NetSure™ Control Unit (M831A) Controller

User Manual

Specification Number: 1M831A
Model Number: M831A

Software Version 7.2.71

The information contained in this document is subject to change without notice and may not be suitable for all applications. While every precaution has been taken to ensure the accuracy and completeness of this document, Vertiv assumes no responsibility and disclaims all liability for damages resulting from use of this information or for any errors or omissions. Refer to other local practices or building codes as applicable for the correct methods, tools, and materials to be used in performing procedures not specifically described in this document.

Names of companies and products are trademarks or registered trademarks of the respective companies. Any questions regarding usage of trademark names should be directed to the original manufacturer.

Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit https://www.vertiv.com/support/ for additional assistance.

TABLE OF CONTENTS

Admonishments Used in this Document

DANGER! Warns of a hazard the reader ***will*** be exposed to that will ***likely*** result in death or serious injury if not avoided. (ANSI, OSHA)

WARNING! Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)

CAUTION! Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)

ALERT! Alerts the reader to an action that ***must be avoided*** in order to protect equipment, software, data, or service. (ISO)

ALERT! Alerts the reader to an action that ***must be performed*** in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)

FIRE SAFETY! Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)

SAFETY! Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

Important Safety Instructions

Safety Admonishments Definitions

Definitions of the safety admonishments used in this document are listed under “Admonishments Used in this Document” on page vii.

General Safety

DANGER! YOU MUST FOLLOW APPROVED SAFETY PROCEDURES.
Performing the following procedures may expose you to hazards. These procedures should be performed by qualified technicians familiar with the hazards associated with this type of equipment. These hazards may include shock, energy, and/or burns. To avoid these hazards:

a) The tasks should be performed in the order indicated.

b) Remove watches, rings, and other metal objects.

c) Prior to contacting any uninsulated surface or termination, use a voltmeter to verify that no voltage or the expected voltage is present. Check for voltage with both AC and DC voltmeters prior to making contact.

d) Wear eye protection.

e) Use certified and well maintained insulated tools. Use double insulated tools appropriately rated for the work to be performed.

Personal Protective Equipment (PPE)

DANGER! ARC FLASH AND SHOCK HAZARD.
Appropriate PPE and tools required when working on this equipment. An appropriate flash protection boundary analysis should be done to determine the “hazard/risk” category, and to select proper PPE.

Only authorized and properly trained personnel should be allowed to install, inspect, operate, or maintain the equipment.

Do not work on LIVE parts. If required to work or operate live parts, obtain appropriate Energized Work Permits as required by the local authority, per NFPA 70E “Standard for Electrical Safety in the Workplace”.

Handling Equipment Containing Static Sensitive Components

ALERT! Installation or removal of equipment containing static sensitive components requires careful handling. Before handling any equipment containing static sensitive components, read and follow the instructions under “Static Warning” on page ix.

Static Warning

This equipment contains static sensitive components. The warnings listed below must be observed to prevent damage to these components. Disregarding any of these warnings may result in personal injury or damage to the equipment.

1. Strictly adhere to the procedures provided in this document.
2. Before touching any equipment containing static sensitive components, discharge all static electricity from yourself by wearing a wrist strap grounded through a one megohm resistor. Some wrist straps have a built-in one megohm resistor; no external resistor is necessary. Read and follow wrist strap manufacturer's instructions outlining use of a specific wrist strap.
3. Do not touch traces or components on equipment containing static sensitive components. Handle equipment containing static sensitive components only by the edges that do not have connector pads.
4. After removing equipment containing static sensitive components, place the equipment only on static dissipative surfaces such as conductive foam or ESD bag. Do not use ordinary Styrofoam or ordinary plastic.
5. Store and ship equipment containing static sensitive components only in static shielding containers.
6. If necessary to repair equipment containing static sensitive components, wear an appropriately grounded wrist strap, work on a conductive surface, use a grounded soldering iron, and use grounded test equipment.

1 Introduction

1.1 Preface

These instructions describe the complete functionality of the Vertiv™ NetSure™ Mini Control Unit Controller. Some functionality is dependent on hardware connected to the controller. Your system may not utilize all the functionality described.

Refer also to the Table of Set Values furnished with your system for a list of factory default settings.

When the controller is used in an inverter only system (only inverters are installed in the system), the Web pages are different. Refer to “Inverter Only System” on page 160 for Web page descriptions for an inverter only system.

1.2 Overview

The controller performs the following functions:

- Rectifier Control, including an Energy Optimization Mode
- Solar Converter Control
- Converter Control
- Inverter Control
- System Components Monitoring and System Alarms Generation (including recording alarms in logs)
- Operating Data Acquisition and Data Logs
- Battery Management
- Energy Management via Energy Optimization Mode
- Supervisory Module (SM Modules) Monitoring
- Communications Function
- Efficiency Tracker Function
- Radius Server Feature

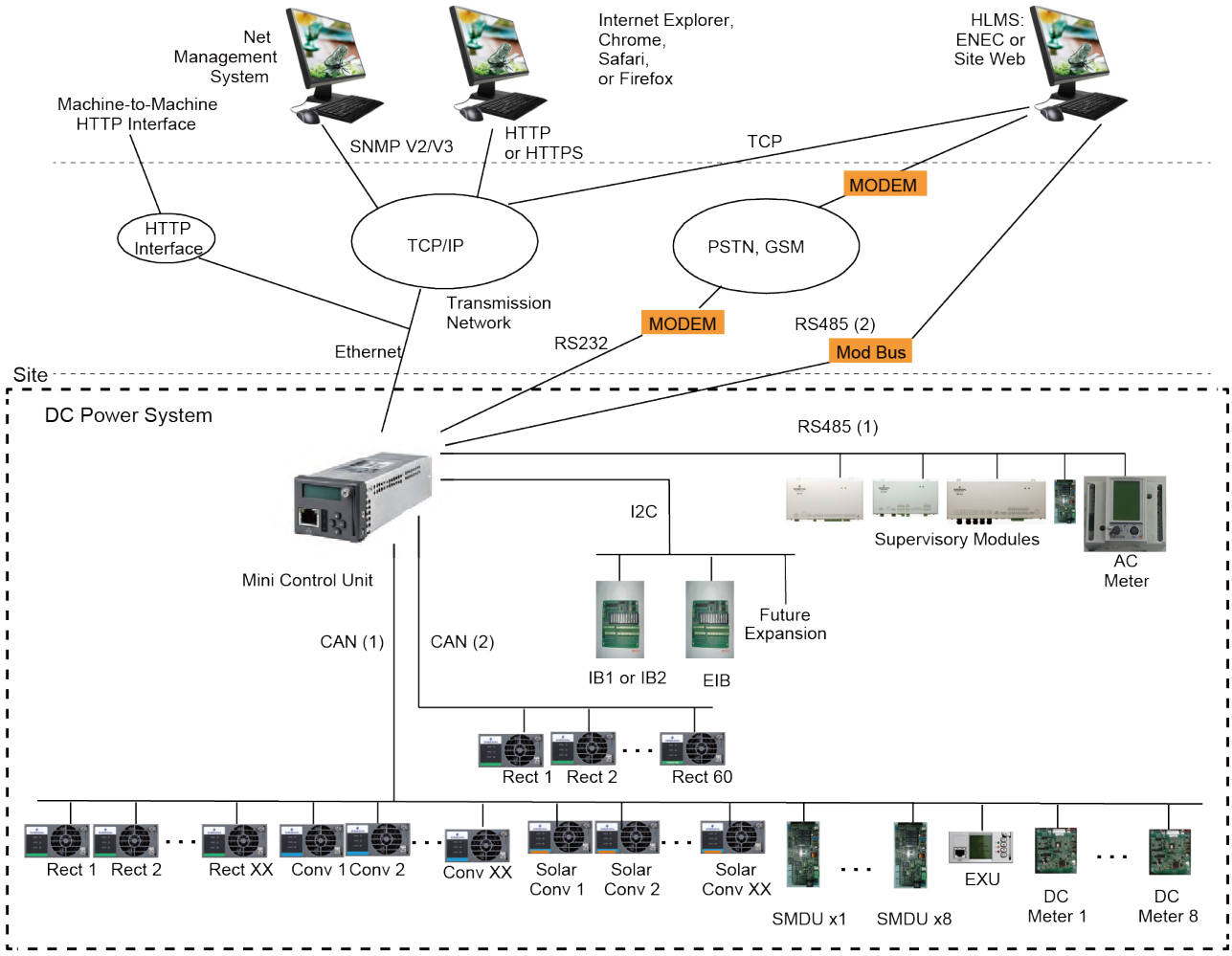
The controller controls the system automatically via configured parameters.

A User can interface with the controller locally using the local keypad and display or locally/remotely using the Web Interface.

The controller can also be accessed via SNMP (v2 and v3). A machine-to-machine HTTP interface is also available.

Figure 1.1 illustrates the various applications that can be used to interface with the controller.

Figure 1.1 Interfacing with the Controller



1.3 Function Descriptions

1.3.1 Rectifier, Solar Converter, Converter, Inverter Control

The controller controls rectifiers, solar converters, converters, and inverters automatically.

NOTE! *Solar Mode has to be enabled for controller control of solar converters (see "Enabling Solar Mode" on page 25).*

ALERT! The controller can be equipped in a system that can either have +24V DC-DC converters installed or -58V DC-DC converters installed. The system cannot have both types of converters installed at the same time.

1.3.2 System Components Monitoring and System Alarms Generation

The controller monitors the components comprising the system (such as the rectifiers, solar converters, converters, inverters, and supervisory modules) and generates alarms if a fault condition occurs. The controller also maintains an alarm history log.

The available system alarms are programmed with an Alarm Severity Level. Each Alarm Severity Level has different visual/audible alarm attributes. Available Alarm Severity Levels and their attributes are listed in Table 1.1.

The available system alarms can also be mapped to alarm relays (located on controller interface boards) that can be wired to external alarm circuits.

Table 1.1 Alarm Severity Levels

Alarm Severity Levels	Red LED	Yellow LED	Audible Alarm Buzzer
Critical Alarm (CR)	ON	--	ON
Major Alarm (MJ)	ON	--	ON
Observation Alarm (OA)	OFF	ON	OFF
No Alarm (NA)	OFF	OFF	OFF

- **Alarm Status Setting:** Indicates if the alarm is active or not active, and the severity level if active. The available alarm status settings are as follows.
  - **Critical Alarm:** The fault endangers the power systems continued function.
  - **Major Alarm:** The fault reduces the power systems functionality.
  - **Observation Alarm:** Special operating condition.
  - **No Alarm:** The alarm is disabled, and no alarm is given.
- The alarm indicator turns OFF if the fault(s) that triggered the alarm clears.
- The audible alarm can be silenced by pressing any key on the controller's local interface pad. The audible alarm is also silent if the fault(s) that triggered the alarm clears.
- An audible alarm cutoff feature can be programmed that silences the audible alarm after a preset programmable time period. The audible alarm can also be disabled.

1.3.3 Operating Data Acquisition and Data Logs

The controller acquires and analyses real time data from the system's components such as the rectifiers, solar converters, converters, inverters, and supervisory modules.

The controller uses this data to process alarms and also records data in logs. The logs are viewed using the Web Interface and consists of the following. Logs can be saved in the .html (Web page) or .txt (text) format.

Data History Log/Event Log/Alarm History Log: There is a maximum of 60,000 data points recorded between these logs.

- **Alarm History Log:** Records 4000 latest alarms. The Web Interface displays the latest 500 items.
- **Battery Test Log:** Up to ten (10) battery discharge tests can be recorded.
- **Event Log:** Records 4000 latest events. The Web Interface displays the latest 500 items.
- **Data History Log:** The Web Interface displays the latest 500 items, and you can upload a file with up to the latest 6,000 items in a single date range. Use multiple date ranges to upload more than 6,000 items.
- **System Log:** Records 3000 items in run log. The Web Interface displays the latest 500 items.
- **Diesel Test Log:** Records 500 latest diesel test results.

NOTE! *For all logs except the* ***Battery Test Log****, once maximum number of log entries is reached, new entries overwrite the oldest entries.*

1.3.4 Battery Management

The controller provides the following battery management functions.

- Battery Charge Temperature Compensation
- Battery Equalize Charge
- Battery Charge Current Limit
- High and Low Battery Temperature Alarms
- Battery Thermal Runaway Management (BTRM) Feature (Reduces Voltage during a High Battery Temperature Condition)
- Battery Discharge Test
- Battery Test Logs (maximum ten [10] tests saved)
- Battery LVD (Low Voltage Disconnect)
- Battery Capacity Prediction
- Battery Block and Battery Midpoint Monitoring
- Thermal Runway Detection and Management

Battery Charge Temperature Compensation

The controller can be programmed to automatically increase or decrease system output voltage to maintain battery float current as battery temperature decreases or increases, respectively. Battery life can be extended when an optimum charge voltage to the battery with respect to temperature is maintained. Temperature is monitored by a sensor mounted on the battery. See your power system documentation for temperature sensor information. You can also set high and low compensation temperature alarms.

Functional Description (See Figure 1.2):

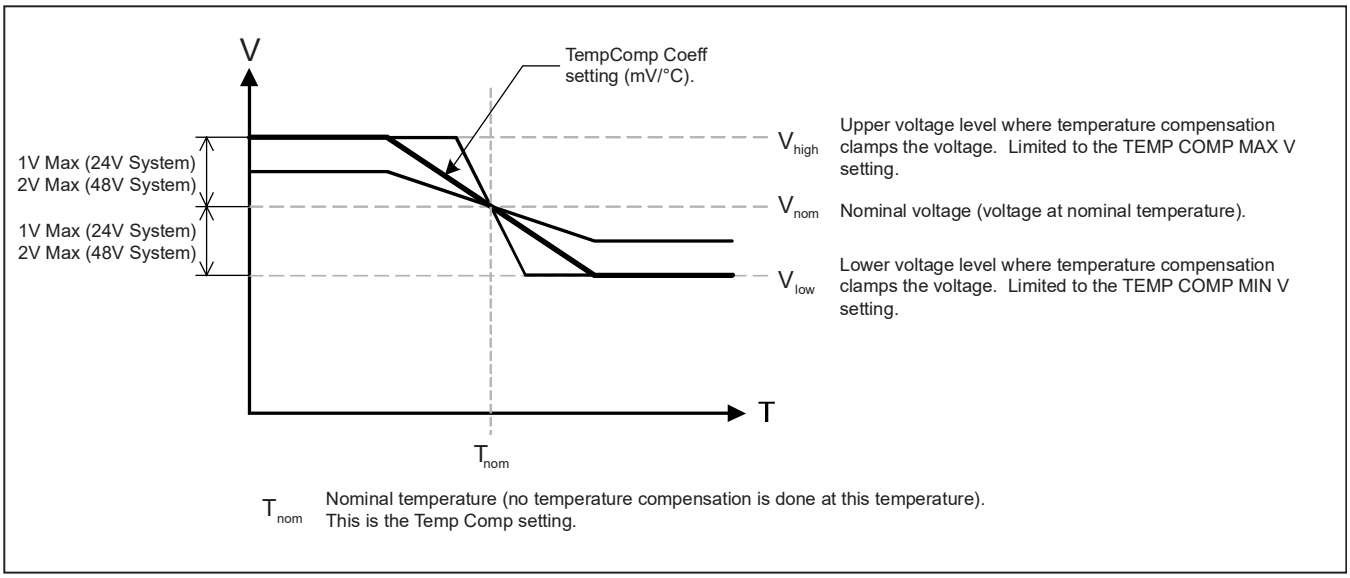
Battery charge temperature compensation adds a correction term, related to the temperature of the batteries, to the nominal value of the system voltage. The degree of regulation (TempComp Coeff), expressed in mV/°C/battery string, can be set per battery manufacturer recommendations.

To protect batteries and voltage-sensitive loads, compensation is automatically limited to a maximum of two volts (48V systems) or one volt (24V systems) above or below the nominal output level (float setting). Temperature compensation can be set to clamp lower than this by enabling the Temperature Compensation Clamp feature. When enabled, temperature compensation will clamp if the battery temperature reaches either the Temp Comp Max Voltage setting or the Temp Comp Min Voltage setting.

Temperature compensation is automatically disabled if communication between the controller and all rectifiers is lost, a DC over or under voltage alarm activates, a low voltage disconnection occurs, manual mode is entered, or the system enters the equalize or test modes.

Refer to “Specifications” on page 186 for temperature probe and reading accuracy.

Figure 1.2 Temperature Compensated Voltage Control



Battery Equalize Charge and Battery Charge Current Limit

The controller can increase system output voltage for equalizing the charge on all battery cells of a conventional flooded cell battery, or for recharging the battery following a commercial power failure.

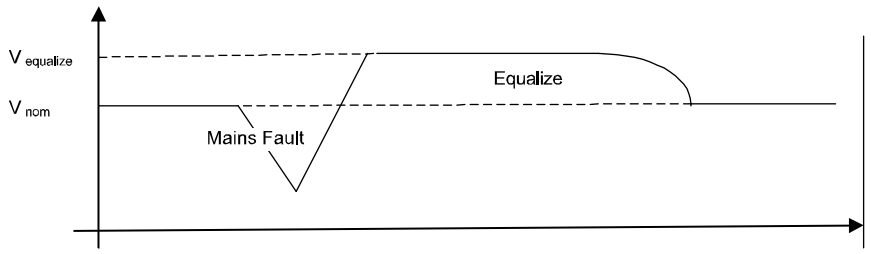
The charging function can be initiated cyclically (scheduled), automatically, or manually.

Refer to the battery manufacturer's instructions for equalize charging instructions.

Functional Description (See Figure 1.3):

- **Start of Charging:** When the battery charge current exceeds a preset value for three (3) minutes or if the calculated battery capacity has decreased to a preset value (after a commercial AC failure, for example), the charging function of controller is activated. A charging signal is sent from the controller to the rectifiers to increase the voltage up to the battery charging level $V_{equalize}$.
- **Battery Current Limitation:** After a commercial AC failure or when some battery cells are permanently damaged, the current to the batteries can be quite extensive. To avoid overheating or further damages to the battery, the controller limits the battery current to a preset level by limiting the charging voltage of the rectifiers. Should the battery current still exceed a higher preset value, an alarm is issued. Battery charge current is limited to the value set in the controller, as long as battery voltage is above 47 VDC.
- **End of Charging:** When the charging current drops below a preset value, a defined prolonged charging time is started before the charging is stopped and the voltage of the rectifiers return to the float charging level (V_{nom}). For safety, there is an equalized charging limit time that stops the charging after a preset time.

Figure 1.3 Voltage Characteristics on Commercial AC Failure and Automatic Equalize Charging



High and Low Battery Temperature Alarms

The controller can monitor battery temperature via a temperature sensor mounted on a battery cell. Values for high battery temperature and low battery temperature alarms can then be programmed into the controller.

Battery Thermal Runaway Management (BTRM) Feature

The Battery Thermal Runaway Management (BTRM) feature reduces voltage during a high battery temperature condition.

You can designate a temperature sensor as the BTRM sensor. The BTRM sensor has High 2 and High 1 BTRM temperature alarm limits. If battery temperature exceeds the "BTRM Temp High 2" setting, system voltage is lowered to the BTRM voltage setting. This feature can also be disabled.

Battery Discharge Test and Battery Test Logs

The controller can perform battery discharge tests to check the condition of the battery(s). There are three (3) types of battery discharge tests:

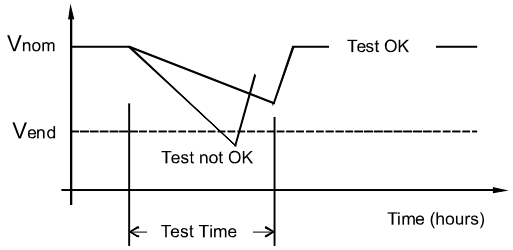
- Battery Test without Constant Current
- Battery Test with Constant Current
- Short Time Test (requires two battery shunts)

A User can manually start a battery discharge test or program the controller to automatically start battery discharge tests at scheduled intervals. Twelve (12) Constant Current Tests can be scheduled by the month-day-hour. A Short Time Test can be scheduled to be performed every 1-365 days. During a battery discharge test, the controller controls the rectifiers output to place the entire load or partial load on the batteries. The controller monitors the discharge of the battery and saves the results in a battery test log. The controller stores ten (10) battery discharge tests.

Functional Description:

For manual battery discharge tests as well as for scheduled battery discharge tests, the following parameters must be set: End Test Voltage, End Test Time, and End Test Capacity. See Figure 1.4.

Figure 1.4 Battery Test Diagram



Battery Discharge Test Sequence:

- For a Constant Current Test, the output voltage of the rectifiers is reduced so that the batteries supply the preset Constant Current Test Current to the load.
- If Constant Current is disabled, then the current being delivered by the batteries will be dependent on the load.
- For a Short Time Test, the output voltage of the rectifiers is reduced so that only the batteries power the load. If the batteries fail, the rectifiers power the load.
- The battery test continues until one of the following occurs:
  - The preset End Test Time, see Figure 1.4, expires. The battery has passed the test.
  - The battery capacity drops below the preset End Test Capacity. The battery has passed the test.

  - The battery voltage drops below the preset End Test Voltage (Vend) (see Figure 1.4). The battery has not passed the test and the test is interrupted. A bad battery alarm is activated.
  - If a critical alarm occurs during the test or there's not enough load, the battery test is aborted. In such cases a "Battery Test Fail" alarm will be activated (indicating the test couldn't be done). This alarm is different from the "Bad Battery" alarm (meaning the test was completed but the battery didn't pass it).

- A battery test alarm is active during a battery discharge test.
- If the battery has not passed the test, a bad battery alarm is activated.
- After the battery discharge test, the output voltage of the rectifiers increases so that the rectifiers supply the system and charge the batteries.

NOTE! *A procedure for performing a manual battery discharge test is provided on page 31.*

Battery LVD (Low Voltage Disconnect)

To prevent serious damage to the batteries during a commercial AC power failure, the batteries can be disconnected by voltage or time control.

The batteries are reconnected automatically when commercial AC power is restored, and a predetermined DC voltage level is reached.

See "LVD Tab Programmable Parameter Descriptions" on page 95 for descriptions of programmable LVD parameters.

Battery Capacity Prediction

The controller can predict battery capacity. When a battery is connected to the system at initial setup or increasing the number of batteries, you need to update the Battery Ah rating. After doing this and making sure the battery is fully charged you need to reset the battery capacity used percentage by performing the "Reset Battery Capacity" command to tell the controller that the batteries are 100% charged. From this point forward the controller will keep track of the battery current and time to predict the battery capacity used.

Battery Block and Battery Midpoint Monitoring

The controller can monitor battery blocks (12 V blocks) or midpoint battery voltage of battery strings connected to the EIB (Controller Extended Interface Board) assembly. An alarm is issued when either battery block voltage or battery midpoint voltage is abnormal.

Thermal Runaway Detection and Management

Functional Description:

The system uses several control mechanisms to avoid thermal runaway.

- During a short high-rate discharge, the batteries will normally get hot. The controller takes this into consideration. After completion of the discharge duty, the batteries are recharged with a limited current to avoid heating the batteries any further.
- The temperature of the batteries can be monitored, and the controller sets the charge voltage appropriately, as previously described under "Battery Charge Temperature Compensation" on page 4.
- In addition to battery temperature compensation, if battery temperature rises above a set temperature limit, the system stops battery charging completely by lowering the output voltage to the "BTRM Voltage" setting. This allows the batteries to cool down. The system also provides alarm notification of this occurrence. Power supplied to customer equipment is not interrupted. See "Setting Battery Thermal Runaway Management (BTRM) Feature" on page 28 for programming.
- The battery LVD circuits can be programmed to open (disconnect) if a high temperature event occurs (HTD-High Temperature Disconnect). The contactor(s) open when battery temperature rises above a programmable value and close

again when battery temperature falls below another programmable value. See “LVD Tab Programmable Parameter Descriptions” on page 95 for programming.

Peak Load Shifting (TOU, Time of Use)

The Peak Load Shift function gives the possibility for the user to schedule, up to four times per day, a period where the rectifier output voltage is changed to a specified level.

This can be used to prevent battery charging during specified times or batteries allowing to be discharged.

1.3.5 Energy Management

Energy Management consists of an Energy Optimization Mode.

Energy Optimization Mode

The controller provides an Energy Optimization Mode (ECO) function. Energy Optimization permits an installation to only operate rectifiers as needed to maintain the load and keep batteries in a fully charged condition. As load increases, Energy Optimization turns on additional rectifiers as needed to maintain the load. As load decreases, Energy Optimization places rectifiers in standby to conserve energy usage. Rectifiers which are always operating to maintain any load requirements are cycled through the group of rectifiers controlled by this feature to provide uniform operating times for each rectifier.

ALERT! The Energy Optimization Mode should NOT be used in systems that operate without batteries.

NOTE! *If the battery is ever disconnected, disable Energy Optimization Mode until the battery is reconnected.*

The following operating conditions apply:

1. The ECO mode is only enabled upon normal system operation. If any of the following alarms occurs, the system cannot enter or will exit the ECO mode.
    a) Current imbalance (only when imbalance current protection is enabled).
    b) Input fail.
    c) Any one rectifier over temp.
    d) Any one rectifier Input fail.
    e) Any one rectifier fault.
    f) Any one rectifier over voltage.
    g) Any one rectifier fan fault.
    h) Any one rectifier no response.
    i) Any one battery fuse open.
    j) Any one LVD disconnect.
    k) Battery is in charge or discharge, as defined below:
        - Battery current > [battery rated capacity × 0.005], or battery current > “Min Charge” setting, means battery in charge.
        - Battery current < [battery rated capacity × -0.003], or battery current < “Min Discharge” setting, means battery in discharge.

l) Under voltage.

m) Any one rectifier in current limit mode.

2. The system load cannot exceed the system energy saving point (default value is 45%). Otherwise, the system cannot enter or will exit the ECO mode.

3. When the rectifier load exceeds its optimal operating point, the system will exit the ECO mode, and the controller will recalculate and then turn off any unnecessary rectifiers. After that, the system can enter the ECO mode again.

4. If the system enters the ECO mode and then exits for five consecutive times within one hour, an abnormal alarm (ECO Cycle Alarm) will be generated, and the system can no longer enter the ECO mode until the ECO Cycle Alarm is cleared manually or retires automatically after 24 hours.

Peak Load Shift

The NCU provides a Peak Load Shift (PLS) function. The Peak Load Shift function, when enabled, will limit the power at the input of the rectifiers to a settable level. This might lead to that during period of times the batteries gets discharged. When the function is enabled, it is possible to disable the LLVD's, so that the system voltage can go lower than normal without disconnecting load.

As a feature to protect from batteries to get deeper discharged that expected there is a stop voltage level. When the measured system voltage is lower that the stop voltage level the PLS function will be interrupted and remove the input power limit.

ALERT! The Peak Load Shift should NOT be used in systems that operate without batteries.

NOTE! *If the battery is ever disconnected, disable Peak Load Shift until the battery is reconnected.*

1.3.6 Supervisory Module (SM Modules) Monitoring

Various devices (supervisory modules) can be connected to the controller to extend its monitoring capabilities.

1.3.7 Communications Function

The controller is able to communicate with different equipment or, connect to different equipment for communication. See Figure 1.5.

a) 10M/100M Ethernet Port: The controller can communicate with a supervisory computer or other devices through its 10M/100M Ethernet port. The communication cable shall be a shielded cable. The Ethernet port is located on the front panel of the controller. This port supports Dynamic Host Configuration Protocol (DHCP) function.

NOTE! *Some systems may have an IB4 board with a second Ethernet port. The IB4 board is connected to the controller's backplane connector (USB) via a factory provided cable. Refer to your system's documentation for location of the IB4 board (if furnished).*

b) Controller Digital Inputs: The controller provides (via system interconnect connectors, refer to your system documentation for location) connections for two (2) programmable binary digital inputs (located on the controller). See also "Controller Digital Input and Relay Output Connections" on page 185.

c) Controller Relay Outputs: The controller provides (via system interconnect connectors, refer to your system documentation for location) connections for four (4) programmable form-C relay outputs (located on the controller). The relay outputs can be connected to customer external alarm circuits. Each relay output can be configured to change state when one or more alarm events occur. The relay outputs can also be connected to customer external equipment, so that the relay output can control or interface with the customer external equipment. See also "Controller Digital Input and Relay Output Connections" on page 185.

d) IB2 (Interface Board) and EIB (Extended Interface Board): Some systems may have an IB2 (Interface Board) and/or EIB (Extended Interface Board) connected to the controller. Each IB2 board provides eight (8) dry relay outputs. Each EIB board provides five (5) dry relay outputs. Every relay output has a set of NC (normally close) and NO (normally open) contacts.

   The relay outputs can be connected to customer external alarm circuits. Each relay output can be configured to change state when one or more alarm events occur.

   The relay outputs can also be connected to customer external equipment, so that the relay output can control or interface with the customer external equipment.

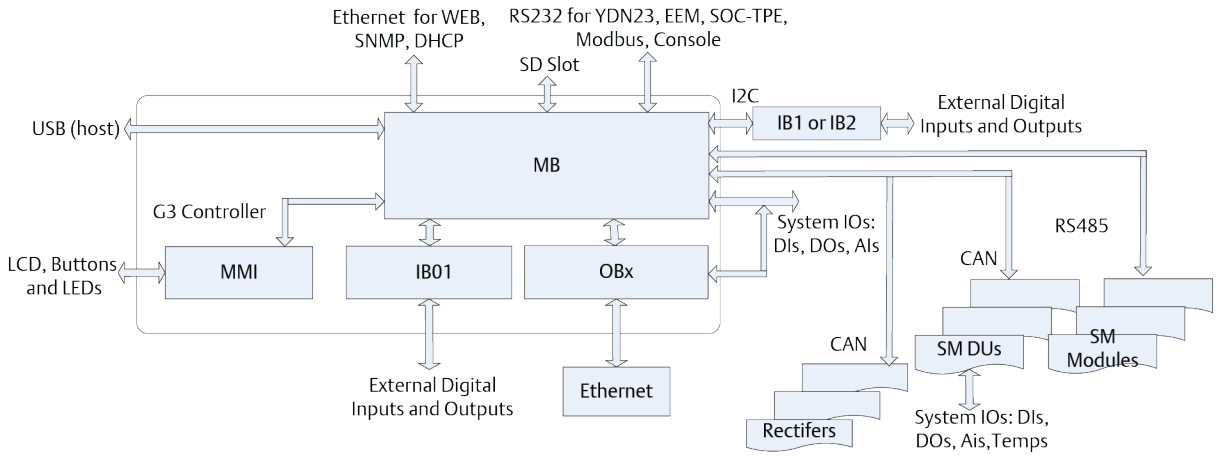
e) IB4 (Interface Board 4): Some systems may have an IB4 board. The IB4 board is a USB to LAN converter for the controller, which includes a USB and an Ethernet port. The IB4 board is connected to the controller's backplane connector (USB) via a factory provided cable. Refer to your system's documentation for location of the IB4 board (if furnished).

f) RS-485 Port: The controller can communicate with an SM-AC, SM-Bat, or SMIO through the RS-485 port. The RS-485 port uses the parameters 19200, n, 8, 1.

g) Modbus Protocol: The controller can communicate with an AC Meter using the Modbus protocol.

h) Machine-to-Machine HTTP Interface:

Figure 1.5 The Controller Perspective



1.3.8 Efficiency Tracker Function

The controller has an efficiency tracker function if the tracking for estimating energy saving is installed in the system.

The system can calculate energy saving for R48-3500e4, R48-3500e3 or R48-3200 and then present saving in kWh based on average load of last 24h, week, month, 12 months since day1. Elapsed Saving, System Details are displayed on the Efficiency Tracker Web page.

Refer to "Web Interface Screens" on page 65.

1.3.9 Radius Server Feature

When the radius server feature is enabled and a User attempts to login using the LCD or web page, the controller first checks the username/password entered for a match programmed in the controller. If the controller authenticates, then the controller grants the User access. This step is to allow a login in case the radius server is not available, has changed, etc.

If the authentication fails (either not present or wrong password), then the controller checks the username/password entered using the radius interface. If the controller authenticates, then the controller grants the User access. If authentication fails, the controller notifies the User and does not grant the User access.

If an IB4 board is present, the radius messages are sent to the IB4 network interface; otherwise, the radius messages are sent to the front (craft) port.

The controller uses vendor-specific attributes to select the User's level of access. The Vertiv vendor id is 6302. The vendor-specific attribute is VV-Priv, which is a string with 4 possible values:

- Administrator: Administrator
- Browser: Browser
- Operator: Operator
- Engineer: Engineer

Here is the dictionary definition of this Vertiv vendor-specific attribute:

VENDOR	Vertiv	6302	
BEGIN-VENDOR	Vertiv		
ATTRIBUTE	VV-Priv	1	string
END-VENDOR	Vertiv		

If the server responds with an unknown Service-Type, the controller will record the event in the system log and act as though access was rejected, per RFC 2865.

The controller does not support the Access-Challenge response from the server. If this response is received, it is ignored.

The radius server settings are programmed using the Web Interface. Admin privilege level access is required.

2 Operation

2.1 Controller Initialization

The controller goes through an initialization process when power is initially applied to the system.

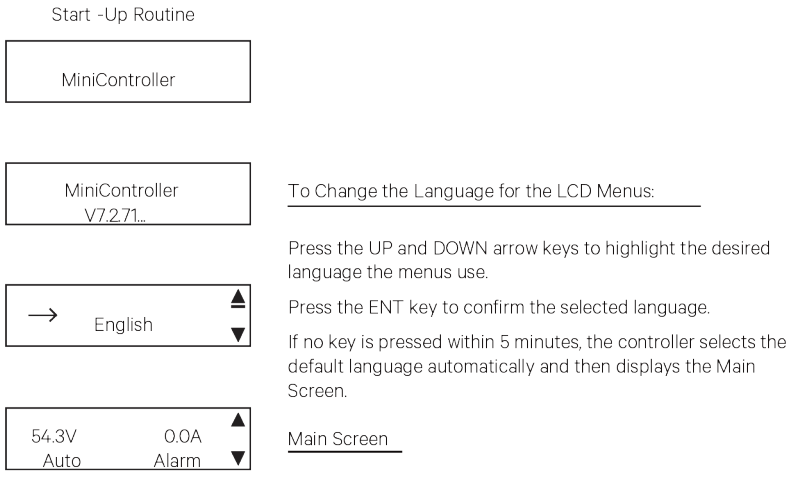
NOTE! *The initialization routine takes several minutes. During that time various alarm indicators may illuminate on the controller's front panel and an audible alarm may sound. Disregard all alarms. An audible alarm can be silenced at any time by momentarily depressing the ENT key on the controller.*

NOTE! *The controller does not turn off any relay when the controller is reset/replaced. If the relay is active when the controller is reset/replaced, it will stay active whether or not the alarm condition still exists. If possible, the alarm condition should be cleared before the controller is reset/replaced. If the alarm is not cleared, after starting the controller, it may be necessary to manually trigger an alarm condition to clear all alarm relays.*

Initialization

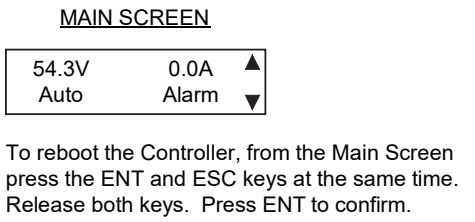
1. After the controller is powered on, it goes through an initialization routine. See Figure 2.1.
2. When initialization is complete, the language screen appears. Press the UP or DOWN arrow key to select the desired language. Press the ENT key to confirm the selection. See Figure 2.1.

Figure 2.1 Controller Start-Up



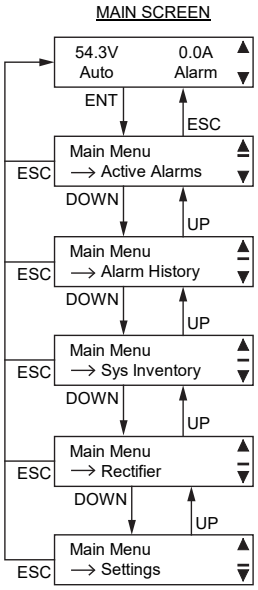
3. The MAIN SCREEN displays. See Figure 2.2.

Figure 2.2 Controller Local Display MAIN SCREEN



4. From the MAIN SCREEN, press the ENT key to go to the MAIN MENU. See Figure 2.3.

Figure 2.3 Controller Local Display MAIN MENU



5. From the MAIN MENU, you can press the UP and DOWN arrow keys to select a submenu. Press the ENT key to enter the selected submenu.

NOTE! *Repeatedly press the ESC key to return in reverse order level by level from any submenu until the MAIN SCREEN appears.*

2.2 Controller's Front Panel Indicators

There are three (3) indicators located on the controller's front panel. Refer to Figure 2.4. Refer to Table 2.2 for the function of the indicators.

2.3 Controller's Front Panel Menu Navigation Keys and Local Display

There are four (4) menu navigation keys and a local display located on the controller's front panel. Refer to Figure 2.4. Refer to Table 2.3 for the function of the menu navigation keys.

NOTE! *When the local display is lit, if no button is pushed for eight (8) minutes, the backlight of the local display extinguishes, and the controller returns to the MAIN SCREEN. Press any key to re-activate the local display.*

Figure 2.4 Controller's Front Panel Indicators and Menu Navigation Keys Locations

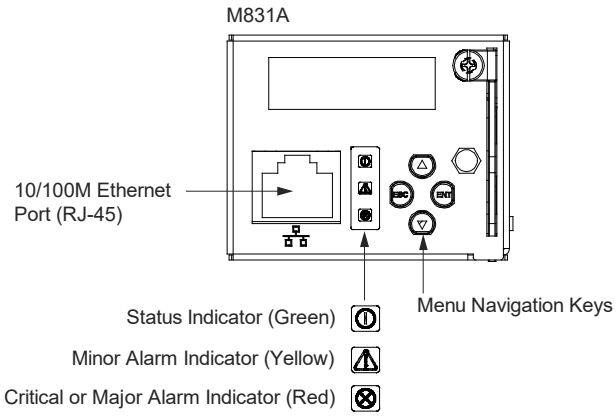


Table 2.2 Controller's Front Panel Indicators

Indicator		Normal State	Fault State	Fault Cause
	Status (Green)	On	Off	No input power to the controller.
	Observation Alarm (Yellow)	Off	On	The system has one or more active minor alarms. Alarm conditions are programmable.
	Major or Critical Alarm (Red)	Off	On	The system has one or more active major or critical alarms. Alarm conditions are programmable.

Table 2.3 Controller's Front Panel Menu Navigation Keys

Key Symbol	Key Name	Function	
ESC	Escape	Press this key to go back to a previous menu or to cancel setting a parameter.	Press ESC and ENT together to reset the controller, then press ENT to accept or ESC to cancel.
ENT	Enter	Press this key to go forward to the next menu, to select a parameter to edit, or to validate a parameter setting change.	
▲	Up Arrow	Press the up or down arrow keys to scroll through the menus or to change the value of a parameter.	--
▼	Down Arrow		

Press any key to silence an audible alarm.

2.4 Passwords and Privilege Levels

Local Keypad and Display

Anyone can browse the controller via the local keypad and display. A User Name and Password is required to change settings. User Names and associated passwords are programmed into the controller via the Web Interface. To change settings locally, a User Name and Password for a User with an access level of Level B (Operator) or higher is required. See "Users Tab" on page 113. Once a password is entered locally, it remains in effect for a preset time period to allow navigating between menus without re-entering the password.

Web Interface

Web interface access always requires a Username and password to be entered to gain access.

Web Interface User Privilege Levels: Users are programmed with a "privilege level" (see **Table 5.1** on page 115). A User has access to his/her level menus, plus all menus of the lesser privilege levels.

2.5 Multiple Languages Supported

Multiple languages are supported in the Local Interface and Web Interface. Refer to "Language Tab" on page 121.

2.6 Using the Local Keypad and Display

See also "Passwords and Privilege Levels" on page 14.

2.6.1 Local Menu Navigation Keys and Local Display

See “Controller’s Front Panel Menu Navigation Keys and Local Display” on page 13.

2.6.2 Local Display Menus

Refer to “Local Display Menus” on page 52.

2.6.3 Navigating the Local Display Menus

To Select a Sub-Menu

From the MAIN SCREEN, press the ENT key to go to the MAIN MENU.
From the MAIN MENU, press the UP and DOWN keys to highlight the desired sub-menu.
Press the ENT key to enter the selected sub-menu.

To Select a User and Enter a Password (Settings Menus)

To select a User, use the UP and DOWN arrow keys to select a User previously programmed into the controller. Press ENT to select the User. Note that only Users programmed into the controller are shown. Users are programmed via the Web Interface.

To enter a password, use the UP and DOWN keys to choose a character. Press ENT to accept and move to the next character. Continue this process until all characters are entered. Press ENT again to accept the password. Default Password: 12345678.

To Change a Parameter (Settings Menus)

Press the UP and DOWN keys to move up and down the list of parameters.
Press ENT to select the parameter.
Press the UP and DOWN keys to change the parameter.
Press ENT to make the change. Press ESC to cancel the change.

2.7 Using the Web Interface

See also “Passwords and Privilege Levels” on page 14.

NOTE! *The controller supports a 10/100M Ethernet connection.*

2.7.1 Overview

Via the Web Interface, a User (with proper access level) can:

- View real-time operating information (rectifiers, solar converters, converters, inverters, AC, DC, batteries, etc.).
- View and download information recorded in logs.
- Send control commands.
- Set programmable parameters.
- Download and upload the “SettingParam.tar” file.
- Download firmware to the controller.

2.7.2 Supported Browsers

Multiple browsers are supported in the Web Interface. The User can use Chrome, Safari, or Firefox.

2.7.3 Web Interface Screens

Refer to “Web Interface Screens” on page 65.

2.7.4 Logging into the Controller via Web Interface Access

Multiple browsers are supported. The User can use Chrome, Safari, or Firefox.

Procedure

1. In your browser, enter http:// and the controller's IP address (see "Connecting a Local Computer Directly to the Controller when the System is NOT Equipped with an IB4 Board" on page 18 or "Connecting a Local Computer Directly to the Controller when the System IS Equipped with an IB4 Board" on page 20) and press **ENTER**. If your site requires secure HTTP and you were furnished with a controller configuration with secure HTTP, enter https:// and the controller's IP address and press **ENTER**.

2. If this is the first time the controller is accessed remotely, the following screen appears. This informs a User to change the default password the first time the controller is accessed remotely. If the below procedure was performed, for subsequent logins the window in the next step appears.

   a) Enter the old password (default 12345678).

   b) Enter a new password.

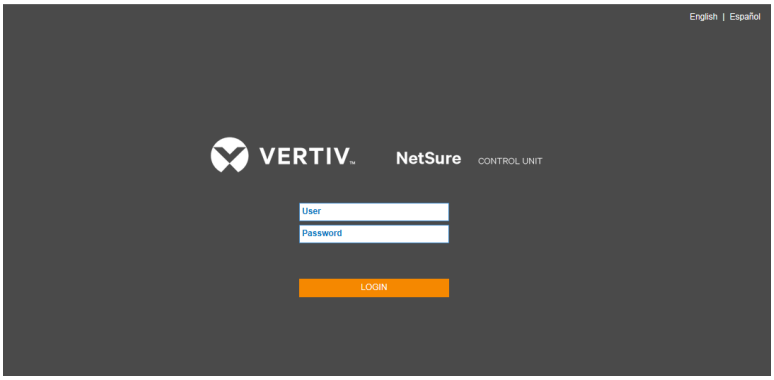
   c) Re-enter the new password.

   d) Click the "Confirm Button".

NOTE! *By default, the "User Name" is "admin" and the "Password" is "12345678". See also "Users Tab" on page 113.*

3. The following Web Interface Login window opens. Enter a valid **User Name** and **Password**, then click **LOGIN**.

NOTE! *Before entering a Username and password, you can select a local language that the Web Interface menus use from those listed in the top right corner of the login window. See "Language Tab" on page 121.*



4. After entering a valid **User Name** and **Password** and clicking **LOGIN**, the Web Interface "HOMEPAGE" window opens. Refer to "Web Interface Screens" on page 65.

2.8 Setup Procedures

2.8.1 Setting IPv4 Communications Parameters (if controller not set as DHCP)

The controller's IPv4 parameters (IP, subnet mask, and gateway addresses) must be set to match your company's network settings. The default settings for these parameters are shown below.

- IP Address: 192.168.1.2
- Subnet Mask Address: 255.255.255.0
- Gateway Address: 192.168.1.1

Local Menu Navigation:

Main Menu / Settings / Communication / enter parameters.

Web Menu Navigation:

Advance Settings Menu / Ethernet Tab / enter parameters.

2.8.2 Setting IPv6 Communications Parameters (if controller not set as DHCPv6)

The controller's IPv6 parameters (IPv6 address, IPv6 prefix, and IPv6 gateway address) must be set to match your company's network settings. The default settings for these parameters are shown below.

- Link-Local Address: fe80:209:f5ff:fe09:1002/64
- IPv6 Address: 20fa:fffd:fffc:fffb:fffa:fff9:fff8:fff7
- IPv6 Prefix: 0
- IPv6 Gateway: 20fa:1:fffe:ffff:fffe:fffd:ffff:fffe

Local Menu Navigation:

Main Menu / Settings / Communication / enter parameters.

Web Menu Navigation:

Advance Settings Menu / Ethernet Tab / enter parameters.

2.8.3 Setting for DHCP and DHCPv6

The DHCP and DHCPv6 functions allow the controller to acquire an IP address automatically. This function can only be enabled or disabled via the local display and keypad. If this function is enabled and the acquisition of an IP address fails, an alarm is generated. If the acquisition of an IP address is successful, you need to record the IP address automatically acquired by the controller to access the controller via the Web Interface. This IP address is displayed on the main system info screen (Main Menu / ESC) in the IP Address field or in the local display menu (Main Menu / Settings Icon / Comm Settings) in the IP Address field below the DHCP setting.

Local Menu Navigation:

Main Menu / Settings / Communication / DHCP (set to enabled) (can also view acquired IP address).
Main Screen / ESC / ENT (to view acquired IP address).

Web Menu Navigation:

None.

2.8.4 Connecting the Controller to your Local Area Network (LAN) when the System is NOT Equipped with an IB4 Board

An Ethernet port is located on the front panel of the controller. This port supports Dynamic Host Configuration Protocol (DHCP) function.

Procedure

1. If your system **does not have** an IB4 board, connect the Local Area Network (LAN) to the controller's front panel port. This port can be assigned an IP address or can be set for DHCP. If set for DHCP, it will get its IP address from a DHCP server on the network. Refer to "Setting IPv4 Communications Parameters (if controller not set as DHCP)" on page 17 or "Setting IPv6 Communications Parameters (if controller not set as DHCPv6)" on page 17 to set the port parameters;
   or, "Setting for DHCP and DHCPv6" on page 17 to set the port as DHCP or DHCPv6.

2.8.5 Connecting the Controller to your Local Area Network (LAN) when the System IS Equipped with an IB4 Board

NOTE! *Your system may be furnished with an IB4 board. The IB4 board provides a second Ethernet port. The Ethernet port located on the controller's front panel can ONLY be used to connect a computer directly to the controller. The Ethernet port located on the IB4 board can be used to connect the controller to your Local Area Network (LAN). Refer to your system's documentation for location of the IB4 board (if furnished).*

NOTE! *If your system has an IB4 board, DO NOT connect your Local Area Network (LAN) to the controller front Ethernet port.*

Some systems may have an IB4 board with a second Ethernet port. This port supports Dynamic Host Configuration Protocol (DHCP) function. Refer to your system's documentation for location of the IB4 board (if furnished).

Procedure

1. If your system **has** an IB4 board, connect the Local Area Network (LAN) to the IB4 board port. The IB4 board port can be assigned an IP address or can be set for DHCP. If it is set for DHCP, it will get its IP address from a DHCP server on the network. Refer to "Setting IPv4 Communications Parameters (if controller not set as DHCP)" on page 17 or "Setting IPv6 Communications Parameters (if controller not set as DHCPv6)" on page 17 to set the port parameters;
   or,
   "Setting for DHCP and DHCPv6" on page 17 to set the port as DHCP or DHCPv6.

2.8.6 Connecting a Local Computer Directly to the Controller when the System is NOT Equipped with an IB4 Board

An Ethernet port is located on the front panel of the controller. This port supports Dynamic Host Configuration Protocol (DHCP) function.

If your system **does not have** an IB4 board, perform the following procedure.

Procedure

1. Before connecting your computer directly to the controller's Ethernet port, use the following procedure to record your computer's network settings (so they can be returned to these values when done) and then change these settings in your computer to match the communications settings programmed in the controller.

   a) Record your computer's network settings.

   b) Record whether the IP settings are set to automatic (DHCP) or are manually set. If manually set, also record the following:

   IP Address: _____
   Subnet Mask: _____

Default Gateway: _____

c) Record the following controller's IP parameters. If these parameters were not changed, they should be at the default values as shown in the example section below.

IPv4

IP Address: _____
Subnet Mask: _____
Default Gateway: _____

Example:
IP Address: 192.168.1.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.1.1

IPv6

IPv6 Address: _____
IPv6 Prefix: _____
IPv6 Gateway: _____

Example:
IPv6 Address: 20fa:fffd:fffc:fffb:fffa:fff9:fff8:fff7
IPv6 Prefix: 0
IPv6 Gateway: 20fa:1:fffe:ffff:fffe:fffd:ffff:fffe

d) Change your local computer's network settings using the information you acquired in the above step, except that the last part of the IP address needs to be replaced with any different number.

IPv4

IP Address: _____
Subnet Mask: _____
Default Gateway: _____

Example:
IP Address: 192.168.1.3
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.1.1

IPv6

IPv6 Address: _____
IPv6 Prefix: _____
IPv6 Gateway: _____

Example:
IPv6 Address: 20fa:fffd:fffc:fffb:fffa:fff9:fff8:fff7
IPv6 Prefix: 0
IPv6 Gateway: 20fa:1:fffe:ffff:fffe:fffd:ffff:fffe

e) Note that you may have to reboot your local computer for the settings to take effect. Follow any instruction you see on the screen.

2. Connect your computer directly to the controller's Ethernet port (RJ-45 jack located on the front of the controller). See Figure 2.4. The controller's front panel port is configured with an IP address. Default is 192.168.1.2. This is the address you will type into your Web browser to access the controller's Web Interface. You will also have to set the properties on your computer (refer to the previous procedure in step 1).

3. When finished, disconnect your computer from the controller and, if necessary, reset your computer network settings as recorded in step 1.

2.8.7 Connecting a Local Computer Directly to the Controller when the System IS Equipped with an IB4 Board

NOTE! *Your system may be furnished with an IB4 board. The IB4 board provides a second Ethernet port. The Ethernet port located on the controller's front panel can ONLY be used to connect a computer directly to the controller. The Ethernet port located on the IB4 board can be used to connect the controller to your Local Area Network (LAN). Refer to your system's documentation for location of the IB4 board (if furnished).*

An Ethernet port is located on the front panel of the controller. This port supports Dynamic Host Configuration Protocol (DHCP) function.

Some systems may have an IB4 board with a second Ethernet port. Refer to your system's documentation for location of the IB4 board (if furnished).

If your system **has** an IB4 board, perform the following procedure.

Procedure

1. Connect your computer directly to the controller's Ethernet port (RJ-45 jack located on the front of the controller). See Figure 2.4. The controller's front panel port will have the following IPv4 Address: 192.168.100.100. Enter the address 192.168.100.100 in your Web browser to access the controller's Web Interface via IPv4. The controller's front panel port will have the following IPv6 Address. IPv6 Link-Local Address: fe80::209:f5ff:fe09:1002/64 or IPv6 Address: 20fa:fffd:fffc:fffb:fffa:fff9:fff8:fff7. Enter the IPv6 Link-Local Address: [fe80::209:f5ff:fe09:1002/64] or IPv6 Address: [20fa:fffd:fffc:fffb:fffa:fff9:fff8:fff7] to access the controller's Web Interface via IPv6.
2. When finished, disconnect your computer from the controller.

2.9 Common Tasks Performed via the Local Keypad and/or Web Interface

2.9.1 General

Refer also to "Local Display Menus" on page 52 and "Web Interface Screens" on page 65 for menu item descriptions.

NOTE! *Ensure current configuration is backed up prior to changing settings (see "Backing Up the Controller Configuration" on page 31). Create new backup files after every successful update for your records and in case of controller failure.*

NOTE! *If you add or remove hardware from the system (except rectifiers, solar converters, converters, and inverters), update the inventory via the "Auto Config" menu item (see "Updating the Controller's Device Inventory" on page 31).*

NOTE! *Some settings are restricted by other settings. Refer to Figure 3.1 for setting restrictions.*

2.9.2 Reset Admin Password Feature

The factory sets the controller's "Reset Admin Password" feature when the controller is shipped. This feature reminds a User to reset the factory password when the controller is first initialized and also prevents a User from logging in remotely until the default password is changed. Once the default password is changed, this feature turns off automatically. If it is desired to re-activate this feature, from the local display, press the ESC and Down Arrow buttons at the same time. Press ENTER when prompted to activate this feature.

2.9.3 Viewing Alarms

Local Menu Navigation:

Main Menu / Active Alarms / ENT.

Web Menu Navigation:

Active alarms are listed at the top of the window. Click on an alarm category to expand the alarm list.

2.9.4 Viewing System Status

Local Menu Navigation:

Main Screen.

Web Menu Navigation:

System status is displayed in the right window pane of the Home page. Select the Power System tab and use the interactive links to view the various device group status pages. See “Device Group Status Pages” starting on page 69.

2.9.5 Viewing the Controller’s Device Inventory

Local Menu Navigation:

Main Menu / Sys Inventory / ENT to view Inventory.

Web Menu Navigation:

System Inventory Menu.

2.9.6 Clearing or Resetting Alarms

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / navigate the various device tabs to select an alarm to clear.

2.9.7 Clearing Logs

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / Clear Data Tab / select log to clear.

2.9.8 Disabling the Local Keypad Sound

Local Menu Navigation:

Main Menu / Settings / Sys Settings / Keypad Voice.

Web Menu Navigation:

None.

2.9.9 Blocking Alarms

Local Menu Navigation:

None

Web Menu Navigation:

Settings Menu / System Tab / Outgoing Alarms Blocked.

2.9.10 Changing the Date and Time

Local Menu Navigation:

Main Menu / Settings / Sys Settings / Date.
Main Menu / Settings / Sys Settings / Time.

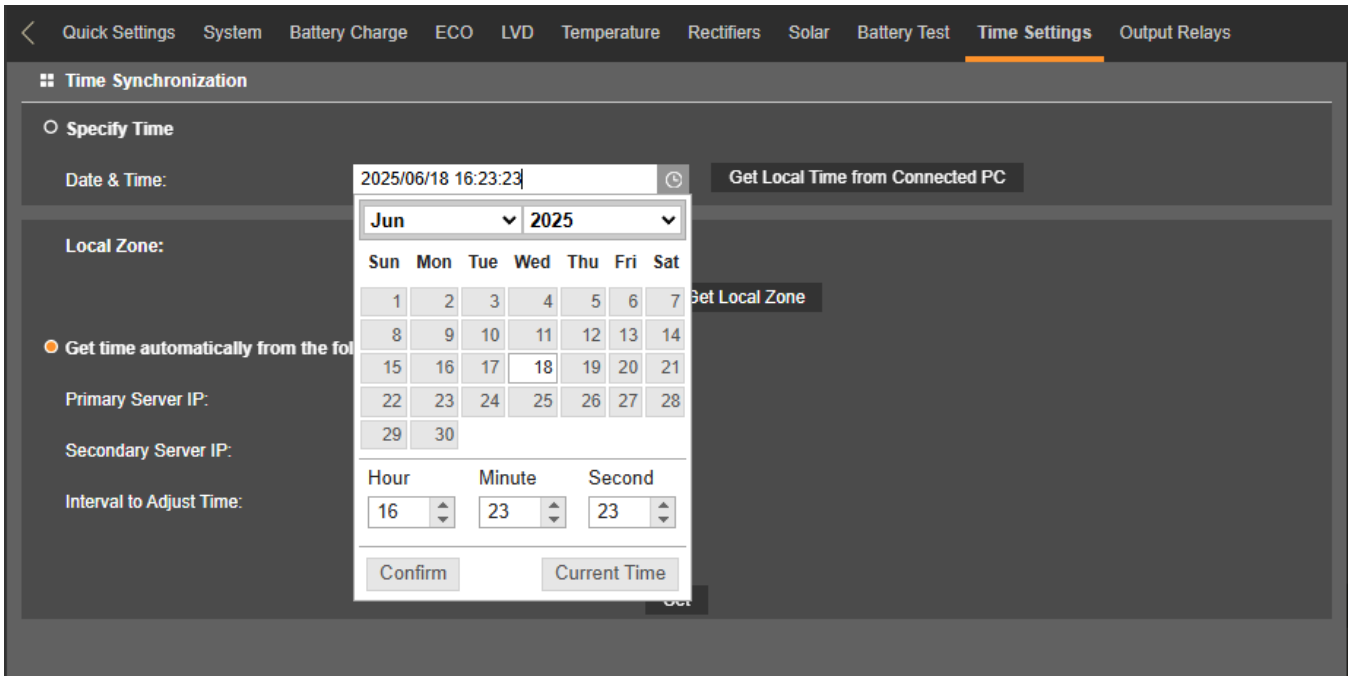
To enter a Date or Time, press ENT. Use the UP and DOWN keys to choose a character. Press ENT to accept and move to the next character. Continue this process until all characters are entered. Press ENT again to accept the date or time. Press ESC to cancel.

Web Menu Navigation:

Settings Menu / Time Settings Tab.

In the Specify Time section, click on "Get Local Time from Connected PC" and then “Set” to automatically set the date and time. To manually set the date and time, click on “the clock symbol” and enter the date and time. See Figure 2.5. Then select the “Confirm” button. Then click on “Set” to save the change.

Figure 2.5 Manual Date and Time Menu



2.9.11 Adding, Deleting, and Modifying Users

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / Users Tab.

2.9.12 Setting IP Communications Parameters (if controller not set as DHCP or DHCPv6)

See also “Setting IPv4 Communications Parameters (if controller not set as DHCP)” on page 17 and “Setting IPv6 Communications Parameters (if controller not set as DHCPv6)” on page 17.

Local Menu Navigation:

Main Menu / Settings / Communication / enter parameters.

Web Menu Navigation:

Advance Settings Menu / Ethernet Tab / enter parameters.

2.9.13 Setting for DHCP and DHCPv6

Local Menu Navigation:

See “Setting for DHCP and DHCPv6 on page 17.

Web Menu Navigation:

None.

2.9.14 Setting SNMP Parameters

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SNMP Tab.

2.9.15 Setting Auto Equalize

Local Menu Navigation:

Main Menu / Settings / FLT/EQ Change
Also enter additional parameters from Web Interface (Settings Menu / Battery Tab / enter parameters)

Web Menu Navigation:

Settings Menu / Battery Tab / Automatic Equalize (set to Yes) then enter the following parameters.

- Equalize Start Current
- Equalize Start Capacity
- Equalize Stop Current
- Equalize Stop Delay Time
- Maximum Equalize Charge Time

2.9.16 Manually Forcing LVDs

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / System Tab / “Auto/Manual” State (change to Manual).
then
Settings Menu / LVD Tab / LVD 1 Control or LVD 2 Control (select the other state).
then

Settings Menu / LVD Tab / LVD 1 Control or LVD 2 Control (select the original state).
then
Settings Menu / System Tab / “Auto/Manual” State (change to Auto).

2.9.17 Manually Forcing Relays

After completing the following steps, the relay will momentarily toggle to the chosen state. The relay then reverts back to being controlled by the controller.

NOTE! *This may take a few minutes.*

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Output Relays Tab / Relay (select the other state) then press the SET button.

2.9.18 Assigning Severity Level to Alarms

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / Alarms Tab and DI Alarms Tab.

2.9.19 Assigning Relays to Alarms

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / Alarms Tab and DI Alarms Tab.

2.9.20 Placing the System in Float or Equalize Charge Mode

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Battery Tab / “Equalize/Float” Charge Control.

2.9.21 Viewing/Changing the Float Voltage Setting

Local Menu Navigation:

Main Menu / Settings / FLT/EQ Voltage / Float Voltage.

Web Menu Navigation:

Settings Menu / Battery Tab / Float Charge Voltage.

2.9.22 Viewing/Changing the Equalize Voltage Setting

Local Menu Navigation:

Main Menu / Settings / FLT/EQ Voltag / EQ Voltage.

Web Menu Navigation:

Settings Menu / Battery Tab / Equalize Charge Voltage.

2.9.23 Setting Battery Parameters

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Battery Tab / enter parameters.

2.9.24 Setting Battery Capacity Parameters

NOTE! *After setting the battery capacity, the User should also reset the battery capacity (battery must be fully charged). (from the Web Interface; Settings Menu / Battery Tab / Reset Battery Capacity) (from the Local Interface; Settings Menu / Batt Settings / Reset Batt Cap).*

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Battery Tab / Batt1 Rated Capacity.
or
See “Individual Battery Settings Page” on page 81.

2.9.25 Setting Rectifier High Voltage Shutdown

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Rectifiers Tab / HVSD (set to enabled) then set HVSD Limit.

2.9.26 Setting Solar Converter High Voltage Shutdown

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Solar Tab / HVSD Limit.

2.9.27 Enabling Solar Mode

When solar converters are all installed prior to applying power and starting system, the controller will NOT communicate with solar converters until SOLAR MODE is enabled. To enable SOLAR MODE, refer to the following procedure.

Local Menu Navigation:

None.

Web Menu Navigation:

Settings / System Tab / Solar Mode / set to “SOLAR” or “RECT-SOLAR” or “Disabled”.

If you have both rectifiers and solar converters in the system, you have an option to set Solar Mode to “RECT-SOLAR”. In the Battery Settings tab you set the “Float Charge Voltage (Solar)” parameter to the desired float setting. If battery current imitation mode is to Current, the parameter “Float Charge Voltage (Rect)” setting **MUST** be set 0.3 V lower than the “Float Charge Voltage (Solar)” parameter setting for solar converters to operate properly.

2.9.28 Setting Over Voltage Alarm 1

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / System Tab / Over Voltage 1.

2.9.29 Setting Over Voltage Alarm 2

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / System Tab / Over Voltage 2.

2.9.30 Setting Under Voltage Alarm 1

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / System Tab / Under Voltage 1.

2.9.31 Setting Under Voltage Alarm 2

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / System Tab / Under Voltage 2.

2.9.32 Setting Temperature Sensors

Temperature sensors may be connected to the…

- System Temperature Ports 1, 2, 3 (if available),
- Temp1 and Temp2 ports on an IB2 Interface Board,
- Temp1 and Temp2 ports on an EIB Interface Board,
- Temp1 through Temp8 ports of up to eight (8) SM-Temp modules, and

Each port (sensor) may be set as None, Battery, or Ambient.

A temperature sensor set as an ambient temperature sensor may also be set as the sensor which displays the ambient temperature on the Web Interface’s Homepage.

A temperature sensor set as a battery temperature sensor may also be set as the temperature compensation sensor (in addition, the temperature compensation sensor is the sensor which displays the battery temperature on the Web Interface's Battery Device Group Status Page).

A temperature sensor set as a battery temperature sensor may also be set as the BTRM (Battery Thermal Runaway Management) sensor (in addition, the BTRM sensor is the sensor which is used for the High Temperature Disconnect [HTD] Feature.)

Procedure

1. Set each temperature sensor in the system to None, Battery, or Ambient.

   Local Menu Navigation:

   None.

   Web Menu Navigation:

   Settings Menu / Temp Probes Tab.

   Also enter values for the temp probe temperature alarms from the Web Interface (Settings Menu / Temp Probes Tab).

2. If desired, set a temperature sensor set as an ambient temperature sensor as the sensor which displays the ambient temperature on the Web Interface's Homepage.

   Local Menu Navigation:

   None.

   Web Menu Navigation:

   Settings Menu / System Tab / Main Ambient Temp Sensor.

   Also enter values for the ambient temperature alarms from the Web Interface (Settings Menu / System Tab).

3. If desired, set a temperature sensor set as a battery temperature sensor as the battery temperature compensation sensor.

   Local Menu Navigation:

   Main Menu / Settings / Temp Comp / Sens TempComp.

   Web Menu Navigation:

   Settings Menu / Temperature Tab / Sensor for Temp Compensation.

   Also enter values for the compensation temperature alarms from the Web Interface (Settings Menu / Temperature Tab).

4. If desired, set a temperature sensor set as a battery temperature sensor as the BTRM sensor.

   Local Menu Navigation:

   None.

   Web Menu Navigation:

   Settings Menu / Temperature Tab / BTRM Temp Sensor.

   Also enter values for the BTRM temperature alarms from the Web Interface (Settings Menu / Battery Tab).

2.9.33 Setting Battery Charge Temperature Compensation

The following need to be set for the Battery Charge Temperature Compensation feature.

See above for selecting the battery temperature compensation temperature sensor (or select maximum or average) and setting compensation temperature alarms.

Refer to “Specifications” on page 186 for temperature probe and reading accuracy.

Local Menu Navigation:

Main Menu / Settings / Temp Comp / Enter values for TempComp Center and Temp Comp Coeff.

Web Menu Navigation:

Settings Menu / Battery Charge Tab.

Enter values for the following parameters:
Temp Compensation Center, Temp Comp Coefficient (slope).

2.9.34 Setting Battery Thermal Runaway Management (BTRM) Feature

The following need to be set for the Battery Thermal Runaway Management (BTRM) feature.

See above for selecting the Battery Thermal Runaway Management (BTRM) temperature sensor and setting BTRM temperature alarms.

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Battery Charge Tab.

Enter values for the following parameters:
“Very High Battery Temp Action” and “Very High Temp Voltage”.

2.9.35 Configuring the Controller Identification of Rectifiers and Assigning which Input AC Phase is Connected to the Rectifiers

When rectifiers are all installed prior to applying power and starting the system, the order in which the controller identifies the rectifiers is by serial number (lowest serial number is Rect 1, next lowest is Rect 2, etc.). If you prefer the controller to identify the rectifiers by position in the system, perform the following procedure.

Upon power up, the controller arbitrarily assigns phase L1, L2, L3 to each rectifier. This assignment is used to display rectifier input feed voltage(s). The User may reassign the feed to each rectifier per your specific installation by following the procedure below.

Local Menu Navigation:

None.

Web Menu Navigation:

See “Individual Rectifier Settings Page” on page 71 and set the Rectifier Position and Phase (repeat for every rectifier).
then
Settings Menu / Rectifiers Tab / “Confirm Rect Position/Phase”.

2.9.36 Configuring the Controller Identification of Solar Converters

When solar converters are all installed prior to applying power and starting the system, the order in which the controller identifies the solar converters is by serial number (lowest serial number is Solar Conv 1, next lowest is Solar Conv 2, etc.). If you prefer the controller to identify the solar converters by position in the system, perform the following procedure.

NOTE! *See also "Enabling Solar Mode" on page 25.*

Local Menu Navigation:

None.

Web Menu Navigation:

See "Individual Solar Converter Settings Page" on page 74 and set the Solar Converter ID (repeat for every solar converter).
then
Settings Menu / Solar Converters Tab / Confirm Solar Converter ID.

2.9.37 Configuring the Controller Identification of Converters

When converters are all installed prior to applying power and starting the system, the order in which the controller identifies the converters is by serial number (lowest serial number is Conv 1, next lowest is Conv 2, etc.). If you prefer the controller to identify the converters by position in the system, perform the following procedure.

Local Menu Navigation:

None.

Web Menu Navigation:

See "Individual Converter Settings Page" on page 76 and set the Converter ID (repeat for every converter).
then
Settings Menu / "DC/DC" Converters Tab / Confirm Converter ID.

2.9.38 Setting Digital Inputs

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / DI Alarms Tab

2.9.39 Setting Battery Block and Battery Midpoint Monitoring (if equipped with an EIB Assembly)

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / Battery Tab / and enter the following parameters.

Parameters

- EIB-# Voltage Type
- EIB-# Block In-Use Num
- EIB-# Block Voltage Diff or Block Voltage Diff (Mid)

2.9.40 Setting External Shunts (connected to the EIB Assembly)

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / Shunts Tab / EIB-# / press “Modify/View” and enter the following parameters. When done, press “Set”.

Parameters

- Set As (Not Used, General, Load, Battery, Source)
- Signal Full Name
- Signal Abbr Name
- Full Scale Current
- Full Scale Voltage
- Break Value (Device Rating)
- High 1 Curr Limit Alarm (% of Breaker Value)
- High 1 Curr Alarm Severity
- High 1 Curr Alarm Relay
- High 2 Curr Limit Alarm (% of Breaker Value)
- High 2 Curr Alarm Severity
- High 2 Curr Alarm Relay

WEB Menu Navigation (for shunts set as battery):

See “Individual Battery Settings Page” on page 81.

Parameters

- EIB#Battery #, Rated Capacity

2.9.41 Clearing the Maintenance Alarm

A maintenance time can be set which, once expires, issues a maintenance alarm. When the maintenance alarm is issued, perform the routine maintenance and reset the maintenance timer. To reset the maintenance timer and clear the Maintenance Alarm, clear the Maintenance Run Time.

Local Menu Navigation:

None.

Web Menu Navigation:

Settings Menu / System Tab / “Auto/Manual” State (change to Manual).
then
Settings Menu / System Tab / Clear Maintenance Run Time.
then
Settings Menu / System Tab / “Auto/Manual” State (change to Auto).

2.9.42 Performing a Manual Battery Discharge Test

Procedure

1. Check that the Rated Battery Capacity is set up correctly for each battery.
   Local Menu: None
   Web Menu: Settings Menu / Battery Test
2. Check that the following Battery Test parameters are set correctly: Test Voltage Level, End Test Voltage, End Test Time, End Test Capacity, Record Threshold.
   Local Menu: None.
   Web Menu: Settings Menu / Battery Test / Battery Test Control.
3. Start the battery discharge test.
   Local Menu: None.
   Web Menu: Settings Menu / Battery Test / Battery Test Control.
4. Wait for the test to end.
5. View the battery test log and upload it to your computer as required. See “Battery Test Log Tab” on page 102.

2.9.43 Updating the Controller’s Device Inventory

Local Menu Navigation:

Main Menu / Settings / Sys Settings / Auto Config.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab / Auto Config.

NOTE! *This is only needed if you have added or removed equipment on RS485 bus.*

2.9.44 Backing Up the Controller Configuration

To back up the controller configuration, simply save the file named "SettingParam.tar".

NOTE! *It is strongly recommended that you save a copy of the “SettingParam.tar” file whenever you make any changes to the controller. Then, if you ever replace the controller or perform a "Restore Defaults" procedure, you can restore your customized settings by downloading the previously saved “SettingParam.tar” file back into the controller.*

Prior to changing controller settings, ensure the current "SettingParam.tar" file is backed up. After making changes, create a new backup file.

To aid in file management, you may change the name of the "SettingParam.tar" file to differentiate it from other "SettingParam.tar" files saved. The new name can use alpha and numeric characters preceding the original "SettingParam.tar" name (the end of the new file name **must** always be "SettingParam.tar"; for example, an acceptable filename would be "seville4SettingParam.tar").

Saving the “SettingParam.tar” File

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.
See “Retrieve "SettingParam.tar" File Procedure” on page 125 to retrieve the “SettingParam.tar” file.

2.9.45 Reloading a Backed-Up Controller Configuration

To reload the controller configuration, simply download a saved "SettingParam.tar" file into the controller.

Reloading the “SettingParam.tar” File

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.
See “Upload/Download Procedure” on page 126 to download a "SettingParam.tar" file into the controller.

2.9.46 Upgrading the Controller Using an Application ("All") Package

This procedure is typically used to upgrade your controller when a new release of firmware is available for your application. The name of the Application "All" Package file must end in .tar or .tar.gz. An Application “All” package file has both the application (software) and configuration settings file and is supplied by contacting the Vertiv DC Power technical assistance center for an application upgrade that is specific to the model and serial number of the power system.

A User can upgrade an NCU in two ways. One is using a USB memory device (described below), and the second is via the Web interface (see “Upload/Download Procedure” on page 126). When using the Web interface method and software version 6.2.60 or higher, you must first download the “Clean-up” package to prepare for the new “All” package. The “Clean-up” package is not required when using the USB method.

A User can copy an Application ("All") Package from your computer to a USB memory device. You can then place the USB memory device into the USB port of the mini system and then download the file into the controller. If upgrading the controller with a USB drive other than the supplied USB, the following USB drive specifications must be adhered to:

- USB 2.0 or below, 32G or less, formatted fat32 file system.

Web Menu Navigation (To Download an Application ("All") Package):

Advance Settings Menu / SW Maintenance Tab.
See “Upload/Download Procedure” on page 126 to download an Application (“All”) Package into the controller.

2.9.47 Restoring Factory Default Configuration

This procedure is used to restore all changes made to the controller to factory defaults.

Procedure

ALERT! When this procedure is performed, the controller’s existing configuration and parameter settings will be lost. The “SettingParam.tar” file is deleted. Before restoring the factory default configuration, if you have made any changes to the controller, save the “SettingParam.tar” file (see Backing Up the Controller Configuration on page 31).

Local Menu Navigation:

Main Menu / Settings / Sys Settings / Reload Config.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.
See “Restore Factory Default Configuration Procedure” on page 124.

2.9.48 Rebooting the Controller

NOTE! *The controller does not turn off any relay when the controller is reset/replaced. If the relay is active when the controller is reset/replaced, it will stay active whether or not the alarm condition still exists. If possible, the alarm condition should be cleared before the controller is reset/replaced. If the alarm is not cleared, after starting the controller, it may be necessary to manually trigger an alarm condition to clear all alarm relays.*

Local Menu Navigation:

At the MAIN SCREEN, press ENT and ESC at the same time to reset the controller.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab / Reboot Controller button.

2.9.49 Changing the Names of Items Displayed in the LCD and Web-Interface Menus

Local Menu Navigation:

none.

Web Menu Navigation:

Navigate to the appropriate tab in the Advance Settings menu. Press “Modify” and enter the signal name parameter(s). When done, press “Set”.

Digital Inputs

Advance Settings Menu / DI Alarms Tab.

Shunts

Advance Settings Menu / Shunts Tab.

Fuses

Advance Settings Menu / Fuse Tab.

2.10 Resolving Alarms

Table 2.3 lists the alarms that are shown in the Web Interface Advance Settings Menu under the Alarms Tab. These are also the possible alarms that display in the alarm screens on the local display and Web Interface. Table 2.3 also provides guidelines for fixing the condition that caused the alarm.

NOTE! *These instructions describe the complete functionality of the controller. Some functionality is dependent on hardware connected to the controller. Some alarms listed may not display in your system or may be named differently. Refer to the controller Table of Set Values furnished with your system.*

Refer also to the controller Table of Set Values furnished with your system for the factory default “Alarm Severity Level” settings and “Alarm Relay” mapping to the available alarms.

Rectifier Lost Alarm Description: The rectifier lost alarm occurs if the controller updates the inventory and finds that the number of rectifiers is different. Two conditions cause the controller to update its inventory. The first condition is if the controller reboots. Every time the controller starts up it updates the inventory. The second condition is when a rectifier is installed in the system. This causes the controller to update its inventory. When a rectifier is installed, the controller re-inventories which clears any “Rect Comm Fail” alarms. The controller then finds the inventory doesn’t match what it used to and a “Rectifier Lost” alarm is activated.

Table 2.4 Available Alarms

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Power System Alarms		
Supervision Unit Internal Fault	Controller self-detection test fails.	Replace the controller.
CAN Communication Failure	CAN bus communications failure. No devices communicating on CAN bus.	Check communications cables.
Outgoing Alarms Blocked	Alarm relays are forced in the "off" state and alarms are blocked from changing the relay state.	Verify why controller setting was changed before changing back.
Maintenance Alarm	Controller issues a maintenance alarm.	Perform routine maintenance and reset maintenance timer.
Config Error (Backup Config)	Configuration error 1.	Reload the "SettingParam.tar" file.
Config Error (Default Config)	Configuration error 2.	
Abnormal Load Current	When a load shunt is furnished, the system load current measurement is imbalanced with internally calculated system load current. This is a check to see if the shunt reading is accurate and makes sense.	Check why current is imbalanced. Check what current is not being reported correctly (load, rectifier, battery, etc.).
Overload	Output overload condition.	Check the load.
SPD	Surge protection device needs attention.	Check surge protection device.
Emergency Stop/Shutdown	System in emergency stop or emergency shutdown mode.	Check why the system was placed in this mode.
System Temp 1 Not Used	Temperature sensor port #1 is not used.	Temperature probe is enabled but not plugged in.
System Temp 2 Not Used	Temperature sensor port #2 is not used.	
System Temp 3 Not Used	Temperature sensor port #3 is not used.	
IB2-1 Temp 1 Not Used	Temperature sensor port #1 (on IB2-1 Board) is empty.	Temperature probe is enabled but not plugged in.
IB2-1 Temp 2 Not Used	Temperature sensor port #2 (on IB2-1 Board) is empty.	
IB2-2 Temp 1 Not Used	Temperature sensor port #1 (on IB2-2 Board) is empty.	
IB2-2 Temp 2 Not Used	Temperature sensor port #2 (on IB2-2 Board) is empty.	
EIB-1 Temp 1 Not Used	Temperature sensor port #1 (on EIB-1 Board) is empty.	
EIB-1 Temp 2 Not Used	Temperature sensor port #2 (on EIB-1 Board) is empty.	
EIB-2 Temp 1 Not Used	Temperature sensor port #1 (on EIB-2 Board) is empty.	
EIB-2 Temp 2 Not Used	Temperature sensor port #2 (on EIB-2 Board) is empty.	
System Temp 1 Sensor Fail	Temperature sensor #1 failure.	Replace temperature sensor. Note: The alarm “Temp Sensor Fail” will occur if the temperature probe fails internally or is not plugged in; however, this alarm will be suppressed if “Temp Not Used” alarm is active.
System Temp 2 Sensor Fail	Temperature sensor #2 failure.	
System Temp 3 Sensor Fail	Temperature sensor #3 failure.	

Table 2.3

Alarm Name	Alarm Description	Action to Correct
IB2-1 Temp 1 Sensor Fail	Temperature sensor #1 (connected to IB2-1 Board) failure.	Replace temperature sensor. Note: The alarm "Temp Sensor Fail" will occur if the temperature probe fails internally or is not plugged in; however, this alarm will be suppressed if "Temp Not Used" alarm is active.
IB2-1 Temp 2 Sensor Fail	Temperature sensor #2 (connected to IB2-1 Board) failure.	
IB2-2 Temp 1 Sensor Fail	Temperature sensor #1 (connected to IB2-2 Board) failure.	
IB2-2 Temp 2 Sensor Fail	Temperature sensor #2 (connected to IB2-2 Board) failure.	
EIB-1 Temp 1 Sensor Fail	Temperature sensor #1 (connected to EIB-1 Board) failure.	
EIB-1 Temp 2 Sensor Fail	Temperature sensor #2 (connected to EIB-1 Board) failure.	
EIB-2 Temp 1 Sensor Fail	Temperature sensor #1 (connected to EIB-2 Board) failure.	
EIB-2 Temp 2 Sensor Fail	Temperature sensor #2 (connected to EIB-2 Board) failure.	
DHCP Failure	The DHCP function is enabled, but effective IP address cannot be acquired.	Verify DHCP IP address.
PLC Config Error	PLC configuration error.	Re-enter the PLC logic functions.
RS485 Communication Failure	485 communications failure.	--
OBSERVATION SUMMARY	Minor alarm summary (one or more alarms designated as minor is active).	Check additional alarms.
MAJOR SUMMARY	Major alarm summary (one or more alarms designated as major is active).	Check additional alarms.
CRITICAL SUMMARY	Critical alarm summary (one or more alarms designated as critical is active).	Check additional alarms.
Rectifier Group Lost	A rectifier group cannot be detected by the controller.	Check communications cables. Check additional alarms.
Output Over Voltage 1	Output voltage is higher than the Output Over Voltage 1 Alarm threshold.	Check why system voltage is high. Check the alarm setting.
Output Over Voltage 2	Output voltage is higher than the Output Over Voltage 2 Alarm threshold.	
Output Under Voltage 1	Output voltage is lower than the Output Under Voltage 1 Alarm threshold.	Check why system voltage is low. If there is a mains failure, check if some load could be switched off in order to prolong the operating time of the plant. If the system load is too high related to rectifier capacity, install additional rectifiers. If the batteries are being recharged, the alarm will cease by itself when battery voltage has increased to the charging level.
Output Under Voltage 2	Output voltage is lower than the Output Under Voltage 2 Alarm threshold.	
Over Voltage 1 (24V)	Output voltage is higher than the Over Voltage 1 Alarm threshold.	Check why system voltage is high. Check the alarm setting.
Over Voltage 2 (24V)	Output voltage is higher than the Over Voltage 2 Alarm threshold.	
Under Voltage 1 (24V)	Output voltage is lower than the Under Voltage 1 Alarm threshold.	Check why system voltage is low. If there is a mains failure, check if some load could be switched off in order to prolong the operating time of the plant. If the system load is too high related to rectifier capacity, install additional rectifiers. If the batteries are being recharged, the alarm will cease by itself when battery voltage has increased to the charging level.
Under Voltage 2 (24V)	Output voltage is lower than the Under Voltage 2 Alarm threshold.	
Diesel Run Over Temp	Diesel generator run over temperature alarm.	Check diesel generator.
DG1 is Running	Diesel generator 1 is running.	--

Table 2.3

Alarm Name	Alarm Description	Action to Correct
DG2 is Running	Diesel generator 2 is running.	--
Hybrid is High Load	Diesel generator high load alarm.	Check load on diesel generator.
DG1 Failure	Diesel generator 1 has failed.	Check diesel generator.
DG2 Failure	Diesel generator 2 has failed.	Check diesel generator.
Grid is on	AC is on grid.	--
High Ambient Temperature	Main Ambient Temperature High1 alarm.	Check why temperature is high or low.
Low Ambient Temperature	Main Ambient Temperature Low alarm.	
Very High Ambient Temperature	Main Ambient Temperature High2 alarm.	
Ambient Temp Sensor Fault	Main ambient temperature sensor failure.	Replace temperature sensor.
DI1 Alarm	Controller Digital input #1 alarm is active.	Check why alarm is active.
DI2 Alarm	Controller Digital input #2 alarm is active.	
DI3 Alarm	Controller Digital input #3 alarm is active.	
DI4 Alarm	Controller Digital input #4 alarm is active.	
DI5 Alarm	Controller Digital input #5 alarm is active.	
DI6 Alarm	Controller Digital input #6 alarm is active.	
DI7 Alarm	Controller Digital input #7 alarm is active.	
DI8 Alarm	Controller Digital input #8 alarm is active.	
IB Communication Failure	IB Communication Fails	--
Relay Testing	Relay Test in progress.	--
Testing Relay 1	Relay1 Test in progress.	--
Testing Relay 2	Relay2 Test in progress.	--
Testing Relay 3	Relay3 Test in progress.	--
Testing Relay 4	Relay4 Test in progress.	--
Testing Relay 5	Relay5 Test in progress.	--
Testing Relay 6	Relay6 Test in progress.	--
Testing Relay 7	Relay7 Test in progress.	--
Testing Relay 8	Relay8 Test in progress.	--
System Temp1 High 2	Temperature sensor #1 sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
System Temp1 High 1	Temperature sensor #1 sensing temperature higher than high temperature threshold 1.	
System Temp1 Low	Temperature sensor #1 sensing temperature lower than low temperature threshold.	
System Temp2 High 2	Temperature sensor #2 sensing temperature higher than high temperature threshold 2.	
System Temp2 High 1	Temperature sensor #2 sensing temperature higher than high temperature threshold 1.	
System Temp2 Low	Temperature sensor #2 sensing temperature lower than low temperature threshold.	
System Temp3 High 2	Temperature sensor #3 sensing temperature higher than high temperature threshold 2.	
System Temp3 High 1	Temperature sensor #3 sensing temperature higher than high temperature threshold 1.	
System Temp3 Low	Temperature sensor #3 sensing temperature lower than low temperature threshold.	
IB2-1 Temp1 High 2	Temperature sensor #1 (connected to IB2-1 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.

Table 2.3

Alarm Name	Alarm Description	Action to Correct
IB2-1 Temp1 High 1	Temperature sensor #1 (connected to IB2-1 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
IB2-1 Temp1 Low	Temperature sensor #1 (connected to IB2-1 board and set as Ambient) sensing temperature lower than low temperature threshold.	
IB2-1 Temp2 High 2	Temperature sensor #2 (connected to IB2-1 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
IB2-1 Temp2 High 1	Temperature sensor #2 (connected to IB2-1 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
IB2-1 Temp2 Low	Temperature sensor #2 (connected to IB2-1 board and set as Ambient) sensing temperature lower than low temperature threshold.	
IB2-2 Temp1 High 2	Temperature sensor #1 (connected to IB2-2 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
IB2-2 Temp1 High 1	Temperature sensor #1 (connected to IB2-2 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
IB2-2 Temp1 Low	Temperature sensor #1 (connected to IB2-2 board and set as Ambient) sensing temperature lower than low temperature threshold.	
IB2-2 Temp2 High 2	Temperature sensor #2 (connected to IB2-2 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
IB2-2 Temp2 High 1	Temperature sensor #2 (connected to IB2-2 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
IB2-2 Temp2 Low	Temperature sensor #2 (connected to IB2-2 board and set as Ambient) sensing temperature lower than low temperature threshold.	
EIB-1 Temp1 High 2	Temperature sensor #1 (connected to EIB-1 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
EIB-1 Temp1 High 1	Temperature sensor #1 (connected to EIB-1 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
EIB-1 Temp1 Low	Temperature sensor #1 (connected to EIB-1 board and set as Ambient) sensing temperature lower than low temperature threshold.	
EIB-1 Temp2 High 2	Temperature sensor #2 (connected to EIB-1 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
EIB-1 Temp2 High 1	Temperature sensor #2 (connected to EIB-1 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
EIB-1 Temp2 Low	Temperature sensor #2 (connected to EIB-1 board and set as Ambient) sensing temperature lower than low temperature threshold.	
EIB-2 Temp1 High 2	Temperature sensor #1 (connected to EIB-2 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
EIB-2 Temp1 High 1	Temperature sensor #1 (connected to EIB-2 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
EIB-2 Temp1 Low	Temperature sensor #1 (connected to EIB-2 board and set as Ambient) sensing temperature lower than low temperature threshold.	

Table 2.3

Alarm Name	Alarm Description	Action to Correct
EIB-2 Temp2 High 2	Temperature sensor #2 (connected to EIB-2 board and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
EIB-2 Temp2 High 1	Temperature sensor #2 (connected to EIB-2 board and set as Ambient) sensing temperature higher than high temperature threshold 1.	
EIB-2 Temp2 Low	Temperature sensor #2 (connected to EIB-2 board and set as Ambient) sensing temperature lower than low temperature threshold.	
SMTemp1 Temp1 High 2	Temperature sensor #1 (connected to SM-Temp 1 and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
SMTemp1 Temp1 High 1	Temperature sensor #1 (connected to SM-Temp 1 and set as Ambient) sensing temperature higher than high temperature threshold 1.	
SMTemp1 Temp1 Low	Temperature sensor #1 (connected to SM-Temp 1 and set as Ambient) sensing temperature lower than low temperature threshold.	
...	...	...
SMTemp1 Temp8 High 2	Temperature sensor #8 (connected to SM-Temp 1 and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
SMTemp1 Temp8 High 1	Temperature sensor #8 (connected to SM-Temp 1 and set as Ambient) sensing temperature higher than high temperature threshold 1.	
SMTemp1 Temp8 Low	Temperature sensor #8 (connected to SM-Temp 1 and set as Ambient) sensing temperature lower than low temperature threshold.	
...	...	...
SMTemp8 Temp1 High 2	Temperature sensor #1 (connected to SM-Temp 8 and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
SMTemp8 Temp1 High 1	Temperature sensor #1 (connected to SM-Temp 8 and set as Ambient) sensing temperature higher than high temperature threshold 1.	
SMTemp8 Temp1 Low	Temperature sensor #1 (connected to SM-Temp 8 and set as Ambient) sensing temperature lower than low temperature threshold.	
...	...	...
SMTemp8 Temp8 High 2	Temperature sensor #8 (connected to SM-Temp 8 and set as Ambient) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
SMTemp8 Temp8 High 1	Temperature sensor #8 (connected to SM-Temp 8 and set as Ambient) sensing temperature higher than high temperature threshold 1.	
SMTemp8 Temp8 Low	Temperature sensor #8 (connected to SM-Temp 8 and set as Ambient) sensing temperature lower than low temperature threshold.	
High Load Level1	Load current above high level 1 setting.	Check why load current is high.
High Load Level2	Load current above high level 2 setting.	
IB0-DI1 Alarm	IB0-DI1 Alarms	--
IB0-DI2 Alarm	IB0-DI2 Alarms	
Testing Relay 14	Relay14 Test in progress.	--
Testing Relay 15	Relay15 Test in progress.	--
Testing Relay 16	Relay16 Test in progress.	--

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Testing Relay 17	Relay17 Test in progress.	--
Over Maximum Power Alarm	NOT IMPLEMENTED AT THIS TIME	NOT IMPLEMENTED AT THIS TIME
SMS Modem Fail	SMS modem has failed.	Check why SMS modem failed.
Manual State	Controller in manual state.	--
SNMP Config Error	SNMP configuration error.	--
DG1 Test Start Fail	DG1 Test did not start.	Check Diesel Generator 1.
DG2 Test Start Fail	DG2 Test did not start.	Check Diesel Generator 2.
DG1 Test Stop Fail	DG1 Test did not stop.	Check Diesel Generator 1.
DG2 Test Stop Fail	DG2 Test did not stop.	Check Diesel Generator 2.
Hybrid Shift Active	Hybrid Shift is Active.	--
SolarShiftSOC Disabled BMSFail	The solar shift SOC function is disabled when BMS fails.	--
Mains Failure	Rectifier commercial AC input power failure.	--
DG1 Failed to Stop	Diesel Generator 1 did not stop running	Check Diesel Generator 1.
DG1 Failed to Stop	Diesel Generator 2 did not stop running	Check Diesel Generator 2.
Rectifier Group Alarms		
Multiple Rectifiers Fail	More than one rectifier has failed or a Mains Failure.	Check input voltage to rectifiers. Replace rectifiers.
Rectifier Lost	A rectifier cannot be detected by the controller.	Reset the Rectifier Lost alarm. Replace defective rectifier.
ECO Active	Rectifier Energy Optimization Mode is enabled.	Check why system was placed into this mode.
All Rectifiers Comm Fail	No response from all rectifiers.	Check the connectors and cables or the CAN loop. Replace the controller.
ECO Cycle Alarm	If Energy Optimization Mode is enabled and the controller oscillates in and out of Energy Optimization more than 5 times, this alarm is generated.	Check for other alarms. Reset this alarm.
Low Rectifier Capacity	Rectifier Capacity is low.	--
High Rectifier Capacity	Rectifier Capacity is high	--
Rectifier Alarms		
AC Input Failure	No input power to a rectifier.	Check why no input power available.
Rectifier High Temperature	A rectifier has a high temperature condition.	Check why the temperature is high.
Rectifier Fault	A rectifier has a fault condition.	Refer to the Rectifier User Manual for troubleshooting information.
Overvoltage	A rectifier has an overvoltage condition.	
Rectifier Protected	A rectifier is in protected mode.	
Fan Failure	A rectifier's fan has failed.	Replace fan.
Current Limit	NOT IMPLEMENTED AT THIS TIME	NOT IMPLEMENTED AT THIS TIME
Communication Fail	A rectifier has lost communications with the controller.	Check communications cables. Reset the Communication Fail alarm. Replace the rectifier.
Derated	A rectifier is in output power derating mode.	Refer to the Rectifier User Manual for troubleshooting information.
Current Sharing Alarm	A rectifier has a current sharing alarm.	
AC Under Voltage Protection (Three Phase Rectifier's Only)	A rectifier is in under voltage protection mode. Example: When the rectifier's input voltage is between a predefined value (see Rectifier User's Manual) and the rectifier's power draw is greater than a predefined power level (see Rectifier's User's Manual), you will get the alarm "Input Under Voltage Protection".	

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Rectifier Group 2 [3, 4] Alarms		
Multi-Rectifiers Failure	No response from all rectifiers.	Check the connectors and cables or the CAN loop. Replace the controller.
Rectifier Lost	A rectifier cannot be detected by the controller.	Reset the Rectifier Lost alarm. Replace defective rectifier.
ECO Mode Active	Rectifier Energy Optimization Mode is enabled.	Check why system was placed into this mode.
All Rectifiers Comm Fail	A rectifier has lost communications with the controller.	Reset the Comm Fail alarm. Replace defective rectifier.
ECO Cycle Alarm	If Energy Optimization Mode is enabled and the controller oscillates in and out of Energy Optimization more than 5 times, this alarm is generated.	Check for other alarms.
Low Rectifier Capacity	Rectifier Capacity is low.	--
High Rectifier Capacity	Rectifier Capacity is high	--
Group I [II, III] Rectifier Alarms		
Input Failure	No input power to a rectifier.	Check why no input power available.
Rectifier High Temperature	A rectifier has a high temperature condition.	Check why temperature is high.
Rectifier Fault	A rectifier has a fault condition.	Refer to Rectifier User Manual for troubleshooting information.
Overvoltage	A rectifier has an over voltage condition.	
Rectifier Protected	A rectifier is in protected mode.	
Fan Failure	A rectifier's fan has failed.	Replace fan.
Power Limit	NOT IMPLEMENTED AT THIS TIME	NOT IMPLEMENTED AT THIS TIME
Rectifier Communication Fail	A rectifier has lost communications with the controller.	Check communications cables. Reset the Communication Fail alarm. Replace the rectifier.
Derated	A rectifier is in output power derating mode.	Refer to Rectifier User Manual for troubleshooting information.
Current Sharing Alarm	A rectifier has a current sharing alarm.	
Input Undervoltage Protection	A rectifier is in under voltage protection mode.	
Solar Converter Group Alarms		
Multiple Solar Converter Failure	More than one solar converter has failed.	Check input voltage to solar converters. Replace solar converters.
Solar Converter Lost	A solar converter cannot be detected by the controller.	Reset the Solar Converter Lost alarm. Replace defective solar converter.
All Solar Converters Comm Fail	No response from all solar converters for a time duration of 73 hours.	Check the connectors and cables or the CAN loop. Check the DC input to the solar converters. Replace the controller.
Solar Converter Alarms		
Input Failure	No input power to a solar converter.	Check why no input power available.
Solar Converter Temperature High	A solar converter has a high temperature condition.	Check why temperature is high.
Solar Converter Fail	A solar converter has a fault condition.	Refer to Solar Converter User Manual for troubleshooting information.
Over Voltage	A solar converter has an overvoltage condition.	
Solar Converter Protected	A solar converter is in protected mode.	
Fan Fail	A solar converter's fan has failed.	Replace fan.
Current Limit	A solar converter is in current limit.	Solar converter overload. The load is higher than solar converter capacity. If one or more of the solar converters are defective, replace the faulty solar converters.
Solar Converter Comm Fail	A solar converter has lost communications with the controller.	Check communications cables. Reset the Solar Converter Communication Fail alarm. Replace the solar converter.

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Derated	A solar converter is in output power derating mode.	Refer to Solar Converter User Manual for troubleshooting information.
Current Share Alarm	A solar converter has a current sharing alarm.	
Input Under Voltage Protection	A solar converter is in under voltage protection mode.	
Input Not DC	Input to solar converter mounting position is not DC.	--
Low Light Intensity	The light intensity is low	--
Insulation Detect Fail	The insulation detection fails	Replace the insulation detector.
Insulation Fail Posi PE	Positive input and PE insulation fails.	Replace the PE insulation.
Insulation Fail Negi PE	Negative input and PE insulation fails	Replace the PE insulation.
Battery Group Alarms		
Short Battery Test Running	Battery is in short time test mode.	--
Equalize for Test	Battery is in equalize charge test mode.	--
Manual Test	Battery is in manual battery discharge test mode.	--
Planned Test	Battery is in planned battery test mode.	--
AC Failure Test	Input has been switched off to the rectifiers to perform a battery discharge test.	--
Manual Equalize Charge	Battery is in manual equalize charging mode.	--
Automatic Equalize	Battery is in automatic equalize charging mode.	--
Cyclic Equalize Charge	Battery is in cyclic equalize charging mode.	--
Discharge Current Imbalance	Battery distribution current imbalance alarm.	The currents from two groups of batteries are not equal. Check the batteries.
Abnormal Battery Current	The equalize charging current exceeds the alarm setting.	Check the alarm setting.
Temperature Compensation Active	Battery charge temperature compensation is active.	--
Battery Current Limit Active	Battery is in current limit.	--
Bad Battery	Battery test fails.	Check the batteries.
Battery Discharge	Battery is discharging.	A battery test is active (the discharge test will stop automatically). There is a mains failure (check that it is not caused by open AC input circuit breaker). The system load is higher than rectifier capacity, causing the batteries to discharge (install additional rectifiers).
Battery Test Fail	Battery test fails.	Check the batteries.
Very High Compensation Temperature	Compensation temperature sensor sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High Compensation Temperature	Compensation temperature sensor sensing temperature higher than high temperature threshold 1.	
Low Compensation Temperature	Compensation temperature sensor sensing temperature lower than low temperature threshold.	
Compensation Sensor Fault	Temperature Compensation temperature sensor failure.	Replace temperature sensor.

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Very High Temp1	Temperature sensor #1 sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High Temp 1	Temperature sensor #1 sensing temperature higher than high temperature threshold 1.	
Low Temp 1	Temperature sensor #1 sensing temperature lower than low temperature threshold.	
Very High Temp2	Temperature sensor #2 sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High Temp 2	Temperature sensor #2 sensing temperature higher than high temperature threshold 1.	
Low Temp 2	Temperature sensor #2 sensing temperature lower than low temperature threshold.	
Very High Temp 3 (OB)	Temperature sensor #3 sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High Temp 3 (OB)	Temperature sensor #3 sensing temperature higher than high temperature threshold 1.	
Low Temp 3 (OB)	Temperature sensor #3 sensing temperature lower than low temperature threshold.	
Very High IB2 Temp1	Temperature sensor #1 (connected to IB2-1 board and set as Battery) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High IB2 Temp1	Temperature sensor #1 (connected to IB2-1 board and set as Battery) sensing temperature higher than high temperature threshold 1.	
Low IB2 Temp1	Temperature sensor #1 (connected to IB2-1 board and set as Battery) sensing temperature lower than low temperature threshold.	
Very High IB2 Temp2	Temperature sensor #2 (connected to IB2-1 board and set as Battery) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High IB2 Temp2	Temperature sensor #2 (connected to IB2-1 board and set as Battery) sensing temperature higher than high temperature threshold 1.	
Low IB2 Temp2	Temperature sensor #2 (connected to IB2-2 board and set as Battery) sensing temperature lower than low temperature threshold.	
Very High EIB Temp1	Temperature sensor #1 (connected to EIB-1 board and set as Battery) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High EIB Temp1	Temperature sensor #1 (connected to EIB-1 board and set as Battery) sensing temperature higher than high temperature threshold 1.	
Low EIB Temp1	Temperature sensor #1 (connected to EIB-1 board and set as Battery) sensing temperature lower than low temperature threshold.	

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Very High EIB Temp2	Temperature sensor #2 (connected to EIB-1 board and set as Battery) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High EIB Temp2	Temperature sensor #2 (connected to EIB-1 board and set as Battery) sensing temperature higher than high temperature threshold 1.	
Low EIB Temp2	Temperature sensor #2 (connected to EIB-1 board and set as Battery) sensing temperature lower than low temperature threshold.	
Very High at Temp 8	Temperature sensor #1 (connected to SM-Temp 8 and set as Battery) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High at Temp 8	Temperature sensor #1 (connected to SM-Temp 8 and set as Battery) sensing temperature higher than high temperature threshold 1.	
Low at Temp 8	Temperature sensor #1 (connected to SM-Temp 8 and set as Battery) sensing temperature lower than low temperature threshold.	
Very High at Temp 9	Temperature sensor #8 (connected to SM-Temp 9 and set as Battery) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High at Temp 9	Temperature sensor #8 (connected to SM-Temp 9 and set as Battery) sensing temperature higher than high temperature threshold 1.	
Low at Temp 9	Temperature sensor #8 (connected to SM-Temp 9 and set as Battery) sensing temperature lower than low temperature threshold.	
…	…	…
Very High at Temp 71	Temperature sensor #1 (connected to SM-Temp 71 and set as Battery) sensing temperature higher than high temperature threshold 2.	Check why temperature is high or low.
High at Temp 71	Temperature sensor #1 (connected to SM-Temp 71 and set as Battery) sensing temperature higher than high temperature threshold 1.	
Low at Temp 71	Temperature sensor #1 (connected to SM-Temp 71 and set as Battery) sensing temperature lower than low temperature threshold.	
…	…	…
Very High BTRM Temperature	Battery temperature (monitored by the sensor set as BTRM) is higher than the BTRM Temperature Alarm 2 threshold.	Check why temperature is high or low.
High BTRM Temperature	Battery temperature (monitored by the sensor set as BTRM) is higher than the BTRM Temperature Alarm 1 threshold.	
BTRM Temperature Sensor Fault	BTRM temperature sensor failure.	Replace temperature sensor.
Li-Ion Battery Lost	A Li-Ion Battery cannot be detected by the controller.	Check communications cables. Clear the Li-Ion Battery Lost alarm.
1 Li-Ion Battery Disconnect	One (1) Li-Ion Battery is disconnected.	Check why the Li-Ion Battery disconnected.
2+Li-Ion Battery Disconnect	Two (2) or more Li-Ion Batteries are disconnected.	Check why the Li-Ion Batteries disconnected.
1 Li-Ion Battery No Reply	One (1) Li-Ion Battery has lost communications with the controller.	Check communications cables. Clear the Li-Ion Communication Fail alarm.
2+Li-Ion Battery No Reply	Two (2) Li-Ion Battery has lost communications with the controller.	Check communications cables. Clear the Li-Ion Communication Fail alarm.
Inventory Update In Process	Only available if controller configuration includes the Li-Ion battery interface. Li-Ion Battery inventory being updated.	--

Table 2.3

Alarm Name	Alarm Description	Action to Correct
ABCL is active	Only available if controller configuration includes the Li-Ion battery interface. Active Battery Charge Current Limit is active.	--
Battery Charge Prohibited Alarm	Only available if controller configuration includes the Li-Ion battery interface. A battery charge prohibited alarm is active.	See why alarm is active.
Bad Battery Block	Battery block fails.	Check batteries.
Bad Battery Block2	Battery block2 fails.	Check batteries.
Battery Test Multiple Abort	The battery test is aborted	Check batteries.
BT Interrupted-Main Fail	Battery test is interrupted and mains fail.	Check the mains.
AC is on Standby	AC is on Standby mode.	--
PLS Control by SOC failed	If you enable PLS and if system voltage goes below PLS volt or if battery SOC goes below PLS SOC limit.	--
BMS Lost	BMS lost communications with the controller	Check the BMS.
Battery 1 Alarms		
Current Limit Exceeded	Battery current limit point is exceeded.	--
Over Battery Current	Battery is in over current.	--
Low Capacity	Battery has low capacity.	Check the batteries.
Battery Current Imbalance Alarm	Battery Current Imbalance Alarm	Check the batteries.
Battery Current High 1 Curr	Current above High 1 limit.	Check why current is high.
Battery Current High 2 Curr	Current above High 2 limit.	
Battery Fuse Alarms		
Battery MCB Alarm	Battery MCB is open.	Find out and eliminate the reason the fuse is open before replacing. Check for overload or short circuit. If the fuse was manually removed, check with the person that removed it before reinserting it.
Fuse 2 Alarm		
...	...	
Fuse 6 Alarm	Fuse #6 is open.	
SMDU Battery Fuse Unit Alarms (SMDU Module must be present in system)		
Batt Fuse 1 Alarm	Battery fuse #1 is open.	Find out and eliminate the reason the fuse is open before replacing. Check for overload or short circuit. If the fuse was manually removed, check with the person that removed it before reinserting it.
...	...	
Batt Fuse 6 Alarm	Battery fuse #4 is open.	
SMDU Battery Alarms (SMDU Module must be present in system)		
Exceed Current Limit	Battery current limit point is exceeded.	--
Over Battery Current	Battery is in over current.	--
Low Capacity	Battery has low capacity.	Check the batteries.
SM Battery Alarms (SM-BAT Module must be present in system)		
Current Limit Exceeded	Battery is in over current.	--
Over Battery Current	Battery current is high.	--
Battery Leakage	Battery has leakage current.	Check the batteries.
Low Acid Level	Battery has low acid level.	Check the batteries.
Battery Disconnected	Battery disconnection is active.	--
High Battery Temperature	Battery has high temperature condition.	--
Low Battery Temperature	Battery has low temperature condition.	--

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Cell Voltage Difference	Battery cell voltage difference detected.	Check the batteries.
SM-BAT Unit Failure	Battery monitoring device has failed.	Replace device.
Battery Temperature Sensor Failure	Battery temperature sensor has failed.	Replace temperature sensor.
Low Capacity	Battery has low capacity.	Check the batteries.
Battery Not Responding	Battery monitoring device has lost communications with the controller.	Check communications cables.
Temperature Sensor not Used	No battery temperature sensor.	--
DC Distribution Alarms		
Overvoltage 1	Output voltage is higher than the Over Voltage 1 Alarm threshold.	Check why system voltage is high. Check the alarm setting.
Overvoltage 2	Output voltage is higher than the Over Voltage 2 Alarm threshold.	
Undervoltage 1	Output voltage is lower than the Under Voltage 1 Alarm threshold.	Check why system voltage is low. If there is a mains failure, check if some load could be switched off in order to prolong the operating time of the plant. If the system load is too high related to rectifier capacity, install additional rectifiers. If the batteries are being recharged, the alarm will cease by itself when battery voltage has increased to the charging level.
Undervoltage 2	Output voltage is lower than the Under Voltage 2 Alarm threshold.	
Overvoltage 1(24V)	Output voltage is higher than the Over Voltage 1 Alarm threshold.	Check why system voltage is high. Check the alarm setting.
Overvoltage 2(24V)	Output voltage is higher than the Over Voltage 2 Alarm threshold.	
Undervoltage 1(24V)	Output voltage is lower than the Under Voltage 1 Alarm threshold.	Check why system voltage is low. If there is a mains failure, check if some load could be switched off in order to prolong the operating time of the plant. If the system load is too high related to rectifier capacity, install additional rectifiers. If the batteries are being recharged, the alarm will cease by itself when battery voltage has increased to the charging level.
Undervoltage 1(24V)	Output voltage is lower than the Under Voltage 2 Alarm threshold.	
Current High Current	Current above High 1 limit.	Check why current is high.
Current Very High Current	Current above High 2 limit.	
Current High 1 Curr	Current above High 1 limit.	Check why current is high.
Current High 2 Curr	Current above High 2 limit.	
DC Fuse Unit Alarms		
Load MCB Alarm	DC output load MCB is open.	Find out and eliminate the reason the fuse is open before replacing. Check for overload or short circuit. If the fuse was manually removed, check with the person that removed it before reinserting it.
Fuse 2 Alarm	DC output fuse #2 is open.	
...	...	
Fuse 12 Alarm	DC output fuse #12 is open.	
SMDU DC Fuse Alarms (SMDU Module must be present in system)		
Fuse 1 Alarm	DC output fuse #1 is open.	Find out and eliminate the reason the fuse is open before replacing. Check for overload or short circuit. If the fuse was manually removed, check with the person that removed it before reinserting it.
...	...	
Fuse 16 Alarm	DC output fuse #16 is open.	
SMDUP1 [2, 3, 4, 5, 6, 7, 8] DC Fuse Alarms (SMDU+ Module must be present in system)		
Fuse 1 Alarm	DC output fuse #1 is open.	Find out and eliminate the reason the fuse is open before replacing. Check for overload or short circuit. If the fuse was manually removed, check with the person that removed it before reinserting it.
...	...	
Fuse 25 Alarm	DC output fuse #25 is open.	

Table 2.3

Alarm Name	Alarm Description	Action to Correct
LVD Unit Alarms (Low voltage disconnect must be present in system)		
LVD 1 Disconnect	LVD1 contactor is in disconnect mode.	--
BLVD Disconnected	BLVD contactor is in disconnect mode.	--
LVD1 Failure	LVD1 contactor has failed.	Check the contactor functions. Replace the contactor.
BLVD Failure	BLVD contactor has failed.	
LVD3 Unit Alarms		
LVD 3 Disconnect	LVD3 contactor is in disconnect mode.	--
LVD 3 Fail	LVD3 contactor has failed.	Check the contactor functions. Replace the contactor.
SMDU LVD Alarms (SMDU Module must be present in system)		
LVD 1 Disconnect	LVD1 contactor is in disconnect mode.	--
LVD 2 Disconnect	LVD2 contactor is in disconnect mode.	--
LVD 1 Contactor Fail	LVD1 contactor has failed.	Check the contactor functions. Replace the contactor.
LVD 2 Contactor Fail	LVD2 contactor has failed.	
Rectifier AC Alarms		
High Line Voltage L1-L2	Voltage between Line 1 and Line 2 is higher than the High Line Voltage Alarm threshold.	Check why voltage is high.
Very High Line Voltage L1-L2	Voltage between Line 1 and Line 2 is higher than the Very High Line Voltage Alarm threshold.	
Low Line Voltage L1-L2	Voltage between Line 1 and Line 2 is lower than the Low Line Voltage Alarm threshold.	Check why voltage is low.
Very Low Line Voltage L1-L2	Voltage between Line 1 and Line 2 is lower than the Very Low Line Voltage Alarm threshold.	
High Line Voltage L2-L3	Voltage between Line 2 and Line 3 is higher than the High Line Voltage Alarm threshold.	Check why voltage is high.
Very High Line Voltage L2-L3	Voltage between Line 2 and Line 3 is higher than the Very High Line Voltage Alarm threshold.	
Low Line Voltage L2-L3	Voltage between Line 2 and Line 3 is lower than the Low Line Voltage Alarm threshold.	Check why voltage is low.
Very Low Line Voltage L2-L3	Voltage between Line 2 and Line 3 is lower than the Very Low Line Voltage Alarm threshold.	
High Line Voltage L3-L1	Voltage between Line 3 and Line 1 is higher than the High Line Voltage Alarm threshold.	Check why voltage is high.
Very High Line Voltage L3-L1	Voltage between Line 3 and Line 1 is higher than the Very High Line Voltage Alarm threshold.	
Low Line Voltage L3-L1	Voltage between Line 3 and Line 1 is lower than the Low Line Voltage Alarm threshold.	Check why voltage is low.
Very Low Line Voltage L3-L1	Voltage between Line 3 and Line 1 is lower than the Very Low Line Voltage Alarm threshold.	
High Phase Voltage L1	Line 1 voltage is above high voltage threshold.	Check why voltage is high.
Very High Phase Voltage L1	Line 1 voltage is above very high voltage threshold.	
Low Phase Voltage L1	Line 1 voltage is below low voltage threshold.	Check why voltage is low.
Very Low Phase Voltage L1	Line 1 voltage is below very low voltage threshold.	
High Phase Voltage L2	Line 2 voltage is above high voltage threshold.	Check why voltage is high.
Very High Phase Voltage L2	Line 2 voltage is above very high voltage threshold.	
Low Phase Voltage L2	Line 2 voltage is below low voltage threshold.	Check why voltage is low.

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Very Low Phase Voltage L2	Line 2 voltage is below very low voltage threshold.	
High Phase Voltage L3	Line 3 voltage is above high voltage threshold.	Check why voltage is high.
Very High Phase Voltage L3	Line 3 voltage is above very high voltage threshold.	
Low Phase Voltage L3	Line 3 voltage is below low voltage threshold.	Check why voltage is low.
Very Low Phase Voltage L3	Line 3 voltage is below very low voltage threshold.	
Mains Failure	Commercial AC power failure.	Check why no commercial AC power.
Solar Converter		
Input Fail	No input power to a solar converter.	Check why no input power available.
Solar Converter Temperature High	A solar converter has a high temperature condition.	Check why temperature is high.
Solar Converter Fail	A solar converter has a fault condition.	Refer to Solar Converter User Manual for troubleshooting information.
Over Voltage	A solar converter has an overvoltage condition.	
Solar Converter Protected	A solar converter is in protected mode.	
Fan Fail	A solar converter's fan has failed.	Replace fan.
Current Limit	A solar converter is in current limit.	Solar converter overload. The load is higher than solar converter capacity. If one or more of the solar converters are defective, replace the faulty solar converters.
Solar Converter Comm Fail	A solar converter has lost communications with the controller.	Check communications cables. Reset the Solar Converter Communication Fail alarm. Replace the solar converter.
Derated	A solar converter is in output power derating mode.	Refer to Solar Converter User Manual for troubleshooting information.
Current Share Alarm	A solar converter has a current sharing alarm.	
Input Under Voltage Protection	A solar converter is in under voltage protection mode.	
Input Not DC	Input to solar converter mounting position is not DC.	--
Low Light Intensity	The light intensity is low.	--
Insulation Detect Fail	The insulation detection fails.	--
Insulation Fail Posi PE	This is part of ground fault detection when you have connected PV panels to input +. Alarm is generated if any leakage current flowing from + cable to ground.	Fix the insulation fault and restart MPPT modules
Insulation Fail Negi PE	This is part of ground fault detection when you have connected PV panels to input+. Alarm is generated if any leakage current flowing from - cable to ground.	
IB2-1(Interface Board) Alarms (IB2-1must be present in system)		
Communication Fail	IB2-2 board has lost communications with the controller.	Check communications cables.
DI1 Alarm	Digital input #1 alarm is active.	Check why alarm is active.
...	...	
DI7 Alarm	Digital input #7 alarm is active.	
DI8 Alarm	Digital input #8 alarm is active.	
IB2-2 D01 Test	Testing Relay 1 (on IB2-2 Board).	--
...	...	
IB2-2 D08 Test	Testing Relay 8 (on IB2-2 Board).	
EIB-1 (Extended Interface Board) Alarms (EIB-1 board must be present in system)		
EIB Communication Fail	EIB-1 board has lost communications with the controller.	Check communications cables.

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Bad Battery Block	Battery block fails.	Check batteries.
EIB-1 D01 Test	Testing Relay 1 (on EIB-1 Board).	--
...	...	
EIB-1 D05 Test	Testing Relay 5 (on EIB-1 Board).	
Current1 High 1 Curr	Current 1 above High 1 limit.	Check why current is high.
Current1 High 2 Curr	Current 1 above High 2 limit.	
Current2 High 1 Curr	Current 2 above High 1 limit.	
Current2 High 2 Curr	Current 2 above High 2 limit.	
Current3 High 1 Curr	Current 3 above High 1 limit.	
Current3 High 2 Curr	Current 3 above High 2 limit.	
EIB-1 (Extended Interface Board) Battery Alarms (EIB-1 Board must be present in system)		
Battery Current Limit Exceeded	Battery current limit point is exceeded.	--
Battery Over Current	Battery is in over current.	--
Battery Low Capacity	Battery has low capacity.	Check the batteries.
SMDU Unit 1 [2, 3, 4, 5, 6, 7, 8] Alarms (SMDU Module must be present in system)		
Under Voltage	Distribution voltage is below under voltage threshold.	Check why system voltage is low.
Over Voltage	Distribution voltage is above over voltage threshold.	Check why system voltage is high.
Communication Fail	The SMDU 1 has lost communications with the Controller.	Check communications cables.
Current1 High 1 Current	Current 1 above High 1 limit.	Check why current is high.
Current1 High 2 Current	Current 1 above High 2 limit.	
...	...	
...	...	
Current5 High 1 Current	Current 5 above High 2 limit.	
Current5 High 2 Current	Current 5 above High 2 limit.	
Shunt1 Coefficient Conflict	Shunt 1 coefficient conflicting.	Verify shunt size.
...	...	
Shunt5 Coefficient Conflict	Shunt 4 coefficient conflicting.	
Current1 High 1 Curr	Current 1 above High 1 limit.	Check why current is high.
Current1 High 2 Curr	Current 1 above High 2 limit.	
...	...	
...	...	
Current5 High 1 Curr	Current 5 above High 1 limit.	
Current5 High 2 Curr	Current 5 above High 2 limit.	
Converter Group Alarms		
Multiple Converters Fail	More than one converter has failed.	Check input voltage to converters. Replace converters.
Converter Lost	A converter cannot be detected by the Controller.	Reset the Converter Lost alarm. Replace defective converter.
All Converters Comm Fail	No response from all converters.	Check the connectors and cables or the CAN loop. Replace the controller.
Over Current	Over current condition exists.	Check why.

Table 2.3

Alarm Name	Alarm Description	Action to Correct
Converter Protect	A converter is in protected mode.	Refer to Converter User Manual for troubleshooting information.
Converter Alarms		
Communication Fail	A converter has lost communications with the controller.	Check communications cables. Reset the Communication Fail alarm. Replace the converter.
Over Temperature	A converter has an over temperature condition.	Check why temperature is high.
HVSD Alarm	A converter has an overvoltage condition.	Refer to Converter User Manual for troubleshooting information.
Fan Fail	A converter's fan has failed.	Replace fan.
Power Limit	NOT IMPLEMENTED AT THIS TIME	NOT IMPLEMENTED AT THIS TIME
Low Input Volt	Input voltage to a converter is low.	--
Converter Fail	A converter has a fault condition.	Refer to Converter User Manual for troubleshooting information.
EEPROM Fail	A converter's EEPROM has failed.	
Thermal Shutdown	A converter is in thermal shutdown.	
Mod ID Overlap	Converter module ID's overlap.	--
Under Voltage	A converter has an under voltage condition. (The hysteresis value is 2V.)	--
Over Voltage	A converter has an over voltage condition. (The hysteresis value is 2V.)	--
Under Voltage (24V)	A converter has an under voltage condition. (The hysteresis value is 1V.)	--
Over Voltage (24V)	A converter has an over voltage condition. (The hysteresis value is 1V.)	--
Converter Summary Alarm	Converter alarm summary (one or more alarms designated as converter is active).	"Manufacturer Use" Only.
SMDUP 1 [2, 3, 4, 5, 6, 7, 8] Unit Alarms (SMDU+ Module must be present in system)		
Communication Fail	Communications failure.	Check communications cables.
Current1 High 1 Current	Current 1 above High 1 limit.	--
Current1 High 2 Current	Current 1 above High 2 limit.	--
…	…	--
…	…	--
Current25 High 1 Current	Current 25 above High 1 limit.	--
Current25 High 2 Current	Current 25 above High 2 limit.	--
Shunt Coefficient Conflict	Shunt coefficient conflicting.	Verify shunt size.
Fuel Tank Group Alarms		
Fuel Group Communication Fail	Fuel tank group communication failure.	Check communications cables.
SMIO Generic Unit 1 Alarms (SM-IO Module must be present in system)		
SMIO Failure	SMIO has failed.	--
SMIO Generic Unit 3 [4, 5, 6, 7, 8] Alarms (SM-IO Module must be present in system)		
High Analog Input 1 Alarm	Input #1 above high alarm threshold.	--
Low Analog Input 1 Alarm	Input #1 below low alarm threshold.	--
…	…	--
…	…	--

Table 2.3

Alarm Name	Alarm Description	Action to Correct
High Analog Input 5 Alarm	Input #5 above high alarm threshold.	--
Low Analog Input 5 Alarm	Input #5 below low alarm threshold.	--
High Frequency Input Alarm	Input frequency above high frequency alarm threshold.	--
Low Frequency Input Alarm	Input frequency below low frequency alarm threshold.	--
SMIO Failure	SM-IO board failure.	Replace the board.
Testing Relay 1	Testing Relay 1.	--
Testing Relay 2	Testing Relay 2.	
Testing Relay 3	Testing Relay 3.	
Diesel Generator Group Alarms		
Diesel Test in Progress	Diesel test in progress.	--
Diesel Generator Test Failure	Diesel test failed.	--
Diesel Generator Alarms		
Low DC Voltage	Generator has low DC voltage.	--
Diesel Generator Supervision Fai	Generator monitoring device has failed.	--
Diesel Generator Failure	Generator has failed.	--
Diesel Generator Connected	Generator is connected to the system.	--
Low Fuel Level	Generator has low fuel level.	--
High Water Temperature	Generator has high water temperature.	--
Low Oil Pressure	Generator has low oil pressure.	--
Periodical Maintenance Required	Periodical maintenance is required to be performed.	--
SMDUH Unit 1 [2, 3, 4, 5, 6, 7, 8] Alarms (SMDUH Module must be present in system)		
Under Voltage	Distribution voltage is below low voltage threshold.	Check why system voltage is low.
Over Voltage	Distribution voltage is above high voltage threshold.	Check why system voltage is high.
Communication Fail	The SMDUH has lost communications with the controller.	Check communications cables.
OBFuel Tank Alarms		
High Fuel Level Alarm	Fuel tank high level alarm.	--
Low Fuel Level Alarm	Fuel tank low level alarm.	--
Fuel Theft Alarm	Fuel tank theft alarm.	--
Tank Height Error	Fuel tank height error.	--
Fuel Tank Config Error	Fuel tank configuration error.	--
SM Temp Group Alarms (SM-Temp Module must be present in system)		
SM Temp Lost	SM-Temp cannot be detected by the controller.	Reset the SMTemp Lost alarm. Replace defective SM-Temp.
SM Temp 1-8 Alarms (SM-Temp Module must be present in system)		
Communication Fail	SM-Temp has lost communications with the controller.	Check communications cables.
Temperature Probe 1 Shorted	Probe shorted.	Replace temperature probe.
...	...	
Temperature Probe 8 Shorted	Probe shorted.	
Temperature Probe 1 Open	Probe open.	Replace temperature probe.

Table 2.3

Alarm Name	Alarm Description	Action to Correct
...	...	
Temperature Probe 8 Open	Probe open.	
Inverter Group (module must be present in system) Alarms		
Inverter Lost	An inverter cannot be detected by the controller.	Reset the Inverter Lost Alarm. Replace defective inverter.
All Inverters Communication Failure	No response from all inverters.	Check the connectors and cables or CAN loop.
Inverter High Load	Inverter has high load.	Check why inverter has high load.
Synchronization Phase Failure	Inverters phase not in sync.	Check cables between inverter shelves. Replace inverter.
AC Out Setting Error	AC Out setting is error.	--
Synchronization Frequency Failure	Inverters frequency not in sync.	--
Synchronization Mode Failure	Inverters mode not in sync.	--
Redundancy Warning	Redundancy is about to be lost, for example if number of expected inverters are 6, redundancy is 2, and there are 5 inverters in the system.	--
Redundancy Lost	Redundancy is lost, for example if number of expected inverters are 6, redundancy is 1, and there are 5 inverters in the system.	Put same number of inverters in the system.
Redundancy Lost+1	Redundancy is lost, for example if number of expected inverters are 6, redundancy is 1, and there are 4 inverters in the system.	Put same number of inverters in the system.
Redundancy Lost+2	Redundancy is lost, for example if number of expected inverters are 6, redundancy is 1, and there are 3 inverters in the system.	Put same number of inverters in the system.
Redundancy Lost+3	Redundancy is lost, for example if number of expected inverters are 6, redundancy is 1, and there are 2 inverters in the system.	Put same number of inverters in the system.
Inverter (module must be present in system) Alarms		
No Response	No response from inverter.	Reset the Inverter Lost Alarm. Replace defective inverter.
Inverter Fail	An inverter has a fault condition.	Refer to Inverter User Manual for troubleshooting information.
Input AC Volt Abnormal	An inverter has an AC input voltage condition.	--
Input DC Volt Abnormal	An inverter has a DC input voltage condition.	--
Over Temperature	An inverter has an over temperature condition.	--
Fan Fault	An inverter has a fan condition.	--
About Over Load	An inverter is near to being over loaded.	--
Over Load	An inverter has an overload condition.	Check why inverter is over loaded.
Module ID Repeated	An inverter has an ID repeated.	Refer to Inverter User Manual for troubleshooting information.
Parallel Flow Anomaly	An inverter has a parallel flow condition.	--
Parallel Out of Sync	An inverter has a parallel sync condition.	--
Parallel CAN Comm Fail	An inverter has a parallel CAN Comm condition.	--
Phase Anomaly	An inverter has a phase condition.	--
Inverter DC Only Mode		--
Software Remote Stop	An inverter has been stopped by software.	--
Hardware Remote Stop	An inverter has been stopped by hardware.	--
Low Output Voltage	An inverter has a low output voltage.	--
Inverter Derating	An Inverter is in output power derating mode.	--

3 Local Display Menus

3.1 Overview

This section provides descriptions of the local display menus. Refer also to “Passwords and Privilege Levels” on page 14 and “Description of Local Display Menus Programmable Parameters” on page 63. For Web interface, refer to “Web Interface Screens” on page 65.

3.2 Factory Default Setpoints

Refer to the Table of Set Values furnished with your system for a list of factory default values.

3.3 Adjustment Range Restrictions

See Figure 3.1.

Figure 3.1 Adjustment Range Restrictions

Setting HVSD	HVSD >= Float + 0.5V
	HVSD >= EQ + 0.5V
Setting OV2	OV2 >= OV1
Setting OV1	OV1 <= OV2
	OV1 > UV1
Setting EQ	EQ > Float
	EQ <= HVSD - 0.5V
Setting Float	Float < EQ
	Float > UV1 + 0.5V

Setting LVR	LVR > LVD
Setting UV1	UV1 >= UV2
	UV1 < OV1
	UV1 < Float - 0.5V
Setting Test End	Test End >= Test Volt + 0.2V
Setting Test Volt	Test Volt <= Test End - 0.2V
Setting UV2	UV2 <= UV1
Setting LVD	LVD < LVR

These restrictions will apply even if the function is disabled.

NOTE:

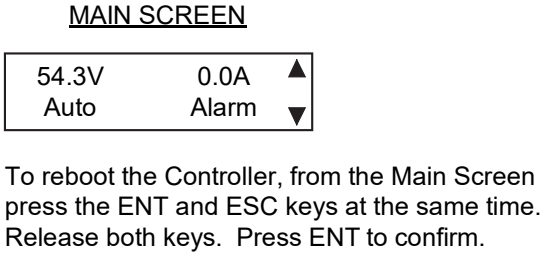
1.When using Solar Converters, Solar (Folat),& Rect(Float) have the same restrictions.

2.When using Solar Converters, Solar (EQ),& Rect (EQ) have the same restrictions.

3.4 Main Screen

The MAIN SCREEN is shown in Figure 3.2. This is the first screen displayed when the local display is activated by pressing any key on the controller’s front panel.

Figure 3.2 MAIN SCREEN



3.5 Information Screens (accessed from the MAIN SCREEN)

Information screens can be accessed from the MAIN SCREEN as shown in Figure 3.3 and Figure 3.4.

Figure 3.3 Information Screens (using UP and DOWN arrow keys)

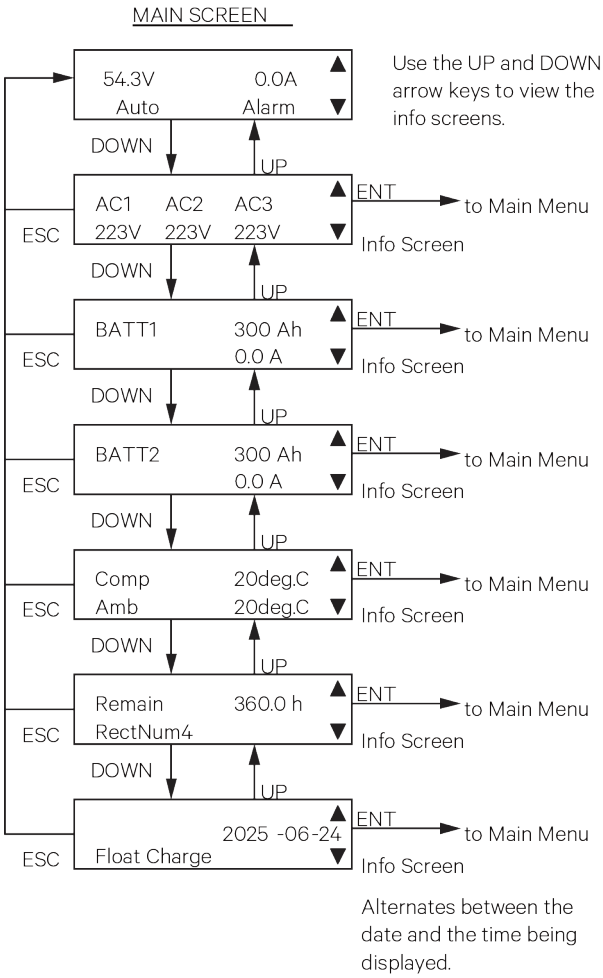
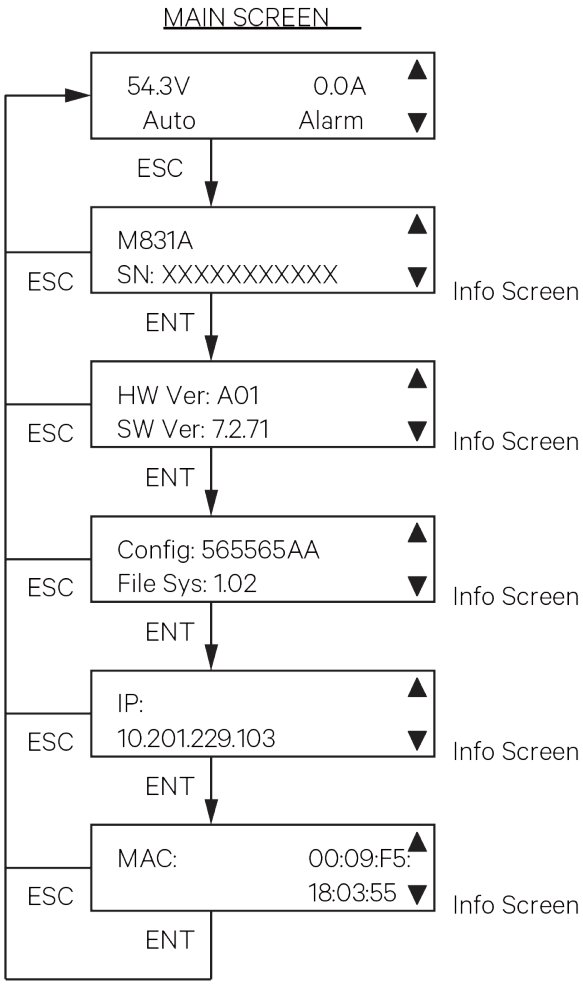


Figure 3.4 Information Screens (Using ESC and ENT Keys)



Use the ESC and ENT key to view the info screens.

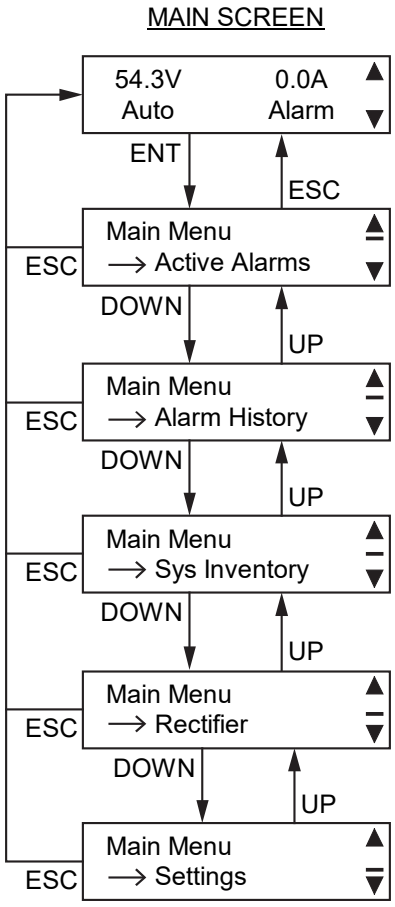
INFO SCREENS
(Returns to MAIN SCREEN after a preset time period.)

3.6 Main Menu

From the MAIN SCREEN, press the ENT key to go to the MAIN MENU. From the MAIN MENU, you can press the UP and DOWN arrow keys to select a submenu. Press the ENT key to enter the selected submenu. See Figure 3.5. Refer to the next section for submenu illustrations.

NOTE! *Repeatedly press the ESC key to return in reverse order level by level from any submenu until the MAIN SCREEN appears.*

Figure 3.5 MAIN MENU



3.7 Local Display Menus

Figure 3.6 provides flow diagrams of the menus accessed via the controller local display and keypad.

NOTE! *These instructions describe the complete functionality of the controller. Some functionality is dependent on hardware connected to the controller. Some menu items shown may not be present in the controller used in your system.*

Figure 3.6 Local Display Menus (cont'd on next page)

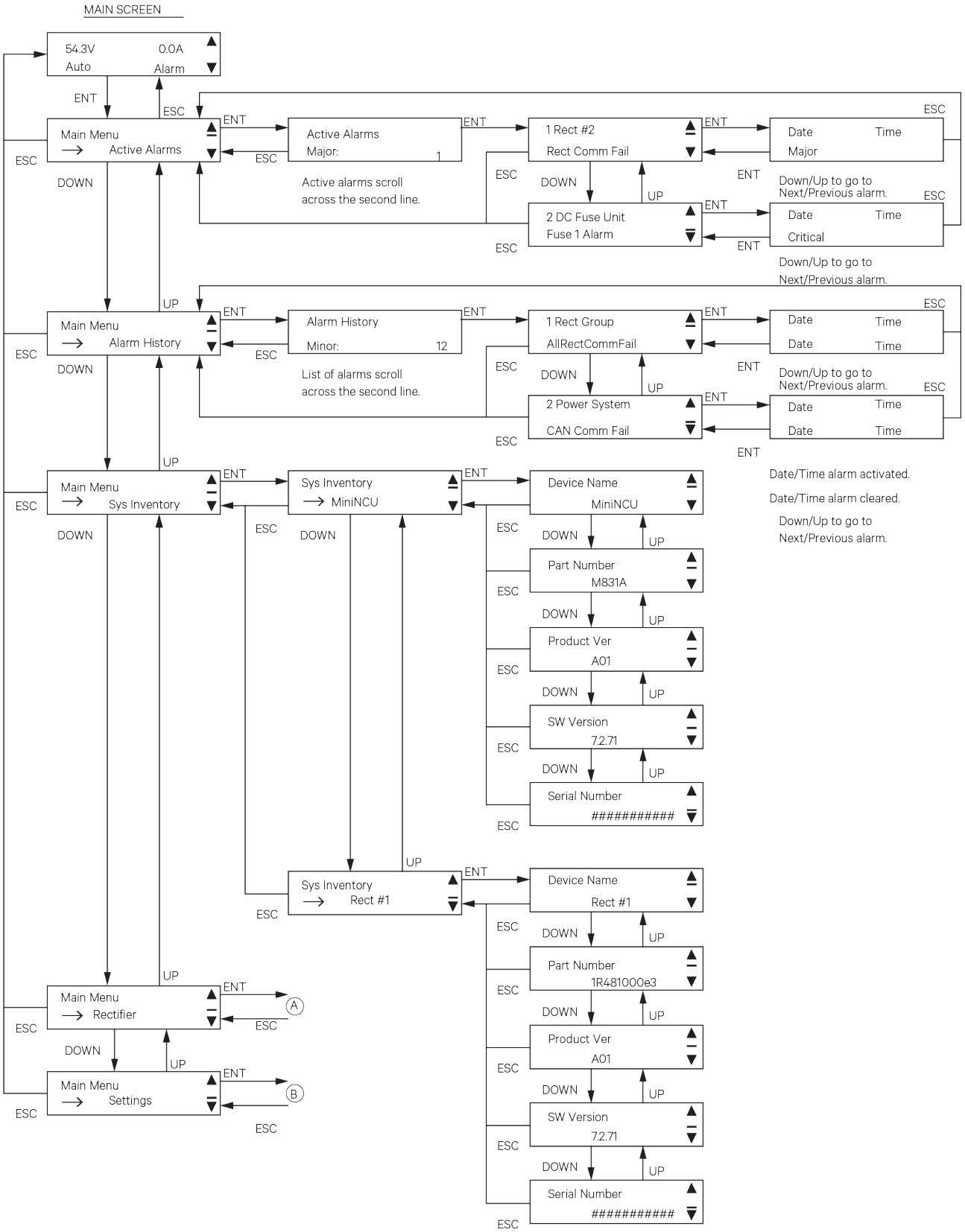


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)

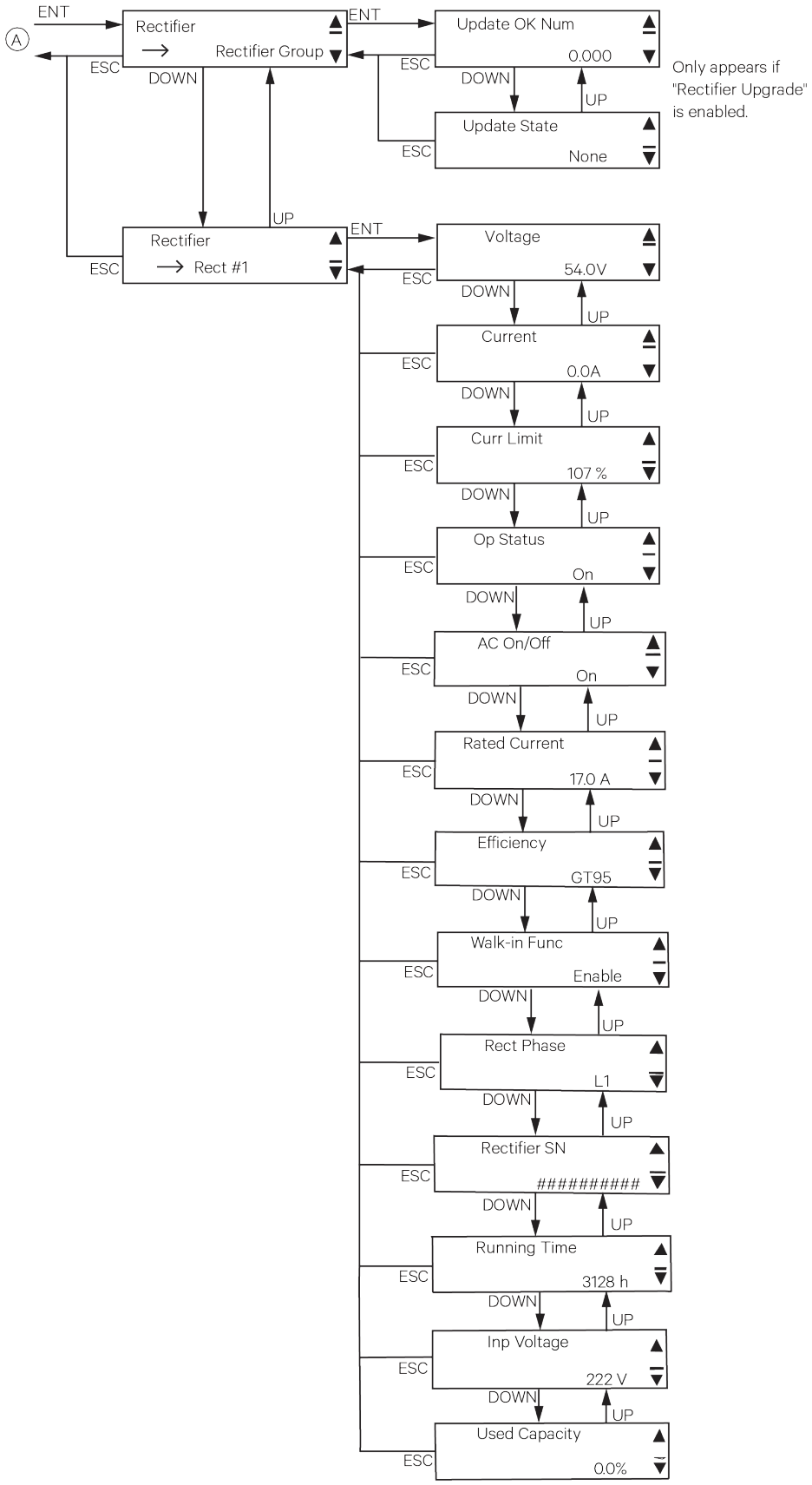
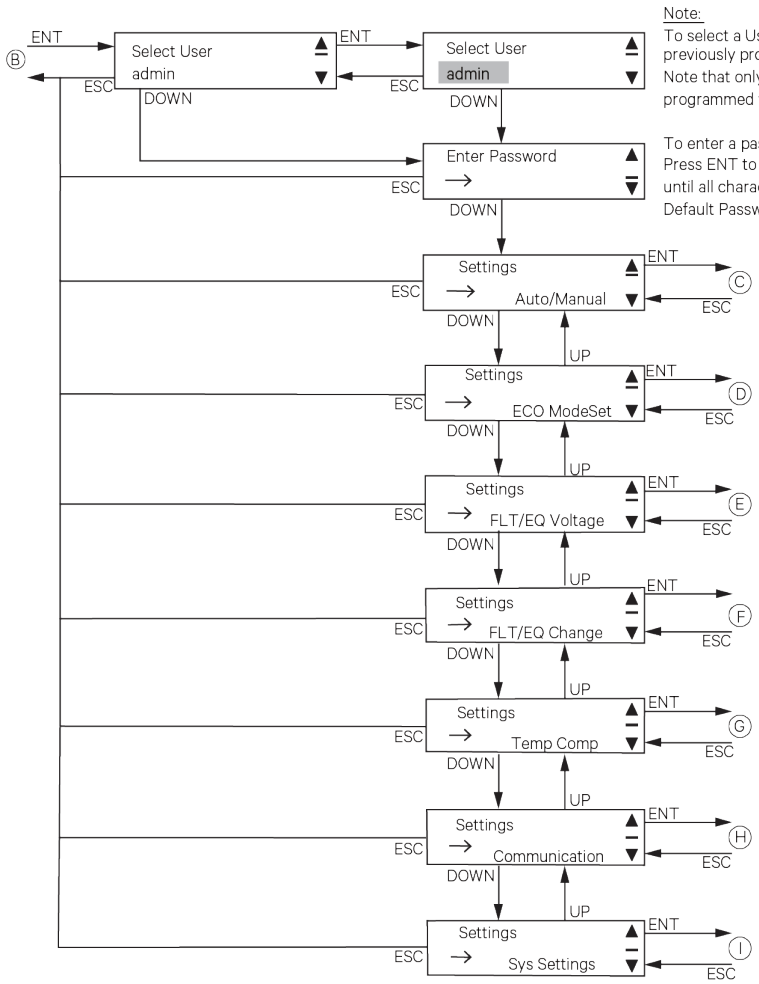


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)



Note:
To select a User, use the UP and DOWN arrow keys to select a User previously programmed into the controller. Press ENT to select the User. Note that only Users programmed into the controller are shown. Users are programmed via the Web Interface.

To enter a password, use the UP and DOWN keys to choose a character. Press ENT to accept and move to the next character. Continue this process until all characters are entered. Press ENT again to accept the password. Default Password: 12345678

Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)

To Change a Parameter:

Press the UP and DOWN arrow keys to move up and down list of parameters.

Press ENT to select the parameter.

Press the UP and DOWN keys to change the parameter.

Press ENT to make the change.

Press ESC to cancel the change.

The parameter values shown in ( ) are the adjustment range or acceptable values.

Factory default settings are listed in the controller Table of Set Values furnished with your system.

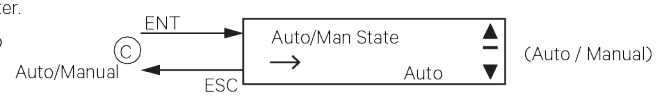


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)

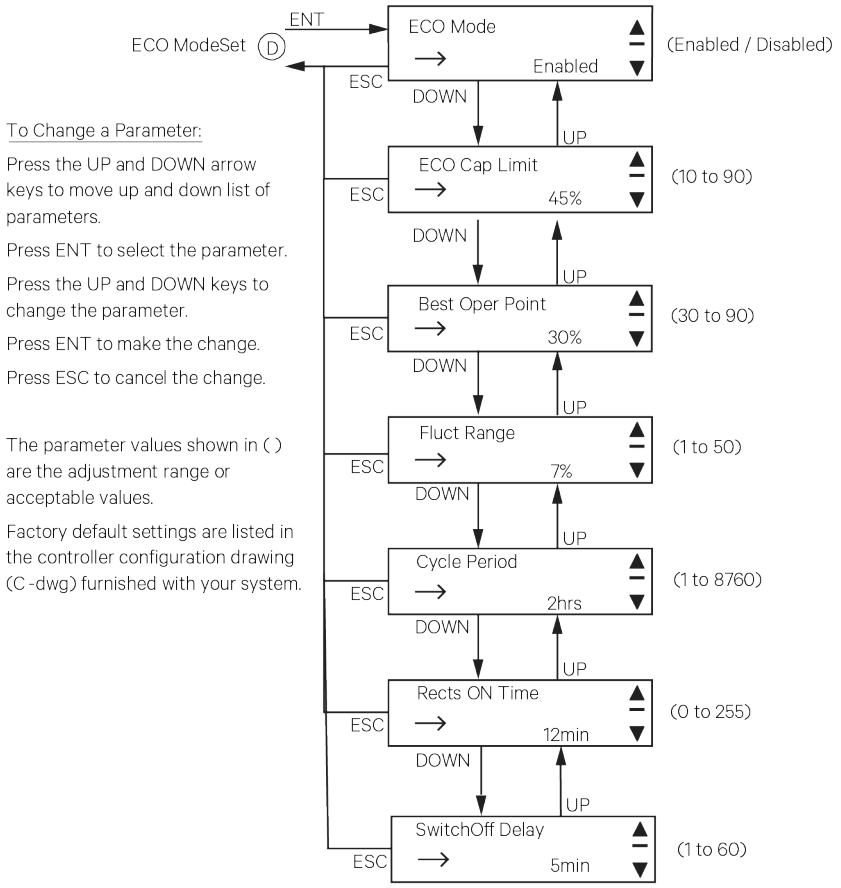


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)

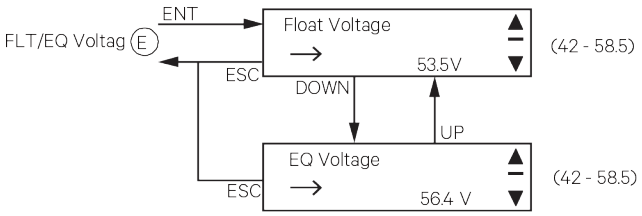


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)

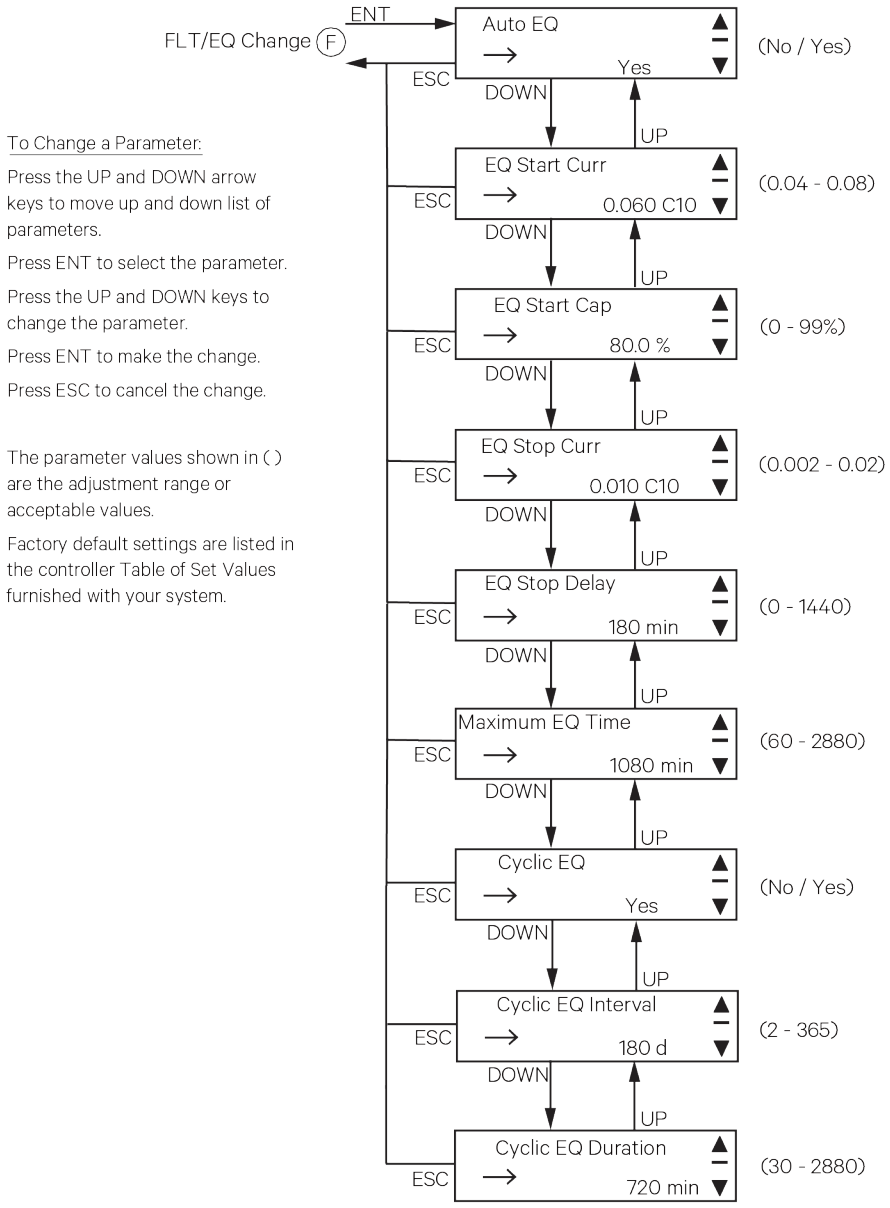


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)

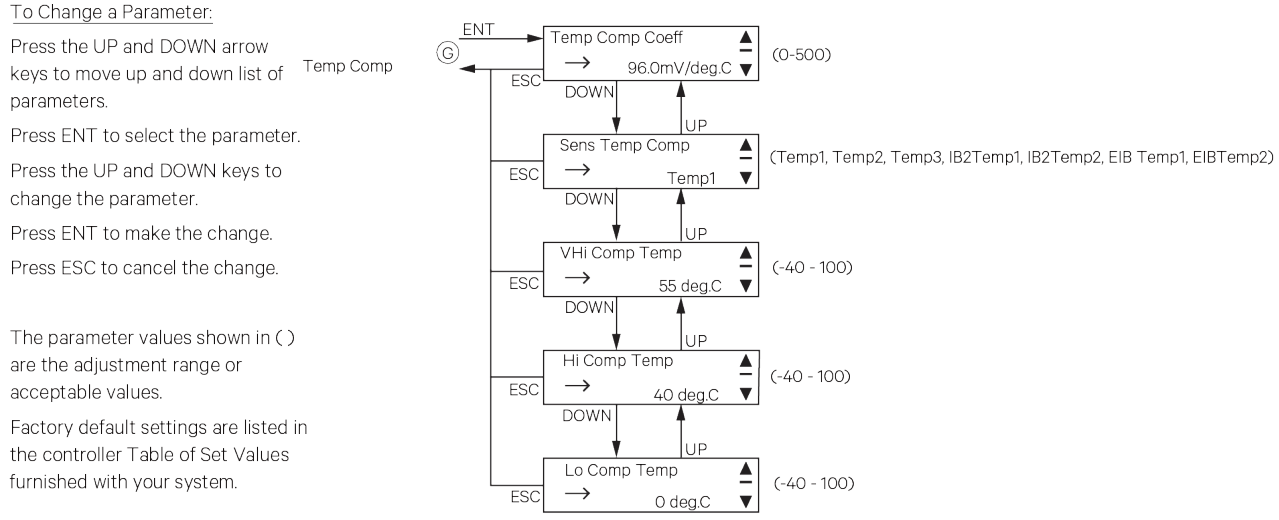


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)

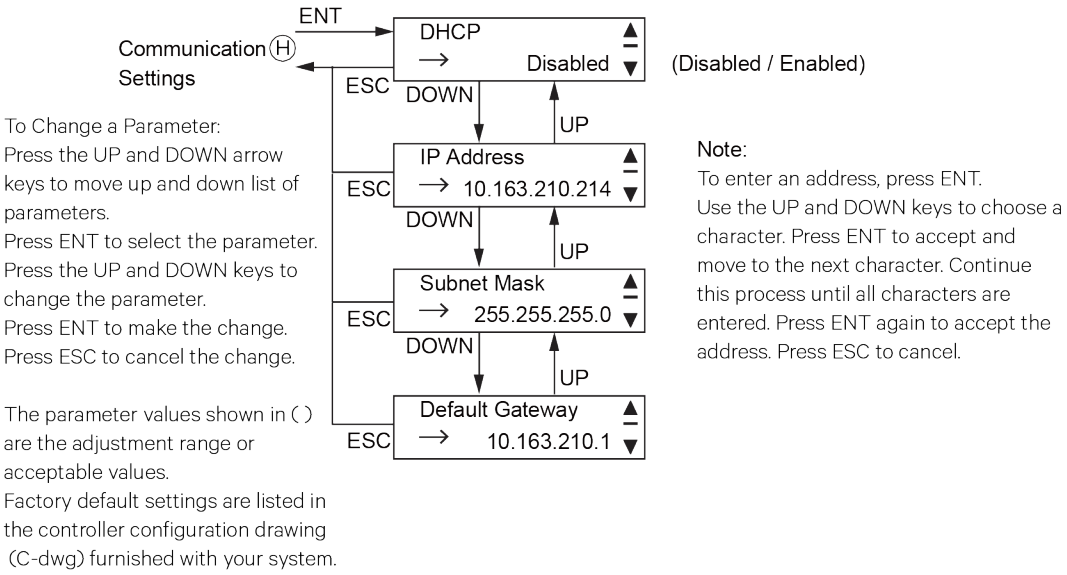
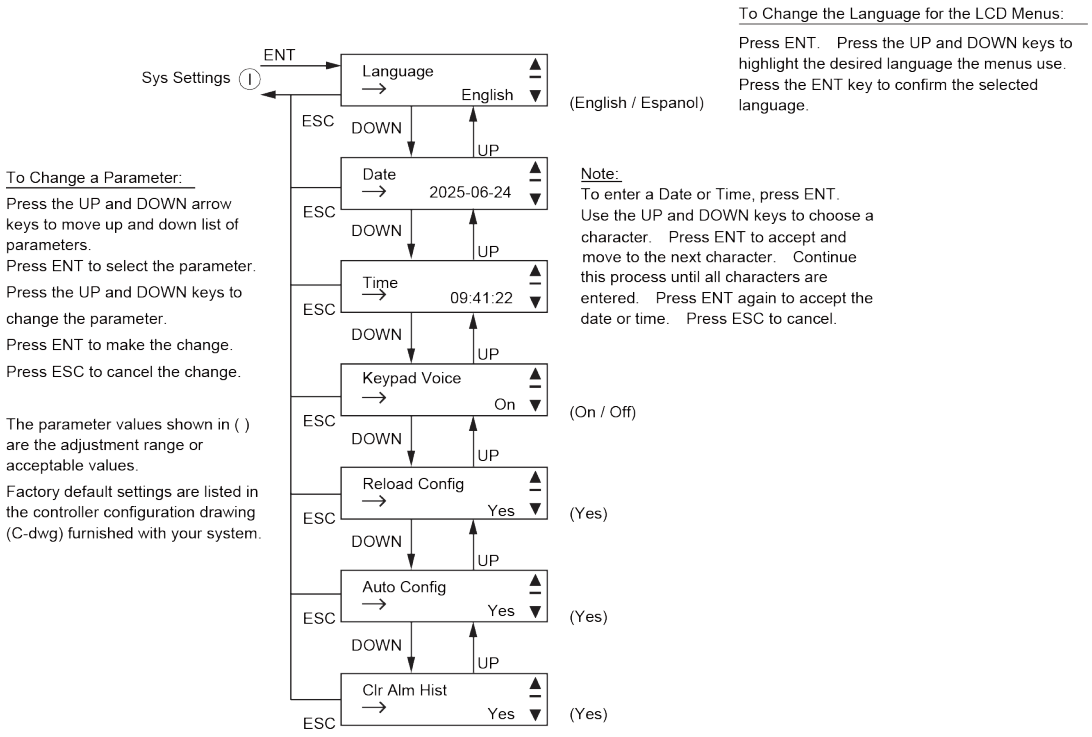


Figure 3.6 Local Display Menus (cont'd from previous page, cont'd on next page)



4 Description of Local Display Menus Programmable Parameters

The following are descriptions of the programmable parameters presented in the local display menus.

4.1 Settings Menu

See Figure 3.6.

4.1.1 Maintenance Sub-Menu

- **Auto/Man State:**
  - **Auto:** The controller automatically controls the power system.
  - **Manual:** A User can manually change certain power system control settings. When you return to Auto Mode, any settings changed in Manual Mode are returned to their previous setting (setting before being placed in Manual Mode). This provides a convenient means of making temporary adjustment changes for testing purposes.

4.1.2 ECO ModeSet Sub-Menu

- **ECO Mode:** Enables or disables the Energy Optimization Mode feature for all rectifiers. When enabled, the following parameters can be set.

ALERT! The Energy Optimization Mode should NOT be used in systems that operate without batteries.

- **ECO cap Limit:** If used system capacity is above this level, ECO mode will not become active.
- **Best Oper Point:** Percent of full load capacity that the rectifiers operate under in the Energy Optimization mode.
- **Fluct Range:** If load fluctuation is less than this value, rectifiers are not turned on or off for Energy Optimization.
- **Cycle Period:** This is the time period that rectifiers are turned on and off to maintain an equal operating time for all rectifiers in the system.
- **Rects ON Time:** Time all rectifiers are turned on at the end of the “Cycle Period”.
- **SwitchOff Delay :** Delay to turn off a rectifier.

4.1.3 FLT/EQ Voltag Setting Sub-Menu

Options in this menu are: Float Voltage and EQ Voltage.

- **Float Voltage:** Float charge output voltage setting for rectifiers.
- **EQ Voltage:** Equalize charge output voltage setting for rectifiers.

4.1.4 FLT/EQ Change Settings Sub-Menu

- **Auto EQ:** Enables or disables the Automatic Equalize Charge feature.

  EQ Start Curr: The system is transferred to Equalize Charge mode when battery charge current increases to this setting. For example, a value of 0.060C10 means that an Automatic Equalize is started if the battery charge current is greater than 6% of the battery’s nominal capacity.

  EQ Start Cap: The system is transferred to Equalize Charge mode when remaining battery capacity decreases to this setting.

EQ Stop Curr: When in Equalize Charge mode and the battery charge current decreases below this setting for the "EQ Stop Delay" time period, the system is transferred to Float Charge mode. For example, a value of 0.010C10 means that when the charging current is less than 1% of the battery's nominal capacity, the system returns to the Float mode.

EQ Stop Delay: See "EQ Stop Curr" above.

NOTE! *If the power system has been automatically placed in Equalize mode, disabling Auto EQ will* ***not*** *return the system to Float mode until the current Equalize cycle is completed. To return immediately to Float mode, navigate as follows: Main Menu / Settings Icon / Maintenance / "EQ/FLT Control", and select Float Charge.*

Maximum EQ Time: This is the maximum duration, in minutes, that an Automatic Equalize Charge will last regardless of the other settings.

Cyc EQ: Enables or disables cyclic (scheduled) Equalize charging. When enabled, the following parameters can be set.

Cyc EQ Interval: Cyclic (scheduled) Equalize charging interval.

Cyc EQ Duration: Cyclic (scheduled) Equalize charging duration.

4.1.5 Communication Sub-Menu

- **DHCP:** The DHCP function allows the controller to acquire an IP address automatically. This function can only be enabled or disabled via the local display and keypad. If this function is enabled and the acquisition of an IP address fails, an alarm is generated. If the acquisition of an IP address is successful, you need to record the IP address automatically acquired by the controller to access the controller via the Web Interface. This IP address is displayed in the IP Address field below the DHCP setting in the local display menu (Main Menu / Settings Icon / Comm Settings).
- **IP Address:** Sets the controller's IPv4 address. Enter the address in the format nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255. The address must be a valid address and must not be 255.255.255.255.
- **Subnet Mask:** Sets the controller's IPv4 network netmask. Enter the address in the format nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255.
- **Default Gateway:** Sets the controller's IPv4 gateway address. Enter the address in the format nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255. This is the address of the gateway of the network on which the controller resides. The address must be a valid address and must not be 255.255.255.255.

4.1.6 Sys Settings Sub-Menu

- **Language:** Select the language the menus are displayed in.
- **Date:** Sets the date. Refer to "Changing the Date and Time" on page 22 for a procedure to change the date.
- **Time:** Sets the time. Refer to "Changing the Date and Time" on page 22 for a procedure to change the time.
- **Keypad Voice:** Sets the keypad sound on or off.
- **Reload Config:** Restores the controller's default settings.
- **Auto Config:** Auto configures the controller for the devices connected to it.
- **Clr Alm Hist:** Clears the alarm history.

5 Web Interface Screens

5.1 Overview of Web Function

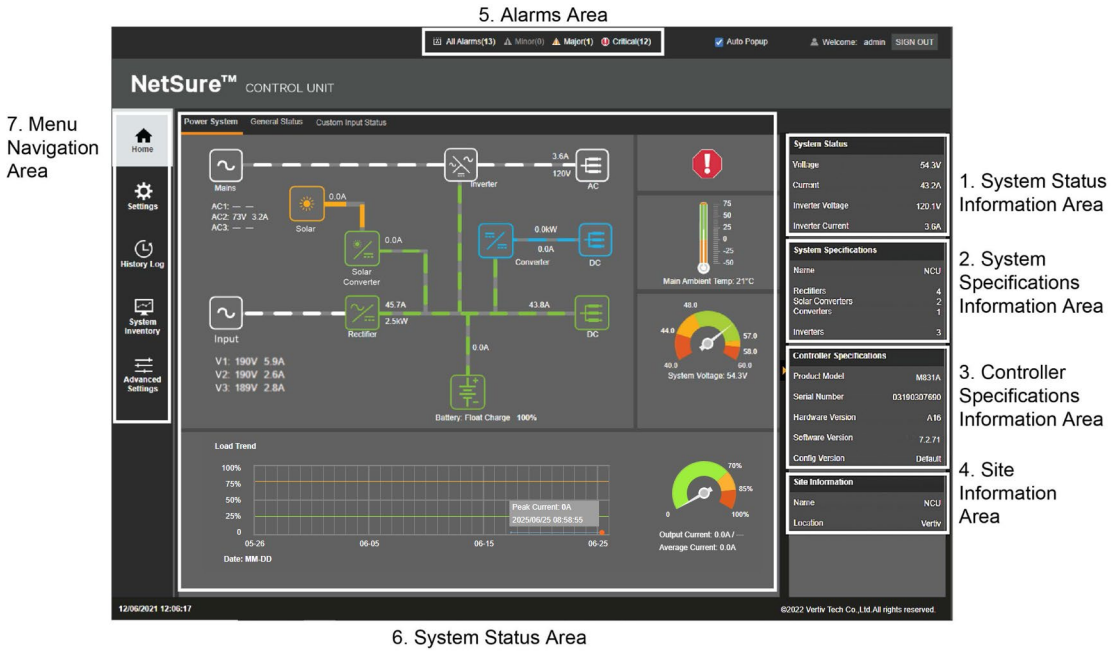
This section provides descriptions of the Web Interface Screens. Refer also to “Passwords and Privilege Levels” on page 14 and “Using the Web Interface” on page 15. For Local Display Menus, refer to “Local Display Menus” on page 52.

NOTE! *Best viewed at 1024 x 768 resolution.*

5.2 Homepage

In the Web Interface, after entering a valid **User Name** and **Password** and clicking **LOGIN**, the "Homepage" window opens. See also “Logging into the Controller” on page 16.

Figure 5.1 Sample of Homepage (with Rectifiers, Solar Converters, Converters, and Inverters Installed in System)



The homepage window is divided into the following areas:

1. System Status Information Area (see “System Status Information Area” on page 66).
2. System Specifications Information Area (see “System Specifications Information Area” on page 66).
3. Controller Specifications Information Area (see “Controller Specifications Information Area” on page 66).
4. Site Information Area (see “Site Information Area” on page 66).
5. Alarms Area (see “Alarms Area” on page 67).
6. System Status Area (see “System Status Area” on page 68).
7. Menu Navigation Area (see “Menu Navigation Area” on page 85).

5.3 System Status Information Area

Output voltage and output current are displayed here.

5.4 System Specifications Information Area

System specifications are displayed here.

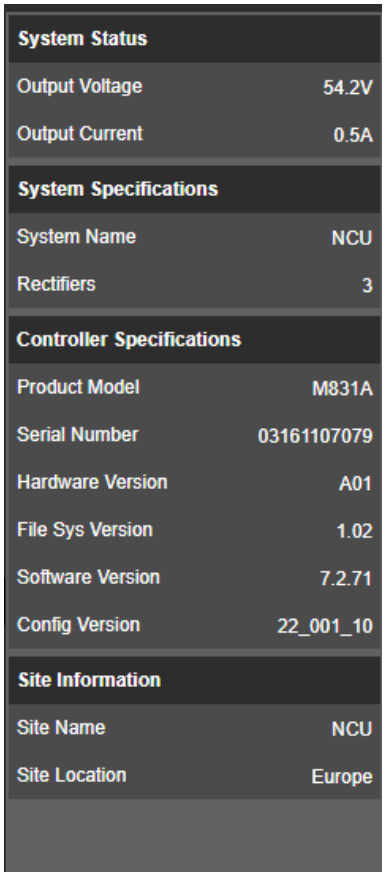
5.5 Controller Specifications Information Area

Controller specifications are displayed here.

5.6 Site Information Area

Site information is displayed here.

Figure 5.2 System Status Information, System Specifications Information, Controller Specifications Information, and Site Information Areas



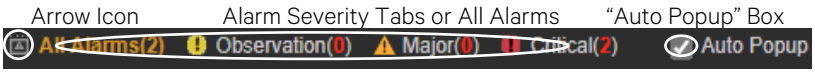
5.7 Alarms Area

Any alarms active in the power system are shown in this area.

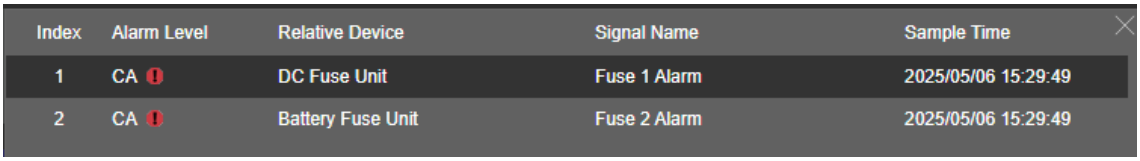
- When viewing the Alarm List, click the “arrow” icon to collapse the Alarm List. Click the "arrow" icon again to expand the Alarm List.
- The alarms area contains tabs to allow viewing all alarms or a type of alarm (severity). For example, click the Critical tab to display alarms set as Critical alarms.
- When the “Auto Popup” box is checked and the Alarm List is collapsed, a new alarm will cause the Alarm List to expand.

NOTE! *Minor alarms are shaded yellow, major alarms are shaded orange, and critical alarms are shaded red.*

Figure 5.3 Alarms Area



Alarm List Collapsed



Alarm List Expanded

5.8 System Status Area

System status is displayed in this area and consists of a Power System tab (see page 68).

Temperature Reading

- The temperature sensor set as “Main Ambient Temp Sensor” (Settings Menu / System Tab) is the sensor which displays the ambient temperature on the Power System tab.

System Current Reading

- “System Current” equals total rectifier current or total solar converter current minus total battery current when battery shunt exists or calculated battery current. If you do not calculate battery current, “System Current” equals total rectifier current or total solar converter current.

Calculated Load Current Reading

This value changes based on equipment installed.

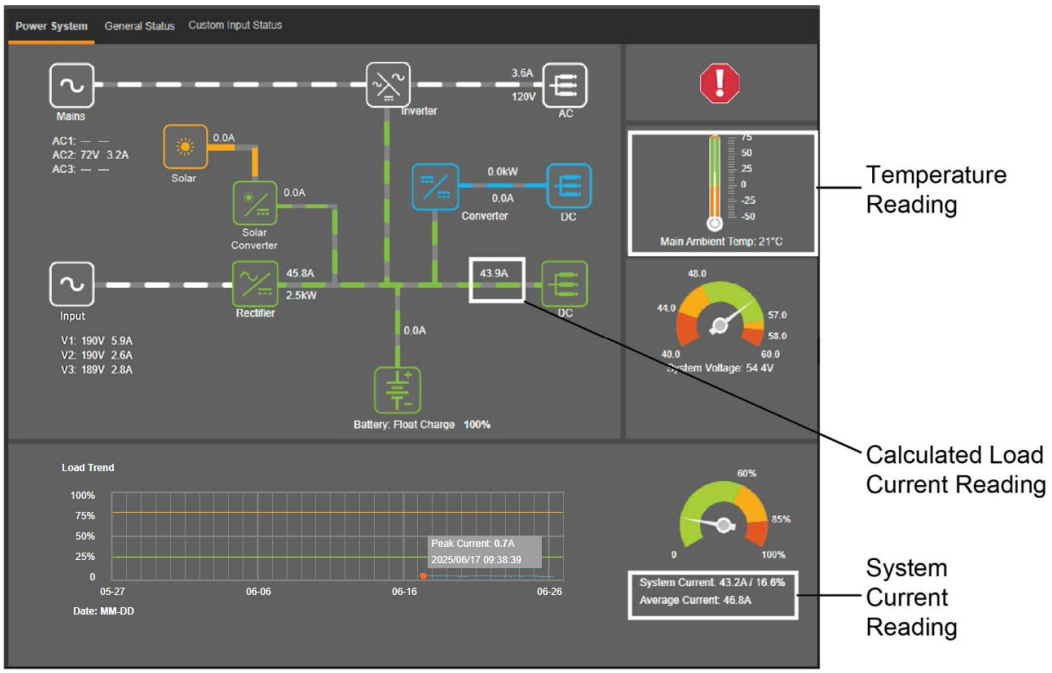
- If no Load Shunts, then the value is calculated same as the "System Current".
- If Load Shunts exist and Converters exist, then the value is calculated as:
  System Current - Converter Input Current
- If Load Shunts exist and no Converters, then the value is same as the "Total DC Load".

5.8.1 Power System Tab

The Power System tab displays power system status in a graphical block diagram format. This includes status of the input power, modules (i.e., rectifiers, solar converters, converters, inverters), DC load, AC load, and battery. Also displayed are alarm status, ambient temperature, output voltage, output current, average current, and a load trend chart.

NOTE! *The load trend chart gets data from the “Data History Log” and will plot the MAXIMUM value per hour per day.*

Figure 5.4 Sample Power System Tab (with Rectifiers, Solar Converters, Converters, and Inverters Installed in System)



Power System Status Graphical Block Diagram

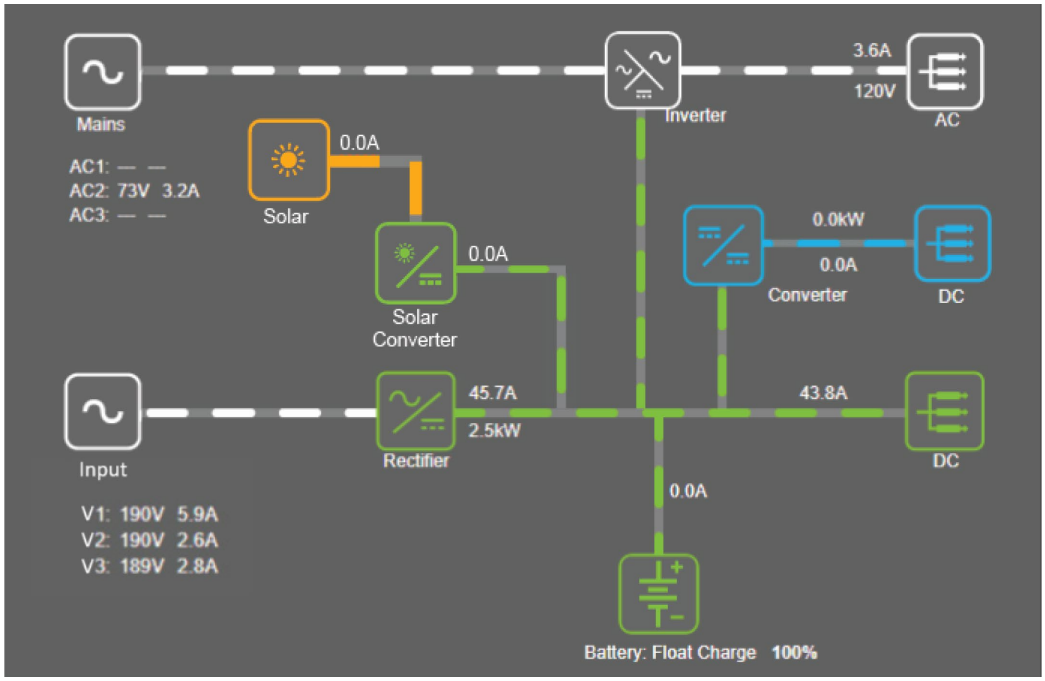
The power system status area is User interactive. Clicking on the various icons will take you to specific status Web pages, as explained in the next sections.

Device Group Status Pages

The power system status block diagram has interactive links. Clicking on a link takes you to that device group's status page. A device group's status page displays current or logged operating parameters for that device group.

The following sections describe the Module (i.e., rectifier, converter, solar converter, inverter), DC, AC, and the Battery device groups as samples of how to use these links.

Figure 5.5 Sample Power System Status Page Block Diagram (with Rectifiers, Solar Converters, Converters, and Inverters Installed in System)



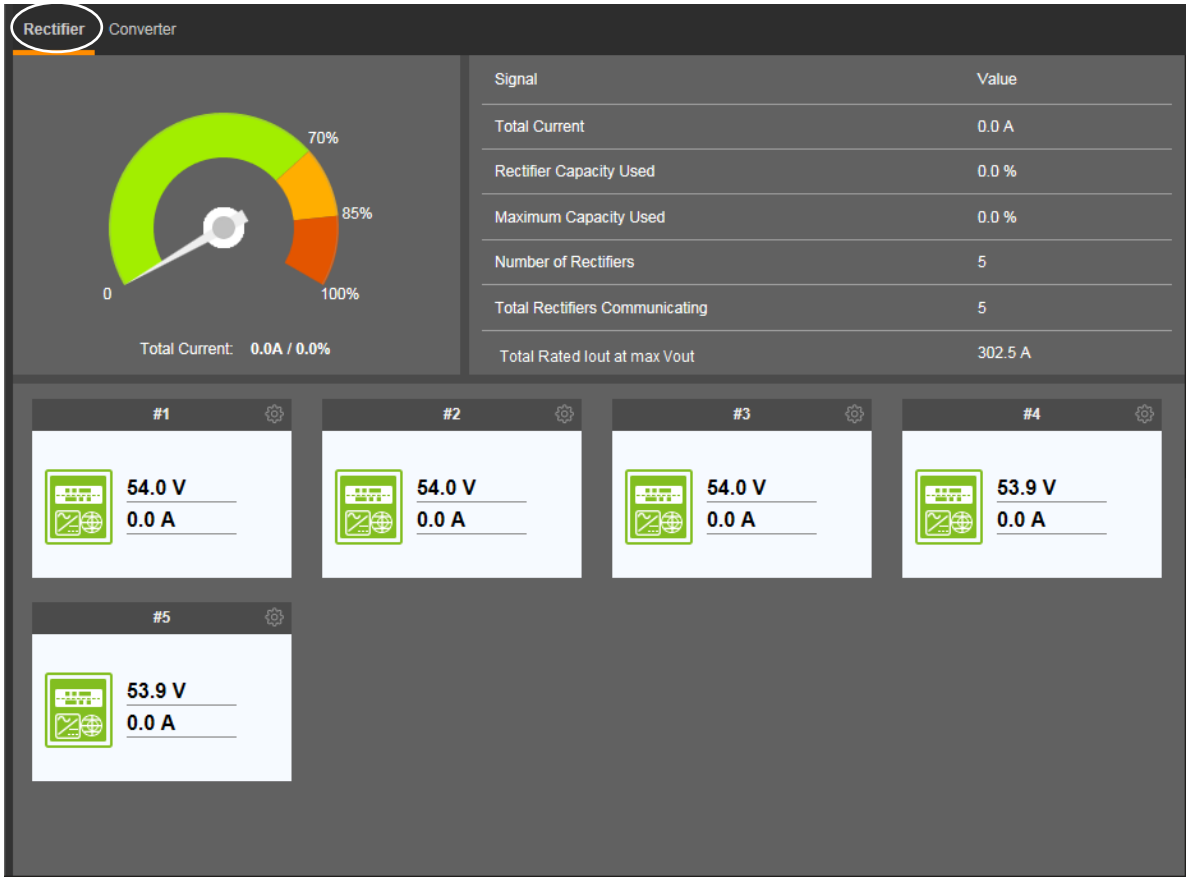
Module (Rectifier, Converter, Solar Converter, Inverter) Device Group Status Page

Clicking on a rectifier, converter, solar converter, or inverter icon on the power system status block diagram opens the status page for the module's Device Group. The Module Device Group status page contains multiple tabs (depending on the modules installed in your power system). This includes Rectifier, Converter, Solar Converter, and Inverter tabs.

Rectifier Device Group Status Page Tab

This tab displays status values such as "Total Current", "Number of Rectifiers", etc.

Figure 5.6 Rectifier Device Group Status Page Tab



NOTE! *The "Rectifier Capacity Used" and load percentage indicators are based on the nominal ratings under nominal operating conditions.*

NOTE! *"Rectifier Capacity Used" and "Maximum Used Capacity" are based on 54 VDC.*

Individual Rectifier Status Page

Displayed on the Rectifier Device Group status page are the individual rectifiers installed in the system. Click on an individual rectifier icon to display its status such as "Valid Rated Current", etc.

Figure 5.7 Individual Rectifier Status Page

Individual Rectifier Settings Page

In the Rectifier Device Group Status Page Tab, click the settings wheel icon to go to the individual rectifier settings page. Click Back to go back to the Rectifier Device Group Status Page Tab.

Figure 5.8 Selecting an Individual Rectifier Settings Page

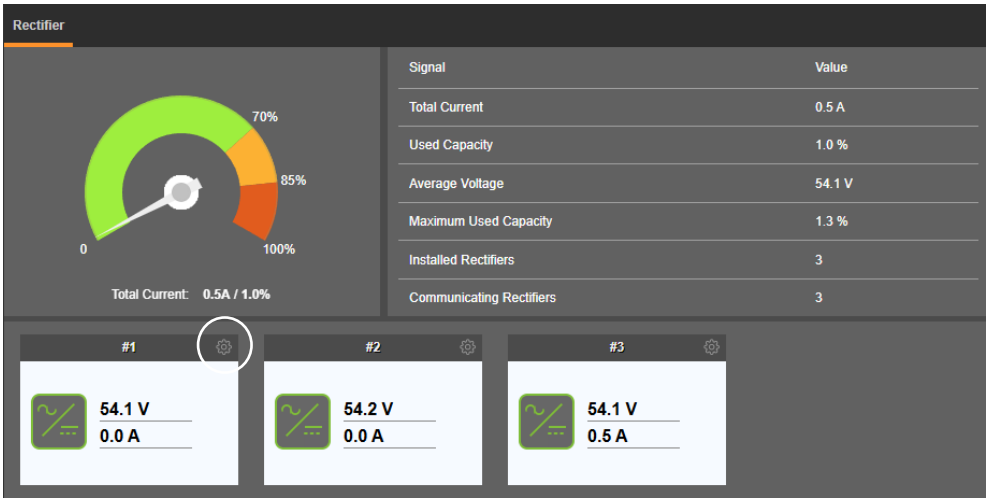
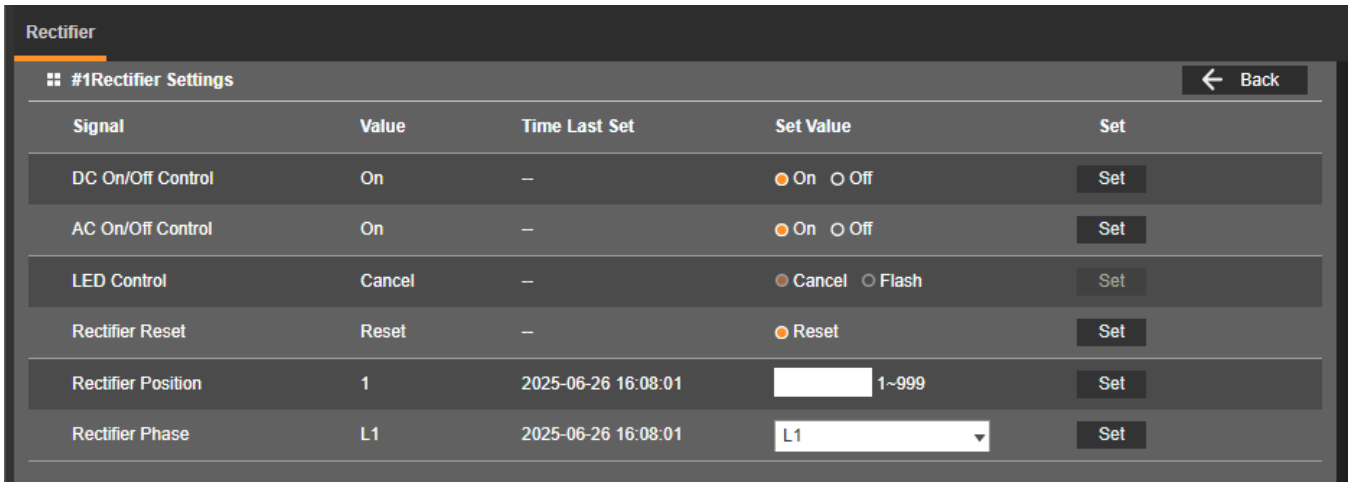


Figure 5.9 Individual Rectifier Settings Page



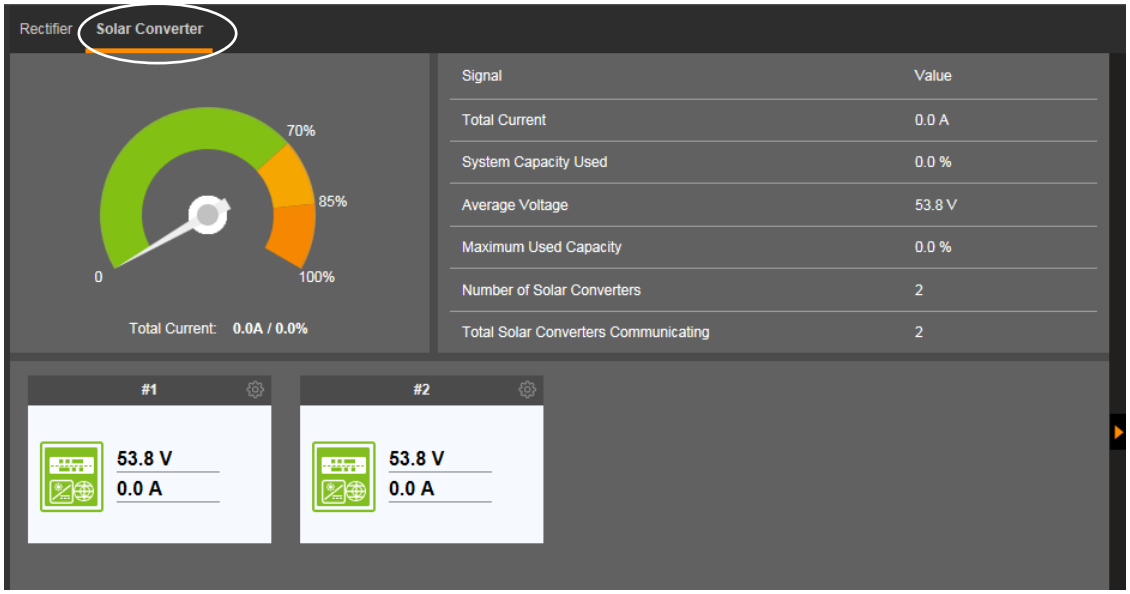
NOTE! *Settings that appear "grayed out" can only be made when the controller is in the "manual control" state. If the controller is set for "automatic" control, change the "Auto/Manual State" setting first to the "Manual" setting.*

- **DC Output On/Off Control:** Temporarily turns the rectifier's output on or off when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **AC Input On/Off Control:** Temporarily turns the rectifier's input on or off when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **LED Control:** Temporarily sets whether or not the rectifier's local power indicator blinks when the controller is communicating with the rectifier when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Rectifier Reset:** Temporarily sets the rectifier's over voltage reset feature when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Rectifier Position :** Sets the rectifier's identification number.
- **Rectifier Phase :** Indicates the phase connected to the rectifier's input.

Solar Converter Device Group Status Page Tab

This tab displays status values such as “Total Current”, “Number of Solar Converters”, etc.

Figure 5.10 Solar Converter Device Group Status Page Tab

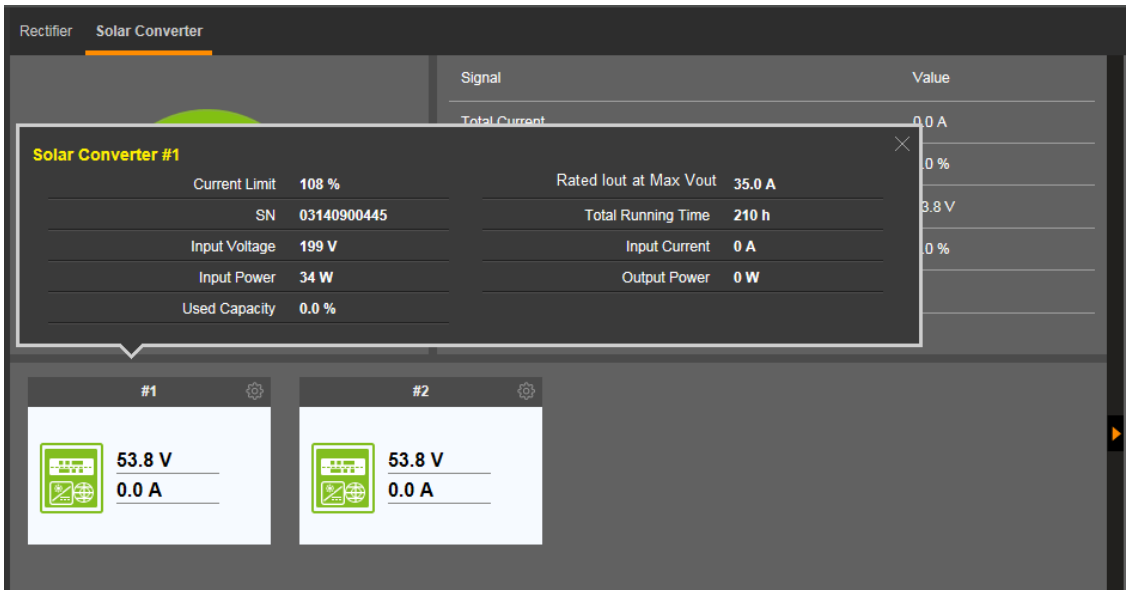


NOTE! *“System Capacity Used” and “Maximum Used Capacity” are based on 54 VDC.*

Individual Solar Converter Status Page

Displayed on the Solar Converter Device Group status page are the individual solar converters installed in the system. Click on an individual solar converter icon to display its status such as "Input Current", "Output Power", etc.

Figure 5.11 Individual Solar Converter Status Page



Individual Solar Converter Settings Page

In the Solar Converter Device Group Status Page Tab, click the settings wheel icon to go to the individual solar converter settings page. Click Back to go back to the Solar Converter Device Group Status Page Tab.

Figure 5.12 Selecting an Individual Solar Converter Settings Page

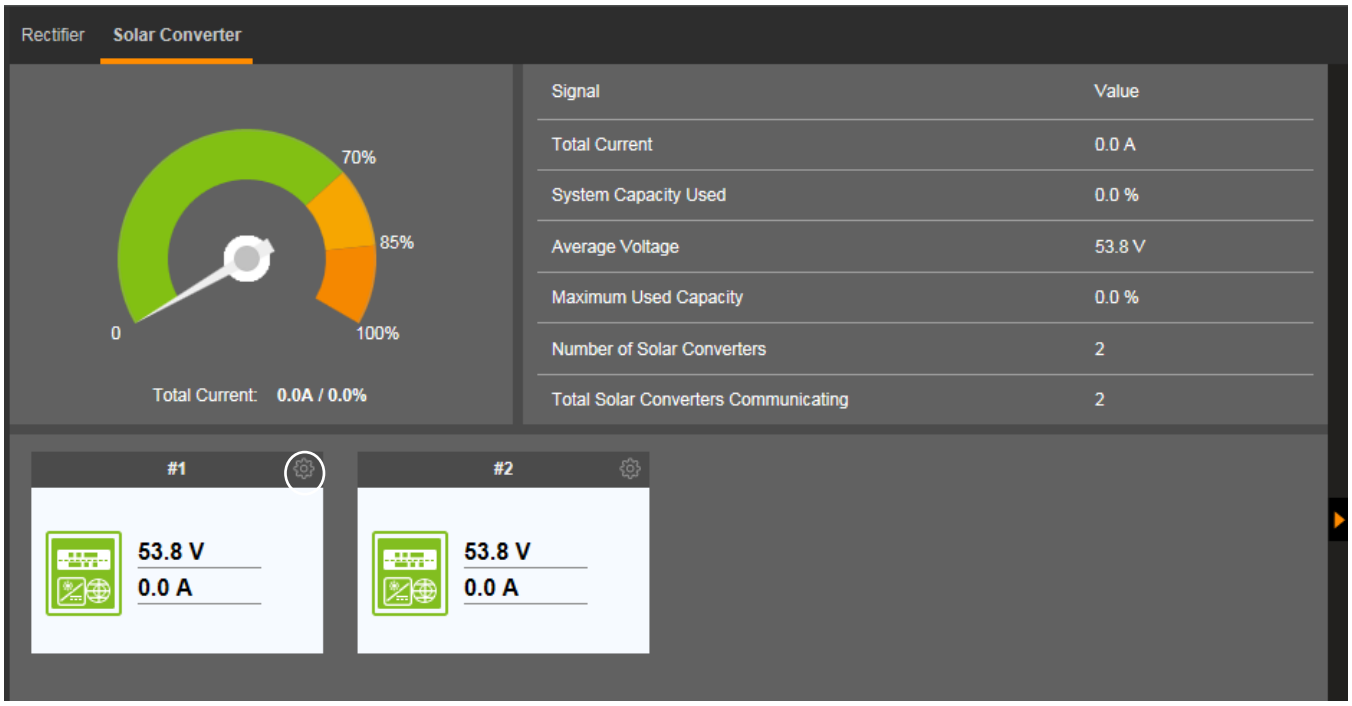
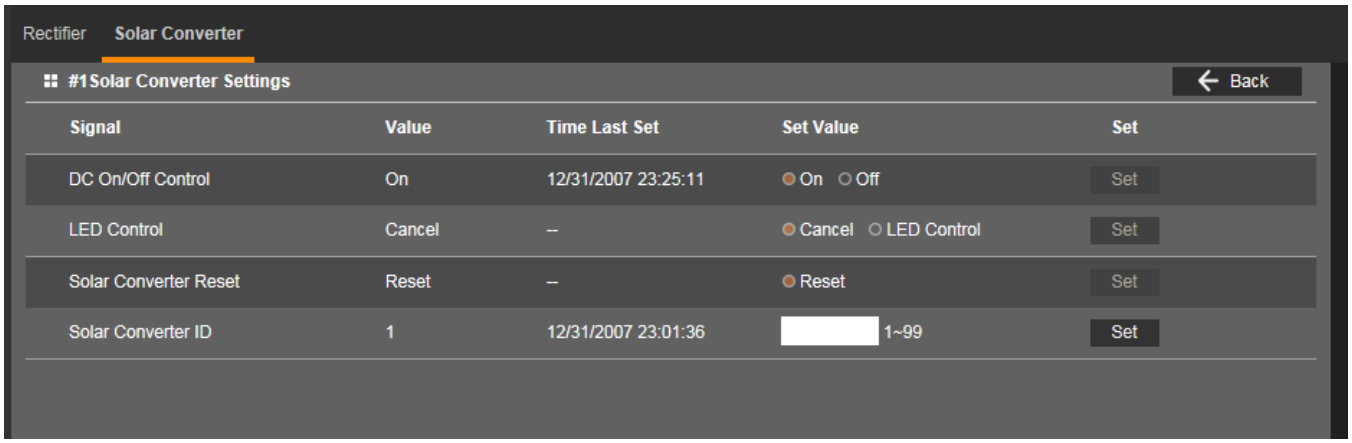


Figure 5.13 Individual Solar Converter Settings Page



NOTE! *Settings that appear "grayed out" can only be made when the controller is in the "manual control" state. If the controller is set for "automatic" control, change the "Auto/Manual State" setting first to the "Manual" setting.*

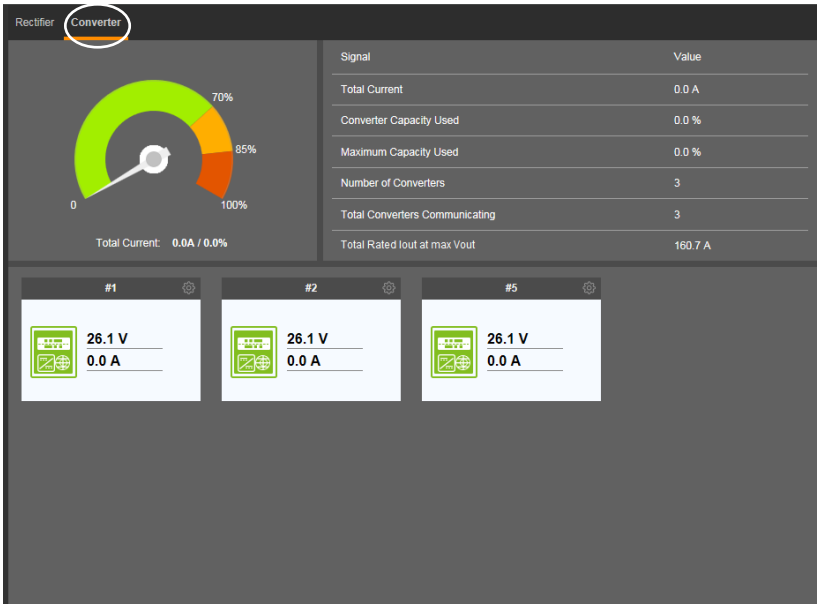
- **DC On/Off Control:** Temporarily turns the solar converter's DC output on or off when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.

- **LED Control:** Temporarily sets whether or not a solar converter's local power indicator blinks when the controller is communicating with the solar converter when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Solar Converter Reset:** Temporarily sets the solar converter's over voltage reset feature when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Solar Converter ID:** Sets the solar converter's identification number.

Converter Device Group Status Page Tab

This tab displays status values such as "Total Current", "Number of Converters", etc.

Figure 5.14 Converter Device Group Status Page Tab

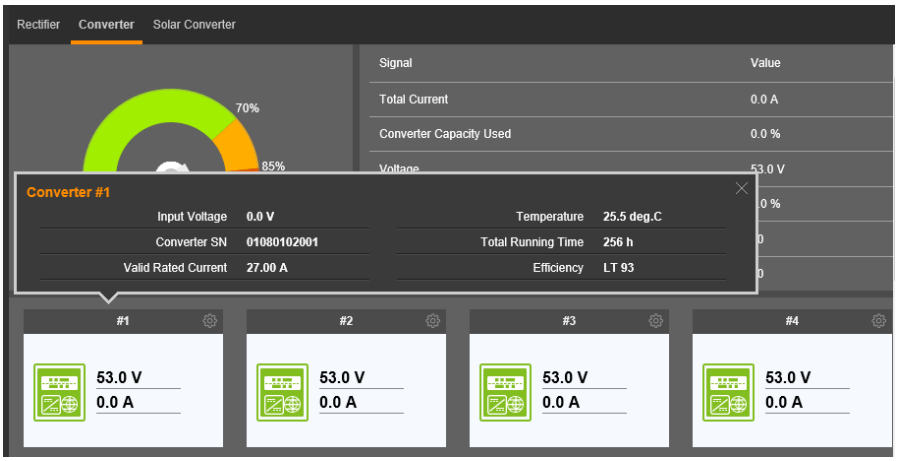


NOTE! *"Converter Capacity Used" and "Maximum Capacity Used" are based on 26 VDC.*

Individual Converter Status Page

Displayed on the Converter Device Group status page are the individual converters installed in the system. Click on an individual converter icon to display its status such as "Current", etc.

Figure 5.15 Individual Converter Status Page



Individual Converter Settings Page

In the Converter Device Group Status Page Tab, click the settings wheel icon to go to the individual converter settings page. Click Back to go back to the Converter Device Group Status Page Tab.

Figure 5.16 Selecting an Individual Converter Settings Page

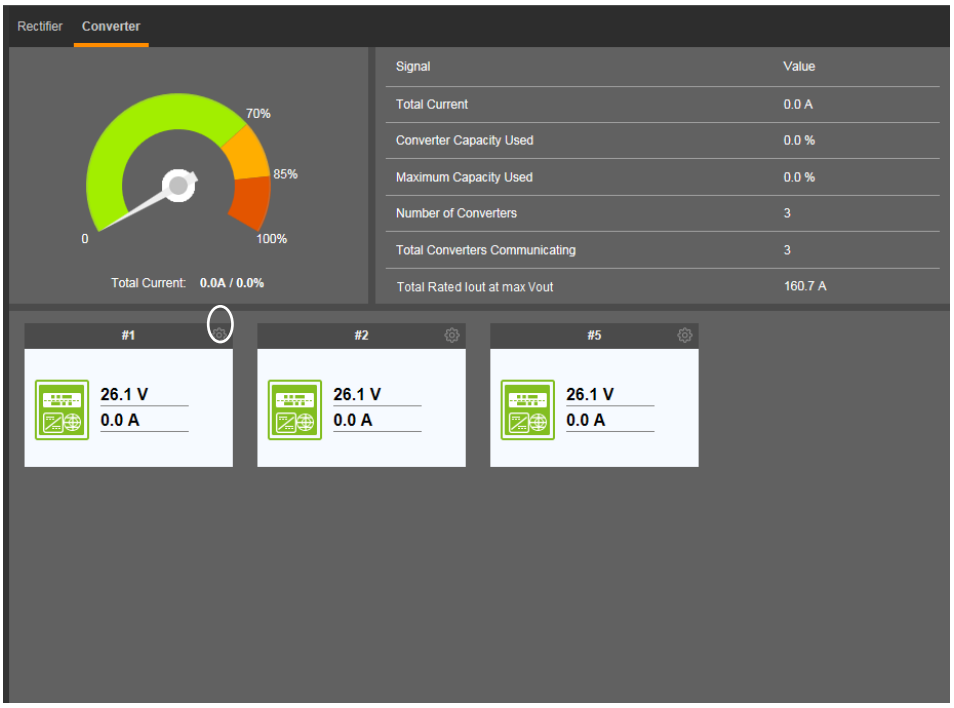
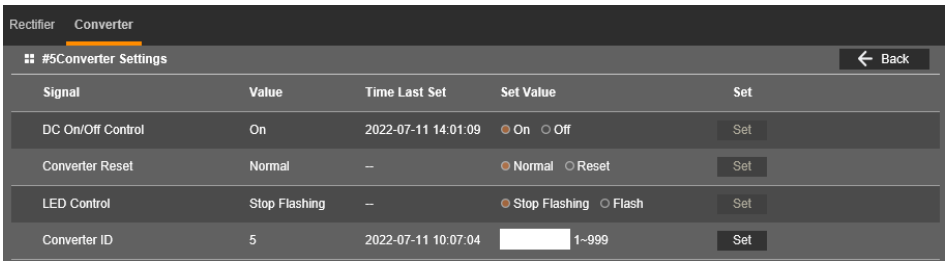


Figure 5.17 Individual Converter Settings Page



NOTE! *Settings that appear "grayed out" can only be made when the controller is in the "manual control" state. If the controller is set for "automatic" control, change the "Auto/Manual State" setting first to the "Manual" setting.*

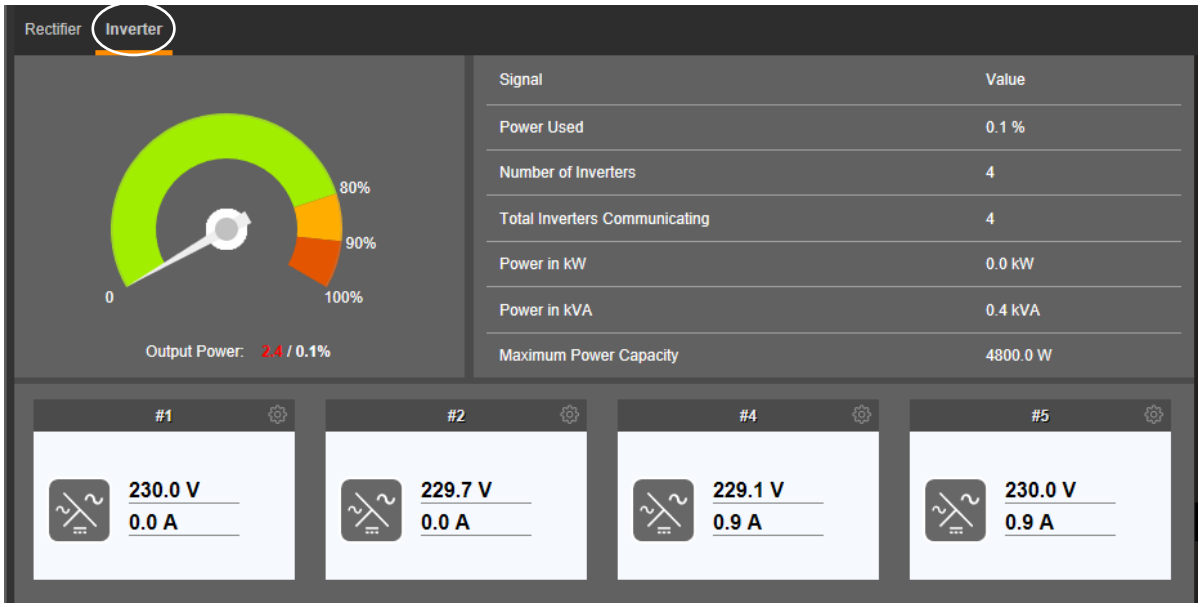
- **DC On/Off Control:** Temporarily turns the converter's DC output on or off when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Converter Reset:** Temporarily sets the converter's over voltage reset feature when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **LED Control:** Temporarily sets whether or not a converter's local power indicator blinks when the controller is communicating with the converter when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Converter ID:** Sets the converter's identification number.

NOTE! After Setting ID for all converters, you must go to Settings-DC / DC Converters Tab and click 'Yes' on 'Confirm Converters Position' to make your changes take effect.

Inverter Device Group Status Page Tab

This tab displays status values such as "Total Current", "Number of Inverters", etc.

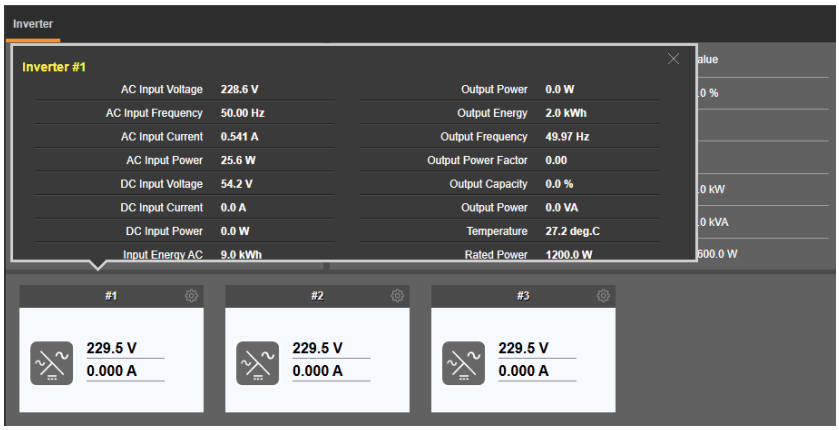
Figure 5.18 Inverter Device Group Status Page Tab



Individual Inverter Status Page

Displayed on the Inverter Device Group status page are the individual inverters installed in the system. Click on an individual inverter icon to display its status such as "Output Power", etc.

Figure 5.19 Individual Inverter Status Page



Individual Inverter Settings Page

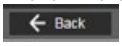
In the Inverter Device Group Status Page Tab, click the settings wheel icon  to go to the individual inverter settings page. Click  to go back to the Inverter Device Group Status Page Tab.

Figure 5.20 Selecting an Individual Inverter Settings Page

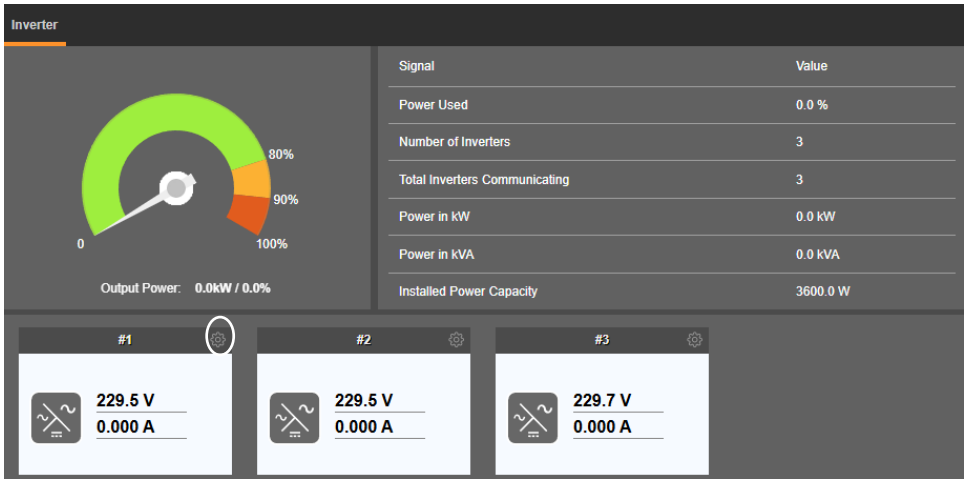
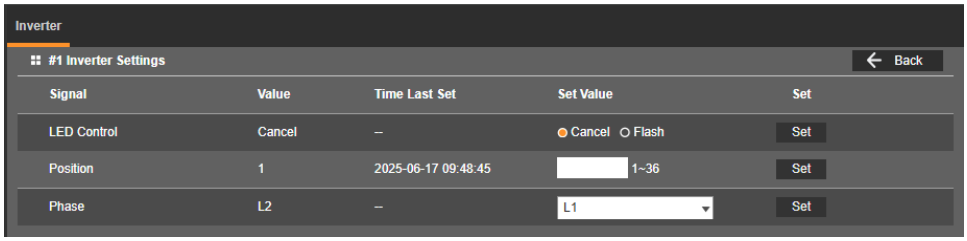


Figure 5.21 Individual Inverter Settings Page



NOTE! *Settings that appear "grayed out" can only be made when the controller is in the "manual control" state. If the controller is set for "automatic" control, change the "Auto/Manual State" setting first to the "Manual" setting.*

- **LED Control:** Temporarily sets whether or not an inverter's local power indicator blinks when the controller is communicating with the inverter when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Position:** Sets the inverter's identification number.
- **Phase:** Indicates the phase connected to the inverter's input.

NOTE! After Setting Position and / or Phase for all inverters, you must go to Settings-Inverter Tab and click 'Yes' on 'Confirm Inverter ID / Phase' to make your changes take effect.

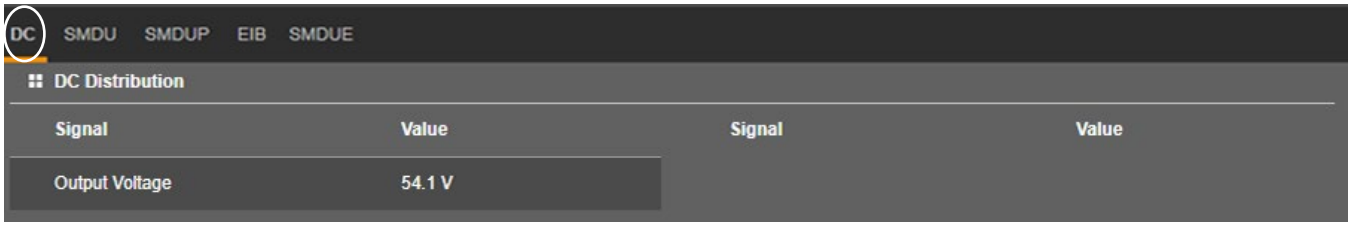
DC Device Group Status Page

Clicking on the DC icon on the power system status block diagram opens the status page for the DC Device Group. The DC Device Group status page contains multiple tabs (depending on the DC equipment installed in your power system). This includes DC, SMDU, SMDUP and EIB. The DC status page tab is shown next for an example.

DC Status Tab

This tab displays status values such as "DC Voltage".

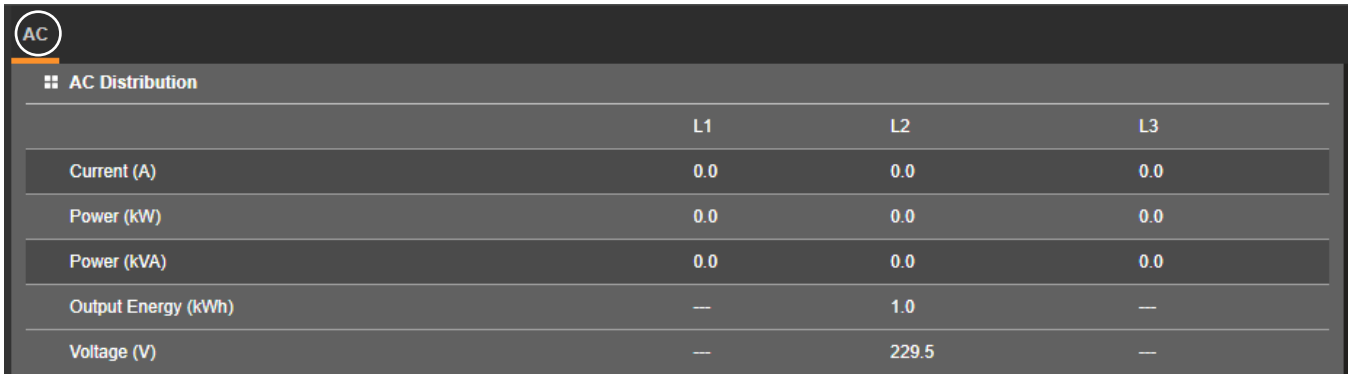
Figure 5.22 DC Device Group Status Tab



AC Device Group Status Page

Clicking on the AC icon on the power system status block diagram opens up the status page for the AC Distribution. The AC distribution status tab is shown for an example.

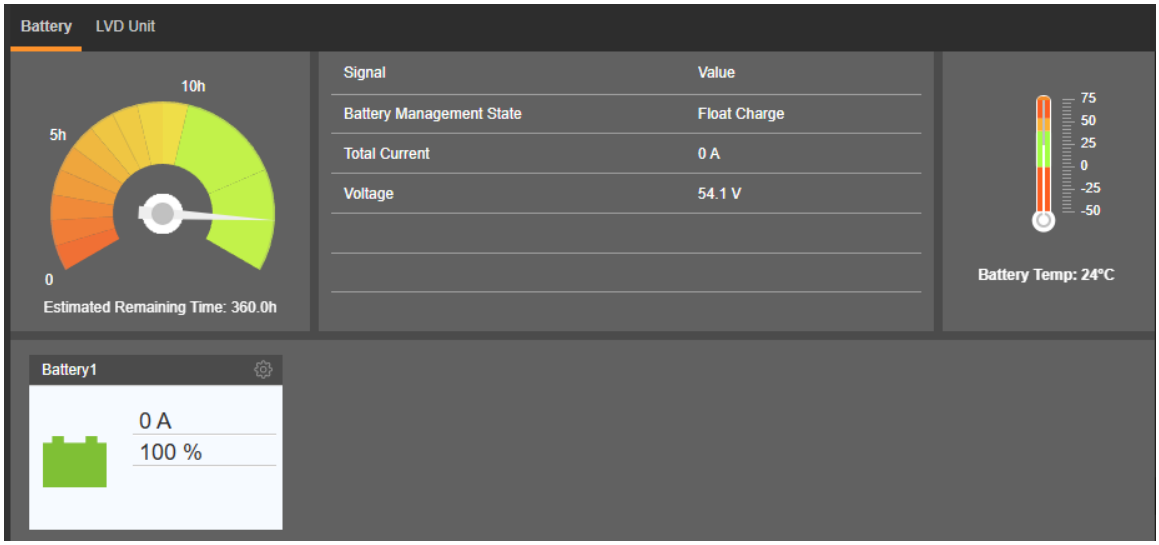
Figure 5.23 AC Device Group Status Page



Battery Device Group Status Page

Clicking on the battery icon on the power system status block diagram opens the status page for the Battery Device Group. The Battery Device Group status page displays battery status values such as "Battery Management State" and "Battery Temp". The actual display of the Battery Device Group status page is dependent on the controller configuration and if SMDU or EIB shunts are programmed as battery shunts (see Figure 5.24 for samples). If Lithium-Ion Battery(s) are connected and communicating via RS485, the BMS Battery Icon will appear and clicking on the icon will display status values such as Battery Current, SOC, Cycle Count, and Date of Manufacturing.

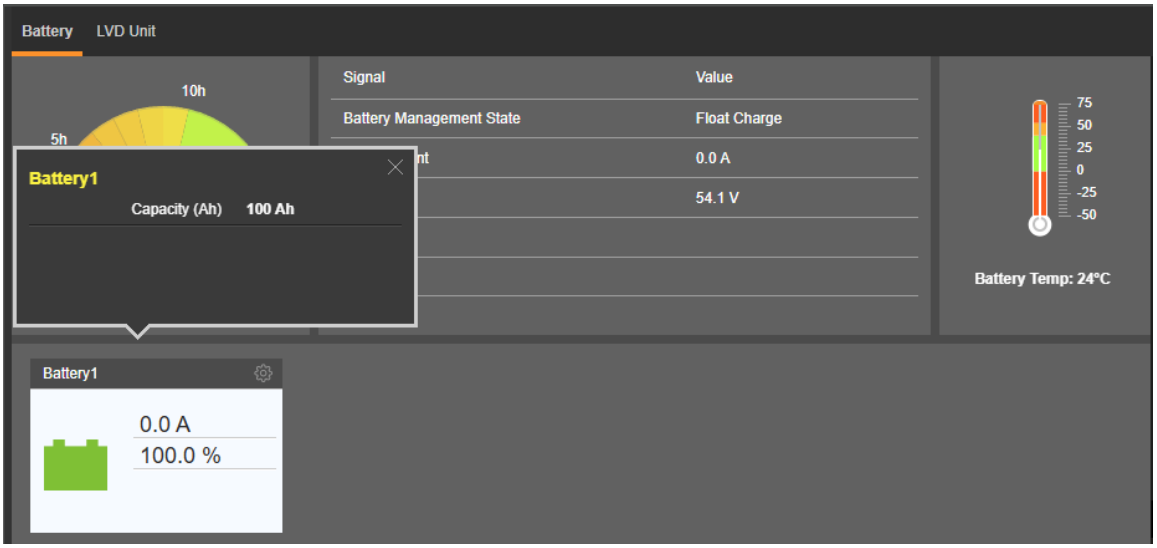
Figure 5.24 Sample Battery Device Group Status Page



Individual Battery Status Page

Displayed on the Battery Device Group status page are the individual batteries installed in the system. Hover the mouse over an individual battery icon to display its status such as "Battery Remaining (Ah)". The actual display of an Individual Battery status page is dependent on the controller configuration and if SMDU or EIB shunts are programmed as battery shunts (see Figure 5.25 for samples). If Lithium-Ion Battery(s) are connected and communicating via RS485, the BMS Battery Icon will appear and clicking on the icon will display status values such as Battery Current, SOC, Cycle Count, and Date of Manufacturing.

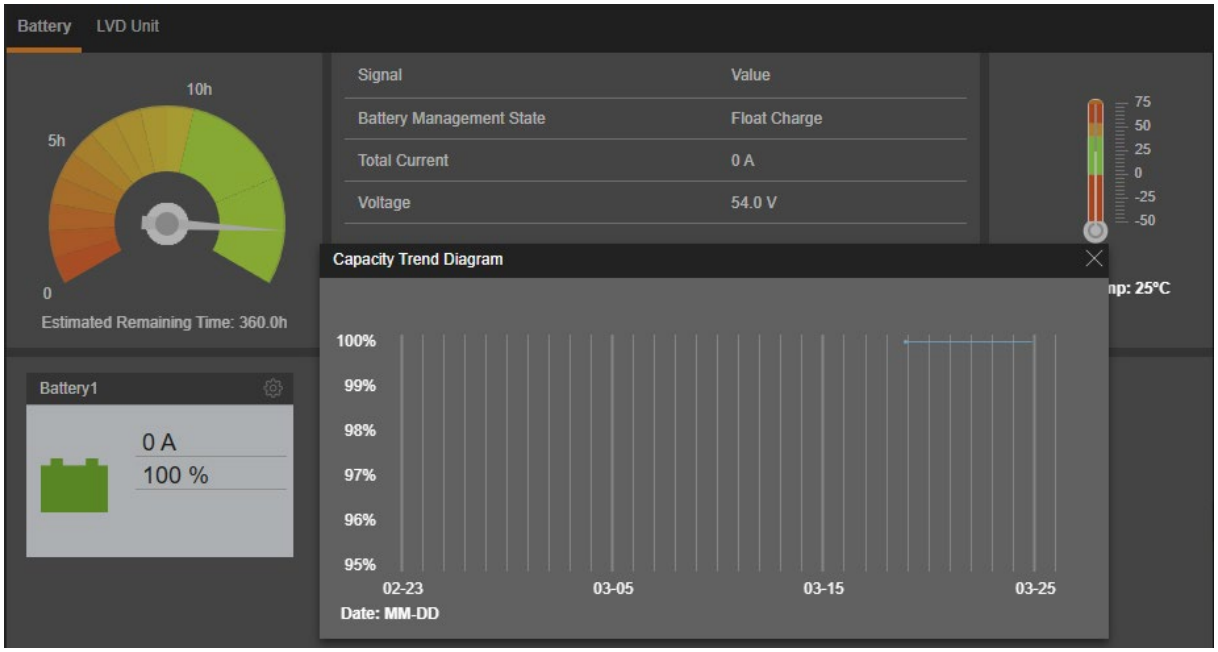
Figure 5.25 Sample Individual Battery Status Page



Individual Battery Capacity Trend Diagram or Info Screen

Displayed on the Battery Device Group status page are the individual batteries installed in the system. Click on an individual battery (Battery 1) to display its "Capacity Trend Diagram" or “info screen”. The actual display of an individual battery capacity trend diagram or info screen is dependent on the controller configuration. See Figure 5.26 for sample).

Figure 5.26 Sample Individual Battery Capacity Trend Diagram



Individual Battery Settings Page

In the Battery Device Group Status Page Tab, click the settings wheel icon to go to the individual battery settings page. See Figure 5.27. Click Back to go back to the Battery Device Group Status Page Tab. The actual display of an Individual Battery status is dependent on the controller configuration and if SMDU or EIB shunts are programmed as battery shunts (see Figure 5.28.) If Lithium-Ion Battery(s) are connected and communicating via RS485, the BMS Battery Icon will appear and clicking on the icon will display status values such as Battery Current, SOC, Cycle Count, and Date of Manufacturing.

Figure 5.27 Selecting an Individual Battery Settings Page

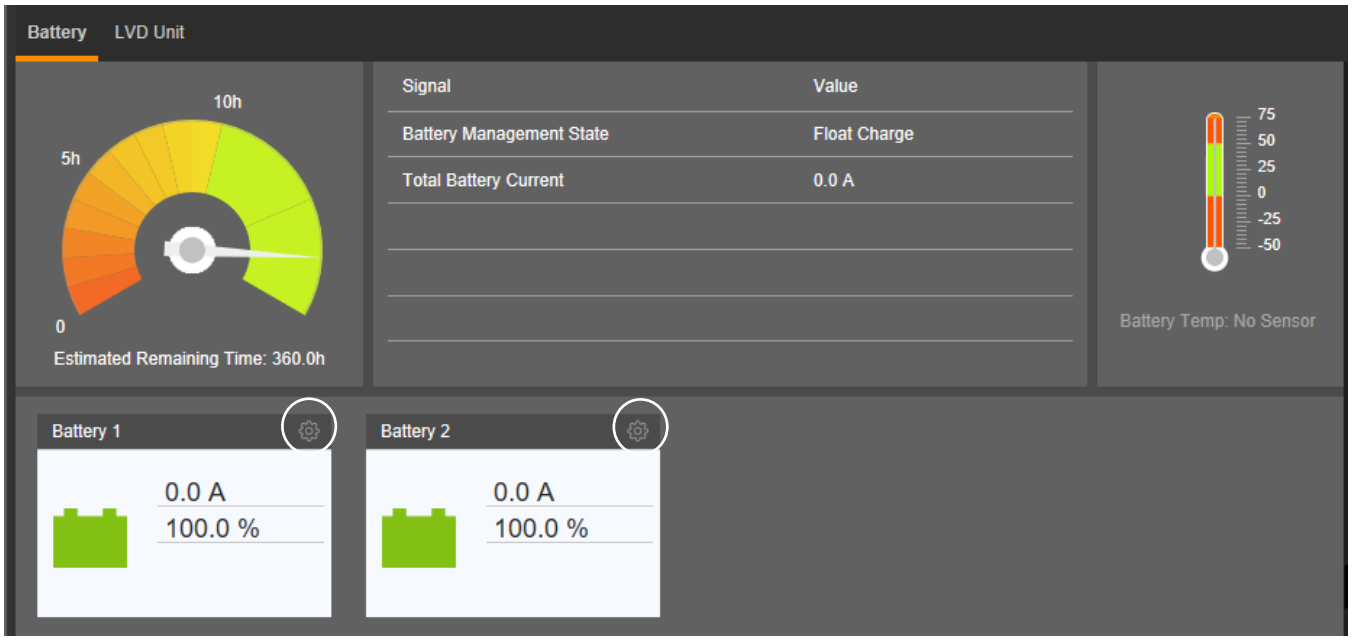
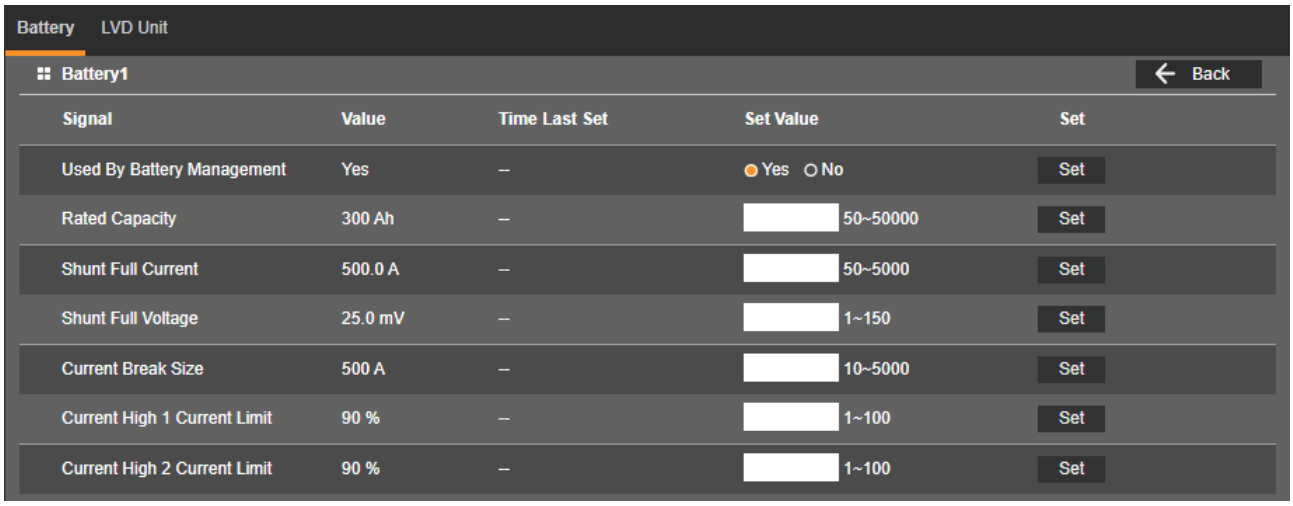


Figure 5.28 Individual Battery Settings Page (Battery #)



- **Used By Battery Management:** Select Yes to use the battery management feature and No to not use the feature for this battery.
- **Rated Capacity:** Enter the battery string's rated capacity.

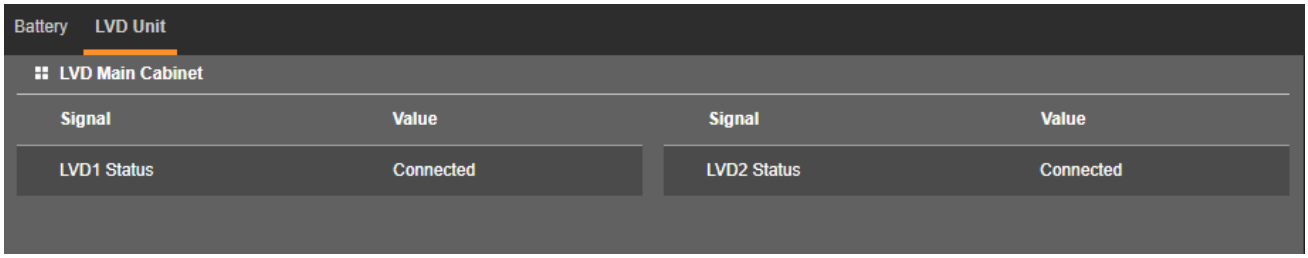
NOTE! *The "Rated Capacity" is the total of all the batteries rated capacities connected in parallel.*
Example: Three (3) 200 Ah batteries are connected in parallel and connected to the main system, then "Battery 1" "Rated Capacity" should be set to 600 Ah.

- **Shunt Full Current:** Enter the battery string's shunt current rating.

- **Shunt Full Voltage:** Enter the battery string's shunt voltage.
- **Current Break Size:** Enter the threshold value of current alarm.
- **Current High1 Current Limit:** Enter the high current limit point of current1.
- **Current High2 Current Limit:** Enter the too high current limit point of current1.

LVD Unit Page

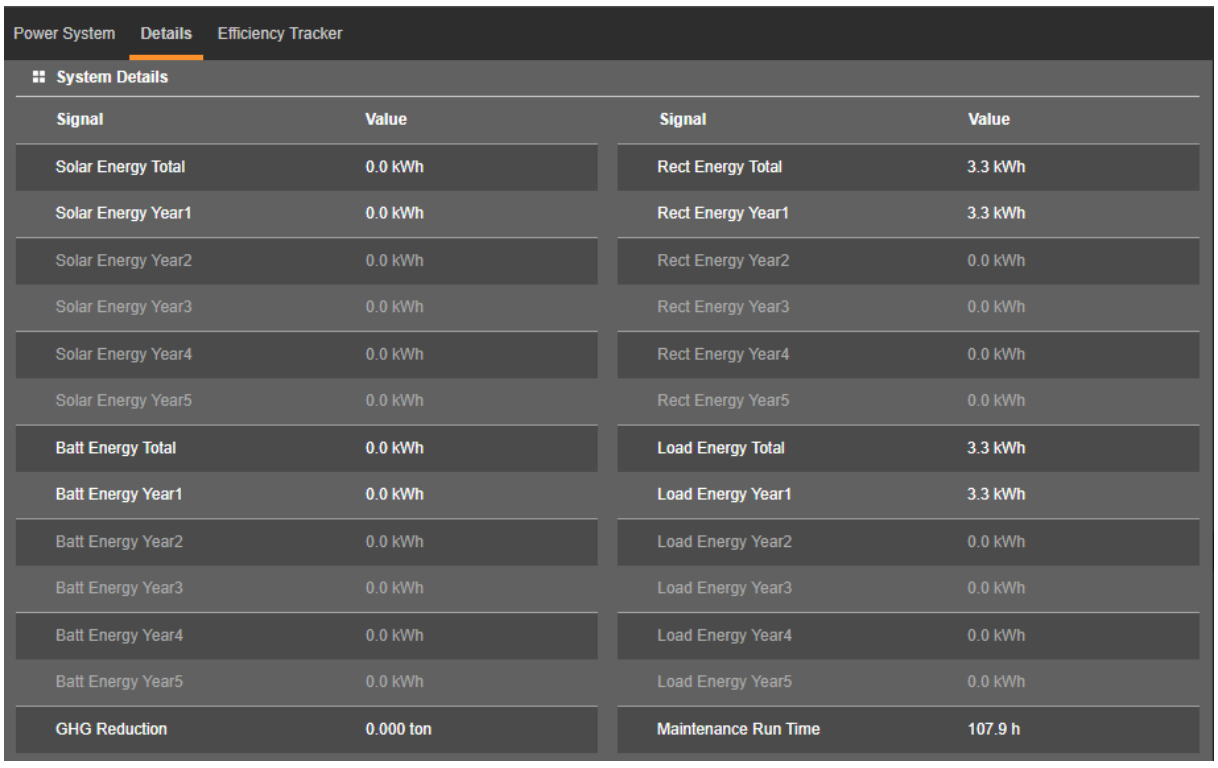
Figure 5.29*: LVD Unit Page*



5.8.2 System Details Tab

The User Details tab displays additional status entries.

Figure 5.30 System Details Tab

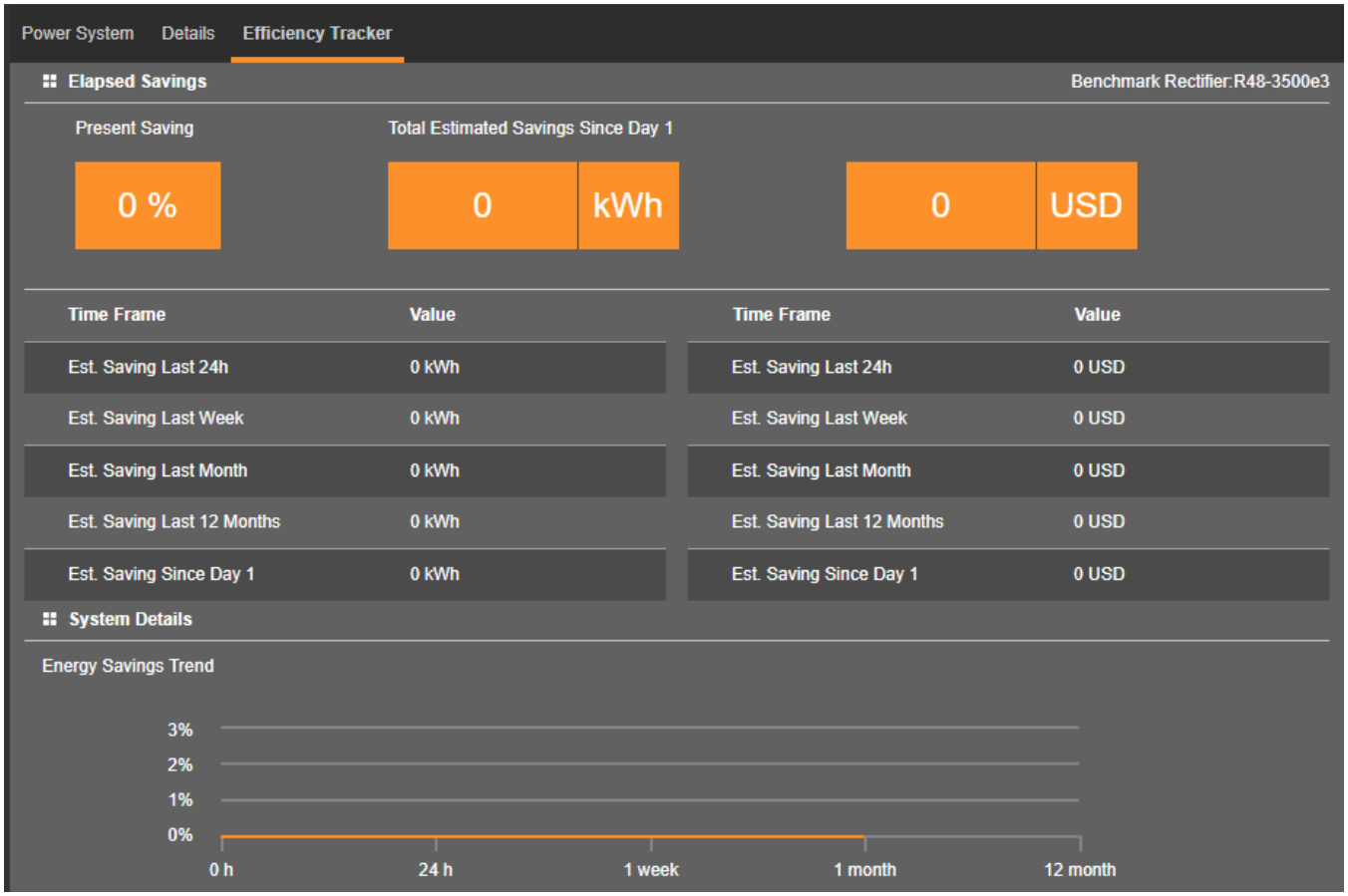


5.8.3 Efficiency Tracker Tab

The system can calculate energy saving for R48-3500e4, R48-3500e3 or R48-3200 and then present saving in kWh based on average load of last 24h, week, month, 12 months since day1.

Elapsed Saving, System Details are displayed on the Efficiency Tracker Web page.

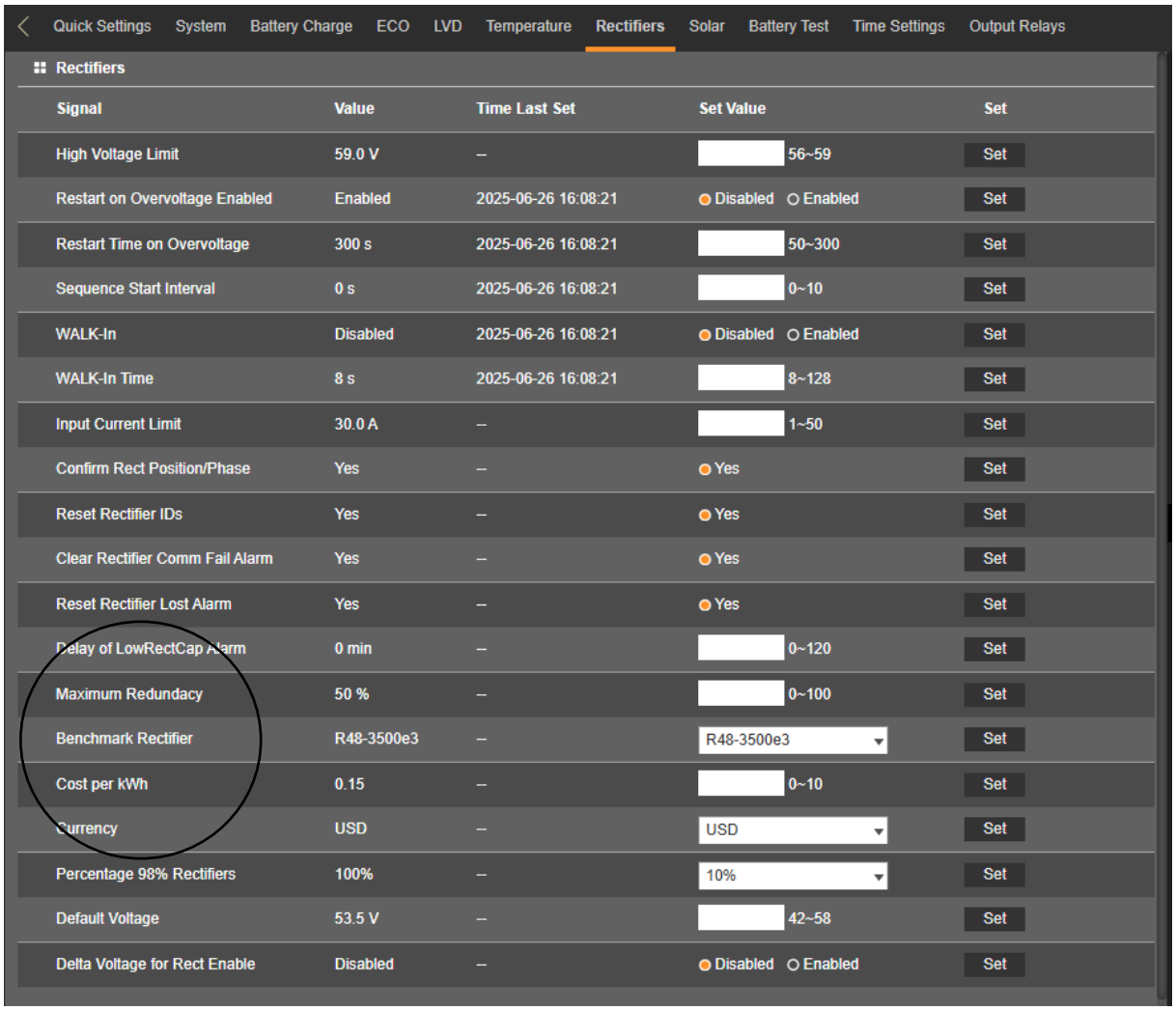
Figure 5.31 Efficiency Tracker Tab



Set Related Parameters

Click Settings and then select Rectifiers, set Benchmarks, Cost per kWh, Currency and Percentage 98% Rectifiers. As shown in the following:

Figure 5.32 Set Related Parameters for Efficiency Tracker



5.9 Menu Navigation Area

Available menus are displayed in this area. When a menu is clicked on, the system status screen is replaced with the selected menu's screen. Note that there is a menu item named HOME to return to the system status screen.

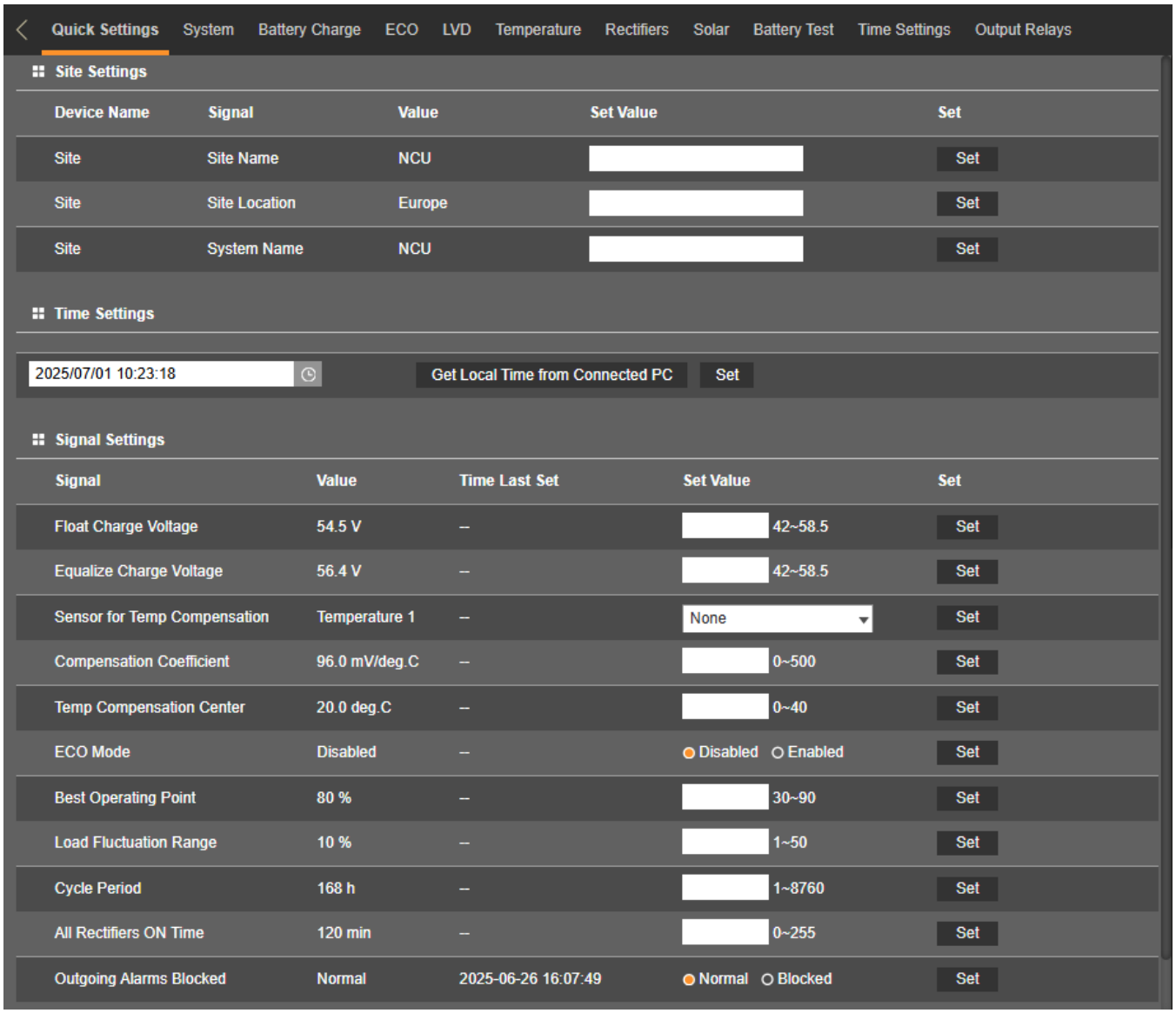
Located at the top of each main menus are tabs to select the various sub-menus. If there are more sub-menus then can be displayed in the window, an arrow appears to navigate to the additional sub-menus.

Figure 5.33 Menu Navigation Area

5.9.1 Settings Menu

The Settings Menu allows you to change (if you have the proper privilege level programmed in your user settings) the settings of the various programmable parameters. Settings are grouped per function. Select a tab in the Settings Menu to change that function's programmable parameters.

Figure 5.34 Settings Menu



Changing Programmable Parameters in the Settings Menu

To change a programmable parameter, select or enter a new value for the parameter then click on “Set” to change the value.

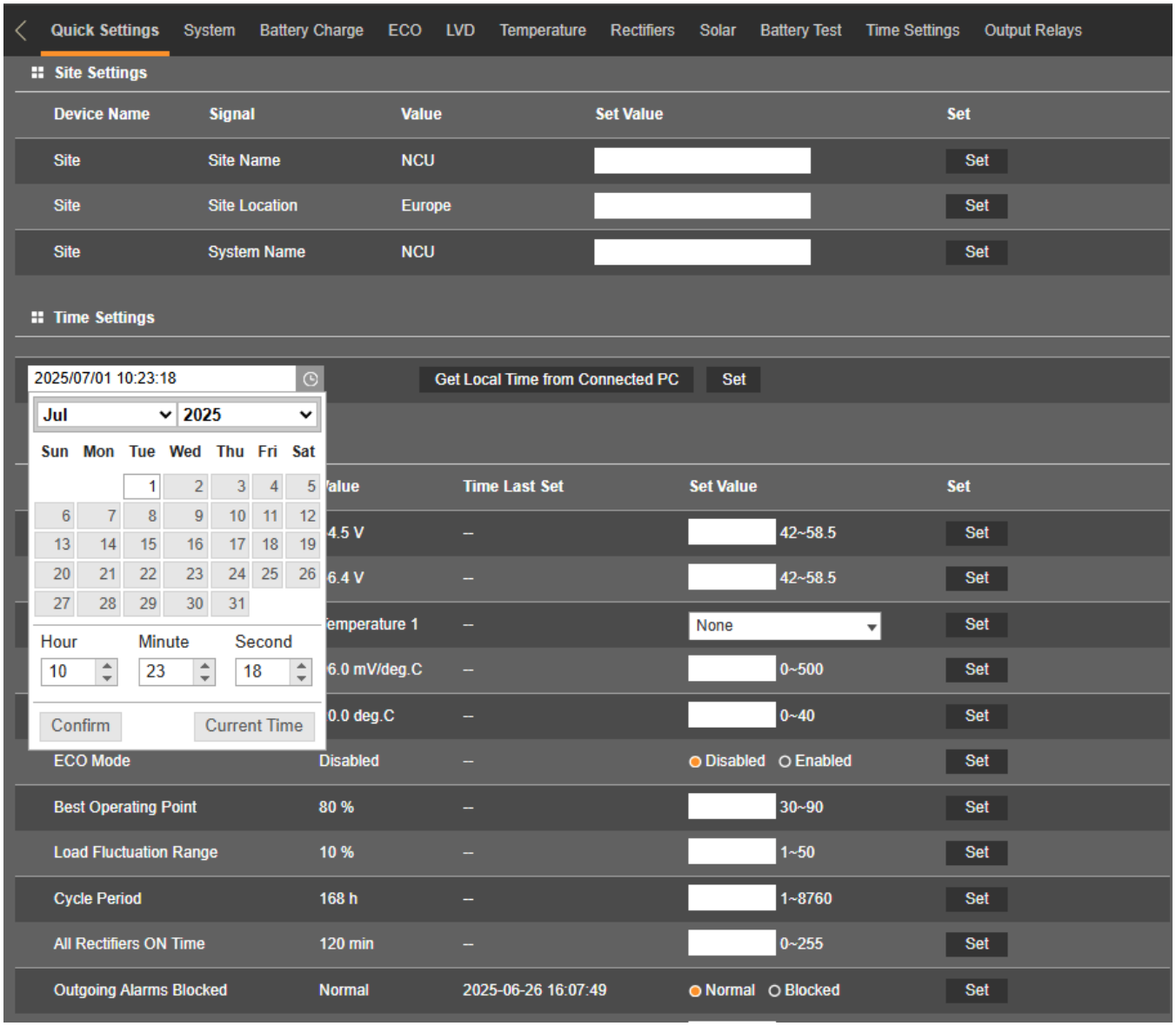
NOTE! *Settings that appear "grayed out" can only be made when the controller is in the "manual control" state. If the controller is set for "automatic" control, change the “Auto/Manual State” setting first to the “Manual” setting.*

Quick Settings Tab Programmable Parameter Descriptions

- **Site Settings:** Enter a "Site Name", "Site Location", and "System Name".
- **Time Settings:** Enter the time or select "Get Local Time from Connected PC".

  In the Time Settings section, click on "Get Local Time from Connected PC" and then “Set” to automatically set the date and time. To manually set the date and time, click on “the clock symbol” and enter the date and time. Then select the “Confirm” button. See Figure 5.35. In the Time Settings section, click on “Set” to save the change.

Figure 5.35 Manual Date and Time Menu



- **Signal Settings:**

  - **Float Charge Voltage:** Float Charge output voltage setting.
  - **Equalize Charge Voltage: Equalize** Charge output voltage setting.
  - **Sensor for Temp Compensation:** Select "None" for no temperature compensation, or the temperature probe [System Temp1, System Temp2, System Temp3, IB2-1 Temp1, IB2-1 Temp2, IB2-2 Temp1, IB2-2 Temp2, EIB-1 Temp1, EIB-1 Temp2, EIB-2 Temp1, EIB-2 Temp2, SMTemp1 Temp1, …, SMTemp1 Temp8, …, SMTemp8 Temp1, …, SMTemp8 Temp8], sensing battery temperature for temperature compensation. You can also select Maximum or Average which takes the maximum or average reading of the temperature probes [any of System Temp1, System Temp2, System Temp3, IB2-1 Temp1, IB2-1 Temp2, IB2-2 Temp1, IB2-2 Temp2, EIB-1 Temp1, EIB-1 Temp2, EIB-2 Temp1, EIB-2 Temp2, SMTemp1 Temp1, …, SMTemp1 Temp8, …, SMTemp8 Temp1, …, SMTemp8 Temp8], set as battery temperature probes. When set, the following parameters can also be set.
  - **Compensation Coefficient:** Sets the temperature compensation slope or rate of change per °C above or below the "Temperature Compensation Center" setting. This value is expressed in millivolt per °C per string (mV/°C/str). For example, for a rate of change of 72 mV/°C/str in a 24-cell 48V nominal battery string, the rate of change is 3 mV per cell.
  - **Temp Compensation Center:** Sets the temperature at which the system operates at normal voltage levels.

ALERT! The Energy Optimization Mode should NOT be used in systems that operate without batteries.

NOTE! *If the battery is ever disconnected, disable Energy Optimization Mode until the battery is reconnected.*

  - **ECO Mode:** Enables or disables the Energy Optimization Mode feature for all rectifiers. When enabled, the following parameters can be set.
    Best Operating Point: Percent of full load capacity that the rectifiers operate under in the Energy Optimization Mode.
    Load Fluctuation Range: If load fluctuation is less than this value, rectifiers are not turned on or off for Energy Optimization.
    Cycle Period: This is the time period that rectifiers are turned on and off to maintain an equal operating time for all rectifiers in the system.
    All Rects ON Time: Time all rectifiers are turned on at the end of the “Cycle Period”.
  - **Outgoing Alarms Blocked:**
    Normal: Alarms are processed normally.
    Blocked: Forces the alarm relays in the "off" state and blocks alarms from changing the relay state.
  - **Batt1 Rated Capacity:** Enter the battery string’s rated capacity.

NOTE! *Only reset the battery capacity when the battery is fully charged; otherwise, the battery charge status may not be accurate.*

System Tab Programmable Parameter Descriptions

Power System

- **Reset Maintenance Run Time:** In manual mode, the only selection for " Reset Maintenance Run Time" is Yes. Once Yes is selected and confirmed, the Power System's Maintenance Run Time log is cleared.

- **Clear Energy Accumulated:** Clears the accumulated energy. Once Yes is selected and confirmed, the Energy accumulated is cleared.

- **Auto/Manual State:**

  Auto: The controller automatically controls the power system.

  Manual: A User can manually change certain power system control settings. This provides a convenient means of making temporary adjustment changes for testing purposes.

- **To Auto Delay:** Sets time limit in manual mode. When time has expired the NCU will go back to Auto mode. A delay of 0h, means that NCU will always stay in manual mode.
- **With Fan Control Unit:** Whether there is a fan control unit.
- **Maintenance Interval:** The maintenance cycle time is the number of days before a Maintenance Alarm is issued.
- **Over Load Alarm Level:** Sets the overload alarm level, the settable point starts from 50%.
- **Emergency Stop/ Shutdown:**

  -Disabled: Disables the Emergency Stop and Emergency Shutdown functions.

  -EStop: Enables the Emergency Stop function. (If utilized in the system, an Estop signal shuts down and locks out the system. The system must be manually restarted. Refer to the system instruction manual for restarting procedure.)

  -EShutdown: Enables the Emergency Shutdown function. (If utilized in the system, an EShutdown signal shuts down the system. The system automatically restarts when the signal is removed.)

- **Outgoing Alarms Blocked:**

  Normal: Alarms are processed normally.

  Blocked: Forces the alarm relays in the "off" state and blocks alarms from changing the relay state.

- **Over Voltage 1:** Sets the Over Voltage 1 alarm point.
- **Over Voltage 2:** Sets the Over Voltage 2 alarm point.
- **Under Voltage 1:** Sets the Under Voltage 1 alarm point.
- **Under Voltage 2:** Sets the Under Voltage 2 alarm point.
- **System Type:** Sets the system type: Mixed or Inverter Only.
- **Solar Mode:** Sets solar mode as Disabled, RECT-SOLAR, or SOLAR.

  -**Disabled:** Disables the solar mode function.

  -**RECT-SOLAR:** If you have both rectifiers and solar converters in the system, set Solar Mode to “RECT-SOLAR”. In the Battery Settings tab, also set the “Float Charge Voltage (Solar)” parameter to the desired float setting. If battery current imitation mode is the to Current, the parameter “Float Charge Voltage (Rect)” setting MUST be set 0.3 V lower than the “Float Charge Voltage (Solar)” parameter setting for solar converters to operate properly.

  -**SOLAR:** If you have only solar converters in the system, set Solar Mode to “SOLAR”.

- **Running Way (For Solar):** Sets the running way as RECT First or Solar First.
- **GHG Reduction Coefficient:** Sets the Green House Gas emission reduction factor.
- **DHCP Enable:** The DHCP function allows the controller to acquire an IP address automatically. This function can only be enabled or disabled via the local display and keypad. If this function is enabled and the acquisition of an IP address fails, an alarm is generated. If the acquisition of an IP address is successful, you need to record the IP address automatically acquired by the controller to access the controller via the Web Interface. This IP address is displayed in the IP Address field below the DHCP setting in the local display menu (Main Menu / Settings Icon / Comm Settings).
- **Reconfig FCUPlus:** Sets the time for reconfigure FCUPlus.

- **SSH Enabled:** Enables or disables the SSH protocol.
- **Only Monitor BMS and FCUP:** Chooses whether or not to only monitor BMS and FCUP. When this setting is set to yes, only BMS batteries and FCUP will be searched for when doing an auto config, which makes this procedure quicker. If you have other equipment on the RS485 bus, like a Carlo Gavazzi AC meter, this setting needs to be set to No.

AC Equipment

Rectifier AC

- **Nominal Phase Voltage:** Enter the nominal line to neutral voltage (single phase rectifier) or nominal line to line voltage (three phase rectifier).
- **Mains Failure Alarm Threshold 1:** Sets the mains fail alarm 1 value (percent of nominal).
- **Mains Failure Alarm Threshold 2:** Sets the mains fail alarm 2 value (percent of nominal).

Corresponding Alarms:

Low Phase Voltage L1 (Nominal Minus "Mains Failure Alarm 1" Percent of Nominal)

Very Low Phase Voltage L1 (Nominal Minus " Mains Failure Alarm 2" Percent of Nominal)

High Phase Voltage L1 (Nominal Plus " Mains Failure Alarm 1" Percent of Nominal)

Very High Phase Voltage L1 (Nominal Plus "V Mains Failure Alarm 2" Percent of Nominal)

L1 used in the example above, L2 and L3 are similar.

DC Equipment

DC Distribution

- **Shunt Full Current:** Enter the shunt's current rating.
- **Shunt Full Voltage:** Enter the shunt's voltage rating.
- **Load Shunt Exists:** Whether the load shunt is existed.

LVD Group

NOTE! *HTD Reconnect Point and HTD Point require a BTRM sensor. The BTRM sensor is the sensor which is used for the High Temperature Disconnect (HTD) Feature.*

- **HTD Reconnect Point:** Sets temperature at which a reconnect will occur following a high temperature disconnect.
- **HTD Point:** Sets high temperature limit at which LVD1 and/or LVD2 contactors will open (disconnect) if the HTD1 and/or HTD2 features are enabled. If this temperature is reached, a disconnect occurs regardless of voltage.
- **LVD3 Enable:** Enables or disables LVD3.

  Relay for LVD3: Selects relay for LVD3.

EIB Equipment

EIB1

- **Shunt # Set As (Not Used, General, Load, Battery):**

  Not Used: Indicates this shunt input is not used.

General: Indicates the measurement of the shunt will be displayed and will not be added to Total DC Load or Total Battery Load.

Load: Indicates the measurement of the shunt will be displayed and added to the Total DC Load.

Battery: Indicates the measurement of the shunt will be displayed and added to the Total Battery Load and used with Battery Management.

- **Shunt # Full Current:** Enter the shunt's current rating.
- **Shunt # Full Voltage:** Enter the shunt's voltage rating.
- **Voltage Type:** The EIB assembly provides a total of eight (8) DC voltage inputs for battery block monitoring.

  24 (Block 2): Selects the EIB to monitor up to four (4) 24V battery strings with two (2) 12V blocks per string.

  48 (Block 4): Selects the EIB to monitor up to two (2) 48V battery strings with four (4) 12V blocks per string.

  Mid-Point: Selects the EIB to monitor the midpoint voltage of up to eight (8) battery strings for either 24V or 48V systems.

  Disabled: Disables the battery block monitoring feature.
- **Block In-Use Num:** Number of 12 V battery blocks being used.
- **Block Voltage Diff (12V):** This menu item appears if "24 (Block 2)" or "48 (Block 4)" is selected above. The "Block Voltage Diff (12V)" setting selects the alarm threshold for battery block monitoring. The NCU issues an alarm when any block voltage of any battery string has an abnormal value. The alarm is issued when the difference between any block voltage and a reference voltage is greater than the value of the block voltage difference setting.
- **Block Voltage Diff (Mid):** This menu item appears if "Mid-Point" is selected above. The "Block Voltage Diff (Mid)" setting selects the alarm threshold for battery midpoint monitoring. The NCU issues an alarm when any battery midpoint voltage of any battery string has an abnormal value. The alarm is issued when the difference between any battery midpoint voltage and a reference voltage is greater than the value of the block voltage difference setting.

Battery Charge Tab Programmable Parameter Descriptions

- **Very High Battery Temp Action:**

  Disabled: Disables the Battery Thermal Runaway Management feature.

  Lowering Voltage: Sets the Battery Thermal Runaway Management feature to reducing the output voltage when battery temperature exceeds the Very High BTRM Temperature setting.
- **Very High Temp Voltage:** The voltage to use when battery temperature is very and Very High Battery Temp Action is set to Lowering Voltage.
- **Low Capacity Level:** Battery low-capacity alarm set point.
- **Float Charge Voltage:** Float Charge output voltage setting. This setting is visible when solar mode is disabled or battery Current Limit Mode is set to Voltage.
- **Equalize Charge Voltage:** Equalize Charge output voltage setting. This setting is visible when solar mode is disabled or battery Current Limit Mode is set to Voltage.
- **Float Charge Voltage (Solar):** Float Charge output voltage for solar converters. This setting is visible when solar mode is enabled and battery Current Limit Mode is set to Current.

- **Equalize Charge Voltage (Solar):** Equalize Charge output voltage for solar converters. This setting is visible when solar mode is enabled and battery Current Limit Mode is set to Current.
- **Float Charge Voltage (RECT):** Float Charge output voltage for rectifiers. This setting is visible when solar mode is enabled and battery Current Limit Mode is set to Current.
- **Equalize Charge Voltage (RECT):** Equalize Charge output voltage for rectifiers. This setting is visible when solar mode is enabled and battery Current Limit Mode is set to Current.
- **Battery Current Limit:** Maximum battery charging current setting. For example, a value of 0.150C10 means that the charging current is limited to 15% of the battery's nominal capacity.
- **Over Current Setpoint:** Battery over current alarm setting. For example, a value of 0.300C10 means that when the charging current reaches 30% of the battery's nominal capacity, an alarm will be extended.
- **Automatic Equalize:** Enables or disables the Automatic Equalize Charge feature. When enabled, the following parameters can be set.
- **Equalize Start Current:** The system is transferred to Equalize Charge mode when battery charge current exceeds this setting for 3 minutes. For example, a value of 0.060C10 means that an Automatic Equalize is started if the battery charge current is greater than 6% of the battery's nominal capacity.
- **Equalize Start Capacity:** The system is transferred to Equalize Charge mode when remaining battery capacity decreases to this setting.
- **Equalize Stop Current:** When in Equalize Charge mode and the battery charge current decreases below this setting, the equalize charge will continue for the time set in "Equalize Charge Stop Delay Time". After that the system is transferred to Float Charge mode. For example, a value of 0.010C10 means that when the charging current is less than 1% of the battery's nominal capacity, the system returns to the Float mode.
- **Equalize Stop Delay Time:** See "Equalize Charge Stop Current" above.
- **Maximum Equalize Charge Time:** This is the maximum duration, in minutes, that an Automatic Equalize Charge will last regardless of the other settings.
- **Equalize Charge for Test:** Enables or disables the Equalize Charge before battery test feature. When enabled, an equalize charge will be performed before doing a planned battery test.
- **Cyclic Equalize Charge:** Enables or disables cyclic (scheduled) Equalize charging. When enabled, the following parameters can be set.

  Cyclic BC Charge Start Time: The date and time for first cyclic equalize charge.

  Cyclic Equalize Charge Interval: Cyclic (scheduled) Equalize charging interval.

  Cyclic Equalize Charge Duration: Cyclic (scheduled) Equalize charging duration.
- **Temperature Compensation Center:** Sets the temperature at which the system operates at normal voltage levels.
- **Compensation Coefficient:** Sets the temperature compensation slope or rate of change per ºC above or below the "Temp Compensation Center" setting. This value is expressed in millivolt per ºC per string (mV/ºC/str). For example, for a rate of change of 72 mV/ºC/str in a 24-cell 48V nominal battery string, the rate of change is 3 mV per cell.
- **Curr Limited Mode:** Selects the current limit mode (disabled, current, or voltage).
- **Batt 1 Rated Capacity:** Enter the battery string's rated capacity.

- **Batt 2 Rated Capacity:** Enter the battery string's rated capacity.
- **Equalize/Float Charge Control:** Places the system in Equalize Charge or Float Charge mode.
- **Reset Abnormal Batt Curr Alarm:** Resets an abnormal battery current alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm resets.
- **Reset Battery Capacity:** Resets the battery capacity calculation.
- **Clear Batt Curr Pos Threshold：** Sets the battery current value positive threshold. If measured battery current is between 0A and this threshold it will be replaced by 0A.
- **Clear Batt Curr Neg Threshold：** Sets the battery current value negative threshold. If measured battery current is between 0A and this threshold it will be replaced by 0A.
- **Monitor BattCurrImbal:** Enables or disables the monitor battery current imbalance.
- **Deviation Limit:** Sets the Deviation current limit value when Monitor BattCurrImbal is enabled.
- **Allowed Deviation Length:** Sets the allowed Deviation time when Monitor BattCurrImbal is enabled.
- **Alarm Clear Time:** Sets the alarm clear time when Monitor BattCurrImbal is enabled.
- **Min Voltage for BCL:** Sets the minimum voltage for battery charge current limitation function.
- **Action of BattFuseAlm:** Selects the action of battery fuse alarm: Adjust to Min Voltage; Adjust to default Voltage and None.
- **Voltage Adjust Gain:** Sets the voltage adjust gain.
- **Upper Limit:** Sets the upper limit value.
- **Slow Speed Coefficient:** Sets the slow speed coefficient value, the value should be lower than fast speed coefficient.
- **Fast Speed Coefficient:** Sets the fast speed coefficient value, the value should be higher than fast speed coefficient.
- **Cycle Number:** Sets the cycle number.
- **Peak Load Shift Enable:** Enabled or disabled the peak load shift function. When is it active, the rectifiers output voltage will be lowered to “Peak Load Shift Volt” so that the batteries will support some or all of the load.
- **Peak Load Shift Volt:** Rectifier output voltage when peak load shift function is active.
- **Peak Load Shift Batt SOC:** If the battery SOC is below this value, the peak load shift function will not be active.
- **PeakLoad Period1 Start:** Start time for first peak load shift interval.
- **PeakLoad Period1 Stop:** Stop time for first peak load shift interval.
- **PeakLoad Period2 Start** to **PeakLoad Period4 Start**, and **PeakLoad Period2 Stop** to **PeakLoad Period4 Stop**: Additional peak load shift periods.
- **Use Soc BMS:** Chooses whether or not to use Soc from battery management system.
- **Shift to Trad. Cap if BMS Comm Fail:** The controller typically calculates battery state of charge (SOC) using measured battery current and the rated capacity. When “Use Soc BMS” is set to “Yes” in the Battery Charge Setting, the controller will use the SOC reported by the BMS for Li-batteries instead. If communication with the BMS fails and the option Shift to Trad. Cap if BMS Comm Fail is enabled, the controller will revert to calculating SOC traditionally, starting from the last SOC value reported by the BMS.

- **EQTemp Comp Coefficient:** Sets the Equalize temperature compensation slope or rate of change per ºC.
- **MPPT Input Voltage Threshold:** Sets the MPPT input voltage threshold value.
- **Max Diff Volt of Solar and RECT:** Sets the maximum difference between solar voltage and rectifier voltage.
- **Min Diff Volt of Solar and RECT:** Sets the minimum difference between solar voltage and rectifier voltage.
- **Use Rated Batt Cap From BMS:** Chooses whether or not to use rated battery capacity from battery management system.
- **Use BMS BCL:** Chooses whether or not to use battery management system for battery charge current limit
- **Cold Limit Enable:** Enables or disables cold limit function.
- **Cold Limit Temp Threshold:** Sets the cold limit temperature threshold value.
- **Reduced BCL Point:** Sets the reduced battery charge current limit point when cold limit function is enabled and the temperature is below Cold Limit Temp Threshold.

ECO Tab Programmable Parameter Descriptions

- **ECO Mode:** Enables or disables the Energy Optimization Mode feature for all rectifiers. When enabled, the following parameters can be set.

ALERT! The Energy Optimization Mode should NOT be used in systems that operate without batteries.

NOTE! *If the battery is ever disconnected, disable Energy Optimization Mode until the battery is reconnected.*

Best Operating Point: Percent of full load capacity that the rectifiers operate under in the Energy Optimization mode.

Load Fluctuation Range: If load fluctuation is less than this value, rectifiers are not turned on or off for Energy Optimization.

ECO Mode Capacity Limit: Energy Optimization is disabled if the load is greater than this setting.

Cycle Period: This is the time period that rectifiers are turned on and off to maintain an equal operating time for all rectifiers in the system.

All Rects ON Time: Time all rectifiers are turned on at the end of the “Cycle Period”.

Switch Off Delay: When the Energy Optimization feature determines a rectifier can be switched off, this is the time delay before the rectifier is turned off.

- **Reset ECO Cycle Alarm:** Resets the ECO Cycle Alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm resets.

LVD Tab Programmable Parameter Descriptions

LVD Main Cabinet

- **BLVD:** Enables or disables BLVD. When enabled, the following parameters can be set.

BLVD By Battery Capacity: Enables or disables BLVD to disconnect on low battery capacity (when BLVD is enabled).

BLVD Disconnect Capacity: BLVD low battery capacity disconnect setting (when BLVD by Capacity is enabled).

BLVD Voltage: BLVD low voltage disconnect setting (when BLVD is enabled).

BLVD Reconnect Voltage: BLVD reconnect setting (when BLVD is enabled).

BLVD Reconnect Delay: Delay time period until BLVD reconnects.

BLVD By Time: Enables or disables BLVD to disconnect based on time from AC failure (when BLVD is enabled). For BLVD to disconnect, the system voltage must be below the BLVD Reconnect Voltage level and the battery in discharge.

BLVDTime: The time period before BLVD disconnection once an AC fail condition occurs (when BLVD By Time is enabled).

BLVD Dependency: Select if BLVD can disconnect only if LVD 1 or LVD 3 has disconnected, or none.

BLVD Control: Connected or Disconnected BLVD control.

BLVD AC Fail Required to Disconnect: Select if BLVD can disconnect only if AC failure condition occurs.

BLVD AC Required to Reconnect: Select if BLVD can reconnect while in AC failure condition.

High Temp Discon BLVD: Enables or disables the High Temperature 1 Disconnect feature. This feature causes BLVD contactors to open (disconnect) if a high temperature event occurs. (See "HTD Point" and "HTD Reconnect Point" under the "System Tab Programmable Parameter Descriptions" starting on page 89.)

BLVD Contactor Type: Select the type of BLVD Contactor. This setting should not be changed.

LVD1 Control: Manually connect or disconnect LVD1.

Temperature Probes Tab Programmable Parameter Descriptions

- **Ambient Temperature Sensor:** Sets the temperature sensor which displays the ambient temperature on the Web Interface's Homepage. Note that this temperature sensor MUST be set as an ambient temperature sensor. Select "None", or the temperature sensor (System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1 …, SMTemp1 T8, SMTemp8 T1 …, SMTemp8 T8). You can also select Maximum or Average which takes the maximum or average reading of the temperature sensors (any of System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1 …, SMTemp1 T8, SMTemp8 T1 …, SMTemp8 T8) set as ambient temperature sensors. When set to any value except "none", the following parameters can be set.

  High Ambient Temperature Level: Allows you to set an ambient temperature High alarm point.

  Low Ambient Temperature Level: Allows you to set an ambient temperature low alarm point.

  Very High Ambient Temperature Level: Allows you to set an ambient temperature Very High alarm point.

- **System Temperature 1:** Sets this temperature sensor to None, Battery, or Ambient.
- **System Temperature 2:** Sets this temperature sensor to None, Battery, or Ambient.
- **System Temperature 3:** Sets this temperature sensor to None, Battery, or Ambient.
- **Sensor for Temp Compensation:** Select "None" for no temperature compensation, or the temperature sensor (None/ Max/ Average/ Temp1/ Temp2) sensing battery temperature for temperature compensation. You can also select Maximum or Average which takes the maximum or average reading of the temperature sensors (None/ Max/ Average/ Temp1/ Temp2) set as battery temperature sensors. When used with an SM-BRC, you can select to average the SM-BRC temperature sensor readings (Average SMBRC setting).

  Very High Compensation Temperature: Allows you to set a Very High Compensation Temperature alarm point.

  High Compensation Temperature: Allows you to set a High Compensation Temperature alarm point.

Low Compensation Temperature: Allows you to set a Low Compensation Temperature alarm point.

- **BTRM Temp Sensor:** Sets the BTRM (Battery Thermal Runaway Management) temperature sensor. Note that this temperature sensor MUST be set as a battery temperature sensor. Select "None", or the temperature sensor (System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1 …, SMTemp1 T8, SMTemp8 T1 …, SMTemp8 T8). You can also select Maximum or Average which takes the maximum or average reading of the temperature sensors (any of System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1, …, SMTemp1 T8, SMTemp8 T1, …, SMTemp8 T8) set as battery temperature sensors. When used with an SM-BRC, you can select to average the SM-BRC temperature sensor readings. When set to any value except “none”, the following parameters can be set.

  Very High BTRM Temperature: Allows you to set a Very High BTRM Temperature alarm point.

  High BTRM Temperature: Allows you to set a High BTRM Temperature alarm point.

NOTE! *The BTRM sensor is the sensor which is used for the High Temperature Disconnect (HTD) Feature.*

Rectifiers Tab Programmable Parameter Descriptions

- **Voltage Trim:** The voltage level that is sent to all rectifiers when in Auto Mode. Sets voltage level for all solar rectifiers when in Manual Mode.
- **High Voltage Limit:** Sets the High Voltage Shutdown point for all rectifiers.
- **Restart on Overvoltage Enabled:** Enables or disables the Overvoltage Shutdown Restart feature for all rectifiers.
- **Restart Time on Overvoltage:** When the Overvoltage Shutdown Restart feature is enabled and the output exceeds the high voltage limit, the rectifiers restart after this time expires.
- **Sequence Start Interval:** Sets the sequence start interval (time period between starting each rectifier in the system).
- **Walk-In:** Enables or disables the start-up walk-in feature for all rectifiers. When enabled, the following parameters can be set.

  Walk- In Time: Sets the start-up walk-in time when the “Walk-In” setting above is set to enabled.
- **Input Current Limit:** Sets the Input Current Limit point for all rectifiers.
- **Confirm Rect Position/Phase:** Confirms the position and input phase for all rectifiers. This must be done after you have renumbered and/or assigned AC phases to the rectifiers to confirm that you have completed the operation.
- **Reset Rectifier IDs:** The only selection for "Reset Rectifier IDs" is Yes. Once Yes is selected and confirmed, the individual Rectifier Position/ID and Phase will be restored to default.
- **Clear Rectifier Comm Fail Alarm:** Clears a rectifier communication fail alarm.
- **Reset Rectifier Lost Alarm:** Resets a rectifier lost alarm.
- **Delay of LowRectCap Alarm:** Sets the delay of low rectifier capacity value as alarm threshold.
- **Maximum Redundacy:** Sets the maximum redundancy value.
- **Benchmark Rectifier:** Select the benchmark rectifier: R48-3500E3, R48-3200,96%,95%,94%,93%,92%,91%,90% and so on.
- **Cost per kWh:** Sets the cost per kWh value.
- **Currency:** Select the currency: USD, CNY, EUR, GBP and RUB.

- **Percentage 98% Rectifier:** Sets the percentage of rectifiers with 98% efficiency in the system.
- **Default Voltage:** Sets the default voltage, this will be used by rectifiers if controller is not communicating with the rectifiers.
- **Delta Voltage for Rect Enable:** Enables or disables Delta Voltage for rectifier.
- **Delta Voltage for Rect:** Sets the Delta Voltage for rectifier.

Solar Tab Programmable Parameter Descriptions

- **Clear Solar Converter Lost Alarm:** Clears a solar converter lost alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Confirm Solar Converter ID:** After changing solar converter ID assignments, use this menu item to confirm the change. The only selection is Yes. Once Yes is selected and confirmed, the ID setting of all solar converters is updated.
- **Reset Solar Converter IDs:** Resets the solar converter IDs after they have been previously changed and confirmed. The only selection is Yes. Once Yes is selected and confirmed, the NCU resets the solar converter IDs by reassigning ID numbers.
- **Clear Solar Converter Comm Fail Alarm:** Clears a solar converter communication fail alarm.
- **Restart on HVSD:** Enables or disables the Overvoltage Shutdown Restart feature for all solar converters.
- **High Voltage Shutdown Limit:** Sets the High Voltage Shutdown point for all solar converters.
- **HVSD Restart Time:** When the Overvoltage Shutdown Restart feature is enabled and the output exceeds the high voltage limit, the rectifiers restart after this time expires.
- **Walk-In:** Enables or disables the start-up walk-in feature for all rectifiers. When enabled, the following parameters can be set.
- **Walk-In Time:** Sets the start-up walk-in time when the “Walk-In” setting above is set to enabled.
- **Sequence Start Interval:** Sets the sequence start interval (time period between starting each rectifier in the system).
- **Solar Failure Min Time:** The time before a “Solar Communication Failure” alarm occurs. Adjustable from 0 to 7 days with default setting of 3 days. A “0” setting sets a Solar Communication Failure alarm to occur immediately after the event occurs.
- **MPPT Default Voltage:** Sets the default voltage, this will be used by solar converters if controller is not communicating with the solar converters.
- **MPPT Max Current :** Sets the limit for maximum output current for the solar converters.
- **Delta Voltage for MPPT Enable:** Enables or disables Delta Voltage for MPPT.
- **Delta Voltage for MPPT:** Sets the Delta Voltage for MPPT.
- **Solar Converters Off by Voltage:** Enables or disables Solar Converters Off by Voltage function.
- **Solar Converters Off Voltage:** When system voltage is below this setting, the solar converters will be switched off.
- **Solar Converters On Voltage:** When system voltage is above this setting, the solar converters will be switched on.
- **Solar Converters Off by DI:** Enables or disables Solar Converters Off by DI function.
- **Solar Converters Off DI:** When the selected DI becomes active, the solar converters will be switched off.

Battery Test Tab Programmable Parameter Descriptions

- **AC Fail Test:** Enables or disables starting a battery discharge test during an AC input failure condition.

- **Constant Current Test:** Enables or disables a Constant Current Battery Discharge Test. During this test, the controller automatically adjusts the rectifiers' output voltage to maintain the battery discharge current at a preset value (Constant Current Test Current). When enabled, the following parameters can be set.

  Constant Current Test Current: Constant current setting for a Constant Current Battery Discharge Test.

- **Test Voltage Level:** System output voltage setting during a battery discharge test.
- **End Test Voltage:** This is the "end of test voltage level" for battery discharge tests. A battery discharge test will end if battery voltage decreases to this setting.
- **End Test Time:** This is the "end of test time period" for battery discharge tests. A battery discharge test will end if this time period is exceeded.
- **End Test Capacity:** This is the "end of test remaining battery capacity" for battery discharge tests. A battery discharge test will end if remaining battery capacity decreases to this setting. For example, a value of 0.700C10 means that when the discharging current reaches 70% of the battery's nominal capacity, the battery test is ended.
- **Record Threshold:** Every time the battery voltage is changed more than this threshold, a new line is stored in the battery test log.
- **Lowest Capacity for Battery Test:** The lowest allowed battery capacity before executing a battery test.
- **Battery Test Control:** Stops or starts battery test control.
- **Reset Bad Battery Alarm:** Resets a bad battery alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Clear Battery Test Fail Alarm:** Clears a battery test fail alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Reset Discharge Curr Imbalance:** Clears a discharge current imbalance alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Planned Test Enable:** Enables or Disables the planned test function.

  Test Interval: Sets the test interval time.

  Periodic BDT Start Time: Sets the periodic battery discharge test start time.

  Guard Period: During this period before a planned battery test, no Major or Critical alarms and no manual battery test is allowed. If that should happen, the battery test will be re-scheduled according to the Test Interval.

  Initial Test Date: Sets the initial test date for battery discharge test.

  Next BDT Date: The next test date for battery discharge test. This for information only.

Time Settings Tab Programmable Parameter Descriptions

See also “Changing the Date and Time” on page 22.

- **Specify Time**
  - **Get Local Time from Connected PC:** Allows you to automatically set the time. When selected, the controller will get the same time as the connected PC.
  - **Date & Time:** Allows you to manually set the date and time.

- **Local Zone (for synchronization with time servers):** When selected, the controller will get the local zone automatically or you can enter the zone.
- **Get time automatically from the following servers.**
  - When selected, the controller will get the time from the selected time server. The controller will also adjust the time per the "Local Zone" setting.

Inverters Tab Programmable Parameter Descriptions

- **Output Voltage Level:** with options 200V, 208V, 220V, 230V, 240V. This setting is only available when inverters have been switched off.
- **Output Frequency:** with options 50 Hz or 60 Hz. This setting is only available when inverters have been switched off.
- **DC Low Voltage Off:** Low output voltage threshold the inverter will turn off.
- **DC Low Voltage On:** Low output voltage threshold the inverter will turn on.
- **DC High Voltage Off:** High output voltage threshold the inverter will turn off.
- **DC High Voltage On:** High output voltage threshold the inverter will turn on.
- **Inv Primary Input Power:** Sets the input mode of operation (AC Mode, DC Mode, DC Only).
- **Inverters LED Control:** Temporarily sets whether or not an inverter's local power indicator blinks when the controller is communicating with the inverter when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Switch On/Off:** Turns output On/Off to all inverters to check/set the "Output Voltage Level" and "Output Frequency".
- **Fan Speed Control:** Sets the fan speed for all inverters.
- **Clear Inverter Lost Alarm:** Clears an inverter lost alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Confirm Inverter ID/Phase:** After changing inverter ID and/or input feed assignments, use this menu item to confirm the change. The only selection is Yes. Once Yes is selected and confirmed, the ID and feed setting of all inverters are updated.
- **Clear Inverter Comm Fail Alarm:** Clears an inverter communication fail alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Reset Inverter IDs:** Resets the inverter IDs after they have been previously changed and confirmed. The only selection is Yes. Once Yes is selected and confirmed, the controller resets the inverter IDs by reassigning ID numbers.
- **Clear Fault:** Clears an inverter fault alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Reset Energy:** Reset the energy, the only selection is Yes.
- **Quantity Of Inverters:** Sets the quantity of inverters, the maximum quantity is 24.
- **Redundancy:** Sets the redundancy of inverter number.

Output Relays Tab Programmable Parameter Descriptions

Relay IB1-DO1 Normal State to IB1-DO8 Normal State, and Relay IB0-DO1 Normal State to Relay IB0-DO4 Normal State: Choose Energized or Non-Energized for DO Normal state.

Relay IB1-DO1 to Relay IB1-DO8, and Relay IB0-DO1 to Relay IB0-DO4: Choose Energized or Non-Energized for relay output.

5.9.2 History Log Menu

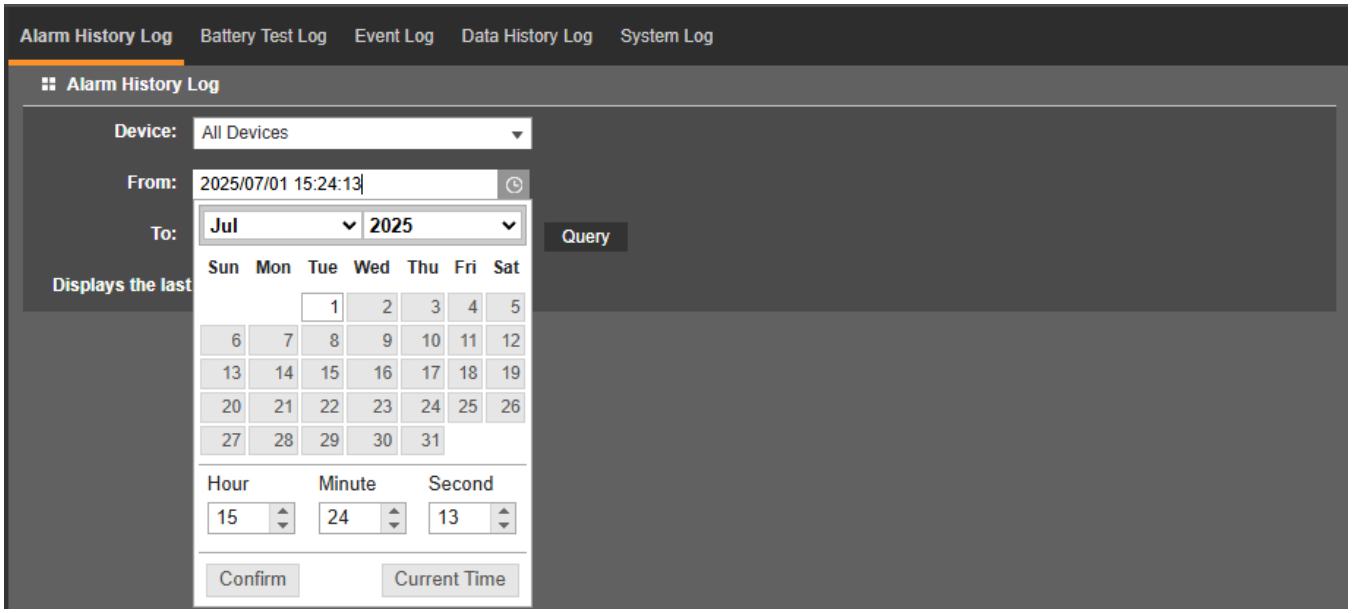
The History Log Menu allows you to view and save the various logs available in the controller.

Alarm History Log Tab

Select Device and Time

Select the "Device" to query from the drop-down list box. Select the "from" and "to" time.

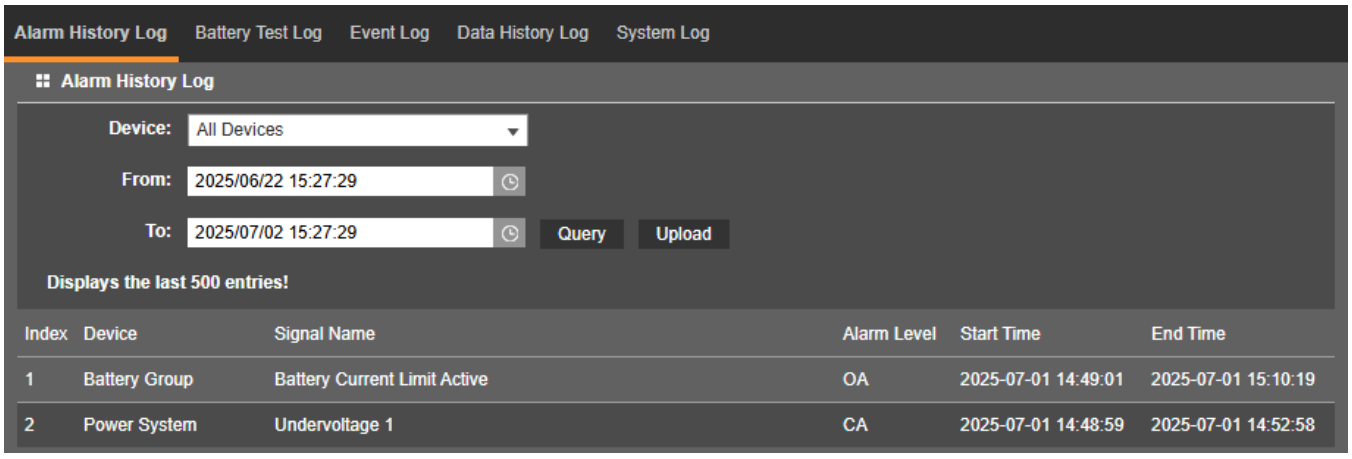
Figure 5.36 Alarm History Log Device and Time Selection



Query Alarm History Log

Click “Query” to query for alarms within selected time slot. The Web page displays the last 500 entries.

Figure 5.37 Alarm History Log Query



Upload Alarm History Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 5.38 Alarm History Log Upload

Query Alarm History Log
Query EquipID: All Devices
Query Time: from 2025-06-22 15:27:29 to 2025-07-02 15:27:29
Total 2 alarm(s) queried.

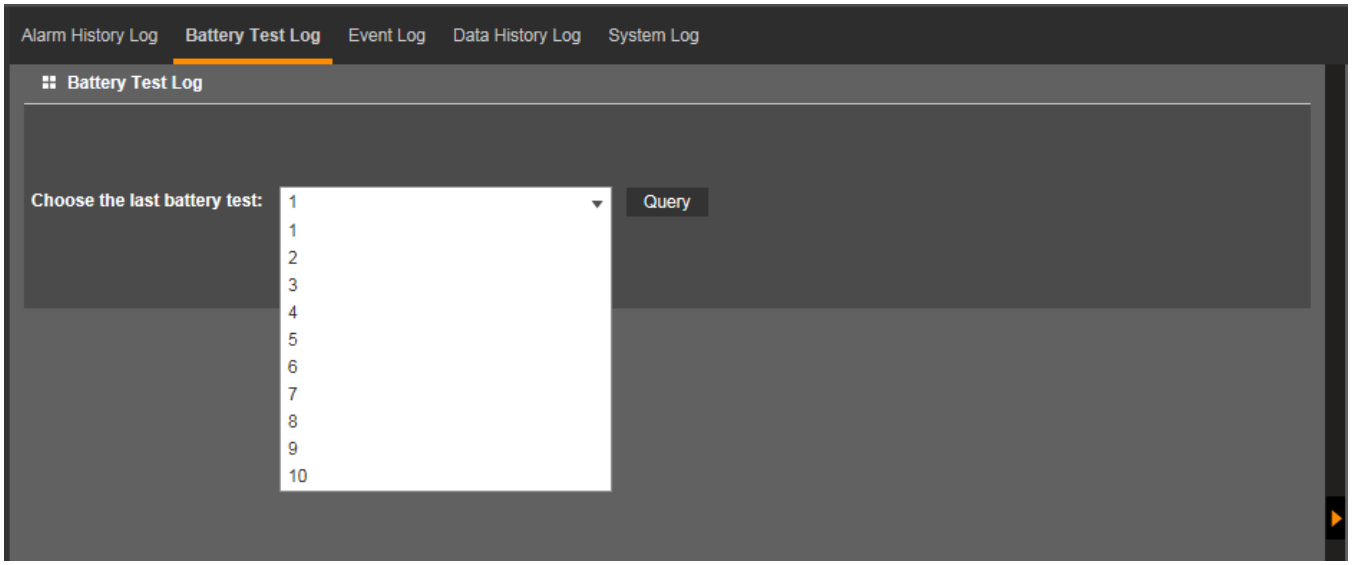
Index	Device Name	Signal Name	Alarm Level	Start Time	End Time
1	Battery Group	Battery Current Limit Active	OA	2025-07-01 14:49:01	2025-07-01 15:10:19
2	Power System	Undervoltage 1	CA	2025-07-01 14:48:59	2025-07-01 14:52:58

Battery Test Log Tab

Select Battery Test Number

Select the Battery Test Log to query from the drop-down list box. Battery test #1 is the most recent.

Figure 5.39 Battery Test Log Number Selection

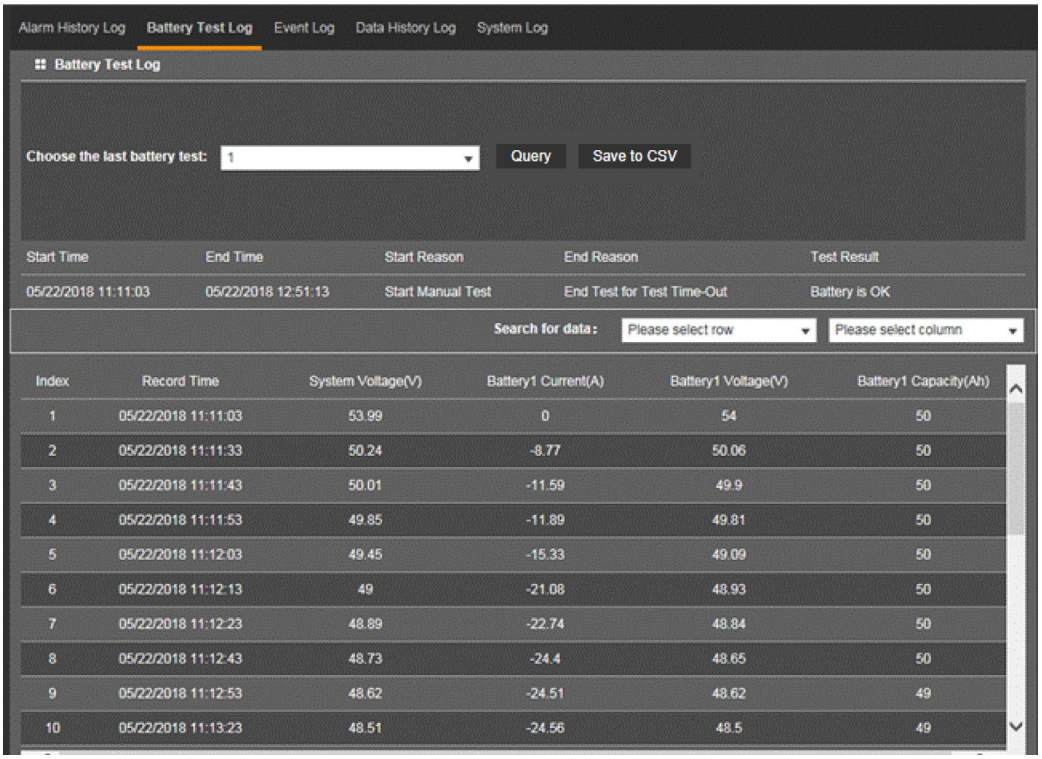


Query Selected Battery Test

Click “Query” to query the selected battery test. The Web page displays up to ten (10) battery tests.

NOTE! *Battery tests in which battery voltage changed less than the Record Threshold setting are not recorded.*

Figure 5.40 Battery Test Log Query



Upload Battery Test Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 5.41 Battery Test Log Upload

Query Battery Test Log
Start time: 05-22-2018 11:11:03
End time : 05-22-2018 12:51:13
Start reason : Start Manual Test
End reason : End Test for Test Time-Out
Test result : Battery is OK

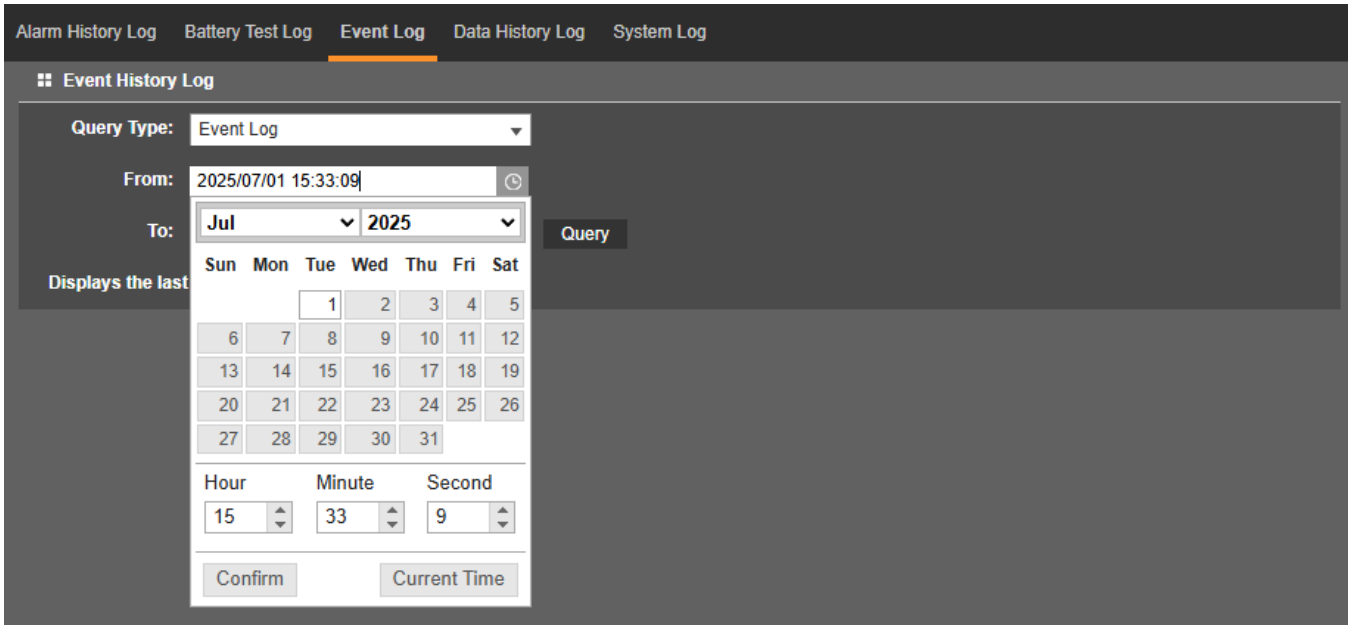
Index	Record Time	System Voltage(V)	Battery1 Current(A)	Battery1 Voltage(V)	Battery1 Capacity(Ah)
1	05-22-2018 11:11:03	53.99	0.00	54.00	50
2	05-22-2018 11:11:33	50.24	-8.77	50.06	50
3	05-22-2018 11:11:43	50.01	-11.59	49.90	50
4	05-22-2018 11:11:53	49.85	-11.89	49.81	50
5	05-22-2018 11:12:03	49.45	-15.33	49.09	50
6	05-22-2018 11:12:13	49.00	-21.08	48.93	50
7	05-22-2018 11:12:23	48.89	-22.74	48.84	50
8	05-22-2018 11:12:43	48.73	-24.40	48.65	50
9	05-22-2018 11:12:53	48.62	-24.51	48.62	49
10	05-22-2018 11:13:23	48.51	-24.56	48.50	49
11	05-22-2018 11:14:02	48.41	-24.63	48.43	49
12	05-22-2018 11:16:33	48.29	-25.86	48.31	48

Event Log Tab

Select Time

Select the "from" and "to" time.

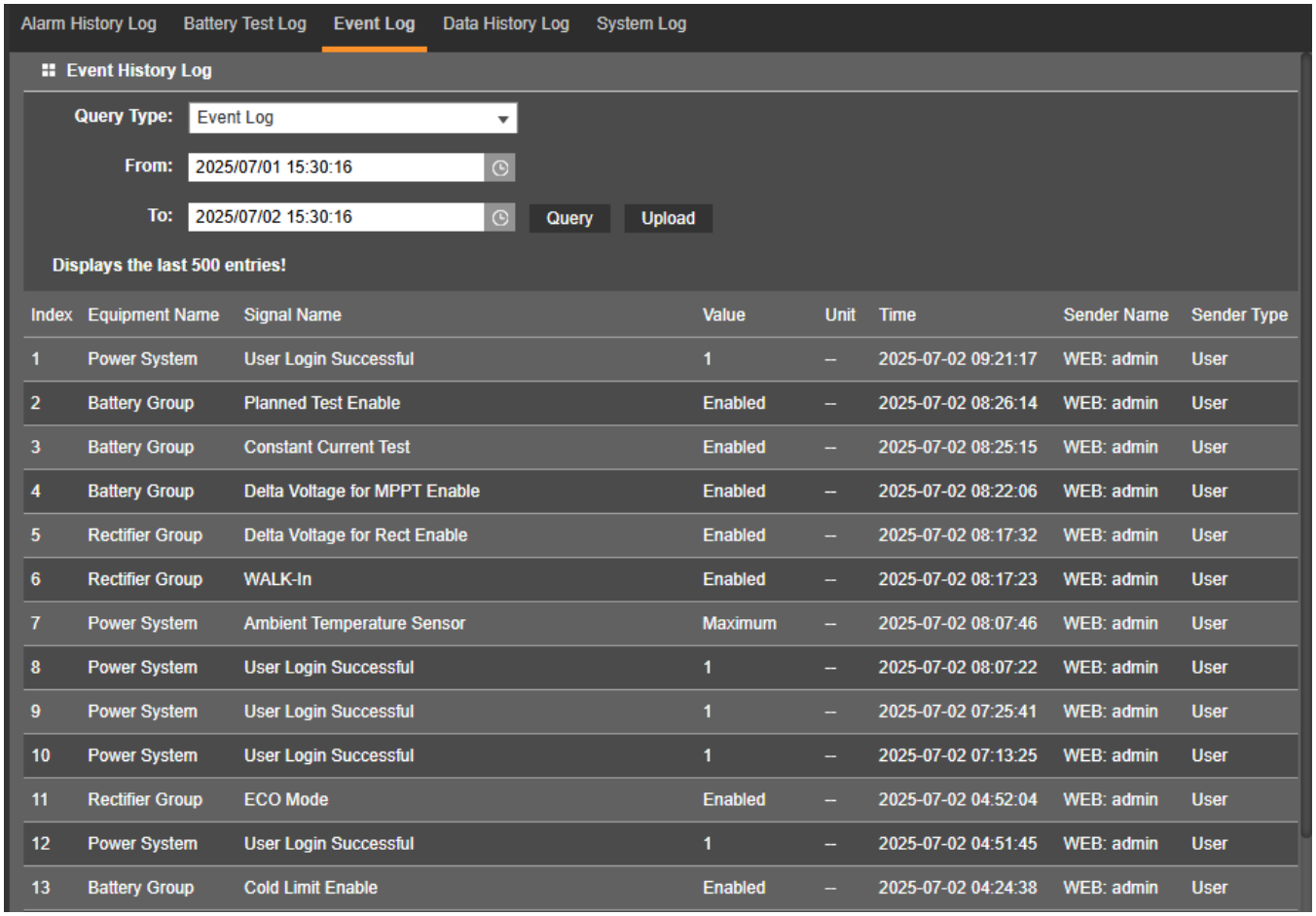
Figure 5.42 Event Log Time Selection



Query Event Log

Click “Query” to query the Event Log. The Web page displays the last 500 entries.

Figure 5.43 Event Log Query



Index	Equipment Name	Signal Name	Value	Unit	Time	Sender Name	Sender Type
1	Power System	User Login Successful	1	--	2025-07-02 09:21:17	WEB: admin	User
2	Battery Group	Planned Test Enable	Enabled	--	2025-07-02 08:26:14	WEB: admin	User
3	Battery Group	Constant Current Test	Enabled	--	2025-07-02 08:25:15	WEB: admin	User
4	Battery Group	Delta Voltage for MPPT Enable	Enabled	--	2025-07-02 08:22:06	WEB: admin	User
5	Rectifier Group	Delta Voltage for Rect Enable	Enabled	--	2025-07-02 08:17:32	WEB: admin	User
6	Rectifier Group	WALK-In	Enabled	--	2025-07-02 08:17:23	WEB: admin	User
7	Power System	Ambient Temperature Sensor	Maximum	--	2025-07-02 08:07:46	WEB: admin	User
8	Power System	User Login Successful	1	--	2025-07-02 08:07:22	WEB: admin	User
9	Power System	User Login Successful	1	--	2025-07-02 07:25:41	WEB: admin	User
10	Power System	User Login Successful	1	--	2025-07-02 07:13:25	WEB: admin	User
11	Rectifier Group	ECO Mode	Enabled	--	2025-07-02 04:52:04	WEB: admin	User
12	Power System	User Login Successful	1	--	2025-07-02 04:51:45	WEB: admin	User
13	Battery Group	Cold Limit Enable	Enabled	--	2025-07-02 04:24:38	WEB: admin	User

Upload Event Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 5.44 Event Log Upload

Query Event Log
Query Time: from 2025-07-01 15:30:16 to 2025-07-02 15:30:16
Total 26 record(s) queried.

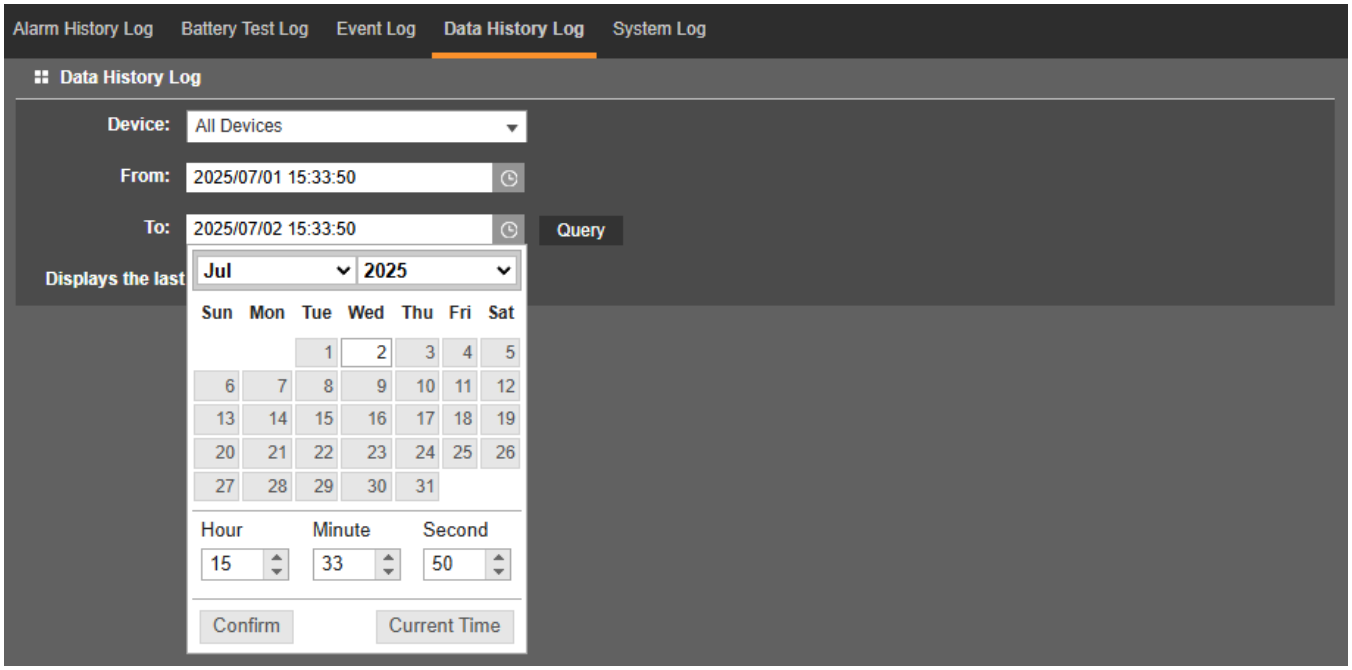
Index	Device Name	Signal Name	Value	Unit	Time	Sender Name	Sender Type
1	Power System	User Login Successful	1	--	2025-07-02 09:21:17	WEB: admin	User
2	Battery Group	Planned Test Enable	Enabled	--	2025-07-02 08:26:14	WEB: admin	User
3	Battery Group	Constant Current Test	Enabled	--	2025-07-02 08:25:15	WEB: admin	User
4	Battery Group	Delta Voltage for MPPT Enable	Enabled	--	2025-07-02 08:22:06	WEB: admin	User
5	Rectifier Group	Delta Voltage for Rect Enable	Enabled	--	2025-07-02 08:17:32	WEB: admin	User
6	Rectifier Group	WALK-In	Enabled	--	2025-07-02 08:17:23	WEB: admin	User
7	Power System	Ambient Temperature Sensor	Maximum	--	2025-07-02 08:07:46	WEB: admin	User
8	Power System	User Login Successful	1	--	2025-07-02 08:07:22	WEB: admin	User
9	Power System	User Login Successful	1	--	2025-07-02 07:25:41	WEB: admin	User
10	Power System	User Login Successful	1	--	2025-07-02 07:13:25	WEB: admin	User
11	Rectifier Group	ECO Mode	Enabled	--	2025-07-02 04:52:04	WEB: admin	User
12	Power System	User Login Successful	1	--	2025-07-02 04:51:45	WEB: admin	User

Data History Log Tab

Select Device and Time

Select the "Device" to query from the drop-down list box. Select the "from" and "to" time.

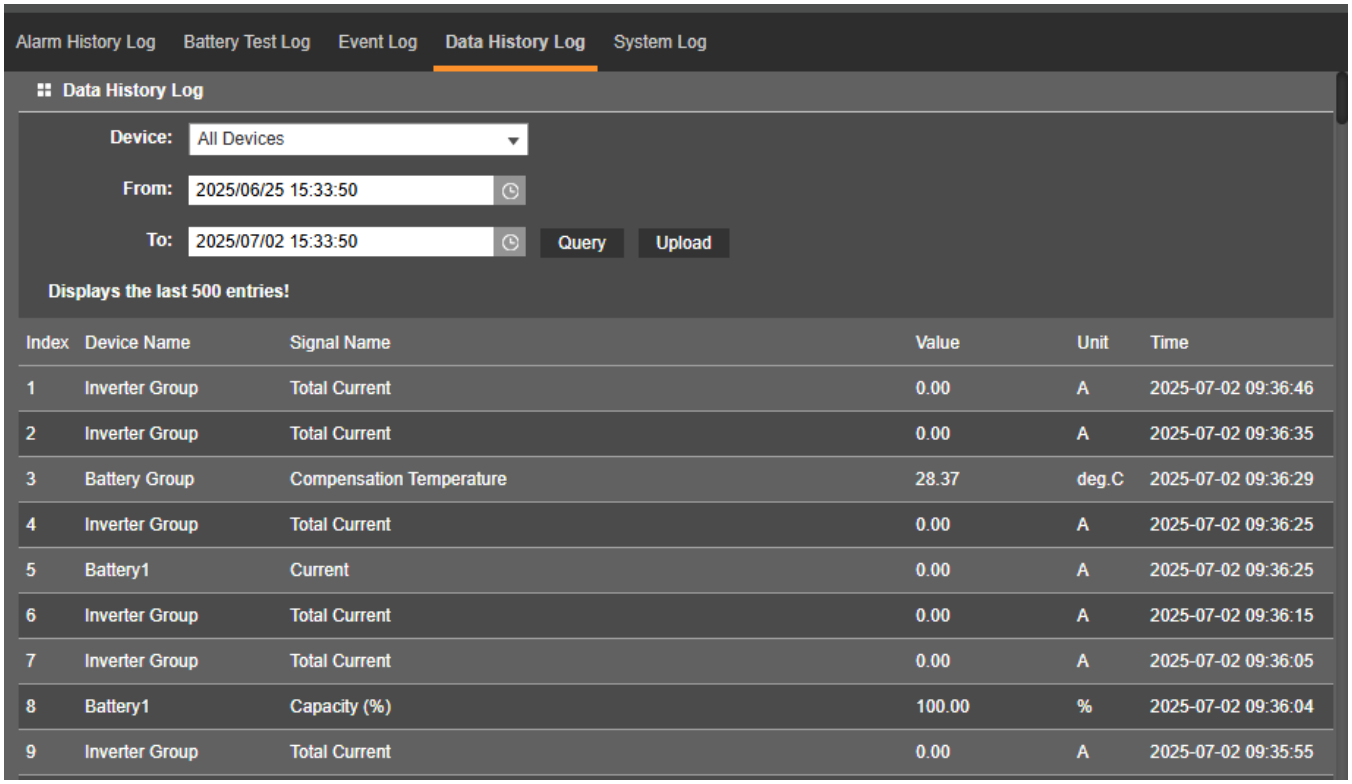
Figure 5.45 Data History Log Device and Time



Query Data History Log

Click “Query” to query for Date History within selected time slot. The Web page displays the last 500 entries.

Figure 5.46 Data History Log Query



Index	Device Name	Signal Name	Value	Unit	Time
1	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:46
2	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:35
3	Battery Group	Compensation Temperature	28.37	deg.C	2025-07-02 09:36:29
4	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:25
5	Battery1	Current	0.00	A	2025-07-02 09:36:25
6	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:15
7	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:05
8	Battery1	Capacity (%)	100.00	%	2025-07-02 09:36:04
9	Inverter Group	Total Current	0.00	A	2025-07-02 09:35:55

Upload Data History Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 5.47 Data History Log Upload

Query Data History Log
Query EquipID: All Devices
Query Time: from 2025-06-25 15:33:50 to 2025-07-02 15:33:50
Total 6000 record(s) queried.

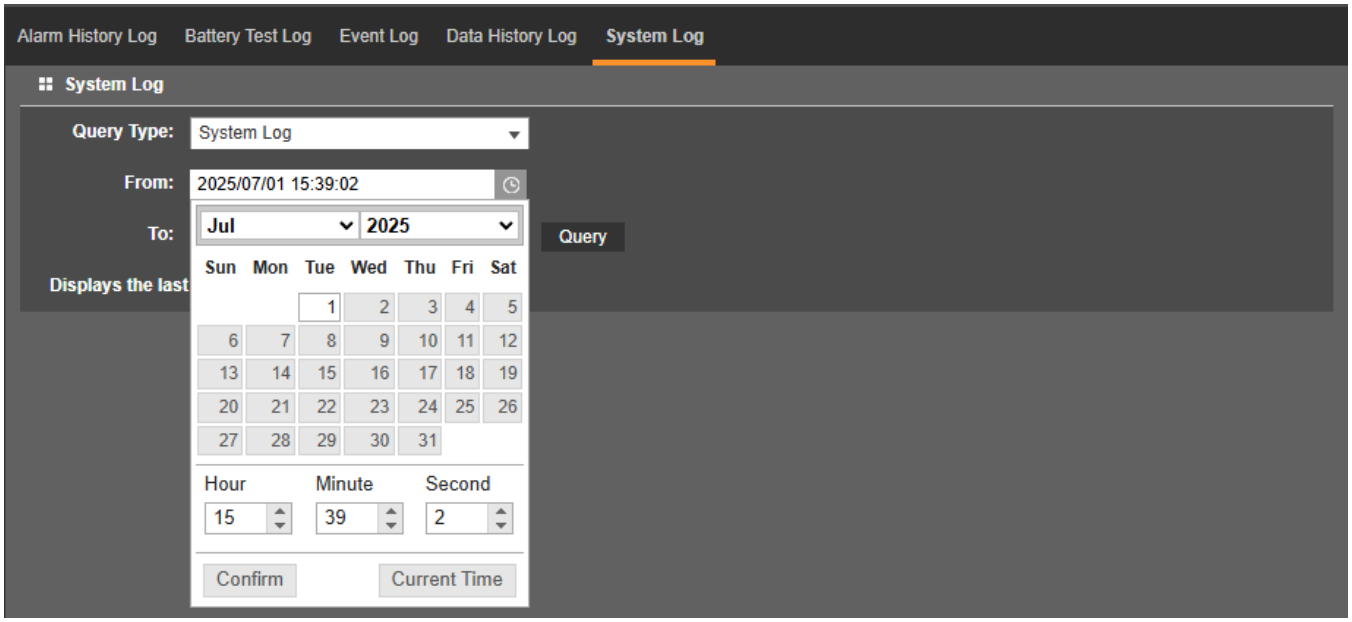
Index	Device Name	Signal Name	Value	Unit	Time
1	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:46
2	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:35
3	Battery Group	Compensation Temperature	28.37	deg.C	2025-07-02 09:36:29
4	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:25
5	Battery1	Current	0.00	A	2025-07-02 09:36:25
6	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:15
7	Inverter Group	Total Current	0.00	A	2025-07-02 09:36:05
8	Battery1	Capacity (%)	100.00	%	2025-07-02 09:36:04
9	Inverter Group	Total Current	0.00	A	2025-07-02 09:35:55
10	Power System	Ambient Temperature	-273.00	deg.C	2025-07-02 09:35:49
11	Inverter Group	Total Current	0.00	A	2025-07-02 09:35:45
12	Inverter Group	Total Current	0.00	A	2025-07-02 09:35:35
13	Battery Group	Compensation Temperature	28.19	deg.C	2025-07-02 09:35:29
14	Inverter Group	Total Current	0.00	A	2025-07-02 09:35:25
15	Battery1	Current	0.00	A	2025-07-02 09:35:24

System Log Tab

Select Time

Select the "from" and "to" time.

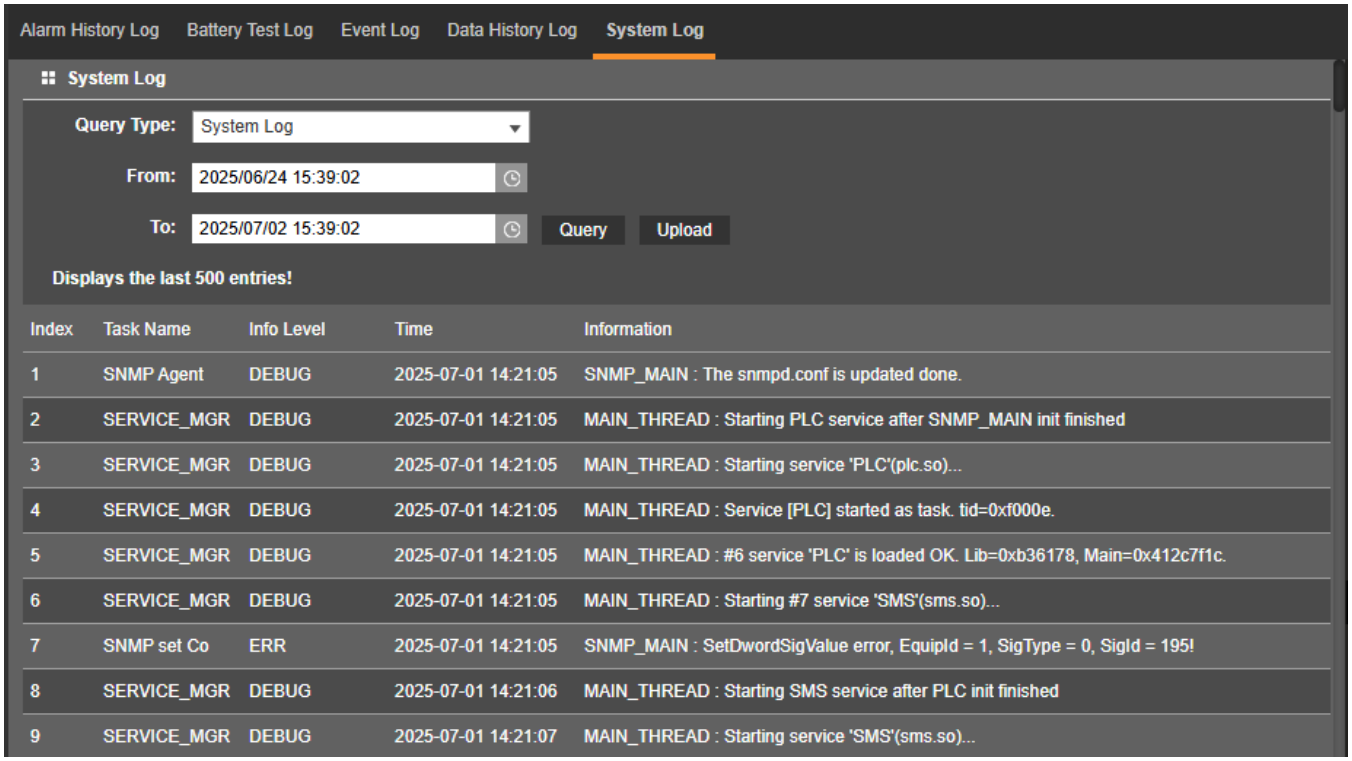
Figure 5.48 System Log Time Selection



Query System Log

Click “Query” to query the System Log. The Web page displays the last 500 entries.

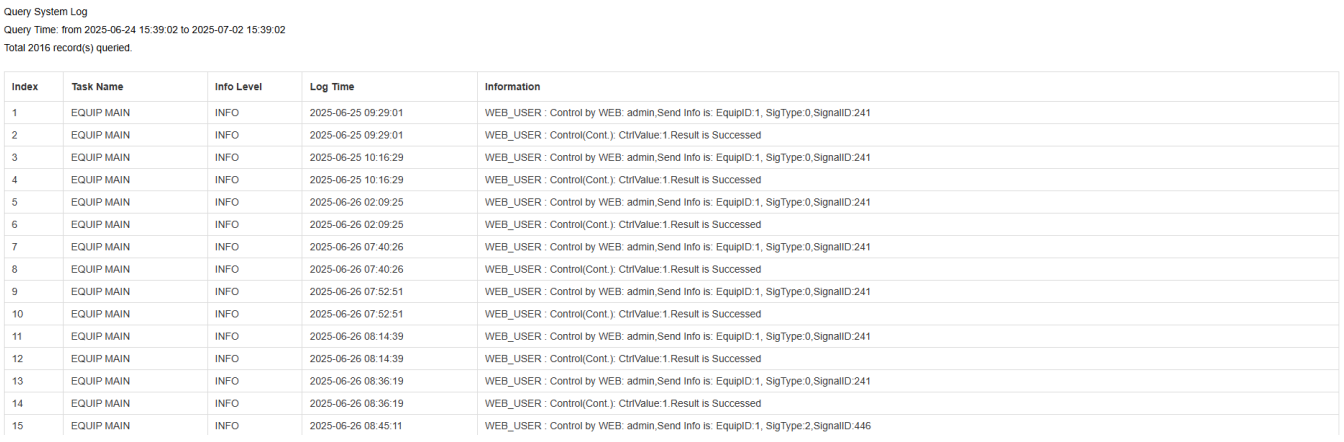
Figure 5.49 System Log Query



Upload System Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 5.50 System Log Upload



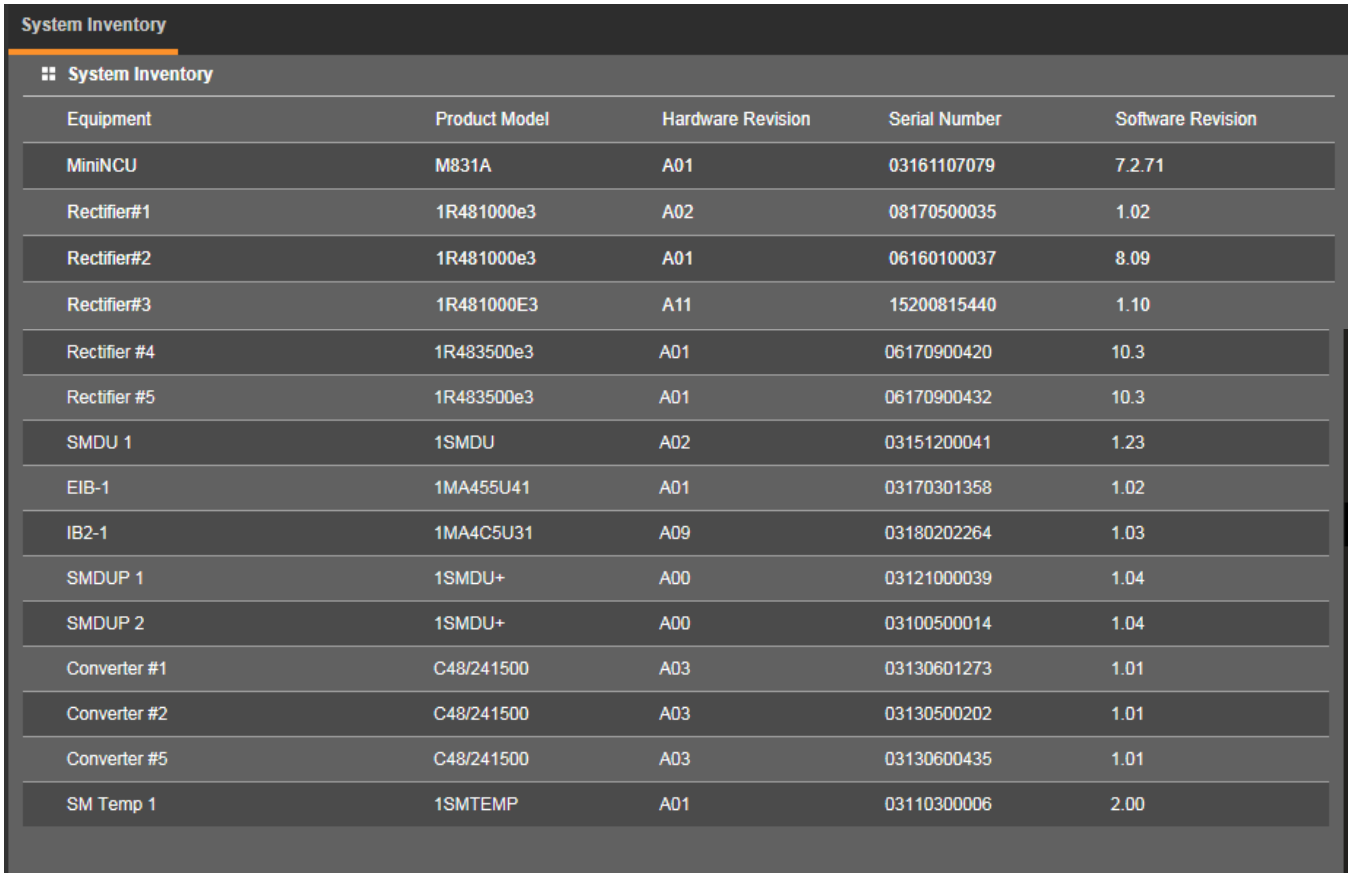
Query System Log
Query Time: from 2025-06-24 15:39:02 to 2025-07-02 15:39:02
Total 2016 record(s) queried.

Index	Task Name	Info Level	Log Time	Information
1	EQUIP MAIN	INFO	2025-06-25 09:29:01	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
2	EQUIP MAIN	INFO	2025-06-25 09:29:01	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
3	EQUIP MAIN	INFO	2025-06-25 10:16:29	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
4	EQUIP MAIN	INFO	2025-06-25 10:16:29	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
5	EQUIP MAIN	INFO	2025-06-26 02:09:25	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
6	EQUIP MAIN	INFO	2025-06-26 02:09:25	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
7	EQUIP MAIN	INFO	2025-06-26 07:40:26	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
8	EQUIP MAIN	INFO	2025-06-26 07:40:26	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
9	EQUIP MAIN	INFO	2025-06-26 07:52:51	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
10	EQUIP MAIN	INFO	2025-06-26 07:52:51	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
11	EQUIP MAIN	INFO	2025-06-26 08:14:39	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
12	EQUIP MAIN	INFO	2025-06-26 08:14:39	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
13	EQUIP MAIN	INFO	2025-06-26 08:36:19	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
14	EQUIP MAIN	INFO	2025-06-26 08:36:19	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
15	EQUIP MAIN	INFO	2025-06-26 08:45:11	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:2,SignalID:446

5.9.3 System Inventory Menu

The System Inventory Menu allows you to view product information of the intelligent devices (i.e. rectifiers, converters, SMDUs, IB, etc.) connected to the controller.

Figure 5.51 System Inventory Menu



Equipment	Product Model	Hardware Revision	Serial Number	Software Revision
MiniNCU	M831A	A01	03161107079	7.2.71
Rectifier#1	1R481000e3	A02	08170500035	1.02
Rectifier#2	1R481000e3	A01	06160100037	8.09
Rectifier#3	1R481000E3	A11	15200815440	1.10
Rectifier #4	1R483500e3	A01	06170900420	10.3
Rectifier #5	1R483500e3	A01	06170900432	10.3
SMDU 1	1SMDU	A02	03151200041	1.23
EIB-1	1MA455U41	A01	03170301358	1.02
IB2-1	1MA4C5U31	A09	03180202264	1.03
SMDUP 1	1SMDU+	A00	03121000039	1.04
SMDUP 2	1SMDU+	A00	03100500014	1.04
Converter #1	C48/241500	A03	03130601273	1.01
Converter #2	C48/241500	A03	03130500202	1.01
Converter #5	C48/241500	A03	03130600435	1.01
SM Temp 1	1SMTEMP	A01	03110300006	2.00

5.9.4 Advanced Settings Menu

The Advanced Settings Menu allows you to change (if you have the proper privilege level programmed in your User settings) the settings of the various advanced programmable parameters. Settings are grouped per function. Select a tab in the Advanced Settings Menu to change that functions programmable parameters.

Ethernet Tab

You can configure the controller's network parameters.

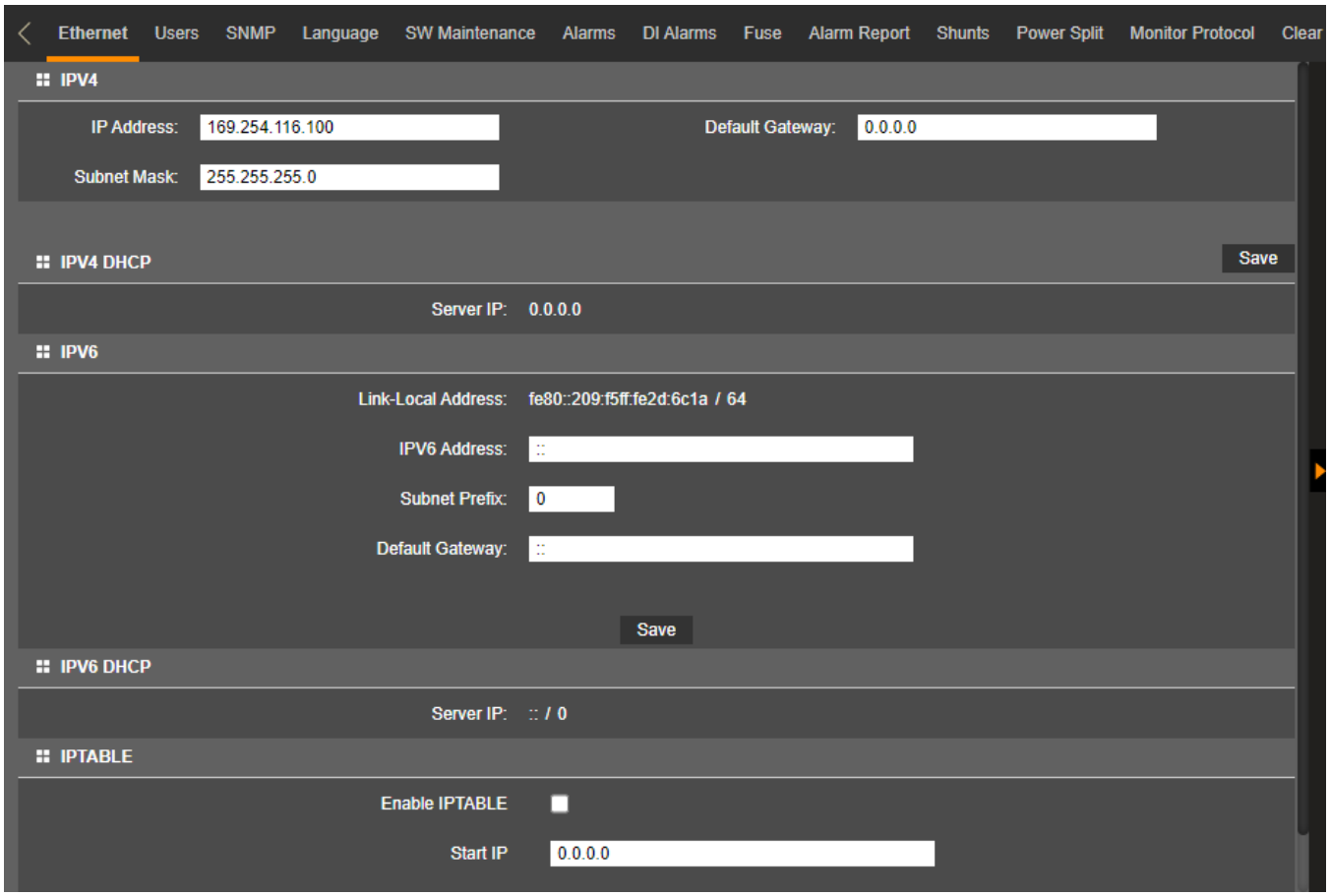
- IPv4: IP Address, Subnet Mask, and Default Gateway.
- IPv6: IPv6 Address, IPv6 Prefix, and IPv6 Gateway.
- IPTABLE: By default, the IP TABLE function is disabled, tick the table behind 'Enable IP TABLE', this will enable 10 IP addresses and grant them permission to access NCU's webpage starting from the Start IP entered by user.

  Example if Start IP is 10.116.56.101, then IPs from 10.116.56.101 to 10.116.56.110 will have to ability to access the NCU's webpage

After modifying the network parameters, click "Save" to validate the change made to the parameters.

NOTE! *After changing the IP Address, you will need to login again with the new IP address.*

Figure 5.52 Ethernet Tab



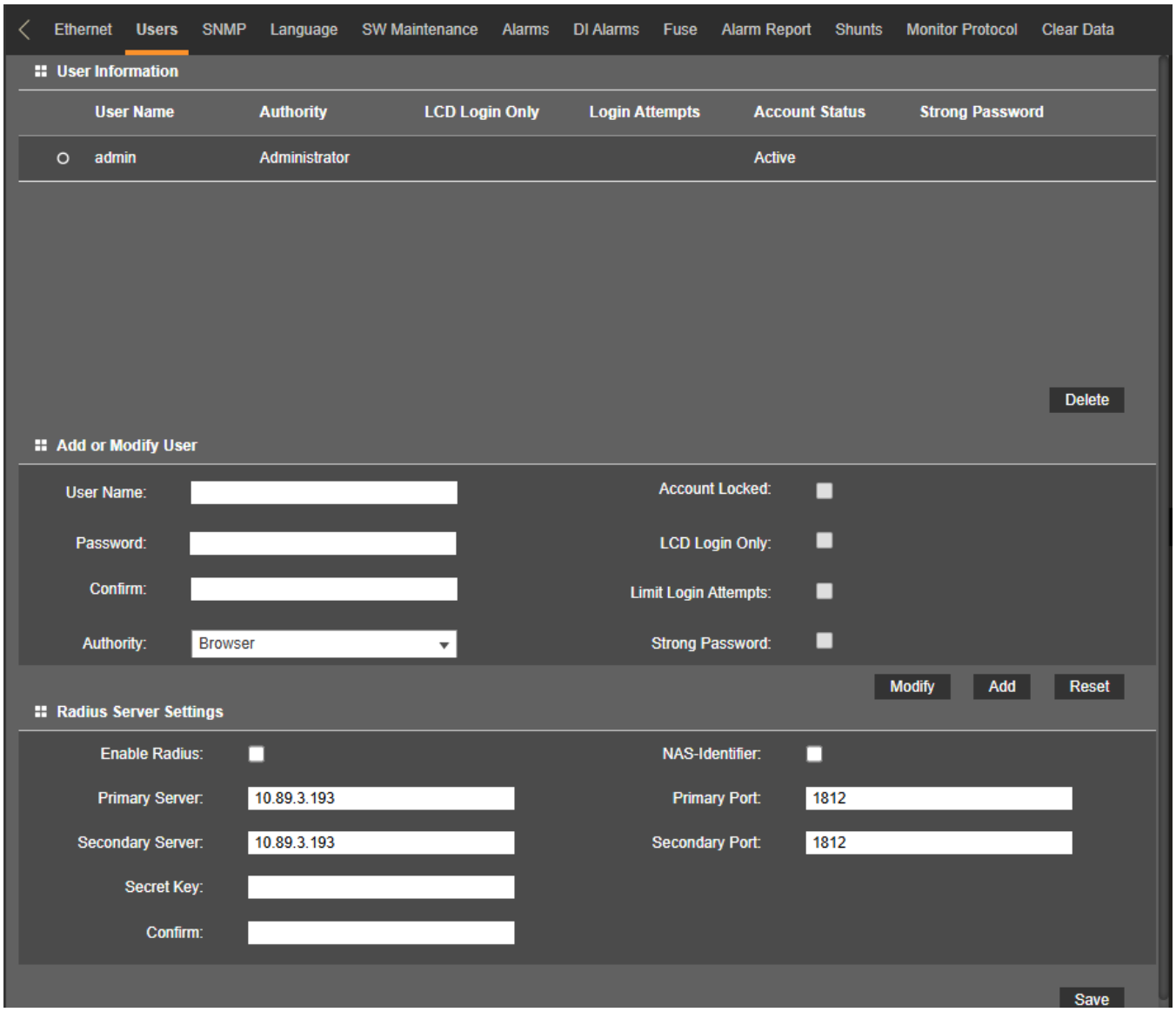
Users Tab

You can add, edit, and delete Users. These are the Users that can log onto the controller both locally (local display access) or remotely using the Web Interface.

- A maximum of sixteen (16) Users can be set up in the controller.
- A maximum of five (5) Users can access the controller at the same time.

You can also enable the radius server feature (see “Radius Server Feature” on page 10) and enter the radius server parameters.

Figure 5.53 Users Tab



Adding a User

1. Enter the User's Name in the "User Name" field.

   User Name: Eight (8) characters maximum; the valid characters are 0-9, a-z, A-Z, and _.

2. Enter a password for this User in the "Password" field.

   Password: Thirteen (13) characters maximum; the valid characters are 0-9, a-z, A-Z, and _. Passwords must be at least six (6) characters long.

3. Re-enter the password for this User in the "Re-enter Password" field.

4. Select the privilege of the User from those listed in the "Privilege" drop-down list box. See "Web Interface User Privilege Levels" on page 115 for a description. See also "Passwords and Privilege Levels" on page 14.

5. Check the following boxes as applicable for this User.

   a) Account Locked: An Admin privilege User can check this box to make an Inactive user account Active again. See "Limit Login Attempts" below.

   b) LCD Access Only: When this option is checked, the associated User can only login using the LCD (cannot login via the web).

   c) Limit Login Attempts: When this option is checked, the associated account will be locked and account status will become Inactive after the user crosses 100 failed attempts to login within its Active status duration, the account can be unlocked by an Admin privilege user only using the "Account Locked" checkbox (see "Account Locked" above).

   d) Strong Password: When this option is checked, a strong password will be required for this User. A strong password is at least 16 characters long, and the password should contain at-least one upper case, one lower case alphabet, one numerical and one special character in its password string.

6. Click the "Add" button to add the User.

NOTE! *To reset the form (i.e. to start over) and erase all information entered, click on the "Reset" button.*

Modifying an Existing User

1. Select the User to be modified from those listed in the "User Information" list.

2. Modify the parameters of this User.

3. Click the "Modify" button to modify the parameters of this User to the new settings.

NOTE! *To reset the form (i.e. to start over) and erase all information entered, click on the "Reset" button.*

Deleting a User

1. Select the User to be deleted from those listed in the "User Information" list.

2. Click the "Delete" button to delete this User.

Web Interface User Privilege Levels

Users are programmed with a “privilege level” (see Table 5.1). A User has access to his/her level menus, plus all menus of the lesser privilege levels.

Table 5.1 User Privilege Levels

Access Level (Privilege Level)	Default User Name and Password	Authority
Level A (Browser)	none set	The User can only read (browse) information in the menus.
Level B (Operator)	none set	The User has access to the system "Manual Mode Control Settings" menus.
Level C (Engineer)	none set	The User has access to the system "Settings" menus.
Level D (Administrator)	admin, 12345678	The User has full access to all menus; including downloading the "SettingParam.tar" file, updating the OS application, and modify/add/delete Users.

Radius Server Settings

Enter the following radius server settings as applicable.

1. Enable Radius: Check this box to enable the radius server authentication feature. The controller will check the radius server for password authentication.
2. NAS-Identifier: Check this box to use the Site Name as the NAS-Identifier. If checked, the “Site Name” programmed into the controller is sent as the NAS-identifier in the authorization request.
3. Primary Server: The IP address of the primary radius server.
4. Primary Port: The port number on the primary radius server used to access the radius interface (default 1812).
5. Secondary Server: The IP address of the secondary radius server (optional). The controller will authenticate using the secondary server if the primary server in unreachable.
6. Secondary Port: The port number on the secondary radius server used to access the radius interface (default 1812) (optional). The controller will authenticate using the secondary server if the primary server in unreachable.
7. Secret Key: A secret key phrase (1 to 31 alphanumeric characters; all ASCII characters valid). This secrete key phrase is sent to the radius server with the authorization request so the server knows it is a valid request.
8. Confirm: Re-enter the Secret Key to confirm it was typed correctly. The “Secrete Key” entry and “Confirm” entry must match.
9. Click the "Save" button to save the radius server settings.

SNMP Tab

Configures SNMP V2 and V3 parameters.

Accepted Trap Level Parameter Description

- **Accepted Trap Level:** Sets SNMP V2 and V3 trap level.

Adding an Entry

1. Enter the parameters in the parameter fields.
2. Click the "Add" button to add the entry.

NOTE! *To reset the form (i.e. to start over) and erase all information entered, click on the “Reset” button.*

Modifying an Existing Entry

1. Select the Entry to be modified from those listed at the top of the screen.
2. Modify the parameters.
3. Click the "Modify" button to modify the parameters for this Entry.

NOTE! *To reset the form (i.e., to start over) and erase all information entered, click on the “Reset” button.*

Deleting an Entry

1. Select the Entry to be deleted from those listed at the top of the screen.
2. Click the "Delete" button to delete this Entry.

NMSV2 Configuration Description (Network Management System)

Configures SNMP Version 1 and 2 parameters.

You can configure the following parameters.

- **NMS IP:** The permitted IP to access the NMSV2 agent. Check the IPV6 box when entering an IPV6 address.
- **Public Community:** The public community string.
- **Private Community:** The private community string.
- **Trap Enabled:** Trap function enabled or disabled.

NOTE! *Only listed IP Addresses will have SNMP access.*

NOTE! *To reset the form (i.e., to start over) and erase all information entered, click on the "Reset" button.*

Figure 5.54 SNMP - NMSV2 Configuration (cont'd on next page)

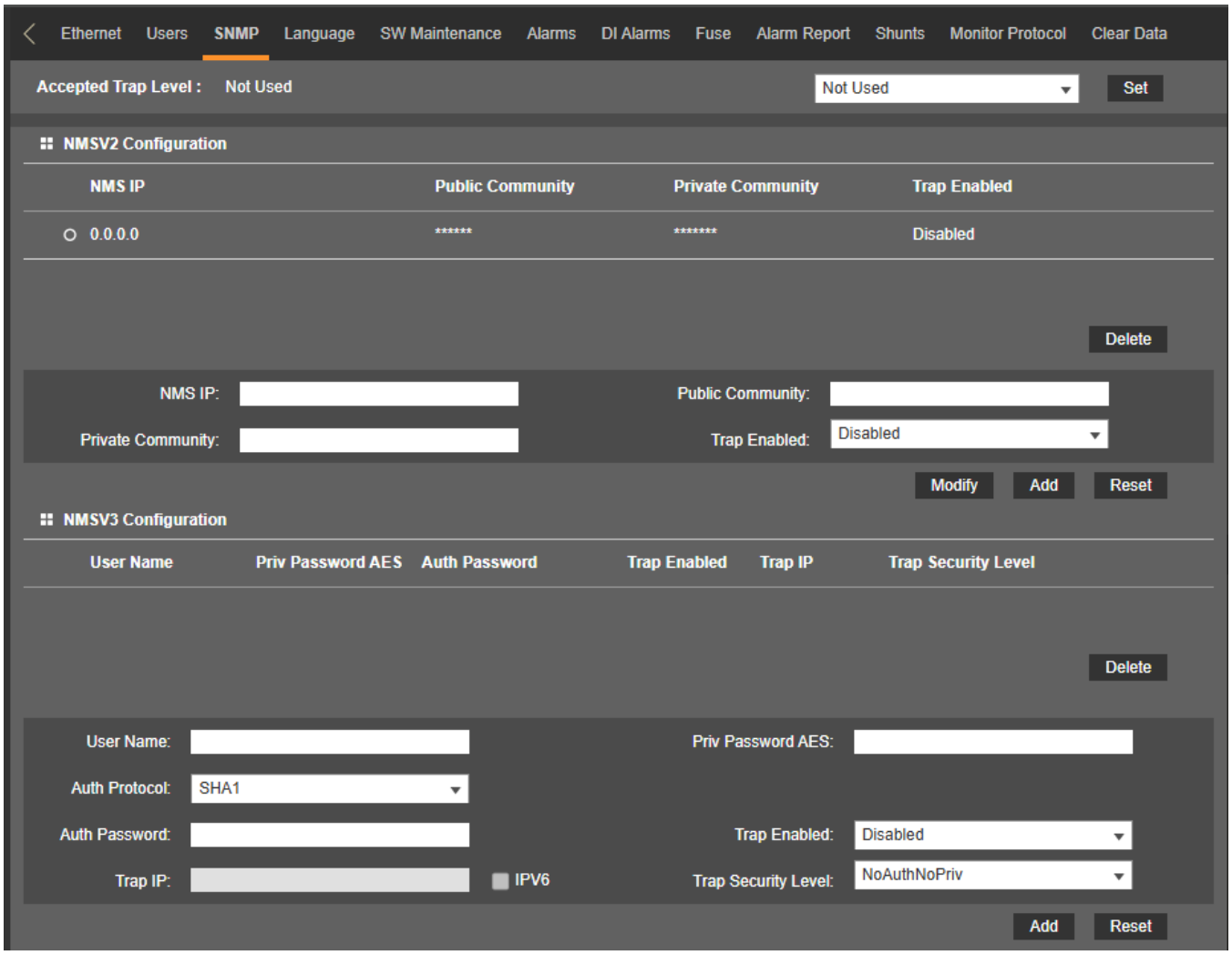
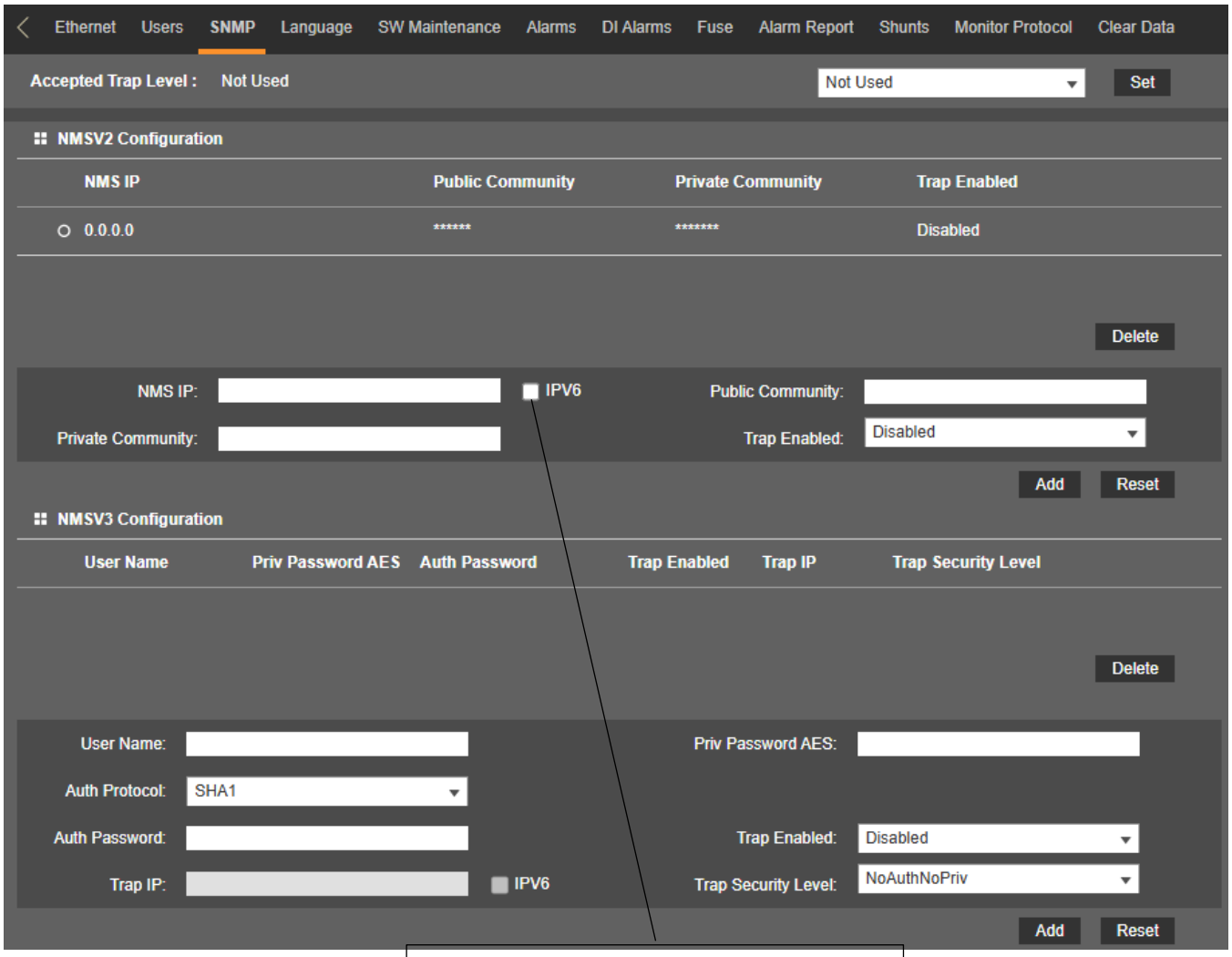


Figure 5.54 SNMP - NMSV2 Configuration (cont'd from previous page)



IPV6 checkbox appears once you start typing an NMS IP. Check the IPV6 box when entering an IPV6 address.

NMSV3 Configuration Description (Network Management System)

Configures SNMP Version 3 parameters.

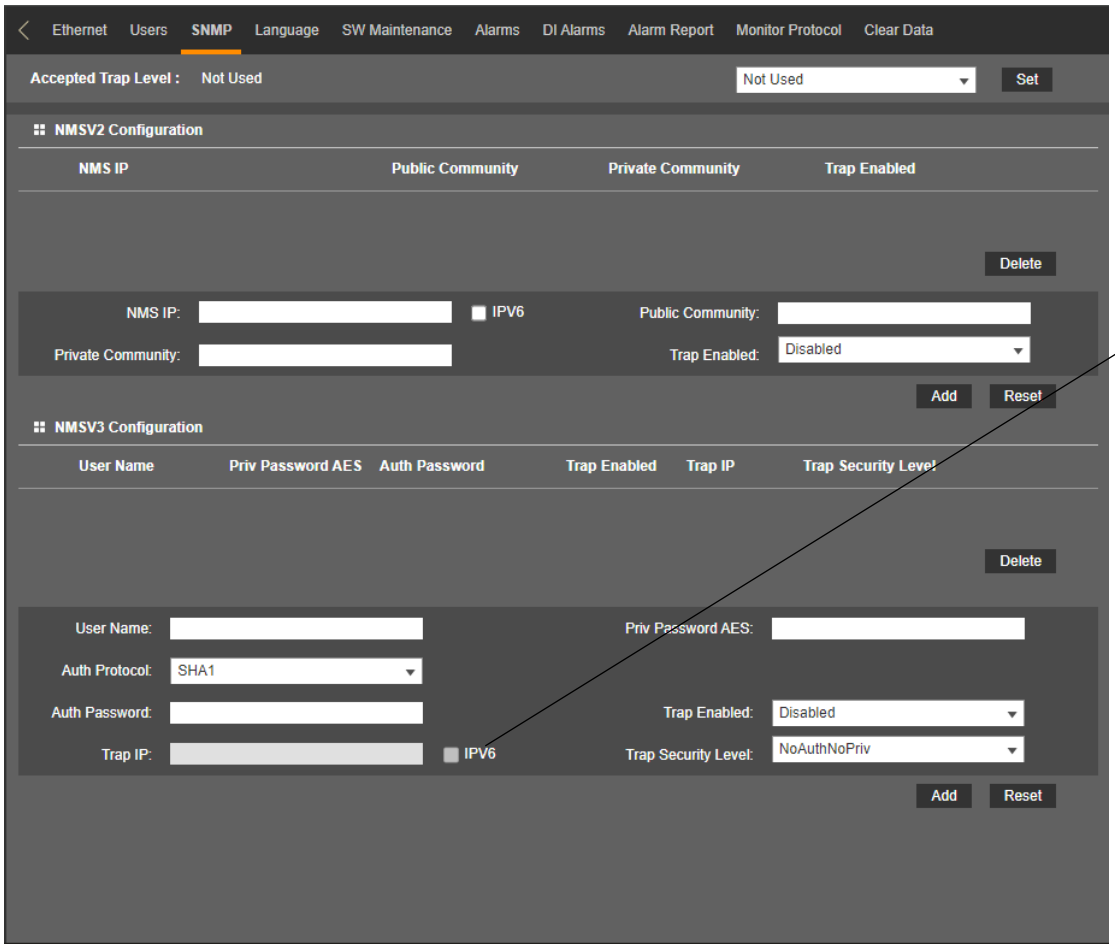
You can configure the following parameters.

- **Use Name:** The permitted User to access the NMSV3 agent.
- **Priv Password AES:** The privacy AES password used to encrypt the data.
- **Auth Protocol:** Selects the authorization protocol: SHA1 or MD5.
- **Auth Password:** The authorization password used to encrypt the digital signature.
- **Trap Enabled:** Trap function enabled or disabled.
- **Trap IP:** The IP to which the trap is sent. Check the IPV6 box when entering an IPV6 trap address.
- **Trap Security Level:** The SNMP v3 data security level (NoAuthNoPriv, AuthNoPriv, or AuthPriv).
  - **NoAuthNoPriv:** SNMP messages are sent without authentication and without privacy.
  - **AuthNoPriv:** SNMP messages are sent with authentication but without privacy.
  - **AuthPriv:** SNMP messages are sent with authentication and with privacy.

NOTE! *For SNMP v3, the security level for Get/Set/Walk operations is set to "AuthPriv" and cannot be adjusted.*

NOTE! *Controller must be reset after configuration of initial SNMP v3 User (Advanced Settings Menu / SW Maintenance Tab / Restore Factory Defaults / Reboot Controller).*

Figure 5.55 SNMP - NMSV3 Configuration



Language Tab

The local display and Web Interface always has an English language option. Multiple local languages are also supported. One local language option is displayed at a time with the English language option. To select another local language option to display, use the Web Interface Language Tab (see Figure 5.56).

You can select from the following local languages: Spanish and French. Once you select a new local language, the controller is automatically rebooted to make the selected local language valid.

See **Figure 5.57** to change the language the local display and Web Interface uses.

Figure 5.56 Language Tab

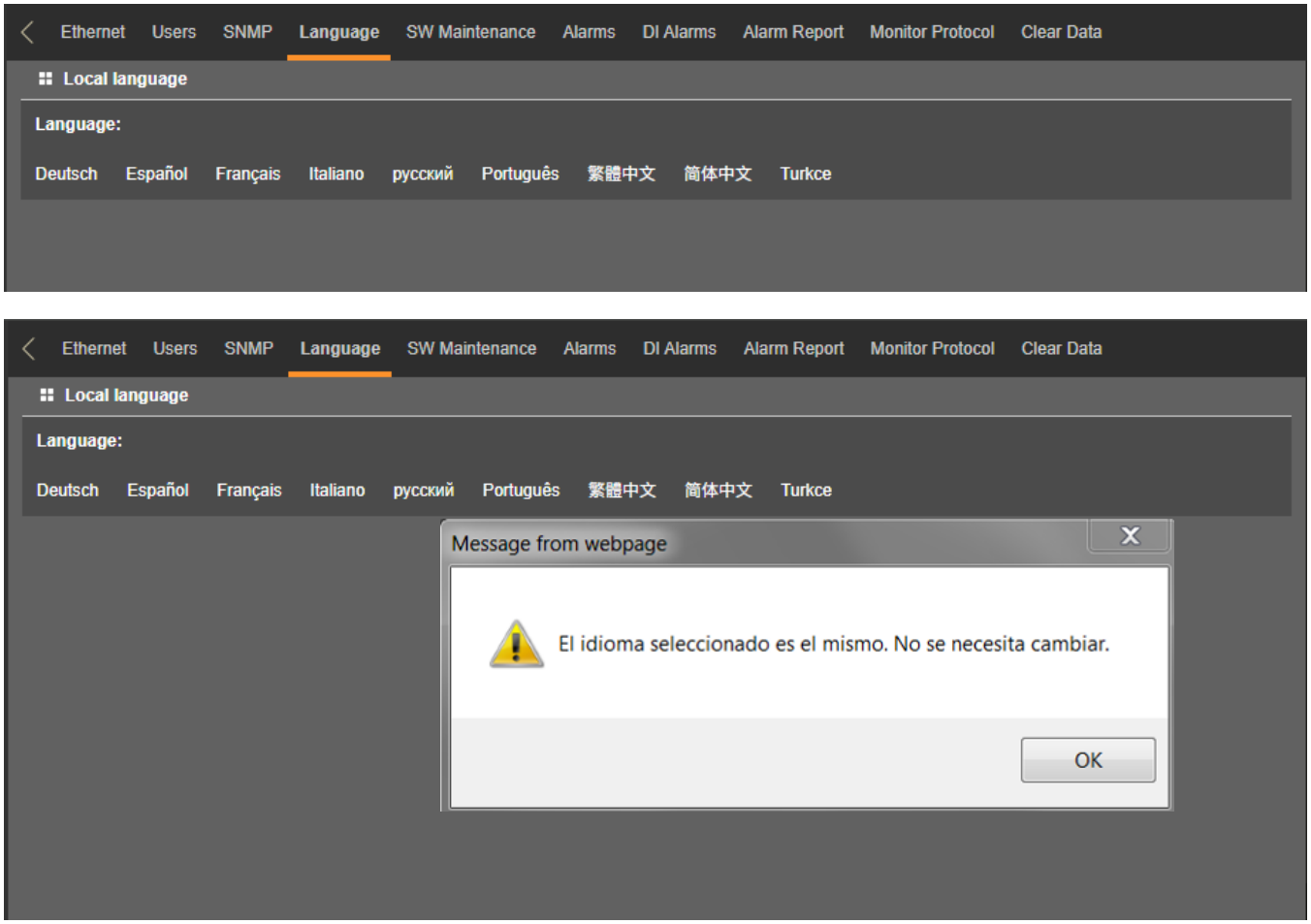
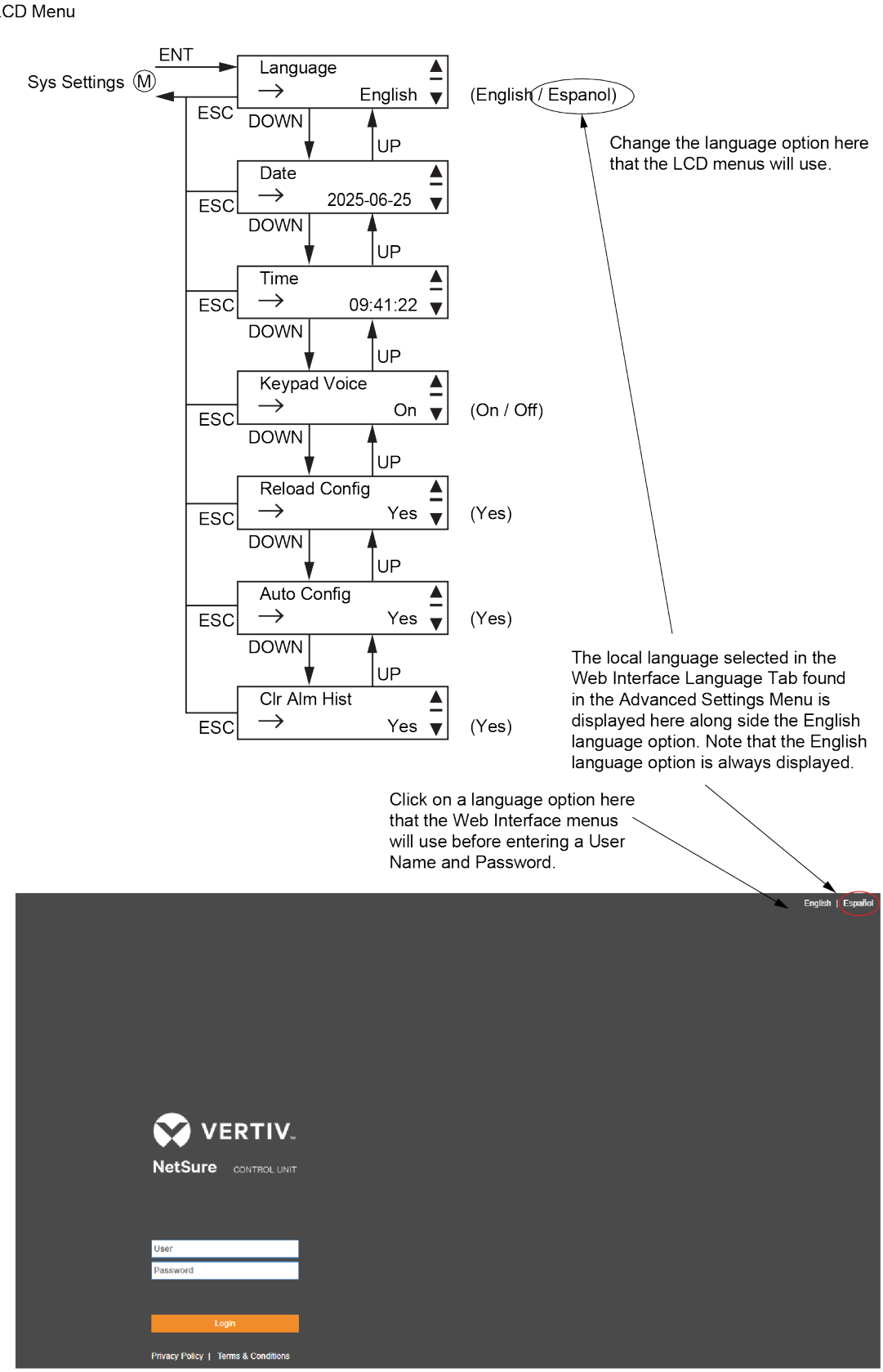


Figure 5.57 Selecting the Local Language for the Local Display and Web Interface Menus

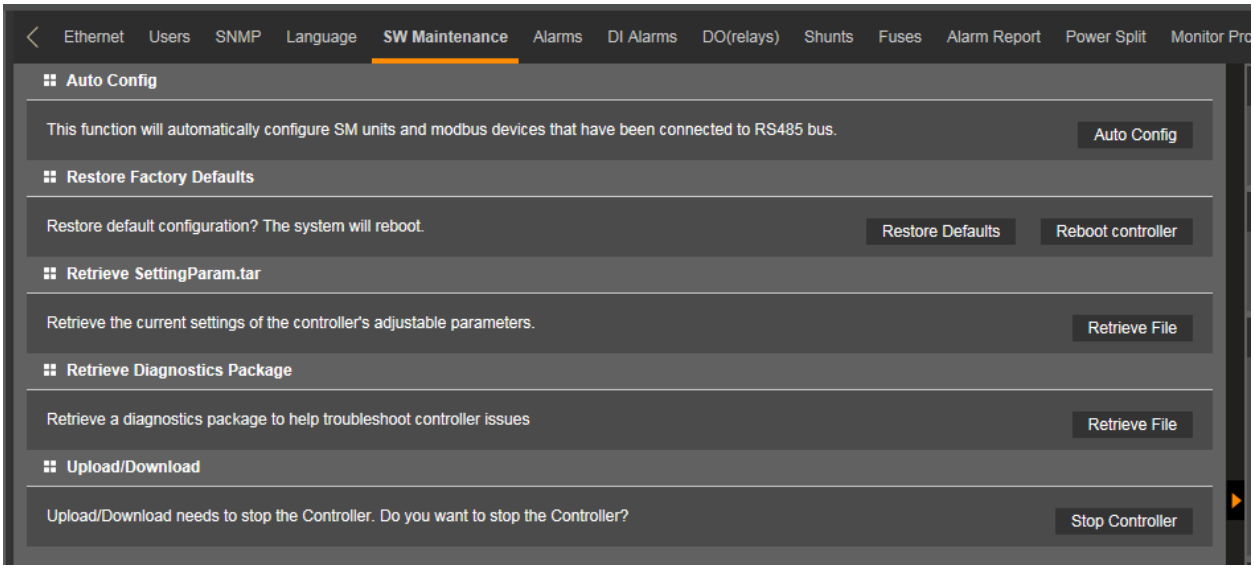


Web Interface Login Screen

SW Maintenance Tab

Allows you to perform software maintenance procedures.

Figure 5.58 SW Maintenance Tab

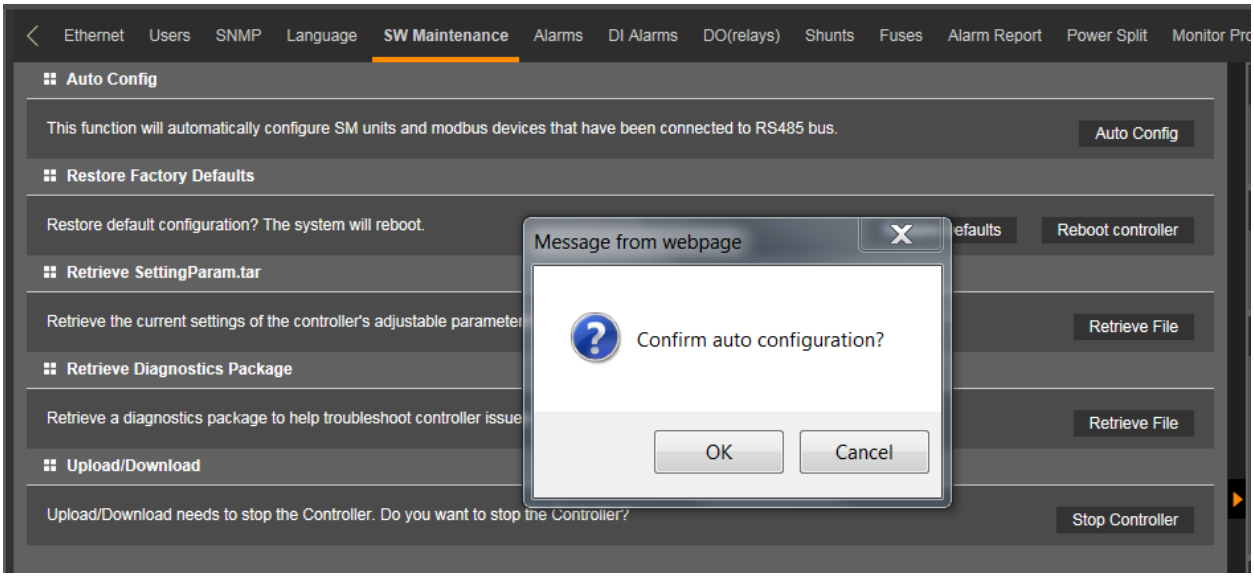


Auto Config Procedure

The auto configuration feature scans the system for intelligent equipment connected to controller via the RS485 BUS (such as Supervisory Modules and Modbus Devices) and configures these into the controller automatically.

To start the auto configuration process, click on the "Auto Config" button.

Figure 5.59 Auto Config



Restore Factory Default Configuration Procedure

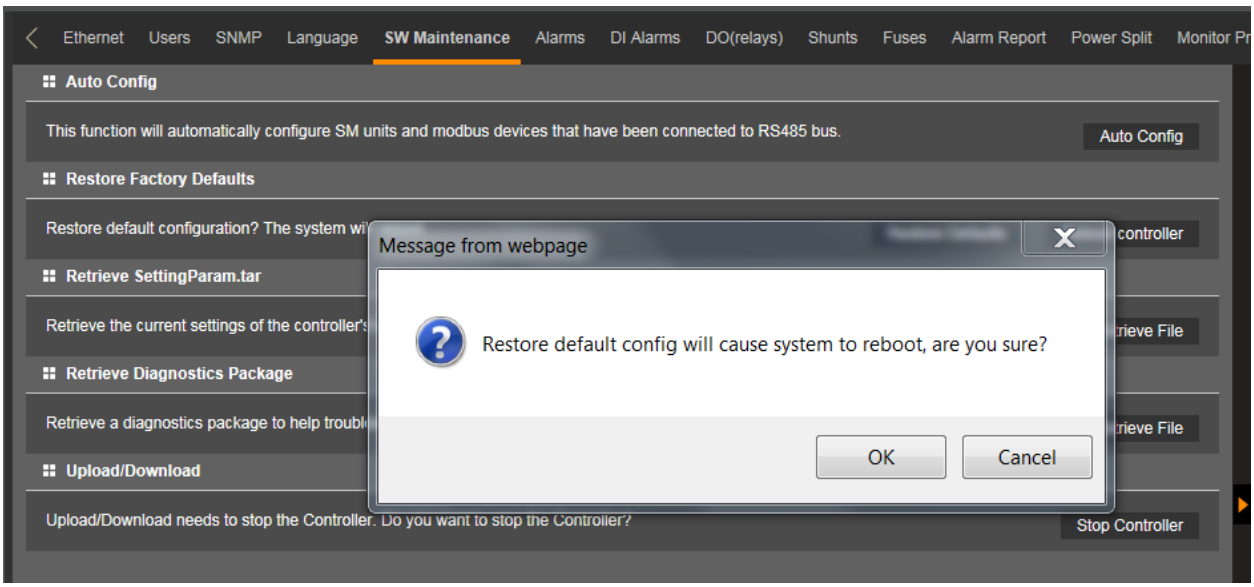
This procedure is used to restore all changes made to the controller to factory defaults.

Procedure

ALERT! When this procedure is performed, the controller's existing configuration and parameter settings will be lost. The "SettingParam.tar" file is deleted. Before restoring the factory default configuration, if you have made changes to the controller, save the "SettingParam.tar" file (see "Backing Up the Controller Configuration" on page 31).

1. Click on the "Restore Defaults" button.

Figure 5.60 Restore Factory Defaults



2. Click "OK" to confirm to overwrite the existing "SettingParam.tar" file in memory with the stored "SettingParam.tar" file.
3. The controller will automatically reboot. All settings WILL BE restored to the defaults of the stored "SettingParam.tar" file.

NOTE! *After rebooting, you must exit your browser and re-login to see any changes made.*

Retrieve "SettingParam.tar" File Procedure

See also “Backing Up the Controller Configuration” on page 31.

A file named “SettingParam.tar” is automatically created/appended by the controller whenever a User (or the factory at the time of shipment) makes changes to the controller via the local display or Web Interface. This file can be saved to your computer so you can restore any custom settings you may have made.

NOTE! *It is strongly recommended that you save a copy of the “SettingParam.tar” file whenever you customize any parameter settings. Then, if you ever replace the controller or perform a "Restore Defaults" procedure, you can restore your customized settings by downloading the previously saved “SettingParam.tar” file back into the controller.*

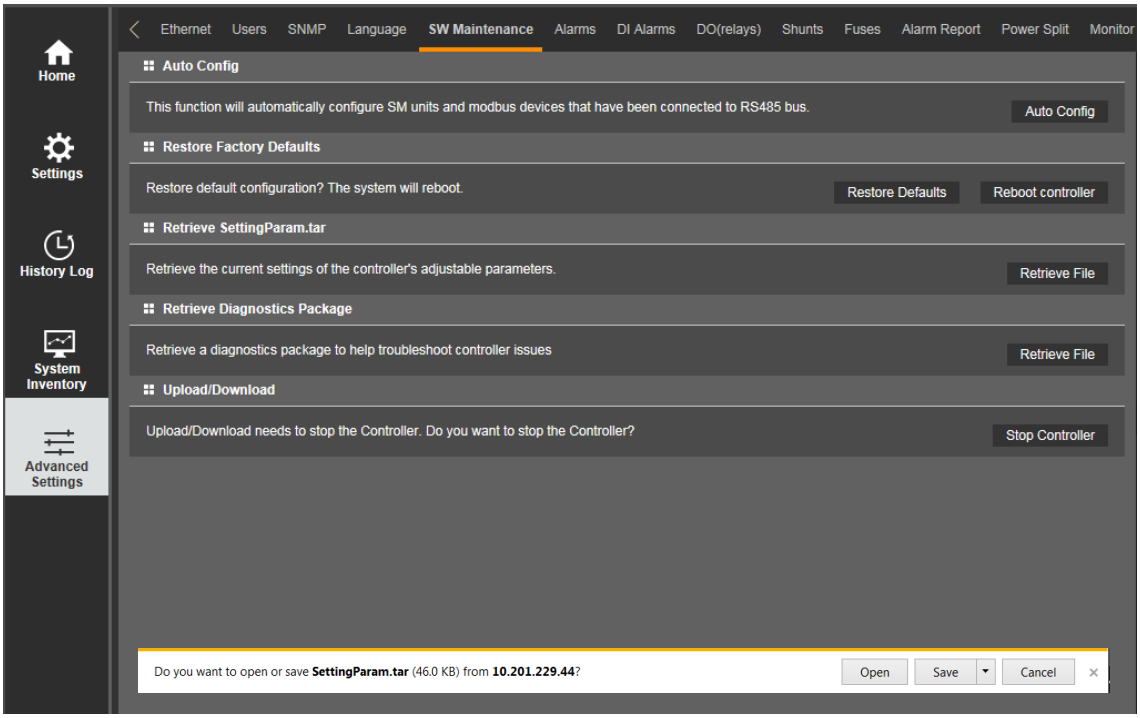
Prior to changing settings, ensure the current "SettingParam.tar" files are backed up. After making changes, create new backup files.

Procedure

1. Click on the “Retrieve File” button to save the file named "SettingParam.tar" to your computer. Select where you want the file to be copied to on your computer.

To aid in file management, you may change the name of the “SettingParam.tar” file to differentiate it from other "SettingParam.tar" files saved. The new name can use alpha and numeric characters preceding the original “SettingParam.tar” name (the end of the new file name **must** always be “SettingParam.tar”; for example, an acceptable filename would be “seville4SettingParam.tar”).

Figure 5.61 Retrieve "SettingParam.tar" File



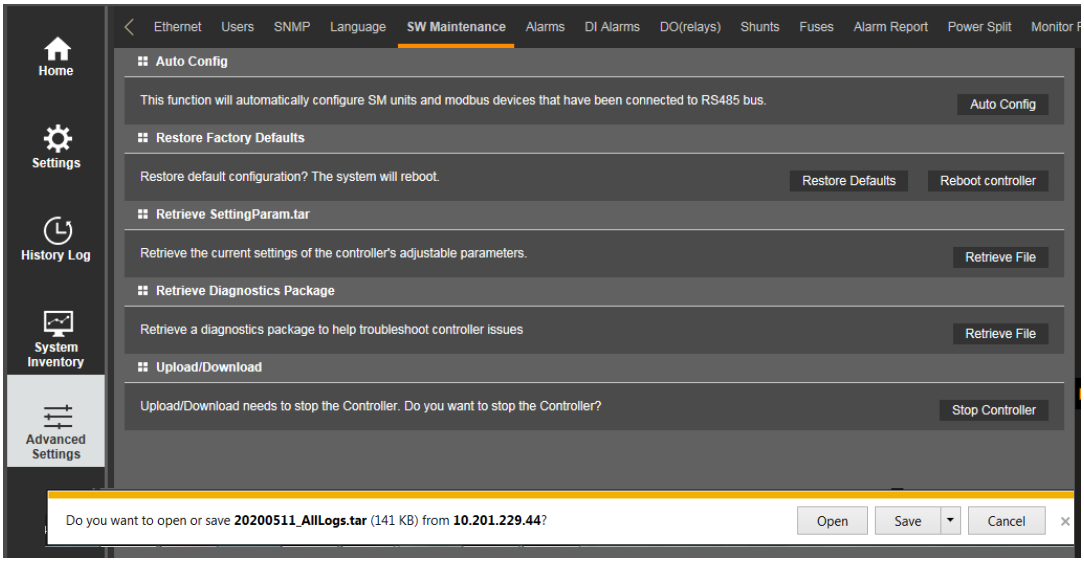
Retrieve Diagnostics Package Procedure

A diagnostics package can be retrieved that contains files useful for Vertiv to diagnose problems with your controller. When asked, retrieve the diagnostics package and send the file to Vertiv.

Procedure

1. Click on the “Retrieve File” button to save the file named "yyyymmdd_AllLogs.tar" to your computer. Select where you want the file to be copied to on your computer. Note that the beginning name of the file is the date the file was extracted.

Figure 5.62 Retrieve Diagnostics Package



Upload/Download Procedure

See also “Backing Up the Controller Configuration” on page 31, “Reloading a Backed-Up Controller Configuration” on page 32, and “Upgrading the Controller Using an Application ("All") Package” on page 32.

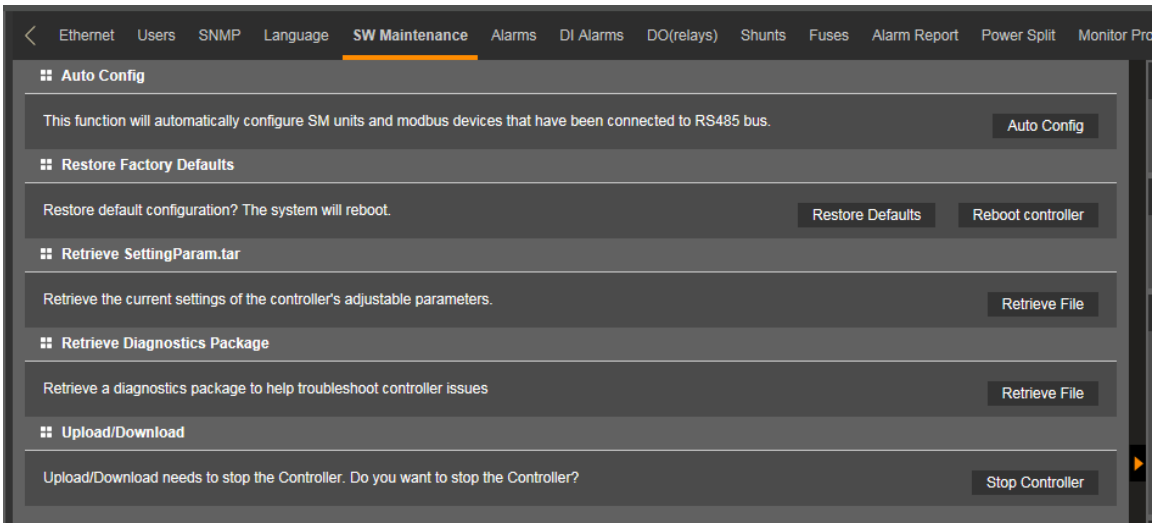
You can download (from your computer into the controller) a configuration package, application ("All") package, language package (filename of each has a tar or tar.gz extension), or “SettingParam.tar file”.

You can upload (from the controller to your computer) a configuration package or language package.

Procedure

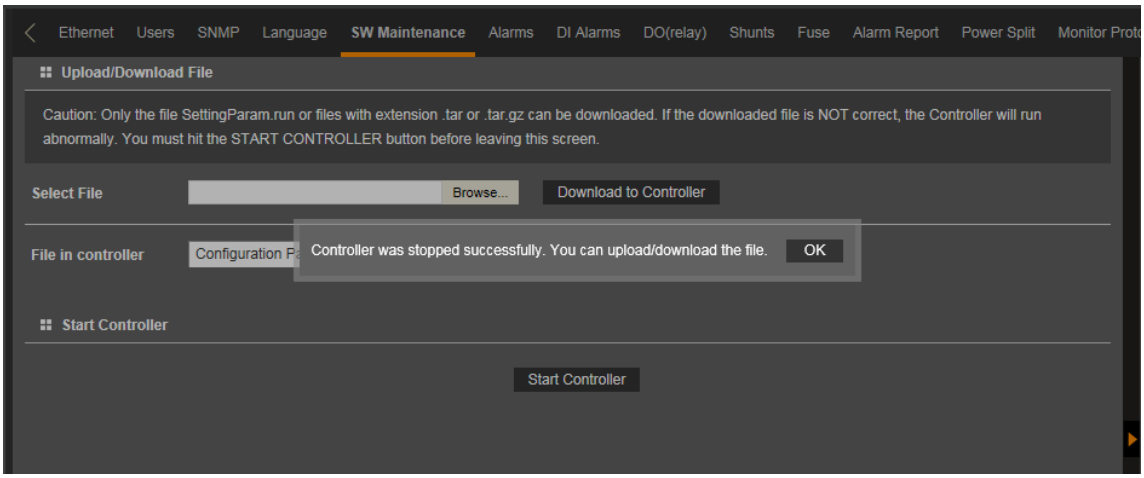
1. To upload or download a file, you need to shut down the controller first. When you select the SW Maintenance Tab, click on the “Stop Controller” button.

Figure 5.63 Upload/Download - Stop Controller



2. The following window opens.

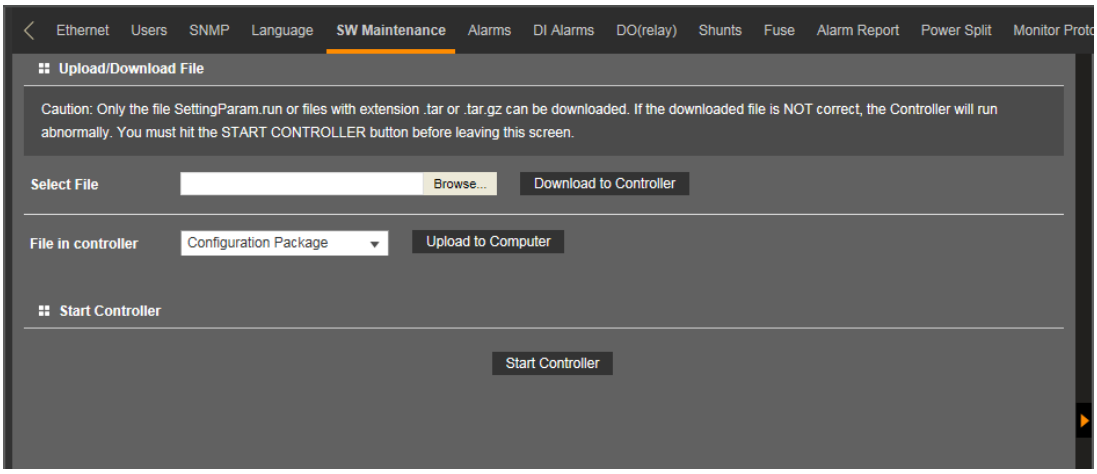
Figure 5.64 Upload/Download --Controller Stopped



3. Click "OK".

4. The following window opens.

Figure 5.65 Upload/Download File



ALERT! Never navigate from this Web page without first clicking on "Start Controller". If you do, you will not have Web access. A manual system reset is required to restore Web access.

5. To **download** (from your computer into the controller) a configuration package, application ("All") package, language package, or a "SettingParam.tar" file; click the "Browse..." button and navigate to the folder where the file to download is located. Select the file to be downloaded and then click the "Download to Controller" button. Click "Start Controller" to restart the controller with the downloaded file installed.

   To **upload** a file to your computer, select "Configuration Package" or "Language Package" from the "File in Controller" drop-down list box, and click on the "Upload to Computer" button to save the file to your computer. Select where you want the file to be copied to on your computer. Click "Start Controller" to restart the Controller.

NOTE! *A Configuration Package is a package of files containing all the default parameter settings and any User changes to alarm severity levels, relay assignments, signal names and site information. Note that the Configuration Package is part of the "SettingParam.tar" file and does not typically need to be downloaded separately.*

NOTE! *An Application "All" package file has both the application (software) and configuration package and is usually supplied for an application upgrade.*

NOTE! *A Language Package is a package of files containing all the default names of the parameters in two languages. Typically these would be in English and Spanish. The language package cannot be changed by the User. Consult Vertiv if a different language package is required.*

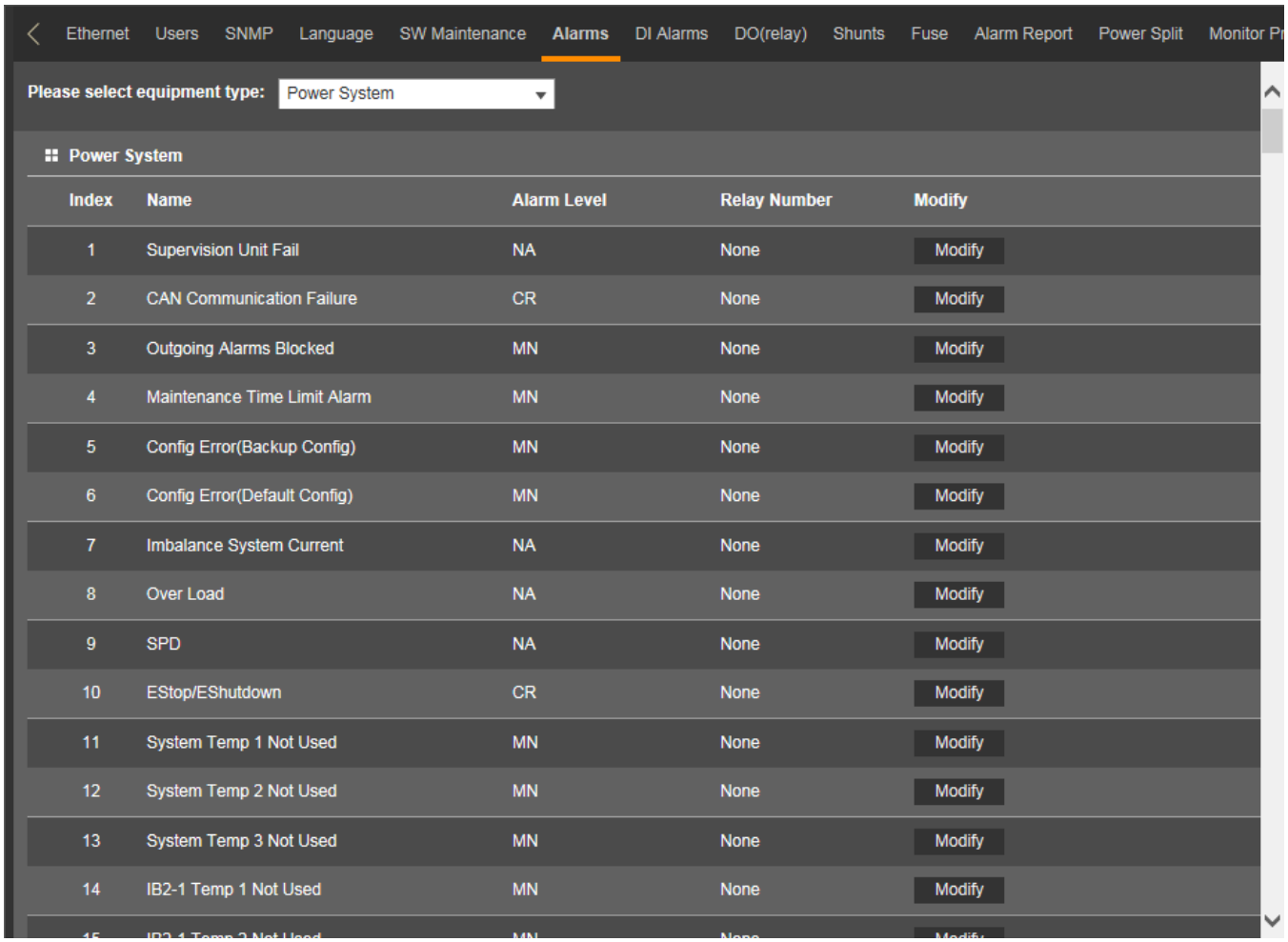
NOTE! *A file named "SettingParam.tar" is automatically created/appended by the Controller whenever a User (or the factory at the time of shipment) makes changes to the controller via the local display or Web Interface. This file also contains the Configuration Package described above.*

Alarms Tab

NOTE! *This list is dynamic and will only show you the equipment that you have in your system.*

- Allows you to define the alarm level for each alarm. (See also Table 1.1 on page 3.)
- Allows you to map alarms to the alarm relays.

Figure 5.66 Alarms Tab



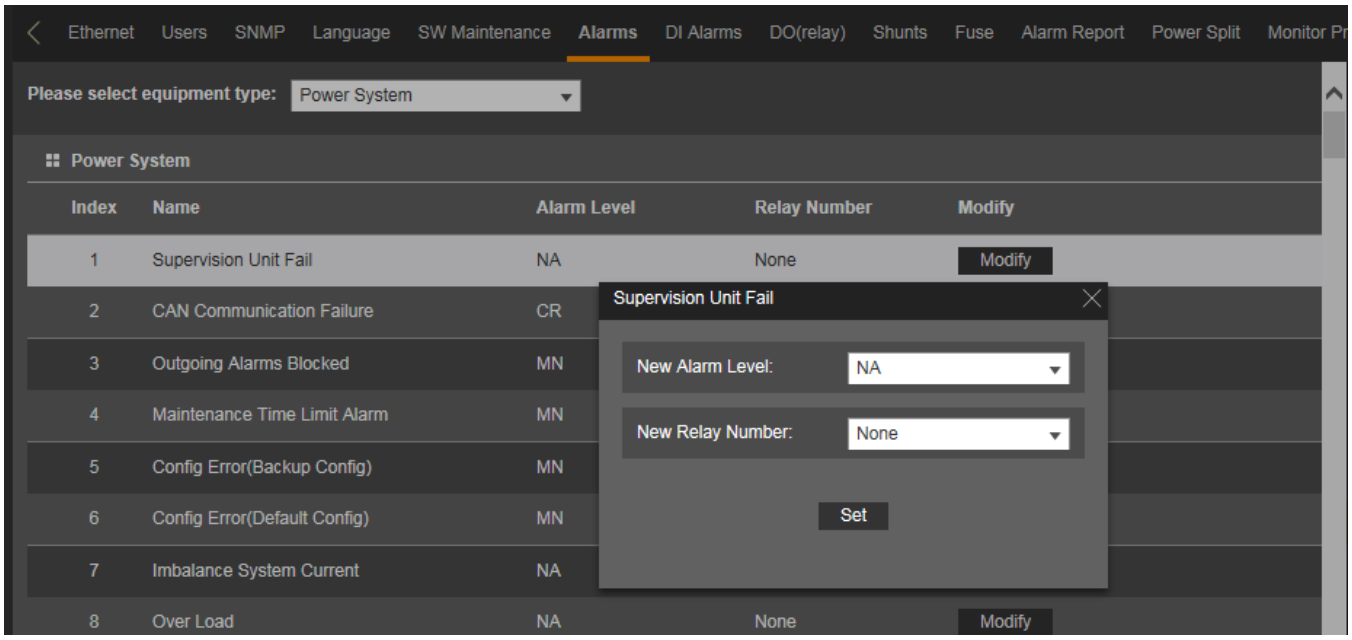
Procedure

1. Select the equipment type to display the alarms associated to it. Also displayed is the alarm level and alarm relay number assigned to this alarm.
2. To modify the alarm level and/or alarm relay number, click on the “Modify” button for that alarm signal.

3. The following window opens. Select the New Alarm Level and/or New Relay Number and click on “Set”.

   “None” means there is no related relay number.

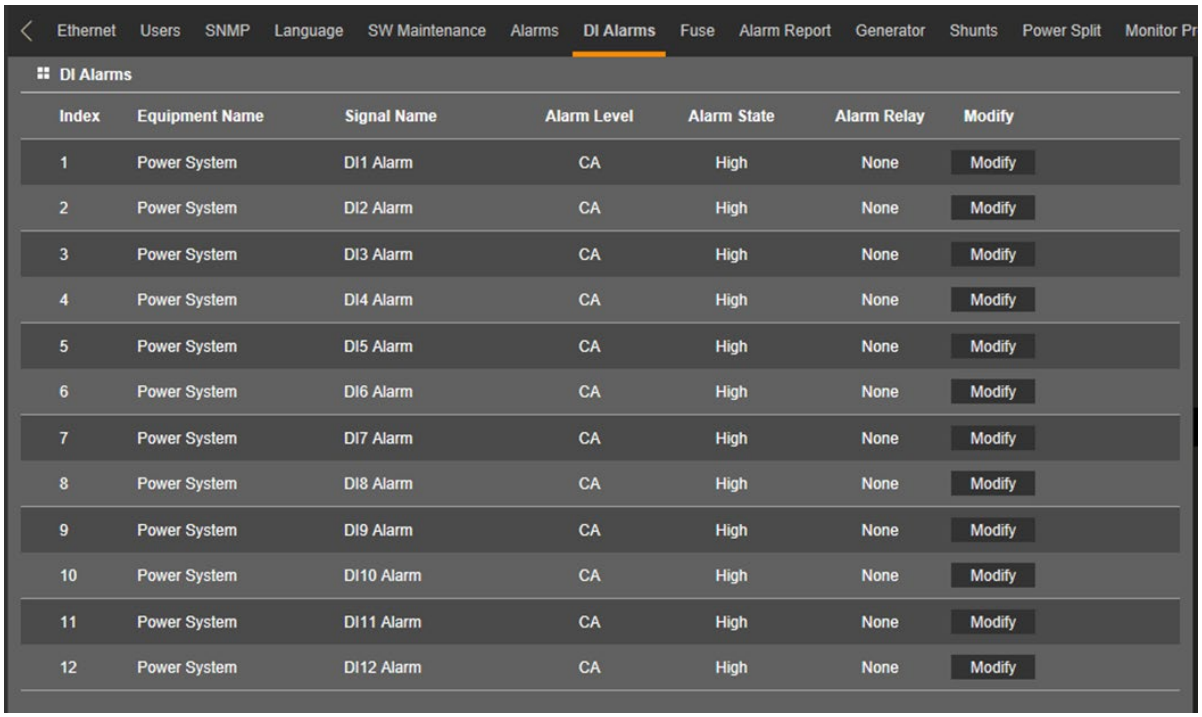
Figure 5.67 Setting Alarm Level / Relay Number



DI Alarms Tab

- Allows you to change the digital input alarm signal full name (name displayed in the Web Interface menus).
- Allows you to change the digital input alarm signal abbreviation name (name displayed in the local display menus).
- Allows you to define the alarm level for each digital input alarm. (See also Table 1.1 on page 3.)
- Allows you to map the digital input alarms to the alarm relays.
- Allows you to set the alarm state for the digital inputs (high or low).

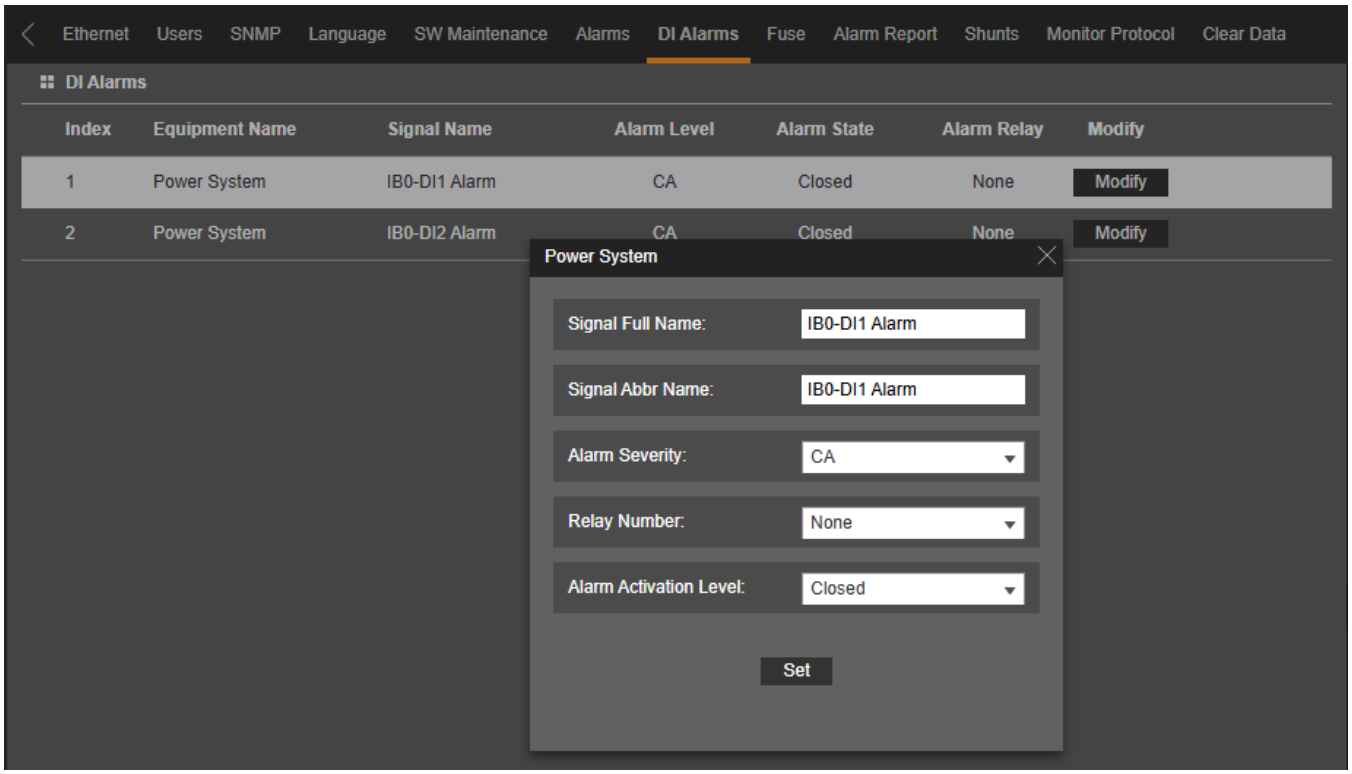
Figure 5.68 DI Alarm Tab



Procedure

1. To modify the digital input alarm parameters, click on the “Modify” button for that digital input alarm signal.
2. The following window opens.

Figure 5.69 Setting DI Alarm



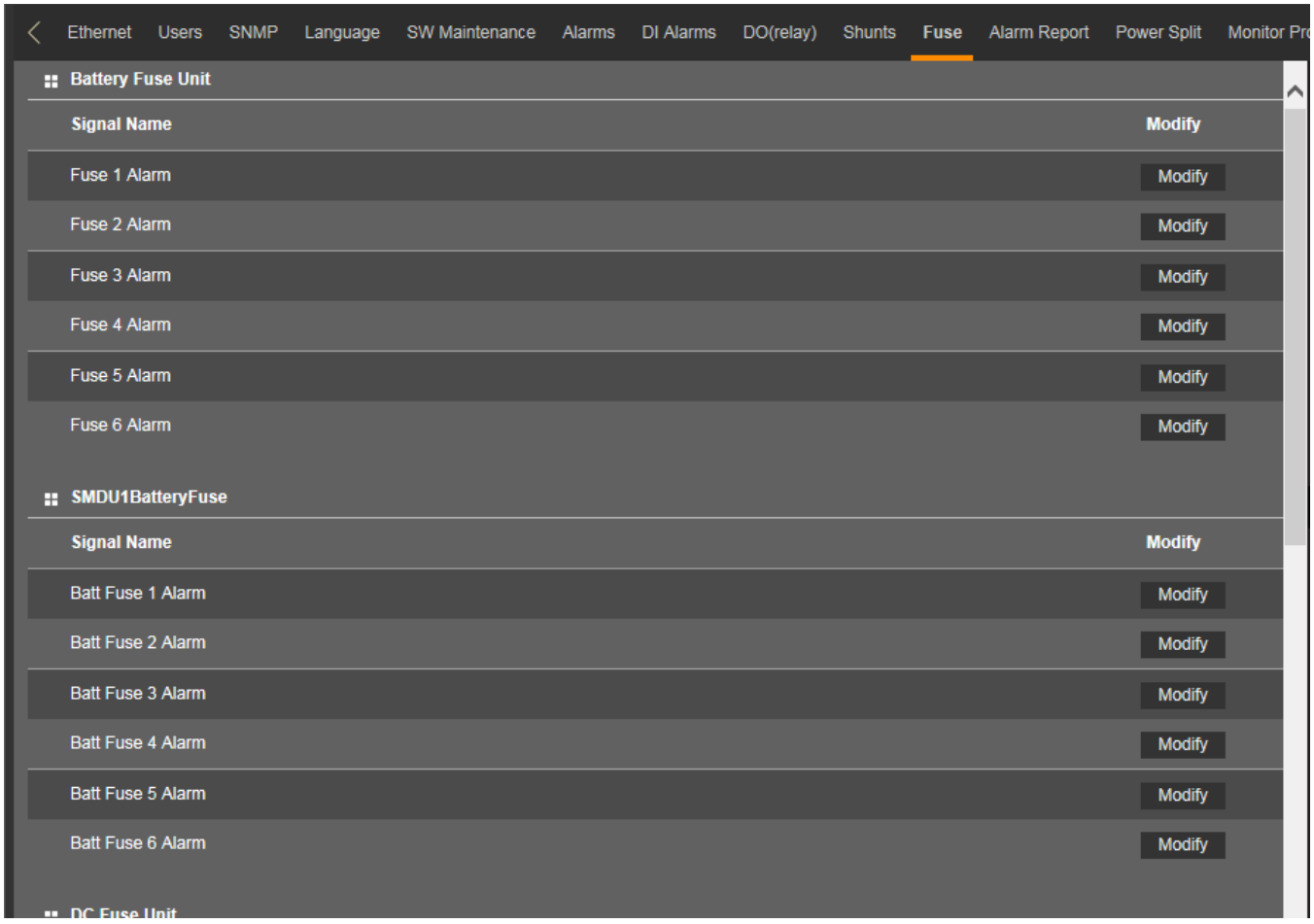
3. Change the following parameters as desired and click on “Set”.

   - **Signal Full Name:** Name displayed in the Web Interface menus.
   - **Signal Abbr Name:** Name displayed in the local display menus.
   - **New Alarm Level:** Alarm level for this digital input alarm. (See also Table 1.1 on page 3.)
   - **New Relay Number:** Select a relay number to map to this digital input alarm. “None” means there is no related relay number.
   - **New Alarm State:** Select high or low to set the alarm state for the digital input.

Fuse Tab

- Allows you to change the fuse full name (name displayed in the Web Interface menus).
- Allows you to change the fuse abbreviation name (name displayed in the local display menus).

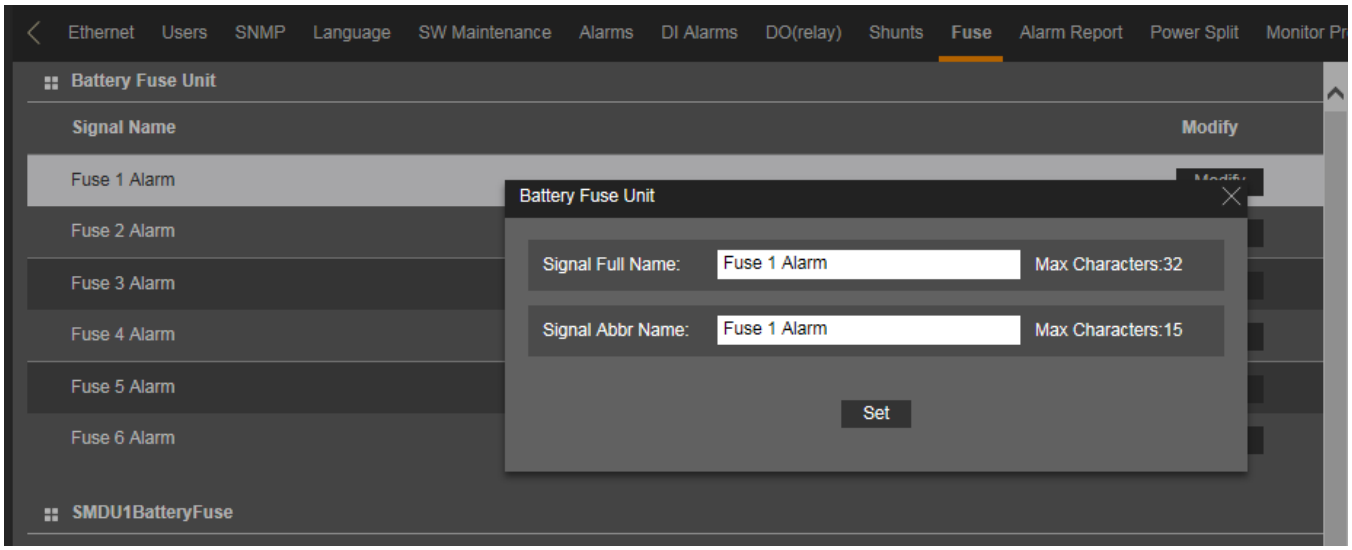
Figure 5.70 Fuse Tab



Procedure

1. To change the fuse name, click on the “Modify” button for that fuse.
2. The following window opens.

Figure 5.71 Changing Fuse Names



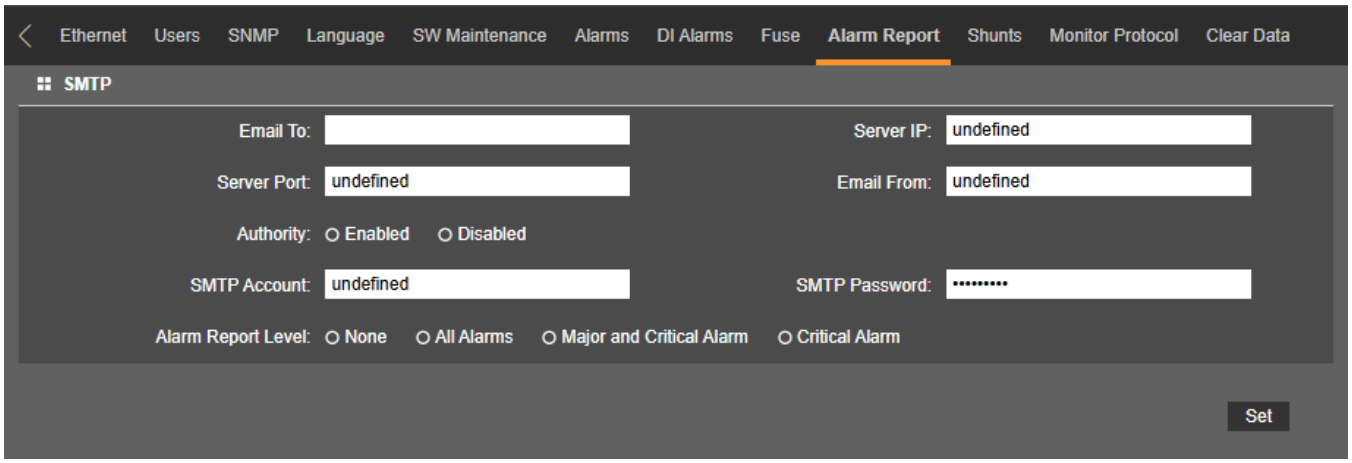
3. Change the following parameters as desired and click on “Set”.
   - **Signal Full Name:** Name displayed in the Web Interface menus.
   - **Signal Abbr Name:** Name displayed in the local display menus.

Alarm Report Tab

- In the SMTP section, you can set the Alarm Report Feature.
- In the SMS section, you can set cell phone number for receiving alarm reports and the alarm report level.

NOTE! *A GSM modem must be connected to the USB port of the controller for SMS functionality.*

Figure 5.72 Alarm Report Tab



Alarm Report Feature

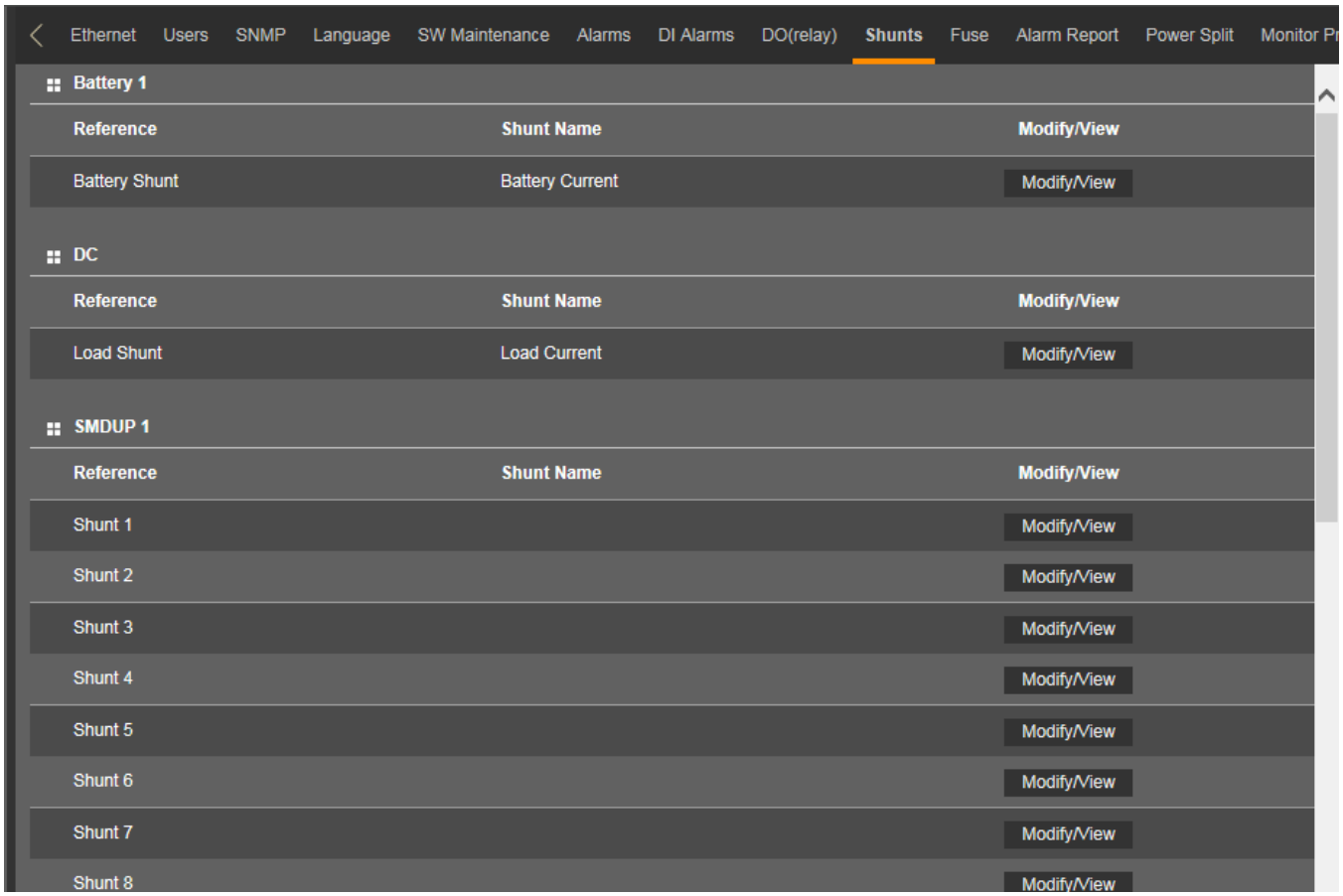
Set the following parameters.

- **Email To:** Valid email recipient to receive alarm reports.
- **Server IP:** IPV4 Server address. Obtain from your IT department.
- **Server Port**: Server port. Obtain from your IT department.
- **Email From:** The controller or Site email address. Will be displayed in the email from field of the received email.
- **Privilege:** Select Enabled (if email authentication is required) or Disabled as required (see your IT department). When enabled, set the following parameters.
  - **SMTP Account:** SMTP account number. Obtain from your IT department.
  - **SMTP Password:** SMTP password. Obtain from your IT department.
- **Alarm Report Level:** Select the level of alarm reports you want to receive.

Shunts Tab

- Allows you to change the shunts signal full name (name displayed in the Web Interface menus).
- Allows you to change the shunts signal abbreviation name (name displayed in the local display menus).
- Allows you to set the shunts parameters.

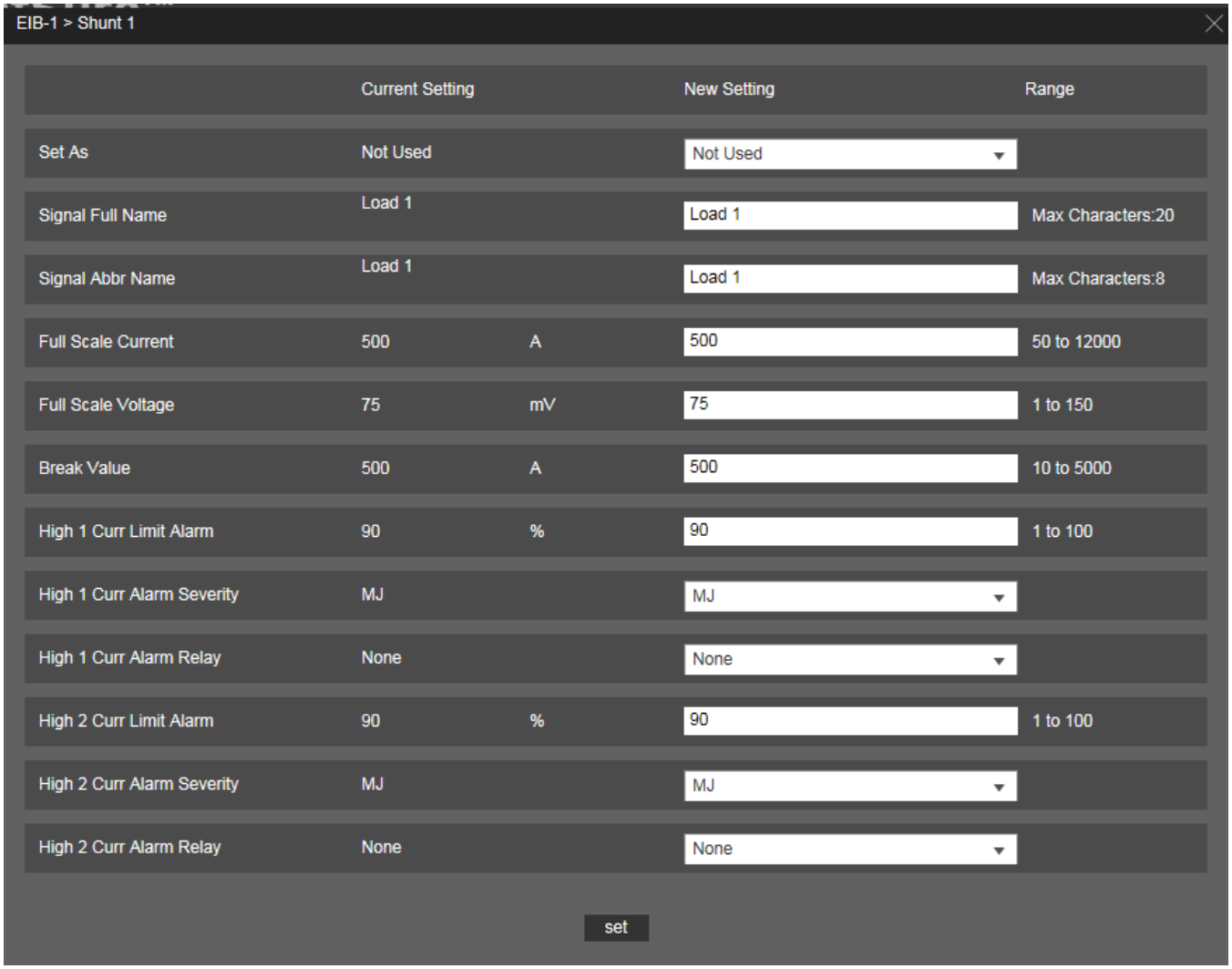
Figure 5.73 Shunts Tab



Procedure

4. To modify the shunt parameters, click on the “Modify/View” button for that shunt.
5. The following window opens.

Figure 5.74 Setting Shunt Parameters



6. Change the following parameters as desired and click on “Set”.

   For Battery Shunts:

   - Note that for battery shunts, the Set As option is not displayed.

   For DC Shunts:

   - **Set As (Yes, No):**
     - **Yes:** Indicates this shunt input is used.
     - **No:** Indicates this shunt input is not used.

   For EIB and SMDU Shunts:

- **Set As (Not Used, General, Load, Battery, Source):**

  - **Not Used:** Indicates this shunt input is not used.
  - **General:** Indicates the measurement of the shunt will be displayed and will not be added to Total DC Load or Total Battery Load.
  - **Load:** Indicates the measurement of the shunt will be displayed and added to the Total DC Load.
  - **Battery:** Indicates the measurement of the shunt will be displayed and added to the Total Battery Load and used with Battery Management.
  - **Source:** Indicates the measurement of the shunt will be displayed as source current and will be added to other sources.

For SMDU+ Shunts:

- **Set As (Enabled, Disabled):**

  - **Enabled:** Indicates this shunt input is used.
  - **Disabled:** Indicates this shunt input is not used.

- **Signal Full Name:** Name displayed in the Web Interface menus.
- **Signal Abbr Name:** Name displayed in the local display menus.
- **Full Scale Current:** Enter the value of the shunt's full current rating.
- **Full Scale Voltage:** Enter the value of the shunt's full-scale voltage (at rated current).
- **Break Value:** Enter the value desired as the reference for the high current alarms (typically the rating of the breakers or fuses fed by the shunt, if applicable).
- **High 1 Curr Limit Alarm:** Enter the percentage value of the "Break Value" for alarm.

High 1 Curr Alarm Severity: Alarm level for this alarm.

High 1 Curr Alarm Relay: Select a relay number to map to this alarm.
“None” means there is no related relay number.

- **High 2 Curr Limit Alarm:** Enter the percentage value of the "Break Value" for alarm.

High 2 Curr Alarm Severity: Alarm level for this alarm.

High 2 Curr Alarm Relay: Select a relay number to map to this alarm.
“None” means there is no related relay number.

Monitor Protocol Tab

You can select "EEM", "YDN23", or "Modbus" as the protocol. To make the new protocol valid, click the “Valid after Restart" button.

Figure 5.75 Monitor Protocol Tab

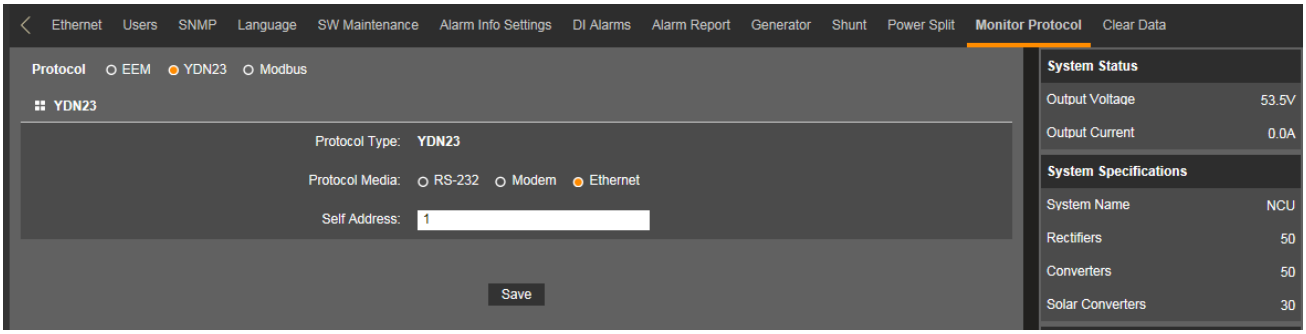
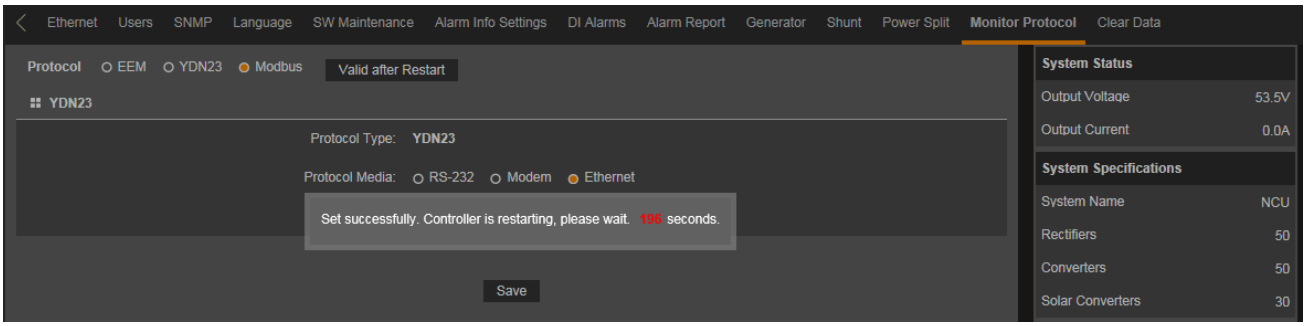


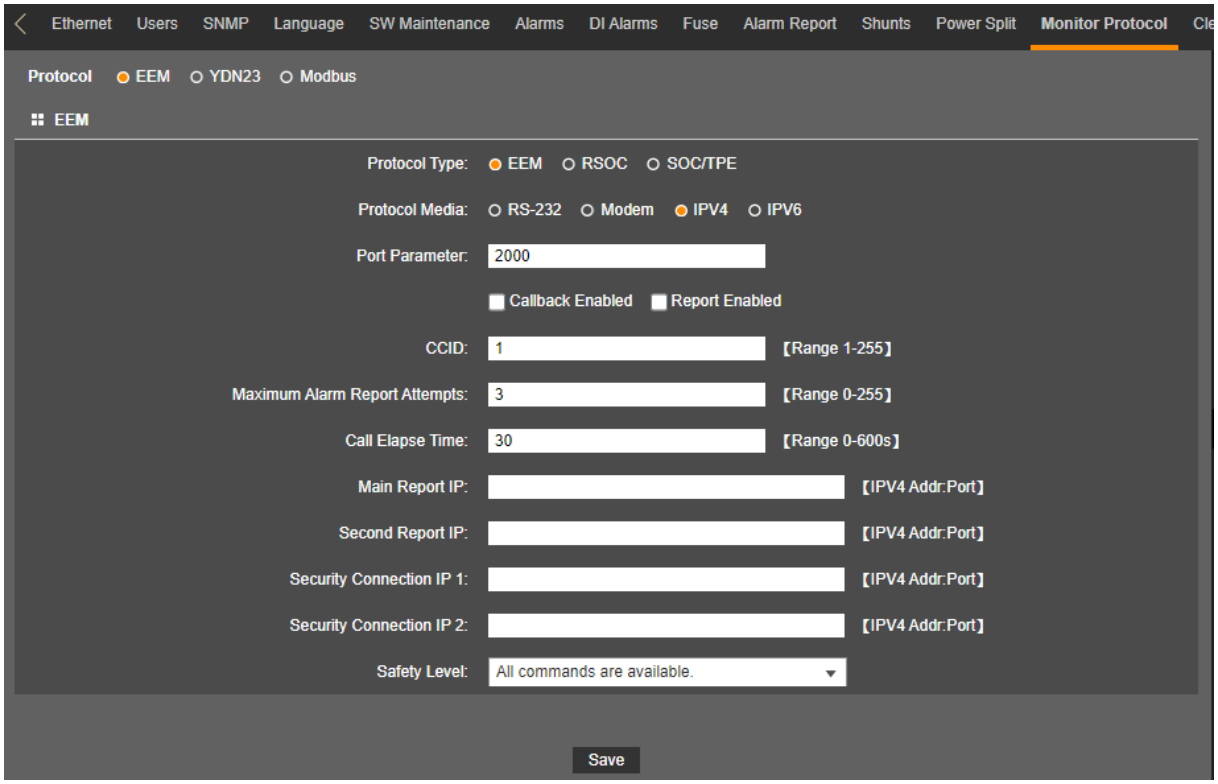
Figure 5.76 Valid after Restart



EEM Protocol

You can set EEM protocol parameters.

Figure 5.77 EEM Protocol

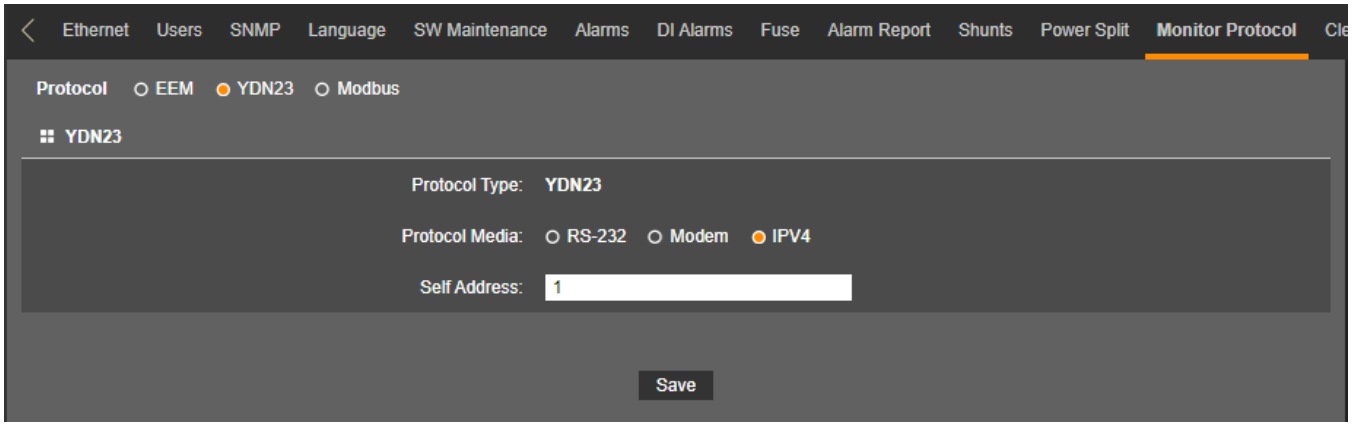


- **Protocol Type:** Select EEM, RSOC, or SOC/TPE per site requirements.
- **Protocol Media:** Select RS-232, Modem, IPV4, or IPV6 per site requirements.
- **Port Parameter:** Enter the port parameters per site requirements.
- **Callback Enabled:** Select per site requirements.
- **Report Enabled:** Select per site requirements.
- **CCID:** Enter value per site requirements.
- **Maximum Alarm Report Attempts:** Enter value per site requirements.
- **Call Elapse Time:** Enter value per site requirements.
- **Main Report IP:** Sets the main report IP.
- **Second Report IP:** Sets the second report IP.
- **Security Connection IP1:** Sets the Security Connection IP1.
- **Security Connection IP2:** Sets the Security Connection IP2.
- **Safety Level:** Select per site requirements.

YDN23 Protocol

You can set YDN23 protocol parameters.

Figure 5.78 YDN23 Protocol

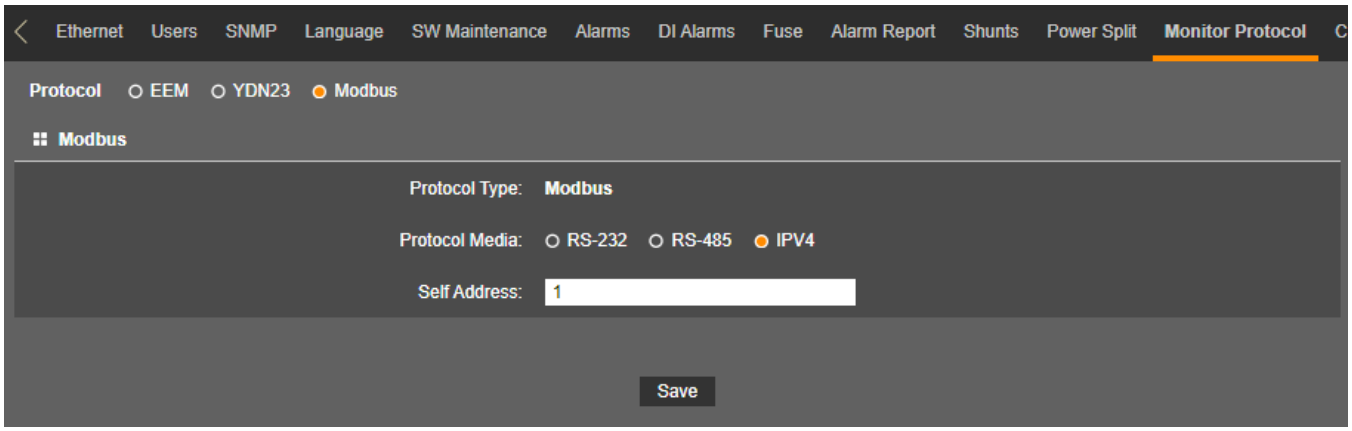


- **Protocol Media:** Select RS-232, Modem, or IPV4 per site requirements.
- **Self Address:** Enter the parameter per site requirements.

Modbus Protocol

You can set Modbus protocol parameters.

Figure 5.79 Modbus Protocol

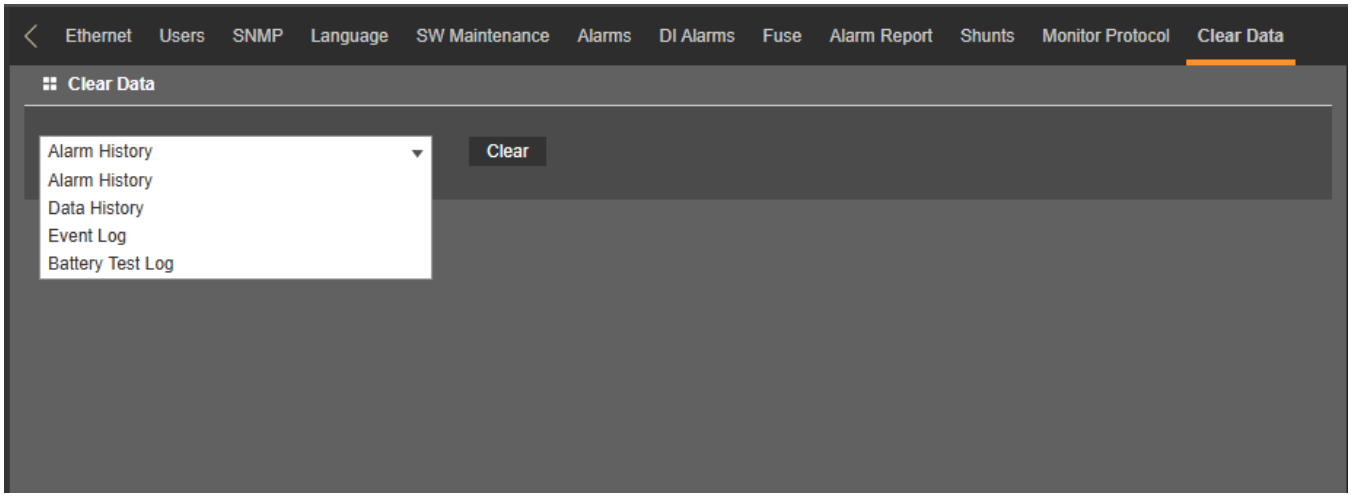


- **Protocol Media:** Select RS-232, Modem, or IPV4 per site requirements.
- **Self Address:** Enter the parameter per site requirements.

Clear Data Tab

Select the data log to be cleared from those listed in the drop-down list box. Click on the “Clear” button to clear the corresponding data.

Figure 5.80 Clear Data



6 Accessing the Controller via a Network Management System (NMS)

6.1 General

The controller has an SNMP agent function.

Users can use a Network Management System (NMS) to perform the following operations:

- Query the operation status and input/output signals of the devices connected to the controller.
- Browse the active alarms.
- Set the float voltage.
- Set the battery current limit.
- Read Ah Battery Capacity
- Set Battery Equipment Rated Capacity

When the controller generates alarms, the SNMP agent can be configured to notify the NMS through TRAPS automatically.

6.2 NMS Supported by SNMP Agent

SNMP is a technology used for network management. The technology is based on implementing an information base called MIB (Managed Information Base). This MIB contains parameters that are of interest from a management perspective. All LAN connected equipment that supports SNMP also supports a default MIB called MIB-II.

The SNMP Agent responds to requests received via the SNMP protocol and also actively sends TRAPS to a specified manager when certain MIB values change state. This is used to actively inform a manager when an alarm situation is recognized.

6.2.1 NMS Supported by SNMP v2

The SNMP agent of the controller supports SNMPv2.

All the NMS that supports SNMPv2c can be used to access the controller. The NMS includes HP OpenView, IBM NetView, Novell ManageWise, SunNet Manager, and so on.

6.2.2 NMS Supported by SNMP v3

The controller has SSL and SNMP V3 function, which makes the controller more powerful and more secure.

With SSL, you can browse/set the Webpage with https. If your site requires secure HTTP and you were furnished with a controller configuration with secure HTTP, enter https:// and the controller's IP address and press **ENTER**. Data is encrypted in the transmission. You can also browse/set the MIB library with SNMP v3. Data is also encrypted in the transmission.

6.3 MIB Installation

6.3.1 Installation

The Controller's MIB is named " NETSURE-MIB-047.mib". Contact your Vertiv representative for the location on the Web to download the MIB file.

Use the MIB loading function of the NMS to load the MIB database. Refer to the User Manual provided with the NMS for the detailed loading method.

6.3.2 Contents of the Controller's MIB

The contents of the MIB supported by the controller's SNMP agent and the OID are listed in Table 6.1. For the details, refer to the MIB file named "Netsure.mib".

6.4 Accessing the Controller through an NMS

6.4.1 Apply Administrative Privilege

In order to use the NMS to manage the devices connected to the controller, the administrative authority needs to be applied for the NMS, that is, add the NMS information to the access list of SNMP agent.

Add NMS through Web Browser

Refer to "NMSV2 Configuration Description (Network Management System)" on page 117 and "NMSV3 Configuration Description (Network Management System)" on page 119 for the method of adding NMS.

6.5 ESR Configure

The EEM Protocol is used for communication between the Main Computer and the controller. The Main Computer is the computer superior to the controller (the client of the controller). On this page, all parameters needed for communication with a main EEM computer are to be set.

User Information Configuration: On this page, Users, their privilege and password are configured.

Time Synchronization: On this page, the system time and date are to be set.

Automatic time synchronization from time servers can also be configured.

Table 6.1 Contents of the Controller's MIB

Identification Group		
identManufacturer	The name of the equipment manufacturer.	R
identModel	The manufacturers model designation of the power system.	R
identControllerFirmwareVersion	The firmware (software) version of the controller.	R
identName	The name of the power plant. This object should be set by the administrator.	R/W
identSNMPCfgVer	The SNMP configuration version.	R
identSerialNumber	The serial number of this controller.	R
identHWerVersion	The Hardware version of the controller.	R
identSiteLocation	The Site Location of the controller.	R/W
identControllerConfigVer	The Configuration Version for the controller.	R
identMacID	The MAC ID for the controller.	R
identSystemName	The System Name for the controller.	R/W
identProductModel	The Product Model of the controller.	R
identCriticalAlarms	Number of active critical alarms.	R
identPrimaryIp	Primary IP of the controller.	R
identNTPMode	NTP mode of the controller. MANUAL - NTP is disabled NTP - NTP is enabled	R
identSystemDateTime	System date and Time of the controller.	R/W
identLocalZone	Local Time zone for the controller, as a positive or negative offset from GMT. Format hh:mm.	R
System Group		
systemStatus	Status of the complete plant (highest alarm). One of... (1) unknown - status has not yet been defined (2) normal - there are no activated alarms (3) warning - OA, lowest level of 'abnormal' status (4) minor - A3 (5) major - MA (6) critical - CA, highest level of 'abnormal' status (7) unmanaged (8) restricted (9) testing (10) disabled	R
systemVoltage	System voltage, stored as mV.	R
systemCurrent	System current, stored as mA.	R
systemUsedCapacity	Used capacity, stored as percentage of the total capacity.	R
Battery Group		
psBatteryVoltage	Battery voltage, stored as mV, including positive or negative sign.	R
psTotalBatteryCurrent	Battery current, stored as mA, including positive or negative sign.	R
psLowestBatteryCapacity	Calculated capacity, stored as milli % of the total capacity. Lowest available capacity for multiple battery strings.	R
psBatteryNominalCapacity	Nominal installed capacity, stored as mAh.	R

Battery Table		
psBatteryTable	Battery table.	R
psBatteryEntry	Battery measurement table entry.	R
psBatteryIndex	Automatically generated index object.	R
psBatteryCurrent	Battery current in amps.	R
psBatteryName	Battery shunt name.	R
psBatteryCapacityAh	Capacity, stored as Ah	R
psBatteryCapacityPer	State of charge, stored as %	R
psBatteryRatedCapacity	Rated capacity, stored as mAh	R
BMS Table		
psBmsEntry	BMS Measurement Table Entry.	R
psBmsIndex	Automatically generated index object.	R
psBmsVoltage	BMS voltage in mV.	R
psBmsCurrent	BMS Current in mA.	R
psBmsRatedCapacity	BMS rated capacity, in mAh.	R
psBmsStateOfCharge	BMS State Of Charge in percent.	R
psBmsCapacity	BMS capacity in Ah.	R
psBmsAverageTemperature	BMS cell average temperature, stored as 0.001 Celsius degree.	R
psBmsAmbientTemperature	BMS ambient temperature, stored as 0.001 Celsius degree.	R
psBmsProductNumber	BMS Product Number	R
psBmsHWVersion	BMS Hardware Version	R
psBmsSWVersion	BMS Software Version	R
psBmsSerialNumber	BMS Serial Number	R
psBmsDOManfacturer	BMS Date Of Manufacture	R
psBmsChargeCurrentLimit	BMS Current limit in A	R
Input Group		
psInputLineAVoltage	The AC Line 1 voltage, stored as mV.	R
psInputLineBVoltage	The AC Line 2 voltage, stored as mV.	R
psInputLineCVoltage	The AC line C voltage, stored as mV.	R
psTemperature Group		
psTemperature1	The first route temperature, stored as 0.001 Celsius degree.	R
psTemperature2	The second route temperature, stored as 0.001 Celsius degree.	R
Temperature Table		
psTemperatureTable	Temperature measurement table.	R
psTemperatureEntry	Temperature measurement table entry.	R
psTemperatureIndex	Temperature sensor number.	R
psTemperatureMeasurement	Temperature value in centigrade.	R
psTemperatureName	Configured temperature sensor name.	R
psTemperatureType	Temperature sensor Type. (1) none (2) ambient (3) battery	R

psTemperatureAlarmStatus	Temperature sensor Alarm Status. (1) high (2) low (3) fail (4) none	R
psStatusCommunication	The status of communication with the Power System. (1) unknown (2) normal (3) interrupt indicates some errors occurred between Power System and agent	R
Battery Mode		
psStatusBatteryMode	The status of battery modes. FloatCharging (2), ShortTest (3), BoostChargingForTest (4), MnualTesting (5), PlanTesting (6), ACFailTesting (7), ACFail (8), ManualBoostCharging (9), AutoBoostCharging (10), CyclicBoostCharging (11), MasterBoostCharging (12), MasterBateryTesting (13).	R
SM Series Group		
psSMACNumber	The number of SM AC module.	R
psSMBATNumber	The number of SM BAT module.	R
psSMIONumber	The number of SM IO module.	R
Rectifier Group		
psNumberOfInstalledRectifiers	Number of rectifiers.	R
psNumberOfRectifiersCommunicating	Number of rectifiers communicating.	R
psRectifiersUsedCapacity	Used capacity, stored as % of the total capacity.	R
Rectifier Table		
psRectifierTable	Table holding information about individual rectifier.	R
psRectifierEntry	An entry (conceptual row) in the rectifier info table.	R
psRectifierIndex	Automatically generated index object.	R
PsRectifierProductNumber	Rectifier product number.	R
PsRectifierHWVersion	Rectifier hardware revision.	R
psRectifierSWVersion	Rectifier software revision.	R
psRectifierSerialNumber	Rectifier serial number.	R
psRectifierCurrent	Rectifier current, stored as mA.	R
psRectifierIdent	Rectifier physical location identifier.	R
psRectifierFail	The type of alarm change. One of... (1) Activated (2) Deactivated	R
psRectifierTotalCurrent	Total output current, stored as mA.	R

The Distribution		
psTotalLoadCurrent	Total load current, stored as mA.	R
Distribution Load Table		
psDistributionLoadTable	Table of shunts configured as loads.	R
psDistributionLoadEntry	Distribution measurement table entry	R
psDistributionLoadIndex	Automatically generated index object.	R
psDistributionLoadCurrent	Distribution current, stored as mA.	R
psDistributionLoadName	Distribution name.	R
Distribution General Table		
psDistributionGeneralTable	Distribution Table.	R
psDistributionGeneralEntry	Distribution measurement table entry.	R
psDistributionGeneralIndex	Automatically generated index object.	R
psDistributionGeneralCurrent	Distribution current, stored as mA.	R
psDistributionGeneralName	Distribution name.	R
Converter Group		
numberOfInstalledConverters	Number of converters.	R
numberOfConvertersCommunicating	Number of converters communicating.	R
convertersUsedCapacity	Used capacity, stored as % of the total capacity.	R
psConverterVoltage	Converter voltage in mV.	R
psTotalConverterCurrent	Total converter current in mA.	R
Converter Table		
psConverterTable	Table holding information about individual converters.	R
psConverterEntry	An entry (conceptual row) in the converter info table.	R
psConverterIndex	Automatically generated index object.	R
psConverterProductNumber	Converter product number.	R
psConverterHWVersion	Converter hardware revision.	R
psConverterSWVersion	Converter software revision.	R
psConverterSerialNumber	Converter serial number.	R
psConverterCurrent	Converter current, stored as mA.	R
psConverterIdent	Converter physical location identifier.	R
psConverterFail	The type of alarm change. (1) activated (2) deactivated	R
Control Group		
controlBatteryTest	Control battery test, start (1), stop (0).	R/W
controlRelay8	Control relay8, close (1), open (0).	R/W
controlRelay7	Control relay7, close (1), open (0).	R/W
controlRelay6	Control relay6, close (1), open (0).	R/W
controlRelayTest	Control relay test, auto (2), manual (1), disabled (0).	R/W
controlEqualizeCharge	Control battery equalize charge, start (1), stop (0).	R/W
restartNCU	Restarts the NCU. Default value is 123. Write of any number will restart the NCU	R/W

Equipment Signal Table		
psEquipmentSignalTable	Table of indexed equipment signal values.	R
equipmentSignalTableEntry	An entry (conceptual row) in the equipment signal table.	R
psEquipmentSignalTableEntryIndex	The unique sequence number of this equipment signal.	R
psEquipmentSignalValue	Indexed equipment signal value.	R
SMDUH Table **SMDUH Current Table**		
psSMDUHCurrentTable	Table holding information about SMDUH currents.	R
psSMDUHCurrentEntry	An entry (conceptual row) in the SMDUHTable.	R
psSMDUHCurrentIndex	Automatically generated index object.	R
psSMDUHCurrent1	SMDUH Current 1, stored as mA.	R
PsSMDUHCurrent2	SMDUH Current 2, stored as mA.	R
PsSMDUHCurrent3	SMDUH Current 3, stored as mA.	R
PsSMDUHCurrent4	SMDUH Current 4, stored as mA.	R
PsSMDUHCurrent5	SMDUH Current 5, stored as mA.	R
PsSMDUHCurrent6	SMDUH Current 6, stored as mA.	R
PsSMDUHCurrent7	SMDUH Current 7, stored as mA.	R
PsSMDUHCurrent8	SMDUH Current 8, stored as mA.	R
PsSMDUHCurrent9	SMDUH Current 9, stored as mA.	R
psSMDUHCurrent10	SMDUH Current 10, stored as mA.	R
psSMDUHCurrent11	SMDUH Current 11, stored as mA.	R
psSMDUHCurrent12	SMDUH Current 12, stored as mA.	R
psSMDUHCurrent13	SMDUH Current 13, stored as mA.	R
psSMDUHCurrent14	SMDUH Current 14, stored as mA.	R
psSMDUHCurrent15	SMDUH Current 15, stored as mA.	R
psSMDUHCurrent16	SMDUH Current 16, stored as mA.	R
psSMDUHCurrent17	SMDUH Current 17, stored as mA.	R
psSMDUHCurrent18	SMDUH Current 18, stored as mA.	R
psSMDUHCurrent19	SMDUH Current 19, stored as mA.	R
PsSMDUHCurrent20	SMDUH Current 20, stored as mA.	R
SMDUH Power Table		
psSMDUHPowerTable	Table holding information about SMDUH power.	R
psSMDUHPowerEntry	An entry (conceptual row) in the SMDUHPowerTable.	R
psSMDUHPowerIndex	Automatically generated index object.	R
psSMDUHPower1	SMDUH Power 1, stored as W.	R
psSMDUHPower2	SMDUH Power 2, stored as W.	R
psSMDUHPower3	SMDUH Power 3, stored as W.	R
psSMDUHPower4	SMDUH Power 4, stored as W.	R
psSMDUHPower5	SMDUH Power 5, stored as W.	R
psSMDUHPower6	SMDUH Power 6, stored as W.	R
psSMDUHPower7	SMDUH Power 7, stored as W.	R
psSMDUHPower8	SMDUH Power 8, stored as W.	R

psSMDUHPower9	SMDUH Power 9, stored as W.	R
psSMDUHPower10	SMDUH Power 10, stored as W.	R
psSMDUHPower11	SMDUH Power 11, stored as W.	R
psSMDUHPower12	SMDUH Power 12, stored as W.	R
psSMDUHPower13	SMDUH Power 13, stored as W.	R
psSMDUHPower14	SMDUH Power 14, stored as W.	R
psSMDUHPower15	SMDUH Power 15, stored as W.	R
psSMDUHPower16	SMDUH Power 16, stored as W.	R
psSMDUHPower17	SMDUH Power 17, stored as W.	R
psSMDUHPower18	SMDUH Power 18, stored as W.	R
psSMDUHPower19	SMDUH Power 19, stored as W.	R
psSMDUHPower20	SMDUH Power 20, stored as W.	R
SMDUH Energy Table		
psSMDUHEnergyTable	Table holding information about SMDUH energy counters.	R
psSMDUHEnergyEntry	An entry (conceptual row) in the SMDUHEnergyTable.	R
psSMDUHEnergyIndex	Automatically generated index object.	R
psSMDUHTotalEnergy1	SMDUH Total Energy 1, stored as Wh.	R
PsSMDUHTotalEnergy2	SMDUH Total Energy 2, stored as Wh.	R
PsSMDUHTotalEnergy3	SMDUH Total Energy 3, stored as Wh.	R
PsSMDUHTotalEnergy4	SMDUH Total Energy 4, stored as Wh.	R
PsSMDUHTotalEnergy5	SMDUH Total Energy 5, stored as Wh.	R
PsSMDUHTotalEnergy6	SMDUH Total Energy 6, stored as Wh.	R
PsSMDUHTotalEnergy7	SMDUH Total Energy 7, stored as Wh.	R
PsSMDUHTotalEnergy8	SMDUH Total Energy 8, stored as Wh.	R
PsSMDUHTotalEnergy9	SMDUH Total Energy 9, stored as Wh.	R
psSMDUHTotalEnergy10	SMDUH Total Energy 10, stored as Wh.	R
psSMDUHTotalEnergy11	SMDUH Total Energy 11, stored as Wh.	R
psSMDUHTotalEnergy12	SMDUH Total Energy 12, stored as Wh.	R
psSMDUHTotalEnergy13	SMDUH Total Energy 13, stored as Wh.	R
psSMDUHTotalEnergy14	SMDUH Total Energy 14, stored as Wh.	R
psSMDUHTotalEnergy15	SMDUH Total Energy 15, stored as Wh.	R
psSMDUHTotalEnergy16	SMDUH Total Energy 16, stored as Wh.	R
psSMDUHTotalEnergy17	SMDUH Total Energy 17, stored as Wh.	R
psSMDUHTotalEnergy18	SMDUH Total Energy 18, stored as Wh.	R
psSMDUHTotalEnergy19	SMDUH Total Energy 19, stored as Wh.	R
PsSMDUHTotalEnergy20	SMDUH Total Energy 20, stored as Wh.	R
SMDUH2 Table		
SMDUH2 Current A Table		
psSMDUHHCurrentATable	Table holding information about SMDUH2 currents.	R
psSMDUHHCurrentEntry	An entry (conceptual row) in the SMDUH2Table.	R
psSMDUHHCurrentIndex	Automatically generated index object.	R
psSMDUHHCurrent1	SMDUH2 Current 1, stored as mA.	R
PsSMDUHHCurrent2	SMDUH2 Current 2, stored as mA.	R

PsSMDUHHCurrent3	SMDUH2 Current 3, stored as mA.	R
PsSMDUHHCurrent4	SMDUH2 Current 4, stored as mA.	R
PsSMDUHHCurrent5	SMDUH2 Current 5, stored as mA.	R
PsSMDUHHCurrent6	SMDUH2 Current 6, stored as mA.	R
PsSMDUHHCurrent7	SMDUH2 Current 7, stored as mA.	R
PsSMDUHHCurrent8	SMDUH2 Current 8, stored as mA.	R
PsSMDUHHCurrent9	SMDUH2 Current 9, stored as mA.	R
psSMDUHHCurrent10	SMDUH2 Current 10, stored as mA.	R
psSMDUHHCurrent11	SMDUH2 Current 11, stored as mA.	R
psSMDUHHCurrent12	SMDUH2 Current 12, stored as mA.	R
psSMDUHHCurrent13	SMDUH2 Current 13, stored as mA.	R
psSMDUHHCurrent14	SMDUH2 Current 14, stored as mA.	R
psSMDUHHCurrent15	SMDUH2 Current 15, stored as mA.	R
psSMDUHHCurrent16	SMDUH2 Current 16, stored as mA.	R
psSMDUHHCurrent17	SMDUH2 Current 17, stored as mA.	R
psSMDUHHCurrent18	SMDUH2 Current 18, stored as mA.	R
psSMDUHHCurrent19	SMDUH2 Current 19, stored as mA.	R
PsSMDUHHCurrent20	SMDUH2 Current 20, stored as mA.	R
SMDUH2 Current B Table		
psSMDUHHCurrentBTable	Table part B holding information about SMDUH2 currents.	R
psSMDUHHCurrentBEntry	An entry (conceptual row) in the SMDUH2Table.	R
psSMDUHHCurrentBIndex	Automatically generated index object.	R
psSMDUHHCurrent21	SMDUH2 Current 21, stored as mA.	R
psSMDUHHCurrent22	SMDUH2 Current 22, stored as mA.	R
psSMDUHHCurrent23	SMDUH2 Current 23, stored as mA.	R
psSMDUHHCurrent24	SMDUH2 Current 24, stored as mA.	R
psSMDUHHCurrent25	SMDUH2 Current 25, stored as mA.	R
psSMDUHHCurrent26	SMDUH2 Current 26, stored as mA.	R
psSMDUHHCurrent27	SMDUH2 Current 27, stored as mA.	R
psSMDUHHCurrent28	SMDUH2 Current 28, stored as mA.	R
psSMDUHHCurrent29	SMDUH2 Current 29, stored as mA.	R
PsSMDUHHCurrent30	SMDUH2 Current 30, stored as mA.	R
PsSMDUHHCurrent31	SMDUH2 Current 31, stored as mA.	R
PsSMDUHHCurrent32	SMDUH2 Current 32, stored as mA.	R
PsSMDUHHCurrent33	SMDUH2 Current 33, stored as mA.	R
PsSMDUHHCurrent34	SMDUH2 Current 34, stored as mA.	R
PsSMDUHHCurrent35	SMDUH2 Current 35, stored as mA.	R
PsSMDUHHCurrent36	SMDUH2 Current 36, stored as mA.	R
PsSMDUHHCurrent37	SMDUH2 Current 37, stored as mA.	R
PsSMDUHHCurrent38	SMDUH2 Current 38, stored as mA.	R
PsSMDUHHCurrent39	SMDUH2 Current 39, stored as mA.	R
PsSMDUHHCurrent40	SMDUH2 Current 40, stored as mA.	R
SMDUH2 Power A Table		
psSMDUHHPowerATable	Table holding information about SMDUH2 power.	R

psSMDUHHPowerEntry	An entry (conceptual row) in the SMDUHHPowerTable.	R
psSMDUHHPowerIndex	Automatically generated index object.	R
psSMDUHHPower1	SMDUH2 Power 1, stored as W.	R
psSMDUHHPower2	SMDUH2 Power 2, stored as W.	R
psSMDUHHPower3	SMDUH2 Power 3, stored as W.	R
psSMDUHHPower4	SMDUH2 Power 4, stored as W.	R
psSMDUHHPower5	SMDUH2 Power 5, stored as W.	R
psSMDUHHPower6	SMDUH2 Power 6, stored as W.	R
psSMDUHHPower7	SMDUH2 Power 7, stored as W.	R
psSMDUHHPower8	SMDUH2 Power 8, stored as W.	R
psSMDUHHPower9	SMDUH2 Power 9, stored as W.	R
psSMDUHHPower10	SMDUH2 Power 10, stored as W.	R
psSMDUHHPower11	SMDUH2 Power 11, stored as W.	R
psSMDUHHPower12	SMDUH2 Power 12, stored as W.	R
psSMDUHHPower13	SMDUH2 Power 13, stored as W.	R
psSMDUHHPower14	SMDUH2 Power 14, stored as W.	R
psSMDUHHPower15	SMDUH2 Power 15, stored as W.	R
psSMDUHHPower16	SMDUH2 Power 16, stored as W.	R
psSMDUHHPower17	SMDUH2 Power 17, stored as W.	R
psSMDUHHPower18	SMDUH2 Power 18, stored as W.	R
psSMDUHHPower19	SMDUH2 Power 19, stored as W.	R
psSMDUHHPower20	SMDUH2 Power 20, stored as W.	R
SMDUH2 Power B Table		
psSMDUHHPowerBTable	Table part B holding information about SMDUH2 power values.	R
psSMDUHHPowerBEntry	An entry (conceptual row) in the SMDUH2Table.	R
psSMDUHHPowerBIndex	Automatically generated index object.	R
psSMDUHHPower21	SMDUH2 Power 21, stored as W.	R
psSMDUHHPower22	SMDUH2 Power 22, stored as W.	R
psSMDUHHPower23	SMDUH2 Power 23, stored as W.	R
psSMDUHHPower24	SMDUH2 Power 24, stored as W.	R
psSMDUHHPower25	SMDUH2 Power 25, stored as W.	R
psSMDUHHPower26	SMDUH2 Power 26, stored as W.	R
psSMDUHHPower27	SMDUH2 Power 27, stored as W.	R
psSMDUHHPower28	SMDUH2 Power 28, stored as W.	R
psSMDUHHPower29	SMDUH2 Power 29, stored as W.	R
psSMDUHHPower30	SMDUH2 Power 30, stored as W.	R
psSMDUHHPower31	SMDUH2 Power 31, stored as W.	R
psSMDUHHPower32	SMDUH2 Power 32, stored as W.	R
psSMDUHHPower33	SMDUH2 Power 33, stored as W.	R
psSMDUHHPower34	SMDUH2 Power 34, stored as W.	R
psSMDUHHPower35	SMDUH2 Power 35, stored as W.	R
psSMDUHHPower36	SMDUH2 Power 36, stored as W.	R
psSMDUHHPower37	SMDUH2 Power 37, stored as W.	R
psSMDUHHPower38	SMDUH2 Power 38, stored as W.	R

psSMDUHHPower39	SMDUH2 Power 39, stored as W.	R
psSMDUHHPower40	SMDUH2 Power40, stored as W.	R
SMDUH2 Energy A Table		
psSMDUHHEnergyTable	Table holding information about SMDUH2 energy counters.	R
psSMDUHHEnergyEntry	An entry (conceptual row) in the SMDUH2EnergyTable.	R
psSMDUHHEnergyIndex	Automatically generated index object.	R
psSMDUHHTotalEnergy1	SMDUH2 Total Energy 1, stored as Wh.	R
PsSMDUHHTotalEnergy2	SMDUH2 Total Energy 2, stored as Wh.	R
PsSMDUHHTotalEnergy3	SMDUH2 Total Energy 3, stored as Wh.	R
PsSMDUHHTotalEnergy4	SMDUH2 Total Energy 4, stored as Wh.	R
PsSMDUHHTotalEnergy5	SMDUH2 Total Energy 5, stored as Wh.	R
PsSMDUHHTotalEnergy6	SMDUH2 Total Energy 6, stored as Wh.	R
PsSMDUHHTotalEnergy7	SMDUH2 Total Energy 7, stored as Wh.	R
PsSMDUHHTotalEnergy8	SMDUH2 Total Energy 8, stored as Wh.	R
PsSMDUHHTotalEnergy9	SMDUH2 Total Energy 9, stored as Wh.	R
psSMDUHHTotalEnergy10	SMDUH2 Total Energy 10, stored as Wh.	R
psSMDUHHTotalEnergy11	SMDUH2 Total Energy 11, stored as Wh.	R
psSMDUHHTotalEnergy12	SMDUH2 Total Energy 12, stored as Wh.	R
psSMDUHHTotalEnergy13	SMDUH2 Total Energy 13, stored as Wh.	R
psSMDUHHTotalEnergy14	SMDUH2 Total Energy 14, stored as Wh.	R
psSMDUHHTotalEnergy15	SMDUH2 Total Energy 15, stored as Wh.	R
psSMDUHHTotalEnergy16	SMDUH2 Total Energy 16, stored as Wh.	R
psSMDUHHTotalEnergy17	SMDUH2 Total Energy 17, stored as Wh.	R
psSMDUHHTotalEnergy18	SMDUH2 Total Energy 18, stored as Wh.	R
psSMDUHHTotalEnergy19	SMDUH2 Total Energy 19, stored as Wh.	R
PsSMDUHHTotalEnergy20	SMDUH2 Total Energy 20, stored as Wh.	R
SMDUH2 Energy B Table		
psSMDUHHEnergyBTable	Table part B holding information about SMDUH2 energy counters.	R
psSMDUHHEnergyBEntry	An entry (conceptual row) in the SMDUH2Table.	R
psSMDUHHEnergyBIndex	Automatically generated index object.	R
PsSMDUHTotalEnergy21	SMDUH2 Total Energy 21, stored as Wh.	R
PsSMDUHTotalEnergy22	SMDUH2 Total Energy 22, stored as Wh.	R
PsSMDUHTotalEnergy23	SMDUH2 Total Energy 23, stored as Wh.	R
PsSMDUHTotalEnergy24	SMDUH2 Total Energy 24, stored as Wh.	R
PsSMDUHTotalEnergy25	SMDUH2 Total Energy 25, stored as Wh.	R
PsSMDUHTotalEnergy26	SMDUH2 Total Energy26, stored as Wh.	R
PsSMDUHTotalEnergy27	SMDUH2 Total Energy 27, stored as Wh.	R
PsSMDUHTotalEnergy28	SMDUH2 Total Energy 28, stored as Wh.	R
PsSMDUHTotalEnergy29	SMDUH2 Total Energy 29, stored as Wh.	R
PsSMDUHTotalEnergy30	SMDUH2 Total Energy 30, stored as Wh.	R
PsSMDUHTotalEnergy31	SMDUH2 Total Energy 31, stored as Wh.	R
PsSMDUHTotalEnergy32	SMDUH2 Total Energy 32, stored as Wh.	R
PsSMDUHTotalEnergy33	SMDUH2 Total Energy 33, stored as Wh.	R
PsSMDUHTotalEnergy34	SMDUH2 Total Energy 34, stored as Wh.	R

PsSMDUHTotalEnergy35	SMDUH2 Total Energy 35, stored as Wh.	R
PsSMDUHTotalEnergy36	SMDUH2 Total Energy 36, stored as Wh.	R
PsSMDUHTotalEnergy37	SMDUH2 Total Energy 37, stored as Wh.	R
PsSMDUHTotalEnergy38	SMDUH2 Total Energy 38, stored as Wh.	R
PsSMDUHTotalEnergy39	SMDUH2 Total Energy 39, stored as Wh.	R
PsSMDUHTotalEnergy40	SMDUH2 Total Energy 40, stored as Wh.	R
Solar Converter		
numberOfInstalledSolarConverters	Number of solar converters, stored as integer.	R
numberOfSolarConvertersCommunicating	Number of solar converters communicating, stored as integer.	R
solarConvertersUsedCapacity	Used capacity, stored as milli % of the total capacity.	R
solarConvertersTotalCurrent	Total output current, stored as mA.	R
solarConvertersTotalPower	Total output power, stored as W.	R
psSolarConverterTable	Table holding information about individual solar converters.	R
psSolarConverterEntry	An entry (conceptual row) in the solarConverterTable.	R
psSolarConverterIndex	Automatically generated index object.	R
psSolarConverterProductNumber	Solar Converter Product Number.	R
psSolarConverterHWVersion	Solar Converter Hardware Revision.	R
psSolarConverterSWVersion	Solar Converter Software Revision.	R
psSolarConverterSerialNumber	Solar Converter Serial Number.	R
psSolarConverterInputVoltage	Solar Converter Input Voltage, stored as mV.	R
psSolarConverterInputCurrent	Solar Converter Input Current, stored as mA.	R
psSolarConverterOutputCurrent	Solar Converter Output Current, stored as mA.	R
psSolarConverterOutputPower	Solar Converter Output Power, stored as mW.	R
Setting Group **System Settings**		
settingUnderVoltageLevel1	Under voltage 1 stored as mV	R/W
settingUnderVoltageLevel2	Under voltage 2 stored as mV	R/W
settingOverVoltageLevel1	Over voltage 1 stored as mV	R/W
settingOverVoltageLevel2	Over voltage 2 stored as mV	R/W
Charge Settings		
settingFloatVoltage	Float voltage stored as mV	R/W
settingEqualizeChargeVoltage	Equalize charge voltage stored as mV	R/W
settingTempCompensationCoefficient	Coefficient for battery temperature compensation stored as micro V	R/W
settingTempCompensationCenter	Center point for battery temperature compensation stored as milli degree C	R/W
settingBatteryCurrentLimit	Battery charge current limit stored as thousandths of C10	R/W
settingMinVoltBCL	Minimum voltage for battery current limitation, stored as mV	R/W
settingPLSEnable	Enable / disable of peak load shifting function	R/W
settingPLSVolt	Voltage level for rectifiers when peak load shift is active. Stored as mV	R/W
settingPLSBattSOC	Minimum SOC level to run peak load shift. Stored as milli %	R/W
settingPLSStart1	Start time 1 for peak load shift. Stored as seconds since midnight. E.g. 3 AM = 10800 seconds.	R/W
settingPLSStop1	Stop time 1 for peak load shift. Stored as seconds since midnight.	R/W
settingPLSStart2	Start time 2 for peak load shift. Stored as seconds since midnight.	R/W
settingPLSStop2	Stop time 2 for peak load shift. Stored as seconds since midnight.	R/W

Rectifier Settings		
settingECOModeEnable	Setting for ECO mode function. 0 - disabled, 1 - enabled.	R/W
settingECOModeFluctRange	Setting for ECO mode allowed fluctuation range, stored as %.	R/W
settingECOModeCycleTime	Setting for ECO mode cycle period, stored as hours.	R/W
settingECOModeOnTime	Setting for ECO mode all rectifers on time, stored as minutes.	R/W
settingECOModeDelay	Setting for ECO mode switch off delay, stored as minutes.	R/W
settingRectDefaultVolt	Rectifier default voltage stored as mV	R/W
settingWalkInEnable	Enable of function WALK In.	R/W
settingWalkInTime	WALK In time, stored as minutes.	R/W
psSolarSettings		
settingMaxDiffVoltMPPTRECT	Maximum voltage difference between solar converters and rectifiers, stored as mV	R/W
settingMinDiffVoltMPPTRECT	Minimum voltage difference between solar converters and rectifiers, stored as mV	R/W
settingMPPTDefaultVolt	Solar converter default voltage stored as mV	R/W
Battery Test Settings		
settingBatteryTestVoltage	Setting for rectifier voltage during battery test, stored as mV.	R/W
settingBatteryTestEndVoltage	Setting for voltage level at which battery test will be stopped, stored as mV.	R/W
settingBatteryTestEndTime	Setting for time at which battery test will be stopped, stored as minutes.	R/W
LVD Settings		
settingLVD1Voltage	Setting for voltage level at which contactor 1 will be opened, stored as mV.	R/W
settingLVD1ByCapacity	Enable / disable of LVD1 by capacity	R/W
settingLVD1Capacity	Setting for capacity level at which LVD1 will be opened, stored as milli %.	R/W
settingLVD1ByTime	Enable / disable of LVD1 by time	R/W
settingLVD1Time	Setting for time after mains failure when LVD1 will be opened, stored as minutes.	R/W
settingLVD2Voltage	Setting for voltage level at which contactor 2 will be opened, stored as mV.	R/W
settingLVD2ByCapacity	Enable / disable of LVD2 by capacity	R/W
settingLVD2Capacity	Setting for capacity level at which LVD2 will be opened, stored as milli %.	R/W
settingLVD2ByTime	Enable / disable of LVD2 by time	R/W
settingLVD2Time	Setting for time after mains failure when LVD2 will be opened, stored as minutes.	R/W
settingLVD3Voltage	Setting for voltage level at which contactor 3 will be opened, stored as mV.	R/W
settingLVD3ByCapacity	Enable / disable of LVD3 by capacity	R/W
settingLVD3Capacity	Setting for capacity level at which LVD3 will be opened, stored as milli %.	R/W
settingLVD3ByTime	Enable / disable of LVD3 by time	R/W
settingLVD3Time	Setting for time after mains failure when LVD3 will be opened, stored as minutes.	R/W
settingLVD4Voltage	Setting for voltage level at which contactor 4 will be opened, stored as mV.	R/W
settingLVD4ByCapacity	Enable / disable of LVD4 by capacity	R/W
settingLVD4Capacity	Setting for capacity level at which LVD4 will be opened, stored as milli %.	R/W
settingLVD4ByTime	Enable / disable of LVD4 by time	R/W
settingLVD4Time	Setting for time after mains failure when LVD4 will be opened, stored as minutes.	R/W
settingLVD5Voltage	Setting for voltage level at which contactor 5 will be opened, stored as mV.	R/W
settingLVD5ByCapacity	Enable / disable of LVD5 by capacity	R/W
settingLVD5Capacity	Setting for capacity level at which LVD5 will be opened, stored as milli %.	R/W
settingLVD5ByTime	Enable / disable of LVD5 by time	R/W
settingLVD5Time	Setting for time after mains failure when LVD5 will be opened, stored as minutes.	R/W

settingLVD6Voltage	Setting for voltage level at which contactor 6 will be opened, stored as mV.	R/W
settingLVD6ByCapacity	Enable / disable of LVD6 by capacity	R/W
settingLVD6Capacity	Setting for capacity level at which LVD6 will be opened, stored as milli %.	R/W
settingLVD6ByTime	Enable / disable of LVD6 by time	R/W
settingLVD6Time	Setting for time after mains failure when LVD6 will be opened, stored as minutes.	R/W
Generator Settings		
settingDOD	Setting for depth of discharge, stored as milli %.	R/W
settingStopSOC	Setting for state of charge when diesel generator should stop, stored as milli %.	R/W
settingStartSOCOnly	Enable / disable of start on SOC only	R/W
settingStopVoltEnable	Enable / disable stop diesel generator on voltage	R/W
settingStopVolt	Setting for voltage level at which diesel generator will be stopped, stored as mV.	R/W
settingHybridEqMode	Hybrid equalising mode	R/W
settingDGStopPointEnable	Enable of Hybrid Shift by Volt	R/W
settingDGStop1Voltage	Hybrid Shift Stop Point 1 Volt, stored as mV	R/W
settingDGStopPoint1StartTime	Start time 1 for voltage hybrid shift. Stored as seconds since midnight. E.g. 3 AM = 10800 seconds.	R/W
settingDGStopPoint1StopTime	Stop time 1 for voltage hybrid shift. Stored as seconds since midnight.	R/W
settingDGStop2Voltage	Hybrid Shift Stop Point 2 Volt, stored as mV	R/W
settingDGStopPoint2StartTime	Start time 2 for voltage hybrid shift. Stored as seconds since midnight.	R/W
settingDGStopPoint2StopTime	Stop time 2 for voltage hybrid shift. Stored as seconds since midnight.	R/W
settingHybridShiftEnabledbySOC	Enable of Hybrid Shift by SOC	R/W
settingSOCStopDGSetting1	Hybrid Shift Stop Point 1 SOC, stored as milli %	R/W
settingSOCStopDGStartTime1	Start time 1 for SOC hybrid shift. Stored as seconds since midnight. E.g. 3 AM = 10800 seconds.	R/W
settingSOCStopDGStopTime1	Stop time 1 for SOC hybrid shift. Stored as seconds since midnight.	R/W
settingSOCStopDGSetting2	Hybrid Shift Stop Point 2 SOC, stored as milli %	R/W
settingSOCStopDGStartTime2	Start time 2 for SOC hybrid shift. Stored as seconds since midnight.	R/W
settingSOCStopDGStopTime2	Stop time 2 for SOC hybrid shift. Stored as seconds since midnight.	R/W
Temperature Settings		
settingVeryHighBatteryTemperature	Level for very high battery temperature alarm stored as degree C	R/W
settingHighBatteryTemperature	Level for high battery temperature alarm stored as degree C	R/W
settingLowBatteryTemperature	Level for low battery temperature alarm stored as degree C	R/W
settingVeryHighAmbientTemperature	Level for very high ambient temperature alarm stored as degree C	R/W
settingHighAmbientTemperature	Level for high ambient temperature alarm stored as degree C	R/W
settingLowAmbientTemperature	Level for low ambient temperature alarm stored as degree C	R/W
Output Information		
outputDCVoltage	Output DC voltage stored as mV	R
outputDCCurrent	Output DC current stored as mA	R
outputDCPower	Output DC power stored as W	R
Inverter group		
numberOfInstalledInverters	number of Inverters, stored as integer.	R
numberOfInvertersCommunicating	number of inverters communicating, stored as integer.	R
invertersUsedCapacity	sed capacity, stored as % of the total capacity.	R

Inverter Table		
psInverterEntry	An entry (conceptual row) in the inverterInfoTable.	R
psInverterIndex	Automatically generated index object.	R
psInverterVoltage	Inverter Output Voltage, stored as mV.	R
psInverterCurrent	Inverter Output Current, stored as mA.	R
psInverterFrequency	Inverter Output Frequency, stored as mHz.	R
psInverterIdent	Inverter physical location identifier.	R
psInverterProductNumber	Inverter Product Number.	R
psInverterHWVersion	Inverter Hardware Revision.	R
psInverterSWVersion	Inverter Software Revision.	R
psInverterSerialNumber	Inverter Serial Number.	R
Consumption Map Info Table		
psConsuMapInfoEntry	An entry (conceptual row) in the psConsuMapInfoTable.	R
psConsuMapInfoIndex	Automatically generated index object.	R
psCabinetName	Name of the cabinet.	R
psBranchNum	Total number of branch designated to the cabinet.	R
psTotalCurrent	Total current of the cabinet, stored as mA.	R
psTotalPower	Total power of the cabinet, stored as mW.	R
psTotalEnergy	Total energy of the cabinet, stored as Wh.	R
psPeakPowerLast24H	Peak power of the cabinet in last 24H, stored as mW.	R
psPeakPowerLastWeek	Peak power of the cabinet in last week, stored as mW.	R
psPeakPowerLastMonth	Peak power of the cabinet in last month, stored as mW.	R
psLoadBranchName1	Load branch 1 name	R
psLoadBranchCurrent1	Load branch 1 current, stored as mA	R
psLoadBranchName2	Load branch 2 name	R
psLoadBranchCurrent2	Load branch 2 current, stored as mA	R
psLoadBranchName3	Load branch 3 name	R
psLoadBranchCurrent3	Load branch 3 current, stored as mA	R
.....		R
psLoadBranchName20	Load branch 20 name	R
psLoadBranchCurrent20	Load branch 20 current, stored as mA	R
Energy Counters		
totalRectifierEnergy	Total rectifier energy, stored as Wh.	R
rectifierEnergyYear1	Rectifier energy for year 1, stored as Wh.	R
rectifierEnergyYear2	Rectifier energy for year 2, stored as Wh.	R
rectifierEnergyYear3	Rectifier energy for year 3, stored as Wh.	R
rectifierEnergyYear4	Rectifier energy for year 4, stored as Wh.	R
rectifierEnergyYear5	Rectifier energy for year 5, stored as Wh.	R
totalSolarEnergy	Total solar converter energy, stored as Wh.	R
solarEnergyYear1	Solar converter energy for year 1, stored as Wh.	R
solarEnergyYear2	Solar converter energy for year 2, stored as Wh.	R
solarEnergyYear3	Solar converter energy for year 3, stored as Wh.	R
solarEnergyYear4	Solar converter energy for year 4, stored as Wh.	R

solarEnergyYear5	Solar converter energy for year 5, stored as Wh.	R
totalBatteryEnergy	Total battery energy, stored as Wh.	R
batteryEnergyYear1	Battery energy for year 1, stored as Wh.	R
batteryEnergyYear2	Battery energy for year 2, stored as Wh.	R
batteryEnergyYear3	Battery energy for year 3, stored as Wh.	R
batteryEnergyYear4	Battery energy for year 4, stored as Wh.	R
batteryEnergyYear5	Battery energy for year 5, stored as Wh.	R
totalLoadEnergy	Total load energy, stored as Wh.	R
loadEnergyYear1	Load energy for year 1, stored as Wh.	R
loadEnergyYear2	Load energy for year 2, stored as Wh.	R
loadEnergyYear3	Load energy for year 3, stored as Wh.	R
loadEnergyYear4	Load energy for year 4, stored as Wh.	R
loadEnergyYear5	Load energy for year 5, stored as Wh.	R
Miscellaneous		
independentInputCurrent	Independent input current, stored as mA	R
greenHouseGasReduction	Amount of GHG reduction, stored as kilos	R
psFuelTable	Table holding information about fuel sensors.	R
psFuelEntry	An entry (conceptual row) in the fuelSensorInfoTable.	R
psFuelIndex	Automatically generated index object.	R
psFuelHeight	Fuel Tank Height, stored as micrometer.	R
psFuelVolume	Fuel Tank Volume, stored as millilitre.	R
psFuelPercent	Fuel Tank Percentage, stored as milli %.	R
Alarm Trap Counter		
alarmLastTrapNo	The sequence number of last submitted alarm trap, also last row in alarmTrapTable.	R
Active Alarm Table		
alarmActiveAlarmTable	Table holding information about the currently active alarms.	R
activeAlarmEntry	An entry (conceptual row) in the alarm trap table.	R
alarmIndex	The unique sequence number of this alarm trap.	R
alarmTime	Date and time when event occurred (local time), including timezone if supported by controller.	R
alarmStatusChange	The type of alarm change. One of… (1) activated (2) deactivated	R
alarmSeverity	The severity of the alarm. One of… (1) warning - OA, lowest level of alarm severity (2) minor - A3 (3) major - MA (4) critical - CA, highest level of alarm severity	R
alarmDescription	Free-text description of alarm.	R
alarmType	Alarm type, i.e. an integer specifying the type of alarm.	R

Events/Traps		
alarmTrap	An alarm trap is sent when an alarm occurs (activated) or returns to normal state (deactivated). Alarm traps are logged in alarmTrapTable. Variables in this trap: * alarmIndex The unique sequence number of this alarm trap. * alarmTime Date and time when event occurred (local time), including timezone if supported by controller. * alarmStatusChange (1) activated or (2) deactivated. * alarmSeverity Integer describing the severity of the alarm. * alarmDescription Free-text description of alarm. * alarmType Integer indicating type of alarm.	--
alarmActiveTrap	An alarm trap is sent when an alarm occurs (activated). Variables in this trap: * alarmTime Date and time when event occurred (local time), including timezone if supported by controller. * alarmSeverity Integer describing the severity of the alarm. * alarmDescription Free-text description of alarm. * alarmType Integer indicating type of alarm.	--
alarmCeaseTrap	An alarm trap is sent when an alarm returns to normal state (clear, deactivated). Variables in this trap: * alarmTime Date and time when event occurred (local time), including timezone if supported by controller. * alarmSeverity Integer describing the severity of the alarm. * alarmDescription Free-text description of alarm. * alarmType Integer indicating type of alarm.	--

In Table 6.1, R means OID is read-only (GET), and R/W means OID can be read and modified (GET/SET).

7 Inverter Only System

7.1 General

When the controller is used in an inverter only system (only inverters are installed in the system), the Web pages are different than those previous described. Refer to this section for Web page descriptions for an inverter only system.

7.2 Web Interface Screens

7.2.1 Overview of Web Function

This section provides descriptions of the Web Interface Screens. Refer also to “Passwords and Privilege Levels” on page 14 and “Using the Web Interface” on page 15.

NOTE! *Best viewed at 1024 x 768 resolution.*

7.2.2 Homepage

In the Web Interface, after entering a valid **Username** and **Password** and clicking **LOGIN**, the "Homepage" window opens. See also “Logging into the Controller” on page 16.

Figure 7.1 Controller Homepage

The homepage window is divided into the following areas:

1. System Status Information Area (see “System Status Information Area” on page 161).

2. System Specifications Information Area (see “System Specifications Information Area” on page 161).
3. Controller Specifications Information Area (see “Controller Specifications Information Area” on page 161).
4. Site Information Area (see “Site Information Area” on page 161).
5. Alarms Area (see “Alarms Area” on page 163).
6. System Status Area (see “System Status Area” on page 163).
7. Menu Navigation Area (see “Menu Navigation Area” on page 169).

7.2.3 System Status Information Area

Output voltage and output current is displayed here.

7.2.4 System Specifications Information Area

System specifications are displayed here.

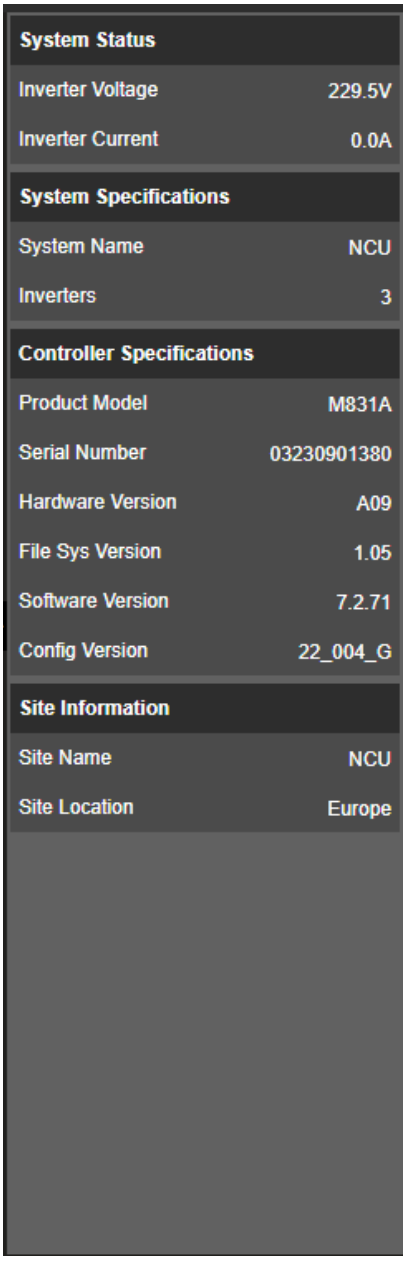
7.2.5 Controller Specifications Information Area

Controller specifications are displayed here.

7.2.6 Site Information Area

Site information is displayed here.

Figure 7.2 System Status Information, System Specifications Information, Controller Specifications Information, and Site Information Areas



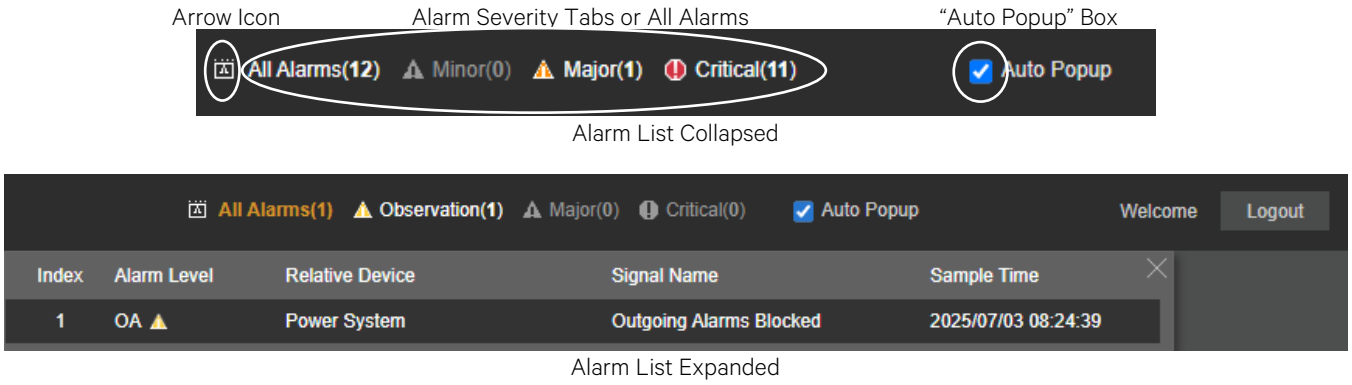
7.2.7 Alarms Area

Any alarms active in the power system are shown in this area.

- When viewing the Alarm List, click the “arrow” icon to collapse the Alarm List. Click the "arrow" icon again to expand the Alarm List.
- The alarms area contains tabs to allow viewing all alarms or a type of alarm (severity). For example, click the Critical tab to display alarms set as Critical alarms.
- When the “Auto Popup” box is checked and the Alarm List is collapsed, a new alarm will cause the Alarm List to expand.

NOTE! *Minor alarms are shaded yellow, major alarms are shaded orange, and critical alarms are shaded red.*

Figure 7.3 Alarms Area



7.2.8 System Status Area

General

System status is displayed in this area and consists of a Power System status tab (see page 163) and a General Status tab (see page 168).

Power System Status Tab

The Power System status tab displays power system status in a graphical block diagram format. This includes status of the input power, inverters, and AC load. Also displayed are alarm status, ambient temperature, output power, average power, and a load trend chart.

Temperature Reading

- The temperature sensor set as “Main Ambient Temp Sensor” (Settings Menu / System Tab) is the sensor which displays the ambient temperature on the Power System status tab.

NOTE! *The load trend chart gets data from the “Data History Log” and will plot the MAXIMUM value per hour per day.*

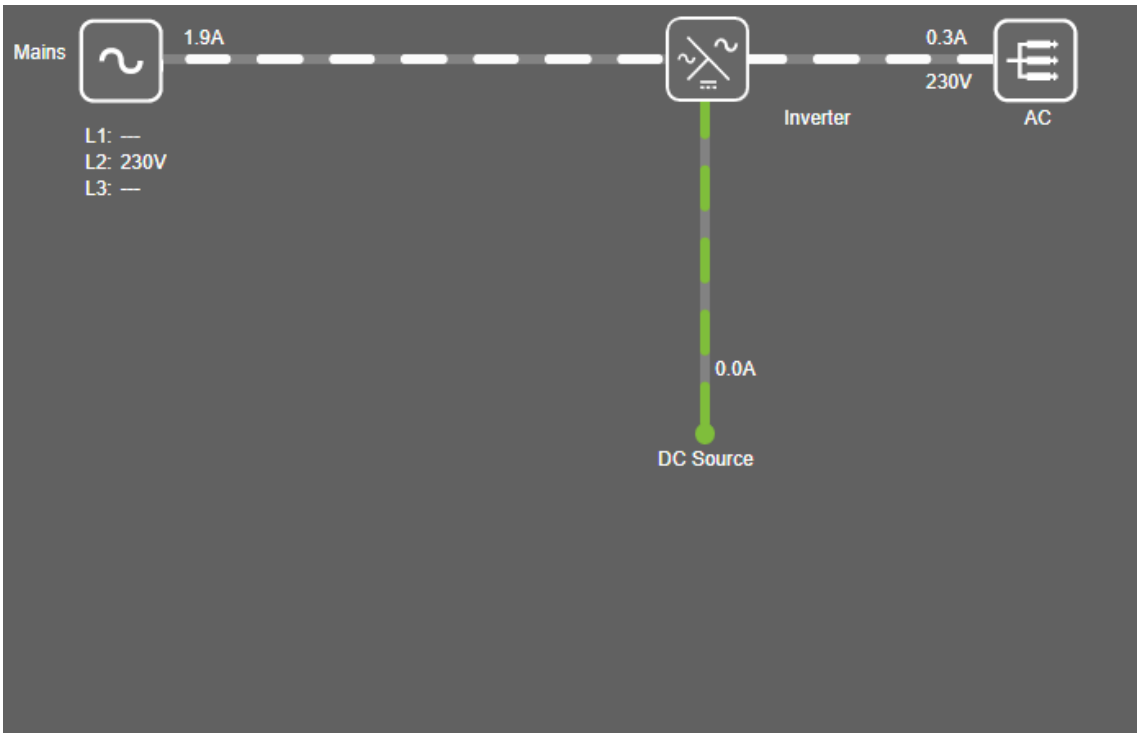
Figure 7.4 Power System Status Tab

Power System Status Graphical Block Diagram

General

The power system status block diagram has User interactive links. Clicking on the various icons will take you to that device's status Web page. A device status page displays current or logged operating parameters for that device.

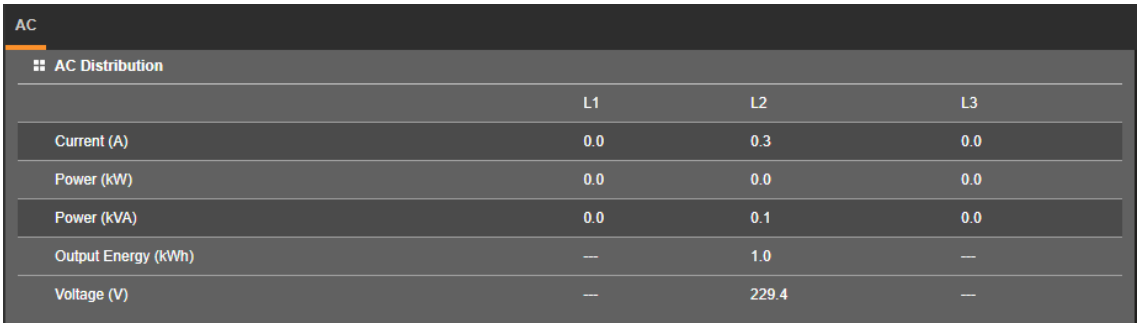
Figure 7.5 Power System Status Page Block Diagram



Inverter AC Mains Status Web Page

Clicking on the inverter Mains icon on the power system status block diagram opens the inverter AC mains status web page.

Figure 7.6 Inverter AC Mains Status Web Page

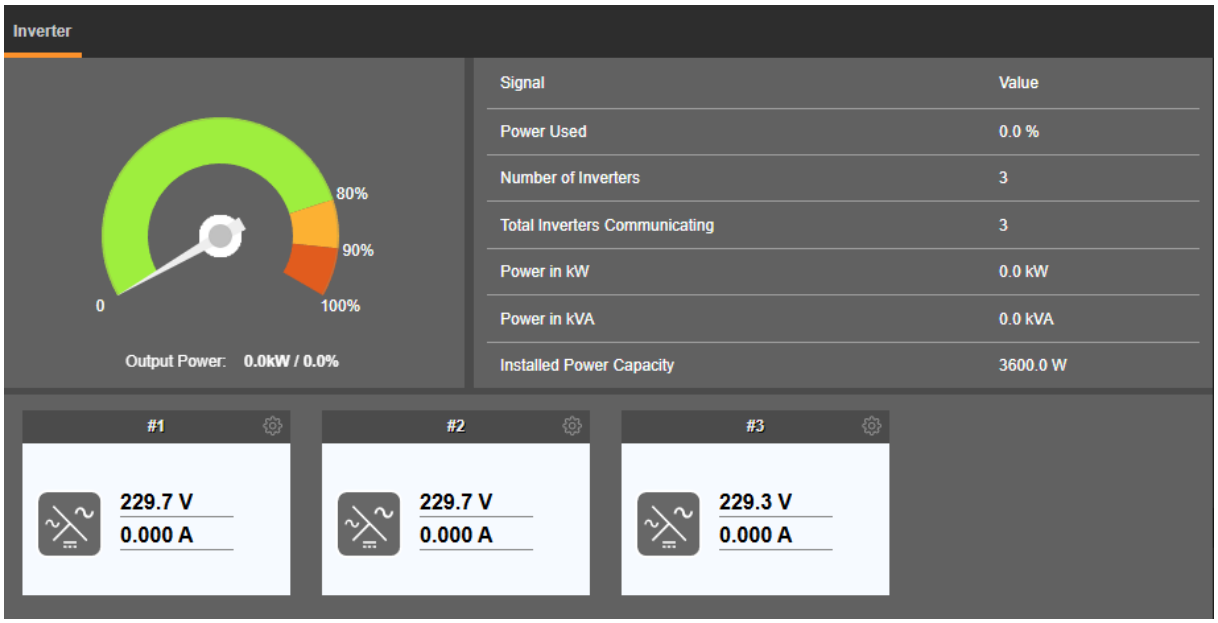


	L1	L2	L3
Current (A)	0.0	0.3	0.0
Power (kW)	0.0	0.0	0.0
Power (kVA)	0.0	0.1	0.0
Output Energy (kWh)	—	1.0	—
Voltage (V)	—	229.4	—

Inverter Module Status Web Page

Clicking on the Inverter icon on the power system status block diagram opens the inverter module status web page.

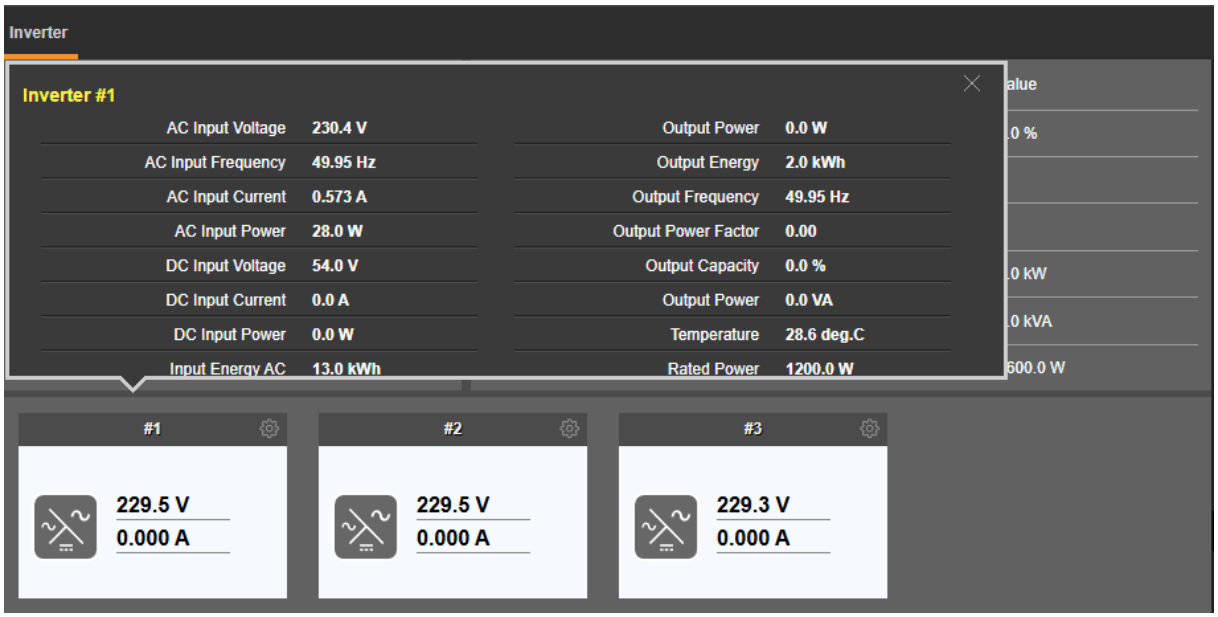
Figure 7.7 Inverter Module Status Web Page



Individual Inverter Module Status

Displayed on the inverter module status web page are the individual inverters installed in the system. Click on an individual inverter icon to display its status such as "Output Power", etc.

Figure 7.8 Individual Inverter Module Status



Individual Inverter Module Settings Page

On the inverter module status web page, click the settings wheel icon to go to the individual inverter module settings page. Click Back to go back to the inverter module status web page.

Figure 7.9 Selecting an Individual Inverter Module Settings Page

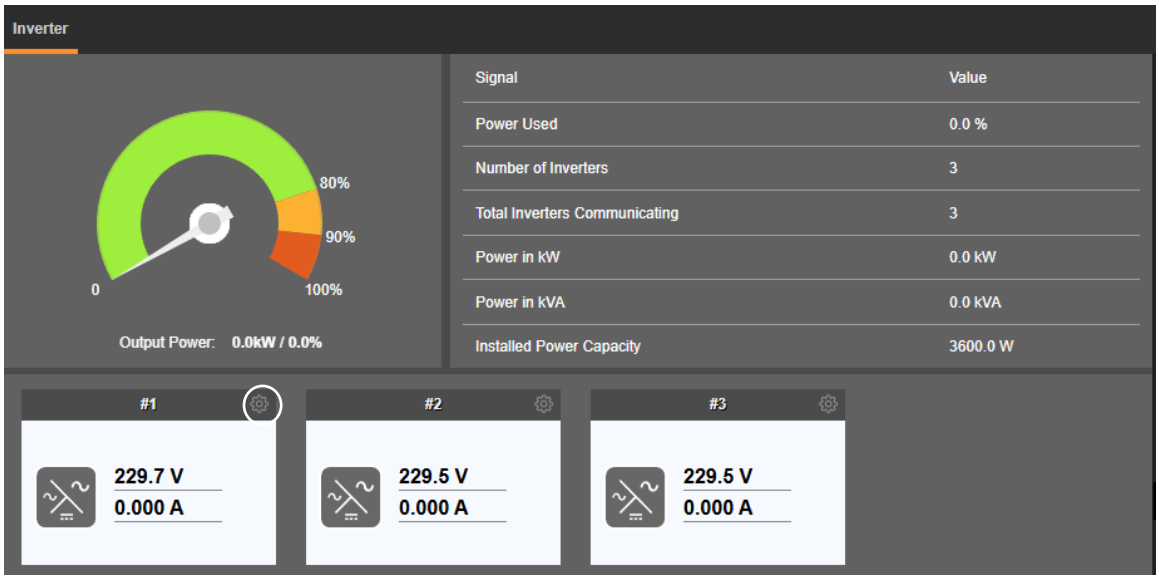
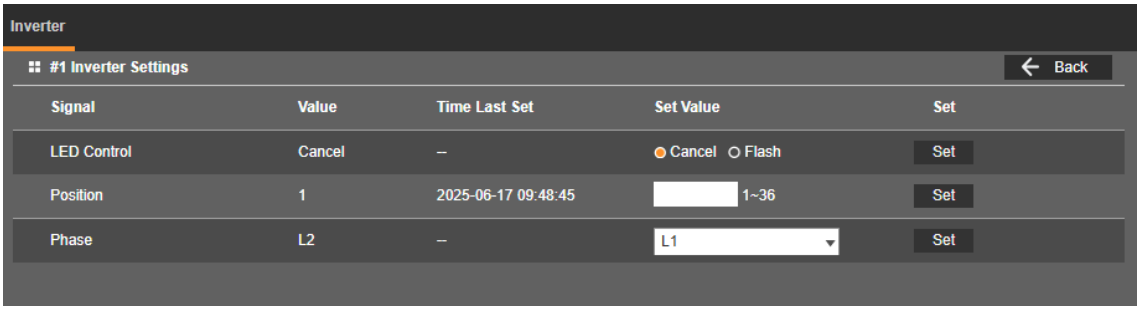


Figure 7.10 Individual Inverter Module Settings Page



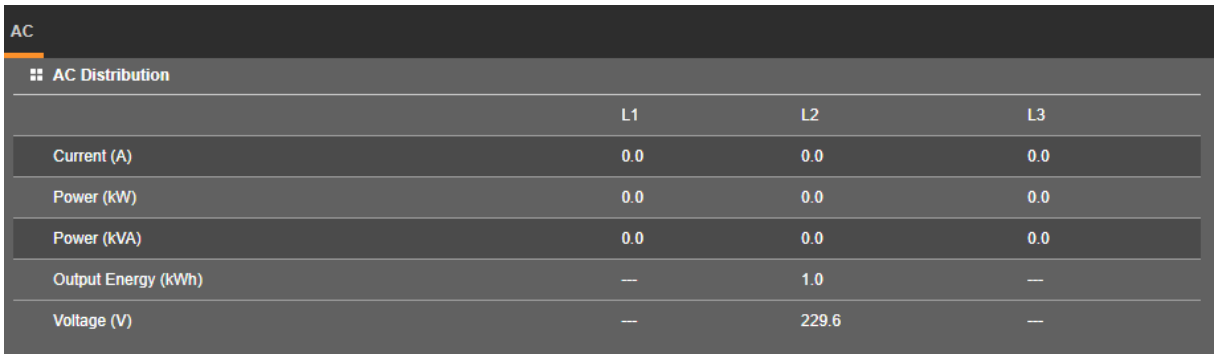
NOTE! *Settings that appear "grayed out" can only be made when the controller is in the "manual control" state. If the controller is set for "automatic" control, change the "Auto/Manual State" setting first to the "Manual" setting.*

- **LED Control:** Temporarily sets whether or not an inverter's local power indicator blinks when the controller is communicating with the inverter when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Position:** Sets the inverter's identification number.
- **Phase:** Indicates the phase connected to the inverter's input.

AC Load Status Page

Clicking on the AC icon on the power system status block diagram opens the AC load status page.

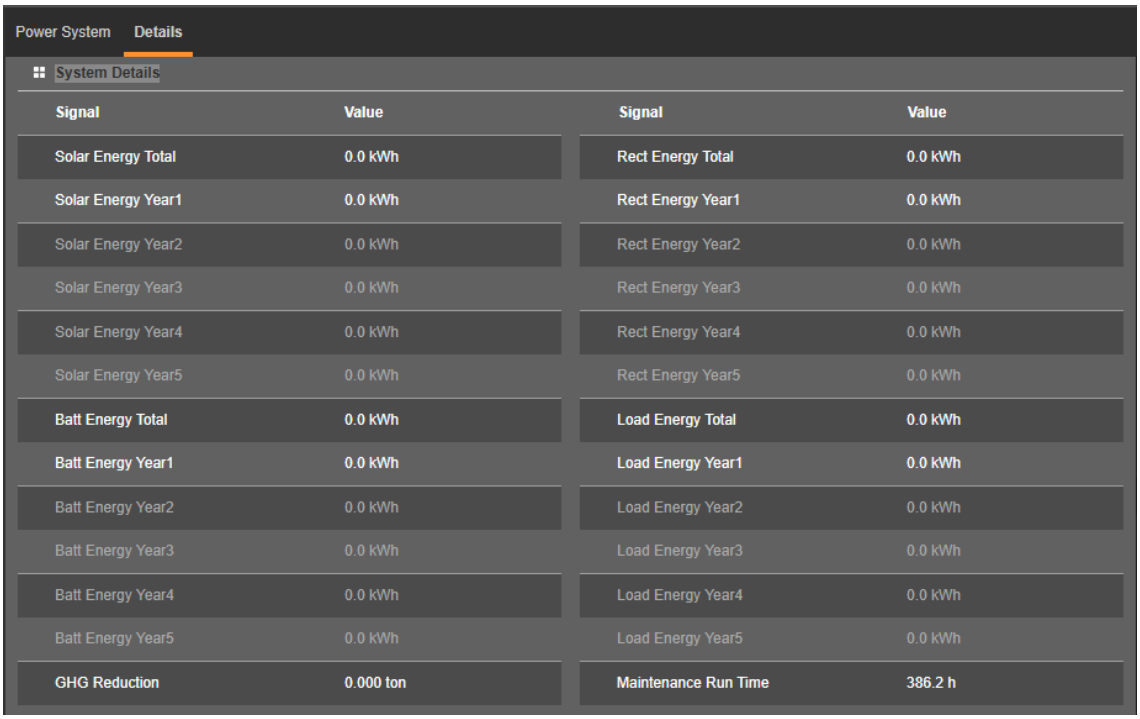
Figure 7.11 AC Load Status Page



System Details Tab

The System Details tab displays general status information as shown in the following illustration.

Figure 7.12 System Details Tab



7.2.9 Menu Navigation Area

General

Available menus are displayed in this area. When a menu is clicked on, the system status screen is replaced with the selected menu's screen. Note that there is a menu item named HOME to return to the system status screen.

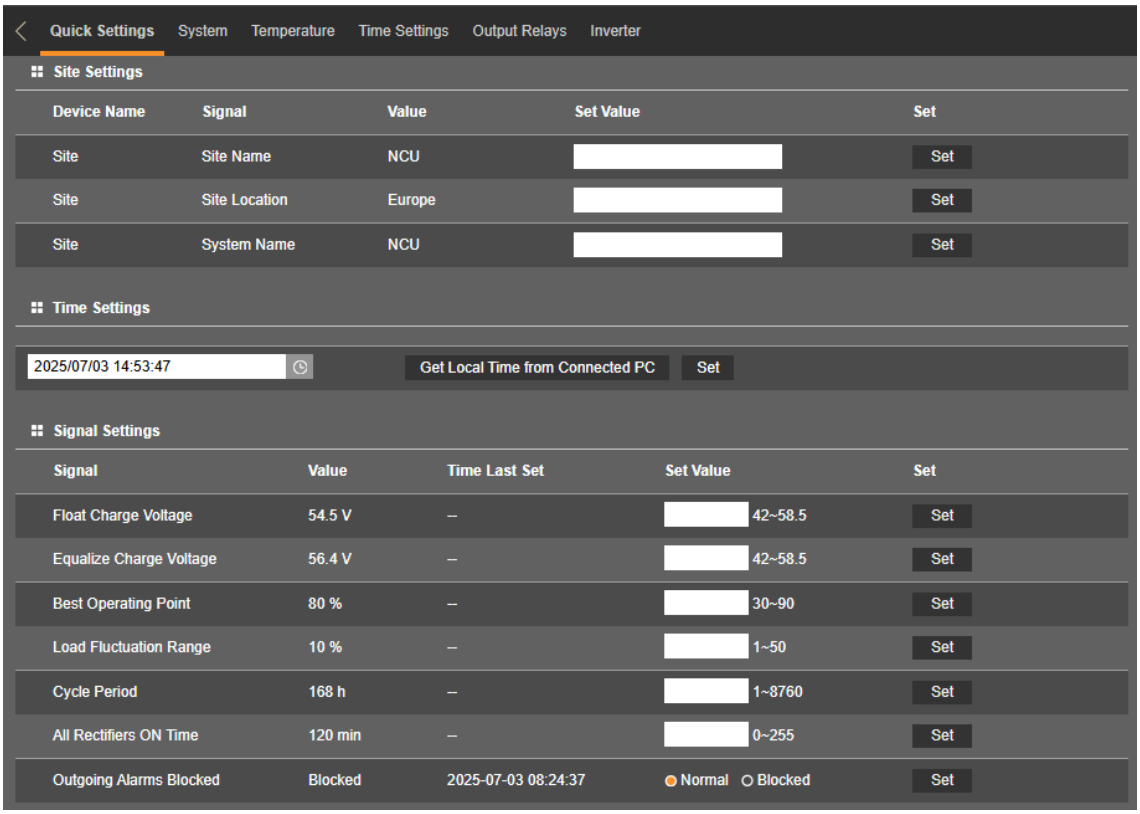
Located at the top of each of the main menus are tabs to select the various sub-menus. If there are more sub-menus then can be displayed in the window, an arrow appears to navigate to the additional sub-menus.

Figure 7.13 Menu Navigation Area

Settings Menu

The Settings Menu allows you to change (if you have the proper privilege level programmed in your User settings) the settings of the various programmable parameters. Settings are grouped per function. Select a tab in the Settings Menu to change that function's programmable parameters.

Figure 7.14 Settings Menu



Changing Programmable Parameters in the Settings Menu

To change a programmable parameter, select or enter a new value for the parameter then click on “Set” to change the value.

NOTE! *Settings that appear "grayed out" can only be made when the controller is in the "manual control" state. If the controller is set for "automatic" control, change the “Auto/Manual State” setting first to the “Manual” setting.*

Quick Settings Tab Programmable Parameter Descriptions

- **Site Settings:** Enter a "Site Name", "Site Location", and "System Name".
- **Time Settings:** Enter the time or select "Get Local Time from Connected PC".

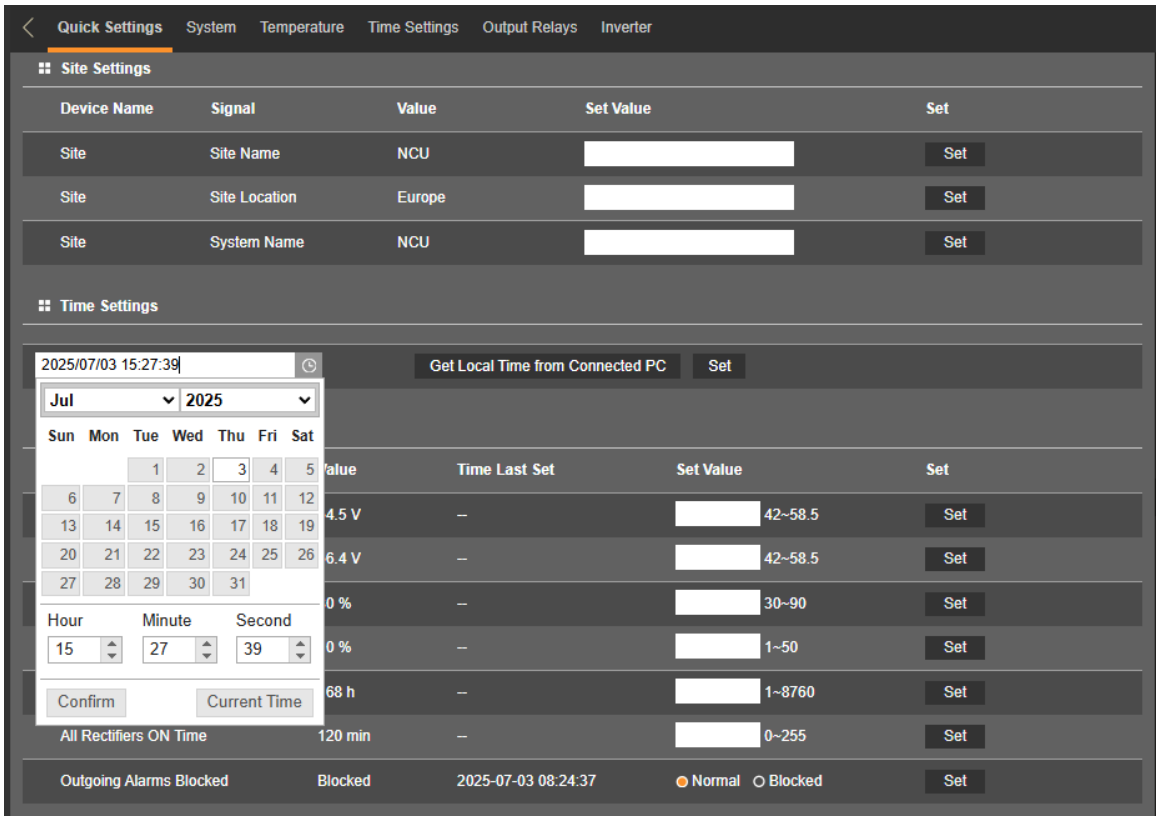
  In the Time Settings section, click on "Get Local Time from Connected PC" and then “Set” to automatically set the date and time. To manually set the date and time, click on “the clock symbol” and enter the date and time. Then select the “Confirm” button. See Figure 7.15. In the Time Settings section, click on “Set” to save the change.

- **Signal Settings:**

  - **Float Charge Voltage:** Float Charge output voltage setting.
  - **Equalize Charge Voltage:** Equalize Charge output voltage setting.
  - **Best Operating Point:** Percent of full load capacity that the rectifiers operate under in the Energy Optimization Mode.
  - **Load Fluctuation Range:** If load fluctuation is less than this value, rectifiers are not turned on or off for Energy Optimization.
  - **Cycle Period:** This is the time period that rectifiers are turned on and off to maintain an equal operating time for all rectifiers in the system.
  - **All Rects ON Time:** Time all rectifiers are turned on at the end of the “Cycle Period”.

- **Outgoing Alarms Blocked:**
  Normal: Alarms are processed normally.
  Blocked: Forces the alarm relays in the "off" state and blocks alarms from changing the relay state.

Figure 7.15 Manual Date and Time Menu



System Tab Programmable Parameter Descriptions

Power System

- **Reset Maintenance Run Time:** In manual mode, the only selection for " Reset Maintenance Run Time" is Yes. Once Yes is selected and confirmed, the Power System's Maintenance Run Time log is cleared.
- **Clear Energy Accumulated:** Clears the accumulated energy. Once Yes is selected and confirmed, the Energy accumulated is cleared.
- **Auto/Manual State:**

  Auto: The controller automatically controls the power system.

  Manual: A User can manually change certain power system control settings. This provides a convenient means of making temporary adjustment changes for testing purposes.
- **To Auto Delay:** Sets time limit in manual mode. When time has expired the NCU will go back to Auto mode. A delay of 0h, means that NCU will always stay in manual mode.
- **With Fan Control Unit:** Whether there is a fan control unit.

- **Maintenance Interval:** The maintenance cycle time is the number of days before a Maintenance Alarm is issued.
- Over Load Alarm Level: Sets the overload alarm level, the settable point starts from 50%.
- **Emergency Stop/ Shutdown:**

  -Disabled: Disables the Emergency Stop and Emergency Shutdown functions.

  -EStop: Enables the Emergency Stop function. (If utilized in the system, an Estop signal shuts down and locks out the system. The system must be manually restarted. Refer to the system instruction manual for restarting procedure.)

  -EShutdown: Enables the Emergency Shutdown function. (If utilized in the system, an EShutdown signal shuts down the system. The system automatically restarts when the signal is removed.)

- **Outgoing Alarms Blocked:**

  Normal: Alarms are processed normally.

  Blocked: Forces the alarm relays in the "off" state and blocks alarms from changing the relay state.

- **System Type:** Sets the system type: Mixed or Inverter Only.
- **GHG Reduction Coefficient:** Sets the Green House Gas emission reduction factor.
- **DHCP Enable:** The DHCP function allows the controller to acquire an IP address automatically. This function can only be enabled or disabled via the local display and keypad. If this function is enabled and the acquisition of an IP address fails, an alarm is generated. If the acquisition of an IP address is successful, you need to record the IP address automatically acquired by the controller to access the controller via the Web Interface. This IP address is displayed in the IP Address field below the DHCP setting in the local display menu (Main Menu / Settings Icon / Comm Settings).
- **Reconfig FCUPlus:** Sets the time for reconfigure FCUPlus.
- **SSH Enabled:** Enables or disables the SSH protocol.
- **Only Monitor BMS and FCUP:** Chooses whether or not to only monitor BMS and FCUP. When this setting is set to yes, only BMS batteries and FCUP will be searched for when doing an auto config, which makes this procedure quicker. If you have other equipment on the RS485 bus, like a Carlo Gavazzi AC meter, this setting needs to be set to No.

AC Equipment

Rectifier AC

- **Nominal Phase Voltage:** Enter the nominal line to neutral voltage (single phase rectifier) or nominal line to line voltage (three phase rectifier).
- **Mains Failure Alarm Threshold 1:** Sets the mains fail alarm 1 value (percent of nominal).
- **Mains Failure Alarm Threshold 2:** Sets the mains fail alarm 2 value (percent of nominal).

Corresponding Alarms:

Low Phase Voltage L1 (Nominal Minus "Mains Failure Alarm 1" Percent of Nominal)

Very Low Phase Voltage L1 (Nominal Minus " Mains Failure Alarm 2" Percent of Nominal)

High Phase Voltage L1 (Nominal Plus " Mains Failure Alarm 1" Percent of Nominal)

Very High Phase Voltage L1 (Nominal Plus "V Mains Failure Alarm 2" Percent of Nominal)

L1 used in the example above, L2 and L3 are similar.

Temperature Probes Tab Programmable Parameter Descriptions

- **Ambient Temperature Sensor:** Sets the temperature sensor which displays the ambient temperature on the Web Interface's Homepage. Note that this temperature sensor MUST be set as an ambient temperature sensor. Select "None", or the temperature sensor (System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1 …, SMTemp1 T8, SMTemp8 T1 …, SMTemp8 T8). You can also select Maximum or Average which takes the maximum or average reading of the temperature sensors (any of System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1 …, SMTemp1 T8, SMTemp8 T1 …, SMTemp8 T8) set as ambient temperature sensors. When set to any value except "none", the following parameters can be set.

  High Ambient Temperature Level: Allows you to set an ambient temperature High alarm point.

  Low Ambient Temperature Level: Allows you to set an ambient temperature low alarm point.

  Very High Ambient Temperature Level: Allows you to set an ambient temperature Very High alarm point.

- **System Temperature 1:** Sets this temperature sensor to None, Battery, or Ambient.
- **System Temperature 2:** Sets this temperature sensor to None, Battery, or Ambient.
- **System Temperature 3:** Sets this temperature sensor to None, Battery, or Ambient.
- **BTRM Temp Sensor:** Sets the BTRM (Battery Thermal Runaway Management) temperature sensor. Note that this temperature sensor MUST be set as a battery temperature sensor. Select "None", or the temperature sensor (System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1 …, SMTemp1 T8, SMTemp8 T1 …, SMTemp8 T8). You can also select Maximum or Average which takes the maximum or average reading of the temperature sensors (any of System T1, System T2, System T3, IB2 T1, IB2 T2, EIB T1, EIB T2, SMTemp1 T1, …, SMTemp1 T8, SMTemp8 T1, …, SMTemp8 T8) set as battery temperature sensors. When used with an SM-BRC, you can select to average the SM-BRC temperature sensor readings. When set to any value except "none", the following parameters can be set.

  Very High BTRM Temperature: Allows you to set a Very High BTRM Temperature alarm point.

  High BTRM Temperature: Allows you to set a High BTRM Temperature alarm point.

NOTE! *The BTRM sensor is the sensor which is used for the High Temperature Disconnect (HTD) Feature.*

Time Settings Tab Programmable Parameter Descriptions

See also "Changing the Date and Time" on page 22.

- **Specify Time**
  - **Get Local Time from Connected PC:** Allows you to automatically set the time. When selected, the controller will get the same time as the connected PC.
  - **Date & Time:** Allows you to manually set the date and time.
- **Local Zone (for synchronization with time servers):** When selected, the controller will get the local zone automatically or you can enter the zone.
- **Get time automatically from the following servers.**
  - When selected, the controller will get the time from the selected time server. The controller will also adjust the time per the "Local Zone" setting.

Output Relays Tab Programmable Parameter Descriptions

Relay IB1-DO1 Normal State to IB1-DO8 Normal State, and Relay IB0-DO1 Normal State to Relay IB0-DO4 Normal State: Choose Energized or Non-Energized for DO Normal state.

Relay IB1-DO1 to Relay IB1-DO8, and Relay IB0-DO1 to Relay IB0-DO4: Choose Energized or Non-Energized for relay output.

Inverters Tab Programmable Parameter Descriptions

- **Output Voltage Level:** With options 200V, 208V, 220V, 230V, 240V. This setting is only available when inverters have been switched off.
- **Output Frequency:** With options 50 Hz or 60 Hz. This setting is only available when inverters have been switched off.
- **DC Low Voltage Off:** Low output voltage threshold the inverter will turn off.
- **DC Low Voltage On:** Low output voltage threshold the inverter will turn on.
- **DC High Voltage Off:** High output voltage threshold the inverter will turn off.
- **DC High Voltage On:** High output voltage threshold the inverter will turn on.
- **Inv Primary Input Power:** Sets the input mode of operation (AC Mode, DC Mode, DC Only).
- **Inverters LED Control:** Temporarily sets whether or not an inverter's local power indicator blinks when the controller is communicating with the inverter when the controller is in Manual mode. Setting returns to original when controller is returned to the Auto mode.
- **Switch On/Off:** Turns output On/Off to all inverters to check/set the "Output Voltage Level" and "Output Frequency".
- **Fan Speed Control:** Sets the fan speed for all inverters.
- **Clear Inverter Lost Alarm:** Clears an inverter lost alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Confirm Inverter ID/Phase:** After changing inverter ID and/or input feed assignments, use this menu item to confirm the change. The only selection is Yes. Once Yes is selected and confirmed, the ID and feed setting of all inverters are updated.
- **Clear Inverter Comm Fail Alarm:** Clears an inverter communication fail alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Reset Inverter IDs:** Resets the inverter IDs after they have been previously changed and confirmed. The only selection is Yes. Once Yes is selected and confirmed, the controller resets the inverter IDs by reassigning ID numbers.
- **Clear Fault:** Clears an inverter fault alarm. The only selection is Yes. Once Yes is selected and confirmed, the alarm clears.
- **Reset Energy:** Reset the energy, the only selection is Yes.
- **Quantity Of Inverters:** Sets the quantity of inverters, the maximum quantity is 24.
- **Redundancy:** Sets the redundancy of inverter number.

History Log Menu

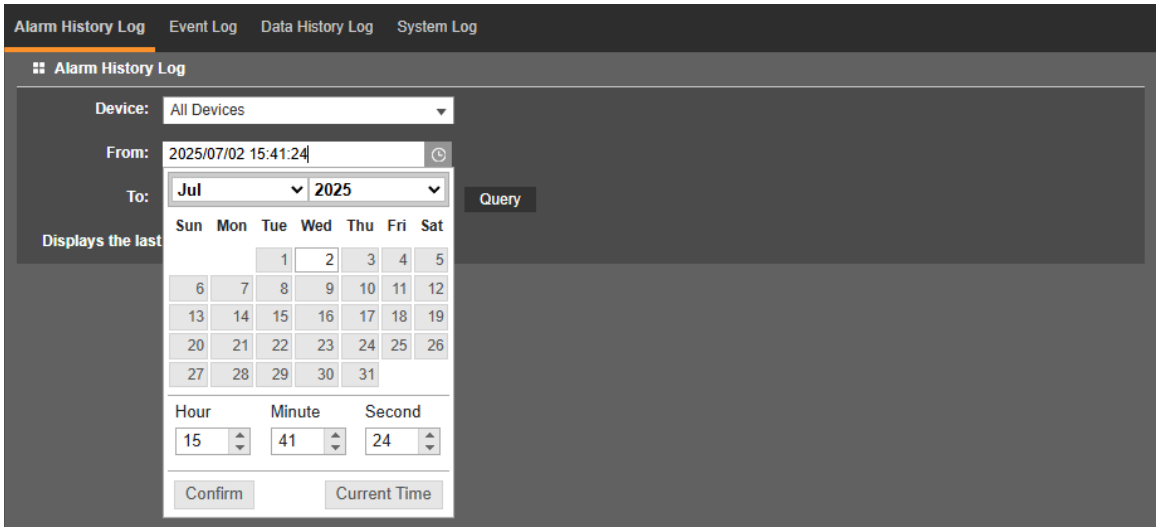
The History Log Menu allows you to view and save the various logs available in the controller.

Alarm History Log Tab

Select Device and Time

Select the "Device" to query from the drop-down list box. Select the "from" and "to" time.

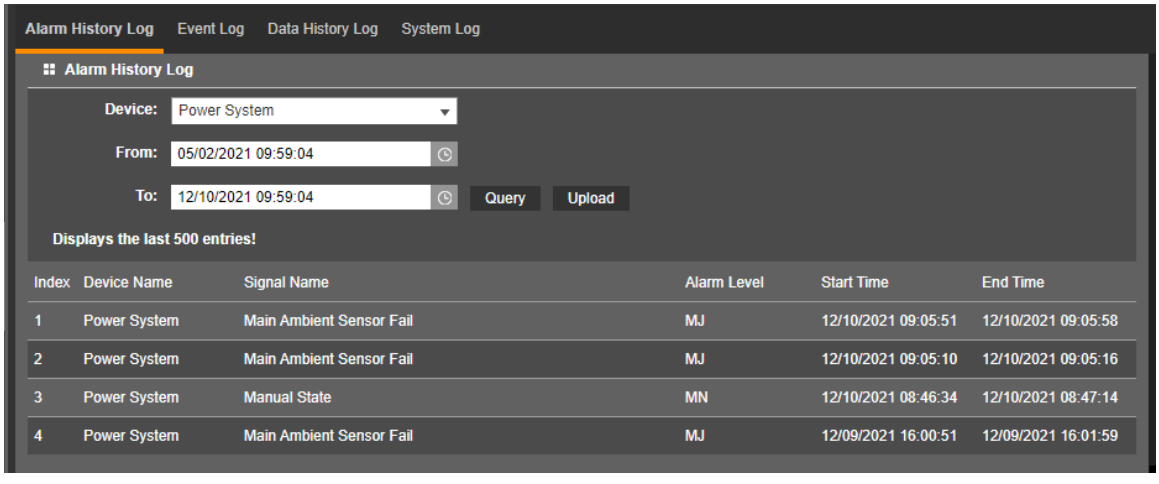
Figure 7.16 Alarm History Log Device and Time Selection



Query Alarm History Log

Click “Query” to query for alarms within selected time slot. The Web page displays the last 500 entries.

Figure 7.17 Alarm History Log Query



Upload Alarm History Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 7.18 Alarm History Log Upload

Query Alarm History Log
Query EquipID: Power System
Query Time: from 05-02-2021 08:59:04 to 12-10-2021 09:59:04
Total 4 alarm(s) queried.

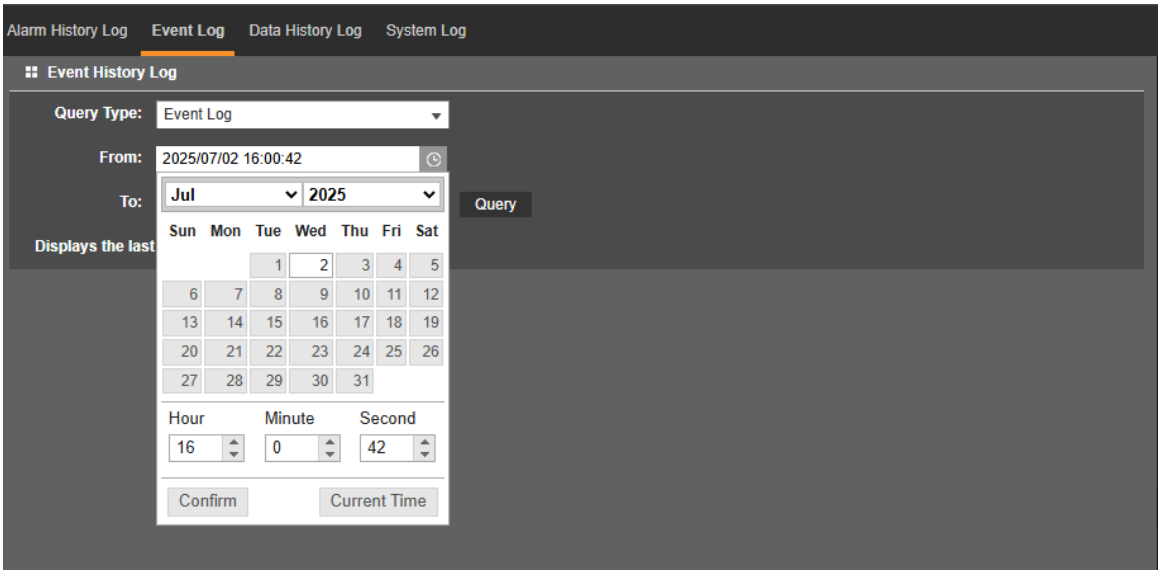
Index	Device Name	Signal Name	Alarm Level	Start Time	End Time
1	Power System	Main Ambient Sensor Fail	MA	12-10-2021 09:05:51	12-10-2021 09:05:58
2	Power System	Main Ambient Sensor Fail	MA	12-10-2021 09:05:10	12-10-2021 09:05:16
3	Power System	Manual State	OA	12-10-2021 08:46:34	12-10-2021 08:47:14
4	Power System	Main Ambient Sensor Fail	MA	12-09-2021 16:00:51	12-09-2021 16:01:59

Event Log Tab

Select Time

Select the "from" and "to" time.

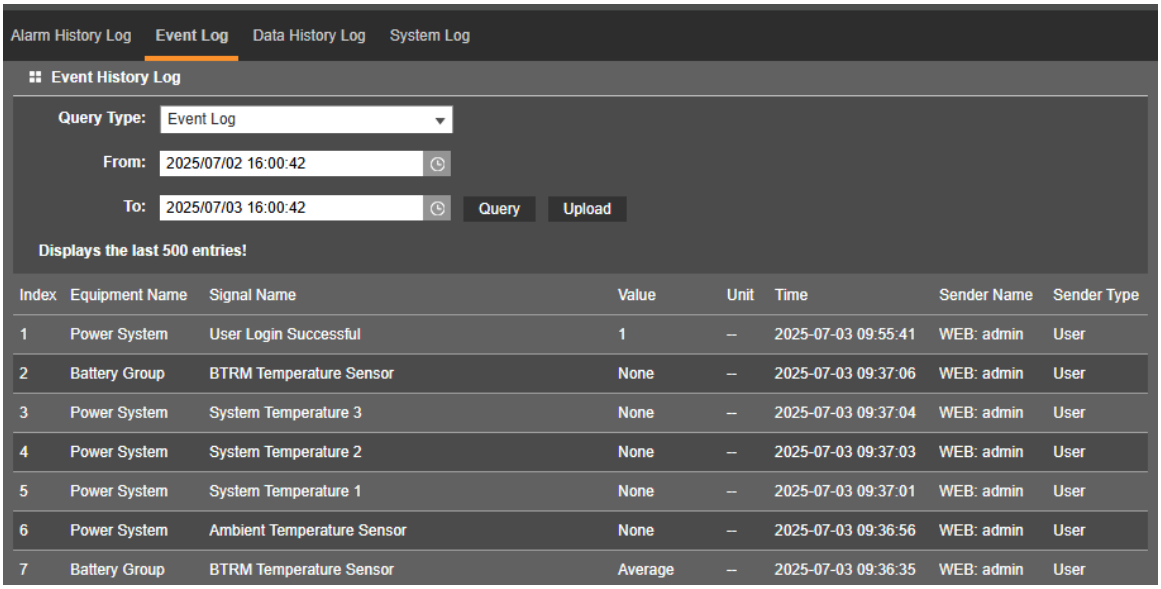
Figure 7.19 Event Log Time Selection



Query Event Log

Click “Query” to query the Event Log. The Web page displays the last 500 entries.

Figure 7.20 Event Log Query



Index	Equipment Name	Signal Name	Value	Unit	Time	Sender Name	Sender Type
1	Power System	User Login Successful	1	--	2025-07-03 09:55:41	WEB: admin	User
2	Battery Group	BTRM Temperature Sensor	None	--	2025-07-03 09:37:06	WEB: admin	User
3	Power System	System Temperature 3	None	--	2025-07-03 09:37:04	WEB: admin	User
4	Power System	System Temperature 2	None	--	2025-07-03 09:37:03	WEB: admin	User
5	Power System	System Temperature 1	None	--	2025-07-03 09:37:01	WEB: admin	User
6	Power System	Ambient Temperature Sensor	None	--	2025-07-03 09:36:56	WEB: admin	User
7	Battery Group	BTRM Temperature Sensor	Average	--	2025-07-03 09:36:35	WEB: admin	User

Upload Event Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 7.21 Event Log Upload

Query Event Log
Query Time: from 2025-07-02 16:00:42 to 2025-07-03 16:00:42
Total 16 record(s) queried.

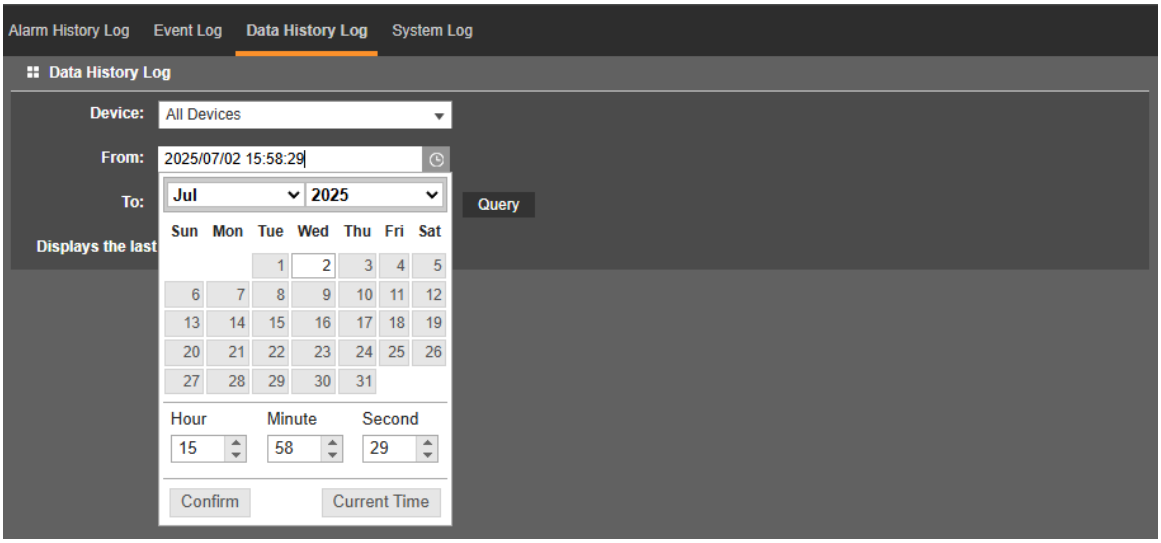
Index	Device Name	Signal Name	Value	Unit	Time	Sender Name	Sender Type
1	Power System	User Login Successful	1	--	2025-07-03 09:55:41	WEB: admin	User
2	Battery Group	BTRM Temperature Sensor	None	--	2025-07-03 09:37:06	WEB: admin	User
3	Power System	System Temperature 3	None	--	2025-07-03 09:37:04	WEB: admin	User
4	Power System	System Temperature 2	None	--	2025-07-03 09:37:03	WEB: admin	User
5	Power System	System Temperature 1	None	--	2025-07-03 09:37:01	WEB: admin	User
6	Power System	Ambient Temperature Sensor	None	--	2025-07-03 09:36:56	WEB: admin	User
7	Battery Group	BTRM Temperature Sensor	Average	--	2025-07-03 09:36:35	WEB: admin	User
8	Power System	System Temperature 3	Ambient	--	2025-07-03 09:36:30	WEB: admin	User

Data History Log Tab

Select Device and Time

Select the "Device" to query from the drop-down list box. Select the "from" and "to" time.

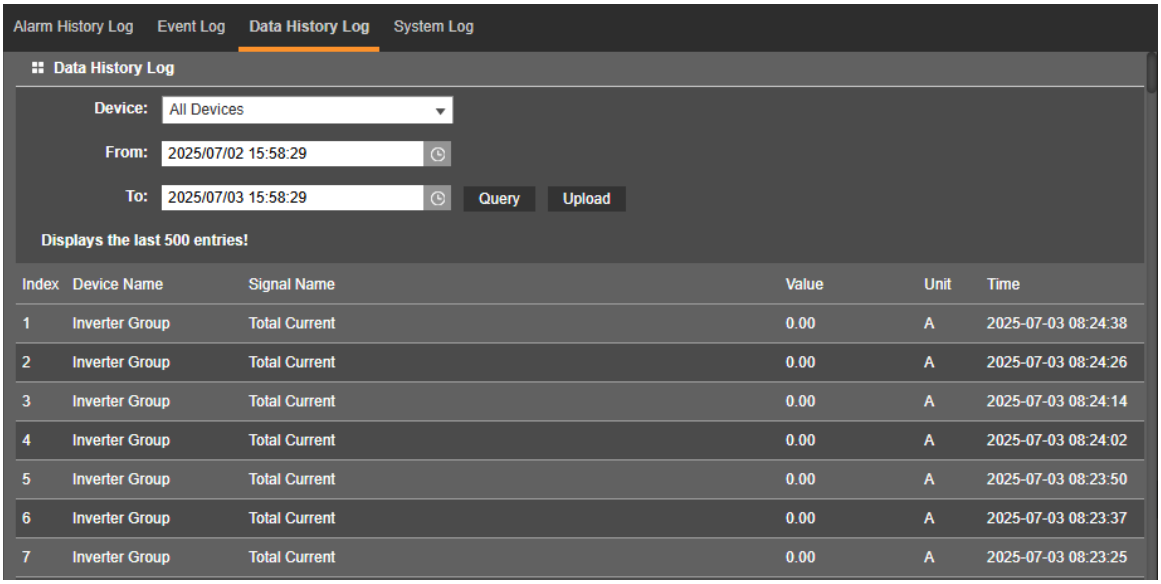
Figure 7.22 Data History Log Device and Time



Query Data History Log

Click “Query” to query for Date History within selected time slot. The Web page displays the last 500 entries.

Figure 7.23 Data History Log Query



Upload Data History Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 7.24 Data History Log Upload

Query Data History Log
Query EquipID: All Devices
Query Time: from 2025-07-02 15:58:29 to 2025-07-03 15:58:29
Total 6000 record(s) queried.

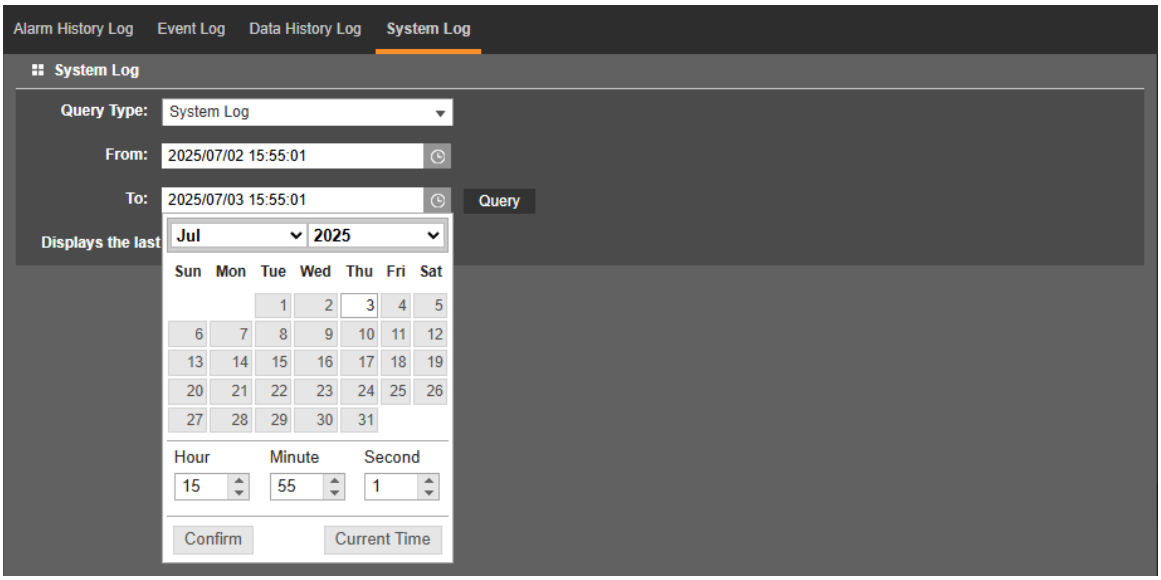
Index	Device Name	Signal Name	Value	Unit	Time
1	Inverter Group	Total Current	0.00	A	2025-07-03 08:24:38
2	Inverter Group	Total Current	0.00	A	2025-07-03 08:24:26
3	Inverter Group	Total Current	0.00	A	2025-07-03 08:24:14
4	Inverter Group	Total Current	0.00	A	2025-07-03 08:24:02
5	Inverter Group	Total Current	0.00	A	2025-07-03 08:23:50
6	Inverter Group	Total Current	0.00	A	2025-07-03 08:23:37
7	Inverter Group	Total Current	0.00	A	2025-07-03 08:23:25
8	Inverter Group	Total Current	0.00	A	2025-07-03 08:23:13
9	Inverter Group	Total Current	0.00	A	2025-07-03 08:23:01
10	Inverter Group	Total Current	0.27	A	2025-07-03 08:22:54
11	Inverter Group	Total Current	0.00	A	2025-07-03 08:22:46

System Log Tab

Select Time

Select the "from" and "to" time.

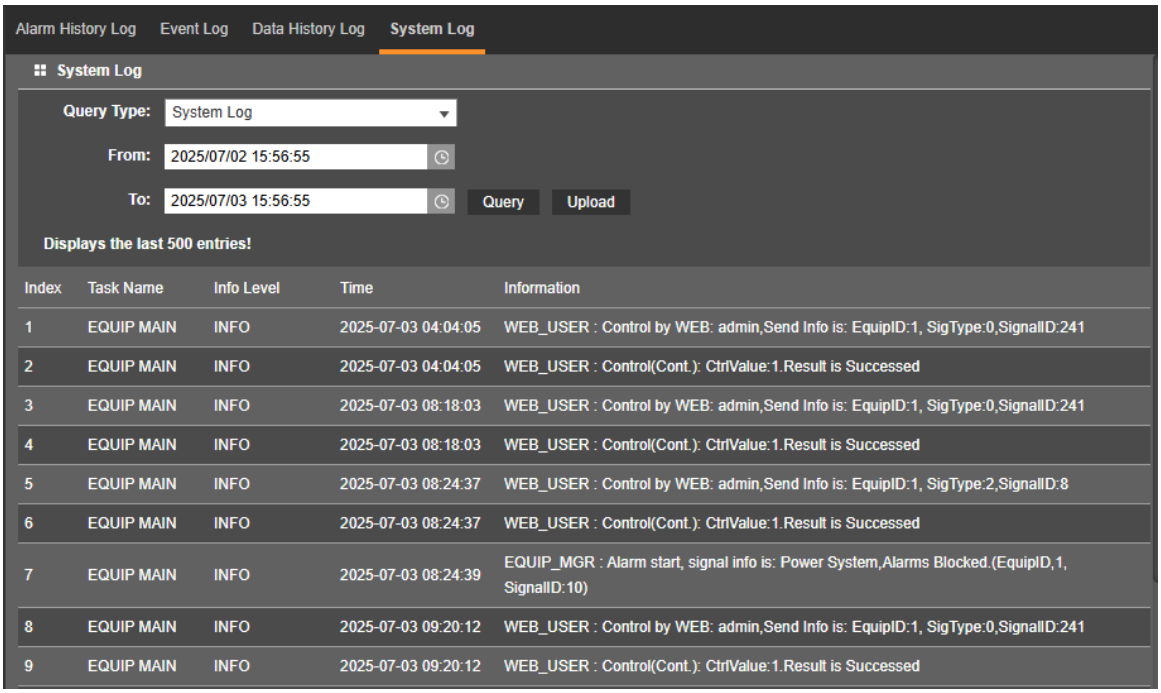
Figure 7.25 System Log Time Selection



Query System Log

Click “Query” to query the System Log. The Web page displays the last 500 entries.

Figure 7.26 System Log Query



Index	Task Name	Info Level	Time	Information
1	EQUIP MAIN	INFO	2025-07-03 04:04:05	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
2	EQUIP MAIN	INFO	2025-07-03 04:04:05	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
3	EQUIP MAIN	INFO	2025-07-03 08:18:03	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
4	EQUIP MAIN	INFO	2025-07-03 08:18:03	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
5	EQUIP MAIN	INFO	2025-07-03 08:24:37	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:2,SignalID:8
6	EQUIP MAIN	INFO	2025-07-03 08:24:37	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
7	EQUIP MAIN	INFO	2025-07-03 08:24:39	EQUIP_MGR : Alarm start, signal info is: Power System,Alarms Blocked.(EquipID,1, SignalID:10)
8	EQUIP MAIN	INFO	2025-07-03 09:20:12	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
9	EQUIP MAIN	INFO	2025-07-03 09:20:12	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed

Upload System Log

Click “Upload” to open the log into another window. You can then save the log as an .html (Web page) or .txt (text) file.

Figure 7.27 System Log Upload

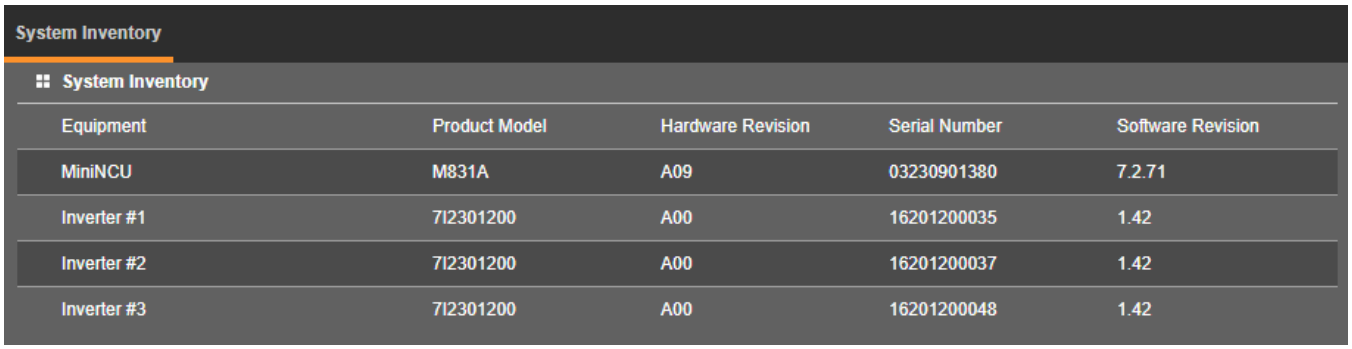
Query System Log
Query Time: from 2025-07-02 15:56:55 to 2025-07-03 15:56:55
Total 33 record(s) queried.

Index	Task Name	Info Level	Log Time	Information
1	EQUIP MAIN	INFO	2025-07-03 04:04:05	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
2	EQUIP MAIN	INFO	2025-07-03 04:04:05	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
3	EQUIP MAIN	INFO	2025-07-03 08:18:03	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
4	EQUIP MAIN	INFO	2025-07-03 08:18:03	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
5	EQUIP MAIN	INFO	2025-07-03 08:24:37	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:2,SignalID:8
6	EQUIP MAIN	INFO	2025-07-03 08:24:37	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
7	EQUIP MAIN	INFO	2025-07-03 08:24:39	EQUIP_MGR : Alarm start, signal info is: Power System,Alarms Blocked.(EquipID,1, SignalID:10)
8	EQUIP MAIN	INFO	2025-07-03 09:20:12	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
9	EQUIP MAIN	INFO	2025-07-03 09:20:12	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
10	EQUIP MAIN	INFO	2025-07-03 09:34:59	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:0,SignalID:241
11	EQUIP MAIN	INFO	2025-07-03 09:34:59	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
12	EQUIP MAIN	INFO	2025-07-03 09:36:17	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:2,SignalID:208
13	EQUIP MAIN	INFO	2025-07-03 09:36:17	WEB_USER : Control(Cont.): CtrlValue:1.Result is Successed
14	EQUIP MAIN	INFO	2025-07-03 09:36:22	WEB_USER : Control by WEB: admin,Send Info is: EquipID:1, SigType:2,SignalID:50

System Inventory Menu

The System Inventory Menu allows you to view product information of the intelligent devices (i.e., controller, inverters, etc.) in the system.

Figure 7.28 System Inventory Menu



Advanced Settings Menu

The Advanced Settings Menu allows you to change (if you have the proper privilege level programmed in your User settings) the settings of the various advanced programmable parameters. Settings are grouped per function. Select a tab in the Advanced Settings Menu to change that functions programmable parameters.

Ethernet Tab

You can configure the controller's network parameters. See “Ethernet Tab” on page 111.

Users Tab

You can add, edit, and delete Users. These are the Users that can log onto the controller both locally (local display access) or remotely using the Web Interface. See “Users Tab” on page 113.

SNMP Tab

Configures SNMP V2 and V3 parameters. See “SNMP Tab” on page 116.

Language Tab

The local display and Web Interface always has an English language option. Multiple local languages are also supported. One local language option is displayed at a time with the English language option. To select another local language option to display, use the Web Interface Language Tab. See “Language Tab” on page 121.

SW Maintenance Tab

Allows you to perform software maintenance procedures. See “SW Maintenance Tab” on page 123.

Alarms Tab

Allows you to define the alarm level for each alarm. Allows you to map alarms to the alarm relays. See “Alarms Tab” on page 129.

DI Alarms Tab

Allows you to change the digital input alarm signal full name (name displayed in the Web Interface menus). Allows you to change the digital input alarm signal abbreviation name (name displayed in the local display menus). Allows you to define the alarm level for each digital input alarm. Allows you to map the digital input alarms to the alarm relays. Allows you to set the alarm state for the digital inputs (high or low). See “DI Alarms Tab” on page 130.

Alarm Report Tab

In the SMTP section, you can set the Alarm Report Feature. In the SMS section, you can set cell phone number for receiving alarm reports and the alarm report level. See “Alarm Report Tab” on page 135.

Monitor Protocol Tab

You can select "EEM", "YDN23", or "Modbus" as the protocol. See “Monitor Protocol Tab” on page 139.

Clear Data Tab

Select the data log to be cleared from those listed in the drop-down list box. Click on the “Clear” button to clear the corresponding data. See also “Clear Data Tab” on page 142.

8 Replacement Procedures

8.1 Controller Replacement

DANGER! Follow all "Important Safety Instructions" found in the documentation provided with the system the controller is installed in.

ALERT! *CONTROLLER HANDLING.*
Installation or removal of the controller requires careful handling. To avoid possibility of controller damage from static discharge, a static wrist strap grounded through a one megohm resistor should always be worn when handling the controller. ESD-protective packaging material must also be used when carrying/shipping the controller.

NOTE! *Depending on your network security settings, when you remove a device that is connected to your network and assign the same IP address to the replacement device, you may not be allowed to communicate with the replacement device over the network. Contact your network administrator for assistance.*

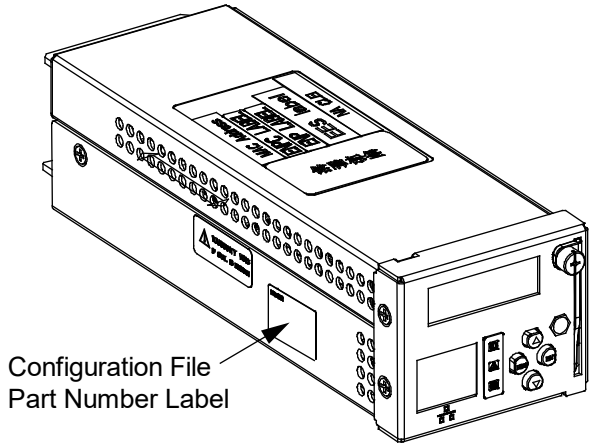
NOTE! *The controller does not turn off any relay when the controller is reset/replaced. If the relay is active when the controller is reset/replaced, it will stay active whether or not the alarm condition still exists. If possible, the alarm condition should be cleared before the controller is reset/replaced. If the alarm is not cleared, after starting the controller, it may be necessary to manually trigger an alarm condition to clear all alarm relays.*

The controller is hot swappable. It can be removed and installed with the system operating and without affecting the output bus.

Procedure

1. Before performing this procedure, ensure the replacement controller contains the same configuration file as the existing controller. Refer to the Configuration File Part Number Label on the side of the replacement controller for the Configuration Part Number (see Figure 8.1). If the existing controller is operational, navigate the menus to view its configuration file (MAIN SCREEN / ESC).

Figure 8.1 Controller Configuration Label Location

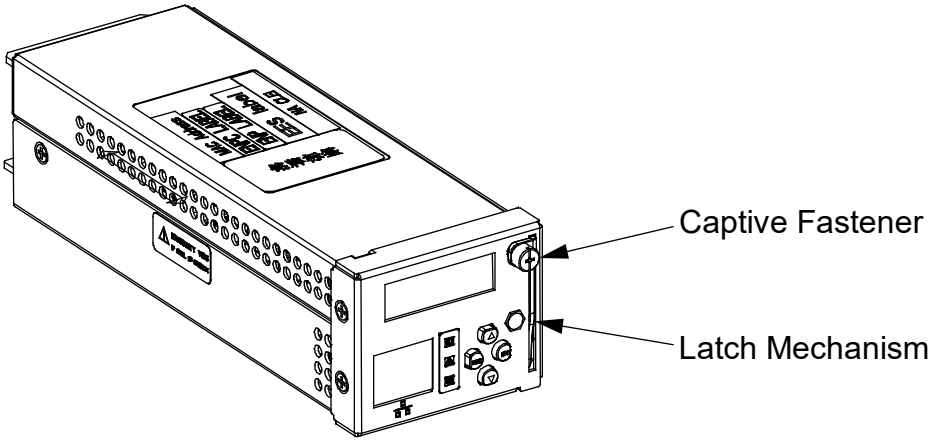


2. Performing this procedure may activate external alarms. Do one of the following. If possible, disable these alarms. If these alarms cannot be easily disabled, notify the appropriate personnel to disregard any future alarms associated with this system while this procedure is being performed.

3. Connect an approved grounding strap to your wrist. Attach the other end to a suitable ground.

4. Loosen the captive fastener securing the latch mechanism to the front of the controller to be replaced. Pull the latch mechanism away from the controller (this will retract the latch mechanism located on the bottom of the controller). This unlocks the controller from the shelf. Refer to Figure 8.2.

Figure 8.2 Latch Mechanism on the Controller



5. Slide the controller completely from the shelf.
6. Loosen the captive fastener securing the latch mechanism to the front of the replacement controller. Pull the latch mechanism away from the controller (this will retract the latch mechanism located on the bottom of the controller).
7. Slide the controller completely into its mounting position.
8. Push the latch mechanism into the front panel of the controller, and secure by tightening the captive fastener. This locks the controller securely to the shelf.
9. Wait for the controller to finish booting and verify that the complete system operates normally.
10. Enable the external alarms or notify appropriate personnel that this procedure is finished.
11. Ensure that there are no local or remote alarms active on the system.

9 Controller Digital Input and Relay Output Connections

9.1 Controller Digital Inputs

The controller has two (2) programmable binary digital inputs for customer connections. These are factory wired to system interconnect connectors. Refer to your system documentation for location. Refer to “Specifications” on page 186 for ratings.

NOTE! *Note that some digital inputs may be factory programmed for a specific use. Refer to the controller Table of Set Values furnished with your system.*

9.2 Controller Relay Outputs

The controller has four (4) programmable form-C relay outputs for customer connections. Each relay output can be configured to change state when one or more alarm events occur. These are factory wired to system interconnect connectors. Refer to your system documentation for location. Refer to “Specifications” on page 186 for ratings.

NOTE! *Note that some relay outputs may be factory programmed for a specific use. Refer to the controller Table of Set Values furnished with your system.*

9.3 IB2 (Controller Interface Board) and EIB (Controller Extended Interface Board)

One or more IB2 (Controller Interface Board) and/or EIB (Controller Extended Interface Board) may be connected to the controller. The IB2 and EIB provide additional digital inputs and relay outputs. Note that some digital inputs and/or relay outputs may be factory wired to the system. Refer to your Power System documentation for IB2 and EIB connections and specifications.

10 Specifications

Input Voltage Range: 19 VDC to 60 VDC.

Power Consumption, Maximum: 5 W.

Operating Temperature Range: -40 °C to +75 °C (-40 °F to +167 °F).

Relative Humidity: Capable of operating in an ambient relative humidity range of 0% to 90%, non-condensing.

Dimensions (H x W x D):

- 43.5 mm (H) x 52 mm (W) x 152 mm (D)
  1.71" (H) x 2.05" (W) x 5.98" (D)

Weight: < 1 kg (2.2 lbs).

Indicators:

- Status (Green)
- Minor Alarm (Yellow)
- Critical / Major Alarm (Red)

Local and Remote Access Passwords: Refer to "Passwords and Privilege Levels" on page 14 and "Using the Web Interface" on page 15.

Controller Digital Input Ratings:

- Maximum Voltage Rating: 60 VDC.
- Active High: > 19 VDC.
- Active Low: < 1 VDC.

Controller Relay Ratings:

- Steady State: 0.5 A @ 60 VDC, 1.0 A @ 30 VDC.
- Peak: 3 A @ 30 VDC.

IB2 and EIB (Controller Interface Board) Ratings:

- **Digital Input Ratings:**
  - Maximum Voltage Rating: 60 VDC.
  - Active High: > 19 VDC.
  - Active Low: < 1 VDC.
- **Relay Ratings:**
  - Steady State: 0.5 A @ 60 VDC; 1.0 A @ 30 VDC.
  - Peak: 3 A @ 30 VDC.

Factory Default Setpoints: Refer to the Table of Set Values furnished with your system for a list of factory default values.

Safety and Standards Compliance:

- Electrical: IEC 60950-1, EN 60950-1, UL 60950-1

- EMC: EN 300 386, 2001 Class B; FCC Part 15, Class B
- Environmental: CE; NEBS Level 3 (pending)
- GR-3108 Class 2 Compliant (pending)

Temperature Probe Accuracy:

- Calibration Error (-25 °C to +105 °C): ±2 °C
- Nonlinearity (-25 °C to +105 °C): 0.4 °C

Controller Temperature Probe Input Accuracy (-10 °C to +65 °C): ±2 °C

Connect with Vertiv on Social Media


https://www.facebook.com/vertiv/


https://www.instagram.com/vertiv/


https://www.linkedin.com/company/vertiv/


https://www.x.com/vertiv/

Vertiv.com | Vertiv Headquarters, 505 N Cleveland Ave, Westerville, OH 43082, USA

UM1M831A_REVG