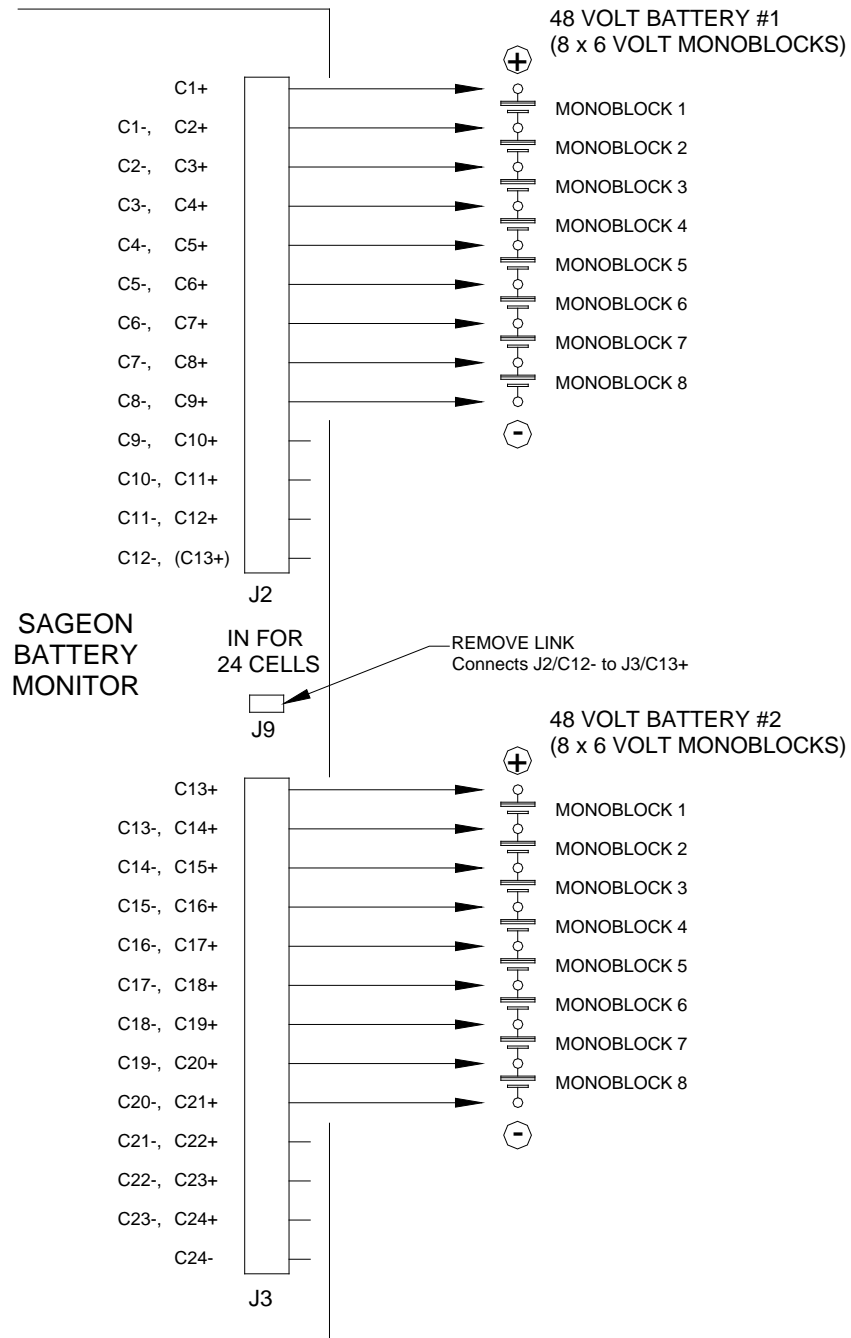


Figure 14. SBM connections to two 48V (8 monoblock) battery string.

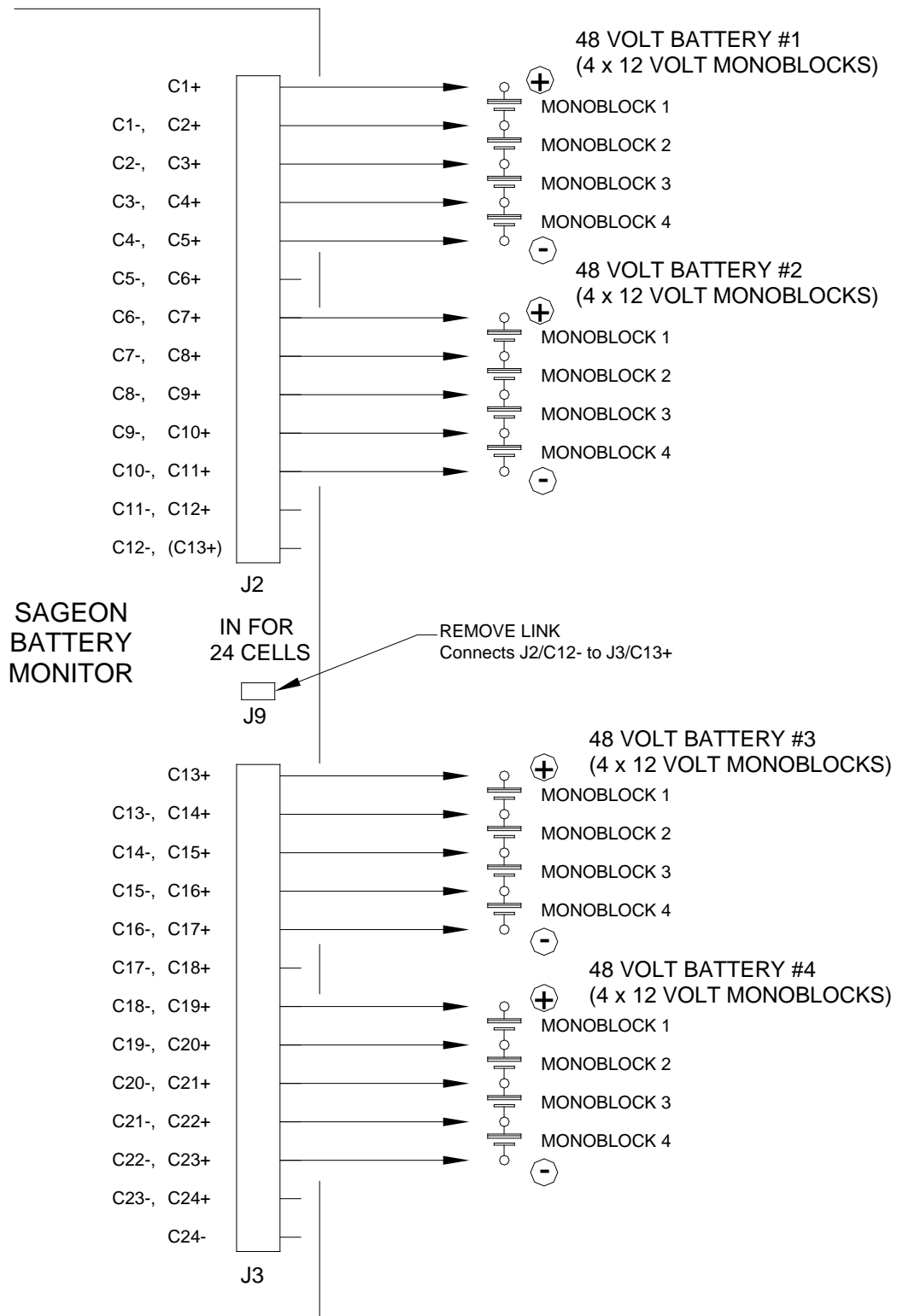


Figure 15. SBM connections to four 48V (4 monoblock) battery string.

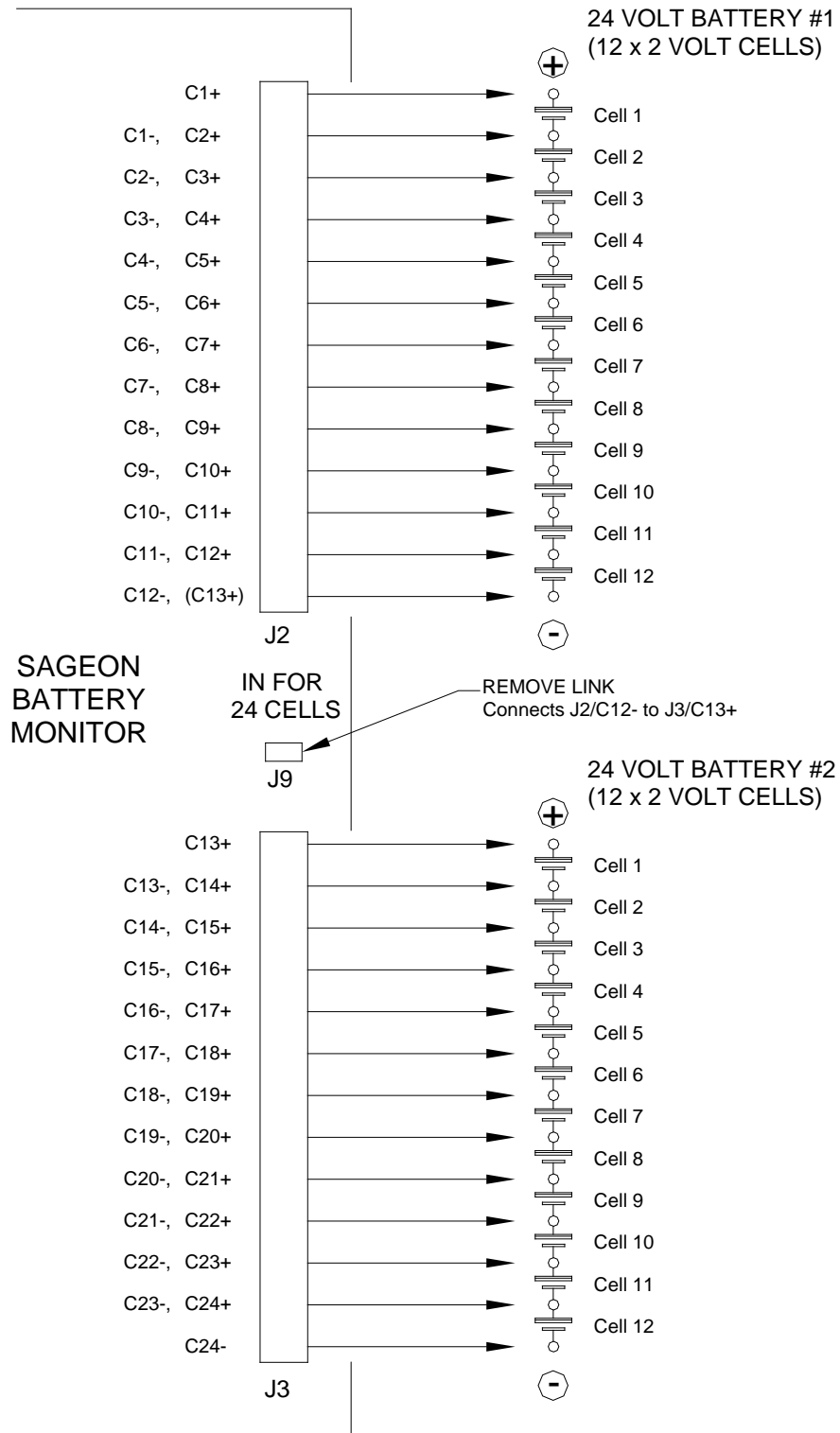


Figure 16. SBM connections to two 24V (12 cell) battery string.

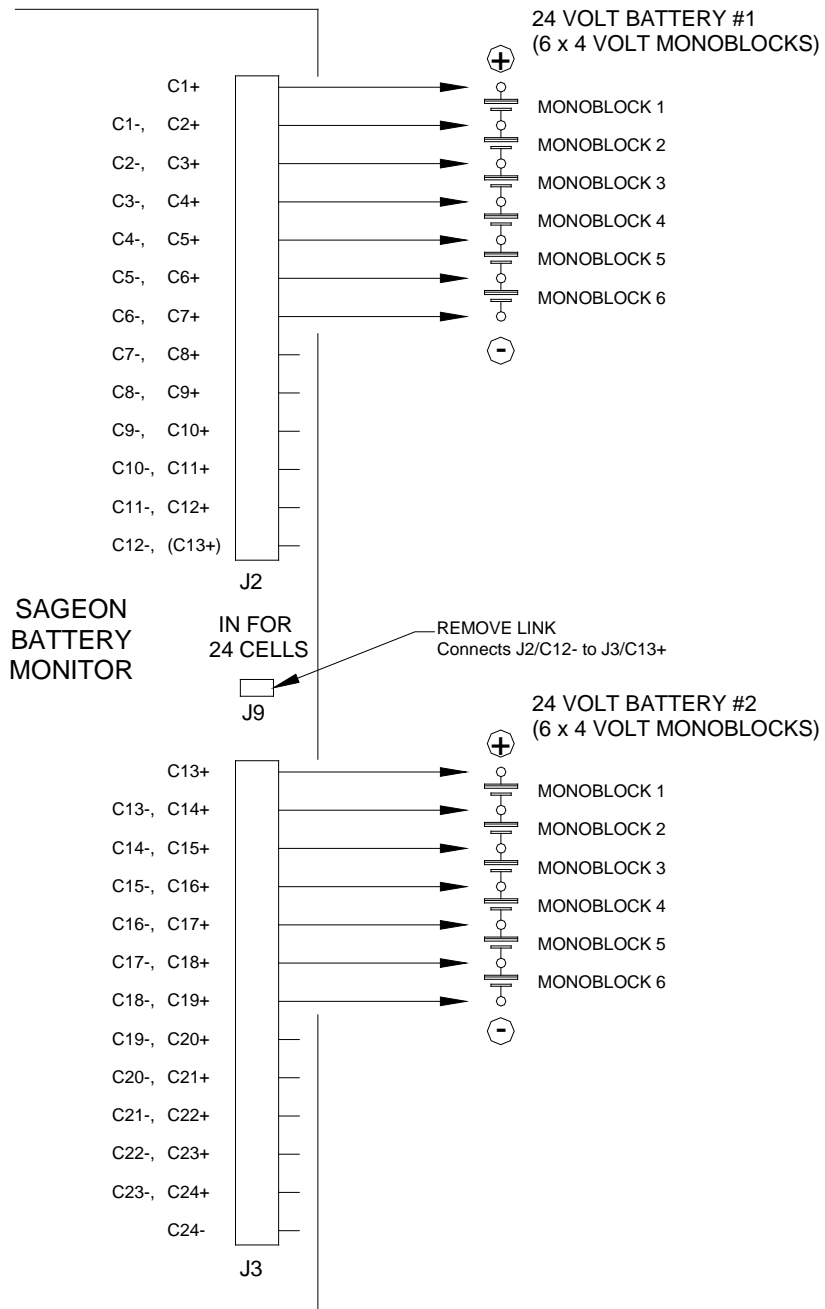


Figure 17. 24V connection for 2-strings of 4V monoblocks

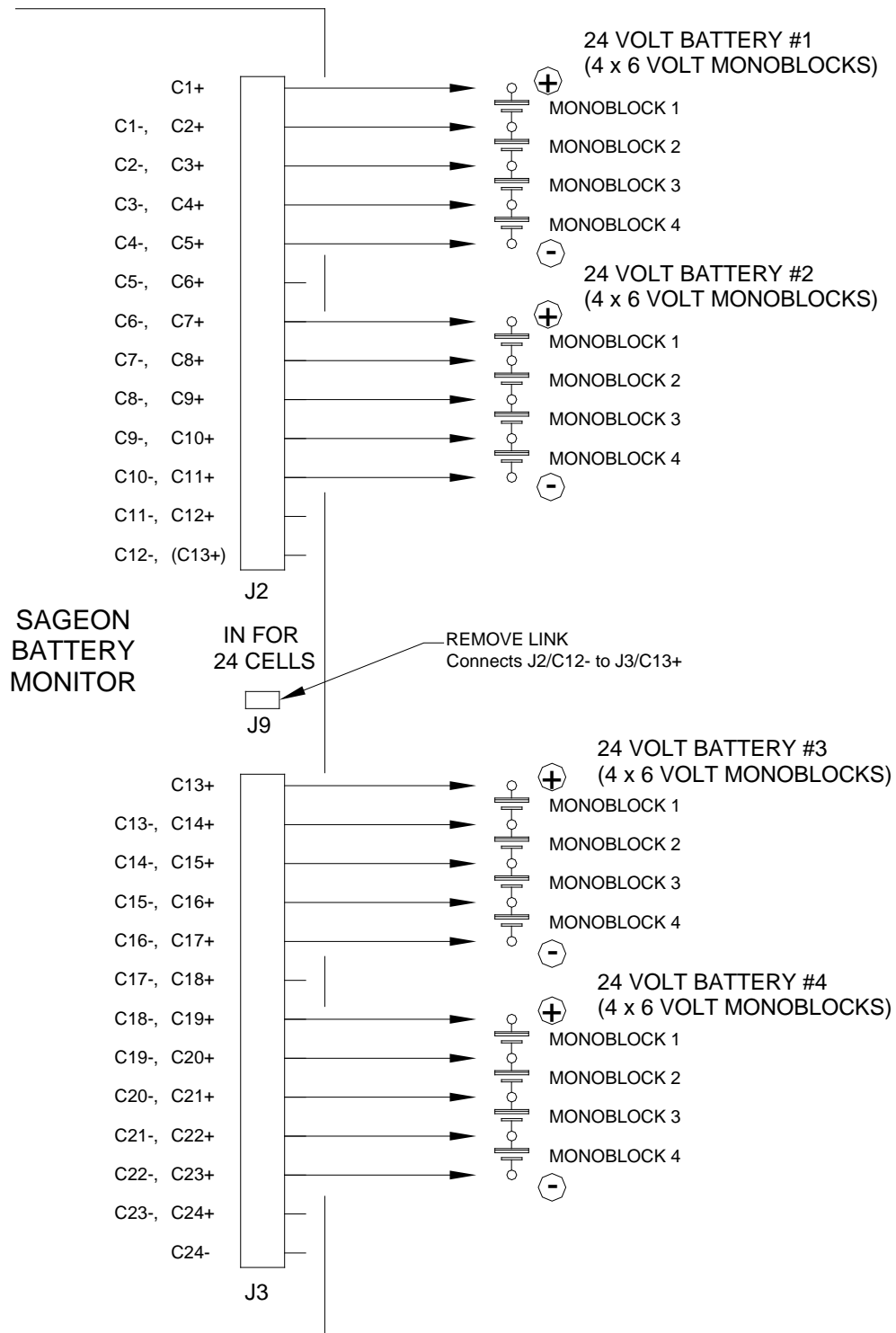


Figure 18. SBM connections to four 24V (4 monoblock) battery string.

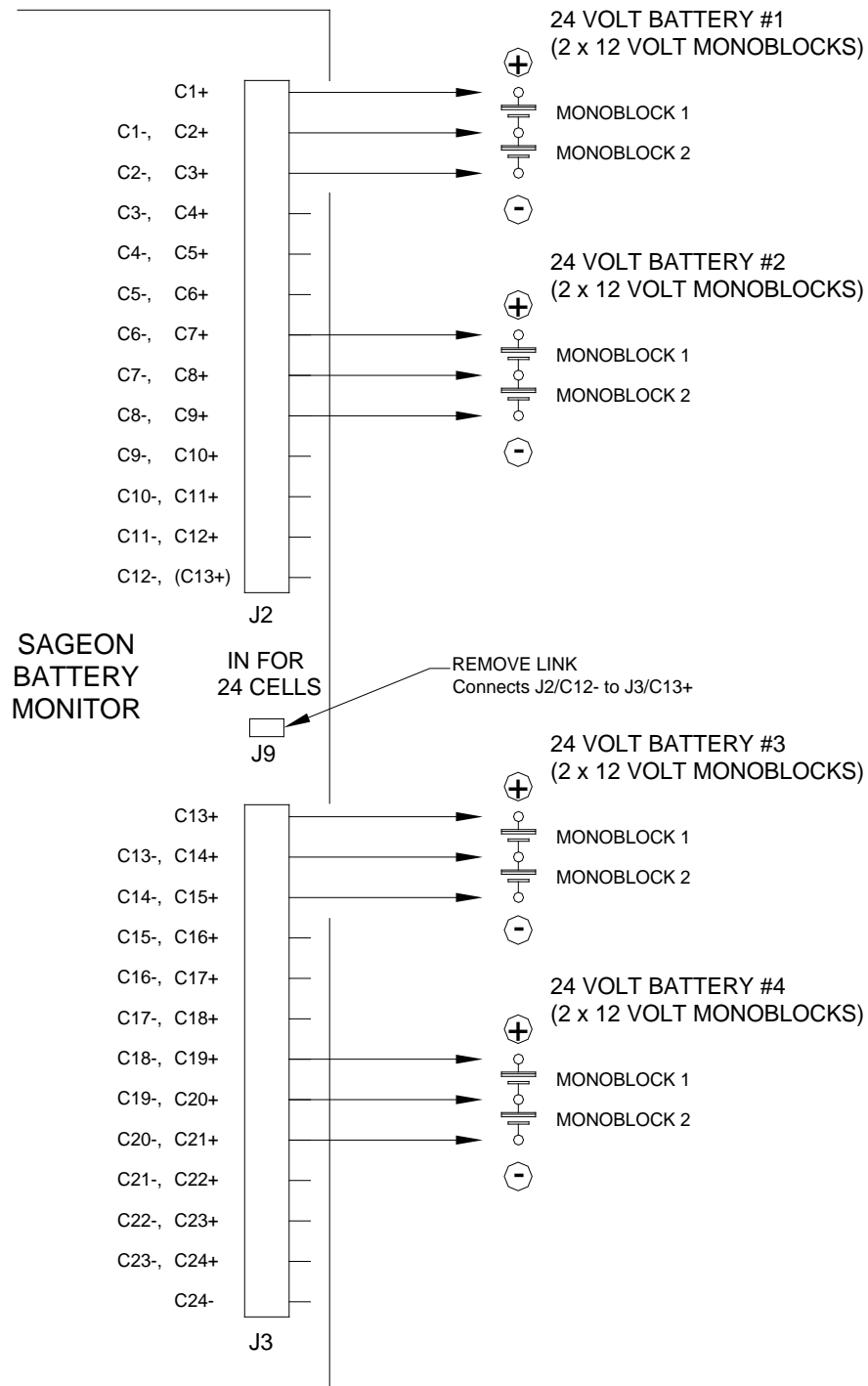


Figure 19. SBM connections to four 24V (2 monoblock) battery string.

### 5.3. DIP SWITCH SELECTION OF CELL VOLTAGES

Battery configuration is selected via the main menu of the SCU, whereas the cell or monoblock voltage must be selected via dip-switch “Cell V-Select” on the PCB (S2). The following table indicates the DIP-switch setting for different cell/monoblock voltages:

CELL/MONOBLOCK VOLTAGE	(1)	(2)	(3)
12V	ON	OFF	OFF
6V	OFF	ON	OFF
4V	OFF	OFF	ON
2V	OFF	OFF	OFF

### 5.4. DIP SWITCH SELECTION OF ADDRESS

Each SBM requires a unique address in order for the SCU to know which SBM is connected to which battery string(s). Set the “Unit Address” on each SBM according to the chart below.

SBM	Switch Number 1	Switch Number 2	Switch Number 3	Switch Number 4
First	ON	OFF	OFF	OFF
Second	OFF	ON	OFF	OFF
Third	OFF	OFF	ON	OFF
Fourth	OFF	OFF	OFF	ON

### 5.5. SYSTEM SETUP FOR SBM

#### 5.5.1. Relationship between “SBM Batteries” and “Num Batteries”

In the next two sections, you will be led through a series of menus to get to the menu of “SBM Batteries”. This is where you define the number of batteries whose cell voltages are to be monitored by the SCU, hence the name “SBM Batteries”. There is no need to program the SCU for how many SBM boards are connected to the system; the SCU automatically calculates the number of SBM boards that it requires from the number of “SBM Batteries” that are entered.

**Programming Note:** Earlier versions of the Sageon Power Plant’s “SCU” referred to the “SBM Batteries” as “BCM Batteries”. Aside from this terminology change, there is no difference of operation of earlier versions.

As an example, consider a 48V system, and you have three battery strings whose cell voltages you would like to monitor, you need to enter 3 for the number of SBM Batteries. You do not need to tell the SCU the number of SBMs that are required. The SCU will automatically calculate the required number of SBMs. The number of SBMs required for different battery configuration is shown in the following table:

Batt Config	SBM Batt = 1	SBM Batt = 2	SBM Batt = 3	SBM Batt = 4
24 cell, 2V	1 SBM	2 SBM	3 SBM	4 SBM
12 cell, 4V	1 SBM	1 SBM	2 SBM	2 SBM
8 cell, 6V	1 SBM	1 SBM	2 SBM	2 SBM
4 cell, 12V	1 SBM	1 SBM	1 SBM	1 SBM
12 cell, 2V	1 SBM	1 SBM	2 SBM	2 SBM
6 cell, 4V	1 SBM	1 SBM	2 SBM	2 SBM
4 cell, 6V	1 SBM	1 SBM	1 SBM	1 SBM
2 cell, 12V	1 SBM	1 SBM	1 SBM	1 SBM

A similar menu but for very different purposes, appears in the Systems menu as follows:

**Num Batteries X** ( where X is the number of batteries)

The number of batteries entered here is the number of batteries that are being monitored for their currents. “Num Batteries” and “SBM Batteries” are not related except that value entered for “Num Batteries” must be greater or equal to “SBM Batteries”. This is because Num Batteries determines the number of batteries accessible via the BAT menu, via which we access the cell voltages. Therefore, if only two batteries are defined for Num Batteries, then you will not have access to cell voltages of Battery 3 or 4, even if they are defined as 4 in the SBM Batteries menu. Normally Num Batteries is set to be the same as SBM Batteries.

## 6. SAGEVIEW SETUP

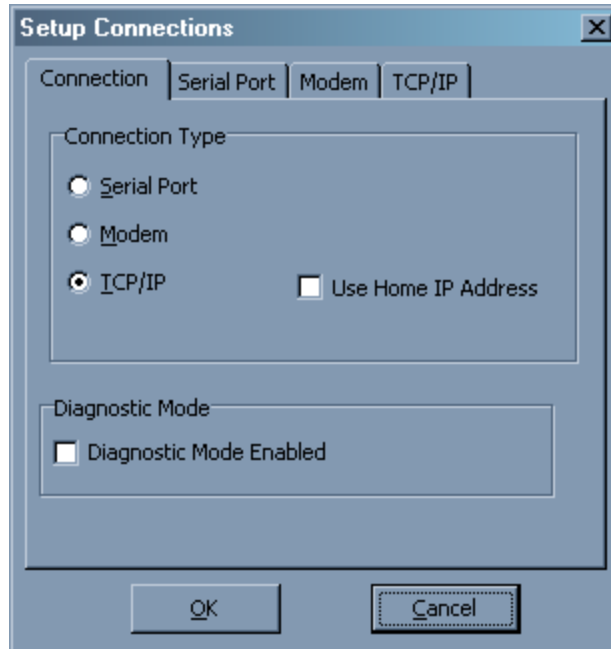
SageView quick start setup:

- Install SageView on the PC
- Configure Network parameters on SageNet hardware (see SageNET User Manual)
- Configure Network settings in Sageview (Phone Book)
- Set system alarm levels and system time in SCU screen
- Set Number of RECTs to 0
- Set System checkbox to Standby
- Set Interface Parameters > Interface Type to Battery Distribution
- Set number of Current Transducers (if equipped)
- Set current transducer full scale reading (if equipped)
- Enable Bat Mon check box
- Set number of BCM batteries
- Set cell voltage and deviation alarm levels
- Write configuration to SCU
- Configure alarm relays
- Write alarm configuration to SCU

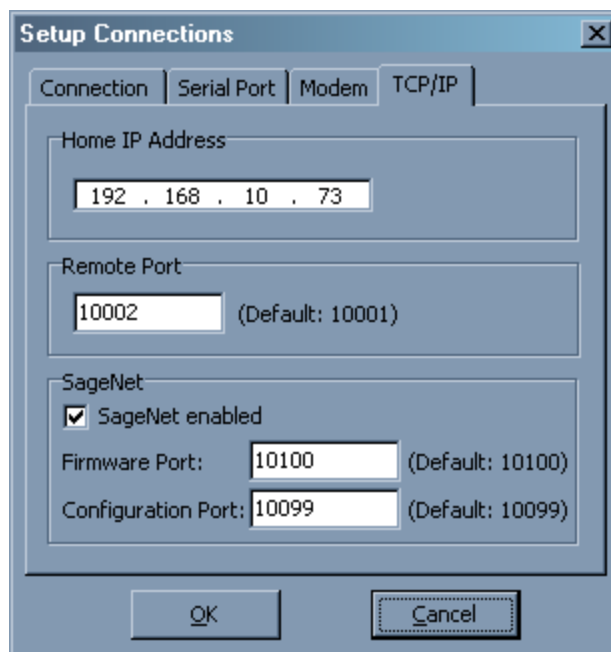


After all connections of the standalone battery monitor have been made:

Install Sageview from the CD provided. Open Sageview and configure your communications options using **Options > Connection setup...** If multiple Sageon installations are to be viewed using this computer station, be sure to uncheck “Use Home IP address” and configure the setup for each Sageon under **Connection > Phone Book...**

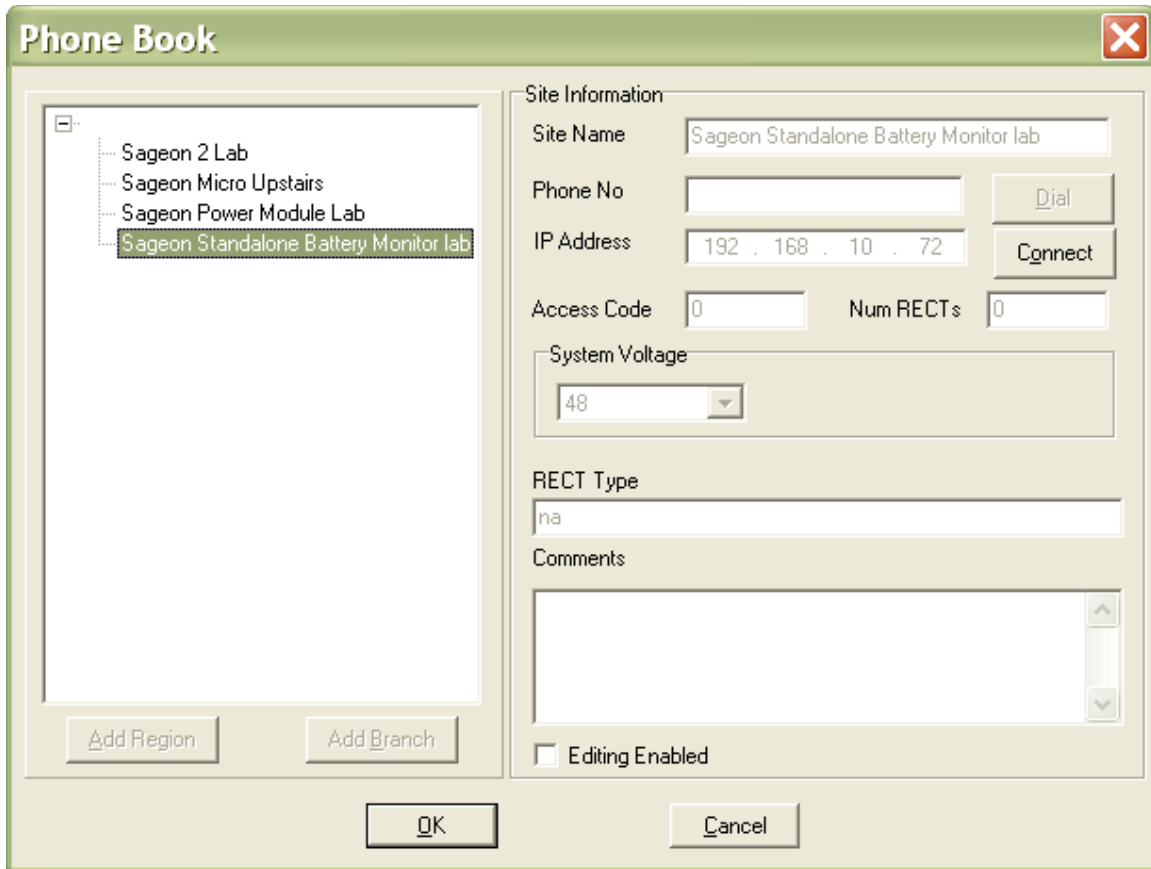


The standalone battery monitor comes equipped with a SageNet communications card; using this card, the user can connect simultaneously to the battery monitor using 2 different ports: 10001 or 10002. Under **Options > Connection setup > TCP/IP tab** enter the port number in the **Remote Port field** for this session of SageView (either 10001 or 10002).

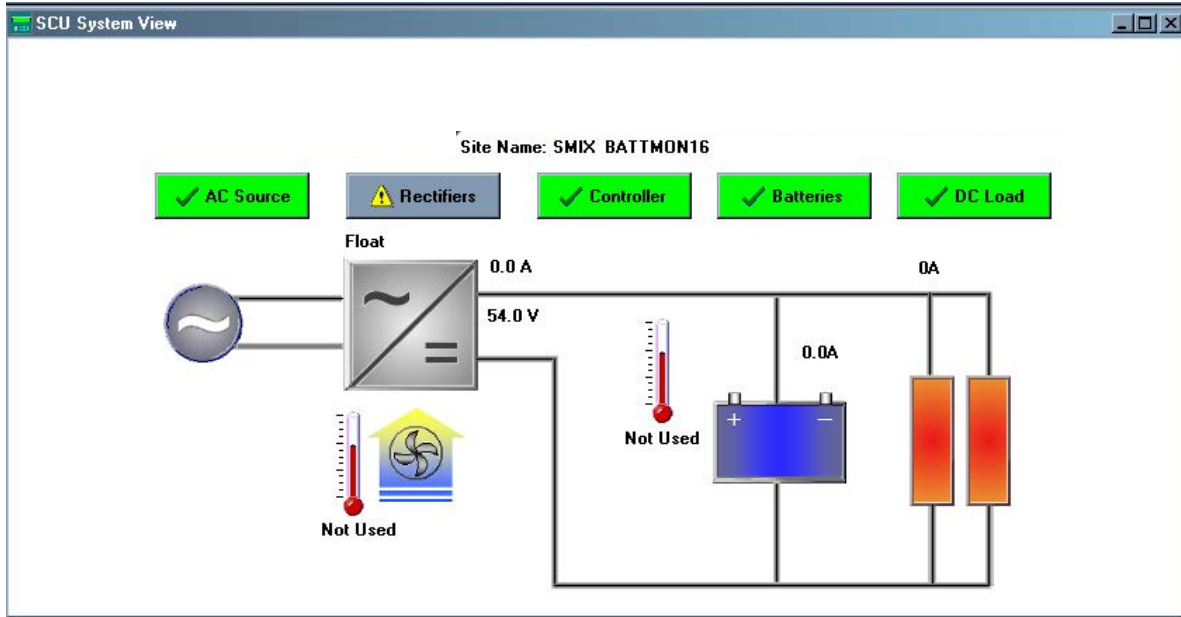


Click OK when the configuration is complete. When logged in as an administrator, under **Connection > Phone Book...** you can set up multiple sites by checking “Editing Enabled”, and adding regions and branches to your Phone Book.

**NOTE:** The default IP address of the Sageon Shield Standalone Battery Monitor is 192.168.10.60. Refer to section 6 for more information on how to configure the IP address of the Sageon system.

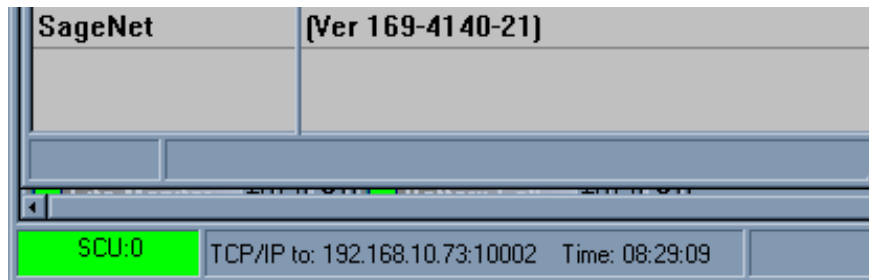


The Site Name that is entered on this screen will also be viewable at the top of the graphical SCU system view screen.



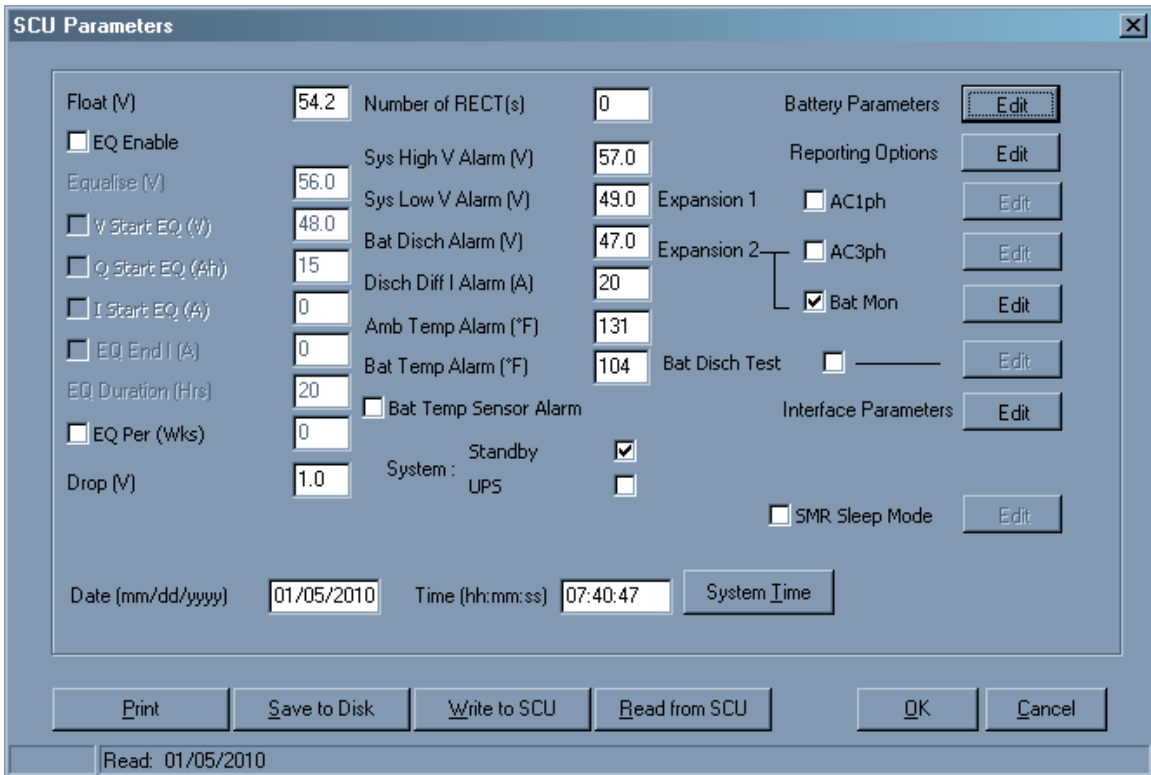
Be sure that the Access Code in SageView **under SCU > Access Code...** matches the Access Code of the Sageon system you are trying to connect.

After configuration of your network is complete, choose the site to which you wish to connect and click Connect in the Phone Book.



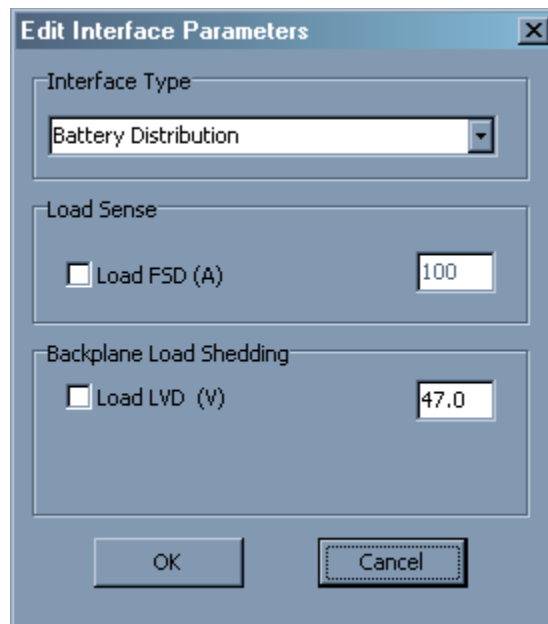
In the bottom left hand corner the icon should change to "green". The IP address and the port number connected to will be displayed.

In the top menu bar click SCU or from the main menu dropdowns click SCU > Display Parameters...

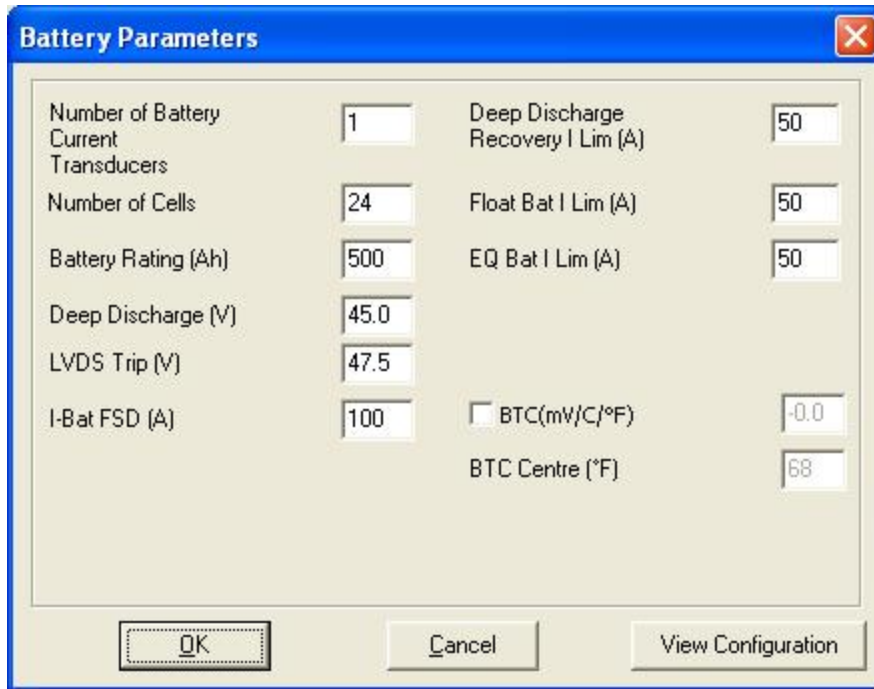


Set the Number of RECTs equal to zero. Set the desired alarm threshold levels for system voltage. EQ Enable should be unchecked, EQ Per should be unchecked. Bat Disch Test, SMR Sleep Mode, AC1ph, and AC3ph should be unchecked.

Click the Interface Parameters button, set the Interface type to Battery Distribution; leave Load FSD and Load LVD unchecked.

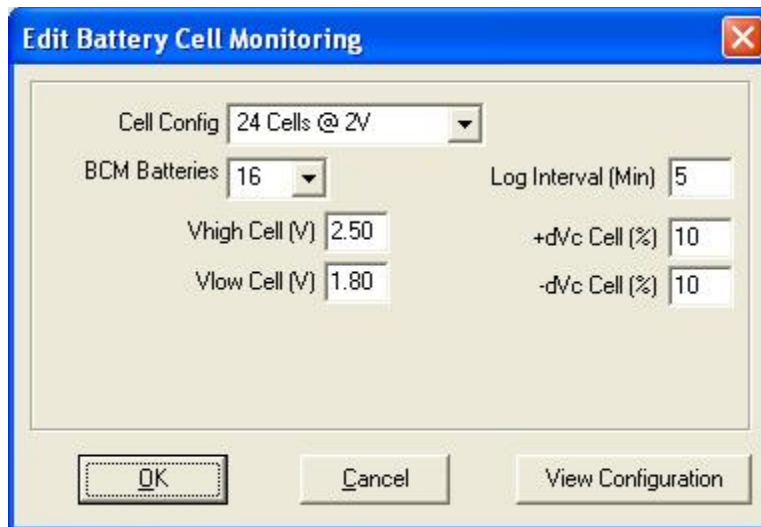


Click the Edit button next to Battery Parameters.



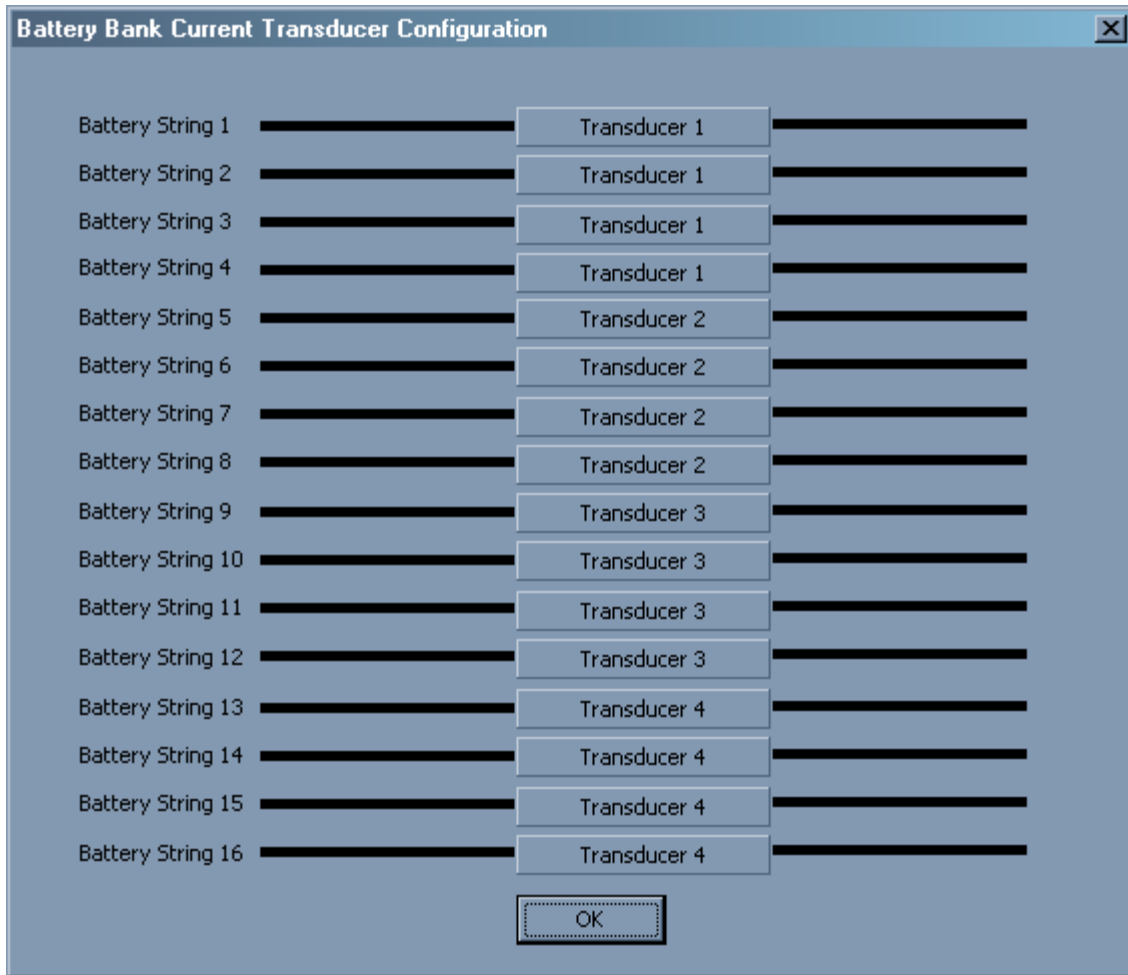
Set the Number of Battery Current Transducers that are in your system. The minimum is 1 the maximum is 4. I-Bat FSD (A) is the full-scale rating of the current transducer.

Click the Edit button next to the Bat Mon checkbox.



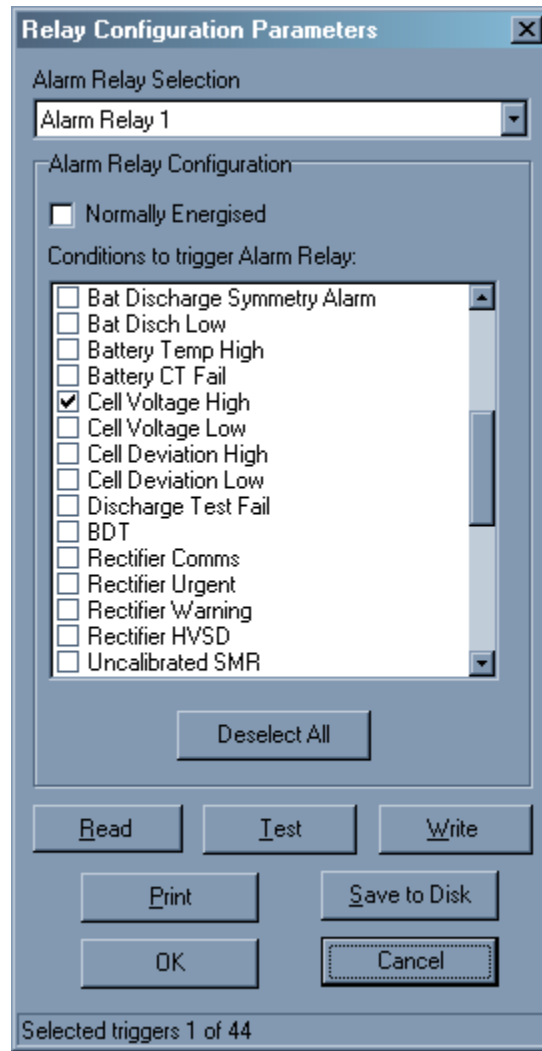
Set the proper cell configuration for your system. Set the number of BCM batteries. This will be equal to the number of Battery Strings that you have in your system. Set the high and low cell voltage thresholds and the cell deviation from average thresholds from this screen.

Based on the number of BCM Batteries and the Number of Battery Current Transducers that you have selected, clicking View Configuration will show the routing of each battery string through the proper transducer.



When changes have been made and you are satisfied with the system setup be sure to “Write to SCU” from the SCU parameters screen.

Click the Relays button at the top of the screen or from the main menu dropdowns select Relays > Display Parameters...



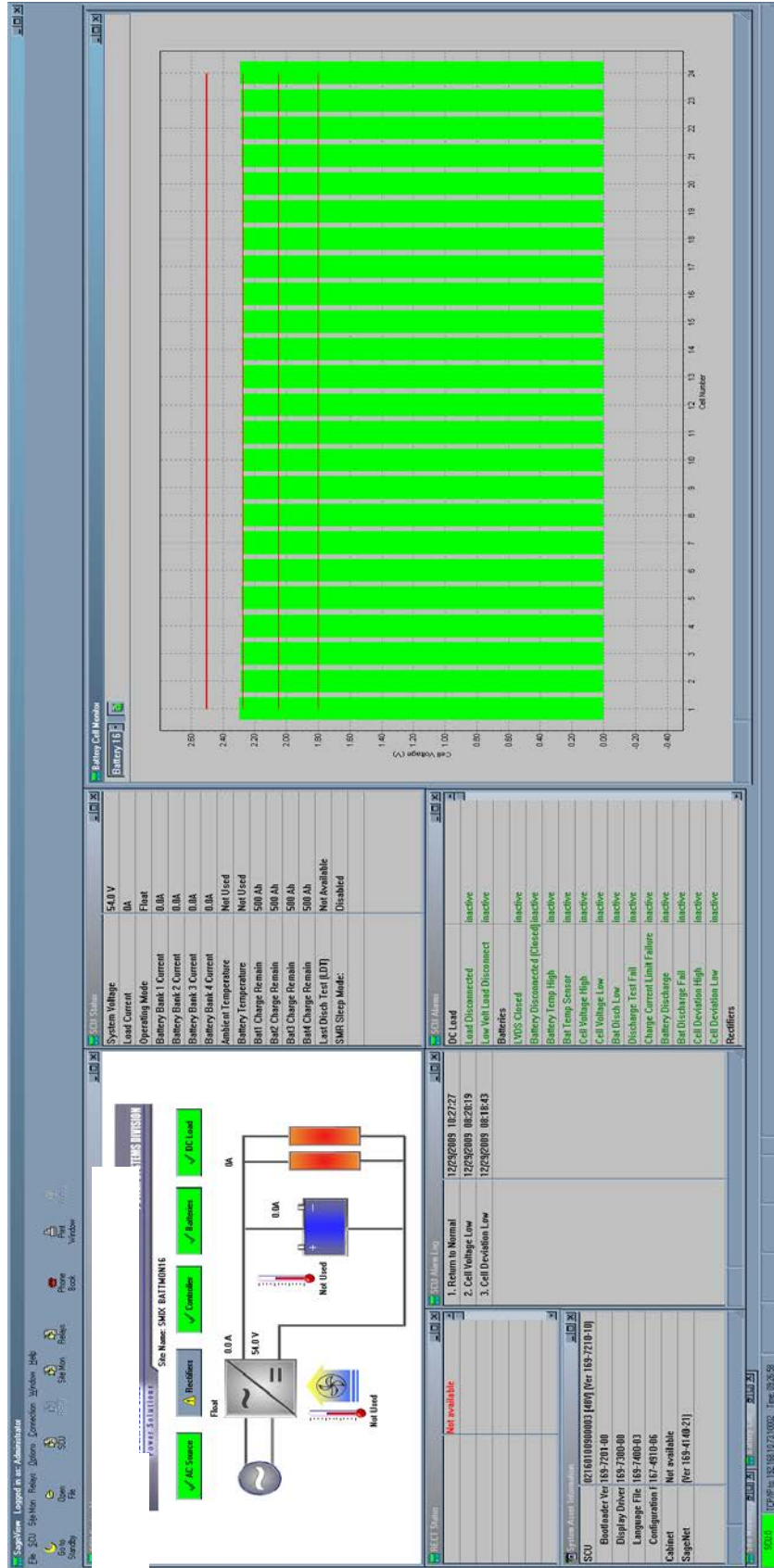
The alarm relays have been reconfigured from the standard Sageon Micro defaults and standardized for a battery monitor specific application; the relay settings are as follows:

- Relay 1: Cell V High
- Relay 2: Cell V Low
- Relay 3: Cell dev. High
- Relay 4: Cell dev. Low
- Relay 5: General Alarm

The relays are 1 Form C contacts.

If you wish to add additional alarms or change the current setup do so from this screen and then Click Write; if no changes are desired click the “Cancel” button to exit this screen.

Sageview should now be ready to monitor the battery strings.





## 7. SETTING UP NETWORK INTERFACES

### 7.1. PROGRAMMING IP ADDRESSES USING DEVICE INSTALLER SOFTWARE

This is the simplest way of programming the interface operating parameters; no high level of computer skills is required. Device Installer is a software utility package developed by Lantronix. It includes a number of handy tools making programming of various parameters and firmware update very easy. The installation package is available for free download from Lantronix. At the time of publication, it was located at following Web address: <http://www.lantronix.com/support/downloads/?p=DEVICEINSTALLER>

Run DeviceInstaller.exe. You will be guided through the installation process. This utility is also included on the Sageview Installation/Documentation CD that is included with the Standalone Battery Monitor.

#### 7.1.1. Preparations for local address set up

- From your network administrator obtain the new IP address. Also, ask for your network class.
- Connect PC to the controller's network interface (directly or via a network).
- Power-up the controller.
- Start Device Installer program.

#### 7.1.2. Local IP address set up procedure

- On Device Installer tool bar, click "IP" button. A new window "Assign IP Address" will open.
- Enter the unit Ethernet address/MAC ID as stated on information label.
- Enter assigned new IP address.
- Select correct network class.
- Click "Set IP Address" button.

The process takes several seconds to complete and the progress is indicated below IP address field. When completed, a dialog box will pop-up showing a success message, or the one below.



Often it is a false alarm. To verify if the unit has in fact been programmed, do following:

- On Device Installer tool bar, click "Search Network" button (first on the left hand side). A new window "Search Network for Devices" will open
- In the new window check selection of the network class, then click "Start Search" button. After search is completed, check the window for address you just tried to program (there may be many addresses listed).
- If the new address is listed, click "Save" button. Details of new device will be added to the Device Installer data base.
- If the new address is NOT listed, repeat the programming procedure.

#### 7.1.3. Preparations for gateway address set up

- From your network administrator obtain the gateway IP address
- Connect a PC to the controller's network interface (directly or via a network).

- Power-up the controller.
- Start Device Installer program.

#### 7.1.4. Gateway IP address set up procedure

- In Device Installer device list select the address of the unit you want to configure.
- On Device Installer tool bar, click “Manage device configuration button”. A new window “Device Management” will open.
- Click “Telnet to Device” button.
- Telnet window will open, showing a message similar to the one below:

```
*** Lantronix Cobox Universal Device Server ***  
Serial Number 1297-041 Software Version V03.9 (000211)
```

Press Enter to go into Setup Mode

*Note: If Enter is not pressed within 3 seconds the connection will be terminated.*

- If Enter was pressed within time-out window, a message similar to the sample below will be printed to Telnet window:

```
*** basic parameters  
Hardware: Ethernet Autodetect  
IP addr 192.168.000.098, no gateway set
```

```
***** Channel 1 *****  
Baudrate 09600, I/F Mode 4C, Flow 00  
Port 10001  
Remote IP Adr: --- none ---, Port 00000  
Connect Mode: C0 Disconn Mode: 00  
Flush Mode: 00
```

```
Change Setup : 0 Server configuration  
                1 Channel 1 configuration  
                7 Factory defaults  
                8 Exit without save  
                9 Save and exit          Your choice ?
```

Type 0 followed by Enter.

The first item in server configuration is local IP address. That has been programmed already, but it is necessary to go through all bytes. Information in brackets shows current setting, which can be modified by typing new entry followed by Enter key. Next item after IP address reads:

Set gateway IP address (N) [or (Y)]

If value is (Y) – just press Enter, if (N) – press ‘Y’ followed by enter. Next item will be:

Gateway IP address (nnn)

Enter assigned gateway address, then press Enter at each item until set up menu is shown again. Terminate Telnet session by typing 8 or 9.

## 7.2. PROGRAMMING IP ADDRESSES USING ARP AND TELNET ACCESS

Procedure described below is recommended for advanced users with understanding of operation of networks.

**NOTE:** The following IP addresses and MAC addresses are only examples; in your setup use the desired IP addresses for the host machine and gateway address. The appropriate hardware MAC address will be located on a label just above the SageNET module on the rear of the Sageon Shield Standalone Battery Monitor.

### 7.2.1. Preparations for local address set up

- From your network administrator obtain new IP address. Also, ask for your network class.
- Connect PC to the controller's network interface (directly or via a network).
- Power-up the controller

### 7.2.2. Local IP address set up procedure

*The following section is excerpted from Lantronix "Embedded Integration Kit" Revision D 06/03/02, Part Number 900-226.*

The unit's IP address must be configured before a network connection is available. If the unit has no IP address, you can use Address Resolution Protocol (ARP) method from Windows-based systems to assign a temporary IP address. If you want to initially configure the unit through the network, follow these steps:

1. On a Windows-based host, create an entry in the host's ARP table using the *intended* IP address and the hardware address (MAC address) of the unit, which is found on the rear of the unit.

```
arp -s 191.12.3.77 00-20-4A-xx-xx-xx
```

*Notes:*

- i. *The IP address used here is an example and a value within the range of allowable IP addresses in your network may need to be used. The DOS command **ipconfig** with display the IP address of the Windows-based host machine.*
- ii. *The ARP table on the PC must have at least one IP address defined other than its own.*

2. Type **ARP -a** at the DOS command prompt to verify that there is at least one entry in the ARP table. If the local machine is the only entry, ping another IP address on your network to build a new entry in the ARP table; the IP address must be a host other than the machine on which you are working. Once there is at least one additional entry in the ARP table, use the following command to ARP an IP address to the unit:

```
arp -s 192.168.0.97 00-20-4a-xx-xx-xx
```

3. Open a Telnet connection to port 1. The connection will fail quickly, but the unit will temporarily change its IP address to the one designated in this step.

```
telnet 192.168.0.97 1
```

**Note:** Telnet is disabled by default in Windows 7/Vista. Enable telnet by following these steps:

- 1.) Click Start
- 2.) Control Panel
- 3.) Programs and Features
- 4.) Turn Windows features ON/OFF
- 5.) Check Telnet Client
- 6.) Click OK

4. Finally, open a Telnet connection to port 9999, and press Enter within three seconds to go into Setup Mode. If you wait longer than three seconds, the unit will reboot.

```
telnet 192.168.0.97 9999
```

5. Set all required parameters

**Note:** The IP address you just set is temporary and will revert to the default value when the unit 's power is reset unless you log into the unit and store the changes permanently. Refer to the chapter on configuration for instructions on permanently configuring the IP address.

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### 7.2.3. Configuring the Unit

*The following section is excerpted from Lantronix "Embedded Integration Kit" Revision D 06/03/02, Part Number 900-226.*

You must configure the Lantronix Interface so that it can communicate on a network with Sageon CSU and communicate with the Sageon CSU unit via the internal serial port.

The unit's configuration is stored in nonvolatile memory (NVRAM) and is retained without power. You can change the configuration at any time. The unit performs a reset after the configuration has been changed and stored.

#### 7.2.3.1. Using a Telnet Connection

To configure the unit over the network, establish a Telnet connection to port 9999.

1. From the Windows Start menu, click **Run** and type the following command, where x.x.x.x is the IP address and 9999 is the unit's fixed network configuration port number.

```
telnet x.x.x.x 9999 (Example: telnet 192.168.100.123 9999)
```

Note: Be sure to include a space between the IP address and 9999.

2. Click **OK**.

3. The Lantronix Universal Device Server window displays.

```
*** Lantronix Cobox Universal Device Server ***
```

```
Serial Number 1297-041 Software Version V03.9 (000211)
```

Press Enter to go into Setup Mode

4. To enter the Setup Mode, you must press Enter within 3 seconds.

```
*** basic parameters
```

```
Hardware: Ethernet Autodetect
```

```
IP addr 192.168.000.098, no gateway set
```

```
***** Channel 1 *****
```

```
Baudrate 09600, I/F Mode 4C, Flow 00
```

```
Port 10001
```

**Remote IP Adr: --- none ---, Port 00000**  
**Connect Mode: C0 Disconn Mode: 00**  
**Flush Mode: 00**

**Change Setup : 0 Server configuration**  
    **1 Channel 1 configuration**  
    **7 Factory defaults**  
    **8 Exit without save**  
    **9 Save and exit**           **Your choice ?**

5. Select an option on the menu by entering the number of the option in the **Your choice ?** field and pressing **Enter**.
6. To enter a value for a parameter, type the value and press **Enter**, or to confirm a current value, just press **Enter**.
7. When you are finished, save the new configurations (option **9**). The unit will reboot.

#### 7.2.4. Server Configuration (Network Configuration)

These are the unit's basic network parameters. The following parameters are displayed when you select login into the unit:

\*\*\* basic parameters  
Hardware: Ethernet Autodetect  
IP addr 192.168.000.098, no gateway set

Select 0 and press Enter to configure the Lantronix Interface Server's basic parameters

#### **IP Address**

The IP address must be set to a unique value in your network.

*Note: Lantronix Interface cannot connect to the network if the assigned IP address is already in use by another device.*

#### **Gateway Address**

The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the *Lantronix Interface*.

*Note: The gateway address must be within the local network.*

#### **Subnet Mask**

A netmask defines the number of bits taken from the IP address that are assigned for the host section.

*Note: Class A: 24 bits; Class B: 16 bits; Class C: 8 bits.*

The *Lantronix Interface* prompts for the number of host bits to be entered, then calculates the netmask, which is displayed in standard decimal-dot notation when the saved parameters are displayed (for example, 8-bit = 255.255.255.0).

Netmask	Number of bits reserved for host	Binary equivalent
255.255.255.255	0-bits	11111111.11111111.11111111.11111111
255.255.255.254	1-bit	11111111.11111111.11111111.11111110
255.255.255.252	2-bits	11111111.11111111.11111111.11111100
255.255.255.248	3-bits	11111111.11111111.11111111.11111000
255.255.255.240	4-bits	11111111.11111111.11111111.11110000
255.255.255.224	5-bits	11111111.11111111.11111111.11100000
255.255.255.192	6-bits	11111111.11111111.11111111.11000000
255.255.255.128	7-bits	11111111.11111111.11111111.10000000
255.255.255.0	8-bits	11111111.11111111.11111111.00000000
255.255.0.0	16-bits	11111111.11111111.00000000.00000000
255.0.0.0	24-bits	11111111.00000000.00000000.00000000

**Note:** Some values may be atypical implementations but are provided in this table for completeness and *ex gratia*.

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