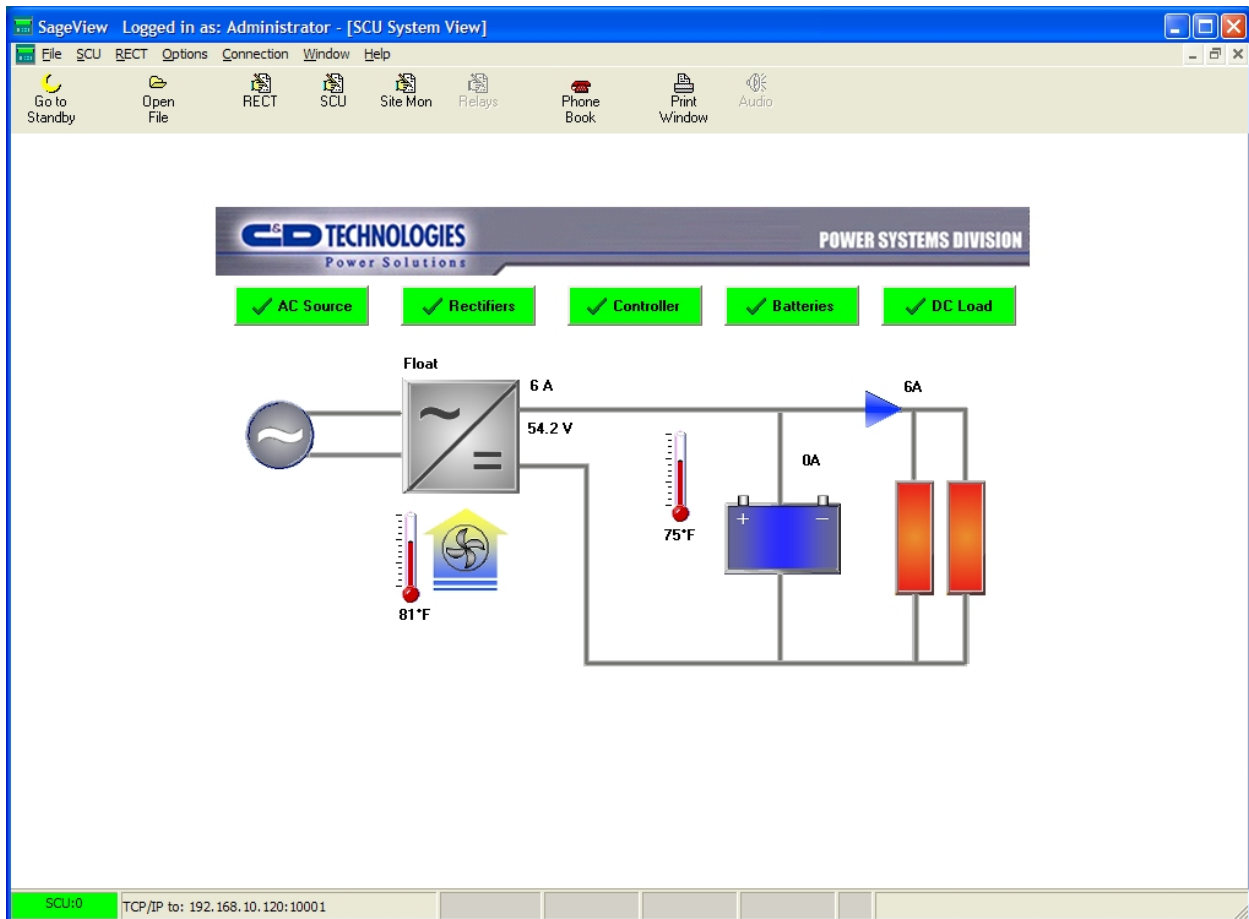


Technical Guide for SageView® Screens & Menus



APPROVED

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ISSUE HISTORY

Issue	Page(s) Altered	Description	Appr'd Date
1	All	ORIGINAL RELEASE; ECN 16038	JPR, 8/10/07
2	All	Updated to reflect SageView software usage for all Sageon Power Plants.	EWB, 2/13/09
3	All	Made minor typo corrections throughout manual. See ECN 17623 (W.Deakins)	CJM 3/25/11

QUALIFIED PERSONS

The software and equipment described herein should be installed, configured, operated and serviced only by qualified persons thoroughly familiar with:

- The Sageon® Product Manuals and any documents referenced in this guide
- DC Power Plant operation including the operation of battery strings
- Applicable on-site procedures, licensing requirements, and safety requirements

DOCUMENT SUMMARY

This technical guide focuses on the SageView® software package which provides users with a Microsoft Windows® graphical user interface for easy configuration and status monitoring of a Sageon® DC Power Plant. SageView® is free to customers who have purchased a Sageon product and is distributed on CD-ROM with each system shipped from the factory.

This guide provides detailed explanations of the SageView screens, menu options, operating parameters, and status values. The information in this guide is provided as additional detail to the information already provided in Sageon® manuals and SageView® online help.

Thank you for purchasing a Sageon® Power Plant. We at C&D are proud of the quality of our products and welcome any suggestions to further improve our design to fit your needs.

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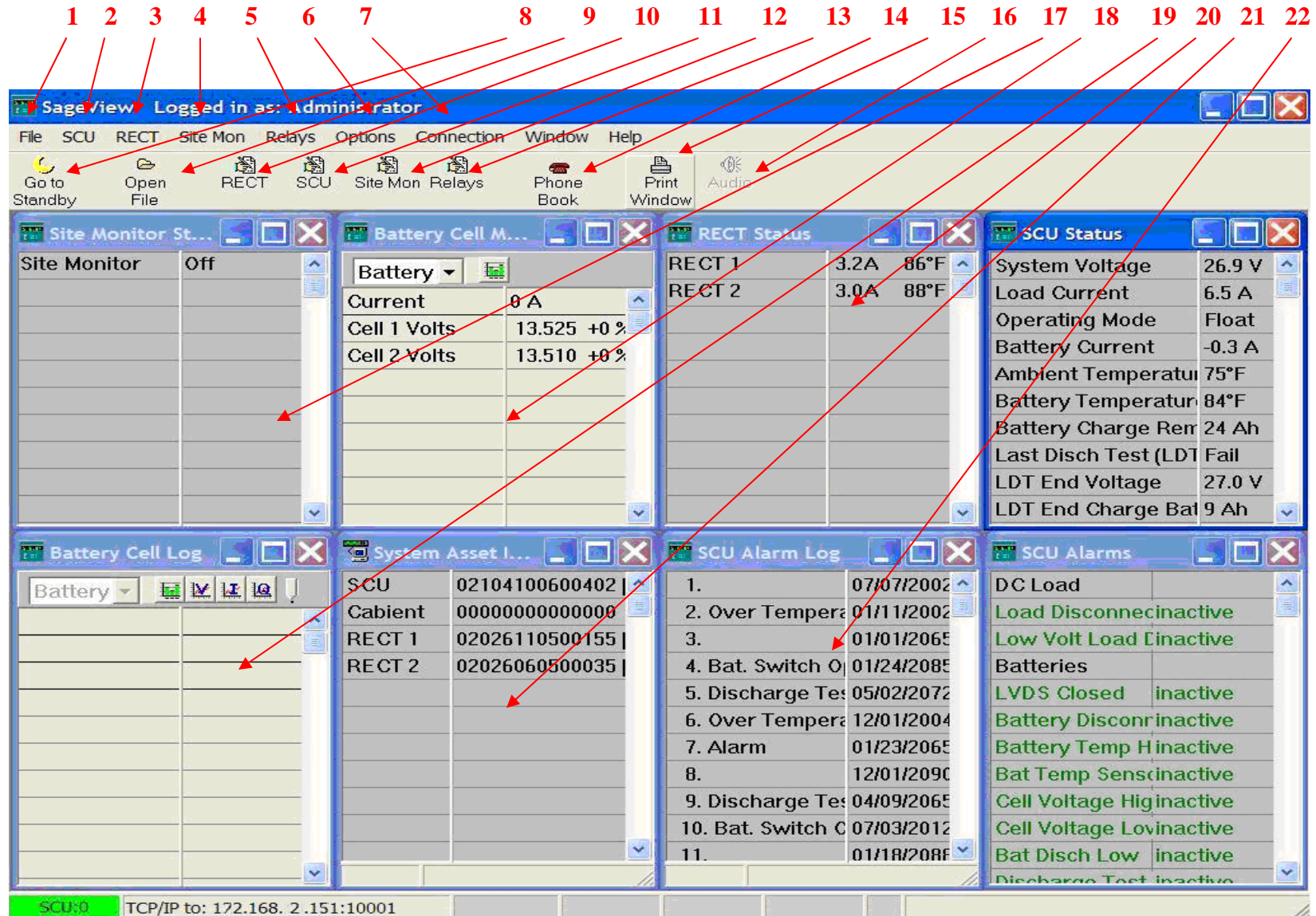
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SageView® Visual Index (section number)



SageView® Visual Index (section number)

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The screenshot displays the SageView software interface for monitoring a SCU (Site Control Unit). The main window, titled "SCU System View", shows a power system diagram with the following components and data:

- AC Source:** 25.4 A
- Rectifiers:** 26.9 V
- Controller:** 19.5 A
- Batteries:** 82°F, 1.3 h
- DC Load:** 5.9 A

On the right side, there are two panels:

- SCU Status:** A table of system parameters.

System Voltage	26.9 V
Load Current	5.9 A
Operating Mode	Float
Battery Current	19.5 A
Ambient Temperature	77°F
Battery Temperature	82°F
Battery Charge Remain	9 Ah
Total est. battery time	1.3 h
Est. Bat1 Time Remain	Battery Charging
Last Disch Test (LDT)	Fail
LDT End Voltage	27.0 V
LDT End Charge Bat1	9 Ah
LDT Duration	00:00
LDT Date	06/03/2006
Controller Serial Num	02104100600402
Cabinet Serial Number	00000000000000
- SCU Alarms:** A list of alarm conditions, all currently inactive.

DC Load	
Load Disconnected	inactive
Low Volt Load Disc	inactive
Batteries	
LVDS Closed	inactive
Battery Disconnect	inactive
Battery Temp High	inactive
Bat Temp Sensor	inactive
Cell Voltage High	inactive
Cell Voltage Low	inactive
Bat Disch Low	inactive
Discharge Test Fail	inactive
Battery Discharge	inactive
Bat Discharge Sym	inactive
Cell Deviation High	inactive
Cell Deviation Low	inactive
Rectifiers	
Rectifier Urgent	inactive

At the bottom left, the status bar shows "SCU:0" and "TCP/IP to: 172.168.2.151:10001".

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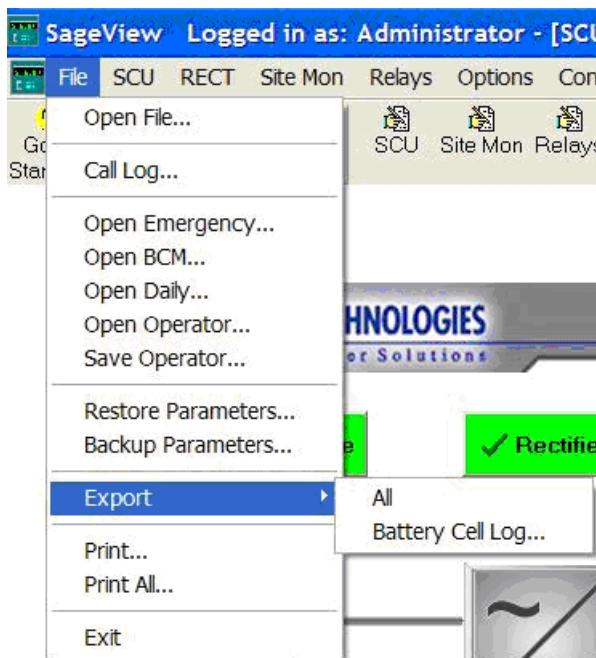
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Notice:

<p>This guide does not include installation and configuration instructions for SageView®, that information is documented in the Sageon Product Manual supplied with each power plant.</p>

1. File Menu



Clicking the File text will produce the drop down menu shown to the left. Options available under the File Menu include:

- Open File
- Call Log
- Open Emergency
- Open BCM
- Open Daily
- Open Operator
- Save Operator
- Restore Parameters
- Backup Parameters
- Export – All
- Export – Battery Cell Log
- Print
- Print All
- Exit

1.1. Open File

Opens a previously saved parameter file from disk. A dialog box is displayed to select the file name. The parameter file can be any of the following types:

- SMR Parameter File
- Site Monitor Parameter File
- CSU/SCU Parameter File
- Relays Parameter File

1.2. Call Log

Displays a list of the most recent Unacknowledged Calls. An Unacknowledged Call is generated automatically when a SCU reports due to an alarm condition or a programmed Daily Call-up and the user of the receiving PC does not respond to the 'Stay Connected' message. Unacknowledged Calls can be generated from either a TCP/IP, modem or direct serial connection. The list of Unacknowledged Calls are actually disk files that contain the status of the SCU at the time of Call-up. Selecting the name of the file will open the file and display the SCU operating status.

1.3. Open Emergency

Displays the list of SCU status files that have been generated as a result of an Emergency Call-up.

Emergency files are always stored in the ..\CSUemerg subdirectory. The first up to 7 characters of the file name is the SCU Access Code (leading zeros are removed). The file

extension, along with the last character of the file name, form a unique (sequential) identifier for this Call-up from the particular SCU calling. This ensures that Call-up files are not over-written by subsequent Call-ups and are always available for future reference.

The only way to delete a Call-up file is for the user to manually remove it from the appropriate directory using the operating system functions (e.g. Windows Explorer).

1.4. Open BCM

Displays the list of SCU status files that have been generated as a result of the Sageon® Battery Monitor (SBM).

SBM files are always stored in the ..\CSUbcm subdirectory. The first up to 7 characters of the file name is the SCU Access Code (leading zeros are removed). The file extension, along with the last character of the file name, form a unique (sequential) identifier for this SBM file from the particular SCU.

When SageView® receives battery discharge log entries while in Standby mode, the consecutive files of the same discharge will have a number of file added as last part of file name. Extensions of those files remain the same. For example, if SCU with access code 1234567 sent three part Discharge Log entries, SageView® will create files 1234567a1.013, 1234567a2.013 and 1234567a3.013. This ensures that SBM files are not over-written by subsequent SBM events and are always available for future reference.

The only way to delete a SBM file is for the user to manually remove it from the appropriate directory using the operating system functions (e.g. Windows Explorer).

1.5. Open Daily

Displays the list of SCU status files that have been generated as a result of a Daily Call-up.

Daily Call-up files are always stored in the ..\CSUdaily subdirectory. The first up to 7 characters of the file name is the SCU Access Code (leading zeros are removed).

The file extension, along with the last character of the file name, form a unique (sequential) identifier for this Call-up from the particular SCU calling. This ensures that Call-up files are not over-written by subsequent Call-ups and are always available for future reference.

The only way to delete a Call-up file is for the user to manually remove it from the appropriate directory using the operating system functions (e.g. Windows Explorer).

1.6. Open Operator

Displays the list of SCU status files that have been previously saved by the Operator.

Operator files are always stored in the ..\CSUoper subdirectory. The first up to 7 characters of the file name is the SCU Access Code (leading zeros are removed).

The file extension, along with the last character of the file name, forms a unique (sequential) identifier for this Operator File from the particular SCU connected. This ensures that Operator Files are not over-written by subsequent Saves and are always available for future reference.

The only way to delete an Operator file is for the user to manually remove it from the appropriate directory using the operating system functions (e.g. Windows Explorer).

1.7. *Save Operator*

Saves the current SCU status as a disk file in the ..\CSUoper subdirectory.

The file name is generated automatically using characters of the SCU Access Code (leading zeros are removed). The file extension, along with the last character of the file name, forms a unique (sequential) identifier for this Operator File from the particular SCU connected. This ensures that Operator Files are not over-written by subsequent Saves and are always available for future reference.

The only way to delete an Operator file is for the user to manually remove it from the appropriate directory using the operating system functions (e.g. Windows Explorer).

1.8. *Restore Parameters*

Loads all the parameters of the SCU that have been saved in a parameter backup file. Once the parameters are loaded the application attempts to write the loaded values into the SCU.

The parameters include:

- SCU Parameters
- RECT Parameters
- Site Monitor Parameters
- Programmable Relay Parameters

The tool bar buttons of each parameter type will be marked as “(modified)” until the associated parameters are written to the SCU. (see Section 2.1.31)

The user will be asked to enter the write-protect password at the start of the restoration, and then a progress dialogue is displayed for each parameter type as it is written to the SCU.

1.9. *Backup Parameters*

Saves all the parameters of the SCU into one file for later restoration. The extension of these files are *.BAK.CSV. The parameters include:

- SCU Parameters
- RECT Parameters
- Site Monitor Parameters
- Programmable Relay Parameters

This can be used to save the set-up of a SCU, so that this set-up can be duplicated to other SCUs as they are deployed.

1.10. *Export - All*

The File Export command is used to export the data in all windows except the Battery Cell Log Window, to a disk file. The exported file format is 'Comma Separated Values' (CSV), which can be read directly by Microsoft Excel, and used to generate customized graphs and data presentations

1.11. *Export – Battery Cell Log*

The File Export command is used to export the data in the Battery Cell Log Window to a disk file. The exported file format is 'Comma Separated Values' (CSV), which can be read directly by Microsoft Excel, and used to generate customized graphs and data presentations

1.12. *Print*

Prints the currently selected window.

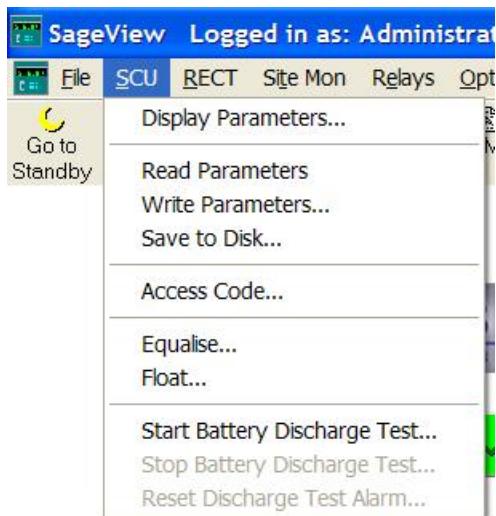
1.13. *Print All*

Prints all of the SageView® windows.

1.14. *Exit*

Exits the SageView® program.

2. SCU Menu



Clicking the SCU text will produce the drop down menu shown to the left.

- Display Parameters
- Read Parameters
- Write Parameters
- Save to Disk
- Access Code
- Equalize
- Float
- Start Battery Discharge Test
- Stop Battery Discharge Test
- Reset Discharge Test Alarm

2.1. Display Parameters

Selecting the 'Display Parameters' option in the SCU Menu will cause the screen show to the left to appear. This screen allows configuration of various system parameters as well as serving as the entry point into other configuration screens

Screen Parameters:

2.1.1 Float (V)

This is the float voltage setting for the system. Under normal operation for a DC power system, the back up batteries are connected in parallel with the rectifiers and load; and the batteries do not provide any power while the AC mains are available. In this condition, the batteries are kept fully charged by float charging while the rectifiers provide the entire load current. This mode of system operation yields the longest battery life while ensuring that full capacity of the batteries are available in the event of a mains power failure.

The voltage required to provide the float charging of a valve regulated lead-acid (VRLA) battery is typically 2.23V to 2.25V per cell in the battery string. Hence for a 24 cell string, the float voltage is typically set between 53.5V to 54.0V. Note that the value for the float voltage is the reference voltage for battery temperature compensation.

When using float mode for recharging batteries after a period of discharge, it is common to limit the battery charging current until the battery voltage reaches the float voltage. **For correct float voltage settings for each system, always consult the battery manufacturers' datasheets for recommended operating levels.**

2.1.2 EQ Enable Checkbox

Checking this box will enable the Equalize Charge function for the plant. Equalize Charge is only recommended for flooded cell technology batteries.

2.1.3 Equalize (V)

This is the equalize voltage setting for the system. Equalize mode provides a higher charging voltage to the batteries and is useful for decreasing charging times of batteries that have been discharged as well as equalizing the cell voltages after long periods of float charging.

Note:

Some new VRLA battery technologies do not require equalize charging under normal conditions. Always consult the manufacturers recommendations for battery charging.

2.1.4 V Start EQ (V)

System voltage threshold used to initiate Equalization charging of the batteries. This parameter can be set to a level below which, an equalization charging cycle will be performed. The level is typically set to a voltage that the batteries will reach after a long period of discharging (several hours). Check the box to the left of the parameter label to enable this parameter.

The equalization charge in this mode is used to reduce the charging time of the batteries after a long duration power failure. Consult Installation and Operation Manual and the battery manufacturers recommendations for the appropriate range of this parameter.

2.1.5 Q Start EQ (Ah)

The system capacity depletion threshold is used to initiate Equalization charging of the batteries. This parameter is used to set the limit of depletion of system capacity (supplied by the batteries to the load), beyond which an Equalization charging cycle will be performed. Each time the battery is required to provide load current and is subsequently recharged in float mode, the efficiency of charging is only 90-99%. Hence, after a number of such cycles, the capacity of the system may be diminished to a point where Equalization voltage charging is required to recover full capacity.

This function keeps an accumulated measurement of the unrecovered charge (an efficiency of 90% is assumed) and will initiate an Equalization cycle once the limit to capacity loss is reached. A typical value used is a depletion of 10% of the rated system capacity (in Ah). This parameter can be enabled by checking the box to the left of the parameter, and can be used in conjunction with V Start Eq(V). Note, if this function is enabled, the Equalize voltage must be set higher than the float voltage to prevent the system being latched into Equalize mode. (Float voltage = Equalize voltage will not result in extra capacity being added to the battery).

Note that this function requires the Sageon® Plant be equipped with optional battery current transducers that provide battery string current information to the plant.

2.1.6 I Start EQ (A)

This function is used to initiate Equalization charging of the batteries if the charging current in float mode exceeds the set threshold. This function is normally disabled.

Note that this function requires the Sageon® Plant be equipped with optional battery current transducers that provide battery string current information to the plant.

2.1.7 EQ End (A)

This parameter is used to terminate an Equalize charge cycle based on the fall in charging current in the battery as it nears full capacity. Once the charging current falls below the

threshold of this parameter, the system reverts to float charging mode and trickle charges the battery.

This parameter can be set and used in conjunction with the fixed Equalization charging time described below. In this case, the Equalization mode is terminated either when the charging current falls below the threshold set with EQ End I (A) or after a fixed duration, which occurs first. A typical value used is 5% of the rated Ampere-Hours, i.e. for a 100AH battery, a setting of 5A is typically used.

Note that this function requires the Sageon® Plant be equipped with optional battery current transducers that provide battery string current information to the plant.

2.1.8 EQ Duration (Hrs)

This parameter is used to terminate an Equalization cycle after a fixed charging duration.

This function can be used in conjunction with the charging current limit as described above. If termination is to be made only by EQ End I (A), this parameter should be set to the maximum value of 48 hours.

2.1.9 EQ Per (Wks)

This parameter sets the time period between Equalization cycles. If no Equalization cycle has been performed due to a discharge event, then the system will initiate an Equalization cycle after the time set by this parameter has elapsed. Each time an equalization cycle is initiated by a discharge event, the timer for this parameter is reset. See the Installation and Operation Manual for limits of this parameter.

2.1.10 Drop (V)

This is the value of the expected system voltage drop between the output of the RECTs and the voltage sense point for the system at full load. In this case the system voltage drop is simply the calculated bus bar voltage drop at full load (including battery-charging current) from the bus bar resistance. This value will not typically require change by the operator.

2.1.11 Number of RECTs

This parameter sets the number of rectifiers the SCU will communicate with in the system. The value should be set to equal the normal number of rectifiers operating in the system. Refer to the Rack Power System Operation and Installation Manual for the maximum number of RECTs the SCU in the system can communicate with. Note that if Number of RECTs is set to a value larger than the number of rectifiers physically installed, the plant will begin generating failure alarms for the missing rectifiers.

2.1.12 Sys High V Alarm (V)

The system voltage upper limit alarm is set by this parameter. If the system voltage rises to this level or above due to either a faulty Rectifier or an external effect from the load terminals, the SCU generates a warning alarm. Note that in some cases, this parameter can be used to confirm the system is in equalize mode by setting this parameter to a voltage between the float and equalize voltage settings.

This alarm differs from the Rectifier High Voltage alarm, which is used to signal a problem with an individual Rectifier, perhaps due to poor electrical connection between the Rectifier and the system (excess voltage drop between Rectifier and system sense point).

A system voltage High alarm is an indication alarm only to inform the user that the system is operating above the expected voltage range. Most users are not interested in Rectifier high or low voltage alarms, and set this parameter to a level that will not cause false alarms.

2.1.13 Sys Low V Alarm (V)

This alarm performs a similar function to the Sys High V Alarm (V) but sets the lower voltage limit for normal operation. If the system voltage drops below this level due to a mains failure or a system overload, the SCU flags a warning alarm. This alarm level is often set to a level where the batteries are approaching minimum capacity.

This alarm differs from the Rectifier Low Voltage alarm, which is used to flag an internal problem with an Rectifier (insufficient supply available).

2.1.14 Bat Disch Alarm (V)

This alarm setting is used to indicate that the system has fallen below the battery open circuit terminal voltage (48V) and that the batteries are discharging. This alarm usually appears shortly after an AC failure and the threshold is set to typically 1V below the open circuit voltage of the battery string. For example, for a 24 cell battery, $V_{oc} = 2.0V/cell$, implies V_{oc} for the battery is 48V. Hence the alarm is set to 47.0V.

Note that in this example, the terminal voltage will drop up to 0.3V/cell lower if the battery is supplying a high load current, and would cause this alarm to be generated almost as soon as the AC fails.

2.1.15 Disch Diff I Alarm (A)

This parameter sets the Battery discharge current differential alarm threshold. This alarm will only function if two or more battery strings are present, and is used during an AC power outage to provide an indication of the state of the batteries. When the batteries are supplying the load, the difference in discharge current between each string is quite small for a “good” set of batteries. If one battery is supplying considerably less current than the other, it is usually an indication that a problem exists with that battery string. The discharge current difference to activate the alarm is typically set to 20% of the maximum expected discharge (load) current.

Note that this function requires the Sageon® Plant be equipped with optional battery current transducers that provide battery string current information to the plant.

2.1.16 Amb. Temp Alarm (°F)

This parameter sets the high ambient temperature alarm threshold. This alarm is used to alert the user that the remote site temperature has risen to a level that can shorten the life of both the batteries and the rectifiers

2.1.17 Bat Temp Alarm (°F)

This parameter sets the high battery temperature alarm threshold. A temperature sensor located within the battery enclosure (attached to a battery; typical at the midpoint) measures the battery temperature.

This alarm is used to alert the user that the average battery temperature has risen to a level that may shorten battery life or that battery thermal runaway may be in progress (particularly if the ambient temperature is low). Note that a single sensor provides an estimate of the average temperature of the battery string and that it is possible for a faulty cell to operate at a much higher temperature with only a small increase in the measured average battery temperature.

2.1.18 Bat Temp Sensor Alarm Checkbox

This check box enables/disables the battery temperature sensor alarm (see Batt Temp Alarm (°F) above). The box should be “unchecked” or disabled if there is no battery temperature sensor fitted to the system.

2.1.19 System: Standby / UPS Checkboxes

These check boxes are used to indicate how the type of system operation is being used. A standby type of system is defined as a system where the load is normally very low or zero and occasionally increases to a high level potentially greater than the output capability of the rectifiers. Under these conditions, the rectifiers are usually only charging the batteries and would indicate ‘No Demand’ (Nd) or ‘Low Load’ (Lo) alarms (see RECT Status Window) which are not an indicator of a problem for this type of system. Checking the Standby box causes the SCU to inhibit these alarms to prevent ‘nuisance’ alarms when the rectifiers are only supplying battery float current (tens to hundreds of milliamperes).

A UPS type of system is defined as a system where the rectifiers are normally supplying a significant load current (>10% system capacity) as well as battery charging current. In this type of system, a sudden drop in load to a level that would cause either a ‘No Demand’ (Nd) or ‘Low Load’ (Lo) alarm to be flagged, is an indicator of a load or DC connection failure (circuit breaker, connection link, etc). For most telecommunications applications, the UPS check box is ticked. (Note: These checkboxes have no effect on system operation or output; only alarming.)

2.1.22 Date (mm/dd/yyyy)

This parameter shows the system date according to the remote SCU. To change the date, simply overwrite the date shown (it will be highlighted in yellow) and write the change to the SCU using the Write to SCU button.

2.1.23 Time (hh:mm:ss)

This parameter shows the system time according to the remote SCU. To change the time, overwrite the time shown and write the change to the SCU using the Write to SCU button.

2.1.22 Battery Parameters Edit Button

Parameter	Value
Number of Batteries	1
Number of Cells	12
Battery Rating (Ah)	25
Deep Discharge (V)	23.0
LVDS Trip (V)	22.0
I-Bat FSD (A)	50
Deep Discharge Recovery I Lim (A)	50
Float Bat I Lim (A)	6
EQ Bat I Lim (A)	50
BTC (mV/C/°F)	-0.0
BTC Centre (°F)	68

Clicking the 'Battery Parameters' Edit Button in the SCU screen will cause the screen shown to the left to appear. This screen allows configuration of various battery parameters.

Screen Parameters

2.1.22.1 Number of Strings

This parameter sets the number of complete batteries in the system. A complete battery is defined as a string of individual cells or mono-blocks (groups of cells in series). This parameter is used to enable monitoring of battery currents.

2.1.22.2 Number of Cells

This parameter sets the number of cells in each battery and is used for battery temperature compensation. The number of cells equals the actual number of chemical cells NOT the number of mono-blocks. For example, a string of 8 x 6V mono-blocks (48V open circuit voltage) consists of 24 cells, since each 6V mono-block is made from 3 base cells.

2.1.22.3 Battery Rating (Ah)

The rated battery capacity is the capacity of a single battery string in the system. It is assumed that multiple battery strings all have the same rated capacity.

This parameter is used to provide an indication of remaining battery capacity during a discharge. The capacity of the battery, measured in ampere-hours (Ah), is a measure of the amount of energy a battery can deliver in a certain time (h) when discharging with a constant current (A) until a given voltage is reached (final or minimum discharge voltage). Rated capacity of a battery is the capacity at a specified temperature (typically 20°C) for a specified discharge current and a specified final discharge voltage. Most battery data specifies rated capacity for a current that will provide 8-10 hours of discharge (low discharge current).

The battery capacity is effected by discharge current and battery temperature. The higher the discharge current, the smaller the battery capacity and the lower the final discharge voltage. At lower temperatures, the capacity is reduced, while at higher temperatures, the capacity is

increased. Within a limited temperature range, the capacity varies by about 1% per 1°C. The capacity, can be made less sensitive to temperature by using battery temperature compensation.

Note that this function requires the Sageon® Plant be equipped with optional battery current transducers that provide battery string current information to the plant.

2.1.22.4 Deep discharge (V)

This parameter sets the system voltage threshold below which the batteries are deemed to have been discharged below their minimum discharge voltage and an alarm is generated.

Discharge curves of the batteries for various loads are usually provided by battery manufacturers and can be used to determine the Deep Discharge voltage to for each site. The final discharge voltage on the discharge curves is the specified minimum voltage level when discharging with a specified current. For example, a 10 hour discharge of a 100Ah battery at 10A load has a minimum discharge voltage of 1.8V/cell. For the same battery discharging at 50A load, the battery has only a 1 hour capacity rating and a minimum discharge voltage of 1.65V/cell. If the voltage falls below this minimum specified level, a "deep discharge" has occurred, resulting in stressing of the active material on the battery plates. Repeated discharging below the final discharge voltage damages the structure of the active material in the battery plates and leads to a shortening of battery service life.

From the example above, the range of Deep Discharge (V) for a 24 cell battery is 40V to 43.5V. Recovering from a deep discharge usually requires that the battery charging current is limited to a value less than that used during a normal charging cycle, until the battery voltage has risen above the deep discharge voltage.

2.1.22.5 LVDS Trip (V)

This parameter sets the system voltage below which the low voltage disconnection switch (LVDS) will operate to protect the batteries from being destructively discharged. The value of this parameter is usually set for a minimum battery cell voltage of 1.65V to 1.85V depending on the expected load and the minimum voltage the operator wishes to discharge the battery to. This equates to a voltage range of 40V to 44.5V for the example of a 24 cell battery system.

Discharge curves of the batteries for various loads are usually provided by battery manufacturers and can be used in conjunction with the LVDS trip voltage to determine the system operating time for each site. The setting of the LVDS trip voltage can also be used to set the lower voltage limit for the communications system, below which the communications equipment is not specified to operate.

For systems where the LVDS is not used this parameter is usually set to 42V and does not have any effect on the system operation.

2.1.22.6 Battery Current Sensor (A)

This parameter sets the size of the optional battery current transducer. Typically, one transducer will be used for each battery string, with all transducers being of the same ampere rating.

2.1.22.7 Deep Discharge Recovery I Lim (A)

This feature is only available if the Sageon® Plant is equipped with the optional battery current transducers.

This parameter sets the battery charging current limit for a battery that has been deep discharged. The battery current is limited to this value until the battery voltage exceeds the Deep Discharge (V) threshold voltage.

The SCU operates in such a way that the output voltage of the RECTs is reduced from the float voltage to a level slightly above the battery open circuit voltage. The battery current is then set by the voltage difference between the RECTs and the battery open circuit voltage, and the total resistance of the system wiring and the battery internal resistance. The battery charging current is measured by an optional current transducer, which the SCU uses to control the Rectifier voltage and hence the battery current.

Consult the data from the battery manufacturer for suggested values of charging current limits.

2.1.22.8 Float Bat I Lim (A)

This feature is only available if the Sageon® Plant is equipped with the optional battery current transducers.

This parameter sets the battery charging current limit when the battery voltage is between the deep discharge voltage and the system float voltage. Consult the data from the battery manufacturer for suggested values of charging current limits.

2.1.22.9 Eq Bat I Lim (A)

This feature is only available if the Sageon® Plant is equipped with the optional battery current transducers.

This parameter sets the battery charging current limit when the battery is undergoing an Equalization charge and the battery voltage exceeds the system float voltage. Consult the data from the battery manufacturer for suggested values of charging current limits.

2.1.22.10 BTC (mV/C/°F) Checkbox and Edit Field

Checking the check box to the left of this parameter enables battery temperature compensation. The idea of compensating the battery float voltage with respect to temperature is related to the variation in electrochemical voltage with temperature due to chemical reaction rates effecting cell pH.

At lower temperatures, the battery cell voltage increases, while at higher temperatures, the cell voltage decreases. If the system voltage is held constant for a variation in temperature, the battery charging current will drop at low temperatures and will cause a significant increase in the charging time of the batteries. A worse problem occurs for the batteries at high temperatures, where the drop in cell voltage causes an increase in charging current. If the charging current is not limited, then increase in current leads to further heating and eventually thermal runaway of the batteries.

Battery temperature compensation is used to negate this affect. The ambient temperature range over which the temperature compensation operates is 50°F to 95°F (10°C to 35°C) and is NOT user adjustable. Note that the value entered for the parameter is the magnitude of the compensation, however the compensation has a negative coefficient so that the battery float voltage decreases with increasing temperature. The units for this parameter is mV per degree Fahrenheit per cell (mV/C/°F) and the value varies depending on battery technology. Consult the battery data for battery temperature compensation coefficient and center temperature.

At ambient temperatures above 95°F, battery temperature compensation remains constant at the value obtained at 95°F. Similarly, at temperatures below 50°F, the compensation remains at the value obtained at 50°F. At very high ambient, where the battery temperatures exceed 100°F, loss of electrolyte through an increased gassing rate and water evaporation increases, causing the battery capacity and performance to reduce.

2.1.22.11 BTC Centre (°F)

The battery temperature compensation center temperature is the temperature at which the compensation adjustment is zero. The temperature entered for this parameter is usually the temperature at which the manufacturer specifies the rated battery capacity. In some cases, the battery manufacturer may provide battery temperature compensation data that can be entered in the appropriate parameters. When setting this parameter, please note that some manufacturers may specify temperature in °C and others in °F.

2.1.23 Reporting Options Edit Button

Clicking the 'Reporting Options' Edit Button in the SCU screen will cause the screen show to the left to appear. This screen allows configuration of the remote reporting feature available for Sageon® Power Systems equipped with the modem interface.

Screen Parameters:**2.1.23.1 Alarm Report Check Box**

When this check box is checked, the remote SCU will dial up the numbers in Phone Num 1, 2, 3 to report the occurrence of a system or Rectifier alarm.

2.1.23.2 Modem Check Box

This checkbox is used to tell SageView® the type of connection being used for the SCU to make a report. If the SCU is remote and must use a phone line to make the report, the Modem checkbox must be checked and at least one phone number must be entered.

Note: If the SCU is using a TCP/IP connection or local and a direct connection to the PC is made, this checkbox must not be checked.

2.1.23.3 Daily Report Check Box

When this check box is checked, the remote SCU will dial up the numbers in Phone Num 1, 2 & 3 sequentially at a specified time to report any occurrence of a system or Rectifier alarm during the day and will communicate the present system operation statistics. The remote SCU will remain connected until the user terminates the remote communication.

2.1.23.4 Daily Time

This is the specified time each day that the remote SCU being communicated with will dial the user to send the daily report.

2.1.23.5 Phone Num 1..3

These fields are the three phone numbers the remote SCU will dial sequentially, at 3 minute intervals, until communication with the user (via SageView®) is established. The SCU will continue to cycle through the phone numbers indefinitely until SageView® confirms receipt of the sent information.

2.1.24 Expansion 1 – AC1ph (optional hardware add-on package)

Checking the Expansion 1 – AC1ph check box enables the single phase AC monitor (MMIB1) and permits access to the Edit button. Pressing this button opens the single phase AC monitor parameter window. Detailed information about the parameters used to operate the single phase AC monitor is contained in this window. The parameters used/required are:

Voltage High (V)

Sets the alarm threshold for AC over-voltage (Voltage is Line to Neutral)

Voltage Low (V)

Sets the alarm threshold for AC under-voltage

Frequency High (Hz)

Sets the alarm threshold for the supply frequency being too high

Frequency Low (Hz)

Sets the alarm threshold for the supply frequency being too low

Current FSD (A)

Sets the scaling factor for the AC current transducer. The value equals the current represented by 4V at the output of the transducer. Normally set to 100A.

2.1.25 Expansion 2 – AC3ph (optional hardware add-on package)

Checking the Expansion 2 – AC3ph checkbox enables the three phase AC monitor (MMIB2) and permits access to the Edit button. Pressing this button opens the three phase AC monitor parameter window. Detailed information about the parameters used to operate the three phase AC monitor is contained in this window. The parameters used/required are:

Voltage High (V)

Sets the alarm threshold for AC over-voltage (Voltage is Line to Neutral)

Voltage Low (V)

Sets the alarm threshold for AC under-voltage

Frequency High (Hz)

Sets the alarm threshold for the supply frequency being too high

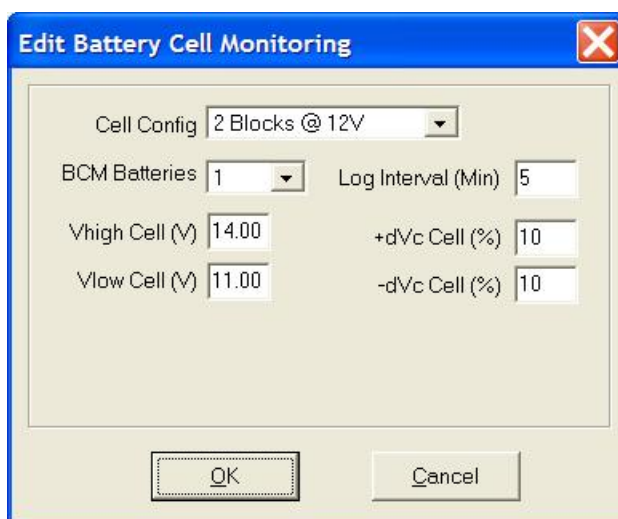
Frequency Low (Hz)

Sets the alarm threshold for the supply frequency being too low

Current FSD (A)

Sets the scaling factor for the AC current transducer. The value equals the current represented by 4V at the output of the transducer. Set to 100A if a standard MMIB2 is used with a single turn through the current transducer.

2.1.26 Expansion 2 – Battery Monitor (Bat Mon) Checkbox and Edit Button



Clicking the 'Bat Mon' Edit Button in the SCU screen will cause the screen show to the left to appear. This screen allows configuration of the optional Sageon® Battery Monitor.

Screen Parameters:**2.1.26.1 Cell Config**

This parameter is limited to a selection list. The configuration of the battery string is set using this parameter. For example, if the battery consists of 24 individual cells of 2V, and the battery cell monitor is connected to each of the cells, the parameter needs to be set to "24 cells @ 2V". Alternatively, if the battery consist of 8 mono-blocks of 6V and the SBM is connected only to the terminals of the mono-blocks, the parameter needs to be set to "8 blocks @ 6V".

2.1.26.2 BCM Batteries

This parameter sets the number of battery strings being monitored by the SBM.

2.1.26.3 Vhigh Cell (V)

This parameter sets the upper limit of cell voltage, above, which the cell is regarded as being faulty and an alarm is flagged. Typically, this parameter is set to the gassing threshold of 2.35V.

2.1.26.4 Vlow Cell (V)

This parameter sets the lower limit of cell voltage, below, which the cell is regarded as being faulty and an alarm is flagged. For a cell voltage to be excessively low, a high level of self discharge is required or an internal fault in the cell is present. Typically, this parameter is set to a value below the final discharge voltage, for example 1.75V.

2.1.26.5 Log Interval (Min)

This parameter sets the interval in minutes between subsequent measurements of the battery cell voltages for storing in the battery cell log. The log is particularly useful for recording battery performance during a discharge, and can provide advanced warning of problems with individual cells in the battery string.

2.1.26.6 +dVc Cell (%)

This parameter sets the threshold (in percentage of the average cell voltage) of cell voltage deviation above the average cell voltage of the battery. A deviation larger than the threshold indicates the cell is faulty and an alarm is flagged. In normal operation, the individual cell voltages vary from the average cell voltage by up to 100mV (5%). Hence a typical value used for this alarm threshold is 10%-20% to avoid false alarms.

2.1.26.7 -dVc Cell (%)

This parameter sets the threshold (in percentage of the average cell voltage) of cell voltage deviation below the average cell voltage of the battery. A deviation larger than the threshold indicates the cell is faulty and an alarm is flagged. This parameter is usually set to the same value as +dVc Cell (%).

2.1.27 Bat Disch Test Checkbox and Edit Button

Checking the 'Bat Disch Test' checkbox and clicking the Edit Button in the SCU screen will cause the screen show to the left to appear. This screen allows configuration of the optional automatic battery discharge test.

Screen Parameters:

2.1.27.1 Period (days)

Sets the number of days between periodic battery discharge tests. If this function is not to be used, the value should be set to 0.

2.1.27.2 Test Time (hh:mm)

Sets the time of day the automatic discharge test will be performed if enabled. If the period function is set to 0, SageView® will ignore this value.

2.1.27.3 Test Current (A)

This feature is only available if the Sageon® Power Plant is equipped with the optional battery current transducers.

Sets the current to be drawn from the batteries during the discharge test. Note that the value of the test current must be less than the system load current for the SCU to be able to control the test current.

Alternatively, ticking the 'Current = Load' check box or setting the value to zero will result in the battery supplying the total load current (RECTs deliver zero output current). This is known as an 'uncontrolled load'. The output voltage of the RECTs is then set to the End Voltage (see below) and will prevent the battery discharging below this level.

2.1.27.4 End Voltage (V)

Sets the battery discharge voltage at which the test will be terminated. This parameter is usually set to a few volts above the deep discharge voltage.

2.1.27.5 Duration (hh:mm)

Sets the maximum duration of the battery discharge test. The test is terminated either by the End Voltage condition, End Charge condition or after the fixed duration, whichever occurs first.

2.1.27.6 Current=Load Check Box

Checking the 'Current = Load' check box or setting the value to zero will result in the battery supplying the total load current (RECTs deliver zero output current). This is known as an 'uncontrolled load'. The output voltage of the RECTs is then set to the End Voltage (see below) and will prevent the battery discharging below this level.

2.1.27.7 End Charge (Ah)

This feature is only available if the Sageon® Power Plant is equipped with the optional battery current transducers.

Sets the condition for termination of the battery discharge test based on the amount of charge removed from the battery. The charge removed is calculated from the product of the test current and the time elapsed.

2.1.28 System Time Button

This button modifies the date and time shown on the screen to the date and time of the host computer running SageView®. The values will be highlighted to indicate they have been modified and can then be written to the remote SCU. Please note that only hours and minutes are set, so clock of SCU will not be fully synchronized with the PC.

2.1.29 Print Button

This button prints all SCU parameters in a table format using the currently selected system printer.

2.1.30 Save to Disk Button

Saves the currently displayed SCU Parameters to disk for later retrieval. A dialogue box is displayed to select the appropriate file name. The file is saved in a Comma Separated Value CSV format.

2.1.31 Write to SCU Button

This function is used to write the settings displayed in the SCU Parameters Window to the SCU's non-volatile memory. A SCU must be connected to perform this operation. The writing of the settings to the SCU usually takes several seconds.

2.1.32 Read from SCU Button

This function reads the operating Parameters from the currently connected SCU. If no SCU is currently connected, this option is unavailable. This function provides an update of the parameters displayed when selected from within the SCU Parameters window.

2.2. *Read Parameters*

See Read from SCU Button above

2.3. *Write Parameters*

See Write to SCU Button above

2.4. *Save to Disk*

See Save to Disk Button above

2.5. *Access Code*

Allows the setting of the Access Code required to communicate with a SCU.

An Access Code is a special identification number stored in the SCU memory. It is used to identify the SCU and helps prevent unauthorized access. In a multi SCU system, the Access Code should be unique.

In order for SageView® to communicate with a SCU remotely, the Access Code entered in SageView® must match the Access Code stored in the SCU.

2.6. *Equalize*

Manually select Equalize mode for the plant

2.7. *Float*

Manually select Float mode for the plant

2.8. *Start Battery Discharge Test*

Manually start a Battery Discharge Test for the plant

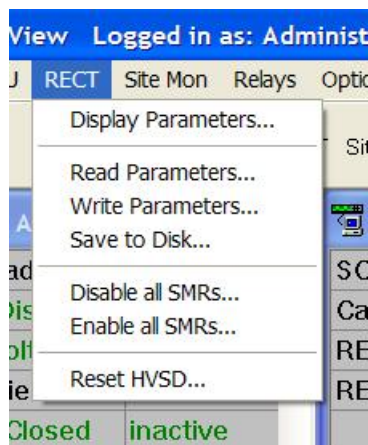
2.9. *Stop Battery Discharge Test*

Manually stop (return to float) a Battery Discharge test

2.10. *Reset Discharge Test Alarm*

Clear any alarms resulting from last Battery Discharge test.

3. RECT Menu



Clicking the RECT text will produce the drop down menu shown to the left.

- Display Parameters
- Read Parameters
- Write Parameters
- Save to Disk
- Disable all SMRs
- Enable all SMRs
- Reset HVSD

3.1. Rectifier Parameters

The Rectifier Parameters allows configuration of certain operation characteristics of the rectifier, these characteristics include:

- High Alarm (V)
- Low Alarm (V)
- HVSD Trip (V)
- Current Lim (A)

3.1.1 High Alarm (V)

This parameter sets the rectifier high voltage alarm threshold. Note that when writing the parameter to the rectifier(s), the rectifier may reject the new value (causing a write error) if the parameter is outside the acceptable range for the rectifier.

3.1.2 Low Alarm (V)

This parameter sets the rectifier low voltage alarm threshold. Note that when writing the parameter to the rectifier(s), the rectifier may reject the new value (causing a write error) if the parameter is outside the acceptable range for the rectifier.

3.1.3 HVSD Trip (V)

This parameter sets the rectifier High Voltage Shutdown threshold. Note that when writing the parameter to the rectifier(s), the rectifier may reject the new value (causing a write error) if the parameter is outside the acceptable range for the rectifier. Use caution if changing this parameter, it controls shutdown of the rectifier and as such, may cause an interruption of power to the load.

3.1.4 Current Lim (A)

This parameter sets the rectifier current limit. Note that when writing the parameter to the rectifier(s), the rectifier may reject the new value (causing a write error) if the parameter is outside the acceptable range for the rectifier. The rectifier will not accept a current limit value greater than its physical maximum.

3.1.5 Adjust Level

This parameter is used to manually adjust the current sharing parameter within the RECT. This value is normally determined automatically by the SCU whenever the system AC is established and the load exceed 25% of the RECT current limit. This parameter should not be

changed by the end-user, unless instructed to do so by the factory. This is the only parameter that can be sent to individual RECTs.

3.2. *Read Parameters*

Reads the operating Rectifier Parameters via the currently connected SCU.

3.3. *Write Parameters*

Writes the settings displayed in the Rectifier Parameters Window to the Rectifier's non-volatile memory.

A dialogue box appears where the Rectifier number can be entered or alternatively the parameters can be sent to all RECTs in the system

3.4. *Save to Disk*

Saves the currently displayed Rectifier Parameters to disk for later retrieval. The file is saved in a Comma Separated Value CSV format (i.e. *.SMR.CSV)

3.5. *Disable all RECTs*

Sends a command to ALL RECTs to shutdown and thus provide no current drive to the load and batteries.

Warning: If no batteries are installed, or there is a defect in the battery string, this command will cause power to be discontinued to the load.

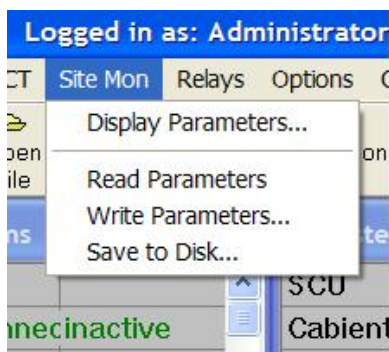
3.6. *Enable all RECTs*

Sends a command to enable ALL RECTs that were previous disabled with the Disable All RECTs Command.

3.7. *Reset HVSD*

Sends a command to ALL RECTs to reset a previous High Voltage Shutdown (HVSD) condition.

4. Site Monitor Menu



Clicking the Site Mon text will produce the drop down menu shown to the left.

Display Parameters
Read Parameters
Write Parameters
Save to Disk

4.1. Display Parameters

Allows display and editing of the Site Monitor Parameters.

	User Name	Out1	Out2	Out3	Out4	Alarm	High	Low	Scale	Units	
Analog 1	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Analog 2	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Analog 3	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Analog 4	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Analog 5	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Analog 6	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Analog 7	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Analog 8	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100.0	10.0	100.0	<input type="text" value=""/>	
Digital 1	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tick for Normally Closed Input			
Digital 2	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Site Monitor Enable Manual On <input type="checkbox"/> Out1 <input type="checkbox"/> Out3 <input type="checkbox"/> Out2 <input type="checkbox"/> Out4 <input type="button" value="Write to SM"/> <input type="button" value="Save to Disk"/> <input type="button" value="Read from SM"/> <input type="button" value="Print"/> <input type="button" value="OK"/> <input type="button" value="Cancel"/>			
Digital 3	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 4	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 5	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 6	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 7	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 8	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 9	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 10	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 11	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Digital 12	<input type="text" value=""/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Read: 05/23/2007

Screen Parameters

4.1.1 User Name

A description field used to label the channel. The text in this field will appear in the site monitor data window as the label for the measurement data.

4.1.2 Out1..Out4 – Output Relay Control

These check boxes define the output relay that will be activated when the analog input exceeds the preset limits or the digital input changes from its normal state. There are 4 voltage free contact relays that can be controlled by the analog and digital inputs via the check boxes (Out1 to Out4).

4.1.3 High / Low Limits

These two parameters set the upper and lower limits of the analog input channels, outside of which an alarm will be indicated. The values are in the units describing the measurements. e.g. A low fuel limit of 20 gallons is input as 20, the scaling is taken care of by the scale factor parameter (see below).

Alarm limits can be disabled by setting individual limits to zero. One or both limits can be set to zero. For example, if the upper fuel limit is not to be alarmed, setting the upper limit to 0 while the lower limit is set to 20 gallons will only flag an alarm when the fuel level is too low.

4.1.4 Scale & Units

These parameters are used to define the full scale measurement and the units to display in the site monitor data window. The Scale parameter is the full scale measurement in the units specified that equates to +4.0V at the analog input.

4.1.5 Tick for Normally Closed Input

These check boxes to the right of the Alarm check boxes are used to define the normal state of a digital input. If the state for normal operation (no alarm flagged) is normally closed, the box must be checked.

4.1.6 Alarm

This check box enables reporting of Site Monitor alarms by SageView®. When enabled, and an alarm condition exists from the Site Monitor, the SCU will report the alarm in a manner similar to a system alarm. On SageView®, the channel that generated the alarm will be flashing in the Site Monitor Data window.

4.1.7 Site Monitor Enable Check Box

This check box is used to enable or disable the remote site monitor. In order to get data updates from the remote site monitor, this box must be checked.

4.1.8 Manual On – Out1..Out4

These check boxes are used to manually force the output relays to be in the energized state. This is useful if, for example, one relay is used to control a battery ventilation fan, it can be forced to be on until the user reverts control back to the site monitor digital inputs (i.e. hydrogen sensor, etc).

4.2. *Read Parameters*

Reads the operating Site Monitor Parameters via the currently connected SCU.

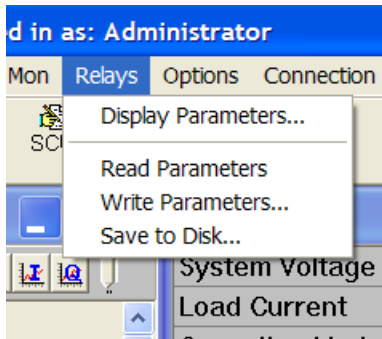
4.3. *Write Parameters*

Writes the settings displayed in the Site Monitor Parameters Window to the SCU's non-volatile memory.

4.4. *Save to Disk*

Saves the currently displayed Site Monitor Parameters to disk for later retrieval. The file is saved in a Comma Separated Value CSV format (i.e. *.SMP.CSV).

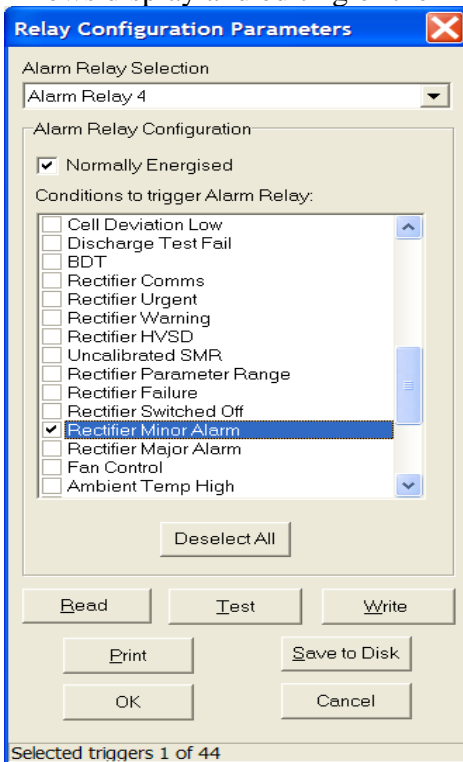
5. Relays Menu



This menu option is only available when connected to a Sageon® Micro Power Plant

5.1. Display Parameters

Allows display and editing of the Relay Configuration



Relay Configuration Parameters Dialog:

A SCU has five available relays and their activation is user programmable. Each individual relay's activation can be triggered by an event or alarm that is a part of a user selected group of events or alarms. Each item in the Relay Configuration Parameters window is detailed below:

Alarm Relay Selection:

Selects which relay is being configured.

Alarm Relay Configuration:

Defines the group of events or alarms that will trigger the activation of the selected relay. The fields used to configure the relay's trigger group are described below.

Normally Energized:

Selects whether the selected relay is in the "Normally Energized" or "Normally Closed" state. If this check box is checked, the selected relay will go into the "Open" state when a trigger event or alarm occurs.

Useful hint:

A relay can be used to monitor the "health" of the controller. Declaring a relay as "Normally Energized" without selecting any trigger events will keep that relay in "Closed" state as long as the SCU is operating properly.

Conditions to trigger Alarm Relay:

All possible alarms and events are listed and the user can select which group of events will individually trigger the selected relay. The items that are checked by the user will form a part of the trigger group for the relay. The alarms and events available will depend on the supplied SCU configuration. Typical alarm triggers can be seen in SCU Alarm Window. The event triggers may include:

Event Labels	Event Description
General Alarm	Any SCU alarm has occurred.
RECT Failure	Any RECT has failed.
RECT Switched Off	User has switched of the RECTs via the SCU.
RECT Minor Alarm	One RECT has failed.
RECT Major Alarm	More than one RECT has failed.
Fan Control	Control of a cabinet fan.
BDT	Battery Discharge Test active. (Note: This event selection is exclusive and all other selected events and alarms will be un-checked if this is checked.)

Deselect All:

Deselects all items in the “Conditions to trigger Alarm Relay” list.

The following action buttons are provided on the Relay Configuration Parameter Dialogue:

Write Button

This function is used to write the settings displayed in the Relay Configuration Parameters Dialogue to the SCU’s non-volatile memory. A SCU must be connected to perform this operation. The writing of the settings to the SCU usually takes several seconds.

If you logged in as a user with “Administrator” or “Configurer” privileges you will not be asked for your username and password to access this feature. However, if you login as a user with “Monitor” or “Viewer” privileges you will be asked for a username and password with the privileges necessary to access this feature. See ‘User Management’.

Read Button

This function reads the programmable relay operating parameters from the currently connected SCU.

Save to Disk Button

Saves the currently displayed Programmable Relay Parameters to disk for later retrieval. A dialogue box is displayed to select the appropriate file name. The file is saved in a Comma Separated Value CSV format (i.e. *.RMP.CSV). The same thing can be achieved by clicking on ‘Save to Disk...’ in the main Relays menu.

Print Button

This button prints all Programmable Relay Parameters in a table format using the currently selected system printer.

Test Button

This button temporarily reverses the state of the relay selected in Alarm Relay Selection field to allow the relay’s operation to be remotely tested. After the user has verified that

the state of the relay has been changed, the relay state is changed back to its original state.

5.2. *Read Parameters...*

Same as “Read Button,” in section 5.1, above.

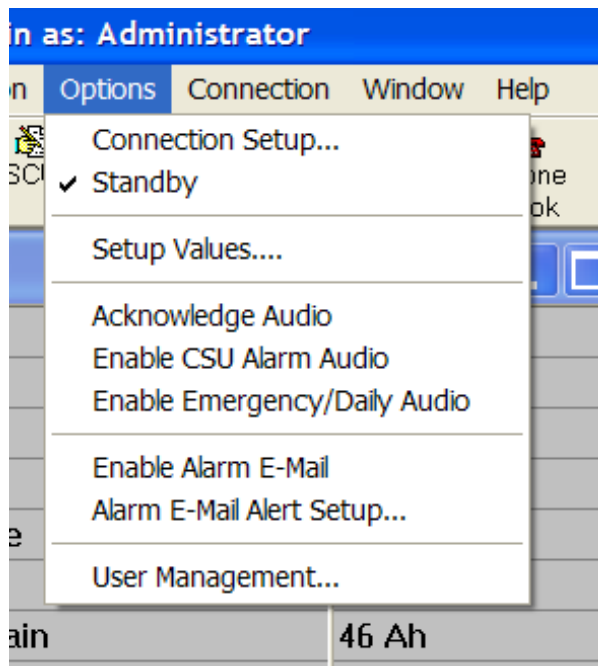
5.3. *Write Parameters...*

Same as “Write Button” in section 5.1, above.

5.4. *Save to Disk*

Same as “Save to Disk Button” in section 5.1, above.

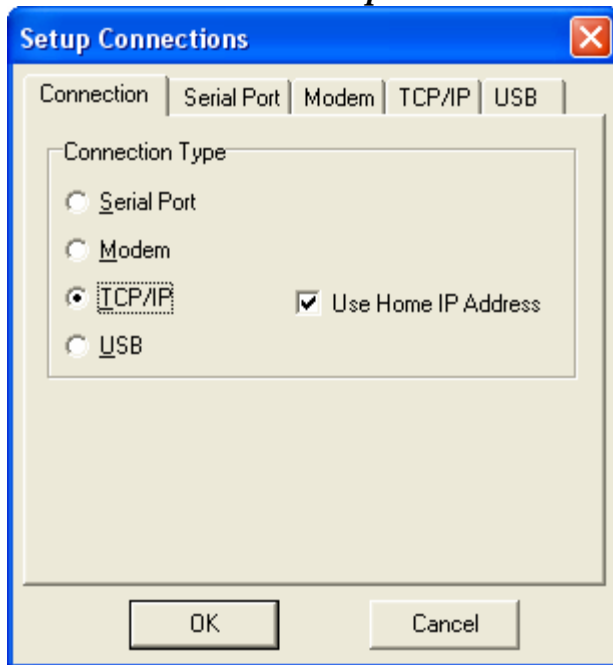
6. Options Menu



The Options menu allows access to several commonly used features. These features include:

- Connection Setup
- Standby
- Setup Values
- Acknowledge Audio.
- Enable SCU Alarm Audio
- Enable Emergency / Daily Audio
- Enable Alarm E-mail
- Alarm E-mail Alert Setup
- User Management

6.1. Connection Setup



Connection tab:
Allows selection of which communications port SageView® will use.

Specifies the type (or protocol) of connection to the SCU as follows:

Serial Port

Connection is made via a direct serial port connection to the SCU. For this type of connection, the SCU Access Code is required. For RS-232 Serial Port connections use a standard RS-232-C DTE to DTE (null modem) cable with a DB9 female connector for the SCU side and a plug suitable for your computer on the other end (usually a female plug).

Modem

Connection to the SCU is via a modem link. Connect the modem to the computer using a standard RS-232-C DTE to DCE cable. Select a cable with plugs suitable for your computer and modem (usually RJ11 or RJ12).

Notes:

1. The Serial Port that the modem is connected to must be set on the Serial Port tab of the Connection Set-up dialogue.
2. It is not recommended to use a telephone line connected through a local digital PABX system. PABX's often send their own digital codes over the line which can interfere with communications between the computer and remote site.

TCP/IP

Connection to the SCU is via a TCP/IP LAN link.

Connect the SCU Ethernet interface to the LAN and ensure that the unit has been assigned an unique IP Address. The IP Address for a SCU can either be specified by selecting an entry

from the Phone Book or using the Home IP Address entered in the Connection Setup. If the Home IP Address is to be used, the Use Home IP Address check box should be checked.

USB

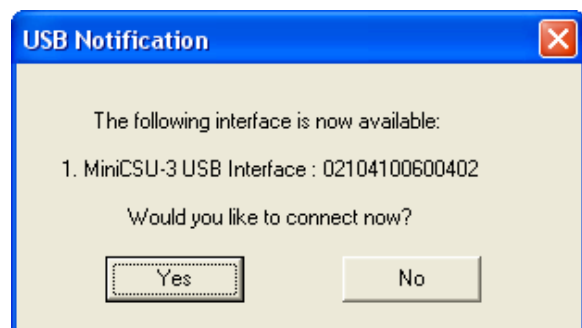
Connection is made via a USB port connection to the SCU.

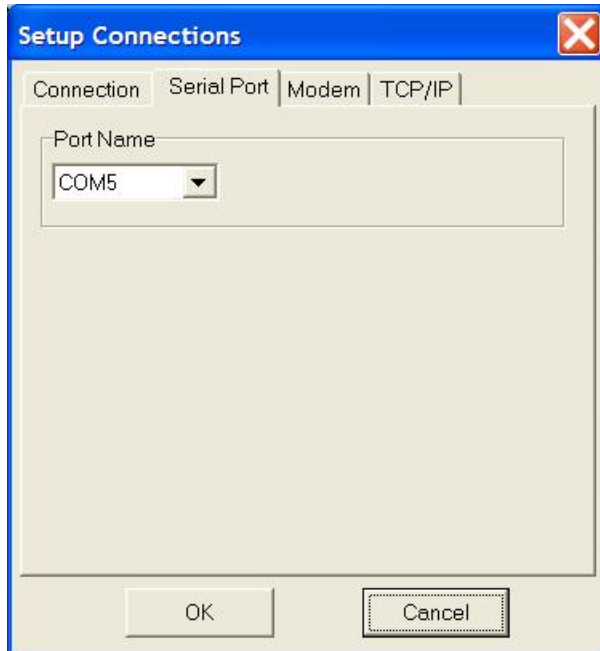
This option is only available if a SCU is connected to a USB port of the PC. The SCU does not need to be switched on for the USB interface to be detected.

The USB connection uses a standard USB A to B cable. The A end plugs into the PC and the B end into the SCU.

The SCU USB connection requires that a USB driver be installed on the PC. The first time the SCU is plugged into the PC via the USB port, a Microsoft® Windows dialogue box will appear asking the user to install the SCU 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. A copy of the USB drivers is also kept in the 'C:\Program Files\C&D Technologies\SageView\Driver' directory of the PC SageView® has been installed upon.

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





Serial Port tab:

Allows configuration of the Serial Port connection to the SCU.

Port Name

Specifies the hardware interface port that the SCU Serial or Modem connection is made through.

SageView® detects the Serial Ports physically present and available on the computer. If a port is being used by another application it will not be listed. SageView® only supports communications ports named COMx, where x is a number between 1 and 255.

Modem tab:

Allows configuration of the Modem connection to the SCU.

Serial Port - Port Name

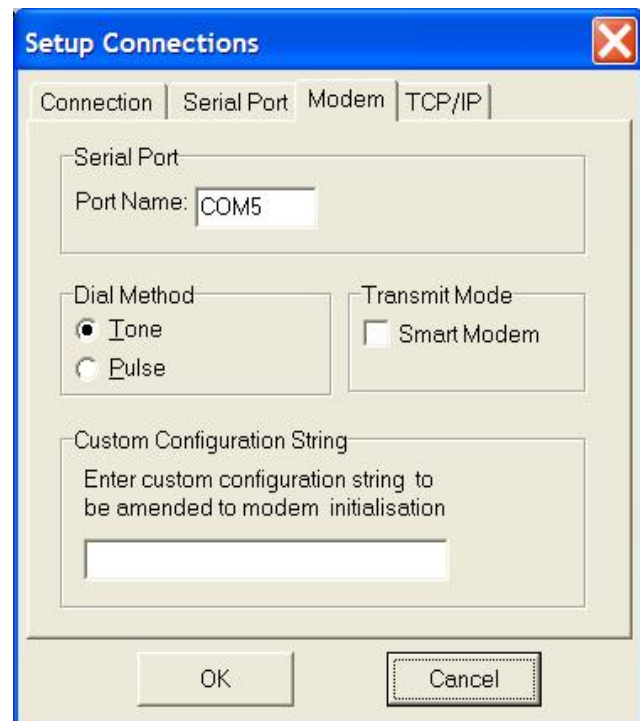
A read-only field that shows the Port Name selected on the Serial Port tab. This specifies the serial port to which the modem will be connected.

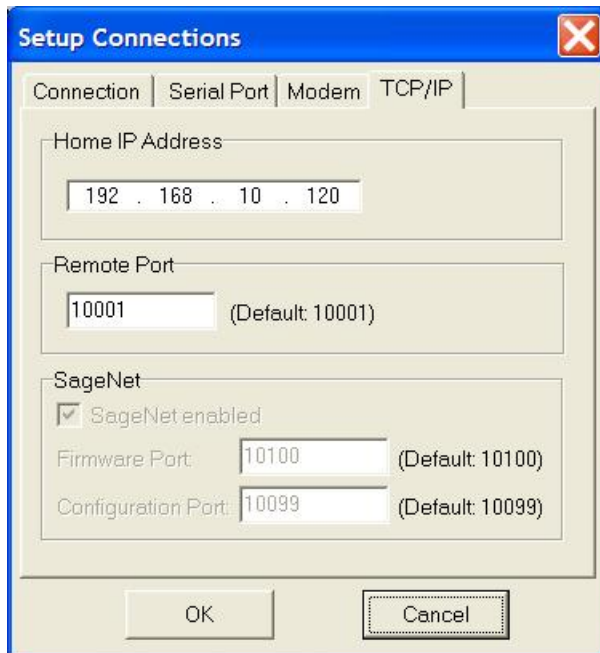
Dial Method

Specifies the dialing method used for the modem.

Custom Configuration String

SageView® configures the modem's settings to its requirements at the program start-up, and every time a connection via modem is made. The program uses basic set of Hayes commands.





Note: If a Sage Net unit is equipped; 2 users may simultaneously log in to Sageview. The second user must use Remote Port 10002, otherwise leave Remote Port as 10001.

USB tab:

Allows the SCU to be selected from the available SCU USB devices currently connected to the PC.

Device Selection:

Specifies the SCU USB device that SageView® should connect too. Each SCU USB device is listed by its serial number.

(Note: This tab only appears in the “Setup Connections” dialog when the SCU is connected to a computer’s USB port.)

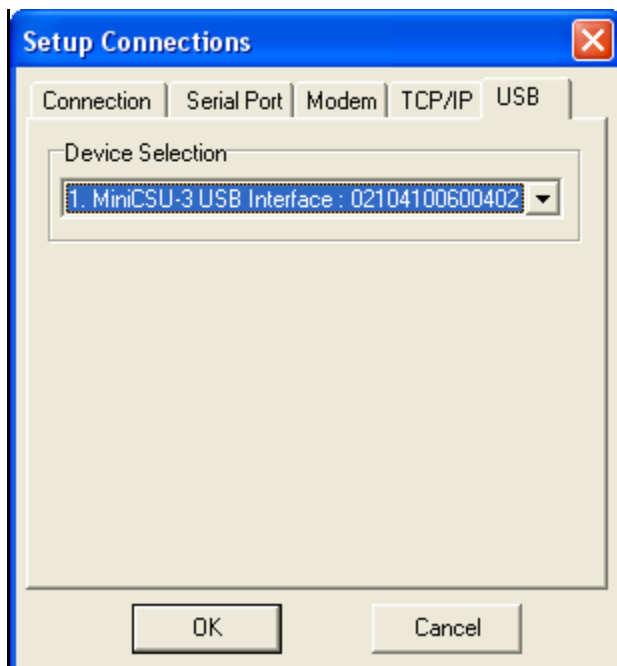
TCP/IP tab:

Allows configuration of the TCP/IP connection to the SCU.

Connect the SCU SageNet® or TCP/IP interface to the network and ensure that the unit has been assigned an unique IP Address.

The IP Address for a SCU can either be specified by selecting an entry from the Phone Book or using the Home IP Address entered in the Connection Setup. If the Home IP Address is to be used, the Use Home IP Address check box should be checked. The Remote Port value will also need to be configured in the Connection Setup.

It may be necessary to specify whether the TCP/IP connection is via a SageNet® unit. If a SageNet® unit is being used, a Firmware Port and Configuration Port will need to be specified in the Connection Setup.



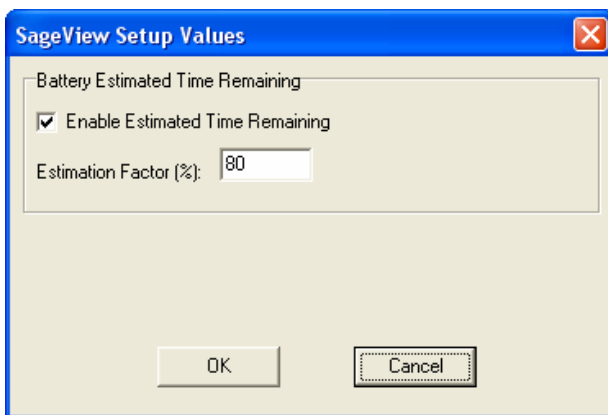
6.2. Standby

Sets the SageView® software to Standby mode. In Standby mode, SageView® is not in constant communication with the SCU. Instead, SageView® waits for the SCU to initiate communications from one of the following events:

- Emergency Call - The SCU has detected a change in state of its alarms.
- Daily Call - The specified Daily Call-up Time has been reached
- Cell Call-up - The Battery Cell Monitor memory is nearly full and it is time to save this information to disk.

Standby mode is also activated when a file is opened from disk.

6.3. Setup Values



This window allows the setting of values there are specific to the operation of SageView® (not the SCU).

Battery estimated time remaining:
 Enable Estimated Time Remaining
 Estimation Factor (%)

When checked, the battery time remaining estimates are displayed on the SCU Status window. See SCU Status Window.

Estimation Factor (%)

The Estimated Battery Time Remaining values provided by SageView® only provides a crude indication of time remaining and its reliability is heavily reliant on the data the user provides. The relationship between the charge remaining and time remaining is non-linear and is dependent upon a number of factors which include:

1. Battery state of health (including: age and amount of use)
2. Environmental conditions
3. State of charge and
4. Magnitude of the load current.

The Estimation Factor is a user-entered percentage that is used to weigh down the calculated Estimated Battery Time Remaining, which allows the user to take into account some of these factors. The default value is 80%.

The algorithm used here is:

$$\text{time remaining} = (\text{estimation factor} * \text{estimated charge remaining}) / \text{battery discharge current}$$

The user should select an Estimation Factor that gives a very conservative time remaining, which will mean that the Estimated Battery Time Remaining will expire well before the LVDS is activated causing the system to potentially fail.

The user uses this functionality at their own risk.

6.4. Acknowledge Audio

Temporarily terminates the SageView® audio alarm.

An audio alarm can be (re-) generated under the following conditions:

- Emergency Call-up from the SCU
- Daily Call-up from the SCU
- SCU alarm condition changed

6.5. Enable SCU Alarm Audio

When enabled, generates an audio alarm if the SCU alarm condition changes.

6.6. Enable Emergency / Daily Audio

When checked, generates an audio alarm from an emergency or daily call-up.

6.7. Enable Alarm E-mail

Enable sending E-mail alerts when alarms occur.

6.8. Alarm E-mail Alert Setup

Set up Alarm E-mail configuration.

Alarm E-mail Alert Setup

Connection | Alert Address | Alert Selection

SMTP Server Settings (Outgoing Mail)

Host:

Port:

User ID:

Senders Details

Name:

E-Mail Address:

OK Cancel

Connection tab:**SMTP Server Settings (Outgoing Mail)**

Host: The DNS name or dotted IP address of the remote host to connect to.

For example:

'mail-hub.bigpond.net' or 192.168.0.100.

Port: The port number that the SMTP server will listen on. The default is 25.

UserID/Username: The user name needed to connect to the specified mail server.

Senders Details

Name: Notifies the recipient of who the name of the message sender is. For example 'SageView'.

E-mail Address: The E-Mail address of the message sender. For example: 'sageview@cdtechno.com'.



Alarm E-mail Alert Setup

Connection | **Alert Address** | Alert Selection

Sent Alerts To

To:

CC:

BCC:

Subject

Title of alert e-mail:

Use Default

Send Test Message

OK Cancel

Alert Address tab:**Sent Alerts To:**

To: The E-Mail address of the recipient. For example: 'sageview@cdtechno.com'.

CC: The E-Mail address of the Carbon Copy recipient.

BCC: The E-Mail address of the Blind Carbon Copy recipient.

Subject - Title of alert e-mail:

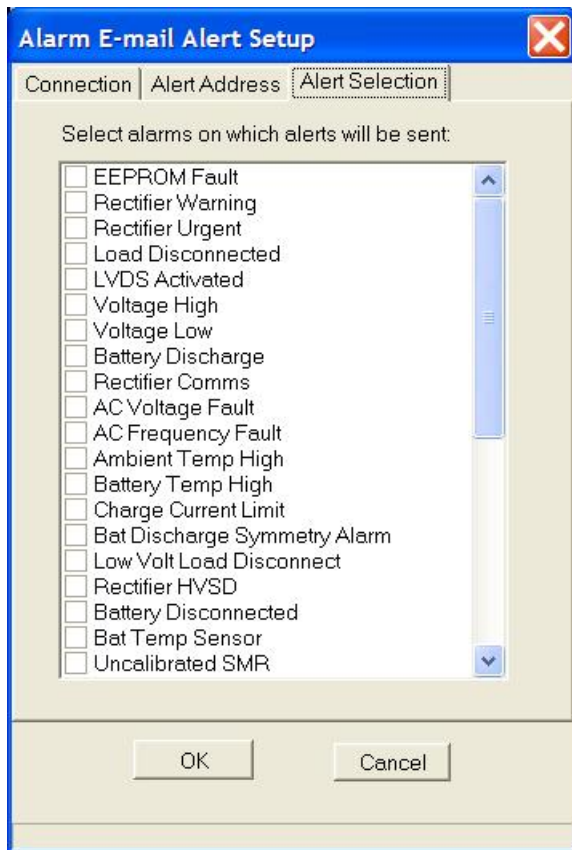
The subject line of the e-mail alert message.

Use Default button

This button sets the e-mail alert message subject to the default value.

Send Test Message button

Sends a test message to the recipient(s) to check that all the configuration settings are correct.



Alert Selection tab:

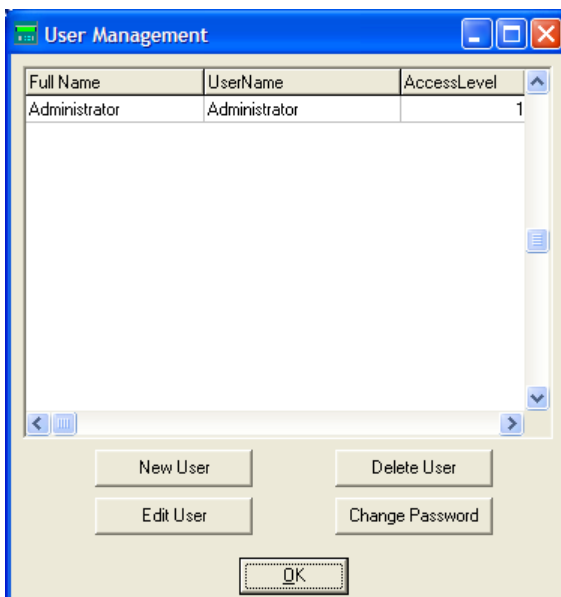
Allows the configuration of which SCU alarms will trigger the sending of an e-mail alert message.

Select alarms on which alerts will be sent:

The user is presented with a list of SCU alarms, selectable by checking a check-box next to the alarm name. The alarms are defined in SCU Alarm Window.

Whenever a SCU Alarm is generated which is selected in the list and the Alarm E-Mail Alert is enabled, an e-mail message is sent to recipients listed on the Alert Address tab.

6.9. User Management



User Management allows the Administrator to create, edit and delete other user accounts and set user account permission levels.

Note: the Administrator account cannot be deleted.

When SageView® is installed for the first time, the program uses the default password '**configuration**' for the Administrator account. It is recommended that the SageView® Administrator change this default password for extra protection.

6.9.1 New User

Used to create new users for the SageView® system.

Full Name:

Enter the full name of the user.

Username:

Enter the name the user is required to use to log into the SageView® system.

Password and Confirm Password:

Enter the user's password into these sections to set the password for the user.

Access Level:

The SageView® permissions access level of the user:

- 1 – Administrator (The user has complete access to the system, including setting of parameters and set-up values. A user with Administrator permissions has complete access to the User Management system and can add/delete users and change any user passwords – including the default 'Administrator' password).
- 2 – Configurer (The user has control access to the system, including setting of parameters and some set-up values excluding SageNet® setup. They have access to the User Management system to change their own password).
- 3 – Monitor (The user can connect to a SCU interface and monitor it's status, but cannot change parameters. They have access to the User Management system to change their own password).
- 4 – Viewer (The user has the same permissions as 'Monitor' above except the user cannot access the User Management system).Edit User

Edit the selected user's Full Name, Username and Access Level.

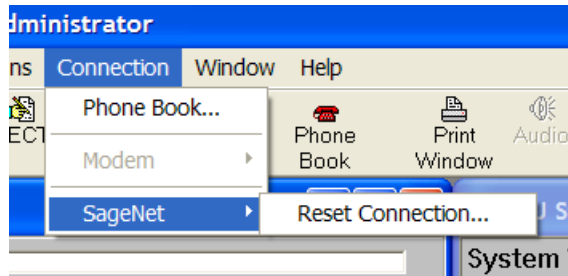
6.9.3 Delete User

Will delete the selected user account from User Management.

6.9.4 Change Password

Allows the user to change their password

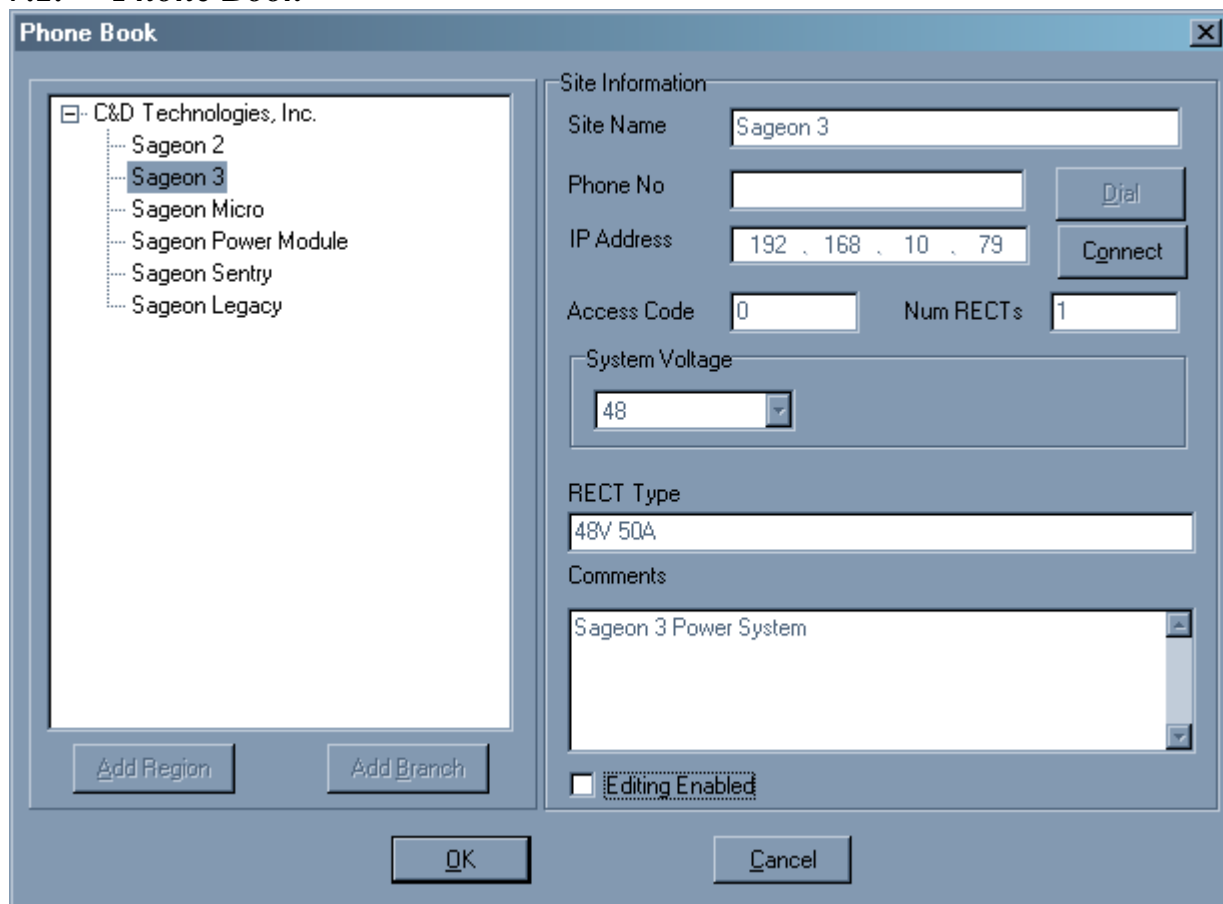
7. Connection Menu



The Connection menu allows access to some communication features. These features include:

- Phone Book
- Modem
- SageNET – Reset Connection

7.1. Phone Book



The primary use of the Phone Book is to catalog connection details for SCUs located at various sites. The connections can either be via a dial-up modem connection or a via TCP/IP connection.

The Phone Book also stores information relating to particular sites:

- Site Name
- Phone Number
- IP Address
- SCU Access Code
- Number of Rectifiers
- System Voltage
- Rectifier (RECT) Type
- Additional (user) comments

The Phone Book can be edited by the user (password is required) and is automatically saved to disk after editing is complete. Editing is enabled by checking the Editing Enabled check box.

The user can connect to a SCU via a modem or TCP/IP connection using the Dial or Connect button. Which of the two buttons is enabled is dependant upon what Connection Type has been selected by the user in the Connection Setup accessed from the Options menu.

7.2. Modem – Hangup SCU

This option is only available when “Modem” is selected in the “Connection Setup” dialog and a SageView® session has been established with an SCU.

7.3. SageNET – Reset Connection

This menu allows the connection to a SageNet® communication module to be reset.

8. Connect to CSU / Go to Standby Button

This button toggles between ‘Standby’ and ‘Connected’ modes. (See *Options Menu* → *Standby*, above.)

9. Open File Button

(See *File Menu* → *Open File*, above.)

10. RECT Button

(See *RECT Menu* → *Rectifier Parameters*, above.)

11. SCU Button

(See *SCU Menu* → *Display Parameters*, above.)

12. 'Site Mon' Button



Clicking this button opens the same window as the Site Mon → Display Parameters menu selection.

13. Relays Button



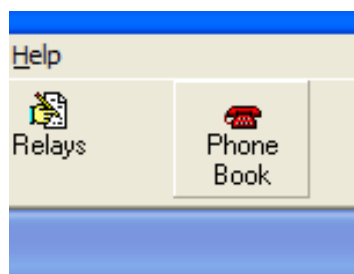
Allows the display and editing of the Relay Configuration Parameters. The same can be achieved by selecting Relays - Display Parameters.

This command opens the Relay Configuration Parameters Dialogue, where parameters may be:

- Edited
- Saved to disk
- Read from the SCU
- Written to the SCU
- Printed

If setting of a parameter has been changed and has not yet been written to the SCU Programmable Relays, caption of this button will include a message "(Modified)".

14. Phone Book Button



Clicking this button opens the same window as the Connection – Phone Book menu selection.

Please see section 7.1 for details.

15. Print Window Button

When this button is selected, the Print Dialog appears, allowing the user to select the appropriate printer and properties. This function is also available from the File menu (Print, Print All).

16. Audio Button

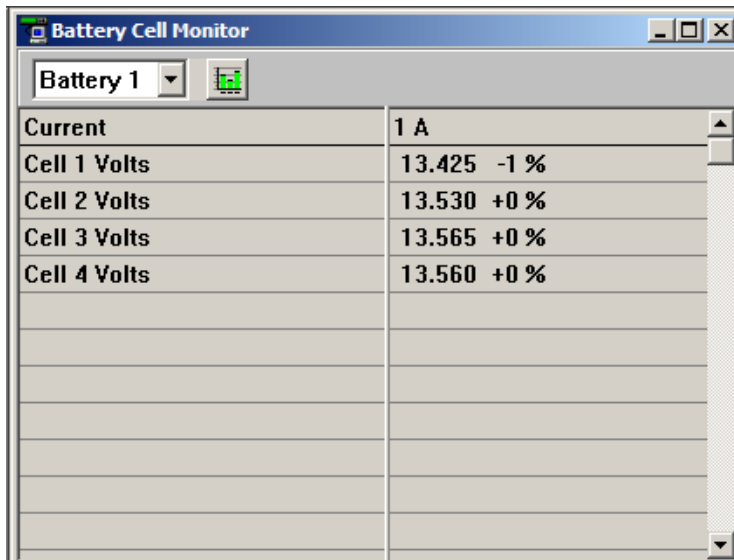
(Note: This button is only available when the audible alarm sounds.)
Temporarily terminates the SageView® audible alarm.

17. Site Monitor Status Window

This window displays the labeled channels of the Sageon® site monitor and their corresponding data values as measured by the remote site monitor. Any site monitor alarms are represented by the text of the affected channels being changed to red. A channel changed to yellow indicates a value out of range (see Site Monitor Parameters Dialogue). The data values are displayed with the units defined in the site monitor parameters window.

18. Battery Cell Monitor Window

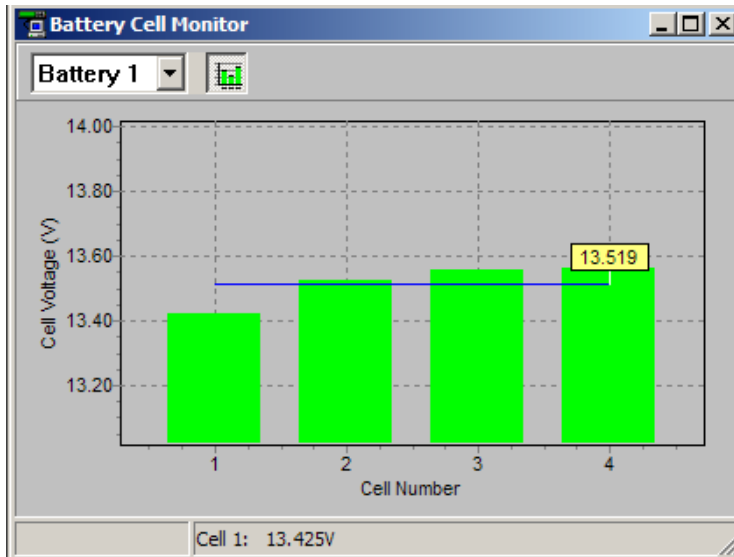
The Battery Cell Monitor Window displays real-time data on the voltage of each cell being monitored by the Sageon® Battery Monitor. This data may be displayed either textually or in a histogram.



The screenshot shows a window titled "Battery Cell Monitor" with a dropdown menu set to "Battery 1" and a battery icon. Below is a table with two columns: the left column lists parameters and the right column shows values and percentage changes.

Parameter	Value
Current	1 A
Cell 1 Volts	13.425 -1 %
Cell 2 Volts	13.530 +0 %
Cell 3 Volts	13.565 +0 %
Cell 4 Volts	13.560 +0 %

Textual display of
battery cell voltages.



Histogram display of battery cell voltages.

19. Battery Cell Log Window

The Battery Cell Log Window displays data from the last battery discharge. This data may be formatted in several ways. Note that the Battery Cell Log Window will only be visible if the Sageon® Power Plant is equipped with the (optional) Sageon® Battery Monitor. Complete data logging (including string current) is only available if the Sageon® Power Plant is equipped with both the (optional) Sageon® Battery Monitor and (optional) Battery String Current Transducer(s).

The formatting options available include:

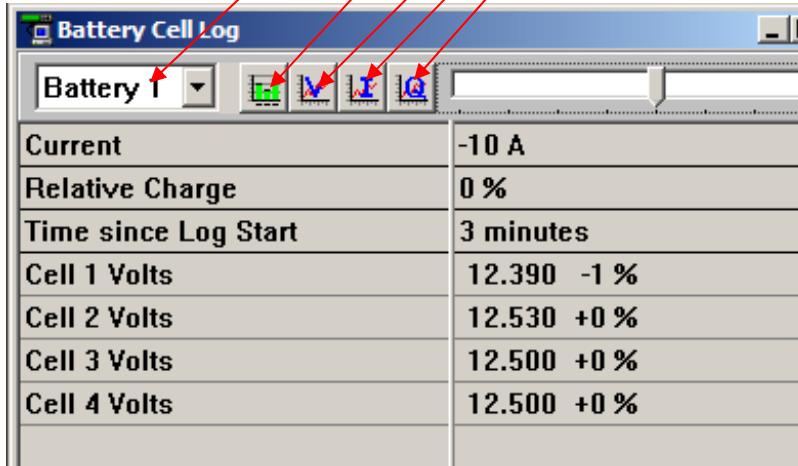
Select string to display

Toggle Data / Histogram Display

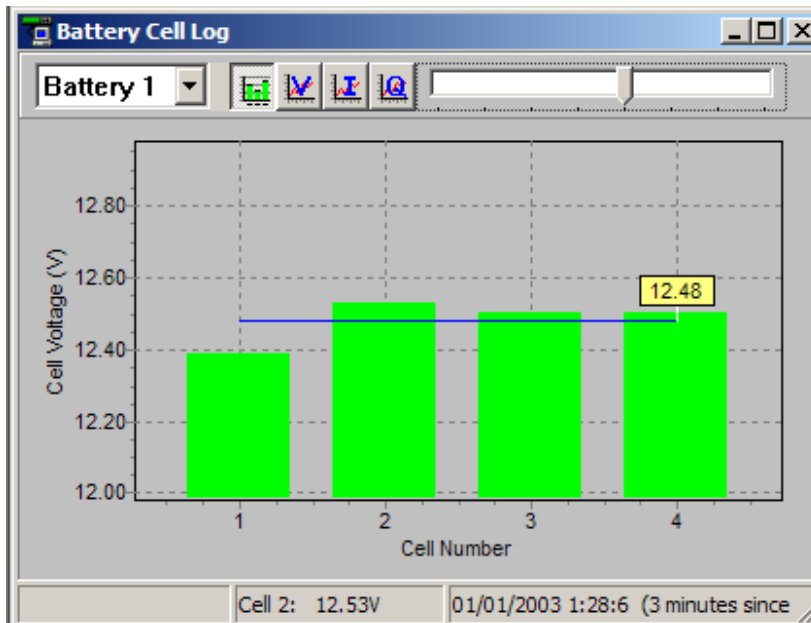
Graph Cell Voltages

Graph String Current

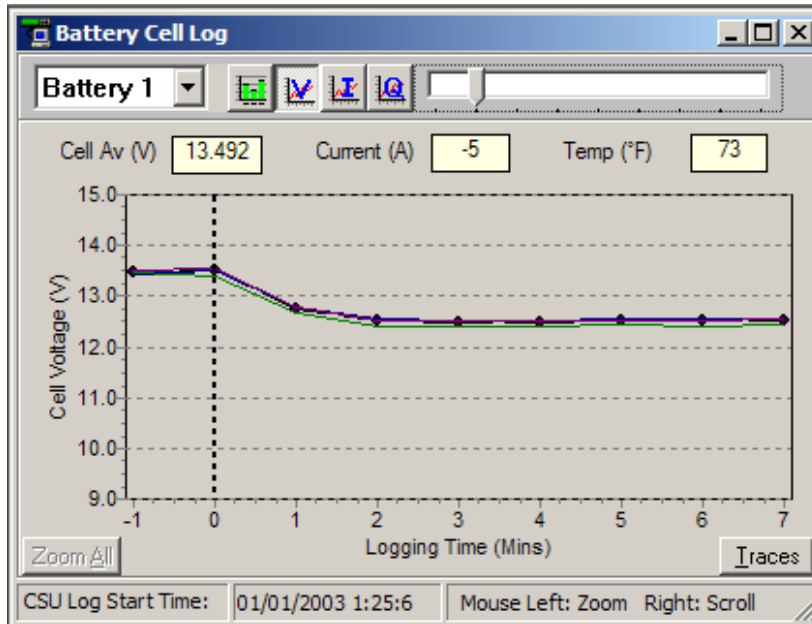
Graph String Capacity (Ah)



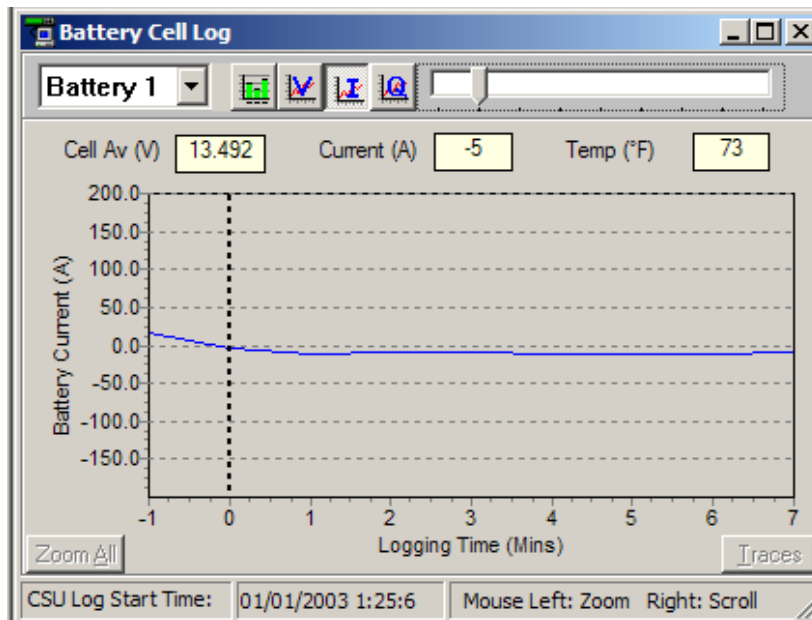
The default Battery Cell Log window shows battery cell information in a textual mode.



Clicking on the Histogram button causes the Battery Cell Log window to display battery cell voltages in a Histogram. In this example, four 12V mono-blocks are displayed, large systems would display data for as many as twenty-four individual 2V cells.

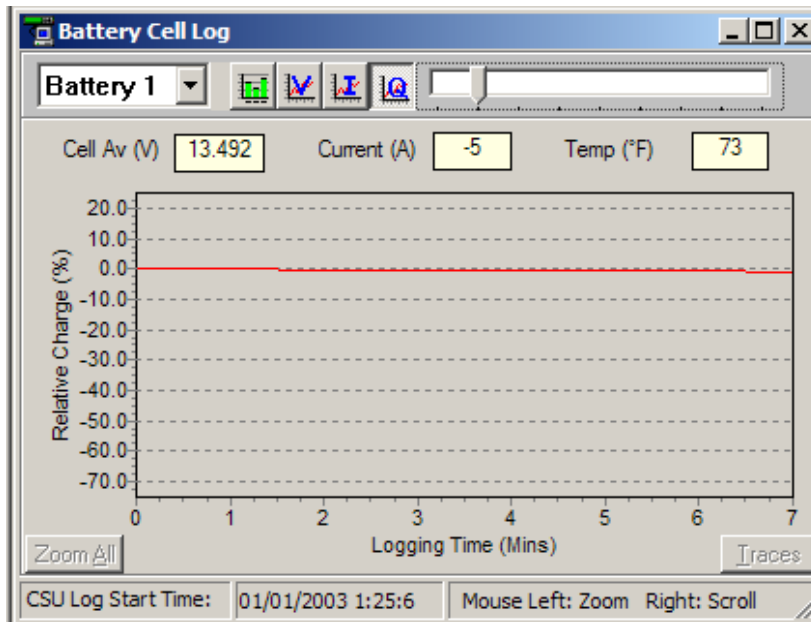


Clicking on the Graph-V button causes the Battery Cell Log window to graph battery cell voltages.



Clicking on the Graph-I button causes the Battery Cell Log window to graph battery string current.

Please note that battery string current is only available if the Sageon® system is equipped with optional battery current transducer(s).



Clicking on the Graph-Q button causes the Battery Cell Log window to graph battery string capacity.

Please note that battery string capacity is only available if the Sageon® system is equipped with optional battery current transducer(s).

20. Rectifier (RECT) Status Window

RECT Status		
RECT 1	2.9A	86°F
RECT 2	3.3A	88°F

The Rectifier (RECT) Status Window displays output current and internal temperature for each rectifier in the Sageon® system. If the rectifier is reporting faults, a two letter abbreviation for those faults will be displayed following the temperature.

The following are the fault code abbreviations for Sageon® Micro Rectifiers:

Ac	AC failure
Eq	Equalize mode
Ff	Fan failure
Il	Output current limit
Lo	No load on rectifier
Oh	Overheat
Po	Output power limit
Sd	Shutdown by command from SCU
Th	High temperature
Vh	Output high voltage
Vl	Output low voltage
Vs	High voltage shutdown

The following are fault code abbreviations for Standard Sageon® Rectifiers:

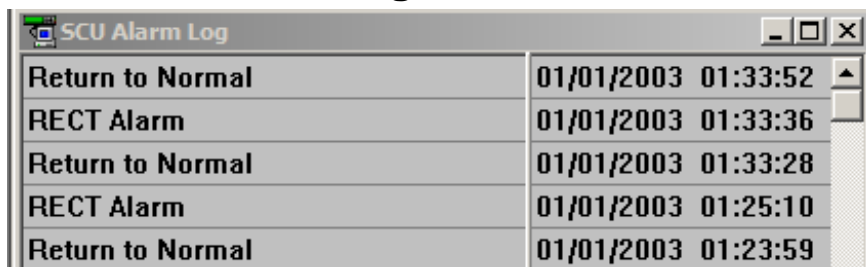
Vh	Output high voltage
Vl	Output low voltage
Il	Output current limit
Po	Output power limit
Th	Heat-sink temperature high and thermal limit is active
Nd	No demand (output voltage is higher than internal regulation value)
Lo	Load current low (less than 0.9A)
Ma	Operating parameters out of allowable range (or eeprom fault)
Sd	Shutdown by command from SCU (user command)
Mr	Internal voltage reference faulty
Mc	Rectifier communication fault (generated within Sageon® controller)
Vs	High voltage shutdown (output), latched alarm (user setting or fault)
Unit Off	Unit is shut down due to AC out of range or rectifier primary circuit fault
Ts	Temperature sensor fault
Dc	DC-DC feedback fault, latched alarm
Ff	Fan failure (or inadequate air flow)

'Mouse over' help is available for all rectifier fault codes. If a fault code is displayed, place the mouse cursor over the fault code and a pop-up will appear which explains the fault code.

21. System Asset Information Window

This window displays the asset information (if available) of the main components of the system including controllers, rectifiers and interface units. Note that some or all of the asset information may not be available from older models. A detailed description of available asset information is available in SageView® Help (select the *Help Menu* → *Help Topics* → search for *Asset Information* in the index.)

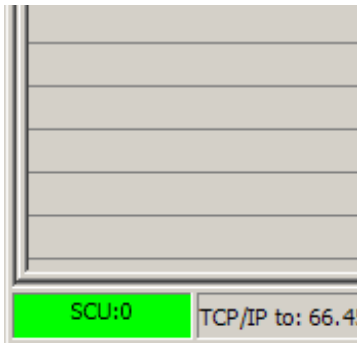
22. SCU Alarm Log Window



SCU Alarm Log	
Return to Normal	01/01/2003 01:33:52
RECT Alarm	01/01/2003 01:33:36
Return to Normal	01/01/2003 01:33:28
RECT Alarm	01/01/2003 01:25:10
Return to Normal	01/01/2003 01:23:59

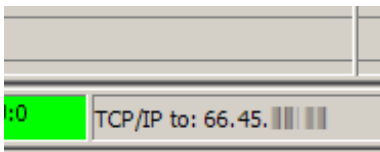
This window shows the last 1000 alarms generated by the SCU and when they occurred. The most recent alarm entry is always at the top of the list. If an alarm is logged and some time later, all the alarms flags are reset, the SCU Alarm log will add an entry of "Return to Normal".

23. Status Bar



The lower right hand corner of the SageView® screen displays a connection status bar. When connected, this bar will be shown in green, along with the access code of the SCU being monitored. In standby mode, this bar will display 'Standby' in yellow. When disconnected, this bar will display 'Disconnected' in red.

24. Connection Identification



In the bottom of the SageView® screen a Connection Identification bar is displayed. When connected, this bar will indicate the type of connection (IP Address for TCP/IP, serial port for RS-232, USB, or phone number for modem connections).

25. System View Window

This window displays the basic system status according to the SCU in a graphic representation of the system circuit diagram.

The alarm status of the system can be quickly assessed by the colored buttons along the top the window. There is a button for each functional block of the system, which are:

- AC Source
- Rectifiers
- Controller
- Batteries
- DC Load

The colors of the buttons are interpreted in the following way:

- **Green**: There are no alarms active for the associated functional block.
- **Yellow**: There are warnings or minor alarms active for the associated functional block.
- **Red**: There are urgent or major alarms active for the associated functional block.

The active alarms are listed in a hint box associated with each button, which is displayed when the mouse cursor is passed over the button.

The parameters that are displayed for each functional block are:

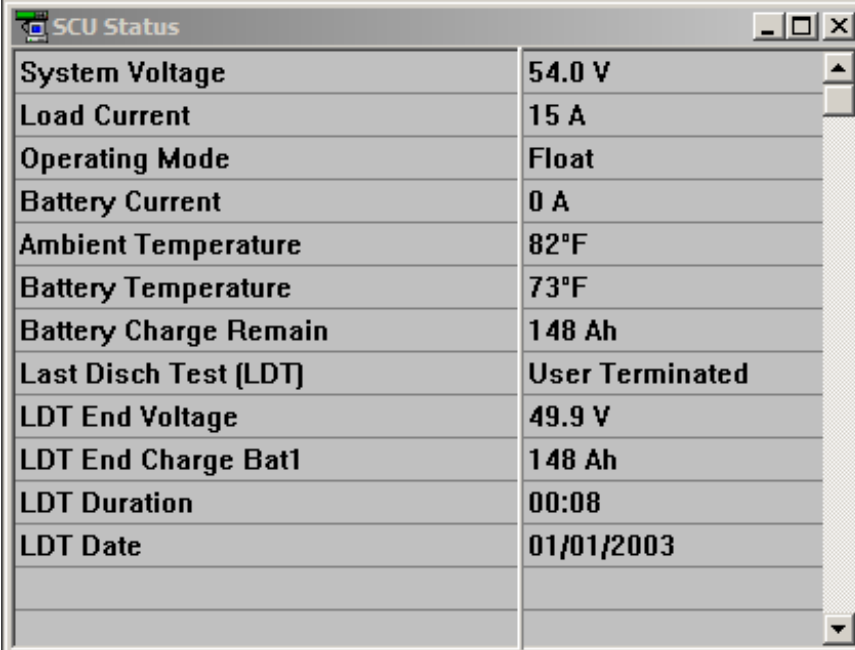
- AC Source
- AC voltage and current for each phase (if available)

- Rectifier
- Mode of operation (float or equalize), output voltage, and output current
- Controller
- Ambient temperature
- Batteries
- Discharge or charge current, battery temperature, and estimated time remaining (if activated)
- If the battery is discharging or charging an arrow is displayed to show the direction of the current.
- DC Load
- Load current.
- If there is current flow into the load an arrow is displayed to show the direction of the current.

The DC Load diagram is animated to indicate that the connection to the SCU is live.

26. SCU Status Window

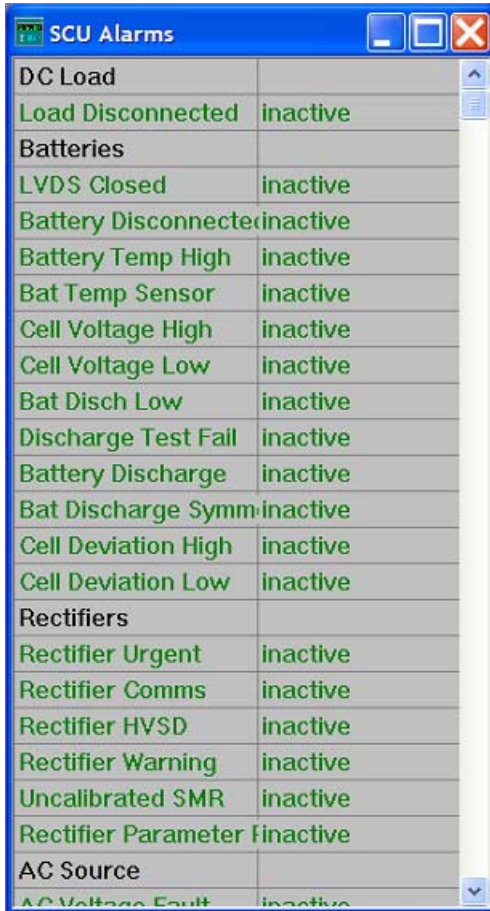
The SCU Status Window displays real time status information about the Sageon® Plant. Information such as System Voltage, Load Current, Operating Mode and Ambient Temperature are always available. Additional information such as battery current, battery temperature and last discharge test results will also be displayed if they are available.



SCU Status	
System Voltage	54.0 V
Load Current	15 A
Operating Mode	Float
Battery Current	0 A
Ambient Temperature	82°F
Battery Temperature	73°F
Battery Charge Remain	148 Ah
Last Disch Test (LDT)	User Terminated
LDT End Voltage	49.9 V
LDT End Charge Bat1	148 Ah
LDT Duration	00:08
LDT Date	01/01/2003

27. SCU Alarms Window

The SCU Alarms Window displays all the possible sources for a Sageon® Power Plant alarm. When inactive, these alarms are shown in green text, when active the alarms are shown in red text. The alarms displayed will vary from system to system dependant upon the equipment installed. Following is an example screen from a Sageon® Micro Power Plant with the Sageon® Battery Monitor option:



The screenshot shows a window titled "SCU Alarms" with a list of alarms and their status. The status is "inactive" for all listed alarms, which are displayed in green text. The window has a blue title bar with standard Windows window controls (minimize, maximize, close).

Alarm Source	Status
DC Load	
Load Disconnected	inactive
Batteries	
LVDS Closed	inactive
Battery Disconnect	inactive
Battery Temp High	inactive
Bat Temp Sensor	inactive
Cell Voltage High	inactive
Cell Voltage Low	inactive
Bat Disch Low	inactive
Discharge Test Fail	inactive
Battery Discharge	inactive
Bat Discharge Symm	inactive
Cell Deviation High	inactive
Cell Deviation Low	inactive
Rectifiers	
Rectifier Urgent	inactive
Rectifier Comms	inactive
Rectifier HVSD	inactive
Rectifier Warning	inactive
Uncalibrated SMR	inactive
Rectifier Parameter	inactive
AC Source	
AC Voltage Fault	inactive

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