

User Guide

Eltek Controller Web Interface



Web Interface

Power System Controllers

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The latest version of this document and other Eltek product documents are available online at eltek.sharefile.com.

Safety and Environmental Precautions

IMPORTANT: Read user instructions before operating equipment!

The following documents are available online at eltek.sharefile.com.

Controller User Guides	
Smartpack2 Master Controller:	Doc #350020.013
Smartpack S Controller:	Doc #350030.013
Compack Controller:	Doc #350011.013
Other Controller/Monitor Guides	
I/O Monitor2 Installation Guide:	Doc #351509.033



Read and observe all safety statements and requirements below before performing any installation or operation work on power equipment.

Failure to comply with the safety statements and requirements contained in this document may result in injury and/or equipment damage, and it may void the user's authority to operate the equipment.

Full product manuals are available online at: eltek.sharefile.com



WARNING: HAZARDOUS VOLTAGE AND ENERGY LEVELS CAN PRODUCE SERIOUS SHOCKS AND BURNS. Only authorized, qualified, and trained personnel should attempt to work on power equipment. The equipment is to be connected to supply mains by a qualified personal in accordance with local and national codes (e.g. NEC, CEC, etc). Refer to datasheets for full product specifications.



WARNING: Changes or modifications to the system not expressly approved by the party responsible for the compliance could void the user's authority to operate the system.



CAUTION: Refer to the battery manufacturer's documentation for recommended battery settings. It is the user's responsibility to enter proper battery parameters.

Observe local and national electrical, environmental, and workplace codes.

NOTICE: Alarm contacts are rated for a maximum voltage of 60 V, SELV (Safety Extra Low Voltage) and a maximum continuous current of 0.5A.

Table of Contents

Comprehensive Overview	9
1. Guide Overview	10
Eltek Controllers with Web Interface	11
Web Interface Features	12
Functions Available Only Through the Web Interface.....	12
Controller Login and Access Levels.....	13
Requirements	15
Hardware	16
Software	16
Recommended	17
Optional.....	17
Direct Connection with the Controller	17
2. Web Interface Overview	24
Alarm Icons and Monitors.....	25
Alarm Monitor Variables and Brackets	25
Category Buttons.....	26
3. Home	28
System Overview Window.....	28
System Status and Operational Mode	29
Power System Components, Controller Nodes, and Inputs.....	31
System History Window.....	80
System Monitors Window.....	81
4. System Configuration.....	82
Power System	83
Power system.....	83
Mains.....	91
Generator.....	93
Rectifiers.....	98
[Solar Charger]	103

[Wind]	104
[Fuel Cell]	105
[DcDc Converter]	106
Load.....	106
Battery	108
Control System	124
Device Settings.....	141
Time Settings	141
Network Settings	141
SNMP Settings.....	147
User Accounts.....	161
5. Alarm Configuration	165
Alarm Monitors Edit Windows	166
General Alarm Monitor Window (not LVD)	167
Edit Window for LVBD.....	175
Edit Window for LVLD.....	176
Alarm Configuration Menus	177
Power System	177
Eltek CAN Nodes.....	210
AC Mains Monitor	211
Battery Monitor	213
Load Monitor	214
Flexi Monitor.....	219
I/O Monitor Alarm Monitors	223
I/O Monitor Output Relays.....	227
6. Logs.....	228
Event Log.....	228
Data Log.....	229
Energy Log	231
Accumulated.....	235
Hourly	235
Daily.....	237
Weekly	238

Generator Log.....	239
Battery Cycles.....	240
Battery Tests	241
Battery Run Time.....	244
Mains log.....	245
Change Log	246
Save Logs to File.....	247
Accounts Log.....	249
DoD Cycle Count	250
7. Commands	251
System	251
Battery	253
Output Test.....	254
Virtual Inputs	256
Software Upgrade.....	256
Load/Save Config.....	258
Load Config File	258
Save Config File.....	259
8. Statistics.....	262
9. Help	264
10. Logout.....	265
Procedures.....	266
1. Procedures Overview	267
2. Setup	268
Setting Float (Reference) Voltage	268
Setting Rectifier Current Limit	269
Battery Configuration	270
Number of Banks	271
Capacity and Number of Battery Strings	271
Battery Table.....	272

Setting Battery Charging Current Limit.....	274
Battery Discharge Testing.....	275
Battery Temperature Compensation.....	279
Temperature Probe Setup	283
Controllers.....	283
Flexi Monitors	287
Setting Alarms	289
Input Alarms.....	290
Output Alarm Relays.....	295
Alarm Setpoints	296
Setting Alarm Battery Voltage Alarm (Example).....	296
Setting Nag Alarms	300
Setting Site Information	302
Setting Generator Activation.....	304
Setting SNMP Communication.....	307
SNMP Web-Based Configuration.....	308
SNMP Implementation.....	309
Load Monitor and Flexi Monitor Setup	311
Load Monitor	311
Flexi Monitor.....	317
Logical Groups (Boolean Algebra)	322
Email (SMTP) Setup.....	325
3. Operation	329
Using the Commands Buttons.....	329
System	329
Battery	330
Output Test.....	331
Virtual Inputs	332
Alarm Relay Test	341
Manual Battery Discharge Test.....	341
Downloading Logs	342
Downloading Statistics	346

Downloading and Uploading Configuration Files	347
Download Configuration Files	347
Upload Configuration Files	351
4. Administration	353
Administering User Accounts	353
Change Controller Name	354
Find and Change the IP Address	355
Find the IP Address.....	355
Change the IP Address	358
Trademark and Copyright Notices.....	360
Glossary.....	361
Acronyms	366
Index.....	367

Comprehensive Overview

1. Guide Overview

This guide provides information and instructions for the Web Interface featured on the following Eltek controllers:

- Smartpack2
- Smartpack S
- Compack

Eltek controllers are designed for use with Eltek dc power systems only.

The topics covered in this guide include how to establish communication between an Eltek controller and a computer, comprehensive descriptions of each page and field of the web interface, and how to apply parameter settings through the web interface.

NOTE: Screenshots for the web interface are taken from the Smartpack2 controller (unless otherwise noted).

NOTE: For the **Smartpack2** and **Smartpack S** controllers, setup and operational functions can be performed through either the web interface or display panel. The **Compack** controller does not have a display panel and therefore *requires* the use of a computer and an Ethernet connection for the web interface in order to adjust parameters.

Table 1.1 – Controller Documentation

Controller Unit	Document(s)
Eltek Controllers (general documentation)	Description of System Functionality – Smartpack2 Smartpack Compack (350020.073) Configuration Guide – Smartpack2, Smartpack S, Compack Controllers (370013.063)
Smartpack2	Navigation and Menu Tree – Smartpack2 Controller (370017.033) User's Guide – Smartpack2 Basic Controller (350021.013) User's Guide – Smartpack2 Basic Industrial Controller (350025.013) User's Guide – Smartpack2 Master Controller (350020.013)
Smartpack S	User Guide – Smartpack S Controller (350030.013)
Compack	User's guide – Compack Monitoring and Control Unit (350011.013)

Controller Unit	Document(s)
CAN Nodes	Installation Guide – Battery Monitor CAN Bus Node (351507.033) Installation Guide – IO Monitor2 CAN Node (351509.033) Installation Guide – IO Monitor, CAN Nodes T1&T3 (351503.033) Installation Guide – Load Monitor, CAN Bus Node (351506.033)

REVISION NOTE: This guide was written using Smartpack2 controller software revision 2.3. Menus and options may vary as later software revisions are released.

Eltek Controllers with Web Interface

The following table lists the available Eltek controllers that feature the web interface.

Table 1.2 – Eltek Controllers with Web Interface

Image	Controller	Description
	Smartpack2 Master	The primary interface and data aggregation unit for the Smartpack2 controller system; it contains the display interface, Ethernet port (for web interface), and SD card slot. The Master unit is connected to Smartpack2 Basic or Smartpack2 Basic Industrial controllers and a variety of CAN Nodes. Smartpack2 controllers are integrated into large- and medium-sized Eltek power systems.
	Smartpack S	Smartpack S is primarily used with Eltek Flatpack S power systems. It contains a display interface and Ethernet port, as well as alarm input and output terminals.
	Compac	The smallest Eltek controller, used primarily with Micropack power systems. It has no display interface, so the web interface must be used to configure controller parameters. It does contain alarm input and output terminals.

Web Interface Features

The Eltek Controller Web Interface features the following advantages:

- **Platform independence:** The web interface operates in common computer operating system platforms (like Windows®, Mac®, UNIX, etc.) that support standard web browsers capable of running JavaScript.

NOTE: The web interface is fully tested using the latest versions of Microsoft® Internet Explorer® and Mozilla® Firefox®. Limited tests are also performed with Google Chrome™, Apple Safari®, and Opera™; but there is no guarantee that full functionality is supported with these browsers.

- **No software installation required:** Communication with the web interface is facilitated by standard HTTP.
- **Field upgrades:** Controller firmware can be upgraded over the network.
- **Simultaneous sessions:** Multiple login sessions are supported, which can be utilized for cooperative troubleshooting efforts, training purposes, or other collaborative, multi-user sessions.
- **Security:** Several group access levels are provided, restricting unauthorized attempts to alter system settings.
- **Protected Operating Firmware:** The operating firmware is executed from RAM, so there is no file system to corrupt or damage. The controller's RAM is not accessible externally, which provides excellent security against malicious attacks. In the event that the RAM is corrupted, a controller reboot loads a fresh copy of the operating code.
- **Embedded SNMP Agent:** Standard SNMP traps are provided upon occurrences of alarm conditions; GET and SET operations are supported to retrieve data and perform remote operations on the power plant. The MIB files are provided with the controller's firmware.

Functions Available Only Through the Web Interface

The following functions are not available through the controller displays of the Smartpack2 and Smartpack S controllers (the Compact controller does not have a display); they can only be set and/or adjusted through the web interface:

- **DC Plant Information:** Information regarding the dc system and installation site details, including site name and location, power system model, and installation and service dates.

System Conf. > Power System > Power System > System Info

- **SNMP Configuration:** Simple Network Management Protocol settings for communication with a Network Management System (NMS) that uses SNMP v1, v2c, or v3.

System Conf. > Device Settings > SNMP Settings

Controller Login and Access Levels

The controller web interface can be accessed through a network (e.g., a LAN), through the Internet, or through direct Ethernet connection with a computer.

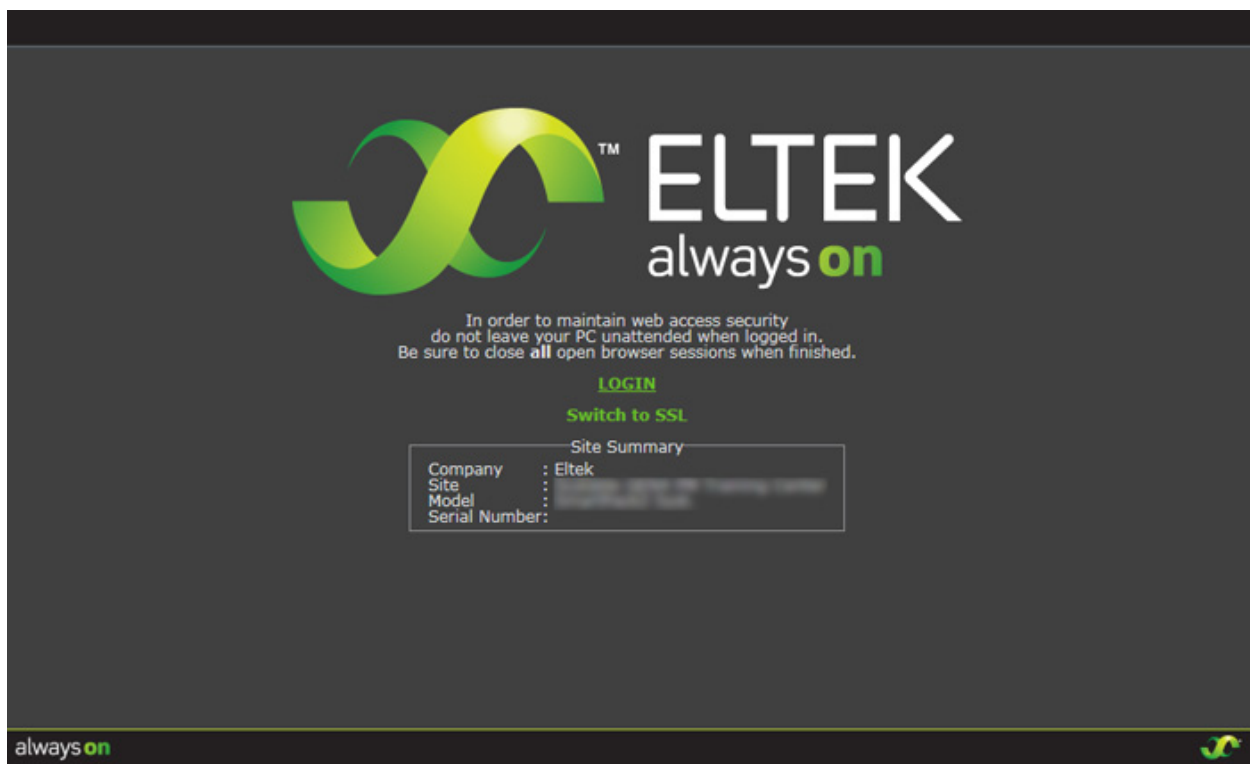


Figure 1.1 – Web Interface Login Page

- **LOGIN** – link for a normal connection
- **Switch to SSL** – link for a Secure Sockets Layer connection

Click on the **Switch to SSL** link if encrypted, secure communication is required between the computer and controller.

NOTE: Due to strict security settings, some web browsers and local networks may prohibit SSL connections that are missing valid certificates. If access is blocked by the web browser, it may be possible to use an alternate web browser that permits a temporary exception for each session. For example,

Mozilla Firefox currently allows users to add a temporary exception when a valid certificate is missing.

Table 1.3 – User Access Levels

#	User Name	Default Password	Access Level	Notes
1	admin	admin	3 – admin	Administrator access, read-write
2	control	control	2 – control	Control (service) access, read-write
3	status	status	1 – status	Status (view) access, read-only
4	(configurable)	(configurable)	3 – admin <i>or</i> 2 – control <i>or</i> 1 – status	User defined
...	(configurable)	(configurable)	3 – admin <i>or</i> 2 – control <i>or</i> 1 – status	User defined
10	(configurable)	(configurable)	3 – admin <i>or</i> 2 – control <i>or</i> 1 – status	User defined

For security reasons, it is advisable to log in with the admin account and change the default passwords. The maximum number of simultaneous logins for each user can be changed, and additional user account types can be configured through the **User Accounts** configuration page (**System Conf.** > **Device Settings** > **User Accounts**). Up to ten different user accounts can be configured and assigned one of the three access level options.

NOTE: Simultaneous login using one account is supported, but more logins reduce bandwidth and slow down controller response.

Access levels define user permissions. There are three principal access levels:

- **Admin:** Read-Write access. Administrator credentials allow changes to be made to all system parameters and must be entered when logging in to the web interface. The default credentials are:

User name: **admin**

Password: **admin**

NOTE: It is *not* advisable to make this access level widely available as critical changes can be made, especially to user accounts and SNMP configuration. The **control** access level is recommended for regular maintenance purposes.

- **Control:** Read-Write access. Control credentials allow changes to be made to most system parameters but excludes some settings and commands, such as SNMP configuration, user accounts, and the “Delete Event Log” command. The default credentials are:

User name: **control**

Password: **control**

NOTE: It is advisable to make this access level available for regular maintenance, as it prevents changes from being made to critical features like user accounts and SNMP configuration.

- **Status:** Read-only access. Status credentials permit viewing parameter settings but prevent making and saving changes. The default credentials are:

User name: **status**

Password: **status**

NOTE: User names and passwords *are* case-sensitive.

When logged in, the access level can be found in the bottom right corner of the web interface pages.

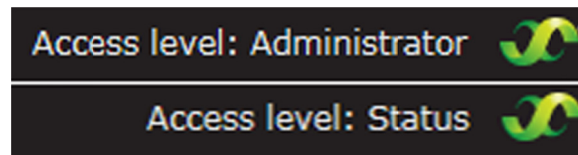


Figure 1.2 – Access Level Indicators (bottom right of web page)

CAUTION: For security reasons, do not leave your computer unattended after logging in. When logging out, make sure to close all browser windows that were opened during the web interface session.

Requirements

NOTE: Adjusting settings on the Compact controller requires the use of a computer and an Ethernet connection. The Smartpack2 and Smartpack S controllers can be configured using either the display panel or a connection to a computer.

Make sure the User Guides for the controller and power system are on hand. If not, please visit the Eltek ShareFile site (<http://eltek.sharefile.com/>) and download the relevant documents.

Hardware

- Computer with network card/adaptor (Ethernet port, Ethernet port adapter, or wireless card)
- If working through a local or wide area network (LAN or WAN), the controller's Ethernet port must be connected to the network with an Ethernet cable

For a direct connection between a computer and an Eltek controller:

- Computer with Ethernet port or Ethernet port adapter
- Ethernet cable (either cross-over or straight-through)

Software

The following software is required to use the Web Interface:

- One of the following **web browsers**:
 - Internet Explorer® 9 or later
 - Mozilla Firefox® 12 or later

NOTE: Internet Explorer 9 is not available for Windows XP. If the computer is running Windows XP, then Mozilla Firefox 12 or later should be downloaded and used to ensure full functionality of the web interface.

The web interface is fully tested using the latest versions of Microsoft® Internet Explorer® and Mozilla® Firefox®. Limited tests are also performed with Google Chrome™, Apple Safari®, and Opera™; but there is no guarantee that full functionality is supported with these browsers.

- The latest version of Oracle Java™ installed on the computer *and enabled* in the web browser
- **IMPORTANT:** The following Eltek applications/interfaces require the specified communication ports to be available (i.e., not blocked by the local network administration or IT group):
 - Eltek Network Utility:
 - UDP port 20034
 - TCP port 80
 - Web Interface:
 - TCP port 80
 - TCP port 443

Recommended

The following is recommended:

- Eltek Network Utility (ENU): an Eltek program that locates Eltek controllers located on a network and facilitates software updates.

NOTE: This utility is required for the procedure in the “Direct Connection with the Controller” section, as it provides the easiest way to determine the IP address of an Eltek controller.

- Requires Microsoft® Windows XP and later (e.g., Vista, 7, 8).
- This utility can be downloaded from the Internet at <http://msm.eltek.com/enu>.

Optional

It may be advantageous in some cases to install the Eltek *PowerSuite* program on the computer to be used. For example, if the computer is running Windows XP and it is not possible to install one of the required web browsers, then *PowerSuite* is the most convenient way to access and configure the controller through a computer.

- *PowerSuite*
 - Requires Microsoft® Windows XP and later (e.g., Vista, 7, 8).
 - UDP port 4002 must be available
 - *PowerSuite* is on the CD provided with the controller. It can also be downloaded from Eltek's FTP site (<ftp://ftp.eltek.com>); please contact Eltek for the current credentials.

NOTE: *PowerSuite* is *not* covered in this guide. If necessary, please consult the documentation provided on the CD as well as the online help file at <http://onlinedocs.eltek.com/wip4/mywip/powersuite>; please contact Eltek for the current credentials.

Direct Connection with the Controller

Direct connection between the Eltek controller and a computer using an Ethernet cable is the most reliable method for establishing a communication connection.

For controllers with a *display* (Smartpack2, Smartpack S), the controller's IP address can be found at the following location in the *display* menu:

Main Menu > Sys.Config. > PowerSystem > General System Config. > Agent IP Address (four lines, one line per octet)

SIMPLE METHOD: If the Eltek controller's IP address is known, then the computer can be connected to the controller (via Ethernet cable) and the controller IP address typed into an Internet browser address bar on the computer. This is the simplest connection method. If, however, the Web Interface login page does not appear in the browser, then use the following procedure with the Eltek Network Utility (ENU) to troubleshoot.

NOTE: This procedure requires installation of the Eltek Network Utility (ENU) program in order to determine the Eltek controller's IP address and to change it if necessary.

To establish a direct connection with an Eltek controller:

1. Connect an Ethernet cable (either cross-over or straight-through) to the controller and computer Ethernet ports.

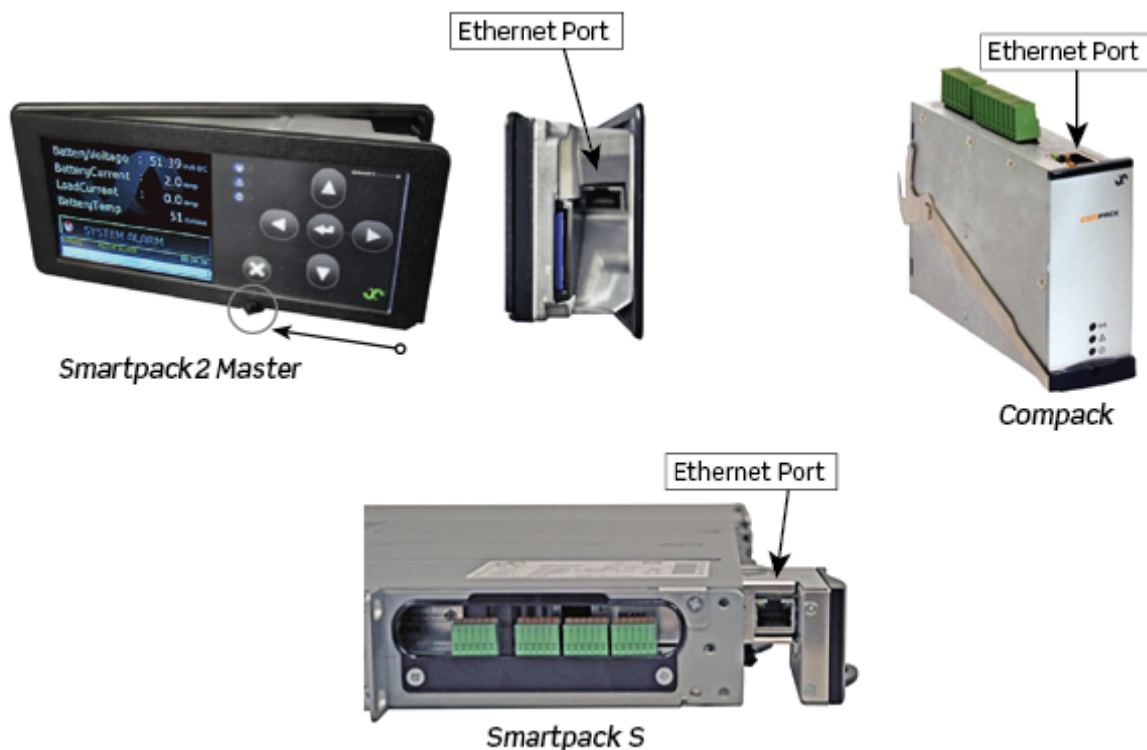


Figure 1.3 - Controller Ethernet Ports

2. Launch the Eltek Network Utility (ENU) on the computer.

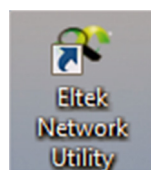


Figure 1.4 - Eltek Network Utility Icon

3. After the ENU program opens, click on the search button (magnifying glass icon) in the upper left corner to find the controller. Wait for the window to populate.

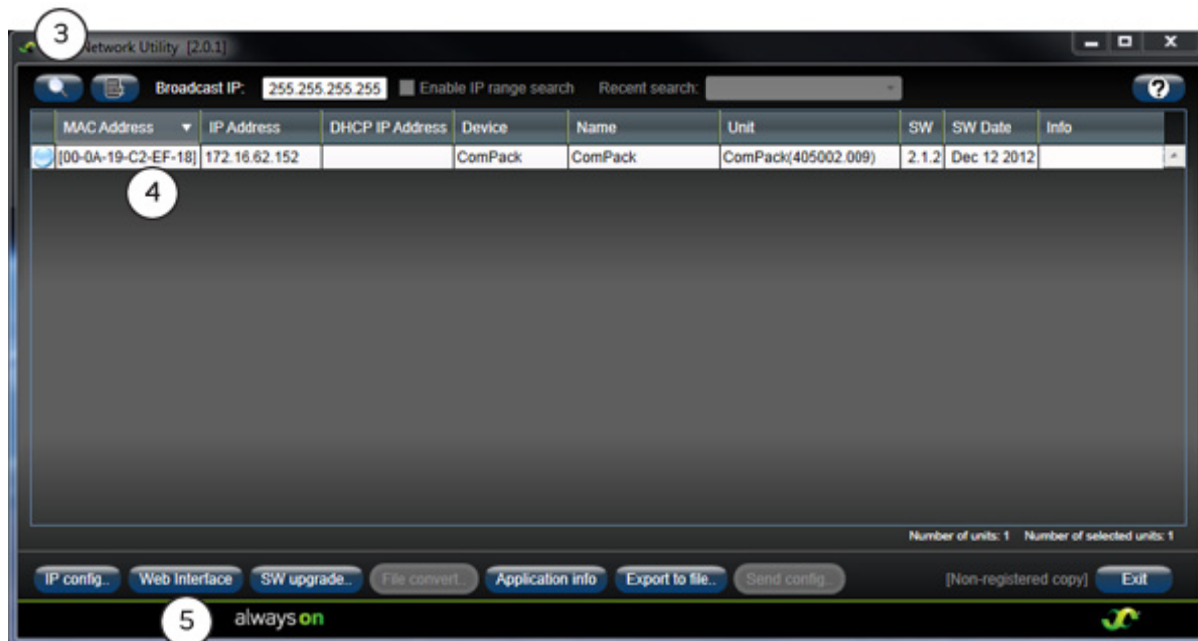


Figure 1.5 – Eltek Network Utility Window

4. Click on the controller line to select it.
NOTE: By default, Eltek controllers are shipped with a static IP address of **192.168.10.20**.
5. Click on the **Web Interface** button.
6. Does the Login page appear in the web browser? (See the following figure.)

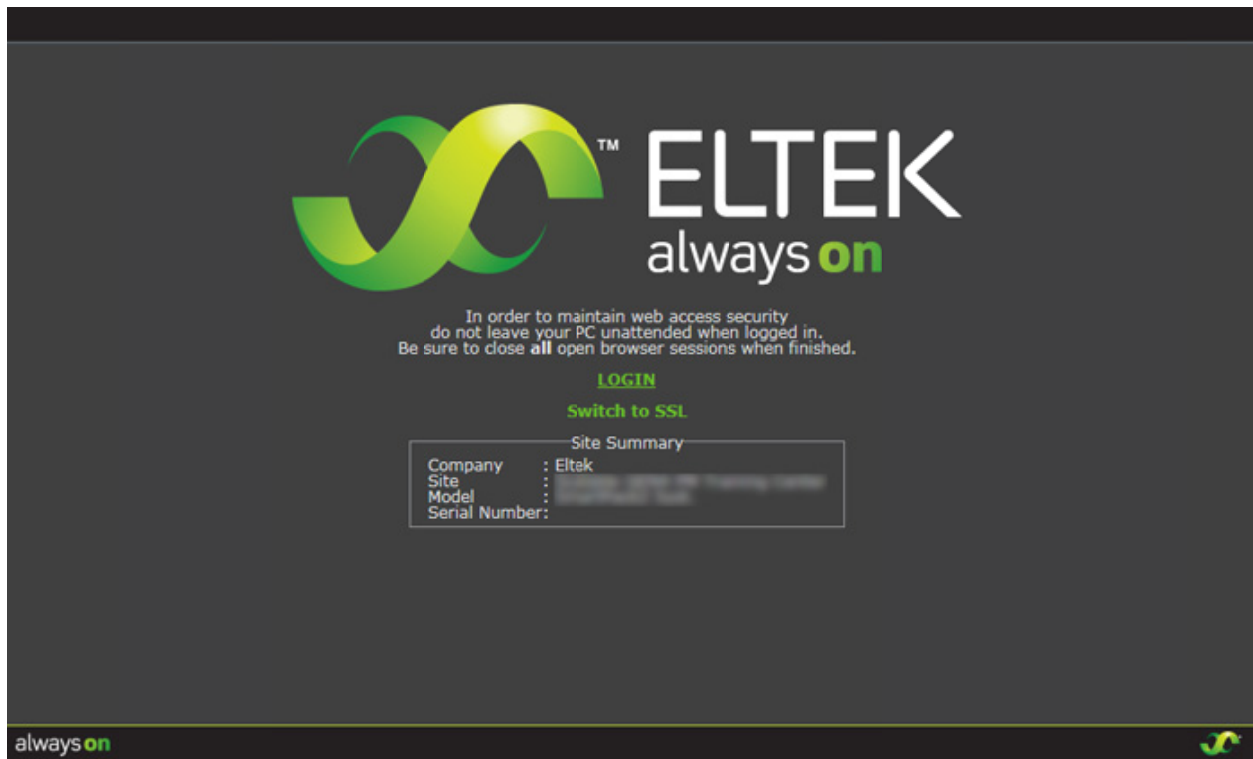


Figure 1.6 – Web Interface Login Page

If YES, then skip to step 20.

If NO, then the controller's IP address must be changed to be closer to the IP address of the computer. Continue to the next step.

7. On the computer, launch a **Command Prompt** window. This can be done in one of two ways:
 - Click the **Start** button, choose **Run**, type **cmd** in the text field, and click the **OK** button.
 - Click the **Start** button, choose **All Programs**, select **Accessories**, and then select **Command Prompt**.

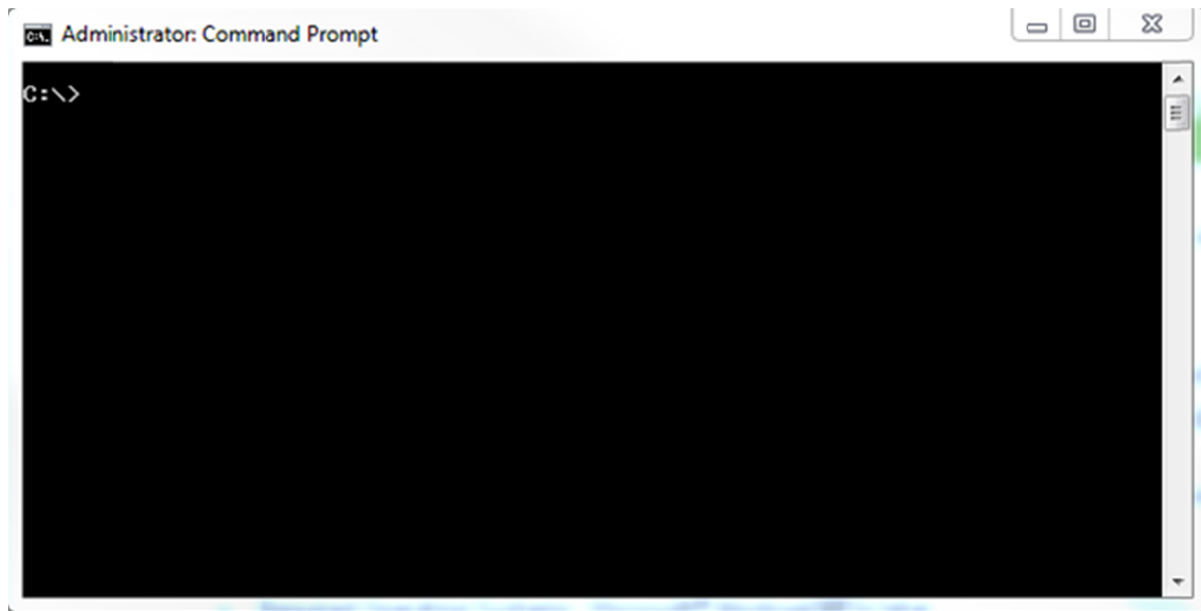


Figure 1.7 – Command Prompt Window

8. At the command prompt, type **ipconfig** and press **[ENTER]**. A series of lines appears listing all of the TCP/IP identities of the computer.
9. Find the heading **Ethernet adapter Local Area Connection** (or similar text); it may be necessary to scroll upwards in the command prompt window. Locate the **IPv4 address** line and write down or copy the address. It consists of four sets of numbers (or, octets) separated by three periods (in the form **x.x.x.x**). This address is needed in step 15.
10. Type **exit** at the prompt to close the Command Prompt window.
11. In the ENU program, select the controller and click on the **IP Config...** button. The **Ip configuration** window appears.
12. Click on the **Clear IP** button.
13. Make sure the check box under **DHCP** is **NOT** checked (empty).
14. Click in the field under **IP Address** until the box is highlighted and a cursor appears.
15. Type an address that is close to the IP address of the computer. The first three numbers (or octets) should be exactly the same to ensure that both the computer and controller are on the same network; the last number (octet) should be different by a few digits.

FOR EXAMPLE: If the computer's IPv4 address is **192.168.1.30**, then use the first three numbers (**192.168.1**) for the controller's address. For the last number, pick something close to the computer's last address number, like **35**.

The resulting IP address for the controller in this example will be **192.168.1.35**.

NOTE: If an invalid address is entered, the box shows a red outline. Omit leading zeroes.

16. Click the **Submit** button. There may be a “click” from the controller as it reboots to apply the new IP address. Allow 30 seconds for the controller to finish the reboot cycle.
17. Click the **Close** button of the **Ip configuration** window.

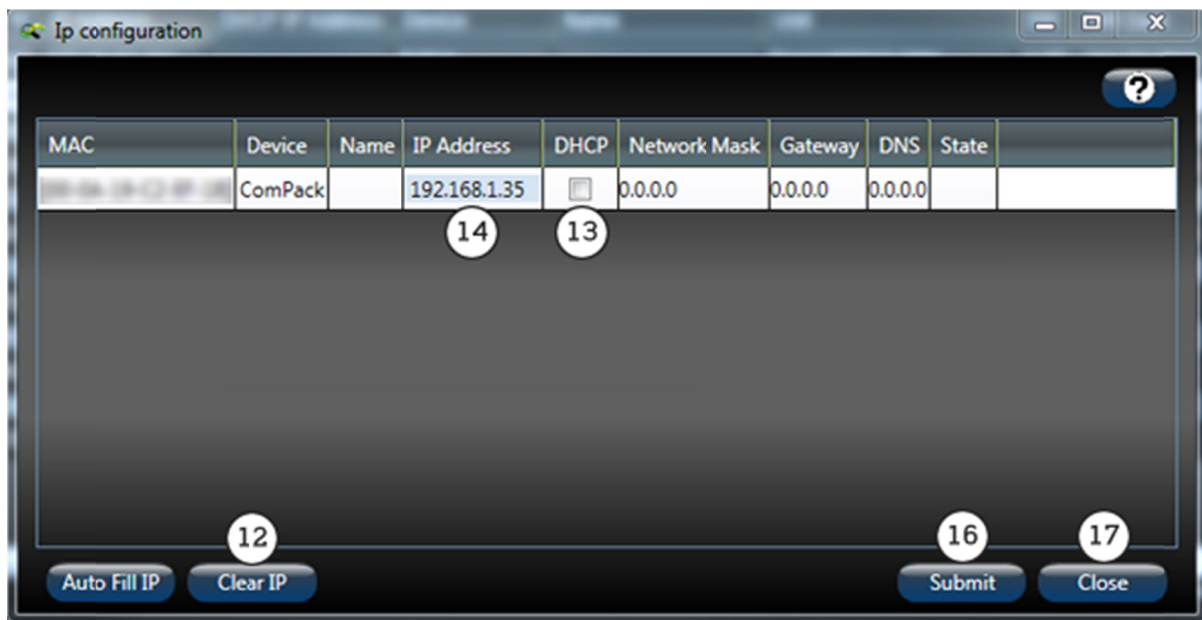


Figure 1.8 – Ip Configuration Window

18. After the controller reboots, return to the main window of the ENU program and click the search button again. The controller appears in the list with the new IP address.
19. Select the controller and click the **Web Interface** button. The login page appears (as shown in Step 6).
20. Click the **LOGIN** link.

NOTE: If a secured connection is required, use the **Switch to SSL** link instead.

21. At the prompt, type in the username and password. The defaults are:

Username: **admin**

Password: **admin**

NOTE: The username and password are case-sensitive. If these credentials do not work, then they have been changed on site. Consult site personnel and/or site documentation for the current credentials.

Controller connection is now established. Make sure to logout from the controller when you are finished.

NOTE: If the controller is to be connected to a local area network (LAN) after configuration is complete, contact the local network administrator to determine if a static IP address is to be assigned or if the IP address will be assigned dynamically (DHCP). Use the "Ip configuration" window to set the controller IP configuration according to the instructions from the network administrator. Refer to steps 11– 17 again if necessary.

RECOMMENDATION: If connecting the controller to a LAN after setup, make sure to check connectivity through the network!

2. Web Interface Overview

Upon successful login, the home screen appears in the web browser. Along the top of the page are the category buttons, controller model name, and the software and revision numbers. In the bottom right corner is the access level. (See the following figure.) These top and bottom information bars are present at all times in the web interface. The home screen is discussed in the section “Home”.

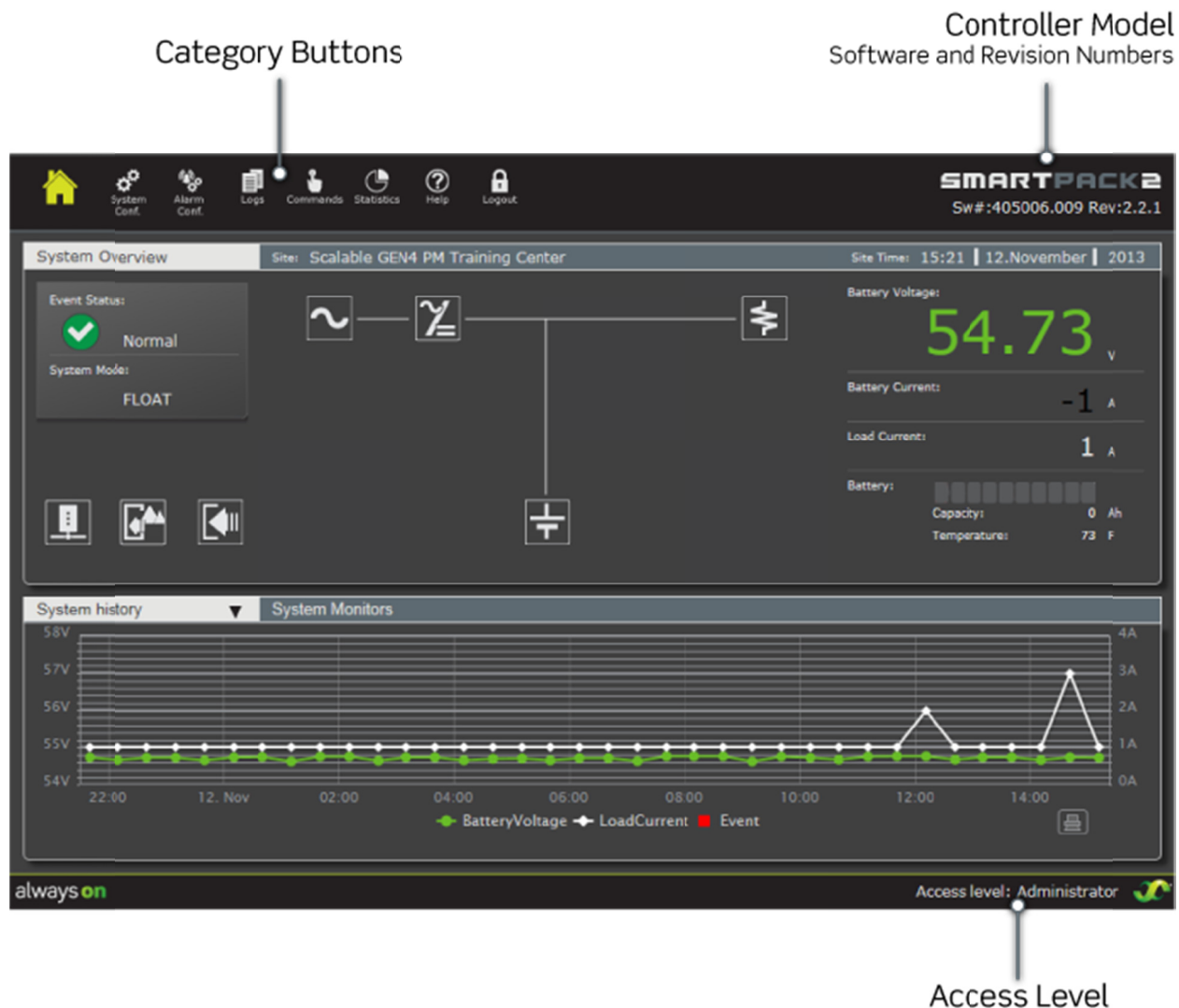


Figure 2.1 – Top and Bottom Information Bars

Alarm Icons and Monitors

Alarm icons appear throughout the web interface, indicating the status of alarm monitors. In every place where alarm icons appear (including the Event Status window and individual alarm monitors) they use the same icons to indicate status, as the following table explains:

Table 2.1 – Alarm Icon Table

Alarm Icon	Definition
	Normal (no active alarms)
	Major Alarm
	Minor Alarm
	Disabled (alarm monitoring is not enabled for this parameter or input)

Alarm Monitor Variables and Brackets

Multiple alarm monitors with the same name can appear in the Web Interface for each Controller or CAN Node device; they are distinguished from each other by sequential numerals. In this guide, such alarm monitors (with numeric designations) are written with variables. For example:

SP2 BasicInd X

ProgInput X.Y

ProgInput XX.Y

The X and Y are variables standing in for numerals. Here is what they indicate:

X = CAN Node or Controller number assigned to distinguish multiple devices of the same type that are connected to the CAN bus. Each parameter with this variable has the same value as that assigned the CAN Node or Controller that it belongs to.

X.Y = Input terminal designation, where X is the number of the CAN Node or Controller, and Y is the input terminal on the device

XX.Y = Input terminal designation for I/O Monitors, where XX is the CAN identification number of the I/O Monitor, and Y is the input terminal on the device

NOTE: Alarm monitors between *brackets* indicate that they only appear when the associated device or input is connected to the system. For example:

[Solar Charger] – only appears if solar chargers are present in the system

[DCDC CurMon X] – only appears if a Load Monitor is assigned to measure current from dc-to-dc converters

Category Buttons

The category buttons are located at the top and left of the web interface.

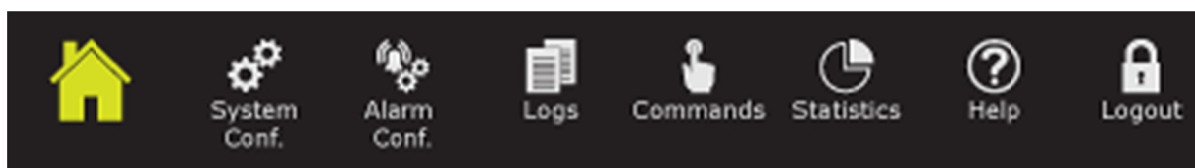


Figure 2.2 – Category Buttons (Icons)

The table below describes the pages or actions that each button represents.

Table 2.2 – Description of Category Buttons

Icon	Category	Description
	Home	This section is read-only. It is the home page, which contains the system overview window and status notifications. Rolling over and clicking the various icons and boxes provides more detailed system information.
	System Configuration	NOTE: This section is password-protected and should only be used by System Administrators Use this section to interrogate the system, make changes, or reprogram the system parameters. Administrators can program basic system parameters, network configuration, system voltages, system calibrations, generators, rectifiers, solar chargers, dc-dc converters, batteries, battery test, battery boost, and battery symmetry configurations.

Icon	Category	Description
	Alarm Configuration	NOTE: This section is password-protected and should only be used by System Administrators Use this section to configure system low-voltage disconnect (LVD) devices and system alarm tables, create/delete and enable/disable alarms and alarm groups, enable/disable system inputs and outputs, program alarms and alarm severity levels for AC mains, generator, rectifiers, solar chargers, dc-dc converters, loads, batteries, inputs/outputs, and the control system.
	Logs	This section is read-only. Use this section to view and save logs about active alarms, system events, voltage, loads, batteries, and battery test results. Logs can be saved to a computer.
	Commands	NOTE: This section is password-protected and should only be used by System Administrators Use this section to execute commands to start and stop specific functions of the power system. Commands include resetting alarms, starting/stopping battery tests, starting/stopping battery boost, resetting system configuration, and executing relay tests; loading and saving configuration files are also performed in this category
	Statistics	This section is read-only. It displays daily and monthly energy statistics for the highest, lowest, and average values.
	Help	This button launches the online help file system, which is password-protected. Please contact Eltek for current credentials.
	Logout	This button logs out of the web interface, ending the current session.

The following sections describe each category in detail.

3. Home

After successful login, the Home page of the web interface appears. It can also be accessed at any time by clicking on the **Home** button in the top menu of category buttons.



Figure 3.1 - Home Button

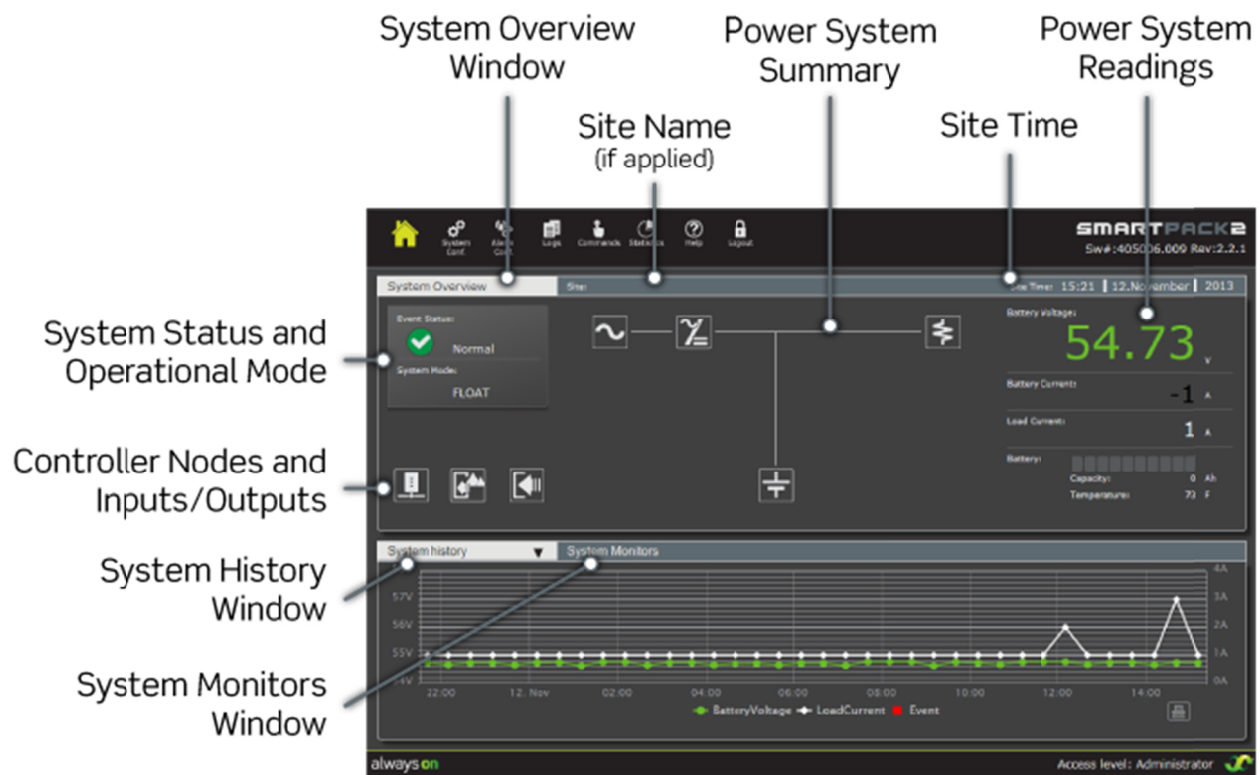


Figure 3.2 - Home Screen Panes and Features

System Overview Window

The System Overview Window provides summary and status information for critical system parameters and components. The panes and buttons in this window can be

clicked with the mouse for more information. In addition, the square buttons in this window provide a dynamic status box when rolled over with the mouse cursor.

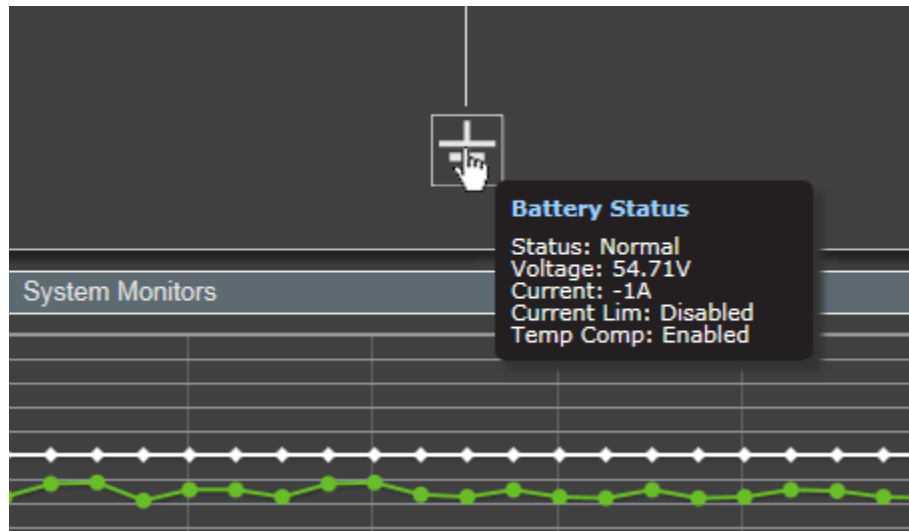


Figure 3.3 – Status Box on Mouse Roll Over (Example: Battery Status)

NOTE: The **Power System Readings** area on the far right of the System Overview Window is *not* interactive; there are no panes or buttons to click.

NOTE: The parameters listed in the summary windows (which appear when the component buttons are clicked) represent the status of alarms rather than real-time readings.

NOTE: The alarm monitors in the summary windows are configured in the **Alarm Configuration** section and show the current status and measured readings of each parameter. This means that if the description (or name) of the alarm or parameter is changed in the **Alarm Configuration** section, the description also changes in the summary windows and anywhere else it appears in the web interface.

Along the top of the System Overview window are the **Site** name (if applied) and **Site Time** (far right).

System Status and Operational Mode

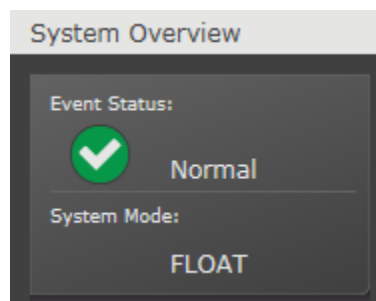
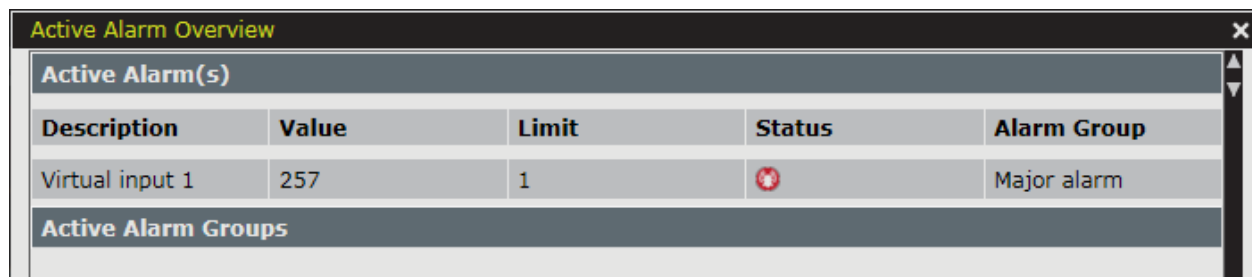


Figure 3.4 – Event Status and System Mode

- **Event Status** indicates whether there is an alarm condition or not. Possible status messages are: Normal, Major Alarm, and Minor Alarm
- **System Mode** indicates the operational mode of the controllers, especially as related to batteries. The system modes are: Float (normal operation), Test (batteries are being tested), Boost (battery voltage is being boosted), and Critical (conditions may open an LVD).

Clicking on the System Status and Operational Mode pane with the mouse brings up the **Active Alarm Overview window**. The following lists appear:

- **Active Alarm(s)** – If one or more alarms are active, then this section lists the individual alarms. If the “Active Alarms Groups” list is visible, then it is necessary to click on the “Active Alarm(s)” header bar to see the active alarms list.



The screenshot shows a window titled "Active Alarm Overview" with a close button (X) in the top right corner. Below the title bar is a header bar labeled "Active Alarm(s)". Underneath is a table with five columns: Description, Value, Limit, Status, and Alarm Group. The table contains one row: "Virtual input 1" with a value of "257", a limit of "1", a status icon (a red circle with a white exclamation mark), and an alarm group of "Major alarm". Below the table is another header bar labeled "Active Alarm Groups".

Description	Value	Limit	Status	Alarm Group
Virtual input 1	257	1		Major alarm

Figure 3.5 – Active Alarm Overview with an Active Alarm

NOTE: Most lists in the web interface are only visible one at a time. It is necessary to click on each list’s header bar to view it.

NOTE: If there are no active alarms, then the “Active Alarm(s)” list is empty.

- **Active Alarm Groups** – This section lists alarm groups. If the **Active Alarm(s)** list is visible, then it is necessary to click on the **Active Alarm Groups** header bar to see the active alarms list.

Active Alarm Overview			
Active Alarm(s)			
Active Alarm Groups			
1	Major alarm	2	Minor alarm
3	Mains alarm	4	Fuse alarm
5	Battery high	6	Battery low
7	Rectifier alarm	8	Alarm Group 08
9	Alarm Group 09	10	Alarm Group 10
11	Alarm Group 11	12	Alarm Group 12
13	Alarm Group 13	14	Alarm Group 14
15	Alarm Group 15	16	Alarm Group 16
17	Alarm Group 17	18	OutpBlocked
LVD Groups			
1	LVBD	2	LVLD1
3	LVLD2	4	
5		6	

Figure 3.6 – Active Alarm Groups List

Power System Components, Controller Nodes, and Inputs

The major portion of the System Overview Window features a diagram of the system component, controller nodes, and inputs detected by the control and monitoring system.

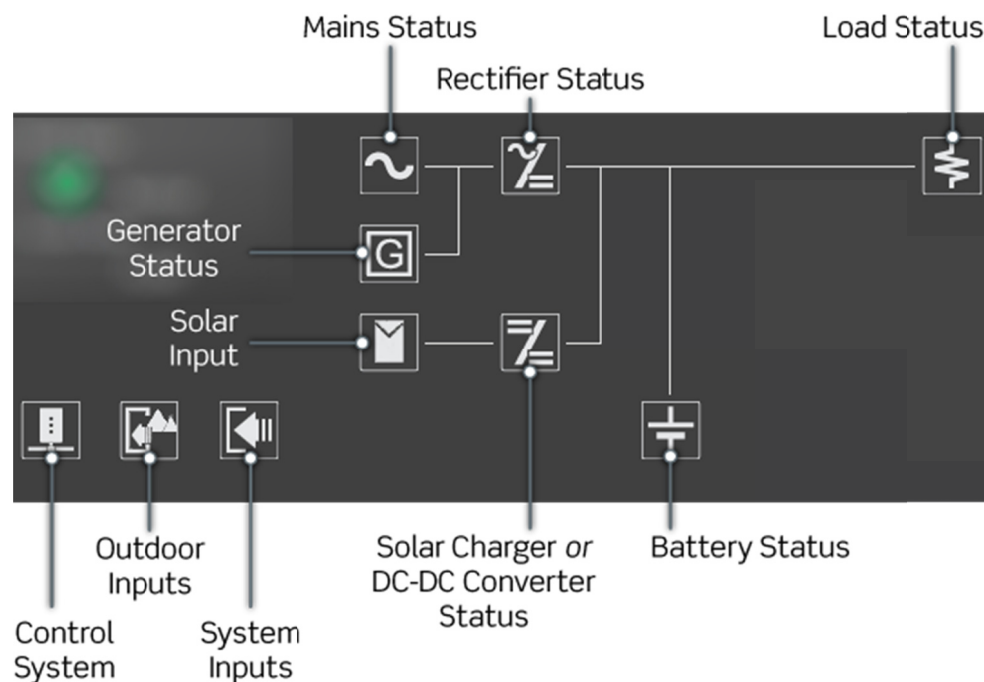


Figure 3.7 - Example of Power System Overview (System with Solar Input)

The following table explains each symbol that can appear in the System Overview diagram:

Table 3.1 - Power System Overview Symbols

Symbol	Component	Definition
	Mains Status	Status of ac input feeds ("mains")
	Generator Status	Status of ac generator
	Rectifier Status	Status of system rectifiers
	Solar Status	Status of solar output (voltage reading only)

Symbol	Component	Definition
	Wind Generator Status	Status of wind turbine output (voltage reading only)
	Fuel Cell Status	Status of fuel cell output (voltage reading only)
	DC-DC Converter / Solar Charger / Wind Charger / Fuel Cell Charger Status	Status of dc-dc converters or chargers (solar, wind, and/or fuel cell)
	Load Status	Status of system loads
	Battery Status	Status of system batteries
	Control System	Status of controllers and CAN Nodes
	Outdoor Inputs	Status of monitoring inputs from outdoor cabinets (principally fans and temperature)
	System Inputs	Status of programmable monitoring inputs like alarms and temperature

Power System Components (AC service, rectifiers, loads, batteries)

Alert symbols appear in a corner of the button if there is an alarm or notice that affects the component. This is especially useful for troubleshooting alarms.

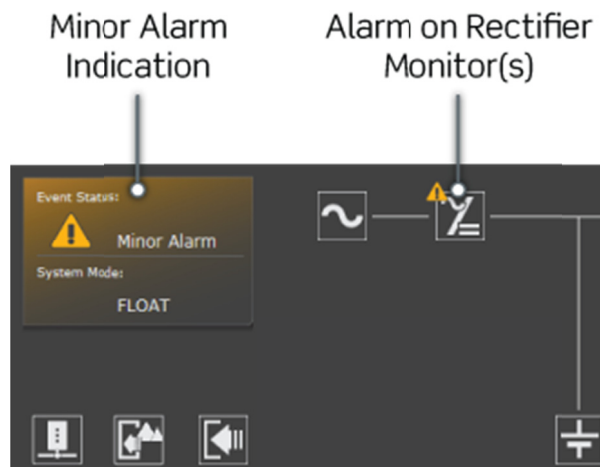


Figure 3.8 - Minor Alarm Notices

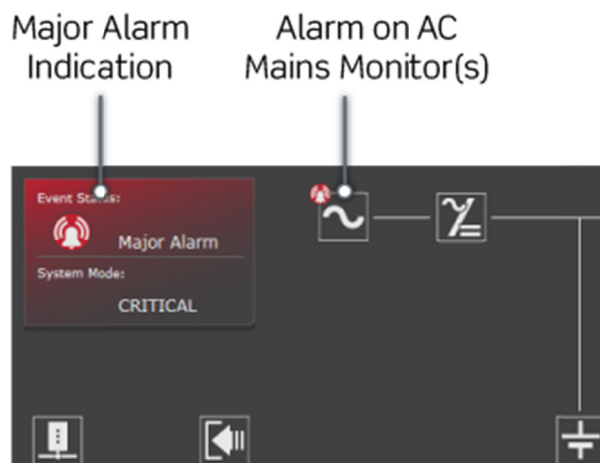


Figure 3.9 - Major Alarm Notices

Mains Status

The **Mains Status** button shows the status of the AC input feed(s).



Mains alarm monitors location:

Alarm Conf. > Power System > Mains

Clicking on the Mains button brings up the **Mains Summary** window.

The following figure shows the **Mains summary** window without groups:

Mains summary ✕				
Mains ▶	Description	Status	Value	Unit
	MainsVolt 1	✓	121	Volt AC
	MainsLow	✓	1	Unit(s)
	Number of Phases		1	
↻				

Figure 3.10 - Mains Summary Window (without groups)

- **Mains summary** – summary of generator alarm monitors
WITHOUT GROUPS – ALARM MONITORS THAT APPEAR WHEN THERE ARE NO SMARTPACK2 BASIC INDUSTRIAL CONTROLLERS PRESENT
 - **Mains** – lists of ac mains group parameters
 - **MainsVolt X** – voltage reading for the ac input feed
NOTE: The number of **MainsVolt** monitors is dependent on how many phases are specified at **System Conf. > Power System > Mains > (Mains Configuration) Number of Phases**
 - **MainsLow** – indicates a low voltage ac mains alarm
 - **Number of Phases** – The number of ac phases on the incoming ac mains lines

The following table lists the Mains alarm monitors (without groups):

Table 3.2 - Mains Alarm Monitors (without groups)

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Mains		MainsVolt X	Volts (ac)	Major High Minor High Major Low Minor Low
		MainsLow	Yes/No	Major Minor
		Number of Phases	Sum	N/A

WITH GROUPS – ALARM SECTIONS AND MONITORS THAT APPEAR WHEN ONE OR MORE SMARTPACK2 BASIC INDUSTRIAL CONTROLLERS ARE PRESENT AND CONNECTED TO RECTIFIERS

- **Mains** – lists of ac mains group parameters (Smartpack2 Basic Industrial controller only)

The following figure shows the **Mains** monitors page with groups:

Mains summary				
Mains	Description	Status	Value	Unit
Mains Group 1	MainsGrpInMajor	0	0	Unit(s)
	MainsGrpInMinor	0	0	Unit(s)
	Number of Mains Groups		1	

Figure 3.11 – Mains Summary Window (with groups)

- **MainsGrpInMajor** – Mains Group In Major, which indicates if the mains group is in Major Alarm status
- **MainsGrpInMinor** – Mains Group In Minor, which indicates if the mains group is in Minor Alarm status
- **Number of Mains Groups** – the number of ac mains groups present (Smartpack2 Basic Industrial controller only)
- **Mains Groups** – lists of voltage parameter readings per ac mains group (Smartpack2 Basic Industrial controller only)

The following figure shows the **Mains Group** monitors page:

Mains summary				
Mains	Description	Status	Value	Unit
Mains Group 1	MainsVolt 1.1	482	482	Volt AC
	MainsVolt 1.2	0	0	Volt AC
	MainsVolt 1.3	0	0	Volt AC
	MainsLow 1	0	0	Unit(s)
	Number of Phases		3	

Figure 3.12 – Mains Groups List

- **MainsVolt X.Y** – Voltage reading for each ac input feed and line.
NOTE: The number of **MainsVolt** monitors is dependent on how many phases are specified at **System Conf. > Power System > Mains > (Mains Configuration) Number of Phases**
- **MainsLow X** – monitor for defining major and minor alarms for low ac input (mains) voltage (from **MainsVolt X.Y**)
- **Number of Phases** – The number of ac phases on the incoming mains lines

The following table lists the Mains alarm monitors (with groups):

Table 3.3 - Mains Alarm Monitors (with groups)

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Mains Summary		MainsGrpInMajor	Yes/No	Major Minor
		MainsGrpInMinor	Yes/No	Major Minor
		Number of Mains Groups	Sum	N/A
Mains Groups	Mains Group X	MainsVolt X.Y	Volts (ac)	Major High Minor High Major Low Minor Low
		MainsLow X	Yes/No	Major Minor
		Number of Phases	Sum	N/A

Generator Status

The **Generator Status** button shows the status of the generator(s), if applicable.



Generator alarm monitors location:

Alarm Conf. > Power System > Generator

Clicking on the **Generator** button brings up the **Generator Summary** window.

The following figure shows the **Generator** monitors page:

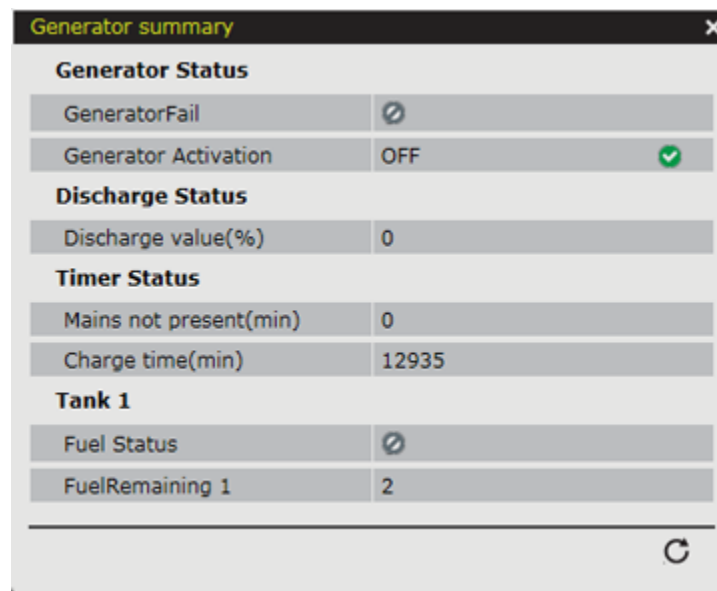


Figure 3.13 – Generator Alarm Summary

- **Generator summary** – summary of generator alarm monitors
 - **Generator Status** – status of generator alarms
 - **GeneratorFail** – monitors ac input when the controller sends a **Generator Activation** signal; this monitor sends an alarm if the **Generator Activation** signal is ON and there is no ac input, indicating that the generator is not delivering ac input power to the system.
 - **Generator Activation** – indicates whether the signal to activate the generator is ON or OFF.
 - **Discharge Status** – status of battery discharge
 - **Discharge value (%)** – estimated battery discharge percentage based on the last measured battery cycle. A depth-of-discharge (DoD)

percentage value can be set as one of the conditions to start the generator.

System Conf. > Power System > Generator > Capacity

- **Timer Status** – alarm monitors for the generator timer
 - **Mains not present** – time (in minutes) that should elapse after an ac mains outage before the generator is signaled by the controller to turn on.
 - **Charge time** – time (in minutes) that the generator ran during the last measured battery cycle
- **Tank X** – fuel tank parameters (maximum of two tanks)
 - **Fuel Status** – indicates if the remaining fuel has dropped below a user-defined threshold.

Alarm Conf. > Power System > Generator > FuelRemaining X

NOTE: **Fuel Status** is configured under the **FuelRemaining X** alarm monitor on the **Alarm Configuration** page. The **FuelRemaining X** line of the **Generator Status** window shows the amount of fuel measured.

- **FuelRemaining X** – real-time measurement of the amount of fuel remaining in the generator fuel tank (units are user-defined)

The following table lists the Generator alarm monitors:

Table 3.4 – Generator Alarm Monitors

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Generator Status		GeneratorFail	N/A	Configurable
		Generator Activation	ON/OFF	N/A
Discharge Status		Discharge value (%)	Percentage	N/A
Timer Status		Mains not present (min)	Minutes	N/A
		Charge time (min)	Minutes	N/A

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Tank X		Fuel Status	(Liquid Volume Units – User Defined)	Major High Minor High Major Low Minor Low
		FuelRemaining X	(Liquid Volume Units – User Defined)	N/A

Rectifier Status

The **Rectifier Status** button shows the status of the rectifiers and total output current.



Rectifiers alarm monitors location:

Alarm Conf. > Power System > Rectifiers

Clicking on the **Rectifier** button brings up the **Rectifier Summary** window.

The following figure shows the **Rectifier – Summary** page (without groups):

Rectifier summary				
Rectifier	Description	Status	Value	Unit
Summary ▶	RectifierCurrent	⊗	1	Amp
Inventory	RectifierError	✓	0	Unit(s)
	RectLowMains	⊗	0	Unit(s)
	RectCommError	✓	0	Unit(s)
	Rect.Capacity	⊗	2	%
	RectCurrShareErr	⊗	0	%
	RectifierTemp	⊗	32	Celsius
	Rectifiers Installed		2	

Figure 3.14 – Rectifier Summary (without groups)

- **Rectifier summary** – summary of rectifier alarm parameters

WITHOUT GROUPS – alarm monitors that appear when there are no Smartpack2 Basic Industrial controllers present

The following figure shows the **Rectifier – Inventory** page (without groups):

ID	Description	Serial	Status	Value	Unit
1	FLATPACK2 48/2000 HE	122471155509	OK	0.5	Amp
2	FLATPACK2 48/2000 HE	131871102391	OK	0.0	Amp

Figure 3.15 – Rectifier Inventory (without groups)

- **RectifierCurrent** – indicates if the sum of all rectifier output current exceeds a predetermined current value
- **RectifierError** – indicates if an alarm is present in a rectifier; if so, then the number of affected rectifiers is indicated under the **Value** column
- **RectLowMains** – indicates if there are any rectifiers experiencing low ac input
- **RectCommError** – indicates if there is a communication error (or failure) with one or more rectifiers; if so, then the number of affected rectifiers is indicated under the **Value** column
- **Rect.Capacity** – indicates whether or not rectifiers are operating within a specified percentage of their output capacity
- **RectCurrShareErr** – indicates if rectifiers are deviating beyond a defined percentage from the mean rectifier output current
- **RectifierTemp** – indicates if rectifiers are operating below a defined temperature value
- **Rectifiers Installed** – indicates how many rectifiers are installed

The following table lists the Rectifier alarm monitors (without groups):

Table 3.5 – Rectifier Alarm Monitors (without groups)

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Rectifier Group X	Summary	RectifierCurrent	Amps	Major Minor
		RectifierError	Sum	Major Minor
		RectLowMains	Sum	Major Minor
		RectCommErr	Sum	Major Minor
		Rect.Capacity	Percentage	Major Minor
		RectCurrShareErr	Percentage	Major Minor
		Rectifier Temp	Degrees	Major High Minor High Minor Low Major Low
		Rectifiers Installed	Sum	N/A
	Rectifier Inventory	(List of Rectifiers)	N/A	N/A

WITH GROUPS – alarm sections and monitors that appear when one or more Smartpack2 Basic Industrial controllers are present and connected to rectifiers

- **Rectifier** – list of overall rectifier alarm parameters

The following figure shows the **Rectifier** monitors page (with groups):

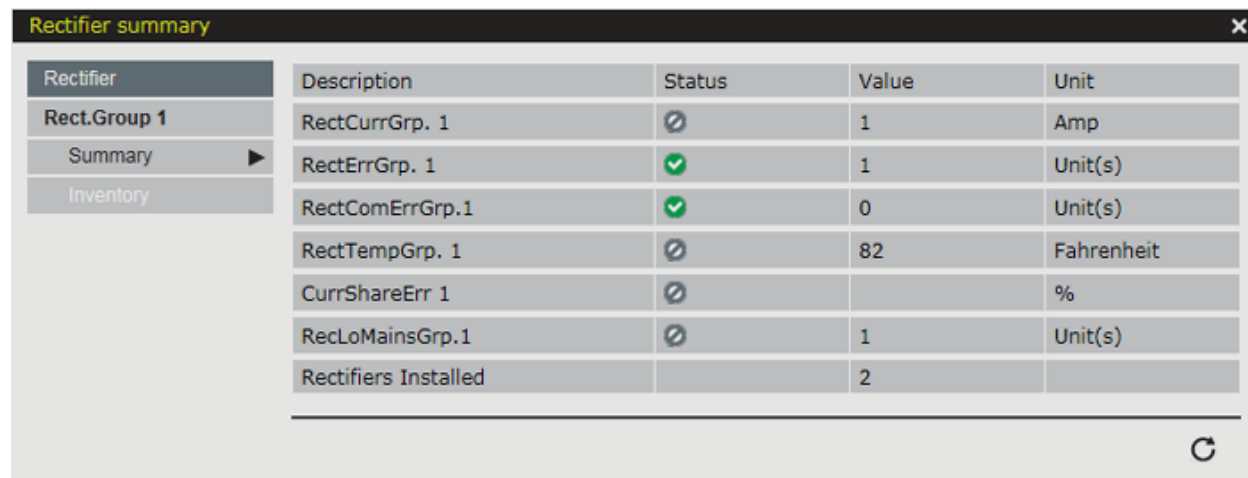
Rectifier summary ✕				
Rectifier ▶	Description	Status	Value	Unit
Rect. Group 1	TotRectCurrent	✓	1	Amp
	RectGrpErr	✓	0	Unit(s)
	RectGroupInMinor	✓	1	Unit(s)
	RectGrpCommErr	✓	0	Unit(s)
	RectCurrShareErr	⊗		%
	TotRectCapacity	⊗	1	%
	RectifierTemp	⊗	82	Fahrenheit
	Rectifiers Groups Installed		1	
	Total Number of Rectifiers		2	

Figure 3.16 – Rectifier Summary (with groups)

- **TotRectCurrent** – Total rectifier current, which indicates if the sum of all rectifier output current exceeds a predetermined current value.
- **RectGrpErr** – Rectifier Group Error, which indicates if an alarm is present in a rectifier group; if so, then the number of affected rectifiers is indicated under the **Value** column.
- **RectGroupInMinor** – Indicates if a rectifier group has a minor alarm; if so, then the number of affected rectifiers is indicated under the “Value” column.
- **RectGrpCommErr** – Rectifier Group Communication Error, indicates if there is a communication error (or failure) within a rectifier group; if so, then the number of affected rectifiers is indicated under the **Value** column.
- **RectCurrShareErr** – Rectifier Current Share Error, indicates if rectifiers are deviating beyond a defined percentage from the mean rectifier output current.
- **TotRectCapacity** – Total Rectifier Capacity, indicates if rectifiers are operating within a specified percentage of their output capacity.
- **RectifierTemp** – Rectifier Temperature, indicates if rectifiers are operating below a defined temperature value.
- **Rectifier Groups Installed** – Indicates the total number of Smartpack2 Basic Industrial controllers with rectifiers connected.

- **Total Number of Rectifiers** – Indicates the total number of rectifiers installed in the power system and communicating with the controller.
- **Rect.Group X** – details for each rectifier group

The following figure shows the **Rectifier Group - Summary** monitors page (with groups):



Rectifier	Description	Status	Value	Unit
Rect.Group 1	RectCurrGrp. 1	⊗	1	Amp
Summary ▶	RectErrGrp. 1	✓	1	Unit(s)
Inventory	RectComErrGrp.1	✓	0	Unit(s)
	RectTempGrp. 1	⊗	82	Fahrenheit
	CurrShareErr 1	⊗		%
	RecLoMainsGrp.1	⊗	1	Unit(s)
	Rectifiers Installed		2	

Figure 3.17 – Rectifier Group Summary

- **Summary** – list of rectifier parameters for the rectifier group:
 - **RectCurrGrp. X** – Rectifier Current Group, indicates if the total rectifier output of the group is below a defined current value.
 - **RectErrGrp. X** – Rectifier Error Group, indicates if there are any rectifier alarms in the group.
 - **RectComErrGrp. X** – Rectifier Communication Error Group, indicates if there are any rectifiers in the group that have stopped communicating with the controller.
 - **RectTempGrp. X** – Rectifier Temperature Group, indicates if rectifiers are operating below a defined temperature value.
 - **CurrShareErr X** – Current Share Error, indicates if rectifiers in the group are deviating beyond a defined percentage from the mean rectifier output current.
 - **RecLoMainsGrp. X** – Rectifier Low Mains Group, indicates if there are any rectifiers experiencing low ac input.
 - **Rectifier Installed in Group** – Indicates how many rectifiers are in the rectifier group.

- **Rectifier Inventory** – inventory list of rectifiers assigned to the rectifier group.
The following figure shows the **Rectifier Group - Inventory** monitors page (with groups):

ID	Description	Serial	Status	Value	Unit
1	Power Pack	092871116649	✓	0.7	Amp
2	Power Pack	092571112553	✓	0.0	Amp

Figure 3.18 – Rectifier Group Inventory

NOTE: The button “Start Reading Data” must be clicked in order to populate the list.

The following table lists the Rectifier alarm monitors (with groups):

Table 3.6 - Rectifier Alarm Monitors (with groups)

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Rectifier		TotRectCurrent	Amps	Major Minor
		RectGrpErr	Sum	Major Minor
		RectGroupInMinor	Sum	Major Minor
		RectGrpCommErr	Sum	Major Minor

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
		TotRectCapacity	Percentage	Major Minor
		RectifierTemp	Degrees	Major High Minor High Major Low Minor Low
		Rectifier Groups Installed	Sum	N/A
		Total Number of Rectifiers	Sum	N/A
Rectifier Group X	Summary	RectCurrGrp. X	Amps	Major Minor
		RectErrGrp. X	Sum	Major Minor
		RecLoMainsGrp.X	Sum	Major Minor
		RectComErrGrp.X	Sum	Major Minor
		CurrShareErr X	Percentage	Major Minor
		RectTempGrp. X	Degrees	Major High Minor High Minor Low Major Low
		Rectifiers Installed in Group	Sum	N/A
	Rectifier Inventory	(List of Rectifiers)	N/A	N/A

Solar Status

The **Solar Status** button shows the status of solar array output, which shows voltage on mouse rollover only; there is no summary window for this button.



NOTE: Solar status only appears if solar chargers and/or solar monitoring inputs are connected to the power system.

Solar charger alarm monitors location:

Alarm Conf. > Power System > Solar Charger

Clicking on the connected **Converter** button brings up the **Solar Charger Summary** window.



The following figure shows the **Solar Charger - Summary** monitors page:

Solar Charger summary				
Solar Charger	Description	Status	Value	Unit
Summary ▶	SolarCurrent	⚙	0	Amp
Inventory	SolarChargerErr	✓	0	Unit(s)
Solar CurMon 1	SolarCommErr	✓	0	Unit(s)
Solar FlexMon 1	Converters Installed		0	

Figure 3.19 – Solar Charger Summary Window

- **Solar Charger Status** – status of solar chargers
 - **Summary** – list of solar monitors for solar charger input
 - **Solar Current** – indicates if there is a high amount of solar current
 - **SolarChargerErr** – indicates if there is an alarm on any solar charger module
 - **SolarCommErr** – indicates if there is a communication error with one or more solar chargers
 - **Solar Chargers Installed** – total of solar chargers installed in the power system

- **Inventory** – lists the solar chargers and information about each module
- **Solar CurMon X** – see section Load Monitors
- **Solar FlexMon X** – see section Flexi Monitors

The following table lists the Solar Charger alarm monitors:

Table 3.7 – Solar Charger Alarm Monitors

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Solar Charger	Summary	SolarCurrent	Amps	Major Minor
		SolarChargerErr	Sum	Major Minor
		SolarCommErr	Sum	Major Minor
		Solar Chargers Installed	Sum	N/A
	Inventory	(List of Solar Chargers)	N/A	N/A

Wind Status

The **Wind Status** button shows the status of wind turbine output, which shows voltage on mouse rollover only; there is no summary window for this button.



NOTE: Wind status only appears if wind chargers and/or wind monitoring inputs are connected to the power system.

Wind charger alarm monitors location:

Alarm Conf. > Power System > Wind Charger

Clicking on the connected **Converter** button brings up the **Wind Charger Summary** window.



The following figure shows the **Wind Charger – Summary** monitors page:

Wind Charger summary				
Wind Charger	Description	Status	Value	Unit
Summary ▶	WindCurrent	🔌	0	Amp
Inventory	WindError	✓	0	Unit(s)
Wind CurMon 1	WindCommError	✓	0	Unit(s)
Wind FlexMon 1	Converters Installed		0	

Figure 3.20 – Wind Charger Summary Window

- **Wind Charger Status** – status of wind chargers
 - **Wind Charger** – menu for wind charger monitors
 - **Summary** – sub-menu for wind charger input
 - **WindCurrent** – alarm monitor for current from the wind chargers
 - **WindError** – alarm monitor for detecting the number of wind chargers experiencing an error
 - **WindCommError** – alarm monitor for detecting the number of wind chargers experiencing communication errors
 - **Converters Installed** – count of the number of wind chargers installed
 - **Inventory** – lists the wind chargers and information about each module
 - **Wind CurMon X** – see section Load Monitors
 - **Wind FlexMon X** – see section Flexi Monitors

The following table lists the Wind Charger alarm monitors:

Table 3.8 - Wind Charger Alarm Monitors

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Wind Charger	Summary	WindCurrent	Amps	Major Minor
		WindError	Sum	Major Minor
		WindCommError	Sum	Major Minor
		Converters Installed	Sum	N/A
	Inventory	(List)	N/A	N/A

Fuel Cell Status

The **Fuel Status** button shows the status of hydrogen fuel cells output, which shows voltage on mouse rollover only; there is no summary window for this button.



Fuel cell charger alarm monitors location:

Alarm Conf. > Power System > FuelCell Charger

NOTE: Fuel Cell status only appears if fuel cell chargers and/or monitoring inputs are connected to the power system.

Clicking on the connected **Converter** button brings up the **Fuel Cell Charger Summary** window.



The following figure shows the **Fuel Cell Charger – Summary** monitors page:

Fuel Cell Charger summary				
FuelCell Charger	Description	Status	Value	Unit
Summary ▶	FuelCellCurrent	⊗	0	Amp
Inventory	FuelCellError	✓	0	Unit(s)
FuelC CurMon 1	FuelCellCommErr	✓	0	Unit(s)
FuelC FlexMon 1	FuelCellCapacity	⊗	0	%
	Converters Installed		0	

Figure 3.21 – Fuel Cell Charger Summary Window

- **Fuel Cell Charger Summary** – status window for fuel cell charger alarms
 - **FuelCell Charger** – menu for fuel cell charger alarm monitors
 - **Summary** – sub-menu for fuel cell charger input
 - **FuelCellCurrent** – alarm monitor for current from fuel cell chargers
 - **FuelCellError** – alarm monitor for detecting the number of fuel cell chargers experiencing errors
 - **FuelCellCommErr** – alarm monitor for detecting the number of fuel cell chargers experiencing communication errors
 - **FuelCellCapacity** – alarm monitor for maximum capacity of fuel cell chargers
 - **Converters Installed** – count of the number of fuel cell chargers installed
 - **Inventory** – lists the fuel cell chargers and information about each module
 - **FuelC CurMon X** – see section Load Monitors
 - **FuelC FlexMon X** – see section Flexi Monitors

The following table lists the Fuel Cell Charger alarm monitors:

Table 3.9 – Fuel Cell Alarm Monitors

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
FuelCell Converter	Summary	FuelCellCurrent	Amps	Major Minor
		FuelCellError	Sum	Major Minor
		FuelCellCommErr	Sum	Major Minor
		FuelCellCapacity	Percentage	Major Minor
		Converters Installed	Sum	N/A
	Inventory	(List)	N/A	N/A

DC-to-DC Converter Status

The **DCDC Converter** button shows information on dc-to-dc converters.



NOTE: The dc-to-dc converter button appears on the right side of the **Power System Overview** diagram since dc-to-dc converters feed loads that are separate from the loads fed by rectifiers.

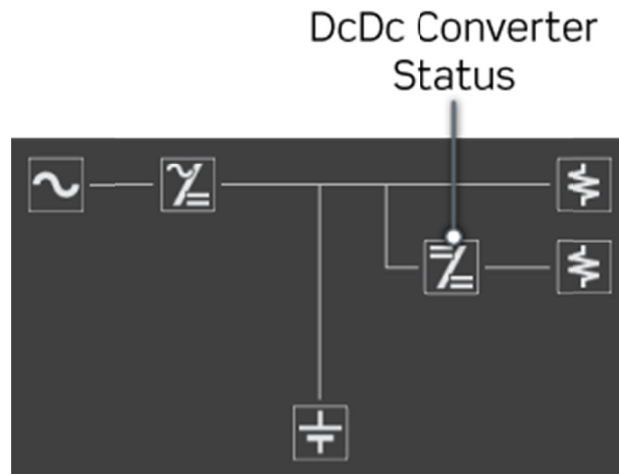


Figure 3.22 - Location of Dc-to-Dc Converter Status Button

Dc-to-dc converter alarm monitors location:

Alarm Conf. > Power System > DcDc Converter

Clicking on the **DCDC Converter** button brings up the **DCDC Converter Summary** window.

- **DCDC Converter Summary** – status window for dc-to-dc converter alarms

- **DcDc Converter** – menu for dc-to-dc converter alarms

- **Summary** – sub-menu for dc-to-dc converter alarm monitors

The following figure shows the **DCDC Converter – Summary** monitors page:

DCDC Converter summary				
DcDc Converter	Description	Status	Value	Unit
Summary	DcDcCurrent	⊗	0	Amp
Inventory	DcDcError	✓	0	Unit(s)
DCDC CurMon 1	DcDcCommError	✓	0	Unit(s)
DCDC FlexMon 1	DcDcCapacity	⊗	0	%
	DcDcTemp	⊗	25	Celsius
	Converters Installed		2	

Figure 3.23 – Dc-to-dc Converter Summary Window

- **DcDcCurrent** – alarm monitor for current from dc-to-dc converters
 - **DcDcError** – alarm monitor for detecting the number of dc-to-dc converters experiencing an error
 - **DcDcCommError** – alarm monitor for detecting the number dc-to-dc converters experiencing communication errors
 - **DcDcCapacity** – alarm monitor for the maximum capacity of the dc-to-dc converters
 - **DcDcTemp** – alarm monitor for high and low temperature thresholds for the dc-to-dc converters
 - **Converters Installed** – count of the number of dc-to-dc converters installed
 - **Inventory** – lists the dc-to-dc converters and information about each module
- The following figure shows the **DCDC Converter – Inventory** monitors page:

The screenshot shows a software window titled "DCDC Converter summary". On the left is a sidebar with three menu items: "DcDc Converter", "Summary", and "Inventory". The "Inventory" item is selected and highlighted. On the right, there is a "Start Reading Data" button and a table with the following data:

ID	Description	Serial	Status	Value	Unit
1	FLATPACK2 DC/DC 18-7	131271135444	✓	0.0	Amp
2	FLATPACK2 DC/DC 18-7	131271135535	✓	0.0	Amp

Figure 3.24 - Dc-to-dc Converter Inventory

- **DCDC CurMon X** – see section Load Monitors
- **DCDC FlexMon X** – see section Flexi Monitors

The following table lists the Dc-to-dc Converter alarm monitors:

Table 3.10 - Dc-to-dc Converter Alarm Monitors

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
DcDc Converter	Summary	DcDcCurrent	Amps	Major Minor
		DcDcError	Sum	Major Minor
		DcDcCommErr	Sum	Major Minor
		DcDcCapacity	Percentage	Major Minor
		DcDcTemp	Degrees	Major Minor

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
		Converters Installed	Sum	N/A
	Inventory	(List)	N/A	N/A

Load Status

The **Load Status** button(s) show the status of load alarms, load current, fuses and/or circuit breakers, and low-voltage disconnects (LVDs).



Load alarm monitors location:

Alarm Conf. > Power System > Load

Clicking on the **Load Status** button brings up the **Load Summary** window.

The following figure shows the **Load** monitors page:

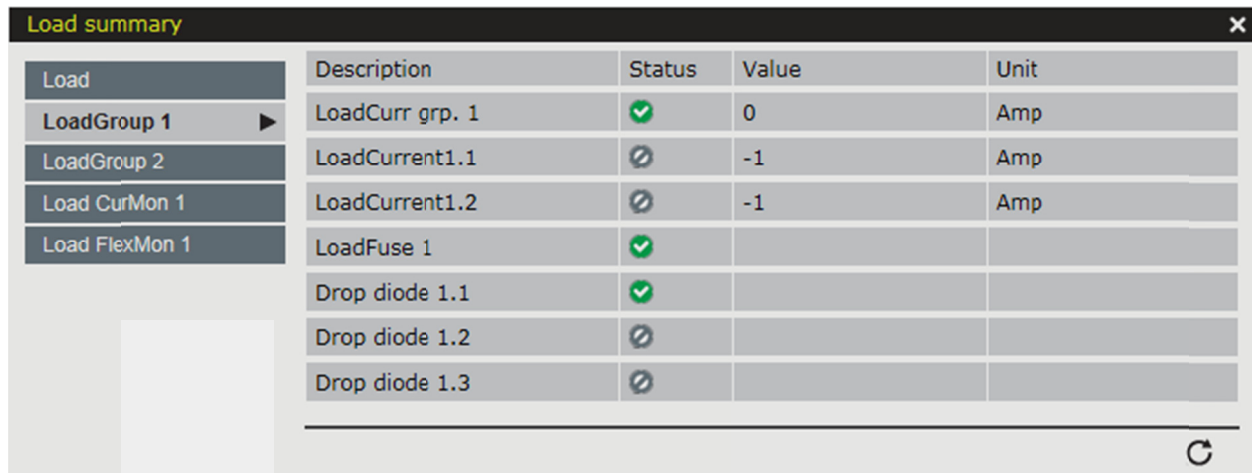
Load summary				
Load	Description	Status	Value	Unit
LoadGroup 1	LoadCurrent	⊗	3	Amp
LoadGroup 2	Number of Load Groups		2	
Load CurMon 1	Fuse Status	✓		
Load FlexMon 1	LVLVD Status	⊗		

Figure 3.25 – Load Summary Window

- **Load Summary** – status window of load alarms
 - **Load** – List of load alarm monitors
 - **LoadCurrent** – Indicates whether load current is below the current level defined in the Alarm Configuration.
 - **Number of Load Groups** – Indicates the number of dc load groups monitored by the power system, intended to represent the number of controllers monitoring distinct groups (or bays) of loads. The number of load groups must be set manually under **System Configuration** (**System Conf. > Power System > Load > Configuration**)

- **Fuse Status** – Indicates the status of the load fuse(s) and/or circuit breaker(s) in the dc load group circuit(s)
- **LVLD Status** – Indicates the status of a load LVD, if one is installed or active
- **LoadGroup X** – Load monitor group for Eltek controllers (one group per controller)

The following figure shows the **Load Group** monitors page:



The screenshot shows a window titled "Load summary" with a close button (X) in the top right corner. On the left is a sidebar with a tree view containing "Load", "LoadGroup 1", "LoadGroup 2", "Load CurMon 1", and "Load FlexMon 1". "LoadGroup 1" is selected, indicated by a right-pointing arrow. The main area displays a table with the following data:

Description	Status	Value	Unit
LoadCurr grp. 1	✓	0	Amp
LoadCurrent1.1	⊗	-1	Amp
LoadCurrent1.2	⊗	-1	Amp
LoadFuse 1	✓		
Drop diode 1.1	✓		
Drop diode 1.2	⊗		
Drop diode 1.3	⊗		

At the bottom right of the table area is a circular refresh icon (C).

Figure 3.26 – Load Group Summary Window

- **LoadCurr grp. X** – Load Current Group, indicates if the total load current drawn by the load group is below a defined current value.
- **LoadCurrentX.Y** – Indicates if the load current through a specific monitoring input is below a defined current value.
- **LoadFuse X** – Indicates whether the fuse or circuit breaker for the load group is open.
- **Drop diode X.Y** – Indicates whether a drop diode is functioning properly (dropping voltage to the required level)
- **LoadPrimary X** – see section Load Monitors
- **Load CurMon X** – see section Load Monitors
- **Load FlexiMon X** – see section Flexi Monitors

The following table lists the Load alarm monitors:

Table 3.11 - Load Alarm Monitors

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Load Summary		LoadCurrent	Amp	Major Minor
		Number of Load Groups	Sum	N/A
		Fuse Status	Yes/No	N/A
		LVL D Status	Yes/No	N/A
Load Group X		LoadCurrGrp. X	Amp	Major High Minor High Minor Low Major Low
		LoadCurrent X.Y	Amp	Major High Minor High Error
		LoadFuse X	Yes/No	Configurable
		Drop diode X.Y	Yes/No	Minor High

Battery Status

The **Battery Status** button shows the status of battery alarms, battery voltage, battery current, and whether current limit and temperature compensation are enabled or disabled.



Battery alarm monitors location:

Alarm Conf. > Power System > Battery

Clicking on the **Battery Status** button brings up the **Battery Summary** window.

The following figure shows the **Battery** monitors page:

Description	Status	Value	Unit
BatteryVoltage	✓	-53.94	Volt DC
BatteryCurrent	✓	0	Amp
BatteryTemp	⊗		Celsius
BatteryLifeTime	⊗	0	Day(s)
LVBD	⊗		
Fuse Status	⊗		
Symmetry Status	⊗		
DeltaStringCurr	⊗	0	%
Note: The capacity values below are estimated values			
BatteryQuality	⊗		%
BatteryTotCap	⊗	180	Δh

Figure 3.27 – Battery Summary Window

- **Battery Summary** – status window of battery alarms
 - **Battery** – list of battery monitors
 - **BatteryVoltage** – Indicates if battery voltage is within acceptable parameters
 - **BatteryCurrent** – Indicates if battery current monitored is within acceptable parameters
 - **BatteryTemp** – Indicates if battery temperature is within acceptable parameters
 - **BatteryLifeTime** – Indicates whether the batteries have exceeded the maximum number of days (user-defined) for a normal life cycle. The number of days is dependent on the batteries operating within the acceptable battery temperature range.
 - **LVBD** – Indicates the status of the system's low-voltage battery disconnect (LVBD) contactor
 - **Fuse Status** – Indicates the status of battery fuses or circuit breakers
 - **Symmetry Status** – Indicates the status of battery symmetry inputs, whether or not there is a significant voltage deviation

- **DeltaStringCurr** – Delta String Current, which indicates that a battery string measurement has deviated from the average of all battery string measurements by a user-specified percentage.

NOTE: The following parameters estimated using calculations based on the Battery Table and battery test results.

- **BatteryQuality** – Battery Quality, which indicates what percentage of the battery’s original capacity remains for charging.
 - **BatteryTotCap** – Battery Total Capacity, indicates whether the batteries have exceeded total capacity (user-defined, amp-hours).
 - **BatteryRemCap** – Battery Remaining Capacity, indicates whether the batteries have exceeded remaining capacity (user-defined, amp-hours).
 - **BatteryUsedCap** – Battery Used Capacity, indicates whether the batteries have exceeded a user-defined amount of charge (amp-hours).
 - **BatteryTimeLeft** – Indicates if the estimated time remaining for battery discharge has dropped below a user-defined threshold (minutes).
 - **Ah Charged** – Indicates if the batteries have been charged beyond a user-defined threshold (amp-hours).
 - **Ah Discharged** – Indicates if the batteries have discharged below a user-defined threshold (amp-hours).
 - **BadTestResults** – Indicates how many battery tests determined that the batteries are “bad”, where **End Voltage** is reached before the time allotted for the Simple Test (a type of battery discharge test)
- **BatteryBank X** – A battery bank consists of two or more battery strings connected in parallel, with each string having the voltage required to support the power system (e.g., 48V or 24V). The number of banks must be manually set under **Battery Configuration (System Conf. > Power System > Battery > Configuration)**.
 - **Voltage**
The following figure shows the **Battery Bank - Voltage** monitors page:

Battery	Description	Status	Value	Unit
BatteryBank 1	BattVolt bank 1		54.73	Volt DC
Voltage				
Currents				
Fuses				
Temperatures				
Symmetry				

Figure 3.28 – Battery Bank Voltage Summary

- **BattVolt bank X** – Indicates the status of the battery voltage alarm for the battery bank.

■ Currents

The following figure shows the **Battery Bank – Current** monitors page:

Battery	Description	Status	Value	Unit
BatteryBank 1	BattCurrent1.1		-2	Amp
Voltage	BattCurrent1.2		0	Amp
Currents				
Fuses				
Temperatures				
Symmetry				

Figure 3.29 – Battery Bank Currents Summary

- **BattCurrentX.Y** – Indicates the status of the battery current inputs for the battery bank, whether they exceed the user-defined high and low current parameters.

■ Fuses

The following figure shows the **Battery Bank – Fuses** monitors page:

Battery	Description	Status
BatteryBank 1	BattFuses 1	⊗
Voltage		
Currents		
Fuses ▶		
Temperatures		
Symmetry		

Figure 3.30 – Battery Bank Fuses Summary

- **BattFuses X** – Indicates the status of any fuses or circuit breakers (open or closed)
- **Temperatures**
The following figure shows the **Battery Bank – Temperatures** monitors page:

Battery	Description	Status	Value	Unit
BatteryBank 1	BatteryTemp1.1	⊗	-40	Celsius
Voltage	BatteryTemp1.2	⊗	-40	Celsius
Currents	BatteryTemp1.3	⊗	-40	Celsius
Fuses				
Temperatures ▶				
Symmetry				

Figure 3.31 – Battery Bank Temperatures Summary

- **BatteryTempX.Y** – Indicates the status of battery temperature inputs for the bank, whether any readings exceed the user-defined high and low temperature parameters.
- **Symmetry**
The following figure shows the **Battery Bank – Symmetry** monitors page:

Battery	Description	Status	Voltage	Delta	Unit
BatteryBank 1	SymmVolt 1.1	⊗	0.10		Volt DC
Voltage	SymmVolt 1.2	⊗	0.09		Volt DC
Currents					
Fuses					
Temperatures					
Symmetry ▶					

Figure 3.32 – Battery Bank Symmetry Summary

- **SymmVolt X.Y** – Indicates if the voltage deviation between the points monitored is greater than a user-defined limit (volts).
- **BattMonStr.X** – list of alarm monitors from a Battery Monitor (Eltek CAN Node) connected to the CAN bus (only appears if connected)

The following figure shows the **Battery Monitor** monitors page:

Battery summary					
Battery	Description	Status	Value	Rating	Unit
BatteryBank 1	BattMonCurr 1	⊗	-2	200	Amp
BatteryBank 2	BattMonFuse 1	⊗		0	
BattMonStr.1 ▶	BattMonTemp 1	✓	73		Fahrenheit
BattMonStr.2	Description	Status	Delta	Value	Unit
Batt FlexMon 1	BattMonSym1.1	⊗		3.46	Volt DC
	BattMonSym1.2	⊗		13.31	Volt DC
	BattMonSym1.3	⊗		13.93	Volt DC
	BattMonSym1.4	⊗		13.62	Volt DC

Figure 3.33 – Battery Monitor Summary Window

- **BattMonCurr X** – Battery Monitor Current, indicates if the battery shunt being monitored exceeds a predefined limit (amps).
- **BattMonTemp X** – Battery Monitor Temperature, indicates if the Battery Monitor's internal temperature sensor exceeds predefined high and low thresholds.
- **BattMonFuse X** – Battery Monitor Fuse, indicates if there is an alarm on a fuse or circuit breaker that is connected to the Battery Monitor

- **BattMonSymX.Y** – Battery Monitor Symmetry input, indicates if the voltage deviation between the points monitored for each symmetry input is greater than a user-defined limit (volts)
- **Batt FlexiMon X** – see section Flexi Monitors

The following table lists the Battery alarm monitors:

Table 3.12 – Battery Alarm Monitor Summary

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Battery		BatteryVoltage	Volts (dc)	Major High Minor High Minor Low Major Low
		BatteryCurrent	Amps	Major High Minor High Minor Low Major Low
		BatteryTemp	Degrees	Major High Minor High Minor Low Major Low
		BatteryLifeTime	Day(s)	Major Minor
		LVBD	N/A	(LVBD)
		Fuse Status	N/A	Configurable
		Symmetry Status	N/A	Major Minor
		DeltaStringCurr	Percentage	Major Minor

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
		BatteryQuality	Percentage	Major Minor
		BatteryTotCap	Amp-hours	Minor Low Major Low
		BatteryRemCap	Amp-hours	Minor Low Major Low
		BatteryUsedCap	Amp-hours	Major Minor
		BatteryTimeLeft	Minutes	Major Minor
		Ah Charged	Amp-hours (x 100)	Major High Minor High
		Ah Discharged	Amp-hours (x 100)	Major High Minor High
BatteryBank X	Voltage	BattVolt bank X	Volts (dc)	Major High Minor High Minor Low Major Low
	Currents	BattCurrent X.Y	Amps	Major High Minor High Minor Low Major Low
	Fuses	BattFuses X	N/A	Configurable
	Temperatures	BatteryTemp X.Y	Degrees	Major High Minor High Minor Low Major Low

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
	Symmetry	SymmVolt X.Y	Volts (dc)	Major Minor
BattMonStr.X		BattMonCurr X	Amps	Major High Minor High Minor Low Major Low
		BattMonTemp X	Degrees	Major High Minor High Minor Low Major Low
		BattMonFuse X	N/A	Configurable
		BattMonSym X.Y	Volts (dc)	Major Minor

Load Monitors

Load Monitors are Eltek CAN Nodes that are connected to the controller system. They can be configured for monitoring these specific power components: load, solar, wind, fuel cell, and dc-to-dc converter input. The Load Monitor as a whole unit is assigned to one of these input types under **System Configuration**:

System Conf. > Power System > Control System > Current Monitor

NOTE: Load Monitors are also called **Current Monitors** in the Web Interface.

Load Monitors are address in this separate section because of their ability to be used for a variety of applications, and because they always maintain the same structure for their alarm monitors.

Load Monitors have eight input channels for fuse monitoring and eight channels for current monitoring. Load Monitors appear in the **Summary** windows with the following names (depending on monitoring type):

Load: **Load CurMon X** (set as **Load CurMon**) or **LoadPrimary X** (set as **Std LoadMon**)

Solar: **Solar CurMon X**

Wind: **Wind CurMon X**

Fuel Cell: **FuelC CurMon X**

Dc-to-dc: **DCDC CurMon X**

Load Monitor alarm monitors location:

Alarm Conf. > Power System > [Applicable Device]

NOTE: The alarm monitors of Load Monitor devices appear under the power component that they are configured for (e.g., load, solar, fuel cell, etc.).

- **[Current Monitor X]**
 - **Fuses**
 - **Fuse X.Y** – Indicates the status of a branch fuse or circuit breaker (open or closed)
 - **Currents**
 - **Current X** – Indicates whether the total current read over all inputs of the monitor is below the defined total current level.
 - **Current X.Y** – Indicates whether the load branch circuit is below the defined current levels
 - **Power**
 - **TotPower X** – Indicates the status of total power read over all inputs of the monitor (not configurable)
 - **Power X.Y** – Indicates the status of power calculations for each programmable input (not configurable)

The following table lists the Load alarm monitors:

Table 3.13 – Load Monitor Alarm Monitors

Monitor Type	Sub-Menu	Alarm Monitor	Unit(s)	Alarm Type(s)
Current Monitor X	Fuses	Fuse X.Y	N/A	Configurable
	Currents	Current X.Y	Amp	Major High Minor High
	Power	TotPower X	Watt	N/A
		Power X.Y	Watt	N/A

Flexi Monitors

Flexi Monitors, like Load Monitors, are Eltek CAN Nodes that can be utilized for a variety of current monitoring types. They can be configured for monitoring these specific power components: load, battery, solar, wind, fuel cell, and dc-to-dc converter input. The Flexi Monitor as a whole unit is assigned to one of these input types under **System Configuration**:

System Conf. > Power System > Control System > Current Monitor

Flexi Monitor alarm monitors location:

Alarm Conf. > Power System > [Applicable Device]

NOTE: The alarm monitors of Flexi Monitor devices appear under the power component that they are configured for (e.g., load, battery, solar, etc.)

Flexi Monitors are address in this separate section because of their ability to be used for a variety of applications, and because they always maintain the same structure for their alarm monitors.

Flexi Monitors have 16 input channels for a variety of monitoring inputs (fuse, current, temperature, etc.). Flexi Monitors appear in the Summary windows with the following names (depending on monitoring type):

Load: **Load FlexMon X**

Battery: **Batt FlexMon X**

Solar: **Solar FlexMon X**

Wind: **Wind FlexMon X**

Fuel Cell: **FuelC FlexMon X**

Dc-to-dc: **DCDC FlexMon X**

Inputs: **Contr FlexMon X** (set as **Std Fleximon**)

- **[Flexi Monitor X]**

- **Inputs**

The following figure shows the **Flexi Monitor - Inputs** monitors page:

Input summary							
	Description	Type	Status	Value	Rating	Unit	
SP2 Master	Current 1	Current	⊗	0		Amp	
SP2 BasicInd 1	ProgInput 1.1	Prog.NO	⊗				
SP2 BasicInd 2	ProgInput 1.2	Prog.NO	⊗				
I/O unit 1	ProgInput 1.3	Prog.NO	⊗				
I/O unit 2	ProgInput 1.4	Prog.NO	⊗				
I/O unit 3	ProgInput 1.5	Prog.NO	⊗				
Contr FlexMon 1	ProgInput 1.6	Prog.NO	⊗				
Inputs	ProgInput 1.7	Prog.NO	⊗				
Power	ProgInput 1.8	Prog.NO	⊗				
	ProgInput 1.9	Prog.NO	⊗				
	ProgInput 1.10	Prog.NO	⊗				

Figure 3.34 – Flexi Monitor Inputs Summary

- **Current X** – Indicates whether the total current read over all inputs of the monitor is below the defined total current level
- **ProgInput X.Y** – indicates the status of programmable inputs, which can be configured for a variety of input types, including fuses, relays, current, and temperature
- **Power**

The following figure shows the **Flexi Monitor – Power** monitors page:

Input summary					
	Description	Type	Power	Energy	Unit
SP2 Master	TotPower 1	Current	0	0	Watt
SP2 BasicInd 1		Prog.NO			
SP2 BasicInd 2		Prog.NO			
I/O unit 1		Prog.NO			
I/O unit 2		Prog.NO			
I/O unit 3		Prog.NO			
Contr FlexMon 1		Prog.NO			
Inputs		Prog.NO			
Power		Prog.NO			
		Prog.NO			
		Prog.NO			
		Prog.NO			
		Prog.NO			
		Prog.NO			

Figure 3.35 – Flexi Monitor Power Summary

- **TotPower X** – Indicates whether the total power read over all inputs of the monitor is below the defined total power level
- **Power X.Y** – indicates the status of the power calculation for each programmable input (not configurable)

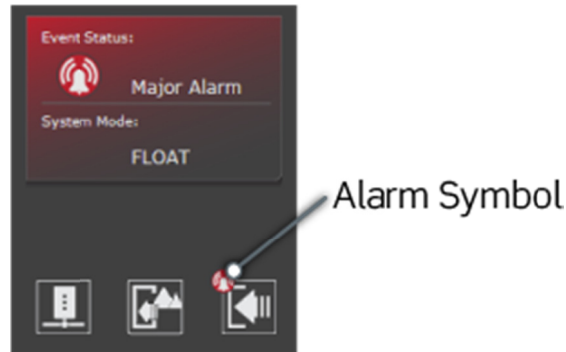
The following table lists the Flexi Monitor alarm monitors:

Flexi Monitor Alarm Monitors

Monitor Type	Sub-Menu	Alarm Monitor	Unit(s)	Alarm Type(s)
Flexi Monitor X	Inputs	Current X	Amp	Major High Minor High
		ProgInput X.Y	N/A (Volt DC)	Configurable
	Power	TotPower X	Watt	N/A
		Power X.Y	N/A	N/A

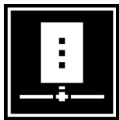
Controller Nodes and Inputs and Outputs

Just as with the Power System Components, alert symbols appear in a corner of the button if there is an alarm or notice that affects the component. This is especially useful for troubleshooting alarms.



Control System

Clicking on the **Control System** button opens the **Control units summary** window, which lists connected CAN Nodes (controllers, monitors, etc.), including part numbers, version number (of the part), serial number, software number and version, and status.



NOTE: Load Monitors are listed as **CurrMonitor X** in this summary window.

- **Control Units Summary** – summary window of controller alarms
 - **Inventory** – list of control and monitoring devices connected to the system

The following figure shows the **Control Units - Inventory** monitors page:

Control units summary								
Inventory	ID	Type	Part#	Ver#	Serial#	SW part#	SW Ver#	Status
Top monitors	1	SP2 BasicInd 1	242100.601	1.6	121171114105	405019.009	2.2	✓
	2	SP2 BasicInd 2	242100.601	1.6	122371166015	405019.009	2.2	✓
	3	SP2 Master 1	242100.500	2.1	123071118292	405006.009	2.2c_1401192	✓
	4	BatteryMon 1	242100.300	2	123471114568	402086.009	1.03	✓
	5	BatteryMon 2	242100.300	2	114271155176	402086.009	1.03	✓
	6	CurrMonitor 1	242100.301	1.2	081671136622	402087.009	02.00	✓
	7	Fleximonitor 1	242100.603	1.2	123445567889	4050xx.009	1.0a	✓
	8	I/O unit 1	242100.502	1.4	123471127423	402088.009	4.1.0	✓
	9	I/O unit 2	242100.502	1.4	123671105959	402088.009	4.1.0	✓
	10	I/O unit 3	242100.306	1.1	123771110870	402088.009	4.1.0	✓

Figure 3.36 – Control Units Inventory Summary

- **Top Monitors** – top-level alarm monitors for controllers and monitoring devices

The following figure shows the **Control Units – Top Monitors** page:

Control units summary					
Inventory	ID	Description	Status	Value	Unit
Top monitors	1	AmbientTemp	⊗	77	Fahrenheit
	2	Batt-AmbientTemp	⊗	-1	Fahrenheit
	3	UserSuspended	✓		
	4	CU Err.Basic	✓	0	Units(s)
	5	CU Err.BattMon	✓	0	Units(s)
	6	CU Err.LoadMon	✓	0	Units(s)
	7	CtrlUnitError	✓	0	Units(s)
	8	CU Err.IO-Unit	✓	0	Units(s)

Figure 3.37 – Control Units Monitors Summary Window

NOTE: The following list is not exhaustive, as monitors can be added for new or updated devices. Alarm monitors only appear when the associated device is connected to the primary controller.

- **AmbientTemp** – the maximum temperature detected by any of the controller temperature inputs (Smartpack2 Basic or Smartpack2 Basic Industrial)
- **Batt-AmbientTemp** – difference between battery temperature and the **AmbientTemp** value (**BatteryTemp** – **AmbientTemp**)

- **User suspended** – indicates if a user account has been suspended due to too many unsuccessful login attempts
- **CU Err.Basic** – indicates if there is an error in one or more of the Smartpack2 Basic or Smartpack2 Basic Industrial controllers
- **CU Err.BattMon** – indicates if there is an error in one or more of the Battery Monitors
- **CU Err.LoadMon** – indicates if there is an error in one or more of the Load Monitors
- **CtrlUnitError** – indicates if there is an error in the primary controller (Smartpack2 Master, Smartpack S, or Compack)
- **CU Err.IO-Unit** – indicates if there is an error in one or more of the I/O Monitor devices

The following table lists the Controller alarm monitors:

Table 3.14 – Battery Summary Window

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Top monitors		AmbientTemp	Degrees	Major High Minor High Minor Low Major Low
		Batt-AmbientTemp	Degrees	Major High Minor High Minor Low Major Low
		UserSuspended	Yes/No	Major
		CU Err.Basic	Sum	Major Minor
		CU Err.BattMon	Sum	Major Minor
		CU Err.LoadMon	Sum	Major Minor

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
		CtrlUnitError	Sum	Major Minor
		CU Err.IO-Unit	Sum	Major Minor

Controller alarm monitors location:

Alarm Conf. > Power System > Control System

System Inputs

Clicking on the **Inputs** button brings up the list of inputs for each control and monitoring device connected to the CAN bus.



Inputs alarm monitors location:

Alarm Conf. > Power System > Inputs

- **Inputs Summary** – summary window of controller and monitor inputs
 - **SP2 Master** – Master controller of the Smartpack2 controller family; includes an interactive display and Ethernet port for the web interface.
 - **Virtual Input X** – Indicates if a virtual input is active.

The following figure shows the **Input** monitors page:

Input summary			✕
SP2 Master	Description	Status	
SP2 BasicInd 1	Virtual input 1	✓	
SP2 BasicInd 2	Virtual input 2	✓	
I/O unit 1	Virtual input 3	✓	
I/O unit 2	Virtual input 4	⊗	
I/O unit 3			
			⌂

Figure 3.38 – Input Summary Window (with Smartpack2 Master)

- **SP2 Basic X** – Smartpack2 Basic controller of the Smartpack2 controller family; includes programmable inputs, temperature inputs, and earth/ground fault detection.

NOTE: The Smartpack2 Basic and Smartpack2 Basic Industrial controllers have the same input alarm monitors. See the **SP2 BasicInd X** list (next) for the alarm monitors.

- **SP2 BasicInd X** – Smartpack2 Basic Industrial controller of the Smartpack2 controller family; includes programmable inputs, temperature inputs, and earth/ground fault detection.

- **Prog. Inputs** – indicates if there is an alarm on the controller's alarm inputs. This designation is for input alarm terminals, with the exception of temperature probes (which use the same terminals). Programmable inputs can be relay input (normally open or normally closed), diode matrix, clock input, or voltage.

The following figure shows the **Smartpack2 Basic – Prog. Inputs** monitors page:

Input summary				✕
SP2 Master	Description	Status	Value	
SP2 Basic 1	ProgInput 1.1	Used for BattTemp		
Prog. Inputs	ProgInput 1.2	⊗		
Temp. Inputs	Converter Fuse	✓		
Earth Fault				
I/O unit 1				
				⌂

Figure 3.39 – Smartpack2 Basic Programmable Inputs

- **Temp. Inputs** – indicates if there is an alarm on the controller's temperature inputs. This designation is reserved for temperature probes connected to input terminals of Eltek controllers.

NOTE: The input terminals used for temperature are the same physical terminals used for the programmable inputs. If the temperature input ("Temperature X.Y") is enabled, then the corresponding Programmable Input ("ProgInput X.Y") is not available; similarly, if the programmable input is enabled, then the corresponding temperature input is not available.

The following figure shows the **Smartpack2 Basic - Temp. Inputs** monitors page:

Input summary ✕

SP2 Master	Description	Status	Value	Unit
SP2 Basic 1	Temperature1.1	Used for BattTemp		
Prog. Inputs	Temperature1.2		-15	Celsius
Temp. Inputs ▶	Temperature1.3	Used as ProgInput		
Earth Fault				
I/O unit 1				



Figure 3.40 – Smartpack2 Basic Temperature Inputs

- **Earth Fault** – if enabled, indicates an earth or ground fault has been detected.

The Earth Fault Detection functionality built-in the *Smartpack2 Basic* controllers can be used to raise an earth fault alarm, when the impedance *ground-to-positive supply conductor* is not the same as the impedance *ground-to-negative supply conductor*. This situation will occur when there is current leakage from the supply conductor (from + or – or both) to ground.

The following figure shows the **Smartpack2 Basic - Earth Fault** monitors page:

Input summary ×				
SP2 Master	Description	Status	Value	Unit
SP2 Basic 1	Earth Faulty 1		572	kOhm
Prog. Inputs				
Temp. Inputs				
Earth Fault ▶				
I/O unit 1				

Figure 3.41 – Smartpack2 Basic Earth (Ground) Fault Inputs

- **I/O unit X** – I/O Monitor, an Eltek CAN Node for accommodating additional programmable inputs.

- **Prog.Input** – programmable inputs, which indicates if there is an alarm on the controller's alarm inputs. This designation is for input alarm terminals, with the exception of temperature probes (which use the same terminals). Programmable inputs can be relay input (normally open or normally closed), diode matrix, clock input, or voltage.

The following figure shows the **I/O Unit** monitors page:

SP2 Master	Description	Status	Value
SP2 Basic 1	ProgInput 82.1	⊗	1
SP2 Basic 2	ProgInput 82.2	⊗	1
IO Unit1	ProgInput 82.3	⊗	1000
IO Unit2 ▶	ProgInput 82.4	⊗	1
IO Unit3	ProgInput 82.5	⊗	1
	ProgInput 82.6	⊗	1

Figure 3.42 – I/O Unit Alarm Monitors

Outdoor Inputs

Outdoor inputs is a special designation for outdoor cabinet inputs, which are supported by the I/O Monitor Type 1 and I/O Monitor Type 3.



Location of configuration page(s):

Alarm Conf. > Power System > Inputs > I/O unit X Outdoor Configuration

- **Outdoor Input Summary** – *summary window of outdoor input monitors*

The following figure shows the **Outdoor Input** monitors page:

Outdoor Input summary ✕					
I/O unit 3 ▶	#	Description	Status	Value	Unit
	1	Fan speed 83.1	⊗	0	%
	2	Fan speed 83.2	⊗	0	%
	3	OutDoorTemp83.1	⊗	69	Fahrenheit
	4	OutDoorTemp83.2	⊗	-41	Fahrenheit
	5	SpeedDev. 83.1	⊗	100	%
	6	SpeedDev. 83.2	⊗	100	%
	7	TempDev. 83.1	⊗	143	Fahrenheit
	8	TempDev. 83.2	⊗	143	Fahrenheit

Figure 3.43 – Outdoor Input Summary Window

- **FanSpeed XX.Y** – indicates if a cabinet fan is near the high or low thresholds for operational capacity (as a percentage of rpms and pulses/revolutions); intended for use with **SpeedDev. XX.Y** (below).
- **OutDoorTemp XX.Y** – indicates if a temperature probe in an outdoor cabinet reports a temperature that exceeds the high or low thresholds; designed to be used to compare the temperatures inside and outside the cabinet for **TempDev XX.Y** (below).
- **SpeedDev. XX.Y** – indicates if the fan speed monitored is deviating from the intended fan speed specified by output **FanControl Y** (alarm output relay).

Location of **Fan Control** parameter: **System Conf. > Power System > Control System > Outdoor > Fan Control Y**

- **TempDev. XX.Y** – indicates if the temperature deviation between the cabinet's internal and external temperature measurements exceeds user-defined thresholds.

The following table lists the Input alarm monitors:

Table 3.15 – Input Alarm Monitors

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
SP2 Master		Virtual Input X	N/A	Configurable
SP2 BasicIcd X	Prog. Inputs	ProgInput X.Y	N/A (Volt DC)	Configurable

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
	Temp. Inputs	Temperature X.Y	Degrees	Major High Minor High Minor Low Major Low
	Earth Fault	EarthFault X	kilo Ohms	Major
IO Unit X (Type 2)		ProgInput XX.Y	N/A (Volt DC)	Configurable
IO Unit X (Type 3)		Fan speed XX.Y	Percentage	Major High Minor High Minor Low Major Low
		OutDoorTemp XX.Y	Degrees	Configurable
		SpeedDev. XX.Y	Percentage	Major Alarm Minor Alarm
		TempDev. XX.Y	Degrees	Configurable

System Measurements (voltage, current, batteries)

Real-time measurements or calculations appear on the right side of the **System Overview** panel:

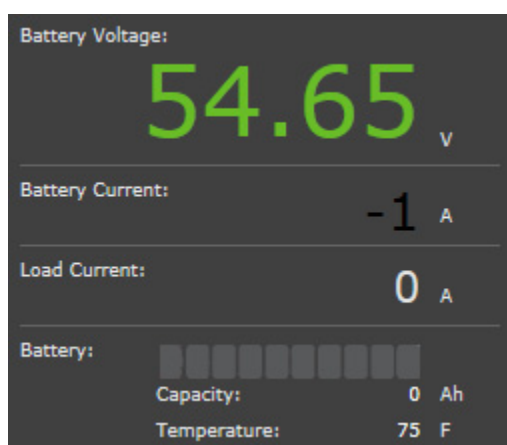


Figure 3.44 – System Measurements Panel

- **Battery Voltage** – real-time measurement of the battery voltage
- **Battery Current** – real-time measurement or calculation of battery current
- **Load Current** – real-time measurement or calculation of the load current
- **Battery Charge/Capacity** – estimated charge and capacity of the battery banks

System History Window

The System History window provides a real-time graph of battery and load voltages, as well as system events.

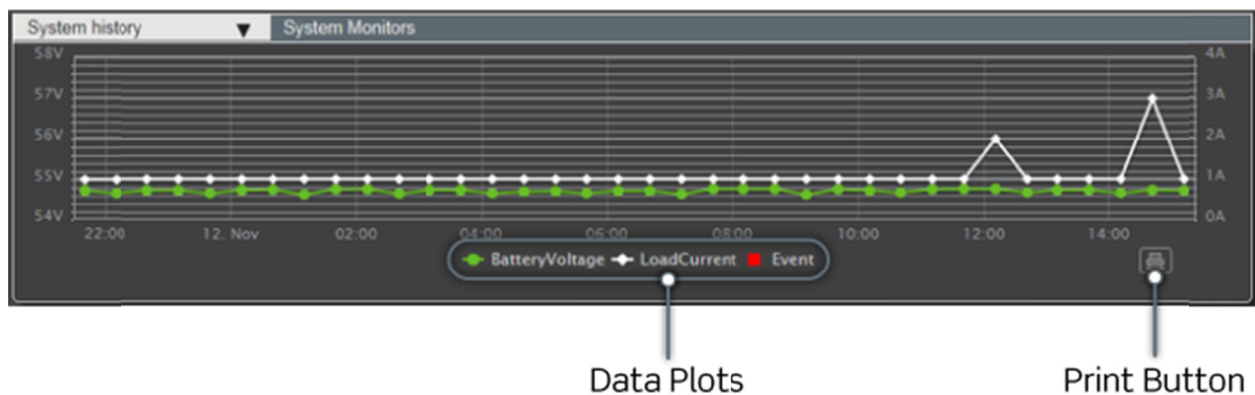


Figure 3.45 – System History Graph

There is a **Print** button in the bottom right corner, which prints the System History graph as it appears.

The **BatteryVoltage**, **LoadCurrent**, and **Event** data points can be toggled on and off by clicking on the respective icons and names in the legend (below the graph).

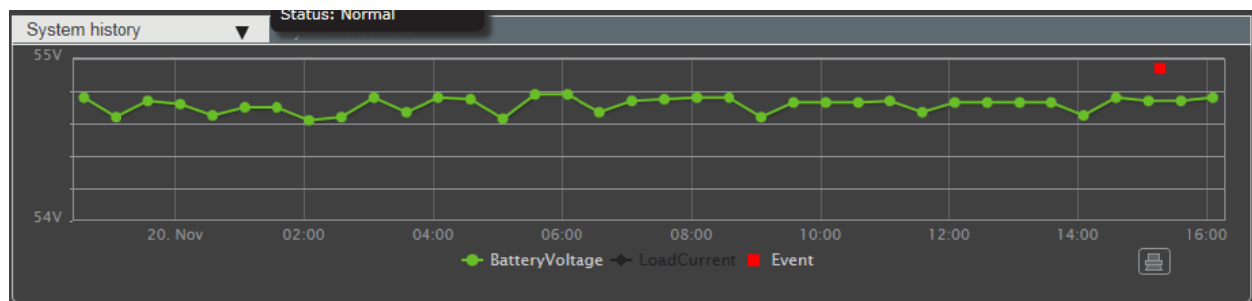


Figure 3.46 – Load Current Toggled OFF

Rolling over the data or event points on the graph with the mouse cursor generates a brief summary of the point.

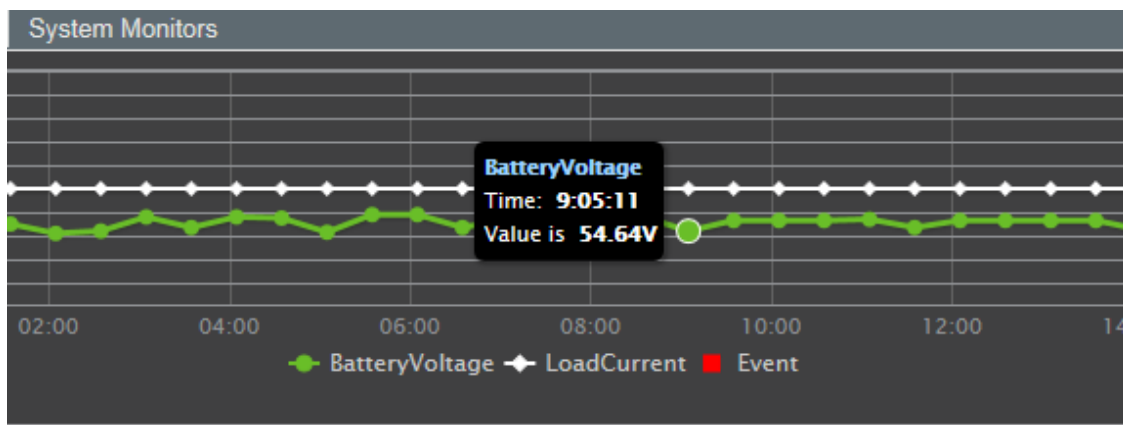


Figure 3.47 – Data Point Highlighted

System Monitors Window

The System Monitors window provides real-time data reported by each controller and monitor connected to the Smartpack2 controller CAN bus.

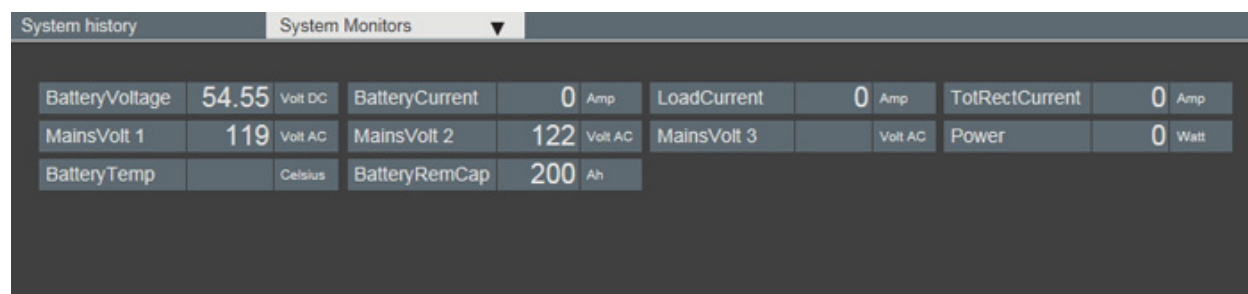


Figure 3.48 – Default System Monitors

The default metrics listed are:

- **Battery voltage and current**
- **Mains (AC utility) voltage**
- **Load Current**
- **Total Rectifier Current**
- **Battery Temperature**
- **Battery Capacity**

NOTE: The **System Monitors** reflect the configurable page of the display (on Smartpack2 Master and Smartpack S controllers) and can be configured using *PowerSuite*.

4. System Configuration

Settings pertaining to system operation, parameters, and various other settings are found in the System Configuration section.



As of the date of this guide, the major submenus are:

- Power System
 - Power System
 - Mains
 - Generator
 - Rectifiers
 - Load
 - Battery
 - Control System
- Device Settings
 - Time Settings
 - Network Settings
 - SNMP Settings
 - User Accounts

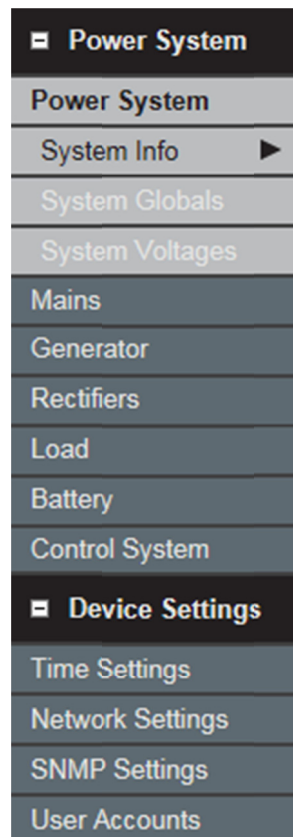


Figure 4.1 - Default Menu for System Configuration

In addition to the major menus, the following appear under Power System when the power modules are either present or configured for monitoring:

- Solar
- Wind
- FuelC (fuel cell)
- DcDc (dc-to-dc converters)

Power System

The **Power System** section contains configurable parameters for site and system information (name, location, etc.), global preferences (units formats, polarity preference, contactor triggers, etc.), and system voltage settings (based on battery parameters).

Power system

The **Power System** sub-section contains parameters related to power system components and global values.

System Info

The **System Info** page is for configuring system and site information. Fields are for free-form text, unless otherwise indicated.

The screenshot shows the 'System Info' page for a 'Power System'. The left sidebar contains a tree view with 'Power System' expanded, showing sub-items: Power System, System Info (selected), System Globals, System Voltages, Mains, Generator, Rectifiers, DcDc Converter, Load, Battery, Control System, Device Settings, Time Settings, Network Settings, SNMP Settings, and User Accounts. The main content area is titled 'DC Plant information' and contains the following fields:

- Company: Text input field
- Site: Text input field
- Model: Text input field (pre-filled with 'SmartPack2 Syst.')
- Serial Number: Text input field
- Install Date [yyyy-mm-dd]: Date picker (pre-filled with 2013-06-23)
- Service Date [yyyy-mm-dd]: Date picker (pre-filled with 2013-06-23)
- Responsible: Text input field
- Message 1: Text input field
- Message 2: Text input field
- Latitude: Latitude input field (pre-filled with 0° 0' 0" N)
- Longitude: Longitude input field (pre-filled with 0° 0' 0" E)
- Elevation: Text input field (pre-filled with 0) followed by 'Meters'

At the bottom right of the page, there are icons for refresh and save.

Figure 4.2 – Power System – System Info Page

NOTE: All fields on this page are optional; none are required. These fields are provided for discretionary purposes by the end user, customer, operator, or owner; they are not filled by Eltek.

- **Company** – name of the company that owns or operates this power system
- **Site** – name for the site or power system

NOTE: This field appears on the **Login** page as **Site**. It is *different* from the field used on the Eltek Network Utility (ENU) for the **Name**; the power system **Name** is configured as part of the network settings (**System Conf.** > **Device Settings** > **Network Settings** > **TCP/IP** > **Device Name**).

- **Model** – model name of the power system
- **Serial Number** – serial number of the power system
- **Install Date** – date that the power system was installed; date format is years, months, days; [yyyy-mm-dd]
- **Service Date** – date of the most recent service/maintenance; date is years, months, days; [yyyy-mm-dd]

- **Responsible** – name of person or organization responsible for the latest service/maintenance performed
- **Message 1** – free-form field for comments on the last service/maintenance performed
- **Message 2** – free-form field for comments on the last service/maintenance performed
- **Latitude** – latitude of site location; format is degrees (ddd), hours (hh), minutes (mm.mm, which includes two decimal places), compass direction (c); [ddd-hh-mm.mm-c]
- **Longitude** – longitude of site location; format is degrees (ddd), hours (hh), minutes (mm.mm, which includes two decimal places), compass direction (c); [ddd-hh-mm.mm-c]
- **Elevation** – elevation of the site, in meters

System Globals

The **System Globals** page is for configuring parameters that are applied to the entire system, such as unit formats, polarity preference, and contactor triggers.

System global settings

System Capacity scale	☒ Ampere Hours	☐ Percentage
Temperature scale	☐ Celsius	☒ Fahrenheit
System Polarity	☐ Positive	☒ Negative
Current Decimal setting	☒ Amps	☐ deciAmps
Store statistics	☐ Disable	☒ Enable
Individual Voltage Control for Battery Groups	☒ Disable	☐ Enable
Individual Current Share for Rectifier Groups	☒ Disable	☐ Enable
Allow rectifier remote on/off	☒ Disable	☐ Enable

Critical premises (Contactor operation)

☒ Mains Minor Low

☐ Battery Current Minor Low

☐ Mains Minor Low OR Battery Current Minor Low

☐ Mains Minor Low AND Battery Current Minor Low

WARNING ! The corresponding software monitor must be enabled for these settings to take effect.

Rectifier and DCDC Group configuration

Group Id	1	2
Rectifier	☒	☒
DCDC	☐	☐

Group Configuration (Smartpack2 Basic Industrial only)

Refresh Save

Figure 4.3 – Power System – System Globals Page (Smartpack2 Basic Industrial)

- **System global settings**

- **System Capacity scale** – choose the format for remaining battery capacity: Ampere-Hours or Percentage
- **Temperature scale** – choose the format for temperature: Celsius or Fahrenheit
- **System Polarity** – choose how system polarity is to be expressed: Positive or Negative

NOTE: System Polarity is not for defining the system's polarity, but rather, for defining how the polarity is expressed throughout the interface. For example, if the system voltage is negative 48 volts (-48V), selecting **Positive** causes the voltage to be displayed *without* the negative symbol (48V); selecting **Negative** causes the voltage to be displayed *with* the negative symbol (-48V).

- **Current Decimal settings** – choose the format for current: Amps or deciAmps (1/10 of an ampere)
- **Store statistics** – for Smartpack2 controllers only: enable or disable saving statistics to the SD card. For additional details, see “Statistics,” on page 262.

- **Individual Voltage Control for Battery Groups** – enable or disable individual voltage control for battery groups
- **Individual Current Share for Rectifier Groups** – enable or disable individual current control for rectifier groups
- **Allow rectifier remote on/off** – enable or disable turning rectifiers on or off remotely (**admin** login required)
- **Critical premises (Contactor operation)** - This section defines alarm conditions that must be met for the system to report a critical condition, which indicates that there is low ac current (mains) and/or low battery current. The choice affects when the low-voltage disconnect (LVD) contactors may be disconnected; by design, LVDs disconnect in critical condition and reconnect in normal condition.
 - **Mains Minor Low** – ac mains low current minor alarm is ON
 - **Battery Current Minor Low** – battery low current minor alarm is ON
 - **Mains Minor Low OR Battery Current Minor Low** – *either* the ac mains low current minor alarm *or* the battery low current minor alarm is ON
 - **Mains Minor Low AND Battery Current Minor Low** – *both* the ac mains low current minor alarm *and* the battery low current minor alarm are ON
- **Rectifier and DCDC Group configuration** - Defines the power module represented by each rectifier group ID (Smartpack2 Basic Industrial only)
 - **Group Id** – rectifier group ID number(s); choose either **Rectifier** (for rectifier modules) or **DCDC** (for dc-to-dc converters) for each **Group Id**

NOTE: Group Id refers to the rectifier group number; the total number is set at **System Conf. > Power System > Rectifiers**

System Voltages

The **System Voltages** page is for configuring critical voltage parameters for system operation.

System voltage levels		
Nominal Voltage	48 V	
Auto-set number of cells based on rectifier output voltage	☐	
Number of Battery Cells	24	
Reference voltage (Cell)	2.2500	V/cell
Reference voltage (Total)	-54.00	V
Boost voltage	2.2500	V/cell (-54.00V)
Rectifier standby voltage	1.8333	V/cell (-44.00V)
Rectifier OVS limit	2.4792	V/cell (-59.50V)
Battery disconnect voltage	1.7500	V/cell (-42.00V)
Battery reconnect voltage	2.0829	V/cell (-49.99V)
Battery test end voltage (Normal test)	1.90 V/cell (-45.5V)	

Note: Changing disconnect voltage will lead to reconnect voltage being changed automatically if no new value is set for it. The difference between disconnect and reconnect voltage will remain the same as before setting the disconnect voltage.




Figure 4.4 – Power System – System Voltages Page

- **Nominal Voltage** – nominal system voltage determined by the Reference voltage (Cell) value and the Number of Battery Cells; not a configurable field
- **Auto-set number of cells based on rectifier output voltage** – check this box to automatically fill the next field—**Number of Battery Cells**—based on the rectifier output voltage
- **Number of Battery Cells** – enter the number of battery cells in each battery string; this field is not configurable if the box for **Auto-set number of cells based on rectifier output voltage** is checked
- **Reference voltage (Cell)** – the charging voltage per battery cell as recommended by the battery manufacturer; this is the same field as **Reference voltage (Cell)** under **System Conf. > Power System > Battery > TempComp**.
- **Reference voltage (Total)** – the charging voltage for an entire battery string as recommended by the battery manufacturer

NOTE: **Reference voltage (Cell)** and **Reference voltage (Total)** are linked; changing one field changes the other when a change is saved.

If **Reference voltage (Cell)** is changed and saved, then **Reference voltage (Total)** updates as follows: Reference voltage (Cell) x Number of Battery

Cells. This field is the same as **Reference voltage (Cell)** under **System Conf. > Power System > Battery > TempComp**.

If **Reference voltage (Total)** is changed and saved, then **Reference voltage (Cell)** updates as follows: $\text{Reference voltage (Total)} \div \text{Number of Battery Cells}$.

Table 4.1 – Calculations for Reference voltage (Cell) and Reference voltage (Total)

If this value is changed...	...then this calculation is performed:
Reference voltage (Cell)	$\text{Reference voltage (Total)} = \text{Reference voltage (Cell)} \times \text{Number of Battery Cells}$
Reference voltage (Total)	$\text{Reference voltage (Cell)} = \text{Reference voltage (Total)} \div \text{Number of Battery Cells}$

- **Boost voltage** – boost charge value per cell; the voltage value must be higher than float (or **Reference**) voltage but lower than the **over-voltage shutdown (OVS)** value. The total string voltage value in parenthesis (to the right of the field) updates based on the value entered and saved.

NOTE: Only enter the boost voltage value recommended by the battery manufacturer. This field is the same as the **Boost voltage** field of the **System Conf. > Power System > Battery > Boost** page.

- **Rectifier standby voltage** – a “safety net” voltage that the rectifiers maintain during a battery discharge test. This is to ensure that power is maintained if the batteries fail; it also prevents the batteries from being disconnected. Therefore, this value (in volts per cell) must be higher than the **Battery disconnect voltage**. The total string voltage value in parenthesis (to the right of the field) updates based on the value entered and saved.
- **Rectifier OVS limit** – over-voltage shutdown value in volts per cell. The total string voltage value in parenthesis (to the right of the field) updates based on the value entered and saved.

NOTE: This field is the same as the **Over voltage shutdown (OVS) limit** field of on the page **System Conf. > Power System > Rectifiers > Configuration**.

- **Battery disconnect voltage** – low battery voltage value (per cell) at which the low-voltage battery disconnect (LVBD) contactor should open. The total string voltage value in parenthesis (to the right of the field) updates based on the value entered and saved.

NOTE: This field is the same as the **Disconnect voltage [V]** field on the **Battery contactor** table found on the **System Conf. > Power System > Battery > Configuration** page.

- **Battery reconnect voltage** – battery voltage value (per cell) at which the low-voltage battery disconnect (LVBD) contactor should close. The total string voltage value in parenthesis (to the right of the field) updates based on the value entered and saved.

NOTE: This field is the same as the **Reconnect voltage [V]** field on the **Battery contactor** table found on the **System Conf. > Power System > Battery > Configuration** page.

NOTE: Changing and saving the **Battery disconnect voltage** without entering a new value for the **Battery reconnect voltage** causes the **Battery reconnect voltage** to be updated automatically, maintaining the same voltage difference as before the change.

- **Battery test end voltage (Normal test)** – end voltage per cell for the Normal Test of Battery Test configuration (**System Conf. > Power System > Battery > Test**), which is derived from the battery definition table (**System Conf. > Power System > Battery > Configuration > Edit battery table**). Therefore, this is not a configurable field. The total string voltage value is in parenthesis (to the right of the field).

The following table indicates which fields of the **System Voltages** page can be set elsewhere in the Web Interface. Changing the value in one field automatically changes the value in the identical field.

Table 4.2 – Identical Parameter Fields

System Voltages Field	Identical Field Elsewhere	Path to Identical Field
Reference voltage (Cell)	Reference voltage	System Conf. > Power System > Battery > TempComp
Boost voltage	Boost voltage	System Conf. > Power System > Battery > Boost
Rectifier OVS limit	Over voltage shutdown (OVS) limit	System Conf. > Power System > Rectifiers > Configuration
Battery disconnect voltage	Disconnect voltage [V]	System Conf. > Power System > Battery > Configuration Battery contactor table

System Voltages Field	Identical Field Elsewhere	Path to Identical Field
Battery reconnect voltage	Reconnect voltage [V]	System Conf. > Power System > Battery > Configuration Battery contactor table

Mains

The **Mains** page is for configuring ac input (mains) parameters.

WITHOUT GROUPS – pages that appear when there are no Smartpack2 Basic Industrial controllers in the system.

Mains Configuration

Number of Phases

Suppress mains alarms when generator is stopped ☐ Enable

Figure 4.5 – AC Mains Page – Without Groups

- **Number of Phases** – enter the number of ac phases per input feed (1-3)
- **Suppress mains alarms when generator is stopped** – check the **Enable** box to suppress ac mains alarms when the generator is turned off

WITH GROUPS – pages that appear when Smartpack2 Basic Industrial controllers are present.

Summary

The **Summary** page is for the ac mains groups.

The screenshot shows the 'Mains Summary Page'. On the left, a sidebar contains a 'Power System' section with options: Power System, Mains (selected), Summary (active), Mains Group, Generator, Rectifiers, Load, Battery, and Control System. Below this is a 'Device Settings' section. The main area is titled 'Mains Group Configuration' and displays 'Number of Groups' with a text input field containing the number '1'.

Figure 4.6 – Mains Summary Page – With Groups

- **Number of Groups** – the number of mains groups, i.e., the number of Smartpack2 Basic Industrial controllers that are monitoring Eltek rectifiers (which report ac mains information)

Mains Group

The **Mains Group** page shows each ac mains group (one per Smartpack2 Basic or Smartpack2 Basic Industrial controller that is monitoring Eltek rectifiers).

The screenshot shows the 'Mains Group Page' for 'Mains Group 1'. The sidebar is identical to Figure 4.6, but 'Mains Group' is selected. The main area is titled 'Mains Group Configuration' and shows settings for 'Mains Group 1'. It includes a 'Number of Phases' input field with the value '3' and a checkbox labeled 'Suppress mains alarms when generator is stopped' with an 'Enable' button.

Figure 4.7 – Mains Group Page – With Groups

- **Number of Phases** – enter the number of ac phases per input feed (1-3)
- **Suppress mains alarms when generator is stopped** – check the **Enable** box to suppress ac mains alarms when the generator is turned off

Generator

The **Generator** section is for configuring generator parameters. Up to two ac generators can be configured.

General

The **General** page is for enabling or disabling generator control and activation, as well as assigning alarm groups and time parameters.

Power System

- Power System
- Mains
- Generator**
 - General
 - Capacity
 - Daily
 - Monthly
 - Voltage Setup
- Rectifiers
- DcDc Converter
- Load
- Battery
- Control System

Device Settings

- Time Settings
- Network Settings
- SNMP Settings
- User Accounts

General Generator Configuration

Generator control ☐ Enable

Long charge time hours

Stop delay minutes

Mains delay minutes

Boost during charge ☒ Enable

Test mode ☐ Enable (Sets hours to minutes)

Event

Generator

Generator

Alarm group

Refresh Save

Figure 4.8 – Generator General Page

- **Generator control** – enable or disable generator control, where the power system controller will send ON and OFF signals to the generator(s)
- **Long charge time** – if the generator is used to charge batteries, this field specifies how many hours the generator should operate to charge the batteries; this value is used when the generator is started by the **Monthly** parameters or battery voltage has dropped below the **Battery disconnect voltage (System Conf. > Power System > Power System > System Voltages)**. **Generator control** must be enabled.
- **Stop delay** – time delay in minutes that the generator should wait to shut off after ac input is restored (to continue charging a bit longer than required by recharge settings)

- **Mains delay** – time delay in minutes that the generator should wait to start after ac input is lost; this helps prevent generator startup when the ac mains outage is brief
- **Boost during charge** – check this box to enable battery boost mode when the system is on generator
- **Test mode** – check this box to enable generator test mode; this changes hours to minutes to accelerate the time limits to confirm that it works properly
- **Event, Alarm Group** – Assign generator events to alarm output groups. There are two **Events** for up to two generators.

Capacity

The **Capacity** page is for setting generator operation based on battery capacity. All of the options on this page can be enabled simultaneously.

Generator Capacity setup

Capacity controlled Generator start/stop ☐ Enable

Start Generator on discharge limit % (DoD)

Stop Generator on charge limit % (SoC)

Capacity/Time controlled Generator start/stop ☐ Enable

Start Generator on discharge limit % (DoD)

Stop Generator on time limit hours

Current limit controlled Generator stop ☐ Enable

Stop Generator on current limit A

Solar Generator stop ☐ Enable

Wind Generator stop ☐ Enable

↻ 📁

Figure 4.9 – Generator Capacity Page

- **Capacity controlled Generator start/stop** – Check this box to enable generator operation based on battery capacity

- **Start Generator on discharge limit** – set the battery Depth of Discharge (DoD) percentage at which the generator should activate
- **Stop Generator on charge limit** – set the battery State of Charge (SoC) percentage at which the generator should deactivate
- **Capacity/Time controlled Generator start/stop** – check this box to enable generator operation based on battery capacity (discharge) to start and time elapsed to stop
- **Start Generator on discharge limit** – set the battery Depth of Discharge (DoD) percentage at which the generator should activate
- **Stop Generator on time limit** – set the number of operational hours that should elapse until the generator deactivates
- **Current limit controlled Generator stop** – check this box to specify a low current threshold at which the generator should deactivate
- **Stop Generator on current limit** – low current level from the generator at which the generator should deactivate
- **Solar Generator stop** – check this box to stop the generator upon solar charger input
- **Wind Generator stop** – check this box to stop the generator upon wind charger input

Daily

The **Daily** page is for configuring daily generator operation.

Generator daily run setup

Daily Generator start ☐ Enable

	Start	Stop	Alarm group
Sunday	09	09	None Selected ▼
Monday	09	09	None Selected ▼
Tuesday	09	09	None Selected ▼
Wednesday	09	09	None Selected ▼
Thursday	09	09	None Selected ▼
Friday	09	09	None Selected ▼
Saturday	09	09	None Selected ▼

Refresh Save

Figure 4.10 – Generator Daily Setup Page

- **Daily Generator start** – check this box to enable daily generator start/stop parameters
NOTE: If there are any days during which the generator(s) should *not* run, *do not* assign an alarm group; this prevents the start and stop signals from being sent during the hours specified for that day.
- **[Sunday – Saturday]** – set start and stop times for each day (24-hour format, HH); assign alarm output group to signal the generator

Monthly

The **Monthly** page is for configuring monthly generator operation.

Generator monthly run setup

Monthly Generator start ☐ Enable

Start time

Day in month(1.start)

Day in month(2.start)

Alarm group

Figure 4.11 – Generator Monthly Setup Page

- **Monthly Generator Start** - check this box to enable monthly generator activation; up to two days can be configured to start the generator
- **Start time** – hour start time (24-hour format, HH; do *not* include minutes). This is the hour during the days specified below that the generator is started. The generator runs until reaching the **Long charge time** value specified (in hours) on the **General** page. Set the alarm group to send the start signal to the generator.
- **Day in month (1.start)** – day of the month to turn on the generator (1-31, DD format)
- **Day in month (2.start)** – day of the month to turn on the generator (1-31, DD format)

Voltage Setup

The **Voltage Setup** page is for configuring generator activation upon battery voltage reaching a low threshold.

Generator voltage setup

Voltage controlled Generator start ☐ Enable

Start generation on Volt

Stop generator after hours

Figure 4.12 – Generator Voltage Setup Page

- **Voltage controlled Generator start** – check this box to enable generator activation upon reaching a low battery voltage threshold
- **Start generation on** – specify the low battery voltage level at which the generator is to be turned on
- **Stop generator after** – specify the number of hours that the generator should run; format is 24-hour (HH).

Rectifiers

The **Rectifiers** section is for configuring rectifier parameters.

Configuration

The **Configuration** page is for setting general rectifier parameters.

The screenshot shows the SMARTPACK2 Configuration page for the Power System - Rectifiers. The page has a dark header with navigation icons and the SMARTPACK2 logo. The left sidebar shows the Power System menu with options: Power System, Mains, Rectifier, Configuration (selected), Efficiency, Generator, Load, Battery, Control System, and Device Settings. The main content area is titled 'Configuration' and contains the following settings:

Parameter	Value	Unit/Action
Number of groups	1	Reallocate unit IDs
Suppress fail when mains is gone	☒ Enable	
Walk-in time	Short time	
Over voltage shutdown (OVS) limit	2.4583	V/cell (59.00 V)
Current limit	☐ Enable	
Current limit value	1000	A
Emergency voltage	53.52	V
Generator dependent delay	☐ Enable	
Startup delay time	0	minutes
Current ramp control	☐ Enable	
Rampup time	30	seconds
Current limit offset	5	%
Silence alarms	☐ Enable	
Redundant units	0	%

Figure 4.13 - Power System - Rectifiers Configuration Page

- **Number of groups/units** – field for the total number of rectifier groups or units, depending on the controller architecture present in the power system (for manual numbering only; the controller automatically counts all Eltek rectifiers)

Rectifier IDs are automatically assigned by the controller, based on the order of installation. If you need to reassign a rectifier ID, click the **Reallocate unit IDs** button to bring up a separate dialog in order to change the ID numbers of rectifiers (see Figure 4.14). Drag and drop the rows to reorder.

ID	Description	Serial	Status	Value	Unit
1	FLATPACK2 48/3000 HE G2	111371107844	OK	0.0	Amp
2	FLATPACK2 48/3000 HE G2	111371106835	OK	0.2	Amp

Figure 4.14 – Reallocate unit IDs

- **Suppress rectifier fail when mains is gone** – check this box to prevent the Rectifier Alarm from triggering during a loss of ac input (mains)
- **Walk-in time** – relative time frame (short or long) that the rectifiers should take to reach float (or **Reference**) voltage (beginning at 44.0 Vdc and rising to 53.5 Vdc). As the writing of this guide, **Short time** is 5 seconds and **Long time** is 60 seconds. This feature is useful when generators are connected.
- **Over voltage shutdown (OVS) limit** – output voltage threshold (in volts per battery cell) at which the rectifiers should shutdown. The total string voltage value in parenthesis (to the right of the field) updates based on the value entered and saved.

NOTE: This is the same field as **Rectifier OVS limit** on the **System Conf. > Power System > Power System > System Voltages** page.

- **Current limit** – check the box to enable current limit on total rectifier output
- **Current limit value** – enter the maximum total rectifier current desired (in amps)

NOTE: Rectifier current limit manages total rectifier output rather than output per rectifier.

NOTE: Eltek rectifiers use a constant-power architecture, which means that output voltage is adjusted to maintain the current limit value. To prevent a system outage, the current limit setting is overridden if system voltage drops too low.

- **Emergency voltage** – enter an emergency voltage value, which is a value lower than float (or **Reference**) voltage that the rectifiers should drop to in the event that an emergency signal is received from an external source
- **Generator dependent delay** – check this box to enable rectifier startup delay when the system is powered by a generator. This feature helps prevent drawing too much current from the generator when it begins supplying power.
- **Startup delay time** – enter the time in minutes that the rectifiers should wait after the generator activates before starting up (to avoid overloading the generator)
- **Silence rectifier alarm** – check this box to silence rectifier alarm reporting through the controller. Rectifiers still alarm normally, but the controller does not report them. This is useful for areas with unreliable ac service.
- **Redundant rectifiers** – Under efficiency management (see the section “Efficiency”), the controller switches off redundant rectifiers if total load current is less than 50% of the system’s total rectifier capacity. To change the load current percentage to a lower value, enter a percentage (lower than 50%) of the total rectifier capacity at which the controller should turn off redundant rectifiers.

Efficiency

The **Efficiency** page is for configuring rectifier efficiency management.

Figure 4.15 – Power System – Rectifiers Efficiency Page

- **Efficiency manager** – select the efficiency profile to use for the system: Disable (none), Enable efficiency manager, or Enable ‘HE’ priority
- **Disable** – no efficiency scheme is employed
- **Enable efficiency manager** – when selected, a list of parameters appears:
 - **Power Save Mode** – determines if the rectifiers can be turned off based on load demand and total rectifier output potential. If “Redundancy” is selected, then one more rectifier than necessary is kept enabled to support the load. If “Non-redundancy” is selected, then only the number of rectifiers necessary to support the load are enabled.

NOTE: Power Save Mode only disables rectifiers if total load current is less than 50% of the total rectifier capacity.

 - **“Rectifier off” delay** – time interval (in minutes) that should pass before turning off a rectifier after turning another one on during efficiency management
 - **Shuffle time** – time interval (in hours) that should pass before rotating rectifiers. When one rectifier is turned off, another is turned on. Rectifiers are rotated sequentially.

- **Test mode** – check this box to test Rectifier Efficiency; it changes hours to minutes and minutes to seconds in order to accelerate the operation of this function to confirm that it works properly.
- **Battery current cancel limit** – battery current offset at which efficiency management is disabled, turning on all available rectifiers

NOTE: The controller automatically disables efficiency management if battery discharge is detected. In very large power systems there is potential for some inaccuracy in battery current readings due to shunt tolerances. Therefore, **Battery current cancel limit** provides a means to enter an offset to prevent disabling efficiency management due to minor variations in battery readings.

- **Enable 'HE' priority** – if the power system is equipped with Eltek's High-Efficiency (HE) modules and they can supply 70% or more of the total load current, then this feature turns off the non-HE rectifiers.

[Solar Charger]

The **Solar Charger** page is for configuring solar chargers and only appears if solar chargers are installed or a CAN Node is configured to monitor solar current.

Configuration

The **Configuration** page is for configuring solar charger modules.

The screenshot displays the SMARTPACK2 web interface for Solar Configuration. The top navigation bar includes icons for Home, System Conf., Alarm Conf., Logs, Commands, Statistics, Help, and Logout, along with the SMARTPACK2 logo and software version Sw#: 405006.009 Rev: 2.4. The left sidebar shows a tree view with 'Power System' expanded, containing sub-items: Power System, Mains, Rectifier, Generator, Solar (selected), Configuration (with a right-pointing arrow), Load, Battery, and Control System. Below this is 'Device Settings'. The main content area is titled 'Solar Configuration' and contains the following settings:

- Number of solar chargers:** A text input field containing the value '1'.
- Suppress solar fail when all inputs are low:** A checkbox that is checked, with the label 'Enable' to its right.
- Silence solar alarm:** An unchecked checkbox with the label 'Enable' to its right.
- Current limit:** An unchecked checkbox with the label 'Enable' to its right.
- Current limit value:** A text input field containing '1000' followed by a unit selector set to 'A'.
- Over voltage shutdown (OVS) limit:** A text input field containing '2.4583' followed by the unit 'V/cell (59.00 V)'.

At the bottom right of the configuration area, there are icons for a refresh button and a save button.

Figure 4.16 – Power System – Solar Page

- **Number of solar chargers** – field for the number of solar charger modules installed
- **Suppress solar fail when all inputs are low** – check the box to suppress low input alarms from the solar chargers (for example, to avoid alarms during the night, when all solar inputs are low)
- **Silence solar alarm** – check the box to silence the alarm from the solar chargers
- **Over voltage shutdown (OVS) limit** – set a high voltage value (volts per cell) at which the solar charger(s) should shut down.

[Wind]

The **Wind** page is for configuring wind chargers and only appears if wind chargers are installed or a CAN Node is configured to monitor wind current.

Configuration

The **Configuration** page is for configuring wind charger modules.

Figure 4.17 – Power System – Wind Page

- **Number of Wind Chargers** – field for the number of wind charger modules installed
- **Suppress Wind Charger fail when all inputs are low** – check the box to suppress low input alarms from the wind chargers

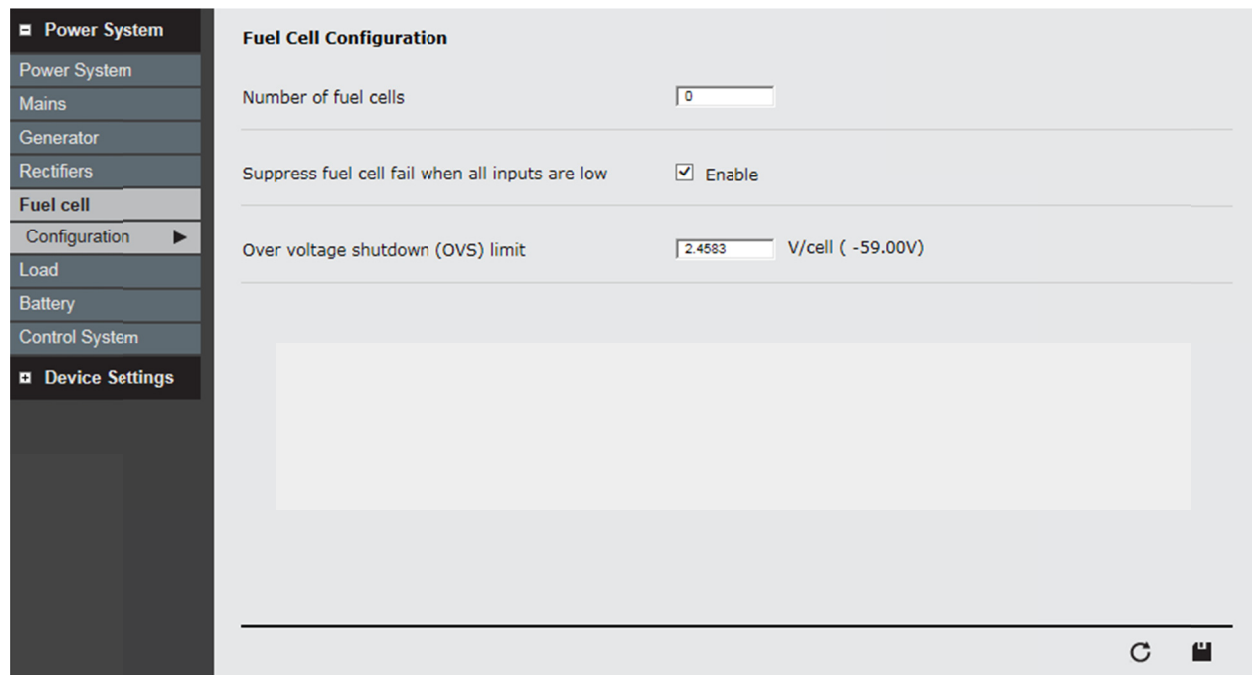
- **Over voltage shutdown (OVS) limit** – set a high voltage value (volts per cell) at which the wind charger(s) should shut down.

[Fuel Cell]

The **Fuel Cell** page is for configuring fuel cell chargers and only appears if fuel cell chargers are installed or a CAN Node is configured to monitor fuel cell current.

Configuration

The **Configuration** page is for configuring fuel cell charger modules.



The screenshot shows a software interface for 'Fuel Cell Configuration'. On the left is a sidebar menu with the following items: 'Power System' (expanded), 'Power System', 'Mains', 'Generator', 'Rectifiers', 'Fuel cell' (selected), 'Configuration' (with a right-pointing arrow), 'Load', 'Battery', 'Control System', and 'Device Settings'. The main content area is titled 'Fuel Cell Configuration' and contains three configuration fields: 1. 'Number of fuel cells' with a text input field containing the value '0'. 2. 'Suppress fuel cell fail when all inputs are low' with a checked checkbox and the label 'Enable'. 3. 'Over voltage shutdown (OVS) limit' with a text input field containing '2.4583' and a unit label 'V/cell (-59.00V)'. Below these fields is a large, empty rectangular box. At the bottom right of the main area are two small icons: a circular arrow (refresh) and a document icon.

Figure 4.18 – Power Systems – Fuel Cell Page

- **Number of FuelCell Chargers** – field for the number of fuel cell charger modules installed
- **Suppress FuelCell Charger fail when all inputs are low** – check the box to suppress low input alarms from the fuel cell chargers
- **Over voltage shutdown (OVS) limit** – set a high voltage value (volts per cell) at which the fuel cell charger(s) should shut down.

[DcDc Converter]

The **DcDc Converter** page is for configuring dc-to-dc converters and only appears if dc-to-dc converters are installed or a CAN Node is configured to monitor dc-to-dc converters.

Configuration

The **Configuration** page is for configuring dc-to-dc converters (if installed).

The screenshot shows the 'DcDc Converter Configuration' page. On the left is a sidebar menu with the following items: 'Power System' (expanded), 'Power System', 'Mains', 'Generator', 'Rectifiers', 'DcDc Converter' (selected), 'Configuration' (with a right-pointing arrow), 'Load', 'Battery', 'Control System', 'Device Settings' (expanded). The main content area is titled 'DcDc Converter Configuration' and contains the following fields: 'Number of DcDc Converters' with a value of 2; 'Output voltage' with a value of 27.00 V; 'Over voltage shutdown (OVS) limit' with a value of 31.00 V; 'Current limit' with an unchecked 'Enable' checkbox; and 'Current limit value' with a value of 1000 A. At the bottom right of the main area are icons for refresh and save.

Figure 4.19 – Power System – DcDc Converter Page

- **Number of DcDc Converters** – field for manually specifying the number dc-to-dc converters in the system
- **Output voltage** – output voltage for the converters
- **Over voltage shutdown (OVS) limit** – high voltage limit for the converters where they shut down
- **Current limit** – check this box to enable current limit on the dc-to-dc converters
- **Current limit value** – total current output in amps for all of the dc-to-dc converters

Load

The **Load** page is for configuring system load parameters.

Configuration

The **Configuration** page is for configuring load group parameters.

Power System

- Power System
- Mains
- Rectifier
- Generator
- DCDC
- Load**
- Configuration ▶
- Battery
- Control System

Device Settings

Load Configuration

Number of load groups: 1 ▼

Select load group: Load group 1 ▼

Load Group contactors

#	Enable	Mode	Description	Disconnect voltage [V]	Reconnect voltage [V]	Disconnect delay [minutes]	Delay after disconnect [seconds]	Mains independent
1	☐	☒ LVD ☐ DCDC	LVL1 1.1	44.00	48.00	30	☐ Enable	0

Note: Mode DCDC sends shutdown to dcdc instead of activating LVD.

Number of load contactors: 1 ▼

⌂ ⌂

Figure 4.20 – Power System – Load Configuration Page
(Number of load contactors set to 1 or greater)

- **Number of load groups** – set the number of load groups present in the entire power system. This number is determined by the number of controller units (like the Smartpack2 Basic and Smartpack2 Basic Industrial controllers) that are monitoring loads.
- **Select load group** – with the **Number of load groups** set, select a load group to configure.

NOTE: Setting load group contactors requires that low-voltage disconnect (LVD) contactors be physically installed in the load circuit(s) monitored by the controller unit, and the contactors must be connected to the LVD terminals of the controller.

- **Load Group contactors** – configurable list of low-voltage load disconnect (LVLD) contactors. The **Number of load contactors** must be set greater than zero (0) in order for the LVLD rows to appear on the table.
- **Enable** – check this box to enable the controller's LVLD terminal
- **Mode** – Use the radio buttons to select the disconnect mode:
 - LVD** – low voltage disconnect contactor
 - DCDC** – shutdown DC/DC converter modules

- **Description** – if necessary, type a description for the LVLD terminal
- **Disconnect voltage [V]** – battery voltage at which the load contactor should open, disconnecting the load from the system
- **Reconnect voltage [V]** – battery voltage at which the load contactor should close, reconnecting the load to the system
- **Disconnect delay [minutes]** – the number of minutes after a loss of ac power (mains) when the load contactor should be opened to disconnect the load circuit(s). The **Enable** box must be checked to enable this feature; otherwise, the delay based on ac power loss is disabled. This feature is intended for non-critical or non-priority loads (those that do not need to be supported by battery back-up).
- **Delay after disconnect [seconds]** – the time (in seconds) that should elapse between signaling the LVLD contactor to open (disconnect) and signaling it to close (reconnect).
- **Mains independent** – check this box to permit the LVLD to close (reconnect) if the **Reconnect voltage** is reached, regardless of whether ac power (mains) has been restored. This is useful if there are power sources other than ac utility input that can power the system and charge the batteries. Leaving the box unchecked ensures that the LVLD does not close until ac power is restored.
- **Number of load contactors** – drop-down list to select the number of LVLD contactor signals available on the controller for the load group specified by the field **Select load group**.

NOTE: The number of contactors available in the drop-down list reflects the number of signal terminals on the controller unit that monitors the specified load group.

Battery

The **Battery** section is for configuring parameters for system batteries.

Configuration

The **Configuration** page is for the general configuration of battery properties, including number of banks, capacity, and battery table.

SMARTPACK2
Sw #: 405006.009 Rev: 2.4

Power System

General Battery configuration

Number of banks: 1

Description: Eltek Std

Capacity [per string/module]: 100 Ah

Number of Battery strings: 1

Battery install date [yyyy-mm-dd]: 2014-12-11

Select Battery Type: Eltek Std [Edit battery table](#)

Discharge cycle threshold[%]: 0 0% = Disable discharge cycle logging

Battery contactor

#	Enable	Description	Disconnect voltage [V]	Reconnect voltage [V]	Delay after disconnect [seconds]	Mains independent	Temperature dependent
1	☒	LVBD	43.00	48.00	0	☐	☐

Figure 4.21 – Power System – Battery Page

- **Number of banks** – the number of battery banks connected to the power system.
NOTE: Since only specific controllers are equipped to monitor batteries (like the Smartpack2 Basic Industrial controller), this number should reflect the number of those controllers (if the power system is so equipped).
- **Description** – free-form field for a description for the batteries (e.g., the type, battery manufacturer, or the configuration employed)
- **Capacity [per string/module]** – the total capacity (in ampere-hours) per battery string
- **Number of Battery strings** – the number of battery strings in each battery bank
- **Battery install date [yyyy-mm-dd]** – the date of battery installation
- **Select Battery Type** – define battery parameters using the battery table
Click on the **Edit battery table** button, and choose from the quick-select drop-down list

Figure 4.22 –Battery Type options

- **Discharge cycle threshold (%)** – The threshold that must be exceeded, before beginning discharge cycle logging; the setting allows the controller to ignore small current variations from discharging to charging or vice versa (see “Battery Cycles” on page 240).
- **Battery contactor** – editable table for the primary controller’s low-voltage battery disconnect (LVBD) contactor terminal.
 - **Enable** – check this box to enable the controller’s low-voltage battery disconnect (LVBD) contactor terminal
 - **Description** – if necessary, type a description for the LVBD terminal
 - **Disconnect voltage [V]** – battery voltage at which the battery contactor should open, disconnecting the batteries from the system

NOTE: This is the same field as the **Battery disconnect voltage** field on the **System Conf. > Power System > Power System > System Voltages** page.
 - **Reconnect voltage [V]** – battery voltage at which the battery contactor should close, reconnecting the batteries to the system

NOTE: This is the same field as the **Battery reconnect voltage** field on the **System Conf. > Power System > Power System > System Voltages** page.
 - **Delay after disconnect [seconds]** – the time (in seconds) that should elapse between signaling the LVBD contactor to open (disconnect) and signaling it to close (reconnect).
 - **Mains independent** – check this box to permit the LVBD to close (reconnect) if the **Reconnect voltage** is reached, regardless of whether ac power (mains) has been restored. This is useful if there are power sources other than ac utility input that can power the system and charge the batteries. Leaving the box unchecked ensures that the LVBD does not close until ac power is restored.
 - **Temperature dependent** – check this box to ensure the LVBD only closes (reconnects) if the battery temperature than the high temperature limit defined in the BatteryTemp alarm monitor

Alarm Conf. > Battery > Battery Alarm Configuration > BatteryTemp

- **Battery Table** – the **Battery Table** contains discharge specifications for the batteries connected to the system. It is accessed by clicking on the **Edit battery table** button on the **Configuration** page of the **Battery** section.

System Conf. > Battery > Configuration > Edit Battery Table

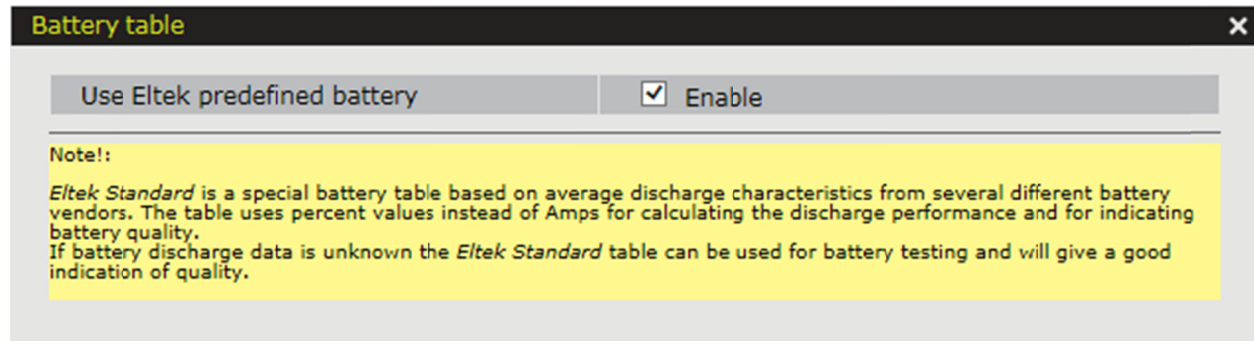


Figure 4.23 - Battery Table - Use predefined table

- **Use Eltek predefined battery** - Check the box to use the Eltek Standard battery table, which is based on average discharge characteristics from a variety battery manufacturers; discharge performance and battery characteristics are based on percent values rather than amps. As such, this table should only be used if the discharge data for the batteries is unknown and the use of estimated values is acceptable. Checking this box removes the editable battery table fields. Leave the box unchecked to use an existing battery table or to configure the battery table manually.

The following figure shows the configurable **Battery Table** window;

Battery table [X]

Use Eltek predefined battery ☐ Enable

Template Options
 [Dropdown]
 Load Table
 Modify table
 Edit table
 Add row
 Delete row

Table Details | File operation

Description: Eltek Std

End volt:		High [V/cell]	Low[V/cell]
		1.90	1.75
#	Minutes	Current Ref1	Current Ref2
1	30	71.2	110.0
2	60	54.5	67.1
3	90	42.4	49.0
4	120	33.3	39.0
5	150	28.5	33.0
6	180	24.2	28.0
7	240	19.2	22.2
8	300	16.0	18.4
9	360	13.9	15.9

[Refresh] [Save]

Figure 4.24 – Battery Table Page – Table Details

- **Template Options** - Drop-down list of battery tables that are loaded in the controller. As of the writing of this guide, templates are available for the following batteries: FIAMM SLA 100 and Exide/GNB Marathon® M12V155FT. The <empty table> option can be selected to clear the current battery table.
 - **Load Table** - After making a selection in the Template Options list, click this button to load the table template
- **Modify table** – the buttons in this section are for editing the battery table
 - **Edit table** – click this button to edit the existing table cells. The table is not editable until this button is clicked.
 - **Add row** – click this button to add a row after the row with the black arrow
 - **Delete row** – click this button to delete the row with the black arrow
- **Table Details** – window that shows the full battery discharge table

NOTE: If the table fails to load completely, click the **Refresh** icon in the lower right of the **Battery table** window (circle with arrow).

- **Description** – field for typing a description of the batteries or battery table used
- **End volt** – end-of-discharge voltage parameters (voltage per cell): High and Low
- **High [V/cell]** – the highest end-of-discharge voltage specification provided by the battery manufacturer
- **Low [V/cell]** – the lowest end-of-discharge voltage specification provided by the battery manufacturer
- **#** - battery table row number
- **Minutes** – the discharge time in minutes
- **Current Ref1** – battery current (in amps) specified by the battery manufacturer for the High [V/cell] end-of-discharge voltage at the minutes indicated in the Minutes column
- **Current Ref2** – battery current (in amps) specified by the battery manufacturer for the Low [V/cell] end-of-discharge voltage at the minutes indicated in the Minutes column

NOTE: The alarm monitors **BatteryQuality** and **BatteryTotCap** use the data from the **Current Ref1** column of the battery table. The alarm monitors **BatteryRemCap** and **BatteryTimeLeft** use the data from the **Current Ref2** column of the battery table.

- **File operation** – window for uploading and downloading battery tables

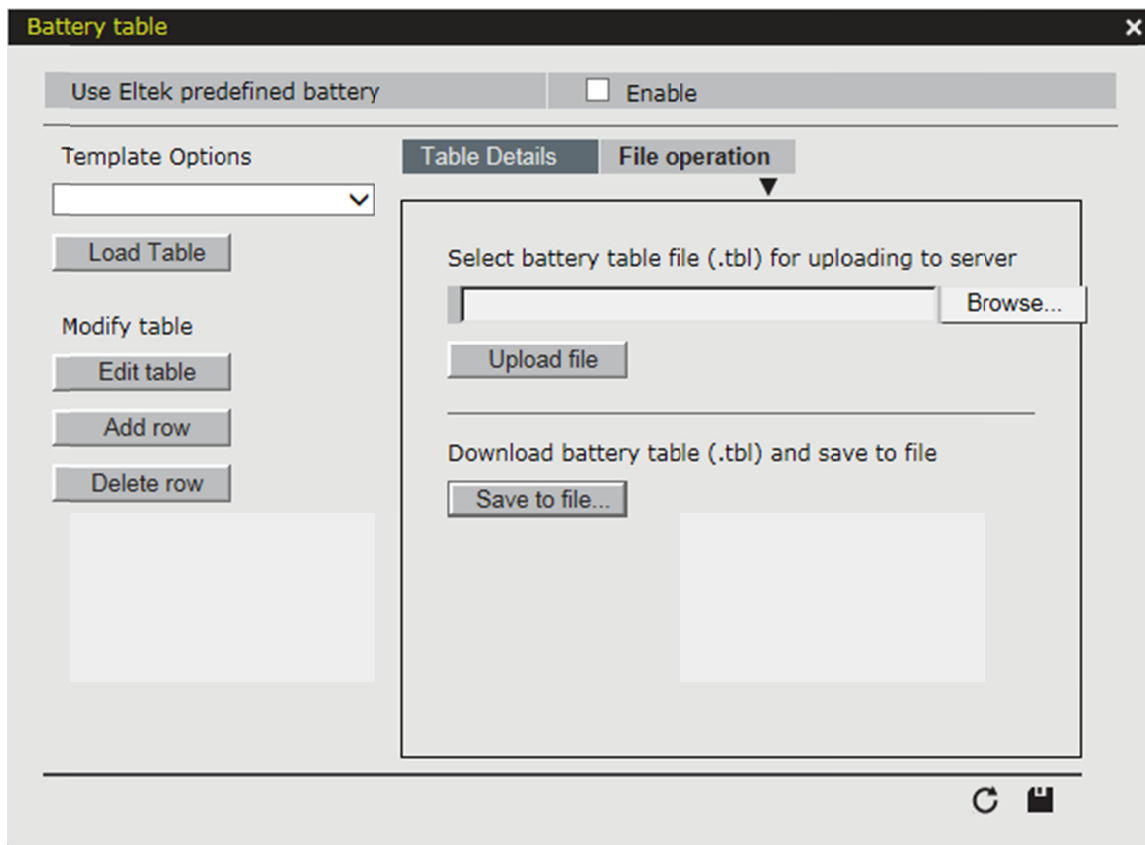
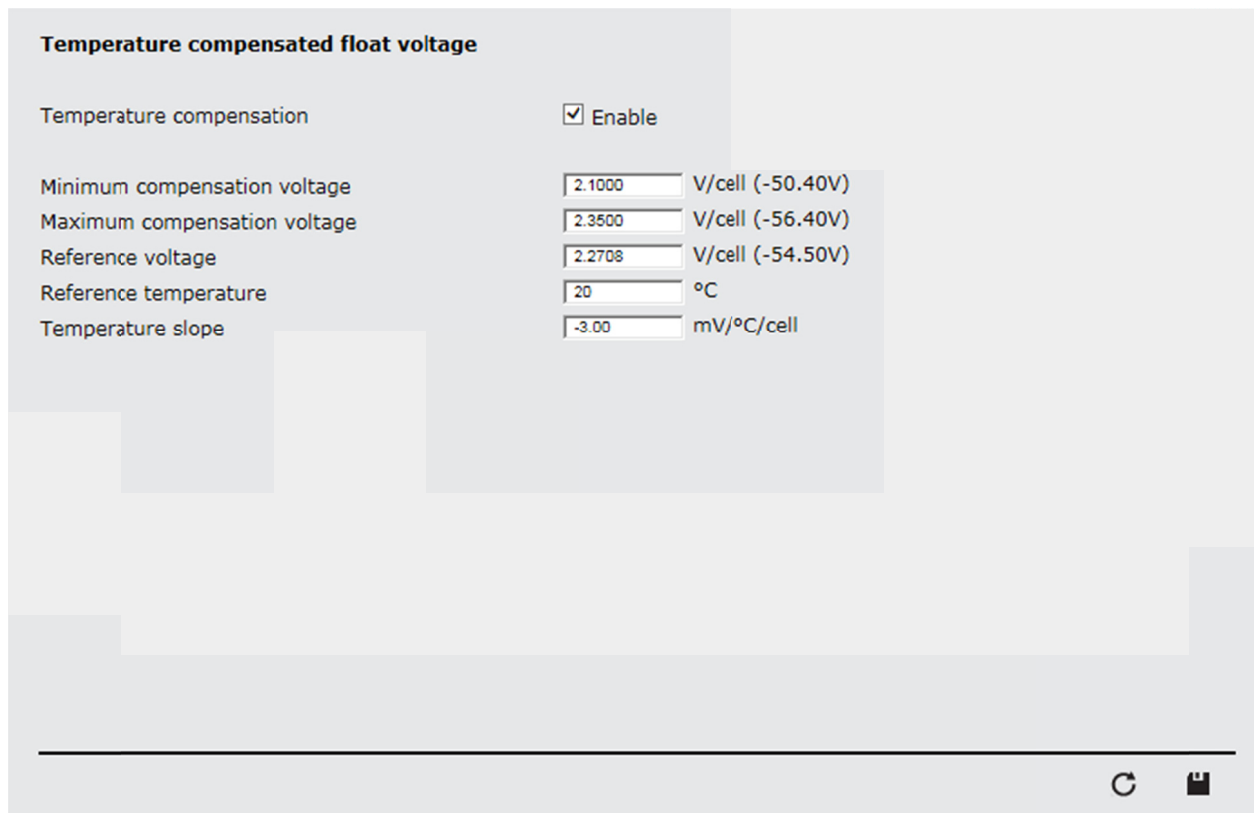


Figure 4.25 – Battery Table Page – File Operation

- **Select battery table file (.tbl) for uploading to server** – this is the section for uploading a battery table file (with extension .tbl) to the controller. Use the **Browse...** button to locate the file on the computer. Use the **Upload file** button to upload the file to the controller.
- **Download battery table (.tbl) and save to file** – this is the section for downloading the battery table from the controller to the computer. Click the **Save to file...** button to select the download location on the computer.

TempComp

The **TempComp** page is for setting battery temperature compensation.



The screenshot shows a web-based configuration interface for battery temperature compensation. The title is "Temperature compensated float voltage". Below it, there is a section for "Temperature compensation" with a checked "Enable" checkbox. Below this, there are five rows of settings, each with a text input field and a unit label:

Setting	Value	Unit
Minimum compensation voltage	2.1000	V/cell (-50.40V)
Maximum compensation voltage	2.3500	V/cell (-56.40V)
Reference voltage	2.2708	V/cell (-54.50V)
Reference temperature	20	°C
Temperature slope	-3.00	mV/°C/cell

At the bottom right of the form, there are two icons: a circular arrow (refresh) and a floppy disk (save).

Figure 4.26 – Battery – Temperature Configuration Page

- **Temperature compensation** – check this box to enable battery temperature compensation
- **Minimum compensation voltage** – minimum charging voltage per battery cell
- **Maximum compensation voltage** – maximum charging voltage per battery cell
- **Reference voltage** – charging voltage per battery cell as recommended by the battery manufacturer; this is the same field as **Reference voltage (Cell)** under **System Conf. > Power System > Power System > System Voltages**
- **Reference temperature** – temperature (in degrees Celsius) for the recommended charging voltage specified by the battery manufacture
- **Temperature slope** – compensation factor in milliVolts per degree Celsius per battery cell (mV/°C/cell) recommended by the battery manufacturer

Current Limit

The **Current Limit** page is for configuring current limits on battery charging.

The screenshot shows a web interface for configuring battery charge current limitations. The page has a light gray background with a darker gray sidebar on the left. The sidebar contains the title 'Battery charge current limitation' and a list of configuration items: 'Battery current limitation', 'String current limitation', 'Mains feed current limit', 'Generator feed current limit', 'Rectifier capacity limitation', and 'Rectifier capacity limit'. The main content area on the right contains the corresponding controls: two checkboxes for 'Enable' (both are disabled), two numeric input fields for current limits (both set to 30 A), and one checkbox for 'Enable' (disabled) and one numeric input field for a percentage limit (set to 10 %). At the bottom right of the page, there are icons for refresh and save.

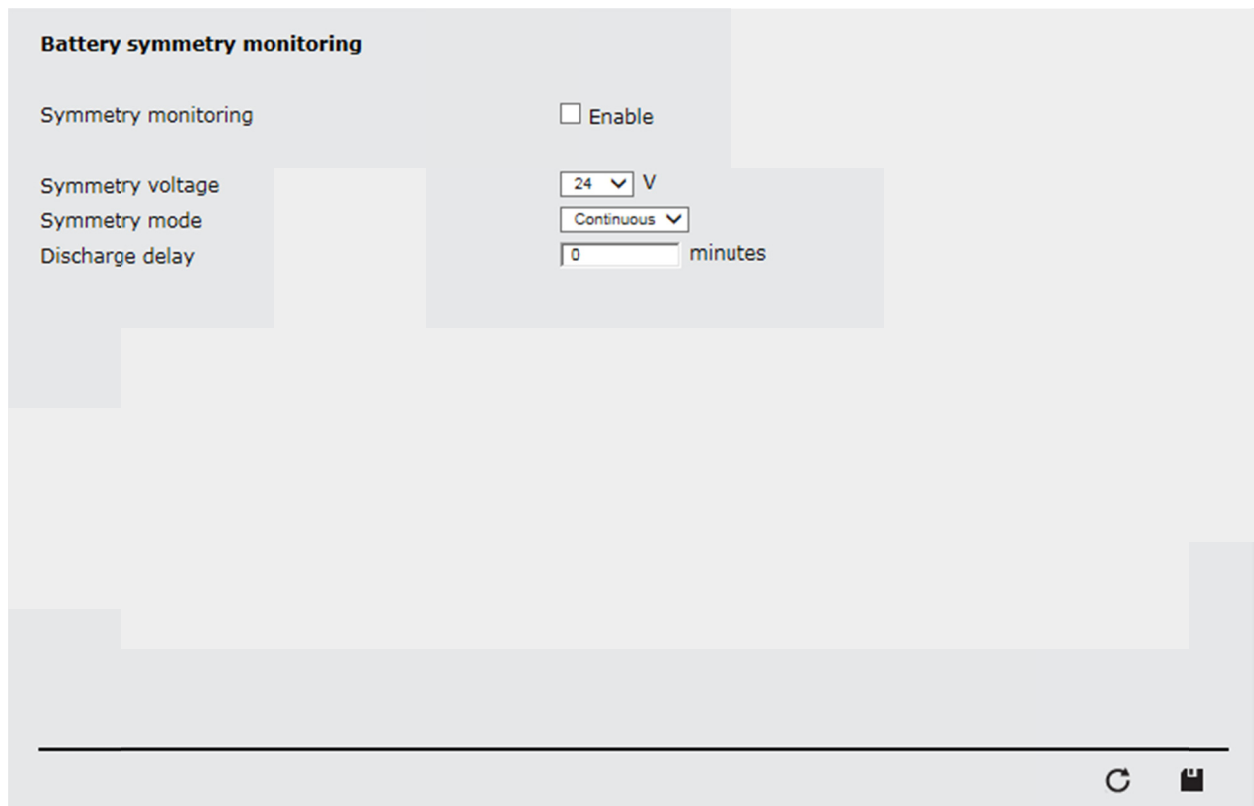
Configuration Item	Control	Value	Unit
Battery current limitation	☐ Enable		
String current limitation	☐ Enable		
Mains feed current limit		30	A
Generator feed current limit		30	A
Rectifier capacity limitation	☐ Enable		
Rectifier capacity limit		10	%

Figure 4.27 – Battery – Current Limit Page

- **Battery current limitation** – check this box to enable current limits on battery charging
NOTE: String current limitation and Rectifier capacity limitation can only be enabled if Battery current limitation is enabled first.
- **String current limitation** – check this box to enable current limit on battery strings; Battery current limitation must be enabled first
- **Mains feed current limit** – the maximum charge current (in amps) to permit for charging the batteries when the system is powered by ac utility (mains) input
- **Generator feed current limit** – the maximum charge current (in amps) to permit for charging the batteries when the system is powered by a generator
- **Rectifier capacity limitation** – check this box to enable battery charge current limits based on total rectifier capacity
- **Rectifier capacity limit** – the maximum percentage of total rectifier capacity to use for battery charge current

Symmetry

The **Symmetry** page is for configuring battery symmetry monitoring.



The screenshot shows a web interface for 'Battery symmetry monitoring'. It features a left sidebar with labels: 'Symmetry monitoring', 'Symmetry voltage', 'Symmetry mode', and 'Discharge delay'. The main area contains a checkbox for 'Enable', a dropdown menu for 'Symmetry voltage' set to '24 V', a dropdown menu for 'Symmetry mode' set to 'Continuous', and a text input for 'Discharge delay' set to '0 minutes'. At the bottom right, there are icons for refresh and save.

Figure 4.28 – Battery – Symmetry Monitoring Page

NOTE: Battery symmetry monitoring requires symmetry inputs. In addition, each symmetry monitoring input alarm monitor must be configured under the corresponding Alarm Configuration section.

- **Symmetry monitoring** – check this box to enable battery symmetry monitoring
- **Symmetry voltage** – select the symmetry voltage that the battery monitoring leads should detect, depending on the symmetry configuration employed. For example, if using 12V battery blocks, select:
 - 12V** for block configuration in a 48V string
 - 24V** for mid-point and double mid-point configurations in a 48V string
 - 12V** for mid-point or block configurations in a 24V string
- **Symmetry mode** – select the symmetry mode, which indicates when symmetry measurements are taken:
 - **Continuous** – battery symmetry measurements are taken continuously

- **Discharge** – battery symmetry measurements are taken only during battery discharge
- **Discharge delay** – time in minutes to wait after a battery discharge begins before starting battery symmetry measurements

Boost

The **Boost** page is for configuring battery boost (fast charge).

Battery boost settings

Boost voltage V/cell (-54.00V)

Current threshold A ☐ Enable

Note: The boost charging will terminate when the charge current drops below the *Current Threshold* limit

Follow-up voltage V/cell (-54.50V) ☐ Enable

Follow-up duration minutes

Temperature compensation ☐ Enable

Manual boost max duration minutes

Interval boost ☐ Enable

Max duration minutes

Next start date [yyyy-mm-dd] - -

Next start time [hh:mm] :

Interval period days

Automatic boost ☐ Enable

Max duration minutes

Charge factor %

Discharge threshold Ah

Voltage Threshold V ☐ Enable

⏮ ⏭

Figure 4.29 – Battery – Boost Settings Page

NOTE: Boost charging must be configured according to the battery manufacturer's specifications. Do not boost charge if the battery manufacturer does not recommend it.

- **Battery boost settings**
 - **Boost voltage** – field for the boost charge voltage per battery cell. Boost voltage must be higher than float (or **Reference**) voltage and lower than the over voltage shutdown (**OVS**) values, which are set on the **System Conf. > Power System > Power System > System Voltages** page.

NOTE: This is the same field as the **Boost voltage** field on the **System Voltages** page.

- **Current threshold** – optional field for setting a minimum charge current. If the battery charge current drops below the **Current threshold**, then battery boost charging is stopped. Check the **Enable** box to enable this feature.
- **Follow-up voltage** – voltage to maintain following the end of a boost charge before reverting to float (or **Reference**) voltage; check the **Enable** box to enable this feature.
- **Follow-up duration** – time in minutes to maintain **Follow-up voltage** (if enabled) before reverting to float (or **Reference**) voltage.
- **Temperature compensation** – check this box to enable temperature compensation (**TempComp**) during battery boost charging.
- **Manual boost max duration** - specify the maximum duration (in minutes) of a boost charge that is started manually

NOTE: The command to start and stop battery boost charge manually is under the **Commands** section (**Commands > Battery**)
- **Interval boost** – check this box to enable interval (or scheduled) boost charging.
 - **Max duration** – specify the maximum duration (in minutes) of an interval (or scheduled) boost charge.
 - **Next start date [yyyy-mm-dd]** – the date for the start of the next scheduled battery boost charge
 - **Next start date [hh:mm]** – the time for the start of the next scheduled battery boost charge (24-hour clock format, HH:MM)
 - **Interval period** – the number of days between scheduled battery boost charges
- **Automatic boost** – check this box to enable automatic battery boost charging based on a battery discharge threshold
 - **Max duration** – specify the maximum duration (in minutes) of an automatic boost charge.
 - **Charge factor** – percentage of the battery capacity that was discharged to recharge using boost charging. Once the specified percentage of battery discharge is boost charged, then Automatic boost charging stops. The **Charge factor** can be greater than 100% since the percentage represents only discharged amp-hours. Range: 60% - 150%
 - **Discharge threshold** – total battery capacity (in amp-hours) discharged by the batteries before Automatic boost charging starts. Range: 0 – 1000 Ah

NOTE: Entering a zero (0) disables the Automatic boost feature.

- **Voltage Threshold** – low battery voltage threshold at which Automatic boost charging starts. Check the Enable box to enable this feature.

Equalize

The **Equalize** page is for configuring battery equalize charging (rebalancing battery cells).

Battery equalize settings

Equalize voltage V/cell (-56.50V)

Current threshold A ☐ Enable

Note: The equalize charging will terminate when the charge current drops below the Current Threshold limit

Follow-up voltage V/cell (-54.50V) ☐ Enable

Follow-up duration minutes

Temperature compensation ☐ Enable

Manual equalize max duration minutes

Interval equalize ☐ Enable

Max duration minutes

Next start date [yyyy-mm-dd] - -

Next start time [hh:mm] :

Interval period days

⌂

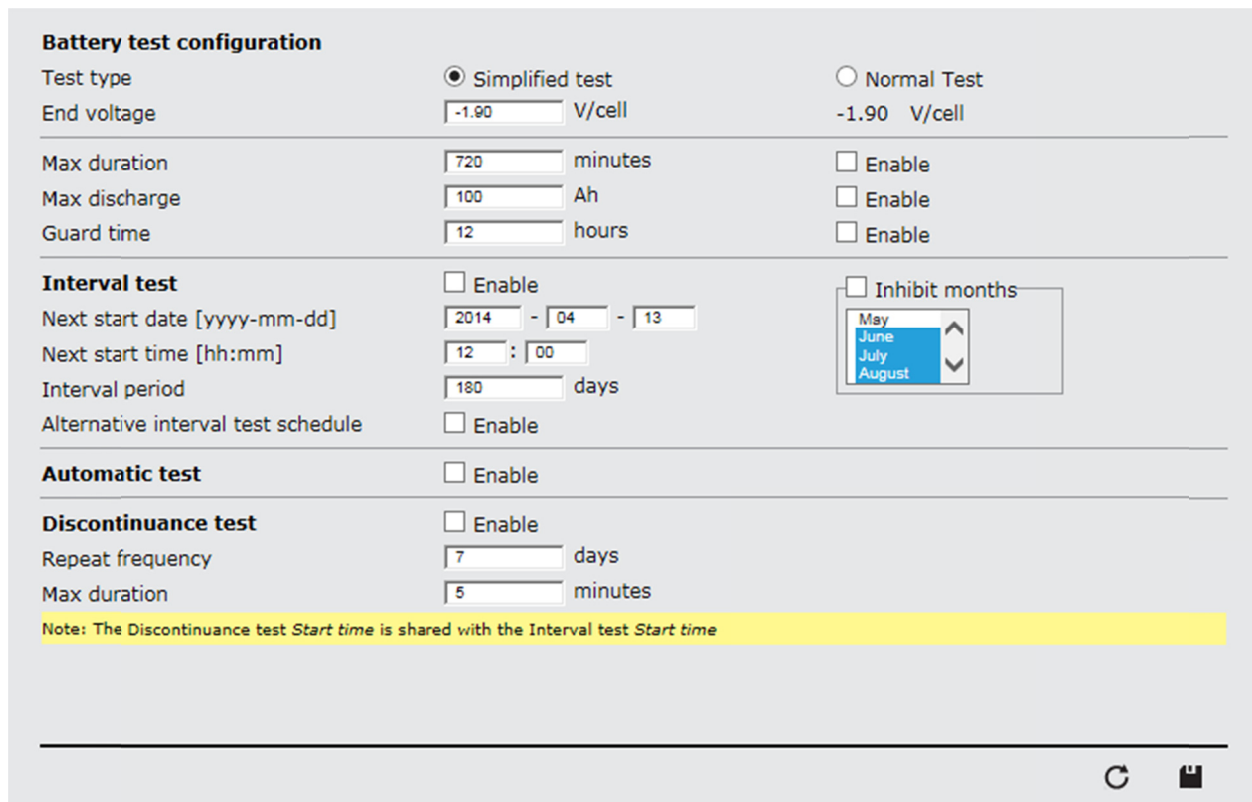
Figure 4.30 – Battery – Equalize Settings Page

- **Battery equalize settings** – parameters for battery equalize charging
 - **Equalize voltage** – field for the equalize charge voltage per battery cell. Equalize voltage must be higher than float (or **Reference**) voltage and lower than the over voltage shutdown (**OVS**) values (**System Conf.** > **Power System** > **Power System** > **System Voltages**)
 - **Current threshold** – optional field for setting a minimum charge current. If the battery charge current drops below the **Current threshold**, then battery equalize charging is stopped. Check the **Enable** box to enable this feature.

- **Follow-up voltage** – voltage to maintain following the end of an equalize charge before reverting to float (or **Reference**) voltage; check the **Enable** box to enable this feature.
 - **Follow-up duration** – time in minutes to maintain **Follow-up voltage** (if enabled) before reverting to float (or **Reference**) voltage.
 - **Temperature compensation** – check this box to enable temperature compensation (**TempComp**) during battery equalize charging.
 - **Manual boost max duration** – specify the maximum duration (in minutes) of an equalize charge that is started manually
- NOTE:** The command to start and stop battery equalize charge manually is under the **Commands** section (**Commands > Battery**)
- **Interval Equalize** – parameters for automated equalize charging
 - **Interval boost** – check this box to enable interval (or scheduled) equalize charging.
 - **Max duration** – specify the maximum duration (in minutes) of an interval (or scheduled) equalize charge.
 - **Next start date [yyyy-mm-dd]** – the date for the start of the next scheduled battery equalize charge
 - **Next start date [hh:mm]** – the time for the start of the next scheduled battery equalize charge (24-hour clock format, HH:MM)
 - **Interval period** – the number of days between scheduled battery equalize charges

Test

The **Test** page is for configuring battery discharge testing.



Battery test configuration

Test type: ☒ Simplified test ☐ Normal Test

End voltage: V/cell V/cell

Max duration: minutes ☐ Enable

Max discharge: Ah ☐ Enable

Guard time: hours ☐ Enable

Interval test ☐ Enable ☐ Inhibit months

Next start date [yyyy-mm-dd]: - -

Next start time [hh:mm]: :

Interval period: days

Alternative interval test schedule ☐ Enable

Automatic test ☐ Enable

Discontinuance test ☐ Enable

Repeat frequency: days

Max duration: minutes

Note: The Discontinuance test Start time is shared with the Interval test Start time

Refresh icon:  Save icon: 

Figure 4.31 – Battery – Test Configuration Page

- **Battery Test Configuration** – page for setting parameters for battery tests
 - **Test type** – select a either a **Simplified Test** or a **Normal Test** (see definitions in the Glossary)
 - **End voltage** – voltage per cell at which battery discharge testing is to stop
 - **Max duration** – time in minutes that a discharge test is to last. Check the **Enable** box to enable this feature.
 - **Max discharge** – maximum battery capacity in amp-hours that is to be discharged before stopping a battery discharge test. Check the **Enable** box to enable this feature.

NOTE: For the **Simple Test**, if either **Max duration** or **Max discharge** are reached before **End voltage**, then the test is registered as “good”. If **End voltage** is reached first, then the battery discharge test is registered as “bad”.

- NOTE:** Under **Normal Test**, battery discharge results are evaluated only if the test is stopped by reaching **End voltage**. Results are discarded if a test is terminated due to reaching **Max duration** or any other reasons (such as manually stopping the test).
- **Guard time** – the number of hours that a battery test should be delayed after a loss of AC input (mains) power. Check the **Enable** box to enable this feature. Range: 0 - 1000
 - **Interval test** – check the **Enable** box to enable interval (or scheduled) battery discharge testing.
 - **Next start date [yyyy-mm-dd]** – the date for the start of the next scheduled battery discharge test
 - **Next start date [hh:mm]** – the time for the start of the next scheduled battery discharge test (24-hour clock format, HH:MM)
 - **Interval period** – the number of days between scheduled battery discharge tests
 - **Alternative interval test schedule** – check the **Enable** box to invert the **Inhibit months** schedule, inhibiting tests for the months that are *not* checked in the **Inhibit months** box
 - **Inhibit months** – check the **Enable** box to enable this feature, which prevents battery discharge testing for the months that are selected in the window below it (January – December); in a Windows environment, hold the Control key of the keyboard to select multiple months. This feature is useful for areas with hot summer months, where it would be unwise to intentionally discharge batteries in elevated heat conditions.
 - **Automatic test** – check the **Enable** box to enable battery discharge testing after loss of ac input (mains) power.

NOTE: Data for an automatic test is recorded only if the **End voltage** is reached.
 - **Discontinuance test** – check this box to enable discontinuance testing, which is used to detect unbalanced battery strings

NOTE: **Discontinuance test** is an advanced battery feature that is used to detect defective or failed battery cells in unbalanced battery strings. It requires at least two battery strings and a separate shunt in each string. The **Discontinuance test** is not covered in this document.

 - **Repeat frequency** – the number days between discontinuance tests
 - **Max duration** – maximum duration (in minutes) of each discontinuance test. Range: 1-10

NOTE: The **Discontinuance test** uses the **Next start date [yyyy-mm-dd]** parameter from the **Interval test** section.

NOTE: The other battery tests have priority over the Discontinuance test.

NOTE: Discontinuance testing does not start if total battery current is less than 5% of the battery shunt value.

Control System

The **Control System** page is for configuring controller units and CAN Nodes.

Communication

The **Communication** page is for setting communication protocols for controllers that support **Modem Callback** (like the Smartpack2 Basic Industrial).

Communication	
Choose control unit	SP2 BasicInd 1
Communications port	COM1
Protocol	pComm protocol
Speed(bps)	38400
Data bits	8
Stop bits	1
Parity	0
Address	1

Figure 4.32 – Control System – Communication Page

NOTE: Eltek controllers are configured for proprietary communication protocols. Please contact Eltek if controller communications require reconfiguration.

- **Choose control unit** – drop-down list of controller units that can be configured
- **Communications port** – drop-down list of communications ports on the controller unit selected

NOTE: The following parameters are only configurable with an **admin** login.

- **Protocol** – communication protocol for the controller; the selection in the drop-down list depends on the communication ports available on the controller (e.g., RS485 and RS232)
 - **pComm** – Eltek’s proprietary communication protocol
 - **Modbus** – protocol for communication using the RS485 port of a controller unit
 - **Callback** – Eltek’s proprietary protocol developed for communication using the RS232 port of a controller unit with third-party modems
- **Speed (bps)** – bit rate of communication (bits per second)
- **Data bits** – the number of data bits in each character for the communication protocol selected
- **Stop bits** – number of stop bits at the end of each character in the communication protocol selected
- **Parity** – error-detection bits in the communication protocol selected
- **Address** – device address for the Modbus protocol only

Modem Callback

The **Modem Callback** page is for configuring a controller to dial an external or remote modem.

Figure 4.33 – Control System – Modem Callback Page (and Interval Dialup Tab)

NOTE: The **Modem Callback** feature only appears in the Web Interface if a controller that supports modem callback is connected. The Smartpack2 Basic Industrial, Smartpack S, and SmartNode units currently support modem callback. Please see the user guides for those units to determine the proper connections and equipment required.

- **Modem Callback setup**

- **Choose control unit**– select a controller module; only controllers that support **Modem Callback** are listed
- **Enable modem callback**– check this box to enable the **Modem Callback** feature
- **Advanced**– button to open a page for more advanced modem setup, especially if a modem requires some level of customization. **Admin** login is required. It is not normally necessary to reconfigure any fields on this page; it is intended for *advanced users only*! Click the **Back** button to return to the **Modem Callback** setup page.

Advanced setup

Back

Commands

Modem initialization:	AT&FE0V1Q0SC=1	Status request:	report
Dial:	ATD	Empty SMS msg box:	AT+CMGD=1,4
Hang up:	ATH	Reset modem:	
Command mode:	+++	Disable pin code:	AT+CLK="SC",0,
Pre cmd:	AT+CMGS=	Enable pin code:	AT+CLK="SC",1,
Mid cmd:	13	Enter pin code:	AT+CPIN=
Post cmd:	26	Pin status:	AT+CPIN?
List sms cmd:	AT+CMGL="REC UNREAD"	Signal strength:	AT+CSQ
Reg status:	AT+CREG?	Pick up phone:	ATA

Responses

Connect OK:	CONNECT	List sms rsp:	+CMGL:
Modem OK:	OK	Pin required:	+CPIN: SIM PIN
Ready for text:	>	Pin ready:	+CPIN: READY
Reg status:	+CREG: 0,1	Signal strength:	+CSQ:
Error rsp:	ERROR	Ring:	RING

Figure 4.34 – Modem Callback – Advanced Setup Page (admin only)

- **Phone number X**– numeric field to enter the phone number of a modem to dial
- **Interval dialup**– check this box to enable dialing of the phone number at regular intervals (as defined under the **Interval Dialup** tab at the bottom of the page)
- **Data**– check this radio button to enable data calling (for a data modem) instead of SMS messaging
- **SMS**– check this radio button to enable SMS messaging (for a GSM modem) instead of data calling

NOTE: **Data** and **SMS** are mutually exclusive options.

NOTE: **SMS** is only available if a GSM modem is enabled under the **GSM** tab at the bottom of the page.

- **Interval Dialup (tab)** – tab to configure interval dialing as a “heartbeat” signal to the network monitoring location

Figure 4.35 – Modem Callback – Interval Dialup Tab

NOTE: Phone numbers to be used for **Interval Dialup** must have their Interval dialup box checked.

- **Enable interval dialup**– check this box to enable the **Interval Dialup** feature
- **Start time**– enter the start time for the initial **Interval Dialup** call; the first field is for the hour (24-hour clock), and the second field is for the minute
- **Interval (hours)**– enter the number of hours to pass between each interval dialup. The maximum value is 8760 (one year).
- **Site message**– free-form field for a message to send with each interval call. The full interval message also includes the **Site Location** name and timestamp.

NOTE: The format for the interval dialup message is as follows:

[Site location]

[Date and time]

[Site message]

- **Alarm Dialup (tab)** – tab to configure dialing modem numbers when an alarm is triggered

The screenshot shows the 'Alarm Dialup' configuration tab. At the top, there are three tabs: 'Interval Dialup', 'Alarm Dialup' (selected), and 'GSM'. Below the tabs, there are four configuration items:

- Enable alarm dialup**: A checkbox that is currently unchecked.
- Number of dial attempts**: A text input field containing the value '3'.
- Dial interval(sec)**: A text input field containing the value '45'.
- Alarm check interval(min)**: A text input field containing the value '1'.

At the bottom right of the form, there are two icons: a circular arrow (refresh) and a floppy disk (save).

4.36 – Modem Callback – Alarm Dialup Tab

- **Enable alarm dialup** – check this box to enable the **Alarm Dialup** feature
- **Number of dial attempts** – number of times to dial the phone number if connection fails
- **Dial interval (sec)** – wait time after dialing a phone number. If there is no connection established, then the next number is dialed (if applicable)
- **Alarm check interval (min)** – time to wait before checking for a system alarm. Longer polling times are recommended to avoid rejecting incoming calls.

NOTE: Alarm groups must be mapped to the phone channels of the controller in order to execute the Alarm Dialup feature. The phone channels are found at the following location:

Alarm Conf. > Power System > Outputs > [Select Unit]

Select the appropriate controller unit to see the phone channels.

- **GSM (tab)** – tab for configuring dialing GSM modems, thereby enabling SMS messaging

The screenshot shows the 'GSM' configuration tab. At the top, there are three tabs: 'Interval Dialup', 'Alarm Dialup', and 'GSM' (selected). Below the tabs, there are two main sections:

- Sim facilities**:
 - Enable GSM**: A checkbox that is currently unchecked.
 - SIM pin code**: A text input field with a 'Send pin code' button next to it.
 - Enable SIM lock**: A checkbox that is currently unchecked, with the text '(Send pin code first)' next to it.
- Network status**:
 - Signal strength**: A text input field followed by a progress bar and the text '0%'.
 - Network status**: A text input field.

At the bottom right of the form, there are two icons: a circular arrow (refresh) and a floppy disk (save).

4.37 – Modem Callback – GSM Tab

- **Enable GSM** – check this box to enable the **GSM** modem feature

NOTE: If the modem has **SIM lock** enabled, do not enable the GSM feature until after sending the **SIM PIN code** (REFERENCE BELOW)

- **Sim facilities** – box for configuring SIM security for the GSM modem
- **SIM pin code** – field for the SIM PIN code of the GSM modem
- **Send pin code** – button to send the **SIM PIN code** to the modem to enable communication between the devices

NOTE: If the modem's SIM card has SIM lock *enabled*, then the PIN must be sent before enabling GSM functionality; otherwise the modem may lock, preventing further communication until the modem is unlocked (which cannot be done from the controller).

- **Enable SIM lock** – command to enable or disable the SIM lock feature of the GSM modem. The PIN code must be sent first in order to change the SIM lock status.
- **Network status** – box for indicating the signal strength of the radio link and status of the network
- **Signal strength** – indicates the strength of the radio link
- **Network status** – indicates the network status, including the possible cause of any communication problems

Outdoor

The **Outdoor** page is for configuring outdoor cabinet fan monitoring through an I/O Monitor Type 1 or Type 3. This page only appears when an I/O Monitor Type 1 or Type 3 is connected.

Outdoor settings I/O unit 3 ▼

Fan control 1

Inhibit "SpeedDev" when Relay 5 is active ☐ Enable

Configuration Calibration Pressure Humidity

Fan configuration

	Temperature	Speed
Low point	20 °Celsius	50 %
High point	70 °Celsius	50 %
Max fan speed	100 °Celsius	☐ Enable
Temperature input	Outdoor temp 1 ▼	

Fan control 2

Inhibit "SpeedDev" when Relay 6 is active ☐ Enable

Configuration Calibration Pressure Humidity

Fan configuration

	Temperature	Speed
Low point	20 °Celsius	50 %
High point	70 °Celsius	50 %
Max fan speed	100 °Celsius	☐ Enable
Temperature input	Outdoor temp 1 ▼	




4.38 - Control Systems - Outdoor Settings Page and Fan Configuration Tab

- **Outdoor settings** – select the I/O Monitor (Type 1 or Type 3) to configure (I/O unit X)
- **Fan control X** (1 and 2) – fan control configuration panes for up to two connected outdoor cabinet fans
 - **Inhibit “SpeedDev” when Relay X is active** – check this box to inhibit the speed deviation alarm monitor (**SpeedDev**) when the **FanControl X.Y** output relay (output relay 5 or 6) is activated
- **Configuration** – fan configuration tab
 - **Fan configuration**
 - **Temperature** – column for temperature values for the Low point and High point parameters
 - **Speed** – percentage of the fan’s operational speed for the temperature points specified
 - **Low point** – low temperature fan speed setting
 - **High point** – high temperature fan speed setting

NOTE: By default, the fan speed for both temperature points is set at 50%. This feature uses the high and low points to create a linear slope to adjust fan speed as temperatures increase and decrease.

- **Max fan speed** – temperature in degrees Celsius at which the fan should reach maximum speed. Check the Enable box to enable this feature.
- **Temperature input** – select the temperature input to use for this fan's speed control parameters
- **Calibration** – fan calibration tab; this function permits changing the default voltage-to-speed relationship used to control fan speed. By default, the low calibration point is configured to zero percent speed (0%) being zero volts (0V); high calibration point is configured to 100 percent speed (100%) being ten volts (10V).
In order to convert the fan speed (tachometer) inputs to the correct percentage speed, the inputs must be configured with the number of pulses per revolution (ppr) and the maximum fan speed (rpm), using the Configuration tab of the alarm monitor input.

Figure 4.39 – Fan Control – Calibration Tab

- **Low calibration point** (default: 0V = 0%)
 - **Speed[%]** – field to enter a percentage for speed control; click the **Enable** button in order to edit the field. Default is zero (0%).
 - **Voltage[V]** – field to enter a voltage value for speed control; click the **Apply** button to apply the voltage value entered. Default is zero volts (0V).

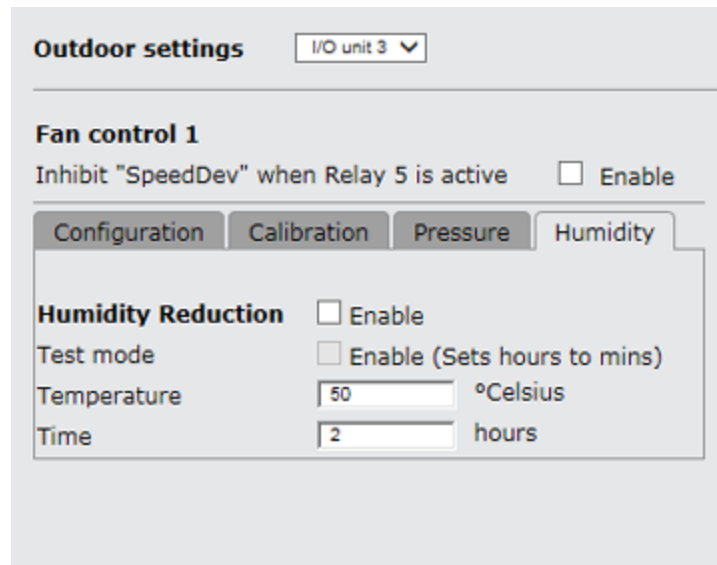
- **High calibration point** (default: 10V = 100%)
 - **Speed[%]** – field to enter a percentage for speed control; click the **Enable** button in order to edit the field. Default is 100%.
 - **Voltage[V]** – field to enter a voltage value for speed control; click the **Apply** button to apply the voltage value entered. Default is ten volts (10V).
- **Pressure** – internal pressure testing for outdoor cabinets to determine whether or not fan filters need to be replaced. During the test, the I/O Monitor increasing fan speed to 100% for ten seconds. If the pressure sensor detects high pressure, an alarm is triggered.

REQUIREMENTS: A pressure sensor configured to send an alarm signal above a certain air pressure threshold (in Pascals) is needed; it must be connected to a programmable input of an I/O Monitor.

The screenshot shows a software interface for 'Outdoor settings'. At the top, there's a dropdown for 'I/O unit 3'. Below it, the 'Fan control 1' section has a checkbox for 'Inhibit "SpeedDev" when Relay 5 is active' which is unchecked, and an 'Enable' button. There are four tabs: 'Configuration', 'Calibration', 'Pressure' (which is selected), and 'Humidity'. Under the 'Pressure' tab, there's a section for 'Interval pressure Test'. It includes an 'Enable' checkbox (unchecked), a 'Next start date' field with the value '2014-01-09' and a calendar icon, a 'Next start time' field with the value '00:00', and an 'Interval period' field with the value '100' and the unit 'days'.

Figure 4.40 – Fan Control – Pressure Tab

- **Interval pressure Test** – check the **Enable** box to enable a periodic pressure test
 - **Next start date** – enter the date for the next test to start (format YYYY-MM-DD); or use the calendar button next to the field
 - **Next start time** – enter the time in (hours and minutes; HH:MM, 24-hour clock format) to begin the pressure test
 - **Interval period** – number of days between each pressure test
- **Humidity** – humidity reduction control; requires a temperature sensor, humidity sensor, and heater (on I/O Monitor alarm relay output 1)



Outdoor settings I/O unit 3 ▼

Fan control 1

Inhibit "SpeedDev" when Relay 5 is active ☐ Enable

Configuration Calibration Pressure **Humidity**

Humidity Reduction ☐ Enable

Test mode ☐ Enable (Sets hours to mins)

Temperature °Celsius

Time hours

Figure 4.41 – Fan Control – Humidity Tab

- **Humidity Reduction** – check the **Enable** box to enable humidity reduction control
 - **Test mode** – check the **Enable** box to enable test mode, which sets the hours specified in the **Time** field to minutes (requires **admin** login); this accelerates the normal operation to test the function of the humidity control
 - **Temperature** – internal cabinet temperature (in degrees Celsius) at which humidity control should terminate
 - **Time** – maximum run time (in hours) of the humidity reduction control

Current Monitor

The **Current Monitor** page is for configuring Eltek Load Monitors, which have eight configurable inputs for current monitoring. This page only appears if Eltek Load Monitors are connected.

Unit to configure	Monitor type	System type	System index	Unit index	Sub system	Unit name	Control unit index
CurrMonitor 1	Std Loadmon Load CurMon Rect CurMon DDC CurMon Solar CurMon Wind CurMon FuelC CurMon	LoadDistribution(3)	1	1	0	LoadPrimary 1	49

Note:
1. When the current monitor is reconfigured, all energy logs will be reset on the reconfigured unit.
2. When changes are saved, a automatic refresh is performed to ensure correct display of data.

Figure 4.42 – Current Monitor Configuration Page

- **Unit to configure** – list of Load Monitors detected by the system controller (not configurable)

NOTE: Monitors of the same type can appear on this list with different unit names. For example, Eltek Load Monitors can appear as **CurrMonitor X** and **Load Monitor X**. The name listed in this column is the same as that of the **Control Units Summary** pane of the **Control System** button (on the **Home** page).

- **Monitor type** – drop-down list of current monitor types:
 - **StdLoadmon** – Standard Load Monitor, intended for load branch circuits where the current only needs to be monitored and not used for any calculations (like total load current); this is useful for fuse and circuit breaker shunts

A Load Monitor configured as **StdLoadmon** appears as **LoadPrimary X** at **Alarm Conf. > Power System > Load**
 - **Load CurMon** – Load Current Monitor, intended for load shunts that need to be summed for total load current calculations; this is useful for shunts located in load bays or other major distribution points where load current branches off of a main power bus.

A Load Monitor configured as **Load CurMon** appears as **LoadCurMon X** at **Alarm Conf. > Power System > Load**

- **Rect CurMon** – Rectifier Current Monitor, intended for monitoring shunts on the output of non-Eltek rectifier bays or ferroresonant rectifiers. Eltek rectifiers communicate output current directly to the controller and do not need auxiliary shunts.

A Load Monitor configured as **RectCurMon** appears as **RectCurMon X** at **Alarm Conf. > Power System > Rectifiers**

- **DCDC CurMon** – Dc-to-dc converter current monitor, intended for monitoring current from non-Eltek dc-to-dc converters. Eltek dc-to-dc converters communicate output current directly to the controller and do not need auxiliary monitoring.

A Load Monitor configured as **DCDC CurMon** appears as **DCDCCurMon X** at **Alarm Conf. > Power System > DcDc Converter**

- **Solar CurMon** – Solar charger current monitor, intended for monitoring current from non-Eltek solar chargers. Eltek solar chargers communicate output current directly to the controller and do not need auxiliary monitoring.

A Load Monitor configured as **Solar CurMon** appears as **Solar CurMon X** at **Alarm Conf. > Power System > Solar Charger**

- **Wind CurMon** – Wind charger current monitor

A Load Monitor configured as **Wind CurMon** appears as **Wind CurMon X** at **Alarm Conf. > Power System > Wind Charger**

- **FuelC CurMon** – Fuel cell charger current monitor

A Load Monitor configured as **FuelCCurMon** appears as **FuelCCurMon X** at **Alarm Conf. > Power System > FuelCell Charger**

- **System type** – unit classification data (hardcoded)
- **System index** – controller data; do not modify
- **Unit index** – controller data; do not modify
- **Sub system** – controller data; do not modify
- **Unit name** – free-form field where the current monitor can be renamed. The name entered here affects how the monitor appears under the respective Alarm Configuration section (**Alarm Conf. > Load**)
- **Control unit index** – the unit's index number relative to all other units on the CAN bus. The index range for Load Monitors is 49 – 62.

Flexi Monitor

The **Flexi Monitor** page is for configuring Eltek Flexi Monitors, which have 16 configurable input channels for monitoring a variety of inputs, including current, voltage, temperature, and relays.

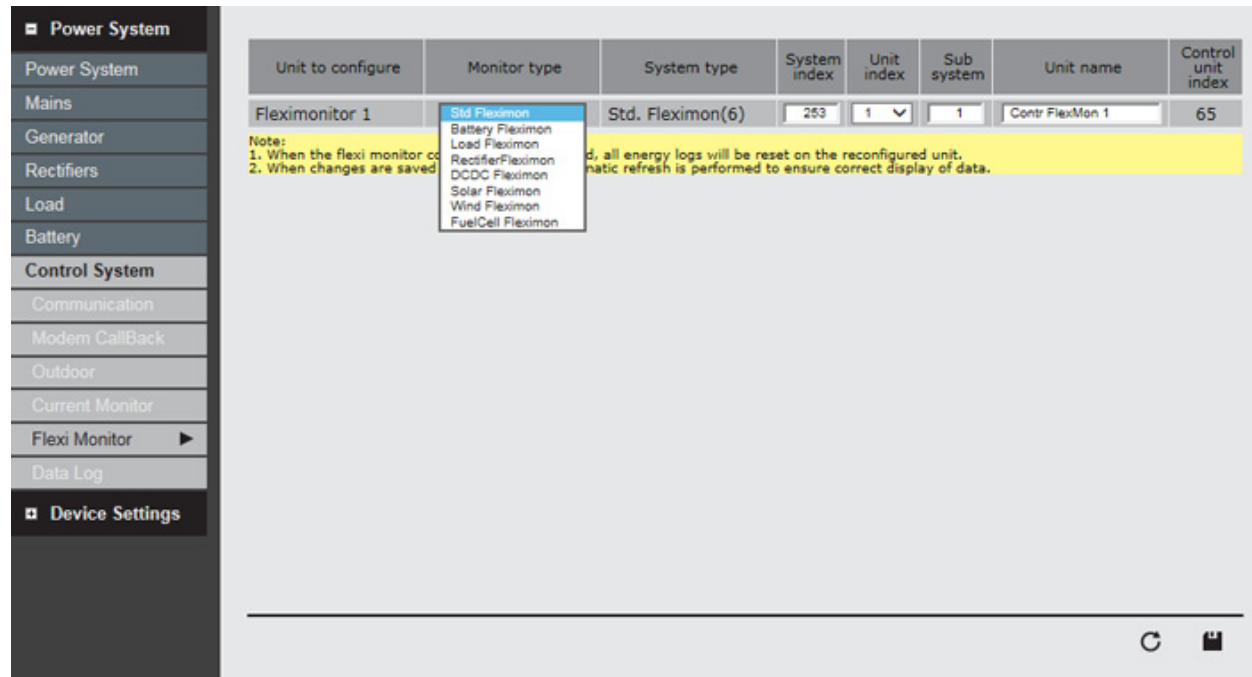


Figure 4.43 – Flexi Monitor Configuration Page

- **Unit to configure** – list of Flexi Monitors detected by the system controller (not configurable)
- **Monitor type** – drop-down list of current monitor types:
 - **StdFleximon** – Standard Flexi Monitor, intended for load branch circuits where the current only needs to be monitored and not used for any calculations (like total load current); this is useful for fuse and circuit breaker shunts
 A Flexi Monitor configured as **StdFleximon** appears as **ContrFlexMon X** at **Alarm Conf. > Power System > Inputs**
 - NOTE:** Flexi Monitors set for StdFleximon (load branch current) monitoring must have the first IDs in the CAN bus chain.
 - **BatteryFleximon** – Battery Flexi Monitor, intended for battery shunts that are to be summed for total load current calculations
 A Flexi Monitor configured as **BatteryFleximon** appears as **BattFlexMon X** at **Alarm Conf. > Power System > Battery**

- **Load Fleximon** – Load Flexi Monitor, intended for load shunts that need to be summed for total load current calculations; this is useful for shunts located in load bays or other major distribution points where load current branches off of a main power bus.

A Flexi Monitor configured as **LoadFleximon** appears as **Load FlexMon X** at **Alarm Conf. > Power System > Load**

- **RectFleximon** – Rectifier Flexi Monitor, intended for monitoring shunts on the output of non-Eltek rectifier bays or ferroresonant rectifiers. Eltek rectifiers communicate output current directly to the controller and do not need auxiliary shunts.

A Flexi Monitor configured as **RectFleximon** appears as **RectFlexMon X** at **Alarm Conf. > Power System > Rectifiers**

- **DCDC Fleximon** – Dc-to-dc converter current monitor, intended for monitoring current from non-Eltek dc-to-dc converters. Eltek dc-to-dc converters communicate output current directly to the controller and do not need auxiliary monitoring.

A Flexi Monitor configured as **DCDCFleximon** appears as **DCDC FlexMon X** at **Alarm Conf. > Power System > DcDc Converter**

- **Solar Fleximon** – Solar charger current monitor, intended for monitoring current from non-Eltek solar chargers. Eltek solar chargers communicate output current directly to the controller and do not need auxiliary monitoring.

A Flexi Monitor configured as **SolarFleximon** appears as **Solar FlexMon X** at **Alarm Conf. > Power System > Solar Charger**

- **Wind Fleximon** – Wind charger current monitor

A Flexi Monitor configured as **Wind Fleximon** appears as **Wind FlexMon X** at **Alarm Conf. > Power System > Wind Charger**

- **FuelCFleximon** – Fuel cell charger current monitor

A Flexi Monitor configured as **FuelCFleximon** appears as **FuelCFlexMon X** at **Alarm Conf. > Power System > FuelCell Charger**

- **System type** – unit classification data (hardcoded)
- **System index** – controller data; do not modify
- **Unit index** – controller data; do not modify
- **Sub system** – controller data; do not modify

- **Unit name** – free-form field where the Flexi Monitor can be renamed. The name entered here affects how the monitor appears under Alarm Conf. > Load
- **Control unit index** – the unit's index number relative to all other units on the CAN bus. The index range for Flexi Monitors is 65 – 78.

Data Log

The **Data Log** page is for configuring data logging parameters for supported controller and monitoring units.

The screenshot displays the 'Data Log Configuration Page' within the SMARTPACK2 software interface. The top navigation bar includes icons for Home, System Conf., Alarm Conf., Logs, Commands, Statistics, Help, and Logout, along with the SMARTPACK2 logo and version information (Sw#: 405006.009 Rev: 2.4). The left sidebar shows a tree view with categories like Power System, Control System, and Device Settings. The main content area is titled 'Datalog setup' and features an 'Advanced' button. The 'Select Unit' dropdown is set to 'SP2 Master 1'. Below this, there are input fields for 'Normal log interval' (30 Minutes) and 'Critical log interval' (10 Minutes). Further down, there are fields for 'Number of log elements' (10), and checkboxes for 'Enable average values' and 'Enable minor/major On-event triggered', both of which are currently unchecked. At the bottom, there is a field for 'Log if any value changes more than' set to 0%.

Figure 4.44 – Data Log Configuration Page

NOTE: Changing parameters on this page for the primary controller (e.g., Smartpack2 Master or Smartpack S) affects how data points are displayed on the **System History** graph of the **Home** page.

- **Select Unit** – drop-down list of controller and monitoring units connected to the system that support data logging
- **Normal log interval** – time interval (in minutes) between system data capture when the controller is in Normal condition (i.e., not in *critical condition*)
- **Critical log interval** – time interval (in minutes) between system data capture when the controller is in Critical condition (which indicates that there is low ac current (mains) and/or low battery current)
- **Number of log elements** – Sets the number of system monitors. This will affect the system monitors of the home page (see “System Monitors

Window” on page 81) and datalogs (see “Data Log” on page 229). The system monitors can be chosen in the **Advanced** button.

- **Enable average values** – check the **Enable** box to enable averaging, which provides an average value for each 10 minute interval rather than an instantaneous reading
- **Enable minor/major On-event triggered** – check the **Enable** box to enable event-triggered logging, where data is captured when minor and major alarm events occur
- **Log if any value changes more than** – percentage change of any value to trigger data capture; enter zero (0) to disable this feature
- **Advanced** – Click the **Advanced** button in the upper right corner, to access the **Monitor setup** options. Drag and drop monitors from **Available monitors** to **Configured monitors**, or vice-versa. The number of configured monitors is limited to the number entered in the **Number of log elements** on **Datalog setup** page (see Figure 4.44).

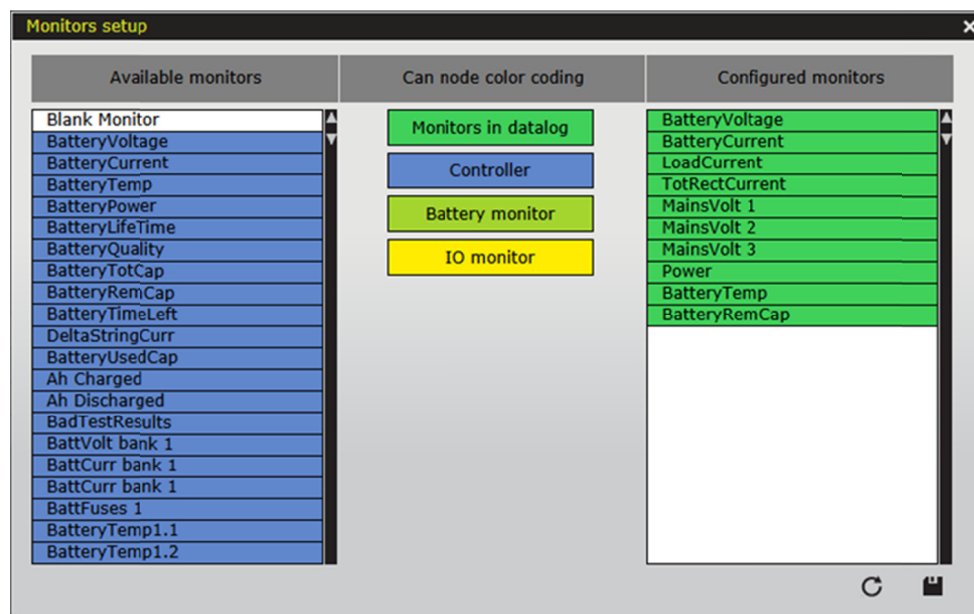


Figure 4.45 – Monitor setup options

License Keys

The **License Keys** page is intended for future implementation, where extended or specialized controller features will be made accessible by license from Eltek; admin permissions are required to view and modify this page.

Device Settings

The **Device Settings** section contains configurable parameters for the controller device itself—particularly time, network, and user account settings.

Time Settings

The **Time Settings** page is for manually configuring the controller's date and time clocks.

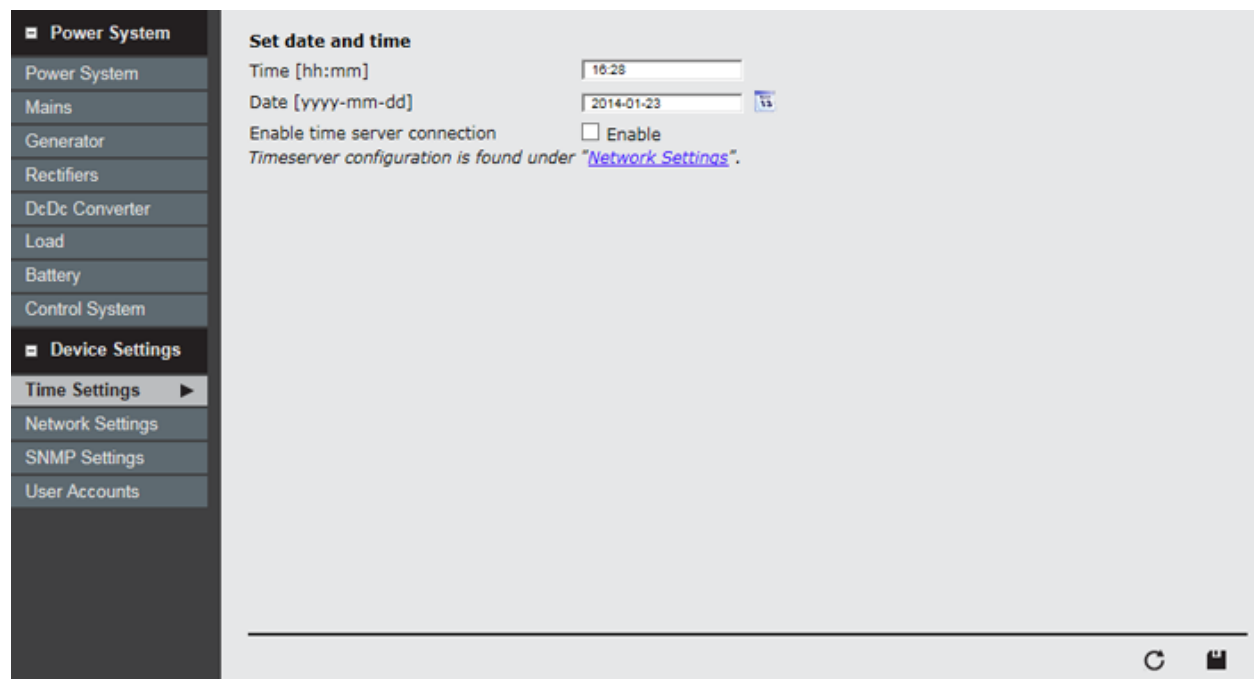


Figure 4.46 – Time Settings Configuration Page

- **Time [hh:mm]** – current time, 24-hour clock format
- **Date [yyyy-mm-dd]** – current date
- **Enable time server connection** – Check the **Enable** box to enable automatic time updates from a local network server; this box is the same as the **Enable** time server connection box on the **Timeserver** page

NOTE: Further configuration is required under the **Timeserver** page under **Network Settings** (a link is provided on the **Time Settings** page)

Network Settings

The **Network Settings** page is for setting controller parameters for use on a computer network.

NOTE: Network settings require specific information about the network to which the controller is to be connected. The local network/systems administrator should be consulted for the required information.

NOTE: Admin login is required to make any changes to **Network Settings**.

TCP/IP

The **TCP/IP** page is for configuring the controller's TCP/IP settings.

TCP/IP Setup

You can get IP settings assigned automatically (DHCP) if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

DHCP ☐ Enable 172.16.62.100

Manual settings

Agent IP Address

Network Subnet Mask

Default Gateway

DNS Server

Device Name

Force SSL protocol ☒ Enable

Secure FTP server ☐ Enable FTPS with SSL/TLS Implicit encryption on port 990

WARNING! Changing any of these parameters will reboot the controller.

Figure 4.47 – TCP/IP Setup Page (DHCP Enabled)

- **TCP/IP Setup**

- **DHCP** – check the Enable box to enable automatic IP configuration by the local network (if the network supports DHCP). If not enabled, then IP settings must be configured manually.

NOTE: By default, Eltek controllers are shipped with a static IP address of 192.168.10.20.

- **Manual settings**

NOTE: Manual configuration of the controller's IP settings must be appropriate for the network to which it is connected. The local network/systems administrator should be consulted for correct configuration.

- **Agent IP Address** – IPv4 address to assign to the controller
- **Network Subnet Mask** – field for the subnet mask

- **Default Gateway** – field for the default gateway (if required)
- **DNS Server** – field to specify a DNS server
- **Device Name** – free-form field to name the controller (this name appears in the Name field of the controller when it appears in the Eltek Network Utility)

NOTE: This is *different* from the **Site** field on the **System Info** page.

- **Force SSL protocol** – check the **Enable** box to force connection through Secure Sockets Layer (SSL) protocol; if left unchecked, SSL connection is an option on the **Login** page

CAUTION: Checking the **Enable** box and saving the change immediately ends the current session and returns the web interface to the **Login** page.

NOTE: To fully implement the **Force SSL protocol** option, it is necessary to login once using the SSL connection. To do so, click on the **Switch to SSL** link, and then log into the web interface by clicking on the **SSL Login** link. Only afterward will the **Switch to non-SSL** link disappear from the **SSL Login** page, requiring the use of the **SSL Login** link.

- **Secure FTP server** – check the **Enable** box to encrypt FTP communication.

eMail

The **eMail** Page is for configuring the controller to send e-mail notifications to up to two e-mail addresses using a local SMTP (Simple Mail Transfer Protocol) network server.

Figure 4.48 – E-mail Configuration Page

- **Mail Server Setup** – setup section for SMTP parameters
 - **SMTP User Name** – field for a user name to access the mail server
 - **SMTP Password** – field for a password to access the mail server
 - NOTE:** **Alarm** messages from the controller do not currently include the **User Name** and **Password**; therefore, if the SMTP server requires authentication, it may block **Alarm** messages from being delivered.
 - **SMTP Server ip-Address** – IP address of the SMTP server to be used for e-mail transmission
 - TIP:** Ping the network to find the email server's IP address.
 - **Sender e-mail Address** – e-mail address for the controller to use as a sender (can be fictitious)
- **Receiver Mail X (1 & 2)**
 - **Receiver E-mail Address X** – e-mail address that are to receive alarm and interval e-mail messages from the controller
 - **Receive alarms** – check this box to send alarm notices to the receiver e-mail address
 - **Receive interval mail** – check this box to send interval messages to the receiver e-mail address
- **Alarm E-Mail Settings**

NOTE: Alarm messages from the controller do not currently include the **User Name** and **Password**; therefore, if the SMTP server requires authentication, it may block **Alarm** messages from being delivered.

- **Alarm mail Subject** – subject line text for alarm e-mail messages sent by the controller
- **Send Off Alarm** – check this box to enable sending a notice when an alarm turns off (is no longer active)

- **Interval E-Mail Settings**

- **Interval Subject** – subject line text for interval e-mail messages sent by the controller
- **Interval Attachment** – name for the data file attached to the interval e-mail address

NOTE: The data file sent as an attachment is a comma-separated values (CSV) file with semi-colons as delimiters.

- **Interval period (min)** – time period (in minutes) between interval e-mail messages
- **Interval start time** – time of day to begin sending interval e-mail messages (24-hour format, HH:MM)

Timeserver

The **Timeserver** page is for setting up a connection to a time server (NTP server).

The screenshot shows the 'Timeserver' configuration page. On the left is a sidebar menu with categories: 'Power System' (containing Power System, Mains, Generator, Rectifiers, DCDC, Load, Battery, Control System) and 'Device Settings' (containing Time Settings, Network Settings, TCP/IP, eMail, Timeserver, Online Help, SNMP Settings, User Accounts). The 'Timeserver' item is selected and highlighted with a right-pointing arrow. The main content area is titled 'Time Server' and contains the following settings: 'Enable time server connection' with an unchecked 'Enable' checkbox; 'Clock synchronization Time-of-day' with a numeric input field showing '0' followed by ':00'; 'UTC Time zone Offset (+-12h)' with a numeric input field showing '0'; and 'NTP Server IP Address (xxx.xxx.xxx.xxx)' with a text input field. Below these fields is a 'Test connection' button. At the bottom right of the main area are two small icons: a circular arrow and a document icon.

Figure 4.49 – Timeserver Configuration Page

- **Enable time server connection** – Check the **Enable** box to enable automatic time updates from a local network server; this box is the same as the **Enable** time server connection box on the **Time Settings** page
- **Clock synchronization Time-of-day** – hour of the day to synchronize with the time server (24-hour clock format, HH)
- **UTC Time zone Offset (+-12h)** – time zone setting, using UTC offset (whole number of hours)
- **NTP Server IP Address (xxx.xxx.xxx.xxx)** – IP address of NTP (Network Time Protocol) server to use
- **Test connection** – button to test connectivity with the NTP server; the result appears to the right of the button

Online Help

The Online Help page is provided to update the location of the online help file (from Eltek).

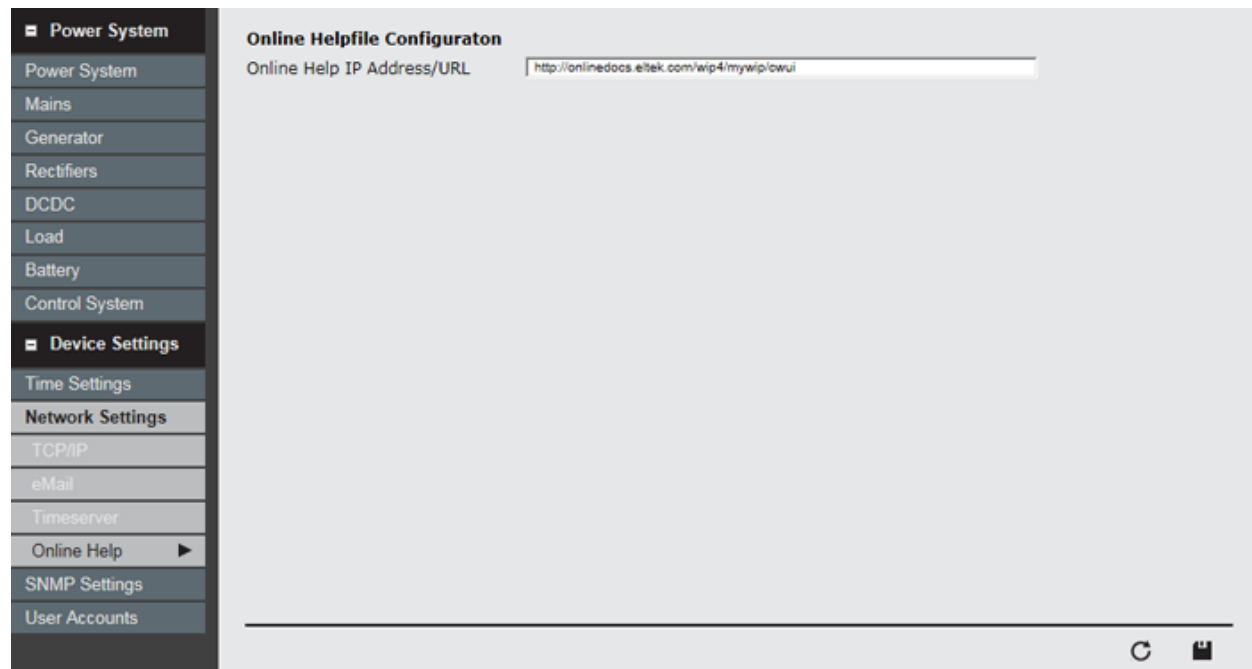


Figure 4.50 – Online Help Configuration Page

CAUTION: Do not change this field without consulting Eltek first. This field directly affects the link for the **Help** button in the top menu bar.

- **Online Help IP Address/URL** – field for the location of Eltek’s Online Help File

SNMP Settings

The **SNMP Settings** page is for configuring the controller for interface with a network that utilizes Simple Network Management Protocol (SNMP).

NOTE: SNMP settings are for establishing the Eltek controller as an object on an existing network. Any other details regarding the network, NMS, or SNMP configuration for the installation site must be obtained from local network/systems administration (IT) and associated documentation. This includes the SNMP version, network settings, security protocols, and community strings.

NOTE: Admin login is required to make any changes to **SNMP Settings**.

Configurations

The **Configuration** page provides general parameters for use with SNMP.

Power System

- Power System
- Mains
- Generator
- Rectifiers
- DCDC
- Load
- Battery
- Control System

Device Settings

- Time Settings
- Network Settings
- SNMP Settings**
 - Configuration ▶
 - User Accounts

General SNMP Configuration

Inhibit Traps ☐ Enable

Send Off Traps ☐ Enable

Trap Repeat Rate(minutes) Set to 0 to disable

Heartbeat Trap Repeat Rate(minutes) Set to 0 to disable

SNMP v3 Configuration

☐ Web-based configuration ☒ SNMP-based configuration

NOTE:
 -"Web-based configuration" disables configuration through SNMP by removing write access of admin user to the SNMP MIBs.
 -"SNMP-based configuration" disables configuration through web interface, resets SNMPv3 configuration and reboots the controller.

Reset SNMP v3 default configurations

Figure 4.51 – SNMP Settings Page (SNMP-based configuration)

- **General SNMP Configuration**

- **Inhibit Traps** – This feature is used in conjunction with the **Block Outputs** command, which is intended for use during system service to prevent false alarms from being transmitted. Enabling the **Inhibit Traps** field when **Block Outputs On** is enabled prevents traps from being sent on the network.

NOTE: The **Block Outputs** command times out if there is no user activity. This command is only available through the display panel menu.

Main Menu > Commands > Block Outputs On

- **Send Off Traps** – Enabling this field sends a trap when an event or alarm returns to normal status (i.e., when the alarm or notice turns "off").
- **Trap Repeat Rate (minutes)** – Interval in minutes of how frequently a trap message should be sent when an event or alarm is in active status. Enter the number zero ("0") to disable.
- **Heartbeat Trap Repeat Rate (minutes)** – Interval in minutes of how frequently a heartbeat trap (signal) should be sent. Enter the number zero ("0") to disable.

NOTE: Configuration options are available for SNMP v3, SNMP v1, and SNMP v2c. Configure the appropriate settings for the SNMP version of the network.

- **SNMP v3 Configuration**– configuration section for SNMPv3
 - **Web-based configuration** – click this radio button to configure SNMP through the controller’s web interface. This option removes the “admin” user’s MIB write access.
 - **SNMP-based configuration** – click this radio button to permit configuration through an SNMP management application rather than the controller’s web interface. Selecting this option resets the SNMP v3 configuration and reboots the controller.

CAUTION: Selecting **SNMP-based configuration** resets web-based configuration information! This reset cannot be reversed!

By default, the controller is set to **SNMP-based configuration**, which means that an SNMP management application will be used to configure the controller’s SNMP settings rather than the controller’s web interface.

Where permissible, a Web-based configuration option is available to configure the controller’s SNMP settings through the web interface. When the radio button is selected, the following menus appear on the left menu bar:

USM Users

Vacm Access

V1/V2 Community

Traps

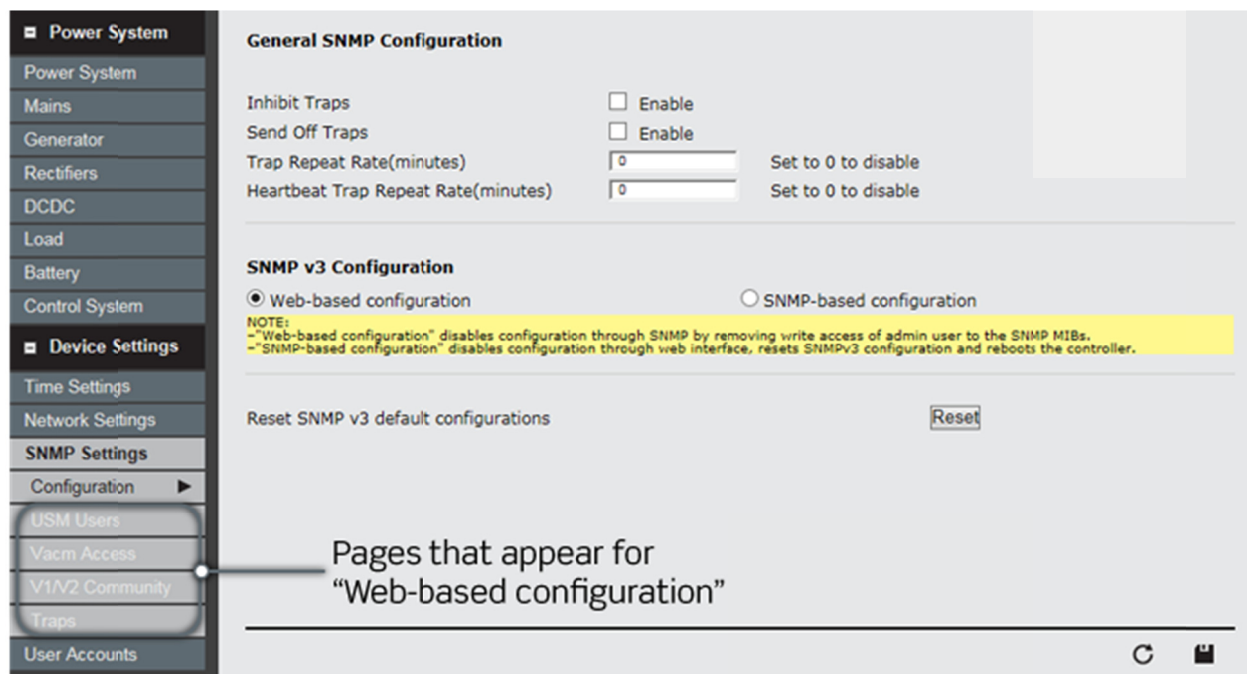


Figure 4.52 – SNMP Settings Page (Web-based configuration)

The following table illustrates the order in which each page should be completed for each version of SNMP:

Table 4.3 - Web-Based Configuration Page Order

Order of Operations	Page (Web-based Configuration)	SNMP v3	SNMP v1/v2c
	USM Users	Set users	Set users (legacy support)
	Vacm Access	Set access permissions	Set access permissions
	V1/V2 Community	N/A	Set Community Names
	Traps	Configure trap receivers with USM Users	Configure trap receivers with Community Names

- **Reset SNMP v3 default configurations** – This button resets the default SNMP configuration. It is especially useful if some condition has resulted in the NMS being blocked out of the controller—if, for instance, all the USM users were accidentally deleted.

CAUTION: As with any "Reset" configuration command, all customized settings are lost when executed. Additionally, the controller reboots when this command is executed.

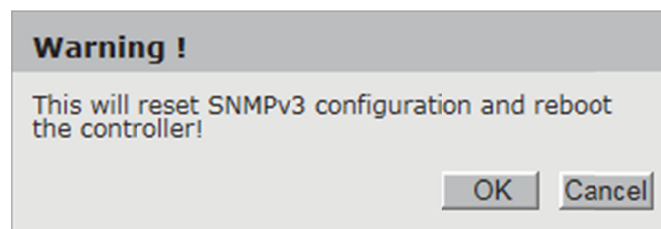


Figure 4.53 – SNMPv3 Reset Warning

NOTE: The following pages only appear if **Web-based configuration** is selected under **SNMP v3 Configuration**:

USM Users

The **USM Users** page is for setting up and configuring user accounts (User-based Security Model). By default, the first four accounts (1-4) are set for standard SNMP v3 users. Accounts 5 and 6 are set for SNMP v2c and SNMP v1 networks, respectively. All user accounts can be modified.

NOTE: The preconfigured SNMP v3 user accounts can be edited, but only the Authentication and Privacy protocols and passphrases can be changed for the accounts. The preconfigured SNMP v2c/v1 accounts can only be viewed, not edited.

Power System		User Account Administration					
#	User Name	Authentication Protocol	Privacy Protocol	Security Group	Delete	Edit	
1	admin	SHA1	AES	admin-webcfg-group	Delete	Edit	
2	control	SHA1	DES	readwrite-group	Delete	Edit	
3	status1	MD5	DES	readonly-group	Delete	Edit	
4	status2	MD5	AES	readonly-group	Delete	Edit	
5	snmpv2c-usr	noAuth	noPriv	snmpv2c-group	Delete	View	
6	snmpv1-usr	noAuth	noPriv	snmpv1-group	Delete	View	
7						New	
8							
9							
10							

Figure 4.54 – USM Users Page

- **#** - User account number
- **User Name** – User name for each account
- **Authentication Protocol** – SNMPv3 authentication protocols (MD5, SHA1); a passphrase field is available in setup
- **Privacy Protocol** – SNMPv3 privacy protocols (DES, AES); a passphrase field is available in setup
- **Security Group** – security level for the user. The following levels are available for the SNMP versions:

Table 4.4 – Security Groups for SNMP Versions

SNMP Version	Security Group	Description
SNMP v3	admin-group	Admin access (level 3)
SNMP v3	readwrite-group	Control access (level 2)
SNMP v3	readonly-group	Status access (level 1)
SNMP v2c	snmpv2c-group	SNMP v2c support only
SNMP v1/v2c	snmpv12c	SNMP v2c and SNMP v1 support
SNMP v1	snmpv1-group	SNMP v1 support only

- **Delete** – Click the **Delete** button to delete the user account row.

CAUTION: The preconfigured accounts can be deleted! Deletions of preconfigured accounts can only be reversed by resetting the SNMP v3 default configurations, which can be done either by selecting the SNMP-based configuration button or clicking the Reset SNMP v3 default configurations button on the Configuration page.

- **Edit** – click the **Edit** button to edit an SNMP v3 user account row (SNMP v2c and SNMP v1 accounts cannot be edited); click the View button to view and SNMP v2c or SNMP v1 user account; click the New button to create a new account (maximum of 10 accounts)

Edit/View **SNMP User profile** Windows (only Authentication and Privacy protocols and passphrases for SNMP v3 can be edited)

Figure 4.55 – SNMP Accounts – Edit and View Windows

- **New** – Click the **New** button to create a new user account.
 - **Select Security Model** – select SNMP version v3, v2c, or v1; click the **Continue...** button to proceed

NOTE: The SNMP version cannot be changed once the **Continue...** button is clicked. If the version needs to be changed, close the **SNMP User profile** window without saving; then, click the **New** button to start over.

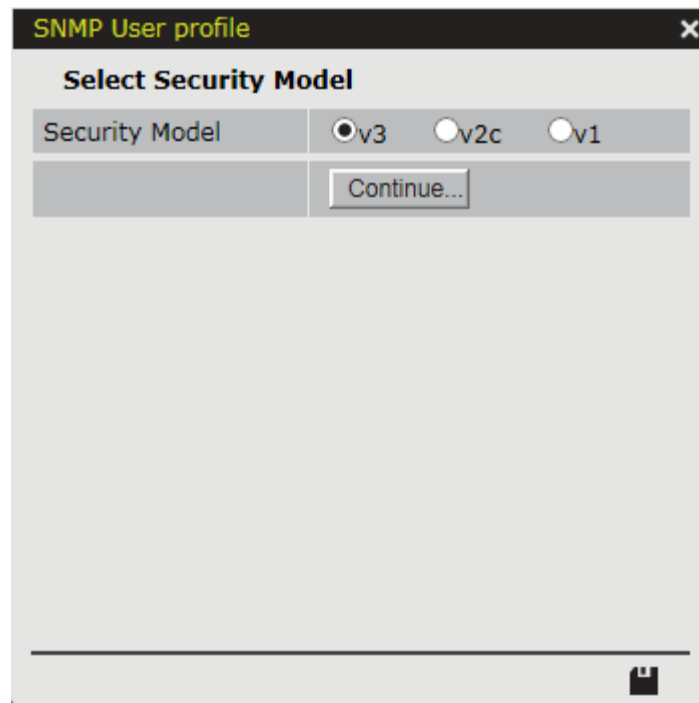


Figure 4.56 – New SNMP User Profile Window

- **SNMP v3 User Profile Configuration**

- **USM User Name** – free-form text field for entering a user name
- **Security Group** – security level to assign to the user

The default SNMP v3 user names reflect the three security levels of Eltek controllers: admin (Administrator), control, and status.

- **Authentication and Privacy**

- **Security Level** – currently, Authentication and Privacy (**AuthPriv**) is the only available security level for SNMP v3, so this parameter cannot be changed.
- **Auth protocol** – authentication protocol to use: MD5 or SHA1
- **Auth passphrase** – passphrase for authentication (required)
- **Priv protocol** – privacy protocol to use: DES or AES
- **Priv passphrase** – passphrase for privacy (required)

The image shows a web interface window titled "SNMP User profile" with a close button (X) in the top right corner. The window contains a "User profile configuration" section with the following fields:

- Security Model:** Three radio buttons labeled v3, v2c, and v1. The v3 button is selected.
- USM User Name:** A text input field.
- Security Group:** A dropdown menu with "admin-group" selected.

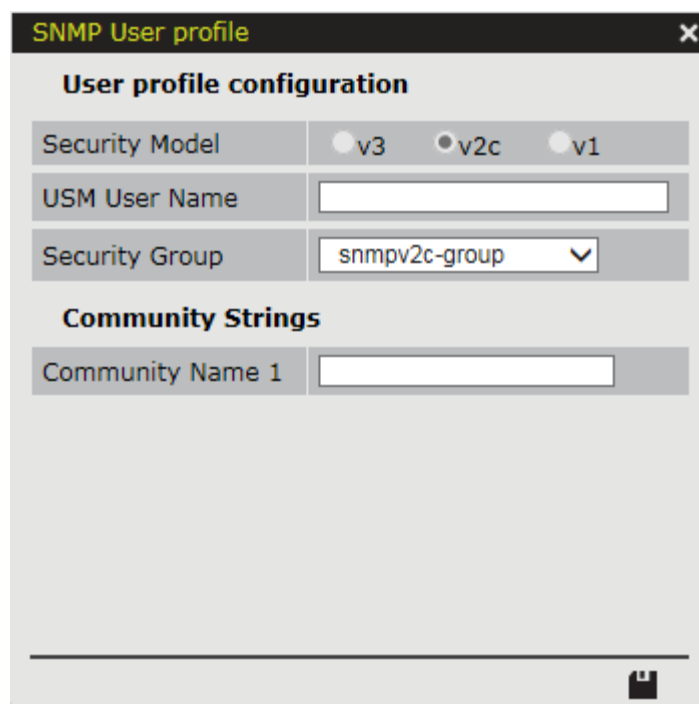
Below these is an "Authentication and Privacy" section with the following fields:

- Security Level:** A dropdown menu with "AuthPriv" selected.
- Auth protocol:** A dropdown menu with "MD5" selected.
- Auth passphrase:** A text input field.
- Priv protocol:** A dropdown menu with "DES" selected.
- Priv passphrase:** A text input field.

At the bottom right of the window is a save icon (a floppy disk).

Figure 4.57 - SNMPv3 User Profile Configuration Window

- **SNMP v1/v2c**
 - **USM User Name** – free-form text field for entering a user name
 - **Security Group** – security level to assign to the user
- **Community Strings** – list of **Community Names** associated with the user profile; all **Community Names** configured for the user profile on the **V1/V2 Community** page appear here
 - **Community Name 1** –one **Community Name** can be configured during the first setup of the **SNMP User profile**. This **Community Name** and more are configurable on the **V1/V2 Community** page; they cannot be edited from the **SNMP User profile** window after first setup.



SNMP User profile

User profile configuration

Security Model: ☐ v3 ☒ v2c ☐ v1

USM User Name:

Security Group:

Community Strings

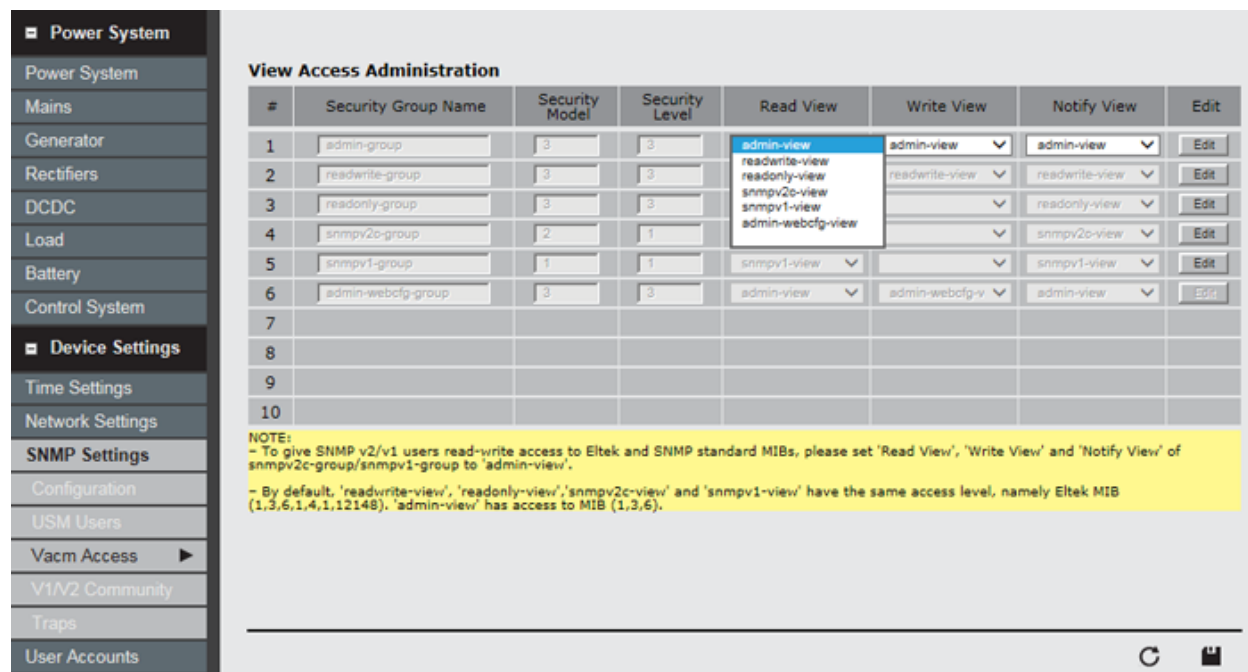
Community Name 1:



Figure 4.58 – SNMPv1/v2c User Profile Configuration Window

Vacm Access

The **Vacm Access** page is for setting view access administration, where read, write, and notify permissions are defined for security groups.



Power System

- Power System
- Mains
- Generator
- Rectifiers
- DCDC
- Load
- Battery
- Control System

Device Settings

- Time Settings
- Network Settings
- SNMP Settings**
 - Configuration
 - USM Users
 - Vacm Access**
 - V1/V2 Community
 - Traps
 - User Accounts

View Access Administration

#	Security Group Name	Security Model	Security Level	Read View	Write View	Notify View	Edit
1	admin-group	3	3	admin-view	admin-view	admin-view	Edit
2	readwrite-group	3	3	readwrite-view	readwrite-view	readwrite-view	Edit
3	readonly-group	3	3	readonly-view	readonly-view	readonly-view	Edit
4	snmpv2c-group	2	1	snmpv2c-view	snmpv2c-view	snmpv2c-view	Edit
5	snmpv1-group	1	1	snmpv1-view	snmpv1-view	snmpv1-view	Edit
6	admin-webcfg-group	3	3	admin-webcfg-view	admin-webcfg-view	admin-view	Edit
7							
8							
9							
10							

NOTE:

- To give SNMP v2/v1 users read-write access to Eltek and SNMP standard MIBs, please set 'Read View', 'Write View' and 'Notify View' of snmpv2c-group/snmpv1-group to 'admin-view'.
- By default, 'readwrite-view', 'readonly-view', 'snmpv2c-view' and 'snmpv1-view' have the same access level, namely Eltek MIB (1,3,6,1,4,1,12148). 'admin-view' has access to MIB (1,3,6).

Figure 4.59 – Vacm Access Configuration Page

- **#** - security group row number
- **Security Group Name** – name of the security group (same as **Security Group** in the **User Profile Configuration** windows of the **USM Users** page)
- **Security Model** – SNMP security model version (3, 2, or 1)
- **Security Level** – security level, reflecting the three security levels of Eltek controllers (1=status, 2=control, 3=admin)
- **Read View** – access level for read permissions
- **Write View** – access level for write permissions (level 3 security only)
- **Notify View** – access level for notifications
- **Edit** – click the **Edit** button to edit the **Read View**, **Write View**, and **Notify View** columns of the security group row

V1/V2 Community

The **V1/V2 Community Page** is for configuring SNMP v1 and SNMP v2c community strings.

Community String Configuration

#	Community Name	User Name	Trap Format	Delete	Edit
1	private	snmpv2c-usr	v2c	Delete	Edit
2	public	snmpv2c-usr	v2c	Delete	Edit
3	v1community	snmpv1-usr	v1	Delete	Edit
4					New
5					
6					
7					
8					
9					
10					

NOTE: When sending traps, the first community string associated with snmpv2c-usr/snmpv1-usr will be used.

Figure 4.60 – V1/V2 Community Configuration Page

- **#** - community string number
- **Community Name** – name of community string for SNMP v1 and SNMP v2c authentication; once the initial setup of a community string is complete, *only*

the **Community Name** is editable. After configuration, the **Community Name** appears on the **Community Strings** list of the associated **User Name**.

- **User Name** – user name to which the **Community Name** is assigned; user names must be set up on the **USM Users** page before they can be assigned on the **V1/V2 Community** page.
- **Trap Format** – SNMP trap format, determined by the **Security Model** selected during setup of the community string
- **Delete** – button for deleting the community string row
- **Edit** – click the **Edit** button to edit the **Community Name** field (no other fields are editable after setup); click the **New** button to add another community string.
 - **SNMP Community String** – window for configuring a new community string (SNMP v1/v2C)
 - **MP Model** – select the appropriate SNMP version for the community string (either **v2c** or **v1**; changes to **Security Model** on the following page)

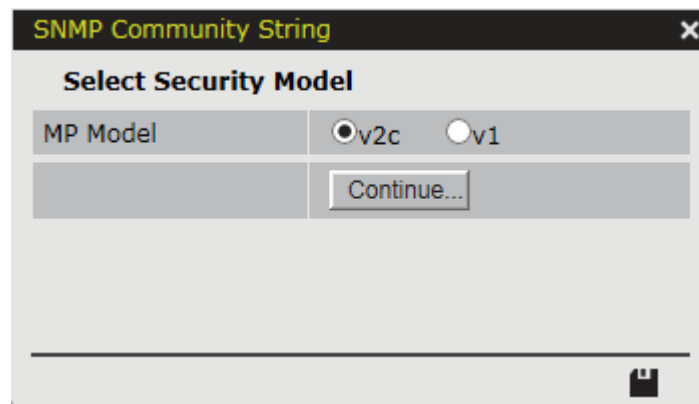
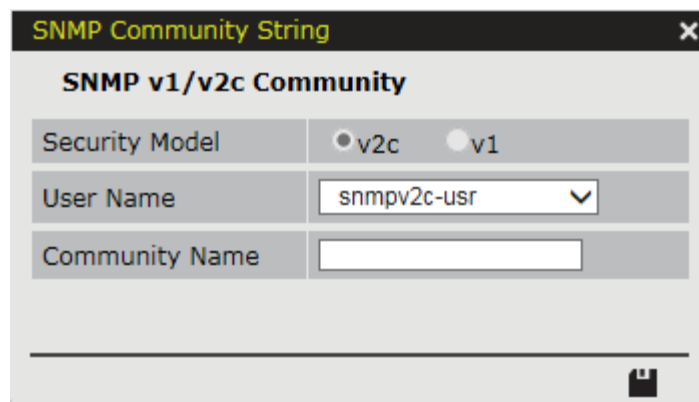


Figure 4.61 – SNMP Security Model Selection Window

- **User Name** – select one of the SNMP v2c or SNMP v1 user names (which come from the **USM Users** page)
- **Community Name** – enter a name for the community string



SNMP v1/v2c Community

Security Model: ☒ v2c ☐ v1

User Name:

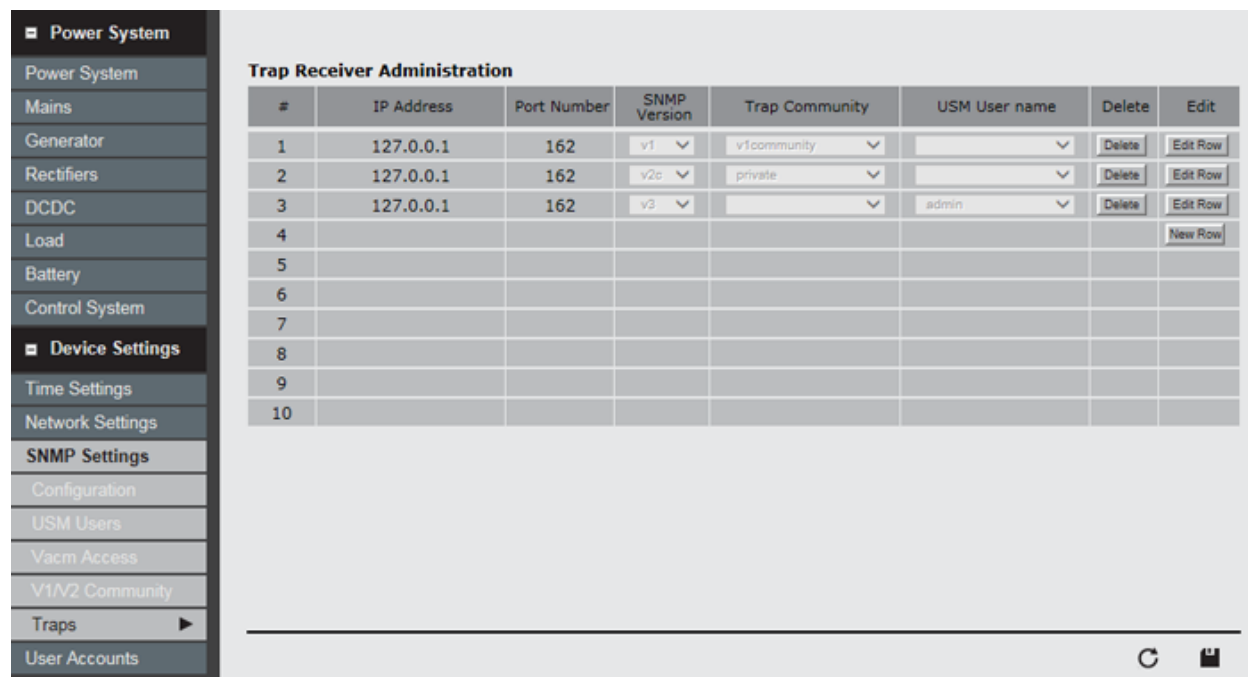
Community Name:



Figure 4.62 – SNMP Community String Configuration

Traps

The **Traps** page is for configuring IP addresses of trap receivers (hosts) for traps sent by the Eltek controller. By default several rows are set up as examples for each SNMP version with IP address 127.0.0.1 (localhost). All rows can be deleted and/or edited.



Trap Receiver Administration

#	IP Address	Port Number	SNMP Version	Trap Community	USM User name	Delete	Edit
1	127.0.0.1	162	v1	v1community		Delete	Edit Row
2	127.0.0.1	162	v2c	private		Delete	Edit Row
3	127.0.0.1	162	v3		admin	Delete	Edit Row
4							New Row
5							
6							
7							
8							
9							
10							

Figure 4.63 – Traps Configuration Page

- **#** - trap receiver number
- **IP Address** – target IP address of the trap host to receive trap messages from the controller
- **Port Number** – target port number of the trap receiver

- **SNMP Version** – SNMP version of the trap host (v3, v2c, or 1)
- **Trap Community** – community string for the trap, which comes from **Community Name** strings set on the **V1/V2 Community** page; this field only applies to SNMP v1 and SNMP v2c.
- **USM User name** – user name from the **USM Users** page; only applies to SNMP v3 (since v3 has no community strings).
- **Delete** – click the **Delete** button to delete the trap receiver
- **Edit Row** – click the **Edit Row** button to edit the trap receiver row (only the SNMP version cannot be edited); click the **New Row** button to add another trap receiver.
 - **SNMP Trap Receiver Configuration** – window for creating and editing trap receivers (hosts)
 - **SNMP v3**
 - **Trap profile configuration**
 - **MP Model** – SNMP version (not editable after initial configuration); during initial configuration, select the appropriate SNMP version and click the **Continue...** button.

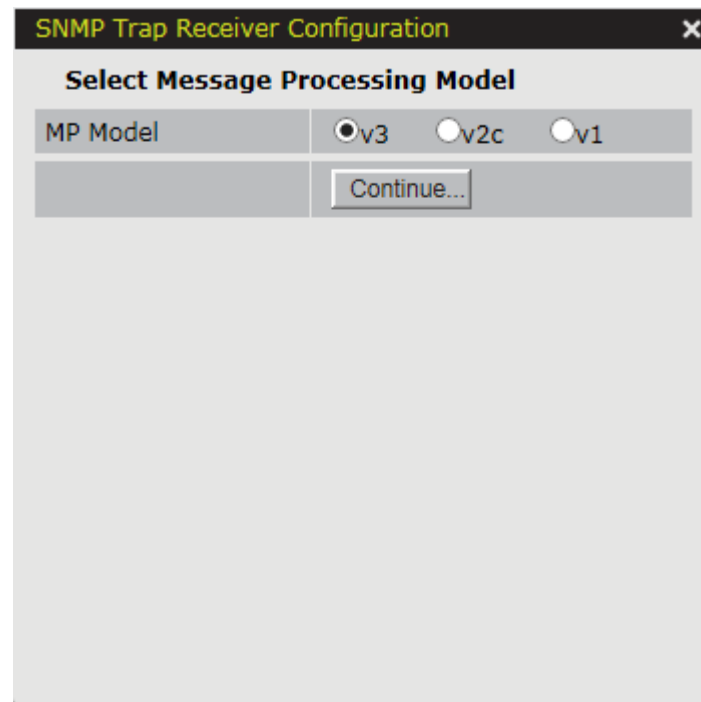
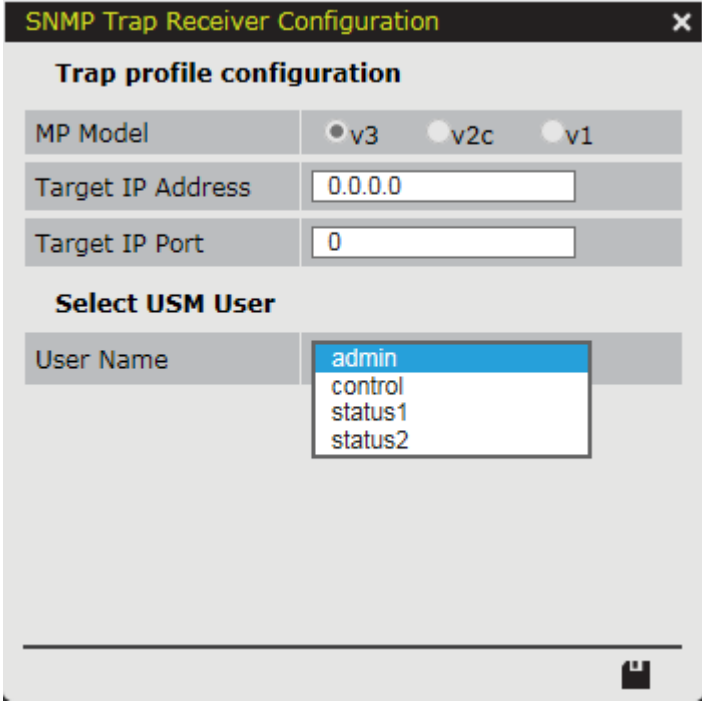


Figure 4.64 – SNMP Trap Model Selection (SNMPv3)

- **Target IP Address** – field for the receiver's IPv4 address

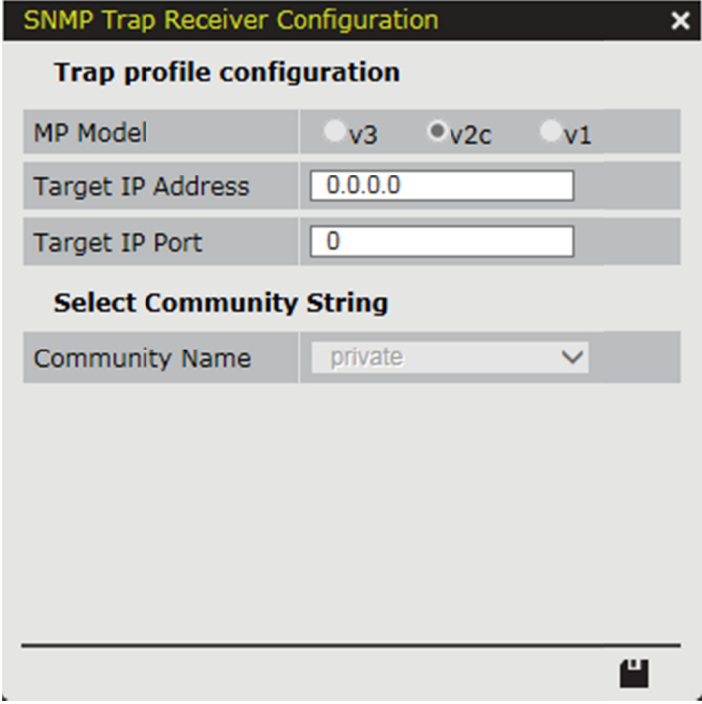
- **Target IP Port** – field for the receiver's IP port
- **Select USM User**
 - **User Name**– For SNMP v3 only, select the user name (which comes from the **USM Users** page)



The image shows a web interface window titled "SNMP Trap Receiver Configuration" with a close button (X) in the top right corner. The window contains a "Trap profile configuration" section with three radio buttons for "MP Model": "v3" (selected), "v2c", and "v1". Below these are two input fields: "Target IP Address" with the value "0.0.0.0" and "Target IP Port" with the value "0". Underneath is a "Select USM User" section with a "User Name" label and a dropdown menu. The dropdown menu is open, showing four options: "admin" (highlighted in blue), "control", "status1", and "status2". At the bottom right of the window is a save icon (a floppy disk).

Figure 4.65 – SNMP Trap Receiver Configuration (SNMPv3)

- **SNMP v1/v2c**
 - **Trap profile configuration**
 - **MP Model** – SNMP version (not editable after initial configuration); during initial configuration, select the appropriate SNMP version and click the **Continue...** button.
 - **Target IP Address** – field for the receiver's IPv4 address
 - **Target IP Port** – field for the receiver's IP port
 - **Select Community String**
 - **Community Name** – For SNMP v1 and SNMP v2c, select the community string (which comes from the **V1/V2 Community** page)



The image shows a configuration window titled "SNMP Trap Receiver Configuration" with a close button (X) in the top right corner. The window is divided into two main sections. The first section, "Trap profile configuration", contains three rows: "MP Model" with radio buttons for v3, v2c (selected), and v1; "Target IP Address" with a text field containing "0.0.0.0"; and "Target IP Port" with a text field containing "0". The second section, "Select Community String", contains a "Community Name" dropdown menu currently set to "private". At the bottom right of the window is a save icon (floppy disk).

Trap profile configuration	
MP Model	☐ v3 ☒ v2c ☐ v1
Target IP Address	0.0.0.0
Target IP Port	0

Select Community String	
Community Name	private

Figure 4.66 – SNMP Trap Receiver Configuration (SNMPv1/v2c)

User Accounts

The **User Accounts** page is for adding and modifying user accounts. The main **User Accounts** page provides information on the current user and allows changing the password.

Figure 4.67 – User Accounts Configuration Page

NOTE: Admin login is required to make any changes to **User Account** settings, except for the current user's password.

- **User Accounts**
 - **Current User Name** – field that identifies the current user (not editable)
 - **Access Level** - field that identifies the current user's access level (not editable)
- **Change Password**
 - **Enter current** – field for the current password
 - **Enter new** – field for a new password
 - **Re-enter new** – second field for verifying the new password (must be the same as the **Enter new** field)
- **Edit Accounts** – click the **Edit Accounts** button to open the **Global Account Settings** page

Power System

Power System

Mains

Generator

Rectifiers

DCDC

Load

Battery

Control System

Device Settings

Time Settings

Network Settings

SNMP Settings

User Accounts

Global Account Settings

Password is required

☒

Username and Password must be different

☒

Password must be different from the 5 previous

☒

Password minimum length

5

Retries before suspension

3

User suspension time[Min]

10

User Account Administration

#	User Name	Password	Access level	Max users	Idle Timeout [min]	Max Lifetime [days]	
1	admin		3	1	5	0	Delete
2	control		2	2	5	0	Delete
3	status		1	3	5	0	Delete
4			0	1	5	0	Enable
5			0	1	5	0	Enable
6			0	1	5	0	Enable

Back

Show Active Sessions

↺

📄

Figure 4.68 – Edit Accounts Page (Admin only)

NOTE: This section is only accessible with admin rights.

- **Global Account Settings** – password settings section
 - **Password is required** – check this box to require passwords for all accounts
 - **Username and Password must be different** – check this box to force user names and passwords to be different
 - **Password must be different from the 5 previous** – check this box to remember the five previous passwords for each user and ensure that new passwords are different
 - **Password minimum length** – enter a value for the minimum character length of passwords
 - **Retries before suspension** – enter a value for the number of unsuccessful login attempts before the user account is temporarily suspended (time determined by the **User suspension time** field)
 - **User suspension time[Min]** – enter a value (in minutes) for the time that a user must wait after account suspension before attempting to log in again

- **User Account Administration** – user account section; up to ten user accounts can be configured; by default, the first three accounts are configured (admin, control, status)
 - **#** - user account number
 - **User Name** – free-form field for user names
 - **Password** – password field
 - **Access level** – access level number:
 - 1 = read-only (status)
 - 2 = read-write (control)
 - 3 = admin (administrator)
 - **Max users** – field to specify the maximum number of users that can be logged in simultaneously
 - **Idle Timeout [min]** – time in minutes after which the controller automatically logs out an idle user
 - **Max Lifetime [days]** – field for the maximum lifetime of the user account; useful for providing temporary access. Enter zero (0) to disable this function.
 - **Delete/Enable** – click the **Delete** button to delete the user account row; click the **Enable** button to enable and configure a user account row
- **CAUTION:** The preconfigured user accounts *can* be deleted!
- **Back** – click the **Back** button to return to the main **User Accounts** page
- **Show Active Sessions** – click this button to see the **Active Sessions** window, which lists the users that are currently logged in

5. Alarm Configuration

Alarm monitors are configured under the **Alarm Conf.** category.



Alarm monitors measure internal and external input signals and logical states. When an alarm monitor is enabled, it compares the parameter measurement with pre-programmed thresholds and raises an alarm in the event a threshold is exceeded. Alarm events are stored in the Event Log. If configured, an alarm output group (AOG) is activated to send an alarm signal to an external receiver.

There are four types of alarm monitors:

- Analog – measured value (like voltage or current)
- Numeric – sum, count, or calculation (like the number of ac phases, rectifiers, or other power modules)
- Logical – state of relays, form-C contacts, or logical combinations of alarm states (e.g., Boolean algebra)
- LVD – a special event-based monitor that opens a low-voltage disconnect (LVD) contactor

NOTE: The status of each alarm monitor appears on the Home page under its respective category.

NOTE: Alarm pages and devices appearing between *brackets* indicate that they only appear when the associated device or input is connected to the system. For example:

- **[Solar]**– only appears if solar chargers are present in the system
- **[DCDC CurMon X]**– only appears if a Load Monitor is assigned to measure current from dc-to-dc converters

On each alarm configuration page, alarm monitors are grouped by controller, category group, or CAN Node sections. As of the date of this guide, the major submenus are:

- Mains
- Generator
- Rectifiers
- [Solar]
- [DcDc Converter]

- [Wind Charger]
- [FuelCell Charger]
- Load
- Battery
- Inputs
- Outputs
- Control System

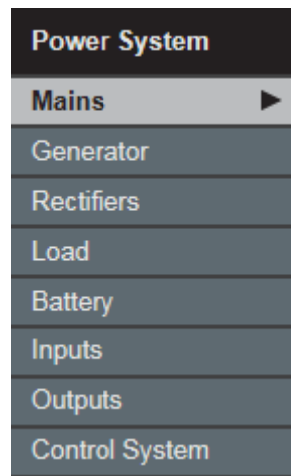


Figure 5.1 – Alarm Configuration Menu (without alternative energy sources)

Alarm Monitors Edit Windows

All alarm monitors share common configuration windows.

Edit Icon		Enable Box		Status Icon
#	Description Field			
Rectifiers Alarm Configuration				
1	TotRectCurrent	☒		✓
2	RectGrpErr	☒		✓
3	RectGroupInMinor	☒		✓
4	RectGrpCommErr	☒		✓
5	TotRectCapacity	☐		⊗
6	RectCmShareErr	☐		⊗
7	RectifierTemp	☐		⊗
Rect.Group 1				

Figure 5.2 – Alarm Monitor Rows

On each configuration page, alarm monitors have unique rows under their subsection headings:

- **Alarm Monitor Row** – alarm monitors are grouped under their respective categories and devices (where applicable)
 - # - row number
 - **Edit** – edit icon; click to open the **Edit** window to configure the alarm monitor
 - **Description** – free-form field for the alarm monitor description
 - **Enable** – check this box to enable the alarm monitor
 - **Status** – indicates the status of the alarm monitor: disabled, OK, Minor alarm, or Major alarm (see Table 2.1 - Alarm Icon Table)

General Alarm Monitor Window (not LVD)

Clicking on the **Edit** icon of the alarm monitor row brings up the **Edit Window**, which is the same for all alarm monitors *except* those for LVDs (LVBD and LVLD).

Description	Value	Unit
Alarm Monitor	☒ Enable	
Manual reset	Disabled	
Hysteresis	0	Volt AC
Time delay	7 seconds	
Monitor Description	MainsVolt 1	

Event	Volt AC	Alarm Group
Major High	280	Mains alarm
Minor High	260	Mains alarm
Minor Low	100	Mains alarm
Major Low	80	Mains alarm

Figure 5.3 – Alarm Edit Window Example (MainsVolt X)

General

Appears as the first tab if there are additional pages of configurations (e.g., Scale, Calibration, and Configuration); otherwise, only the page with its fields appears (without the **General** tab or any other tabs)

- **Description | Value | Unit**
 - **Alarm Monitor** – check the Enable box to enable this alarm monitor

- **Manual reset** – select option (**Disabled, All Levels, Major High only**) from the drop-down list to indicate whether the alarm is permitted to be reset manually—when a Reset Alarms command is executed (button is on the **Commands** page)
 - **Disabled** – the monitor alarm cannot be manually reset (only resets automatically—when the alarm condition is no longer true)
 - **All Levels** – the monitor alarm must be manually reset when triggered by any assigned alarm event
 - **Major High only** – the monitor alarm must be reset manually when the alarm is generated by a Major High alarm event. It is reset automatically if triggered by any other assigned alarm event.
- **Hysteresis**—buffer on either side of the alarm threshold values (higher and lower) in the unit of the alarm parameter (e.g., volts or amps). If the alarm is activated, Hysteresis keeps the alarm active even if the measured value changes slightly within the buffer range specified. This feature prevents rapid ON/OFF switching of the alarm if the measured value is changing rapidly.
- **Time delay** – drop-down list of time delay options (in seconds and minutes) before activating and deactivating the alarm if the thresholds are exceeded.
- **Monitor Description** – free-form field for a description of the alarm monitor
- **Event | [Value] | Alarm Group**
 - **Event** – the name for the specific event to activate when the alarm is activated. Events are logged in the Event Log.

NOTE: Pre-configured alarm events cannot be changed; the drop-down list is grayed out to prevent assigning a different event.

NOTE: The controller has safety mechanisms to prevent activating improperly configured or potentially critical commands.
 - **[Value]** – threshold value at which an alarm should be raised; this field is available for Analog (measured) and Numeric (counted) alarm monitors only; Logical alarm monitors trigger an alarm based on an alarm event rather than a numeric threshold.

Possible units: Volts, Amps, kOhm, Degrees (Fahrenheit or Celcius), Unit(s) (for Numeric count)

- **Alarm Group** – controller alarm group assigned to report the alarm. Alarm groups can be assigned to specific output relays of controllers and monitors that are so equipped.

The status of all active alarm groups can be found in the **Active Alarm Overview** window on the **Home Page** (click on the **Event Status and System Mode** pane).

NOTE: There are at least 20 alarm groups available for each controller, with the first eight pre-configured, ten for custom configuration (**Alarm Group XX**), and two or three alarm groups configured for LVDs (depending on the number of contactor relay controls available through the controller). Pre-configured alarm groups differ by system and, in some cases, by customer requirements.

■ **Events:**

- **Error** – activate an error
- **Minor Alarm** – activate a minor alarm
- **Major Alarm** – activate a major alarm
- **Major Low** – activate a Major Low alarm
- **Minor Low** – activate a Minor Low alarm
- **Major High** – activate a Major High alarm
- **Minor High** – activate a Minor High alarm
- **Event** – activate a generic alarm event. This is useful for inconsequential alarm triggers, like **Virtual Inputs**.
- **Critical** – activate a Critical condition. By default, Critical is a condition where the power system is on battery power only (i.e., primary power sources are offline)
- **Warning** – activate an alarm warning. A warning indicates that an abnormal situation is present; related to a minor alarm
- **Battery Test** – activate a battery test
NOTE: The controller has safety mechanisms to prevent activating improperly configured or potentially critical commands.
- **Boost** – activate battery boost
NOTE: The controller has safety mechanisms to prevent activating improperly configured or potentially critical commands.

- **System Shutdown** – trigger a system shutdown
NOTE: The controller has safety mechanisms to prevent activating improperly configured or potentially critical commands.
- **Reset no of Modules** – reset the number of modules (both power and controller units)
- **Rect Current limit** – activate rectifier current limit
- **Batt Current limit** – activate battery charge current limit
- **Temp Comp** – activating temperature compensation
NOTE: The controller has safety mechanisms to prevent activating improperly configured or potentially critical commands.
- **Boost Inhibit** – inhibit (block) battery boost charging
- **Block Outputs** – alarm output relays are blocked for maintenance purposes; this command is only available through the display panel
- **Generator** – activate a generator (if connected)
NOTE: The controller has safety mechanisms to prevent activating improperly configured or potentially critical commands.
- **Emergency** – active **Emergency voltage** (if configured); the rectifiers drop to **Emergency voltage**
- **Test Inhibit** – inhibit (block) battery tests
- **Equalize** – activate battery equalize charging
NOTE: The controller has safety mechanisms to prevent activating improperly configured or potentially critical commands.
- **Equalize Inhibit** – inhibit (block) battery equalize charging
- **Silence buzzer** – activate a buzzer silence command
- **Earthfault Inhibit** – inhibit (block) earth (ground) fault detection
- **Inverters Shutdown** – activate shutdown of inverters (if applicable)
- **Alarm Groups** - Alarm groups are software assignments for grouping alarms together, which can then be mapped to output alarm channels of controllers and/or CAN nodes. Alarm groups (including names) and output mapping are user-definable. Currently, there are 24 alarm groups available: 18 for output relays and 6 for low-voltage disconnect (LVD) contactors. Alarm events can be assigned to **None** (no alarm group).

Config (Configuration)

The **Configuration** tab is for alarm monitors with programmable inputs (e.g., fuse monitors, relay monitors, temperature probes).

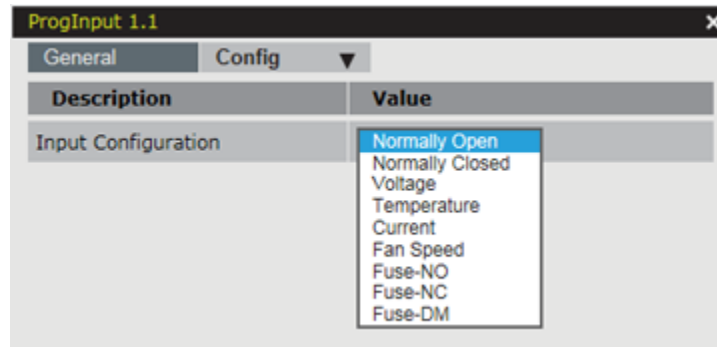


Figure 5.4 – Configuration Tab Example (Flexi Monitor – ProgInput X.Y)

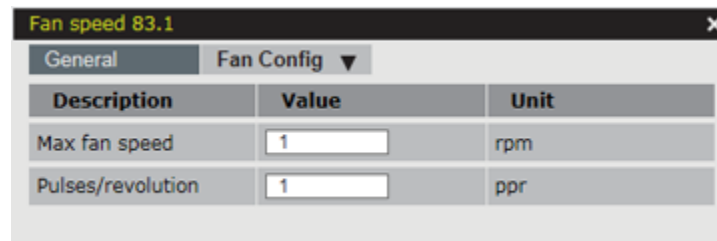
NOTE: The following list of configuration options is exhaustive; available options differ by controller and CAN Node.

- **Normally Open** – alarm is monitoring a normally-open relay contact
- **Normally Closed** – alarm is monitoring a normally-closed relay contact
- **Diode Matrix** – alarm is monitoring a diode matrix
- **Clock Input** – alarm is receiving a clock signal
- **Voltage** – alarm is monitoring a voltage input
- **4-20mA** – alarm is monitoring current between 4 and 20 mA
- **Temperature** – alarm is monitoring a temperature probe input
- **Current** – alarm is monitoring current
- **Fan Speed** – alarm is monitoring fan speed
- **Fuse-NO** – alarm is monitoring a fuse with a normally-open relay contact (scaling available)
- **Fuse-NC** – alarm is monitoring a fuse with a normally-closed relay contact (scaling available)
- **Fuse-DM** – alarm is monitoring a fuse with a diode matrix (scaling available)
- **Outdoor temp 1 / Outdoor temp 2** – alarm is monitoring a temperature probe input from an outdoor cabinet
- **Battery temp** – alarm is monitoring a temperature probe from batteries
- **Rectifier temp** – alarm is monitoring a temperature probe from rectifiers

Fan Config

The **Fan Configuration** tab appears for configuring fan speed monitoring in outdoor cabinet applications.

NOTE: The **Fan Config** tab is available only for I/O Monitor Type 1, I/O Monitor Type 3, and Flexi Monitor.



Description	Value	Unit
Max fan speed	1	rpm
Pulses/revolution	1	ppr

Figure 5.5 – Fan Config Tab Example

- **Max fan speed** – enter the maximum rotations per minute (rpm) from the fan specifications
- **Pulses/revolution** – enter the maximum pulses per revolution (ppr) from the fan specifications

NOTE: Both fan parameters are required in order to convert the signal frequency from the fan speed inputs to accurate speed percentages.

Calibration

Appears when using inputs for current, voltage, or temperature, aiding improved accuracy of input values if they are significantly different from measured values.

CAUTION: Calibration should only be used when the accuracy of the input value is proved to be significantly off the measured value. It should *not* be used as part of an installation procedure. Manufacturer values and proper calibration equipment (e.g., an accurate multimeter) must be available in order to calibrate the input values accurately. Improper calibration can cascade inaccuracy to all controller calculations and functions that use the input value.

NOTE: Calibrating for current measured by a shunt requires entering the shunt ratings under the **Scale** tab.

NOTE: If measuring battery discharge, enter negative values for current.

The screenshot shows a configuration window titled 'OutDoorTemp83.1' with a close button (X) in the top right corner. Below the title bar are three tabs: 'General', 'Calibration' (which is selected and has a dropdown arrow), and 'Config'. The 'Calibration' tab is divided into two sections: 'Low calibration point' and 'High calibration point'. Each section contains two rows of input fields: 'Calibrate value' and 'A/D value'. In the 'Low calibration point' section, the 'Calibrate value' is 32 and the 'A/D value' is 737. In the 'High calibration point' section, the 'Calibrate value' is 69 and the 'A/D value' is 1022. To the right of each 'Calibrate value' field is a unit selector set to 'Fahrenheit' and an 'Apply' button. To the right of each 'A/D value' field is an 'Enable' button. A yellow note box at the bottom of the 'Calibration' tab states: 'Note: By enabling the A/D value, the actual A/D value on the corresponding input will be overwritten by the value in this dialog when the user selects "Apply".' At the bottom right of the window are two icons: a circular arrow (refresh) and a document with a checkmark (save).

Figure 5.6 – Calibration Tab Example (OutDoor Temp XX.Y)

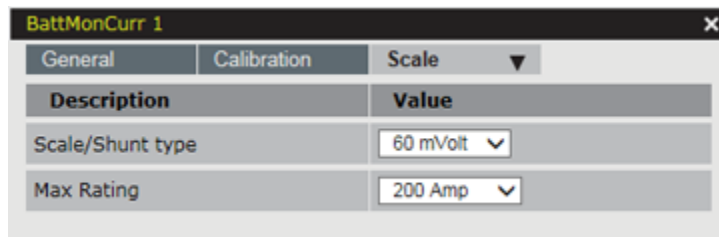
- **Low calibration point** – section for adjusting the low value of the input measurement, but only if necessary (i.e., the lowest value expected is not zero). This is *not* used for such monitors as Battery Temperature, Battery Symmetry Voltage, and Battery Voltage.
- **High calibration point** – section for adjusting the high value of the input measurement
 - **Calibrate value** – field for entering the measured high or low value (depending on the section). Click the **Apply** button to apply the calibration value
 - **A/D value** – analog-to-digital conversion value. Please do not change this value without consulting Eltek, as it is intended for production use only.

CAUTION: By enabling the **A/D value**, the actual A/D value on the corresponding input will be overwritten by the value in this field.

Scale

Tab for entering the values of either a shunt or fuse.

- **Shunt**



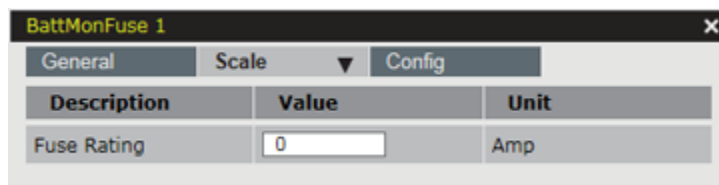
The screenshot shows a window titled "BattMonCurr 1" with a close button (X) in the top right corner. Below the title bar are three tabs: "General", "Calibration", and "Scale". The "Scale" tab is selected and highlighted. Below the tabs is a table with two columns: "Description" and "Value".

Description	Value
Scale/Shunt type	60 mVolt
Max Rating	200 Amp

Figure 5.7 – Scale Tab – Shunt Example (BattMonCurr X)

- **Scale/Shunt Type** – select the mV or Volt value of the shunt from the drop-down list
- **Max Rating** – select the maximum current rating of the shunt (in amps) from the drop-down list

- **Fuse**



The screenshot shows a window titled "BattMonFuse 1" with a close button (X) in the top right corner. Below the title bar are three tabs: "General", "Scale", and "Config". The "Scale" tab is selected and highlighted. Below the tabs is a table with three columns: "Description", "Value", and "Unit".

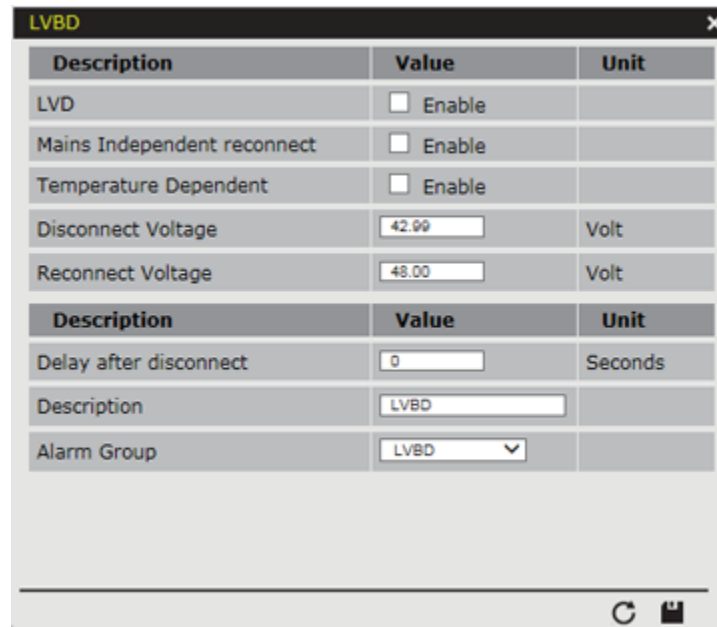
Description	Value	Unit
Fuse Rating	0	Amp

Figure 5.8 – Scale Tab – Fuse Example (BattMonFuse X)

- **Fuse Rating** – enter the fuse rating (in amps)

Edit Window for LVBD

The following parameters appear for the low-voltage battery disconnect (LVBD) edit window.



Description	Value	Unit
LVD	☐ Enable	
Mains Independent reconnect	☐ Enable	
Temperature Dependent	☐ Enable	
Disconnect Voltage	42.00	Volt
Reconnect Voltage	48.00	Volt

Description	Value	Unit
Delay after disconnect	0	Seconds
Description	LVBD	
Alarm Group	LVBD	

Figure 5.9 – LVBD Edit Window

- **LVD** – check the **Enable** box to enable monitoring of the low-voltage battery disconnect contactor
- **Mains Independent reconnect** – check the **Enable** box to permit the LVBD contactor to close if the **Reconnect Voltage** is attained, regardless of whether ac input (mains) is available. This is useful when a backup or secondary power source is capable of supporting battery charging.
- **Temperature Dependent** – check the **Enable** box to permit the LVBD contactor to close when the battery temperature is lower than the value configured for the **BatteryTemp** alarm monitor (**Alarm Conf. > Power System > Battery > Battery Alarm Configuration**)
- **Disconnect Voltage** – discharge voltage threshold at which the LVBD contactor should open to disconnect the batteries; the LVBD alarm is also triggered

NOTE: This field is the same as the **Battery disconnect voltage** (**System Conf. > Power System > Power System > System Voltages**) and **Disconnect voltage [V]** (**System Conf. > Battery > Configuration > System Voltages**) fields under the **System Configuration** section.

- **Reconnect Voltage** – system voltage at which the LVBD contactor should be closed to reconnect the batteries
- NOTE:** This field is the same as the **Battery reconnect voltage (System Conf. > Power System > Power System > System Voltages)** and **Reconnect voltage [V] (System Conf. > Battery > Configuration > System Voltages)** fields under the **System Configuration** section.
- **Delay after disconnect** – time delay (in seconds) to enforce between LVBD disconnect and reconnect
 - **Description** – free-form field for the description of the alarm monitor
 - **Alarm Group** – controller alarm group assigned to report the LVBD alarm

Edit Window for LVLD

The following parameters appear for the low-voltage load disconnect (LVLD) edit window.

Description	Value	Unit
LVD	☐ Enable	
Mains Independent reconnect	☐ Enable	
Disconnect Voltage	44.00	Volt
Reconnect Voltage	48.00	Volt

Description	Value	Unit
Disconnect delay time	30	Minutes
Disconnect delay enable	☐ Enable	
Delay after disconnect	0	Seconds
Description	LVLD 1.1	
Alarm Group	LVLD1	

At the bottom right of the window are icons for refresh and save.

Figure 5.10 – LVLD Edit Window

NOTE: The number of load contactors (LVLDs) must be set under **System Conf. > Power System > Load > Configuration** (parameters **Select load group** and **Number of load contactors**). When configured, the LVLD alarm monitor appears under **Alarm Conf. > Power System > Load > Load Group X**.

- **LVD** – check the **Enable** box to enable monitoring of the low-voltage load disconnect contactor

- **Mains Independent reconnect** - check the **Enable** box to permit the LVLD contactor to close if the **Reconnect Voltage** is attained, regardless of whether ac input (mains) is available. This is useful when a backup or secondary power source is capable of supporting the load.
- **Disconnect Voltage** – low voltage threshold at which the LVLD contactor should open to disconnect the load; the LVLD alarm is also triggered
NOTE: This field is the same as the **Disconnect voltage [V] (System Conf. > Load > Configuration)** under the **System Configuration** section.
- **Reconnect Voltage** – system voltage at which the LVLD contactor should be closed to reconnect the load
NOTE: This field is the same as the **Reconnect voltage [V] (System Conf. > Load > Configuration)** under the **System Configuration** section.
- **Disconnect delay time** – time delay (in minutes) between loss of ac input (mains) and opening the LVLD contactor to disconnect the load; **Disconnect delay enable** (below) must be enabled to use this parameter
- **Disconnect delay enable** – check the **Enable** box to enable **Disconnect delay time** (above)
- **Description** – free-form field for the description of the alarm monitor
- **Alarm Group** – controller alarm group assigned to report the LVLD alarm

Alarm Configuration Menus

Alarm monitors are configured under their respective menus in the Alarm Configuration section.

Power System

The Power System page contains alarm menus for power system alarm monitors (currently, the only alarm menu category).

Mains

The **Mains** page contains alarm monitors for ac input (mains).

WITHOUT GROUPS – alarm sections and monitors that appear when there are no Smartpack2 Basic Industrial controllers present.

Mains Inputs Alarm Configuration				
#	Edit	Description	Enable	Status
1		MainsLow	☒	
2		MainsVolt 1	☒	
3		MainsVolt 2	☒	
4		MainsVolt 3	☒	

Figure 5.11 – Mains Inputs Alarms (without groups)

- **Mains Inputs Alarm Configuration** – section for detecting the number of mains groups with errors
 - **MainsLow X** – monitor for defining major and minor alarms for low ac input (mains) voltage (from **MainsVoltY**)
 - **MainsVoltY** – monitors for defining high and low ac input (mains) voltage thresholds

NOTE: The number of **MainsVolt** monitors is dependent on how many phases are specified at **System Conf. > Power System > Mains > (Mains Configuration) Number of Phases**

NOTE: AC input (mains) voltage is monitored by rectifiers, which report to the controller.

WITH GROUPS – alarm sections and monitors that appear when one or more Smartpack2 Basic Industrial controllers are present and connected to rectifiers.

- **Mains Inputs Alarm Configuration** – section for detecting the number of mains groups with errors

Mains Inputs Alarm Configuration				
#	Edit	Description	Enable	Status
1		MainsGrpInMajor	☐	
2		MainsGrpInMinor	☐	
Mains Group 1				

Figure 5.12 – Mains Inputs Alarms (with groups)

- **MainsGrpInMajor** – monitor for defining a major alarm for mains group errors
- **MainsGrpInMinor** – monitor for defining a minor alarm for mains group errors
- **Mains Group X** – section for mains group monitoring; mains groups appear only for Smartpack2 Basic Industrial controllers that are monitoring rectifiers

Mains Inputs Alarm Configuration					
Mains Group 1					
1	♂	MainsVolt 1.1	☒		✓
2	♂	MainsVolt 1.2	☐		⊗
3	♂	MainsVolt 1.3	☒		✓
4	♂	MainsLow 1	☒		✓

Figure 5.13 – Mains Group Alarms

- **MainsVolt X.Y** – monitors for defining high and low ac input (mains) voltage thresholds

NOTE: The number of **MainsVolt** monitors is dependent on how many phases are specified at **System Conf. > Power System > Mains > (Mains Configuration) Number of Phases**

- **MainsLow X** – monitor for defining major and minor alarms for low ac input (mains) voltage (from **MainsVolt X.Y**)

NOTE: AC input (mains) voltage is monitored by rectifiers, which report to the controller.

- **[Mains Monitor X]** – section for configuring an Eltek AC Mains Monitor (CAN Node); an AC Mains Monitor must be connected for this section to appear. See the section “AC Mains Monitor”.

Table 5.1 – Mains Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Mains	Mains Inputs Alarm Configuration	MainsGrplnMajor	Major Alarm Minor Alarm	Unit(s)	N/A
		MainsGrplnMinor	Major Alarm Minor Alarm	Unit(s)	N/A
	Mains Group X	MainsVolt X.Y	Major High Minor High Minor Low Major Low	Volt AC	N/A
		MainsLow X	Major Alarm Minor Alarm	Unit(s)	N/A

Unit(s) represents a whole sum or count

Generator

Alarm monitors for connected generators (if applicable).

Generator Alarm Configuration				
#	Edit	Description	Enable	Status
1		GeneratorFail	☐	
2		FuelRemaining 1	☐	

Figure 5.14 – Generator Alarms

- **Generator Alarm Configuration** – section for configuring generator alarm monitors
 - **GeneratorFail** – monitor for sending an alarm signal if the controller has signaled the generator to start and no ac input is detected (i.e., the generator fails to start).
 - **FuelRemaining X** – monitor for defining high and low fuel amounts in the generator tank

NOTE: As of the publication date of this document, tank configuration can only be done through PowerSuite.

The following table lists the alarm monitors for the **Generator** page.

Table 5.2 – Generator Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Generator	Generator Alarm Configuration	GeneratorFail	Configurable	N/A	N/A
		FuelRemaining X	Major High Minor High Minor Low Major Low	[Liquid Volume Units – User Defined]	N/A

Rectifiers

Alarm monitors for rectifiers, rectifier groups, and external rectifier monitors.

WITHOUT GROUPS– alarm sections and monitors that appear when there are no Smartpack2 Basic Industrial controllers present

Rectifiers Alarm Configuration					
1	♂	RectifierCurrent	☐		⊗
2	♂	RectifierError	☒		✓
3	♂	RectLowMains	☐		⊗
4	♂	RectCommError	☒		✓
5	♂	Rect.Capacity	☐		⊗
6	♂	RectCurrShareErr	☐		⊗
7	♂	RectifierTemp	☐		⊗

Figure 5.15 – Rectifier Alarms (without groups)

- **Rectifiers Alarm Configuration** – section for configuring rectifier alarm monitors
 - **RectifierCurrent** – monitor for defining maximum current output thresholds for the rectifiers
 - **RectifierError** – monitor for detecting the number of rectifiers experiencing errors
 - **RectLowMains** – monitor for detecting the number of rectifiers experience low ac input (mains)
 - **RectCommError** – monitor for reporting the number of rectifiers experiencing communication errors
 - **Rect.Capacity** – monitor for the percentage of rectifier capacity being used
 - **RectCurrShareErr** – monitor for defining current share deviation (in percentage) across the rectifiers
 - **RectifierTemp** – monitor for defining high and low temperature thresholds

WITH GROUPS – alarm sections and monitors that appear when one or more Smartpack2 Basic Industrial controllers are present and connected to rectifiers

- **Rectifiers Alarm Configuration** – section for configuring rectifier alarm monitors

Rectifiers Alarm Configuration					
1	⌘	TotRectCurrent	☒		⚠
2	⌘	RectGrpErr	☒		✓
3	⌘	RectGroupInMinor	☒		⚠
4	⌘	RectGrpCommErr	☒		✓
5	⌘	TotRectCapacity	☐		⊘
6	⌘	RectCurrShareErr	☐		⊘
7	⌘	RectifierTemp	☐		⊘
Rect.Group 1					

Figure 5.16 – Rectifier Alarms (with groups)

- **TotRectCurrent** – monitor for setting high current thresholds for all rectifier output (if there is more than one rectifier group)
- **RectGrpErr** – monitor for detecting the number of rectifier groups reporting an alarm or error
- **RectGroupInMinor** – monitor for detecting the number of rectifier groups experiencing a minor alarm
- **RectGrpCommErr** – monitor for detecting the number of rectifier groups experiencing a communication error
- **TotRectCapacity** – monitor for the percentage of total rectifier capacity being used
- **RectCurrShareErr** – monitor for detecting current share errors by defining current share deviation (as a percentage)
- **RectifierTemp** – monitor for defining high and low rectifier temperature thresholds
- **Rect.Group X**– section for configuring alarm monitors for a rectifier group, which only appears for a Smartpack2 Basic Industrial controller

Rectifiers Alarm Configuration					
Rect.Group 1					
1		RectCurrGrp. 1	☐		
2		RectErrGrp. 1	☒		
3		RectComErrGrp.1	☒		
4		RectTempGrp. 1	☐		
5		CurrShareErr 1	☐		
6		RecLoMainsGrp.1	☐		

Figure 5.17 – Rectifier Group Alarms

- **RectCurrGrp. X** – monitor for defining maximum current output thresholds for the rectifier group
- **RectErrGrp. X**–monitor for detecting the number of rectifiers experiencing errors within the rectifier group
- **RectComErrGrp. X** – monitor for reporting the number of rectifiers experiencing communication errors within the rectifier group
- **RectTempGrp. X** – monitor for defining high and low temperature thresholds for the rectifier group
- **CurrShareErr X** – monitor for defining current share deviation (as a percentage) across the rectifiers within the rectifier group
- **RecLoMainsGrp. X** – monitor for detecting the number of rectifiers experience low ac input (mains)
- **[RectCurMon X]** – section for configuring the alarm monitors of a Load Monitor that is set to monitor rectifier current. See the section “Load Monitor”.
- **[RectFlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor rectifier current. See the section “Flexi Monitor”.

The following table lists the alarm monitors for the **Rectifiers** page.

Table 5.3 – Rectifiers Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Rectifiers	Rectifiers Alarm Configuration	TotRectCurrent	Major Alarm Minor Alarm	Amp	N/A
		RectGrpErr	Major Alarm Minor Alarm	Unit(s)	N/A

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		RectGroupInMinor	Major Alarm Minor Alarm	Unit(s)	N/A
		RectGrpCommErr	Major Alarm Minor Alarm	Unit(s)	N/A
		TotRectCapacity	Major Alarm Minor Alarm	Percentage	N/A
		RectCurrShareErr	Major Alarm Minor Alarm	Percentage	N/A
		RectifierTemp	Major High Minor High Minor Low Major Low	Degrees	N/A
	Rect.Group X	RectCurrGrp. X	Major Alarm Minor Alarm	Amp	N/A
		RectErrGrp. X	Major Alarm Minor Alarm	Unit(s)	N/A
		RectComErrGrp.X	Major Alarm Minor Alarm	Unit(s)	N/A
		RectTempGrp. X	Major High Minor High Minor Low Major Low	Degrees	N/A
		CurrShareErr X	Major Alarm Minor Alarm	Percentage	N/A
		RecLoMainsGrp.X	Major Alarm Minor Alarm	Unit(s)	N/A

Unit(s) represents a whole sum or count

[Solar]

Alarm configuration page for solar chargers; only appears if an external monitor is connected and/or Eltek solar chargers are installed.

- **Solar Alarm Configuration** – alarm monitors for solar chargers

Solar Alarm Configuration				
#	Edit	Description	Enable	Status
1		SolarCurrent	☐	
2		SolarChargerErr	☒	
3		SolarCommErr	☒	
4		SolarChargerTemp	☐	
Solar CurMon 1				

Figure 5.18 – Solar Alarms

- **SolarCurrent** – monitor for defining maximum output current thresholds for the solar chargers
- **SolarChargerErr** – monitor for detecting the number of solar chargers experiencing an error
- **SolarCommErr** – monitor for detecting the number of solar chargers experiencing communication errors
- **SolarChargerTemp** – monitor for defining high and low temperature thresholds for the solar chargers
- **[SolarCurMon X]** – section for configuring the alarm monitors of a Load Monitor that is set to monitor solar current. See the section “Load Monitor”.
- **[SolarFlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor solar current. See the section “Flexi Monitor”.

The following table lists the alarm monitors for the **Solar** page.

Table 5.4 – Solar Charger Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Solar Charger	Solar Charger Alarm Configuration	SolarCurrent	Major Alarm Minor Alarm	Amp	N/A
		SolarChargeErr	Major Alarm Minor Alarm	Unit(s)	N/A
		SolarCommErr	Major Alarm Minor Alarm	Unit(s)	N/A
		SolarChargerTemp	Major High Minor High Minor Low Major Low	Degrees	N/A

[Wind Charger]

Alarm configuration page for wind chargers; only appears if an external monitor is connected

- **Wind Charger Alarm Configuration** – alarm monitors for wind chargers

Wind Charger Alarm Configuration				
#	Edit	Description	Enable	Status
1		WindCurrent	☐	
2		WindError	☒	
3		WindCommError	☒	
4		WindChargerTemp	☐	
Wind CurMon 1				

Figure 5.19 – Wind Charger Alarms

- **WindCurrent** – monitor for defining maximum output current thresholds for the wind chargers
- **WindError** – monitor for detecting the number of wind chargers experiencing an error
- **WindCommError** – monitor for detecting the number of wind chargers experiencing communication errors
- **WindChargerTemp** – monitor for defining high and low temperature thresholds for the wind chargers
- **[WindCurMon X]** – section for configuring the alarm monitors of a Load Monitor that is set to monitor wind current. See the section “Load Monitor”.
- **[WindFlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor wind current. See the section “Flexi Monitor”.

The following table lists the alarm monitors for the **Wind Charger** page.

Table 5.5 – Wind Charger Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Wind Charger	Wind Charger Alarm Configuration	WindCurrent	Major Alarm Minor Alarm	Amp	N/A
		WindError	Major Alarm Minor Alarm	Unit(s)	N/A
		WindCommErr	Major Alarm Minor Alarm	Unit(s)	N/A
		WindChargerTemp	Major High Minor High Minor Low Major Low	Degrees	N/A

[FuelCell Charger]

Alarm configuration page for fuel cell chargers; only appears if an external monitor is connected

- **FuelCell Alarm Configuration** – alarm monitors for fuel cell chargers

FuelCell Charger Alarm Configuration				
#	Edit	Description	Enable	Status
1		FuelCellCurrent	☐	
2		FuelCellError	☒	
3		FuelCellCommErr	☒	
4		FuelCellCapacity	☐	
5		FuelCellTemp	☐	
FuelC CurMon 1				

Figure 5.20 – Fuel Cell Alarms

- **FuelCellCurrent** – monitor for defining maximum output current thresholds for fuel cell chargers
- **FuelCellError** – monitor for detecting the number of fuel cell chargers experiencing an error
- **FuelCellCommErr** – monitor for detecting the number of fuel cell chargers experiencing communication errors
- **FuelCellCapacity** – monitor for defining maximum output capacity for the fuel cell chargers (as a percentage of maximum output current)

- **FuelCellTemp** – monitor for defining high and low temperature thresholds for fuel cell chargers
- **[FuelC CurMon X]** – section for configuring the alarm monitors of a Load Monitor that is set to monitor fuel cell current. See the section “Load Monitor”.
- **[FuelC FlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor fuel cell current. See the section “Flexi Monitor”.

The following table lists the alarm monitors for the **Fuel Cell** page.

Table 5.6 – Fuel Cell Charger Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
FuelCell Charger	FuelCell Charger Alarm Configuration	FuelCellCurrent	Major Alarm Minor Alarm	Amp	N/A
		FuelCellError	Major Alarm Minor Alarm	Unit(s)	N/A
		FuelCellCommErr	Major Alarm Minor Alarm	Unit(s)	N/A
		FuelCellCapacity	Major Alarm Minor Alarm	Percentage	N/A
		FuelCellTemp	Major High Minor High Minor Low Major Low	Degrees	N/A

[DcDc Converter]

Alarm configuration page for dc-to-dc converters; only appears if dc-to-dc converters are installed or if an external monitor is connected

- **DcDc Converter Alarm Configuration** – alarm monitors for dc-to-dc converters

DCDC Alarm Configuration				
#	Edit	Description	Enable	Status
1		DcDcError	☒	
2		DcDcCommError	☒	
3		DcDcCurrent	☐	
4		DcDcTemp	☐	
5		DcDcCapacity	☐	
DCDC FlexMon 1				

Figure 5.21 - Dc-to-dc Converter Alarms

- **DcDcError** – monitor for detecting the number of dc-to-dc converters experiencing an error
- **DcDcCommError** – monitor for detecting the number of dc-to-dc converters experiencing communication errors
- **DcDcCurrent** – monitor for defining maximum output current thresholds for dc-to-dc converters
- **DcDcTemp** – monitor for defining high and low temperature thresholds for dc-to-dc converters
- **DcDcCapacity** – monitor for defining maximum output capacity for the dc-to-dc converters (as a percentage of maximum output current)
- **[DCDC CurMon X]** – section for configuring the alarm monitors of a Load Monitor that is set to monitor dc-to-dc converter current. See the section “Load Monitor”.
- **[DCDC FlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor dc-to-dc converter current. See the section “Flexi Monitor”.

The following table lists the alarm monitors for the **DCDC Converter** page.

Table 5.7 - Dc-to-Dc Converter Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
DcDc Converter	DcDc Converter Alarm Configuration	DcDcError	Major Alarm Minor Alarm	Unit(s)	N/A
		DcDcCommErr	Major Alarm Minor Alarm	Unit(s)	N/A

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		DcDcCurrent	Major Alarm Minor Alarm	Amp	N/A
		DcDcTemp	Major High Minor High Minor Low Major Low	Degrees	N/A
		DcDcCapacity	Major Alarm Minor Alarm	Percentage	N/A

Load

Alarm monitors for load groups and external load monitors.

- **Load Alarm Configuration** – section for configuring load alarms handled by the system controller

Load Alarm Configuration				
#	Edit	Description	Enable	Status
1		LoadCurrent	☐	
Load Group 1				
Load Group 2				
LoadPrimary 1				

Figure 5.22 – Load Alarms

- **LoadCurrent** – monitor for defining the maximum current draw thresholds for loads
- **Load Group X** – section for configuring load alarms for load groups, which appear for every controller except Smartpack2 Master (appears for Smartpack S, Compack, Smartpack2 Basic and Smartpack2 Basic Industrial)

Load Alarm Configuration					
Load Group 1					
1	⚙	LoadFuse 1	☒		✓
2	⚙	LoadCurr grp. 1	☒		✓
3	⚙	LoadCurrent1.1	☐		⊘
4	⚙	LoadCurrent1.2	☐		⊘
5	⚙	LVLD 1.1	☐		⊘
6	⚙	Drop diode 1.1	☒		✓
7	⚙	Drop diode 1.2	☐		⊘
8	⚙	Drop diode 1.3	☐		⊘
Load Group 2					
LoadPrimary 1					

Figure 5.23 – Load Group Alarms (with LVLD)

- **LoadFuse X** – monitor for a fuse or circuit breaker for the entire load group (if applicable)
- **LoadCurrGrp. X** – monitor for defining the high and low current thresholds for the load group
- **LoadCurrent X.Y** – monitors for defining the maximum current thresholds for individual load branch monitors in the group
- **[LVLD X.Y]** – low-voltage load disconnect contactor monitor; only appears if configured under **System Conf. > Power System > Load**
- **Drop diode X.Y** – monitors for defining the high voltage threshold for drop diodes in the load group
- **[LoadPrimary X]** – section for configuring the alarm monitors of a Load Monitor that is set to **Stdloadmon**. See the section “Load Monitor”.
- **[Load CurMon X]** – section for configuring the alarm monitors of a Load Monitor that is set to **Load CurMon**. See the section “Load Monitor”.
- **[Load FlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor unit that is set to **Load Fleximon**. See the section “Flexi Monitor”.

The following table lists the alarm monitors for the **Load** page.

Table 5.8 – Load Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Load	Load Alarm Configuration	LoadCurrent	Major Alarm Minor Alarm	Amp	N/A
	Load Group X	LoadFuse X	Configurable	N/A	Config Scale (Fuse)
		LoadCurrGrp. X	Major High Minor High Minor Low Major Low	Amp	Calibration (Current) Scale (Shunt)
		LoadCurrent X.Y	Major High Minor High Error Error	Amp	Calibration (Current) Scale (Shunt)
		LVLD X.Y	N/A	N/A	N/A
		Drop diode X.Y	Minor High	Volt DC	N/A

Battery

Alarm monitors for batteries, battery groups, and external battery monitors

- **Battery Alarm Configuration** – section for configuring battery alarm monitors handled by the system controller

Battery Alarm Configuration					
1	⚙	BatteryVoltage	☐	☐	⚙
2	⚙	BatteryCurrent	☐	☐	⚙
3	⚙	BatteryTemp	☒	☐	✓
4	⚙	BatteryLifeTime	☐	☐	⚙
5	⚙	LVBD	☐	☐	⚙
6	⚙	BatteryQuality	☒	☐	✓
7	⚙	BatteryTotCap	☐	☐	⚙
8	⚙	BatteryRemCap	☐	☐	⚙
9	⚙	BatteryTimeLeft	☐	☐	⚙
10	⚙	DeltaStringCurr	☐	☐	⚙
11	⚙	BatteryUsedCap	☐	☐	⚙
12	⚙	Ah Charged	☐	☐	⚙
13	⚙	Ah Discharged	☐	☐	⚙
14	⚙	BadTestResults	☐	☐	⚙
Battery Bank 1					
Battery Bank 2					
Battery Monitor 1					

Figure 5.24 – Battery Alarms

- **BatteryVoltage**—monitor for defining the high and low voltage thresholds for batteries
 - **BatteryCurrent** – monitor for defining the high and low current thresholds for batteries (charge and discharge, respectively)
 - **BatteryTemp** – monitor for defining the high and low temperature thresholds for battery temperature
 - **BatteryLifeTime** – monitor for determining if the batteries have exceeded the maximum number of days (user-defined) for a normal life cycle
 - **LVBD** – monitor for detecting the state of the battery LVD (i.e., whether it is closed or open).
 - **BatteryQuality** – monitor for the percentage of the battery’s original capacity that remains for charging; the controller triggers the alarm if it calculates the battery’s charging capacity to be below the percentage specified
- CAUTION:** Resetting the **BatteryQuality** monitor (i.e., unchecking the **Enable** box and rechecking it) resets the monitor’s value, causing it to lose the percentage it calculated from the last battery test. The value is, however, stored in the battery test result log.
- **BatteryTotCap** – monitor for total maximum capacity of the batteries (in amp-hours)

- **BatteryRemCap** – monitor for maximum discharge thresholds (in amp-hours) for the batteries; it indicates how much battery capacity remains before disconnect
- **BatteryTimeLeft** – monitor for the estimated remaining battery discharge time (in minutes)
- **DeltaStringCurr** – monitor for the maximum deviation (as a percentage) between battery string measurements
- **BatteryUsedCap** – monitor for estimated battery capacity used (in amp-hours); this monitor is analogous to a DOD (Depth of Discharge) measurement
- **Ah Charged** – counter for amp-hours (x100) of charge on the current batteries
- **Ah Discharged** – counter for amp-hours (x100) of discharge on the current batteries

NOTE: **Ah Charged** and **Ah Discharged** are defined in amp-hour divided by 100 as a scaling technique to prevent data overflow; the values are to be multiplied by 100 (x100). Even though one value is for charge and the other for discharge, *both* values are positive (as opposed to negative for discharge). Amp-hours are calculated every minute.

NOTE: **Ah Charged** and **Ah Discharge** values are cleared if the **Battery Capacity** or **Battery Installation Date** are changed.

System Conf. > Power System > Battery > Capacity [per string] / Battery install date [yyyy-mm-dd]

- **BadTestResults** – monitor for counting the number of battery tests where **End Voltage** is reached (**System Conf. > Power System > Battery > Test**) before the time allotted for the Simple Test, indicating that the batteries are “bad”
- **Battery Bank X** – section for configuring battery bank alarm monitors handled by the system controller(s); battery banks are defined at **System Conf. > Power System > Battery > Configuration**

Battery Alarm Configuration					
Battery Bank 1					
1		BattVolt bank 1	☐		
2		BattCurr bank 1	☐		
3		BattCurrent1.1	☐		
4		BattCurrent1.2	☐		
5		BattFuses 1	☐		
6		BatteryTemp1.1	☐		
7		BatteryTemp1.2	☐		
8		BatteryTemp1.3	☐		
9		SymmVolt 1.1	☐		
10		SymmVolt 1.2	☐		
Battery Bank 2					
Battery Monitor 1					
Battery Monitor 2					

Figure 5.25 – Battery Bank Alarms

- **BattVolt bank X** – monitor for defining the high and low voltage thresholds for battery voltage within the battery bank
- **BattCurr bank X** – monitor for defining the high and low (charge and discharge, respectively) current thresholds for the battery bank
- **BattCurrent X.Y** – monitors for defining the high and low current thresholds for battery circuits(other than the battery bank)
- **BattFuses X** – monitor for a fuse or circuit breaker for the entire battery bank (if applicable)
- **BatteryTemp X.Y** – monitors for defining the high and low temperature thresholds for battery temperature inputs
- **SymmVolt X.Y** – monitors for defining maximum voltage deviation between battery symmetry inputs
- **[Battery Monitor X]** –section for configuring the alarm monitors of a Battery Monitor (if connected). See the section “Battery Monitor”.
- **[Batt FlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor battery current. See the section “Flexi Monitor”.

The following table lists the alarm monitors for the **Battery** page.

Table 5.9 - Battery Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Battery	Battery Alarm Configuration	BatteryVoltage	Major High Minor High Minor Low Major Low	Volt DC	N/A
		BatteryCurrent	Major High Minor High Minor Low Major Low	Amp	N/A
		BatteryTemp	Major High Minor High Minor Low Major Low	(Degrees)	N/A
		LVBD*	N/A	N/A	N/A
		BatteryQuality	Major Alarm Minor Alarm	% (Percentage)	N/A
		BatteryTotCap	Minor Low Major Low	Ah	N/A
		BatteryRemCap	Minor Low Major Low	Ah	N/A
		BatteryTimeLeft	Minor Alarm Major Alarm	Min	N/A
		DeltaStringCurr	Major Alarm Minor Alarm	% (Percentage)	N/A
		BatteryUsedCap	Major Alarm Minor Alarm	Ah	N/A
		Ah Charged	Major High Minor High	Ah*100	N/A

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		Ah Discharged	Major High Minor High	Ah*100	N/A
		BadTestResults	Major Alarm	(Count)	N/A
	Battery Bank X	BattVolt bank X	Major High Minor High Minor Low Major Low	Volt DC	Calibration (Voltage)
		BattCurr bank X	Major High Minor High Minor Low Major Low	Amp	N/A
		BattCurrentX.Y	Major High Minor High Minor Low Major Low	Amp	Calibration (Current) Scale (Shunt)
		BattFuses X	Configurable	N/A	Config Scale (Fuse)
		BatteryTempX.Y	Major High Minor High Minor Low Major Low	(Degrees)	
		SymmVolt X.Y	Major Alarm Minor Alarm	Volt DC	Calibration (Voltage)

*LVBD has an alarm monitor edit window that differs from the others. See the section “Edit Window for LVBD” on page 175.

Inputs

Alarm monitor inputs grouped by controller and monitor devices

NOTE: The sections for the controllers and CAN Nodes on this page only appear if the devices are connected to the controller CAN bus.

NOTE: The **ProgInput XX.Y** name changes when configured for a voltage or current input (to **Voltage XX.Y** or **Current XX.Y**, respectively).

- **SP2 Master 1 Input Configuration** – section for configuring the alarm monitors of a Smartpack2 Master controller

SP2 Master 1 Input Configuration					
1	♂	Virtual input 1	☒		✓
2	♂	Virtual input 2	☒		✓
3	♂	Virtual input 3	☒		✓
4	♂	Virtual input 4	☐		⊗
SP2 BasicInd 1 Input Configuration					

Figure 5.26 – Smartpack2 Master Input Alarms

- **Virtual input Y** – monitors for Virtual Inputs, which are manual triggers for toggling an assigned alarm output relay on command

The following table lists the alarm monitors for the **Smartpack2 controller**.

Table 5.10 – Smartpack2 Master Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	SP2 Master 1 Input Configuration	Virtual input X	Configurable	N/A	Config

- **SP2 Basic X Input Configuration or SP2 BasicInd X Input Configuration** – section for configuring the alarm monitors of either a Smartpack2 Basic or a Smartpack2 Basic Industrial controller

SP2 Master 1 Input Configuration					
SP2 BasicInd 1 Input Configuration					
1	♂	Temperature1.1	☐		⊗
2	♂	Temperature1.2	☐		⊗
3	♂	Temperature1.3	☐		⊗
4	♂	EarthFault 1	☐		⊗
5	♂	ProgInput 1.1	☐		⊗
6	♂	ProgInput 1.2	☐		⊗
7	♂	ProgInput 1.3	☐		⊗
SP2 BasicInd 2 Input Configuration					

Figure 5.27 – Smartpack2 Basic and Smartpack2 Basic Industrial Input Alarms

- **Temperature X.Y** – monitors for defining high and low temperature thresholds for temperature probe inputs

- **EarthFault X** – monitor for defining the resistance threshold (in kOhms) for earth (ground) fault detection
- **ProgInput X.Y** – monitors for programmable inputs on the controller, which can be relay inputs or voltage (see NOTE below)

NOTE: The input terminals used for temperature are the same physical terminals used for the programmable inputs. If the temperature input (**Temperature X.Y**) is desired, then the input is configured under the **Temperature X.Y** monitor; if another kind of input is used, then the input is configured under the **ProgInput X.Y** monitor.

The following table lists the alarm monitors for the Smartpack2 Basic and Basic Industrial controllers.

Table 5.11 – Smartpack2 Basic and Basic Industrial Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	SP2 Basic/BasicIndX Input Configuration	Temperature X.Y	Major High Minor High Minor Low Major Low	(Degrees)	N/A
		EarthFault X	Major Alarm	kOhm	N/A
		ProgInput X.Y	Configurable (Voltage - 4 Events)	N/A (Volt DC)	Config Calibration (Voltage only)

If configuring a Programmable Input (**ProgInput**) for **Voltage**, then an untitled field for a voltage threshold appears under the **General** tab (between **Event** and **Alarm Group**, where the **Unit** column is normally located) and must be specified

- **SmartPack S 1 Input Configuration** – section for configuring the alarm monitors of a Smartpack S controller

SmartPack S 1 Input Configuration					
1	⌘	Temperature1.1	☐	☐	⊗
2	⌘	Temperature1.2	☐	☐	⊗
3	⌘	Temperature1.3	☐	☐	⊗
4	⌘	Temperature1.4	☐	☐	⊗
5	⌘	EarthResistance	☐	☐	⊗
6	⌘	Virtual input 1	☐	☐	⊗
7	⌘	Virtual input 2	☐	☐	⊗
8	⌘	Virtual input 3	☐	☐	⊗
9	⌘	Virtual input 4	☐	☐	⊗
10	⌘	ProgInput 1.5	☐	☐	⊗
11	⌘	ProgInput 1.6	☐	☐	⊗
12	⌘	ProgInput 1.7	☐	☐	⊗
13	⌘	ProgInput 1.8	☐	☐	⊗
14	⌘	ProgInput 1.9	☐	☐	⊗
15	⌘	ProgInput 1.10	☐	☐	⊗

Figure 5.28 – Smartpack S Input Alarms

- **Temperature X.Y** – monitors for defining high and low temperature thresholds for temperature probe inputs
- **Earth Resistance** – monitor for defining the resistance threshold (in kOhms) for earth (ground) fault detection
- **Virtual input Y** – monitors for Virtual Inputs, which are manual triggers for toggling an assigned alarm output relay on command
- **ProgInput X.Y** – monitors for programmable inputs on the controller, which can be either relay inputs or voltage

NOTE: The input terminals used for temperature are the same physical terminals used for the programmable inputs. If the temperature input (**Temperature X.Y**) is desired, then the input is configured under the **Temperature X.Y** monitor; if another kind of input is used, then the input is configured under the **ProgInput X.Y** monitor.

The following table lists the alarm monitors for the Smartpack S controller.

Table 5.12 – Smartpack S Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	SmartPack S 1 Input Configuration	Temperature X.Y	Major High Minor High Minor Low Major Low	(Degrees)	N/A
		EarthFault X	Major Alarm	kOhm	N/A
		Virtual input Y	Configurable	N/A	Config
		ProgInput X.Y	Configurable (Voltage - 4 Events)	N/A (Volt DC)	Config Calibration (Voltage only)

If configuring a Programmable Input (**ProgInput**) for **Voltage**, then an untitled field for a voltage threshold appears under the **General** tab (between **Event** and **Alarm Group**, where the **Unit** column is normally located) and must be specified

- **Compact Input Configuration** – section for configuring the alarm monitors of a Compact controller

Compact 1 Input Configuration					
1	⌘	Temperature1.1	☐		⌘
2	⌘	Temperature1.2	☐		⌘
3	⌘	Temperature1.3	☐		⌘
4	⌘	Virtual input 1	☐		⌘
5	⌘	Virtual input 2	☐		⌘
6	⌘	Virtual input 3	☐		⌘
7	⌘	Virtual input 4	☐		⌘
8	⌘	ProgInput 1.5	☐		⌘
9	⌘	ProgInput 1.6	☐		⌘
10	⌘	ProgInput 1.7	☐		⌘
IO Monitor 1 Input Configuration					

Figure 5.29 – Compact Input Alarms

- **Temperature X.Y** – monitors for defining high and low temperature thresholds for temperature probe inputs
- **Virtual input Y** – monitors for Virtual Inputs, which are manual triggers for toggling an assigned alarm output relay on command
- **ProgInput X.Y** – monitors for programmable inputs on the controller, which can be relay inputs or voltage (see NOTE below)

NOTE: The input terminals used for temperature are the same physical terminals used for the programmable inputs. If the temperature input (**Temperature X.Y**) is desired, then the input is configured under the **Temperature X.Y** monitor; if another kind of input is used, then the input is configured under the **ProgInput X.Y** monitor.

The following table lists the alarm monitors for the Compack controller.

Table 5.13 – Compack Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	Compack 1 Input Configuration	Temperature X.Y	Major High Minor High Minor Low Major Low	(Degrees)	N/A
		Virtual input Y	Configurable	N/A	Config
		ProgInput X.Y	Configurable (Voltage - 4 Events)	N/A (Volt DC)	Config Calibration (Voltage only)

If configuring a Programmable Input (**ProgInput**) for **Voltage**, then an untitled field for a voltage threshold appears under the **General** tab (between **Event** and **Alarm Group**, where the **Unit** column is normally located) and must be specified.

- **[I/O unit X Input Configuration]** – section for configuring the input channels of I/O Monitors (Types 1-3). See the section I/O Monitor Alarm Monitors.
- **[ContrFlexMon X]** – section for configuring the input channels of a Flexi Monitor set to **Std Fleximon** (Standard Flexi Monitor). See the section Flexi Monitor.
- **[Mains Monitor X Input Configuration]** –section for configuring the input channels of a Mains Monitor. See the section AC Mains Monitor.

Outputs

Page for mapping alarm groups to output channels and creating logical alarms.

Outputs Logical Groups

Select Unit: SP2 Master 1

#	Alarm Group	Buzzer	Virtual 1	Virtual 2	Virtual 3	Virtual 4
1	Major alarm	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐
7	Rectifier alarm	☐	☐	☐	☐	☐
8	Alarm Group 08	☐	☐	☐	☐	☐
9	Alarm Group 09	☐	☐	☐	☐	☐
10	Alarm Group 10	☐	☐	☐	☐	☐
11	Alarm Group 11	☐	☐	☐	☐	☐
12	Alarm Group 12	☐	☐	☐	☐	☐
13	Alarm Group 13	☐	☐	☐	☐	☐
14	Alarm Group 14	☐	☐	☐	☐	☐
15	Alarm Group 15	☐	☐	☐	☐	☐
16	Alarm Group 16	☐	☐	☐	☐	☐
17	Alarm Group 17	☐	☐	☐	☐	☐

⌂

Figure 5.30 – Smartpack2 Master Outputs (Buzzer, Virtual)

Outputs Logical Groups

Select Unit: SP2 BasicInd 2

#	Alarm Group	Batt contactor	Load contactor 1	Load contactor 2	Alarm output1	Alarm output2	Alarm output3	Phone 1	Phone 2	Phone 3	Phone 4	Phone 5
1	Major alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	Rectifier alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	Hi Temp	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	audible alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	Alarm Group 10	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11	Alarm Group 11	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	☐
12	Alarm Group 12	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13	Alarm Group 13	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

⌂

Figure 5.31 – Smartpack2 Basic Industrial Outputs (Batt/Load Contactor, Alarm Out, Phone)

- **Outputs** – configuration page for mapping alarm output groups to the supported output channels (e.g., relays, contactors, buzzers) of controller and monitor devices
 - **Select Unit** – drop-down list for selecting controllers and CAN Nodes

Table 5.14 – Table of Controller and CAN Node Output Channels

Controller or CAN Node	Output Channel(s)
SP2 Master 1 (Smartpack2 Master)	Buzzer Virtual 1-4
SP2 BasicInd X (Smartpack2 Basic Industrial)	Batt contactor Load contactor 1-2 Alarm output 1-3 Phone 1-5
SP2 Basic X (Smartpack2 Basic)	Batt contactor Load contactor 1-2
I/O unit X (I/O Monitor, Types 1-3)	Alarm output 1-6
SmartPack S 1 (Smartpack S)	Alarm output 1-6 Batt contactor Load contactor Buzzer Phone 1-3 Virtual 1-4
Compack 1 (Compack)	Alarm output 1-3 Batt contactor Load contactor Virtual 1-4

- **Alarm Map** – assignment table for each alarm group. Place a check in the box under the output desired. Alarm groups can be assigned to multiple output channels, and multiple alarm groups can be assigned to the same output channel.

NOTE: Alarm Groups are configurable and may vary in name and order.

Available output channels:

- **Buzzer** – some controllers have an audible buzzer that can be triggered by an alarm
- **Buzzer output** – feature supported by I/O Monitors that triggers a recurring buzzer

NOTE: The **Buzzer output** column only appears in Eltek I/O Monitors that have the latest software revision installed.

- **Alarm output** – output relays associated with physical terminals on the controller or CAN Node; see the manual for each controller or CAN Node to determine which terminals are associated with each alarm output relay
- **Batt contactor** – low-voltage battery disconnect contactor (LVBD); assigning alarm groups to the battery contactor triggers a change in state (either open or closed) in the LVBD. See the manual for each controller or CAN Node to determine which terminals are associated with battery contactor relay(s).
- **Load contactor** – low-voltage load disconnect contactor (LVLD); assigning alarm groups to the battery contactor triggers a change in state (either open or closed) in the LVLD. See the manual for each controller or CAN Node to determine which terminals are associated with load contactor relay(s).
- **Virtual** – some controllers have virtual alarms; assigning an alarm group to a virtual output channel triggers the assigned **Virtual Input**
- **Phone**–modem callback phone number(s); assigning an alarm group to one or more of these output channels sends an alarm message to the phone number(s) configured on the **Modem CallBack** page (**System Conf. > Power System > Control System > Modem CallBack**).
NOTE: To use the **Modem Callback** feature, it must be enabled and phone numbers configured on the **Modem CallBack** page. In addition, modem equipment must be connected to the controller unit that supports modem communication (Smartpack2 Basic Industrial, Smartpack S, or SmartNode).
- **Output Config Window** – clicking on an Output Channel column title opens the **Output Config** window, where the channel can be configured.

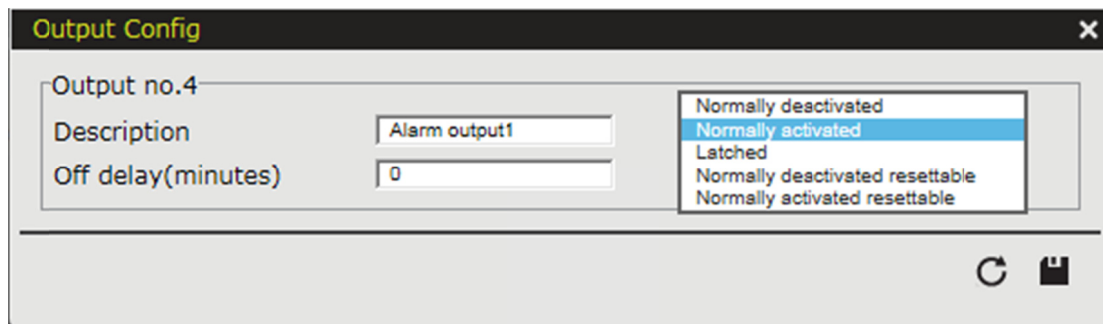


Figure 5.32 – Output Config Window

- **Description** – free-form text field where a description of the output channel can be typed
 - **[Channel Characteristic]** – drop-down list of normal behavior to assign to the relay. The following options are available:
 - **Normally deactivated** – the relay is normally deactivated (normally open)
 - **Normally activated** – the relay is normally activated (normally closed)
 - **Latched** – the channel is for a latched low-voltage disconnect (LVD) contactor (the LVD is latched in place in either state, not requiring energy to remain either open or closed).
 - **Normally deactivated resettable** – the relay is normally deactivated (normally open) and can be reset even if the alarm group is still in alarm. This setting is used for the “nag” feature, which recurs for as long as the triggering alarm is active.
 - **Normally activated resettable** – the relay is normally activated (normally closed) and can be reset even if the alarm group is still in alarm. This setting is used for the “nag” feature, which recurs for as long as the triggering alarm is active.
 - **Off delay (minutes)** – the number of minutes to elapse after receiving an alarm from an alarm group before the output channel should be signaled.
- The following image shows the **Output Config** window for the **Buzzer Output**. The delay timer changes to **Nag timer** when either of the **resettable** options is selected.

The 'Output Config' window shows configuration for 'Output no.1'. It includes a 'Description' field with 'Buzzer Output', a 'Nag timer(minutes)' field with '30', and a dropdown menu set to 'Normally activated resettable'. There are refresh and save icons at the bottom right.

Figure 5.33 - Output Config Window for Buzzer Output (Nag timer instead of Off delay)

- **Logical Groups** - configuration page for creating logic equations to trigger an alarm group when two other alarm groups are in specific states; also known as Boolean algebra

The 'Logical Groups' page shows a table for configuring logic equations. The table has columns for 'IF', 'Alarm Group 1', 'IS', 'Active/Not Active', 'AND', 'Alarm Group 2', 'IS', 'Active/Not Active', '=', and 'Result Group'. A list of alarm groups is on the left, including Major alarm, Minor alarm, Mains alarm, Fuse alarm, Battery high, Battery low, Rectifier alarm, and various Alarm Groups (08-17). A note at the bottom states: 'as result groups must not be assigned to any monitor!'.

IF	Alarm Group 1	IS	Active/Not Active	AND	Alarm Group 2	IS	Active/Not Active	=	Result Group
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	Major alarm	IS	Active	AND	-	IS	Active	=	-
IF	Minor alarm	IS	Active	AND	-	IS	Active	=	-
IF	Mains alarm	IS	Active	AND	-	IS	Active	=	-
IF	Fuse alarm	IS	Active	AND	-	IS	Active	=	-
IF	Battery high	IS	Active	AND	-	IS	Active	=	-
IF	Battery low	IS	Active	AND	-	IS	Active	=	-
IF	Rectifier alarm	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 08	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 09	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 10	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 11	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 12	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 13	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 14	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 15	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 16	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 17	IS	Active	AND	-	IS	Active	=	-
IF	OutpBlocked	IS	Active	AND	-	IS	Active	=	-
Note: Alarm	LVBD								
	LVD1								
	LVD2								

Figure 5.34 - Logical Groups Page

- **[Table Rows]** – equations for activating an alarm output group based on the states of two other alarm output groups. Up to ten logical groups can be configured.

The equation for each line reads as follows:

If **Alarm Group 1** is **[Active or Not Active]** and **Alarm Group 2** is **[Active or Not Active]**, then activate **Result Group**.

- **Alarm Group 1** – drop-down list of alarm groups to select as the first alarm group state to check
- **Alarm Group 2** – drop-down list of alarm groups to select as the second alarm group state to check
- **Active/Not Active** – drop-down list of states for the corresponding alarm group; select either Active or Not Active
- **Result Group** – drop-down list of alarm groups to select as the alarm output group to active if the equation is true
NOTE: Alarm groups assigned to the **Result Group** *cannot* be used for any other alarm monitors. In other words, an alarm group assigned to a **Result Group** must be dedicated to that **Result Group** only.

Control System

The **Control System** page contains alarm monitors for detecting errors (malfunctions) with the controller and CAN Node devices connected to the power system.

Control System				
#	Edit	Description	Enable	Status
1		AmbientTemp	☐	
2		Batt-AmbientTemp	☐	
3		UserSuspended	☒	
4		CU Err.Basic	☒	
5		CU Err.BattMon	☒	
6		CU Err.LoadMon	☒	
7		CU Err.IO-Unit	☒	
8		CtrlUnitError	☒	

Figure 5.35 – Control System Alarms

NOTE: Alarm monitors only appear if the associated controller or CAN Node is present.

- **Ambient Temp** – monitor for the maximum temperature detected by any of the controller temperature inputs (Smartpack2 Basic or Smartpack2 Basic Industrial)
- **Batt-AmbientTemp** – monitor for the difference between battery temperature and the **AmbientTemp** value (**BatteryTemp** – **AmbientTemp**)
- **UserSuspended** – indicates if a user account has been suspended due to too many unsuccessful login attempts

- **CU Err.Basic** – monitor for detecting errors with Smartpack2 Basic or Smartpack2 Basic Industrial controllers
- **CU Err.BattMon** – monitor for detecting errors with connected Battery Monitors
- **CU Err.LoadMon** – monitor for detecting errors with connected Load Monitors
- **CU Err.IO-Unit** – monitor for detecting errors with connected I/O Monitors (Types 1-3)
- **CtrlUnitError** – monitor for detecting errors with the primary controller unit (Smartpack2 Master, Smartpack, or Compack)

The following table lists the alarm monitors for the **Control System** page.

Table 5.15 – Control System Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Control System	Control System	Ambient temp	Major High Minor High Minor Low Major Low	(Degrees)	N/A
		Batt-AmbientTemp	Major High Minor High Minor Low Major Low	(Degrees)	N/A
		UserSuspended	Major Alarm	N/A	N/A
		CU Err.Basic	Major Alarm Minor Alarm	Unit(s)	N/A
		CU Err.BattMon	Major Alarm Minor Alarm	Unit(s)	N/A
		CU Err.LoadMon	Major Alarm Minor Alarm	Unit(s)	N/A
		CU Err.IO-Unit	Major Alarm Minor Alarm	Unit(s)	N/A
		CtrlUnit Error	Major Alarm Minor Alarm	Unit(s)	N/A

Unit(s) represents a whole sum or count

Eltek CAN Nodes

Eltek CAN Nodes provide auxiliary monitoring extensibility to the control system; most CAN Nodes are also equipped with output relays for limited alarm and control signaling. Configuration pages for CAN Nodes only appear in the web interface when they are connected to the controller CAN bus.

Table 5.16 – CAN Nodes – Alarm Monitors and Locations

CAN Node	Function	(Load and Flexi Monitors only)* When Configured As Monitor Type...	Alarm Page Where It Appears	Configuration Heading/Section Name
AC Mains Monitor	Monitor ac input (mains) voltage, frequency and current		Mains	Mains Monitor X
Battery Monitor	Monitor battery charge current, temperature, fuse or circuit breaker, and symmetry measurements		Battery	Battery Monitor X
Load Monitor*	Monitor up to eight load current(s) and eight fuses and/or circuit breakers	Std Loadmon	Load**	LoadPrimary X
		Load CurMon	Load**	Load CurMon X
		Rect CurMon	Rectifiers	Rect CurMon X
		DcDc CurMon	DcDc Converter	DcDc CurMon X
		Solar CurMon	Solar Charger	Solar CurMon X
		Wind CurMon	Wind Charger	Wind CurMon X
		FuelC CurMon	FuelCell Charger	FuelC CurMon X
Flexi Monitor*	Monitor a variety of currents on up to 16 input channels	RectifierFleximon	Rectifiers	Rect FlexMon X
		Battery Fleximon	Battery	Batt FlexMon X
		Load Fleximon	Load	Load FlexMon X
		DcDc Fleximon	DcDc Converter	DcDc FlexMon X
		Solar Fleximon	Solar Charger	Solar FlexMon X
		Wind Fleximon	Wind Charger	Wind FlexMon X
		FuelC Fleximon	FuelCell Charger	FuelC FlexMon X
		Std Fleximon	Inputs	Contr FlexMon X

CAN Node	Function	(Load and Flexi Monitors only)* When Configured As Monitor Type...	Alarm Page Where It Appears	Configuration Heading/Section Name
I/O Monitor Type 1 and Type 3***	Monitor up to six programmable inputs (relays, voltage) and Outdoor Cabinet signals		Inputs	I/O unit X Input Configuration I/O unit X Outdoor Configuration***
I/O Monitor Type 2	Monitor up to six programmable inputs (relays, voltage)		Inputs	I/O unit X Input Configuration

*Load and Flexi Monitors can be configured to monitor several categories of current through the **System Conf.** page (**System Conf.** > **Power System** > **Control System** > **Current Monitor (for Load Monitor) / Flexi Monitor**). The Configuration Heading/Section Name appears when the monitor is configured with the corresponding Monitor Type under the column *When Configured As Monitor Type*....

The Load Monitor appears under the **Load page if configured as either **Std Loadmon** or **Load CurMon**. As **Std Loadmon (LoadPrimary)**, the currents monitored are *excluded* from system current calculations; as **Load CurMon**, the currents monitored are *included* with system current calculations.

***The **Fan Control** parameters required for the fan inputs are configured under the **System Conf.** page (**System Conf.** > **Power System** > **Control System** > **Outdoor**)

AC Mains Monitor

The AC Mains Monitor provides ac input monitoring beyond what the rectifiers report. In addition to voltage readings on each phase, frequency, current and total current can be monitored. The AC Mains Monitor also maintains its own data log.

Alarm Conf. > **Power System** > **Mains**

SP2 Master Input Configuration					
SP2 Basic 1 Input Configuration					
I/O unit 1 Input Configuration					
Mains Monitor1 Input Configuration					
1	⚡	MainsPrin 1	☐		
2	⚡	MainsPrin 2	☐		
3	⚡	MainsPrin 3	☐		
4	⚡	MainsPrin 4	☐		
5	⚡	MainsPrin 5	☐		

Figure 5.36 – AC Mains Monitor Alarms

- **Mains Monitor X** - section for configuring an AC Mains Monitor CAN Node
 - **MainsVolt X.Y** – monitors for defining high and low ac input (mains) voltage thresholds
 - **Frequency X** – monitor for defining alarm thresholds for the measured ac input frequency
 - **MainsCurr X.Y** – monitors for defining alarm thresholds for high ac input (mains) current
 - **TotMainsCurr X** – monitor for defining total ac input high current thresholds

Alarm Conf. > Power System > Inputs

- **Mains Monitor X Input Configuration** – section for configuring the inputs of a Mains Monitor CAN Node
 - **MainsPrin X** – monitors for the configurable input channels of a Mains Monitor

The following table lists the alarm monitors for the Mains Monitor.

Table 5.17 – AC Mains Monitor Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Mains	Mains Monitor X	MainsVolt X.Y	Major High Minor High Minor Low Major Low	Volt AC	N/A

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		Frequency X	Major High Minor High Minor Low Major Low	Hz	N/A
		MainsCurr X.Y	Major High Minor High	Amps	Scale (Shunt)
		TotMainsCurr X	Major High Minor High	Amps	N/A
Inputs	Mains MonitorX Input Configuration	MainsPrin X	Configurable	N/A	Config

Location on Home Page: **Mains Status** button



Battery Monitor

The Battery Monitor provides battery current, fuse, and temperature monitoring as a supplement to the controller.

Alarm Conf. > Power System > Battery

Battery Alarm Configuration					
Battery Bank 1					
Battery Bank 2					
Battery Monitor 1					
1	⚡	BattMonCurr 1	☐		⚙️
2	⚡	BattMonTemp 1	☒		✅
3	⚡	BattMonFuse 1	☐		⚙️
4	⚡	BattMonSym1.1	☒		⚙️
5	⚡	BattMonSym1.2	☒		⚙️
6	⚡	BattMonSym1.3	☒		⚙️
7	⚡	BattMonSym1.4	☒		⚙️
Battery Monitor 2					

Figure 5.37 – Battery Monitor Alarms

- **Battery Monitor X** – section for configuring a Battery Monitor CAN Node

- **BattMonCurr X** – monitor for defining high and low battery charge (OR DISCHARGE? OR CHARGE AND DISCHARGE RATHER THAN HIGH AND LOW?) thresholds; requires a shunt, which must be calibrated and scaled
- **BattMonTemp X** – monitor for defining high and low battery temperature thresholds (in degrees)
- **BattMonFuse X** – monitor for a battery circuit fuse or circuit breaker; fuse rating must be known
- **BattMonSymX.Y** – monitors for battery symmetry measurements; an alarm is triggered if there is a deviation greater than the voltage specified between any two symmetry measurements on this monitor.

The following table lists the alarm monitors for the Battery Monitor.

Table 5.18 – Battery Monitor Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Battery	Battery Monitor X	BattMonCurr X	Major High Minor High Minor Low Major Low	Amp	
		BattMonTemp X	Major High Minor High Minor Low Major Low	(Degrees)	
		BattMonFuse X	Configurable	N/A	
		BatMonSym X.Y	Major Alarm Minor Alarm	Volt DC	

Location on Home Page: Battery Status button



Load Monitor

The Load Monitor is used for monitoring current draw, fuse status, and power consumption (calculated) on load circuits. It can appear in a number of alarm pages with different heading names depending on what **Monitor Type** it is assigned under the **System Conf.** section (**System Conf.** > **Power System** > **Control System** > **Current Monitor**). Regardless of the monitor type assigned, the Load Monitor always has the same configuration sections and alarm monitors. In most cases,

Load Monitor headings end with **CurMon**; the exception is the standard load monitor type (**Std Loadmon**), where the Load Monitor heading is **LoadPrimary**.

Alarm Conf. > Power System > Load

- **LoadPrimary X** – heading for a Load Monitor used to monitor load current that is to be *excluded* from system current calculations. This is the default assignment of a Load Monitor: **Std Loadmon**.
- **Load CurMon X** – heading for a Load Monitor used to monitor load current that is to be *included* with system current calculations. This heading appears when a Load Monitor is set to **Load CurMon**.

Location on **Homepage**: **Load Status** button



Alarm Conf. >Power System > Rectifiers

- **Rect CurMon X** – heading for a Load Monitor used for monitoring non-Eltek rectifiers. This heading appears when a Load Monitor is set to **Rect CurMon**.

Location on **Home** page: **Rectifier Status** button



Alarm Conf. >Power System > DcDc Converter

- **DcDc CurMon X**– heading for a Load Monitor used for monitoring non-Eltek dc-to-dc converters. This heading appears when a Load Monitor is set to **DCDC CurMon**.

Location on **Home** page: **DCDC Status** button



Alarm Conf. >Power System > Solar Charger

- **Solar CurMon X**– heading for a Load Monitor used for monitoring non-Eltek solar chargers. This heading appears when a Load Monitor is set to **Solar CurMon**.

Location on **Home** page: **Solar Charger Status** button



Alarm Conf. >Power System > Wind Charger

- **Wind CurMon X** – heading for a Load Monitor used for monitoring wind chargers. This heading appears when a Load Monitor is set to **Wind CurMon**.

Location on **Home** page: **Wind Charger Status** button



Alarm Conf. >Power System >FuelCell Charger

- **FuelC CurMon X** – heading for a Load Monitor used for monitoring fuel cell chargers. This heading appears when a Load Monitor is set to **FuelC CurMon**.

Location on **Home** page: **FuelCell Charger Status** button



- **Currents** – section for configuring the eight current sense inputs of a Load Monitor

LoadPrimary 1					
Currents					
1	⊕	LoadCurrent 1	☒	☒	✓
2	⊕	Current 1.1	☒	☒	✓
3	⊕	Current 1.2	☐	☐	⊗
4	⊕	Current 1.3	☐	☐	⊗
5	⊕	Current 1.4	☐	☐	⊗
6	⊕	Current 1.5	☐	☐	⊗
7	⊕	Current 1.6	☐	☐	⊗
8	⊕	Current 1.7	☐	☐	⊗
9	⊕	Current 1.8	☐	☐	⊗
Fuses					
Power					

Figure 5.38 – Load Monitor - Currents

- **Current X**–monitor for defining high current thresholds for the total current read by all of the Load Monitor's current sense inputs

- **Current X.Y** – monitors for defining high current thresholds for current read by each of the Load Monitor's current sense inputs
 - **Fuses** – section for configuring the eight fuse (or circuit breaker) monitoring inputs of a Load Monitor

LoadPrimary 1				
Currents				
Fuses				
1	♂	Fuse 1.1	☒	✓
2	♂	Fuse 1.2	☐	⊗
3	♂	Fuse 1.3	☐	⊗
4	♂	Fuse 1.4	☐	⊗
5	♂	Fuse 1.5	☐	⊗
6	♂	Fuse 1.6	☐	⊗
7	♂	Fuse 1.7	☐	⊗
8	♂	Fuse 1.8	☐	⊗
Power				

Figure 5.39 – Load Monitor - Fuses

- **Fuses X.Y** – monitors for fuses or circuit breakers; fuse rating must be known
 - **Power** – section for reporting power calculations (not configurable)

LoadPrimary 1				
Currents				
Fuses				
Power				
1		TotPower 1		
2		Power 1.1		
3		Power 1.2		
4		Power 1.3		
5		Power 1.4		
6		Power 1.5		
7		Power 1.6		
8		Power 1.7		
9		Power 1.8		

Figure 5.40 – Load Monitor - Power

- **TotPower X** – monitor for total power measured on all current sense inputs of a Load Monitor (not configurable)

- **Power X.Y** – monitor for power on each current sense input of a Load Monitor (not configurable)

The following table lists the alarm monitors for the Load Monitor.

Table 5.19 – Load Monitor Alarm Monitors

Menu Page	Section Heading	Sub-Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Load	Load Primary X*	Currents	Current X	Major High Minor High	Amp	
	Load CurMon X*					
Rectifiers	Rect CurMon X					
DcDc Converter	DcDc CurMon X					
Solar Charger	Solar CurMon X					
Wind Charger	Wind CurMon X					
FuelCell Charger	FuelC CurMon X					
			Current X.Y	Major High Minor High	Amp	Calibration (Current) Scale (Shunt)
		Fuses	Configurable	Normally Open Normally Closed Diode Matrix	N/A	Scale (Fuse)
		Power	TotPower X	N/A	N/A	N/A
			Power X.Y	N/A	N/A	N/A

*These headings both appear under the **Load** page, depending on what **Monitor Type** is assigned.

Name on **Control Units Summary** page: **CurrMonitor X** or **LoadMonitor X**

NOTE: Load Monitors are named either **CurrMonitor** or **LoadMonitor** on the **Control Units Summary** page depending on configuration. **CurrMonitor** typically refers to a Load Monitor installed by the factory in large power systems with extensive load distribution. **LoadMonitor** is the name for Load Monitors installed in the field.

Flexi Monitor

Like the Load Monitor, the Flexi Monitor can appear in a number of alarm pages depending on what **Monitor Type** it is assigned under the **System Conf.** section (**System Conf.** > **Power System** > **Control System** > **Flexi Monitor**). Regardless of the Monitor Type assigned, the Flexi Monitor always has the same configuration sections and alarm monitors.

Alarm Conf. > **Power System** > **Inputs**

- **Contr FlexMon X** – generic heading for a Flexi Monitor used to monitor current. This heading appears when a Flexi Monitor is set to **Std Fleximon**.

Location on **Home** page: **System Inputs** button (**ContrFlexMon X**)



Alarm Conf. > **Power System** > **Battery**

- **Batt FlexMon X** – heading for a Flexi Monitor used to monitor battery current. This heading appears when a Flexi Monitor is set to **Battery Fleximon**.

Location on **Home** page: **Battery Status** button (**Batt FlexMon X**)



Alarm Conf. > **Power System** > **Load**

- **Load FlexMon X** – heading for a Flexi Monitor used to monitor load current. This heading appears when a Flexi Monitor is set to **Load Fleximon**.

Location on **Home** page: **Load Status** button (**Load FlexMon X**)



Alarm Conf. > **Power System** > **Rectifiers**

- **Rect FlexMon X** – heading for a Flexi Monitor used for monitoring non-Eltek rectifiers. This heading appears when a Flexi Monitor is set to **RectifierFleximon**.

Location on **Home** page: **Rectifier Status** button (**Flexi Monitor X**)



Alarm Conf. > Power System > DcDc Converter

- **DcDc FlexMon X**– heading for a Flexi Monitor used for monitoring non-Eltek dc-to-dc converters. This heading appears when a Flexi Monitor is set to **DCDC Fleximon**.

Location on **Home** page: **DCDC Status** button (**Flexi Monitor X**)

**Alarm Conf. > Power System > Solar Charger**

- **Solar FlexMon X** – heading for a Flexi Monitor used for monitoring non-Eltek solar chargers. This heading appears when a Flexi Monitor is set to **Solar Fleximon**.

Location on **Home** page: **Solar Charger Status** button (**Flexi Monitor X**)

**Alarm Conf. > Power System > Wind Charger**

- **Wind FlexMon X** – heading for a Flexi Monitor used for monitoring wind chargers. This heading appears when a Flexi Monitor is set to **Wind Fleximon**.

Location on **Home** page: **Wind Charger Status** button (**Flexi Monitor X**)

**Alarm Conf. > Power System > FuelCell Charger**

- **FuelC FlexMon X** – heading for a Flexi Monitor used for monitoring fuel cell chargers. This heading appears when a Flexi Monitor is set to **FuelC Fleximon**.

Location on **Home** page: **FuelCell Charger Status** button (**Flexi Monitor X**)



- **Inputs**– section for configuring the 16 programmable inputs of a Flexi Monitor

Contr FlexMon 1					
Inputs					
1	♂	Current 1		☐	⚠
2	♂	ProgInput 1.1	Normally Open	☐	⚠
3	♂	ProgInput 1.2	Normally Closed	☐	⚠
4	♂	ProgInput 1.3	Voltage	☐	⚠
5	♂	ProgInput 1.4	Temperature	☐	⚠
6	♂	ProgInput 1.5	Current	☐	⚠
7	♂	ProgInput 1.6	Fan Speed	☐	⚠
8	♂	ProgInput 1.7	Fuse-NO	☐	⚠
9	♂	ProgInput 1.8	Fuse-NC	☐	⚠

Figure 5.41 – Flexi Monitor Input Alarms

- **Current X**– monitor for defining high current thresholds for the total current read by all Flexi Monitor inputs that are programmed for current measurement
- **ProgInput X.Y**–monitors for up to 16 inputs of varying types, including relays, voltage, temperature, current, and fan speed.
- **Power** – section for reporting power calculations (not configurable)

Contr FlexMon 1			
Inputs			
Power			
1		TotPower 1	
2		Power 1.1	
3		Power 1.2	
4		Power 1.3	
5		Power 1.4	
6		Power 1.5	
7		Power 1.6	
8		Power 1.7	
9		Power 1.8	
10		Power 1.9	
11		Power 1.10	
12		Power 1.11	
13		Power 1.12	

Figure 5.42 – Flexi Monitor Power Monitors

- **TotPower X** – monitor for total power measured on all applicable inputs of a Flexi Monitor (not configurable)
- **Power X.Y** – monitor for power on each applicable input of a Flexi Monitor (not configurable)

The following table lists the alarm monitors for the Flexi Monitor.

Table 5.20 – Flexi Monitor Alarm Monitors

Menu Page	Section Heading	Sub-Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Rectifiers	RectFlexMon X	Inputs	Current X	Major High Minor High	Amp	
Battery	BattFlexMon X					
Load	Load FlexMon X					
DcDc Converter	DcDcFlexMon X					
Solar Charger	Solar FlexMon X					
Wind Charger	Wind FlexMon X					
FuelCell Charger	FuelCFlexMon X					
Inputs	ContrFlexMon X					
			Current X.Y	Major High Minor High	Amp	Calibration (Current) Scale (Shunt)
			ProgInput X.Y	Configurable (Voltage, Temperature, Current, Fan Speed - 4 Events)	N/A (Volt DC)	Calibration (Voltage) Scale (Shunt, Fuse) (Fan Speed)
		Power	TotPower X	N/A	N/A	N/A
			Power X.Y	N/A	N/A	N/A

If configuring a Programmable Input (**ProgInput**) for **Voltage**, then an untitled field for a voltage threshold appears under the **General** tab (between **Event** and **Alarm Group**, where the **Unit** column is normally located) and must be specified

Name on **Control Units Summary** page: **Fleximonitor X**



I/O Monitor Alarm Monitors

I/O Monitors have six configurable inputs and six output relays. I/O Monitor Type 1 and Type 3 have additional input/output channels for outdoor cabinet applications. I/O Monitor Type 3 supports hybrid power functions (solar, fuel tank, wind, etc.) by providing higher resolution inputs than those in the Type 1. See the installation guides provided with each I/O Monitor for further details.

Alarm Conf. > Power System > Inputs

- **I/O Unit x Input Configuration** – section for configuring the input terminals of the I/O Monitors (Types 1, 2, and 3)

I/O unit 1 Input Configuration					
I/O unit 2 Input Configuration					
1	♂	ProgInput 82.1	☐	☒	
2	♂	ProgInput 82.2	☐	☒	
3	♂	ProgInput 82.3	☐	☒	
4	♂	ProgInput 82.4	☐	☒	
5	♂	ProgInput 82.5	☐	☒	
6	♂	ProgInput 82.6	☐	☒	
I/O unit 3 Input Configuration					
Contr FlexMon 1					
I/O unit 3 Outdoor Configuration					

Figure 5.43 – I/O Monitor Programmable Inputs

- **ProgInput XX.Y** – monitors for up to six inputs: relays, voltage, diode matrix, clock (inputs vary by terminal for I/O Monitor Type 3)
- **I/O unit X Outdoor Configuration** – section for configuring the outdoor cabinet monitors of I/O Monitor Type 1 or Type 3

I/O unit 3 Input Configuration				
Contr FlexMon 1				
I/O unit 3 Outdoor Configuration				
1	♂	Fan speed 83.1	☐	⊗
2	♂	Fan speed 83.2	☐	⊗
3	♂	OutDoorTemp83.1	☐	⊗
4	♂	OutDoorTemp83.2	☐	⊗
5	♂	SpeedDev. 83.1	☐	⊗
6	♂	SpeedDev. 83.2	☐	⊗
7	♂	TempDev. 83.1	☐	⊗
8	♂	TempDev. 83.2	☐	⊗

Figure 5.44 – I/O Monitor Outdoor Inputs

- **Fan speed XX.Y** – monitors for high and low fan speed thresholds (as a percentage); designed to be used in conjunction with **SpeedDev XX.Y** (below)
- **OutDoorTemp XX.Y** – monitors for high temperature thresholds for outdoor cabinet temperature inputs; designed to be used to compare the temperature inside and outside the cabinet for **TempDev XX.Y** (below)
- **SpeedDev. XX.Y** – monitors for fan speed deviation (as a percentage) between the expected fan speed (specified under output relay **Fan Control Y**) and the measured fan speed (**FanSpeed XX.Y**, above)
Location of **Fan Control** parameter: **System Conf. > Power System > Control System > Outdoor > Fan Control Y**
- **TempDev. XX.Y** – monitors for high and low temperature deviation (in degrees) between the temperatures inside and outside of the cabinet

The following table lists the specifications for the programmable inputs of I/O Monitors.

Table 5.21 – I/O Monitor Programmable Input Specifications

Programmable Inputs	I/O Monitor Type 1 and Type 2	I/O Monitor Type 3
1-2	NO/NC Relay, Pull Up/Down (?), Diode Matrix Voltage range: 0-75 V (78 mV resolution)	NO/NC Relay, Pull Up/Down (?), Diode Matrix Voltage range: 0-75 V (78 mV resolution)
3-4	NO/NC Relay, Pull Up/Down (?), Diode Matrix Voltage range: 0-75 V (78 mV resolution)	NO/NC Relay Voltage range 0-13 V (13 mV resolution)
5-6	NO/NC Relay, Pull Up/Down (?), Diode Matrix Voltage range: 0-75 V (78 mV resolution)	NO/NC Relay Voltage range 0-13 V (13 mV resolution) Current measurement 4-20mA (27 μ A resolution)

The following table lists the alarm monitors for the Type 1 and Type 2 I/O Monitors.

Table 5.22 – I/O Monitor Type 1 and Type 2 Input Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	I/O unit X Input Configuration	ProgInput XX.Y	Configurable (Voltage – 4 events)	N/A (Volt DC)	Calibration (Voltage)

If configuring a Programmable Input (**ProgInput**) for **Voltage**, then an untitled field for a voltage threshold appears under the **General** tab (between **Event** and **Alarm Group**, where the **Unit** column is normally located) and must be specified

The following table lists the alarm monitors for the Type 3 I/O Monitor.

Table 5.23 – I/O Monitor Type 3 Input Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	I/O unit X Input Configuration	ProgInput XX.1 ProgInput XX.2	Configurable (Voltage – 4 events)	N/A (Volt DC)	Calibration (Voltage)

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		ProgInput XX.3 ProgInput XX.4	Configurable (Voltage – 4 events)	N/A (Volt DC)	Calibration (Voltage)
		ProgInput XX.5 ProgInput XX.6	Configurable (Voltage, mA – 4 events)	N/A (Volt DC, mA)	Calibration (Voltage, mA)

If configuring a Programmable Input (**ProgInput**) for **Voltage**, then an untitled field for a voltage threshold appears under the **General** tab (between **Event** and **Alarm Group**, where the **Unit** column is normally located) and must be specified.

Name on **Control Units Summary** page: **I/O unit X**



The following table lists the *outdoor* alarm monitors for the Type 1 and Type 3 I/O Monitors.

Table 5.24 – I/O Monitor Type 1 and Type 3 Outdoor Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	I/O unit X Outdoor Configuration	Fan speed XX.Y	Major High Minor High Minor Low Major Low	% (Percentage)	N/A
		OutDoorTemp XX.Y	Major High Minor High Event Event	Degrees	Config (Tempeprature) Calibration (Tempeature)
		SpeedDev. XX.Y	Major Alarm Minor Alarm	% (Percentage)	N/A
		TempDev. XX.Y	Configurable	Degrees	N/A

If configuring a Programmable Input (**ProgInput**) for **Voltage**, then an untitled field for a voltage threshold appears under the **General** tab (between **Event** and **Alarm Group**, where the **Unit** column is normally located) and must be specified.

Location on **Home** page: **Outdoor Input** button (**I/O unit X**)



I/O Monitor Output Relays

Alarm Conf. > Outputs > Select Unit: I/O unit X

All I/O Monitor types have the same appearance on the Outputs page. Each unit (when selected from the drop-down list) shows six alarm relays that can be mapped for all available alarm groups.

NOTE: I/O Monitor Type 1 and Type 3 generate higher output on relays 5 and 6.

#	Alarm Group	Alarm out. 81.1	Alarm out. 81.2	Alarm out. 81.3	Alarm out. 81.4	Alarm out. 81.5	Alarm out. 81.6
1	Major alarm	☐	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐	☐
7	Rectifier alarm	☐	☐	☐	☐	☐	☐
8	Alarm Group 08	☐	☐	☐	☐	☐	☐
9	Alarm Group 09	☐	☐	☐	☐	☐	☐
10	Alarm Group 10	☐	☐	☐	☐	☐	☐
11	Alarm Group 11	☐	☐	☐	☐	☐	☐
12	Alarm Group 12	☐	☐	☐	☐	☐	☐
13	Alarm Group 13	☐	☐	☐	☐	☐	☐
14	Alarm Group 14	☐	☐	☐	☐	☐	☐
15	Alarm Group 15	☐	☐	☐	☐	☐	☐
16	Alarm Group 16	☐	☐	☐	☐	☐	☐
17	Alarm Group 17	☐	☐	☐	☐	☐	☐

Figure 5.45 - I/O Monitor Outputs

The following table lists the output relay specifications for the I/O Monitors.

Table 5.25 - Output Relay Specifications for I/O Monitors

Dry/Form-C Relays	I/O Monitor Types 1 & 3	I/O Monitor Type 2
1-4	1A/60W/75V	1A/60W/75V
5-6	8A/300W/75V	1A/60W/75V

6. Logs

Data collected for power system events, measurements, and user accounts are stored as logs and viewable under the **Logs** category.



Event Log

The **Event Log** page stores alarm events (when alarms are turned on and off), including controller or monitor errors and removal of modules.

- **#** – row number
- **Date/Time** – date and time of the event
- **Description** – brief description of the event. Alarms are listed by the alarm monitor name.
- **Event** – reason for the alarm event

There are three navigation buttons in the bottom right corner: **First page**, **Previous page**, and **Next page**. Each page lists 20 events.

#	Date/Time	Description	Event
1	2015-01-28 02:15:54	RectCommError	ID: 2
2	2015-01-28 02:15:54	RectCommError	ID: 1
3	2015-01-19 19:55:02	RectifierError	Minor Alarm :Off
4	2015-01-19 19:55:02	RectCommError	Minor Alarm :Off
5	2015-01-19 19:54:54	RectifierError	Minor Alarm :On
6	2015-01-19 19:54:54	RectCommError	Minor Alarm :On
7	2015-01-19 19:54:41	RectCommError	ID: 2
8	2015-01-19 19:54:41	RectCommError	ID: 1
9	2015-01-15 05:37:48	RectCommError	ID: 1
10	2015-01-15 05:37:48	RectCommError	ID: 2
11	2015-01-14 10:21:41	BatteryQuality	Minor Alarm :Off
12	2015-01-14 10:21:41	BatteryQuality	Major Alarm :Off
13	2015-01-13 05:49:29	BatteryVoltage	Minor Low :Off
14	2015-01-13 05:49:24	BatteryVoltage	Minor Low :On
15	2015-01-13 05:49:24	Stopped: Test	Info:Off
16	2015-01-13 05:49:24	BatteryQuality	Major Alarm :On
17	2015-01-13 05:49:24	BatteryQuality	Minor Alarm :On
18	2015-01-12 13:23:16	Started: Test	Info:On
19	2015-01-12 13:23:16	Test :On	Info:On
20	2015-01-10 23:23:01	RectifierError	Minor Alarm :Off

Figure 6.1 – Event Log Page

Data Log

The **Data log** page shows parameter measurements stored by controllers and CAN Nodes.

- **Select Unit** – drop-down list of connected controllers and CAN Nodes that record data measurements
- **#** - row number
- **Timestamp** – date and time the measurements are taken for the record (row)
- **[Parameters]** – each column represents a parameter measured by the controller or CAN Node device; parameters differ by unit

There are two navigation buttons in the top right corner: **Latest xx logs** and **Next xx logs**. Type the number of entries desired in the field beside either button, then click the button to view those log entries.

Select Unit		I/O unit 3			
		Latest xx logs		20	Next xx logs 20
#	Timestamp	Out Door Temp83.1	Out Door Temp83.2	Fan speed 83.1	Fan speed 83.2
1	2014-01-24 15:55	69	-41	0	0
2	2014-01-24 15:25	69	-41	0	0
3	2014-01-24 14:55	69	-41	0	0
4	2014-01-24 14:21	69	-41	0	0
5	2014-01-24 13:51	69	-41	0	0
6	2014-01-24 13:21	69	-41	0	0
7	2014-01-24 12:51	69	-41	0	0
8	2014-01-24 12:22	69	-41	0	0
9	2014-01-24 11:52	69	-41	0	0
10	2014-01-24 11:22	69	-41	0	0
11	2014-01-24 10:52	69	-41	0	0
12	2014-01-24 10:22	69	-41	0	0
13	2014-01-24 09:52	69	-41	0	0
14	2014-01-24 09:22	69	-41	0	0
15	2014-01-24 08:53	69	-41	0	0

Figure 6.2 – Data Log Page

The following table describes the data log parameters for each supported controller and CAN Node.

Table 6.1 - Parameters by Controller and CAN Node

Controller or CAN Node (Unit)	Parameter Heading	Description
SP2 Master 1 (Smartpack2 Master)	Battery Voltage	Battery voltage measurement
	Battery Current	Battery current measurement
	Tot Rect Current	Total rectifier current calculation
I/O unit X (I/O Monitor, Types 1 and 3)	Out Door Temp XX.Y	Outdoor temperature measurement
	Fan speed XX.Y	Fan speed calculation
Fleximonitor X	Prog Input X.YY	Programmable input; actual heading name may change depending on the assignment (e.g., voltage or current)

Energy Log

The **Energy logs** page shows energy calculations (in Watt-hours) for major power categories; it displays accumulated or aggregated logs by hour, day, and week. Energy logs are shown for the following items (if available in the system):

- Load
- Rectifier
- Solar
- Wind
- DC/DC
- Generator
- Battery

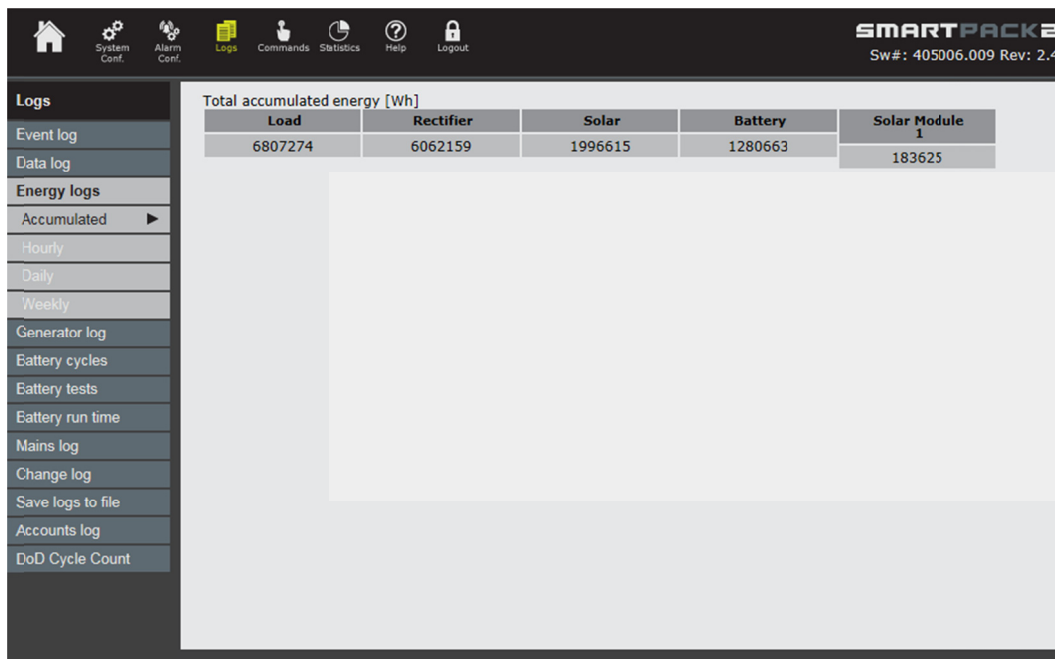


Figure 6.3 – Accumulated Energy Log Page (as an example)

Energy [Wh] per hour the last hours

Summary	Load	Rectifier	Battery
Time tag	Load	Rectifier	Battery
04.02 - 17	15	0	0
04.02 - 16	10	0	0
04.02 - 15	11	0	0
04.02 - 14	15	0	0
04.02 - 13	9	0	0
04.02 - 12	8	0	0
04.02 - 11	4	0	0
04.02 - 10	4	0	0
04.02 - 09	8	0	0
04.02 - 08	4	0	0
04.02 - 07	2	0	0
04.02 - 06	5	0	0
04.02 - 05	1	0	0
04.02 - 04	1	0	0
04.02 - 03	1	0	0
04.02 - 02	2	0	0
04.02 - 01	0	0	0

Figure 6.4 – Hourly Energy Log Page (as an example)

- **Time tag** – column that appears first on the time-based tables (**Hourly**, **Daily**, and **Weekly**); time stamp for the energy calculation.

The time-based **Energy log** tables (excluding the **Accumulated** page) have the same tabs for each power category:

- **Summary** – lists energy totals for **Load** and **Rectifier**; any measurements from connected CAN Nodes that are monitoring these power categories are included in the totals.
- **Load** – lists energy totals for load measurements; columns are added for each controller and CAN Node that measures load current
 - **Load Summary** – total for load measurements; includes controller sense inputs and any Load Monitors set to **Load CurMon** or Flexi Monitors set to **Load Fleximon**
 - **LoadPrimary X** – column for a Load Monitor set to **Std Loadmon**
 - **Load CurMon XX** – column for a Load Monitor set to **Load CurMon**
 - **Load FlexMon** – column for a Flexi Monitor set to **Load Fleximon**
- **Rectifier** – lists energy totals for rectifier output; columns are added for each controller and CAN Node that measures rectifier current
 - **Rectifier Summary** – total for rectifier measurements; includes rectifier measurements and any Load Monitors set to **Rect CurMon** or Flexi Monitors set to **Rect Fleximon**
 - **Rectifier Group X** – energy measurements for total rectifier output in a rectifier group
 - **Rect CurMon XX** – column for a Load Monitor set to **Rect CurMon**
 - **Rect FlexMon X** – column for a Flexi Monitor set to **Rect Fleximon**
- **(Solar)** – lists energy totals for up to six solar chargers; columns are added for each CAN Node that measures solar energy.
 - **Solar Charger Summary** – total for solar measurements; includes controller measurements and any Load Monitors set to **Solar CurMon** or Flexi Monitors set to **Solar Fleximon**
 - **Solar CurMon XX** – column for a Load Monitor set to **Solar CurMon**
 - **Solar FlexMon X** – column for a Flexi Monitor set to **Solar Fleximon**
- **(DCDC)** – lists energy totals for dc-to-dc converters; columns are added for each CAN Node that measures dc-to-dc energy
 - **DcDc Converter Summary** – total for dc-to-dc converter measurements; includes controller measurements and any Load Monitors set to **DCDC CurMon** or Flexi Monitors set to **DCDC Fleximon**
 - **DCDC CurMon XX** – column for a Load Monitor set to **DCDC CurMon**
 - **DCDC FlexMon X** – column for a Flexi Monitor set to **DCDC Fleximon**

- **(Wind)** – lists energy totals for wind chargers; columns are added for each CAN Node that measures wind energy
 - **Wind Charger Summary** – total for wind charger measurements; includes any Load Monitors set to **Wind CurMon** or Flexi Monitors set to **Wind Fleximon**
 - **Wind CurMon XX** – column for a Load Monitor set to **Wind CurMon**
 - **Wind FlexMon X** – column for a Flexi Monitor set to **Wind Fleximon**
- **(Fuel Cell)** – lists energy totals for fuel cell chargers; columns are added for each CAN Node that measures fuel cell energy
 - **FuelCell Charger Summary** – total for fuel cell charger measurements; includes any Load Monitors set to **FuelC CurMon** or Flexi Monitors set to **FuelC Fleximon**
 - **FuelC CurMon XX** – column for a Load Monitor set to **FuelC CurMon**
 - **FuelC FlexMon X** – column for a Flexi Monitor set to **FuelC Fleximon**
- **Battery** – lists energy totals for batteries; columns are added each Flexi Monitor that measures battery current (set to **Battery Fleximon**)
 - **Batt FlexMon X** – column for a Flexi Monitor set to **Battery Fleximon**

Table 6.2 – Names for Load and Flexi Monitors

CAN Node	Appears Under Tab...	Appears As...	When Configured As Monitor Type...
Load Monitor*	Load**	LoadPrimary X	Std Loadmon
	Load**	Load CurMon X	Load CurMon
	Rectifiers	Rect CurMon X	Rect CurMon
	DCDC	DcDc CurMon X	DCDC CurMon
	Solar	Solar CurMon X	Solar CurMon
	Wind	Wind CurMon X	Wind CurMon
	Fuel Cell	FuelC CurMon X	FuelC CurMon
Flexi Monitor*	Rectifiers	Rect FlexMon X	RectifierFleximon
	Battery	Batt FlexMon X	Battery Fleximon
	Load	Load FlexMon X	Load Fleximon
	DCDC	DcDc FlexMon X	DCDC Fleximon
	Solar	Solar FlexMon X	Solar Fleximon
	Wind	Wind FlexMon X	Wind Fleximon
	Fuel Cell Inputs	FuelC FlexMon X	FuelC Fleximon

*Load and Flexi Monitors can be configured to monitor several categories of current through the **System Conf.** page (**System Conf.** > **Power System** > **Control System** > **Current Monitor (for Load Monitor) / Flexi Monitor**). The *Configuration Heading/Section Name* appears when the monitor is configured with the corresponding Monitor Type under the column *When Configured As Monitor Type*....

The Load Monitor appears under the **Load page if configured as either **Std Loadmon** or **Load CurMon**. As **Std Loadmon (LoadPrimary)**, the currents monitored are *excluded* from system current calculations; as **Load CurMon**, the currents monitored are *included* with system current calculations.

Accumulated

The **Accumulated** page lists total accumulated energy (in Watt-hours) by power categories over the lifetime of the controller. Totals are provided for **Load**, **Rectifier**, and **Battery** by default. **Solar**, **DcDc Converter**, **Wind**, **FuelCell**, and **Generator** appear if enabled or present in the system.

Total accumulated energy [Wh]			
Load	Rectifier	Battery	DCDC
8118	16142	258010	0

Figure 6.5 – Accumulated Energy Page

Hourly

The **Hourly** page lists hourly energy totals over the past two days. **Time tag** format is Day.Month – Hour (**DD.MM – HH**), and uses a 24-hour clock.

Energy [Wh] per hour the last hours

Summary	Load	Rectifier	Battery
Time tag	Load	Rectifier	Battery
04.02 - 17	15	0	0
04.02 - 16	10	0	0
04.02 - 15	11	0	0
04.02 - 14	15	0	0
04.02 - 13	9	0	0
04.02 - 12	8	0	0
04.02 - 11	4	0	0
04.02 - 10	4	0	0
04.02 - 09	8	0	0
04.02 - 08	4	0	0
04.02 - 07	2	0	0
04.02 - 06	5	0	0
04.02 - 05	1	0	0
04.02 - 04	1	0	0
04.02 - 03	1	0	0
04.02 - 02	2	0	0
04.02 - 01	0	0	0

Figure 6.6 – Hourly Energy Log Page

Daily

The **Daily** page lists daily energy totals over the last 52 days. **Time tag** format is Day.Month (**DD.MM**).

Energy [kWh] per day the last days

Summary	Load	Rectifier	Battery
Time tag	Load	Rectifier	Battery
3.2	0	0	0
2.2	0	0	0
1.2	0	0	0
31.1	0	0	0
30.1	0	0	0
29.1	2	0	0
28.1	4	0	0
27.1	4	0	0
26.1	4	0	0
25.1	4	0	0
24.1	4	1	0
23.1	4	2	0
22.1	2	0	0
21.1	0	0	0
20.1	0	0	0
19.1	0	0	0
18.1	0	0	1

Figure 6.7 – Daily Energy Log Page

Weekly

The **Weekly** page lists weekly energy totals over the past year. **Time tag** format is Week – Year (**wXX - YYYY**).

Energy [kWh] per week the last weeks

Summary	Load	Rectifier	Battery
Time tag	Load	Rectifier	Battery
w5 - 2014	13	0	0
w4 - 2014	14	3	0
w3 - 2014	1	0	1
w2 - 2014	11	0	2
w53 - 2013	18	1	0
w52 - 2013	16	0	0
w51 - 2013	11	1	0
w50 - 2013	1	0	2644
w49 - 2013	0	0	11534
w48 - 2013	6	4	5812
w47 - 2013	6	0	-10
w46 - 2013	63	178	-10
w45 - 2013	101	626	-8
w44 - 2013	9	768	-10
w43 - 2013	8	793	-9
w42 - 2013	13	758	-9
w41 - 2013	5	157	-4

Figure 6.8 – Weekly Energy Log Page

Generator Log

The **Generator log** page displays accumulated run time and fuel consumption over daily, weekly, and monthly periods for up to two generator fuel tanks.

Select Tank: Tank 1

Accumulated run time[hours]:	0	Accumulated fuel consumption[units]:	0
------------------------------	---	--------------------------------------	---

Generator run time and fuel consumption:

Day			Week			Month		
Date	Run[min]	Fuel	Date	Run[hours]	Fuel	Date	Run[hours]	Fuel
23.1	0	0	w3 - 2014	0	0	Dec 2013	0	0
22.1	0	0	w2 - 2014	0	0	Nov 2013	0	0
21.1	0	0	w1 - 2014	0	0	Oct 2013	0	0
20.1	0	0	w52 - 2013	0	0	Sep 2013	0	0
19.1	0	0	w51 - 2013	0	0	Aug 2013	0	0
18.1	0	0	w50 - 2013	0	0	Jul 2013	0	0
17.1	0	0	w49 - 2013	0	0	Jun 2013	0	0
16.1	0	0	w48 - 2013	0	0	May 2013	0	0
15.1	0	0	w47 - 2013	0	0	Apr 2013	0	0
14.1	0	0	w46 - 2013	0	0	Mar 2013	0	0
13.1	0	0	w45 - 2013	0	0	Feb 2013	0	0
12.1	0	0	w44 - 2013	0	0	Jan 2013	0	0
11.1	0	0	w43 - 2013	0	0	Dec 2012	0	0
10.1	0	0	w42 - 2013	0	0	Nov 2012	0	0
9.1	0	0	w41 - 2013	0	0	Oct 2012	0	0
8.1	0	0	w40 - 2013	0	0	Sep 2012	0	0

Figure 6.9 – Generator Log Page

- **Select Tank** – drop-down list of available fuel tanks that are being monitored (maximum of two tanks)
 - **Accumulated run time[hours]** – total run time while under monitoring
 - **Accumulated fuel consumption[units]** – total fuel consumed while under monitoring
 - **Day** – displays run time (in minutes) and fuel consumption over the past 52 days. Date format is Day.Month (**DD.MM**).
 - **Week** – displays run time (in hours) and fuel consumption over the past year (52 weeks). Date format is Week – Year (**wXX - YYYY**).
 - **Month** – displays run time (in hours) and fuel consumption over the past 52 months. Date format is Month Year (**Mmm YYYY**).

Battery Cycles

The **Battery cycles** page displays the number of battery cycles, according to the discharge threshold (see “Discharge cycle threshold” on page 110), in total and over time intervals.

Total number of battery cycles:

0

Number of Battery cycles the last:

Index	Day	Week	Month
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0

Figure 6.10 – Battery Cycles Log

- **Total number of battery cycles** – total number of battery cycles recorded while under monitoring
- **Index** – index number; the last 52 records are viewable
- **Day** – the number of battery cycles over the last day
- **Week** – the number of battery cycles over the last week
- **Month** – the number of battery cycles over the last month

Battery Tests

The **Battery tests** page displays a table for the results of battery tests.

Test Details Icon

#	Start time	Test duration [min]	Test type	Average current [A]	Disch. energy [Ah]	Temp [°C]	End voltage [V]	Calc quality [%]	Termin. criteria	Test result	
1	2014-03-12 10:12	11	Manual test	-33	-5	25	49.65	100	End time	✓	
2	2014-03-11 09:36	11	Manual test	0	0	24	50.76	100	End time	✓	
3	2014-03-11 09:19	11	Manual test	0	0	24	50.73	100	End time	✓	
4		0	Manual test	0	0	0	0.00	0	User cancel	✗	

Figure 6.11 – Battery Test Results Log

- **#** – record number of each battery test
 - **Start time** – time when the battery test started
 - **Test duration [min]** – battery test duration, in minutes
 - **Test type** – type of battery test executed (Interval, Automatic, or Manual)
 - **Average current [A]** – average discharge current (in amps) measured over the entire test duration
 - **Disch. Energy [Ah]** – total energy (in Amp-hours) discharged during the battery test
 - **Temp [°C]** – average battery temperature during the test
 - **End voltage [V]** – final battery voltage measured at the end of the battery test
 - **Calc quality [%]** – battery quality calculation based on the battery test result, given as a percentage of the original capacity that remains for charging
 - **Termin. criteria** – reason for the termination of the battery test (End Voltage or End Time)
 - **Test result** – symbol indicating whether the test was successfully completed or not.
 - **Test Details Icon** – clicking the icon opens the Battery test details window
- NOTE:** The **Test Details Icon** only appears for successful battery tests.
- **Battery test details** – detailed results of a successful battery test
 - **Start Date & Time** – date and time the battery test began

- **Stop Time** – date and time the battery test ended
- **Duration** – total time of the battery test
- **End Voltage** – battery voltage at the end of the test
- **Discharged Ah** – total amp-hours discharged
- **Calculated Quality** – battery quality percentage based on test results
- **Average Current** – average battery discharge current
- **Battery Temperature** – battery temperature during the test
- **Test result** – result of the battery test (successful or not)
- **Termination Cause** – reason for the battery test ending
- **Select Unit** – select controllers or CAN Nodes that support battery inputs
- **(Inputs)** – check boxes for each battery input on the unit selected; check or uncheck each box to include or exclude the input from the chart and table below.

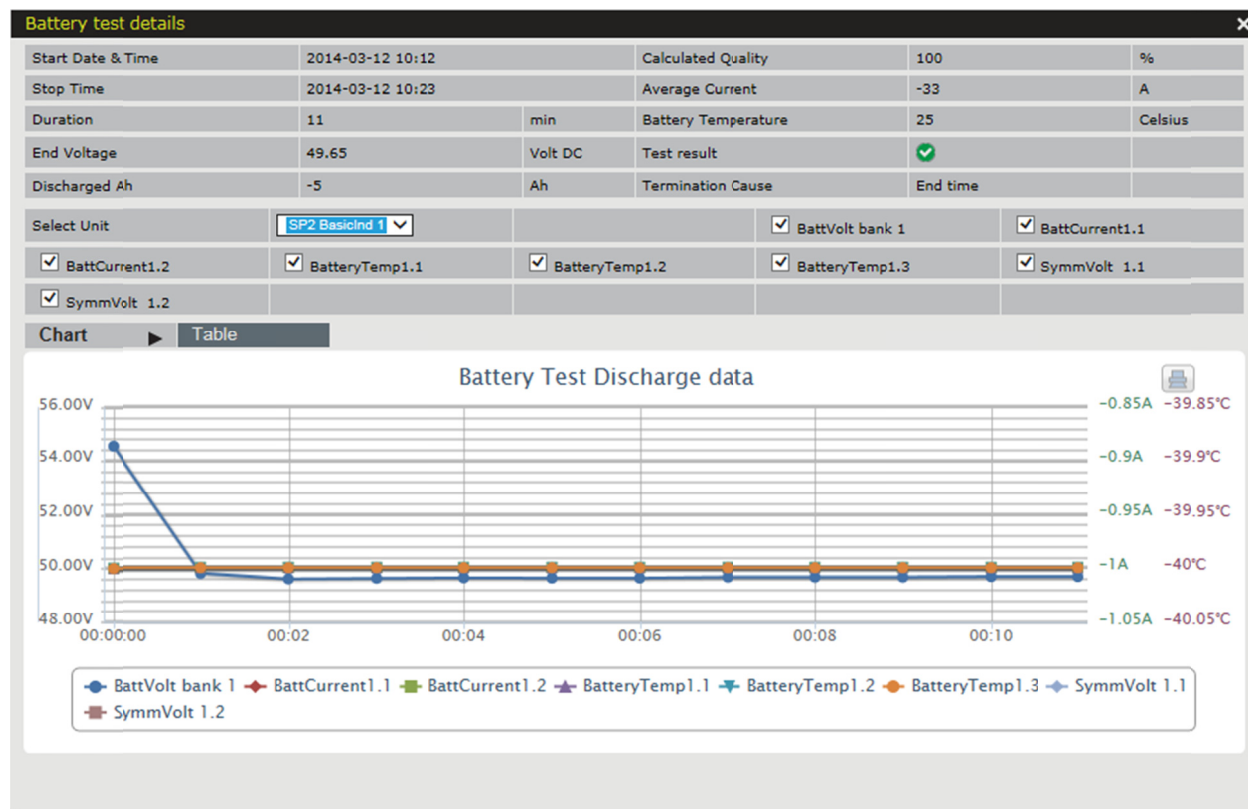


Figure 6.12 – Battery Test Details Window (and Chart)

- **Chart** – tab for the **Battery Test Discharge data** graph
 - **Battery Test Discharge data** – line graph of battery test data from the inputs of the selected unit

NOTE: Details for each data point on the graph can be seen by hovering over a data point with the cursor (mouse-over)
 - **(Inputs)** – legend for each data line and point on the graph; each input can be toggled on and off by clicking on its symbol (on its left)
- **Table** – tab for the data points for each input on the **Chart** page
 - **Time** – the first column lists the time at which each data point was captured
 - **(Input)** – the remaining columns represent each input that is selected for the controller or CAN Node unit

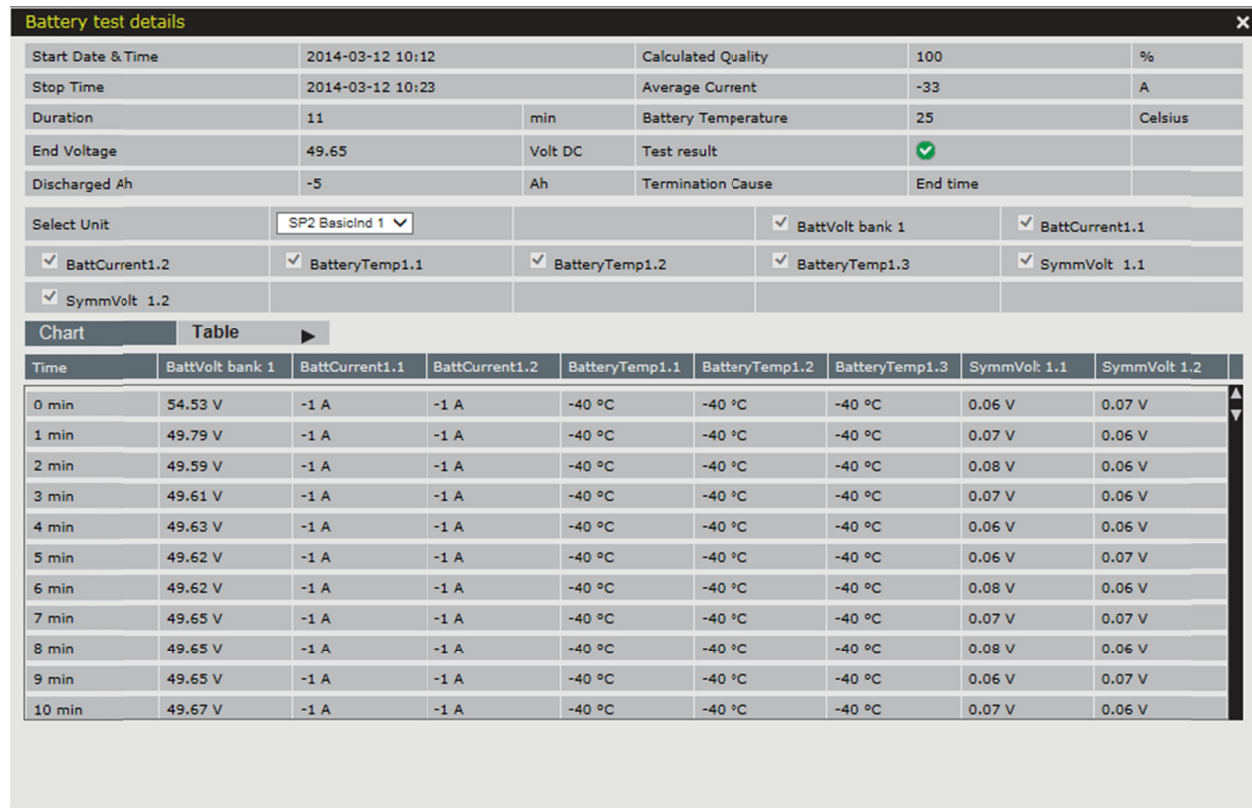


Figure 6.13 – Battery Test Details Window with Table Tab

Battery Run Time

The **Battery run time** log displays battery discharge time in minutes per day, hours per week, hours per month, and accumulated hours.

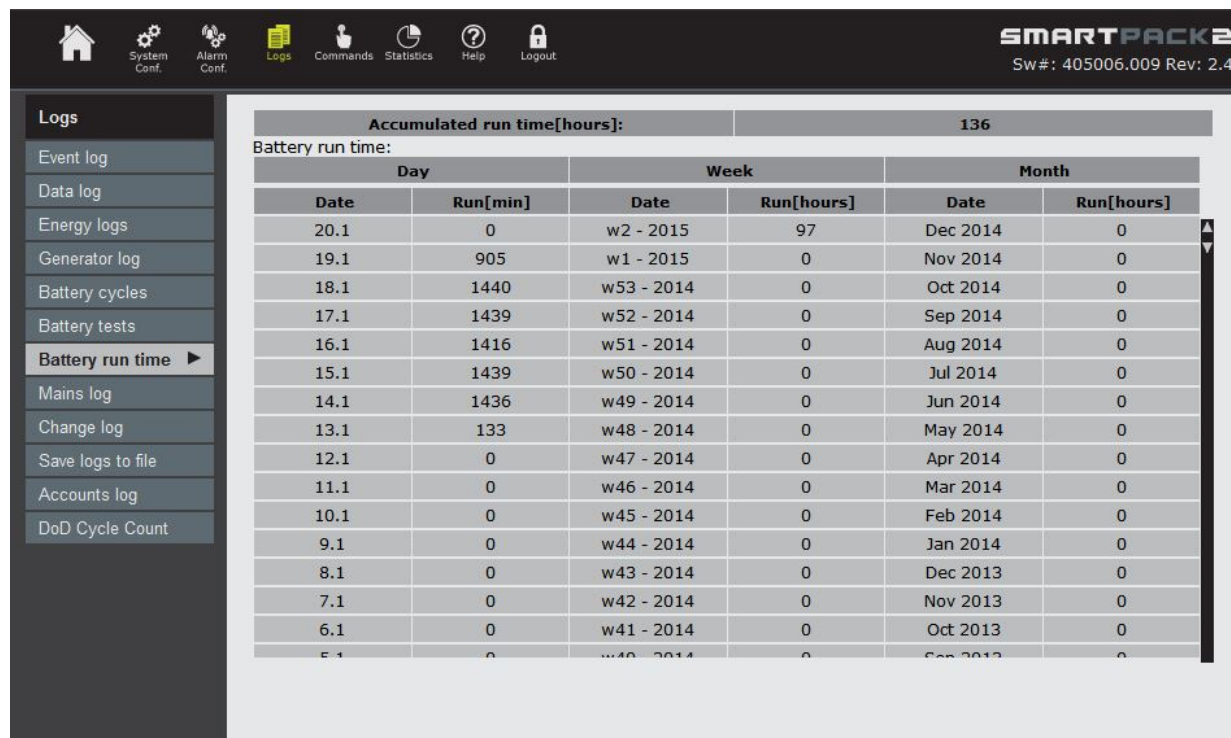


Figure 6.14 - Battery Run Time Window

Mains log

The **Mains run time log** displays AC power run time in minutes per day, hours per week, hours per month, and accumulated hours.

SMARTPACK2
Sw #: 405006.009 Rev: 2.4

Logs

- Event log
- Data log
- Energy logs
- Generator log
- Battery cycles
- Battery tests
- Battery run time
- Mains log**
- Change log
- Save logs to file
- Accounts log
- DoD Cycle Count

Mains Group 1

Select log: Mains run time log ▼

Accumulated run time[hours]: 0

Mains run time:

Day		Week		Month	
Date	Run[min]	Date	Run[hours]	Date	Run[hours]
20.1	1440	w2 - 2015	168	Dec 2014	744
19.1	1440	w1 - 2015	168	Nov 2014	720
18.1	1440	w53 - 2014	168	Oct 2014	744
17.1	1440	w52 - 2014	168	Sep 2014	720
16.1	1440	w51 - 2014	168	Aug 2014	744
15.1	1440	w50 - 2014	168	Jul 2014	744
14.1	1440	w49 - 2014	168	Jun 2014	720
13.1	1440	w48 - 2014	168	May 2014	744
12.1	1440	w47 - 2014	168	Apr 2014	720
11.1	1440	w46 - 2014	168	Mar 2014	744
10.1	1440	w45 - 2014	168	Feb 2014	672
9.1	1440	w44 - 2014	168	Jan 2014	744
8.1	1440	w43 - 2014	168	Dec 2013	744
7.1	1440	w42 - 2014	168	Nov 2013	720
6.1	1440	w41 - 2014	168	Oct 2013	744
5.1	1440	w40 - 2014	168	Sep 2013	720

Figure 6.15 – Mains Log Window

Change Log

The **Change log** page lists system-level changes for technical support purposes.

#	Date/Time	System Part	Description	Change from-to
1	2014-02-04 12:01:45	ControlSystem	06.49.07.255.01.10	?? : 3
2	2014-02-04 12:01:39	ControlSystem	06.49.07.255.01.04	?? : 19567
3	2014-02-04 12:01:39	ControlSystem	06.49.07.255.01.11	?? : 0
4	2014-02-04 12:01:39	ControlSystem	06.49.07.255.01.05	?? : 1
5	2014-02-04 12:00:48	ControlSystem	06.49.07.255.01.10	?? : 7
6	2014-02-04 12:00:44	ControlSystem	06.49.07.255.01.04	?? : 17475
7	2014-02-04 12:00:44	ControlSystem	06.49.07.255.01.11	?? : 1
8	2014-02-04 12:00:44	ControlSystem	06.49.07.255.01.05	?? : 252
9	2014-02-04 12:00:02	ControlSystem	06.49.07.255.01.10	?? : 3
10	2014-02-04 11:59:58	ControlSystem	06.49.07.255.01.04	?? : 19567
11	2014-02-04 11:59:58	ControlSystem	06.49.07.255.01.11	?? : 0
12	2014-02-04 11:59:58	ControlSystem	06.49.07.255.01.05	?? : 1
13	2014-02-04 11:59:09	ControlSystem	06.65.07.255.01.10	?? : 6
14	2014-02-04 11:59:04	ControlSystem	06.65.07.255.01.04	?? : 17263
15	2014-02-04 11:59:04	ControlSystem	06.65.07.255.01.11	?? : 1
16	2014-02-04 11:59:04	ControlSystem	06.65.07.255.01.05	?? : 253

[First page](#)[Previous page](#)[Next page](#)

Figure 6.16 – Change Log Page

NOTE: This page is only viewable with **admin** login.

There are three navigation buttons in the bottom right corner: **First page**, **Previous page**, and **Next page**. Each page lists 16 events.

Save Logs to File

The **Save logs to file** page is for generating a file for any or all logs, which can be downloaded and saved.

Save logs to file				☐ Select/Unselect all
Event log	☐	Number of log items	10000	
Data log	☐	Number of log items	10000	Choose control unit: SP2 Master 1 ▼
Energy log	☐			
Battery cycle log	☐			
Battery test log	☐			
Change log	☐	Number of log items	5000	
Module inventory	☐			

Status: Standby

Figure 6.17 – Save Logs to File Page

- **Select/Unselect all** – check this box to select or unselect all logs
 - **Event log** – check this box to generate a file with the **Event log**
 - **Number of log items** – enter the number of events to include in the log file
 - **Data log** – check this box to generate a file with the **Data log**
 - **Number of log items** – enter the number of events to include in the log file
 - **Choose control unit** – drop-down list of controllers and/or CAN Nodes that record data logs; select a unit from which to generate the data log
 - **Energy log** – check this box to generate a file with the **Energy log**
 - **Generator log** – check this box to generate a file for the **Generator log**
 - **Battery cycle log** – check this box to generate a file with the **Battery cycle log**

- **Battery test log** – check this box to generate a file for the **Battery test log**
- **Change log** – check this box to generate a file with the **Change log**
- **Number of log items** – enter the number of events to include in the log file
- **Module inventory** – check this box to generate a file with the inventory of all controllers, monitors, and power modules connected and operating in the power system
- **Generate log(s)** – after checking one or more log boxes, the **Generate log(s)** button can be pressed to generate a file for one or more logs. A status indicator appears to the right of the button to show progress on generating the log file.

NOTE: Only one file is generated by clicking this button; it contains all logs that are selected.

NOTE: The log file generated is in the comma-separated values (CSV) format and uses semicolons (;) as delimiters. Typical spreadsheet applications can open CSV files.
- **Download log** – after the log file is generated, click the **Download log** button to save the file to your computer.

Accounts Log

The **Accounts log** page displays login and logout attempts of all users, as well as failed login attempts.

#	Account	Description	IP Address	Date	Time
1	USER: admin	Log in from	99.33.73.230	2014-02-05	09:40:00
2	USER: admin	Log out from	99.33.73.230	2014-02-05	09:28:42
3	USER: admin	Log in from	99.33.73.230	2014-02-05	09:23:35
4	USER: status	Log out from	99.33.73.230	2014-02-05	09:23:35
5	USER: status	Log in from	99.33.73.230	2014-02-05	09:23:32
6	USER: control	Log out from	99.33.73.230	2014-02-05	09:23:32
7	USER: control	Log in from	99.33.73.230	2014-02-05	09:23:17
8	USER: status	Log out from	99.33.73.230	2014-02-05	09:23:17
9	USER: status	Log in from	99.33.73.230	2014-02-05	09:23:12
10	Illegal user	Log in from	176.196.20.17	2014-02-05	06:28:24
11	USER: status	Log out from	64.134.71.166	2014-02-04	21:08:02
12	USER: status	Log in from	64.134.71.166	2014-02-04	21:03:01
13	USER: admin	Log out from	64.134.71.166	2014-02-04	21:03:01
14	USER: admin	Log in from	64.134.71.166	2014-02-04	20:48:42
15	USER: admin	Log out from	64.134.71.166	2014-02-04	20:44:53
16	USER: admin	Log in from	64.134.71.166	2014-02-04	20:35:49
17	Illegal user	Log in from	64.134.71.166	2014-02-04	20:29:34
18	USER: status	Log out from	64.134.71.166	2014-02-04	20:29:34
19	USER: status	Log in from	64.134.71.166	2014-02-04	20:29:29
20	USER: admin	Log out from	64.134.71.166	2014-02-04	20:29:28

[First page](#)[Previous page](#)[Next page](#)

Figure 6.18 – Accounts Log Page

NOTE: This page is only viewable with **admin** login.

- **#** - record number; up to 20 records are shown on each page
- **Account** – user or account name associated with the activity

NOTE: “Illegal user” means that the user name entered during the attempt does not exist in the controller. It indicates a failed login attempt, as the controller does not permit access by non-existent user names. A failed password attempt is logged as “Illegal password.”

- **Description** – action type taken by the account (log in or log out)
- **IP Address** – IP address of the computer used for the account
- **Date** – date of the account activity, with format Year-Month-Day (YYYY-MM-DD)

- **Time** – time of the account activity, with format Hour:Minute:Second (HH:MM:SS, 24-hour clock)

There are three navigation buttons in the bottom right corner: **First page**, **Previous page**, and **Next page**. Each page lists 20 events.

DoD Cycle Count

The **DoD cycle counts** page displays depth of discharge cycles of the batteries.

The screenshot shows the SMARTPACK2 web interface. The top header includes navigation icons for Home, System Conf., Alarm Conf., Logs, Commands, Statistics, Help, and Logout. The sidebar menu on the left lists various log categories, with 'DoD Cycle Count' selected. The main content area is titled 'DoD cycle counts' and contains a table with three columns: 'From(%)', 'To(%)', and 'Cycles'. The table lists 10 rows of data, all showing 0 cycles. Below the table, there is a 'Reset cycles to 0' button and an 'Apply' button.

From(%)	To(%)	Cycles
0	10	0
10	20	0
20	30	0
30	40	0
40	50	0
50	60	0
60	70	0
70	80	0
80	90	0
90	100	0

Reset cycles to 0

Figure 6.19 – Depth of Discharge (DoD) Log Page

7. Commands

The **Commands** section contains sets of actions that can be manually executed through the controller. These actions principally consist of resets, tests, software upgrades, and loading or saving configuration files.



System

The **System** page contains commands for system-wide actions involving resets and audio/visual notification (LED, buzzer) tests.

System Commands	
Reset Manual Alarm(s)/Silence Buzzer	Apply
Reset Number of Modules	Apply
Delete Event Log	Apply
Set Default Configuration	Apply Choose system voltage: 48V ▼
Set Default Configuration with Default-xml files	Apply
Set Default Calibration	Apply Choose unit: SP2 Master 1 ▼
Controller led-test	Apply
Rectifier led-test	Apply
Buzzer test	Apply

Figure 7.1 – System Commands Page (Control login)

- **Reset Manual Alarm(s)/Silence Buzzer** – resets manually-triggered alarms and the buzzer. This is useful to silence nuisance alarms and minor alarms triggered while performing maintenance.

NOTE: This silences the built-in buzzer for the Smartpack2 Master controller, not any auxiliary or external buzzer boards.

- **Reset Number of Modules** – resets the number of controllers, monitors, and power modules when any are added or removed from the system. This eliminates communication alarms when a unit is permanently removed from

the system by resetting the number of units to the number that are currently connected to the controller.

- **Delete Event Log** – erases the Event Log; only available with **admin** login (grayed out otherwise)
- **Set Default Configuration** – resets system values to the defaults for the selection made on the **Choose system voltage** drop-down list to the right.

CAUTION: This action is a system reset, removing customized configurations and restoring default values. It returns the controller to its original production state and may require assistance from Eltek to restore settings to post-production values (i.e., the settings it had when shipped for customer use).

- **Choose system voltage** – drop-down list of nominal dc system voltages
- **Set Default Configuration with Default-xml files** – resets system values using a properly-formatted Eltek XML file. An XML file can be used to configure all controller parameters.
- **Set Default Calibration** – resets controllers and CAN Nodes to default calibration values. The unit to be reset is selected in the **Choose unit** drop-down list to the right. This is useful when manual calibration was unsuccessful, possibly triggering measurement and calculation problems.
 - **Choose unit** – drop-down list of connected controllers and CAN Nodes that have calibration reset
- **Controller led-test** – command to test the notification LEDs on the controller
- **Rectifier led-test** – command to test the notification LEDs on the rectifiers
- **Buzzer test** – command to test the buzzer in the controller

Battery

The **Battery** page features commands for battery actions.

Battery Commands	
Start Battery Test	Apply
Stop Battery Test	Apply
Start Battery Boost	Apply
Stop Battery Boost	Apply
Start Battery Equalize	Apply
Stop Battery Equalize	Apply

Figure 7.2 – Battery Commands Page

- **Start Battery Test** – starts a manual battery test based on the configuration on the **Test** page

System Conf. > Power System > Battery > Test

Either the **Simplified Test** or the **Normal Test** is executed (depending on which one is selected on the **Test** page).

- **Stop Battery Test** – stops a battery test that is in progress
NOTE: Manually stopping a battery test causes the results to be discarded.

- **Start Battery Boost** – starts battery boost charging based on the configuration on the **Boost** page

System Conf. > Power System > Battery > Boost

- **Stop Battery Boost** – stops battery boost charging
- **Start Battery Equalize** – starts battery equalize charging based on the configuration on the **Equalize** page

System Conf. > Power System > Battery > Equalize

- **Stop Battery Equalize** – stops battery equalize charging

Output Test

The **Output Test** page has commands for testing output channels on controllers and CAN Nodes.

Output Test: SP2 Master 1, SP2 BasicInd 1, **SP2 BasicInd 2**, I/O unit 1, I/O unit 2, I/O unit 3, Fleximonitor 1

Batt contactor	Apply	State: Connected	Latched contactor
Load contactor 1	Apply	State: Connected	Latched contactor
Load contactor 2	Apply	State: Connected	Latched contactor
Alarm output1	Apply	State: Energized	Normally activated
Alarm output2	Apply	State: Energized	Normally deactivated
Alarm output3	Apply	State: Energized	Normally activated

Output Test duration: Sec

WARNING! Operation of alarm relays will cause false alarm conditions at the connected alarm monitoring equipment!

Figure 7.3 – Output Test Page (Admin login)

NOTE: Activating output channels triggers alarm notifications.

NOTE: Output tests require **admin** login.

- **Output Test** – drop-down list of controllers and CAN Nodes with output channels that can be tested. The output channels mirror the **Outputs** tab of the **Alarm Configuration** section:

Alarm Conf. > Power System > Outputs

NOTE: Activating a Virtual Input channel on the **Output Test** page activates the notification on the Virtual Inputs page. The difference is that activation on the **Output Test** is temporary (it deactivates after the **Output Test duration** expires); a Virtual Input activated on the **Virtual Inputs** page remains so until manually deactivated.

Table 7.1 – Controller and CAN Node Output Channels

Controller or CAN Node	Output Channel(s)
SP2 Master 1 (Smartpack2 Master)	Buzzer Virtual 1-4
SP2 BasicInd X (Smartpack2 Basic Industrial)	Batt contactor Load contactor 1-2 Alarm output 1-3
SP2 Basic X (Smartpack2 Basic)	Batt contactor Load contactor 1-2
I/O unit X (I/O Monitor, Types 1-3)	Alarm output 1-6
SmartPack S 1 (Smartpack S)	Alarm output 1-6 Batt contactor Load contactor Buzzer Virtual 1-4
Compack 1 (Compack)	Alarm output 1-3 Batt contactor Load contactor Virtual 1-4

- **Output Test duration** – time duration (in seconds) for each test activation

Virtual Inputs

The **Virtual Inputs** page is for activating and deactivating Virtual Inputs of controller units.

Virtual Inputs Commands			
Description	Activate/Deactivate	Event	Alarm Group
Virtual input 1	Activate	Major Alarm	Major alarm
Virtual input 2	Activate	Major Alarm	Major alarm
Virtual input 3	Activate	Major Alarm	Major alarm
Virtual input 4	Disabled	Major Alarm	Major alarm

Figure 7.4 – Virtual Inputs Commands Page

- **Description** – names of the Virtual Inputs
- **Activate/Deactivate** – buttons to activate or deactivate Virtual Inputs that are enabled. Inactive Virtual Inputs have a button labeled **Activate**; active sVirtual Inputs have a red button labeled **Deactivate**. If any Virtual Inputs are not enabled, the button is grayed out and labeled **Disabled**.

NOTE: Virtual Inputs are enabled and configured under the **Alarm Configuration** page:

Alarm Conf. > Power System > Inputs > [Controller] Input Configuration

- **Event** – shows the alarm event that is configured for the Virtual Input
- **Alarm Group** – shows the alarm group that is configured for the Virtual Input

Software Upgrade

The **Software Upgrade** page is for upgrading the software for each controller and CAN Node connected to the power system.

NOTE: For more details on this procedure and additional methods for performing a software upgrade, please see Eltek document 370036.063 – *Software Upgrade Procedure*.

Software/Firmware Download from the system controllers SD card/file system							
#	Type	Part#	Ver#	Serial#	SW part#	SW Ver#	Status
1	SP2 BasicInd 1	242100.601	1.6	121171114105	405019.009	2.2	✓
2	SP2 BasicInd 2	242100.601	1.6	122371166015	405019.009	2.2	✓
3	SP2 Master 1	242100.500	2.1	123071118292	405006.009	2.2c_140119	✓
4	BatteryMon 1	242100.300	2	123471114568	402086.009	1.03	✓
5	BatteryMon 2	242100.300	2	114271155176	402086.009	1.03	✓
6	CurrMonitor 1	242100.301	1.2	081671136622	402087.009	02.00	✓
7	Fleximonitor 1	yyyyyyyyyyyy	yyyyyy	FFFFFFFFFFFF	4050xx.009	1.0a	✓
8	I/O unit 1	242100.502	1.4	123471127423	402088.009	4.1.0	✓
9	I/O unit 2	242100.502	1.4	123671105959	402088.009	4.1.0	✓
10	I/O unit 3	242100.306	1.1	123771110870	402088.009	4.1.0	✓

ID	Type	SW part #	SW Version	
Selected Unit :	11 SP2 Master 1	405006.009	2.2c_1401192	Start Software Update

Figure 7.5 – Software Upgrade Page (Smartpack2 only)

NOTE: This feature is available for *Smartpack2* controllers only and requires administrator (**admin**) permissions.

- **Unit table** – lists all connected controllers and CAN Nodes
 - **Type** – name of the controller or CAN Node unit
 - **Part #** - Eltek part number of the unit
 - **Ver #** - revision number of the unit (hardware)
 - **Serial #** - unique serial number of the unit
 - **SW part #** - Eltek part number of the embedded software
 - **SW Ver #** - revision number of the software on the unit
 - **Status** – status indicator for the unit (whether or not it is in alarm)
- **Selected Unit** – Information fields for a unit that is selected on the table
- **Start Software Update** – click this button to start the software update, using the latest file saved to the SD card

NOTE: The software file must be loaded on to the SD card. Alternatively, software can be upgraded from a file on the computer by using the Eltek Network Utility.

Load/Save Config

The **Load/Save Config** pages facilitate loading and saving controller configuration files.

Load Config File

The **Load Config File** page is for loading a configuration file from the computer into the controller.

NOTE: HEX configuration files may not load properly if the software for the controller or CAN Node was upgraded after the HEX file was saved. Please contact Eltek for assistance if this occurs.

#	Type	Part#	Ver#	SW part#	SW Ver#	Status
1	SP2 BasicInd 1	242100.601	1.6	405019.009	2.2	✓
2	SP2 BasicInd 2	242100.601	1.6	405019.009	2.2	✓
3	SP2 Master 1	242100.500	2.1	405006.009	2.2c_1401192	✓
4	BatteryMon 1	242100.300	2	402086.009	1.03	✓
5	BatteryMon 2	242100.300	2	402086.009	1.03	✓
6	CurrMonitor 1	242100.301	1.2	402087.009	02.00	✓
7	Fleximonitor 1	yyyyyyyyyyyy	yyyyyy	4050xx.009	1.0a	✓
8	I/O unit 1	242100.502	1.4	402088.009	4.1.0	✓
9	I/O unit 2	242100.502	1.4	402088.009	4.1.0	✓
10	I/O unit 3	242100.306	1.1	402088.009	4.1.0	✓

Figure 7.6 – Load Config File Page

- **Select file** – click the **Browse...** button to find the configuration file (either an XML or Intel HEX file) on the computer
- **Unit table** – once a configuration file is selected, the applicable controller or CAN Node device is selected for upload
- **Upload Config file** – this button appears in the lower right corner when a configuration file is selected. Once clicked, a progress bar appears to the left of the button.

NOTE: If the selected file is not correctly configured for Eltek units, a warning appears below the file information area stating that the file does not contain the correct information.

Save Config File

The **Save Config File** page is for saving a configuration file to the computer.

NOTE: It is recommended that configuration files for each controller and CAN Node be saved and stored as backup after the power system is configured, as well as each time setpoints are reconfigured.

Save Intel HEX configuration file(s) from the power plant

Reading configuration from the following units ☒ Select/Unselect all

#	Type	Part#	Ver#	SW part#	SW Ver#	Status
☒ 1	SP2 BasicInd 1	242100.601	1.6	405019.009	2.2	✓
☒ 2	SP2 BasicInd 2	242100.601	1.6	405019.009	2.2	✓
☒ 3	SP2 Master 1	242100.500	2.1	405006.009	2.2c_1401192	✓
☒ 4	BatteryMon 1	242100.300	2	402086.009	1.03	✓
☒ 5	BatteryMon 2	242100.300	2	402086.009	1.03	✓
☒ 6	CurrMonitor 1	242100.301	1.2	402087.009	02.00	✓
☒ 7	Fleximonitor 1	yyyyyyyyyyyy	yyyyyy	4050xx.009	1.0a	✓
☒ 8	I/O unit 1	242100.502	1.4	402088.009	4.1.0	✓
☒ 9	I/O unit 2	242100.502	1.4	402088.009	4.1.0	✓
☒ 10	I/O unit 3	242100.306	1.1	402088.009	4.1.0	✓

Figure 7.7 – Save Config File (First Page)

- **Select/Unselect all** – the check box selects and unselects all devices on the unit table below it
- **Unit table** – check the box on the far left of each row to select the controllers and CAN Nodes for which a configuration files should be saved
- **Next** – click the **Next** button (below the table) after selecting all devices from which a configuration file is to be saved to the computer. Another page appears for saving the files.
- **Back** – click the **Back** button to return to the **Save Config File** page
- **Start reading files** – click this button to start assembling the configuration files. A notice appears indicating that the selected file(s) will be read. Click **OK** to continue.

Save Intel HEX configuration file(s) from the power plant

Reading data from control units:

- SP2 BasicInd 1,
- SP2 BasicInd 2,
- SP2 Master 1,
- BatteryMon 1,
- BatteryMon 2,
- CurrMonitor 1,
- Fleximonitor 1,
- I/O unit 1,
- I/O unit 2,
- I/O unit 3

Process Status:

Back Start reading files

Figure 7.8 – Save Config File (Second Page)

- **Stop reading files** – this button appears after the **Start reading files** button has been clicked. Click the **Stop reading files** button to terminate the reading progress. A progress bar appears below this button showing the progress of generating the configuration file.

Once the configuration file is created, a dialog box opens asking where the file should be saved. Choose the location on the computer where the file is to be saved.

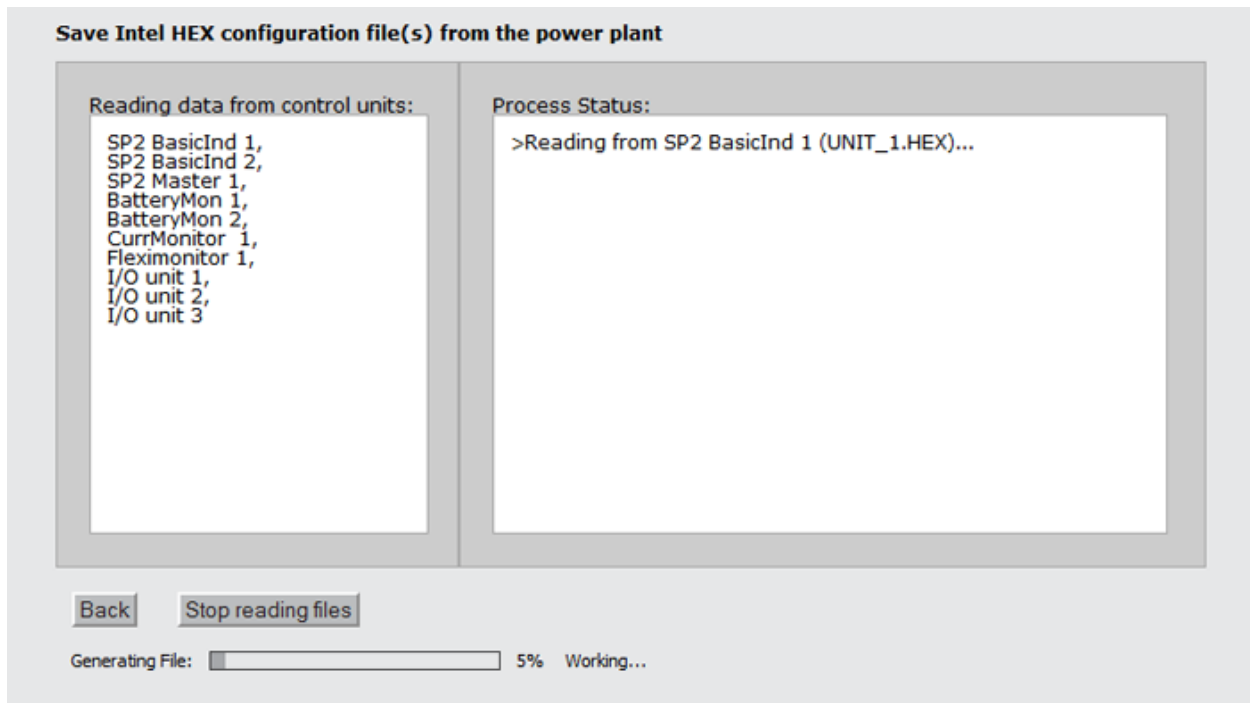


Figure 7.9 – Safe Config Page (Reading File)

- **Read next file** – If multiple files are selected, this button appears after each file is read, along with a **Cancel** button. Click **Read next file** to continue to the next configuration file, or click **Cancel** to stop reading configuration files.

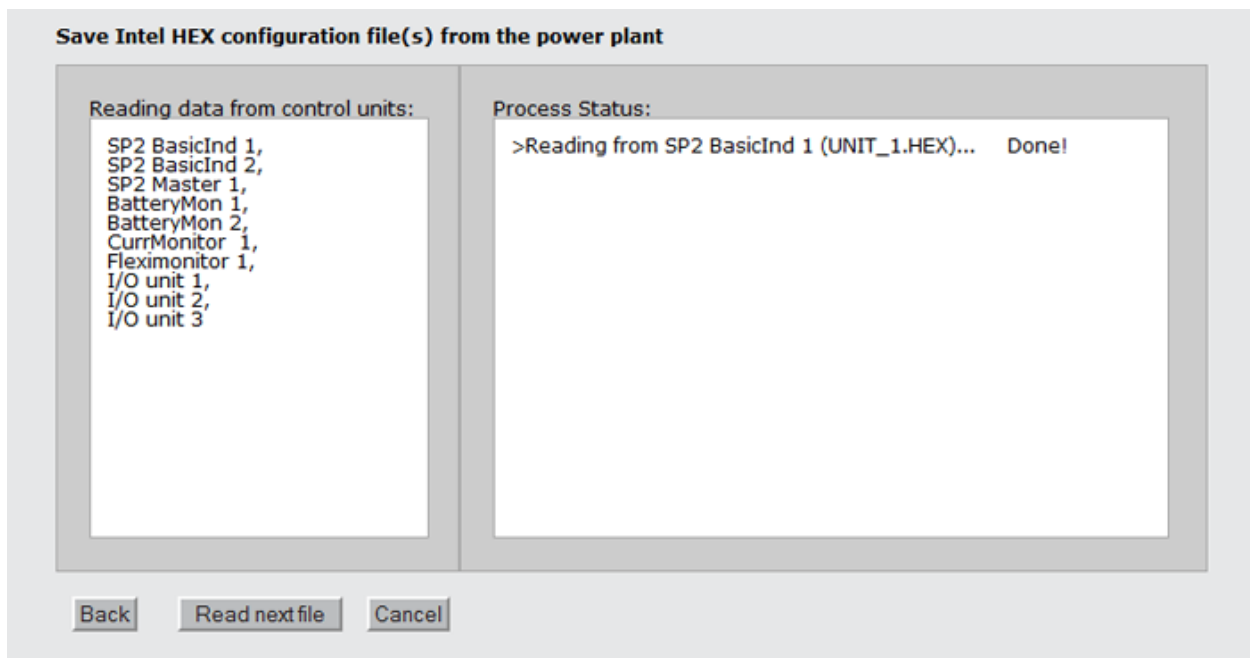


Figure 7.10 – Save Config Page (Read Next File)

8. Statistics

The **Statistics** section provides data based on Telecordia GR-221 specifications. The statistics collected include relevant system data and calculated statistics, such as average results, peak values, etc.



NOTE: *Currently, the Smartpack S controller has the **Statistics** category but does not support it. This category is not available on Compack controllers.*

For statistics to be available:

- This feature must be enabled; see “**Store statistics**” on page 86.
- An SD card is shipped with the controller, and it must be installed in order to store the statistics.
- FTP is required to access the information remotely; see “TCP/IP” (on page 142) for your settings.

NOTE Not all browsers have FTP capability; verify the capability of your software application(s).

Statistics files are stored in comma-separated values (CSV) format and use semicolons (;) as delimiters. Typical spreadsheet applications can open CSV files.

The **Browse SD Card** page is an FTP viewer for statistics files on the controller's SD card; this is available on the Smartpack2 controller *only*.

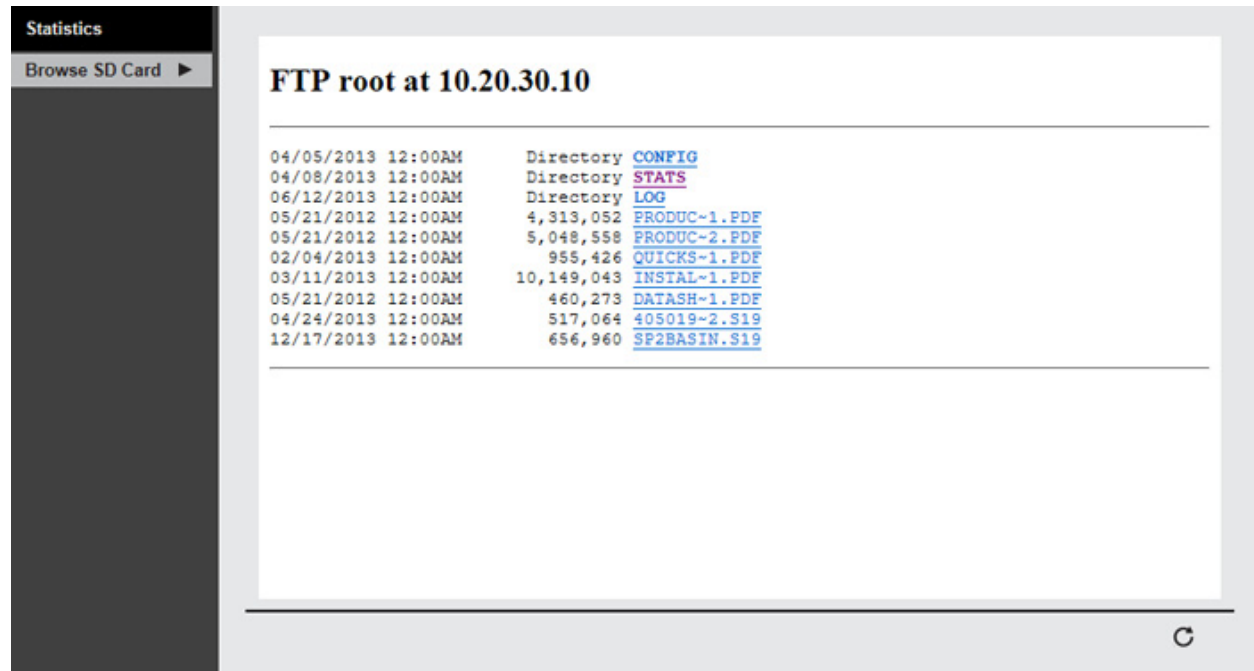


Figure 8.1 – Browse SD Card (Smartpack2 only)

NOTE: This page may be blocked if the network does not permit access to FTP servers.

- **FTP root** –product documentation and software files at the FTP root directory; there are also other directories:
 - **CONFIG** – directory containing configuration files for controller and CAN Node units connected to the system
 - **STATS** – directory containing system measurements and performance statistics (such as current, voltage, temperature), sorted by year. Files for individual input feeds and temperature inputs are also available (under the **FEEDERS** and **TEMPS** directories, respectively).
 - **LOG** – directory containing event and data logs

9. Help

The **Help** button opens the Eltek Help System for the web interface (**CWUI – Controller Web-based User Interface**). Please contact Eltek for the latest access credentials.



10. Logout

The **Logout** button ends the current session, logging out of the user account and returning to the landing page.



Procedures

1. Procedures Overview

Setup of controller functions often requires configuring parameters in several areas of the Web Interface. This section describes the procedures for common controller tasks and functions according to the following categories:

- Setup
- Operation
- Administration

2. Setup

This section describes procedures for basic controller setup that can be accomplished through the Web Interface.

Setting Float (Reference) Voltage



CAUTION: Refer to the battery manufacturer's documented specifications for recommended float voltage per battery cell. It is the user's responsibility to enter proper battery parameters.

NOTE: Float voltage can be calculated based on the voltage required per battery cell.

To set float voltage through the web interface:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on the **Power System** button (below the **Power System** heading), then choose **System Voltages**.
3. Locate the fields called **Reference voltage**. One is for voltage per cell (**Cell**), and the other is total voltage for the system (**Total**).
4. Enter the voltage required using either voltage per cell or total system voltage. The float voltage for the other field is automatically calculated when the change is saved.
5. Click the diskette icon in the lower right-hand corner to save the change. The voltage value in parentheses updates to reflect the new float voltage value.

Float voltage is now set.

System voltage levels		
Nominal Voltage	48 V	
Auto-set number of cells based on rectifier output voltage	☐	
Number of Battery Cells	24	
Reference voltage (Cell)	2.2500	V/cell
Reference voltage (Total)	-54.00	V
Boost voltage	2.2500	V/cell (-54.00V)
Rectifier standby voltage	1.8333	V/cell (-44.00V)
Rectifier OVS limit	2.4792	V/cell (-59.50V)
Battery disconnect voltage	1.7500	V/cell (-42.00V)
Battery reconnect voltage	2.0829	V/cell (-49.99V)
Battery test end voltage (Normal test)	1.90 V/cell (-45.5V)	

Note: Changing disconnect voltage will lead to reconnect voltage being changed automatically if no new value is set for it. The difference between disconnect and reconnect voltage will remain the same as before setting the disconnect voltage.

Figure 2.1 – Setting Float Voltage through the Web Interface

Setting Rectifier Current Limit

Rectifier current limit restricts total output current of all rectifiers.

NOTE: Rectifier current limit manages total rectifier output rather than output per rectifier. Because Eltek rectifiers are constant-power, this means that voltage is adjusted to limit current. Therefore, the controller overrides rectifier current limit when there is any conflict with battery voltage settings.

To set rectifier current limit through the web interface:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Rectifier** button (below the **Power System** heading), then choose **Configuration**.
3. To turn on rectifier current limit, locate the **Current limit** line and select the check box next to the word **Enable**.
4. To set the current limit value, enter the desired maximum current value in the field **Current limit value**.

NOTE: This value is for total rectifier output, not individual rectifiers.

5. Click the diskette icon in the lower right-hand corner to save changes.
Rectifier current limit is now set.

Rectifier Configuration

Number of rectifiers	2
Suppress rectifier fail when mains is gone	☒ Enable
Walk-in time	Short time ▾
Over voltage shutdown (OVS) limit	2.4583 V/cell (59.00V)
Current limit	☒ Enable
Current limit value	1000 x A
Emergency voltage	53.52 V
Generator dependent delay	☐ Enable
Startup delay time	0 minutes
Silence rectifier alarm	☐ Enable
Redundant rectifiers	0 %

↻ 📄

Figure 2.2 – Setting Rectifier Current Limit through the Web Interface

Battery Configuration

Multi-bay power systems (like the Eltek Scalable) may require some setup for the following features:

- Number of banks
- Capacity and number of battery strings
- Setting and/or editing the battery table

To navigate to the **General Battery configuration** page:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Battery** button (below the **Power System** heading). The **Configuration** page appears by default (the first page under the **Battery** sub-menu).

General Battery configuration

Number of banks: 1

Description: Eltek Std

Capacity [per string]: 180 Ah

Number of Battery strings: 1

Battery install date [yyyy-mm-dd]: 2013 - 4 - 18

Battery Type: [Edit battery table](#)

Battery contactor

#	Enable	Description	Disconnect voltage [V]	Reconnect voltage [V]	Delay after disconnect [seconds]	Mains independent	Temperature dependent
1	☐	LVBD	42.00	49.99	0	☐	☐

Figure 2.3 – General Battery Configuration Page

The following sections explain the purpose and configuration of each feature.

Number of Banks

The **Number of banks** parameter reflects the total number of controllers that are equipped to monitor batteries within the system. In multi-bay systems (like the Eltek Scalable system) the value shown should match the total number of bays (both rectifier and distribution) that are present in the system lineup.

NOTE: In the Scalable power system, if the value in the **Number of banks** field is not the same as the total number of bays (both rectifier and distribution bays), then adjust it to match by typing in the number of bays present in the lineup. This affects how many Smartpack2 Basic Industrial controllers appear on certain pages.

Capacity and Number of Battery Strings

It is assumed that all battery strings connected to the system are redundant and thus have the same ampere-hour capacity. To enter the battery Ah capacity:

1. Enter the Ah capacity for a single string in the **Capacity [per string]** field.
2. Enter the number of battery strings in the **Number of Battery strings** field.

The controller automatically multiplies the ampere-hour capacity by the number of battery strings and shows that value at the bottom of the main display screen.

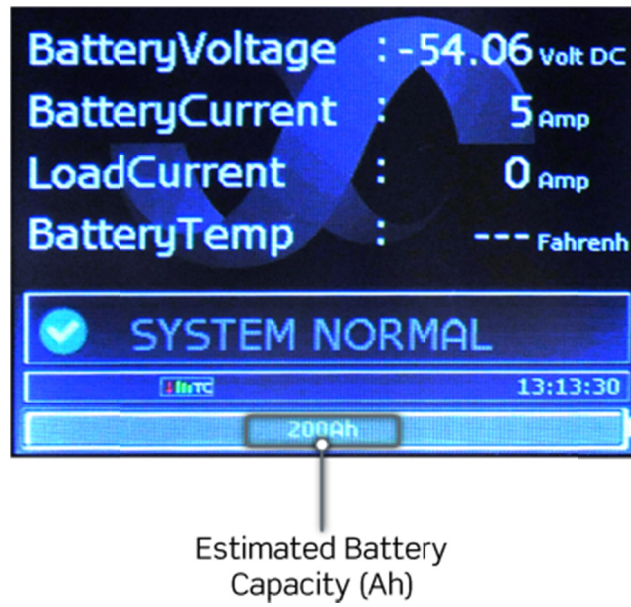


Figure 2.4 - Battery Capacity on Display Screen

Battery Table

The battery table permits entering or uploading custom battery specifications. Such specifications help determine battery health by comparing test data to known performance values.

By default the values are filled in by the **Eltek Std** (Eltek Standard) table. To change either the values or the table:

1. Click the **Edit Battery Table** in the **Battery Type** line.
2. The **Battery table** window appears. By default the option to use Eltek's predefined battery table is enabled.
3. Uncheck the **Enable** box. The window populates with the battery table and action buttons.
4. If any changes are made, be sure to click the **Save** icon (diskette) in the lower right hand corner.

Battery table

Use Eltek predefined battery ☐ Enable

Template Options

▼

Load Table

Modify table

Edit table

Add row

Delete row

Table Details **File operation**

Description:

End volt:	High [V/cell]	Low[V/cell]

#	Minutes	Current Ref1	Current Ref2

⌂

Figure 2.5 - Battery Table Page (table to be loaded)

The following actions can be taken, depending on what is desired:

- To load a table available in the controller system (usually just the *Eltek Standard* table), select the table from the **Template Options** dropdown menu. Then click the **Load Table** button. The table and values load into the **Table Details** box in right side of the window.
- To edit the loaded table, select the **Edit table** button in the left side of the window. This action also allows rows to be added or deleted (using the two buttons immediately below the **Edit table** button).
- To either upload a battery table file or to save the current table to a file, click the **File operation** tab, to the right of the **Table Details** tab.
 - To upload a battery table file, click the **Browse...** button to open an explore window and locate the file. The file must have a ".tbl" extension. Once located, select the file and click the **Upload file** button to load it into the controller.
 - To save the current battery table as a file, click the **Save to file...** button.

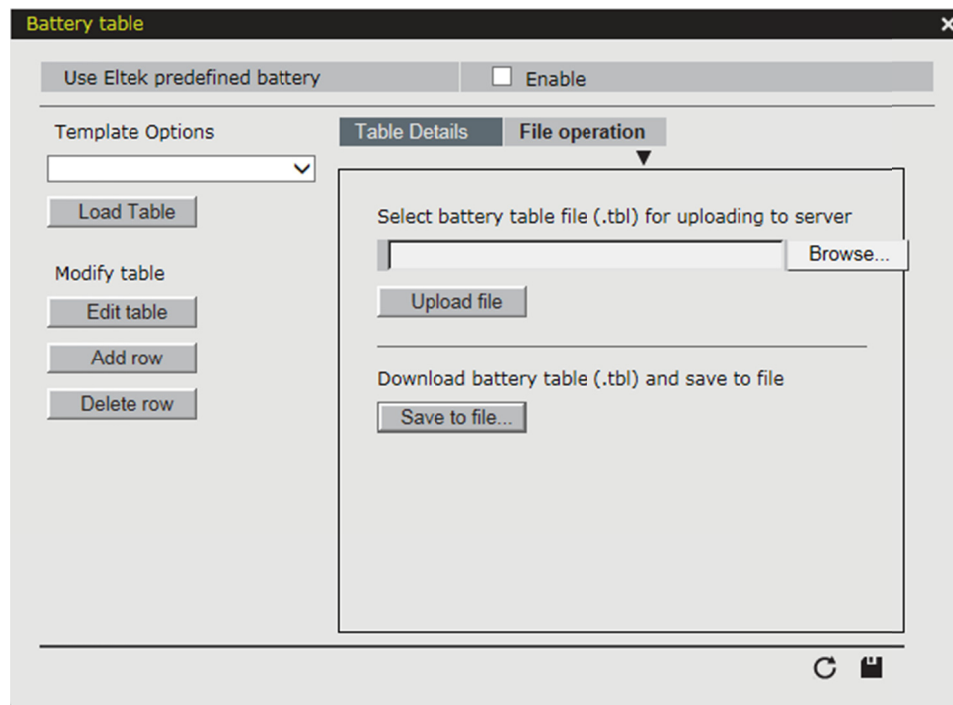


Figure 2.6 – Battery Table - File Operation Page

Setting Battery Charging Current Limit

Battery current limit restricts charge current. Eltek controllers have two separate current limit parameters for different power situations: Mains (normal AC utility service) and Generator (AC backup).

NOTE: A shunt is required in order to use battery current limit.

To set battery charging current limit through the web interface:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Battery** button (below the **Power System** heading), then choose **Current Limit**.
3. To turn on battery current limit, locate the **Battery current limitation** line and check the box next to the word **Enable**.
4. To set current limit values, enter the prescribed maximum current value in the fields for **Mains feed current limit** (normal AC service) and **Generator feed current limit** (if applicable; check site and generator specifications).

NOTE: Normally the value for **Generator feed current limit** is lower than **Mains feed current limit**. If the **Generator feed current limit** is not going to be used, then simply put the same value here as the **Mains feed current limit**.

5. Click the diskette icon in the lower right-hand corner to save changes.

Battery charging current limit is now set.

The screenshot shows the 'Battery charge current limitation' settings in a web interface. On the left is a sidebar menu with the following items: Power System, Mains, Generator, Rectifiers, DcDc Converter, Load, Battery (highlighted), Configuration, TempComp, Current Limit (with a right-pointing arrow), Symmetry, Boost, Equalize, Test, Control System, and Device Settings. The main content area is titled 'Battery charge current limitation' and contains the following settings:

- Battery current limitation: ☐ Enable
- String current limitation: ☐ Enable
- Mains feed current limit: A
- Generator feed current limit: A
- Rectifier capacity limitation: ☐ Enable
- Rectifier capacity limit: %

At the bottom right of the main area, there are two icons: a circular arrow (refresh) and a diskette (save).

Figure 2.7 – Setting Battery Charging Current Limit through the Web Interface

Battery Discharge Testing



CAUTION: Battery discharge testing *requires* specifications from the battery manufacturer. DO NOT proceed with battery testing of any kind without having the documented specifications on hand. If unavailable, contact the battery manufacturer directly. Eltek does not provide battery discharge specifications.

There are two methods of executing battery discharge testing: Simplified and Normal.

- The **Simplified** test does not use the battery table for reference (see the section “Battery Table” beginning on page 272); instead, it relies on user-entered values to determine whether the batteries are able to discharge for the entire duration specified (**Max duration**) or meet the amp-hour value (**Max discharge**) before falling to the voltage per cell specified in the **End voltage** field. All three parameters are user-defined, but must be within the specifications provided by the battery manufacturer. The test stops when any one of the parameters mentioned above (**Max duration**, **Max discharge**, or **End voltage**) is reached.

- The **Normal Test** relies on the battery table for reference, using the battery specifications to determine end voltage. The only editable parameter that affects termination of the test is **Max duration**.

NOTE: Under **Normal Test**, battery discharge results are evaluated only if the test is stopped by reaching **End voltage**. Results are discarded if a test is terminated due to reaching **Max duration** or any other reasons (such as manually stopping the test).

Other configurable parameters on the **Battery Test Configuration** page:

- **Guard time** is the number of hours that a battery test should be delayed after a loss of AC input power.
- **Interval test** facilitates regular, periodic battery testing and also accommodates the inhibiting testing during certain months (for example, summer months).
- **Automatic test** initiates testing when AC input power is lost. Data is recorded only if **End voltage** is reached.
- **Discontinuance test** is an advanced battery feature that is used to detect defective or failed battery cells in unbalanced battery strings. It requires at least two battery strings and a separate shunt in each string. The **Discontinuance test** is not covered in this document.

Battery discharge testing is designed to record the results of battery discharge—whether scheduled, manually started, or caused by an outage of ac power. The following figures show the Battery Test page for both **Simplified** and **Normal** test parameters. The first figure is for the Simplified test:

The screenshot shows the 'Battery test configuration' page in the COMPACK software. The 'Simplified test' radio button is selected. The 'End voltage' is set to 1.90 V/cell. The 'Max duration' is 720 minutes, 'Max discharge' is 100 Ah, and 'Guard time' is 12 hours. The 'Interval test' is disabled. The 'Automatic test' is disabled. The 'Discontinuance test' is disabled. The 'Repeat frequency' is 7 days and 'Max duration' is 5 minutes. A note at the bottom states: 'Note: The Discontinuance test Start time is shared with the Interval test Start time'.

Field	Value	Unit/Label	Enabled/Disabled
Test type	Simplified test		Selected
End voltage	1.90	V/cell	
Max duration	720	minutes	
Max discharge	100	Ah	
Guard time	12	hours	
Interval test	Disabled		Disabled
Automatic test	Disabled		Disabled
Discontinuance test	Disabled		Disabled
Repeat frequency	7	days	
Max duration	5	minutes	

Figure 2.8 – Battery Test Page (Simplified test selected)

The following figure shows which fields are not configurable when set for a Normal battery test:

The screenshot shows the 'Battery test configuration' page in the COMPACK software. The 'Normal Test' radio button is selected. The 'End voltage' is set to 1.90 V/cell. The 'Max duration' is 720 minutes, 'Max discharge' is 100 Ah, and 'Guard time' is 12 hours. The 'Interval test' is disabled. The 'Automatic test' is disabled. The 'Discontinuance test' is disabled. The 'Repeat frequency' is 7 days and 'Max duration' is 5 minutes. A note at the bottom states: 'Note: The Discontinuance test Start time is shared with the Interval test Start time'.

Field	Value	Unit/Label	Enabled/Disabled
Test type	Normal Test		Selected
End voltage	1.90	V/cell	
Max duration	720	minutes	
Max discharge	100	Ah	
Guard time	12	hours	
Interval test	Disabled		Disabled
Automatic test	Disabled		Disabled
Discontinuance test	Disabled		Disabled
Repeat frequency	7	days	
Max duration	5	minutes	

Figure 2.9 – Battery Test Page (Normal test selected)

To set battery discharge testing through the web interface:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Battery** button (below the **Power System** heading).
3. Click on **Test**.
4. Enter settings as required for the batteries. Refer to the descriptions of the fields above.
5. Click on the save icon (diskette) to save changes.

NOTE: The battery table is located under the **Configuration** menu. To access the battery table, choose **System Conf. > Power System > Battery > Configuration > [Edit battery table]**.

The screenshot displays the 'General Battery configuration' section of the web interface. The left sidebar shows the navigation menu with 'Power System' expanded and 'Configuration' selected. The main content area includes the following fields:

- Number of banks: 1
- Description: Eltek S10
- Capacity [per string]: 100 Ah
- Number of Battery strings: 1 x 100Ah capacity = 100Ah as total capacity
- Battery install date [yyyy-mm-dd]: 2012 - 12 - 10
- Battery Type: Edit battery table

Below these fields is the 'Battery contactor' table:

#	Enable	Description	Disconnect voltage [V]	Reconnect voltage [V]	Delay after disconnect [seconds]	Mains independent	Temperature dependent
1	☒	LVBD	43.00	47.00	0	☐	☐

At the bottom right of the configuration area, there are icons for refresh and save.

Figure 2.10 - Edit Battery Discharge Table

NOTE: The battery table can be adjusted only through the web interface. It cannot be changed through the display.

See the section “Manual Battery Discharge Test” for instructions on manually executing a battery discharge test.

Battery Temperature Compensation

CAUTION: Battery temperature compensation *requires* specifications from the battery manufacturer. DO NOT proceed without having the documented specifications on hand. If unavailable, contact the battery manufacturer directly. Eltek does not provide battery manufacturer specifications.

Battery temperature compensation adjusts battery charging voltage after a predefined temperature threshold has been exceeded. The reference voltage and temperature slope are specifications provided by the battery manufacturer. Maximum and minimum compensation voltage should also be defined to protect load equipment.

The fields available are:

- **Temperature compensation** – check the box to enable Temperature Compensated Charging parameters. Clicking again on the box (uncheck) disables the parameters.
- **Minimum compensation voltage** – minimum charging voltage per battery cell (protects connected load equipment).
- **Maximum compensation voltage** – maximum charging voltage per battery cell (protects connected load equipment).
- **Reference voltage** – charging voltage per battery cell recommended by the battery manufacturer at the reference temperature specified in the “Reference Temperature” field.

NOTE: This field is the same parameter as **Reference voltage (Cell)** on the **System Voltages** page (**System Conf.** > **Power System** > **Power System** > **System Voltages**).

- **Reference temperature** – the reference temperature in degrees Celsius that the battery manufacturer specifies for the charging voltage entered in the “Reference Voltage” field.
- **Temperature slope** – compensation factor in millivolts per degree Celsius per battery cell recommended by the battery manufacturer

NOTE: It is necessary to connect battery temperature probes to the input(s) of the controller(s) to be used for this feature. Please see the User Guide provided with the power system controllers for details on what kind of temperature probes to use and where to install them on the controller(s).

The following figure shows the Battery Temperature Compensation page in the Web Interface:

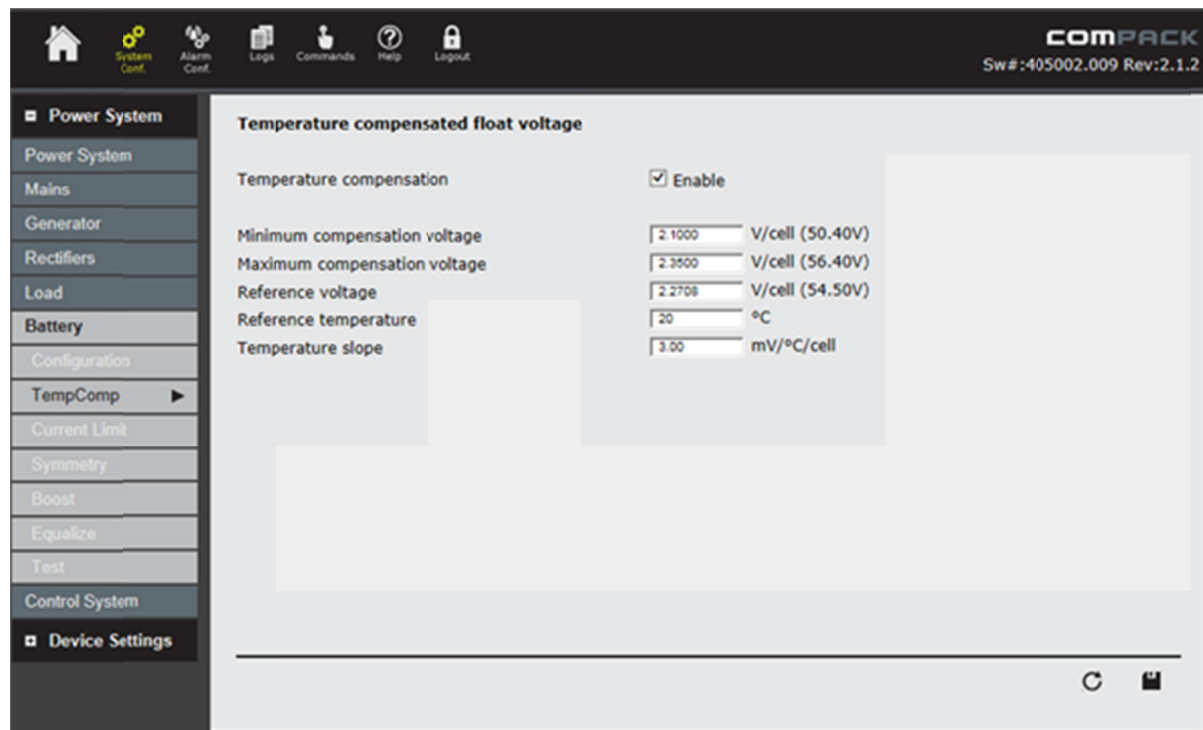


Figure 2.11 – Setting Battery Temperature Compensation through the Web Interface

To set battery temperature compensation through the web interface:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Battery** (below the **Power System** heading).
3. Click on **TempComp**.
4. Enter settings as required for the batteries. See the section “TempComp” beginning on page 115 for detailed descriptions of the fields.
5. Click on the **Save** icon (diskette image) to save changes.

NOTICE: In larger power systems (like the Eltek Scalable), it is necessary to know which ID number is assigned to the Smartpack2 Basic Industrial controller within the control system; this helps identify the controller in the Web Interface. Check the bay label on the inside of the bay door (at the top) for the controller ID number. The line is marked as “SP2 BasicInd _____”.

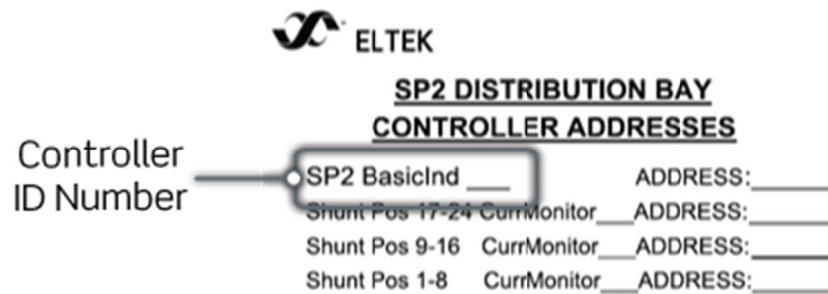


Figure 2.12 – Scalable Bay Controller Address Label (Distribution Bay label shown here)

6. Click on **Alarm Conf.** in the top menu.
7. Click on **Battery** in the left menu. Wait for the window to populate.
8. Under **Battery Alarm Configuration**, locate the **BatteryVoltage** line (usually line #1) and click on the gear icon to open the **Edit** window.

Battery Voltage Monitor

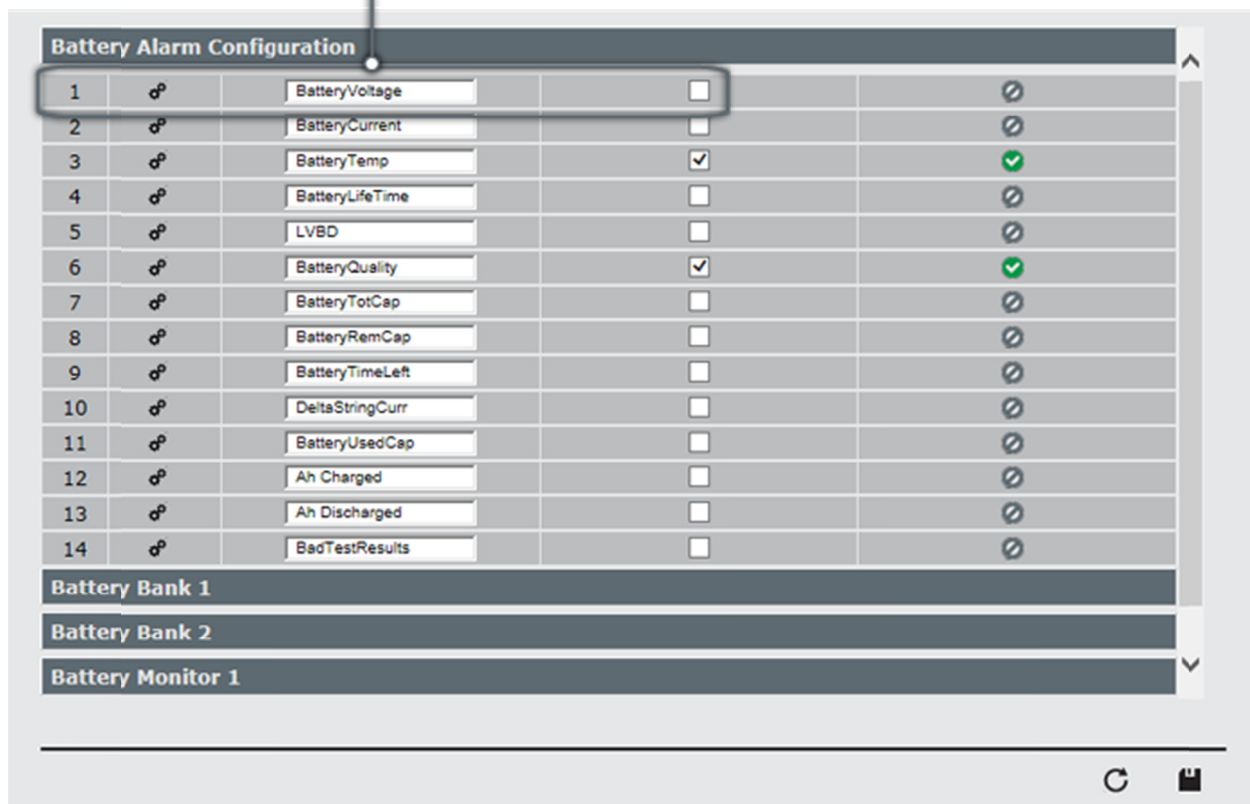


Figure 2.13 – Battery Voltage Alarm Monitor

9. Locate the **Alarm Monitor** line and check the **Enable** box. This enables battery voltage monitoring, which is required for battery temperature compensation.
10. Click on the **Save** icon to save the change.

- Back on the **Battery** page (under **Alarm Conf.**), click on the **Battery Bank** section heading. Wait for the window to populate.

NOTE: There is only one **Battery Bank** heading for Smartpack S and Compack controllers; for Smartpack2, there may be more than one. The number next to **Battery Bank** corresponds to either the Smartpack2 Basic or Smartpack2 Basic Industrial controller ID where the battery probes are installed.

NOTE: If the Smartpack2 Basic or Basic Industrial controller ID does not appear in this list, it may be necessary to adjust the **Number of banks** value in the **Battery Configuration** window. See “Configuration” beginning on page 108 for details.

Battery Temperature
Probe Inputs

Battery Alarm Configuration					
Battery Bank 1					
1	⚙	BattVolt bank 1		☐	⌕
2	⚙	BattCurr bank 1		☐	⌕
3	⚙	BattCurrent1.1		☐	⌕
4	⚙	BattCurrent1.2		☐	⌕
5	⚙	BattFuses 1		☐	⌕
6	⚙	BatteryTemp1.1		☐	⌕
7	⚙	BatteryTemp1.2		☐	⌕
8	⚙	BatteryTemp1.3		☐	⌕
9	⚙	SymmVolt 1.1		☐	⌕
10	⚙	SymmVolt 1.2		☐	⌕
Battery Bank 2					
Battery Monitor 1					
Battery Monitor 2					

Figure 2.14 – Battery Temperature Probe Inputs (Controller)

- Locate the **BatteryTempX.X** monitors.

NOTICE: Battery Temp Probe inputs are numbered according to the ID of the controller and the input position. For example, in the Eltek Scalable plant, **BatteryTemp1.1** means that that input is in the first Smartpack2 Basic Industrial controller and is input #1 on that controller.

- Click on the **Edit** icon (gears) of the first probe input to be enabled.
- Locate the **Alarm Monitor** line and check the **Enable** box to enable the input.
- Click on the **Save** icon to save the change.

16. Repeat steps 13 to 15 for any remaining probe inputs to be enabled.

The temperature probes are now set and battery temperature compensation is enabled.

Temperature Probe Setup

Temperature probe setup for ambient temperature readings is supported by both Eltek controllers and Flexi Monitors. The following sections describe the setup procedure in the Web Interface for both types of devices. For the physical installation of the temperature probe(s), please refer to the documentation for the controller or Flexi Monitor.

Controllers

Eltek controllers are equipped with programmable input terminals that support temperature probes. Smartpack S and Compack controllers have the input terminals located on the units themselves. Smartpack2 controllers require either the Basic or Basic Industrial devices.

NOTE: The **Temperature X.Y** and **ProgInput X.Y** alarm monitors on the controller's **Inputs** heading are the same physical terminals. If the **Temperature** alarm monitor is enabled, then the corresponding **ProgInput** monitor is disabled; and vice-versa.

Terminals Enabled
for Temperature

SP2 Basic 1 Input Configuration				
#	Edit	Description	Enable	Status
1	✎	Temperature1.1	☒	✓
2	✎	Temperature1.2	☒	✓
3	✎	Temperature1.3	☐	⊘
4	✎	Earth Faulty 1	☐	⊘
5		ProgInput 1.1	☐	Used for Temperature
6		ProgInput 1.2	☐	Used for Temperature
7	✎	ProgInput 1.3	☐	⊘

I/O unit 1 Input Configuration

Same Terminals are Disabled
for Other Inputs

Figure 2.15 – Temp Probe Terminals (Smartpack2 Basic)

The following figure illustrates how the same terminals are disabled for use as battery temperature probes:

Battery Alarm Configuration				
Battery Bank 1				
#	Edit	Description	Enable	Status
1		BattVolt bank 1	☐	
2		BattCurr bank 1	☒	
3		BattFuses 1	☒	
4		BatteryTemp1.1	☐	Used for Temperature
5		BatteryTemp1.2	☐	Used for Temperature
6		BatteryTemp1.3	☐	
Battery Monitor 1				

Same Terminals are Disabled for Batteries

Figure 2.16 – Battery Temp Probe Terminals (Smartpack2 Basic)

NOTE: The **BatteryTemp X.Y** alarm monitor under the **Battery Bank** heading for the controller (on the **Battery** page) uses the same terminals as **Temperature X.Y** and **ProgInput X.Y** monitors on the **Inputs** page. If the **BatteryTemp** alarm monitor is enabled, then the corresponding **Temperature** and **ProgInput** monitors are disabled.

SP2 Basic 1 Input Configuration				
1		Temperature1.1	☐	Used for BattTemp
2		Temperature1.2	☐	
3		Temperature1.3	☐	
4		Earth Faulty 1	☐	
5		ProgInput 1.1	☐	Used for BattTemp
6		ProgInput 1.2	☐	
7		ProgInput 1.3	☐	
I/O unit 1 Input Configuration				

Figure 2.17 – Input 1 Used for BattTemp and Disabled for Temperature and ProgInput

NOTE: For the Smartpack S controller, only input terminals 1-4 can be used for temperature monitoring. If so utilized, the corresponding **ProgInput** is disabled.

Terminals for Temperature

SmartPack S 1 Input Configuration				
1	♂	Temperature1.1	☐	⊘
2	♂	Temperature1.2	☐	⊘
3	♂	Temperature1.3	☐	⊘
4	♂	Temperature1.4	☐	⊘
5	♂	EarthResistance	☐	⊘
6	♂	Virtual input 1	☐	⊘
7	♂	Virtual input 2	☐	⊘
8	♂	Virtual input 3	☐	⊘
9	♂	Virtual input 4	☐	⊘
10	♂	ProgInput 1.5	☐	⊘
11	♂	ProgInput 1.6	☐	⊘
12	♂	ProgInput 1.7	☐	⊘
13	♂	ProgInput 1.8	☐	⊘
14	♂	ProgInput 1.9	☐	⊘
15	♂	ProgInput 1.10	☐	⊘

Same Terminals for Programmable Inputs

Figure 2.18 – Temperature and Programmable Input Monitors for Smartpack S

NOTE: For the Compact controller, all three input terminals can be used for temperature monitoring. If so utilized, the corresponding **ProgInput** alarms are disabled.

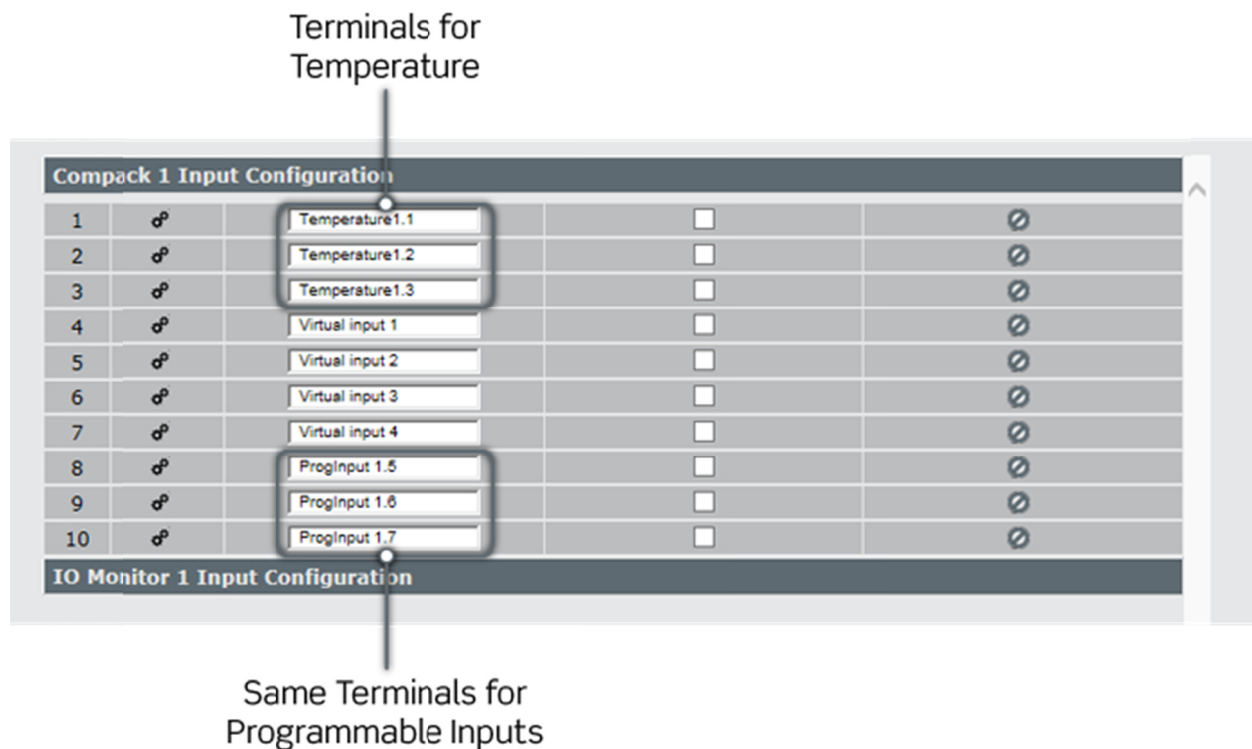


Figure 2.19 – Temperature and Programmable Input Monitors for Compact

If temperature probes are installed for ambient readings and connected to a controller's temperature/programmable input(s), use the following instructions to enable the probe input(s):

1. Click on **Alarm Conf.** in the top menu.
2. Click on **Inputs** in the left menu.
3. After the window populates, click on the heading for the controller that the temperature probe is connected to (e.g., **SP2 BasicInd X Input Configuration** or **Smartpack S Input Configuration**).

NOTE: If the system uses Smartpack2 Basic or Smartpack2 Basic Industrial controllers and they do not appear on the **Inputs** page, it may be necessary to adjust the **Number of banks** value on the **Battery** page under **System Configuration**. See "Configuration" beginning on page 108 for details.

4. Locate the **Temperature X.Y** monitors.

NOTE: The monitor numbers (1.1, 1.2, 1.3) correlate to the terminal numbers of the controller inputs (1, 2, and 3). The first number (**X**) indicates the controller ID number, and the second (**Y**) indicates the input number.

5. Click on the **Edit** icon (next to the list number) to launch the edit window.
6. The first line item is for enabling the probe input. Check the **Enable** box to enable the temperature probe.

7. Make any other adjustments desired for the temperature probe parameters, including alarm thresholds at the bottom.
8. Click on the **Save** icon in the lower right hand corner to save changes.
9. Repeat steps 4 through 8 for any remaining temperature probes to be set.
10. Click on the **Save** icon in the lower right hand corner to save changes.

The temperature probes are now enabled.

Flexi Monitors

If temperature probes are installed using a Flexi Monitor, use the following instructions to enable the probe input(s):

1. Click on **Alarm Conf.** in the top menu.
2. Click on the menu page on the left where the Flexi Monitor appears.

NOTE: Where the Flexi Monitor appears depends on its **Monitor Type** assignment under the **System Configuration** section. To check, navigate to:

System Conf. > Power System > Control System > Flexi Monitor

See Table 2.3 - Flexi Monitor Types and Corresponding Alarm Headings for the **Alarm Configuration** menu page that the Flexi Monitor appears given a **Monitor Type** assignment. By default, the Flexi Monitor is set to **Std Fleximon** and appears under the **Inputs** page of the **Alarm Configuration** section.

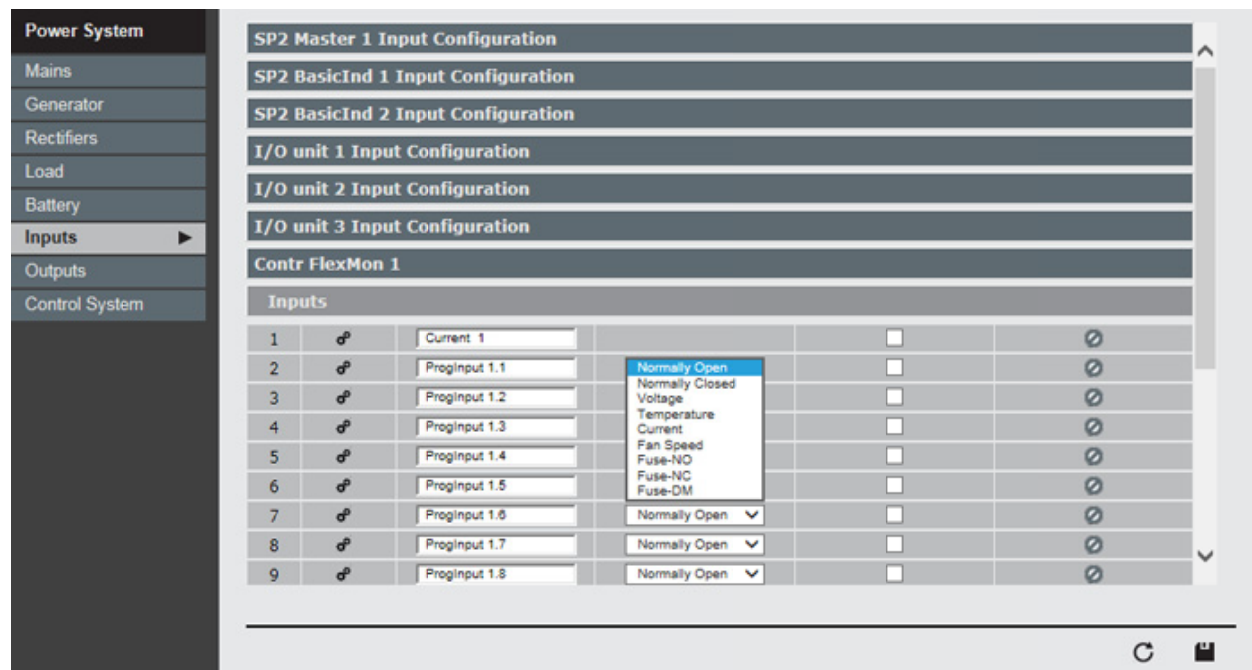


Figure 2.20 – Location of Flexi Monitor Alarms (set as Std Fleximon)

- On the appropriate page, click on the **FlexMon** heading to expand the Flexi Monitor list of alarm monitors. By default, the Flexi Monitor is set to Monitor Type **Std Fleximon** and appears on the **Inputs** page as **Contr FlexMon X**.
- There are 16 channels on the Flexi Monitor. Identify the channel with the temperature probe connected, and click the **Edit** icon beside the corresponding **ProgInput**.

NOTE: By default, each terminal is labeled as **ProgInput X.YY**, **X** represents the ID number assigned to the Flexi Monitor, and **YY** represents the programmable input number.

- When the **Edit** window opens, click on the **Config** tab.
- On the **Config** page, click on the **Input Configuration** drop-down list and select **Temperature**.
- Click on the **Save** icon in the lower right corner of the **Edit** window to save the change. Note that the input description changes to **Temperature X.YY**.
- Click on the **General** tab.
- Locate the **Alarm Monitor** line near the top of the page and check the **Enable** box. This enables the alarm monitor.
- Note the appearance of four alarm events at the bottom of the **Edit** window. Set the temperature thresholds and desired **Alarm Groups** for each **Event**.
- Click on the **Save** icon in the lower right corner to save the changes.

12. Click anywhere outside of the Edit window to close it.

The temperature probe connected to the Flexi Monitor is now set.

Setting Alarms

Alarm settings are configured in the **Alarm Configuration** section of both the web interface and display menus. Alarm monitors for various inputs are assigned to alarm groups. Alarm groups, in turn, are mapped to output channels, including output relays. These assignments are user-configurable. The following diagram illustrates how alarm monitors are assigned to alarm groups, and how alarm groups are mapped to output channels.

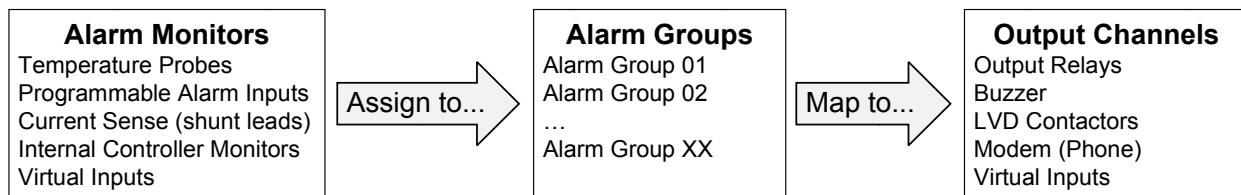


Figure 2.21 – Alarm Assignments Overview

The next two sections explain different parts of the preceding diagram. **Input Alarms** explains what the inputs are on the **Inputs** page of the controller and how to assign them to alarm groups. **Output Alarm Relays** explains the **Outputs** page of the controller, how to map alarm groups to relays, and how to rename alarm groups.

NOTE: Each controller has different alarm input/output interfaces:

- The *Compack* controller has three inputs and three output relays; they are located on the top of the controller.
- The *Smartpack2* controller does not have any input/output terminals built in; instead, an Eltek I/O Monitor is required. I/O Monitors feature six alarm inputs and six output relays.
- The *Smartpack S* controller has six inputs and six output relays; they are located on the left side of the controller (when viewed from the front).



Figure 2.22 – Alarms Terminals for Eltek Controllers

Input Alarms

There are three categories of input alarms:

- **Temperature:** Temperature inputs are just one of several possible designations for the input alarm terminals (three for the Compack controller; six for the Smartpack S; six for an I/O Monitor2 connected to the Smartpack2). Enabling the input for Temperature indicates that a temperature probe is connected to the input terminal selected.
- **Virtual input:** Virtual inputs are for use as manual triggers to toggle an assigned Alarm Group on command. There is no physical terminal associated with these; they are "virtual".
- **Programmable input (ProgInput):** Programmable inputs are the designations for the input alarm terminals, with the exception of temperature probes. The programmable input designation can be used for relay input (normally open or normally closed), diode matrix, clock input, or voltage.

NOTE: The input terminals used for **Temperature** are the same physical terminals used for the **Programmable inputs (ProgInput)**. If the **Temperature** input is enabled, then the corresponding programmable input farther down on the list turns gray and cannot be configured. Similarly, if the **Programmable input** is enabled, then the corresponding **Temperature** input turns gray and cannot be configured.

SP2 Master 1 Input Configuration				
SP2 BasicInd 1 Input Configuration				
1	⚙	Temperature1.1	☐	⊗
2	⚙	Temperature1.2	☐	⊗
3	⚙	Temperature1.3	☐	⊗
4	⚙	EarthFault 1	☐	⊗
5	⚙	ProgInput 1.1	☐	⊗
6	⚙	ProgInput 1.2	☐	⊗
7	⚙	ProgInput 1.3	☐	⊗
SP2 BasicInd 2 Input Configuration				

Figure 2.23 – Temperature and ProgInput Monitors on a Smartpack2 Basic Industrial Controller

NOTE: For the Smartpack2 Basic and Smartpack2 Basic Industrial controllers, the **Temperature X.Y** and **ProgInput X.Y** alarm monitors on the controller's **Inputs** heading are the same physical terminals. If the **Temperature** alarm monitor is enabled, then the corresponding **ProgInput** monitor is disabled; and vice-versa.

Terminals Enabled
for Temperature

SP2 Basic 1 Input Configuration				
#	Edit	Description	Enable	Status
1	⚙	Temperature1.1	☒	✓
2	⚙	Temperature1.2	☒	✓
3	⚙	Temperature1.3	☐	⊗
4	⚙	Earth Faulty 1	☐	⊗
5		ProgInput 1.1	☐	Used for Temperature
6		ProgInput 1.2	☐	Used for Temperature
7	⚙	ProgInput 1.3	☐	⊗
I/O unit 1 Input Configuration				

Same Terminals are Disabled
for Other Inputs

Figure 2.24 – Temp Probe Terminals (Smartpack2 Basic)

The following figure illustrates how the same terminals are disabled for use as battery temperature probes:

Battery Alarm Configuration				
Battery Bank 1				
#	Edit	Description	Enable	Status
1		BattVolt bank 1	☐	
2		BattCurr bank 1	☒	
3		BattFuses 1	☒	
4		BatteryTemp1.1	☐	Used for Temperature
5		BatteryTemp1.2	☐	Used for Temperature
6		BatteryTemp1.3	☐	
Battery Monitor 1				

Same Terminals are
Disabled for Batteries

Figure 2.25 – Battery Temp Probe Terminals (Smartpack2 Basic)

NOTE: For the Smartpack2 Basic and Smartpack2 Basic Industrial controllers, the **BatteryTemp X.Y** alarm monitor under the **Battery Bank** heading for the controller (on the **Battery** page) uses the same terminals as **Temperature X.Y** and **ProgInput X.Y** monitors on the **Inputs** page. If the **BatteryTemp** alarm monitor is enabled, then the corresponding **Temperature** and **ProgInput** monitors are disabled.

SP2 Basic 1 Input Configuration				
1		Temperature1.1	☐	Used for BattTemp
2		Temperature1.2	☐	
3		Temperature1.3	☐	
4		Earth Faulty 1	☐	
5		ProgInput 1.1	☐	Used for BattTemp
6		ProgInput 1.2	☐	
7		ProgInput 1.3	☐	
I/O unit 1 Input Configuration				

Figure 2.26 – Input 1 Used for BattTemp and Disabled for Temperature and ProgInput

NOTE: For the Smartpack S controller, only input terminals 1-4 can be used for temperature monitoring. If so utilized, the corresponding **ProgInput** is disabled.

NOTE: For the Compack controller, all three input terminals can be used for temperature monitoring. If so utilized, the corresponding **ProgInput** alarms are disabled.

To setup an input alarm through the web interface:

1. Click on the **Alarm Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Inputs** and wait for the list to populate.

- Find the input to set and click on the edit icon (gears). Wait for the edit window to populate.

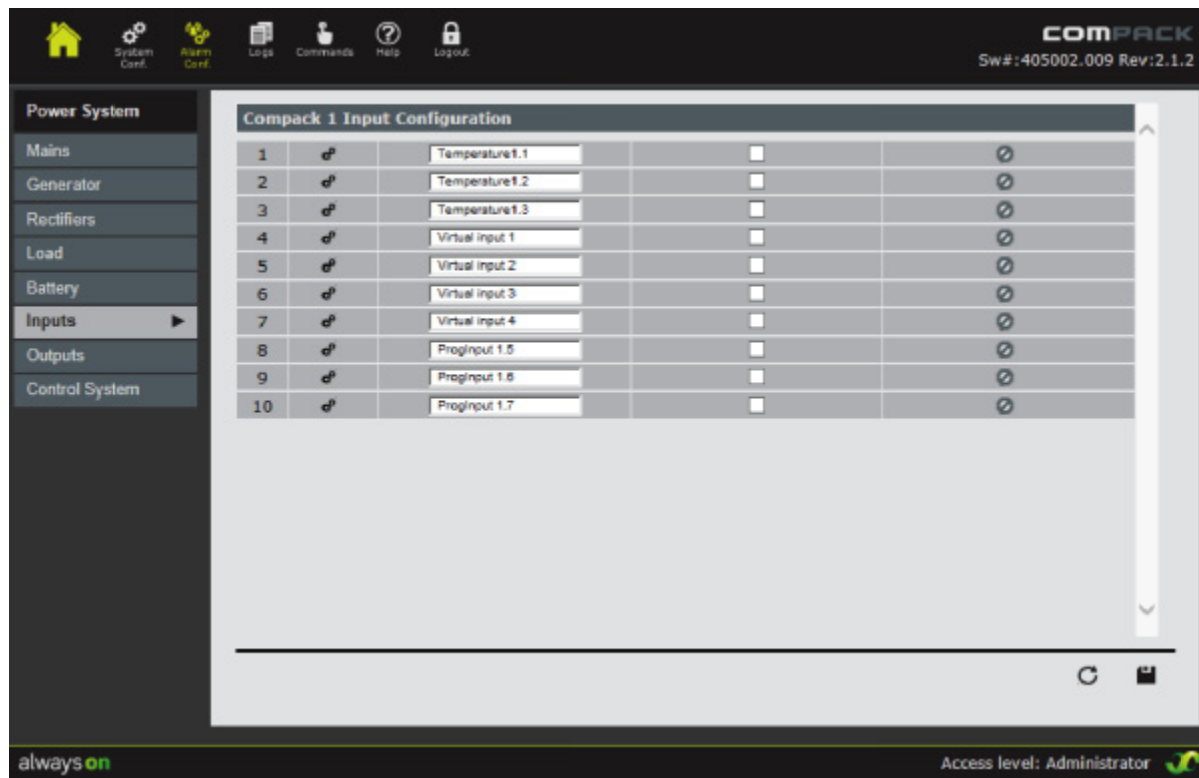


Figure 2.27 – Alarm Inputs Page (Compact Controller)

- Check the **Enable** box.

Virtual input 1 [X]

General [▼] Configuration

Description	Value	Unit
Alarm Monitor	☐ Enable	
Manual reset	Disabled [▼]	
Hysteresis	0.00	
	0 seconds [▼]	
	Virtual input 1	

Alarm Group

None Selected [▼]

- Error
- Minor Alarm
- Major Alarm
- Major Low
- Minor Low
- Major High
- Minor High
- Event**
- Critical
- Warning
- Battery Test
- Boost
- System Shutdown
- Alarm Reset
- Partial Shutdown
- Reset no of Modules
- Rect Current limit
- Batt Current limit
- Temp Comp
- Boost Inhibit
- Block Outputs
- Generator
- Emergency
- Test Inhibit
- Equalize
- Equalize Inhibit
- Silence buzzer
- Earthfault Inhibit

[Refresh] [Save]

Figure 2.28 – Alarm Input Edit Window

- Set the **Event** type. For a virtual input, leave **Event** as **Event**.
- Select the alarm group to trigger when the alarm event occurs.
NOTE: For Programmable Inputs only, click on the **Calibration** tab. Select the type of input.
- Click the **Save** icon (diskette symbol in the lower right corner) to save changes.
- Assign the alarm group to a relay, if not done so already. See the subsequent section for “Output Alarm Relays”.

Output Alarm Relays

Output alarm relays are form-C contacts that are triggered if mapped to one or more alarm groups.

To set output relays through the web interface:

1. Click on the **Alarm Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Outputs** and wait for the list to populate. This can take about a minute to complete.

NOTE: At the top of the window is a drop-down box called **Select Unit**. Use this to select the control unit to which the alarms are connected. This is particularly important for the Smartpack2 Master controller, since the unit itself only has an audible buzzer to assign to the alarm groups. For the Smartpack2 controller, I/O Monitors are required for external alarm input and output; the appropriate I/O Monitor must be selected in the drop-down menu in order to modify alarm relay assignments.

3. For each alarm group that should trigger an output relay, place a check in the box under the relay(s) desired. Relays can be assigned to multiple alarm groups, and alarm groups can trigger multiple relays.

Alarm Group 1 Mapped
to Alarm Output 1

#	Alarm Group	Alarm output 1	Alarm output 2	Alarm output 3	Alarm output 4	Alarm output 5	Alarm output 6
1	Major alarm	☒	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐	☐
7	Rectifier alarm	☒	☐	☐	☐	☐	☐
8	Hi Temp	☐	☒	☐	☐	☐	☐

Figure 2.29 – Alarm Outputs Page (Mapping Example Shown)

4. Change alarm group names as desired to reflect the alarm to be indicated by that group. Click in the **Alarm Group** field to edit the name.
5. Click the **Save** icon (diskette symbol in the lower right corner) to save changes.

The input alarm is now set up.

Alarm Setpoints

Since all alarm parameters are set essentially in the same manner, the following instructions demonstrate how to set Battery Voltage alarm parameters as an example. As the following diagram illustrates, this section explains how to set up alarm inputs (Internal Alarm Parameters in this example), how to assign the parameters to alarm groups, and how to assign alarm groups to output relays.

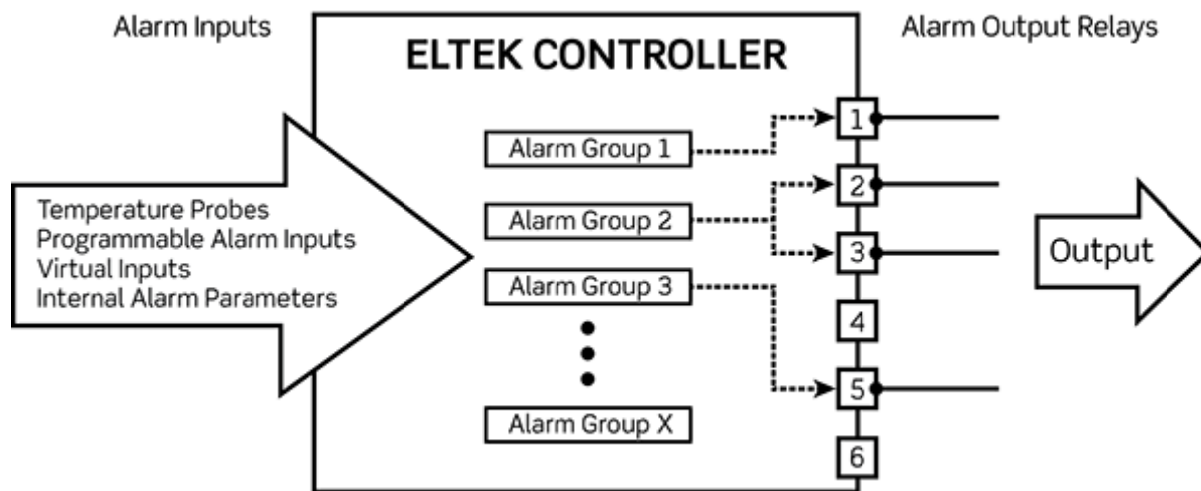


Figure 2.30 - Alarm Groups to Output Relays

Please note that the screenshots are taken from the Compact controller; the process is identical for Smartpack2 and Smartpack S controllers.

Setting Alarm Battery Voltage Alarm (Example)

To illustrate how to set an alarm monitor, the following procedure describes how to set up the Battery Voltage alarm through the Web Interface as an example.

To set alarm Battery Voltage alarm parameters through the web interface:

1. Click on the **Alarm Conf.** icon in the top menu bar.
2. In the left menu bar, click on the **Battery** and wait for the list to populate.
3. Under the **Battery Alarm Configuration** bar, find **BatteryVoltage** (it should be line #1) and click on the **Edit** icon (gear symbol).
4. The edit window opens. Locate the **Alarm Monitor** line and check the **Enable** box.

NOTE: The edit window may vary from revision to revision. Some edit windows have a **General** tab and a **Calibration** tab; if so, click on the **General** tab.

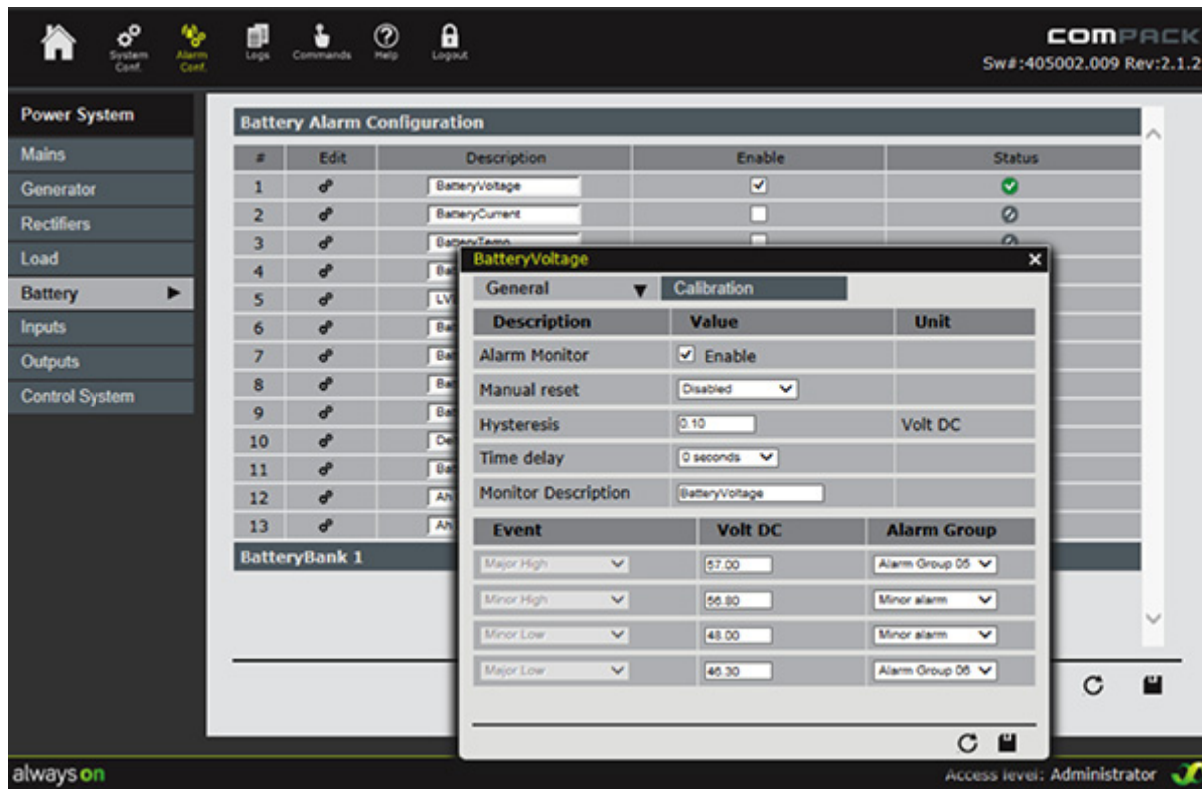


Figure 2.31 - Battery Voltage Alarm Configuration

5. At the very bottom of the edit window is where alarm thresholds are set. For Battery Voltage there are four events: **Major High**, **Minor High**, **Minor Low**, and **Major Low**. Configure parameters as desired. Click the **Save** icon (diskette symbol in the lower right corner) to save changes.
6. Note the **Alarm Group** assignments next to each **Event** line. Click on the drop-down arrow to see the alarm groups available.
The output relay assignment of the alarm group and the alarm group name can be changed on the **Outputs** page. In this example, **Alarm Group 06** will be changed for the **Major Low** parameter of the Battery Voltage alarm.
7. In the current edit window, click the **Save** icon and then close the edit window.
8. Select **Outputs** in the left menu bar. Wait for the window to populate, which can take about a minute to complete.

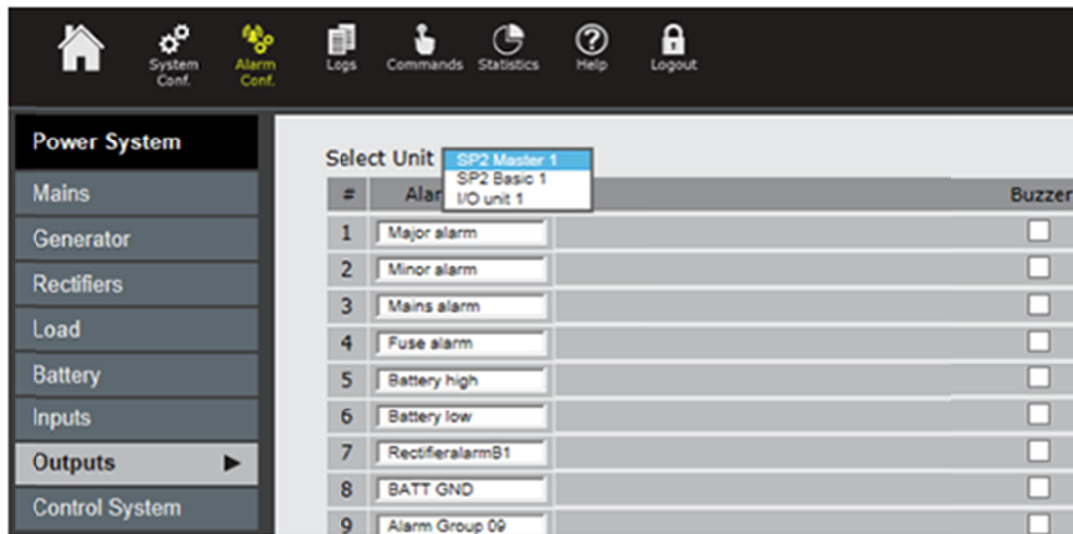


Figure 2.32 – Smartpack2 Alarm Outputs Page (Multiple Control/Monitor Units)

NOTE: At the top of the window is a drop-down box called **Select Unit**. Use this menu to select the control unit to which the alarms are connected. This is particularly important for the Smartpack2 Master controller, since the unit itself only has an audible buzzer to assign to the alarm groups. For the Smartpack2 controller, I/O Monitors are required for external alarm input and output; the appropriate I/O Monitor must be selected in the drop-down menu in order to modify alarm relay assignments.

9. Locate the line of the alarm group assigned to the alarm event (**Alarm Group 06** in this example).

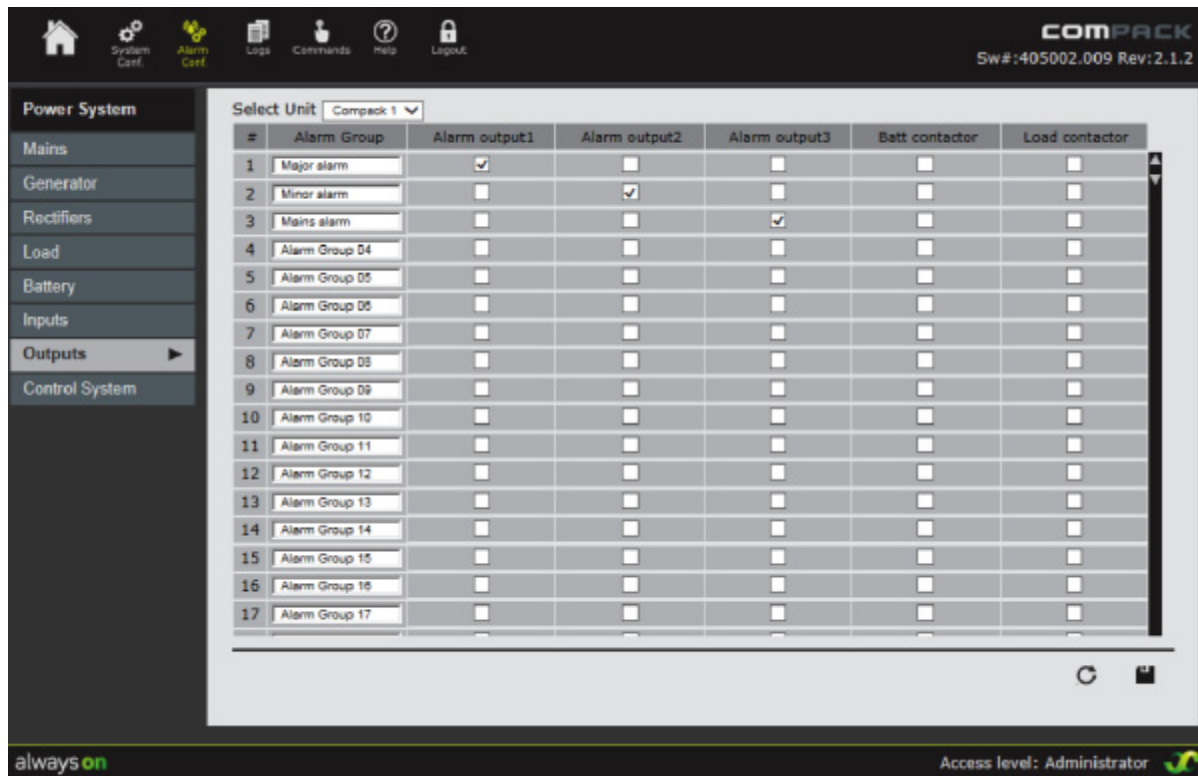


Figure 2.33 – Alarm Output Page (Compack Controller)

10. Click in the field under **Alarm Group** and type in a distinctive name for this alarm group. In this example, the name is changed to **BatteryLowMajor** (line 6 in the preceding figure).
11. Next, select the output relay that the alarm should trigger. In this example, **Alarm output1** is selected because it is the default for all major alarms. Note, too, that there are only three output alarm relays for the Compack controller.
12. Click the **Save** icon (diskette symbol in the lower right corner) to save changes.
13. Return to the **Battery Voltage** edit window by clicking on **Battery** in the left menu bar.
14. Locate **BatteryVoltage** (line #1) and click on the **Edit** icon (gear symbol).
15. After the window populates, click on the **Alarm Group** box in the **Major Low** event line.

BatteryVoltage		
General		Calibration
Description	Value	Unit
Alarm Monitor	☒ Enable	
Manual reset	Disabled	
Hysteresis	0.10	Volt DC
Time delay	0 seconds	
Monitor Description	BatteryVoltage	

Event	Volt DC	Alarm Group
Major High	57.00	Alarm Group 05
Minor High	56.80	Minor alarm
Minor Low	48.00	Minor alarm
Major Low	46.30	BatteryLowMajor

Figure 2.34 – Battery Voltage Edit Window

- Find and select **BatteryLowMajor**.
- Click the **Save** icon (diskette symbol in the lower right corner) to save changes.

The Battery Voltage alarm monitor is now set.

Setting Nag Alarms

Eltek I/O Monitors support the use of a “nag” or recurring buzzer alarm which, even if reset or silenced, activates the buzzer again after a configured time elapses for as long as the triggering alarm group is active.

To enable the nag alarm feature for an alarm group:

- Navigate to the **Alarm Outputs** page (**Alarm Conf.** > **Power System** > **Outputs**).
- Select the unit that will use the nag alarm feature.

NOTE: If the I/O Monitor has the latest software installed, then the first column to appear after the Alarm Group column is called **Buzzer Output**. If it

does not appear, then the I/O Monitor unit requires a software upgrade before proceeding to the next step.

The screenshot shows the 'I/O Monitor Outputs Page' with the 'Logical Groups' tab selected. A 'Select Unit' dropdown is set to 'I/O unit 1'. Below is a table with 17 rows and 8 columns. The first column is '#', the second is 'Alarm Group', the third is 'Buzzer Output', and the remaining five are 'Alarm out. 1' through 'Alarm out. 5'. The 'Buzzer Output' column has checkboxes, and the 'Alarm out.' columns have empty boxes. At the bottom right, there are 'Refresh' and 'Save' icons.

#	Alarm Group	Buzzer Output	Alarm out. 1	Alarm out. 2	Alarm out. 3	Alarm out. 4	Alarm out. 5
1	Power Major	☒	☐	☐	☐	☐	☐
2	Power Minor	☒	☐	☐	☐	☐	☐
3	High Volt HV1	☒	☐	☐	☐	☐	☐
4	High Volt HV2	☒	☐	☐	☐	☐	☐
5	BOD (LV1)	☒	☐	☐	☐	☐	☐
6	VLV (LV2)	☒	☐	☐	☐	☐	☐
7	Rect Major	☒	☐	☐	☐	☐	☐
8	Rect Critical	☒	☐	☐	☐	☐	☐
9	BRKR/FUSE Alarm	☒	☐	☐	☐	☐	☐
10	AC Fail High 1	☒	☐	☐	☐	☐	☐
11	AC Fail High 2	☒	☐	☐	☐	☐	☐
12	AC Fail Low 1	☒	☐	☐	☐	☐	☐
13	AC Fail Low 2	☒	☐	☐	☐	☐	☐
14	Converter Alarm	☒	☐	☐	☐	☐	☐
15	Mult Conv Alarm	☒	☐	☐	☐	☐	☐
16	UProcessor Fail	☒	☐	☐	☐	☐	☐
17	Available	☒	☐	☐	☐	☐	☐

Figure 2.35 - I/O Monitor Outputs Page (with latest software)

- Identify the alarm group(s) in the first column to map to the nag feature and click the corresponding box(es) under the **Buzzer Output** column.
- Click the **Save** icon in the lower right corner to save changes.
- Click on the **Buzzer Output** column heading to open the **Output Config** window.

The screenshot shows the 'Output Config' window. It has a title bar with a close button. Inside, there's a section for 'Output no.1' with a 'Description' field containing 'Buzzer Output', a 'Nag timer(minutes)' field containing '30', and a drop-down menu set to 'Normally activated resettable'. At the bottom right, there are 'Refresh' and 'Save' icons.

Figure 2.36 - Buzzer Output Configuration Window

- Locate the **Description** field. To its right is a drop-down list for configuring the behavior of the buzzer. Select **Normally activated resettable**.

7. For the **Nag timer (minutes)** field, enter the number of minutes that should elapse after the buzzer is silenced before it should activate again. The buzzer will continue activating after the elapsed time for as long as the alarm groups that are mapped to it are active.
8. Click on the **Save** icon in the lower right corner to save changes.

The nag alarm is now set.

Setting Site Information

NOTE: Site information can be set through the web interface only, not through the display. However, site information is readable through the display at the following path:

Main Menu > Logs/Reports > Inventory Report

In the web interface, site information is set on the **System Info** page, where details about the site and the power system installation are entered. Entering a field value is optional, but it is highly recommended for future identification, maintenance and traceability.

To set site information through the web interface:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Power System**.
3. Click on **System Info**.

Figure 2.37 – System Information Page

4. Fill in the fields as desired. All fields are optional.
5. Click on the save icon (diskette) to save changes.

The following fields are available (refer to preceding figure):

- **Company** – Name of the company that owns the power system
- **Site** – Name and/or ID of the site
- **Model** – Power system model (refer to documentation provided with the system)
- **Serial Number** – System serial number or other identification number
- **Install Date** – Installation date (year, month, day)
- **Service Date** – Date of latest service (year, month, day)
- **Responsible** – Person or company that serviced the power system
- **Message lines (1 and 2)** – Free-form fields for any messages related to services performed on the power system (results, unresolved issues, etc.)
- **Latitude** – Latitude of the site (degrees, hours, minutes, hemisphere [north or south])

- **Longitude** – Longitude of the site (degrees, hours, minutes, direction [east or west])
- **Elevation** – Site elevation (in meters)

Setting Generator Activation

Generator activation is triggered by configuring several parameters available through the Web Interface.

NOTE: The activation switch of the generator must be connected to one of the output relays of the power system's controller or monitors (like an I/O Monitor), which serves to activate the generator when signaled by the controller.

NOTE: There is no digital input required from the generator back to the power system. The Eltek controller system determines if the generator has been successfully switched on by detecting the presence (or lack) of ac input.

To set generator activation parameters:

1. Navigate to the **General Generator Configuration** page.

System Conf. > Generator > General > Generator control

General Generator Configuration

Generator control ☒ Enable

Long charge time hours

Stop delay minutes

Mains delay minutes

Boost during charge ☒ Enable

Test mode ☐ Enable (Sets hours to minutes)

Event **Alarm group**

Generator

Generator

Figure 2.38 - Generator Configuration Settings (Example)

2. Locate **Generator control** and check the **Enable** box.

- At the bottom of the page are two **Event** lines for **Generator**. One or both can be assigned to alarm groups to the right. For this example, only one **Alarm group** is assigned.

NOTE: In this example, an alarm group called **Genset** has already been created on the **Outputs** page (**Alarm Conf. > Outputs**). If an alarm group has not already been reserved for switching on the generator, then select one of the unused alarm groups for this purpose.

- Click the **Save** icon in the lower right corner to save changes.
- Navigate to the alarm **Outputs** page.

Alarm Conf. > Output

The screenshot shows the 'Alarm Conf. > Output' page. On the left is a sidebar with a 'Power System' menu containing: Mains, Generator, Rectifier, Solar Charger, Load, Battery, Inputs, **Outputs** (highlighted), and Control System. The main area has two tabs: 'Outputs' and 'Logical Groups'. Below the tabs is a 'Select Unit' dropdown menu set to 'I/O unit 3'. The main table has 8 columns: '#', 'Alarm Group', 'Alarm output 1', 'Alarm output 2', 'Alarm output 3', 'Alarm output 4', 'Alarm output 5', and 'Alarm output 6'. There are 17 rows of data. Row 13, 'Genset', has a checkmark in the 'Alarm output 1' column. Row 9, 'High Minor', has a checkmark in the 'Alarm output 4' column. Row 10, 'Very Low Major', has a checkmark in the 'Alarm output 2' column. Row 11, 'Low Minor', has a checkmark in the 'Alarm output 4' column. Row 12, 'Alarm Group 12', has checkmarks in the 'Alarm output 5' and 'Alarm output 6' columns. Row 15, 'Alarm Group 15', has a checkmark in the 'Alarm output 3' column. At the bottom right are 'Save' and 'Cancel' icons.

#	Alarm Group	Alarm output 1	Alarm output 2	Alarm output 3	Alarm output 4	Alarm output 5	Alarm output 6
1	Major alarm	☐	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐	☐
7	Rectifier alarm	☐	☐	☐	☐	☐	☐
8	Very High Major	☐	☐	☐	☐	☐	☐
9	High Minor	☐	☐	☐	☒	☐	☐
10	Very Low Major	☐	☒	☐	☐	☐	☐
11	Low Minor	☐	☐	☐	☒	☐	☐
12	Alarm Group 12	☐	☐	☐	☐	☒	☒
13	Genset	☒	☐	☐	☐	☐	☐
14	Alarm Group 14	☐	☐	☐	☐	☐	☐
15	Alarm Group 15	☐	☐	☒	☐	☐	☐
16	Alarm Group 16	☐	☐	☐	☐	☐	☐
17	Alarm Group 17	☐	☐	☐	☐	☐	☐

Figure 2.39 – Alarm Outputs Page (Example)

- Locate **Select Unit** and use the drop-down list to select the controller or CAN Node with the output relay that is connected to the generator's activation switch.
- Identify the **Alarm Group** that was selected for the **Generator** event in step 3.

NOTE: If the alarm group has not been renamed, it is recommended to enter a name in the **Alarm Group** field (which is a free-form text field) that reflects its use for sending ON/OFF signals to the generator. In this example, the alarm group has been named **Genset**.

8. Identify the output relay (**Alarm output X**) to which the generator is connected; click the box at the intersection of this output relay column and the alarm group row for the generator.
9. Click the **Save** icon in the lower right corner to save changes.
10. Navigate to the **Generator** alarms page.

Alarm Conf. > Generator > Generator Alarm Configuration

Generator Alarm Configuration				
#	Edit	Description	Enable	Status
1		GeneratorFail	☐	
2		FuelRemaining 1	☐	

Figure 2.40 – Generator Alarm Configuration

11. Click the **Edit** icon next to the **GeneratorFail** monitor.
12. Check the **Enable** box for the **Alarm Monitor** line. This enables the monitor, which reports an alarm if the generator activation signal has been issued, but there is no ac input.

GeneratorFail

Description	Value	Unit
Alarm Monitor	☐ Enable	
Manual reset	Disabled	
Hysteresis	0	
Time delay	4 minutes	
Monitor Description	GeneratorFail	
Event		Alarm Group
Major Alarm		Major alarm




Figure 2.41 – Generator Fail Edit Window

13. Click the **Save** icon in the lower right corner to save changes.
14. Return to the **Generator** configuration pages to set activation parameters. (**System Conf. > Generator**). The generator can be activated by battery current or capacity; voltage; and time parameters (**Capacity, Daily, Monthly,**

and **Voltage Setup**). See the topic “Generator” beginning on page 93 for details on each parameter page.

NOTE: The **Generator** event is automatically triggered if system voltage drops to one volt above the **Battery Disconnect Voltage** (Battery Disconnect Voltage + 1V). This parameter is configured at **Alarm Conf. > Battery > Battery Alarm Configuration > LVBD** (click the **Edit** icon).

Description	Value	Unit
LVD	☒ Enable	
Mains Independent reconnect	☐ Enable	
Temperature Dependent	☐ Enable	
Disconnect Voltage	43.00	Volt
Reconnect Voltage	48.00	Volt

Description	Value	Unit
Delay after disconnect	0	Seconds
Description	LVBD	
Alarm Group	LVBD	

Figure 2.42 – Battery Disconnect Voltage (LVBD Edit Window)

15. Click the **Save** icon in the lower right corner of each configuration page to save changes.

Generator activation is now set.

Setting SNMP Communication

NOTE: This feature is only available through the web interface, not through the display. Simple Network Management Protocol (SNMP) settings through the web interface are available from software revision 2.2 and later. Screenshots in this section are from the Smartpack2 controller.

NOTE: Configuration options are available for SNMP v3, SNMP v1, and SNMP v2c. Configure the appropriate settings for the SNMP version of the network.

This section describes the setup required to establish the Eltek controller as an object on an existing network communicating via SNMP. Any other details regarding the network, Network Management System (NMS), or SNMP configuration for the installation site must be obtained from local systems administration (IT) and

associated documentation. The SNMP version, network settings, security protocols, community strings, etc. should be provided by the local IT group.

NOTE: For detailed overviews of each SNMP page in the Web Interface, please refer to the information in the System Configuration section (“SNMP Settings”, beginning on page 147).

SNMP Web-Based Configuration

To access the SNMP Settings pages:

1. Click on the **System Conf.** icon in the top menu bar.
2. In the left menu bar, click on **Device Settings** to expand the menu.
3. Under **Device Settings**, click on **SNMP Settings**. The **General SNMP Configuration** page appears.

System Conf. > Device Settings > SNMP settings

By default, the controller is set to **SNMP-based configuration**, which means that an SNMP management application will be used to configure the controller's SNMP settings rather than the controller's web interface.

General SNMP Configuration

Inhibit Traps ☐ Enable

Send Off Traps ☐ Enable

Trap Repeat Rate(minutes) Set to 0 to disable

Heartbeat Trap Repeat Rate(minutes) Set to 0 to disable

SNMP v3 Configuration

☐ Web-based configuration ☒ SNMP-based configuration

NOTE:
 -"Web-based configuration" disables configuration through SNMP by removing write access of admin user to the SNMP MIBs.
 -"SNMP-based configuration" disables configuration through web interface, resets SNMPv3 configuration and reboots the controller.

Reset SNMP v3 default configurations

Figure 2.43 – SNMP-based configuration (default)

Where permissible, a **Web-based configuration** option is available to configure the controller's SNMP settings through the web interface. When the radio button is selected, the following menus appear on the left menu bar:

- USM Users
- Vacm Access
- V1/V2 Community
- Traps

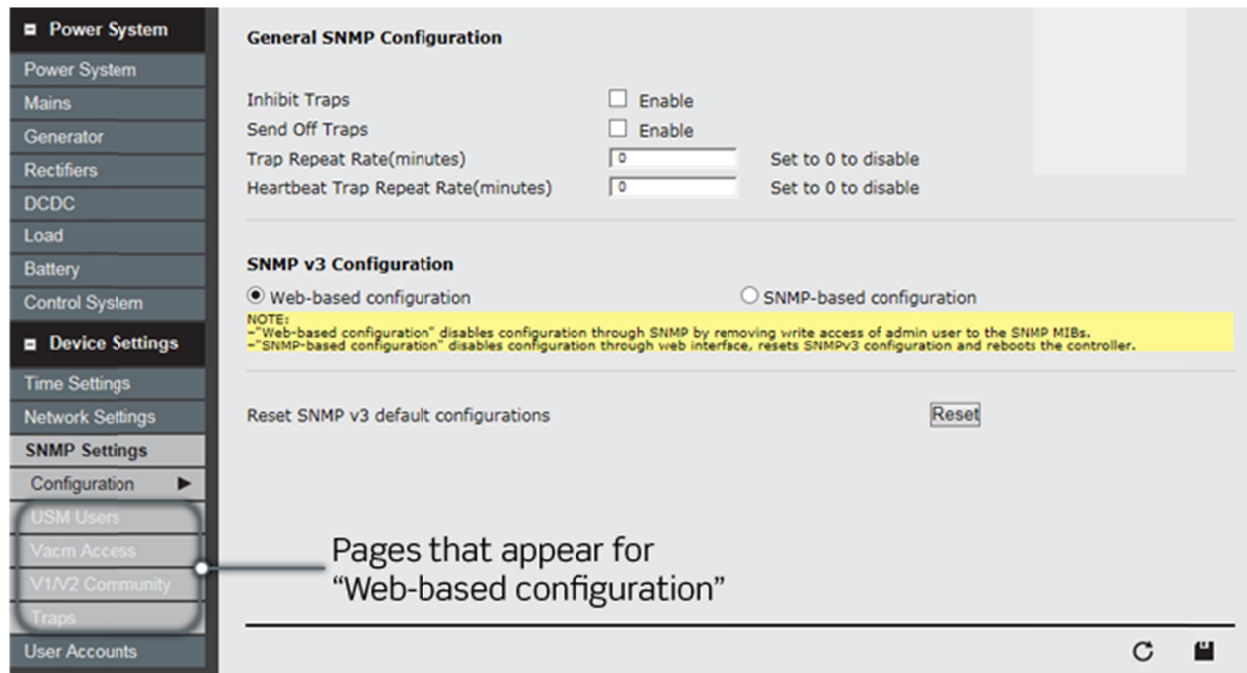


Figure 2.44 – Web-based Configuration Pages

NOTE: For detailed overviews of each SNMP page in the Web Interface, please refer to the information in the System Configuration section.

SNMP Implementation

To configure the controller for the Network Management System (NMS):

1. Compile the Eltek MIB files in the NMS database.
2. Add the Eltek controller object to the management map.
3. Ping the controller to verify connectivity.
4. Define and configure trap handling and SNMP users (especially for SNMP v3).

NOTE: The Management Information Base (MIB) files for Eltek controllers are available only from Eltek. Please contact Eltek Technical Support at 1-800-435-4872 or techsupport.us@eltek.com for the latest MIB files.

Table 2.1 – Alarm Traps (Eltek MIB branch 10)

Trap	Description
alarmPowerSystemTrap	This Trap is sent when an alarm condition occurs in the power system.
alarmBatteryTrap	This Trap is sent when an alarm condition occurs in the Battery subsystem.
alarmLoadGroupTrap	This Trap is sent when an alarm condition occurs in the Load subsystem.
alarmMainsTrap	This Trap is sent when an alarm condition occurs in the Mains subsystem.
alarmRectifierTrap	This Trap is sent when an alarm condition occurs in the Rectifier subsystem.
alarmControlSystemTrap	This Trap is sent when an alarm condition occurs in the Control-system subsystem.
alarmDcDcTrap	This Trap is sent when an alarm condition occurs in theDCDC converter subsystem.
alarmInputsTrap	This Trap is sent when an alarm condition occurs in the Inputs subsystem.
alarmOutputsTrap	This Trap is sent when an alarm condition occurs in the Outputs subsystem.
alarmGeneratorTrap	This trap is sent when an alarm condition occurs in the Generator subsystem.
alarmSolarChargerTrap	This Trap is sent when an alarm condition occurs in the SolarCharger subsystem.
alarmWindChargerTrap	This Trap is sent when an alarm condition occurs in the WindCharger subsystem.
infoHeartBeatTrap	When enabled, this trap transmits a periodic “heartbeat” signal to indicate that the system is connected and operational.

For details on using various SNMP applications with Eltek controllers, please see document #2155710, ***How to SNMP with Eltek Controllers***.

Load Monitor and Flexi Monitor Setup

Eltek Load Monitor and Flexi Monitor units provide supplementary monitoring. After connecting one or more of these devices to the CAN bus, additional setup is required in the controller under the **System Configuration** and **Alarm Configuration** sections.

Load Monitor

Load Monitors are used for monitoring load shunts and load fuses. When connected to the CAN bus of an Eltek controller, a page called **Current Monitor** appears under the **System Configuration** menu:

System Conf. > Power System > Control System > Current Monitor

In addition, the alarm monitors for the Load Monitor appear under the **Alarm Configuration** section; the precise page depends on the **Monitor Type** selected on the **Current Monitor** page.

Alarm Conf. > Power System > [Load / Rectifier / DCDC / Solar / Wind / Fuel Cell]

Table 2.2 – Load Monitor Types and Corresponding Alarm Headings

Monitor Type	Alarm Configuration Page	Section Heading
Std Loadmon	Load	LoadPrimary X
Load CurMon	Load	Load CurMon X
Rect CurMon	Rectifiers	Rect CurMon X
DCDC CurMon	DcDc Converter	DcDc CurMon X
Solar CurMon	Solar Charger	Solar CurMon X
Wind CurMon	Wind Charger	Wind CurMon X
FuelC CurMon	FuelCell Charger	FuelC CurMon X

To configure the Load Monitor in the Web Interface:

1. Navigate to the following page to set the Monitor Type:

System Conf. > Power System > Control System > Current Monitor

2. Identify the Load Monitor (called **CurrMonitor X** under the first column) to configure.

- Under **Monitor type**, select the current type the unit is intended to monitor.
- Click the **Save** icon in the lower right corner to save changes.

Unit to configure	Monitor type	System type	System index	Unit index	Sub system	Unit name	Control unit index
CurrMonitor 1	Std Loadmon Load CurMon Rect CurMon DCDC CurMon Solar CurMon Wind CurMon FuelC CurMon	LoadDistribution(3)	1	1	0	LoadPrimary 1	49

Note:
1. When the current monitor is reconfigured, all energy logs will be reset on the reconfigured unit.
2. When changes are saved, a manual refresh is performed to ensure correct display of data.

Figure 2.45 – Current Monitor Page (for Configuring Load Monitors)

- Navigate to the following page to set the alarm monitors:

Alarm Conf. > Power System > [Load / Rectifier / DCDC / Solar / Wind / Fuel Cell]

NOTE: The alarm page where the Load Monitor appears depends on the selection made on the **Current Monitor** page. See Table 2.2 - Load Monitor Types and Corresponding Alarm Headings for the corresponding page and heading names. Regardless of the section name, the Load Monitor alarm monitors are always the same.

- Identify the alarm section heading for the Load Monitor and click on it to expand it.

The following sections describe how to configure the Load Monitor's shunt and fuse inputs.

Shunt Configuration

To configure a Load Monitor shunt input:

- Click on the **Currents** sub-heading to expand it.

LoadPrimary 1					
Currents					
1	⚙	LoadCurrent 1	☒		✓
2	⚙	Current 1.1	☒		✓
3	⚙	Current 1.2	☐		⊗
4	⚙	Current 1.3	☐		⊗
5	⚙	Current 1.4	☐		⊗
6	⚙	Current 1.5	☐		⊗
7	⚙	Current 1.6	☐		⊗
8	⚙	Current 1.7	☐		⊗
9	⚙	Current 1.8	☐		⊗
Fuses					
Power					

Figure 2.46 - Load Monitor Heading and Sub-headings (Monitor Type: Std Loadmon)

- Identify the shunt input(s) to configure and click on the **Edit** icon.

NOTE: The first row is for **LoadCurrent**, an alarm monitor that sums all of the current inputs and generates an alarm if the sum exceeds the specified threshold.

Current1.1

General

Calibration

Scale

Description	Value	Unit
Alarm Monitor	☐ Enable	
Manual reset	Disabled	
Hysteresis	0	Amp
Time delay	0 seconds	
Monitor Description	Current1.1	
Event	Amp	Alarm Group
Major High	600	Major alarm
Minor High	480	Minor alarm

↺

💾

Figure 2.47 - Load Monitor Current Alarm Monitor (General Tab)

- Click the check box next to **Enable** to enable the alarm monitor.
- Set the amperage threshold (under **Amp**).
- Assign alarm groups (if different from the default).

6. Click the **Save** icon in the lower right corner to save changes.
7. Click the **Scale** tab.

Description	Value
Scale/Shunt type	50 mVolt
Max Rating	600 Amp

Figure 2.48 – Load Monitor Current Shunt Scale Tab

8. Check that the scale and rating are correct; otherwise, change them by using the drop-down lists for **Scale/Shunt type** and **Max rating**.

NOTE: The shunt size and rating must be known and correctly entered on this page in order to get accurate readings.

9. Click the **Save** icon in the lower right corner to save changes.
10. Repeat for any remaining shunt inputs that need to be configured.

The shunt input is now configured.

Fuse Configuration

To configure a Load Monitor fuse (or circuit breaker) monitor input:

1. Click on the **Fuses** sub-heading to expand it.

LoadPrimary 1				
Currents				
Fuses				
1	⚙	Fuse 1.1	☒	✓
2	⚙	Fuse 1.2	☐	⊗
3	⚙	Fuse 1.3	☐	⊗
4	⚙	Fuse 1.4	☐	⊗
5	⚙	Fuse 1.5	☐	⊗
6	⚙	Fuse 1.6	☐	⊗
7	⚙	Fuse 1.7	☐	⊗
8	⚙	Fuse 1.8	☐	⊗
Power				

Figure 2.49 – Load Monitor Fuses Sub-Heading (Monitor Type: Std Loadmon)

- Identify the fuse input(s) to configure and click on the **Edit** icon.

Fuse 1.2

General

Scale

Config

Description	Value	Unit
Alarm Monitor	☐ Enable	
Manual reset	Disabled	
Hysteresis	0	
Time delay	0 seconds	
Monitor Description	Fuse 1.2	
Event		Alarm Group
Major Alarm		Fuse alarm

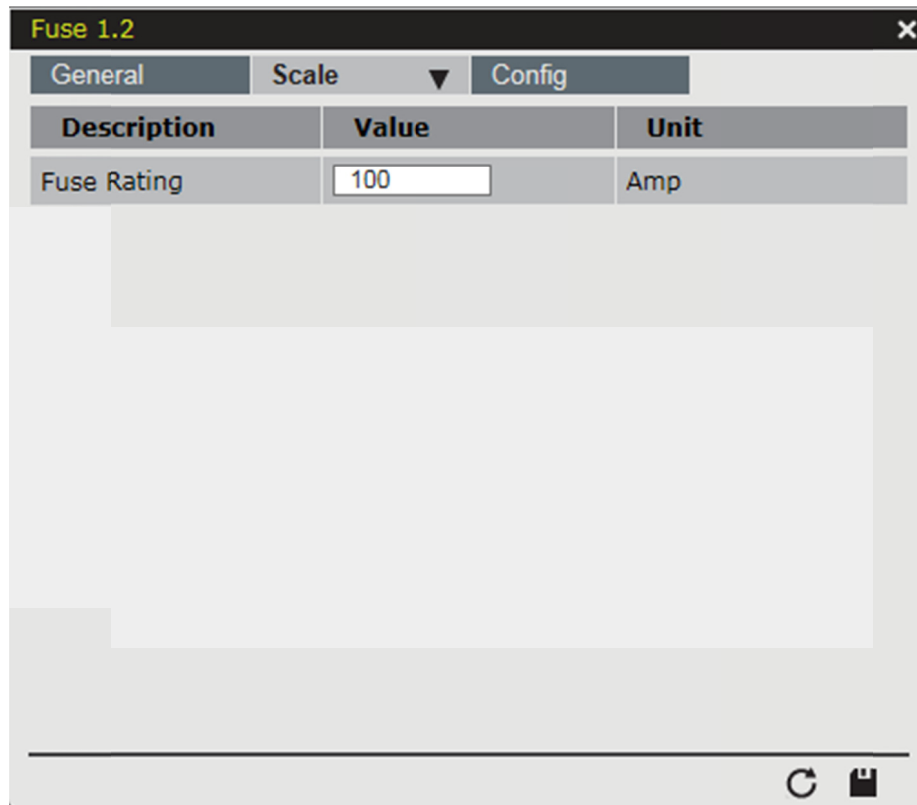
↺

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Figure 2.50 – Load Monitor Fuse Monitor General Tab

- Click the check box next to **Enable** to enable the alarm monitor.
- If desired, change the **Event** and **Alarm Group** assignments (the default assignment is a **Major Alarm** event assigned to the **Fuse alarm** Alarm Group).

5. Click the **Save** icon in the lower right corner to save changes.
6. Click the **Scale** tab.
7. Enter the rating of the fuse (or circuit breaker).
8. Click the **Save** icon in the lower right corner to save changes.



The screenshot shows a web interface window titled "Fuse 1.2" with a close button (X) in the top right corner. Below the title bar are three tabs: "General", "Scale", and "Config". The "Scale" tab is currently selected, indicated by a downward arrow. Below the tabs is a table with three columns: "Description", "Value", and "Unit". The table contains one row with the following data:

Description	Value	Unit
Fuse Rating	100	Amp

Below the table is a large, empty light gray rectangular area. At the bottom right of the window, there are two icons: a circular refresh icon and a square save icon.

Figure 2.51 – Load Monitor Fuse Monitor Scale Tab

9. Click the **Config** tab.
10. Select the type of input that the fuse (or circuit breaker) provides to the Load Monitor (Normally Open, Normally Closed, or Diode Matrix).
11. Click the **Save** icon in the lower right corner to save changes.

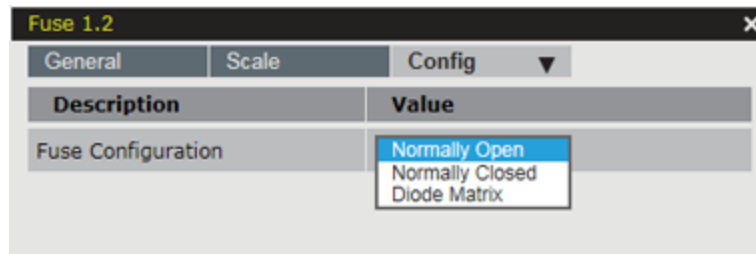


Figure 2.52 – Load Monitor Fuse Configuration Tab

Flexi Monitor

Flexi Monitors can be employed for the following monitoring purposes: current, voltage, temperature, relay input, and fan speed. When connected to the CAN bus of an Eltek controller, a page called **Flexi Monitor** appears under the **System Configuration** menu:

System Conf. > Power System > Control System > Flexi Monitor

In addition, the alarm monitors for the Flexi Monitor appear under the **Alarm Configuration** section; the precise page depends on the **Monitor Type** selected on the **Flexi Monitor** page.

Alarm Conf. > Power System > Battery / Load / Rectifier / DCDC / Solar / Wind / Fuel Cell / Inputs

The following table shows the Alarm Configuration pages and section headings that correspond to each Monitor Type.

Table 2.3 – Flexi Monitor Types and Corresponding Alarm Headings

Monitor Type	Alarm Configuration Page	Section Heading
Std Fleximon	Inputs	Contr FlexMon X
Batt Fleximon	Battery	Batt FlexMon X
Load Fleximon	Load	Load FlexMon X
RectifierFleximon	Rectifiers	Rect FlexMon X
DCDC Fleximon	DcDc Converter	DcDc FlexMon X
Solar Fleximon	Solar Charger	Solar FlexMon X
Wind Fleximon	Wind Charger	Wind FlexMon X
FuelC Fleximon	FuelCell Charger	FuelC FlexMon X

To configure the Flexi Monitor in the Web Interface:

1. Navigate to the following page to set the Monitor Type:
System Conf. > Power System > Control System > Flexi Monitor
2. Identify the Flexi Monitor (under the first column) to configure.
3. Under **Monitor type**, select the current type the unit is intended to monitor.
4. Click the **Save** icon in the lower right corner to save changes.

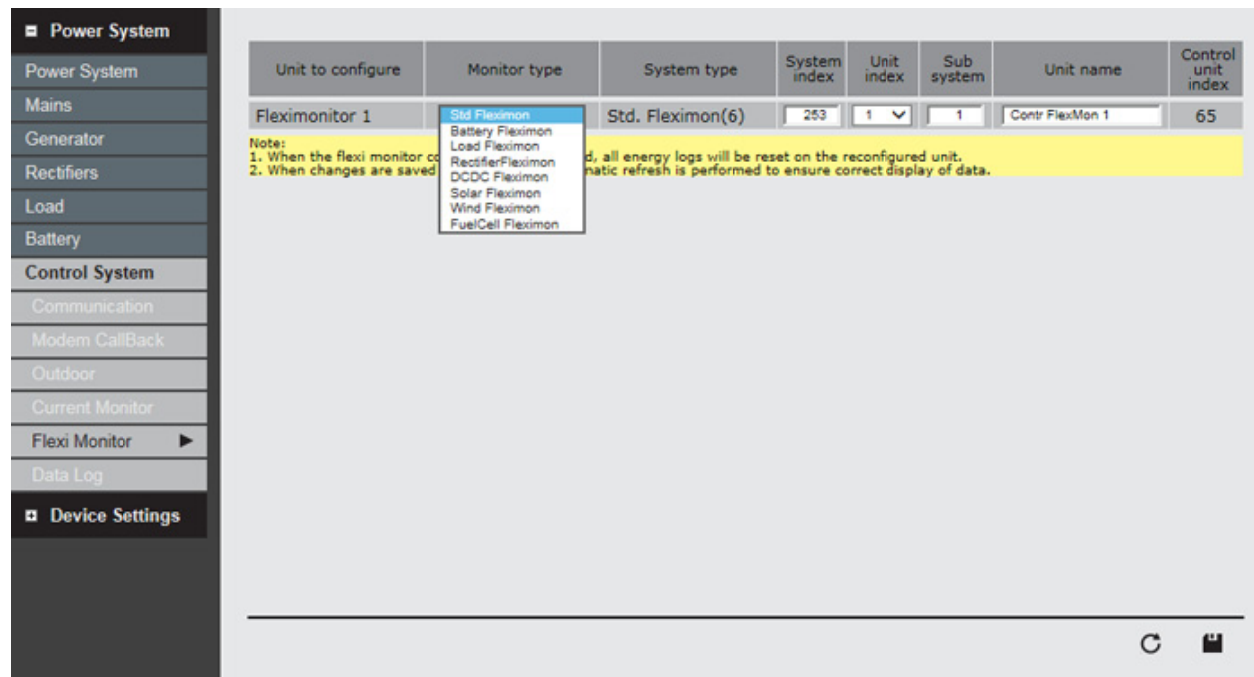


Figure 2.53 – Flexi Monitor Configuration Page

5. Navigate to the following page to set the alarm monitors:
Alarm Conf. > Power System > [Load / Battery / Rectifier / DCDC / Solar / Wind / Fuel Cell / Inputs]
- NOTE:** The alarm page where the Flexi Monitor appears depends on the selection made on the **Flexi Monitor** page. See Table 2.3 - Flexi Monitor Types and Corresponding Alarm Headings for the corresponding page and heading names. Regardless of the Monitor Type name, the Flexi Monitor alarm monitors are always the same.
6. Identify the alarm section heading for the Flexi Monitor and click on it to expand it.
 7. If the **Inputs** sub-heading does not expand, click on the **Inputs** sub-heading to expand it.

Contr FlexMon 1					
Inputs					
1		Current 1		☐	
2		ProgiInput 1.1	Normally Open	☐	
3		ProgiInput 1.2	Normally Closed	☐	
4		ProgiInput 1.3	Voltage	☐	
5		ProgiInput 1.4	Temperature	☐	
6		ProgiInput 1.5	Current	☐	
7		ProgiInput 1.6	Fan Speed	☐	
8		ProgiInput 1.7	Fuse-NO	☐	
9		ProgiInput 1.8	Fuse-NC	☐	

**Figure 2.54 – Configuration Section and Options for Flexi Monitor Inputs
(Alarm Configuration > Inputs Page)**

8. Identify the fuse input(s) to configure and click on the **Edit** icon.

NOTE: The first row is for **Current X**, an alarm monitor that sums all of the current monitors and generates an alarm if the sum exceeds the specified threshold.

NOTE: The input type and **Enable** box can be selected on this page, but these instructions use the Edit window to do so.

9. Click the check box next to **Enable** to enable the alarm monitor.
10. Click the **Save** icon in the lower right corner to save changes.

The screenshot shows a web interface window titled "ProgInput 1.1" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "General" (selected) and "Config". The main content area is divided into two sections. The top section is a table with three columns: "Description", "Value", and "Unit". It contains six rows of configuration options. The bottom section is another table with three columns: "Event", "Value", and "Alarm Group", containing one row of configuration options. At the bottom right of the window, there are two icons: a circular refresh icon and a square save icon.

Description	Value	Unit
Alarm Monitor	☐ Enable	
Manual reset	Disabled ▾	
Hysteresis	0	
Time delay	0 seconds ▾	
Monitor Description	ProgInput 1.1	

Event		Alarm Group
Major Alarm ▾	1	Major alarm ▾

Figure 2.55 – Flexi Monitor Edit Window (General Tab)

11. Click on the **Config** tab.
12. Next to **Input Configuration**, click on the drop-down list and select the type of input that is connected to the alarm monitor channel.

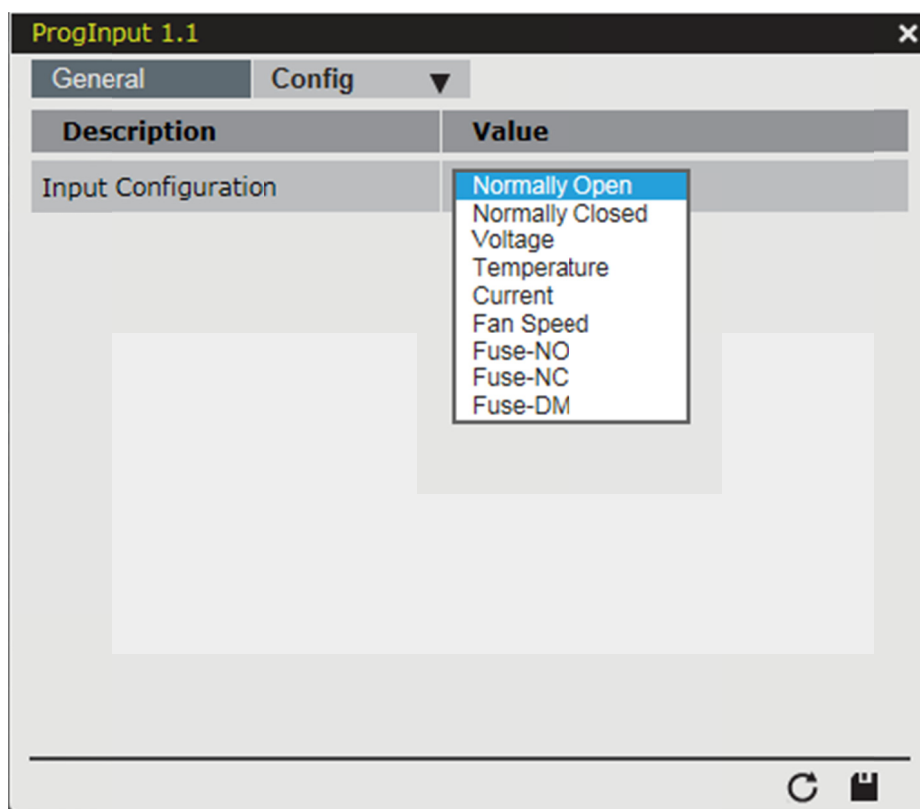


Figure 2.56 – Configuration Tab for Flexi Monitor Inputs (Edit Window)

See the following table for the tabs that appear with each selection. Some input types require additional configuration.

Table 2.4 - Definitions of Inputs and Additional Tabs (where applicable)

Input Type	Definition	Additional Tabs
Normally Open	Normally-open relay	None
Normally Closed	Normally-closed relay	None
Voltage	Voltage input	Calibration
Temperature	Temperature input	None
Current	Current input	Calibration, Scale
Fan Speed	Fan speed (tachometer) input	Fan Config
Fuse-NO	Fuse input, normally-open	Scale
Fuse-NC	Fuse input, normally-closed	Scale
Fuse-DM	Fuse input, diode matrix	Scale

13. If applicable, click on the tab that appears for the input type for further configuration.

CAUTION: Calibration should only be used when the accuracy of the input value is proved to be significantly off the measured value. It should *not* be used as part of an installation procedure. Manufacturer values and proper calibration equipment (e.g., an accurate multimeter) must be available in order to calibrate the input values accurately. Improper calibration can cascade inaccuracy to all controller calculations and functions that use the input value.

14. Return to the **General** tab.
15. In the box between **Event** and **Alarm Group**, set the alarm threshold.
16. Use the drop-down list under **Event** to select the alarm event type.
17. Use the drop-down list under **Alarm Group** to select the alarm group to trigger for alarm output.
18. Click the **Save** icon in the lower right corner to save changes.
19. Repeat steps 8 to 18 for any remaining inputs to configure.

The Flexi Monitor inputs are now configured.

Logical Groups (Boolean Algebra)

Logical groups are provided in the Outputs of the Alarm Configuration section to support Boolean algebra operations. In short, the controller can be configured to trigger an Alarm Group if two other Alarm Groups are in the states specified.

NOTE: The Alarm Group assigned to the Result Group cannot be used for any other alarm monitor.

Currently, the equation functions as follows:

Alarm Group [1] (ON/OFF) + Alarm Group [2] (ON/OFF) = Result Group (ON)

NOTE: The alarm group numbers in the equation above are in brackets because they can be any of the Alarm Groups available in the controller. The Alarm Group numbers in the equation do not specifically indicate Alarm Groups 1 and 2 of the controller.

The page for **Logical Group** is a tab on the **Outputs** page of the **Alarm Configuration** section:

Alarm Conf. > Power System > Outputs > Logical Groups (tab)

IF	Alarm Group 1	IS	Active/Not Active	AND	Alarm Group 2	IS	Active/Not Active	=	Result Group
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	Major alarm	IS	Active	AND	-	IS	Active	=	-
IF	Minor alarm	IS	Active	AND	-	IS	Active	=	-
IF	Mains alarm	IS	Active	AND	-	IS	Active	=	-
IF	Fuse alarm	IS	Active	AND	-	IS	Active	=	-
IF	Battery high	IS	Active	AND	-	IS	Active	=	-
IF	Battery low	IS	Active	AND	-	IS	Active	=	-
IF	Rectifier alarm	IS	Active	AND	-	IS	Active	=	-
IF	Hi Temp	IS	Active	AND	-	IS	Active	=	-
IF	audible alarm	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 10	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 11	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 12	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 13	IS	Active	AND	-	IS	Active	=	-
IF	Dropdiodecontrol	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 15	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 16	IS	Active	AND	-	IS	Active	=	-
IF	Alarm Group 17	IS	Active	AND	-	IS	Active	=	-
IF	OutBlocked	IS	Active	AND	-	IS	Active	=	-

Note:
Alarm
LVBD
LVLD1
LVLD2

as result groups must not be assigned to any monitor!

Figure 2.57 - Logical Groups Tab

To set a Logical Group:

1. Determine the conditions required for two Alarm Groups in order to trigger a unique Alarm Group for the **Result Group**.
IF Alarm Group [1] is active/inactive AND Alarm Group [2] is active/inactive, THEN Result Group is activated.
2. Navigate to the **Logical Groups** tab of the **Outputs** page.
3. Select an Alarm Group from the drop-down list for **Alarm Group 1**.
4. Select the state (**Active** or **Not Active**) that the first Alarm Group should be in as part of the condition to trigger the **Result Group** using the drop-down list for **Active/Not Active** (to the right of the **Alarm Group 1** column).
5. Select an Alarm Group from the drop-down list for **Alarm Group 2**.
6. Select the state (**Active** or **Not Active**) that the second Alarm Group should be in as part of the condition to trigger the **Result Group** using the drop-down list for **Active/Not Active** (to the right of the **Alarm Group 2** column).
7. Select the Alarm Group to be triggered by the conditions of the equation using the drop-down list for **Result Group**.
NOTE: Do *not* assign an Alarm Group to the Result Group if it is used for any other alarm monitor.
8. Click the **Save** icon in the lower right corner to save changes.

Up to 10 Logical Groups can be set.

EXAMPLE: Set up a unique alarm for a situation where there is an ac mains alarm and a rectifier alarm, providing a preliminary indication that the power system may have to switch to back-up power.

1. Go to the **Outputs** page (**Alarm Conf.** > **Outputs** > **Outputs tab**). Wait for the Alarm Groups table to populate.
2. Find an unused Alarm Group (**Alarm Group XX**). Check each device under **Select Unit** to make sure the Alarm Group selected is not mapped to any output channel. The Alarm Group selected for the **Result Group** of the Logical Group equation must be dedicated.
3. Rename the Alarm Group to something descriptive, like “Backup Warning”.
4. Select an output channel for the Alarm Group. In a real-world application, select the output alarm relay to which an external alarm monitor is connected.

#	Alarm Group	Alarm output 1	Alarm output 2
1	Fuse alarm	☐	☐
5	Battery high	☐	☐
6	Battery low	☐	☐
7	Rectifier alarm	☐	☐
8	Very High Major	☐	☐
9	High Minor	☐	☐
10	Very Low Major	☐	☒
11	Low Minor	☐	☐
12	Backup Warning	☒	☐
13	Alarm Group 13	☐	☐
14	Alarm Group 14	☐	☐

Alarm Group Mapped to
Alarm Output Relay

Figure 2.58 – Alarm Group Mapped (Example)

5. Click on the **Save** icon in the lower right corner to save changes.
6. Click on the **Logical Groups** tab (at top, next to the **Outputs** tab).
7. In the first available row, select **Mains alarm** for **Alarm Group 1**.
8. In the **Active/Not Active** list to the right of **Alarm Group 1**, select **Active**.
9. Select **Rectifier alarm** for **Alarm Group 2**.
10. In the **Active/Not Active** list to the right of **Alarm Group 2**, select **Active**.

11. Set **Result Group** to the reserved alarm group (**Backup Warning** in this example).

IF	Alarm Group 1	IS	Active/Not Active	AND	Alarm Group 2	IS	Active/Not Active	=	Result Group
IF	Mains alarm	IS	Active	AND	Rectifier alarm	IS	Active	=	Backup Warning
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-
IF	-	IS	Active	AND	-	IS	Active	=	-

Note:
Alarm groups that are used as result groups must not be assigned to any monitor!

Figure 2.59 – Logic Group Setup Example

12. Click on the **Save** button in the lower right corner to save changes.

Email (SMTP) Setup

Eltek controllers support email delivery of data and alarm messages to other addresses on a local network with an SMTP server.

The following items are required in order to setup email messaging from the controller:

- An SMTP server on the local network
- The SMTP server's IP address
- If authentication is required on the SMTP server, then the **User Name** and **Password** are needed

NOTE: If authentication is required, Alarm messages from the controller cannot be delivered since they do not currently use the **User Name** and **Password** fields.

- Email addresses for recipients (up to two)

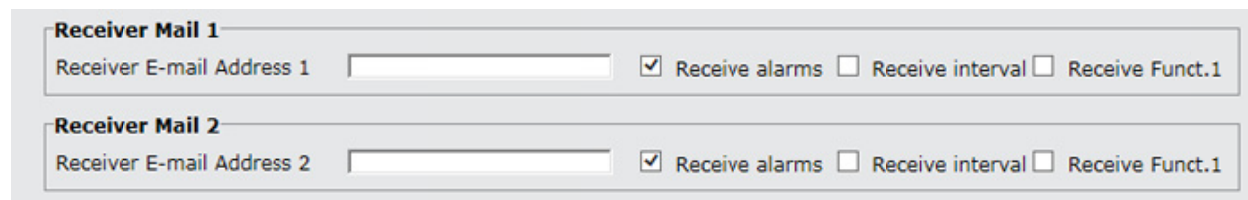
NOTE: The controller, recipients, and SMTP server must be on the same domain. For example, if the server is SMTP.companydomain.com, then all email addresses (including the one selected for the controller) must all have the domain @companydomain.com.

To set up email messaging:

1. Navigate to the **eMail** page (**System Conf.** > **Device Settings** > **Network Settings** > **eMail**). Wait for the Alarm Groups table to populate.

Figure 2.60 – Email (SNMP) Configuration Page

2. If authentication for the SMTP server is required, enter the user name (**SMTP User Name** field) and the password (**SMTP Password** field).
3. For the **SMTP Server ip-Address** field, enter the SMTP server's IP address.
TIP: Ping the network to find the email server's IP address. If uncertain, contact the local systems administrator (IT department) for help.
4. For the **Sender e-mail Address**, enter an email address for the controller. It can be fictitious. This address will appear as the sender's address. The controller cannot receive email messages.
5. Enter email addresses for up to two recipients in the **Receiver Mail X** sections (**Receiver E-mail Address X** fields).

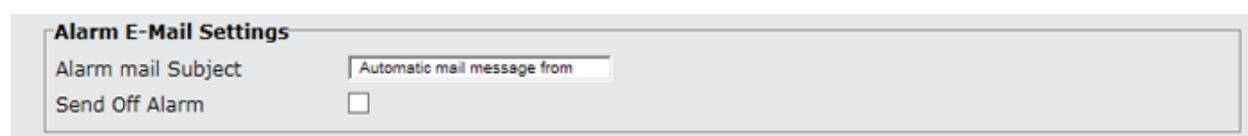


Receiver Mail 1
 Receiver E-mail Address 1 ☒ Receive alarms ☐ Receive interval ☐ Receive Funct.1

Receiver Mail 2
 Receiver E-mail Address 2 ☒ Receive alarms ☐ Receive interval ☐ Receive Funct.1

Figure 2.61 – Receiver Mail Sections

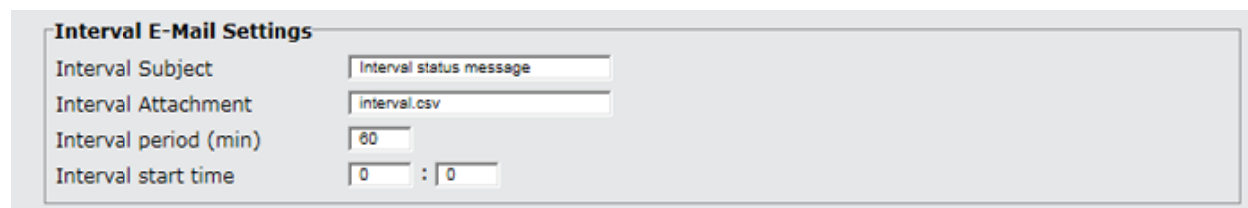
6. Select which messages these recipients are to be sent: Alarms, interval messages (data logs), and/or custom function (**Receive Funct. 1**).
7. If configuring alarm messages, find the **Alarm E-Mail Settings** section.



Alarm E-Mail Settings
 Alarm mail Subject
 Send Off Alarm ☐

Figure 2.62 – Alarm Settings Section

8. Enter the subject line for alarm email messages in the **Alarm mail Subject** field.
9. If a message should be sent if an alarm turns off, select the **Send Off Alarm** box.
10. If configuring interval data messages, find the **Interval E-Mail Settings** section.



Interval E-Mail Settings
 Interval Subject
 Interval Attachment
 Interval period (min)
 Interval start time :

Figure 2.63 – Interval Settings Section

11. If configuring interval data messages, find the **Interval E-Mail Settings** section.
12. Enter the subject line for interval email messages in the **Interval Subject** field.
13. Enter the file name for the data file sent as an attachment in the **Interval Attachment** field.
14. Enter the time between each interval in the **Interval period (min)** field; the units are minutes.

15. Enter the time the intervals should start in the **Interval start time** field (HH:MM format)
16. Click the Save icon in the lower right corner to save changes.

Email notifications using SMTP are now set.

3. Operation

This section describes common operational procedures that can be accomplished through the Controller Web Interface.

Using the Commands Buttons

The **Commands** section provides function buttons to quickly execute basic tests and resets. Click on the **Commands** icon to navigate to this page.



NOTE: Admin-level permissions are required to execute the following commands:

- Delete Event Log
- Output Tests (relays and LVD contactors)

NOTE: When a command button is clicked, a warning message appears to confirm the action. Simply click **OK** to execute the command.

System

Commands on the System page are primarily for silencing active alarms, testing alarm indicators, resetting inventory, and resetting defaults.

For each command, click the **Apply** button to execute the action. The table below lists potential actions and the corresponding command to execute.

Table 3.1 - System Commands

Action	Click the Apply button for...
Silence the alarm buzzer	Reset Manual Alarm(s)/Silence Buzzer
Reset an alarm	Reset Manual Alarm(s)/Silence Buzzer
Refresh inventory count for controllers and/or CAN Nodes	Reset Number of Modules
Refresh inventory count for rectifiers or other power modules	Reset Number of Modules
Test controller LEDs	Controller led-test

Action	Click the Apply button for...
Test rectifier LEDs	Rectifier led-test
Test the alarm buzzer	Buzzer test

NOTE: The **Delete Event Log** command requires admin-level permissions to execute.

The following figure shows the **System Commands** page.

System Commands	
Reset Manual Alarm(s)/Silence Buzzer	Apply
Reset Number of Modules	Apply
Delete Event Log	Apply
Set Default Configuration	Apply Choose system voltage: 48V ▼
Set Default Configuration with Default-xml files	Apply
Set Default Calibration	Apply Choose unit: SP2 Master 1 ▼
Controller led-test	Apply
Rectifier led-test	Apply
Buzzer test	Apply

Figure 3.1 – System Commands Page

Battery

Commands on the **Battery** page are for starting and stopping battery tests and charging modes. For each command, click the **Apply** button to execute the action.

Commands on the **Battery** page are self-explanatory (either Start or Stop the action), so please refer to the relevant sections under the “Battery” topic (Section 4 - System Configuration) for additional details about **Battery Test**, **Battery Boost**, and **Battery Equalize**.

The following figure shows the **Battery** page.

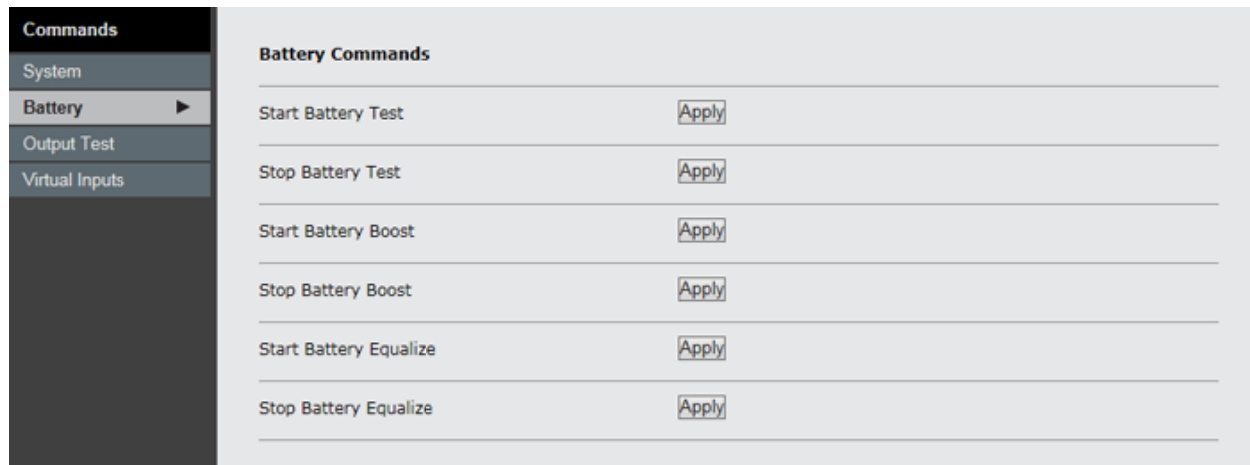


Figure 3.2 – Battery Commands Page

Output Test

The **Output Test** page provides a convenient way to test specific output channels of Eltek controllers and CAN Nodes. Output channels include alarm relays, LVD contactors, buzzers, and virtual inputs.

NOTE: Admin-level permissions are required to execute output tests.



CAUTION: Testing the **Load contactor** and **Battery contactor** channels opens the corresponding LVD contactor! If these channels are to be tested, ensure that opening the contactors does not disrupt system operation.



CAUTION: Testing output channels generates false alarm conditions for any monitors connected to those channels.

To test an output channel:

1. Note the **Output Test duration** time at the bottom of the page. This is the length of time (in seconds) that the test will last. Change if necessary.
2. Select the controller or CAN Node from the **Output Test** drop-down list.
3. Identify the channel to test and click the **Apply** button.
4. Confirm that the output channel has been activated.

NOTE: Virtual Inputs can be tested both on this page and on the **Virtual Inputs** page. Only the primary controller in a power system has virtual inputs (Smartpack2 Master, Smartpack S, and Compack).

The following figure shows the **Output Test** page for a Flatpack S system (which uses the Smartpack S controller).

Output	Apply	State	Normal State
Alarm output1	Apply	State: Not Energized	Normally activated
Alarm output2	Apply	State: Energized	Normally activated
Alarm output3	Apply	State: Energized	Normally activated
Batt contactor	Apply	State: Connected	Latched contactor
Load contactor	Apply	State: Connected	Latched contactor
Alarm output4	Apply	State: Energized	Normally activated
Alarm output5	Apply	State: Energized	Normally activated
Alarm output6	Apply	State: Energized	Normally activated
Buzzer	Apply	State: Not Energized	Normally deactivated

Output Test duration: Sec

WARNING! Operation of alarm relays will cause false alarm conditions at the connected alarm monitoring equipment!

Figure 3.3 – Output Test Page (Smartpack S)

Virtual Inputs

The **Virtual Inputs** page provides a quick means of triggering the Virtual Inputs, which are used to manually activate an Alarm Group which, in turn, activates whichever output channel(s) the alarm group is assigned to.

To set up a Virtual Input:

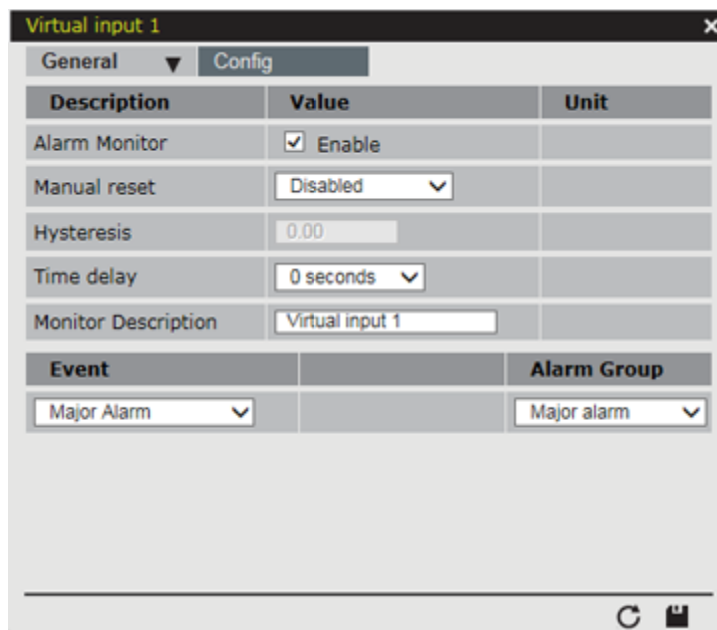
1. Go to the Virtual Input alarm monitor under the **Alarms Conf.** page:
Alarm Conf. > Power System > Inputs > [Controller] Input Configuration

SP2 Master 1 Input Configuration				
1		Virtual input 1	☒	
2		Virtual input 2	☒	
3		Virtual input 3	☒	
4		Virtual input 4	☐	

SP2 BasicInd 1 Input Configuration

Figure 3.4 – Virtual Inputs (Smartpack2 Master)

2. Click on the **Edit** icon (gears) next to the Virtual Input to configure.
3. Check the **Enable** box to enable the Virtual Input.
4. Assign the Virtual Input to an Alarm Group by selected one of the options in the **Alarm Group** drop-down list.
5. Click on the **Save** icon to save changes. The Virtual Input is now enabled and assigned to an Alarm Group.



The screenshot shows a software window titled "Virtual input 1" with a close button (X) in the top right corner. Below the title bar are two tabs: "General" (selected) and "Config". The main area contains a table with three columns: "Description", "Value", and "Unit".

Description	Value	Unit
Alarm Monitor	☒ Enable	
Manual reset	Disabled ▾	
Hysteresis	0.00	
Time delay	0 seconds ▾	
Monitor Description	Virtual input 1	

Below this table is another section with two columns: "Event" and "Alarm Group".

Event	Alarm Group
Major Alarm ▾	Major alarm ▾

At the bottom right of the window are two icons: a circular arrow (refresh) and a floppy disk (save).

Figure 3.5 – Virtual Input Edit Window

6. Click on the **Outputs** page.
7. Locate the Alarm Group that the Virtual Input is assigned to.

NOTE: If the power system contains more than one controller or monitor with output channels, check each device using the **Select Unit** drop-down list to see if the Alarm Group for the Virtual Input is already mapped (assigned) to another channel. Alarm Groups can be mapped to multiple output channels.

8. Map the Alarm Group to an **Output Channel** (for example, an alarm relay or a buzzer).

#	Alarm Group	Batt contactor	Load contactor 1	Load contactor 2	Alarm output1	Alarm output2	Alarm output3	Phone 1	Phone 2	Phone 3	Phone 4	Phone 5
1	Major alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	Rectifier alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	Hi Temp	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	audible alarm	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	Alarm Group 10	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11	Alarm Group 11	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	☐
12	Alarm Group 12	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13	Alarm Group 13	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Figure 3.6 – Map Alarm Groups to Output Channels

The Virtual Input is now set up.

The following graphic illustrates the assignments and mappings required to set up a Virtual Input:

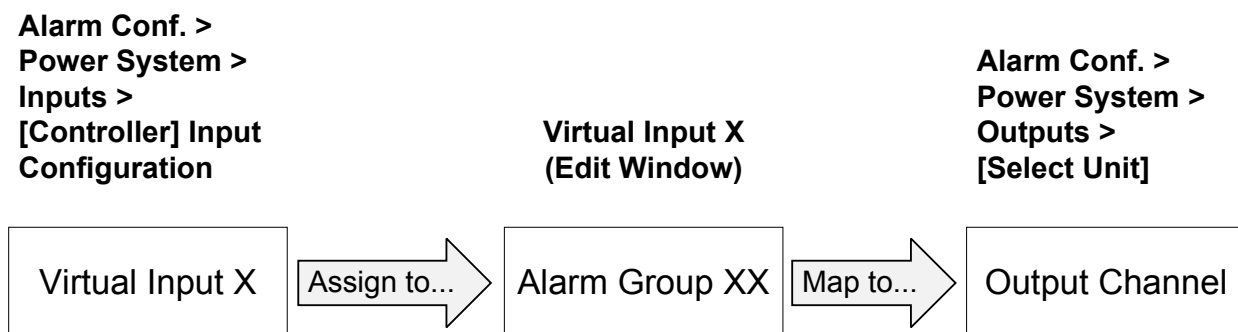


Figure 3.7 – Setup Path for Virtual Inputs

NOTE: Virtual Inputs also appear as output channels on the **Outputs** page. Mapping an Alarm Group to a Virtual Input on the **Outputs** page differs from the procedure described above in that the Alarm Group triggers the Virtual Input. While it is possible to create assignment loops (where a Virtual Input triggers an Alarm Group that is assigned to the same Virtual Input), the signals do *not* create an indefinite loop; the signal sent is either ON or OFF and does not change the state of

the Virtual Input if it is already in the state of the signal (i.e., a Virtual Input that is ON disregards another ON signal; and a Virtual Input that is OFF disregards another OFF signal).

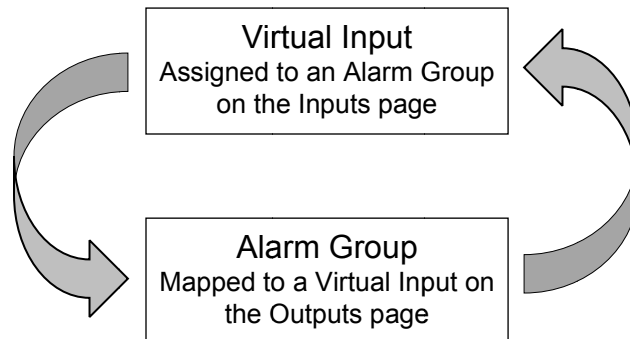


Figure 3.8 – Virtual Input and Alarm Group Assignments



CAUTION: Triggering a Virtual Input that is assigned to an Alarm Group can generate false alarm conditions for any monitors connected to the assigned output channel(s).

To activate a virtual input:

1. Click the **Activate** button to activate the Virtual Input. The button turns red and changes to **Deactivate**.
2. Confirm that the assigned output channel(s) for the Alarm Group is/are active.
3. Click the **Deactivate** button to deactivate the Virtual Input.

NOTE: Unlike the **Output Test** page, which automatically deactivates after the specified duration elapses, activating a Virtual Input on the **Virtual Inputs** page keeps it active until it is manually deactivated.

The following figure shows the Virtual Inputs page.

Commands			
System			
Battery			
Output Test			
Virtual Inputs ▶			

Virtual Inputs Commands			
Description	Activate/Deactivate	Event	Alarm Group
Virtual input 1	Deactivate	Major Alarm	Major alarm
Virtual input 2	Activate	Major Alarm	Major alarm
Virtual input 3	Activate	Major Alarm	Major alarm
Virtual input 4	Disabled	Major Alarm	Major alarm

Figure 3.9 – Virtual Inputs (with an Activated Channel)

EXAMPLE: As an example, consider how a Virtual Input can be used to turn a lamp on or off:

NOTE: Admin permissions are required.

1. Identify an available output relay on one of the power system's controllers or I/O Monitors.

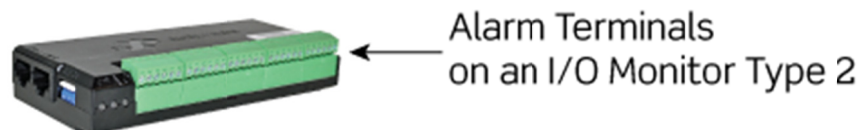


Figure 3.10 – I/O Monitor Type 2

2. Connect a lamp switch to the available output relay.
3. Test functionality by going to the **Commands > Output Test** page; select the device from the **Output Test** drop-down list. Click the **Apply** button next to an **Alarm Output** line. The lamp activates when the correct relay is activated.

Component	Apply	State	Normally
Alarm output1	Apply	Not Energized	activated
Alarm output2	Apply	Energized	activated
Alarm output3	Apply	Energized	activated
Batt contactor	Apply	Connected	contactor
Load contactor	Apply	Connected	contactor
Alarm output4	Apply	Energized	activated
Alarm output5	Apply	Energized	activated
Alarm output6	Apply	Energized	activated
Buzzer	Apply	Not Energized	deactivated

Output Test duration: 10 Sec

WARNING! Operation of alarm relays will cause false alarm conditions at the connected alarm monitoring equipment!

Figure 3.11 – Output Test Page

- Go to the **Alarm Conf. > Outputs** page and select the controller or I/O Monitor device from the **Select Unit** drop-down list.

#	Alarm Group	Alarm output 1	Alarm output 2	Alarm output 3	Alarm output 4	Alarm output 5	Alarm output 6
1	Major alarm	☐	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐	☐
7	Rectifier alarm	☐	☐	☐	☐	☐	☐
8	Very High Major	☐	☐	☐	☐	☐	☐
9	High Minor	☐	☐	☐	☒	☐	☐
10	Very Low Major	☐	☒	☐	☐	☐	☐
11	Low Minor	☐	☐	☐	☒	☐	☐
12	Alarm Group 12	☐	☐	☐	☐	☒	☒
13	Alarm Group 13	☐	☐	☐	☐	☐	☐
14	Alarm Group 14	☐	☐	☐	☐	☐	☐
15	Alarm Group 15	☐	☐	☒	☐	☐	☐
16	Alarm Group 16	☐	☐	☐	☐	☐	☐
17	Alarm Group 17	☐	☐	☐	☐	☐	☐

Figure 3.12 – Alarm Outputs Page for an I/O Monitor

- Locate the Alarm Output in the column headings and click on it (the **Alarm output** heading is a hyperlink). The **Output Config** window appears.

Figure 3.13 - Output Configuration Window for Alarm Output 1

6. Change the text in the **Description** field to something appropriate, like “Lamp”.
7. Make sure **Normally deactivated** is selected in the drop-down list to the right of the **Description** field.
8. Save changes by clicking on the **Save** icon in the lower right corner.
9. Identify an available Alarm Group in the **Alarm Group** column.
10. Change the Alarm Group name to something appropriate, like “Lamp Switch”.
11. Map the Alarm Group to the Alarm Output by placing a check mark in the cell where the Alarm Group and Alarm Output intersect.

Alarm Group 1 Mapped
to Alarm Output 1

Select Unit: I/O unit 2		Alarm output 1	Alarm output 2	Alarm output 3	Alarm output 4	Alarm output 5	Alarm output 6
1	Major alarm	☒	☐	☐	☐	☐	☐
2	Minor alarm	☐	☐	☐	☐	☐	☐
3	Mains alarm	☐	☐	☐	☐	☐	☐
4	Fuse alarm	☐	☐	☐	☐	☐	☐
5	Battery high	☐	☐	☐	☐	☐	☐
6	Battery low	☐	☐	☐	☐	☐	☐
7	Rectifier alarm	☒	☐	☐	☐	☐	☐
8	Hi Temp	☐	☒	☐	☐	☐	☐

Figure 3.14 - Example of Mapping an Alarm Group to an Output

12. Save changes by clicking on the **Save** icon in the lower right corner.
13. Go to the **Alarm Conf. > Inputs** page and click on the **[Controller] Input Configuration** heading.

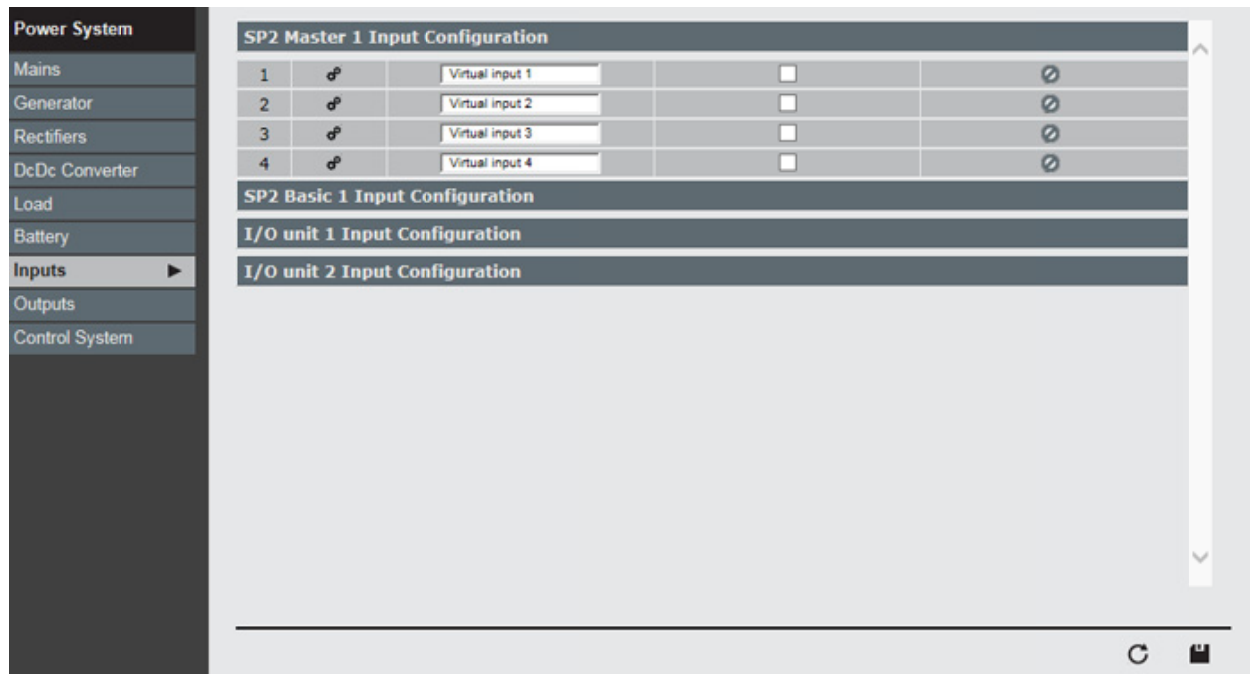


Figure 3.15 – Location of Virtual Inputs (Smartpack2 Master)

14. Identify an available Virtual Input and click on the **Edit** icon to open the **Edit Window**.

Description	Value	Unit
Alarm Monitor	☐ Enable	
Manual reset	Disabled	
Hysteresis	0.00	
Time delay	0 seconds	
Monitor Description	Virtual input 1	

Event	Alarm Group
Major Alarm	Major alarm

Figure 3.16 – Virtual Input Edit Window

15. Check the **Enable** box to enable the Virtual Input.
16. If desired, change the **Monitor Description** field to something appropriate, like “Lamp On/Off”.
17. Select **Event** from the **Event** drop-down list.
18. Select the Alarm Group (“Lamp Switch” from step 10 in this example) under the **Alarm Group** drop-down list.
19. Save changes by clicking on the **Save** icon in the lower right corner.
20. Test functionality on the **Commands > Virtual Inputs** page. Click the **Activate** button next to the Virtual Input selected.

Virtual Inputs Commands			
Description	Activate/Deactivate	Event	Alarm Group
Virtual input 1	Deactivate	Major Alarm	Major alarm
Virtual input 2	Activate	Major Alarm	Major alarm
Virtual input 3	Activate	Major Alarm	Major alarm
Virtual input 4	Disabled	Major Alarm	Major alarm

Figure 3.17 – Virtual Inputs Command Page with Input Activated

Setup of a Virtual Input as a lamp switch is complete.

Alarm Relay Test

The alarm relays can be tested the web interface by going to the **Output Test** page. See the section Output Test.



CAUTION: Testing alarm relays causes alarm conditions. Make sure monitoring equipment and personnel are aware of such testing and will not be adversely affected. It is not recommended to test alarm relays from an off-site location!



CAUTION: Some controller units have relays for low-voltage disconnect (LVD) contactors. Activating these contactors will open them and disconnect any batteries or loads connected!

Manual Battery Discharge Test

To manually execute a battery discharge test:

1. Double-check Battery Test settings (**System Conf. > Battery > Test**). Make sure test parameters are reasonable for the batteries and determine if the test will be Simplified or Normal.

NOTE: Under Normal Test, battery discharge results are evaluated only if the test is stopped by reaching End voltage. Results are discarded if a test is

terminated due to reaching Max duration or any other reasons (such as manually stopping the test).

2. If any changes are made, make sure to save them by clicking on the Save icon in the lower right corner.
3. Go to the **Commands > Battery** page.

Battery Commands	
Start Battery Test	Apply
Stop Battery Test	Apply
Start Battery Boost	Apply
Stop Battery Boost	Apply
Start Battery Equalize	Apply
Stop Battery Equalize	Apply

Figure 3.18 – Battery Commands Page

4. Locate the **Start Battery Test** line and click the **Apply** button to start the manual battery test.

NOTE: The battery test must run its course to the end in order to save results. Otherwise, they will be discarded.

NOTE: If a premature abort is required, click the **Apply** button for **Stop Battery Test**.

Downloading Logs

Logs collected by the controller include:

- **Event log** – Alarm and event history.
- **Data log** – A log of data values, including battery voltage, battery current, load current, total rectifier current, mains voltage, power, battery temperature, and battery remaining capacity. Data is collected at intervals specified in the **Data Log Setup** page of the web interface.

System Conf. > Power System > Data Log

- **Energy log** – A log of energy used for load, rectifier, solar charger, generator, and battery: displayed in watt-hours (total, hourly, daily, and weekly).
- **Generator log** – A log of generator run time and fuel consumption (total, daily, weekly, monthly).
- **Battery cycles** – The number of battery cycles (total, daily, weekly, monthly).
- **Battery tests** – A list of battery discharge tests.
- **Change log** – Parameter change log.
- **Accounts** – A list of logins and logouts, including IP addresses of failed logins.

Logs can be downloaded through the Web Interface.

NOTICE: Logs are stored in “CSV” files, which are delimited by tabs and semicolons. To view the data properly formatted in a spreadsheet program, files must be imported as delimited files, with “tabs” and “semicolons” specified as the delimiters.

Prior to creating and downloading logs, you may want to configure the energy log, in order to choose intervals for the information gathered. Or, you may want to verify the settings that will be applied to logs created and downloaded. To configure or verify datalog settings, see “Data Log” on page 139.

After the datalog has been configured, create and download a log.

To create a log:

1. In the Web Interface, choose **Logs > Save logs to file**.

The screenshot shows the 'Save logs to file' page in the Web Interface. On the left is a sidebar with the following menu items: Logs, Event log, Data log, Energy logs, Generator log, Battery cycles, Battery tests, Change log, Save logs to file (highlighted with a right arrow), and Accounts log. The main content area is titled 'Save logs to file' and includes a 'Select/Unselect all' checkbox. It contains a table of log types with checkboxes and settings:

Log Type	Checkbox	Number of log items	Choose control unit
Event log	☐	10000	
Data log	☐	10000	SP2 Master 1
Energy log	☐		
Battery cycle log	☐		
Battery test log	☐		
Change log	☐	5000	
Module inventory	☐		

At the bottom of the main area, there is a 'Generate log(s)' button, a 'Status: Standby' indicator, and a 'Download log' button.

Figure 3.19 – Save Logs Page in Web Interface

- On the **Save logs to file** page, check **Select/Unselect all** (in the upper right corner of the page). This single action adds a check beside all the logs on the left side of the page. If you do not need all the logs, leave checked only those logs desired; selecting fewer logs will reduce the processing time described in the next step.

Save logs to file			☒ Select/Unselect all
Event log	☒	Number of log items 10000	
Data log	☒	Number of log items 10000	Choose control unit SP2 Master 1
Energy log	☒		
Battery cycle log	☒		
Battery test log	☒		
Change log	☒	Number of log items 5000	
Module inventory	☒		

Status: Standby

Figure 3.20 – Choosing Logs to Download

- After selecting all logs, click the **Generate log(s)** button near the lower left corner of the page.

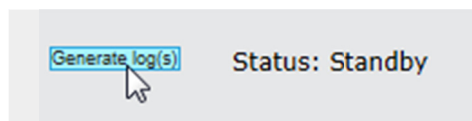


Figure 3.21 – Generate Logs Button

Wait for the process to conclude; the process can take several minutes. After the process is finished, an updated status message appears, indicating that the log generation is **Complete!**

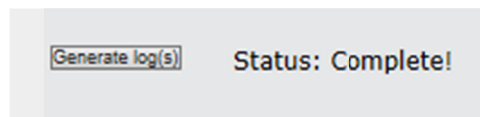


Figure 3.22 – Status: Complete! Message

At this point, the log is available for download.

4. To retrieve the log, click the **Download log** button in the lower right corner of the page.

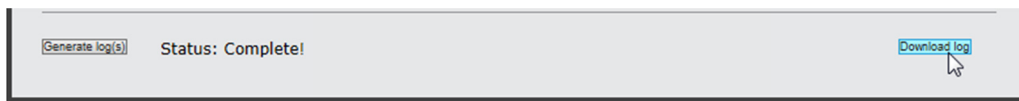


Figure 3.23 - Download Log Button

5. When prompted to open or save the file, choose **Save as**.

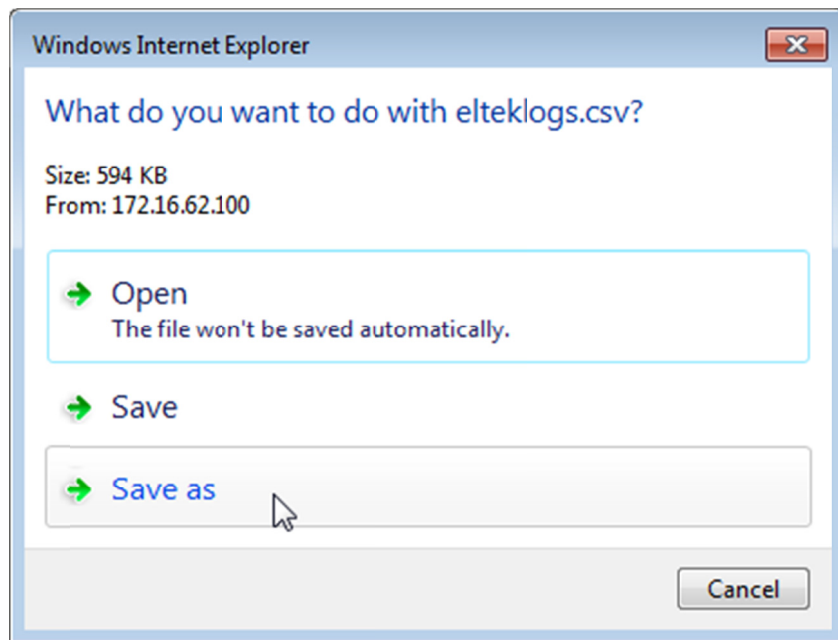


Figure 3.24 - Saving Log

6. In the next dialog, choose the location, filename, and format for the download. From the **Save as type** list, be sure to choose **Microsoft Excel Comma Separated Values File (*.csv)**.

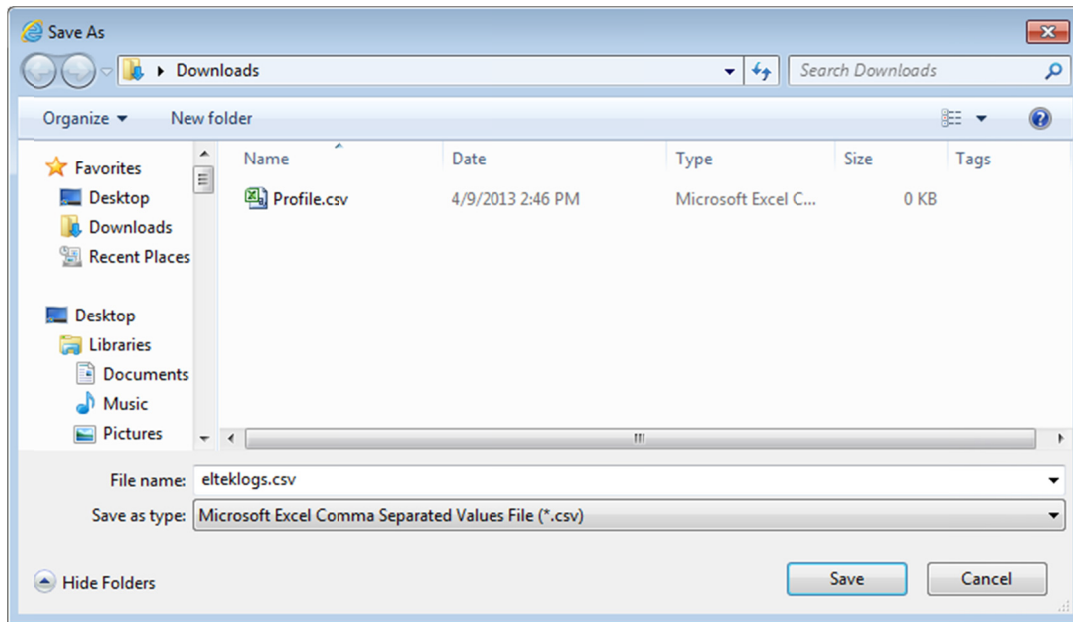


Figure 3.25 – Choosing Location, Filename, and Format

After the file has been saved, it can be imported into a spreadsheet program, such as Microsoft text import, for viewing and analysis.

Downloading Statistics

NOTE: This feature is currently available for Smartpack2 controllers only. This page may be blocked if the local network does not permit access to FTP servers.

The **Statistics** section contains configuration files, system statistics, and event and data logs, which can be downloaded to a computer. See Section 8 - Statistics (under Comprehensive Overview) for detailed descriptions. To download files from this section:

1. Click on the **Statistics** button in the top menu bar to navigate to the statistics window.
2. The default page under **Statistics** is called **Browse SD Card**, where the files are currently stored. As such, the top level may contain user documentation and controller software files (*.s19).
3. To download a file, simply right-click on the hyperlink, choose **Save as...** at the prompt, and navigate to the folder on the computer where the file is to be stored.

FTP root at 10.20.30.10			
04/05/2013	12:00AM	Directory	CONFIG
04/08/2013	12:00AM	Directory	STATS
06/12/2013	12:00AM	Directory	LOG
05/21/2012	12:00AM	4,313,052	PRODUC~1.PDF
05/21/2012	12:00AM	5,048,558	PRODUC~2.PDF
02/04/2013	12:00AM	955,426	QUICKS~1.PDF
03/11/2013	12:00AM	10,149,043	INSTAL~1.PDF
05/21/2012	12:00AM	460,273	DATASH~1.PDF
04/24/2013	12:00AM	517,064	405019~2.S19
12/17/2013	12:00AM	656,960	SP2BASIN.S19

Figure 3.26 – Statistics Window (Smartpack2 Only)

Downloading and Uploading Configuration Files

Configuration files—which store parameter settings for the controller(s) and any connected CAN Nodes—can be saved from and loaded to each device. This is useful when custom configurations are to be loaded on several power systems, or when a custom configuration is either lost or corrupted. These operations are performed through the **Load/Save Config** page of the **Commands** section.

Commands > Commands > Load/Save Config

NOTE: Loading and saving controller configuration files requires administrator permissions (**admin** login).

Configuration files are generated by the controller itself, so the following procedures start with downloading (**Save Config**) the configuration files.

Download Configuration Files

To download configuration files:

1. Navigate to the **Save Config File** page:

Commands > Commands > Load/Save Config > Save Config File

2. The page lists all connected controller and CAN Node devices. By default, all check boxes by each device is selected. Select the devices from which configuration files are to be saved.

- With the desired units selected, click the **Next** button.

Save Intel HEX configuration file(s) from the power plant

Reading configuration from the following units ☒ Select/Unselect all

#	Type	Part#	Ver#	SW part#	SW Ver#	Status
☒ 1	SP2 BasicInd 1	242100.601	1.6	405019.009	2.2	✓
☒ 2	SP2 BasicInd 2	242100.601	1.6	405019.009	2.2	✓
☒ 3	SP2 Master 1	242100.500	2.1	405006.009	2.2c_1401192	✓
☒ 4	BatteryMon 1	242100.300	2	402086.009	1.03	✓
☒ 5	BatteryMon 2	242100.300	2	402086.009	1.03	✓
☒ 6	CurrMonitor 1	242100.301	1.2	402087.009	02.00	✓
☒ 7	Fleximonitor 1	yyyyyyyyyyyy	yyyyyy	4050xx.009	1.0a	✓
☒ 8	I/O unit 1	242100.502	1.4	402088.009	4.1.0	✓
☒ 9	I/O unit 2	242100.502	1.4	402088.009	4.1.0	✓
☒ 10	I/O unit 3	242100.306	1.1	402088.009	4.1.0	✓

Figure 3.27 – Save Config File Page

- On the next page, the controller units to be read from are listed in the **Reading data from control units** box (left). Click the button **Start reading files** to begin downloading the configuration files.

NOTE: The **Back** button can be selected at any time to return to the **Save Config File** page. However, if the **Start reading files** button has been selected, the download continues uninterrupted.

Save Intel HEX configuration file(s) from the power plant

Reading data from control units:

SP2 BasicInd 1,
 SP2 BasicInd 2,
 SP2 Master 1,
 BatteryMon 1,
 BatteryMon 2,
 CurrMonitor 1,
 Fleximonitor 1,
 I/O unit 1,
 I/O unit 2,
 I/O unit 3

Process Status:

Figure 3.28 – Read Page for Save Config File

5. A notice appears indicating that the selected file will be read. Click **OK** to continue.

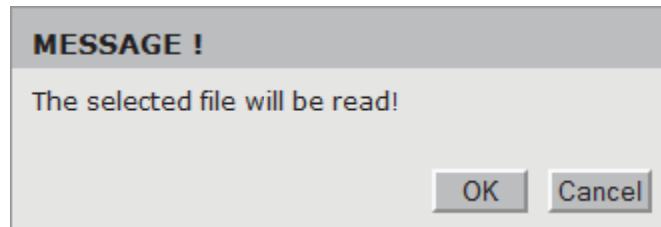


Figure 3.29 – Notice Message

6. A progress message appears in the **Process Status** box on the right, and a progress bar appears at the bottom of the page (**Generating file**). The **Start reading files** changes to **Stop reading files**, which can be clicked to abort the process.

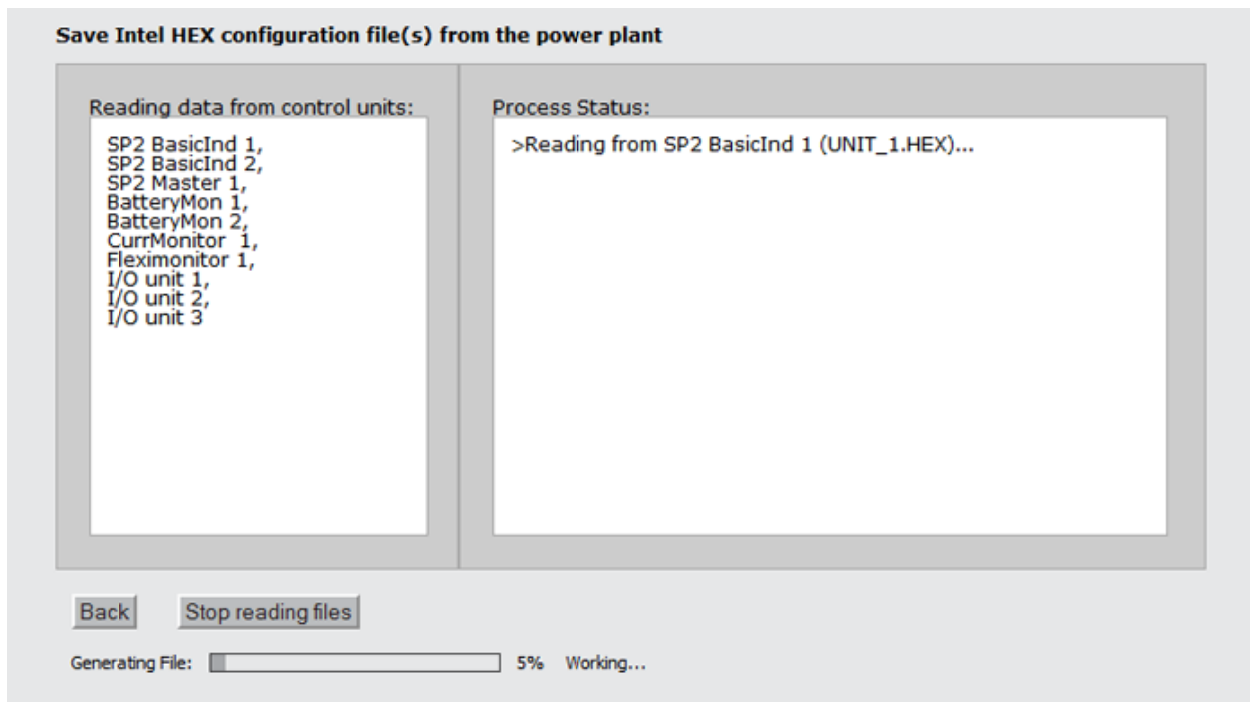


Figure 3.30 – Save in Progress

7. When the configuration file for one unit is ready for download, a dialog box appears asking where the file should be saved. Choose a location on the computer where the file is to be saved.

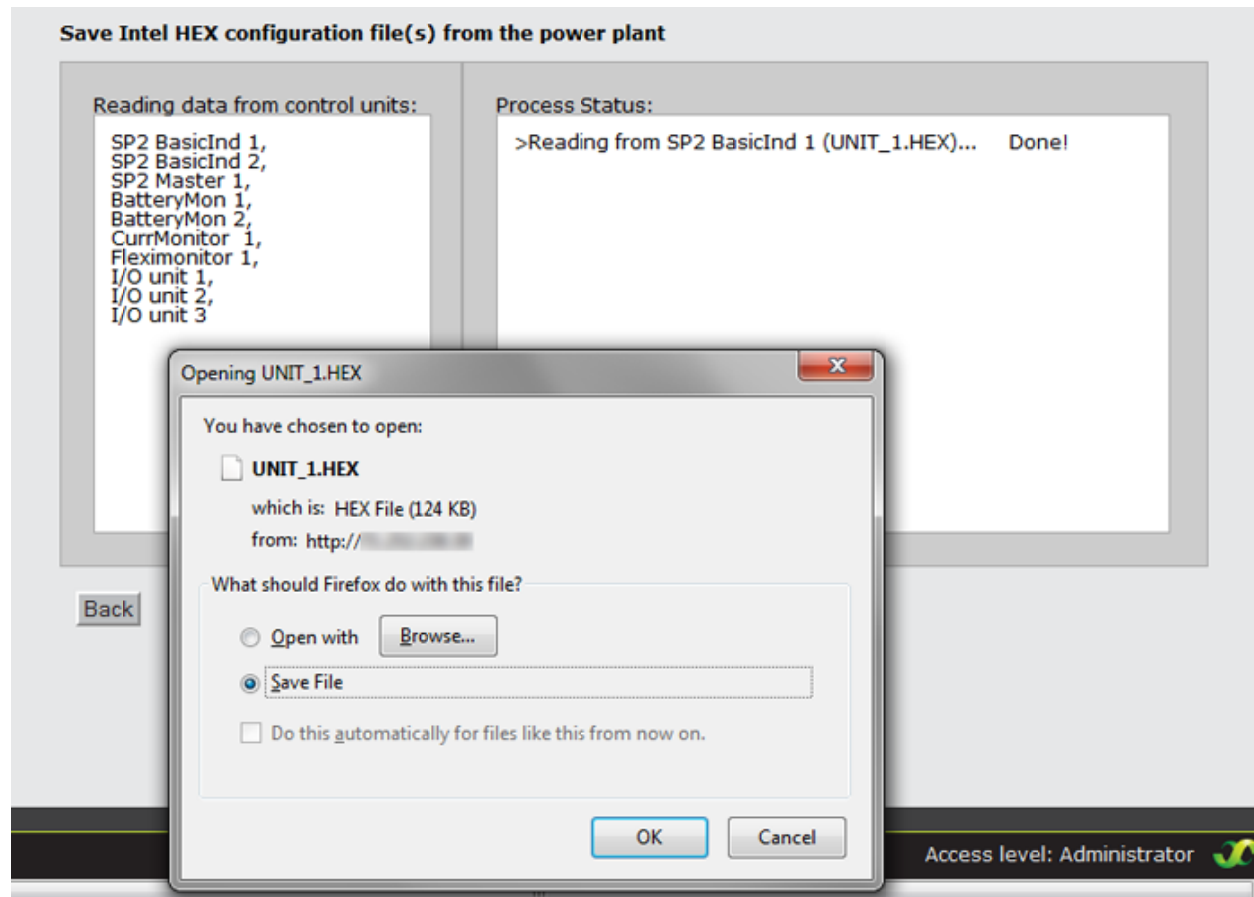


Figure 3.31 – Save File Prompt

8. If multiple files were selected, the buttons **Read next file** and **Cancel** appear. Click the **Read next file** button to read the configuration file for the next controller device. The **Cancel** button can be clicked to cancel the download of the rest of the files.

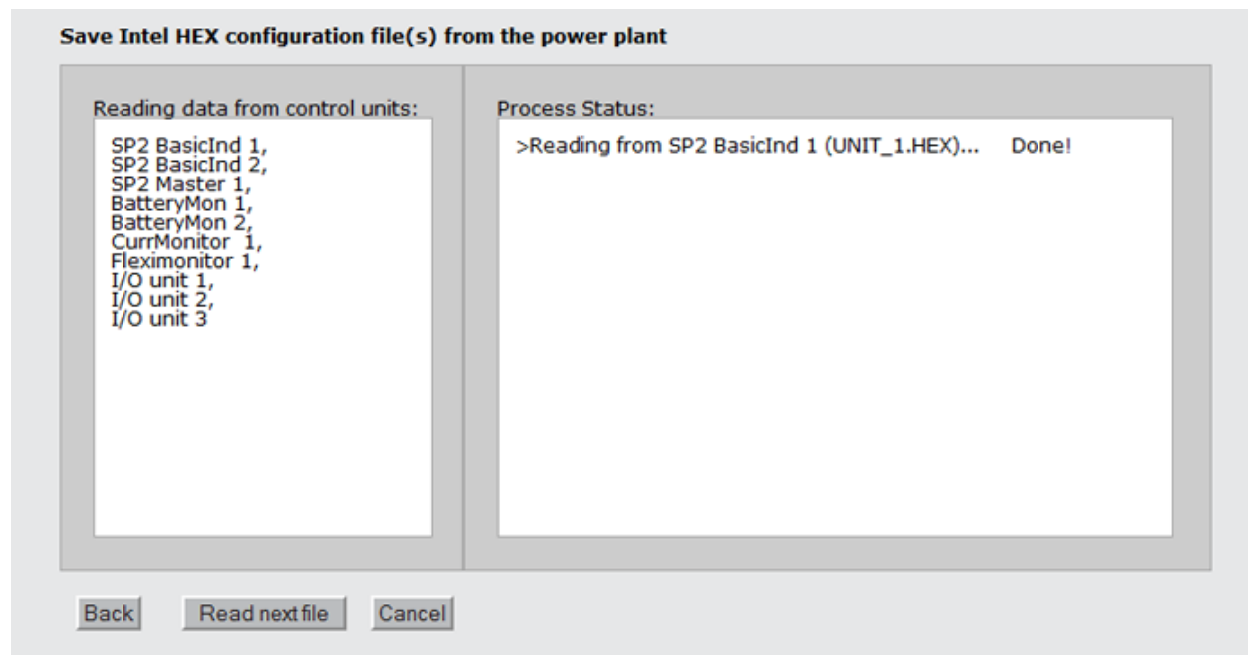


Figure 3.32 – File Save Completed (first device only)

Upload Configuration Files

NOTE: Configuration files for the controllers and/or CAN Nodes must be on the computer being used to access the Web Interface. Make sure that the file names have not been altered, as any alteration will prevent the controller from recognizing the file as valid.

To upload configuration files:

1. Navigate to the **Load Config File** page:

Commands > Commands > Load/Save Config > Load Config File

2. The page that appears lists all controller and CAN Node devices connected to the power system. Click the **Browse...** button at the top of the page to locate the configuration file to load.

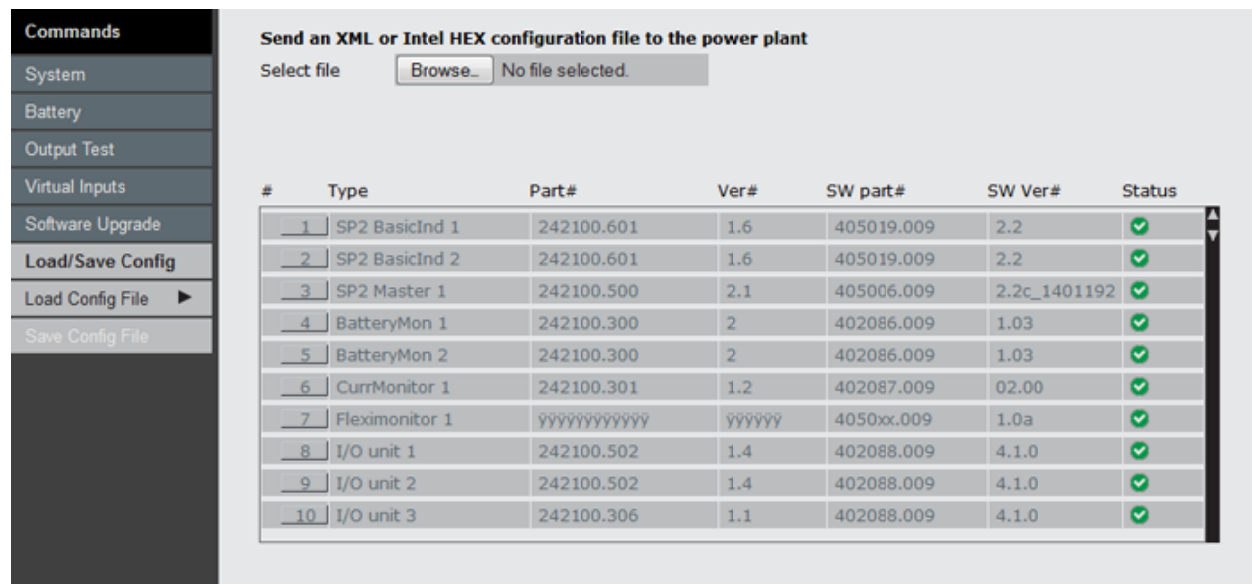


Figure 3.33 - Load Config File Page

- After selecting the configuration file to upload, the Web Interface determines which device the configuration file is for.

If the file is correct, then an **Upload Config file** button appears in the lower right corner.

If the file is not correct, then an error message appears below the list of devices. The file name must be corrected in order to continue. Please contact Eltek for specifications.

- Click the **Upload Config file** button to load the file into the applicable device(s). A progress bar then appears to the left of the button.
- Once the progress bar indicates the upload is complete, the procedure is finished.

Configuration file save and load is complete.

4. Administration

This section describes common administrative tasks that can be accomplished through the Web Interface.

Administering User Accounts

User accounts are administered from the **User Accounts** page:

System Conf. > Device Settings > User Accounts

NOTE: Admin login is required to make any changes to **User Account** settings, except for the current user's password.

To change or add user accounts, navigate to the **User Accounts** page and click the **Edit Accounts** button.

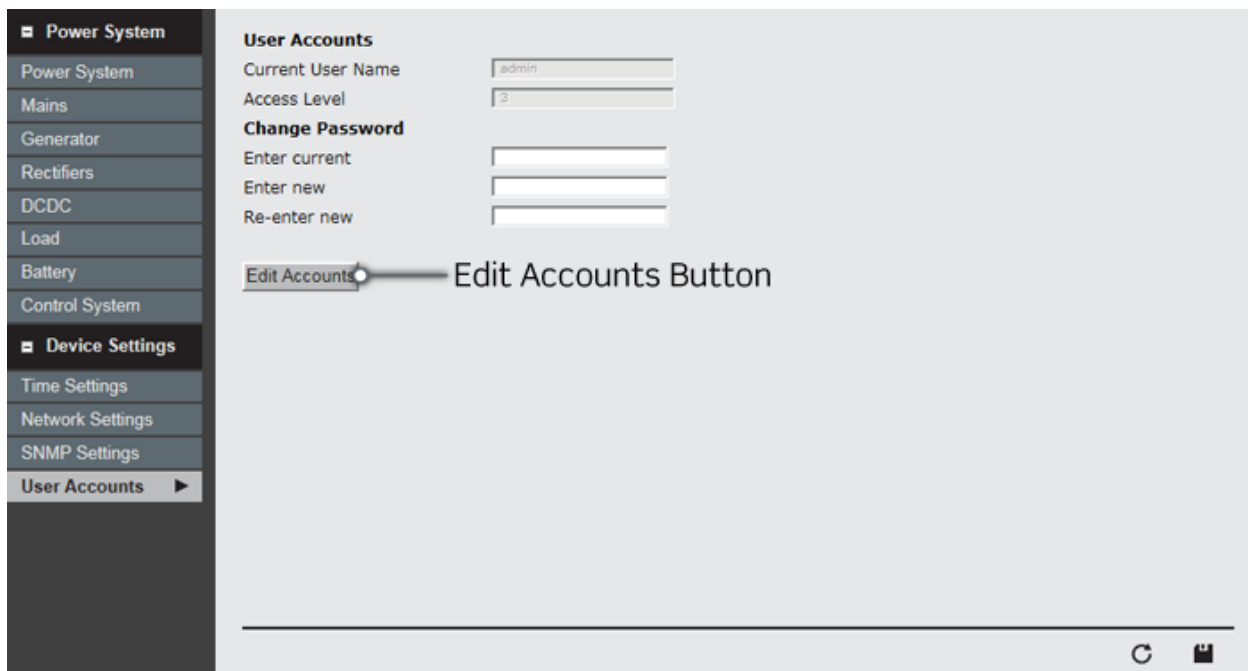


Figure 4.1 – Edit Accounts Button

On the **Edit** page are two sections: **Global Account Settings** and **User Account Administration**.

- **Global Account Settings** – this section is for specifying password requirements. See User Accounts beginning on page 161 for descriptions of each setting.

- **User Account Administration** – this section is for creating, editing, and deleting user accounts. See User Accounts beginning on page 161 for descriptions of each column.
 - To create a new user account, find the first available user account row and click the **Enable** button (at the end of the row).
 - To edit an existing user account, simply click in the field(s) to be modified.
 - To delete an existing user account, click the **Delete** button at the end of the row.

Password Settings

Global Account Settings

Password is required	☒	Password minimum length	5
Username and Password must be different	☒	Retries before suspension	3
Password must be different from the 5 previous	☒	User suspension time[Min]	10

User Account Administration

#	User Name	Password	Access level	Max users	Idle Timeout [min]	Max Lifetime [days]	
1	admin		3	1	5	0	Delete
2	control		2	2	5	0	Delete
3	status		1	3	5	0	Delete
4			0	1	5	0	Enable
5			0	1	5	0	Enable
6			0	1	5	0	Enable

Back Show Active Sessions

Delete Buttons (existing accounts)
Enable Buttons (new accounts)

Figure 4.2 – Edit User Accounts Page

When finished, click the **Save** icon in the lower right corner to save changes.

Change Controller Name

The name of the controller is changed under **Network Settings**:

System Conf. > Device Settings > Network Settings > TCP/IP

NOTE: Changing the name of the controller on this page affects how it appears on any network it is connected to and the Eltek Network Utility program.

The field to change the controller name is called **Device Name**. To change the controller name:

1. Click in the **Device Name** field.
2. If undesired text exists, delete the existing text.
3. Type in the desired name for the controller.
4. Click the **Save** icon in the lower right corner to save changes.

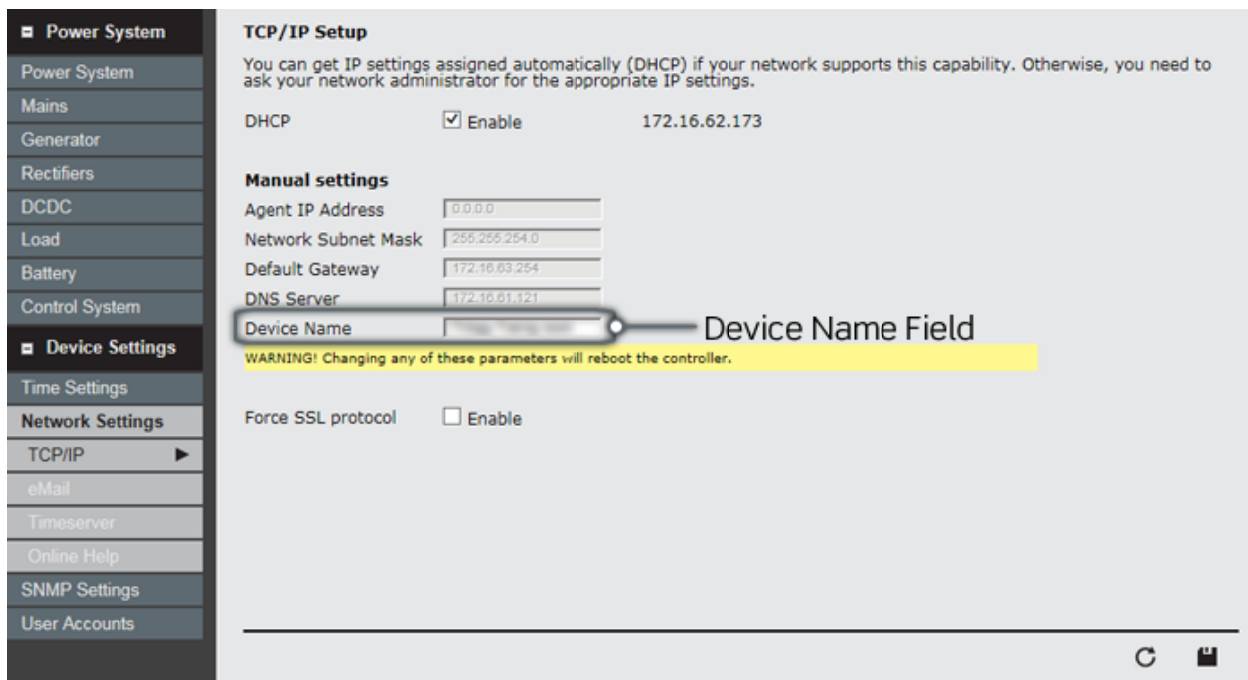


Figure 4.3 – Device Name Field

Find and Change the IP Address

Finding the IP address of an Eltek controller can be done in a number of ways. If the controller is connected to a computer or computer network, then simply navigate to the TCP/IP page to see the current IP address:

System Conf. > Device Settings > Network Settings > TCP/IP

Of course, if a network connection is *not* established with the controller, then the Web Interface is not useful for this procedure. This section explains how the IP address can be found using other methods.

Find the IP Address

By default, all Eltek controllers are shipped with a static IP address of **192.168.10.20**.

It is common for the IP address to be changed after the controller is connected to a computer network. It is either configured with a new static IP address (manually reconfigured) or set to DHCP in order to obtain a dynamic IP address from the network. If a connection through the Web Interface has not been established, then there are two principle ways that the controller's IP address can be found:

- Through the display (if available; the Eltek Compack controller does not have a display)
- Through the Eltek Network Utility (ENU), which must first be installed on to a computer that is connected to the controller (either directly or through a LAN)

Through the Display

NOTE: Since the Compack controller does not have a display, this method cannot be used to find the IP address of a Compack controller. Use the Eltek Network Utility method instead.

To find the IP address of a *Smartpack2* or *Smartpack S* controller:

1. Unlock the screen by pressing the UP key, the DOWN key, and then the ENTER key.
2. Use the keys to navigate to the following screen:
System Config > Power System > General System Config
3. Use the DOWN key to find **Agent IP Address**

NOTE: Each octet of the IPv4 address is on a separate line, so the IP address appears as three-digit groups over four lines.

In the figure below, the IP address is **172.016.062.180**.

Descr.	Val.
Agent IP Address	172
	016
	062
	180
Network Subnet Mask	255
	255
	000
	000
Default GateWay	000
GENERAL SYST. CONFIG.  	

Figure 4.4 – IPv4 Address on Display (each octet is on its own line)

Through the Eltek Network Utility

NOTE: This procedure requires the use of a computer with the Eltek Network Utility (ENU) installed.

1. Launch the Eltek Network Utility (ENU) on the computer.

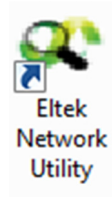


Figure 4.5 - Eltek Network Utility Icon

2. After the ENU program opens, click on the search button (magnifying glass icon) in the upper left corner to find the controller. Wait for the window to populate.

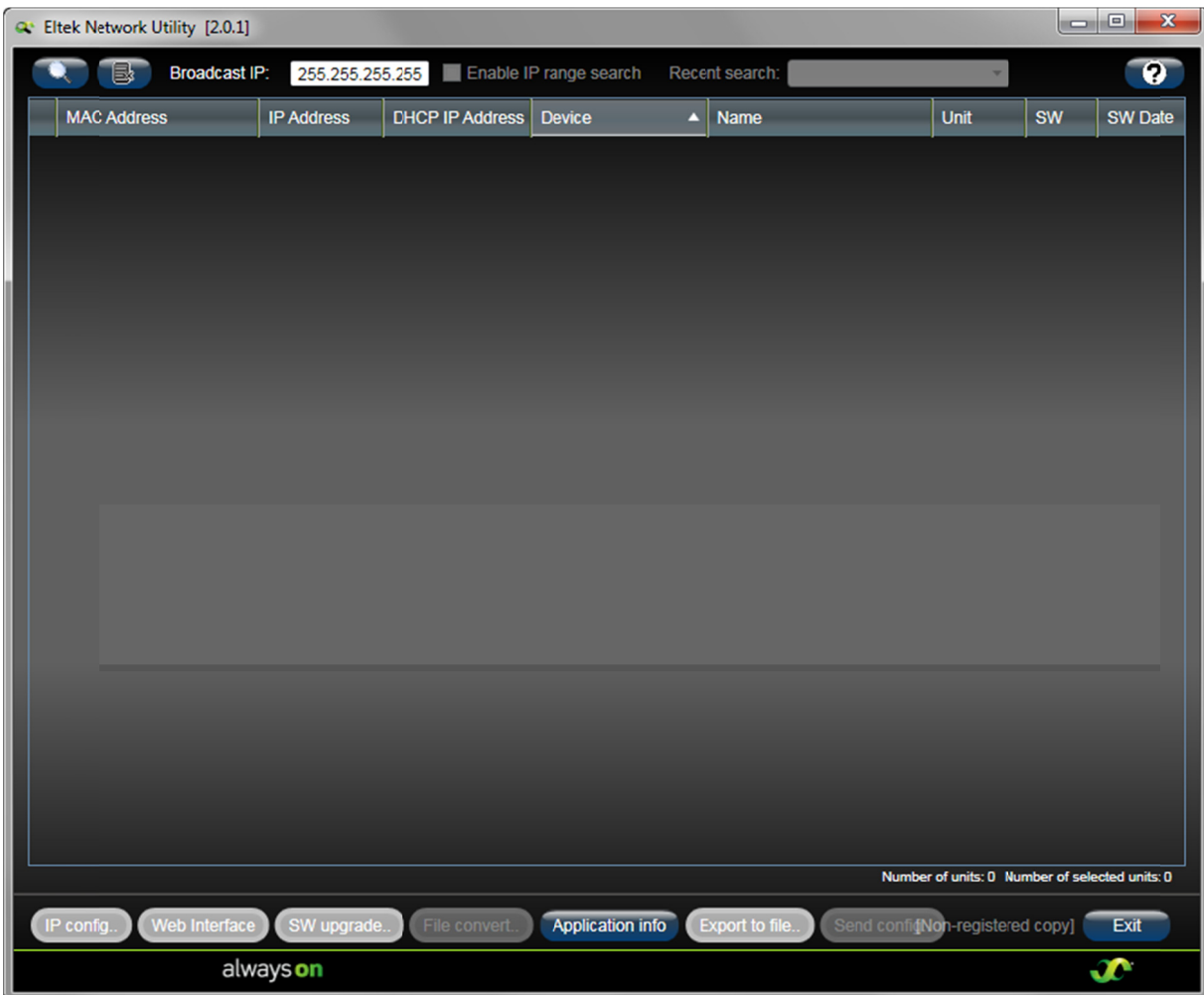


Figure 4.6 - Eltek Network Utility Window

3. Once the controller appears, the IP Address is shown under the **IP Address** column.

Change the IP Address

The IP address of the controller can be changed through the Web Interface on the TCP/IP page:

System Conf. > Device Settings > Network Settings > TCP/IP

By default, Eltek controllers are configured with a static IP address. This can be changed to either another static address or to a dynamic address (DHCP) determined by the network.

NOTE: If the controller is to be connected to a computer network, requirements for proper addressing must be provided by the local systems/network administrator(s) (IT group).

Dynamic (DHCP)

To enable dynamic addressing, simply check the **Enable** box to the right of **DHCP**. The controller will then obtain its new IP address from the network.

The screenshot displays the 'TCP/IP Setup' configuration page. At the top, a message states: 'You can get IP settings assigned automatically (DHCP) if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.' Below this, the 'DHCP' section has a radio button labeled 'Enable' which is selected, and a text field showing the IP address '172.16.62.173'. A line points from the text 'Dynamic Configuration' to this IP address field. Underneath, the 'Manual settings' section contains several input fields: 'Agent IP Address' (0.0.0.0), 'Network Subnet Mask' (255.255.254.0), 'Default Gateway' (172.16.63.254), 'DNS Server' (172.16.61.121), and 'Device Name'. A yellow warning banner below these fields reads: 'WARNING! Changing any of these parameters will reboot the controller.' At the bottom of the form, there is a 'Force SSL protocol' checkbox which is currently unchecked and labeled 'Enable'. The bottom right corner of the interface features a circular refresh icon and a square save icon.

Figure 4.7 - DHCP Configuration

Static (Manual)

To enter a static IP address:

1. Make sure that the **Enable** box next to **DHCP** is *not* checked; otherwise, the fields for the **Manual settings** section cannot be edited.
2. With the fields under **Manual settings** editable, enter the network settings for the controller: **Agent IP Address**, **Network Subnet Mask**, **Default Gateway**, and **DNS Server**. See Network Settings beginning on page 141 for definitions of these fields

NOTE: Not all fields are required for network setup, so consult with the local systems or network administrator(s) for the required information.

3. Once all **Manual settings** fields are configured as needed, click the **Save** icon in the lower right corner to save the changes.

The screenshot displays the 'TCP/IP Setup' configuration interface. At the top, a message states: 'You can get IP settings assigned automatically (DHCP) if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.' Below this, the 'DHCP' section shows an 'Enable' checkbox that is unchecked, with the IP address '10.20.30.10' displayed next to it. The 'Manual settings' section is highlighted with a blue border and contains the following fields: 'Agent IP Address' (10.20.30.10), 'Network Subnet Mask' (255.255.255.0), 'Default Gateway' (0.0.0.0), 'DNS Server' (0.0.0.0), and 'Device Name' (empty). A line points from the text 'Static Configuration' to the 'Manual settings' section. Below the fields, a yellow warning bar reads: 'WARNING! Changing any of these parameters will reboot the controller.' At the bottom, the 'Force SSL protocol' section shows an 'Enable' checkbox that is unchecked. The bottom right corner features a refresh icon and a save icon.

Figure 4.8 – Static IP Configuration

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Glossary

AC Mains Monitor – Eltek CAN Node designed for monitoring ac input (mains), monitoring ac voltage, current, and frequency.

Alarm – a software-generated notice from the system controller that an alarm monitor has detected a measurement or signal that triggered a reportable event.

Alarm Group or Alarm Output Group (AOG) – a software assignment for grouping alarms together and mapping to alarm output channels of the controller or CAN Nodes. Alarm groups are user-definable, and mapping them to the controller's output relays is also customizable. Currently, there are 24 alarm groups available: 18 for relays, and 6 for low-voltage disconnect (LVD) contactors.

Alarm Monitor – a software module that measures input or output signals or logical states and compares the measurement with programmed values or limits, raising an alarm if the programmed threshold is met or exceeded.

Ampacity – the current-carrying capacity or current rating of a power conductor; the term is a portmanteau of the terms ampere and capacity.

Battery Bank – a set of battery strings connected in parallel, with each string consisting of enough batteries to support the full voltage of the power system (e.g., 24V or 48V strings). A power system can be supported by multiple battery banks.

Battery Block – a manufactured battery unit consisting of two or more battery cells and connected in series with other battery blocks to build a battery string. For example, typical telecommunications equipment requires either 24V or 48V batteries; in 24V systems, two 12V blocks are connected to produce the 24V capacity string required; in 48V systems, four 12V blocks are connected to produce the capacity string required.

Battery Boost (Fast or Quick Charge) – battery boost charging is used to accelerate battery recharging by elevating charge voltage. In Eltek controllers, this function is very similar to Battery Equalize charging.

Battery Equalize – battery equalize charging is used to rebalance individual battery cells, since they tend to become slightly unbalanced over time. Equalize charging applies an elevated charge voltage for a few hours in an attempt to rebalance the battery cells. This is used mainly for large lead-acid batteries. In Eltek controllers, this function is very similar to Battery Boost charging.

Battery Monitor – Eltek CAN Node that monitors battery current, temperature, and fuse (or circuit breaker).

Battery Quality – a value representing the percentage of a battery's original capacity that remains for charging.

Battery String – a series of battery blocks that are connected to provide the required dc voltage for a power system. Two or more battery strings connected in parallel comprise a battery bank.

Battery Symmetry – a category of battery voltage monitoring designed to detect battery cells that are failing to hold charge. Symmetry monitoring looks for deviations between the voltage measurements between or within battery strings.

Battery Test – controller mode that records battery performance data during discharge.

CAN Node – an Eltek control unit designed to communicate controller and monitoring information over a proprietary controller area network (CAN) bus. Eltek CAN Nodes include controllers, but

usually refer to the auxiliary monitoring devices (like the Battery Monitor, Load Monitor, and I/O Monitor Types 1-3) that provide additional monitoring and output signal functionality.

Charger – generic term for a power module or system that charges batteries. As such, the term can be applied to rectifiers, converters, and even entire power systems. As used by Eltek, the term is limited to power modules designed for converting energy from solar, wind, or fuel cell sources. See RECTIFIER and CONVERTER for specific uses of these terms.

Compack – a small form-factor Eltek controller designed for use with the Micropack family of power modules. Configuration can only be done through a computer interface (e.g., PowerSuite or the Web Interface). It provides three configurable inputs and three output relays.

Converter – generic term for a power module that converts electric current from one form to another. Though often applied to ac-to-dc power conversion, this term is specifically applied to dc-to-dc power modules, which transform dc voltage from one level to another (e.g., 48 Vdc to 24 Vdc).

Critical premises (Contactor operation) – alarm conditions that must be met for the system to report a critical condition, which indicates that there is low ac current (mains) and/or low battery current. The choice affects when the low-voltage disconnect (LVD) contactors may be disconnected; by design, LVDs disconnect in critical condition and reconnect in normal condition.

Current Monitor – one of the nomenclatures give to Eltek Load Monitors. See Load Monitor.

Depth of Discharge (DOD) – the inverse of SOC (State of Charge), depth of discharge determines how much battery charge has been used during a battery discharge. Eltek controllers report DOD in amp-hours (Ah).

DHCP (Dynamic Host Configuration Protocol) – a network application protocol where devices added to the network obtain configuration information from the network host. Eltek controllers can have DHCP enabled in order to be configured by the computer network. By default, Eltek controllers are pre-configured with a static IP address.

Discontinuance Test – The discontinuance test detects battery string imbalances (caused by such problems as open circuits and short-circuits) faster than battery symmetry measurements. It monitors individual battery string currents (which means that each battery string must have its own shunt) and raises an alarm if any of the currents deviates from the average current for all strings by more than the percentage specified under the DeltaStringCurr alarm parameter (Alarm Conf. > Battery > Battery Alarm Configuration).

Earth Fault Detection – The Earth Fault Detection functionality built-in the Smartpack2 Basic controllers can be used to raise an earth fault alarm, when the impedance ground-to-positive supply conductor is not the same as the impedance ground-to-negative supply conductor. This situation will occur when there is current leakage from the supply conductor (from + or – or both) to ground.

ENU (Eltek Network Utility) – Eltek computer application for locating Eltek controllers on a local network and changing some of their network parameters, upgrading software, and launching the Web Interface. ENU is designed for the Microsoft Windows environment only.

Event – the internal controller action triggered by an alarm monitor when programmed thresholds are exceeded by the monitored signal or logical state device. Events are associated with alarms.

Flexi Monitor – Eltek CAN Node designed for a variety of input monitoring; it is very similar in function to the Load Monitor, but can also be used for monitoring batteries and fans. In addition, its inputs can monitor both current and fuses (or circuit breakers), and each input can be assigned to a type that is different from the others.

Float Voltage – battery charge voltage that compensates for battery self-discharge; this is the power system voltage under normal conditions. It is also called Reference Voltage in the web interface, typically in the context of volts per battery cell.

Genset/Gen-set (Generating set) – backup power supply system, which can be activated, deactivated, and/or monitored by Eltek controllers. Up to two generators and fuel tanks can be monitored.

Hysteresis – lag or delay. In the Web Interface, Hysteresis is a parameter in alarm monitors for entering a tolerance value on either side of the alarm threshold values. This tolerance value prevents rapid ON/OFF switching of the alarm if the measured value is changing rapidly.

I/O Monitor – Eltek CAN Node device that provides auxiliary alarm inputs and output relays. Types 1 and 3 also support inputs and signaling features for outdoor cabinet applications.

I/O Unit – generic term in the Web Interface for Eltek I/O Monitors. See I/O Monitor.

IP Address – Internet Protocol address; the network address of a computer device (such as an Eltek controller).

LAN (Local Area Network) – computer network within a defined area, such as a building or office. Eltek controllers are designed for integration with computer networks through built-in Ethernet ports and TCP/IP parameters.

Load Group – a load group refers to the loads monitored by a single controller unit. All controllers except for the Smartpack2 Master have a load group.

Load Monitor – an Eltek CAN Node that monitors load current. It can be set to a variety of current monitor types, including load, dc-to-dc converters, and alternative energy sources.

LVBD (Low-Voltage Battery Disconnect) – contactor that disconnects batteries from the power system when the specified voltage limit is reached.

LVD (Low-Voltage Disconnect) – contactor that opens and closes a circuit (usually a set of loads or battery banks) based on voltage parameters.

LVLD (Low-Voltage Load Disconnect) – contactor that disconnects loads from the power system when the specified voltage limit is reached.

Mains – the ac power supplied by a utility grid. Eltek's Web Interface uses "mains" because it is a more common term globally.

Mains Group – a mains group is a set of ac inputs for a rectifier group that is monitored by a Smartpack2 Basic Industrial controller; rectifiers must be connected to the Smartpack2 Basic Industrial controller in order for this group to appear.

Normal Test – The **Normal Test** relies on the battery table for reference, using the battery specifications to determine end voltage. The only editable parameter that affects termination of the test is "Max duration". Under **Normal Test**, battery discharge results are evaluated only if the test is stopped by reaching **End voltage**. Results are discarded if a test is terminated due to reaching **Max duration** or any other reasons (such as manually stopping the test).

NTP (Network Time Protocol) – network application protocol for synchronizing computer clocks. Eltek controllers support reception of current time information from an NTP server under the Timeserver page (System Conf. > Device Settings > Network Settings > Timeserver).

OVS (Over-Voltage Shutdown) – protection feature that shuts down rectifiers which exceed high voltage thresholds.

Power Module – generic term for the power-converting units of power systems, including rectifiers and converters. Ac-to-dc rectifiers, dc-to-dc-converters, and solar, wind, and fuel cell chargers are power modules.

PowerSuite – an Eltek software application that provides advanced configuration and monitoring capabilities for computers connected to Eltek controllers. PowerSuite is designed for the Microsoft Windows environment only. The Web Interface is being expanded to offer all of the same capabilities as PowerSuite, since the Web Interface has the distinct advantage of not requiring software installation on the computer accessing the controller.

Rectifier – a power module that converts ac power to dc power. See Converter for comparison.

Rectifier Group – a rectifier group is a set of rectifiers monitored by a single Smartpack2 Basic Industrial controller.

Reference Voltage – voltage per battery cell required to compensate for self-discharge. It is also called Float Voltage.

Simplified Test – The Simplified test does not use the battery table for reference; instead, it relies on user-entered values to determine whether the batteries are able to discharge for the entire duration specified (Max duration) or meet the amp-hour value (Max discharge) before falling to the voltage per cell specified in the "End voltage" field. All three parameters are user-defined, but must be within the specifications provided by the battery manufacturer. The test stops when any one of the parameters mentioned above (Max duration, Max discharge, or End voltage) is reached.

SMTP (Simple Mail Transfer Protocol) – communication protocol for transmitting email messages across a network. Eltek controllers support email communication for reporting purposes.

SNMP (Simple Network Management Protocol) – protocol for managing devices on a computer network. The Eltek controller supports integration onto a network managed by SNMP. Eltek provides MIB (Management Information Base) files for this integration. Currently, Eltek controllers support SNMP v1, v2c, and v3.

SP2 (Smartpack2) – an Eltek controller family designed for use with the Flatpack2 and Powerpack power modules. Most configurations consist of a Smartpack2 Master, Smartpack2 Basic (or Basic Industrial), and I/O Monitor Type 2 unit to comprise the controller system. Additional controllers and CAN Nodes can be added to increase functionality, especially for large-scale power systems.

SP2 Basic (Smartpack2 Basic) – an Eltek controller unit primarily responsible for monitoring rectifiers and reporting data to the Smartpack2 Master controller.

SP2 BasicInd (Smartpack2 Basic Industrial) – an Eltek controller unit designed for more extensive applications than the Smartpack2 Basic unit, including multi-bay power systems, polarity isolation, and Modem Callback.

SP2 Master (Smartpack2 Master) – the central unit of the Smartpack2 controller system, containing both an interactive display and Ethernet port for the Web Interface. It features an SD card that can be used to save and load statistics and software. The Master unit requires other Smartpack2 units in order to form a complete controller system.

SPS (Smartpack S) – an Eltek controller designed for use with the Flatpack S family of power modules. It contains both an interactive display and Web Interface. It provides six configurable inputs and six output relays.

SSL (Secure Sockets Layer) – a cryptographic communication protocol available as a connection option for the Eltek Controller Web Interface.

State of Charge (SOC) – the percentage of battery capacity remaining during a battery discharge. Depth of discharge (DOD) is its inverse.

State of Health (SOH) – calculation of a battery's ability to deliver on its performance ratings based on its quality (percentage of original capacity that remains for charging) and total maximum capacity.

Temperature Compensation – controller feature that adjusts battery charging based on thermal conditions.

Virtual Alarm – a manually-activated toggle for alarm events and alarm groups. A virtual alarm can be used to manually activate and deactivate output channels, depending on how the assigned alarm group is mapped. A virtual alarm may also be treated as an output channel, permitting an alarm group to toggle the virtual alarm.

WAN (Wide Area Network) – a computer network that connects computers across a large area, usually interconnecting numerous office locations and their local area networks (LANs).

Web Interface – the web browser-based user interface provided with Eltek controllers that facilitates power system monitoring and configuration through a computer without requiring installation of Eltek software.

Acronyms

A – ampere (amp)

A/D – analog-to-digital

AC or **ac** – alternating current

Ah – amp-hour

AOG – Alarm Output Group

DC or **dc** – direct current

DOD – Depth of Discharge

ENU – Eltek Network Utility

LAN – Local Area Network

mA – milliamp

MIB – Management Information Base

mV – millivolt

NMS – Network Management System

SMTP – Simple Mail Transfer Protocol

SNMP – Simple Network Management Protocol

SOC – State of Charge

SOH – State of Health

SP - Smartpack

SP2 – Smartpack2

SPS – Smartpack S

SSL – Secure Sockets Layer

TCP/IP – Transmission Control Protocol / Internet Protocol

V – volt

WAN – Wide Area Network

Index

Alarm Group

description, 169, 170

Alarm(s)

event. *See* Event

group. *See* Alarm Group

logical groups. *See* Logical Groups

monitor types, 165

nag (recurring) buzzer, 206, 300

output channels, 205

output relay tests, 254, 331, 341

setting, 289

setup example, 296

Battery

alarm summary window, 58

bank, configure number of, 109

battery table, 111–15

boost. *See* Boost

command buttons, 330

discharge testing. *See* Tests (battery)

disconnect voltage (Battery page), 110

disconnect voltage (System Voltages page), 89

equalize. *See* Equalize charging

estimated Ah capacity, 271

reconnect voltage (Battery page), 110

reconnect voltage (System Voltages page), 90

setting current limit, 274

Boolean Algebra. *See* Logical Groups

Boost

execute, 253

voltage (Boost page), 118

voltage (System Voltages page), 89

Buzzer

silence, 251

CAN Nodes

overview, 210

Commands

using command buttons, 329

Compact

alarm monitors, 201

Configuration files

download from controller, 347

upload to controller, 351

Control System

alarm summary window, 71

Controllers

compatible, 11

documentation, 10

Dc-to-Dc Converter

status window, 52

ENU (Eltek Network Utility)

description, 17

for IP address, 357

for logging in, 18

Equalize charging

description, 120

execute, 253

Event

description, 168

list, 169–70

Flexi Monitor

monitoring types, 219

names by monitor type, 234

setup, 317

Fuel Cell

status window, 50

Generator

alarm group assignment(s), 94

alarm summary window, 38

setting activation parameters, 304

High-voltage shutdown. *See* Over-voltage shutdown (OVS)

Home Page

overview, 28

I/O Monitor

inputs and outputs by Type, 224–26

output relays for Types 1 and 3, 227

Type 3, fan control settings, 131

LED test

- controller, 252
- rectifier, 252

Load

- alarm summary window, 56
- group description, 107, 190
- how to make LVLDs appear, 107

Load Monitor

- configuration page (Current Monitor), 134
- monitoring types, 215
- names by monitor type, 234
- setup, 311

Logical Groups

- description, 207
- setup procedure, 322, 325

Login

- procedure, 17
- SSL (Secure Sockets Layer), 13

Logs

- download, 342

Low-voltage disconnect (LVD)

- setup on Battery page (LVBD), 110
- setup on LVBD alarm monitor, 175
- setup on LVLD alarm monitor, 176

Mains

- alarm summary window, 34

Naming the system

- device (Network Settings), 143, 354
- site (System Info), 84

Networking

- controller IP address, 142, 355

Outdoor Inputs

- alarm summary window, 77

Over-voltage shutdown (OVS)

- set on Rectifiers page, 100
- set on System Voltages page, 89

Parameters

- identical fields (table), 90

Passwords. See User Accounts**PowerSuite**

- description, 17
- unique functions, 81

Rectifier

- alarm summary window, 40
- current limit, 100
- over-voltage shutdown (OVS). See Over-voltage shutdown (OVS)
- setting current limit, 269
- shuffle (rotation) feature, 102
- startup delay, 101
- suppress rectifier fail alarm, 100

Reference voltage

- difference between Cell and Total, 88
- set on System Voltages page, 88
- set on TempComp page, 115
- setup procedure, 268

Reset alarms, 251**Reset modules, 251****Smartpack S**

- alarm monitors, 199

Smartpack2

- Basic and Basic Industrial alarm monitors, 198
- Master alarm monitors, 198

SMTP

- configuration, 144

SNMP

- setup, 307

Solar

- status window, 47

Statistics

- download, 346

Symbols

- alarm icons, 25
- category buttons, 26
- system overview buttons, 32

System Inputs

- alarm summary window, 74

Temperature Compensation

- setup, 279
- temperature probe setup, 283

Test (battery)

- test result details, 241

- Tests (battery)
 - execute, 253, 278, 341
 - setup, 275
- Thermal Compensation. *See* Temperature Compensation
- User Accounts
 - "Illegal user" explanation, 249
 - change current password, 162
 - defaults, 14
 - permissions, 14
 - set inactivity timeout, 164
- Virtual inputs
 - activate/deactivate, 256
- Virtual Inputs
 - setup example, 336
- Web Interface
 - features, 12
 - requirements, 15
 - supported browsers, 12, 16
 - unique functions, 12
- Wind
 - status window, 48

For assistance with technical questions and solutions, please contact Technical Support by email at tech.support@eltek.com or by phone at 1-800-435-4872.



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