User Guide

Eltek Controller Web Interface



Web Browser Interface

Power System Controllers

Doc. No. 370035.013

Issue 2.1, January 2022

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Overview

1. Guide Overview

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

- Smartpack2 Touch
- Smartpack2 Master
- Smartpack S
- Smartpack R
- 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 browser interface, and how to apply parameter settings through the browser interface.

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

Note: For the **Smartpack2**, **Smartpack S**, and **Smartpack R** controllers, setup and operational functions can be performed through either the browser 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 browser interface in order to adjust parameters.

Table 1.1 – Controller Documentation

Controller Unit	Document(s)
Eltek Controllers (general documentation)	Configuration Guide: Eltek Controllers (370013.063)
Smartpack2	Smartpack2 Touch Ports and Navigation (370135.033) 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) User's Guide: Smarkpack2 Touch Controller (350130.013)
Smartpack S	User Guide – Smartpack S Controller (350030.013)
Smartpack R	Smartpack R Ports and Navigation (370149.033) User's Guide: Smartpack R Controller (350166.013)

Controller Unit	Document(s)
Compack	User's Guide – Compack Controller: Monitoring and Control Units (350011.013)
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) User's Guide: Fleximonitor (351535.013) Installation Guide: AC Mains Monitor (351508.033)

Revision Note: This guide was written using Smartpack2 controller software through revision 2.10. Menus and options may vary as later software revisions are released.

Eltek Controllers with Browser Interface

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

Table 1.2 – Eltek Controllers with Browser Interface

Image	Controller	Description
	Smartpack2 Touch	A touchscreen version of the Smartpack2 Master controller. It utilizes an adaptive display that parallels the browser interface. The Touch unit is connected to Smartpack2 Basic or Smartpack2 Basic Industrial controllers and a variety of CAN Nodes.
	Smartpack2 Master	The primary interface and data aggregation unit for the Smartpack2 controller system; it contains the display interface, Ethernet port (for browser interface), and SD card slot. The Master unit is connected to Smartpack2 Basic or Smartpack2 Basic Industrial controllers and a variety of CAN Nodes.

Image	Controller	Description
 	Smartpack S (plug-in or panel-mount)	Smartpack S contains a display interface and Ethernet port, as well as alarm input and output terminals.
	Compack	The smallest Eltek controller, used primarily with Micropack power systems. It has no display interface, so the browser interface must be used to configure controller parameters. It does contain alarm input and output terminals.
	Smartpack R	This retrofit controller brings newer features and security to legacy power systems, using the web browser interface. It is form-fit compatible with Smartpack 1 controllers.

Browser Interface Features

The Eltek Controller browser interface features the following advantages:

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

  Note: The browser interface is fully tested using Google Chrome™, and is compatible with Microsoft® Internet Explorer®, Microsoft Edge®, and Mozilla® Firefox®.

- **No software installation required:** Communication with the web browser interface is facilitated by standard HTTP/HTTPS. The controller supports both IPv4 and IPv6 addresses.
- **Field upgrades:** Controller firmware can be upgraded over a 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, preventing unauthorized attempts to alter system settings. The encrypted protocols provide additional security.
- **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 Browser Interface or Touch Screen

The following functions are not available through the controller displays of the Smartpack2 and Smartpack S controllers (the Compack controller does not have a display); these functions can only be set and/or adjusted through the browser interface or the touch screen on a Smartpack2 Touch controller:

- **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 › 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 browser interface can be accessed through a network (for example, a LAN), through the Internet, or through direct Ethernet connection with a computer.

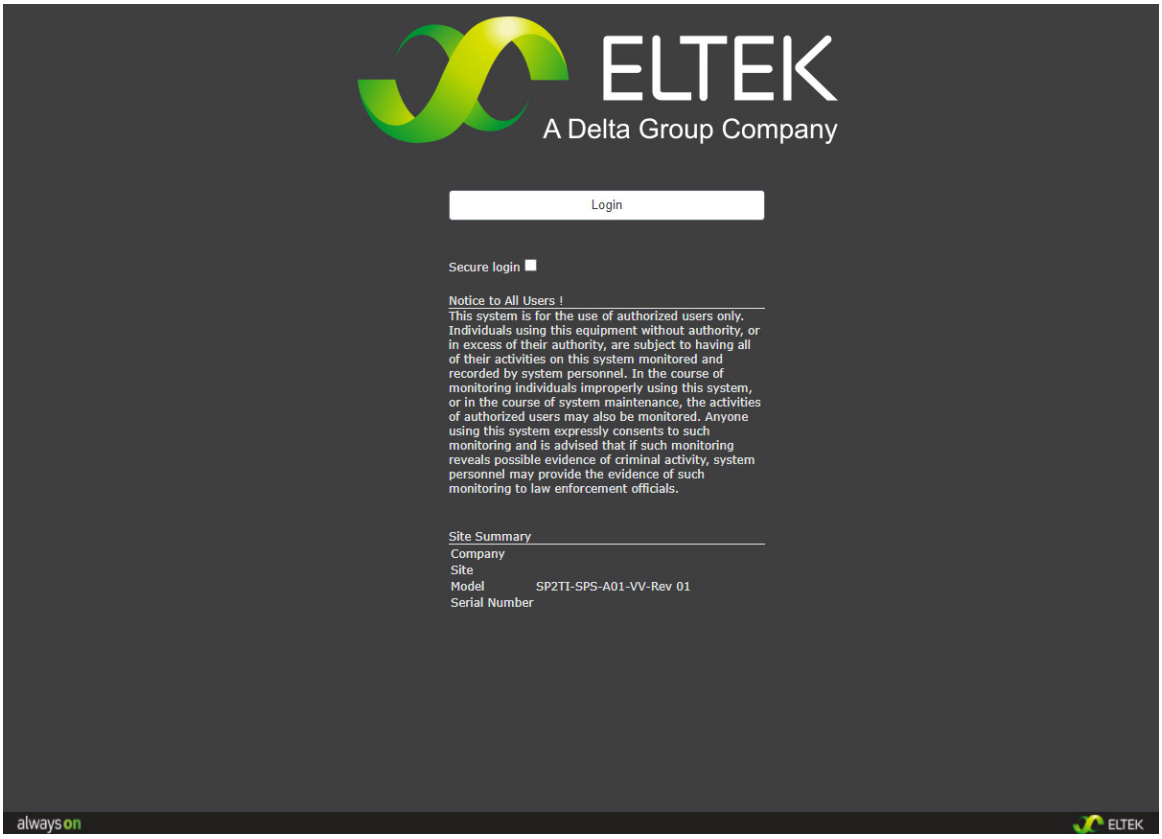


Figure 1.1 – Web Browser Login Page

- **Login** – Click this button to log in. (See access levels in Table 1.3.)
- **IPv6 link** – Click this link to access the controller via IPv6 hexadecimal address.
- **Secure login** – Check this box for an encrypted connection, if secure communication is required between the computer and controller. Check with your IT administrator before using an unencrypted connection.

  Note: Due to strict security settings, some web browsers and local networks may prohibit secure 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 *or* 2 – control *or* 1 – status	User defined
…	(configurable)	(configurable)	3 – admin *or* 2 – control *or* 1 – status	User defined
10	(configurable)	(configurable)	3 – admin *or* 2 – control *or* 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 all system parameters, and must be entered when logging in to the browser 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 is shown in the bottom right corner of the browser interface pages.



Figure 1.2 – Access Level Indicators (bottom right of browser 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 browser interface session.

Password Recovery

This Password Recovery feature applies to the Smartpack Touch and Smartpack R controllers. The feature is covered in the following sections:

- Setting Password Recovery Email Address, next section
- Recovering/Resetting Master Password, page 16

Setting Password Recovery Email Address

When configuring a controller with this feature, be sure to enter a password recovery email address. Failure to provide a recovery address makes the recovery process unavailable, in some cases requiring the return of the controller to Eltek for reprogramming.

To set a password recovery address:

1. Go to **System Conf. › Device Settings › User Accounts › Local Accounts**.

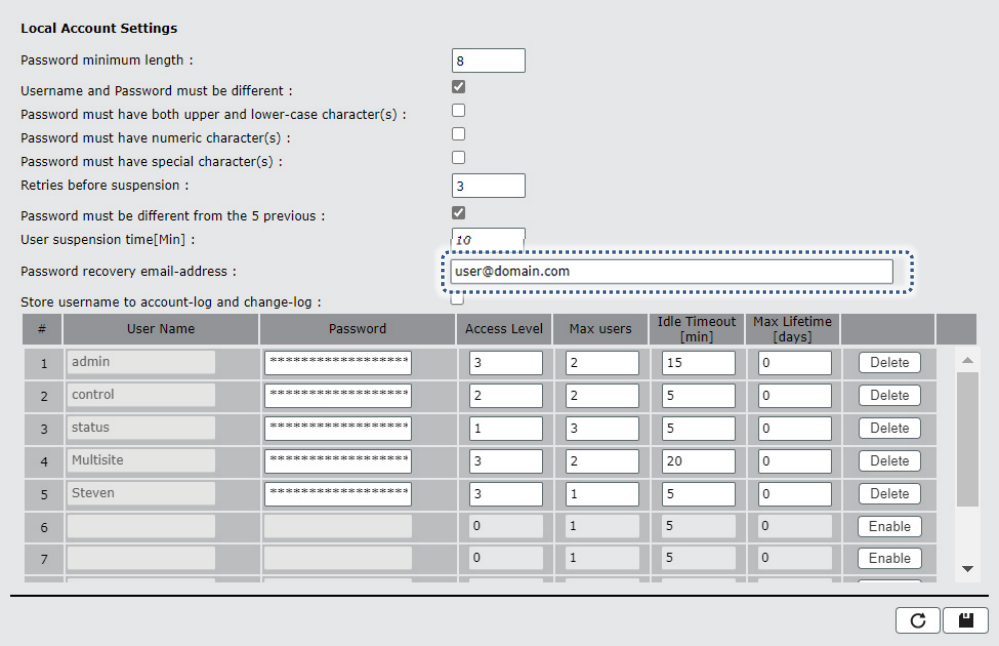


Figure 1.3 – Setting Password Recovery Email Address

2. In the text field, **Password recovery email address**, enter the email address to which you want a recovery link sent, in a case where the password needs to be recovered.

   Note: Check the spelling of the email address carefully. Also remember to keep this field current, if there are changes in your company email system or personnel. This address must be entered during configuration; it cannot be set after the password has already been lost.

3. Click the **Save** button.

For instructions on how to recover/reset the password, see the next section, “Recovering/Resetting Master Password.”

Recovering/Resetting Master Password

Note: In order to use the password recovery feature, you must first enter a password recovery email address. This password must be entered when configuring the controller; the email address cannot be set after the password has already been lost. For instructions on setting a password recovery email address, see the previous section, “Setting Password Recovery Email Address.”

To recover (that is, reset) your Master Password:

1. On the **Sign in** window, for the User name, enter **masterpw**, press the Tab key, and click the **Forgot your password** button. A new page will appear, with options for generating a reset link.

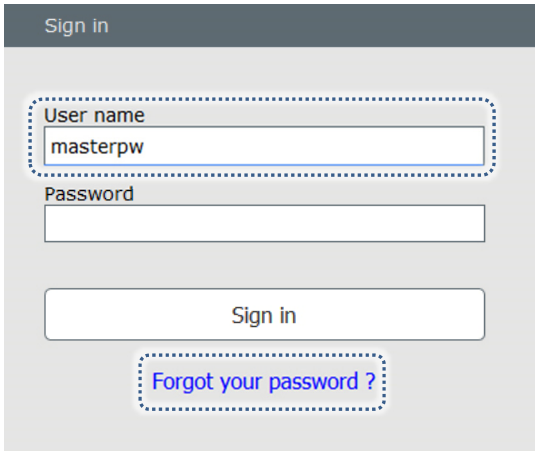


Figure 1.4 – Sign In for Password Recovery

2. On the link request page, do one of the following:
   - Click on the mail link. The link produces a special email message, using your default mail application; send the message.
   - Use a cell phone with a QR-code reader, and scan the code. The QR code produces a special email message, using your default mail application; send the message.

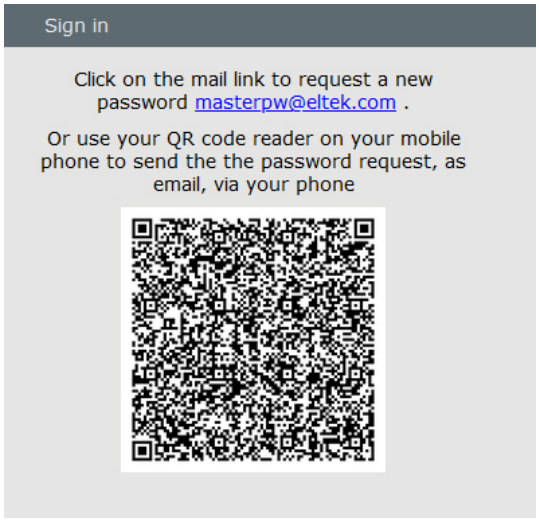


Figure 1.5 – Generating Email Recovery Message

Note: If you have not previously specified a recovery email address, the generated email message will include the message: “No recovery email is

defined in your controller. Send this mail and contact your Eltek service office." You may be required to send the controller back to Eltek for reprogramming.

3. Check the email for the address associated with password recovery. (This is the email address entered in **System Conf. › Device Settings › Local. Accounts**, as covered in the previous section, "Setting Password Recovery Email Address." Follow the instructions given in the email.

   Note: The new password that you are given is good for only 48 hours; you must reset your master password, using the procedure covered in the previous section, "Setting Password Recovery Email Address," page 15. Resetting the master password also deletes all custom user names and passwords, and sets user names and passwords back to factory defaults.

Resetting Locked Account

This procedure can be used when you are locked out of your account, after too many failed logins. The Sign in window displays the message "User Suspended."

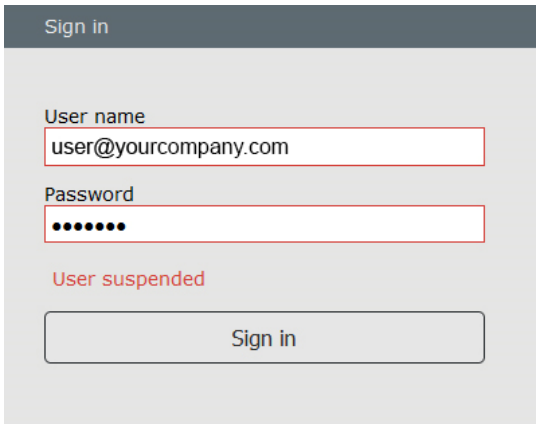


Figure 1.6 – User Suspended Message

Note: In order to use this password reset feature, you must first enter a password recovery email address. This password must be entered when configuring the controller; the email address cannot be set after the password has already been locked. For instructions on setting a password recovery email address, see the previous section, "Setting Password Recovery Email Address," page 15.

To unlock your password:

1. On the **Sign in** window, for the User name, enter **unlockaccount**, press the Tab key, and click the **Blocked Account?** link. A new page will appear, with options for generating a reset link.

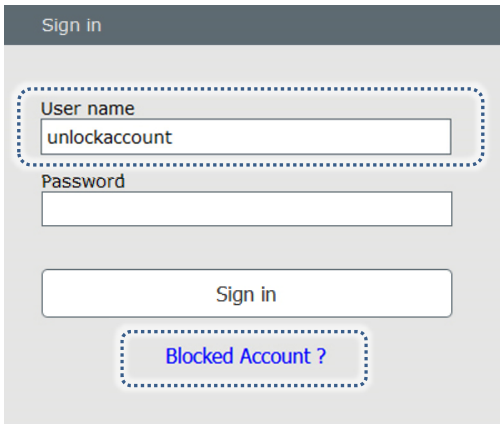


Figure 1.7 – Blocked Account Link

2. On the link request page, do one of the following:
   - Click on the mail link. The link produces a special email message, using your default mail application; send the message.
   - Use a cell phone with a QR-code reader, and scan the code. The QR code produces a special email message, using your default mail application; send the message.

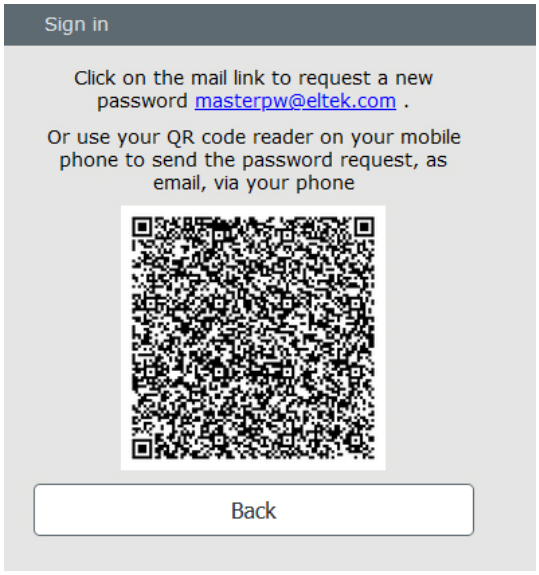


Figure 1.8 – Generating Email Recovery Message

Note: If you have not previously specified a recovery email address, the generated email message will include the message: “No recovery email is defined in your controller. Send this mail and contact your Eltek service office.” You may be required to send the controller back to Eltek for reprogramming.

3. Check the email for the address associated with password recovery. (This is the email address entered in **System Conf. › Device Settings › Local**. **Accounts**, as covered in the previous section, “Setting Password Recovery Email Address.” Use the password given in the email to log in. After you have logged in with the recovery password, your previous password will work for subsequent logins unless you change it.

Requirements

Note: Adjusting settings on the Compack 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/adapter (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 browser interface:

- A web browser

  The browser interface is fully tested using Google Chrome, and is compatible with Microsoft Internet Explorer, Microsoft Edge, and Mozilla Firefox.
- The latest version of Oracle Java™ installed on the computer *and enabled* in the browser 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:

UPD port 20034

TCP port 80

- Browser Interface:

  TCP port 80

  TCP port 443

Recommended

The Eltek Network Utility (ENU) application is recommended. ENU is a program that locates Eltek controllers connected on a network; it facilitates software updates.

Note: This utility is required for the procedure in the following section, "Direct Connection with the Controller," as ENU provides the easiest way to determine the IP address of an Eltek controller. The Eltek Network Utility:

- Requires Microsoft Windows.
- Can be downloaded from the Internet at **http://msm.eltek.com/enu**.

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. The default address is **192.168.10.20**.

> **Note**: On the Smartpack2 Touch controller, this IP address applies to the rear Ethernet port. If you are using the front Ethernet port, the default address is **10.10.0.1**.
>
> **Note**: On the Smartpack R controller, the default **192.168.10.20** address applies to the rear Ethernet port. Alternately, on the Smartpack R, you can connect to the upper front USB port (Type A, top right), using a Wi-Fi dongle, at the address **10.20.0.1**; or connect directly to a computer using the lower USB port (Type B, lower right), at the address is **10.10.0.1**.

If the login page does not appear in the browser, then use the following procedure with the Eltek Network Utility (ENU) to troubleshoot. (See the ENU information on page 21.)

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 1.9 – Controller Ethernet Ports

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

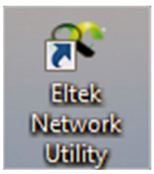


Figure 1.10 – Eltek Network Utility Icon

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

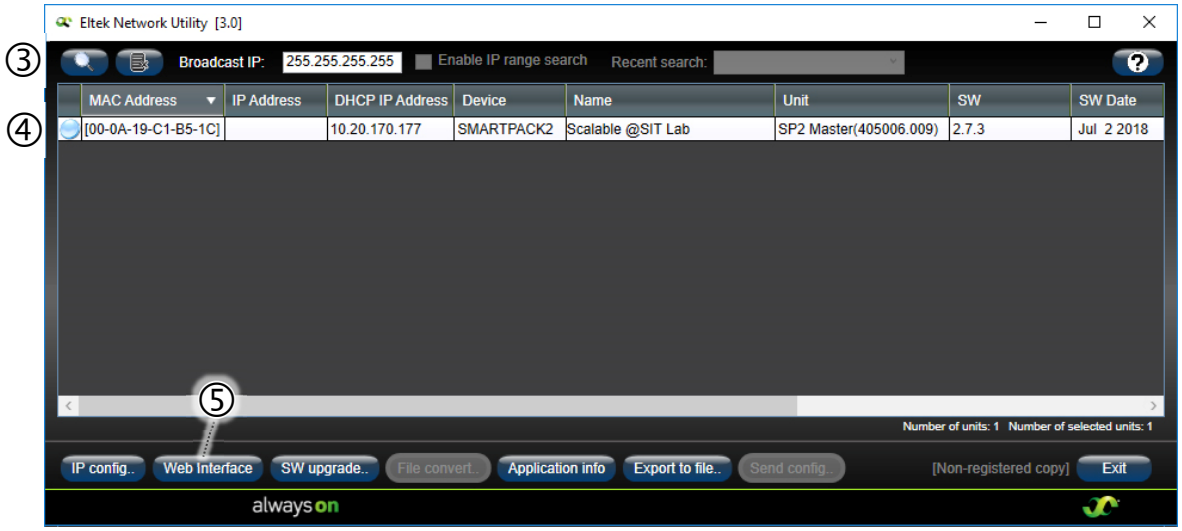


Figure 1.11 – Eltek Network Utility Window

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**.

   Note: On the Smartpack2 Touch controller, this IP address applies to the rear Ethernet port. If you are using the front Ethernet port, the default address is **10.10.0.1**.

5. Click on the **Web Interface** button.
6. Does the Login page appear in the web browser? (See the following figure.)

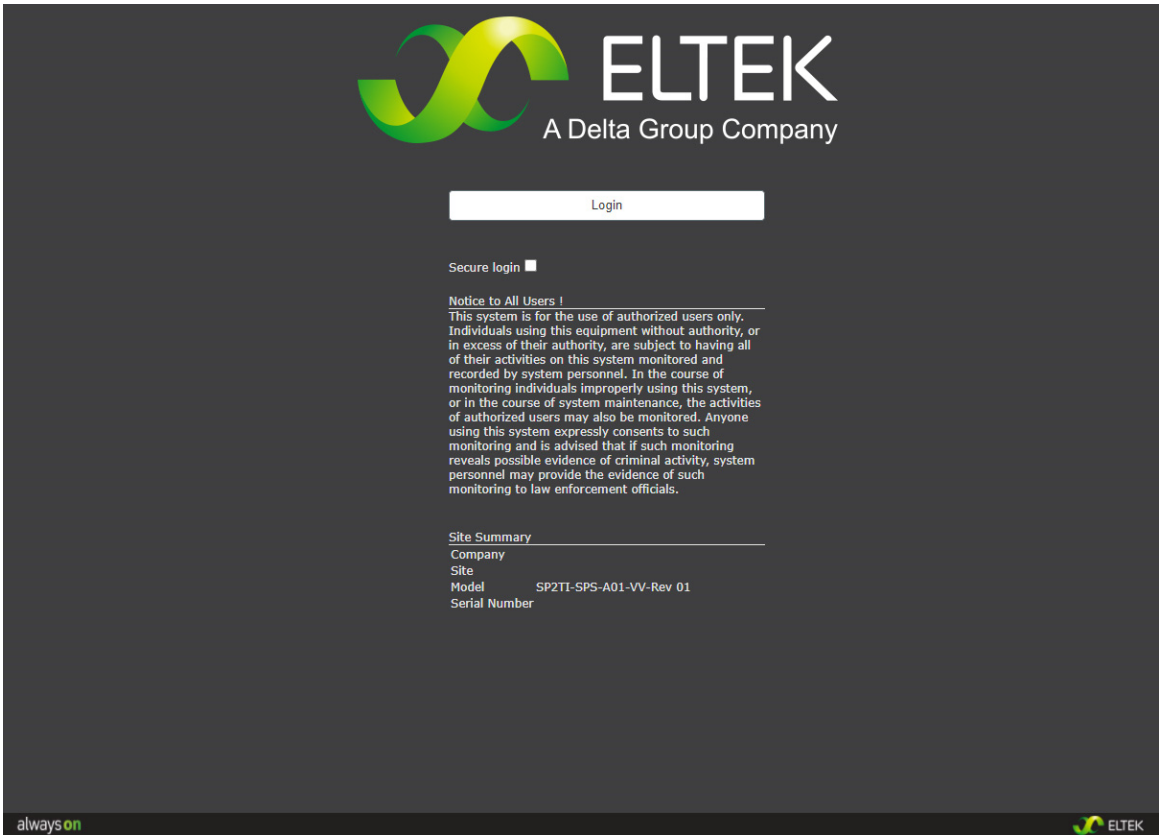


Figure 1.12 – Web Browser Login Page

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**.

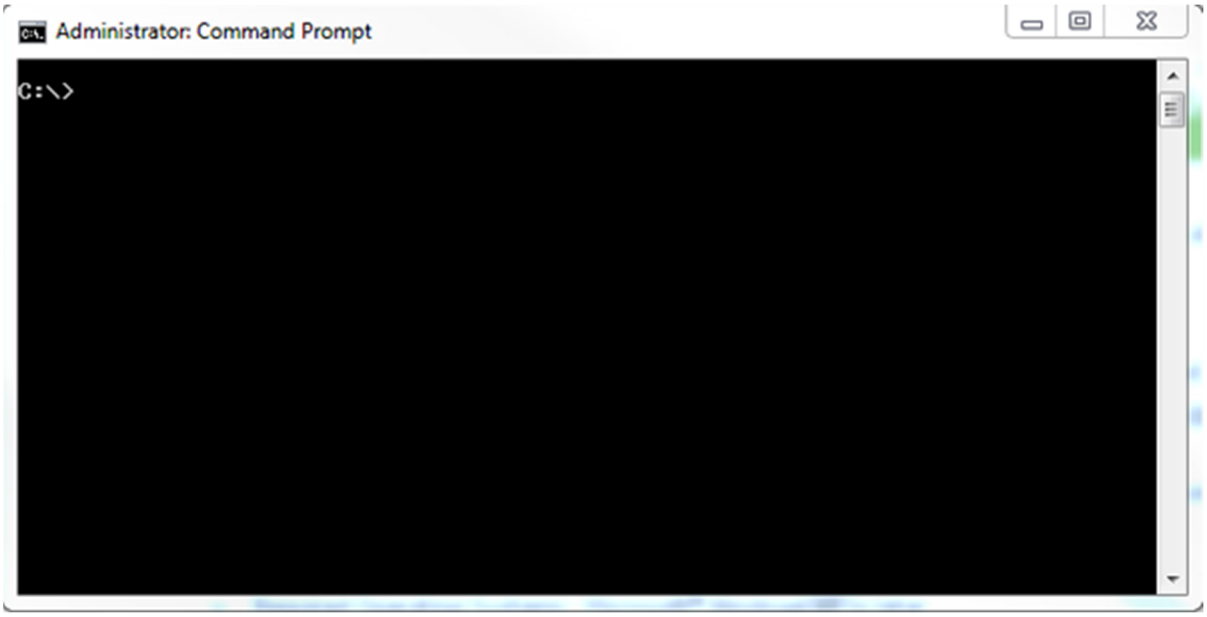


Figure 1.13 – Command Prompt Window

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 is **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 1.14 – 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 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. Browser Interface Overview

Upon successful login, the home screen appears in the 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”.

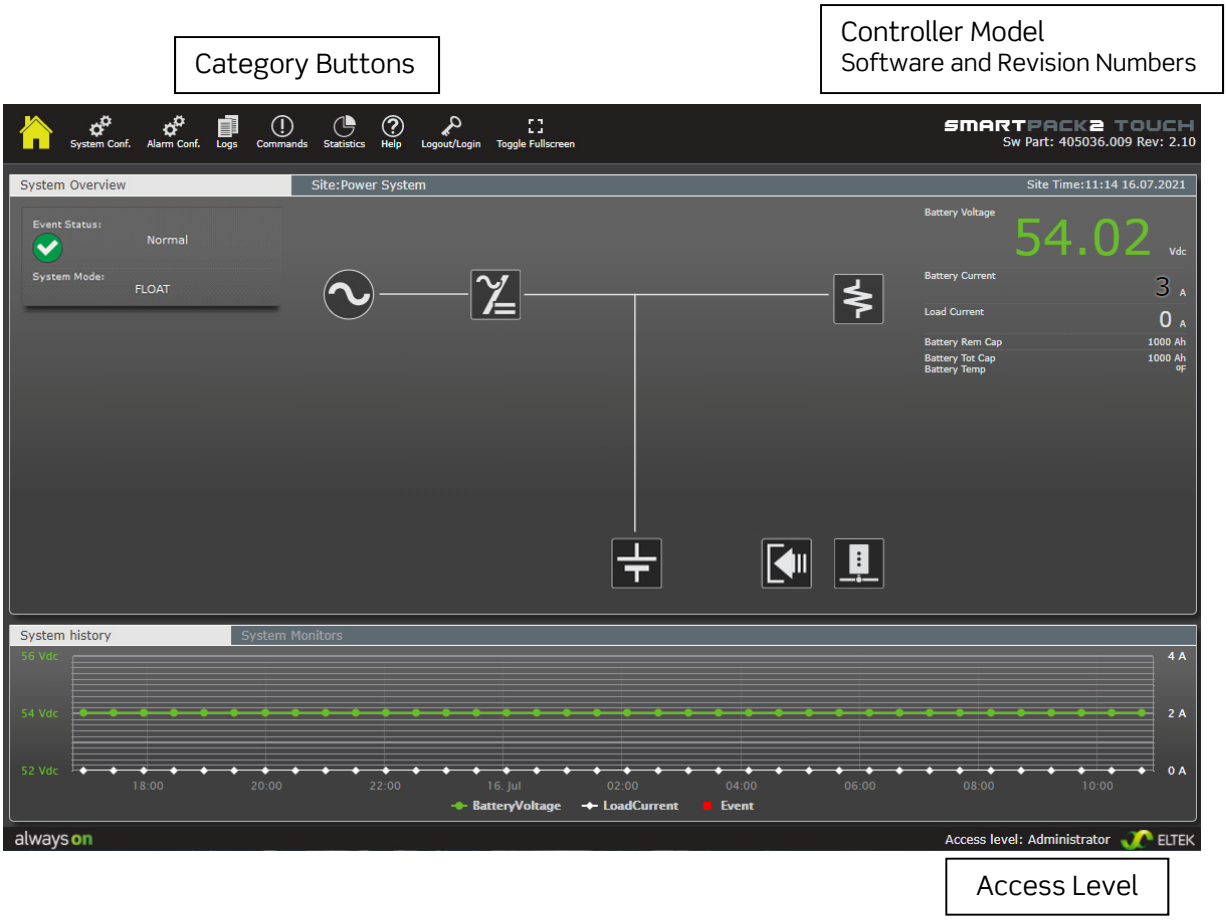


Figure 2.1 – Top and Bottom Information Bars

Alarm Symbols and Monitors

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

Table 2.1 – Alarm Symbol Table

Alarm Symbol	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 browser 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 browser interface.

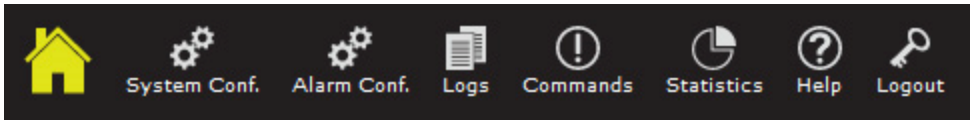


Figure 2.2 – Category Buttons

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

Table 2.2 – Description of Category Buttons

Button	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 buttons 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.

Button	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/Login	This button logs out of the browser interface, ending the current session.
	Toggle Fullscreen	This button is used to enlarge or reduce the size of the browser window.

The following sections describe each category in detail.

3. Home

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

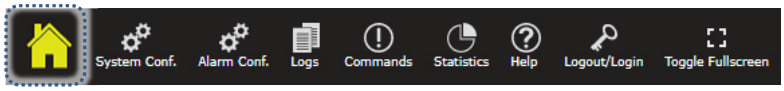


Figure 3.1 – Home Button

System Overview Window

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

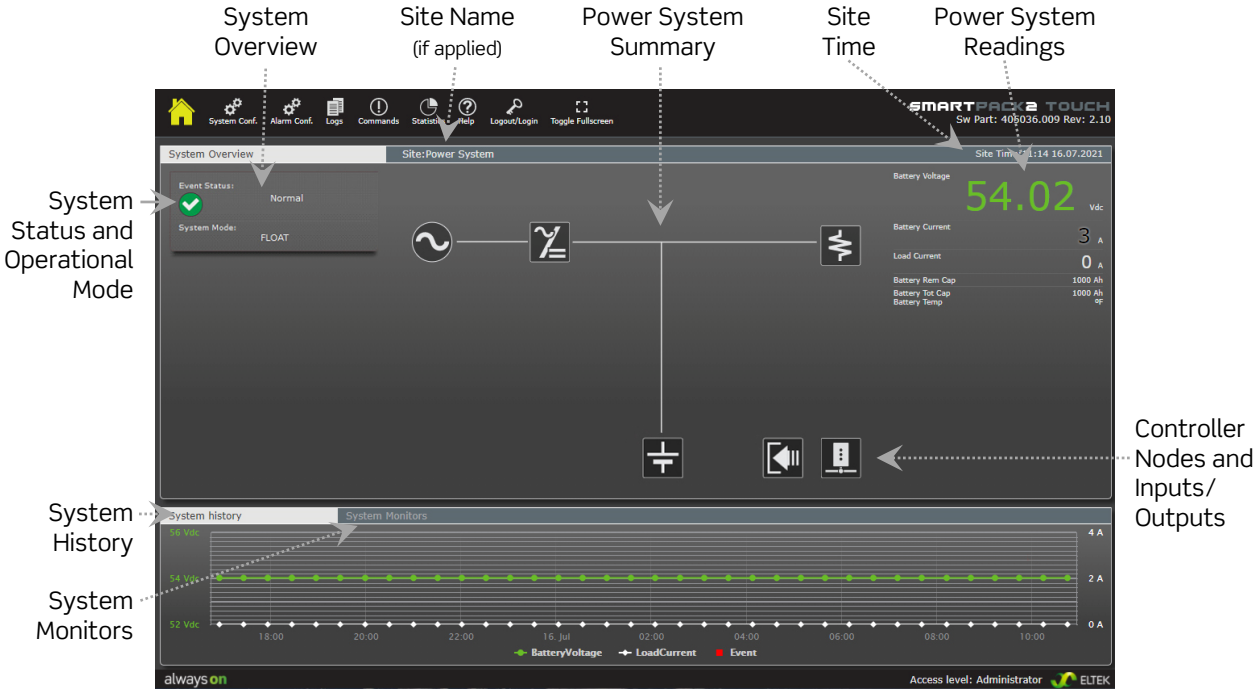


Figure 3.2 – Home Screen Panes and Features

Additionally, you can roll over the square buttons in this window to provide a dynamic status box when rolled over with the mouse cursor.

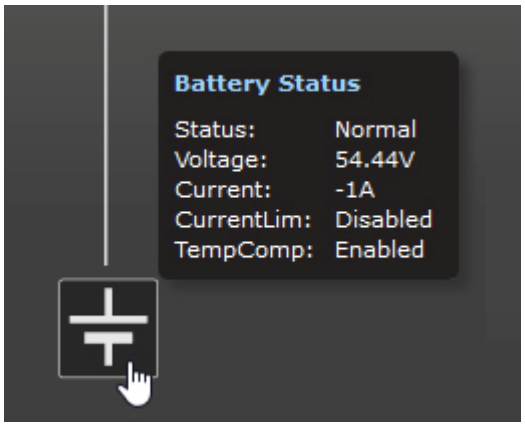


Figure 3.3 – Status Box on Mouse Roll Over (Example: Battery Status)

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.

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.

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 browser 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

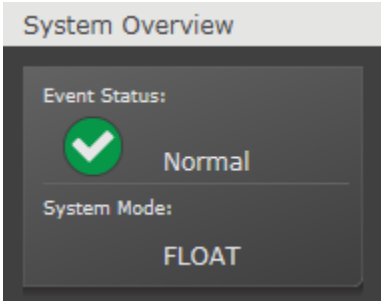


Figure 3.4 – Event Status and System Mode

- **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.

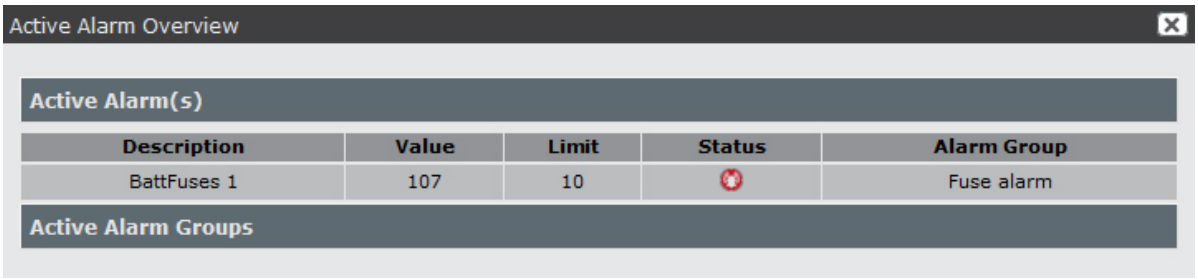


Figure 3.5 – Active Alarm Overview with an Active Alarm

Note: Most lists in the browser 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.

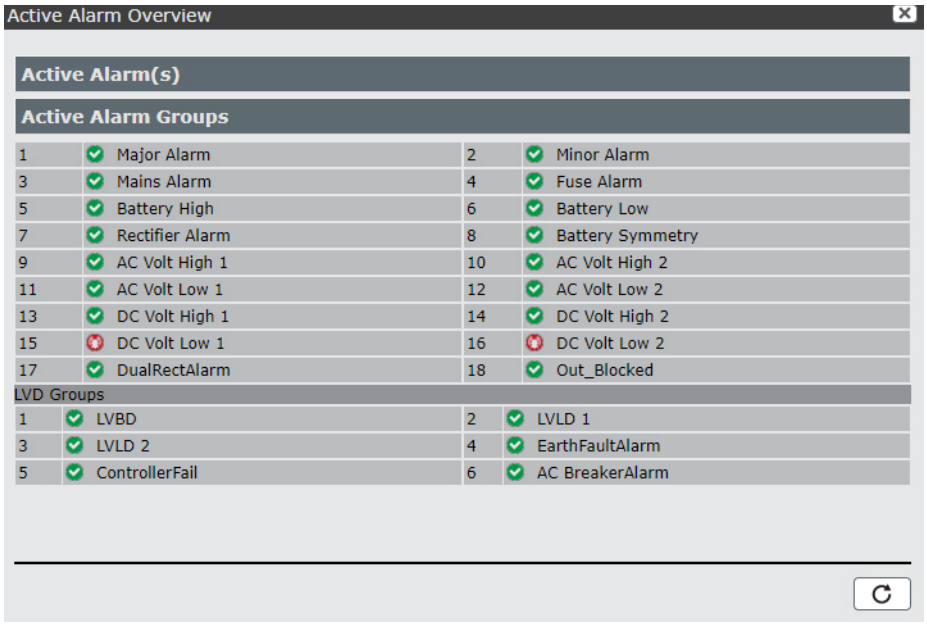


Figure 3.6 – Active Alarm Groups List

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.

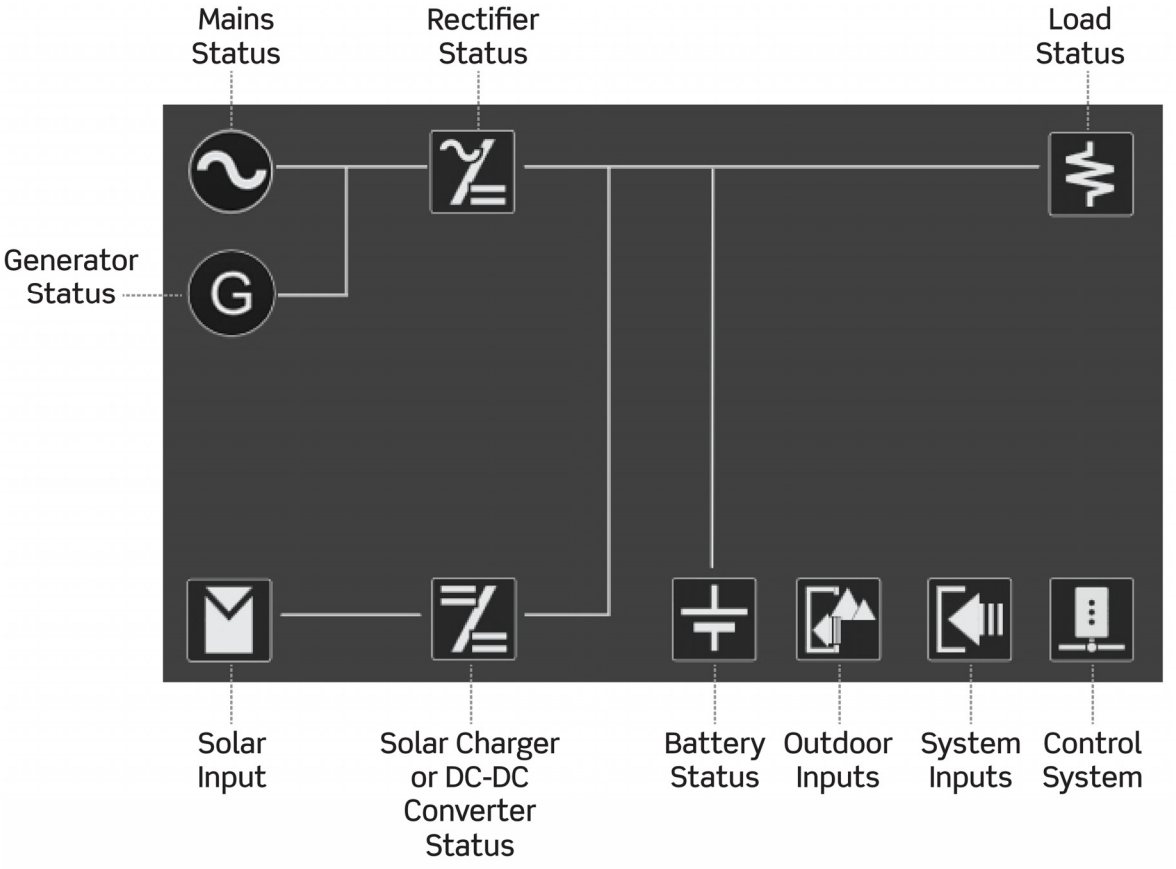


Figure 3.7 – Example of Power System Overview (System with Solar Input)

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

Symbol	Component	Definition
	Solar Status	Status of solar output (voltage reading only)
	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)
	Rectiverter Status	Status of rectiverter
	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.

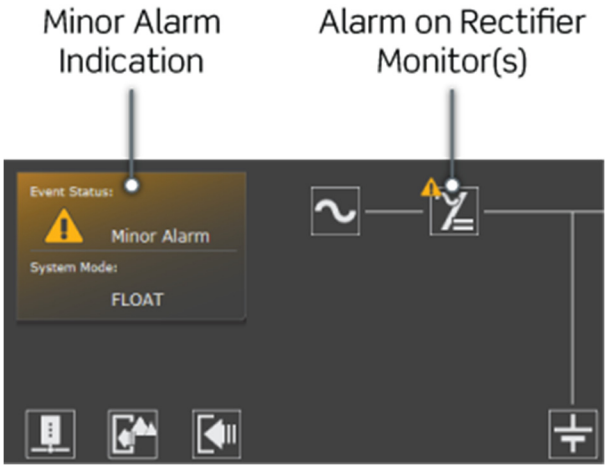


Figure 3.8 – Minor Alarm Notices

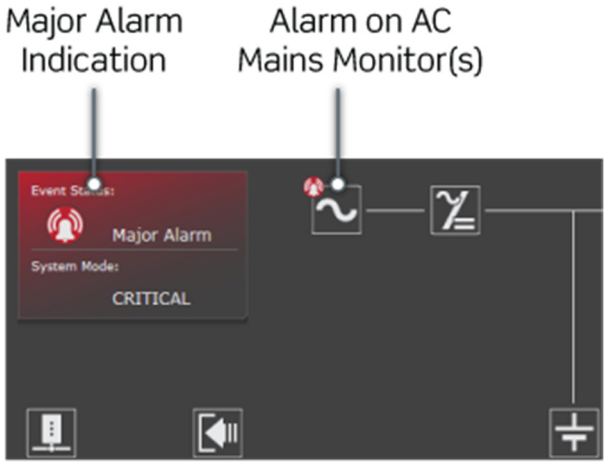


Figure 3.9 – Major Alarm Notices

Mains Status

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



Mains alarm monitors location:

Alarm Conf. › Mains

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

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

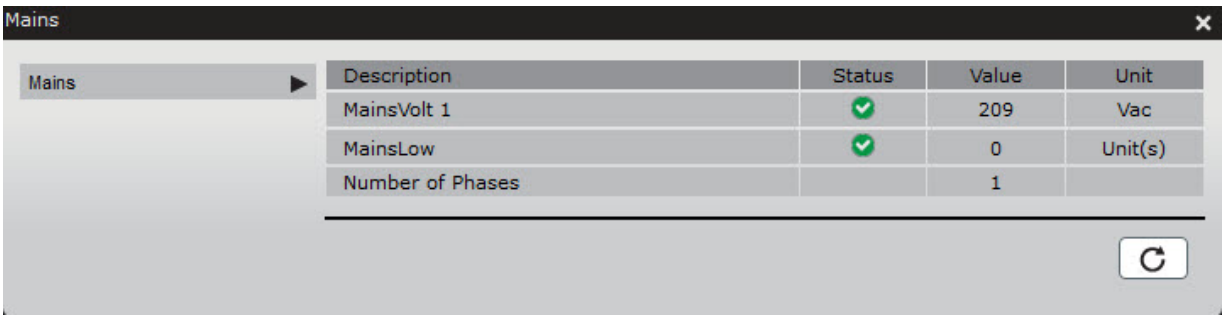


Figure 3.10 – Mains Summary Window (without groups)

- **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. › 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:

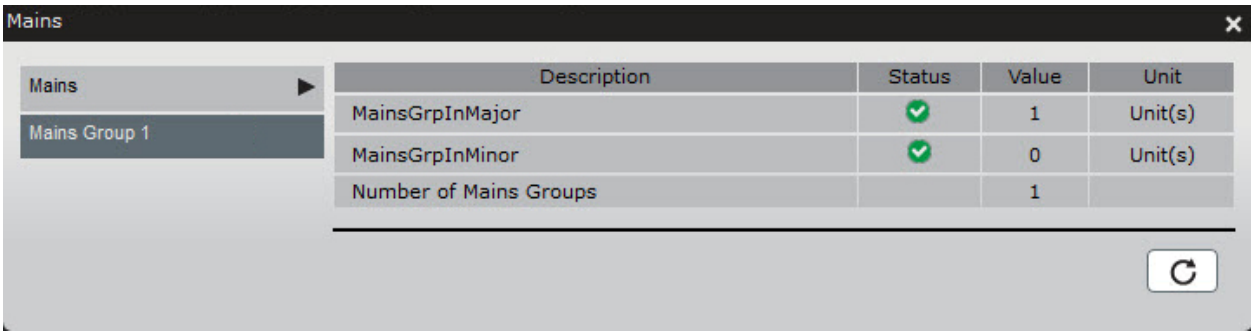


Figure 3.11 – Mains Summary Window (with groups)

- **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.

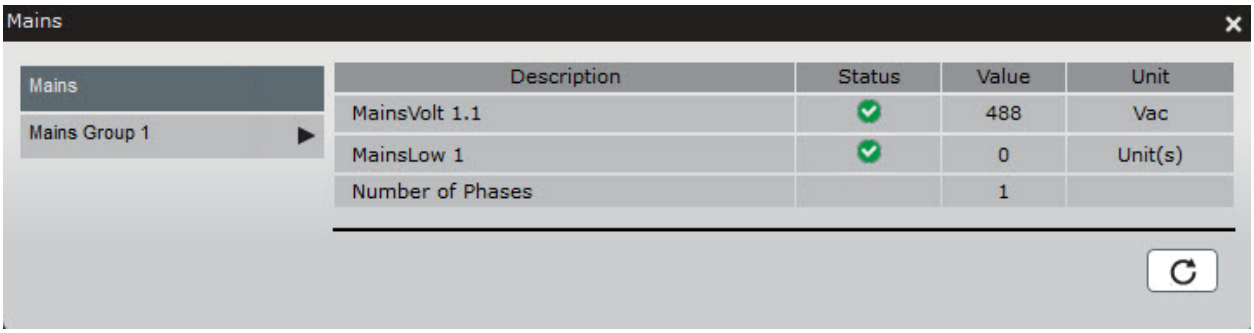


Figure 3.12 – Mains Groups List

- **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. › 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. › Generator

Clicking on the **Generator** button on the home page brings up the **Main** summary window; on this summary window, choose the **Generator** button to view the generator monitors.

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

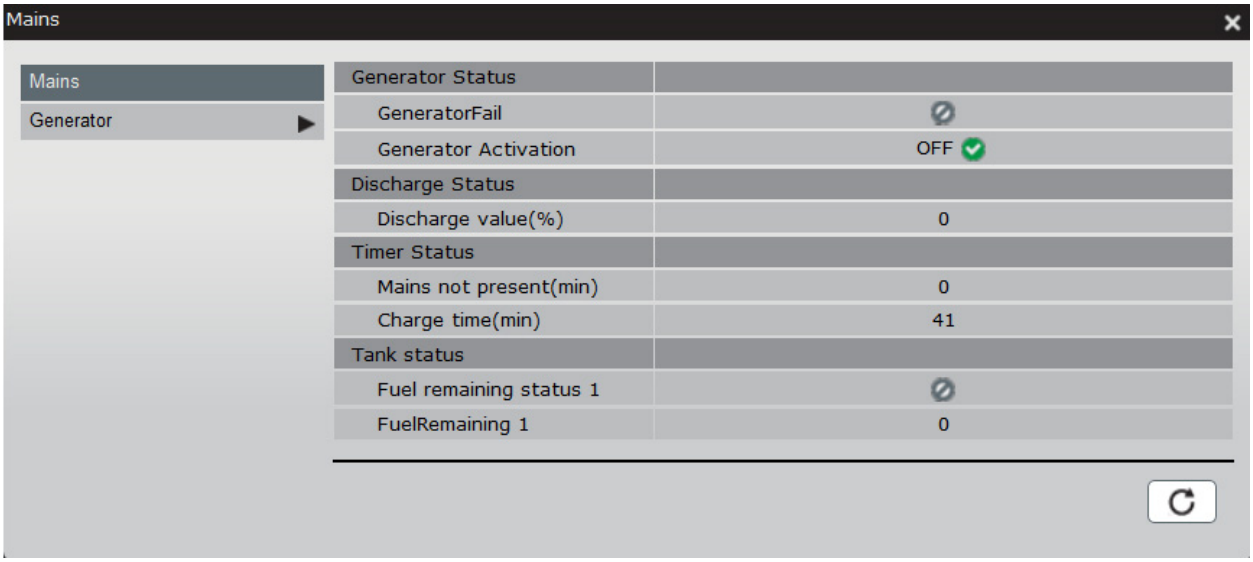


Figure 3.13 – Generator Monitors (Alarm) Summary

- **Generator** – 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. › Generator › Capacity
- **Timer Status** – alarm monitors for the generator timer
  - **Mains not present(min)** – time (in minutes) that should elapse after an AC mains outage before the generator is signaled by the controller to turn on.
  - **Charge time(min)** – 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. › 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.



The rectifier alarm monitors location is:

Alarm Conf. › Rectifier

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

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

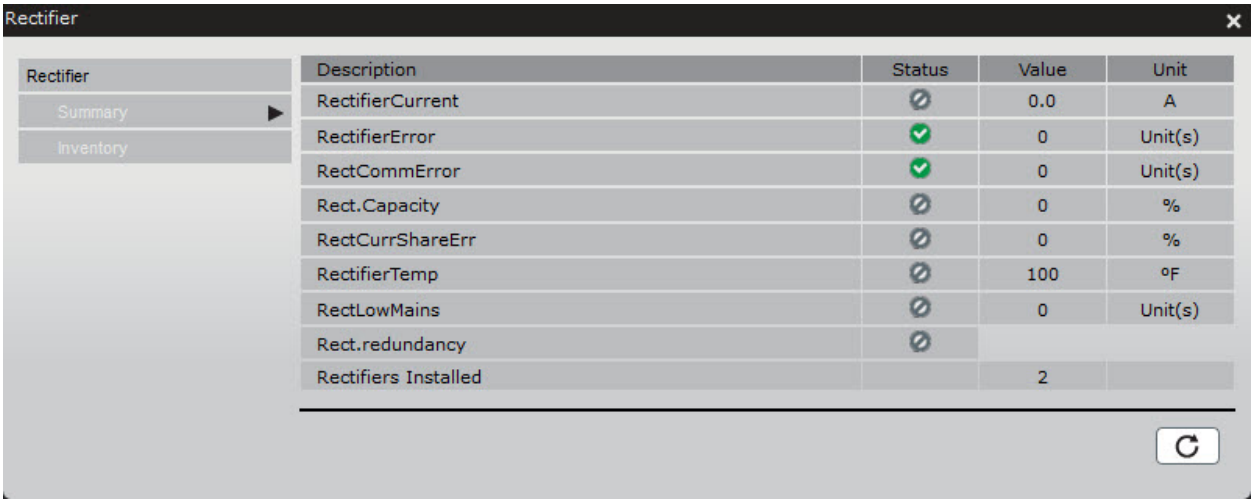


Figure 3.14 – Rectifier Summary (without groups)

- **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):

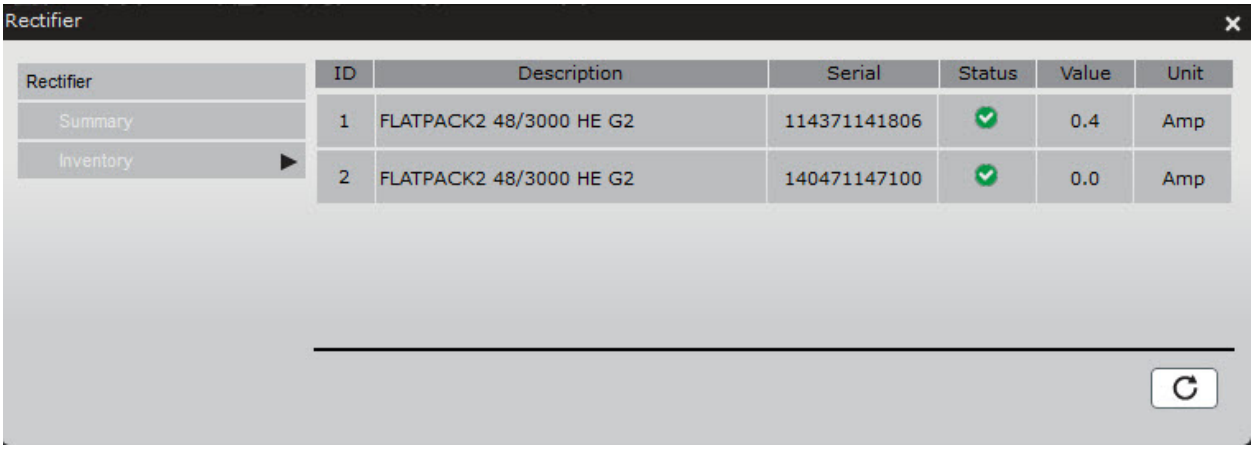


Figure 3.15 – Rectifier Inventory (without groups)

- **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.
- **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.
- **RectLowMains** – indicates if there are any rectifiers experiencing low AC input.
- **Rect.redundancy** – indicates if the system has lost N+1 redundancy.
- **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	Summary	RectifierCurrent	Amps	Major Minor
		RectifierError	Sum	Major Minor
		RectCommError	Sum	Major Minor
		Rect.Capacity	Percentage	Major Minor
		RectCurrShareErr	Percentage	Major Minor
		RectifierTemp	Degrees	Major High Minor High Minor Low Major Low
		RectLowMains	Sum	Major Minor
		Rect.redundancy	N/A	Major
		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).

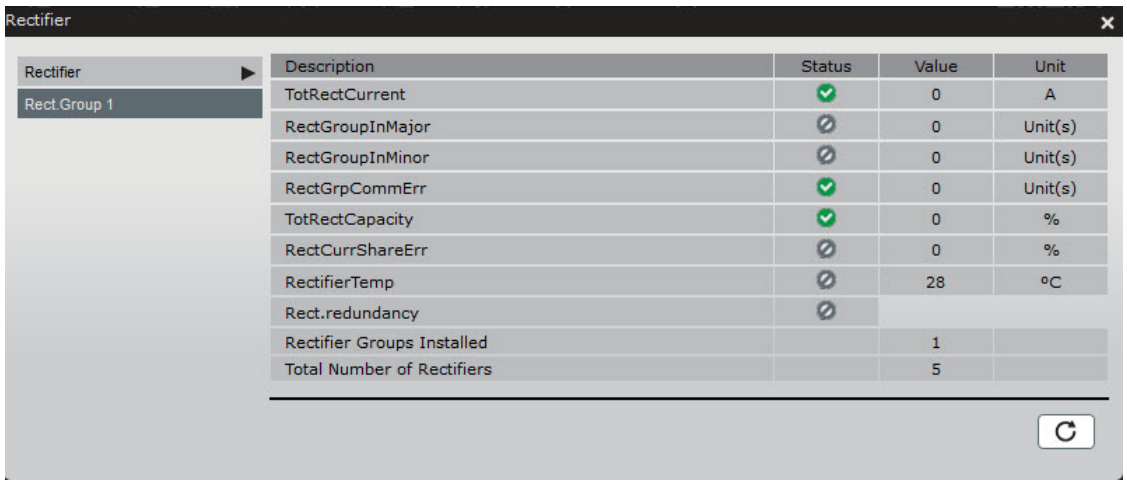


Figure 3.16 – Rectifier Summary (with groups)

- **TotRectCurrent** – indicates if the sum of all rectifier output current exceeds a predetermined current value.
- **RectGroupInMajor** – indicates if a rectifier group has a major alarm; 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** –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.
- **TotRectCapacity** –indicates if 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.
- **Rect.redundancy –** indicates if the system has lost N+1 redundancy.
- **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).

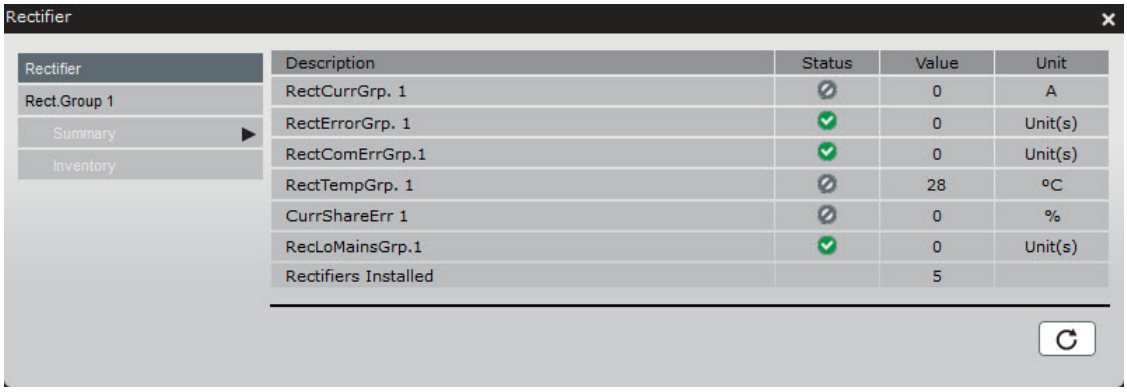


Figure 3.17 – Rectifier Group Summary

- **Summary** – list of rectifier parameters for the rectifier group:
  - **RectCurrGrp. X** – indicates if the total rectifier output of the group is below a defined current value.
  - **RectErrorGrp. X** – indicates if there are any rectifier alarms in the group.
  - **RecComErrGrp. X** – indicates if there are any rectifiers in the group that have stopped communicating with the controller.
  - **RectTempGrp. X** – rectifier temperature 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.
  - **RectLoMainsGrp. X** – rectifier low mains indicates if there are any rectifiers experiencing low AC input.
  - **Rectifiers Installed** – 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).

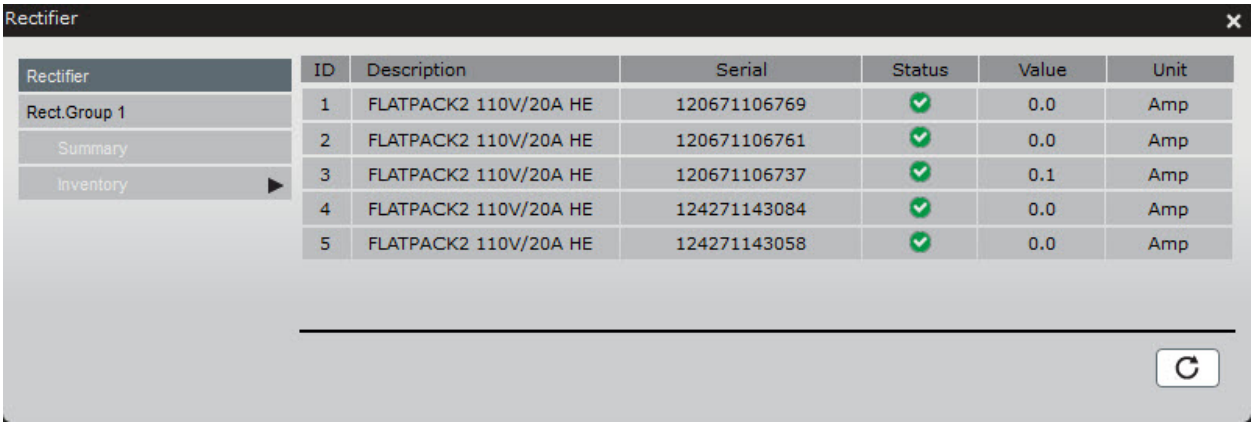


Figure 3.18 – Rectifier Group Inventory

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
		RectGroupInMajor	Sum	Major Minor
		RectifierGroupInMinor	Sum	Major Minor
		RectGrpCommErr	Sum	Major Minor
		TotRectCapacity	Percentage	Major Minor
		RectCurrShareErr	Sum	Major Minor

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
		RectifierTemp	Degrees	Major High Minor High Major Low Minor Low
		Rect.redundancy		
		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
		RectComErrGrp.X	Sum	Major Minor
		RectTempGrp. X	Degrees	Major High Minor High Minor Low Major Low
		CurrShareErr X	Percentage	Major Minor
		RecLoMainsGrp.X	Sum	Major Minor
		Rectifiers Installed [in Group]	Sum	N/A
	Rectifier Inventory	(List of Rectifiers)	N/A	N/A

Rectiverter Status

The **Rectiverter Status** button shows the status of the Rectiverter. A Rectiverter is a dual-output module that produces both AC and DC output.



Note: Rectiverter only appears if Rectiverters are connected to the power system.

The Rectiverter alarm monitor location is:

Alarm Conf. › Rectiverter

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

The following figure shows **Rectiverter summary** monitors page.



Figure 3.19 – Rectiverter Summary Page

RectivtrDCCurr – indicates if the sum of all rectiverter output current exceeds a predetermined current value.

RectivtrError – indicates if an alarm is present in a rectiverters; if so, then the number of affected rectiverters is indicated under the **Value** column.

RectivtrCommErr – indicates if there is a communication error (or failure) with one or more rectiverters; if so, then the number of affected rectiverters is indicated under the **Value** column.

RectivtrDCCap – indicates whether or not rectiverters are operating within a specified percentage of their DC output capacity.

RectivtrDCCuShEr –indicates if rectiverters are deviating beyond a defined percentage from the mean rectiverter DC output current.

RectivtrTemp – indicates if rectiverters are operating below a defined temperature value.

RectivtrACOutV X – indicates if rectiverters are operating outside of a defined AC output voltage.

RectivtrACCShEr X – indicates if rectiverters are deviating beyond a defined percentage from the mean rectiverter AC output current.

RectivtrACCap X – indicates whether or not rectiverters are operating within a specified percentage of their AC output capacity.

Rectiverters Installed – indicates how many rectiverters are installed.

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. › 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.

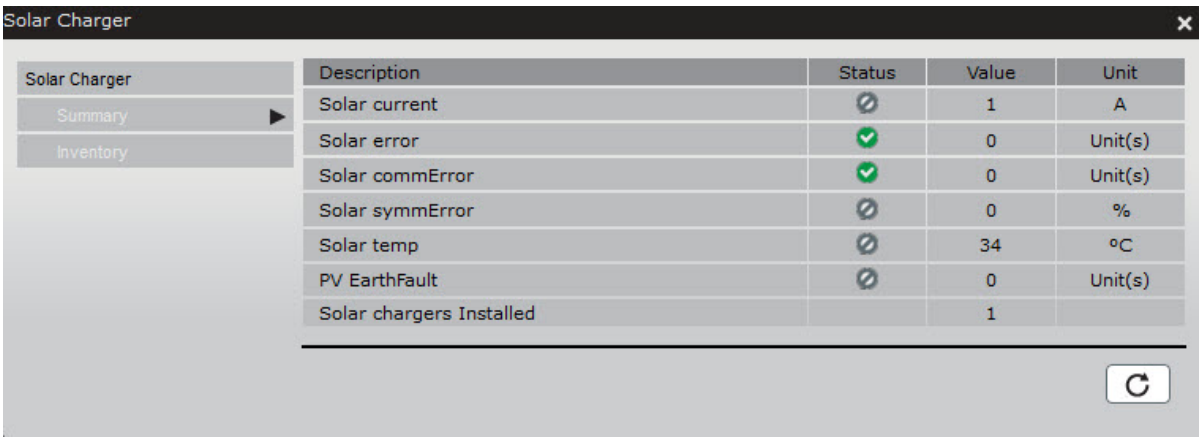


Figure 3.20 – Solar Charger Summary Window

- **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.
    - **Solar error** – indicates if there is an alarm on any solar charger module.
    - **SolarCommError** – indicates if there is a communication error with one or more solar chargers.
    - **Solar symmError** – indicates there is a difference between the output currents of the solar chargers exceeding a specified percentage.
    - **Solar temp** – indicates if chargers are operating outside a defined temperature range.
    - **PV [Photovoltaic] EarthFault** – monitor for defining the number of solar modules with an earth fault.
    - **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	Solar current	Amps	Major Minor
		Solar error	Sum	Major Minor
		Solar commError	Sum	Major Minor
		Solar symmError	Percentage	Major Minor
		Solar temp	Degrees	Major High Minor High Minor Low Major Low
		PV EarthFault	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. › 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.

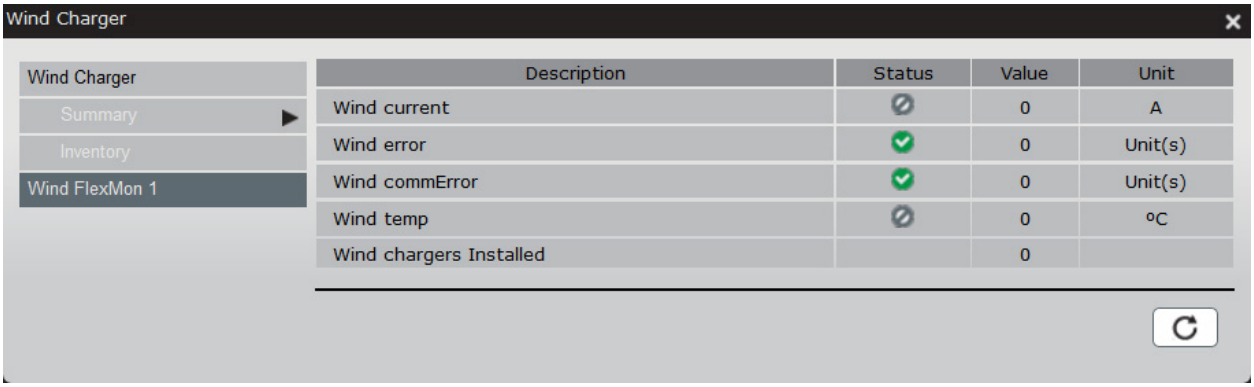


Figure 3.21 – Wind Charger Summary Window

- **Wind Charger Status** – status of wind chargers.
  - **Wind Charger** – menu for wind charger monitors.
    - **Summary** – sub-menu for wind charger input.
      - **Wind current** – alarm monitor for current from the wind chargers.
      - **Wind error** – alarm monitor for detecting the number of wind chargers experiencing an error.
      - **Wind commError** – alarm monitor for detecting the number of wind chargers experiencing communication errors.
      - **Wind temp** – indicates if chargers are operating outside a defined temperature range.
      - **Wind chargers 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,” on page 73.

- **Wind FlexMon X** – see the section “Flexi Monitors” on page 74.

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	Wind current	Amps	Major Minor
		Wind error	Sum	Major Minor
		Wind commError	Sum	Major Minor
		Wind temp	Degrees	Major High Minor High Minor Low Major Low
		Wind chargers 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. › 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:

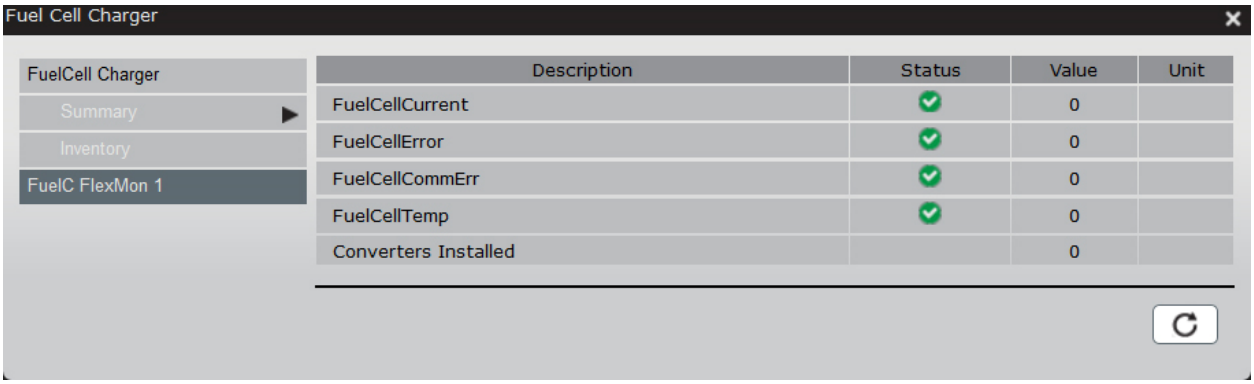


Figure 3.22 – Fuel Cell Charger Summary Window

- **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.
      - **FuelCellTemp** – indicates if chargers are operating outside a defined temperature range.
      - **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,” on page 73.
  - **FuelC FlexMon X** – see section “Flexi Monitors,” on page 74.

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
		FuelCellTemp	Degrees	Major High Minor High Minor Low Major Low
		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.

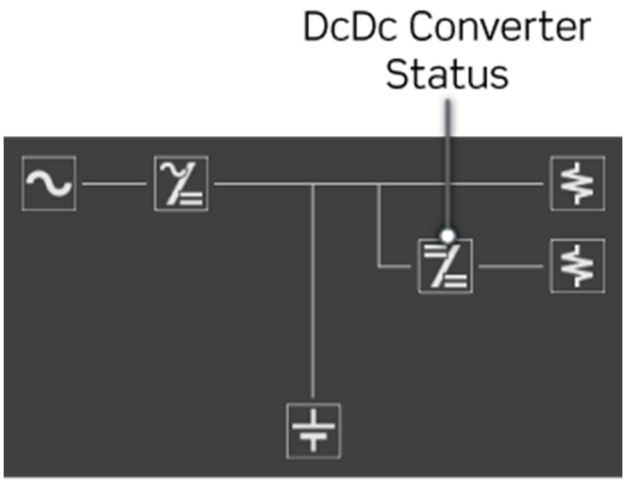


Figure 3.23 – Location of Dc-to-Dc Converter Status Button

Dc-to-Dc converter alarm monitors location:

Alarm Conf. › 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.

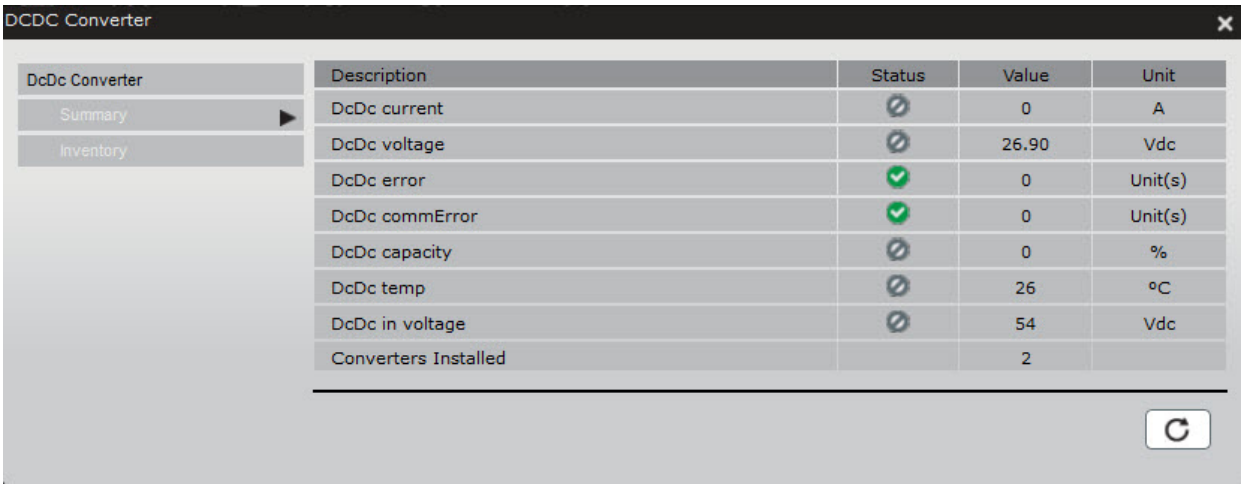


Figure 3.24 – DC-to-DC Converter Summary Window

- ☐ **DcDc current** – alarm monitor for current from DC-to- DC converters.

- ☐ **DcDc voltage** – alarm monitor for output voltage from DC-to- DC converters.
- ☐ **DcDc error** – alarm monitor for detecting the number of DC-to- DC converters experiencing an error.
- ☐ **DcDc commError** – alarm monitor for detecting the number DC-to-DC converters experiencing communication errors.
- ☐ **DcDc capacity** – alarm monitor for the maximum capacity of the DC-to-DC converters.
- ☐ **DcDc temp** – alarm monitor for high and low temperature thresholds for the DC-to- DC converters.
- ☐ **DcDc in voltage** – alarm monitor for the input voltage from 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:

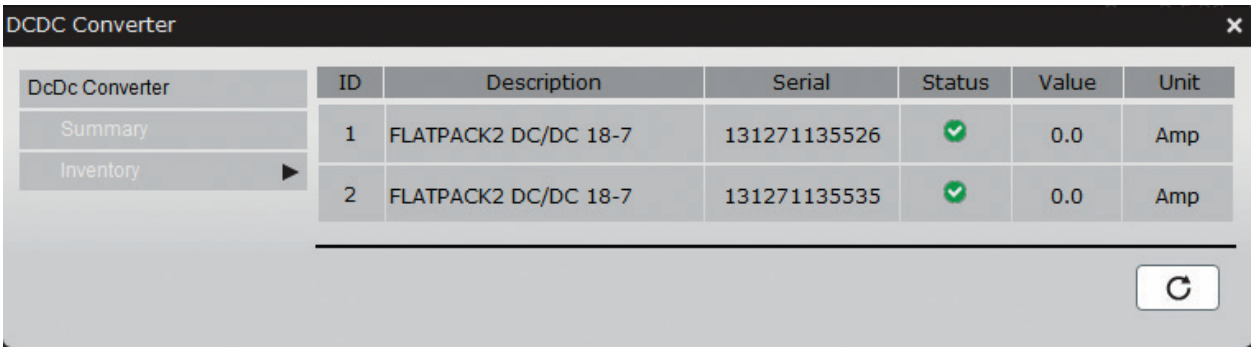


Figure 3.25 – Dc-to-DC Converter Inventory

- o **DCDC CurMon X** – see section “Load Monitors,” on page 73.
- o **DCDC FlexMon X** – see section “Flexi Monitors,” on page 74.

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
		DcDcVoltage	Volts	Major High Minor High Minor Low Major Low
		DcDcError	Sum	Major Minor
		DcDcCommErr	Sum	Major Minor
		DcDcCapacity	Percentage	Major Minor
		DcDcTemp	Degrees	Major Minor
		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. › Load

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

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

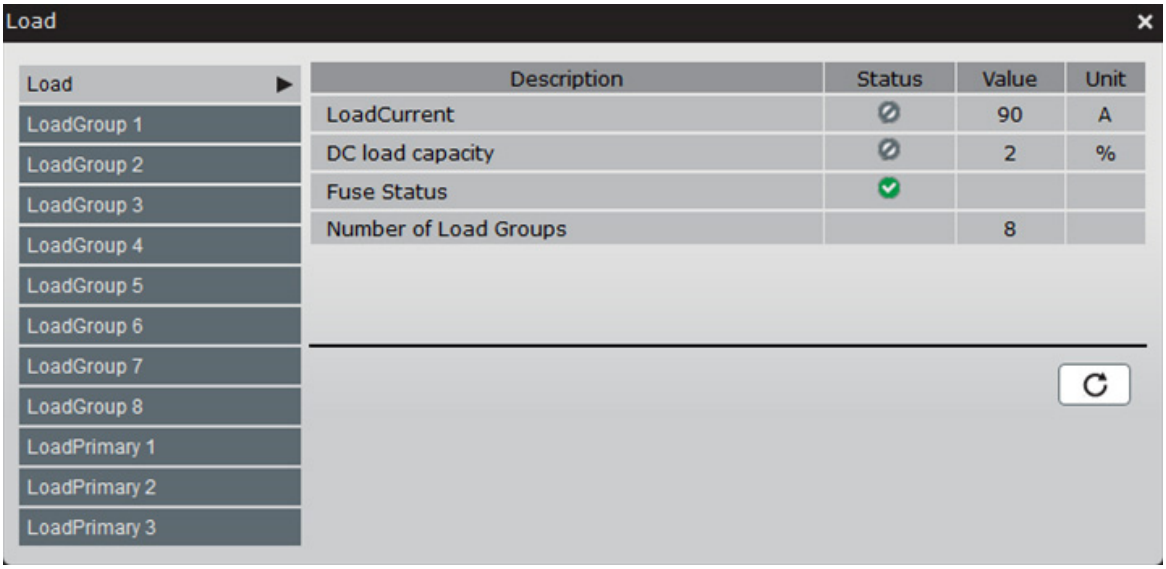


Figure 3.26 – Load Summary Window

- **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.
    - **DC load capacity** – indicates whether or not total DC load (rectifiers and rectiverters) is operating within a specified percentage of the output capacity for all modules.
    - **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.
    - **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. › Load › Configuration**).
  - **LoadGroup X** – Load monitor group for Eltek controllers (one group per controller).

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

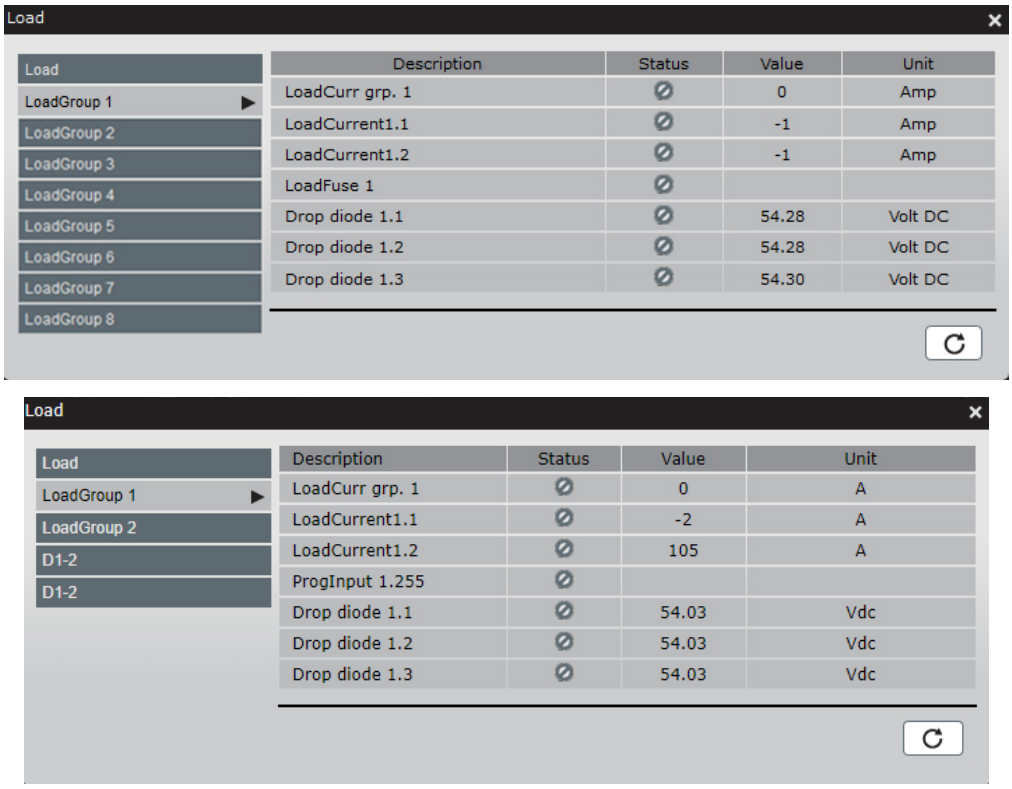


Figure 3.27 – Load Group Summary Window

- **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.
- **LVLD X** – indicates the status of a load LVD, if one is installed or active.
- **Drop diode X.Y** – indicates whether a drop diode is functioning properly (dropping voltage to the required level)

- **LoadPrimary X** – see section “Load Monitors,” on page 73.
- **Load CurMon X** – see section “Load Monitors,” on page 73.
- **Load FlexiMon X** – see section “Flexi Monitors,” on page 74.

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
		DC load capacity	Per cent	Major Minor
		Fuse Status	Yes/No	N/A
		LVLD Status	Yes/No	N/A
		Number of Load Groups	Sum	N/A
Load Group X		LoadCurr grp. 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. › Battery

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

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

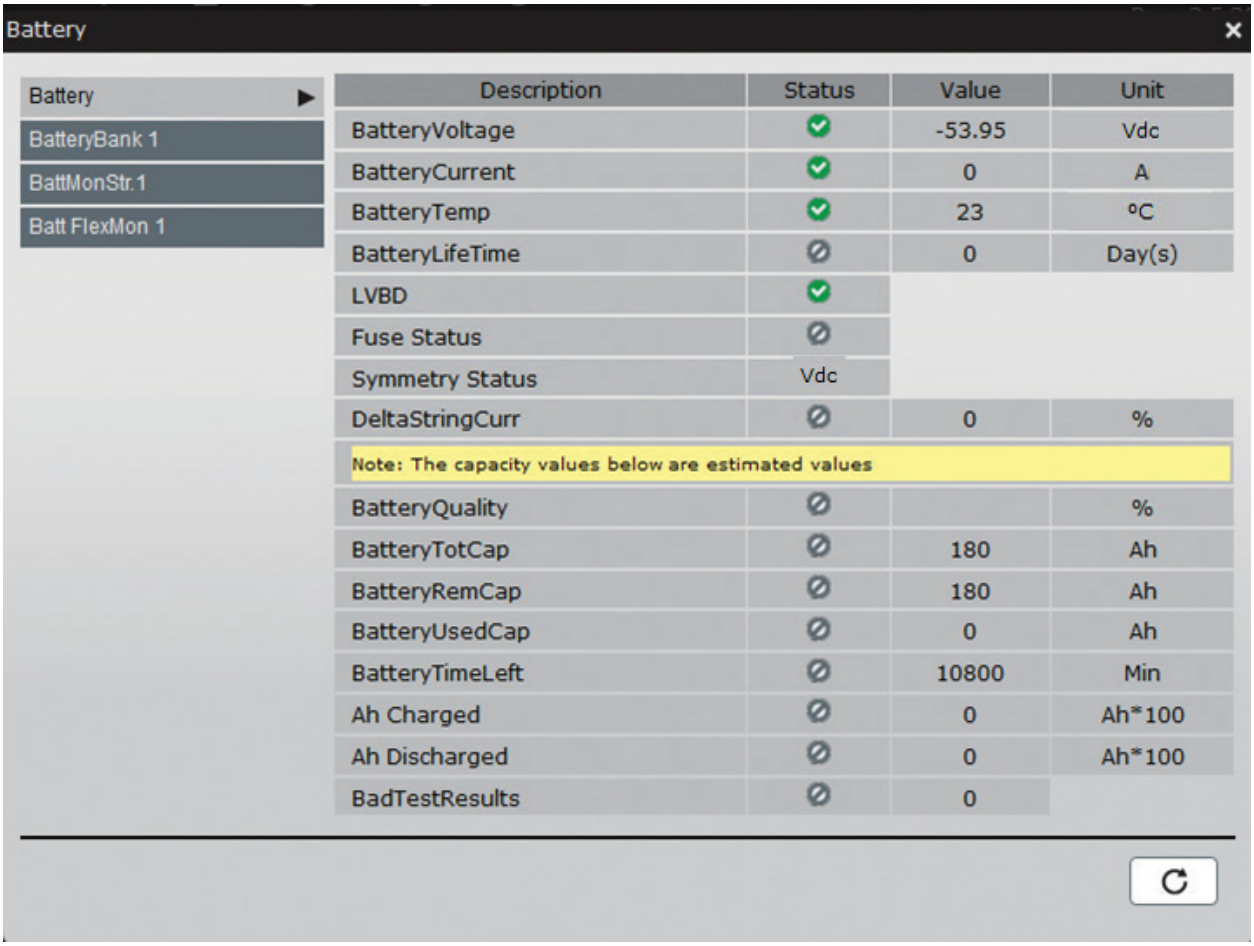


Figure 3.28 – Battery Summary Window

- **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 the life of the battery, in number of days, adjusted for temperature. The number of days is calculated by adding

the number of hours of operation within different temperature ranges, with a weighted factor that accounts for operation within high temperatures.

- **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, indicates that a battery string measurement has deviated from the average of all battery string measurements by a user-specified percentage. The Delta String Current value is an alarm monitor for the Battery Discontinuance Test.

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

- **BatteryQuality** – Battery Quality, 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. › Battery › Configuration**).

■ Voltage

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

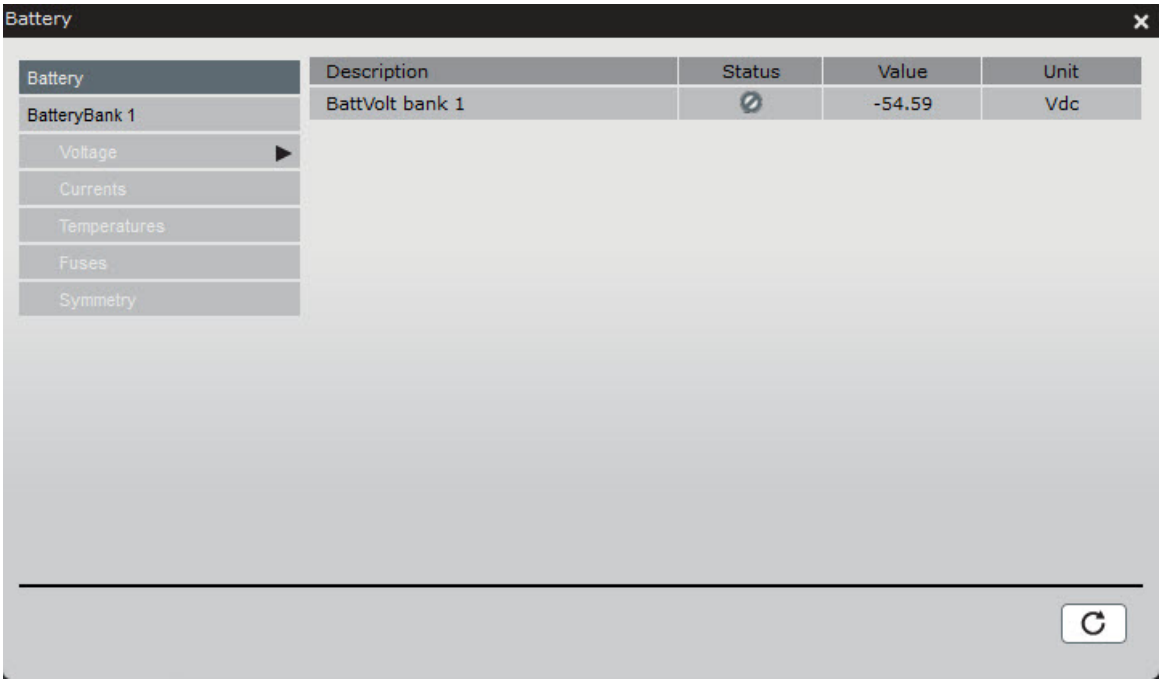


Figure 3.29 – Battery Bank Voltage Summary

- ☐ **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.

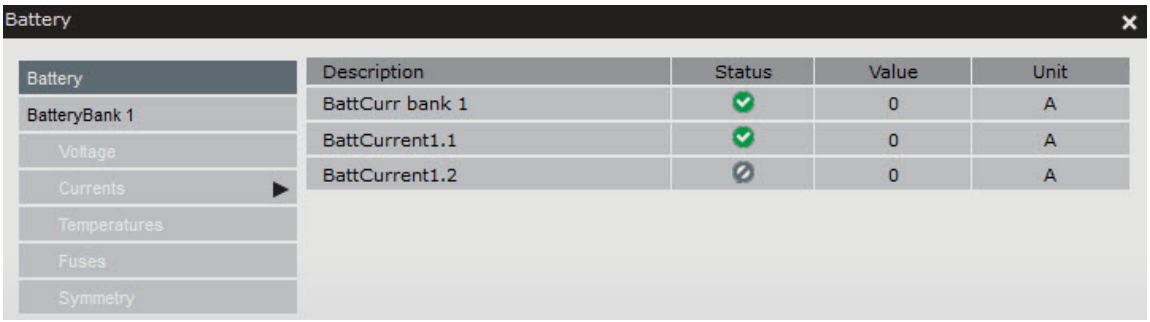


Figure 3.30 – Battery Bank Currents Summary

- ☐ **BattCurrent bank X** – indicates the status of the battery current inputs for the battery bank, whether they exceed the user-defined high and low current parameters.

■ **Temperatures**

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

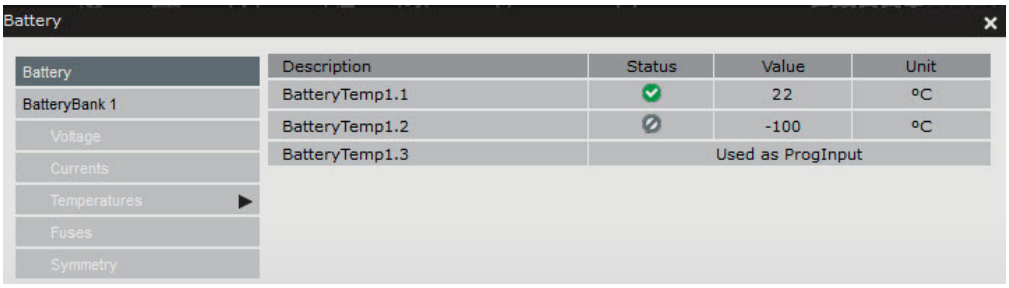


Figure 3.31 – Battery Bank Temperatures Summary

- ☐ **BatteryTempX.Y** – indicates the status of battery temperature inputs for the bank, whether any readings exceed the user-defined high and low temperature parameters.

■ Fuses

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

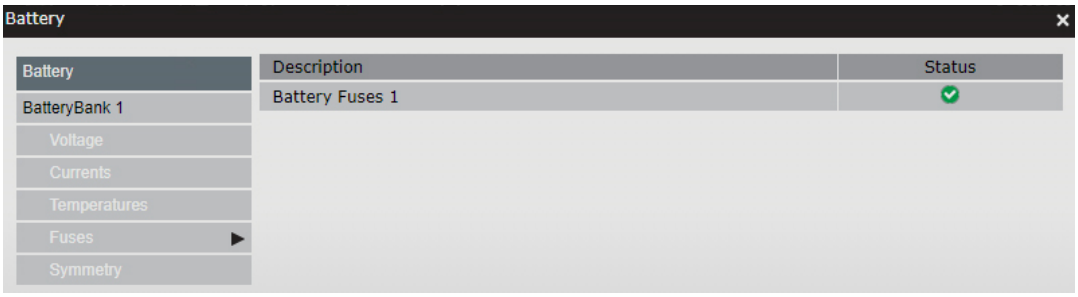


Figure 3.32 – Battery Bank Fuses Summary

- ☐ **BattFuses X** – indicates the status of any fuses or circuit breakers (open or closed).

■ **Symmetry**

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

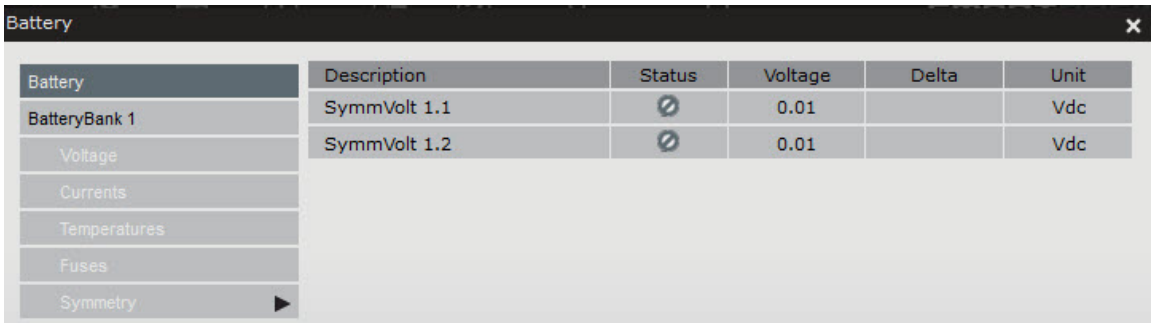


Figure 3.33 – Battery Bank Symmetry Summary

- ☐ **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:

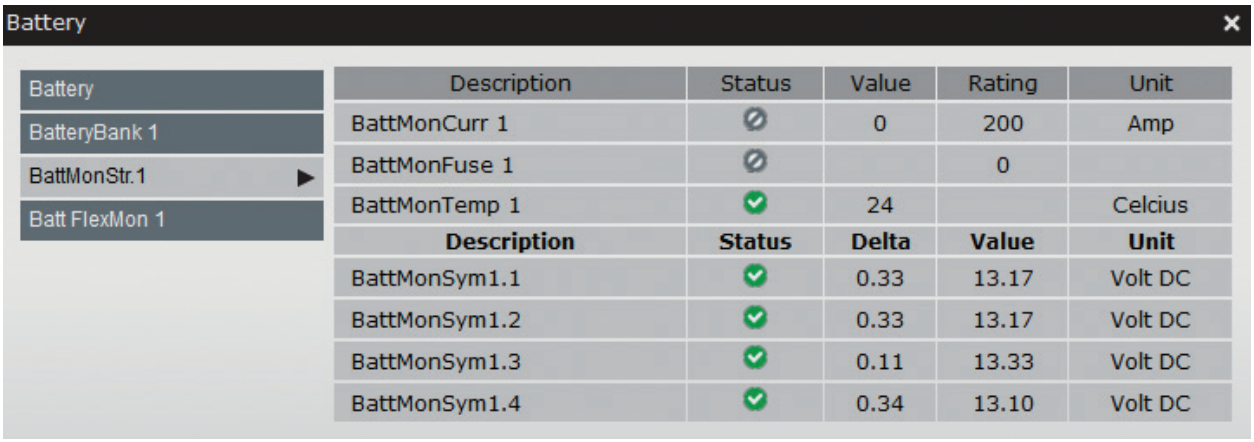


Figure 3.34 – Battery Monitor Summary Window

- **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)

o **Batt FlexiMon X** – see section "Flexi Monitors," on page 74.

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

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
		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
		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

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
		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
	Temperatures	BatteryTemp X.Y	Degrees	Major High
	Fuses	BattFuses X	N/A	Configurable
	Symmetry	SymmVolt X.Y	Volts (DC)	Major Minor
BattMonStr.X		BattMonCurr X	Amps	Major High Minor High Minor Low Major Low
		BattMonFuse X	N/A	Configurable
		BattMonTemp X	Degrees	Major High Minor High Minor Low Major Low
		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. › Control System › Current Monitor

Note: Load Monitors are also called **Current Monitors** in the browser 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. › [Applicable Device]

Note: The alarm monitors of Load Monitor devices appear under the power component for which they are configured (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. › Control System › Current Monitor

Flexi Monitor alarm monitors location:

Alarm Conf. › [Applicable Device]

Note: The alarm monitors of Flexi Monitor devices appear under the power component for which they are configured (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**

Rectifier: **Rect 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.

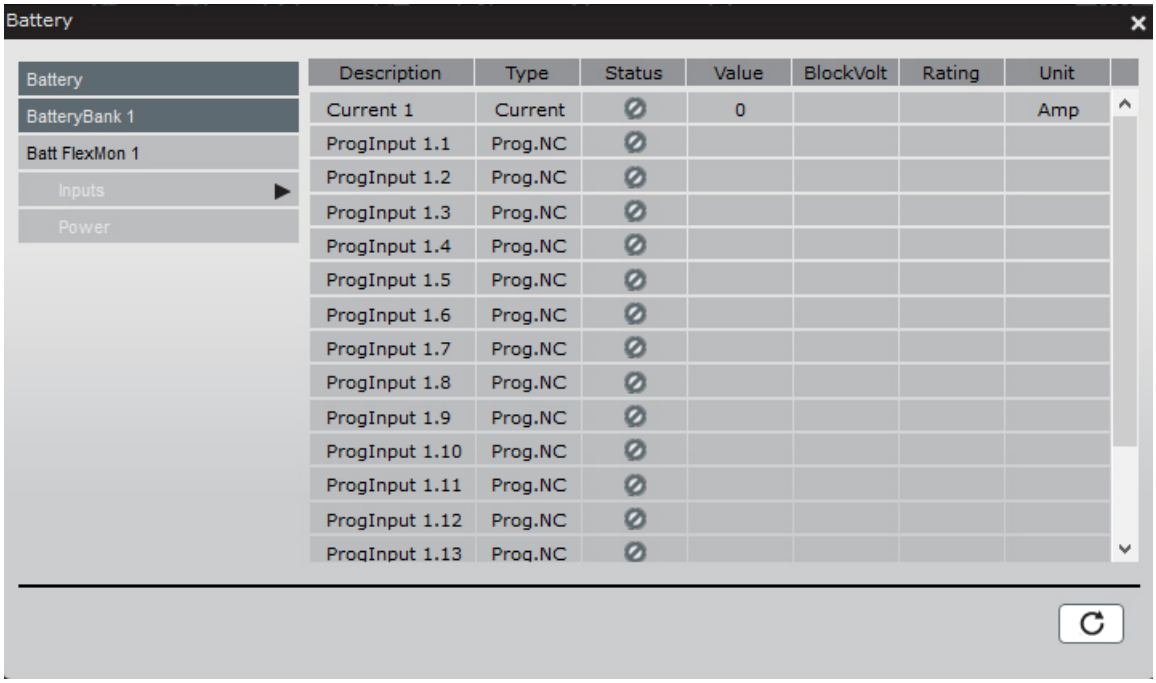


Figure 3.35 – Flexi Monitor Inputs Summary

- **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.

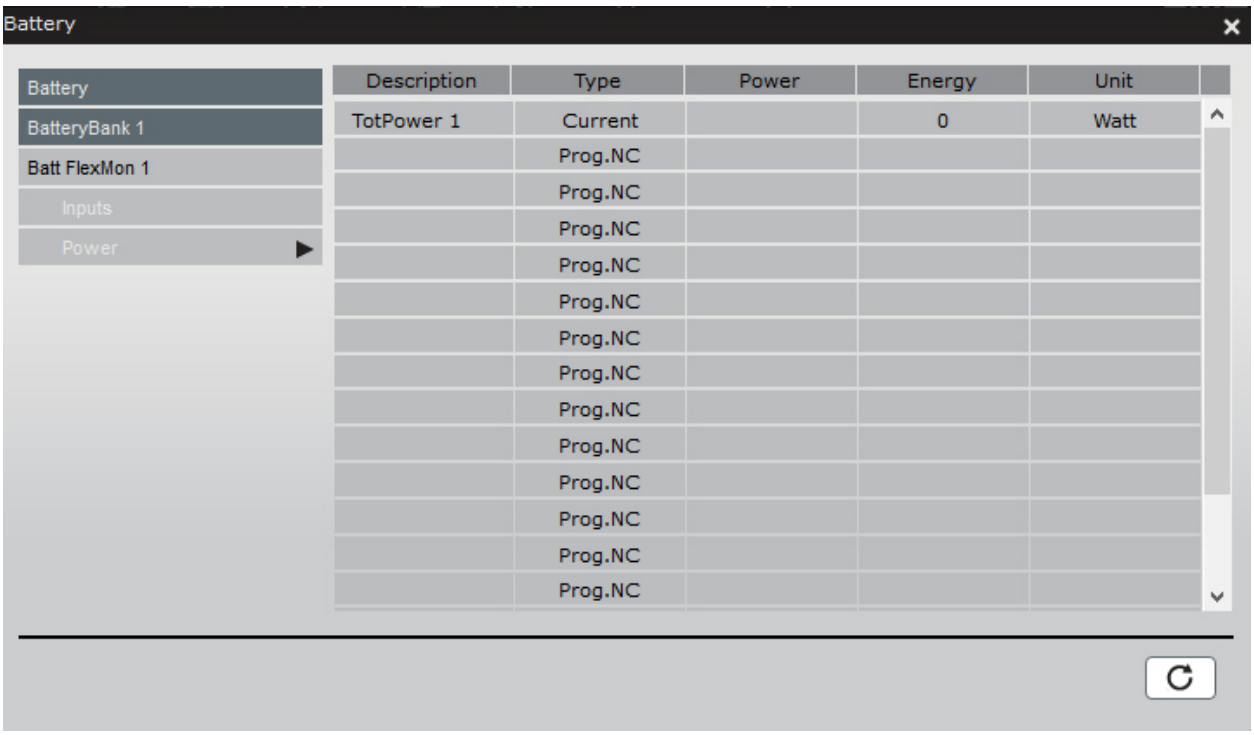


Figure 3.36 – Flexi Monitor Power Summary

- **TotPower X** – indicates whether the total power read over all inputs of the monitor is below the defined total power level.

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

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

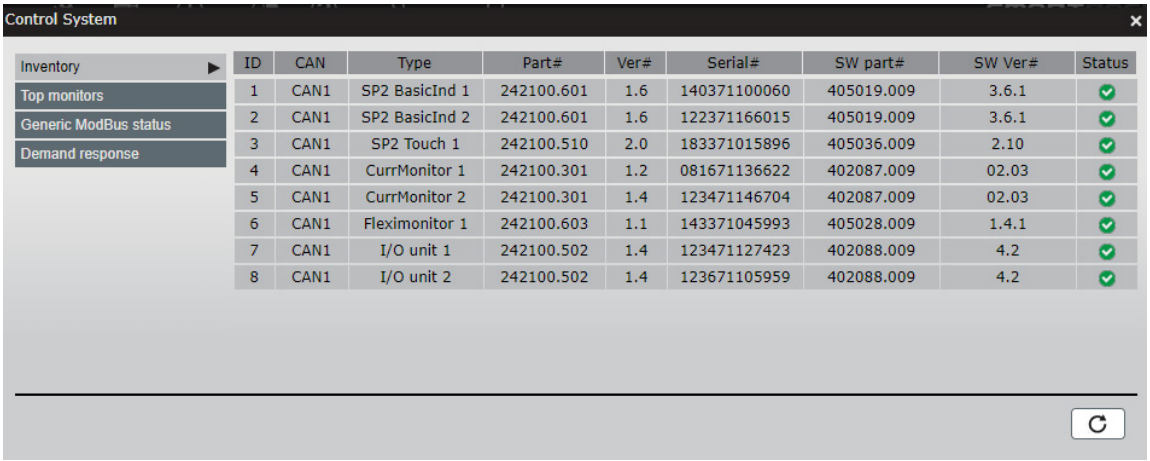


Clicking on the **Control System** button opens the **Control System** window, which initially displays an **Inventory** of lists connected CAN Nodes (controllers, monitors, etc.), including part numbers, version number (of the part), serial number, software number and version, and status.

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

Inventory

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



ID	CAN	Type	Part#	Ver#	Serial#	SW part#	SW Ver#	Status
1	CAN1	SP2 BasicInd 1	242100.601	1.6	140371100060	405019.009	3.6.1	
2	CAN1	SP2 BasicInd 2	242100.601	1.6	122371166015	405019.009	3.6.1	
3	CAN1	SP2 Touch 1	242100.510	2.0	183371015896	405036.009	2.10	
4	CAN1	CurrMonitor 1	242100.301	1.2	081671136622	402087.009	02.03	
5	CAN1	CurrMonitor 2	242100.301	1.4	123471146704	402087.009	02.03	
6	CAN1	Fleximonitor 1	242100.603	1.1	143371045993	405028.009	1.4.1	
7	CAN1	I/O unit 1	242100.502	1.4	123471127423	402088.009	4.2	
8	CAN1	I/O unit 2	242100.502	1.4	123671105959	402088.009	4.2	

Figure 3.37 – Control Units Inventory Summary

From the Control System page, you can also access the following sections

- **Top monitors** (next section, below) – top-level alarm monitors for controllers and monitoring devices.
- **Generic Modbus status** (page 80) –this section is only visible with the Basic Industrial Controller; it shows top-level alarm monitors in communication with third-party devices.
- **Demand Response** (page 81) – top-level alarm monitors for controllers and monitoring devices.

Top monitors

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

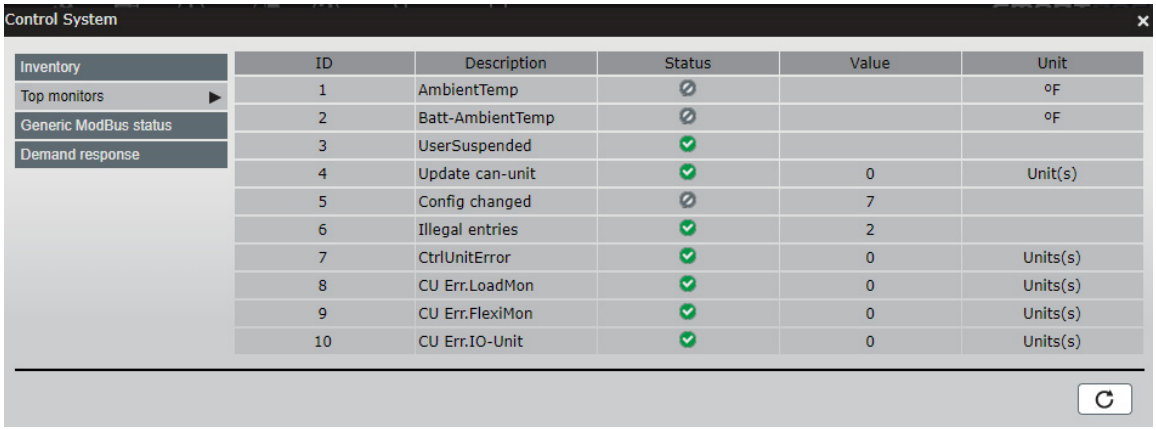


Figure 3.38 – Control System Top Monitors Summary Window

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.
- **Update can-unit** – indicates the need to update firmware on CAN unit(s), in order to work with rectiverters. For additional information about updating the firmware, see “Control System,” page 243.

- **Config changed** – indicates that changes that have been made to the configuration. For additional information about setting the alarm value, see “Control System,” page 243. The value set for the configuration changes is a cumulative total that continues counting, until the alarm is cleared. To clear the alarm, go to **Commands › System**, and click the **Apply** button for **Reset Manual Alarms(s)/Silence Buzzer** on the **System Commands** page.
- **Illegal entries** – indicates unsuccessful attempts to login, either from an invalid user name or invalid password. For additional information about setting the alarm value, see “Control System,” page 243.
- **CtrlUnitError** – indicates if there is an error in the primary controller (Smartpack2 Touch, Smartpack2 Master, Smartpack S, Smartpack R, or Compack).
- **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.
- **CU Err.FlexiMon** – indicates if there is an error in one or more of the Flexi Monitors.
- **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 – Top Monitors 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
		CtrlUnitError	Sum	Major Minor
		CU Err.IO-Unit	Sum	Major Minor

Generic Modbus status

This page shows alarm monitors for third-party devices configured through the **ModbusMaster** protocol found at **System Conf. › Power System › Control System › Communication**. Unless you have configured a specific third-party device, there are no parameters reported on this page. Device configuration is only available for Smartpack Touch, Smartpack S, Smartpack R, and Basic Industrial Controllers.

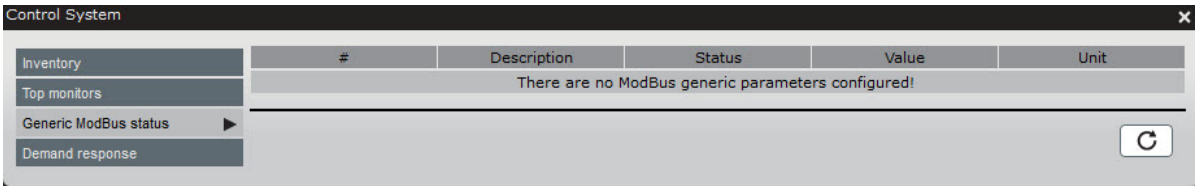


Figure 3.39 – Generic ModBus Summary Window

Demand Response

This page shows alarm monitors for Smart Power Demand response feature that is configured at **System Conf. › Smart Power › Demand response.** For details on Smart Power configuration see “Demand Response,” page 111.

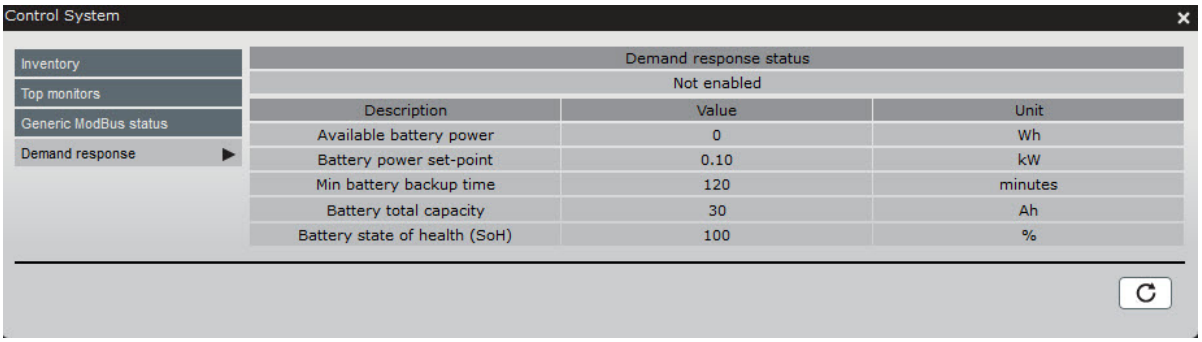


Figure 3.40 – Demand Response Summary Window

- **Available battery power** – indicates the watt hours of battery power available.
- **Battery power set-point** – indicates the value of the battery discharge power, as set in the system configuration for Smart Power.
- **Min battery backup time** – indicates the value of the minimum backup time, as set in the system configuration for Smart Power.
- **Battery total capacity** – indicates the value of the total battery capacity (the number of strings times the battery capacity), as set in the battery configuration (**System Conf. › Battery › Configuration**); see “General Battery Configuration,” page 127.
- **Battery state of health (SoH)** – indicates present capacity of all batteries, calculated as a percentage of the original capacity of the batteries.

Table 3.15 – Demand Response Status

Menu	Sub-Menu (if applicable)	Alarm Monitor	Units Type	Alarm Type(s)
Demand response	Available battery power		Wh	N/A
	Battery power set-point		kW	N/A
	Min battery backup time		minutes	N/A
	Battery total capacity		Ah	N/A
	Battery state of health (SoH)		Per cent	N/A

System Inputs

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



Input alarm monitors location:

Alarm Conf. › Inputs

- **Inputs Summary** – summary window of controller and monitor inputs
  - **SP2 Touch** – The Smartpack2 Touch is the master controller of the Smartpack2 controller family; includes an interactive screen and Ethernet port for the browser interface.
    - **Virtual Input X** – indicates if a virtual input is active.

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

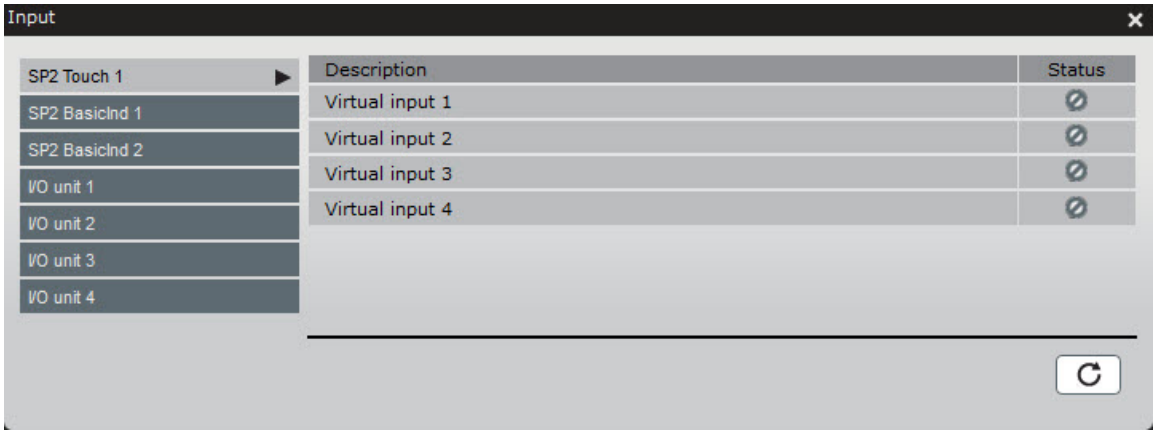


Figure 3.41 – Input Summary Window (with Smartpack2 Touch)

- **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:

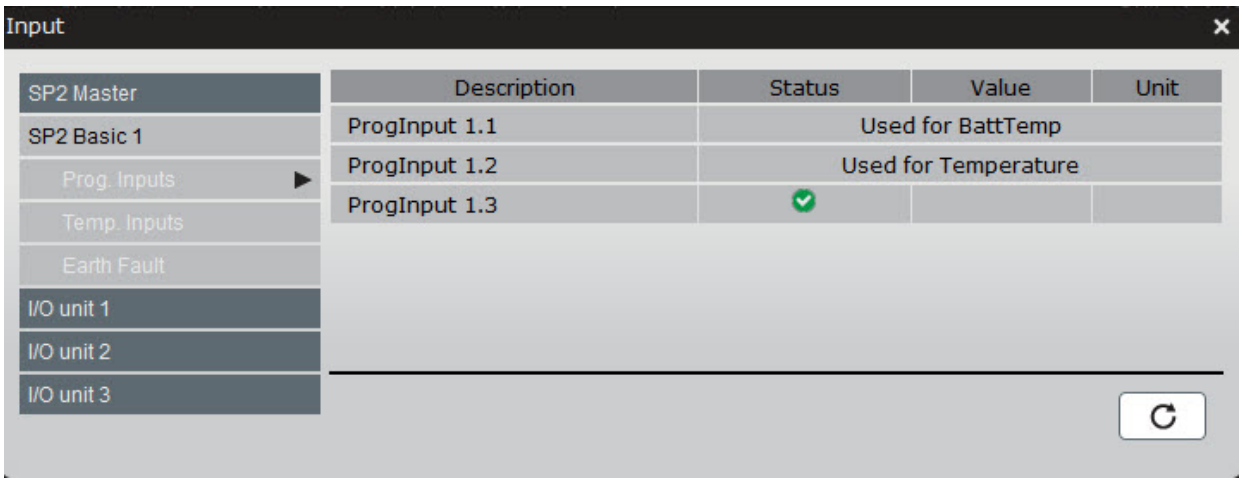


Figure 3.42 – Smartpack2 Basic Programmable Inputs

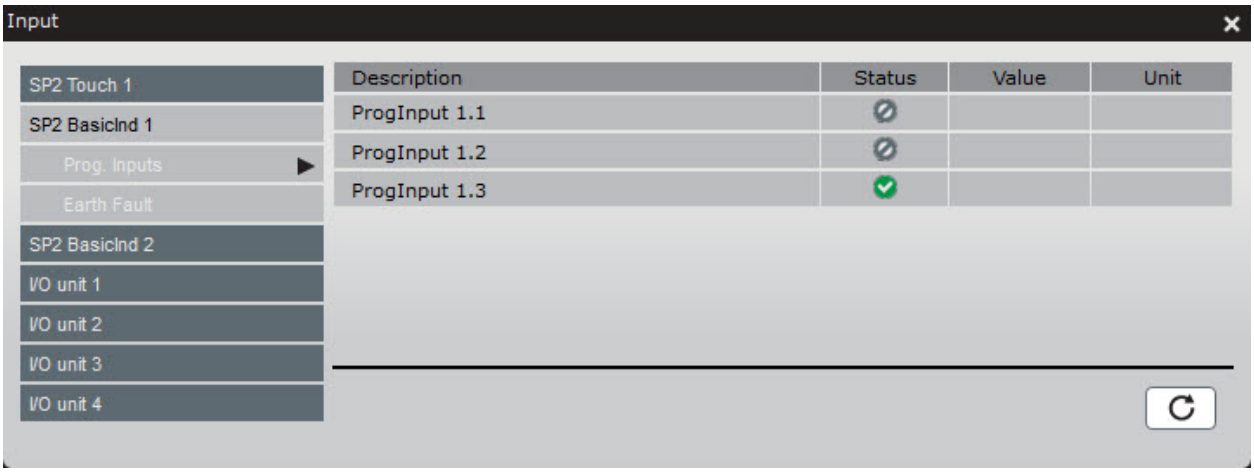


Figure 3.43 – Smartpack2 Basic Industrial Programmable Inputs

- **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:

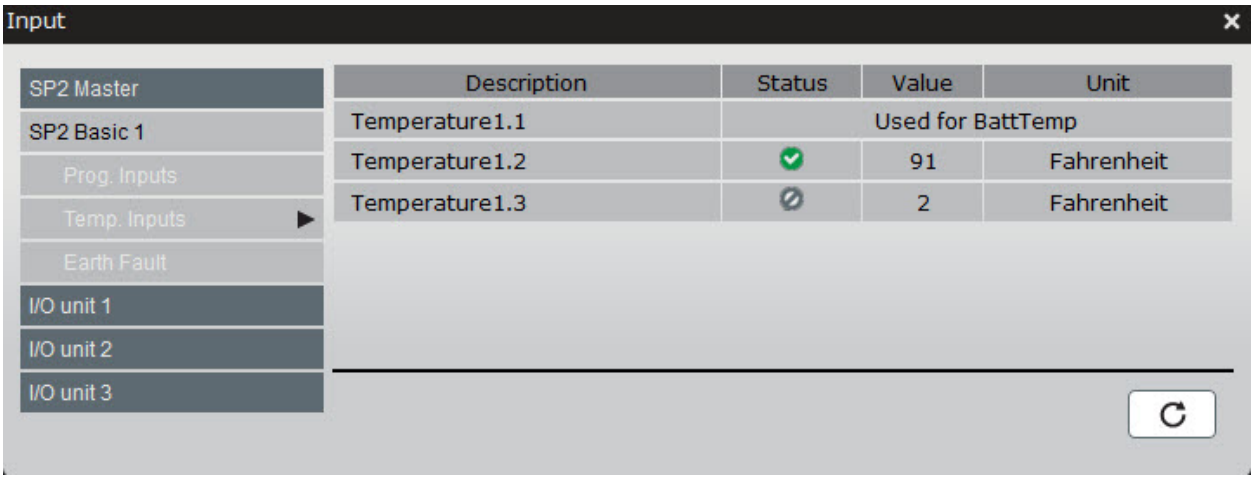


Figure 3.44 – Smartpack2 Basic Temperature Inputs

- **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.

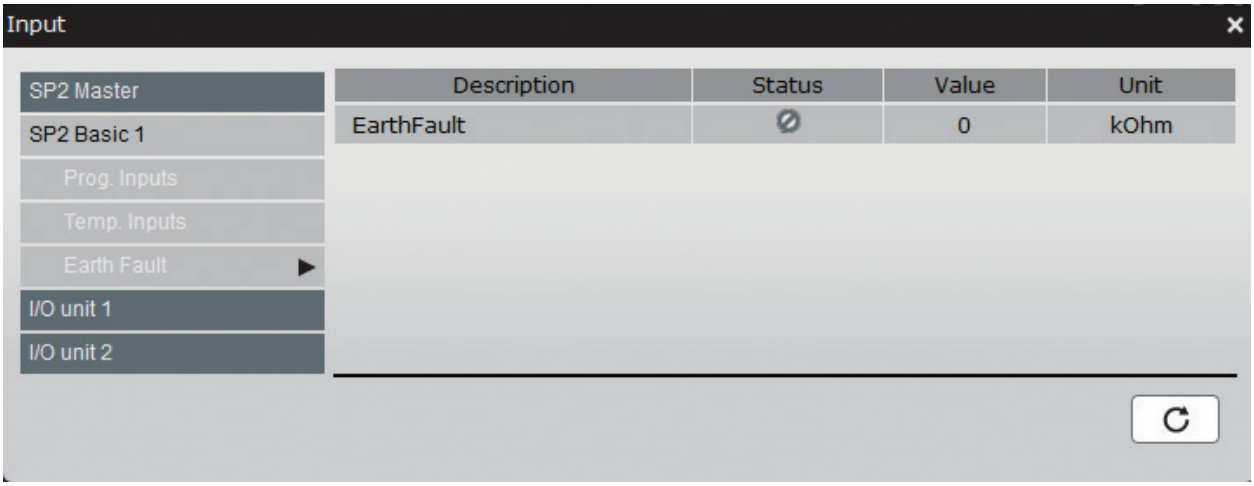


Figure 3.45 – Smartpack2 Basic Earth (Ground) Fault Inputs

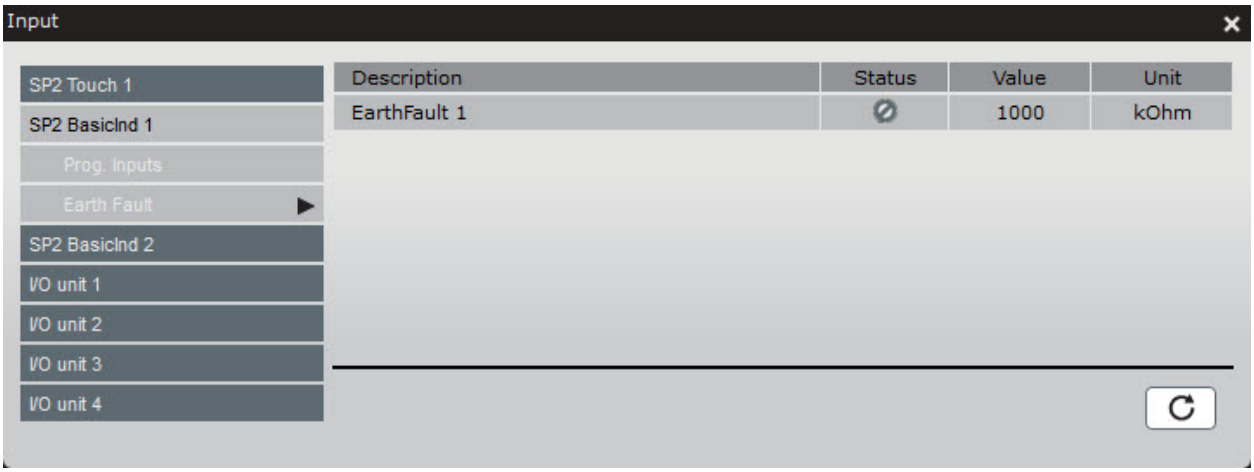


Figure 3.46 – Smartpack2 Basic Industrial Earth (Ground) Fault Inputs

- **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. 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.

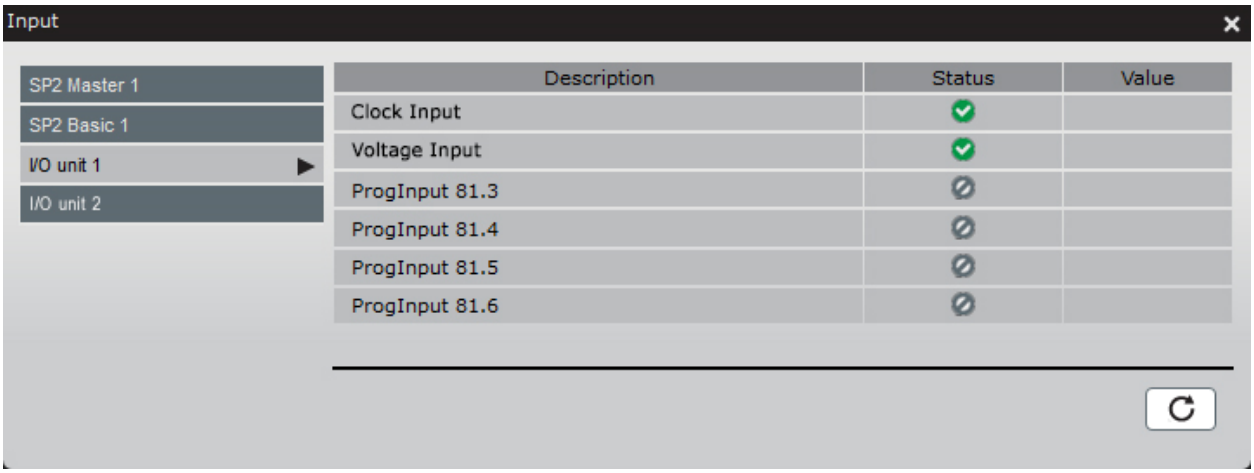


Figure 3.47 – I/O Unit Alarm Monitors (Basic Controller)

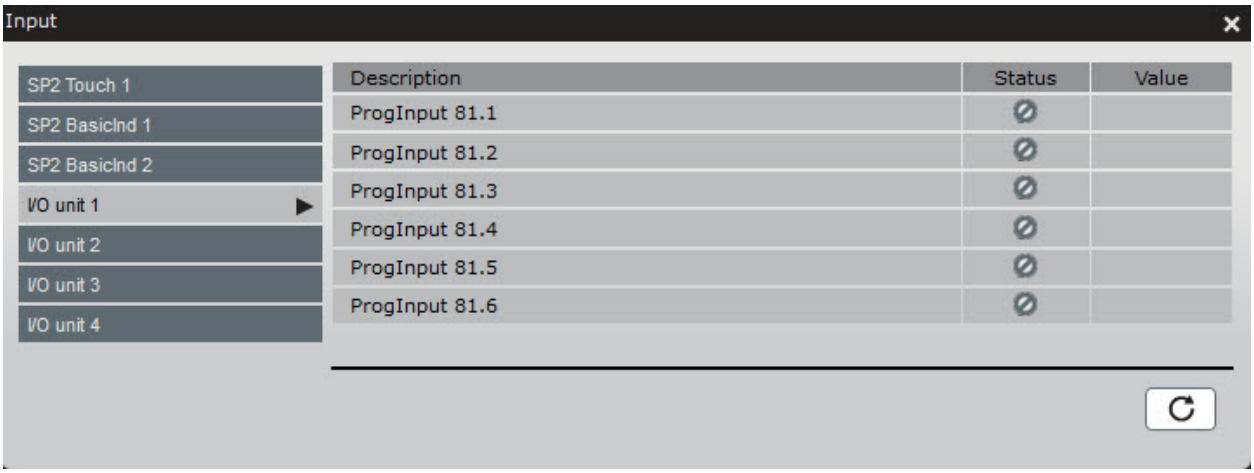


Figure 3.48 – I/O Unit Alarm Monitors (Basic Industrial Controller)

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. › 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:

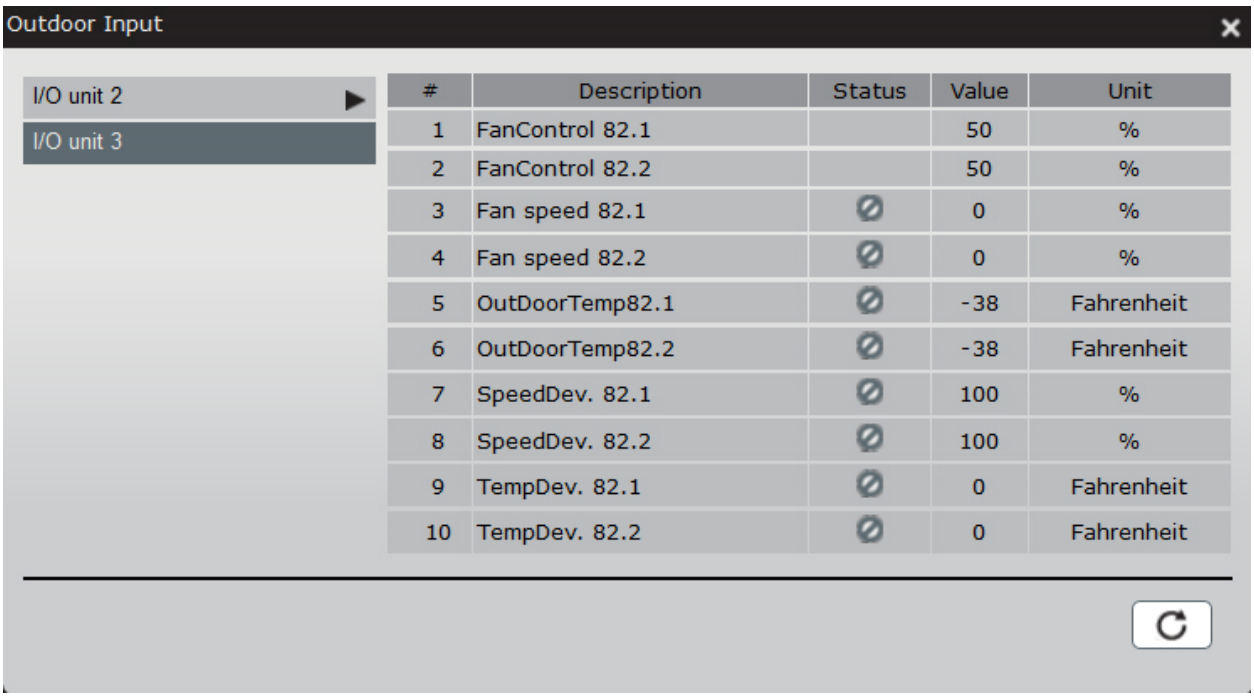


Figure 3.49 – Outdoor Input Summary Window

- **FanControl XX.Y** – the percentage of the fan speed specified by the controller; intended for use with **SpeedDev. XX.Y** (below).
- **Fan speed XX.Y** – the actual measured fan speed, expressed as a percentage of the maximum rated speed for the fan; 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. › 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 3.16 – Input Alarm Monitors

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

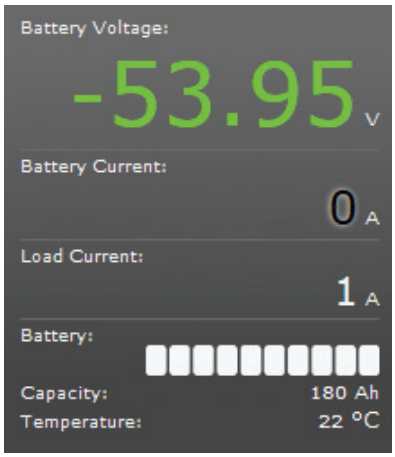


Figure 3.50 – System Measurements Panel

- **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.

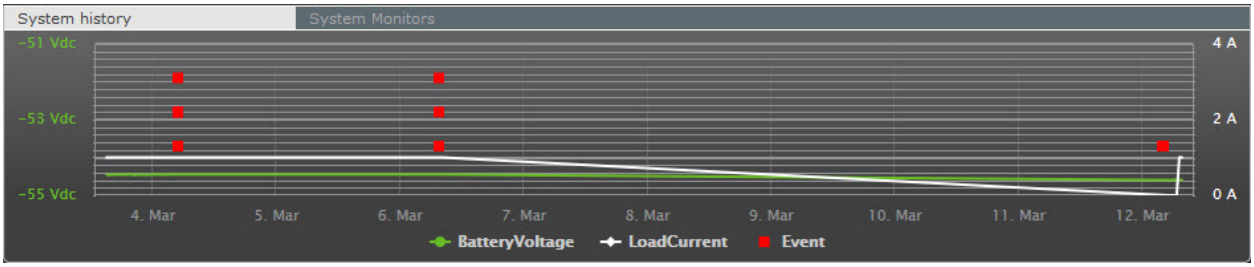


Figure 3.51 – System History Graph

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 symbols and names in the legend (below the graph).

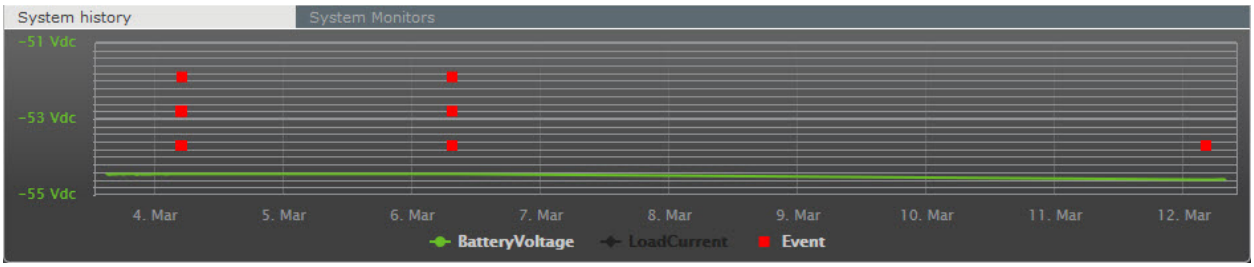


Figure 3.52 – Load Current Toggled OFF

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

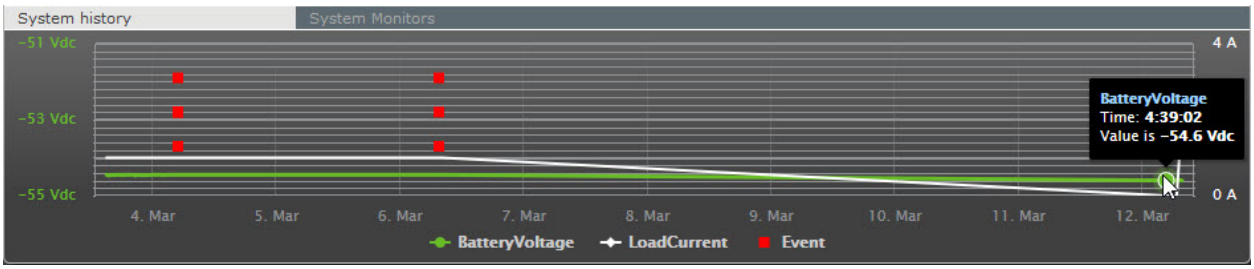


Figure 3.53 – Data Point Highlighted

System Monitors Window

The System Monitors window provides real-time data reported by each controller and monitor connected to the Smartpack2 controller CAN bus. These monitors are user configurable, see section **System Conf .› Control System›Data Log › Advanced**.

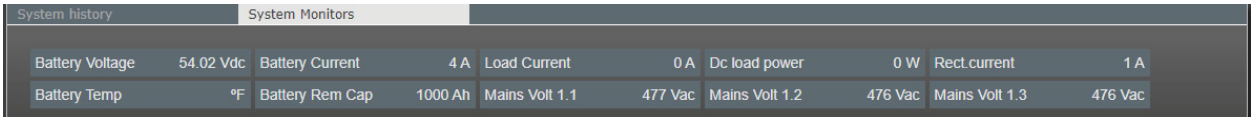


Figure 3.54 – Default System Monitors

The default metrics listed are:

- Battery Voltage
- Mains (AC utility) voltage
- Battery Temperature
- Battery Current
- Battery Remaining Capacity
- Load Current
- Total Rectifier Current
- DC load power

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
  - Rectifier
  - Load
  - Battery
  - Control System
- Device Settings
  - General Settings
  - Network Settings
  - SNMP Settings
  - User Accounts

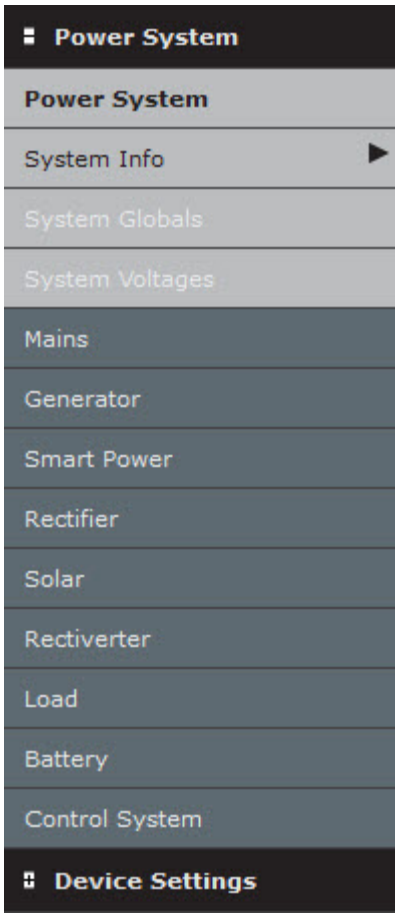


Figure 4.1 – System Configuration Navigation Buttons

In addition to the default navigational buttons, others appear under Power System when the power modules are either present or configured for monitoring:

- Smart Power
- DCDC
- Solar
- Wind
- FuelC (fuel cell)
- Rectiverter

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.

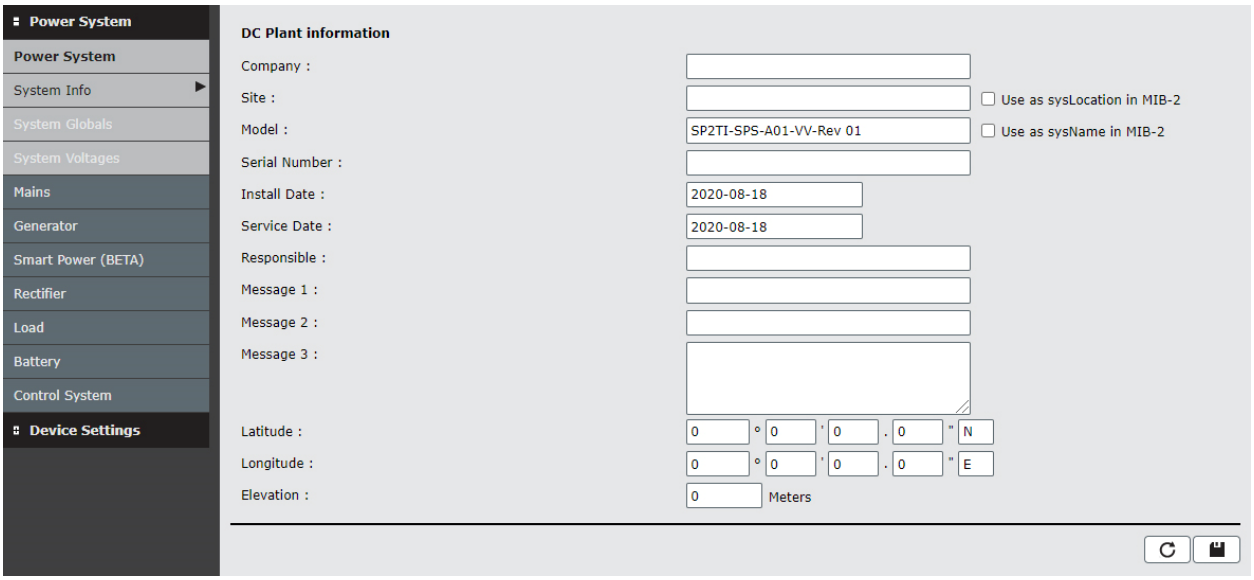


Figure 4.2 – Power System – System Info Page

Note: All fields on this page are optional; none is required. These fields are provided for discretionary purposes by the end user, customer, operator, or owner.

- **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**).
- **Use as sysLocation in MIB-2** – uses the **Site** name for the syslocation (system location) in standard SNMP MIB-2 (RFC 1213).

  Note: To give SNMP v2/v1 users read-write access to standard MIBs, please set **Read View**, **Write View** or **Notifiy View** of **snmpv2c-group**/**snmpsv1-group** to admin-view (**System Conf. › Device Settings › SNMP Settings › Vacm Access**).

- **Model** – model name of the power system.
- **Use as sysName in MIB-2** – uses the **Model** name for the syslocation (system location) in standard SNMP MIB-2 (RFC 1213).

  Note: To give SNMP v2/v1 users read-write access to standard MIBs, please set **Read View**, **Write View** or **Notifiy View** of **snmpv2c-group**/**snmpsv1-group** to admin-view (**System Conf. › Device Settings › SNMP Settings › Vacm Access**).
- **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.
- **Message 3** – 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.

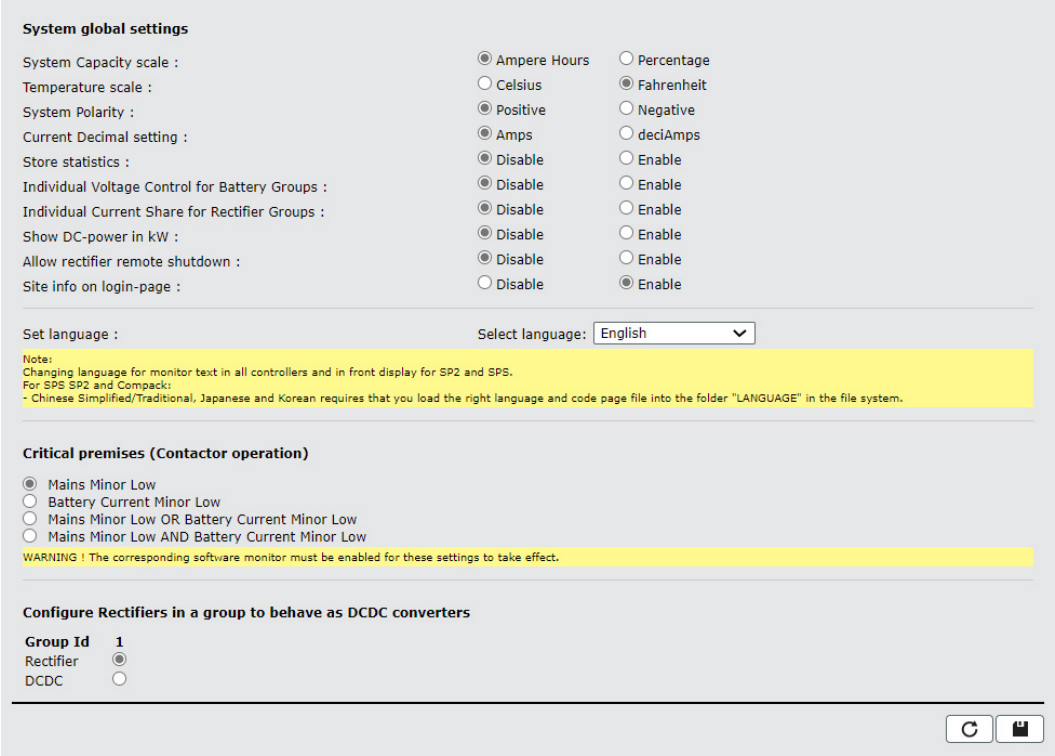


Figure 4.3 – Power System – System Globals Page

- **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 324.
- **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).
- **Site info on login-page** – display site summary information on the login-page.

- **Set Language –** The default language is English. You can change to another language using the menu list.
- **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 voltage (mains) and/or low battery current. The choice affects when the low-voltage disconnect (LVD) contactor may be disconnected; the battery contactor disconnects in a critical condition and reconnects in a normal condition.

  Note: The corresponding software monitor must be enabled for these settings to take place. See “Alarm Configuration Menus,” on page 219.

  - **Mains Minor Low** – AC mains low voltage 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. › Rectifiers**.

System Voltages

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

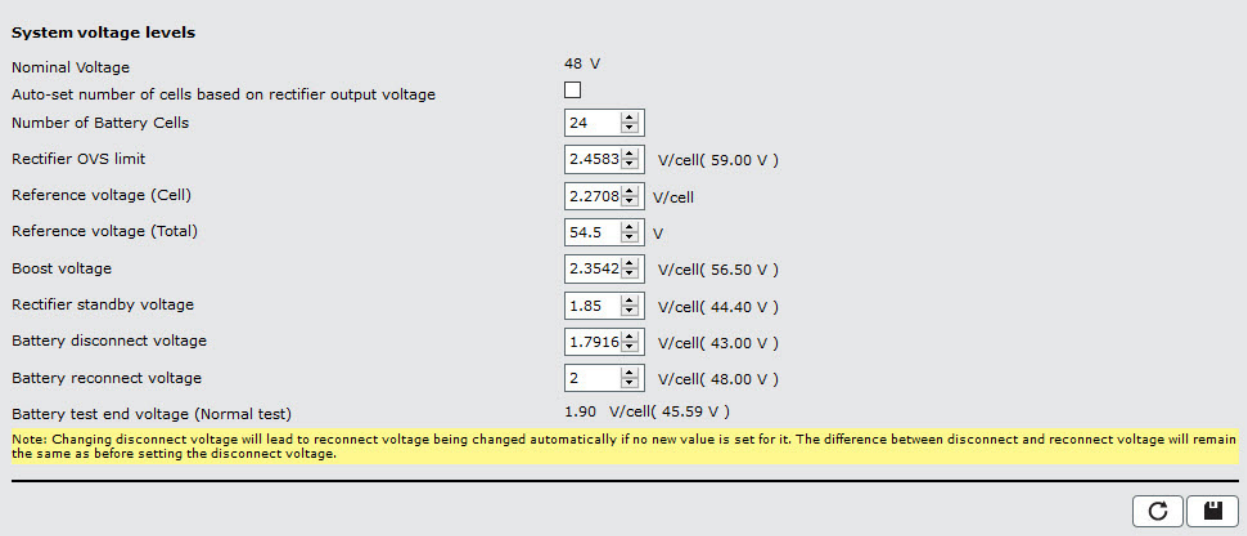


Figure 4.4 – Power System – System Voltages Page

- **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.
- **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. › Rectifiers › Configuration**.
- **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. › 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. › Battery ›TempComp**.

If **Reference voltage (Total)** is changed and saved, then **Reference voltage (Cell)** updates as follows: Reference voltage (Total) ÷ 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)	Reference voltage (Total) = Reference voltage (Cell) X Number of Battery Cells
Reference voltage (Total)	Reference voltage (Cell) = Reference voltage (Total) ÷ 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. › 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.

- **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. › 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. › 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. › Battery › Test**), which is derived from the battery definition table (**System Conf. › 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 browser. 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. > Battery > TempComp
Boost voltage	Boost voltage	System Conf. > Battery > Boost
Rectifier OVS limit	Over voltage shutdown (OVS) limit	System Conf. > Rectifiers > Configuration
Battery disconnect voltage	Disconnect voltage [V]	System Conf. > Battery > Configuration Battery contactor table
Battery reconnect voltage	Reconnect voltage [V]	System Conf. > Battery > Configuration Battery contactor table

Mains

The **Mains** page is for configuring AC input (mains) parameters. The Mains page is configured differently when the controller is configured without groups or with groups. Both configurations are described below.

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

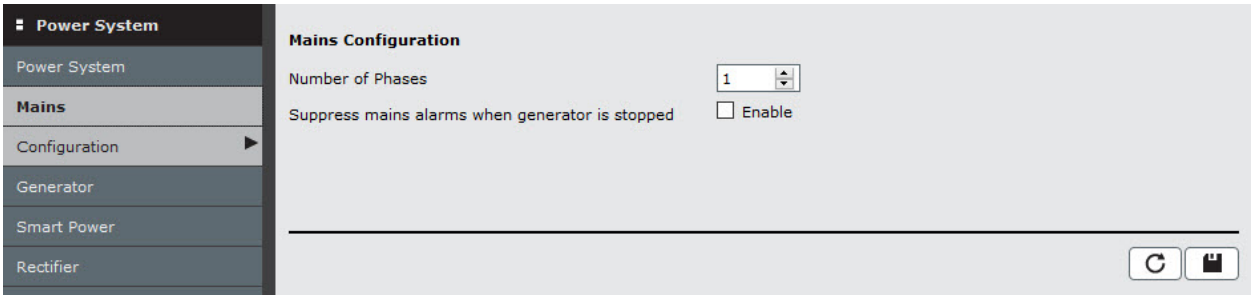


Figure 4.5 – AC Mains Page – Without Groups

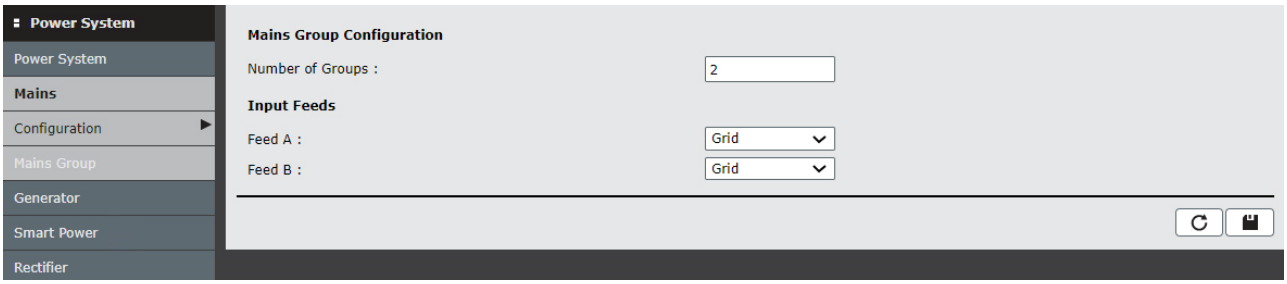


Figure 4.6 – Mains Summary Page – With Groups

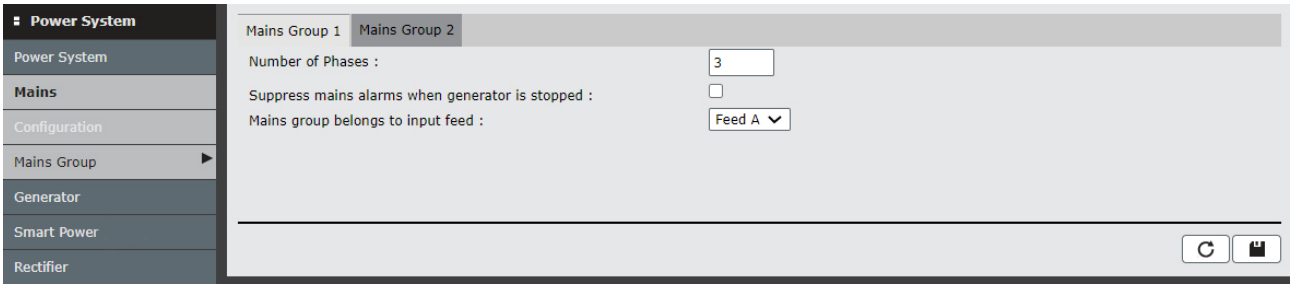


Figure 4.7 – Mains Group Configuration Page

- **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 –when Smartpack2 Basic Industrial controllers are present.

- **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). When the number of groups is two or more, you will see an additional navigational button (on the left) for the **Mains Group** page; this page is used to set additional parameters for each mains group.

- **Feed A** – Choose the power source of Feed A from the menu list **Grid**, **Generator**, or **DC**. Used in rectifier systems with different mains input sources.
- **Feed B** – Choose the power source of Feed B from the menu list: **Grid**, **Generator**, or **DC**.

  Note: A+B systems are rectifier systems with different mains input sources. Feed A and Feed B designations allow you to choose the type of feed to be configured on the **Mains Group** page.
- **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.
- **Mains group belong to input feed** – Configures the input feed for each mains group. Options are **Feed A** or **Feed B**. These feeds are displayed on the home page.

Generator

The **Generator** section is for configuring parameters to control (turn on or off) up to two AC generators.

General

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

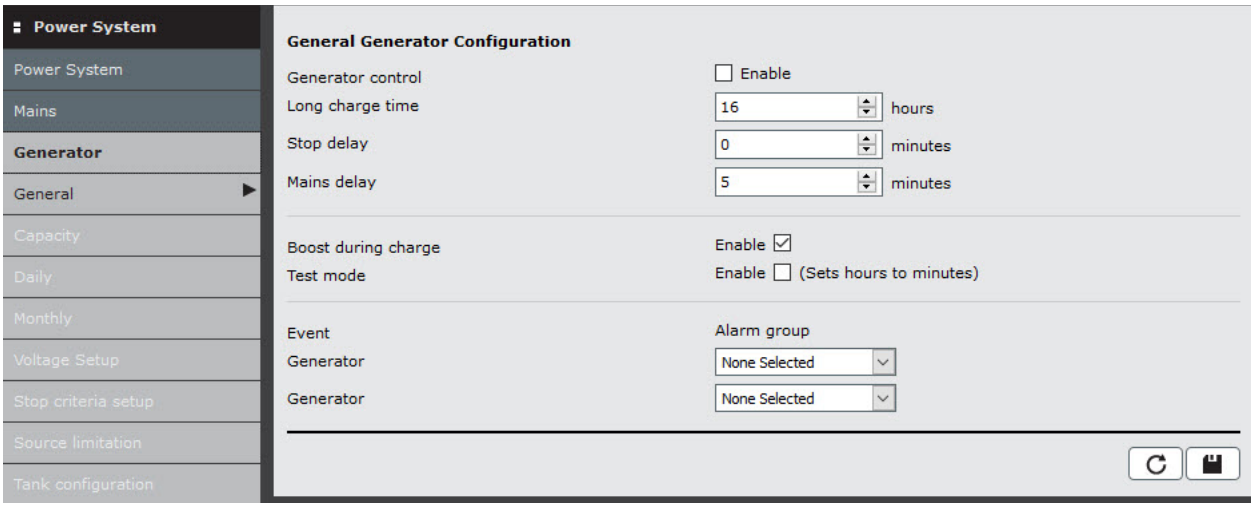


Figure 4.8 – Generator General Page

- **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 › System Voltages**). **Generator control** must be enabled.
- **Stop delay** – time delay in minutes that the generator should wait to shut off after the stop criteria have been reached (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.

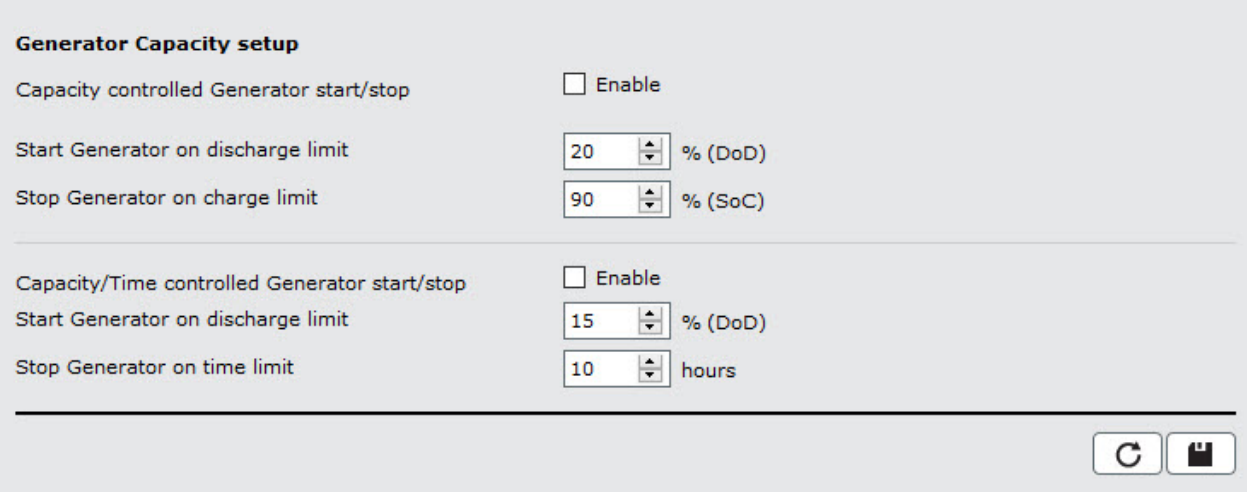


Figure 4.9 – Generator Capacity Page

- **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.

Daily

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

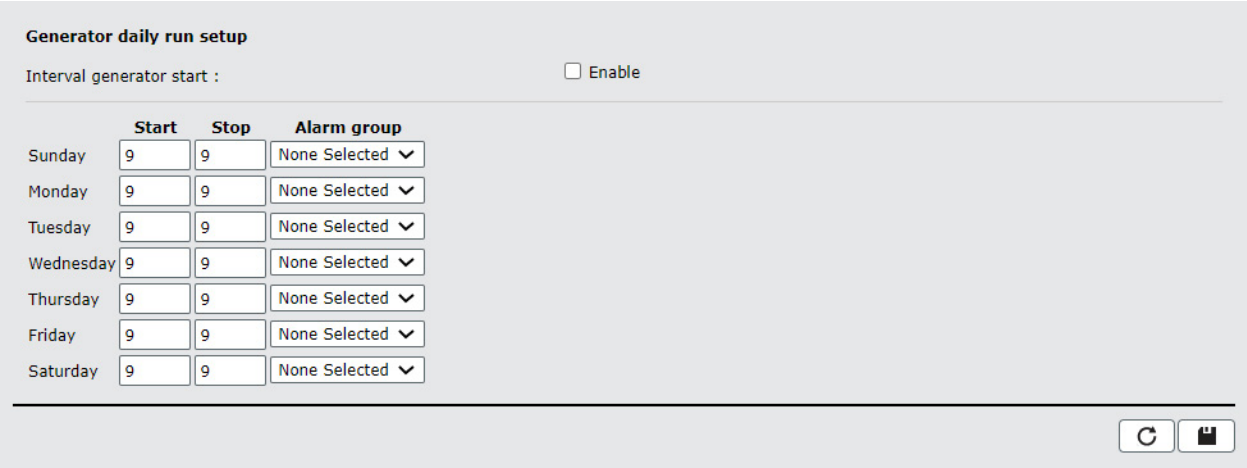


Figure 4.10 – Generator Daily Setup Page

- **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.

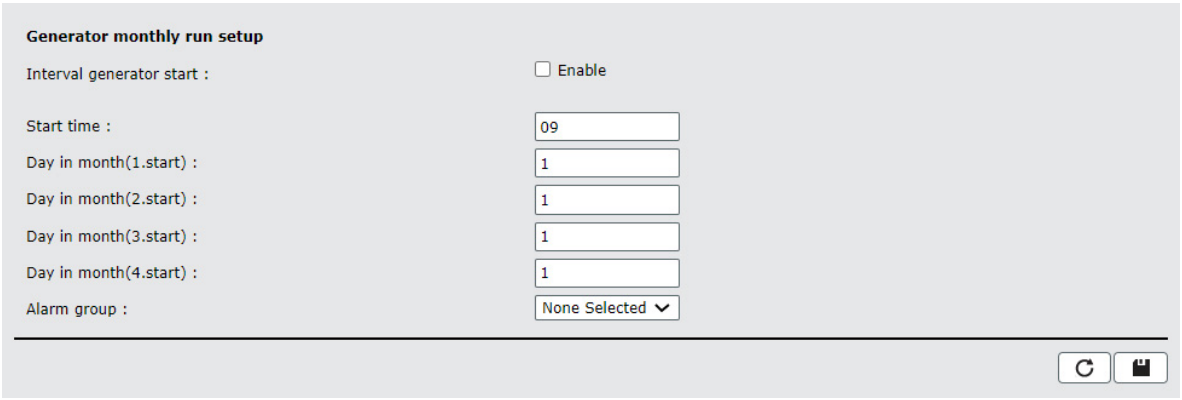


Figure 4.11 – Generator Monthly Setup Page

- **Interval 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).
- **Day in month (3.start)** – day of the month to turn on the generator (1-31, DD format).
- **Day in month (4.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.

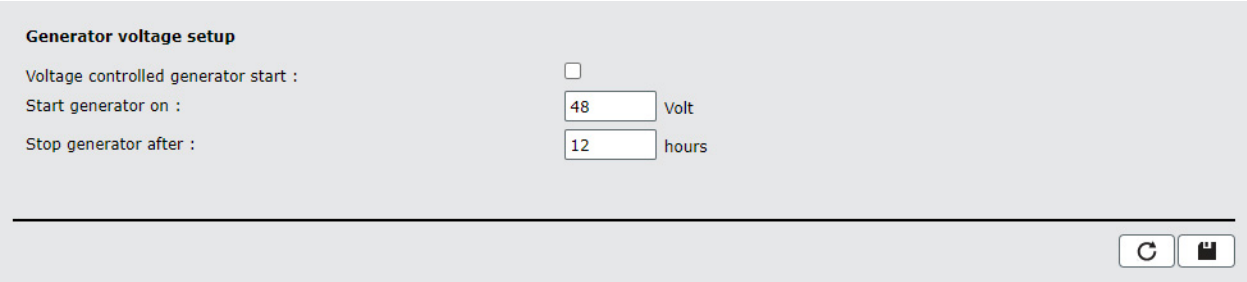


Figure 4.12 – Generator Voltage Setup Page

- **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).

Stop criteria setup

The **Stop criteria setup** page is for configuring generator stop criteria based on current value.

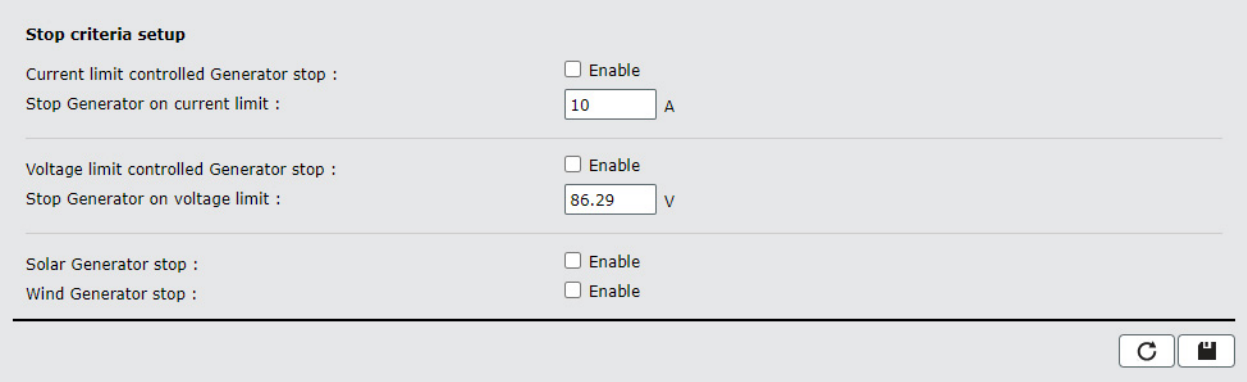


Figure 4.13 – Generator Stop Criteria Setup Page

- **Current limit controlled Generator stop** – check this box to enable the feature to stop the generator based on specified current value for the rectifiers.
- **Stop Generator on current limit** – the current value when the generator will stop.
- **Voltage limit controlled Generator stop** – check this box to enable the feature to stop the generator based on the specified voltage value.
- **Stop Generator on voltage limit** – the voltage value when the generator will stop.
- **Solar Generator stop** – check this box to stop the generator when solar charger is active and capable of carrying the load current for ten minutes.
- **Wind Generator stop** – check this box to stop the generator when wind charger is active and capable of carrying the load current for ten minutes.

Source limitation

The **Source limitation setup** page is for configuring parameters to test generator functionality in data center applications where some rectifiers operate on mains

power and other rectifiers operate on generator. A Basic Industrial controller is required for the feature to function.

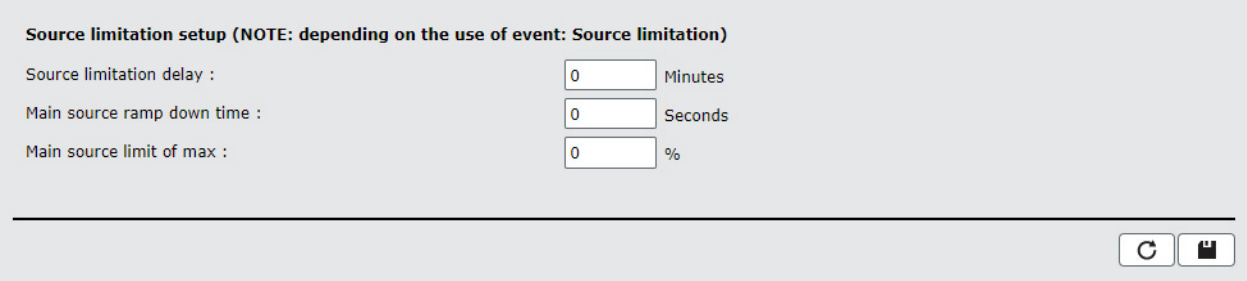


Figure 4.14 – Generator Source Limitation Setup Page

- **Source limitation delay** – the amount of time, in minutes, the controller will delay switching the source of the load from the mains to the generator.
- **Main source ramp down time** – the amount of time, in seconds, the main source will take to ramp down to the main source limit.
- **Main source limit max** – the maximum percentage the controller will allow from the main source.

Tank Configuration

The **Tank Configuration** section is for configuring parameters to monitor diesel generator tanks.

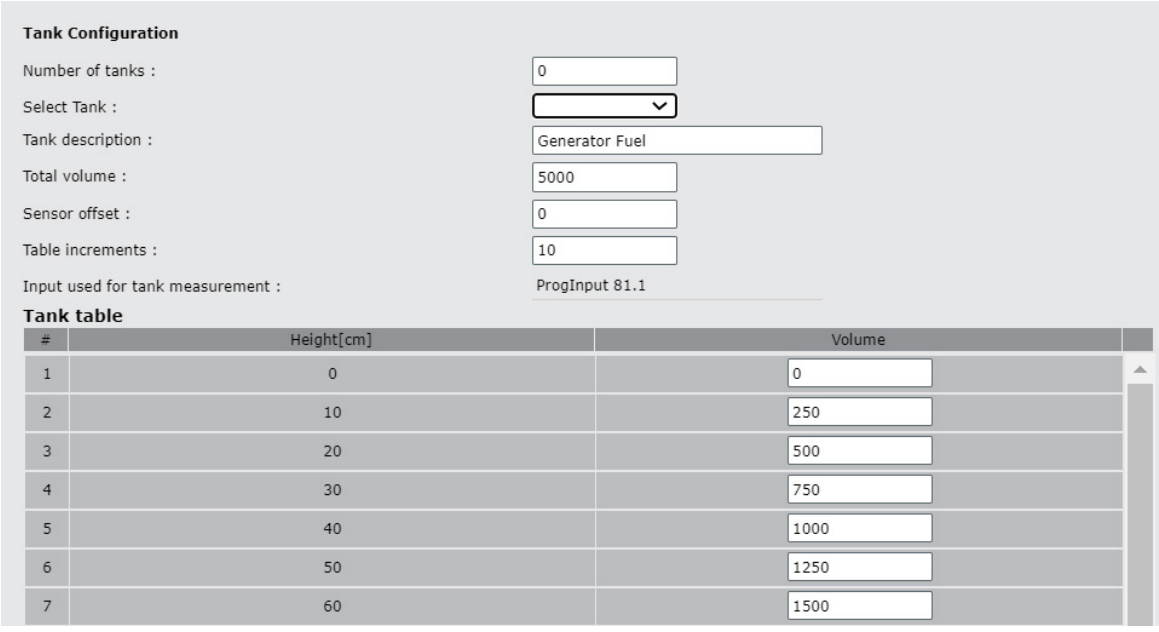


Figure 4.15 – Tank Configuration Page

- **Number of tanks** – Number of fuel tanks monitored in a generator (maximum of two tanks).
- **Select Tank** – Individual tank to be configured.
- **Tank description** – A user-provided description for the tank (recommended to put volume units within the description).
- **Total volume** – Size of the tank (liquid measure of fuel) in desired units. The volume may be entered in liters, gallons, or any other suitable units.
- **Sensor offset** – An offset value to compensate for the unmeasured length, in centimeters, at the bottom of the sensor.
- **Table increments** – Increment used as a scale, in centimeters, to correlate with volume measurements
- **Input used for tank measurement** – the programmable input of the monitor (I/O Monitor, FlexiMonitor, etc.) connected to the sensor. The input is configured in the **Tank Sensor** section (see next section, below).

Tank Sensor

The **Tank Sensor** section is used to select the particular input associated with the fuel sensor.

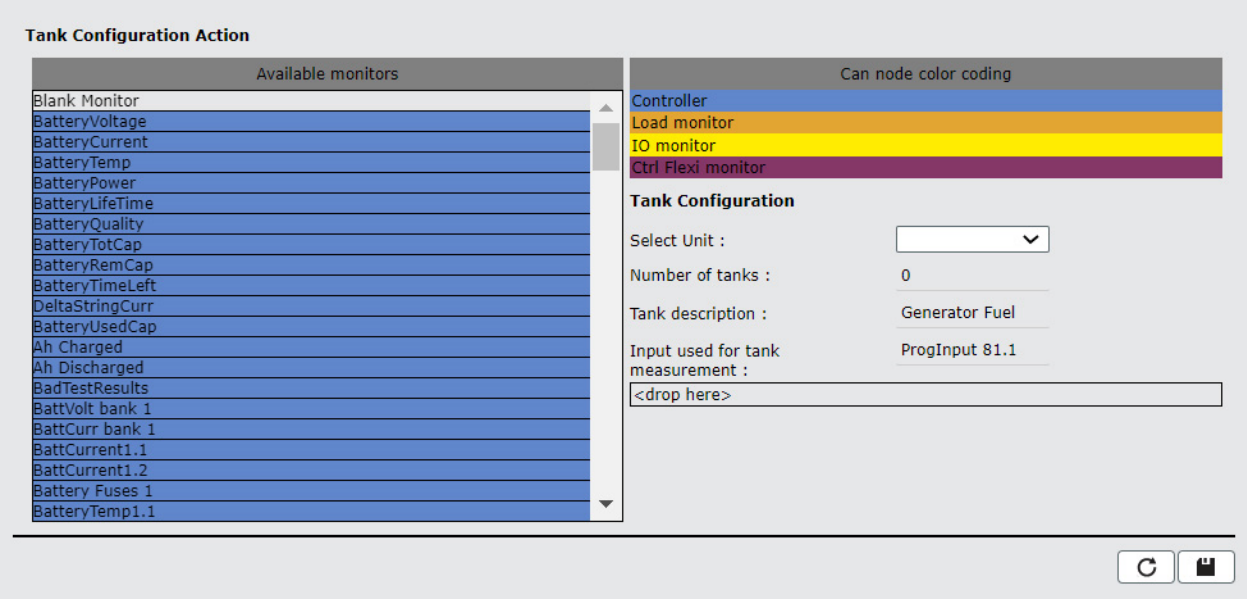


Figure 4.16 – Tank Sensor Page

- **Available monitors** – A list of available monitors (not all monitors are available for tank sensor configuration).
- **Select Unit** – A menu list to choose the tank being configured.

- **Number of tanks** – The total number of tanks available (set on the **Tank Configuration** page; see previous section, above).
- **Tank description** – The description of the tank being configured available (set on the **Tank Configuration** page; see previous section, above).
- **Input used for tank measurement** – The currently-selected input.

Drag and drop the desired alarm monitor from the left column to the **‹drop here›** box in the right column, in order to assign the **Input used for tank measurement**.

Smart Power

Smart Power uses features within the controller to allow you to manage your power intelligently.

Common Configuration

The Smart Power **Common Configuration** page is used to enable or disable Smart Power options and set battery and system protection settings.

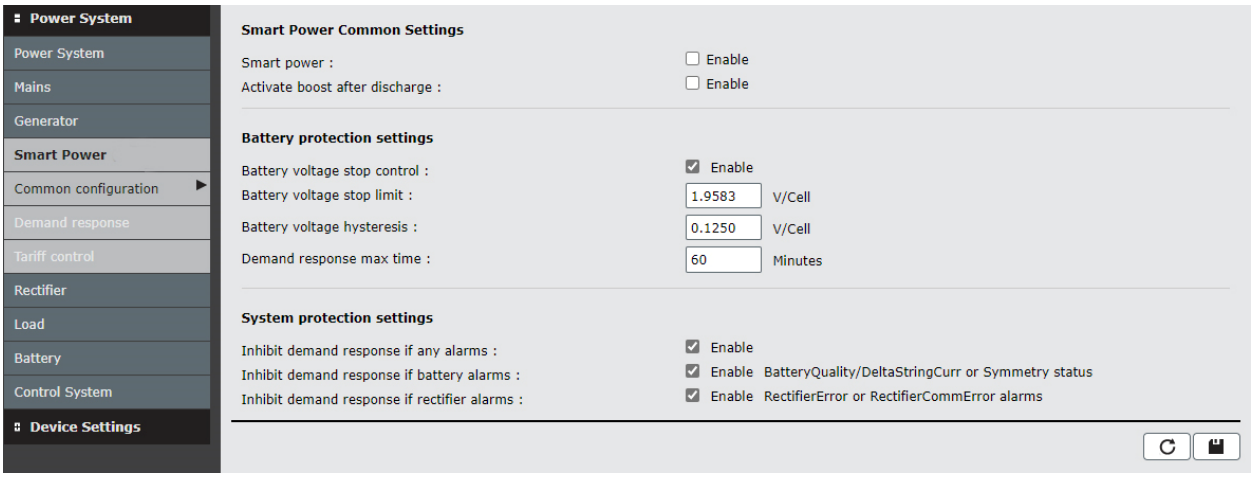


Figure 4.17 –Smart Power Common Settings Page

Smart Power Common Settings

Smart power – Enables or disables the Smart power features.

Activate boost after Demand Response –Enables or disables a battery boost charge upon the conclusion of demand response. For additional information on battery boost, see “Boost,” p. 139.

Battery Protection Settings

Battery voltage stop control – Enables or disables the demand response feature based upon the battery voltage.

Battery voltage stop limit – defines the battery voltage at which to stop the demand response feature. At this point, the output voltage of the rectifiers increases to power the load, but the batteries are not recharged until the **Demand response max time** is reached (see below).

Battery voltage hysteresis – defines the battery voltage hysteresis value at which the demand response feature can resume, provided other start criteria have been met. At this point, the rectifiers are turned back off. When the voltage has reached the **Battery voltage stop limit**, plus this value, the **Demand response** feature can resume.

Demand response max time – defines the maximum time, in minutes, the demand response feature is active. At this point, the rectifiers return to normal operation, powering the load and charging the batteries.

System Protection Settings

These settings modify the behavior of the demand response feature, based on the selections in this section. If the selected alarms are active, demand response will enter an idle state, where battery current equals zero (0), until the alarm is cleared or demand response is deactivated.

Inhibit demand response time if any alarms – if enabled, the controller will inhibit demand response on any active major alarm.

Inhibit demand response if battery alarms – if enabled, the controller will inhibit demand response on specified battery alarms (BatteryQuality, DeltaStringCurr, Symmetry status, or BatteryFuse).

Inhibit demand response if rectifier alarms – if enabled, the controller will inhibit demand response on specified rectifier alarms (RectifierError, RectifierCommError).

Demand Response

Demand response is a power management feature that reduces the output power of the rectifiers, drawing power from the batteries during peak usage times. This capability may be useful for reducing energy sourced from the power grid.

Note: Demand Response can be activated by a Programmable Input, Task Scheduler, Virtual Input, or SNMP.

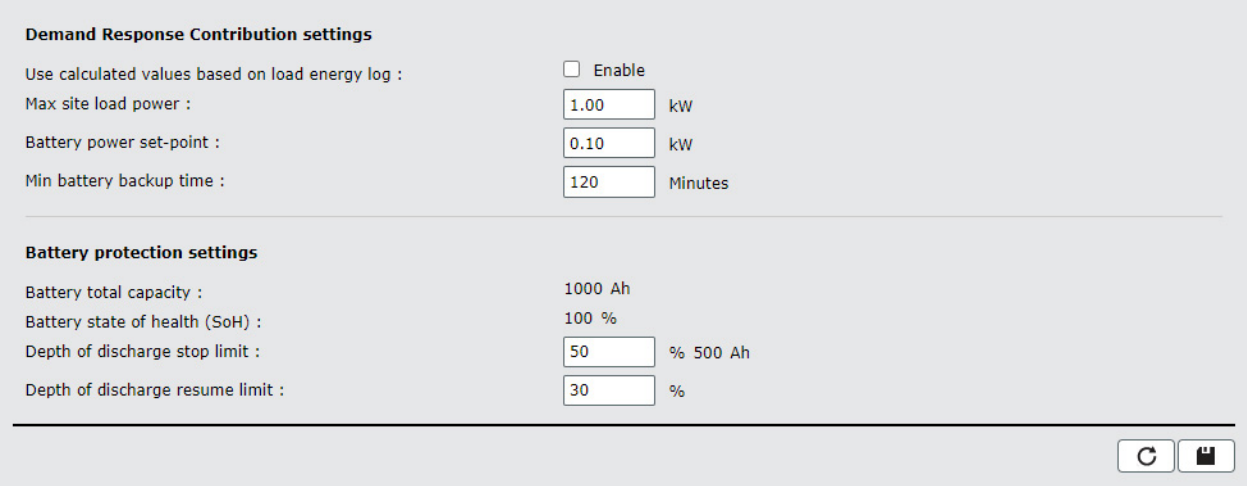


Figure 4.18 – Smart Power Demand Response Page

Demand Response Contribution Settings

Use calculated values based on load energy log – Enables the calculation of values from the load energy log, instead of the **Max site load power** and **Battery power set-point** that follow in the two parameters immediately below this **Enable** box. (For additional information on the load energy log, see “Energy Log,” page 287.)

Max site load power – User-defined maximum site load, used to calculate the battery capacity needed to maintain the minimum battery backup time.

Battery power set-point – User-defined value for battery discharge power.

Min battery backup time – User-defined minimum battery backup time. Demand response will shut off if the battery capacity drops below the value necessary to maintain the minimum backup time.

Battery Protection Settings

Battery total capacity – indicates the value of the total battery capacity (the number of strings times the battery capacity), as set in the battery configuration (**System Conf. › Battery › Configuration**); see “General Battery Configuration,” page 127.

Battery state of health (SoH) – indicates present capacity of all batteries, calculated as a percentage of the original capacity of the batteries.

Depth of discharge stop limit – defines the per cent of total capacity discharge at which to stop the demand response feature. At this point, the output voltage of the rectifiers increases to power the load, but the batteries are not recharged until the **Demand response max time** is reached (see below).

Depth of discharge resume limit – defines the per cent of total capacity discharge at which to allow the demand response feature to resume. When the batteries have

reached 100% minus this value, the **Demand response** feature can resume, provided other start criteria are met.

Tariff Control

The purpose of this function is to allow the batteries to feed the DC load for a specified time to save money when electricity prices are high. For more information on setting the parameters to be enabled, see “Common Configuration,” page 110 and “Demand Response,” page 111.

Note: Tariff Control can be activated by a Programmable Input, Task Scheduler, Virtual Input, or SNMP. Enabling the Tariff Control function overrides the standard Demand Response function, and the event Demand Response starts and stops the Tariff Control service.

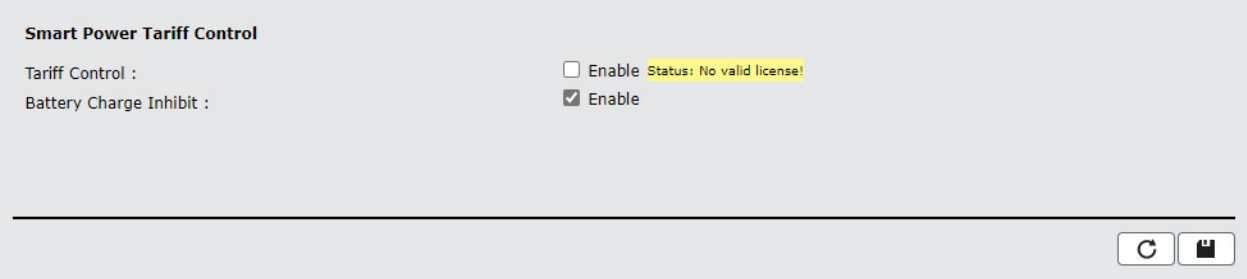


Figure 4.19 –Tariff Control Page

Tariff Control – check the box to enable tariff control. To use this feature, a valid license must first be entered on the page **System Conf. › Control System › License Keys**.

Battery Charge inhibit – When enabled, the system will not start charging batteries before the function is deactivated or maximum time is reached (see page 111). Systems with solar or wind modules will keep their output at reference voltage and provide as much energy as possible.

Rectifiers

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

Configuration

The **Rectifier configuration** page is for setting general rectifier parameters.

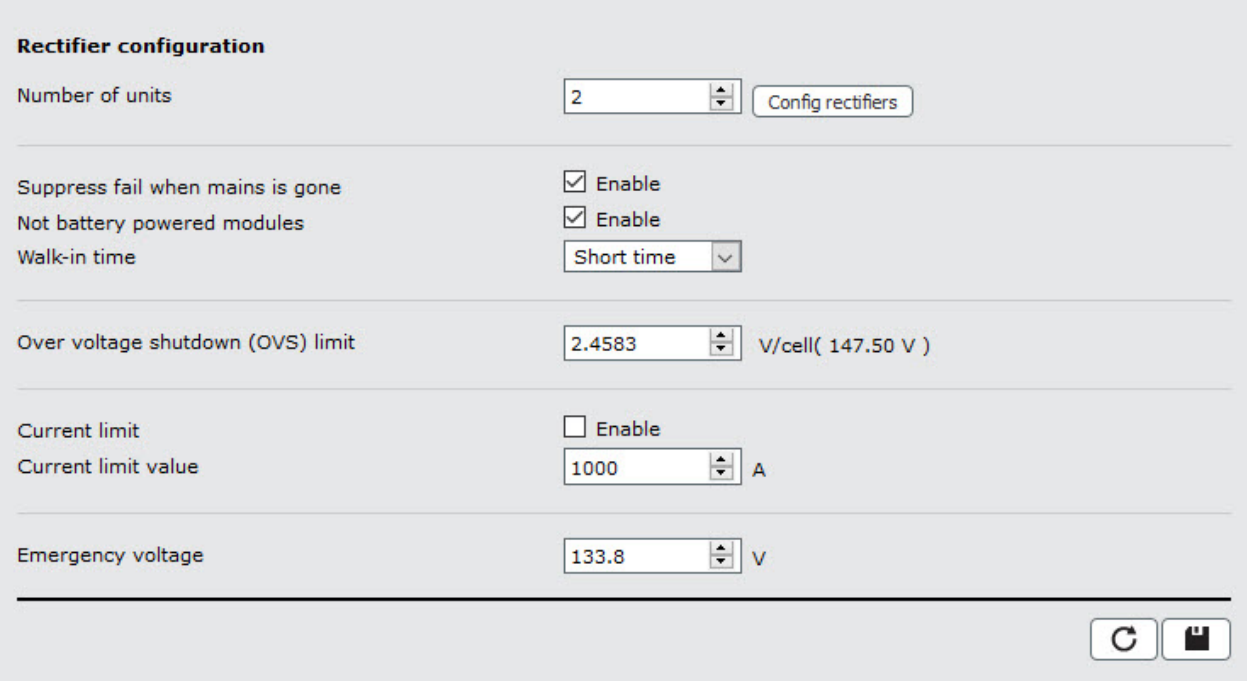


Figure 4.20 –Rectifier Configuration Page (without groups)

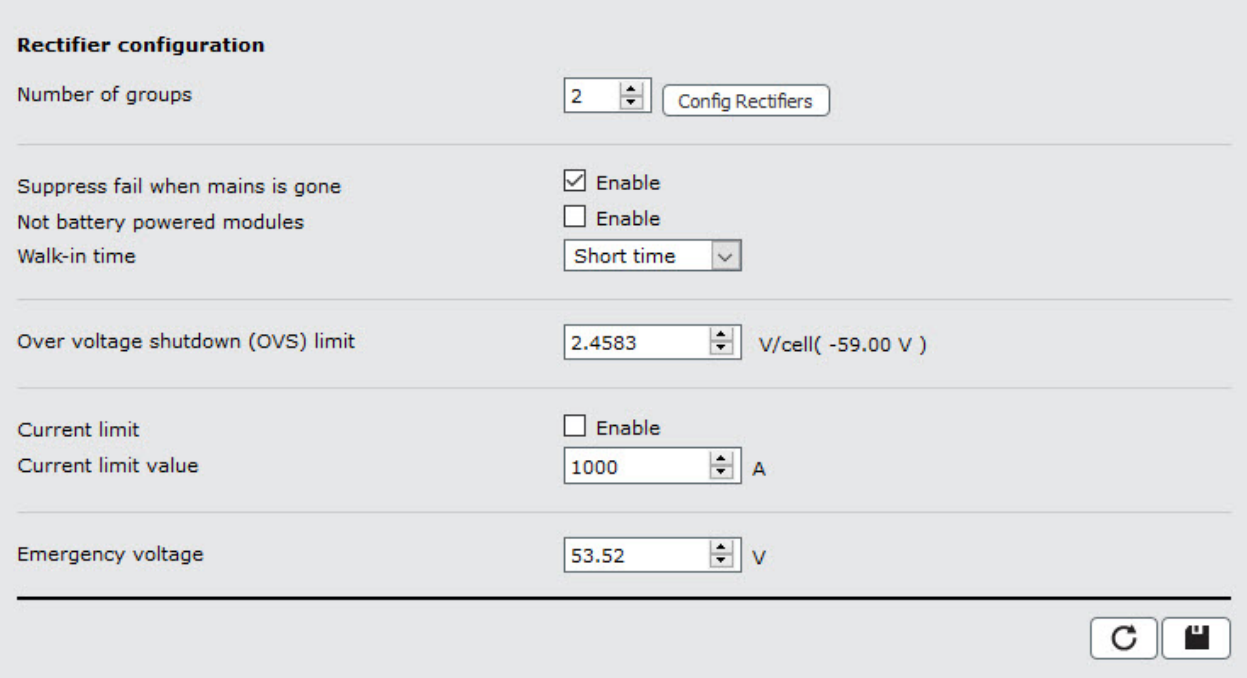


Figure 4.21 –Rectifier Configuration Page (with groups)

- **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 **Configure Rectifiers** button to bring up a separate dialog in order to change the ID numbers of rectifiers (see **Error! Reference source not found.**). Drag and drop the rows to reorder them by clicking and holding the row buttons (☰) next to the serial numbers.

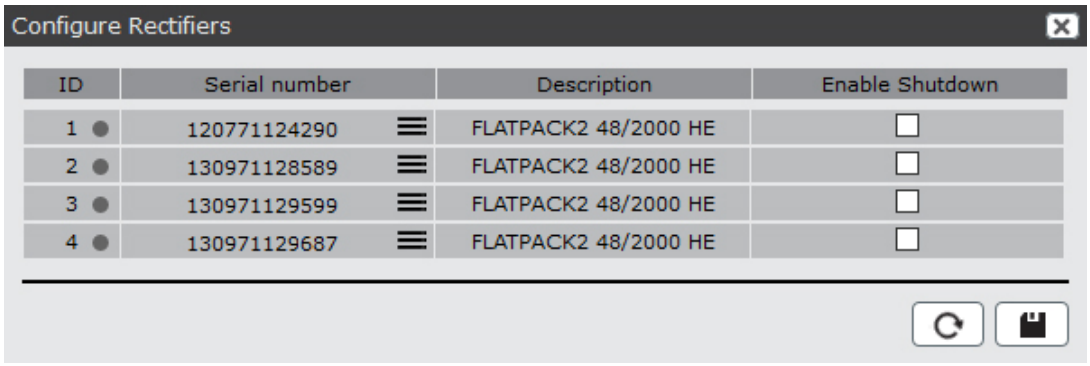


Figure 4.22 – Configure Rectifiers

- **Suppress rectifier fail when mains is gone** – Check this box to prevent the Rectifier Alarm from triggering during a loss of all AC input (mains).

- **Not battery powered modules** – This feature is used only for systems including modules that do not utilize battery-powered communication (such as Flatpack S or Micropack) under specific circumstances:
  - Critical premises parameters must be using a **Mains Minor Low** option [**System Config › System Globals › Critical premises (Contactor information**)].
  - **Mains independent** is not enabled under Battery contactor operation [**System Config › Battery › Battery Contactor › Mains independent**]
- **A+B input feed system** – Check this box, when using an A+B system, to adjust the calculations for the rectifier and battery current limit values to include only rectifiers that are operating. For example, rectifiers with an off-line generator as the input source will not be counted if this feature is enabled.

  Note: A+B systems are rectifier systems with different mains input sources. Feed A and Feed B designations are configured on the **Mains Group** page (see page 101.
- **Walk-in time** – relative time frame (short or long) that the rectifiers should take to reach float (or **Reference**) voltage (for example, beginning at 44.0 VDC and rising to 53.5 VDC, for 48 VDC systems). 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 › 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 into a programmable input.

Advanced Rectifier Configuration

The **Advanced Rectifier configuration** page is for setting additional rectifier parameters.

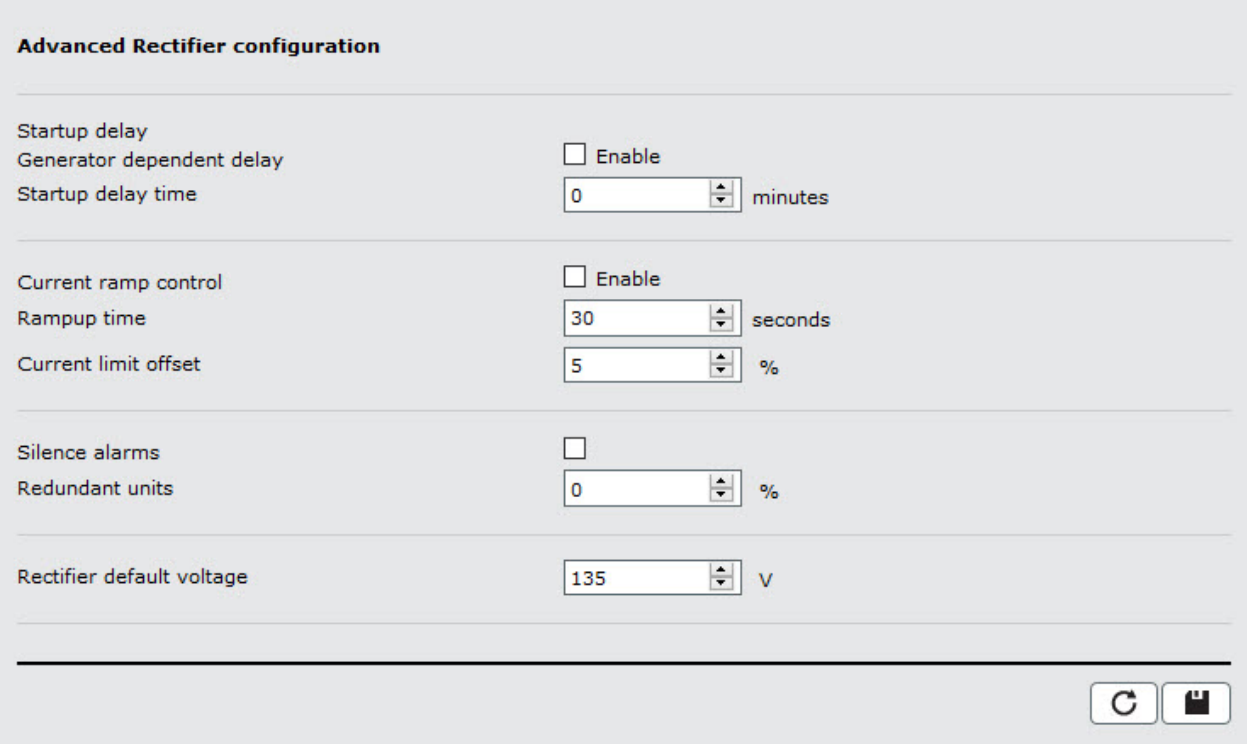


Figure 4.23 –Rectifier Advanced Page (without groups)

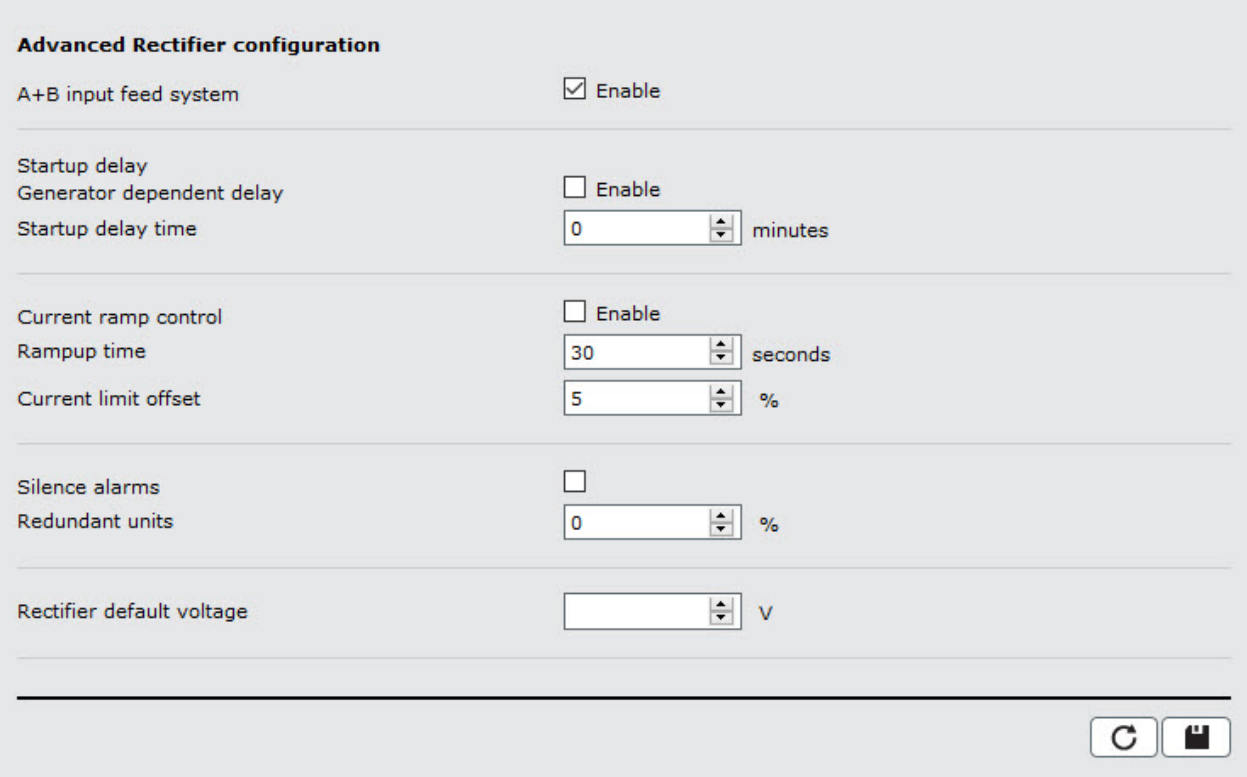


Figure 4.24 – Rectifier Advanced Page (with groups)

- **A+B input feed system (with groups only)** – check this box to enable the feature that allows you to define rectifier groups that are fed by two input power sources, such as one group fed by the grid and another group fed by a generator. (Input sources are defined in **System Conf. › Mains › Configuration › Mains Group Configuration**; see “Mains,” page 101.)
- **Startup delay** – check the **Generator dependent delay** box to **Enable**. 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).
- **Current ramp control** – when enabled, this feature delays load steps on the input source (for example, a generator) by limiting the rectifiers’ output current to the load value plus the **Current limit offset**, delayed by the **Rampup time**, as defined in those parameters. In the case of a positive load step, the additional load is carried by the batteries during the rampup time.
- **Rampup time** – the amount of time in seconds the rectifiers will take to reach the current limit, equal to the load value plus the **Current limit offset**.

- **Current limit offset** – the percentage of current, in additional to the load current, by which the rectifiers will be limited.
- **Silence alarms** – check this box to silence rectifier alarm reporting through the controller. Rectifiers still alarm normally, but the controller does not report them. This feature is useful for areas with unreliable AC service.
- **Redundant units** – sets the percentage of units to trigger the rectifier redundancy alarm. If zero is entered as the value the controller will use N+1 to define the redundancy alarm.

Efficiency

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

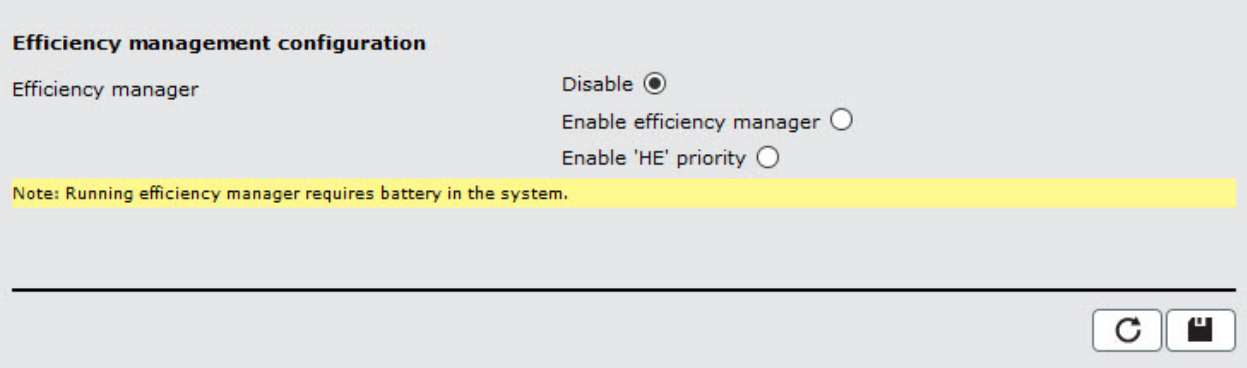


Figure 4.25 – Power System – Rectifiers Efficiency Page

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:

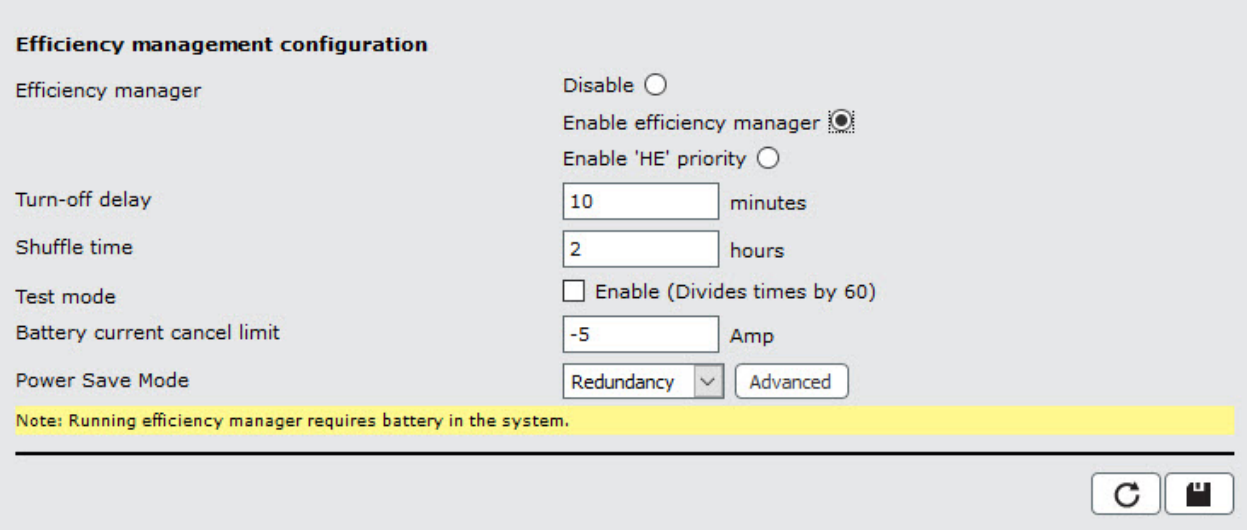


Figure 4.26 – Power System – Rectifiers Efficiency Management Dialog

- **"Turn 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.
- **Power Save Mode** – determines if Redundancy or Non-redundancy mode is active. 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.
- **Advanced –** click on the Advanced button to display additional options for adjusting the percentages used for **No Redundancy Mode** and **Redundancy Mode**.

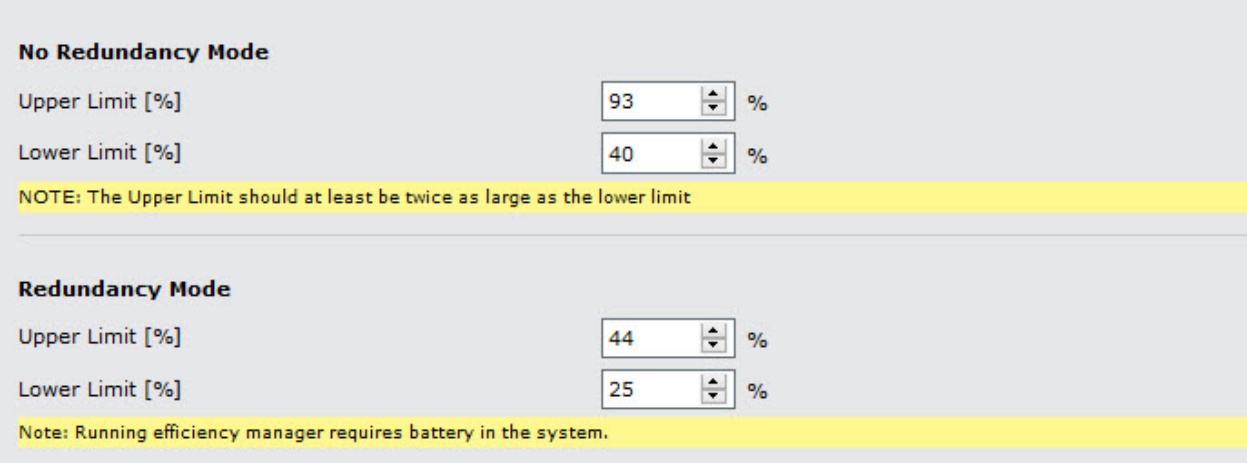


Figure 4.27 – Power System – Rectifiers Efficiency Redundancy Mode

- **Enable 'HE' priority** – if the power system is equipped with Eltek 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. If you enable **HE priority**, the other parameters are hidden.

[Solar Charger]

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

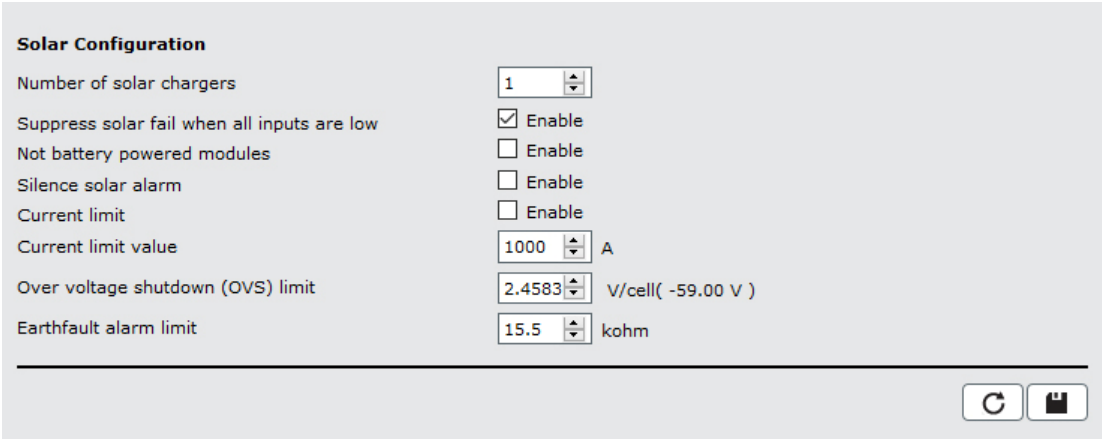


Figure 4.28 – Power System – Solar Page

- **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).

- **Not battery powered modules** – this feature is used only for systems including modules that do not utilize battery-powered communication under specific circumstances:
  - Critic Critical premises parameters must be using a **Mains Minor Low** option [**System Config › System Globals › Critical premises (Contactor information)**].
  - **Mains independent** is not enabled under Battery contactor operation [**System Config › Battery › Battery Contactor › Mains independent**].
- **Silence solar alarm** – check the box to silence the alarm from the solar chargers. This feature is used to avoid nuisance alarms when solar output is intermittent.
- **Current limit** – check the box to enable current limit on total solar output.
- **Current limit value** – enter the maximum total charger current desired (in amps).

  Note: Current limit manages total charger output rather than output per module.

  Note: Eltek chargers 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.
- **Over voltage shutdown (OVS) limit** – set a high voltage value (volts per cell) at which the solar charger(s) should shut down.
- **Earthfault alarm limit** – Threshold in kohm for triggering a PV Earthfault alarm.

[Wind]

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

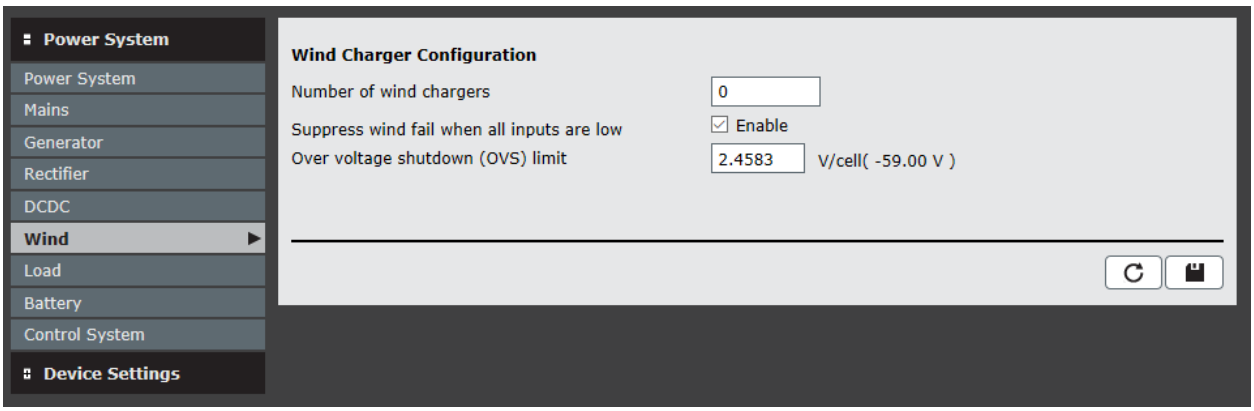


Figure 4.29 – Power System – Wind Page

- **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 Configuration** 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.

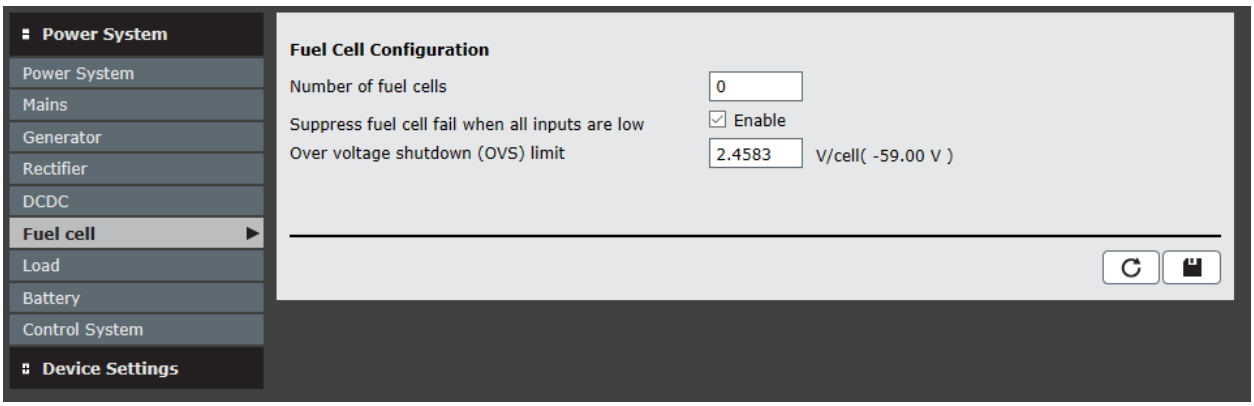


Figure 4.30 – Power Systems – Fuel Cell Page

- **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 Configuration]

The **DCDC Configuration** 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.

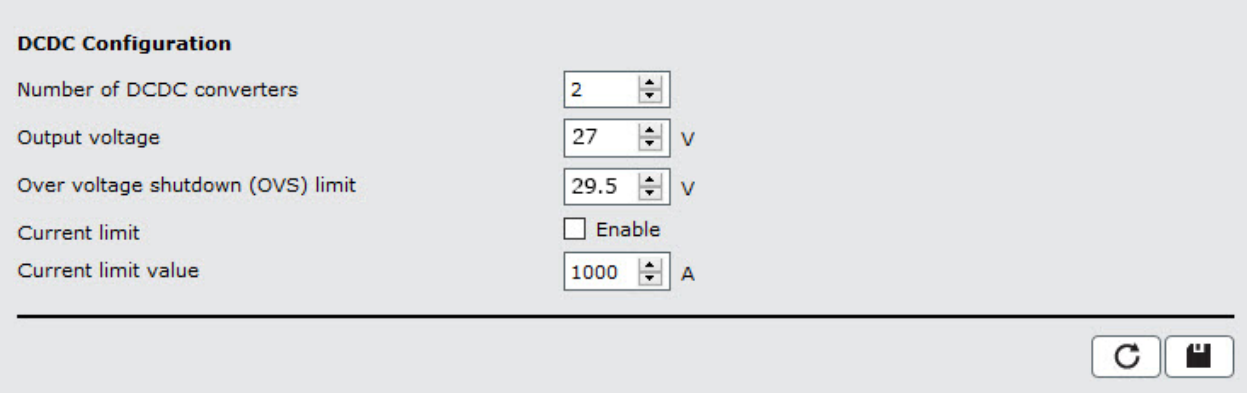


Figure 4.31 – Power System – DCDC Configuration Page

- **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 **Load Configuration** page is for configuring load group parameters.

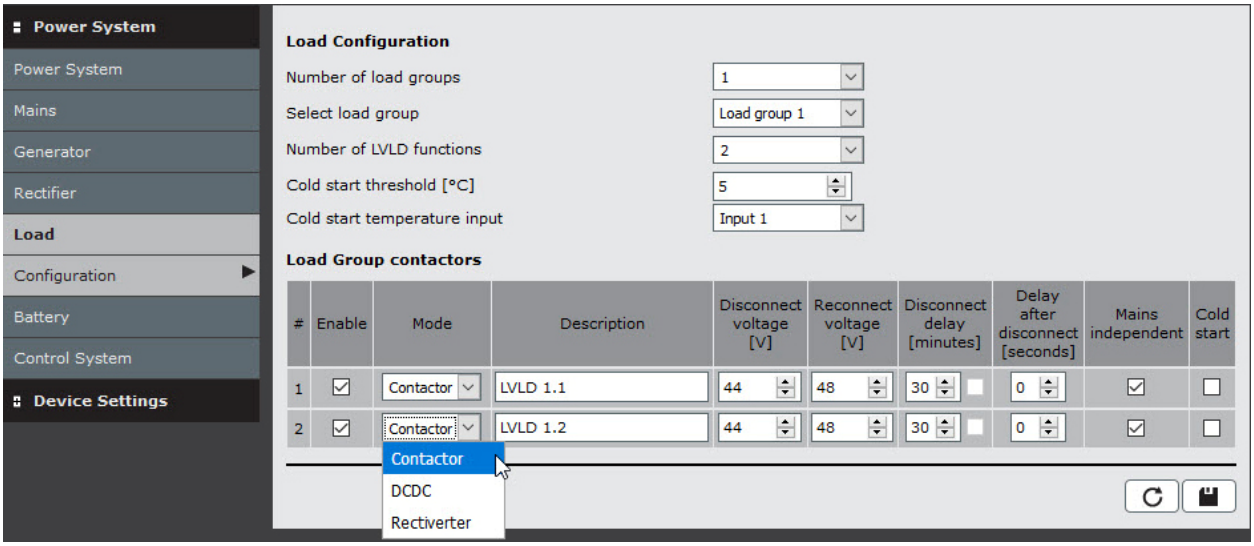


Figure 4.32 – Power System – Load Configuration Page (Number of load contactors set to 1 or greater)

- **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.
- **Number of LVLD functions** – sets the number of LVLDs within the selected group.
- **Cold start threshold** – sets the temperature value at which the contactor will close, for any contactor with cold start enabled. (Not visible with all systems.)

- **Cold start temperature input** – defines the input used to measure the temperature. The options in the list may include the following:
  - **Rectifier Temp** – the internal temperature of the rectifier. (See **Alarm Config › Rectifier › Rectifier Alarm Configuration [Rect.temp]**.)
  - **Input X** – a programmable input defined as a temperature input (See **Alarm Config › Inputs › [Controller Name] Input Configuration**.)
  - **Outdoor Temp X** – a temperature input from an outdoor I/O Monitor. (See **Alarm Config › Inputs › [I/O Monitor Name] Outdoor Configuration**.)
  - **Battery Temp** – the temperature measured by a battery probe. (See **Alarm Config › Battery › Battery Alarm Configuration [Battery Temp]**.)
- **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 low voltage disconnect mode
- **Mode** – Use the radio buttons to select the disconnect mode:
  Contactor – this mode uses a physical contactor to disconnect the load when the criteria is met .
  DCDC – this mode shuts down the DC/DC converter modules when the criteria is met.
  Rectiverter –this mode shuts down the Rectiverter modules when the criteria is met.
- **Description** – if necessary, type a description for the LVLD terminal
- **Disconnect voltage [V]** – the voltage at which the load will be shut off.
- **Reconnect voltage [V]** – the voltage at which the load will be turned back on.
- **Disconnect delay [minutes]** – the number of minutes after a loss of AC power (mains) when the load will be shut off. 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 minimum time (in seconds) that should elapse after the load has been shut off before the controller will turn it back on.
- **Mains independent** – check this box to permit the load to turn back on 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 load does not turn back on until AC power is restored.

- **Cold start** – Prevents the load LVDs from closing if the temperature is too low, even if the reconnect voltage is met. Cold start does not affect the disconnect function. (Not visible with all systems.)

Battery

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

General Battery Configuration

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

Note: the Advanced button in the upper right corner of the General Battery Configuration page provides additional options on a separate page. For details on these additional parameters, see the next section, “Advanced Battery Configuration,” page 134

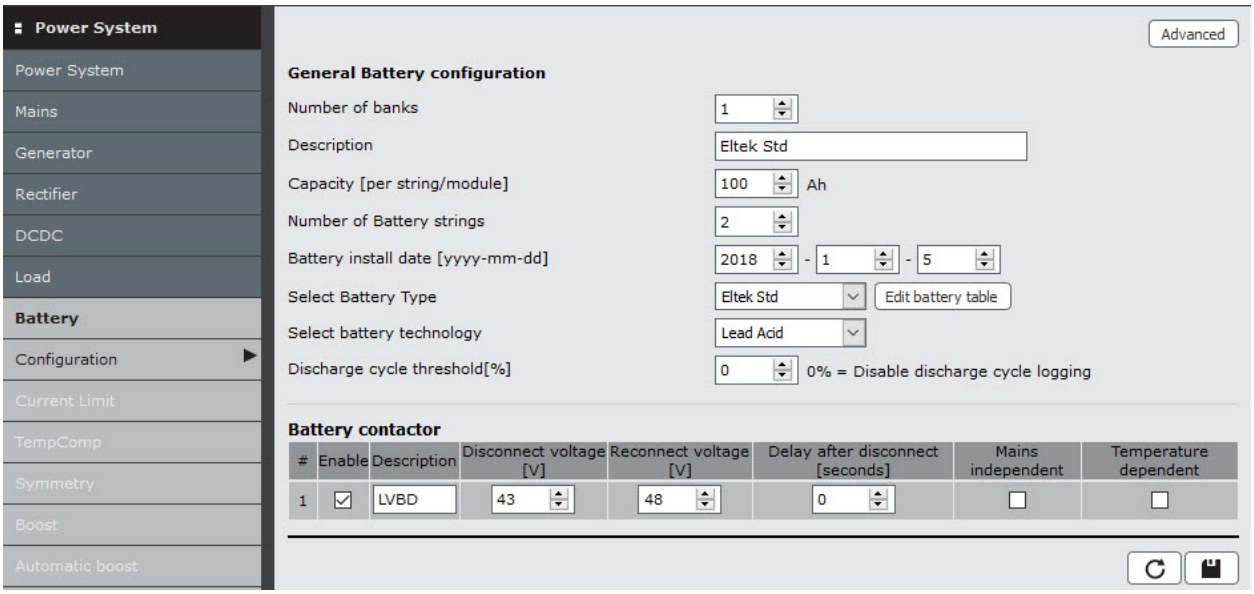


Figure 4.33 – Power System – Battery Page

- **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** – select the battery type to adjust parameters (Reference Voltage, Capacity, Current Limit, Temp Comp, and Battery Table) by choosing from the quick-select menu list. To adjust the battery discharge test curve, by click the **Edit battery table** button; additional details are founc below, page 130.

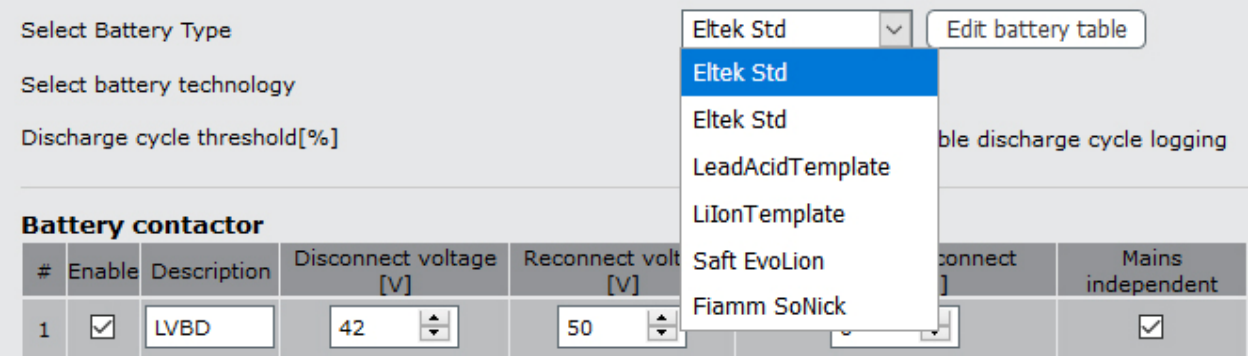


Figure 4.34 –Battery Type Options

- **Select battery technology** – define battery chemistry technology by choosing from the quick-select menu list. Menus will adjust based selected technology.

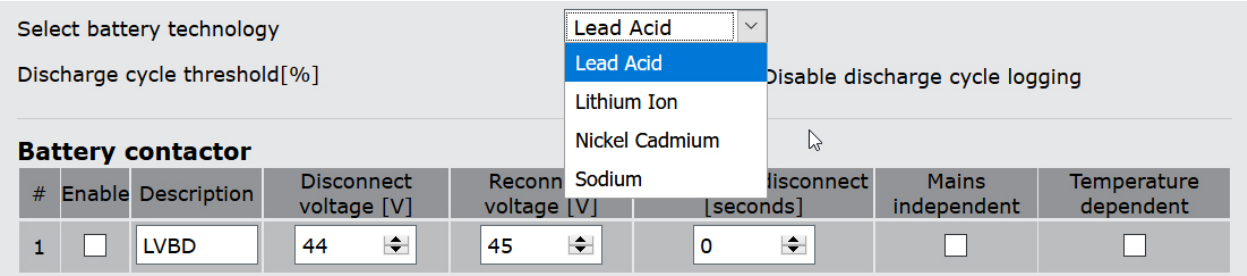


Figure 4.35 – Battery Technology Options

Lead Acid is the default mode. If using other technologies, choose the technology that matches your system. Other supported technologies include:

- Lithium Ion
- Nickel Cadmium
- Sodium

After selecting battery technology, various additional options are available. Refer to the following table for battery configuration options available for each technology.

Table 3.3 – Battery Configuration Options

Function	LeadAcid	LiIon	NiCad	Sodium
BatteryConfig				
LVBD	Yes	Yes	Yes	Yes
Battery/AdvancedSetup	Yes	No	Yes	No
CurrentLimit	Yes	Yes	Yes	No
TempComp	Yes	No	Yes	No
Symmetry	Yes	Yes	Yes	Yes
BatteryBoost	Yes	No	Yes	No
BatteryEqualize	Yes	No	Yes	No
BatteryTest	Yes	No	Yes	No
Discont.Test	Yes	No	Yes	No
Battery Status				
Battery Bank	Yes	Yes	Yes	Yes
BatteryModuleInfo	No	Yes	No	Yes
BatteryAlarmConfig				
BatteryBank	Yes	Yes	Yes	Yes
BatteryCommands				
BatteryTest	Yes	No	Yes	No
BatteryBoost	Yes	No	Yes	No
BatteryEqualize	Yes	No	Yes	No
BatteryLogs				
BatteryTest	Yes	No	Yes	No

- **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 297).
- **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 › 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 › System Voltages** page.
  - **Delay after disconnect [seconds]** – the minimum 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

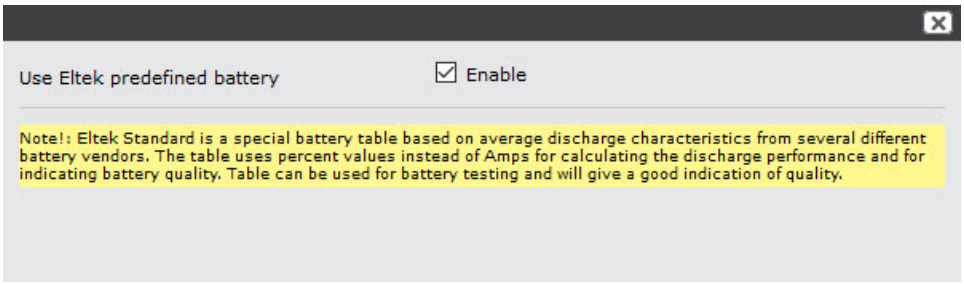


Figure 4.36 – Battery Table – Use predefined table

- **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.

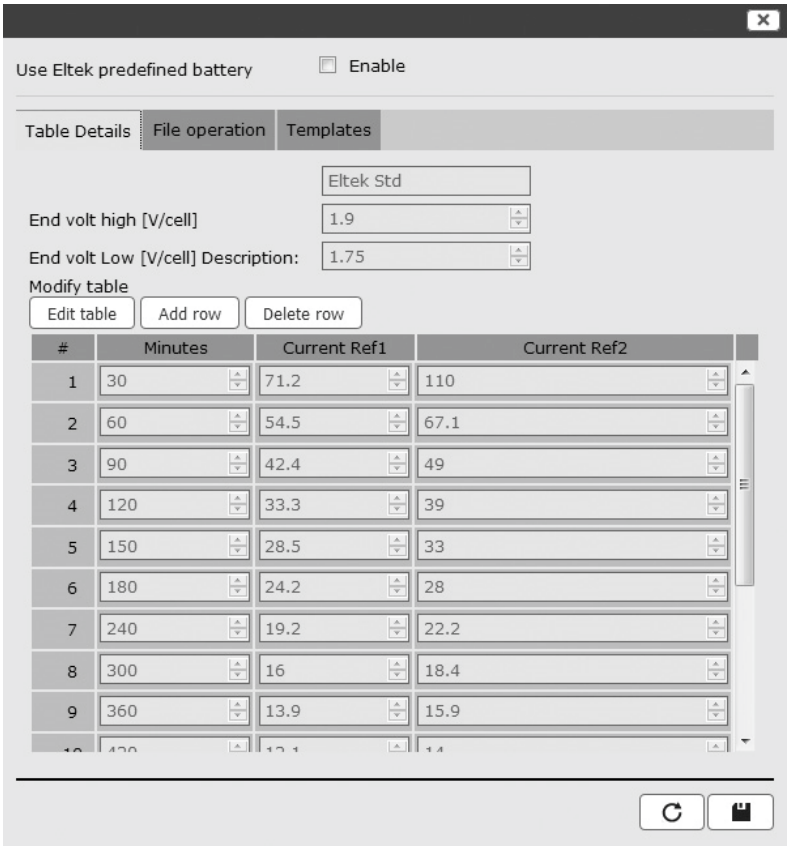


Figure 4.37 – Battery Table Page – Table Details Tab

- **Edit 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** button in the lower right of the **Battery table** window (circle with arrow).

- **Description** – a description of the batteries or battery table used.
- **End volt high [V/cell]** – the highest end-of-discharge voltage specification provided by the battery manufacturer.
- **End volt 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

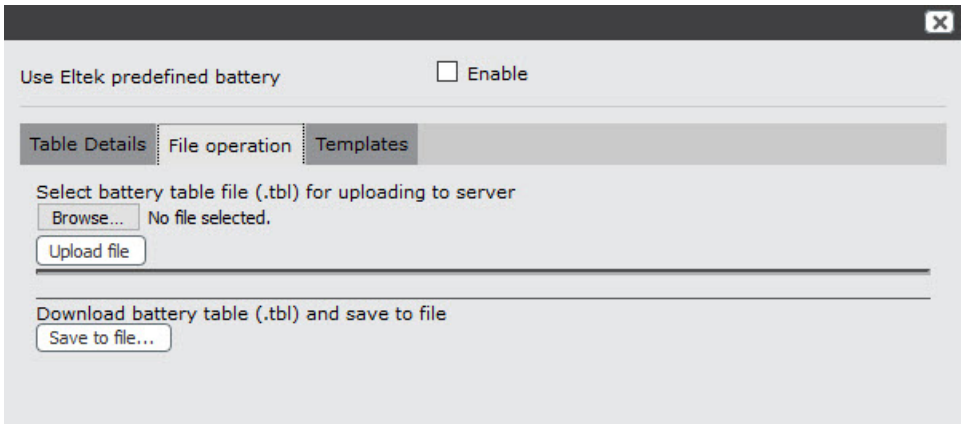


Figure 4.38 – Battery Table Page – File Operation Tab

- **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.

- **Templates Options** - Menu list of battery tables that are loaded in the controller. As of the writing of this guide, templates are available for the following batteries. The <empty table> option can be selected to clear the current battery table.

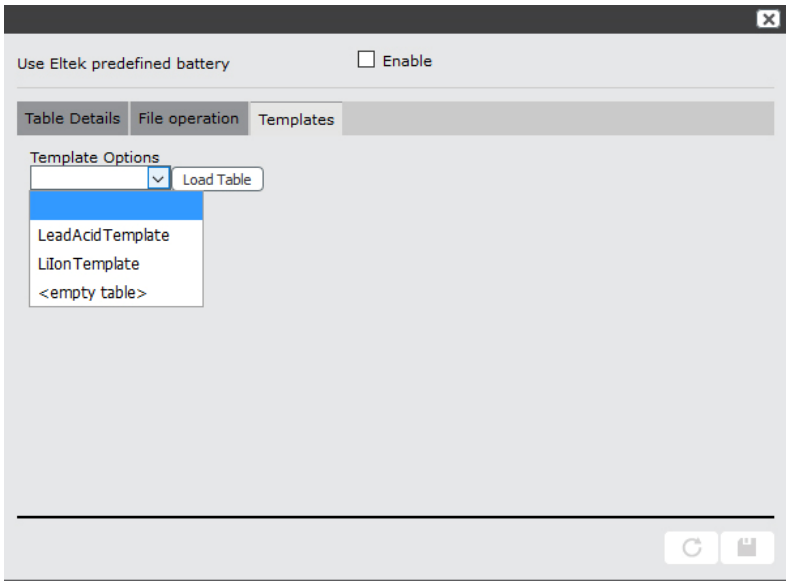


Figure 4.39 – Battery Table Page – Templates Tab

- **Load Table** - after making a selection in the Template Options list, click this button to load the table template.

Advanced Battery Configuration

The **Advanced** button on the General Battery Configuration page (see page 127, above) allows for correction parameters related to State of Health (SoH) and State of Charge (SoC) in batteries. Enter the values required for the calculations used to establish **SoC reset criteria** and **SoH adjustments** for the batteries.

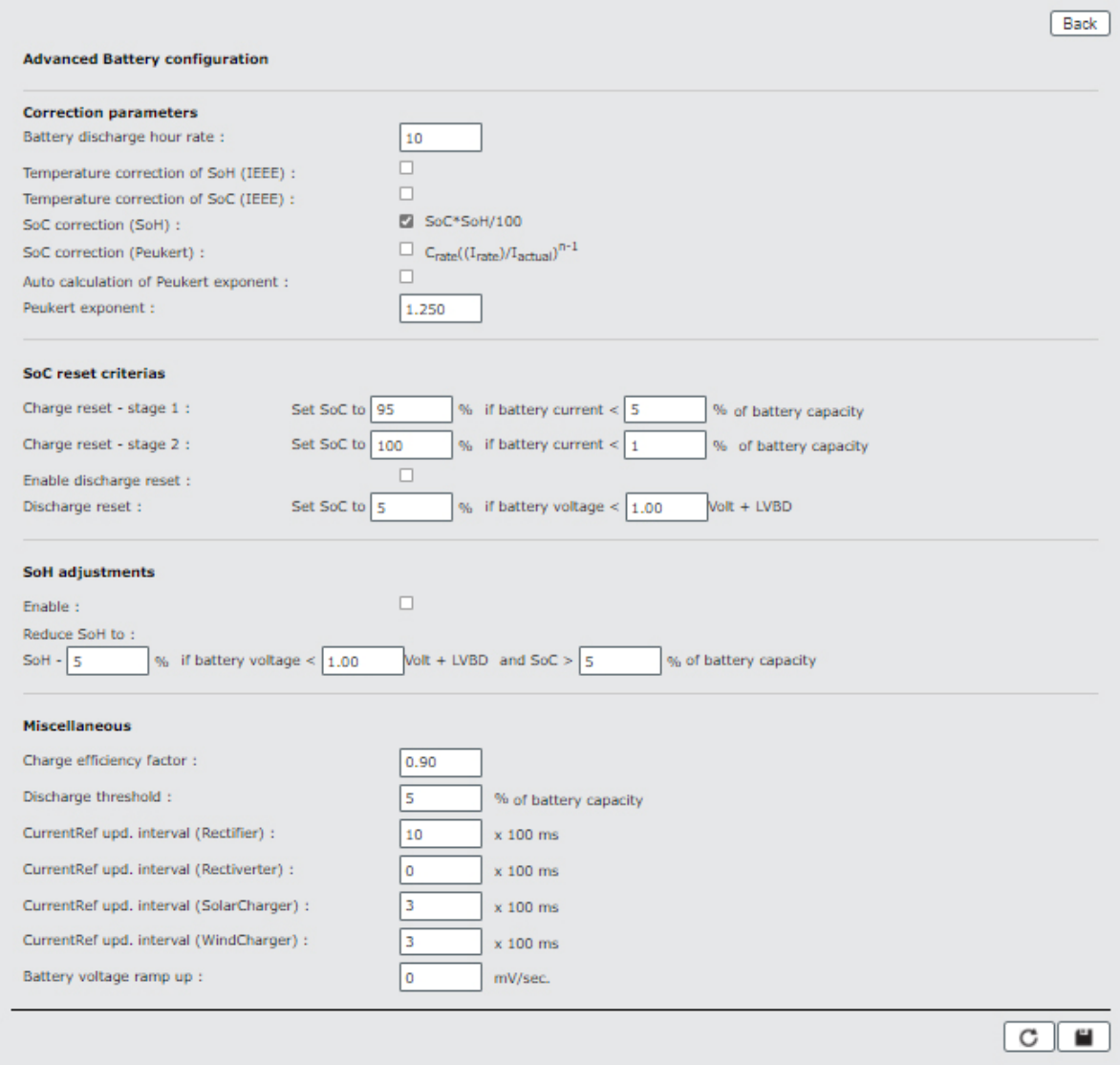


Figure 4.40 – Advanced Battery Configuration Page

Current Limit

The Current Limit page is for setting battery charge current limitation.

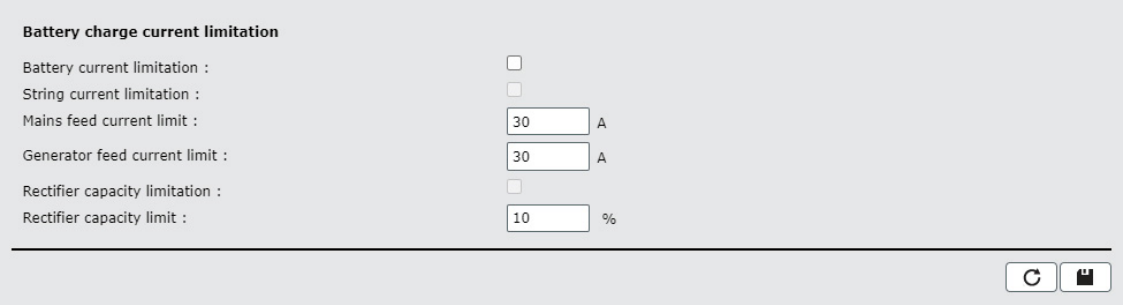


Figure 4.41 – Battery –Current Limit Configuration Page

- **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.

TempComp

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

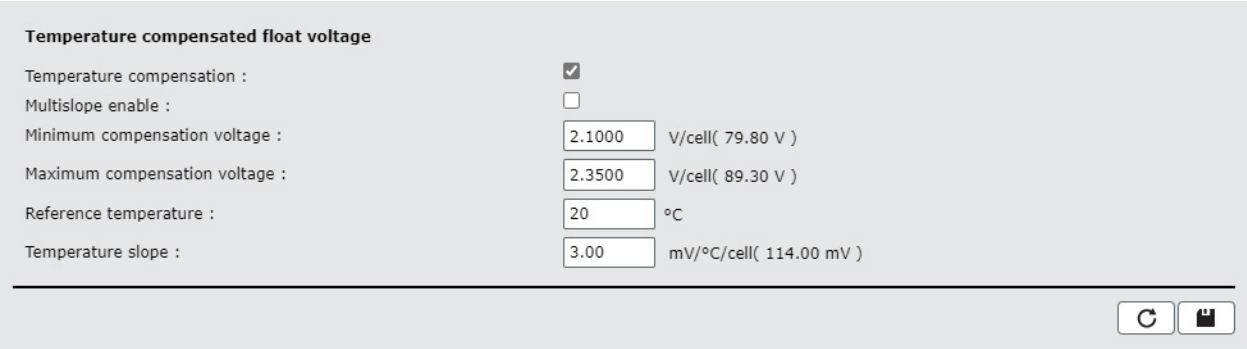


Figure 4.42 – Battery – Temperature Compensated Float Voltage Page

- **Temperature compensation** – check this box to enable battery temperature compensation.
- **Multislope enable** – check this box to enable multislope temperature compensation, instead of singleslope temperature compensation.
- **Minimum compensation voltage** – minimum charging voltage per battery cell.
- **Maximum compensation voltage** – maximum charging voltage per battery cell.
- **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.

Note: for Battery reference voltage, see **Reference voltage (Cell)** under **System Conf. › Power System › System Voltages**

If **Multislope** is enabled, the following options appear.

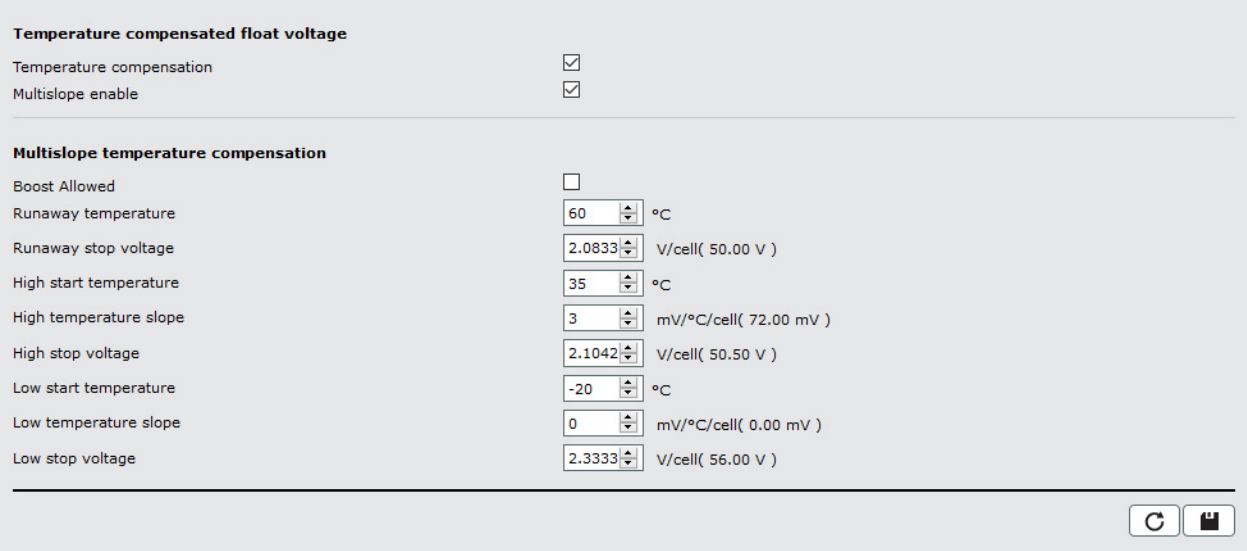


Figure 4.43 – Multislope Options

This feature either increases (low thermal compensation) or decreases (high thermal compensation) the output voltage of the rectifier, if the battery temperature exceeds a set limit. The thermal runaway feature drops rectifier output voltage if the batteries experience excessive. If battery boost is activated and the runaway temperature is exceeded, Thermal Compensation settings override boost and decrease voltage to the runaway stop voltage. Battery boost continues to run at the thermal compensation voltage level.

- **Boost Allowed** – If enabled, allows the boost feature to activate during an active thermal compensation state.
- **Runaway temperature** – The temperature value that (if exceeded) will drop the rectifier output voltage to the **Runaway stop voltage**.
- **Runaway stop voltage** – The voltage value to which the rectifier output will fall when the **Runaway temperature value** is exceeded.
- **High start temperature** – The temperature value that (if exceeded) activates temperature compensation.
- **High temperature slope** – The voltage the controller will reduce the system voltage by each degree over the **High start temperature** value.
- **High stop voltage** – The lowest voltage value the controller will allow while temperature compensation is active.
- **Low start temperature** – The temperature value that (if the temperature falls below it) activates low temperature compensation.

- **Low temperature slope** – The voltage the controller will increase the system voltage by each degree under the **Low start temperature** value.
- **Low stop voltage** – The highest voltage value the controller will allow while low temperature compensation is active.

Symmetry

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

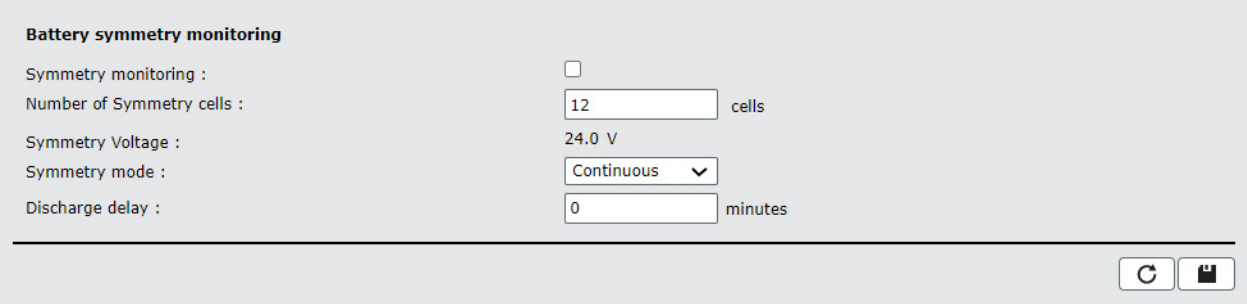


Figure 4.44 – Battery Symmetry Monitoring Page

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

- **Symmetry monitoring** – check this box to enable battery symmetry monitoring. (Monitoring must be enabled to make changes to other values.)
- **Number of Symmetry cells** – Based on your batteries, enter the number of cells per block. Some examples are:
  - **6** cells for block measurement of a set of four (4) 12V monoblock batteries.
  - **84** cells for mid-point measurement of a set of 168 2V batteries.
  - **30** cells for block measurement of a set of 60 2V batteries.
- **Symmetry voltage** – This value is informational, based upon the **Number of Symmetry cells** and your battery chemistry. For example, for Lead Acid and Lithium Ion batteries, the calculation uses two (2) volts per cell; for NiCad batteries, the calculation uses 1.2 volts per cell.
- **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).

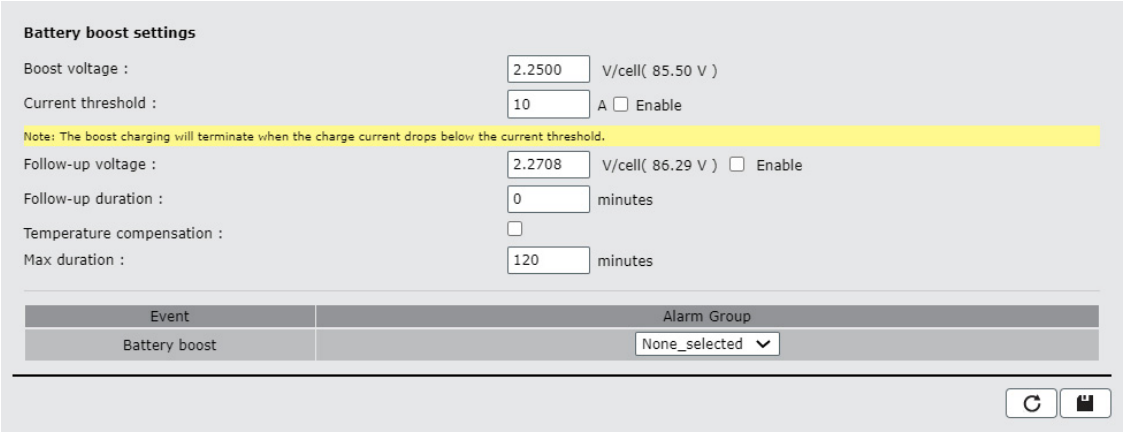


Figure 4.45 – Battery – Boost Settings Page

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.

- **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 › 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.

- **Max duration** –the maximum duration (in minutes) of a boost charge unless stopped manually or automatically by reaching the Current Threshold value.

  Note: The command to start and stop battery boost charge manually is under the **Commands** section (**Commands › Battery**).

- **Battery Boost Event** – assigns the battery boost function to an alarm group. When battery boost is active the alarm group will also activate.

Automatic boost

The **Automatic Boost** page is for enabling and configuring parameters for automatic boost.

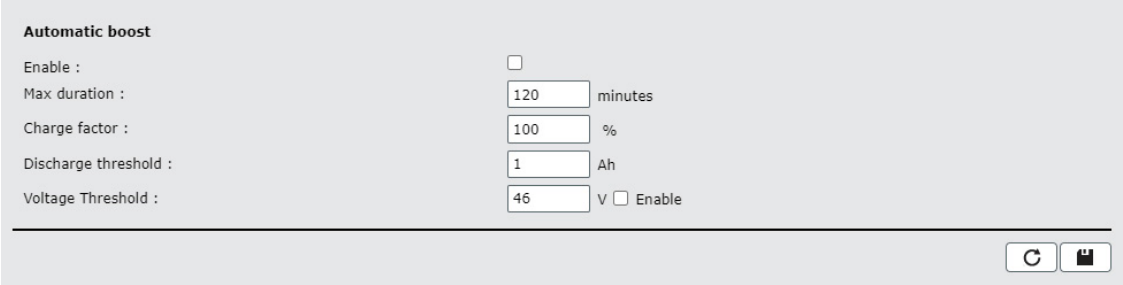


Figure 4.46 – Battery – Automatic Boost Settings Page

- **Enable** – 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 is 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.

Interval boost

The **Interval Boost** page is for enabling and configuring parameters for automatic boost.

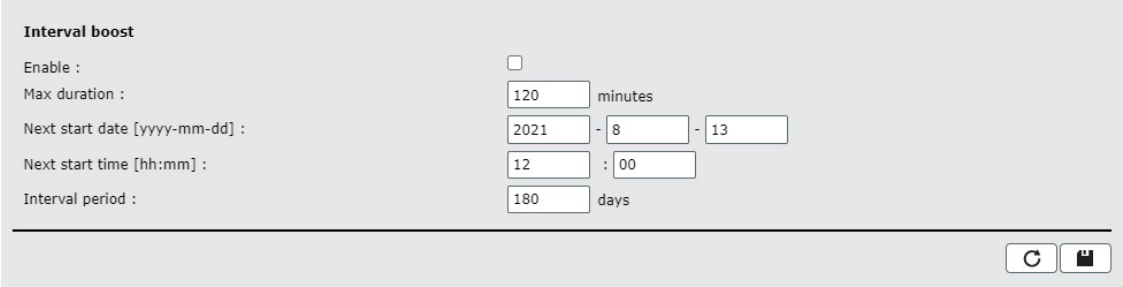


Figure 4.47 – Battery – Interval Boost Settings Page

- **Enable** – 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.

Equalize

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

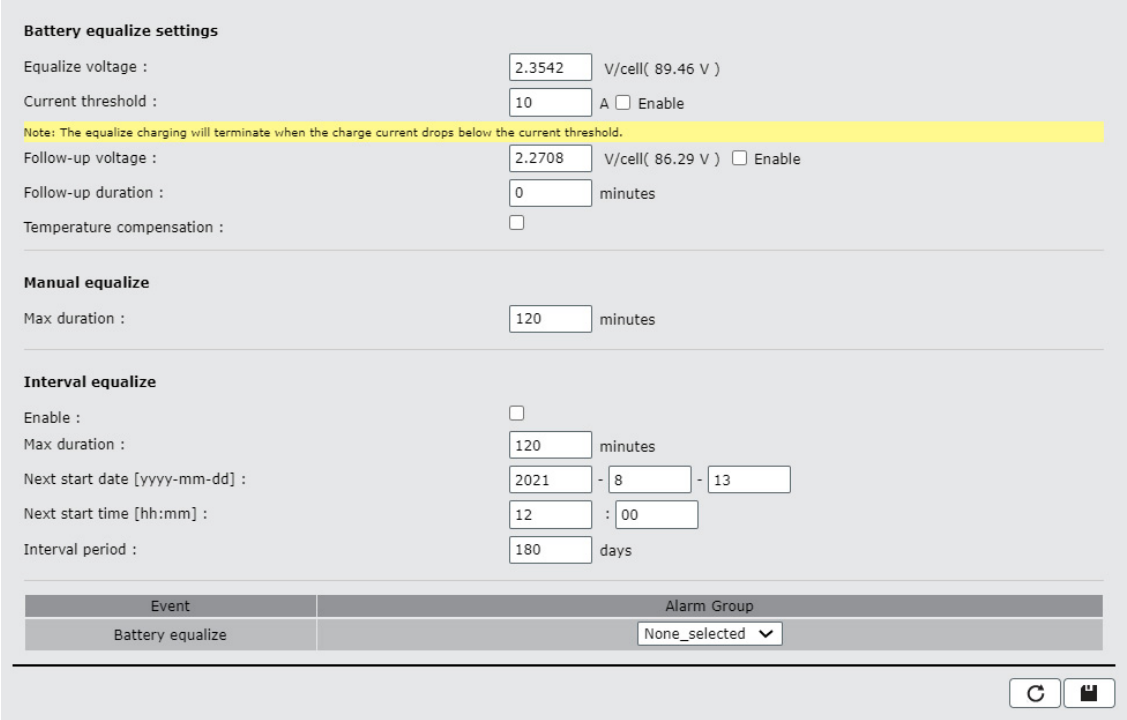


Figure 4.48 – Battery – Equalize Settings Page

- **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 › 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
- **Battery Equalize Event** – assigns the battery equalize function to an alarm group. When battery equalize is active the alarm group will also activate.

Temperature Monitor

The **Battery Temperature Monitor** page is for calculating a weighted effect of temperature on battery lifetime.

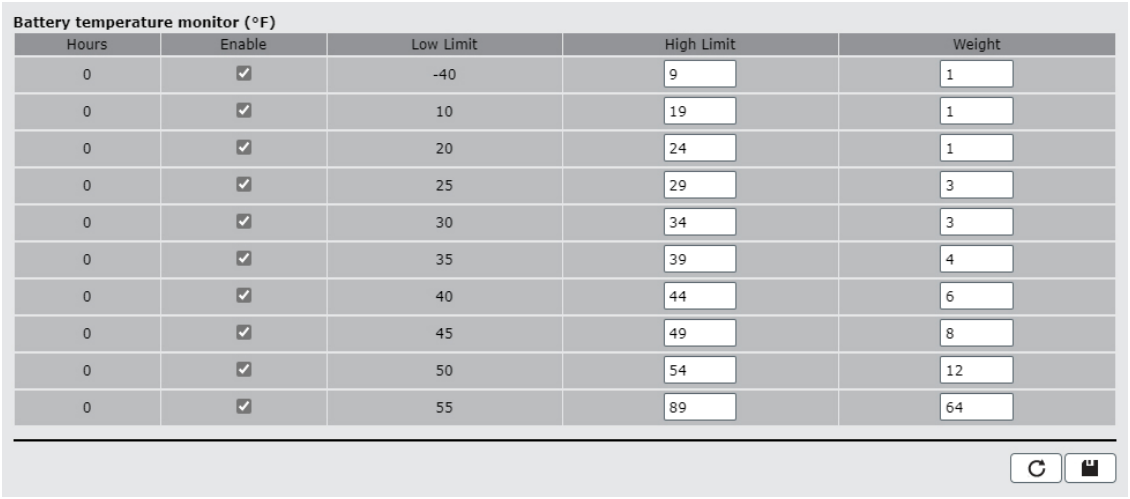


Figure 4.49 – Battery – Temperature Monitor Page

Hours – the number of hours that the batteries have been operating at the designated temperature range between **Low Limit** and **High Limit**. These values can be recent under **Commands › Battery [Battery Commands] › Reset Battery Life Time Monitor** (click **Apply**).

Enable – enables or disables the monitoring for the temperature range listed on the line to the right. Temperatures are given in °C.

Low Limit – the lower temperature of the range being monitored. The lower limit is set to one degree higher than the value for the **High Limit** on the previous line.

High Limit – the user-defined high temperature for the range being monitored.

Weight – a user-defined multiplier for calculating a weighted measure of the effects of temperature on battery lifetime. The weighted value is used to activate the battery lifetime alarm monitor.

DoD Life Cycle Weight

The **DoD Life Cycle Weight** parameters correspond to the **DoD Life Cycle Count** log found in the Logs section. The assigned **Weight** prescribes the value used by the log to count the number of full cycles of the batteries. A full discharge of the batteries to 100% DoD counts as one (1) full cycle. In the following figure, ten discharges of less than 10% equals one (1) full cycle.

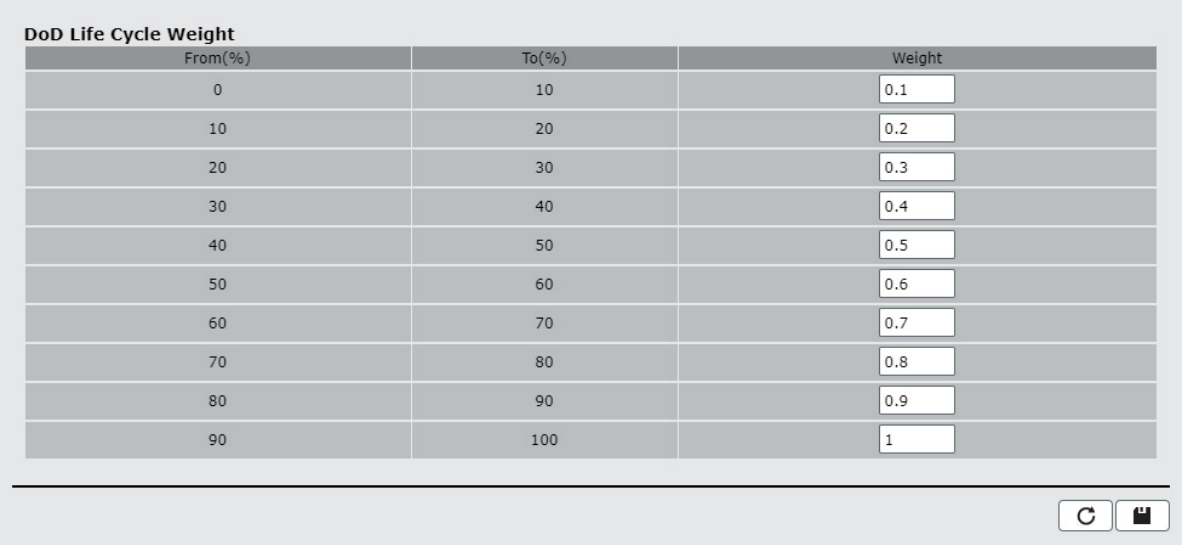


Figure 4.50 –DoD Life Cycle Weight Page

Test

The **Test** page is for setting parameters for battery tests.

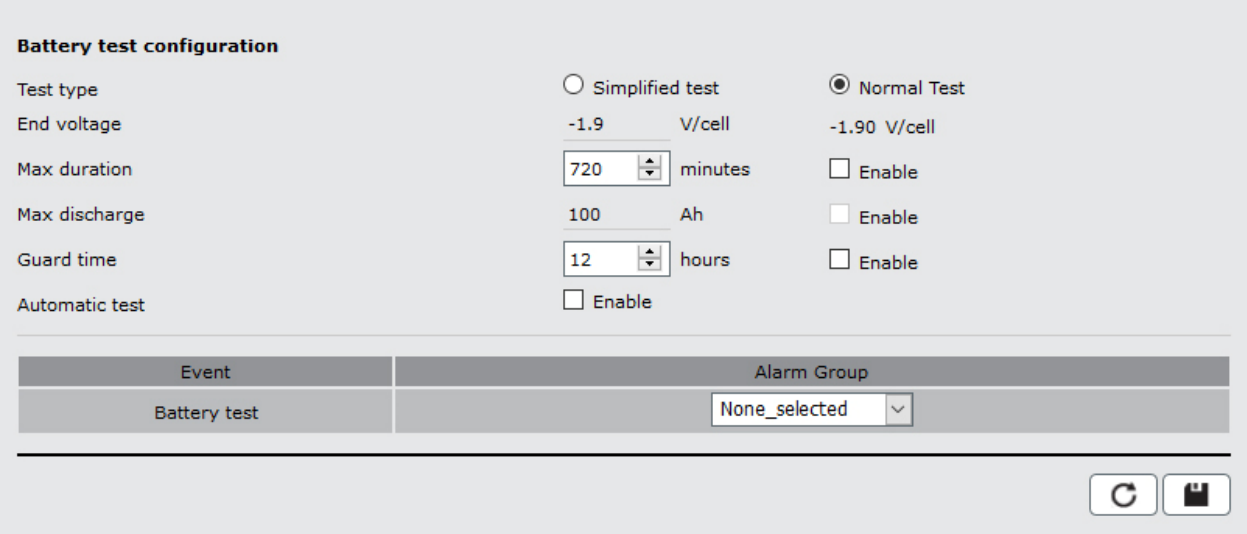


Figure 4.51 – Battery – Test Configuration Page

- **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. heck 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
- **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.

- **Battery test event** - assigns the battery test function to an alarm group. When battery test is active the alarm group will also activate.

Interval test

The **Interval Test** page is for enabling and setting parameters for scheduled battery discharge testing.

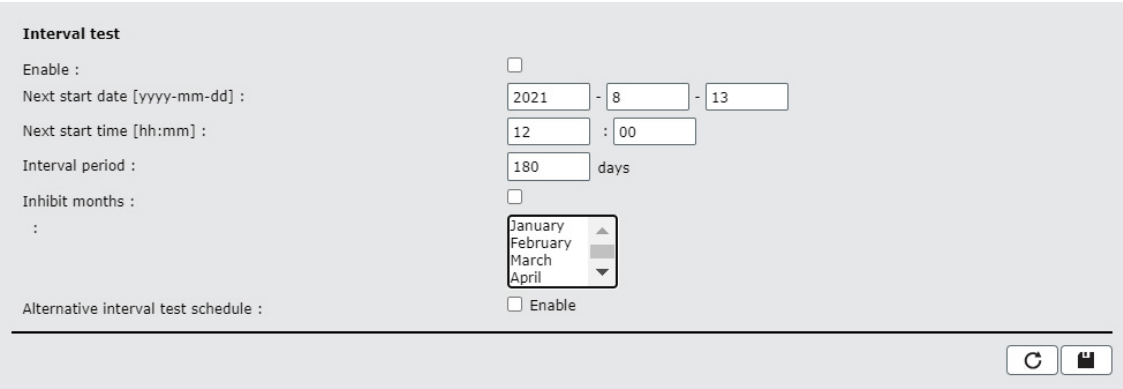


Figure 4.52 – Battery – Interval Test Configuration Page

- **Enable** – check the 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
- **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.
- **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.

Discontinuance test

The **Discontinuance Test** page is for enabling and setting parameters for the discontinuance test feature.

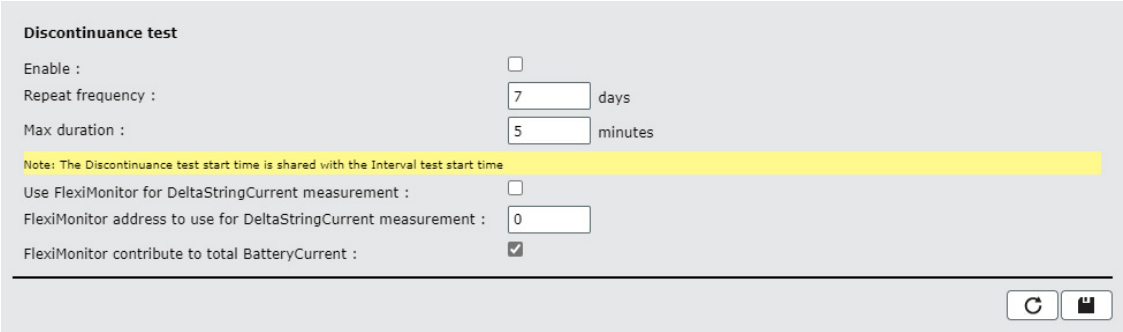


Figure 4.53 – Battery – Discontinuance Test Configuration Page

- **Enable** – 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 is 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.

- **Use FlexiMonitor for DeltaStringCurrent measurement** – check this box to use a Fleximonitor's current measurements for the discontinuance test rather than the main system controller's measurements. The Fleximonitor must be configured as a Battery Fleximon (**System Conf › Control System Flexi Monitor › [Monitor Type** list**]**) and inputs configured as current (**Alarm Conf. › Battery › Batt FlexMon x › Inputs › [Type** list**]**)
- **FlexiMonitor address to use for DeltaStringCurrent** – designates the address (1 – 14) of the Fleximonitor (based on DIP switches where 0000 is address 1) used for discontinuance test.
- **FlexiMonitor contribute to total BatteryCurrent** – check this box to include the current measurements from the Fleximonitor in the Battery Current value shown on the main page. If you are using a battery shunt to measure the total battery current at the system level, leave this box unchecked.

Analog voltage control

The **Analog voltage control** page provides settings for analog output voltage control. Analog voltage control will allow you to vary the output voltage by varying the voltage to a programmable input. This feature is only available when using the Basic Industrial controller with an input configured to measure voltage and the event set to **Analog Voltage Control**, see the sections on input configuration (page 247) and Event Value Alarm Group (page 209).

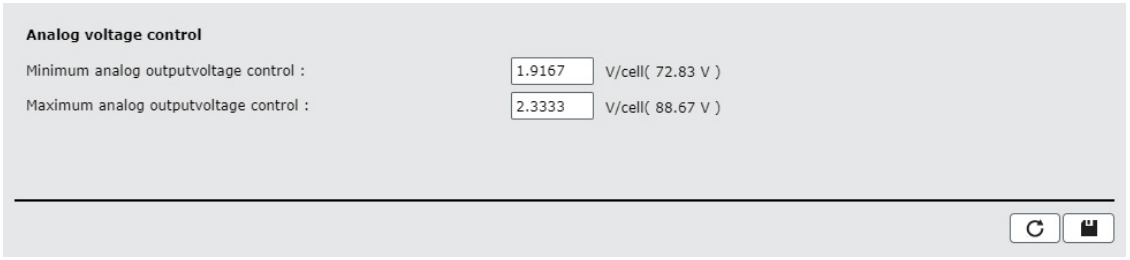


Figure 4.54 – Battery – Analog Voltage Control Configuration Page

Minimum analog output voltage control – the minimum voltage to which you can control the rectifier output voltage.

Maximum analog output voltage control – the maximum voltage to which you can control the rectifier output voltage.

Control System

The **Control System** options are for configuring controller units and CAN Nodes.

Communication

The **Communication** page is for setting communication protocols for controllers that support communication to external. (Not visible on controllers without communication ports.)

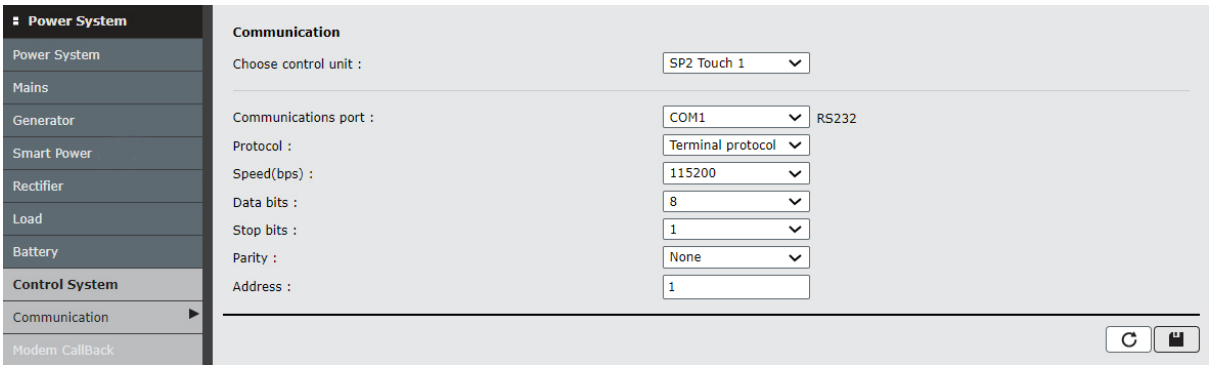


Figure 4.55 – Control System – Communication Page

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

- **Choose control unit** – menu list of controller units that can be configured.
- **Communications port** – menu 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 menu list depends on the communication ports available on the controller (such as RS485 and RS232).
  - **pComm** – Eltek's proprietary communication protocol for PowerSuite.
  - **Modbus** [**Modbus-Slave**] – protocol for using the serial port of a controller unit, for an external device to obtain data from the controller regarding your system. (For additional information, see *Eltek Controllers Modbus Description*, Doc. No. 2027380.)
  - **Callback** – Eltek's proprietary protocol developed for communication using the serial port of a controller unit with third-party modems.
  - **Comli**– Enables a telecom operator specific communication protocol. (For additional information, see *Smartpack/Smartnode Comli Description*, Doc. No. 2028179.)

- **cscp** – Enables a telecom operator specific communication protocol. (For additional information, see *Smartpack/Smartnode CSCP protocol description*, Doc. No. 2095982.)
- **Terminal** – Enables a terminal communication protocol for developers; not applicable for ordinary customer use.
- **EOC TPE** – Enables a telecom operator specific communication protocol. Generally not used.
- **EOC Modem** – Enables a telecom operator specific communication protocol. Generally not used.
- **EOC TCP** – Enables a telecom operator specific communication protocol. Generally not used.
- **ModBus-Master** – protocol for using the serial port of an Eltek controller to obtain information from an external device, such as smart batteries or generators. Choosing the **ModBusMaster** reveals additional setup parameters. The settings you enter are dependent upon the specific device being used; information regarding such devices must be obtained from documentation supplied with those devices.

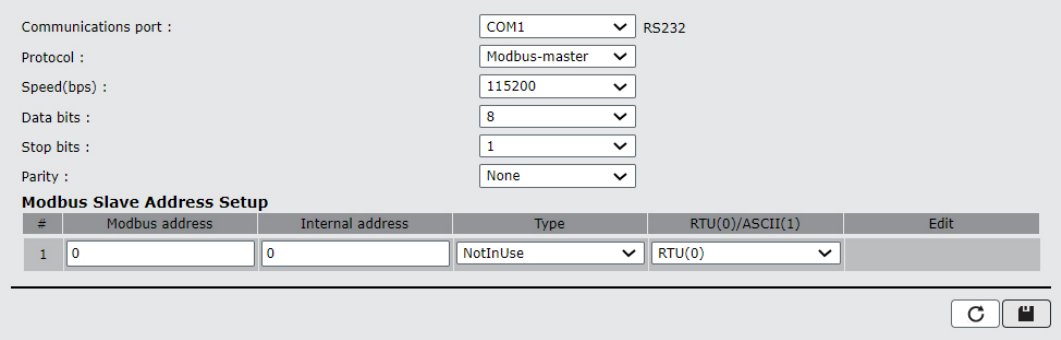


Figure 4.56 – ModBusMaster Parameters

- **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.

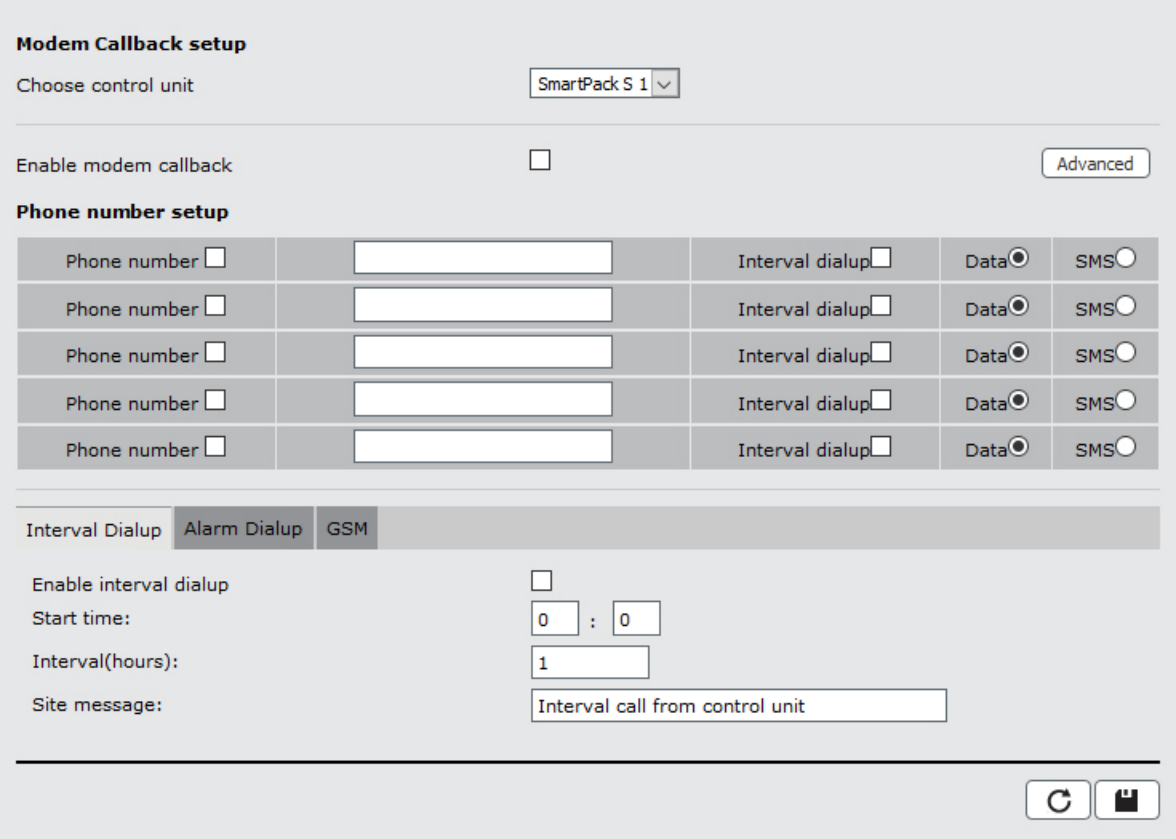


Figure 4.57 – Control System – Modem Callback Page (and Interval Dialup Tab)

Note: The **Modem Callback** feature only appears in the browser interface of a controller that supports modem callback is connected. Smartpack2 Touch, Smartpack S, and Smartpack R units currently support modem callback; this feature was removed from the Smartpack2 Basic Industrial controller in version 3.3. 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.

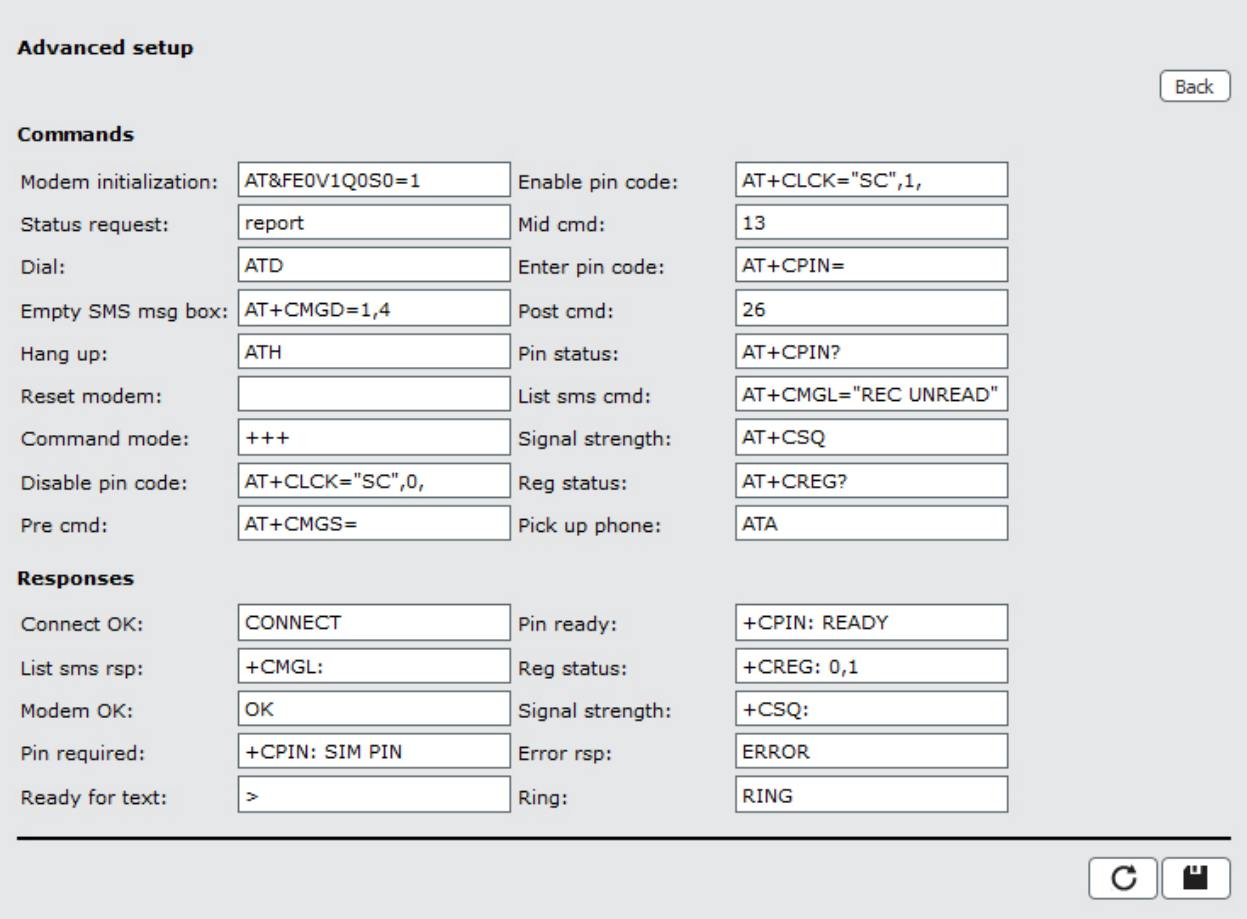


Figure 4.58 – Modem Callback – Advanced Setup Page (admin only)

- **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.

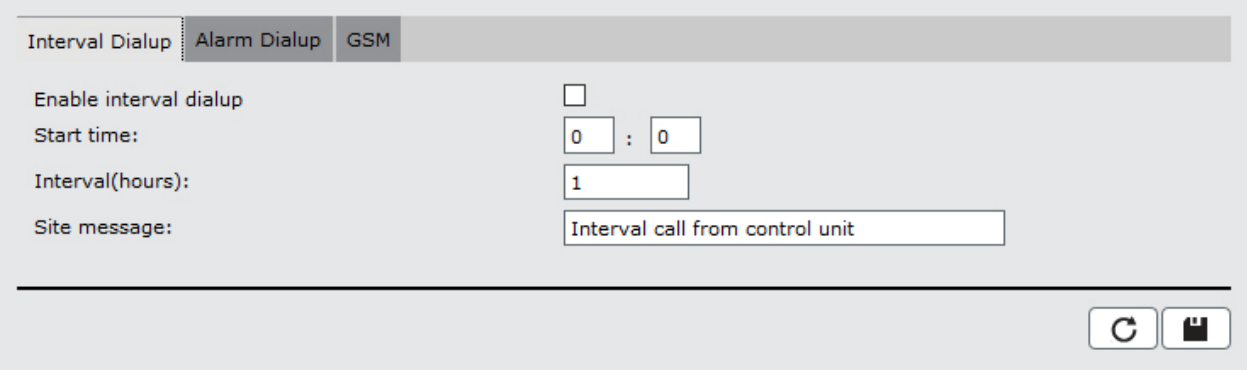


Figure 4.59 – Modem Callback – Interval Dialup Tab

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.

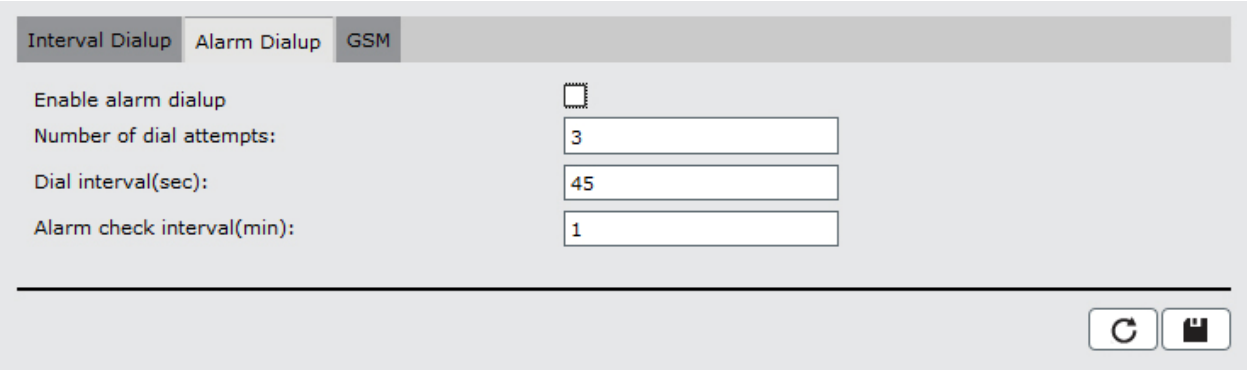
  Note: The format for the interval dialup message is as follows:

  [Site location]

  [Date and time]

  [Site message]

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



4.60 – Modem Callback – Alarm Dialup Tab

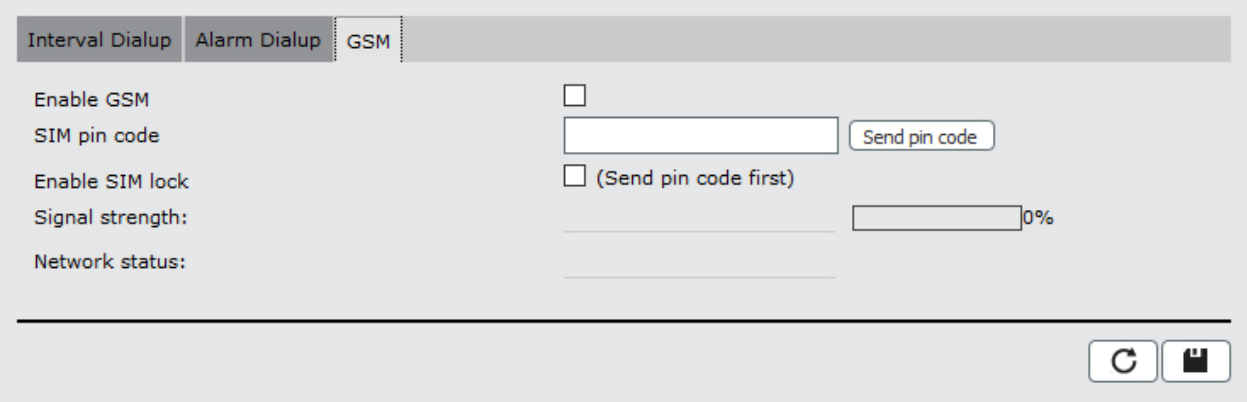
- **Enable alarm dialup** – check this box to enable the **Alarm Dialup** feature.
- **Number of dial attempts** – number of times to dial the phone number if connection fails.
- **Dial interval (sec)** – wait time after dialing a phone number. If there is no connection established, then the next number 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.



4.61 – Modem Callback – GSM Tab

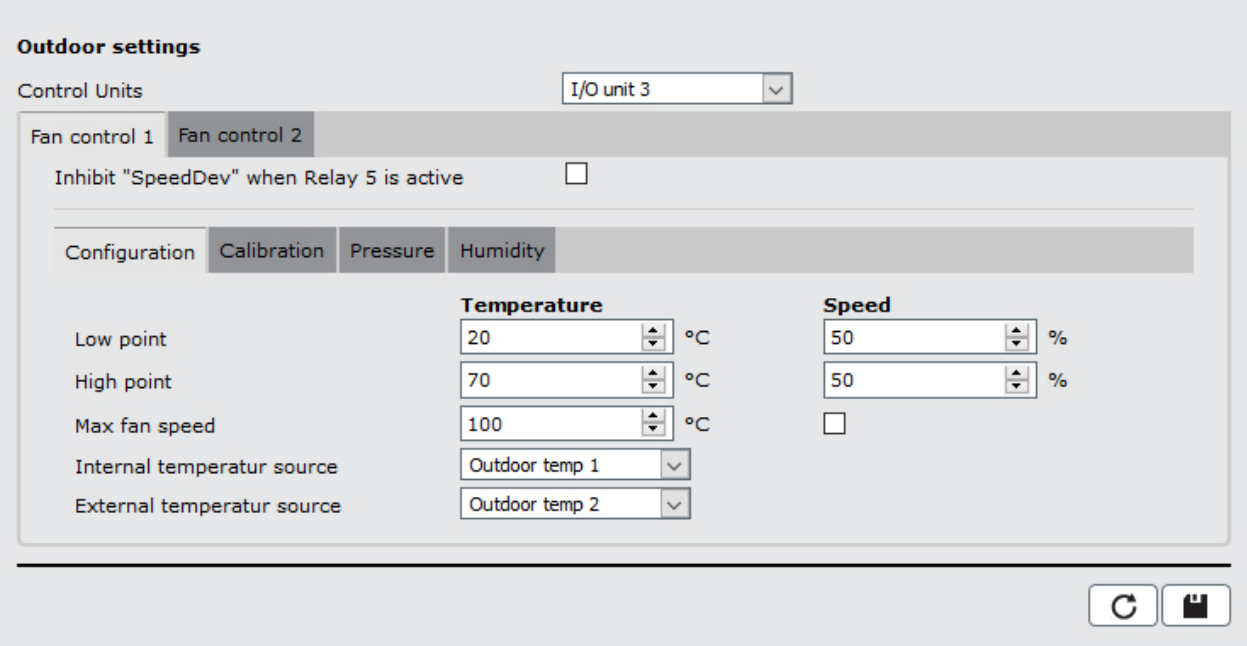
- **Enable GSM** – check this box to enable the **GSM** modem feature.

  Note: If the modem has **SIM lock** enabled, do not enable the GSM feature until after sending the **SIM PIN code** (see 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. This page only appears when an I/O Monitor Type 1 or Type 3, or Smartpack S controller is connected.



4.62 - Control Systems – Outdoor Settings Page and Fan Configuration Tab

- **Outdoor settings** – select the I/O Monitor (Type 1 or Type 3) or Smartpack S controller 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.

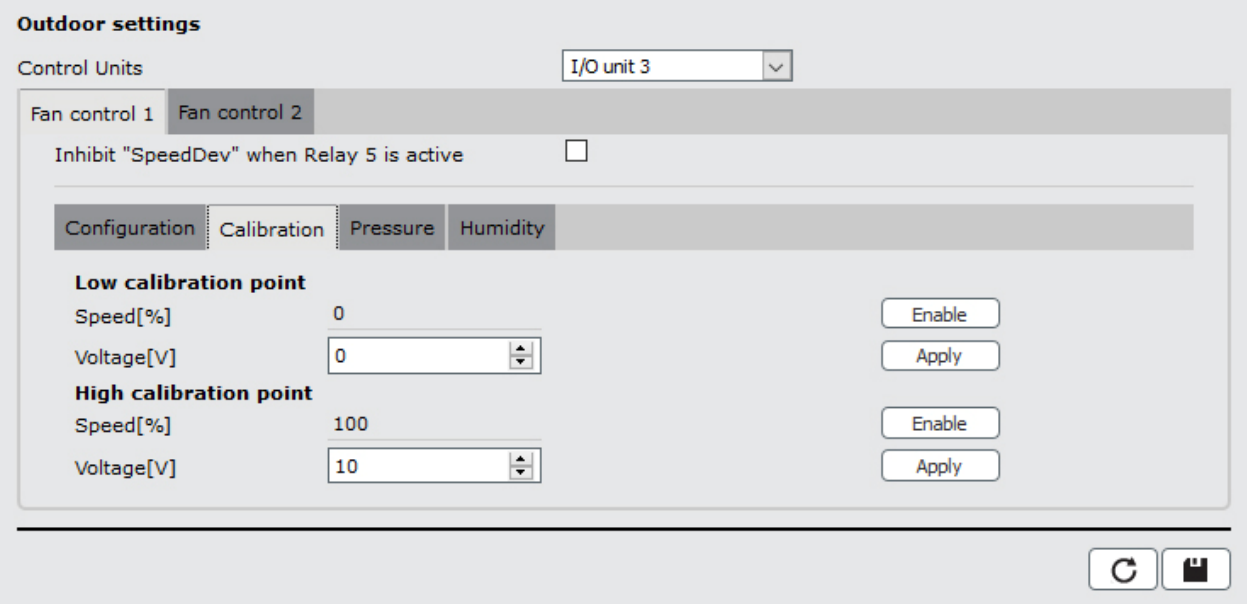


Figure 4.63 – Fan Control – Calibration Tab

- **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).

o **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.

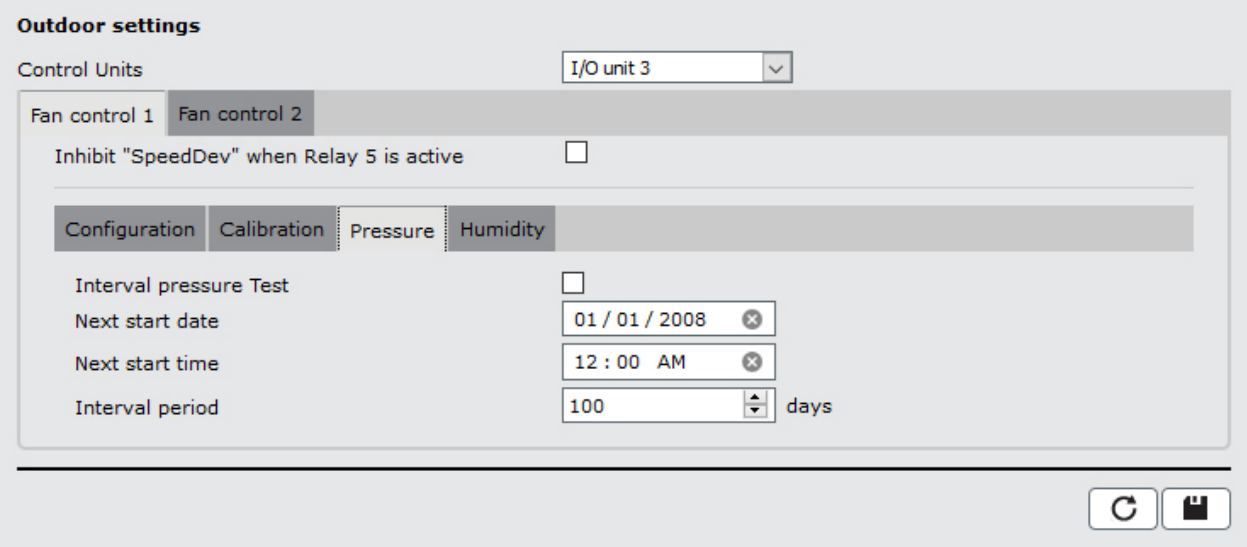


Figure 4.64 – Fan Control – Pressure Tab

■ **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)

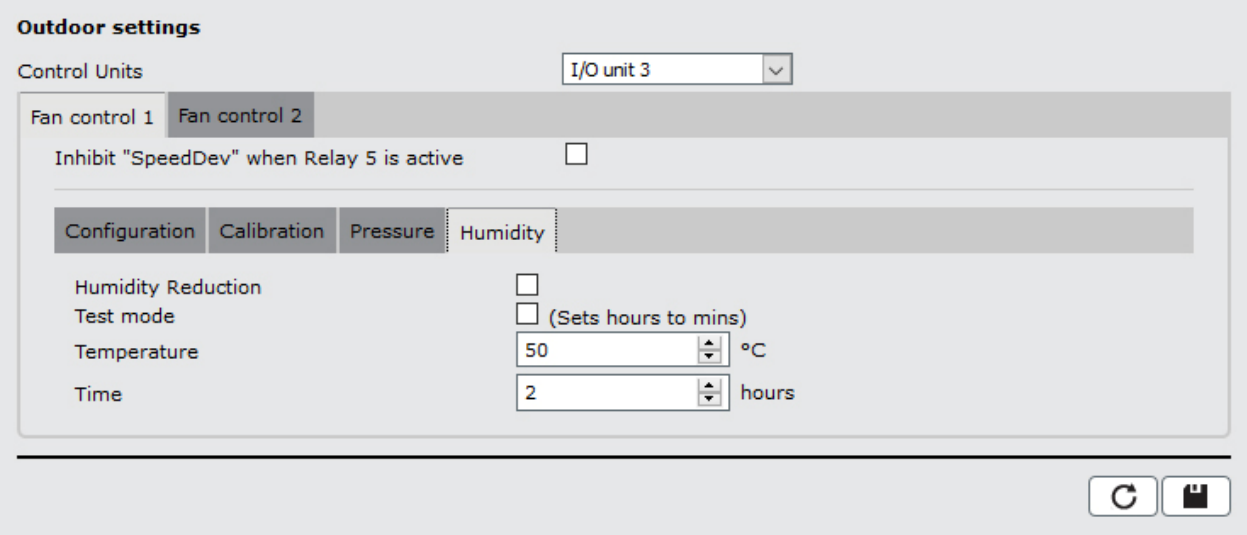


Figure 4.65 – Fan Control – Humidity Tab

- **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.

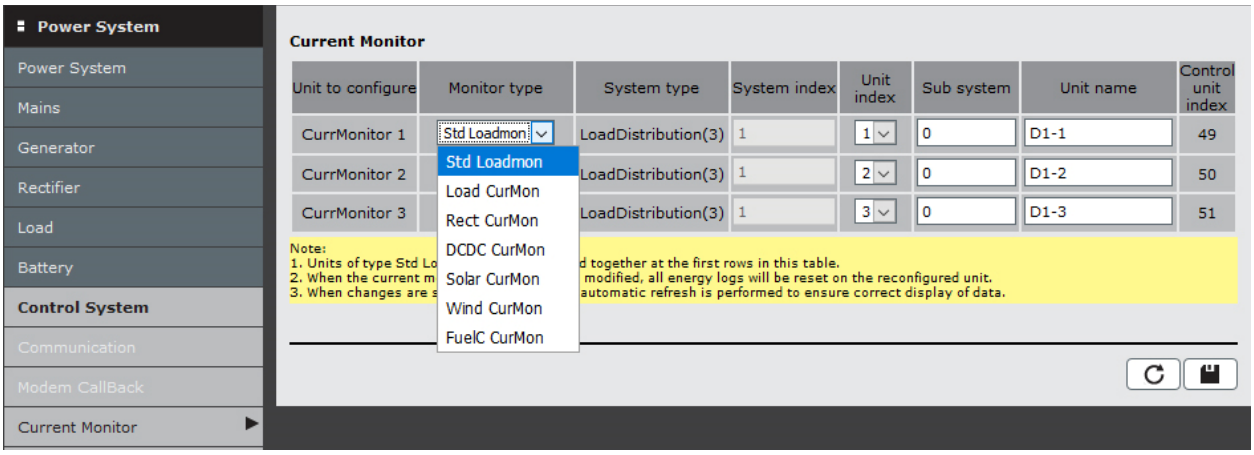


Figure 4.66 – Current Monitor Configuration Page

- **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** – menu 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. › Load**

    Note: Load Monitors set for StdLoadmon (load branch current) monitoring must have the first IDs in the CAN bus chain.
  - **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 from a main power bus.

    A Load Monitor configured as **Load CurMon** appears as **LoadCurMon X** at **Alarm Conf. › 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.

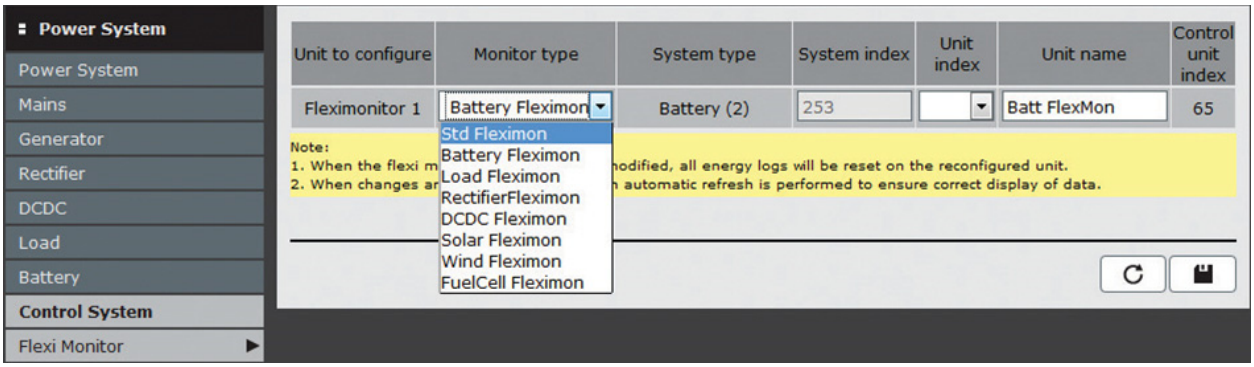


Figure 4.67 – Flexi Monitor Configuration Page

- **Unit to configure** – list of Flexi Monitors detected by the system controller (not configurable).
- **Monitor type** – menu 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-DCconverters 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. › 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.
- **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.

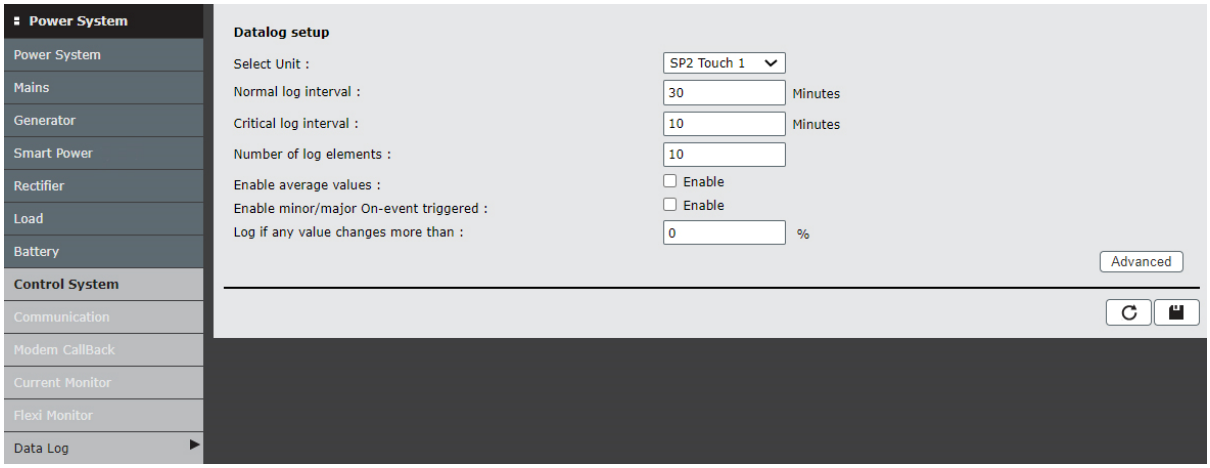


Figure 4.68 – Data Log Configuration Page

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** – menu 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 91) and datalogs (see “Data Log” on page 286). 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 4.68).

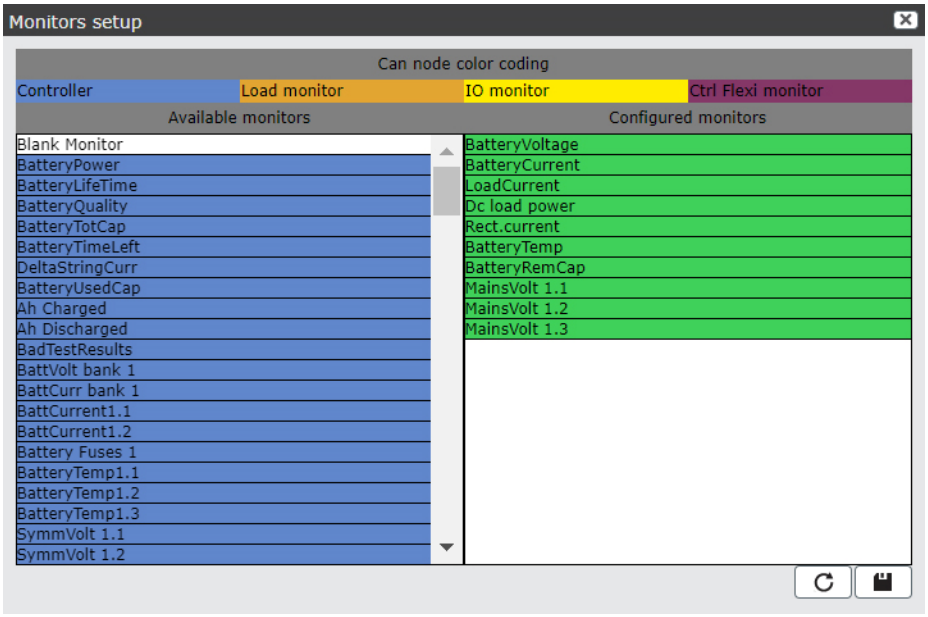


Figure 4.69 – Monitor setup options

Task Scheduler

- The **Task Scheduler** configuration page is for configuring parameters to schedule tasks for the controller to complete.

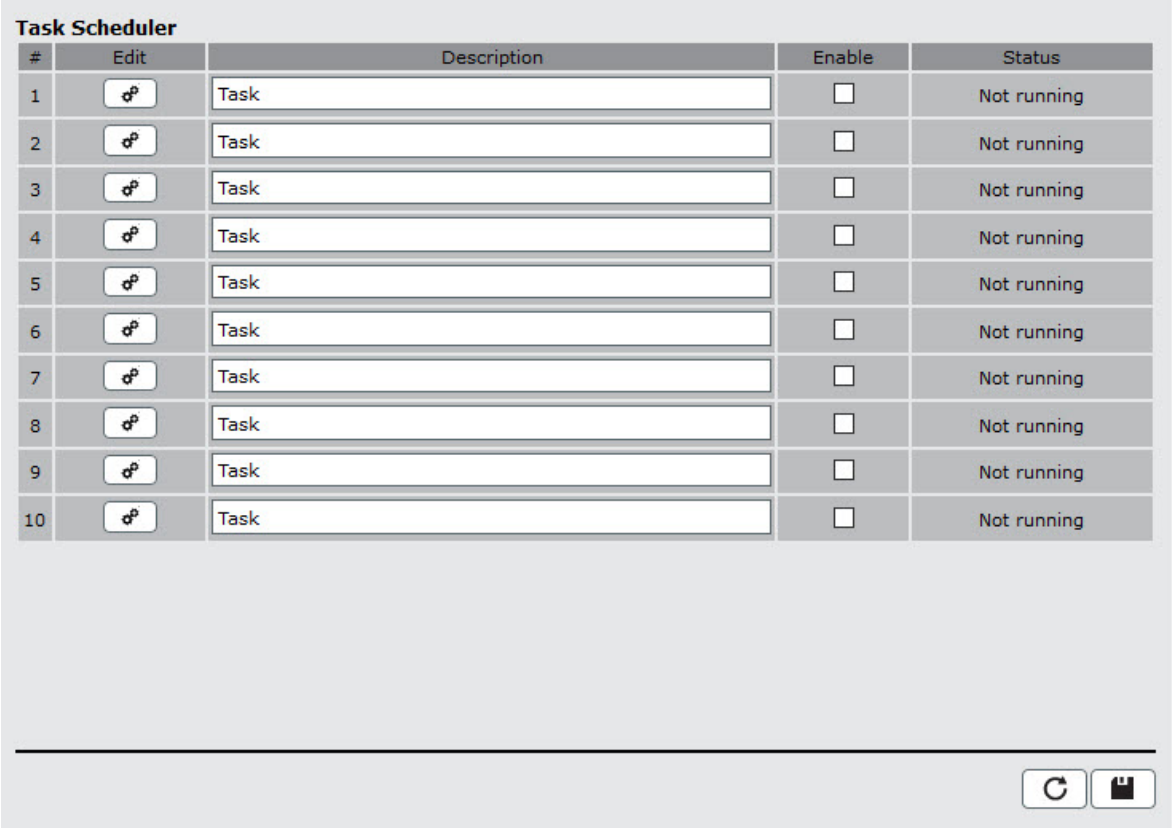


Figure 4.70 – Task Scheduler Configuration Options

- Edit – Click on edit button to configure specific task.
  - Trigger type – parameter for how often the task will trigger.
    - One time
    - Hourly
    - Daily
    - Weekly
    - Monthly
  - Start date (dd-mm-yyyy) – the date the event will activate.
  - Start time (hh-mm) – the time of day the event will activate.
  - Duration (minutes) – how long the event will be active.
  - Task command – the event that is activated when the task is run.

- Task alarm group – the alarm group that will be activated when the task is run.

- Description – user defined name for the task.
- Enable – Click this radio button to enable the task.
- Status – indicates whether the task is running or not.

Front Page Settings

The **Front page settings** allows you to configure the parameters displayed on the home page as well as the front display. To change the configured monitors drag and drop the monitors from the Available monitors list to the configured monitors list. The maximum number of items is eight (8).

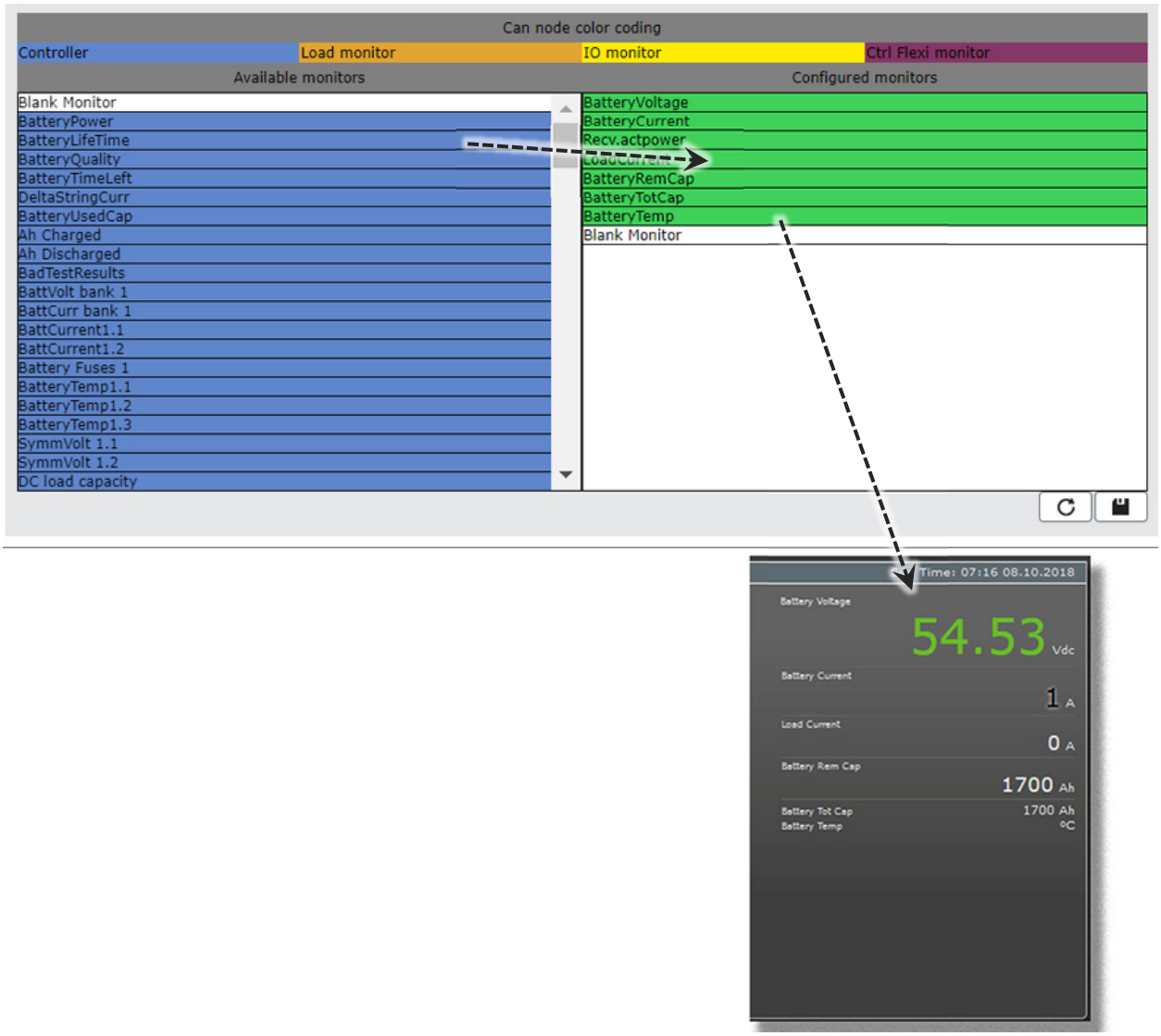


Figure 4.71 – Front Page Settings

Dual Master

The **Dual master** allows you to use two Master controllers that are mirror images of each other for one power system.

To use dual master controllers:

1. Connect the master controllers together through the CAN bus.
2. Set the addresses for the controllers.

   The default ID is **11**; one of the controllers must be changed to **12**. To change the address on the second controller, go to **System Conf. › Control System / Dual master**.

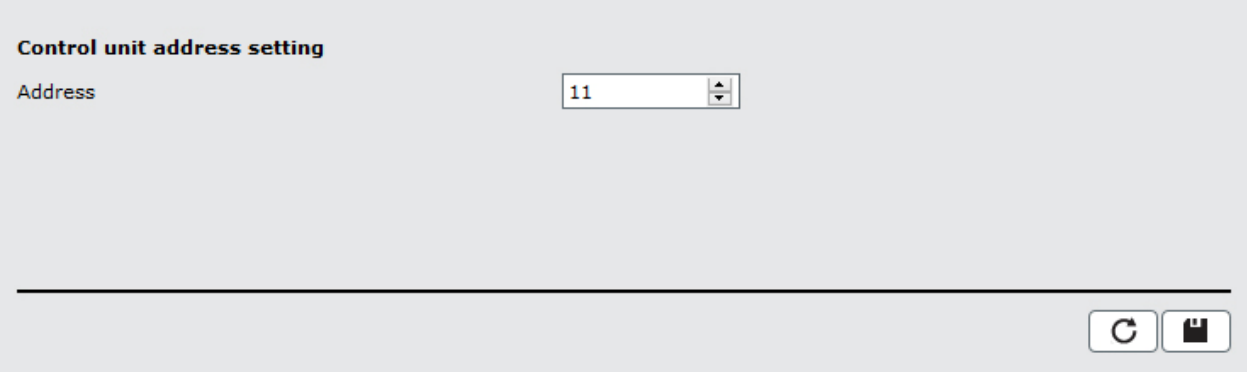


Figure 4.72 – Dual Master Configuration Options

3. Reset the controllers back to factory defaults:

   Go to **Commands › System**, and click the **Apply** button for **Set Default Configuration**.

   Note: Connecting an additional master after programming the first module will not inherit settings from the first master. That is why you must reset to factory defaults and then program them together.
4. Set other configuration parameters as desired. From this point, settings changed on one controller are mirrored on the other. There are three exceptions to the mirroring:
   - User accounts and passwords
   - Network TCP/IP settings
   - Controller ID settings (see step 2 above)

Note: You will not get a communication error alarm in the system if one of the masters stops communicating. Top level events are generated only from one unit.

License Keys

The **License Keys** page is for specialized controller features (such as tariff control and support for Ballard fuel cells) that are accessible only with a license from Eltek; admin permissions are required to view and modify this page. This feature works only with Smartpack Touch and Smartpack R controllers (on a per-controller basis), and keyed to the MAC address of the controller(s).

If you have a license key for special features, enter (or paste) the key into the first available field under **Key**.

Device Settings

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

General Settings

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

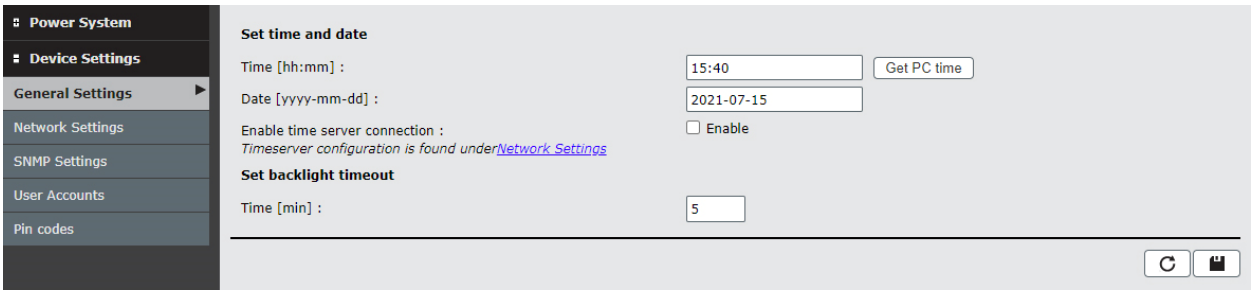


Figure 4.73 – Time Settings Configuration Page

- **Time [hh:mm]** – current time, 24-hour clock format.
- **Get PC time** – click this button to set time from connected PC.
- **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 under the Network Settings menu.

  Note: Further configuration is required under the **Timeserver** page under **Network Settings** (a link is provided on the **General Settings** page).

  Set backlight timeout – the **Time**, in minutes, that the screen or display remains illuminated, before dimming due to inactivity.

Network Interface Settings

The **Network interface** 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**.

Ethernet Local Area Network (LAN) Settings

To configure settings for your Local Area Network (LAN) go to **System Config › Network Settings**. This path takes you to the **Network interface** page.

Note: If you are using a non-Touch controller, the Network interface page appears only with the parameters shown in the Figure 4.74, below. If you are using a Smartpack Touch controller, there are additional parameters (tabs), as covered in the following sections, beginning with “eth01 (Smartpack Touch, Smartpack R),” page 173.

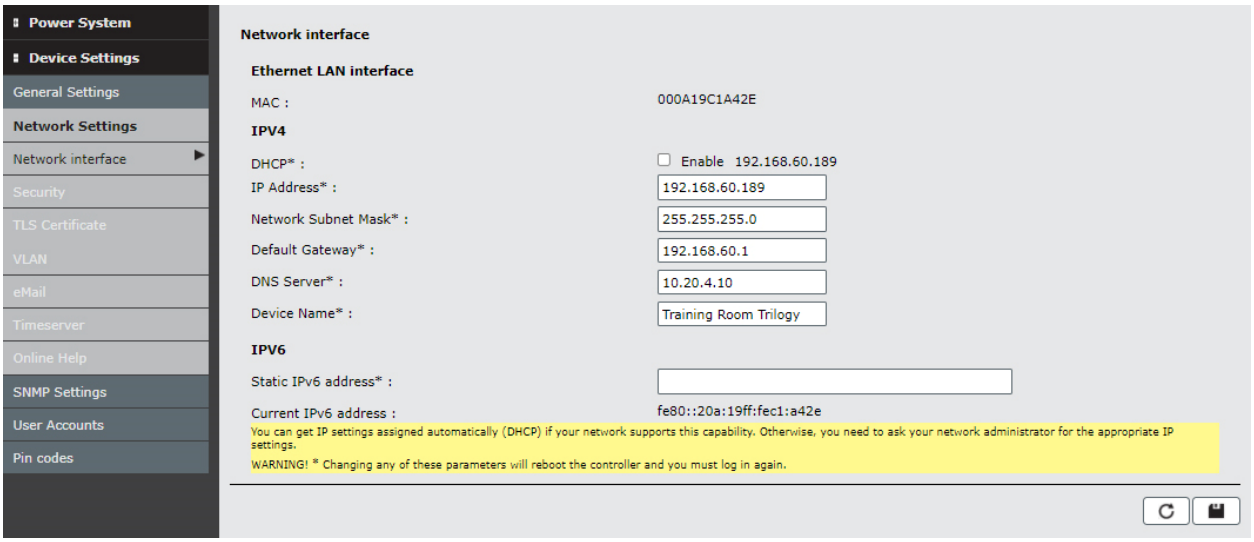


Figure 4.74 – Network Interface Page (Non-Touch Controller)

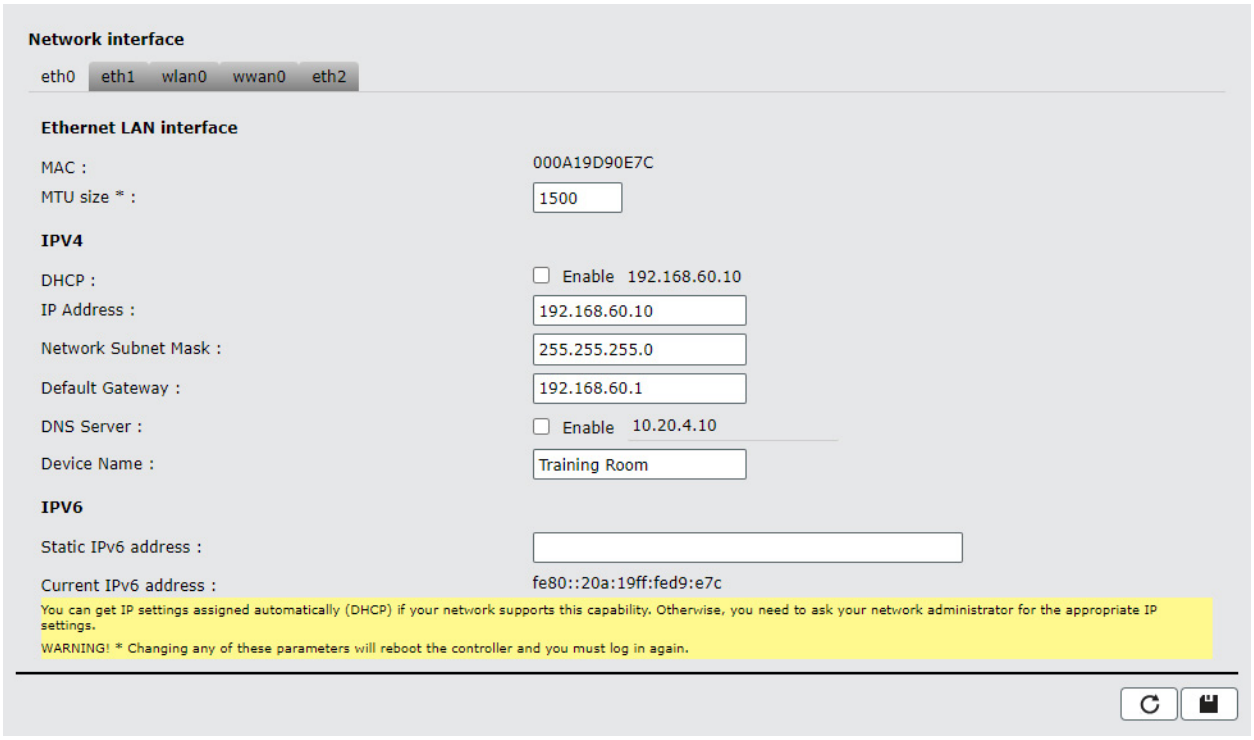


Figure 4.75 – Network Interface Page (Touch Controller)

- **Ethernet LAN Interface**
  - **MAC** – displays the MAC address of the controller.

- **MTU size** – Maximum Transmission Unit (MTU) size is the maximum packet size, in bytes, that can be transmitted over your network. If there is a decrease in speed, a lag, or disconnections on your network, you may wish to limit the size of data packets. If you change this parameter, the controller will reboot.

  Note: This feature is only available on Smartpack Touch and Smartpack R controllers.

- **IPV4**
  - **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.

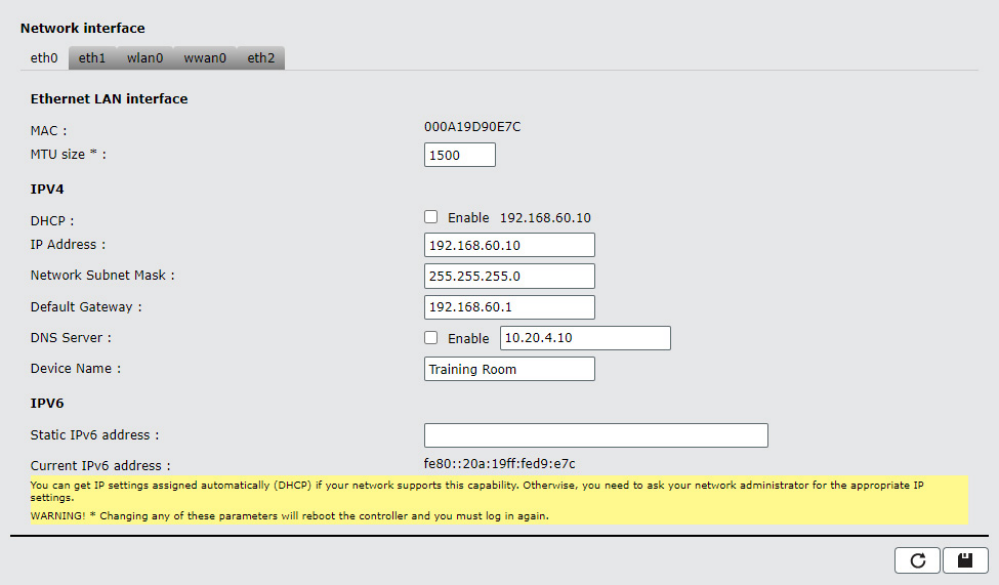


Figure 4.76 – Network Interface Page, Manual Configuration (Touch Controller)

- (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.

- **IPV6**
  - **Static Ipv6 address** – Enter a new IP address (obtained from network administrator).

    Note: Changing the IP address will reboot the controller.
  - **Current Ipv6 address** – This line shows the current IP address. The controller has a default address preconfigured based on the MAC address of the controller.

eth0 (Smartpack Touch, Smartpack R)

The **eth0** tab appears as the default page on the **Network interface** page (see Figure 4.75, above). This tab is for configuring the side internet port of a Smartpack2 Touch controller, or the rear Ethernet port on the Smartpack R. This port is provided for a permanent connection to a LAN. IP settings are assigned automatically (DHCP), if your network supports this capability. Otherwise, configure your settings manually, as described in the preceding section on "Ethernet Local Area Network (LAN) Settings," beginning on page 170.

eth01 (Smartpack Touch, Smartpack R)

The **eth1** tab provides information regarding the front internet port of a Smartpack2 Touch controller, or the USB Type B port on the front of the Smartpack R. This port is a "craft" port with limited functionality. It can be used to connect a computer directly to the controller, in order to configure the controller. It has a fixed IP address of 10.10.0.1 for addressing the controller. Any computer connected to this port, running a DHCP client, will be given an IP address. The port does not provide routing functionality; it cannot be used for LAN connection; use the side Ethernet port for connection to a LAN.

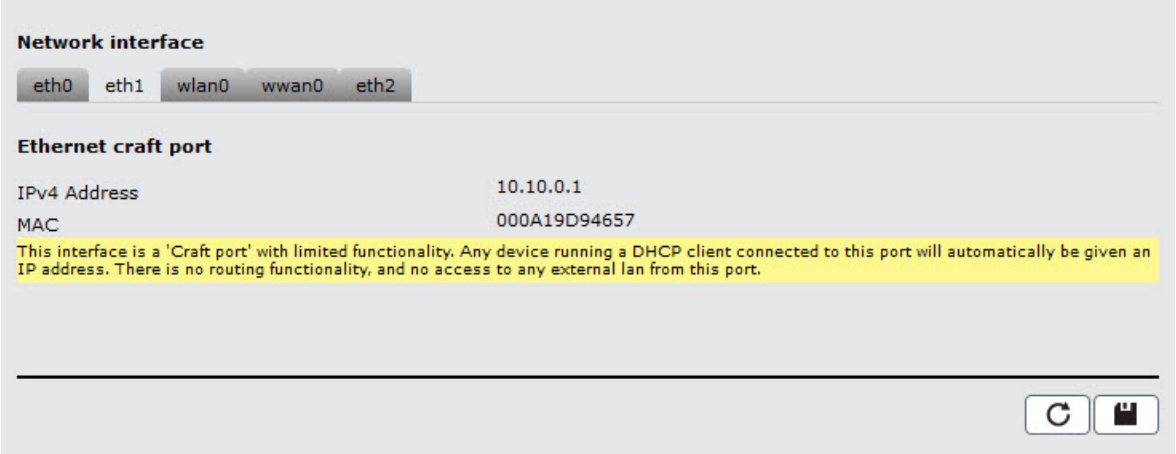


Figure 4.77 – eth1 Page

wlan0 (Smartpack Touch, Smartpack R)

The **wlan0** tab provides information regarding the front USB 2 port of a Smartpack2 Touch controller, or the front USB port (Type A) on a Smartpack R controller. This port is a “craft” port with limited functionality. It can be used to connect a computer directly to the controller, using a Wi-Fi USB dongle, in order to configure the controller. It has a fixed IP address of 10.20.0.1 for addressing the controller. Any device connected to this port, running a DHCP client, will be give an IP address. The Wi-Fi network is given a fixed name of sp2t_xxxxx, where the last five digits are the last five digits of the serial number of the controller. This network name is also used for the Wi-Fi password.

Note: For a list of supported dongles, see the online help, accessed through the **Help** button at the top of the **Home** page.

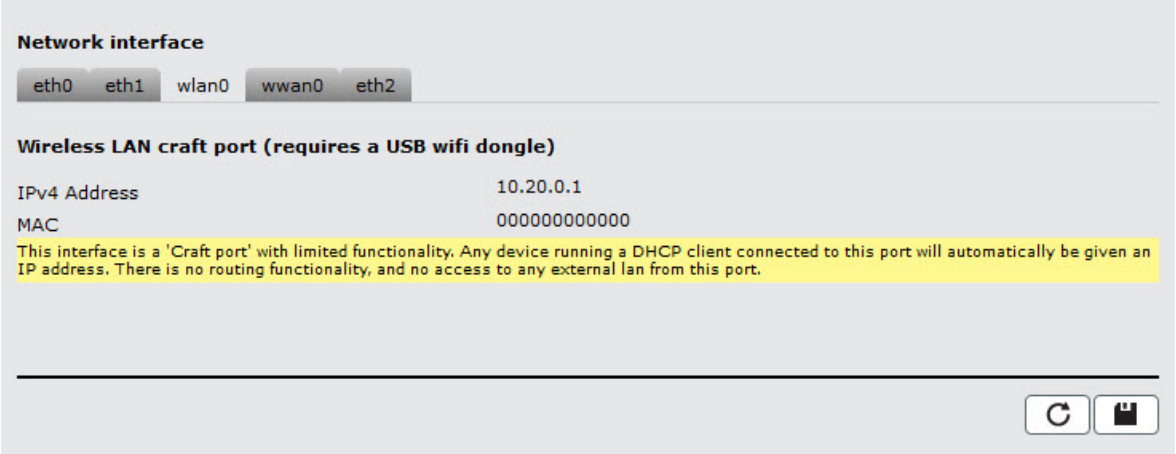


Figure 4.78 – wlan Page

wwan0 (Smartpack Touch, Smartpack R)

The **wwan0** tab provides information regarding a USB port, when using the port to connect a 4G cellular modem.

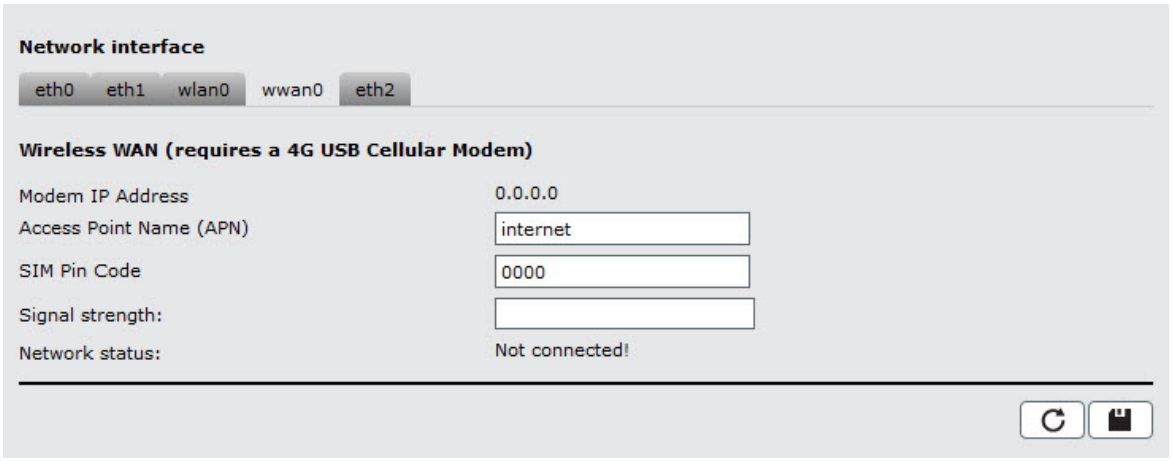


Figure 4.79 – wwan0 Page

- **Modem IP Address** – the IP address of the 4G cellular modem, when connected to the front USB port.
- **Access Point Name (APN)** – Enter a name for the network associated with the modem.
- **SIM PIN Code** – Enter the PIN code for the SIM card in the modem.
- **Signal strength** – an indicator bar illustrating the strength of the signal for the modem.
- **Network status** – Indicates whether network is connected or not.

Note: For a list of supported modems, see the online help, accessed through the **Help** button at the top of the **Home** page.

eth2 (Smartpack Touch, Smartpack R)

The **eth2** tab provides information when using a USB Gigabit Ethernet adapter. IP settings are assigned automatically (DHCP), if your network supports this capability. Otherwise, obtain IP settings from your network administrator and enter them manually.

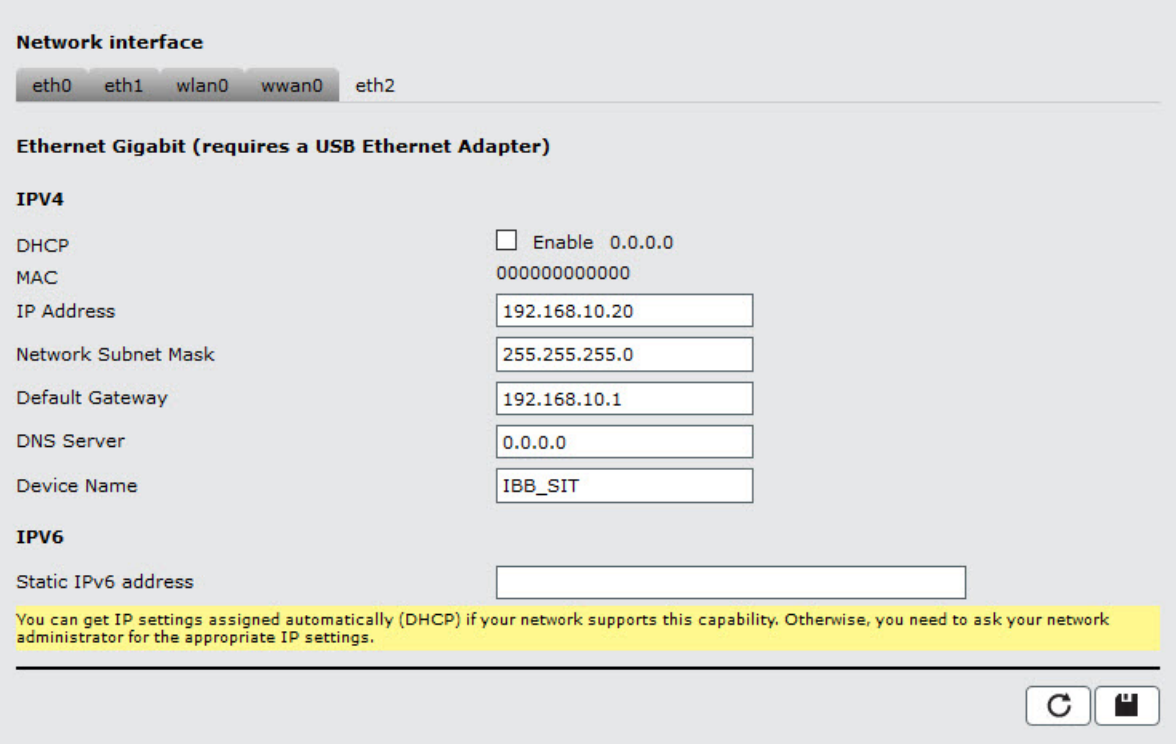


Figure 4.80 – eth2 Page

- **IPV4**
  - **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.

- **IPV6**
  - **Static Ipv6 address** – Enter a new IP address (obtained from network administrator).

    Note: Changing the IP address will reboot the controller.

Note: For a list of supported USB Gigabit Ethernet adapters, see the online help, accessed through the **Help** button at the top of the **Home** page.

Security Setup

The Security Setup page is for configuring network security. It includes sections for **TCP/IP Security** and **Modbus TCP**.

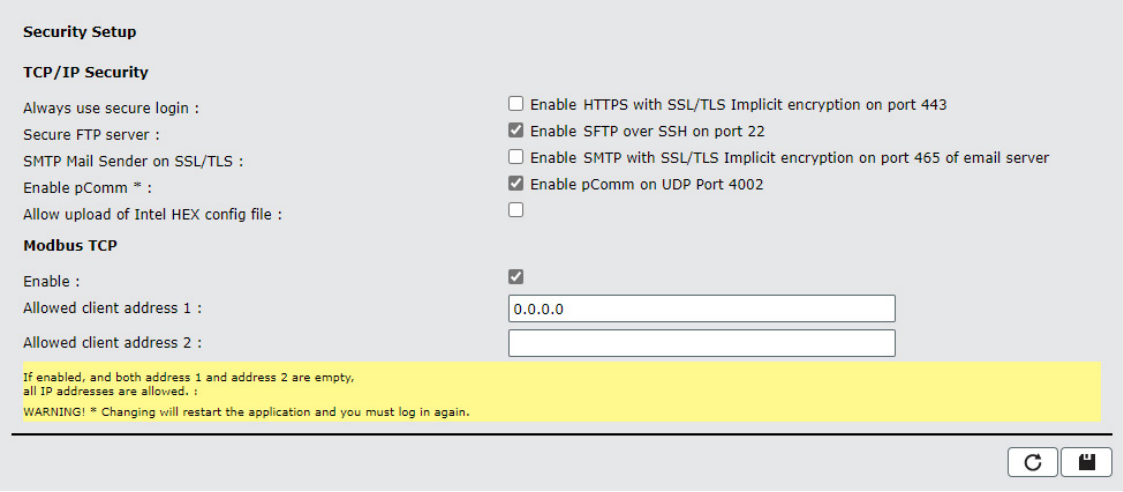


Figure 4.81 – TCP/IP Setup, Security and Modbus Settings (Smartpack2 Touch)

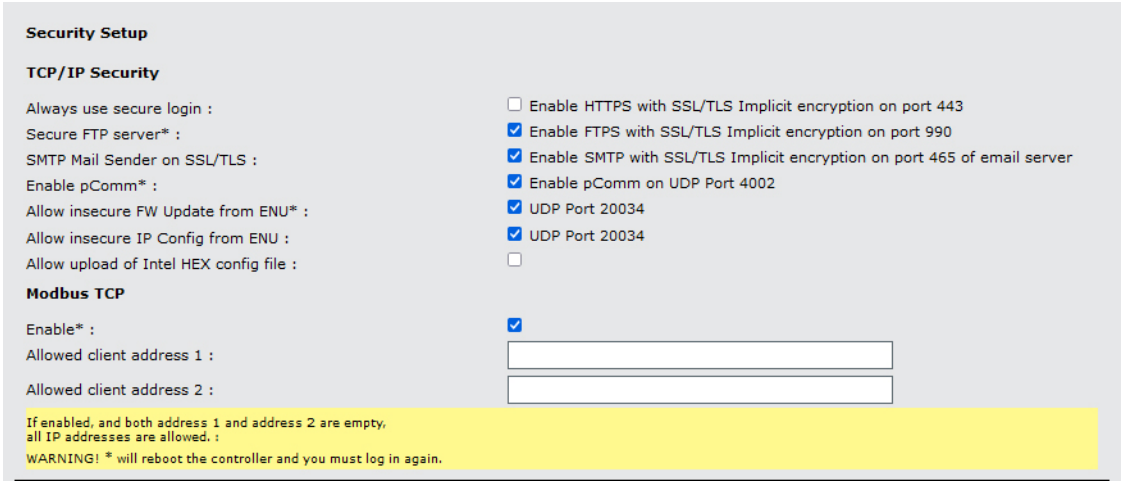


Figure 4.82 – TCP/IP Setup, Security and Modbus Settings (Smartpack2 Master)

The **TCP/IP Security** section includes:

- **Always use secure login** – check the Enable box to require an encrypted (HTTPS) connection to the controller's web interface; if left unchecked, an encrypted connection is otherwise an option on the **Login** page.

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

- **Secure FTP server** – Check the **Enable** box to encrypt FTP communication over SSH on port 22 on Smartpack Touch and Smartpack R controllers (port 990 on other controllers). For secure FTP communication, the controller uses SFTP. When this box is checked, port 21 is closed, to disallow unsecure FTP communication.
- **SMTP Mail Sender on SSL/TLS** – Check the **Enable** box to encrypt email communication over port 465. See "SNMP Settings," on page 186.
- **Enable pComm** – Check the box to run pComm on **UDP Port 4002**, which allows unencrypted communication to Eltek's PowerSuite program. Note that leaving this box unchecked will disable the use of PowerSuite.
- **Allow insecure FW Update from ENU** – Checking this box allows software updates through the Eltek Network Utility (ENU). If checked software updates are only allowed using encrypted .CRY files and proper authentication with the administrator username and password.
- **Allow insecure IP Config from ENU** – Checking this box allows IP Configuration through the Eltek Network Utility (ENU). If left unchecked IP configuration will only be available from the web interface.

- **Allow upload of Intel HEX config file** – Checking this box allows you to upload a configuration file. If unchecked you will only be allowed to use XML configuration files.

The **Modbus TCP section** includes:

- **MODBUS** – Checking the **Enable** box allows MODBUS communication through the network interface. If MODBUS communication is not necessary, or not allowed on your network, it can be disabled. If enabled, an IP address of the computer used for communicating to the controller must be entered below.
- **Allowed client address 1**: Enter the specific IP address of the computer communicating to the controller.
- **Allowed client address 1**: Enter the specific IP address of the computer communicating to the controller.

VPN Client Setup (Smartpack Touch, Smartpack R)

These settings are used to enable and configure VPN client setup.

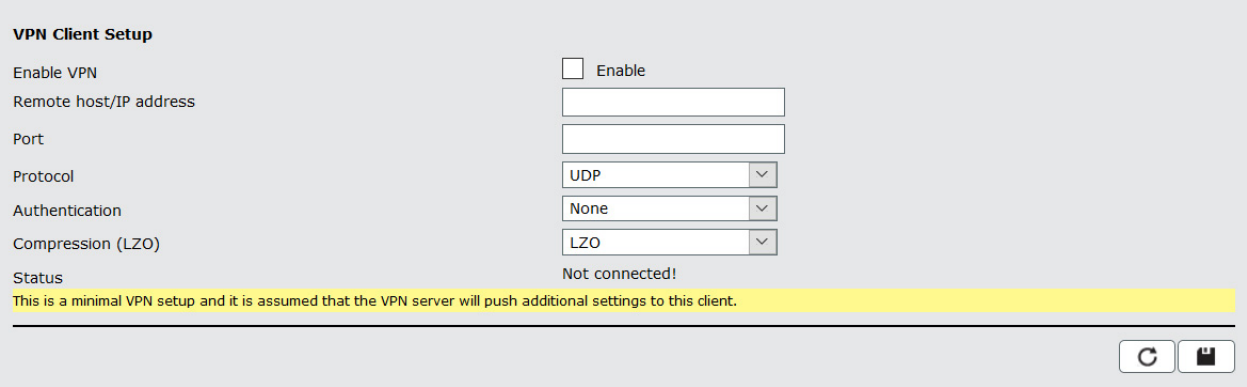


Figure 4.83 - VPN Client Settings

- **Enable VPN** – Enables or disables VPN.
- **Remote host / IP address** – The IP address of the remote VPN server.
- **Port** – The port for the remote VPN server.
- **Protocol** – The protocol for the remote VPN server (choose **UDP** or **TCP** from menu list).
- **Authentication** – The authentication method used for VPN (choose **None** or **TLS**).
- **Compression (LZO)** – Enables or disables compression (**LZO** or **None**).
- **Status** – The current status of the connection to the VPN server.

TLS Certificate

This section allows you to enter a TLS certificate, whether from a certificate authority, or a self-generated certificate. A self-signed certificate will clear the warning associated with an HTTPS login ("This site is not secure"), but it does not provide additional security.

After a certificate is entered or generated here (using this page), it must also be loaded into your browser, using the browser's security features.

A typical procedure for using a TLS certificate includes the following steps:

1. Purchase a certificate from a certificate authority, or generate a self-signed certificate using the button on this page.
2. If using a purchased certificate, paste the contents of the certificate and TLS key into the corresponding text fields on this page. If you generated a self-signed certificate from this page, the certificate and key are already copied into the controller's memory.
3. Load the certificate into your browser, using the security features of the browser.

Note: This section does not display any current certificate information, whether default or customer-loaded. Any certificates reside in the memory of the controller.

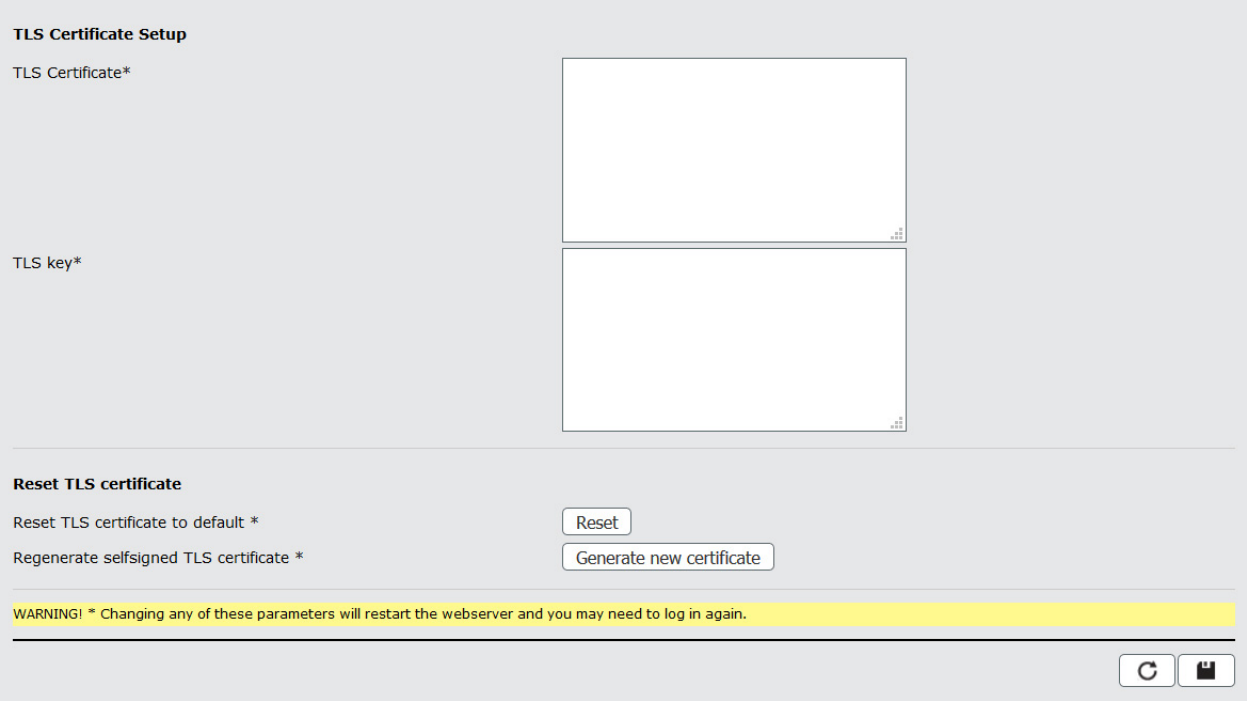


Figure 4.84 – TLS Certificate Settings

TLS Certificate – Paste the contents of a valid certificate into this field. Text must be entered in ASCII format, and enclosed within the proper tags (`-----BEGIN CERTIFICATE-----[text]-----END CERTIFICATE-----`).

TLS key – Paste the contents of a valid key file into this field. Text must be entered in ASCII format, and enclosed within the proper tags (`-----BEGIN RSA PRIVATE KEY-----[text]-----END RSA PRIVATE KEY-----`).

Reset TLS certificate to default – Clears the contents of any files loaded by the user, and restores the factory default certificate.

Regenerate selfsigned TLS certificate – Generates a certificate and places it in the controller's memory. You have to use an FTP client to retrieve the file from the certificates/https subdirectory on the controller (**etc › certificates› https**). This button is only visible on the Smartpack Touch and Smartpack R controllers; for other controllers, you must purchase a certificate, or use a separate tool or service to generate a self-signed certificate.

VLAN (Smartpack Touch or Smartpack R only)

This page enables and configures VLAN settings.

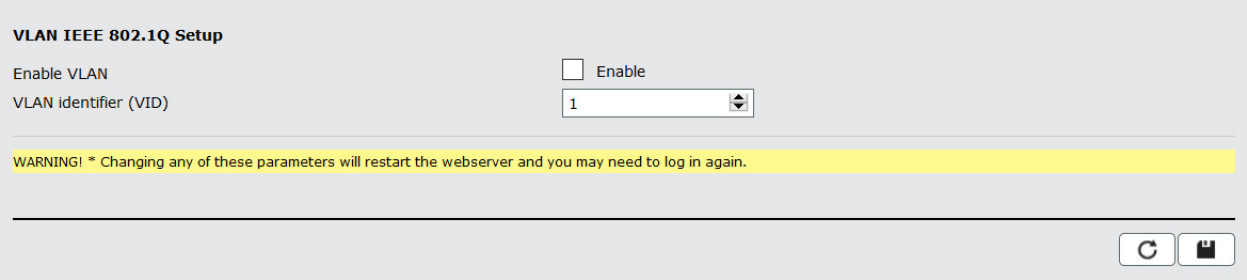


Figure 4.85 – VLAN Setup

Enable VLAN – Enables the controller to connect to a Virtual Local Area Network.

VLAN identifier (VID) – The identification number of the VLAN to which the controller will be connected.

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.

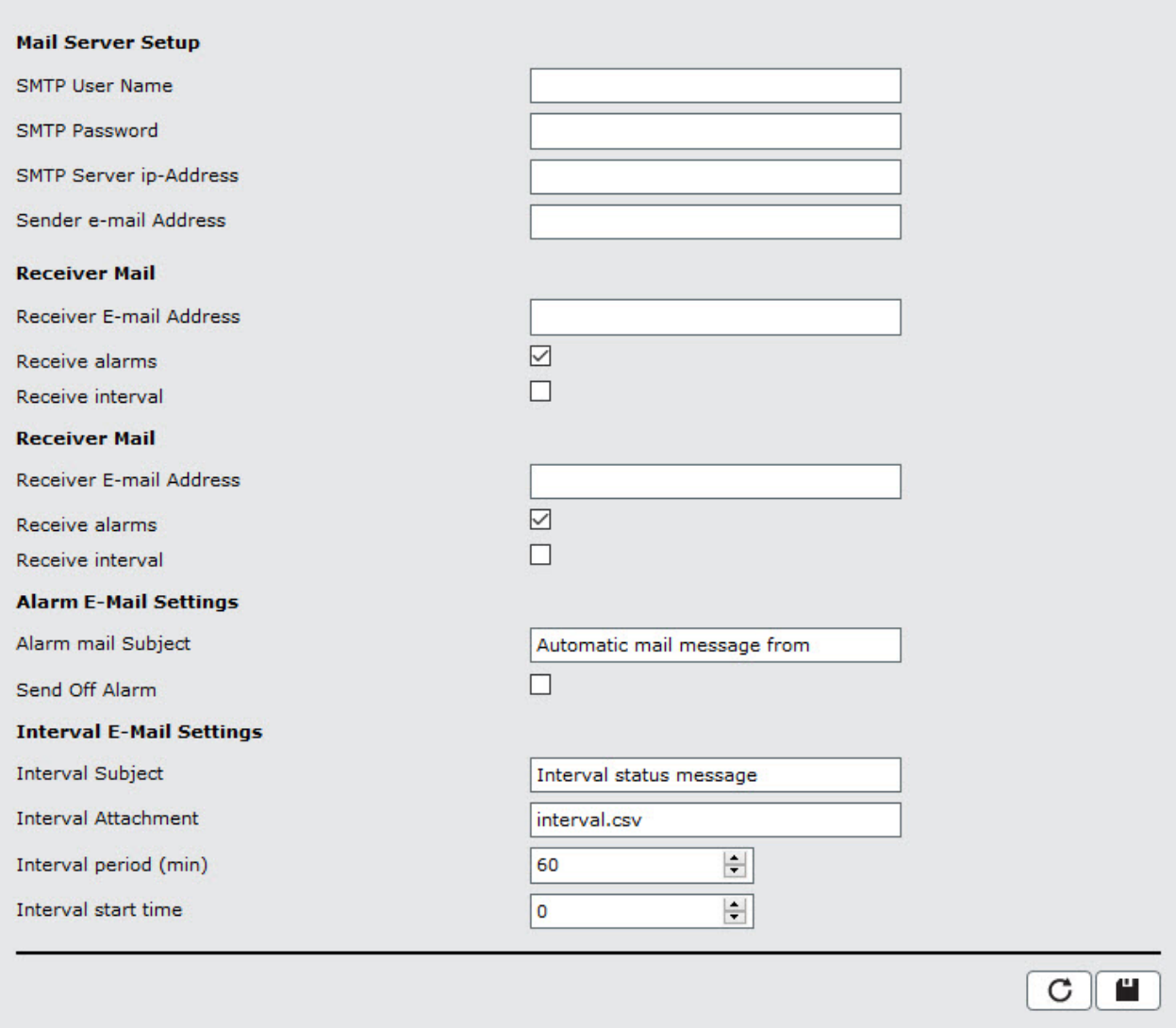


Figure 4.86 – E-mail Configuration Page

- **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. If you are using an email server that does not require authentication then leave the password field blank. Entering a password assumes that the email server requires authentication.

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** – This feature is for specialized use, and requires an authenticated server and data files resident within the controller memory.
- **Alarm E-Mail Settings**
  - **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** – The number of hours, past midnight, to begin sending interval e-mail messages.

Time Server

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

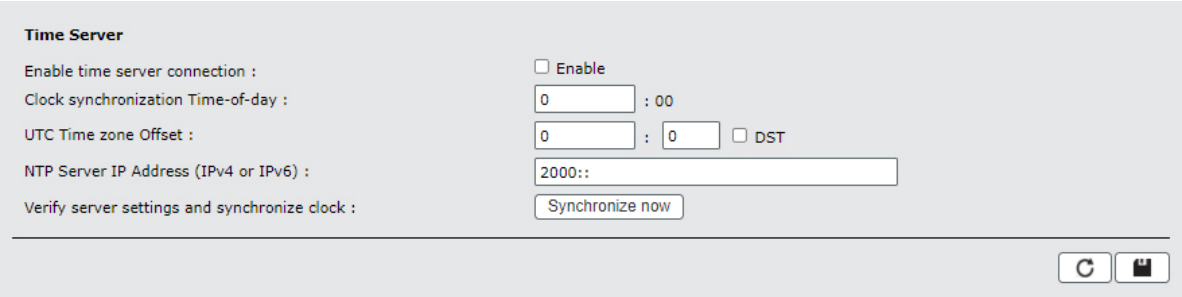


Figure 4.87 – Time Server Configuration Page

- **Enable time server connection** – Check the **Enable** box to enable automatic time updates from a network time server; this box is the same as the **Enable** time server connection box on the **Time Settings** page.
- **Clock synchronization Time-of-day** – The hour of the day to synchronize with the time server (24-hour clock format, HH).
- **UTC Time zone Offset (+-12h)** – The time zone setting, using UTC offset (whole number of hours).
- **DST (Daylight Saving Time)** – Check this box if your time zone is subject to Daylight Saving Time.
- **NTP Server IP Address (IPv4 or IPv6)** – The IP address of NTP (Network Time Protocol) server to use.
- **Verify server settings and synchronize clock** – This button tests 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 4.88 – 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.

Note: To use the online help, you must click on the **Help** button at the top of the browser window, and enter a password. If you need to obtain the password for the online help, contact Eltek Technical Support.

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**.

SNMP Configuration

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

Note: In version 2.9 and later, SNMP settings can be configured using XML files; see "SNMP Configuration Using XML files" on page 374 for additional details.

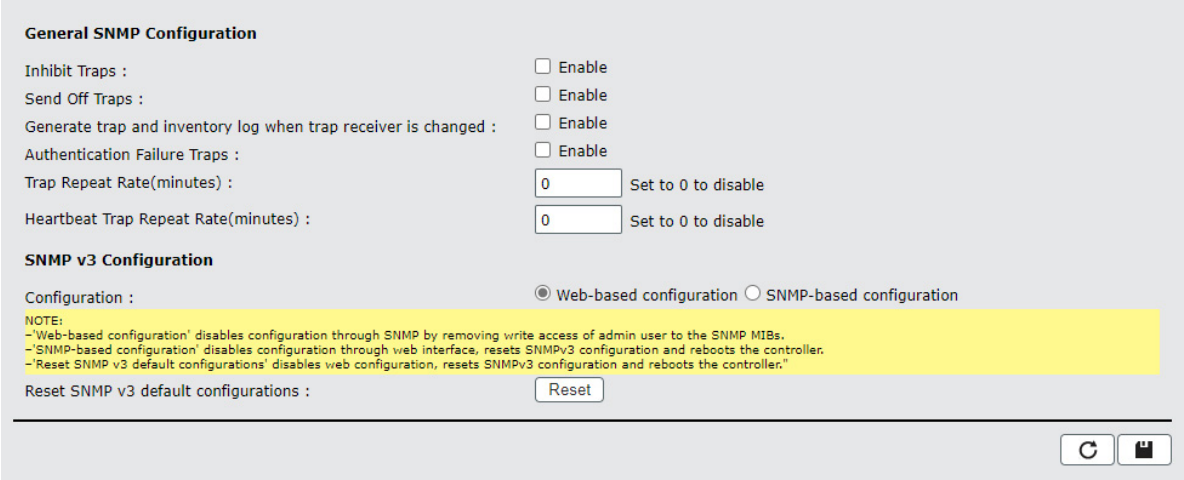


Figure 4.89 – SNMP Settings Page (SNMP-based configuration)

- **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").
  - **Generate trap and inventory log when trap receiver is changed** – enabling this field generates a trap, and saves the inventory log into the memory of the controller whenever the trap receiver is changed.
  - **Authentication Failure Traps** – enabling this field generates a trap whenever an authentication failure occurs.
  - **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 browser 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 browser interface.

    CAUTION: Selecting **SNMP-based configuration** resets browser-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 browser 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 (see page 189)
    - Vacm Access (see page 194)
    - V1/V2 Community (see page 195)
    - Traps (see page 196)

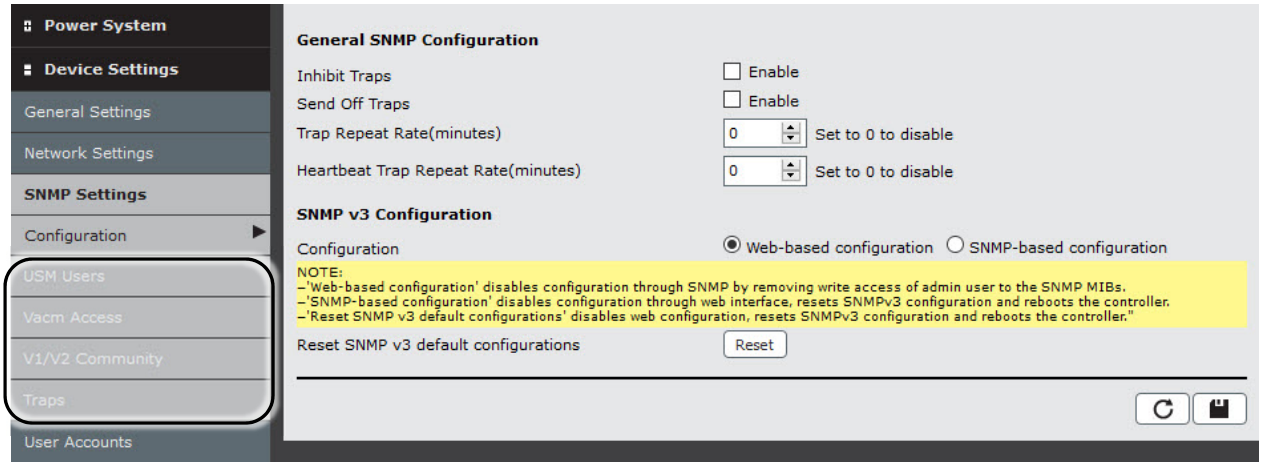


Figure 4.90 – SNMP Settings Page (Web-based configuration)

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

Table 4.4 - 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.

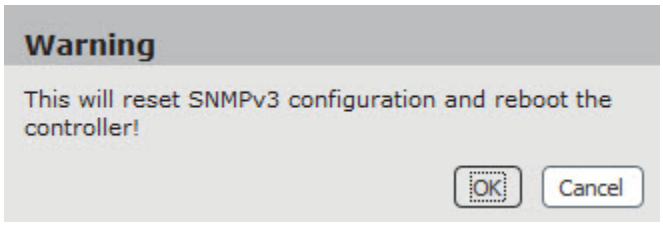


Figure 4.91 – SNMPv3 Reset Warning

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.

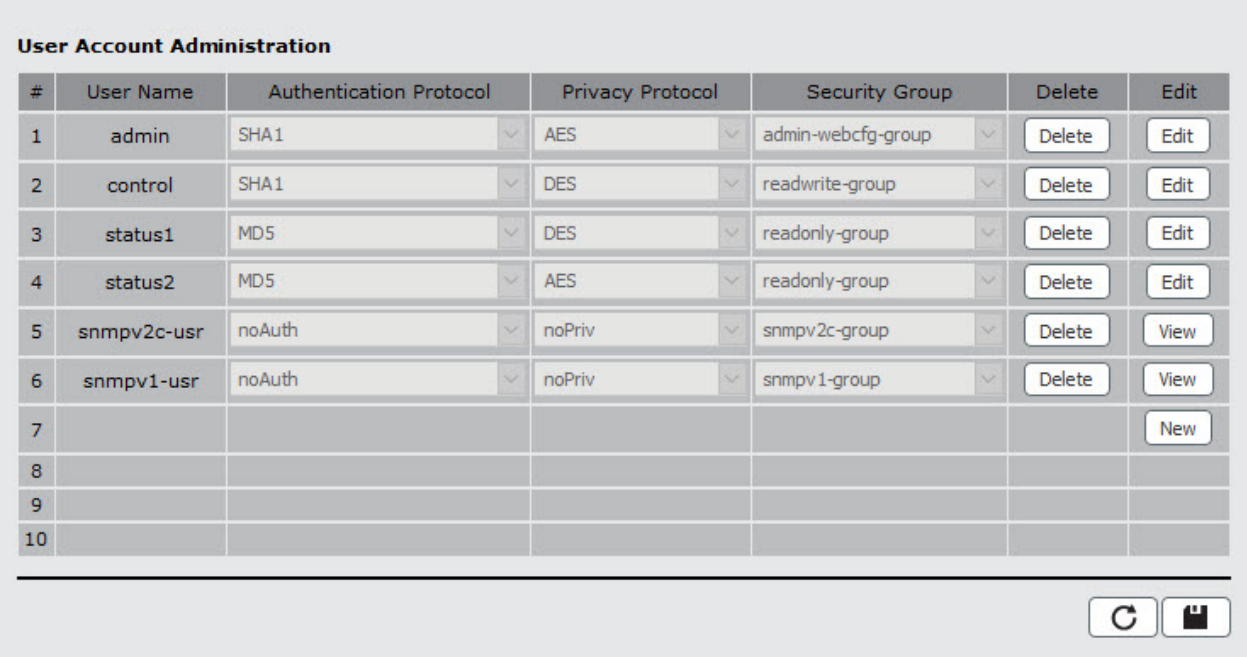


Figure 4.92 – USM Users Page

- **#** - 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 4.5 – 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).

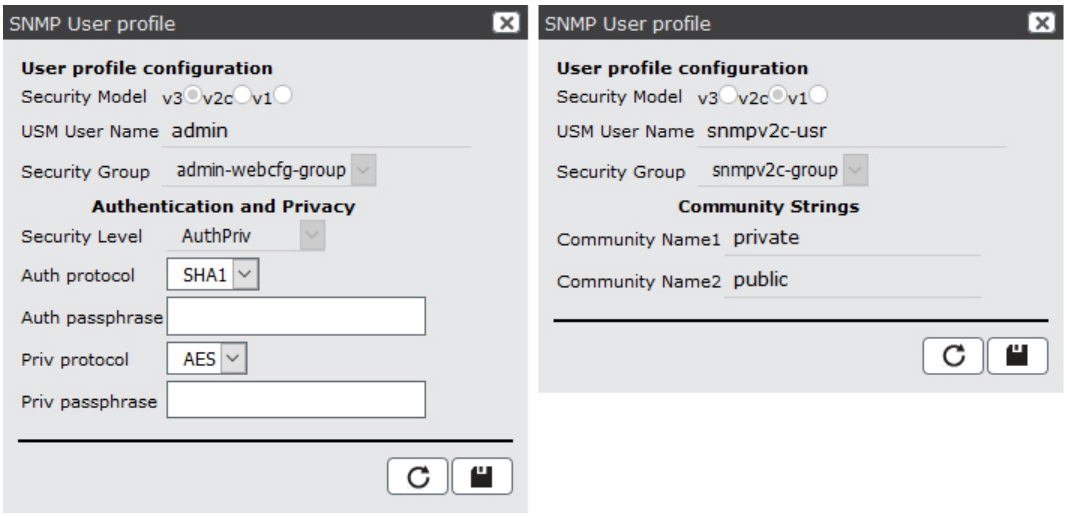


Figure 4.93 – SNMP Accounts – Edit and View Windows

- **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.

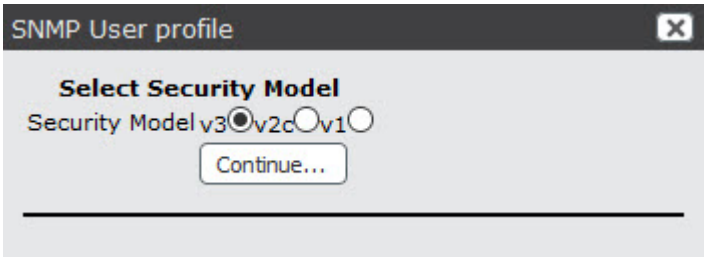


Figure 4.94 – SNMP Accounts – Edit and View Windows

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.

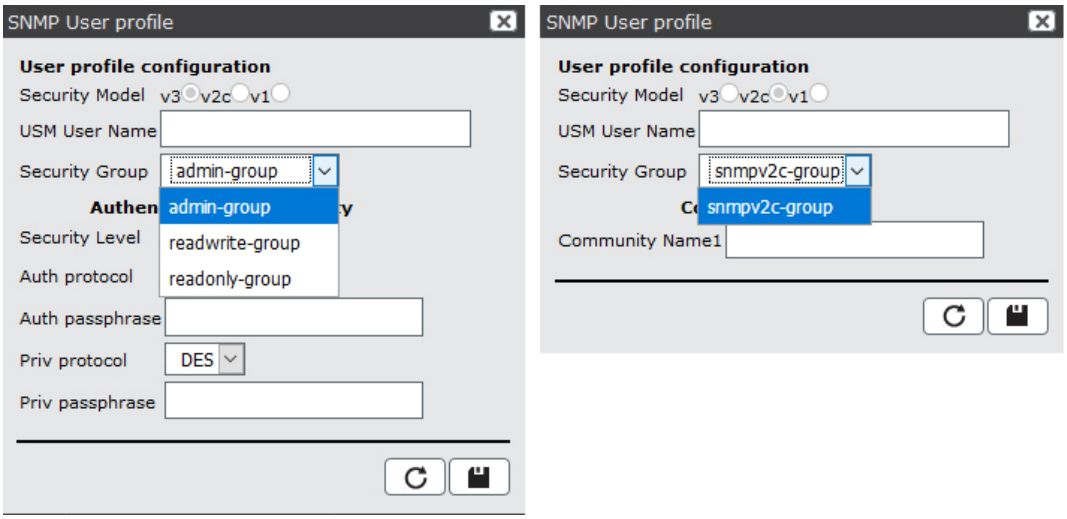


Figure 4.95 – New SNMP User Profile Window

- **SNMP v3 User Profile Configuration**

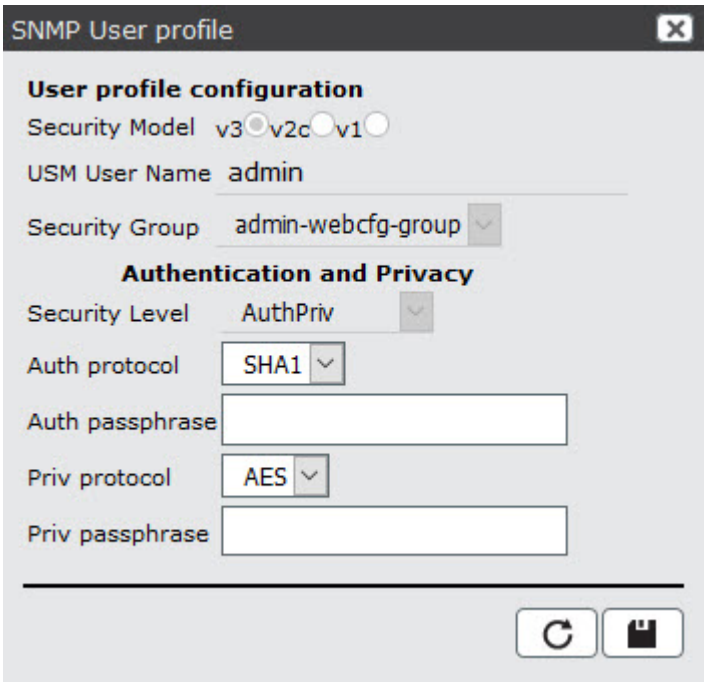


Figure 4.96 – SNMPv3User Profile Configuration Window

- **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).
- **SNMP v1/v2c**

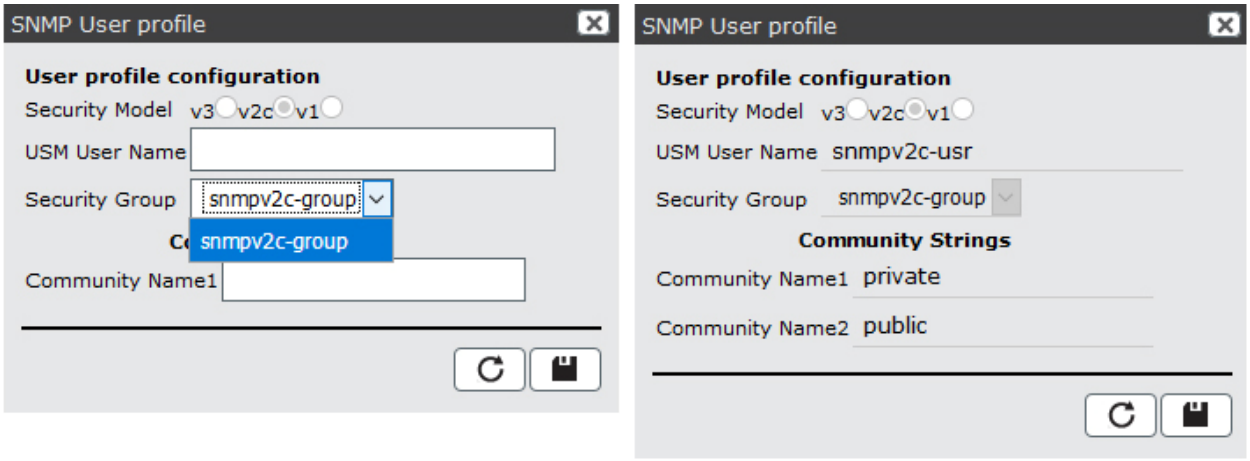


Figure 4.97 – SNMPv1/v2c User Profile Setup and Configuration Windows

  - **USM User Name** –Text field for entering a user name. For v1 and v2c, the name can be entered when creating a new user, but cannot be edited after first setup.
  - **Security Group** –Security level assigned to the user. For v1 and v2c, the group can be selected when creating a new user, but cannot be edited after first setup.
- **Community Strings** –**Community Name** 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.

Vacm Access

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

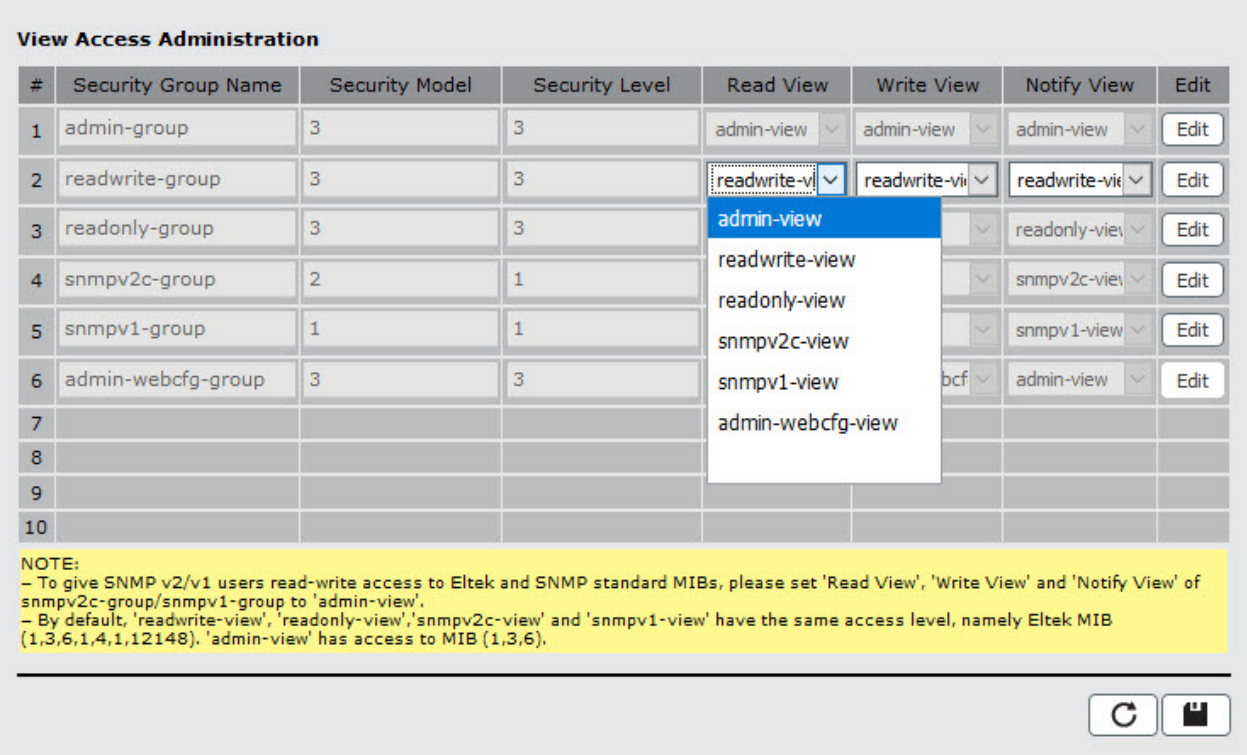


Figure 4.98 – Vacm Access Configuration Page

- **#** - 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.

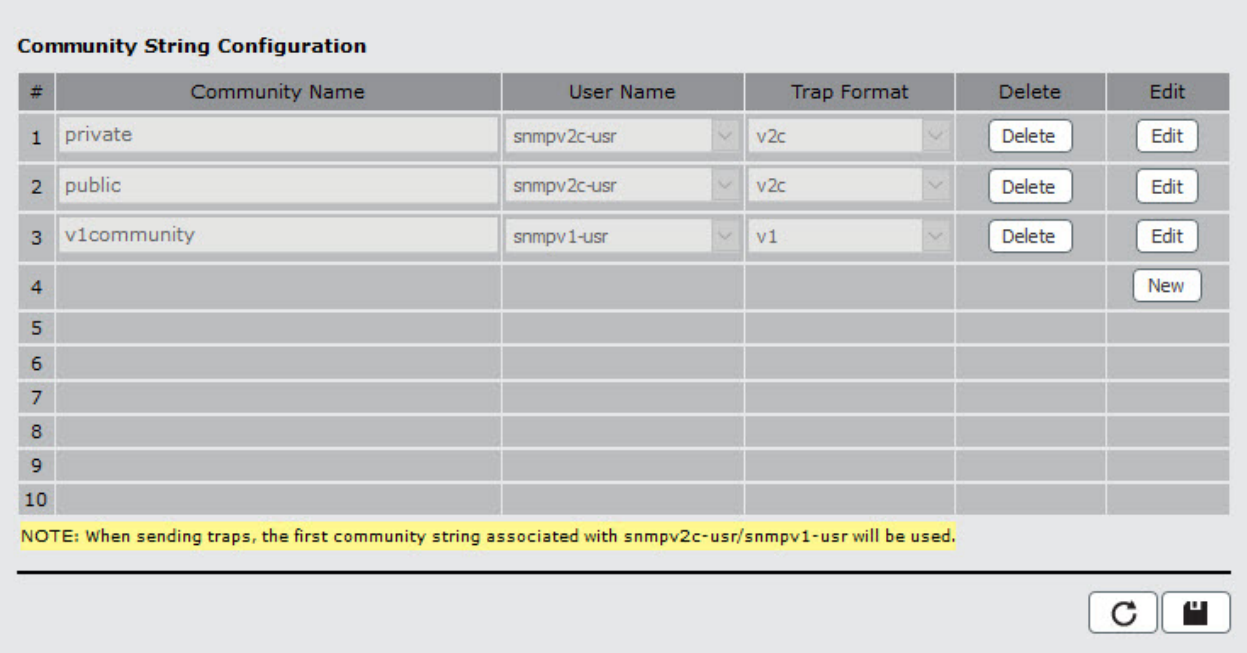


Figure 4.99 – V1/V2 Community Configuration Page

- **#** - 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).

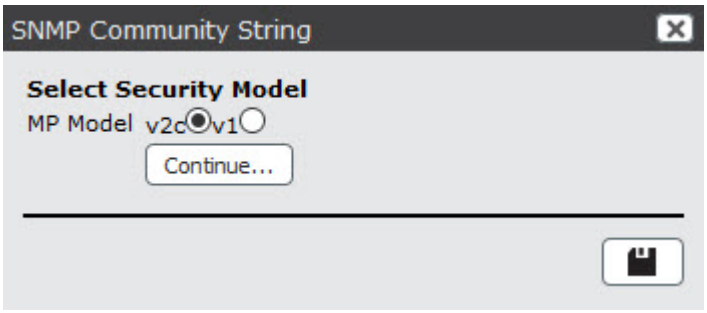


Figure 4.100 – SNMP Security Model Selection Window

- **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.

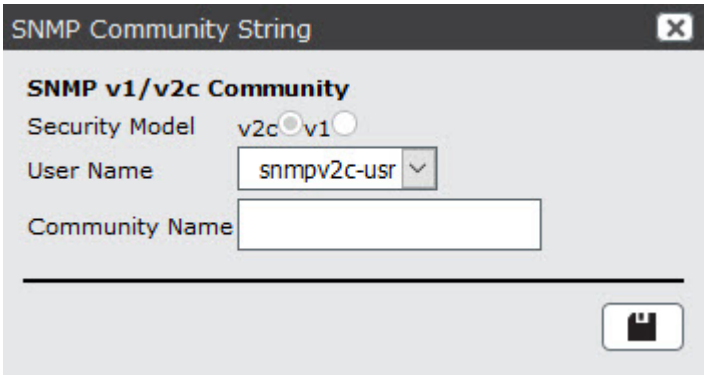


Figure 4.101 – SNMP Community String Configuration

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.

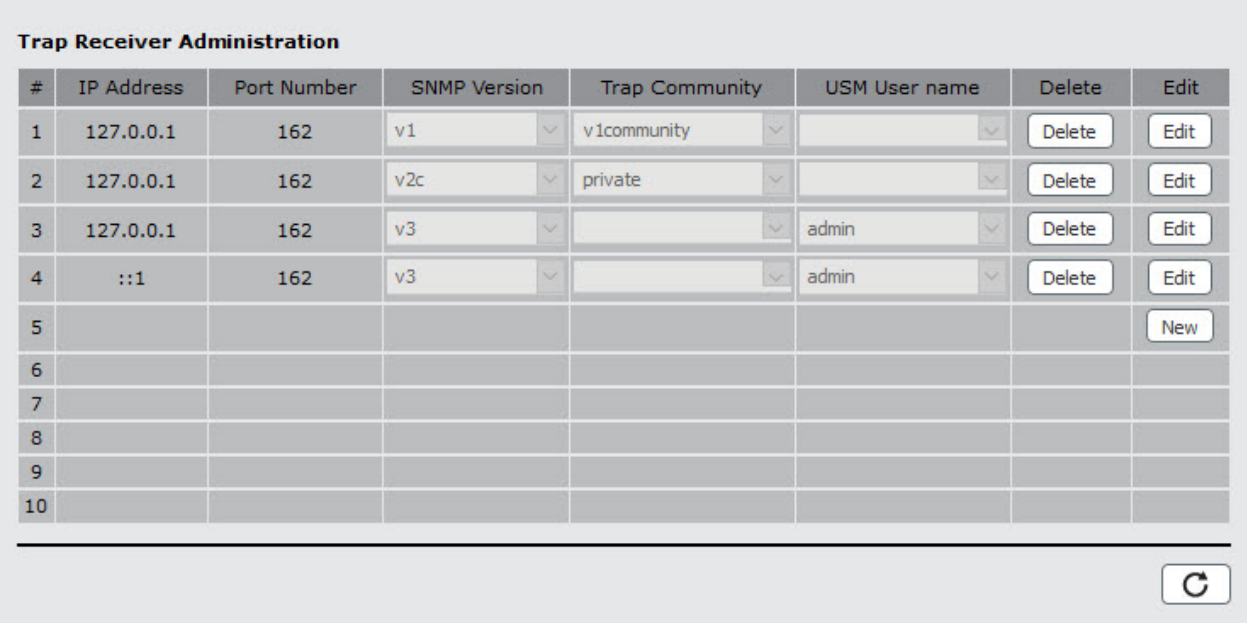


Figure 4.102 – Traps Configuration Page

- **#** - 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.

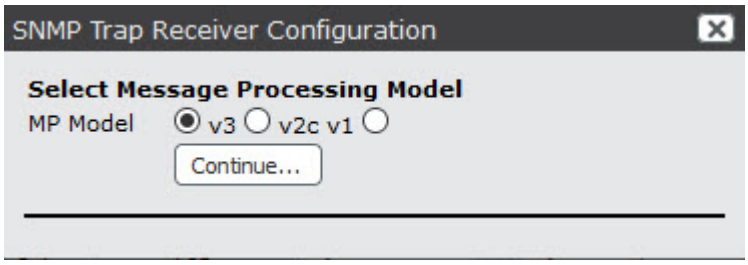


Figure 4.103 – SNMP Trap Model Selection (SNMPv3)

- **Target IP Address** – field for the receiver's IPv4 address or DNS name.

  Note: The DNS option is only available for Smartpack Touch and Smartpack R controllers (version 2.10 or later).

- **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).

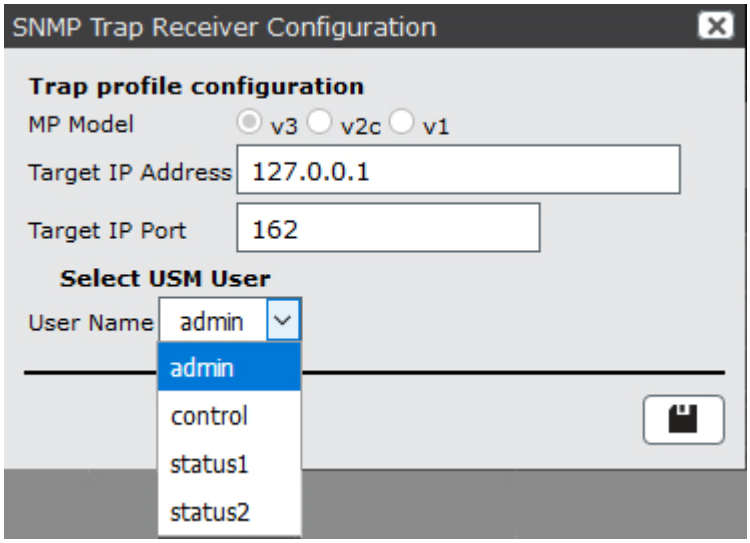


Figure 4.104 – SNMP Trap Receiver Configuration (SNMPv3)

o 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).

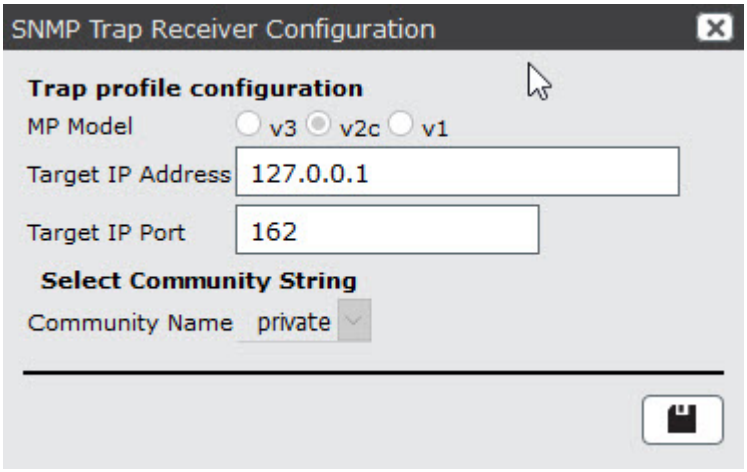


Figure 4.105 – SNMP Trap Receiver Configuration (SNMPv1/v2c)

User Accounts

The **User Accounts** section is for adding and modifying user accounts.

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

Change Password

The **Change Password** page provides information on the current user and permits changing the password for this user.

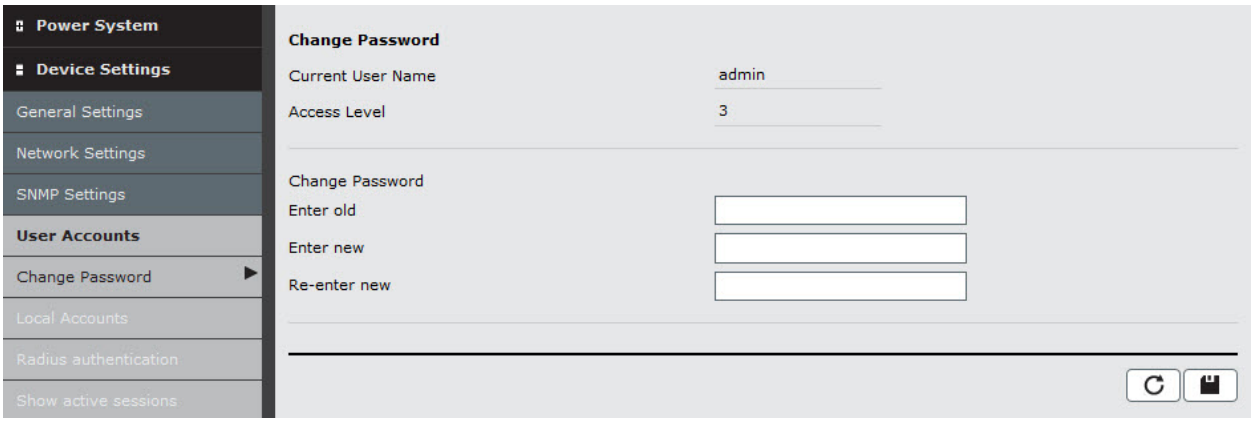


Figure 4.106 – Change Password Page

- **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**

  Note: This menu is hidden if logging in through Radius.

  - **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).

Local Accounts

The **Local Accounts Settings** page is used to configure the accounts of local users. This page is only visible to users with admin rights.

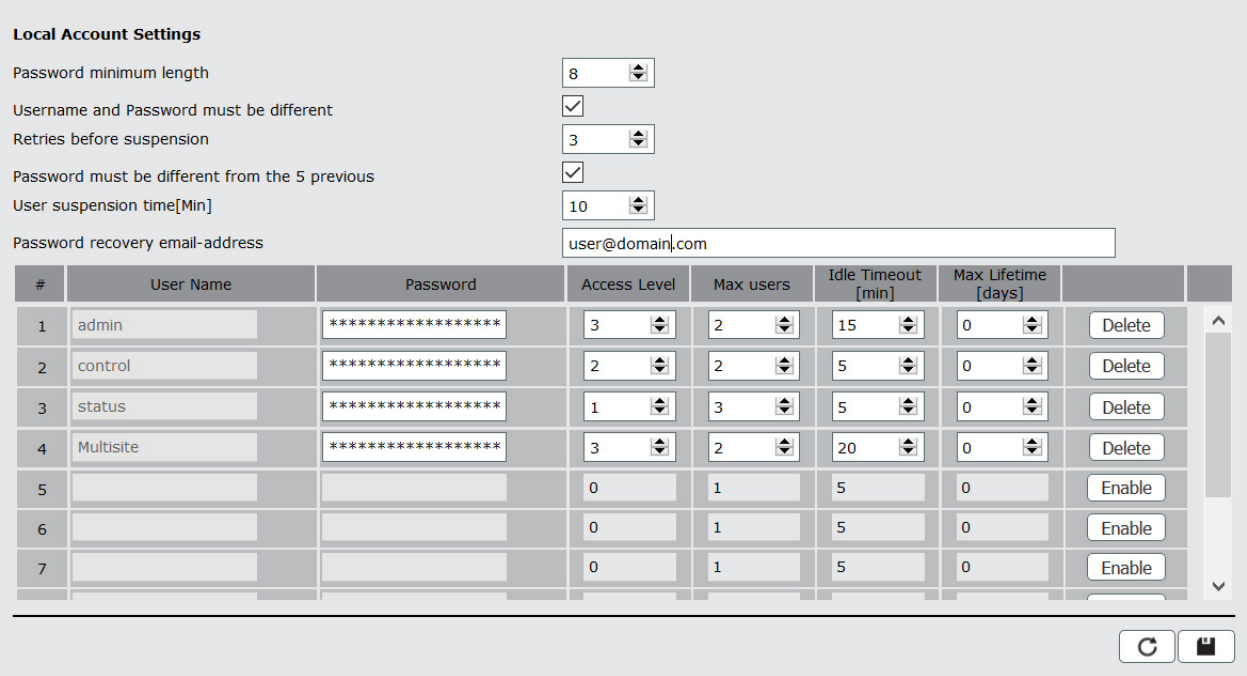


Figure 4.107 – Edit Accounts Page (Admin only)

Note: This section is only accessible with admin rights.

- **Password is required** – check this box to require passwords for all accounts for Smartpack S, Smartpack2, Compact controllers. By default, passwords are required for Smartpack Touch and Smartpack R controllers.
- **Password minimum length** – enter a value for the minimum character length of passwords.
- **Username and Password must be different** – check this box to force user names and passwords to be different.
- **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).
- **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.
- **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.

- **Password recovery email-address** – Enter the email address to which a reset password will sent (for Smartpack Touch and Smartpack R only). This address is used in conjunction with a recovery request initiated from the login page when choosing the **Forgot Password** option.

  Note: If no recovery email address is specified in this field, you will have to contact customer support for password recovery.

- **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!

Radius Authentication

Radius Authentication – A single sign-on protocol that enables customers to use multiple controllers, without having to program user names and passwords individually. This requires a centralized server for storing user names and passwords.

Note: This section is only accessible with admin rights.

To use radius authentications, two things must be in place:

1. User accounts data must be stored on a Radius server.

2. In order for the radius server to be able to send correct, a dictionary file must be called.

To obtain additional details about the proper format for account data and the dictionary file, consult the details found in the online help at:

http://onlinedocs.eltek.com/wip4/mywip/functionality2/index.html#!Documents/radius2.htm

General (case-sensitive) login credentials for the online help are:

User Name: **Eltek**

Password: **powerConversion**

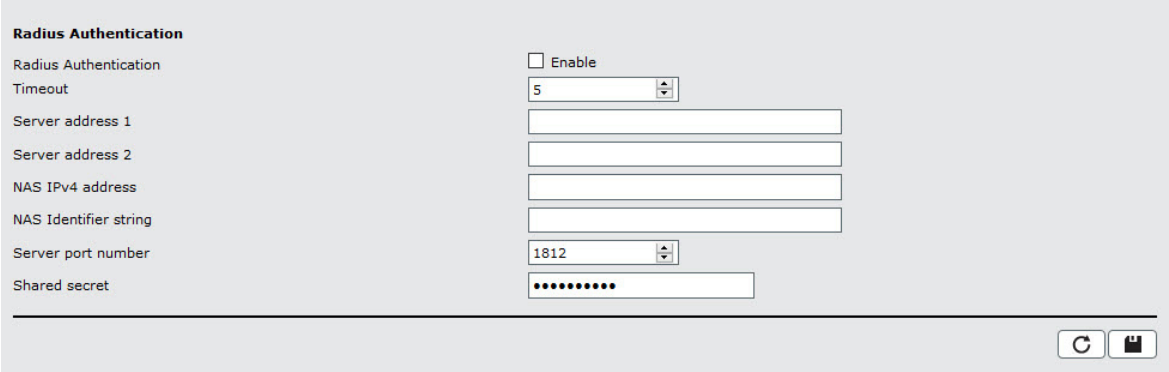


Figure 4.108 – Radius Authentication Settings

- **Radius Authentication** – Check this box to enable this radius authentication.
- **Timeout** – The maximum time, in seconds, allowed for the server to respond. The maximum value is 60 seconds.
- **Server address 1** – The IP address of the radius server.
- **Server address 2** – The IP address of a second server (optional).
- **NAS IPv4 address** – Enter the IP address for the network access server (NAC).
- **NAS Identifier string** – Enter the designation (for example, server name) of the network access server.
- **Server port number** – The port through which to access the server; the default is 1812.
- **Shared secret** – A password, pass-phrase, or numeric key for accessing the radius server.

Show active sessions

This page displays details concerning clients currently connected to the controller.

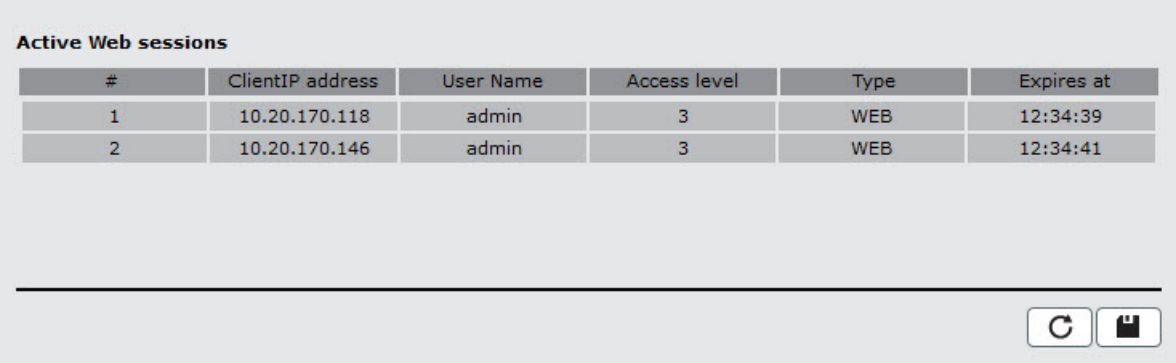


Figure 4.109 – Active Web Sessions Page

Pin Codes

The **Pin Codes** page is for programming Pin codes on non-Touch controllers, such as Smartpack S and Smartpack2 Master. This is an alternative to setting the codes on the display.

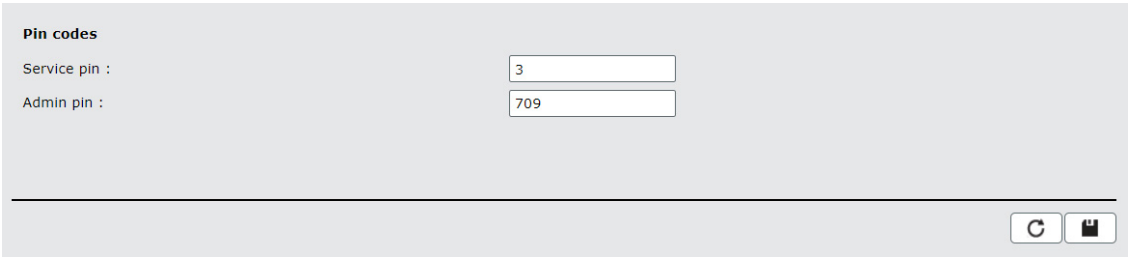


Figure 4.110 – Pin Codes Page

- **Service pin** – Enter a pin for non-administrative users.
- **Admin pin** – Enter a pin for administrative users.

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
- [Rectiverter]
- [Solar]

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

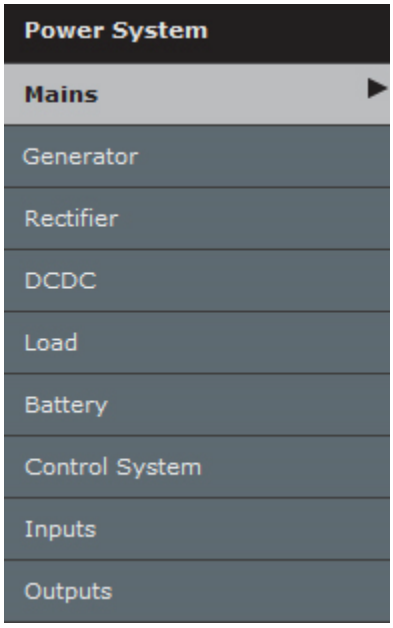


Figure 5.1 – Alarm Configuration Menu (without alternative energy sources)

Alarm Monitors Edit Windows

All alarm monitors share common configuration windows.

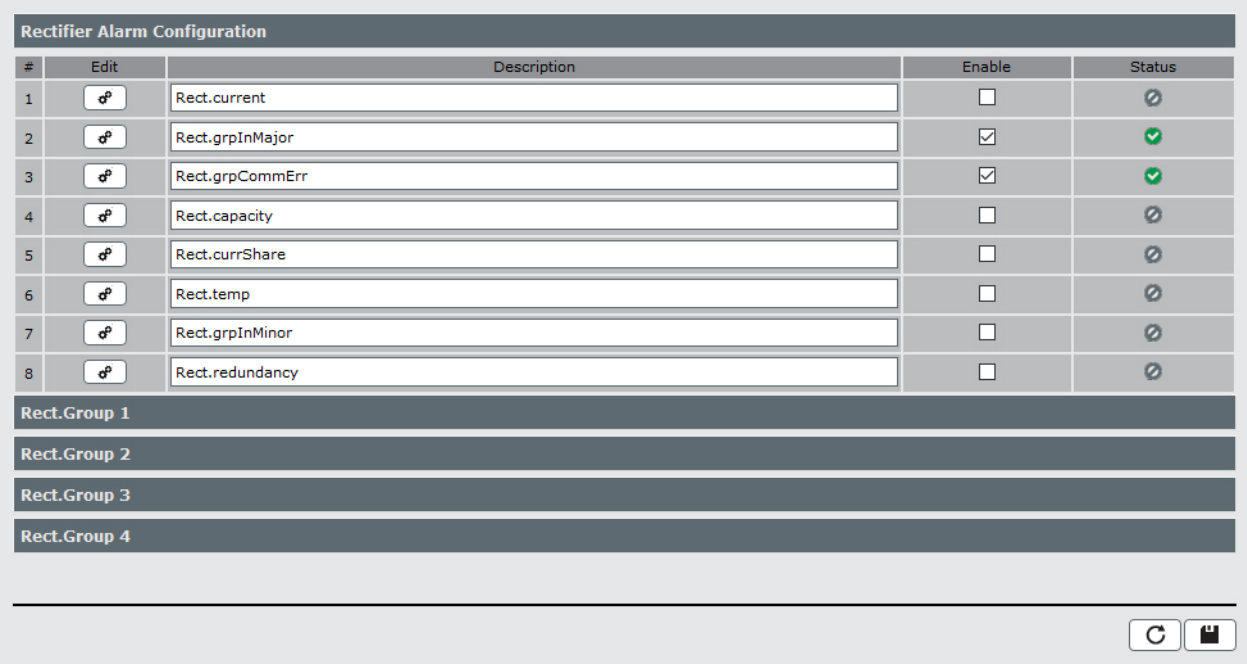


Figure 5.2 – Alarm Monitor Rows

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 button; 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** button of the alarm monitor row brings up the **Edit Window**, which has a similar look for all alarm monitors *except* those for LVDs (LVBD and

LVLD; see “Edit Window for LVBD,” on page 217 and “Edit Window for LVLD,” on page 218).

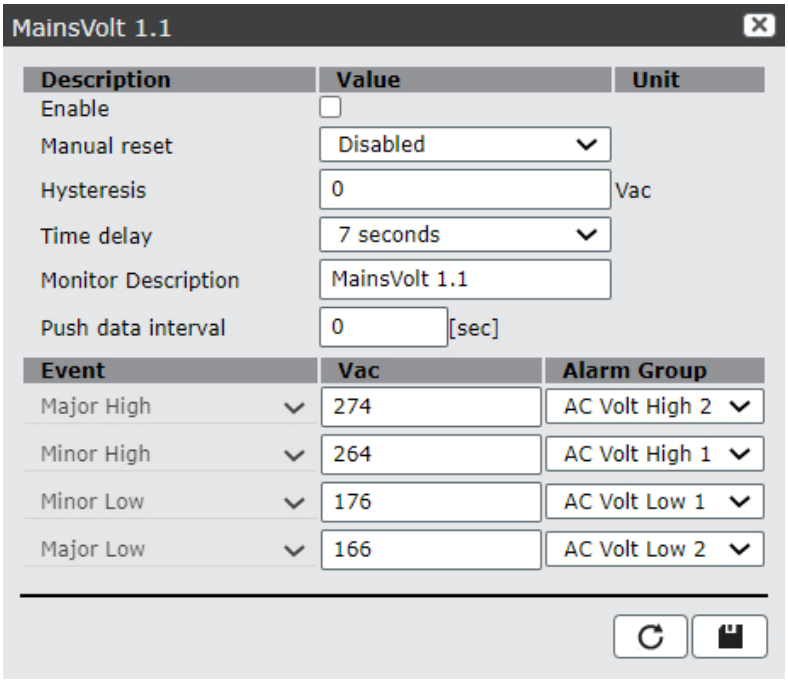


Figure 5.3 – Alarm Edit Window Example (MainsVolt X)

General

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 menu 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** – menu 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.
- **Push data interval** – the interval at which the result of a monitor measurement is sent; only used in customized configurations.

- **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 menu 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.
  - ☐ **Normal** – retain normal status in specified circumstances when an alarm is not necessary.
  - ☐ **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** – used for non-alarm events.
  - ☐ **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.
  - ☐ **Alarm reset** – resets manual alarms.
  - ☐ **Partial rectifier shutdown** – shuts down rectifiers based on the percentage value entered into the **Redundant units** value set on the **Rectifier configuration** page at **System Conf. › Rectifier › Rectifier**.
  - ☐ **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** – prevent (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**– prevent (block) battery equalize charging.
- ☐ **Silence buzzer –** activate a buzzer silence command.
- ☐ **Earthfault Inhibit** – prevent (block) earth (ground) fault detection.
- ☐ **DCDC Shutdown** – shuts down all DC-to-DC converters.
- ☐ **Source limitation** – in an A+B feed system, it limits the output of the A feed, when testing the B feed (generator). The A feed is limited based on the parameters of the **Source limitation setup** page, **System Conf. › Generator› Source limitation setup**.
- ☐ **Manual bypass** – activates a manual bypass function.
- ☐ **Analog voltage control** – triggers the analog voltage control function, based on the parameters set on the **Analog voltage control** page, **System Conf. › Battery › Analog voltage control**.
- ☐ **Rectiverter Shutdown** – shuts down the AC output of all rectiverters.

- ☐ **Task Active** – activates the task scheduler. (See “Task Scheduler,” on page 166 .”)
- ☐ **External Generator Stop** – shuts down the generator.
- ☐ **External Generator Start** – starts the generator.
- ☐ **Snmp Trap Test** – sends SNMP traps to the trap servers designated on the **Trap Receiver Administration** page found at **System Conf. › Device Settings › SNMP Settings › Traps**.
- ☐ **Demand Response** – activates the Demand Response function. (For additional details, see “Demand Response,” page 111.)
- ☐ **Reset Circuit** – activates the reset circuit for the Safetypack.
- ☐ **Reboot** – reboots the controller.
- ☐ **Save logs to ftp area** – generates and saves logs to the log folder in the memory of the controller. The logs can be accessed through FTP.

■ **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. Settings are made on the **Outputs** page at **Alarm Conf. › Outputs**. 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).

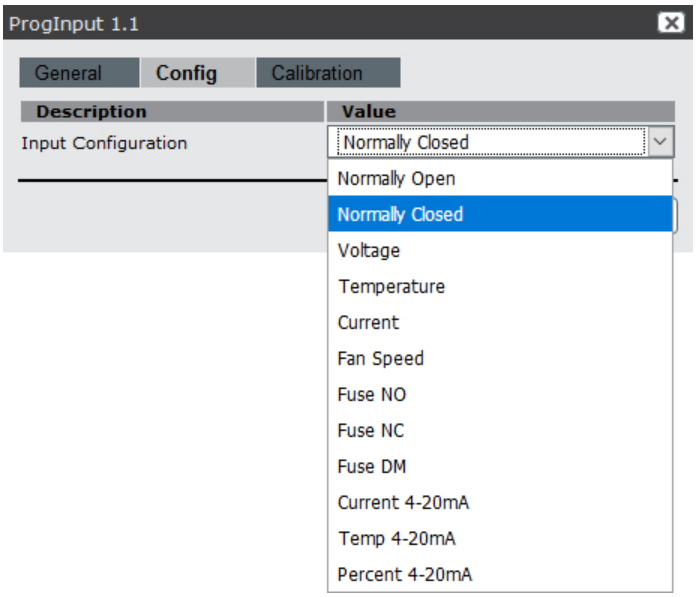


Figure 5.4 – Configuration Tab Example (Flexi Monitor – ProgInput X.Y)

Note: The following list describes configuration options; 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.
- **Voltage** – alarm is monitoring a voltage input.
- **Temperature** – alarm is monitoring a temperature probe input that uses a thermistor.
- **Current** – alarm is monitoring current.
- **Fan Speed** – alarm is monitoring fan speed.
- **Diode Matrix** – alarm is monitoring a diode matrix.
- **Clock Input** – alarm is receiving a clock signal.
- **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).
- **Current 4-20mA** – alarm is monitoring a current probe that uses a sensor with a current output between 4 and 20 mA.
- **Temp 4-20mA** – alarm is monitoring a temperature probe that uses a sensor with a current output between 4 and 20 mA.

- **Percent 4-20mA** – alarm is monitoring a device with a 4-20mA signal, measured as a percentage of the signal.
- **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, Flexi Monitor, Smartpack S (hardware version 3 or later), and Smartpack S panel mount.

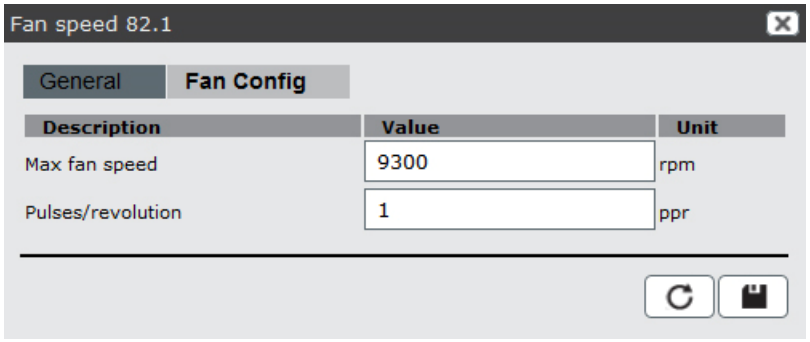


Figure 5.5 – Fan Config Tab Example

- **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.

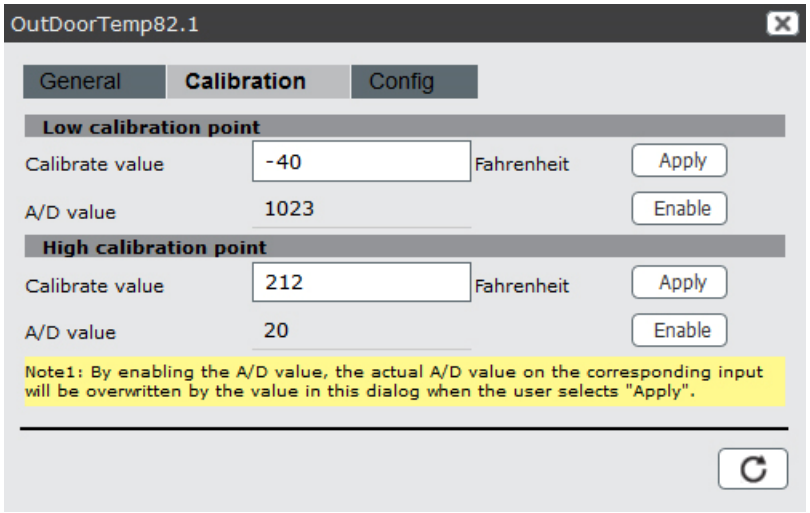


Figure 5.6 – Calibration Tab Example (OutDoor Temp XX.Y)

- **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**

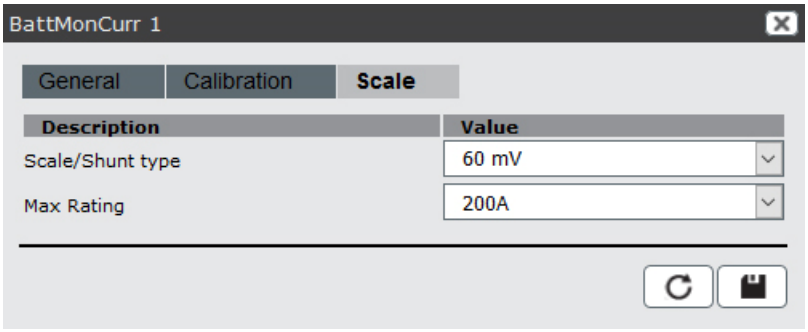


Figure 5.7 – Scale Tab – Shunt Example (BattMonCurr X)

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

- **Fuse**

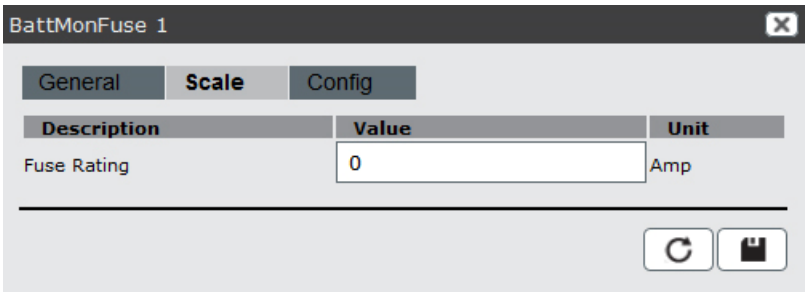


Figure 5.8 – Scale Tab – Fuse Example (BattMonFuse X)

  - **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.

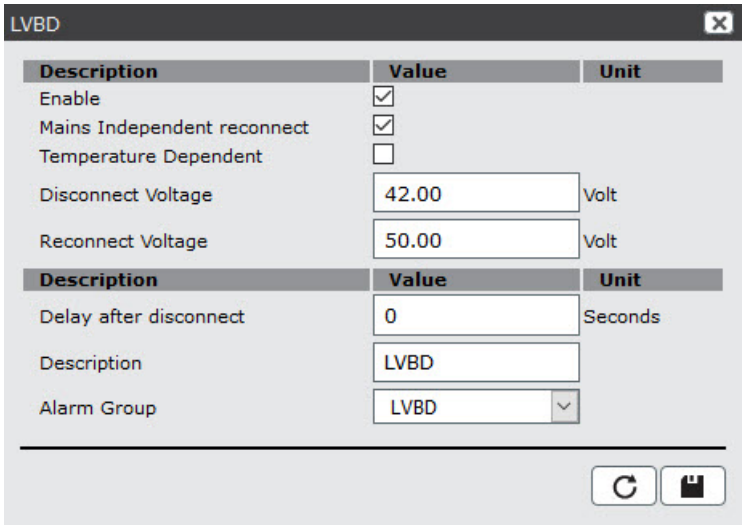


Figure 5.9 – LVBD Edit Window

- **LVBD** – 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. › 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 › 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 › 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.

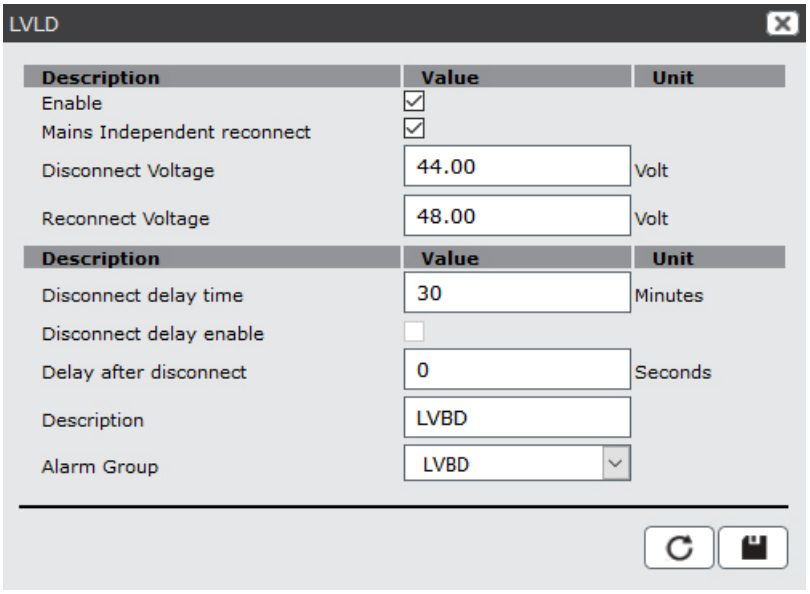


Figure 5.10 – LVLD Edit Window

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

- **LVLD** – 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).
- **Delay after disconnect [seconds]** – the minimum time (in seconds) that should elapse after the load has been shut off before the controller will turn it back on.
- **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).

Note: The number of mains groups is defined at **System Conf. › Configuration › Mains Group Configuration › Number of Groups**.

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

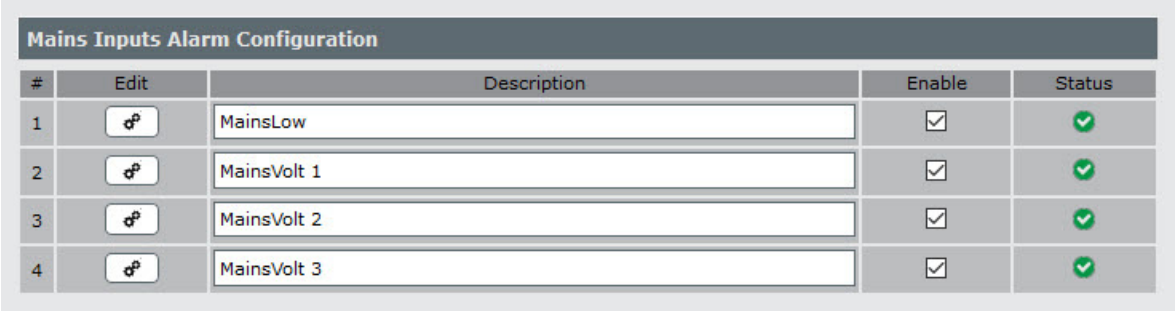


Figure 5.11 – Mains Inputs Alarms (without groups)

- **Mains Inputs Alarm Configuration** – section for detecting the number of mains groups with errors.
  - **MainsLow** – monitor for defining major and minor alarms for low AC input (mains) voltage (from **MainsVolt X**).
  - **MainsVolt X** – 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. › 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.

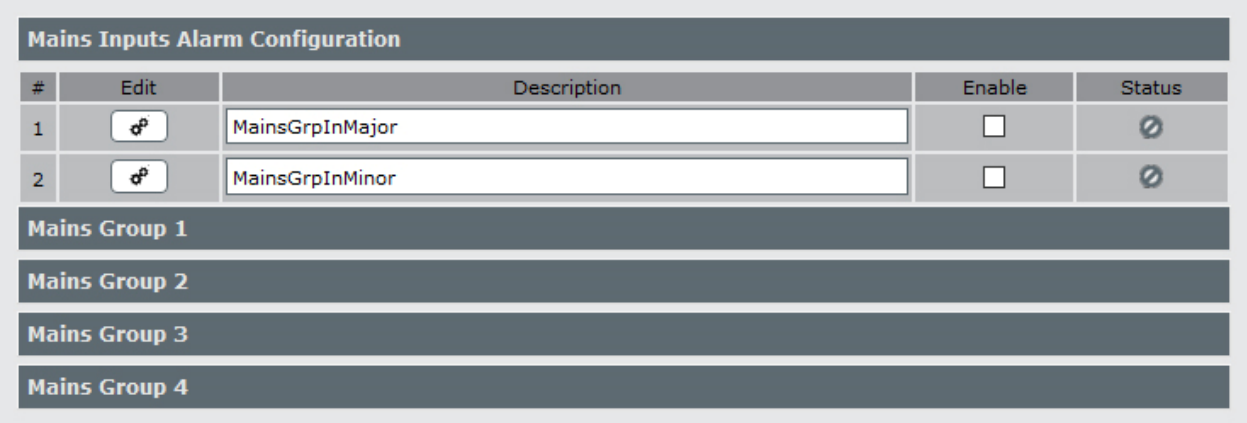


Figure 5.12 – Mains Inputs Alarms (with groups)

  - **MainsGrpInMajor** – monitor for defining an alarm, based on the number of mains groups in major alarm.

- **MainsGrpInMinor** – monitor for defining an alarm, based on the number of mains groups in minor alarm.

- **Mains Group X** – section for mains group monitoring; mains groups appear only for Smartpack2 Basic Industrial controllers that are monitoring rectifiers

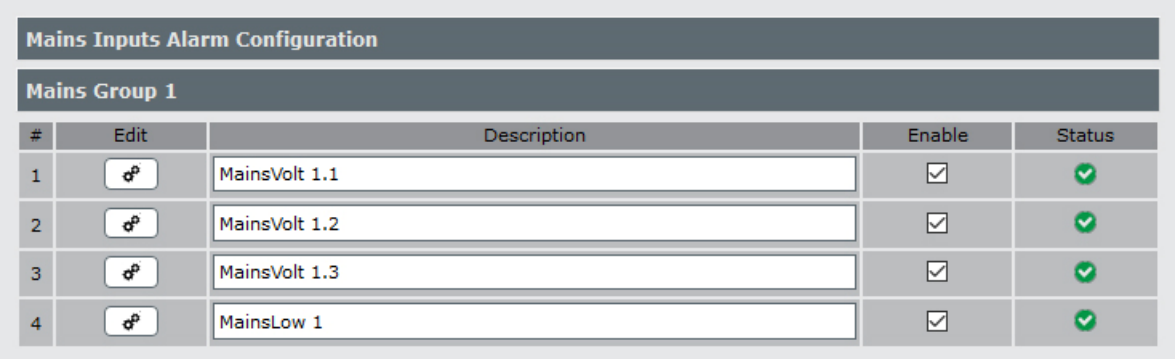


Figure 5.13 – Mains Group Alarms

  - **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. › Mains › Mains Group › Mains Group X** [tab] **› 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	MainsGrpInMajor	Major Alarm Minor Alarm	Unit(s)	N/A
		MainsGrpInMinor	MajorAlarm Minor Alarm	Unit(s)	N/A

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
	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).

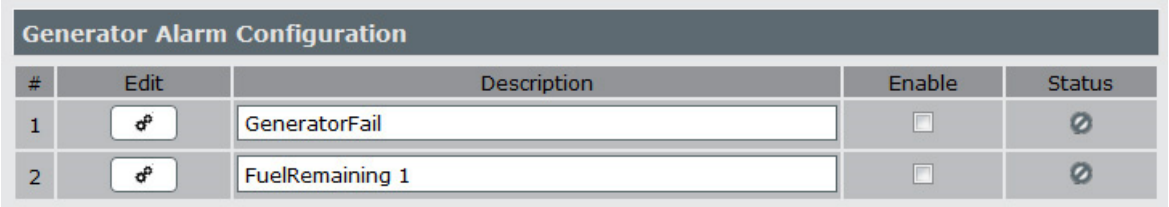


Figure 5.14 – Generator Alarms

- **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: For tank configuration, go to **System Conf. › Generator › Tank configuration**.

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.

Note: Rectifier groups are defined at **System Conf. › Rectifier › Rectifier [configuration]**.

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

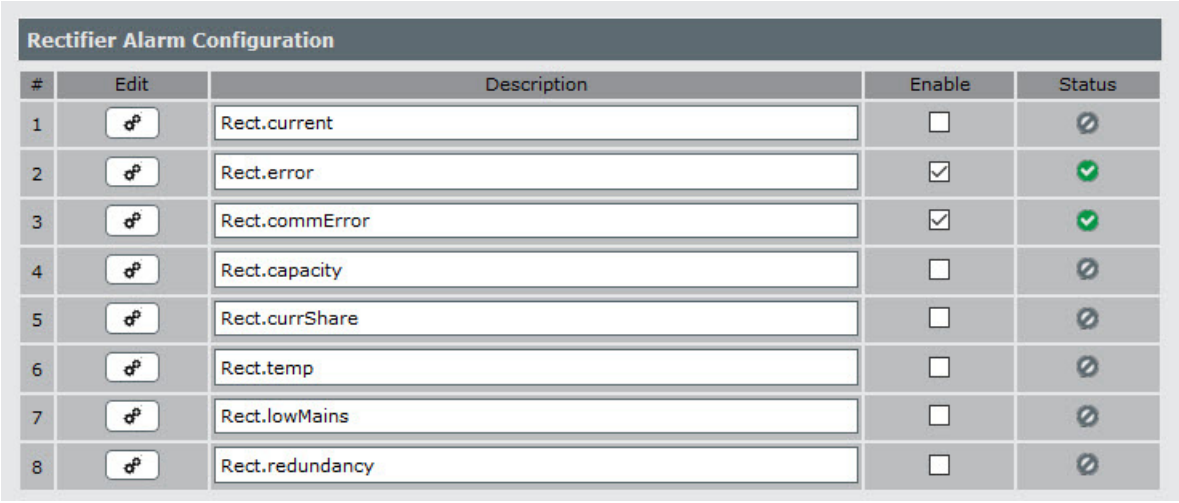


Figure 5.15 – Rectifier Alarms (without groups)

- **Rectifiers Alarm Configuration** – section for configuring rectifier alarm monitors.
  - **Rect.current** – monitor for defining maximum current output thresholds for the rectifiers.

- **Rect.error** – monitor for detecting the number of rectifiers experiencing errors.
- **Rect.commError** – monitor for detecting the number of rectifiers experiencing communication errors.
- **Rect.capacity** – monitor for the percentage of rectifier capacity being used.
- **Rect.currShare** – monitor for defining current share deviation (in percentage) across the rectifiers. Current is shared proportionately among rectifiers of different capacity within the same system.
- **Rectifier.temp** – monitor for defining high and low temperature thresholds.
- **Rect.lowMains** – monitor for detecting the number of rectifiers experiencing low AC input (mains).
- **Rect.redundancy** – monitor for detecting the loss of redundancy among the rectifiers within the system. The value for redundant rectifiers is specified on the rectifier configuration page (see “Redundant Units” on page 119).

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.

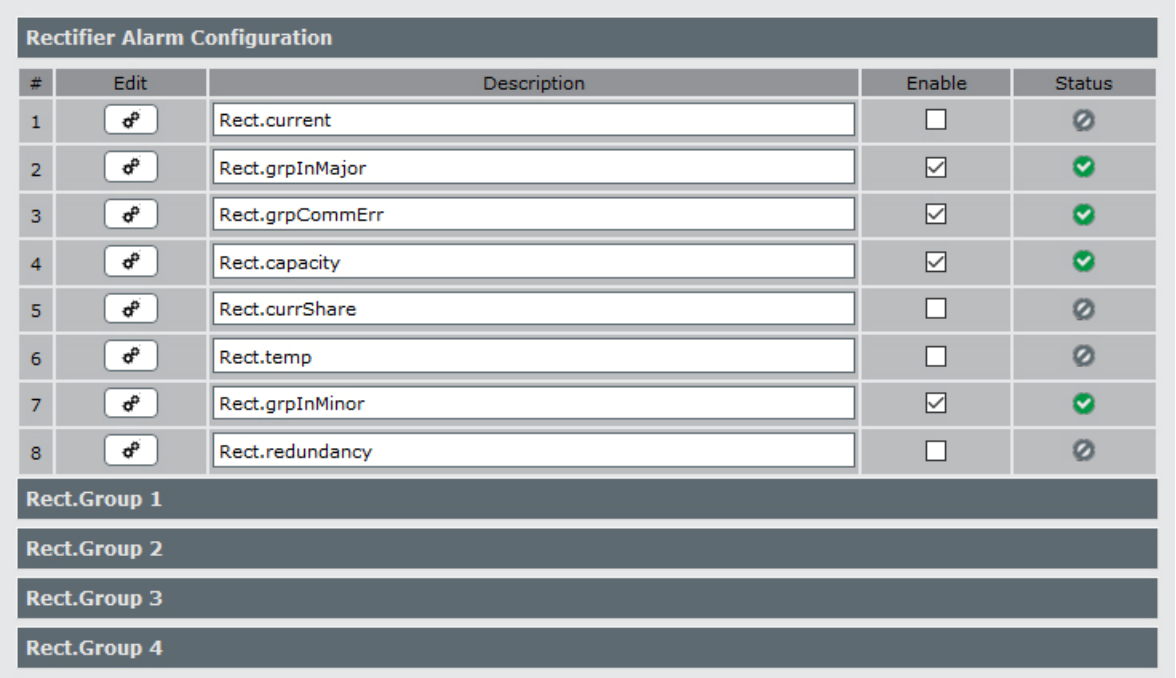


Figure 5.16 – Rectifier Alarms (with groups)

- **Rect.current** – monitor for setting high current thresholds for all rectifier output (if there is more than one rectifier group).
- **Rect.grpInMajor** – monitor for detecting the number of rectifier groups experiencing a major alarm.
- **Rect.grpCommErr** – monitor for detecting the number of rectifier groups experiencing a communication error.
- **Rect.capacity** – monitor for the percentage of total rectifier capacity being used.
- **Rect.currShare** – monitor for detecting current share errors by defining current share deviation (as a percentage).
- **Rect.temp** – monitor for defining high and low rectifier temperature thresholds.
- **Rect.grpInMinor** – monitor for detecting the number of rectifier groups experiencing a minor alarm.

- **Rect.redundancy** – monitor for detecting the failure of redundant rectifiers. The value for redundant rectifiers is specified on the rectifier configuration page (see “Redundant Units” on page 119).

- **Rect.Group X**– section for configuring alarm monitors for a rectifier group, which only appears for a Smartpack2 Basic Industrial controller.

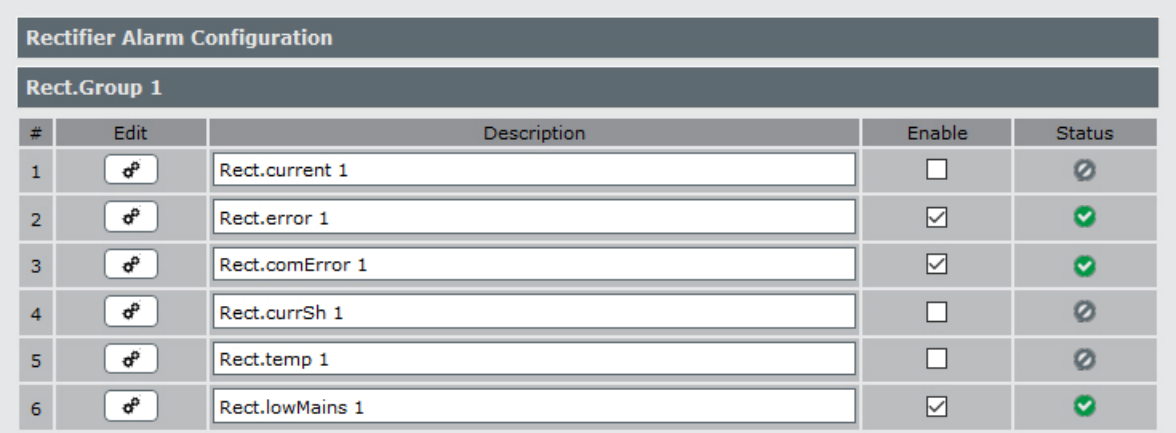


Figure 5.17 – Rectifier Group Alarms

- **Rect.current X** – monitor for defining maximum current output thresholds for the rectifier group.
- **Rect.error X**–monitor for detecting the number of rectifiers experiencing errors within the rectifier group.
- **Rect.comError X** – monitor for detecting the number of rectifiers experiencing communication errors within the rectifier group.
- **Rect.currSh X** – monitor for defining current share deviation (as a percentage) across the rectifiers within the rectifier group. Current is shared proportionately among rectifiers of different capacity within the same system.
- **Rect.temp X** – monitor for defining high and low temperature thresholds for the rectifier group.
- **Rect.loMains X** – monitor for detecting the number of rectifiers experience low AC input (mains).

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	Rectifier Alarm Configuration	Rect.current	Major Alarm Minor Alarm	Amp	N/A
		Rect.grpInMajor	Major Alarm Minor Alarm	Unit(s)	N/A
		Rect.groupCommError	Major Alarm Minor Alarm	Unit(s)	N/A
		Rect.capacity	Major Alarm Minor Alarm	Percentage	N/A
		Rect.currShare	Major Alarm Minor Alarm	Percentage	N/A
		Rect.error	Major Alarm Minor Alarm	Unit(s)	N/A
		Rect.temp	Major High Minor High Minor Low Major Low	Degrees	N/A
		Rect.grpInMinor	Major Alarm Minor Alarm	Unit(s)	N/A
		Rect.redundancy	Major Alarm	N/A	N/A
	Rect.Group X	Rect.current X	Major Alarm Minor Alarm	Amp	N/A
		Rect.error X	Major Alarm Minor Alarm	Unit(s)	N/A
		Rect.comError X	Major Alarm Minor Alarm	Unit(s)	N/A
		Rect.currSh X	Major Alarm Minor Alarm	Percentage	N/A
		Rect.temp X	Major High Minor High Minor Low Major Low	Degrees	N/A

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		Rec.lowMains X	Major Alarm Minor Alarm	Unit(s)	N/A

Unit(s) represents a whole sum or count

- **[RectCurMon X]** – this section appears when a current monitor is defined as a rectifier current monitor (**System Conf. › Control System › Current Monitor › Monitor Type › Rect CurMon**). See the section “Load Monitor” on page 269.
- **[RectFlexMon X]** – this section appears when a Flexi Monitor monitor is defined as a rectifier Flexi Monitor (**System Conf. › Control System › Current Monitor › Monitor Type › RectifierFleximon**). See the section “Flexi Monitor” on page 273.

[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.

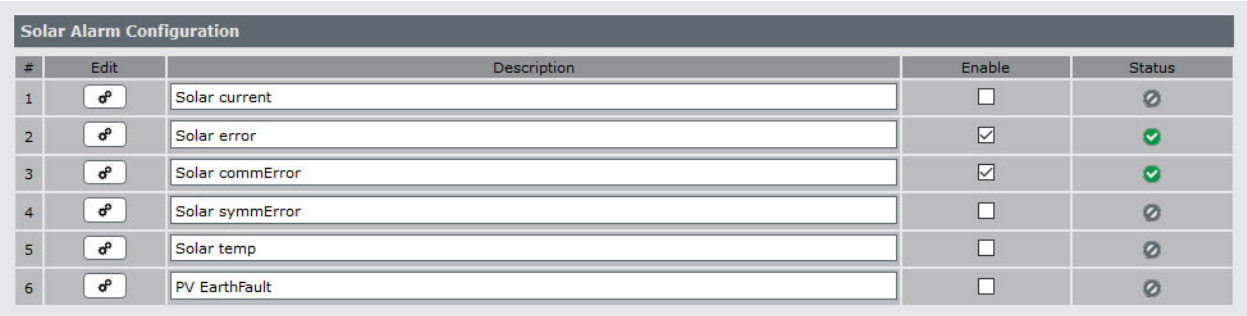


Figure 5.18 – Solar Alarms

  - **Solar current** – monitor for defining maximum output current thresholds for the solar chargers.
  - **Solar error** – monitor for detecting the number of solar chargers experiencing an error.
  - **Solar commError** – monitor for detecting the number of solar chargers experiencing communication errors.
  - **Solar symmError** – monitor for defining the difference of output current, in percentage, between solar chargers.

  - **Solar temp** – monitor for defining high and low temperature thresholds for the solar chargers.
  - **PV [Photovoltaic] EarthFault** – monitor for defining the number of solar modules with an earth fault.

- **[SolarCurMon X]** – This section appears when a current monitor is defined as a solar current monitor (**System Conf. › Control System › Current Monitor › Monitor Type › Solar CurMon**). See the section "Load Monitor" on page 269.
- **[SolarFlexMon X]** – This section appears when a Flexi Monitor monitor is defined as a solar Flexi Monitor (**System Conf. › Control System › Current Monitor › Monitor Type › Solar Fleximon**). See the section "Flexi Monitor" on page 273.

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	Solar current	Major Alarm Minor Alarm	Amp	N/A
		Solar error	Major Alarm Minor Alarm	Unit(s)	N/A
		Solar commError	Major Alarm Minor Alarm	Unit(s)	N/A
		Solar symmError	Major Minor	Percentage	N/A
		Solar temp	Major High Minor High Minor Low Major Low	Degrees	N/A
		PV EarthFault	Major Minor	Unit(s)	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.

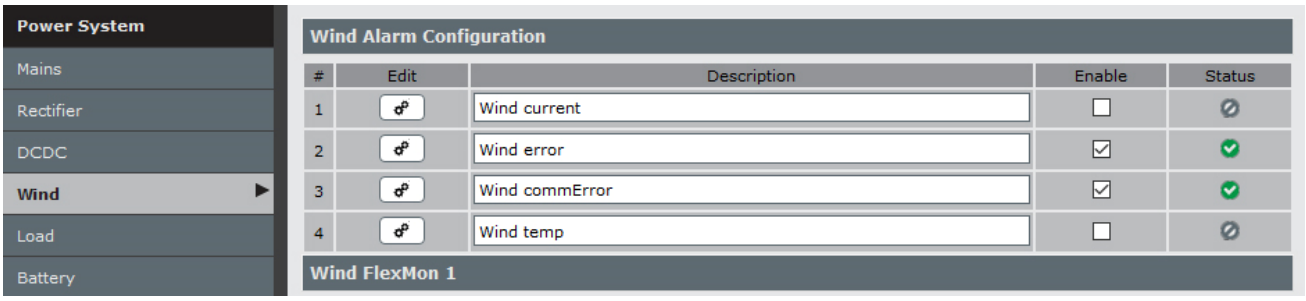


Figure 5.19 – Wind Alarms

  - **Wind current** – monitor for defining maximum output current thresholds for the wind chargers.
  - **Wind error** – monitor for detecting the number of wind chargers experiencing an error.
  - **Wind commError** – monitor for detecting the number of wind chargers experiencing communication errors.
  - **Wind temp** – 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” on page 269.
- **[WindFlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor wind current. See the section “Flexi Monitor” on page 273.

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	Wind current	Major Alarm Minor Alarm	Amp	N/A
		Wind error	Major Alarm Minor Alarm	Unit(s)	N/A
		Wind commErr	Major Alarm Minor Alarm	Unit(s)	N/A
		Wind temp	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.

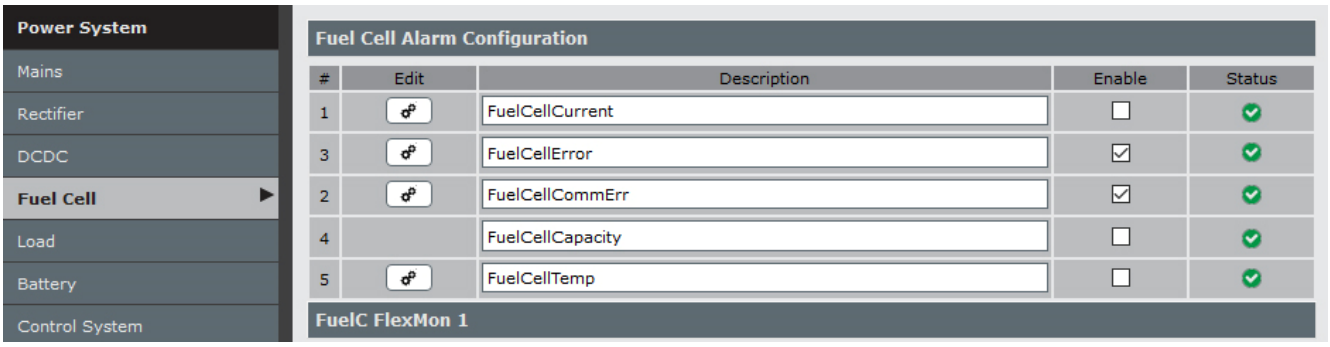


Figure 5.20 – Fuel Cell Alarms

- **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” on page 269.
- **[FuelC FlexMon X]** – section for configuring the alarm monitors of a Flexi Monitor that is set to monitor fuel cell current. See the section See the section “Flexi Monitor” on page 273.

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.

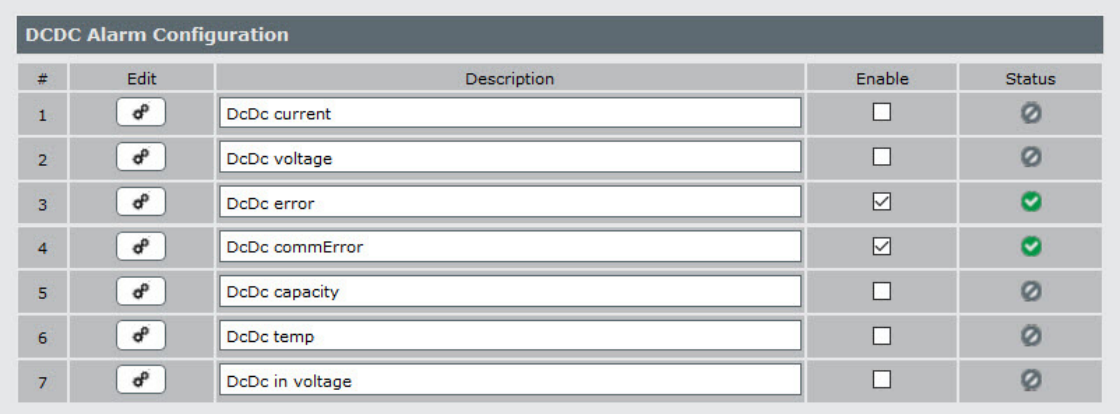


Figure 5.21 – Dc-to-DC Converter Alarms

- **DcDc current** – monitor for defining maximum output current thresholds for DC-to- DC converters.
- **DcDc voltage** – monitor for defining the high and low output voltage thresholds for DC-to-DC converters.
- **DcDc error** – monitor for detecting the number of DC-to-DC converters experiencing an error.
- **DcDc commError** – monitor for detecting the number of DC-to-DC converters experiencing communication errors.
- **DcDc capacity** – monitor for defining maximum output capacity for the DC-to-DC converters (as a percentage of maximum output current).
- **DcDc temp** – monitor for defining high and low temperature thresholds for DC-to-DC converters.
- **DcDc in voltage** – monitor for defining the high and low input voltage thresholds for DC-to-DC converters.

- **[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” on page 269.
- **[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” on page 273.

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	DcDc current	Major Alarm Minor Alarm	Amp	N/A
		DcDc voltage	Major High Minor High Minor Low Major Low	Volt DC	N/A
		DcDc error	Major Alarm Minor Alarm	Unit(s)	N/A
		DcDc commError	Major Alarm Minor Alarm	Unit(s)	N/A
		DcDcCapacity	Major Alarm Minor Alarm	Percentage	N/A
		DcDcTemp	Major High Minor High Minor Low Major Low	Degrees	N/A
		DcDc in voltage	Major High Minor High Minor Low Major Low	Volt DC	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.

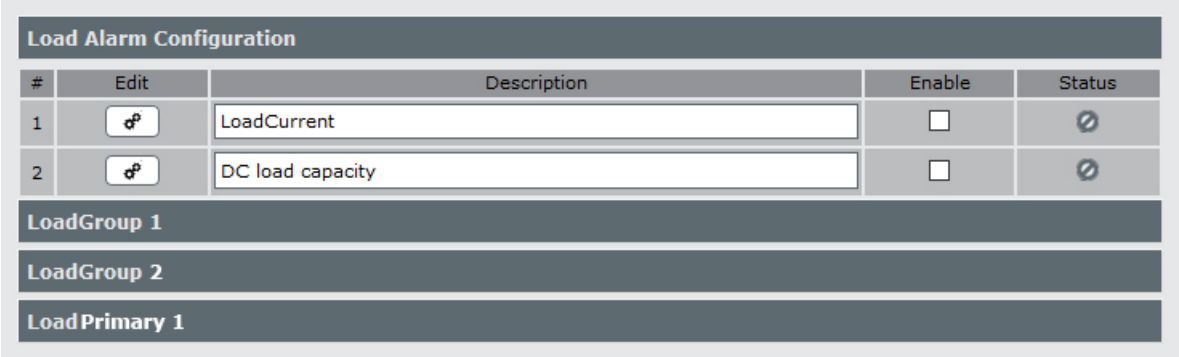


Figure 5.22 – Load Alarms

- **LoadCurrent** – monitor for defining the maximum current draw thresholds for loads.
- **DC load capacity** – monitor for defining the total DC load (rectifiers and rectiverters) within a specified percentage of the output capacity for all modules.

- **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).

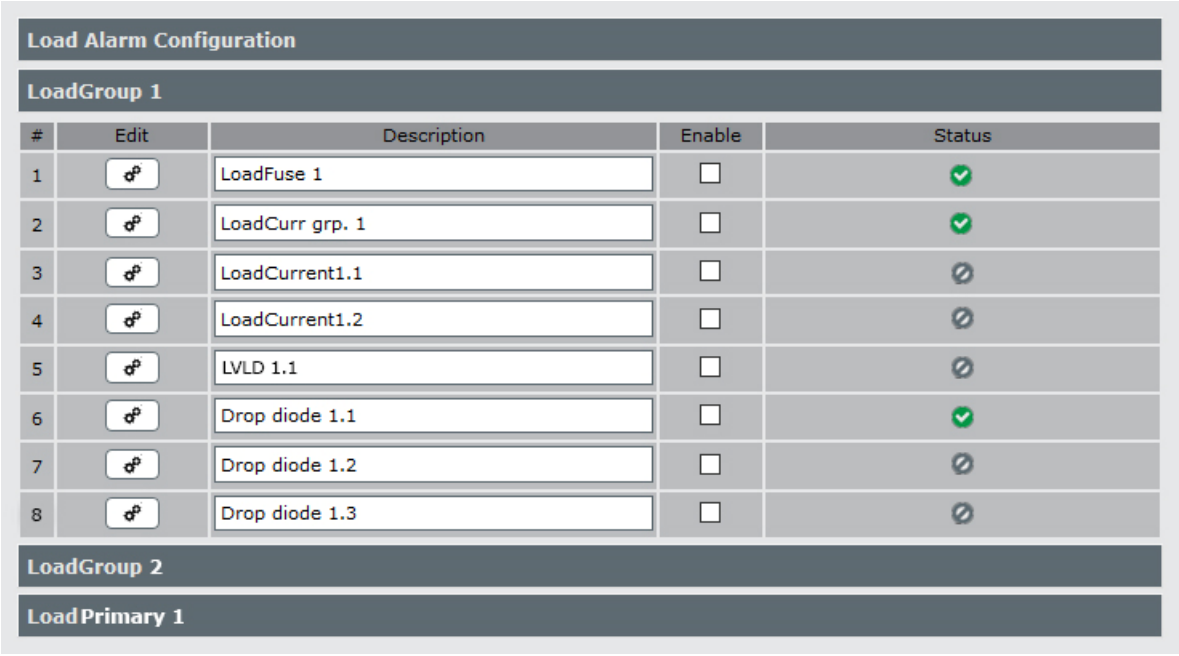


Figure 5.23 – Load Group Alarms (with LVLD)

- **LoadFuse X** – monitor for a fuse or circuit breaker for the entire load group (if applicable).
- **LoadCurr grp. 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. › 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" on page 269. Heading names depend on the nomenclature assigned under **System Conf. › Control System › Current 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" on page 269. Heading names depend on the nomenclature assigned under **System Conf. › Control System › Current 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" on page 273. Heading names depend on the nomenclature assigned under **System Conf. › Control System › Current 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
		DC load capacity	Major Alarm Minor Alarm	Percent	N/A
	Load Group X	LoadFuse X	Configurable	N/A	Config Scale (Fuse)
		LoadCurr grp. X	Major High Minor High Minor Low Major Low	Amp	Calibration (Current) Scale (Shunt)

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		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.

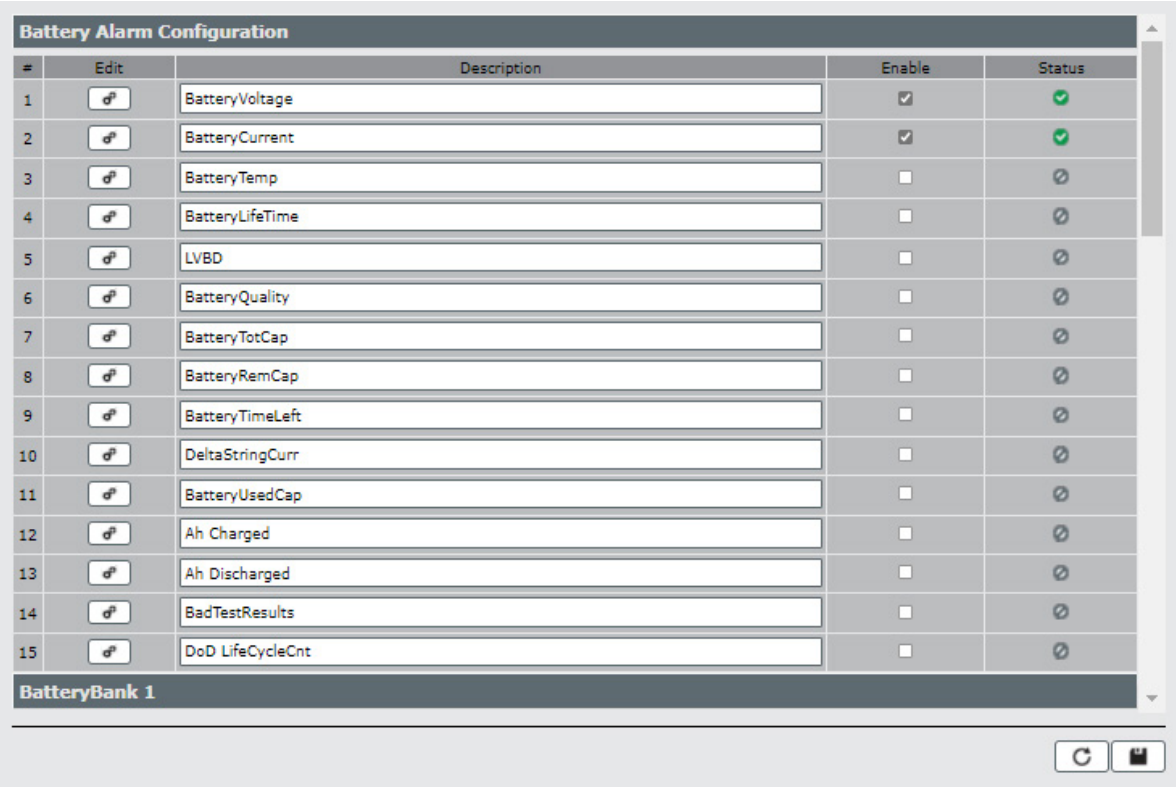


Figure 5.24 – Battery Alarms

- **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 defining the anticipated lifetime of the battery. The number of days is calculated by adding the number of hours of operation within different temperature ranges, with a weighted factor that accounts for operation within high temperatures.
- **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. › 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. › Battery › Test**) before the time allotted for the Simple Test, indicating that the batteries are "bad".

- **DoD LifeCycleCnt** (Depth of Discharge Life Cycle Count) – monitor for defining the number of discharge cycles of the battery. The number of cycles is calculated by adding the number of times the battery has discharged, multiplied by a weighted factor. For a detailed log of cycles, see Logs > DoD Life Cycle Count.

- **Battery Bank X** – section for configuring battery bank alarm monitors handled by the system controller(s); battery banks are defined at **System Conf. > Battery > Configuration**.

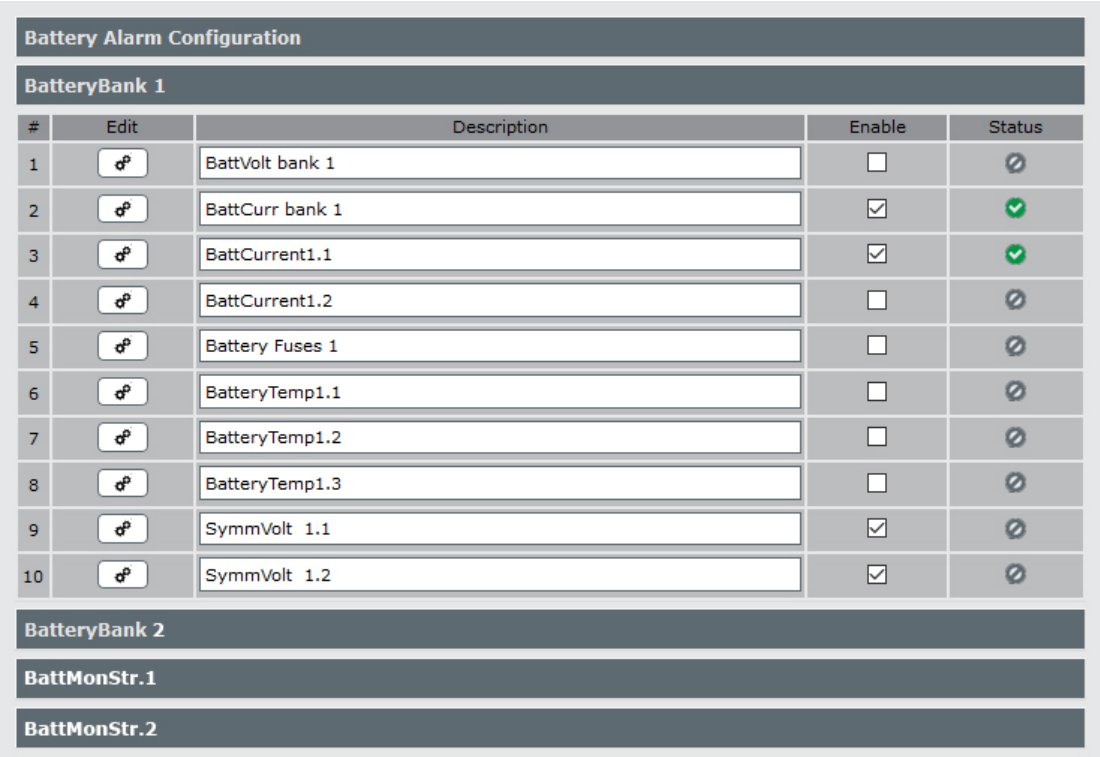


Figure 5.25 – Battery Bank Alarms

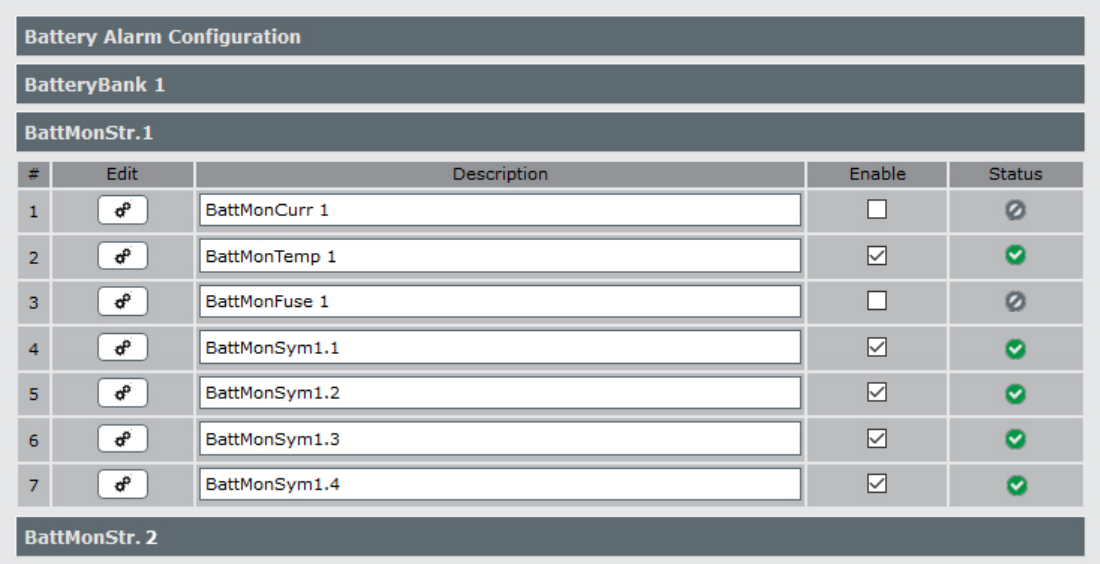


Figure 5.26 – Battery Monitor String Alarms

- **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).
- **Battery Fuses 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” on page 267.
- **[Batt FlexMon X]** – section for configuring the alarm monitors of a Battery Flexi Monitor. See the section “Flexi Monitor” on page 273.

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
		BatteryLifeTime	Major Minor	Days	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

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		Ah Charged	Major High Minor High	Ah*100	N/A
		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
		BattCurr bank X	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 217.

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.

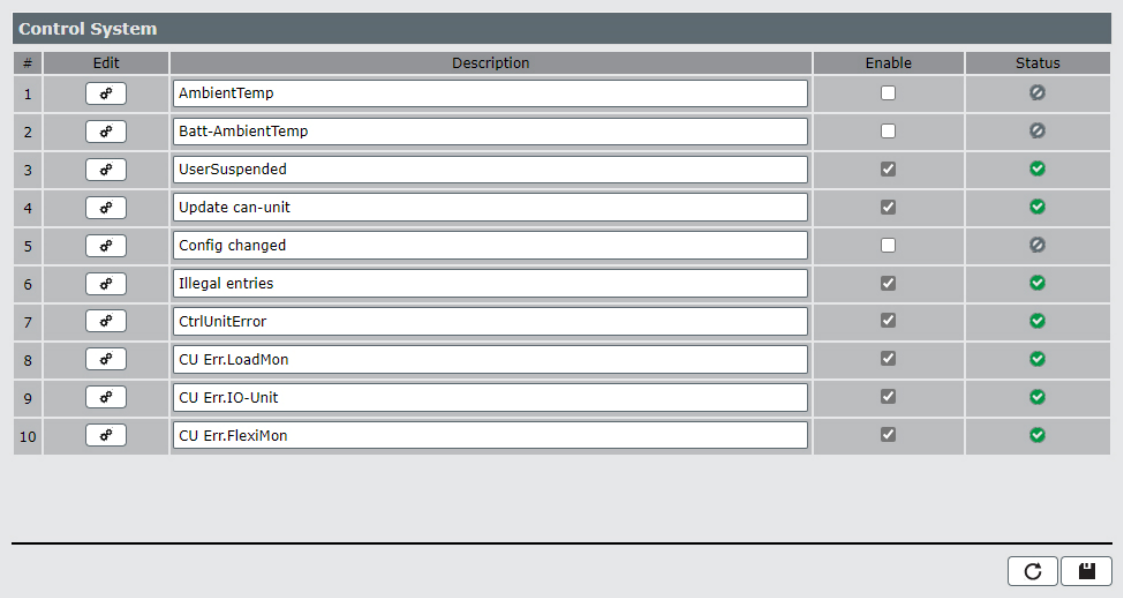


Figure 5.27 – Control System Alarms Page

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. The number of attempts can be defined in the **Local Account Settings** page (**System Conf. › Device Settings › User Accounts › Local Accounts**.); see page 201 for additional details.
- **Update can-unit** – indicates the need to update firmware on CAN unit(s), in order to work with rectiverters.
- **Config changed** – monitor for detecting changes that have been made to the configuration. The value set for the configuration changes is a cumulative total that continues counting, until the alarm is cleared. To clear the alarm, go to **Commands › System**, and click the **Apply** button for **Reset Manual Alarms(s)/Silence Buzzer** on the **System Commands** page. The current count of configuration changes can be viewed from the **Control System › Top Monitors** page, accessed from the Home Page; see page 78 for additional details.

- **Illegal entries** – monitor for detecting unsuccessful attempts to login, either from an invalid user name or invalid password. To clear the alarm, go to **Commands › System**, and click the **Apply** button for **Reset Manual Alarms(s)/Silence Buzzer** on the **System Commands** page. The current count of illegal entries can be viewed from the **Control System › Top Monitors** page, accessed from the Home Page; see page 78 for additional details.
- **CtrlUnitError** – monitor for detecting errors with the primary controller unit (Smartpack2 Master, Smartpack, or Compack).
- **CU Err.IO-Unit** – monitor for detecting errors with connected I/O Monitors (Types 1-3).
- **CU Err.Basic** – monitor for detecting errors with Smartpack2 Basic or Smartpack2 Basic Industrial controllers.
- **CU Err.FlexiMon** – monitor for detecting errors with FlexiMonitor controllers. See the section “Flexi Monitor” on page 273.
- **CU Err.BattMon** – monitor for detecting errors with connected Battery Monitors.
- **CU Err.LoadMon** – monitor for detecting errors with connected Load Monitors

The following table lists the alarm monitors for the **Control System** page.

Table 5.10 – 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
		Update can-unit	Major Alarm	N/A	N/A
		Config changed	Major Alarm		N/A
		Illegal entries	Major Alarm Minor Alarm		N/A

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		CtrlUnit Error	Major Alarm Minor Alarm	Unit(s)	N/A
		CU Err.IO-Unit	Major Alarm Minor Alarm	Unit(s)	N/A
		CU Err.Basic	Major Alarm Minor Alarm	Unit(s)	N/A
		CU Err.FlexiMon	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

Unit(s) represents a whole sum or count

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 Touch [or SP2 Master] 1 Input Configuration** – section for configuring the alarm monitors of a Smartpack2 Master controller.

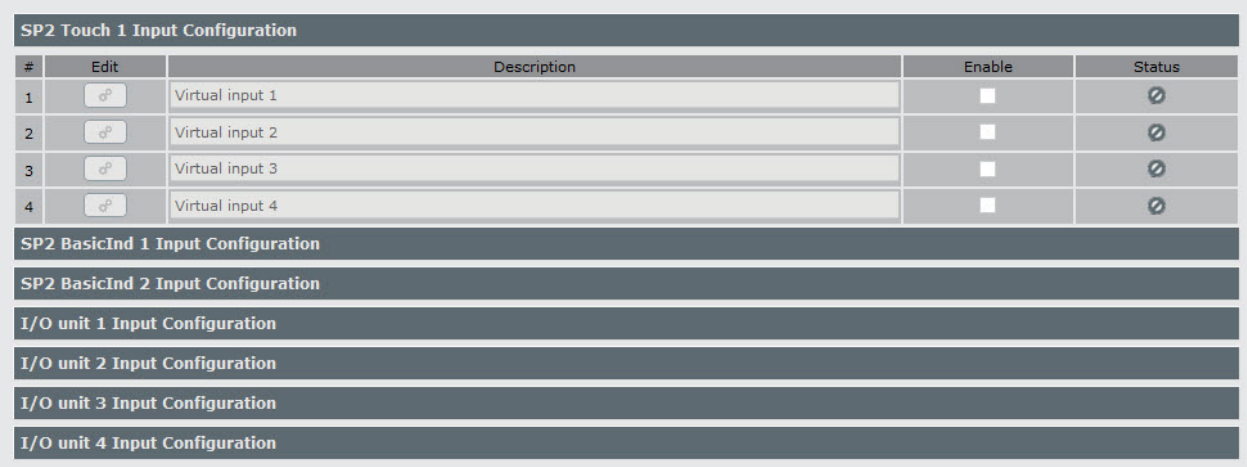


Figure 5.28 – Smartpack2 Touch Master Input Alarms

- **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 5.11 – 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.

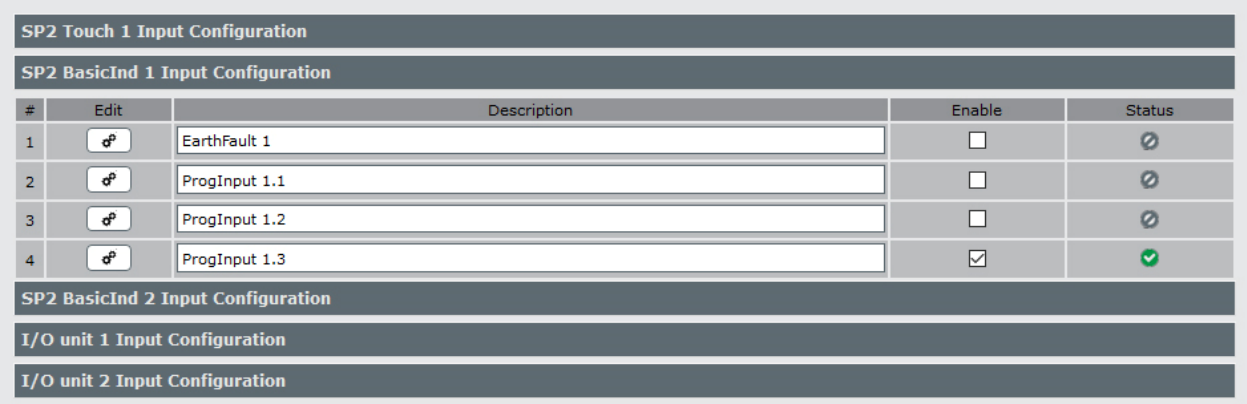


Figure 5.29 – Smartpack2 Basic Industrial Controller Input Alarms

- **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).
- **Temperature X.Y** – monitors for defining high and low temperature thresholds for temperature probe inputs.

  Note: The input terminals used for temperature for the Basic and Basic Industrial Controllers are the same physical terminals used for the programmable inputs.

The following table lists the alarm monitors for the Smartpack2 Basic Industrial and Basic controllers.

Table 5.12 – Smartpack2 Basic and Basic Industrial Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	SP2 Basic/BasicIndX Input Configuration	EarthFault X	Major Alarm Minor Alarm	kOhm	Calibration

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
	SP2 BasicIndX Input Configuration	ProgInput X.Y	Configurable	N/A	Config
		Voltage X.Y	Major High Minor High Minor Low Major Low	VDC	Config Calibration
		Temperature X.Y	Major High Minor High Minor Low Major Low	Degrees	Config Calibration (temp 4-20mA only)
	SP2 Basic Input Configuration	ProgInput X.Y	Configurable	N/A	Config
	SP2 Basic Input Configuration	Temperature X.Y	Major High Minor High Minor Low Major Low	(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

- **Smartpack S 1 Input Configuration** – section for configuring the alarm monitors of a Smartpack S controller.

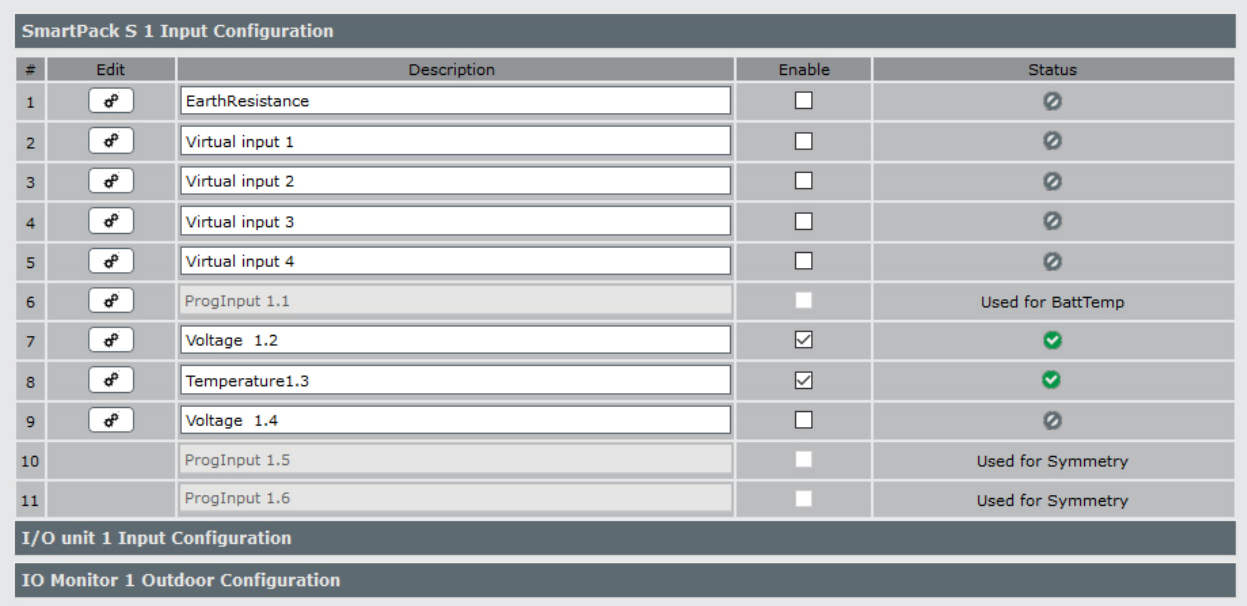


Figure 5.30 – Smartpack S Input Alarms

- **EarthResistance [or EarthFault]** – 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 **Normally Open/Closed**, **Voltage**, **Temperature**, or **Temp 4-20mA**.

The following table lists the alarm monitors for the Smartpack S controller.

Table 5.13 – Smartpack S Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	SmartPack S 1 Input Configuration	EarthFault X	Major Alarm	kOhm	N/A
		Virtual input Y	Configurable	N/A	Config

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		ProgInput X.Y	Configurable	N/A	Config
		Voltage X.Y	Major High Minor High Minor Low Major Low	VDC	Config Calibration
		Temperature X.Y	Major High Minor High Minor Low Major Low	Degrees	Config Calibration (temp 4-20mA only)

- **Compack Input Configuration** – section for configuring the alarm monitors of a Compack controller.

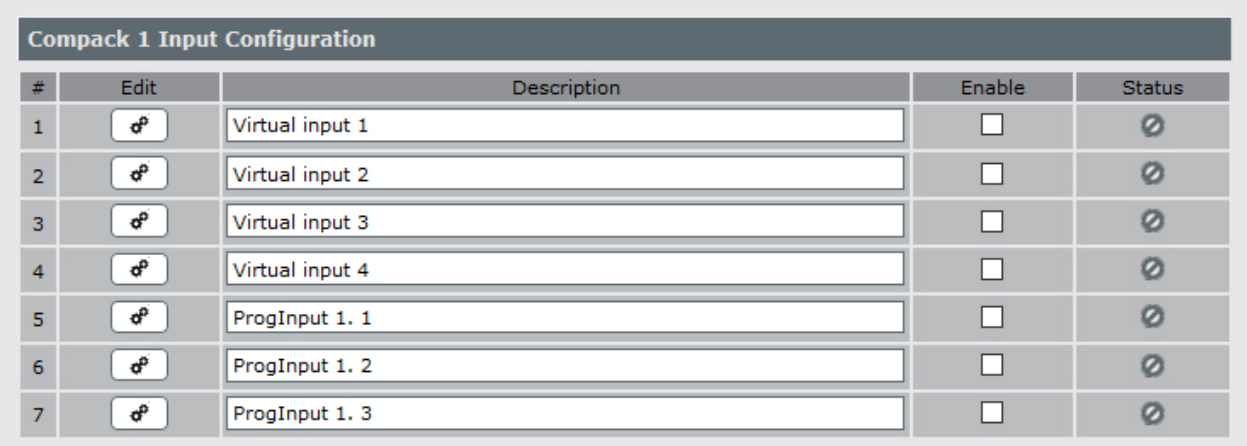


Figure 5.31 – Compack Input Alarms

  - **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 normally open/closed, voltage, temperature, or temp 4-20mA.

The following table lists the alarm monitors for the Compack controller.

Table 5.14 – Compack Alarm Monitors

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
Inputs	Compack 1 Input Configuration	Virtual input Y	Configurable	N/A	Config
		ProgInput X.Y	Configurable	N/A	Config
		Voltage X.Y	Major High Minor High Minor Low Major Low	VDC	Config Calibration
		Temperature X.Y	Major High Minor High Minor Low Major Low	Degrees	Config Calibration (temp 4-20mA only)

- **[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," on page 279.
- **[FlexiMonitor X]** – section for configuring the input channels of a Flexi Monitor set to **Std Fleximon** (Standard Flexi Monitor). See the section "Flexi Monitor" on page 273.
- **[Mains Monitor X Input Configuration]** –section for configuring the input channels of a Mains Monitor. See the section "AC Mains Monitor," on page 264.

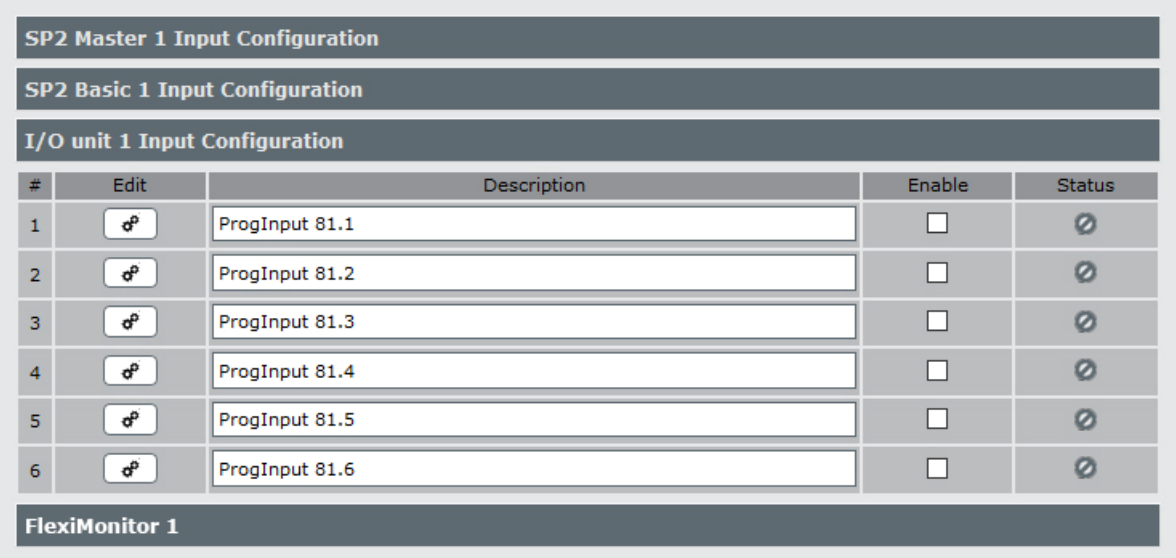


Figure 5.32 – I/O Unit Input Alarms

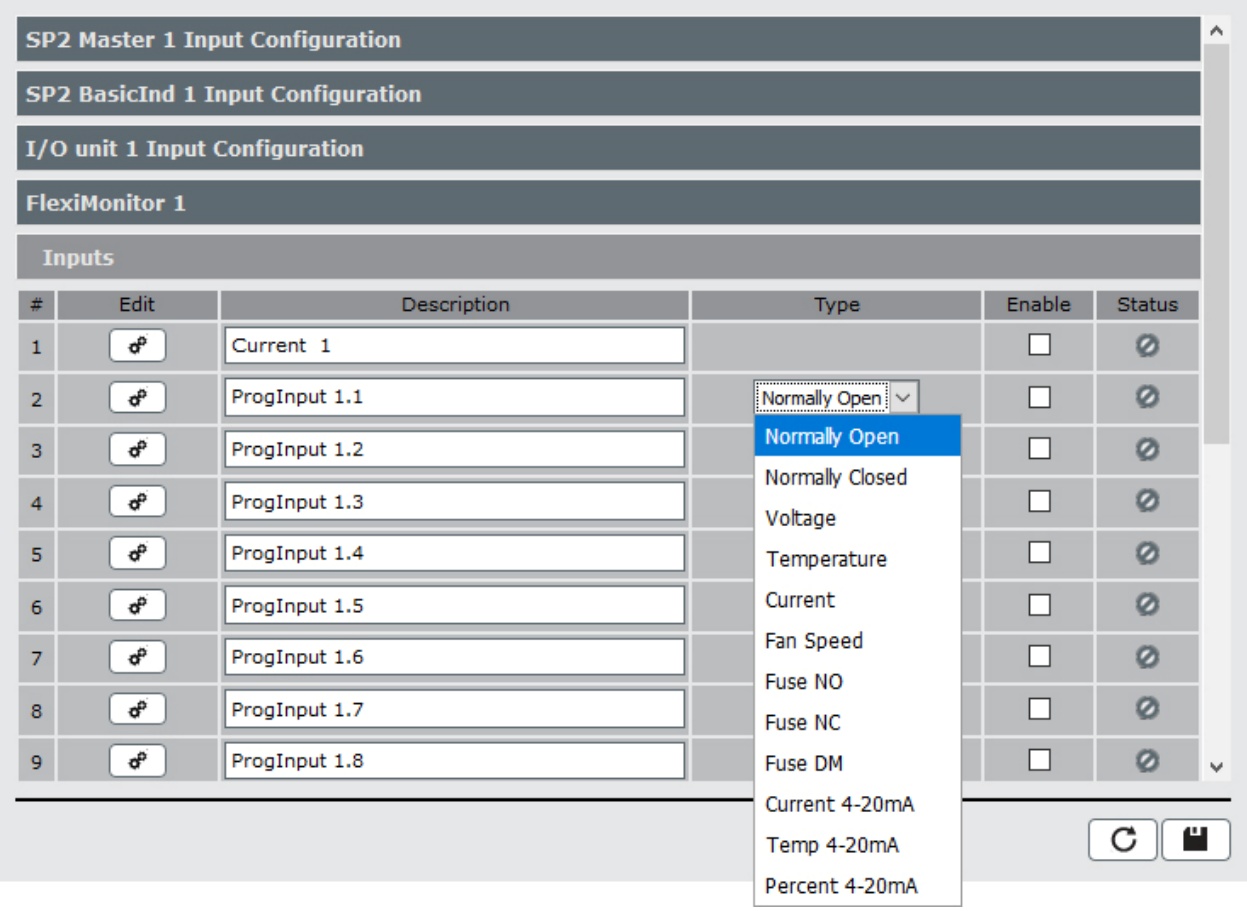


Figure 5.33 – FlexiMonitor Input Alarms

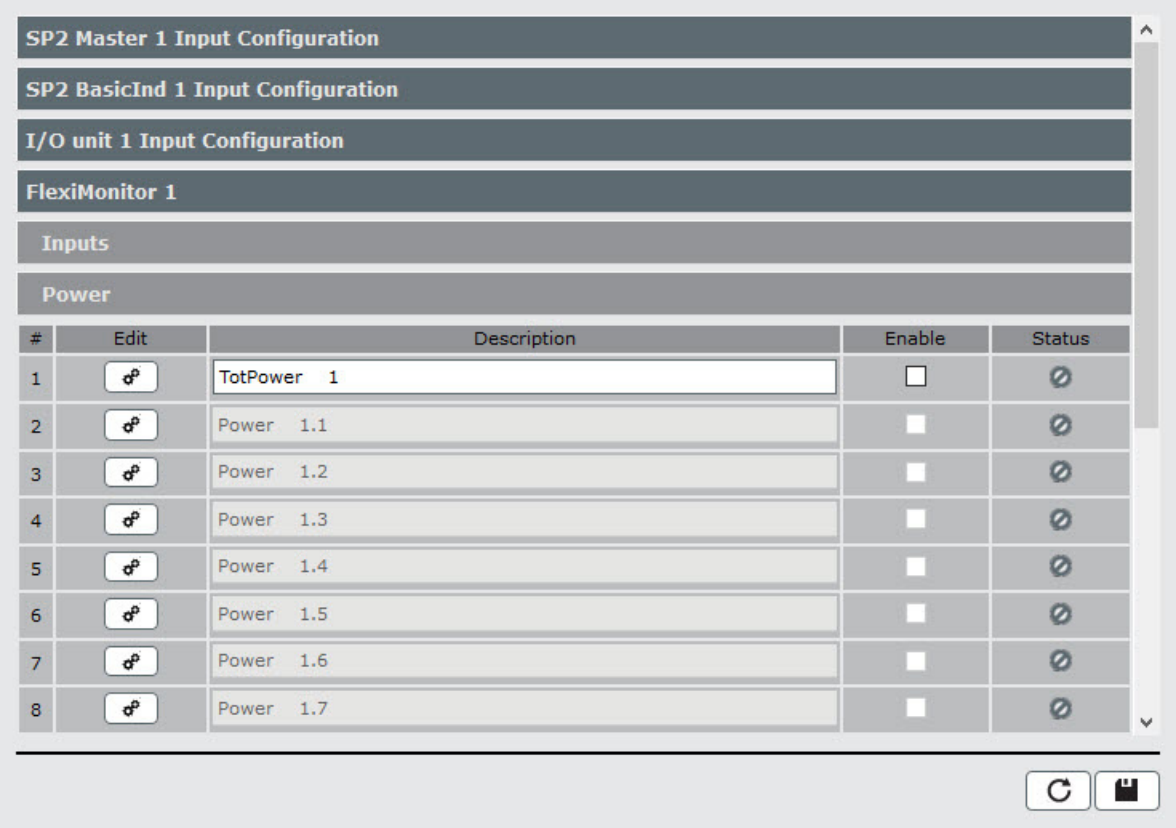


Figure 5.34 – FlexiMonitor Input Alarms Power

Outputs

Page for mapping alarm groups to output channels and creating logical alarms. The outputs page may look different, depending upon the controller being mapped. The following figures illustrate the mapping for different controllers.

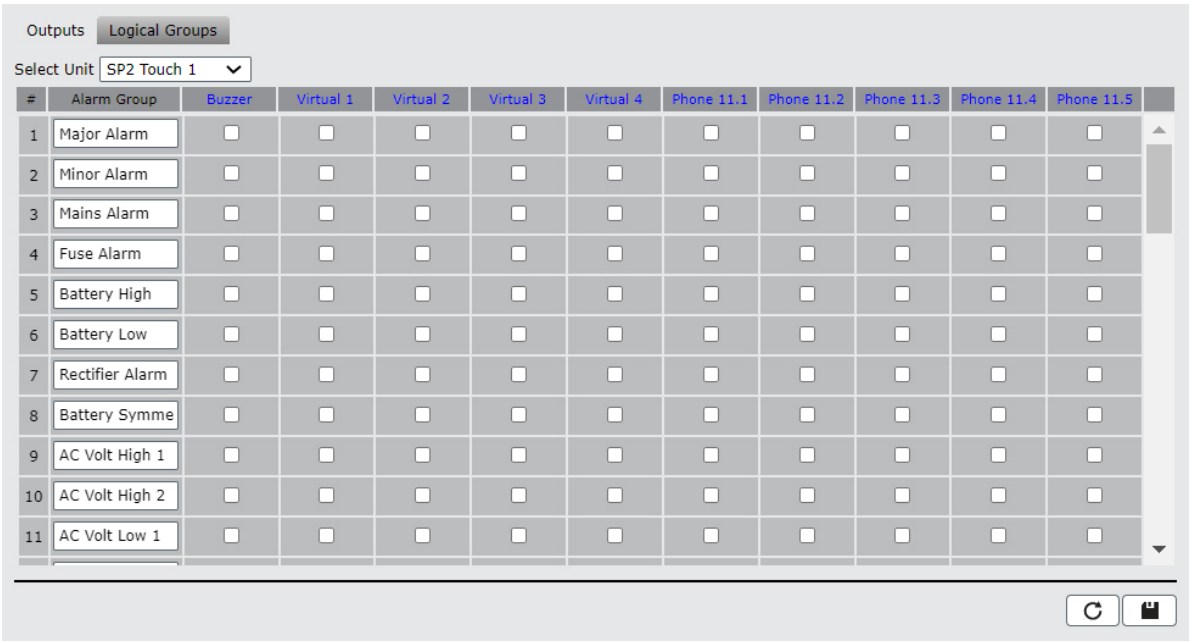


Figure 5.35 – Smartpack2 Touch Outputs (Buzzer, Virtual)

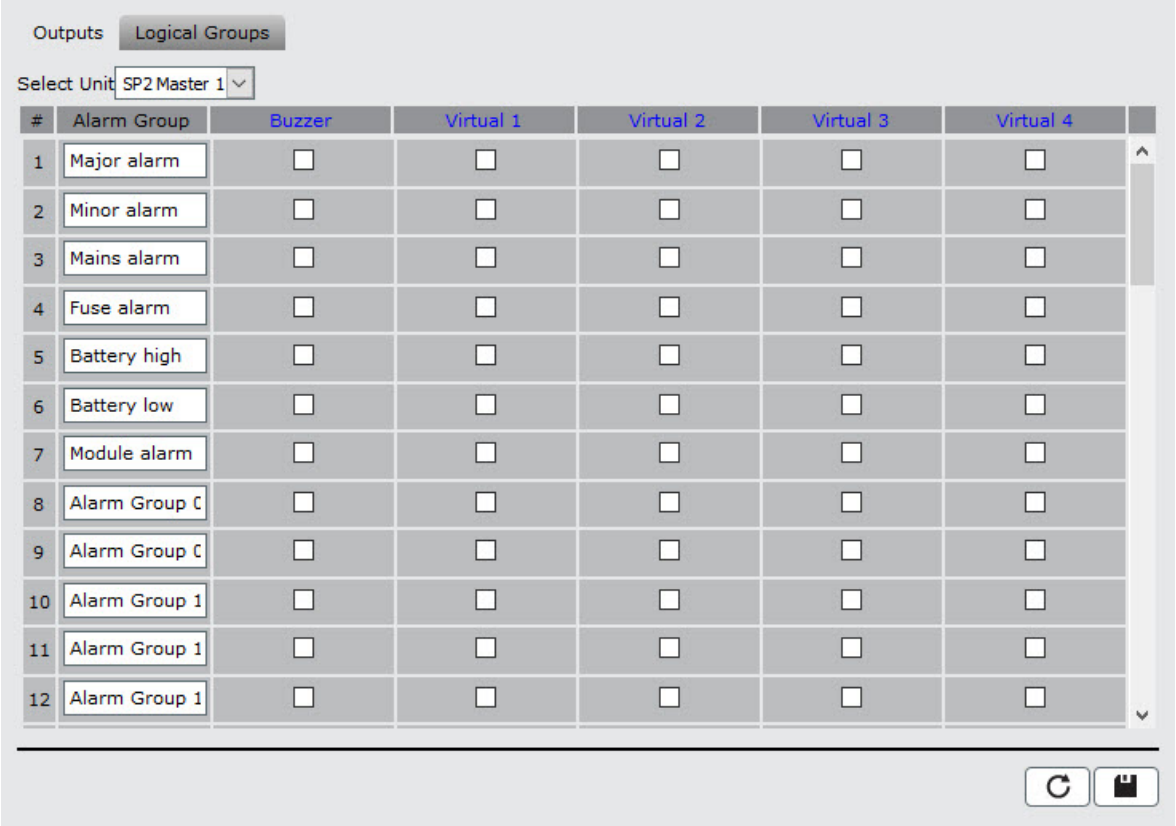


Figure 5.36 – Smartpack2 Master Outputs (Buzzer, Virtual)

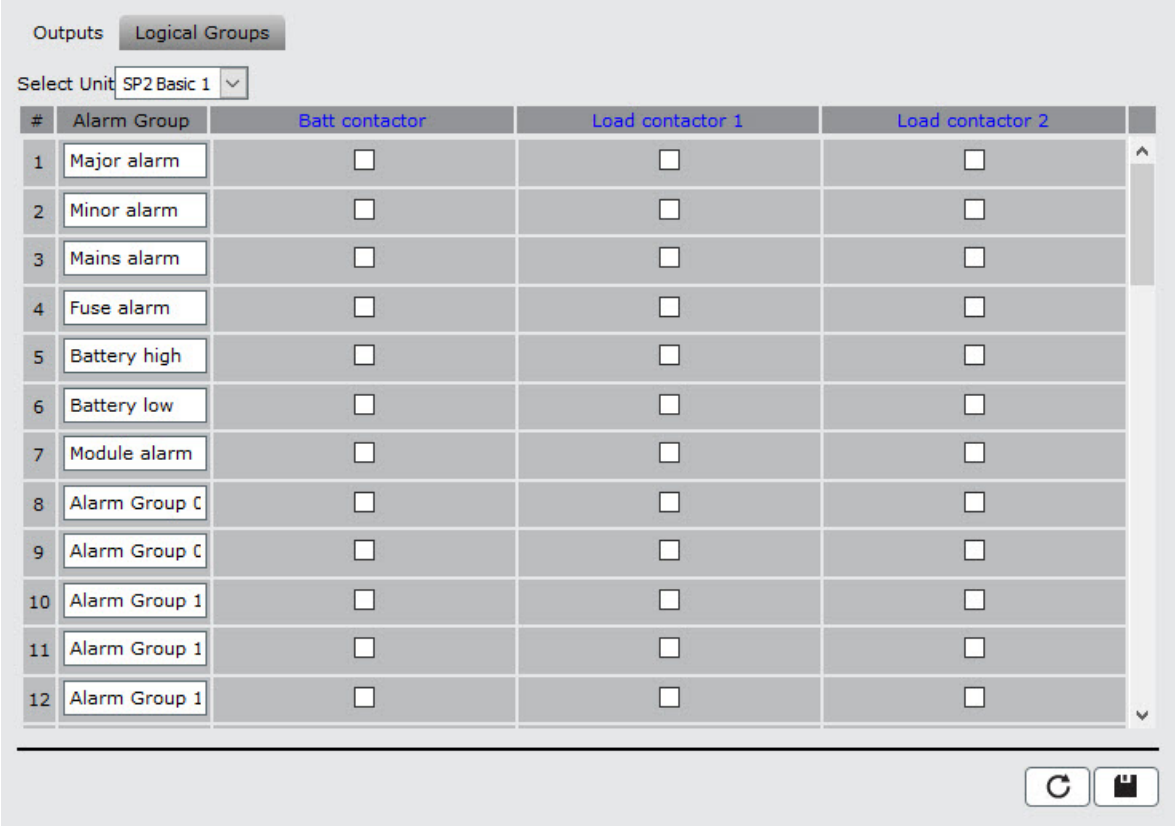


Figure 5.37 – Smartpack2 Basic Outputs (Battery Contactor, Load Contactor)

- **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** – menu list for selecting controllers and CAN Nodes.

Table 5.15 – Table of Controller and CAN Node Output Channels

Controller or CAN Node	Output Channel(s)
SP2 Touch X	Buzzer Virtual 1-4 Phone 1-5
SP2 Master X (Smartpack2 Master)	Buzzer Virtual 1-4

Controller or CAN Node	Output Channel(s)
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. › 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 (Smartpack S, SmartNode, or Smartpack2 Basic Industrial; this feature was removed from the Smartpack2 Basic Industrial controller in version 3.3).

- **Output Config Window** – clicking on an Output Channel column title opens the **Output Config** window, where the channel can be configured.

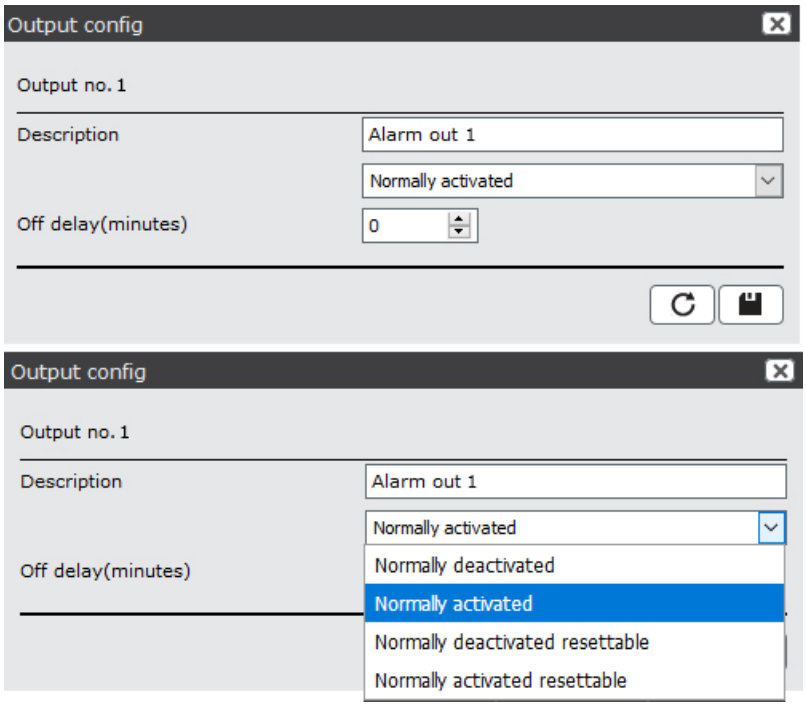


Figure 5.38 – Output Config Window

- **Description** – free-form text field where a description of the output channel can be typed.
- **[Channel Characteristic]** – menu 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.

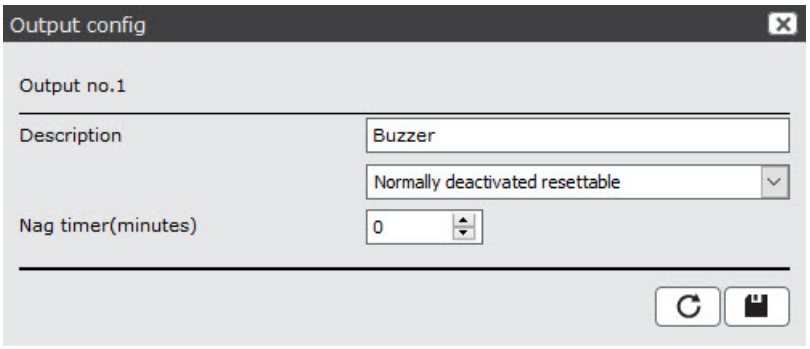


Figure 5.39 – Output Config Window for Buzzer Output (Nag timer instead of Off delay)

- **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.

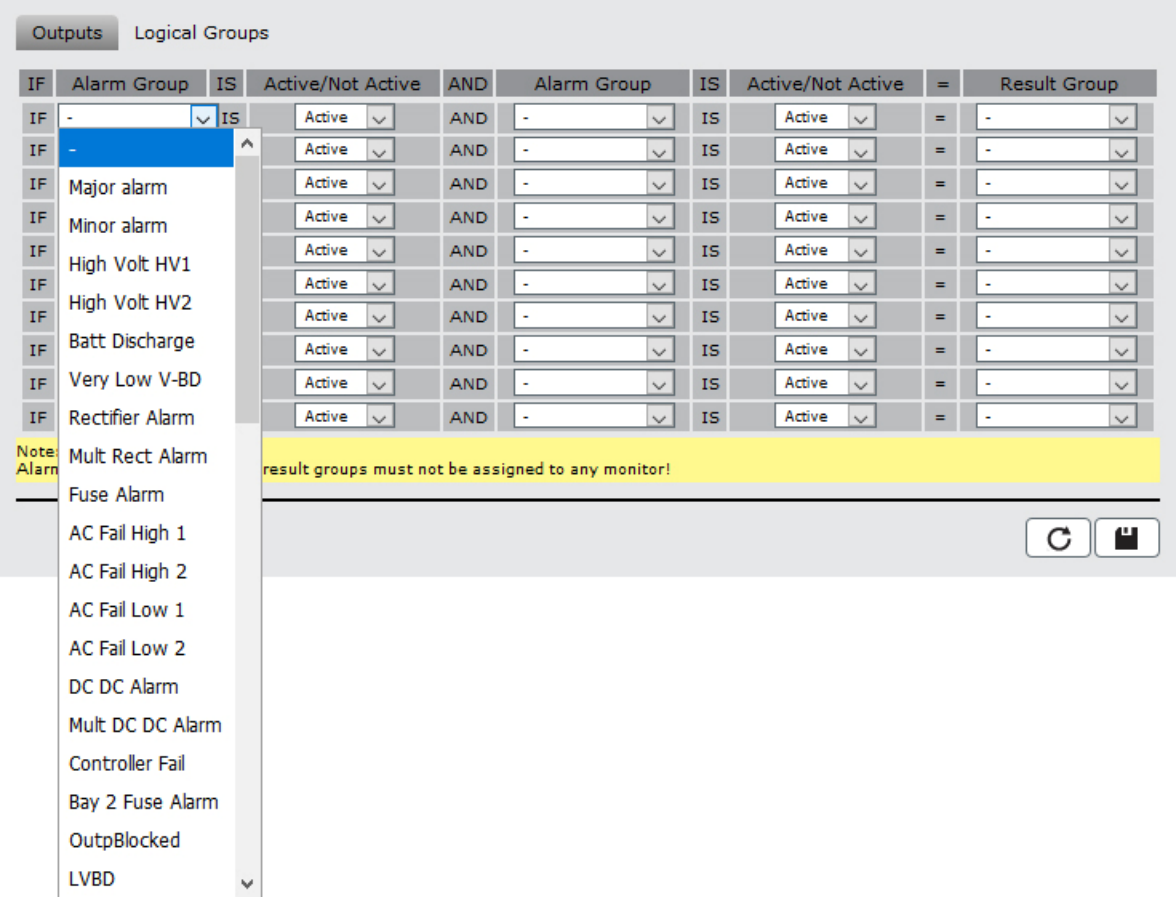


Figure 5.40 – Logical Groups Page

- **[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** – menu list of alarm groups to select as the first alarm group state to check.
  - **Alarm Group 2** – menu list of alarm groups to select as the second alarm group state to check.
  - **Active/Not Active** – menu list of states for the corresponding alarm group; select either **Active** or **Not Active**.
  - **Result Group** – menu 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.

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 browser interface when they are connected to the controller CAN bus.

Table 5.16 – CAN Nodes – Alarm Monitors and Locations

CAN Node	Function	When Configured As Monitor Type... (Load and Flexi Monitors only)*	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

CAN Node	Function	When Configured As Monitor Type... (Load and Flexi Monitors only)*	Alarm Page Where It Appears	Configuration Heading/Section Name
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	FlexiMonitor X
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. › 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. › 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. › Mains

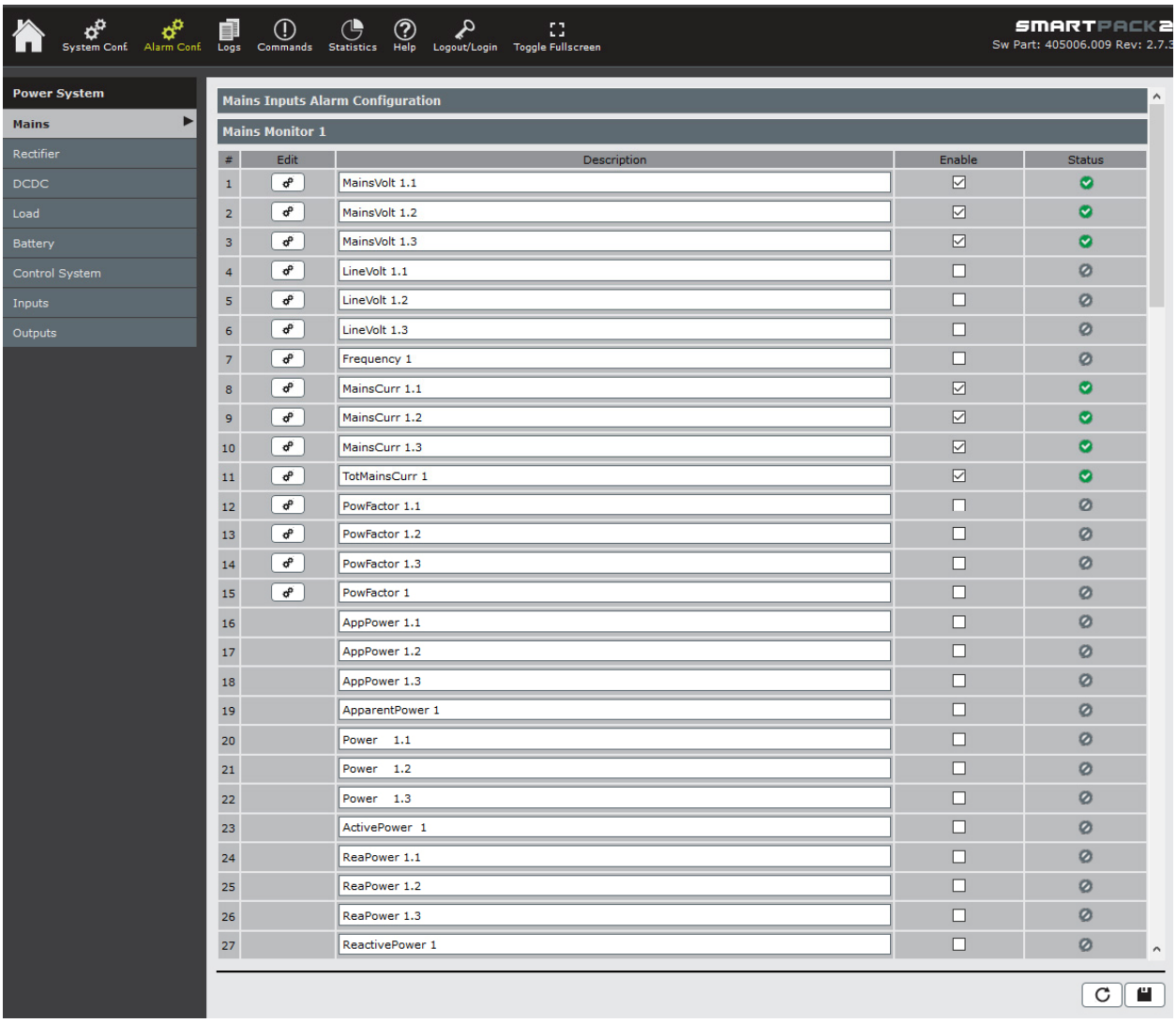


Figure 5.41 – AC Mains Monitor Alarms

- **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.
  - **LineVolt X.Y** – monitors for defining high and low AC input (line) 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.

- **PowFactor X.Y** – monitors for defining alarm thresholds for low power factor per line.
- **PowFactor X** – monitor for defining alarm threshold for low power factor across all lines.
- **AppPower X.Y** – monitors for defining alarm thresholds of apparent power per line. Apparent power is the combination of reactive power and active (real) power and it measured in Volt-Amps (VA).
- **ApparentPower X** – monitors for defining alarm thresholds of apparent power across all lines.
- **Power X.Y** – monitors for defining alarm thresholds of active (real) power per line.
- **ActivePower X** – monitor for defining alarm threshold of active (real) power across all lines.
- **ReaPower X.Y** – monitors for defining alarm thresholds of reactive power across all lines. Reactive power is the unusable power caused by inductive or capacitive loads, and it measured in Volt-Amps Reactive (VAR).
- **ReactivePower X** – monitors for defining alarm thresholds of reactive power across all lines.

Alarm Conf. › 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
		LineVolt 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
		PowFactorX.Y	Minor Low Major Low	N/A	N/A
		PowFactorX	Minor Low Major Low	N/A	N/A
		AppPower X.Y	N/A	N/A	N/A
		ApparentPower X	N/A	N/A	N/A
		Power X.Y	N/A	N/A	N/A
		ActivePower X	N/A	N/A	N/A
		RealPower X.Y	N/A	N/A	N/A
		ReactivePower 1	N/A	N/A	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. › Battery

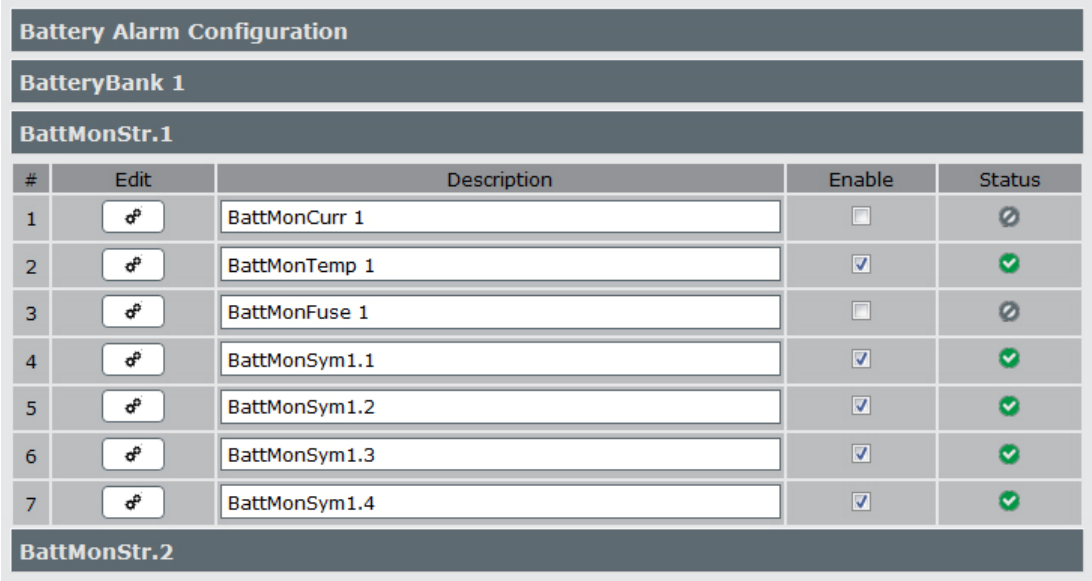


Figure 5.42 – Battery Monitor Alarms

- **BattMonStr.X** – section for configuring a Battery Monitor CAN Node.
  - **BattMonCurr X** – monitor for defining charge (high) and discharge (low) alarm thresholds; requires a shunt, which must be calibrated and scaled.
  - **BattMonTemp X** – monitor for defining high and low battery temperature alarm thresholds (in degrees).
  - **BattMonFuse X** – monitor for a battery fuse or circuit breaker alarm; fuse rating must be known.
  - **BattMonSymX.Y** – monitors for battery symmetry voltage 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	BatteryMontStr.X	BattMonCurr X	Major High Minor High Minor Low Major Low	Amp	
		BattMonTemp X	Major High Minor High Minor Low Major Low	(Degrees)	

Menu Page	Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		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. › 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. › 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 **Home** page: **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.

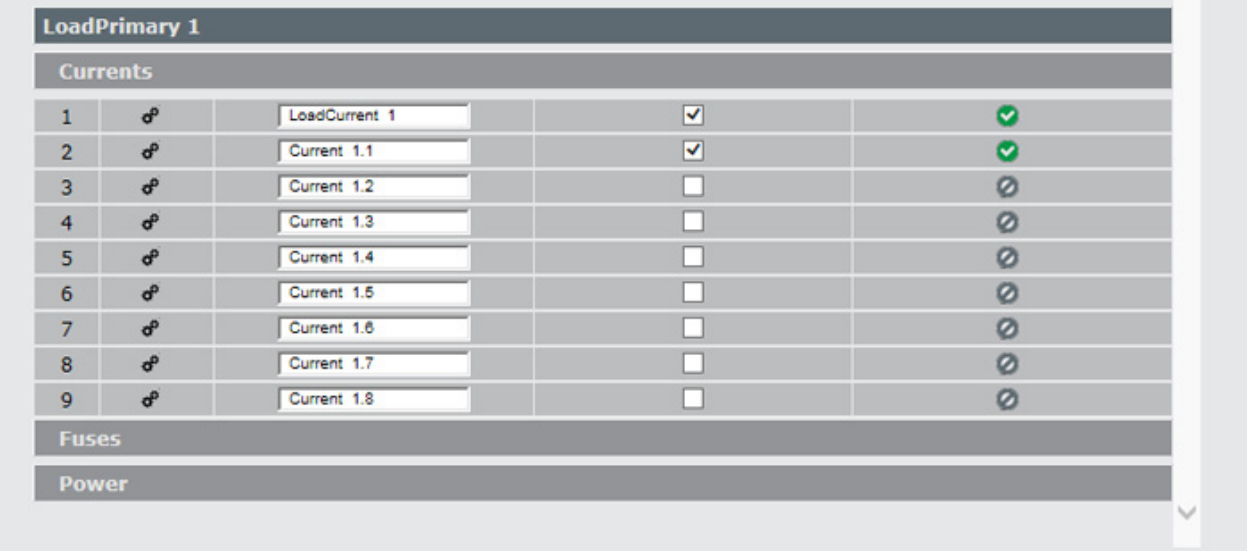


Figure 5.43 – Load Monitor, Currents

- **LoadCurrent 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.

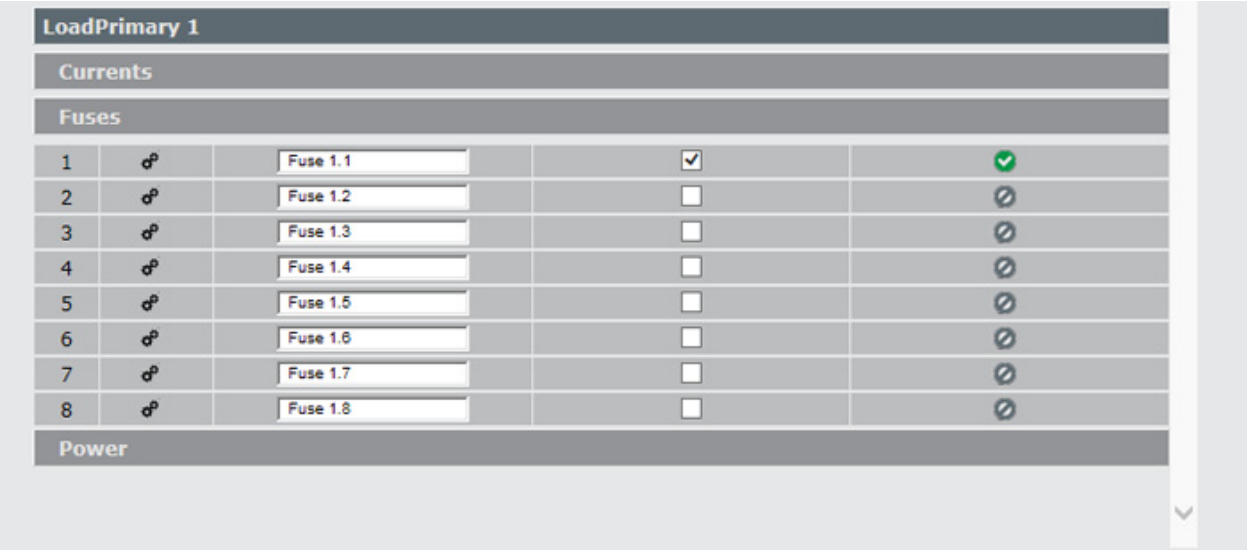


Figure 5.44 – Load Monitor, Fuses

- **Fuse X.Y** – monitors for fuses or circuit breakers; fuse rating must be known.

- **Power** – section for reporting power calculations (not configurable).

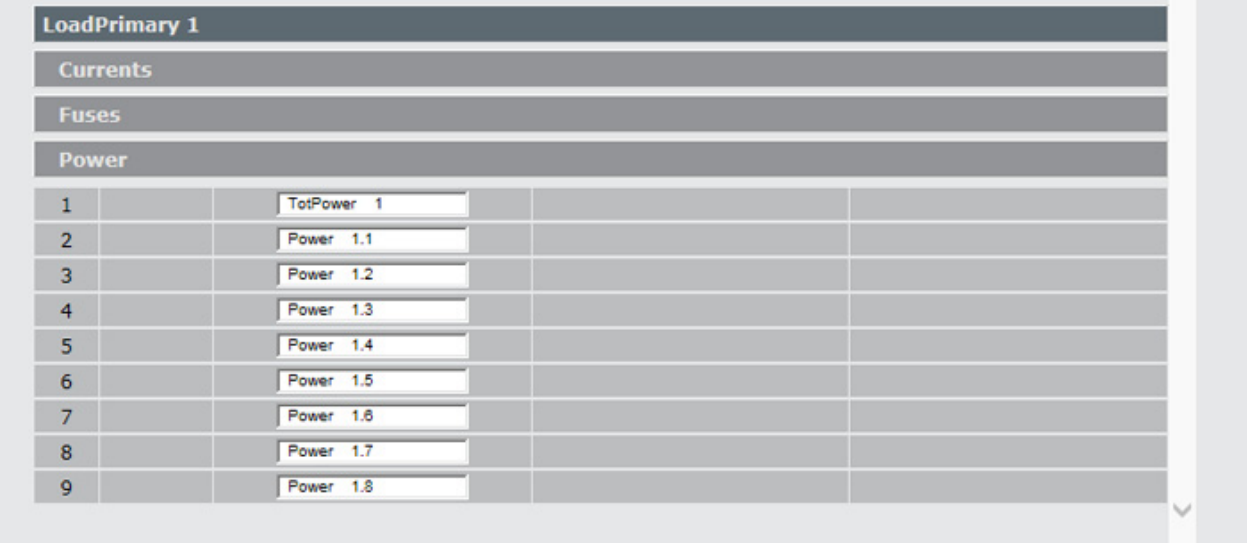


Figure 5.45 – Load Monitor, Power

- **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* Load CurMon X*	Currents	LoadCurrent X	Major High Minor High	Amp	
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)

Menu Page	Section Heading	Sub-Section Heading	Alarm Monitor	Alarm Events	Unit	Tabs
		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.

The name on the **Control Units Summary** page is **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. › Control System ›Flexi Monitor**). Regardless of the Monitor Type assigned, the Flexi Monitor always has the same configuration sections and alarm monitors.

Alarm Conf. › 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. › 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. › 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. › 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. › 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. › 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

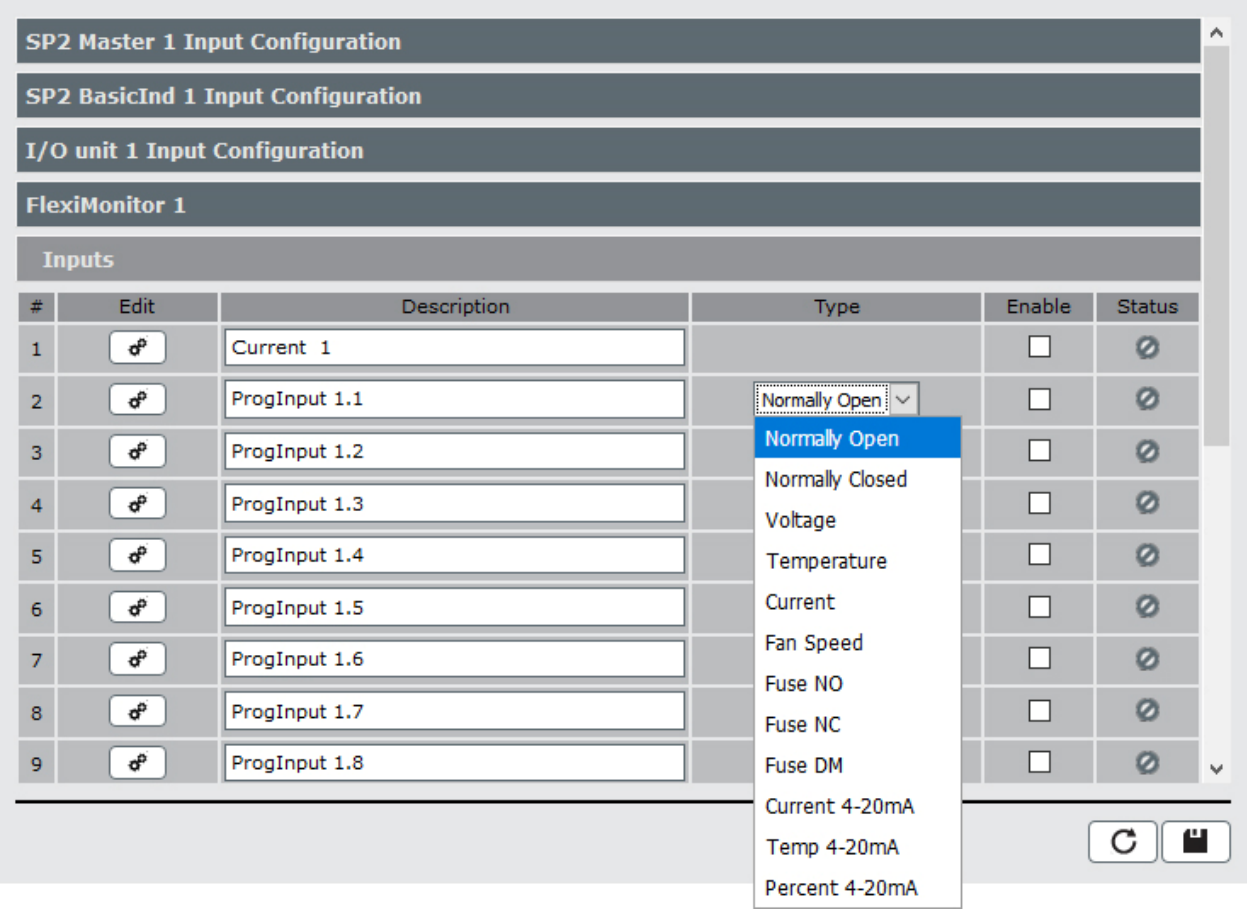


Figure 5.46 – Flexi Monitor Input Alarms

  - **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)

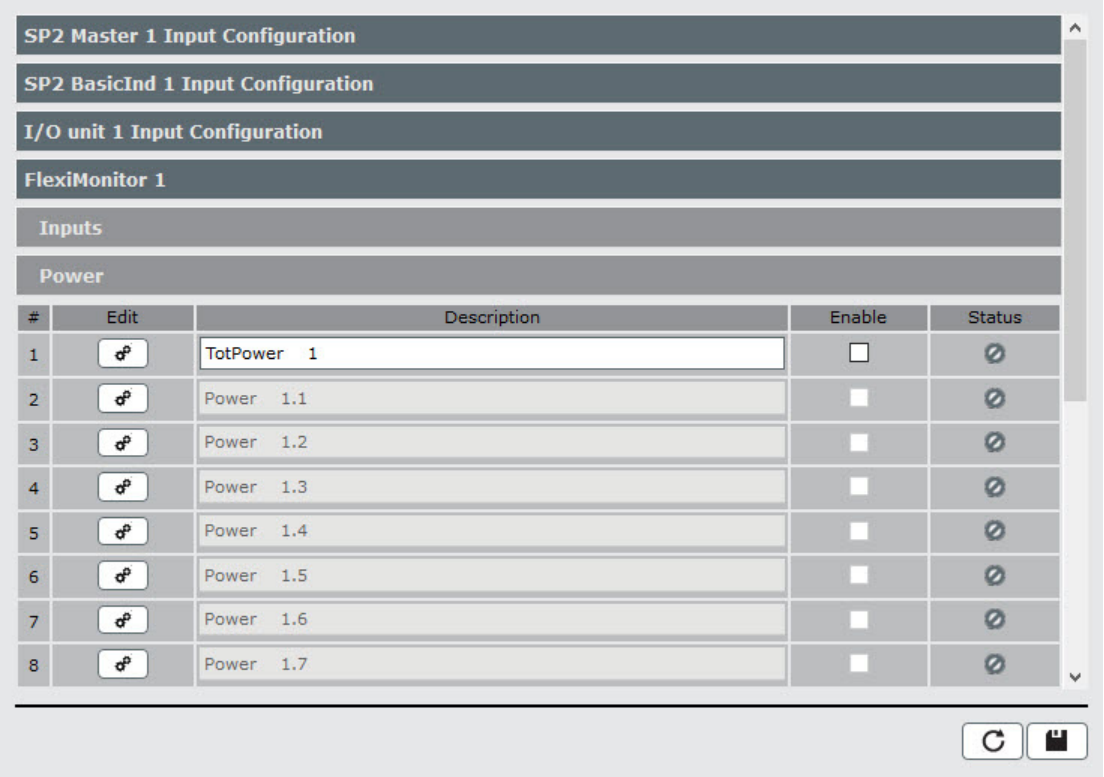


Figure 5.47 – Flexi Monitor Power Monitors

- **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

The name on **Control Units Summary** page is **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. › Inputs

- **I/O Unit x Input Configuration** – section for configuring the input terminals of the I/O Monitors (Types 1, 2, and 3).

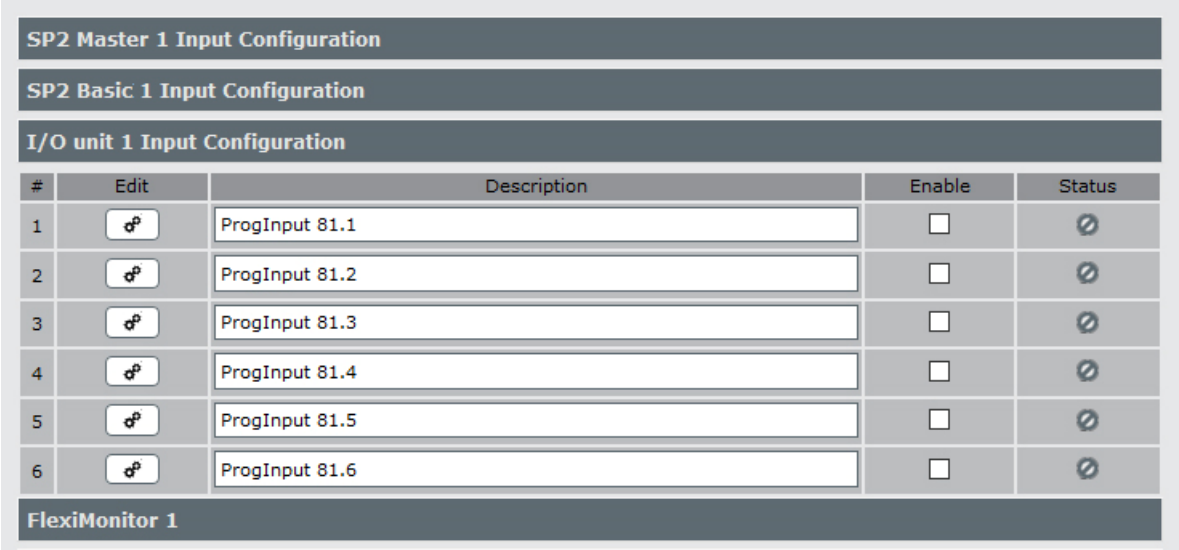


Figure 5.48 – I/O Monitor Programmable Inputs

  - **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.

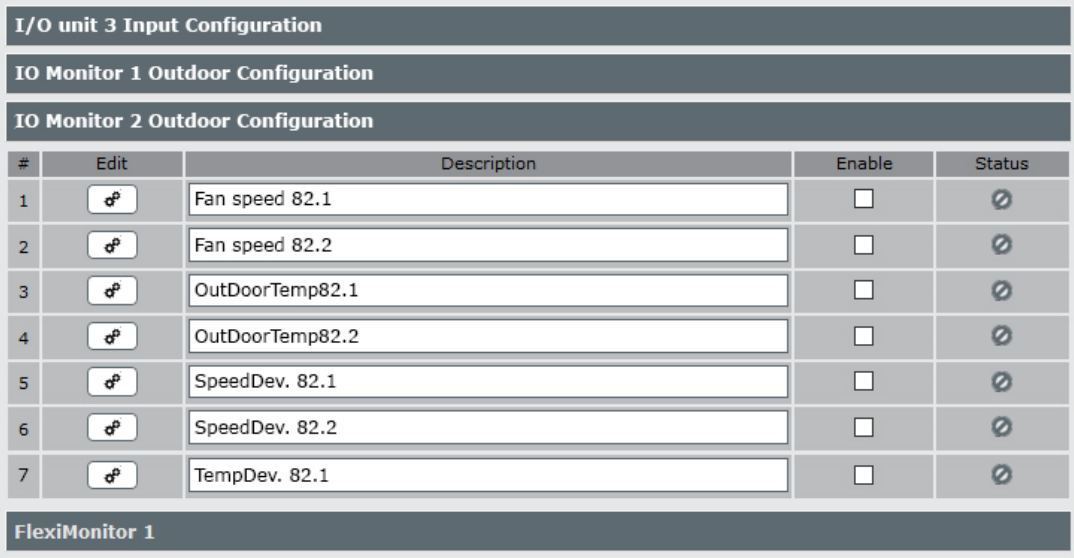


Figure 5.49 – I/O Monitor Outdoor Inputs

- **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. › 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 1and Type 2	I/O Monitor Type 3
1-2	NO/NC Relay, Diode Matrix, Clock Input, Voltage Voltage range: 0 – 75 V (78 mV resolution)	NO/NC Relay, Diode Matrix, Clock Input, Voltage Voltage range: 0 – 75 V (78 mV resolution)
3-4	[Same as above.]	NO/NC Relay, Diode Matrix, Clock Input, Voltage Voltage range 0 – 10 V (13 mV resolution)
5-6	[Same as above.]	NO/NC Relay, Diode Matrix, Clock Input, Voltage, Current 4 – 20 mA Voltage range 0 – 10 V (13 mV resolution) Current measurement 4 – 20mA (27 µA 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)
		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.

The name on **Control Units Summary** page is **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 (Temeprature) 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 menu list) shows six alarm relays that can be mapped for all available alarm groups.

Note: I/O Monitor Type 1 and Type 3 are rated for higher current on relays 5 and 6.

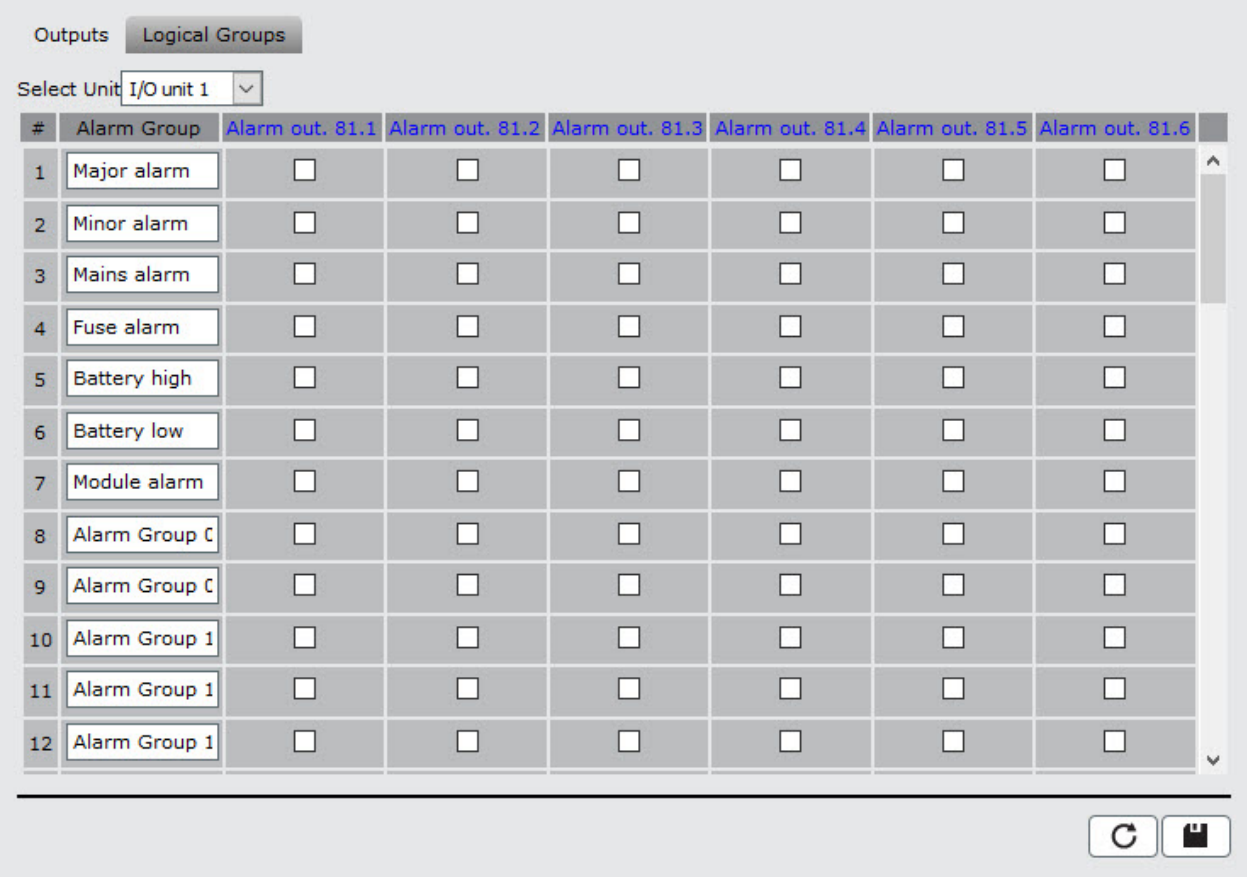


Figure 5.50 – I/O Monitor Outputs

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.

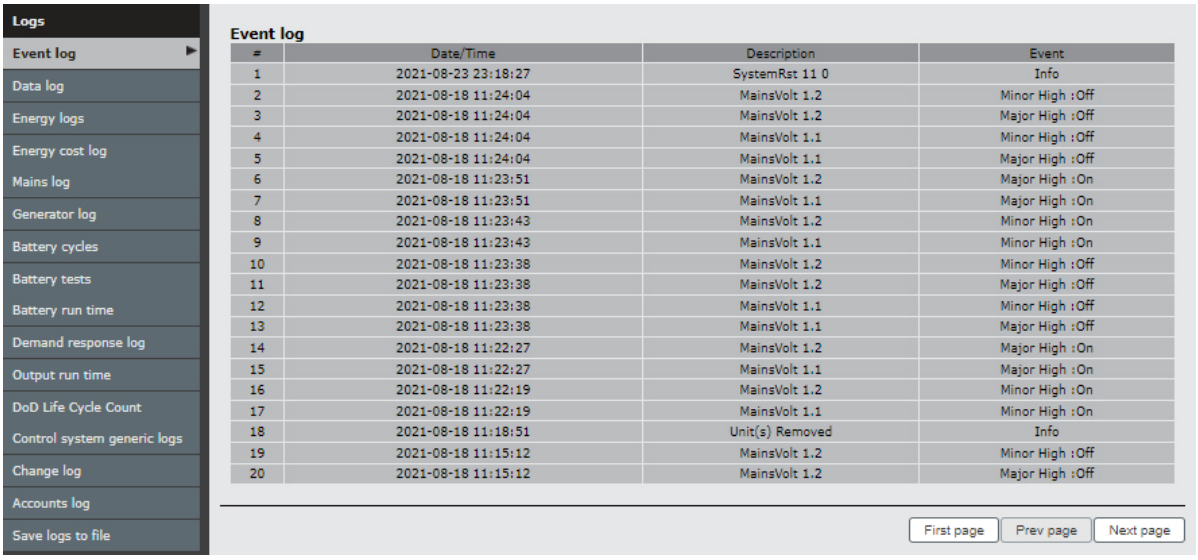


Event Log

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	2021-08-23 23:18:27	SystemRst 11 0	Info
2	2021-08-18 11:24:04	MainsVolt 1.2	Minor High :Off
3	2021-08-18 11:24:04	MainsVolt 1.2	Major High :Off
4	2021-08-18 11:24:04	MainsVolt 1.1	Minor High :Off
5	2021-08-18 11:24:04	MainsVolt 1.1	Major High :Off
6	2021-08-18 11:23:51	MainsVolt 1.2	Major High :On
7	2021-08-18 11:23:51	MainsVolt 1.1	Major High :On
8	2021-08-18 11:23:43	MainsVolt 1.2	Minor High :On
9	2021-08-18 11:23:43	MainsVolt 1.1	Minor High :On
10	2021-08-18 11:23:38	MainsVolt 1.2	Minor High :Off
11	2021-08-18 11:23:38	MainsVolt 1.2	Major High :Off
12	2021-08-18 11:23:38	MainsVolt 1.1	Minor High :Off
13	2021-08-18 11:23:38	MainsVolt 1.1	Major High :Off
14	2021-08-18 11:22:27	MainsVolt 1.2	Major High :On
15	2021-08-18 11:22:27	MainsVolt 1.1	Major High :On
16	2021-08-18 11:22:19	MainsVolt 1.2	Minor High :On
17	2021-08-18 11:22:19	MainsVolt 1.1	Minor High :On
18	2021-08-18 11:18:51	Unit(s) Removed	Info
19	2021-08-18 11:15:12	MainsVolt 1.2	Minor High :Off
20	2021-08-18 11:15:12	MainsVolt 1.2	Major High :Off

Figure 6.1 – Event Log Page

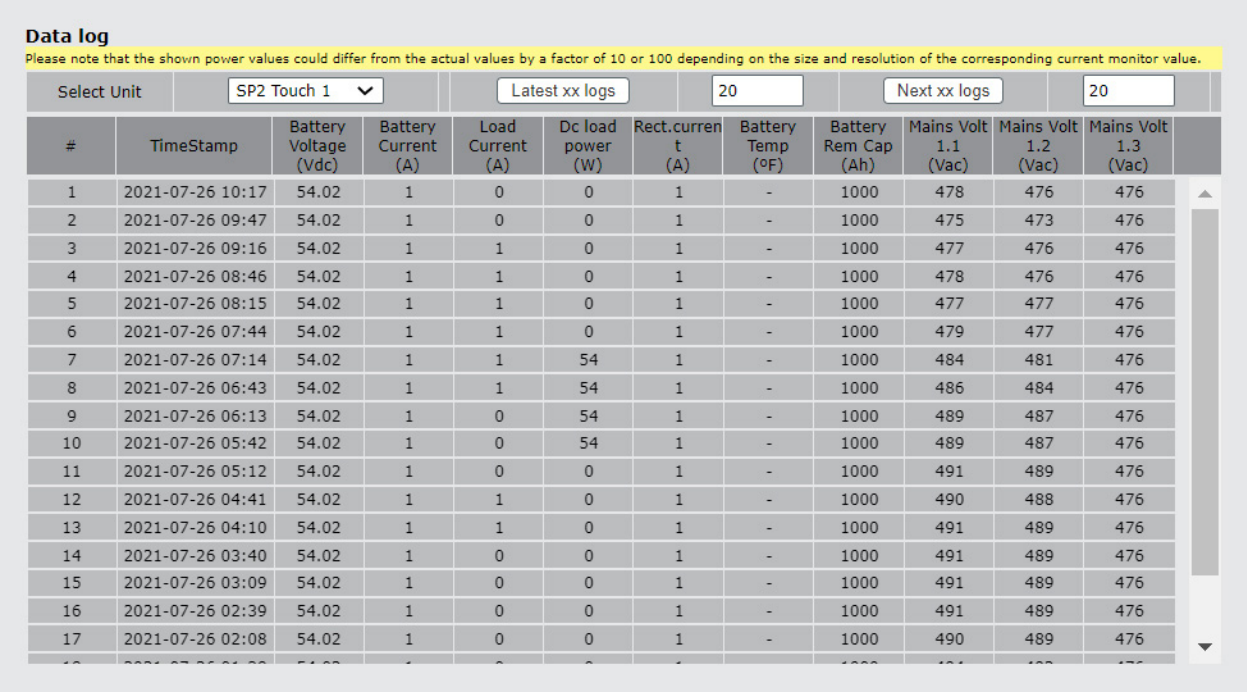
Data Log

The **Data log** page shows parameter measurements stored by controllers and CAN Nodes.

- **Select Unit** – menu list of connected controllers and CAN Nodes that record data measurement.
- **#** - 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.

For details about setting the measured parameters of datalogs, see “Data Log,” on page 164.



Data log

Please note that the shown power values could differ from the actual values by a factor of 10 or 100 depending on the size and resolution of the corresponding current monitor value.

Select Unit: SP2 Touch 1 | Latest xx logs: 20 | Next xx logs: 20

#	TimeStamp	Battery Voltage (Vdc)	Battery Current (A)	Load Current (A)	Dc load power (W)	Rect.current (A)	Battery Temp (ºF)	Battery Rem Cap (Ah)	Mains Volt 1.1 (Vac)	Mains Volt 1.2 (Vac)	Mains Volt 1.3 (Vac)
1	2021-07-26 10:17	54.02	1	0	0	1	-	1000	478	476	476
2	2021-07-26 09:47	54.02	1	0	0	1	-	1000	475	473	476
3	2021-07-26 09:16	54.02	1	1	0	1	-	1000	477	476	476
4	2021-07-26 08:46	54.02	1	1	0	1	-	1000	478	476	476
5	2021-07-26 08:15	54.02	1	1	0	1	-	1000	477	477	476
6	2021-07-26 07:44	54.02	1	1	0	1	-	1000	479	477	476
7	2021-07-26 07:14	54.02	1	1	54	1	-	1000	484	481	476
8	2021-07-26 06:43	54.02	1	1	54	1	-	1000	486	484	476
9	2021-07-26 06:13	54.02	1	0	54	1	-	1000	489	487	476
10	2021-07-26 05:42	54.02	1	0	54	1	-	1000	489	487	476
11	2021-07-26 05:12	54.02	1	0	0	1	-	1000	491	489	476
12	2021-07-26 04:41	54.02	1	1	0	1	-	1000	490	488	476
13	2021-07-26 04:10	54.02	1	1	0	1	-	1000	491	489	476
14	2021-07-26 03:40	54.02	1	0	0	1	-	1000	491	489	476
15	2021-07-26 03:09	54.02	1	0	0	1	-	1000	491	489	476
16	2021-07-26 02:39	54.02	1	0	0	1	-	1000	491	489	476
17	2021-07-26 02:08	54.02	1	0	0	1	-	1000	490	489	476

Figure 6.2 – Data Log Page

The following table describes some 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

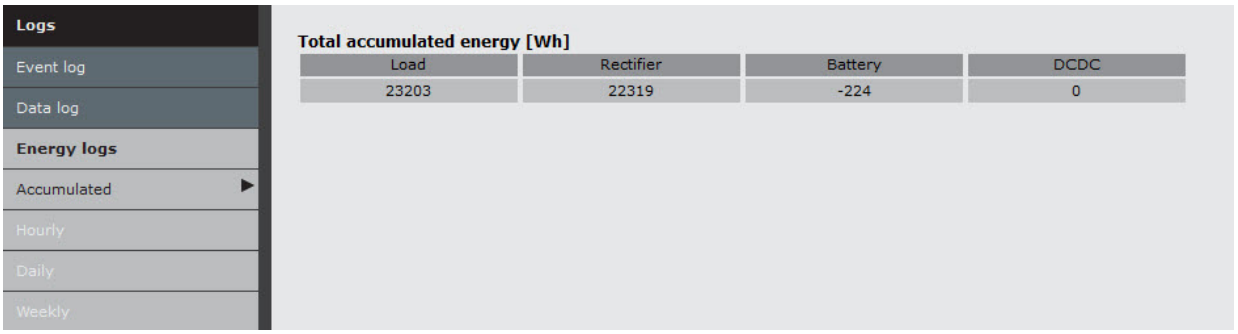


Figure 6.3 – Accumulated Energy Log Page (as an example)

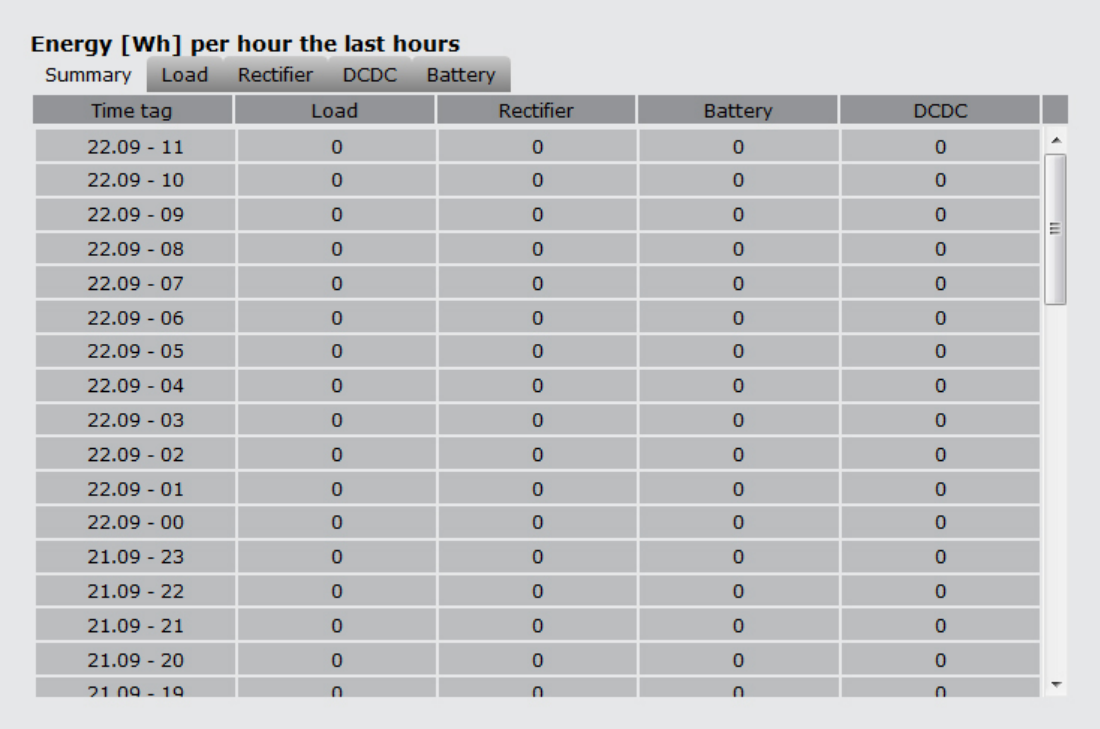


Figure 6.4 – Hourly Energy Log Page (as an example)

- **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. › 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.

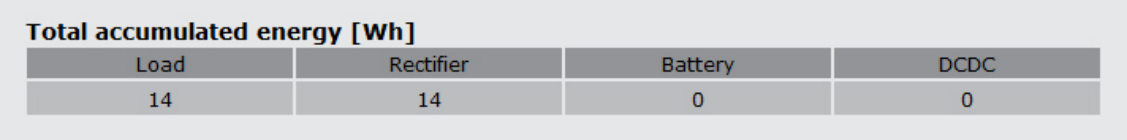


Figure 6.5 – Accumulated Energy Page

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.

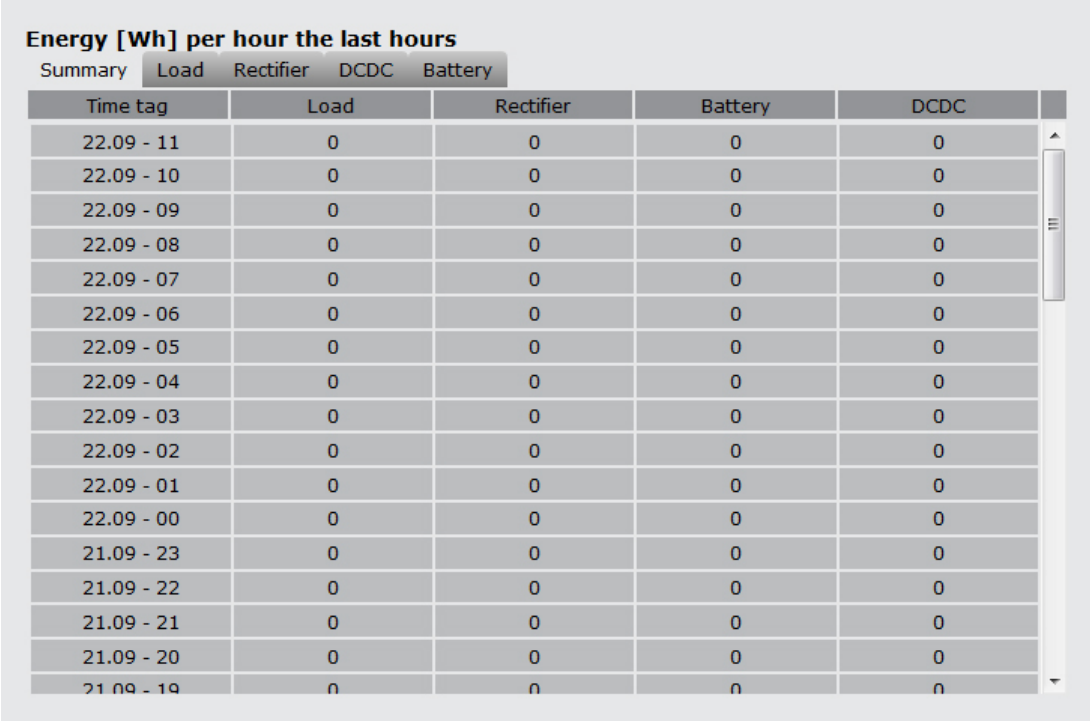
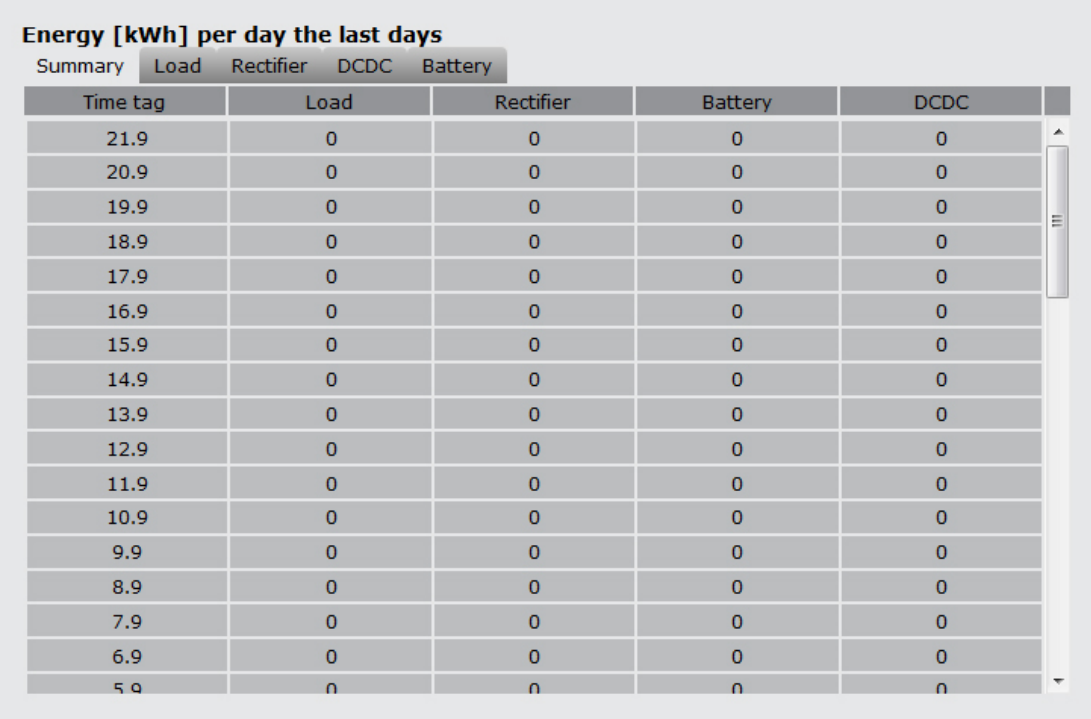


Figure 6.6 – Hourly Energy Log Page

Daily

The **Daily** page lists daily energy totals over the last 52 days. **Time tag** format is Day.Month (**DD.MM**).

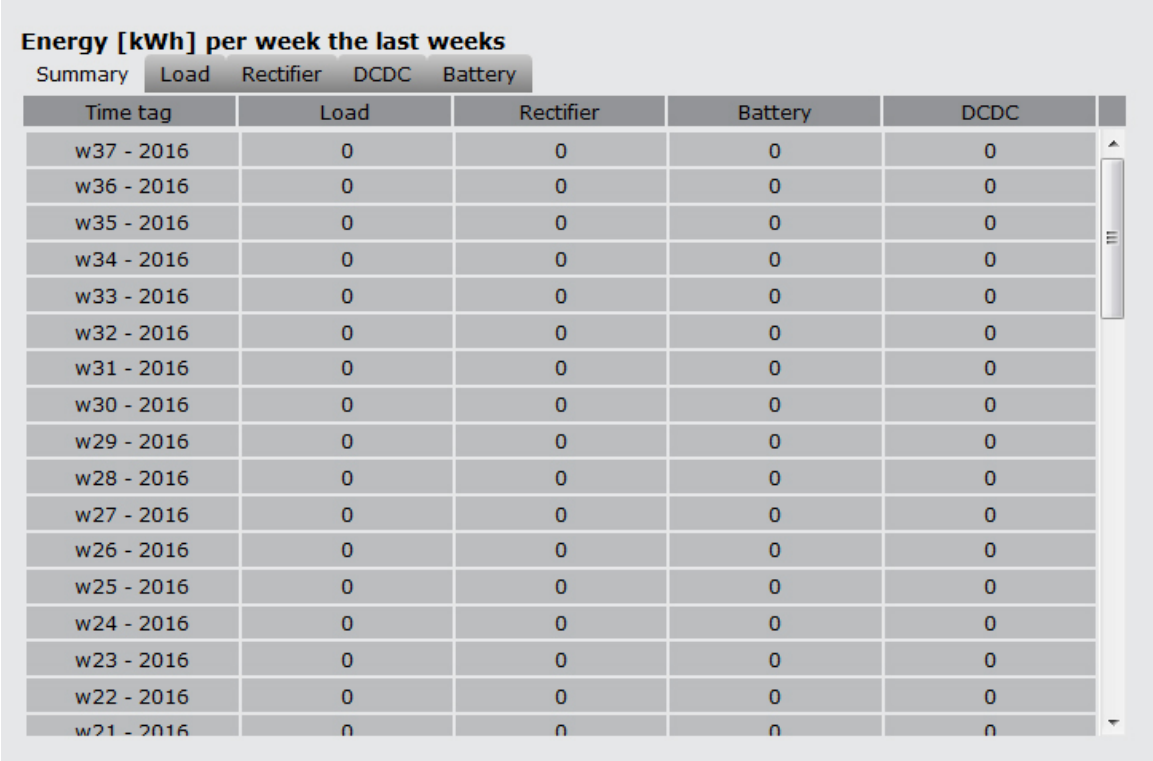


Time tag	Load	Rectifier	Battery	DCDC
21.9	0	0	0	0
20.9	0	0	0	0
19.9	0	0	0	0
18.9	0	0	0	0
17.9	0	0	0	0
16.9	0	0	0	0
15.9	0	0	0	0
14.9	0	0	0	0
13.9	0	0	0	0
12.9	0	0	0	0
11.9	0	0	0	0
10.9	0	0	0	0
9.9	0	0	0	0
8.9	0	0	0	0
7.9	0	0	0	0
6.9	0	0	0	0
5.9	0	0	0	0

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**).



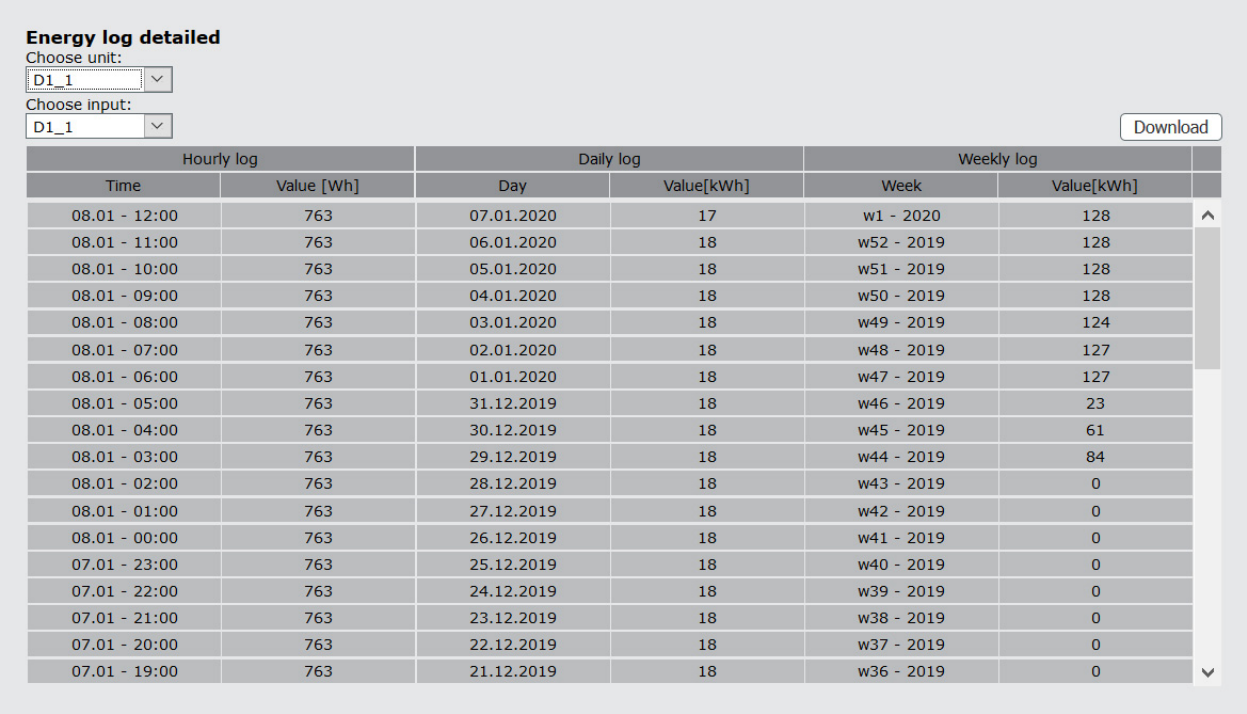
Time tag	Load	Rectifier	Battery	DCDC
w37 - 2016	0	0	0	0
w36 - 2016	0	0	0	0
w35 - 2016	0	0	0	0
w34 - 2016	0	0	0	0
w33 - 2016	0	0	0	0
w32 - 2016	0	0	0	0
w31 - 2016	0	0	0	0
w30 - 2016	0	0	0	0
w29 - 2016	0	0	0	0
w28 - 2016	0	0	0	0
w27 - 2016	0	0	0	0
w26 - 2016	0	0	0	0
w25 - 2016	0	0	0	0
w24 - 2016	0	0	0	0
w23 - 2016	0	0	0	0
w22 - 2016	0	0	0	0
w21 - 2016	0	0	0	0

Figure 6.8 – Weekly Energy Log Page

Detailed

The **Energy log Detailed** page shows energy usage (in watt-hours or kilowatt-hours) for individual measurements; it displays energy usage by hourly for the last fifty hours, daily for the last fifty days, and weekly for the last fifty weeks. The Detailed log requires a Load Monitor or Fleximonitor with inputs configured to current measurement measuring current from a shunt or current transducer. If you do not have a Load Monitor or Fleximonitor, the **Energy log detailed** page is not present.

To configure a Load Monitor or FlexiMonitor, see Load Monitor and Flexi Monitor Setup, page 376.



Energy log detailed

Choose unit: D1_1

Choose input: D1_1

Download

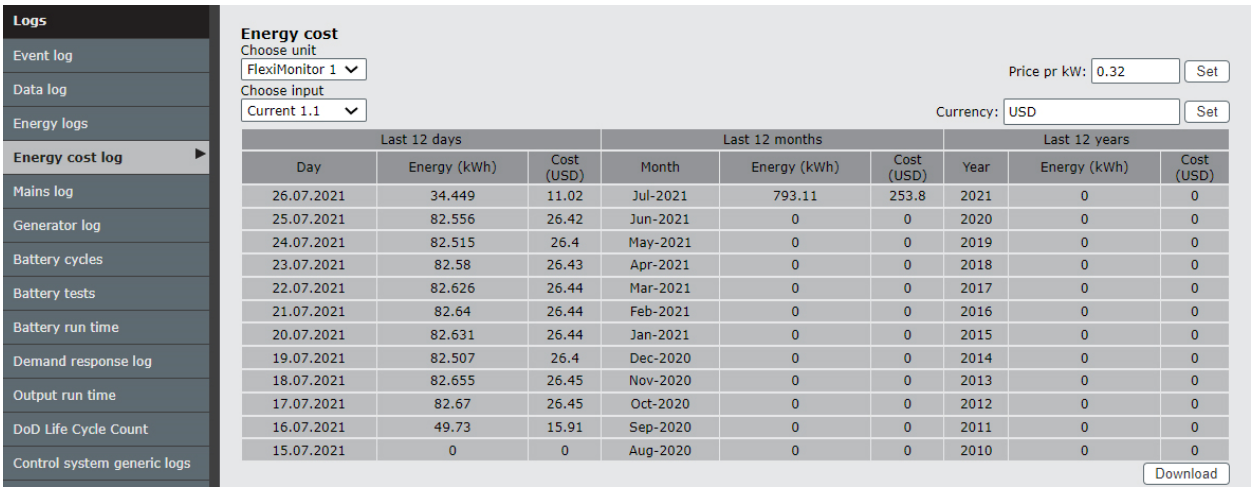
Hourly log		Daily log		Weekly log	
Time	Value [Wh]	Day	Value[kWh]	Week	Value[kWh]
08.01 - 12:00	763	07.01.2020	17	w1 - 2020	128
08.01 - 11:00	763	06.01.2020	18	w52 - 2019	128
08.01 - 10:00	763	05.01.2020	18	w51 - 2019	128
08.01 - 09:00	763	04.01.2020	18	w50 - 2019	128
08.01 - 08:00	763	03.01.2020	18	w49 - 2019	124
08.01 - 07:00	763	02.01.2020	18	w48 - 2019	127
08.01 - 06:00	763	01.01.2020	18	w47 - 2019	127
08.01 - 05:00	763	31.12.2019	18	w46 - 2019	23
08.01 - 04:00	763	30.12.2019	18	w45 - 2019	61
08.01 - 03:00	763	29.12.2019	18	w44 - 2019	84
08.01 - 02:00	763	28.12.2019	18	w43 - 2019	0
08.01 - 01:00	763	27.12.2019	18	w42 - 2019	0
08.01 - 00:00	763	26.12.2019	18	w41 - 2019	0
07.01 - 23:00	763	25.12.2019	18	w40 - 2019	0
07.01 - 22:00	763	24.12.2019	18	w39 - 2019	0
07.01 - 21:00	763	23.12.2019	18	w38 - 2019	0
07.01 - 20:00	763	22.12.2019	18	w37 - 2019	0
07.01 - 19:00	763	21.12.2019	18	w36 - 2019	0

Figure 6.9 – Energy Cost Log Page

Energy cost log

The **Energy cost log** page shows energy usage (in kilowatt-hours) and cost for individual measurements; it displays Energy usage and cost by month for the last twelve months and by year for the last 12 years. Energy cost log requires a Fleximonitor with inputs configured to current measurement measuring current from a shunt or current transducer. If you do not have a Fleximonitor, the **Energy cost log** is not present.

To configure a FlexiMonitor, see Load Monitor and Flexi Monitor Setup, page 376.

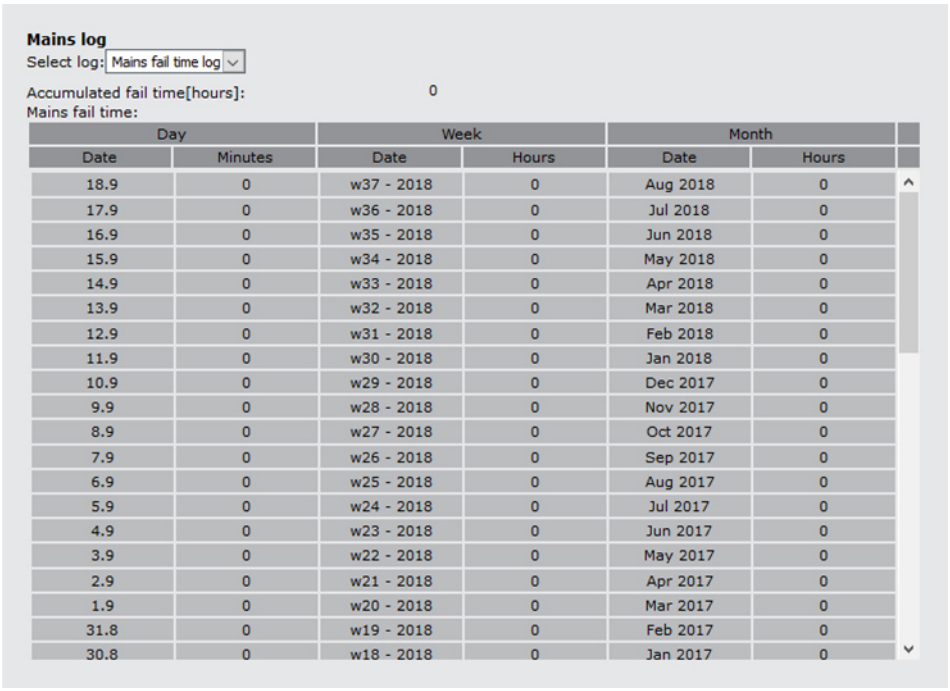


Last 12 days			Last 12 months			Last 12 years		
Day	Energy (kWh)	Cost (USD)	Month	Energy (kWh)	Cost (USD)	Year	Energy (kWh)	Cost (USD)
26.07.2021	34.449	11.02	Jul-2021	793.11	253.8	2021	0	0
25.07.2021	82.556	26.42	Jun-2021	0	0	2020	0	0
24.07.2021	82.515	26.4	May-2021	0	0	2019	0	0
23.07.2021	82.58	26.43	Apr-2021	0	0	2018	0	0
22.07.2021	82.626	26.44	Mar-2021	0	0	2017	0	0
21.07.2021	82.64	26.44	Feb-2021	0	0	2016	0	0
20.07.2021	82.631	26.44	Jan-2021	0	0	2015	0	0
19.07.2021	82.507	26.4	Dec-2020	0	0	2014	0	0
18.07.2021	82.655	26.45	Nov-2020	0	0	2013	0	0
17.07.2021	82.67	26.45	Oct-2020	0	0	2012	0	0
16.07.2021	49.73	15.91	Sep-2020	0	0	2011	0	0
15.07.2021	0	0	Aug-2020	0	0	2010	0	0

Figure 6.10 – Energy Cost Log Page

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.

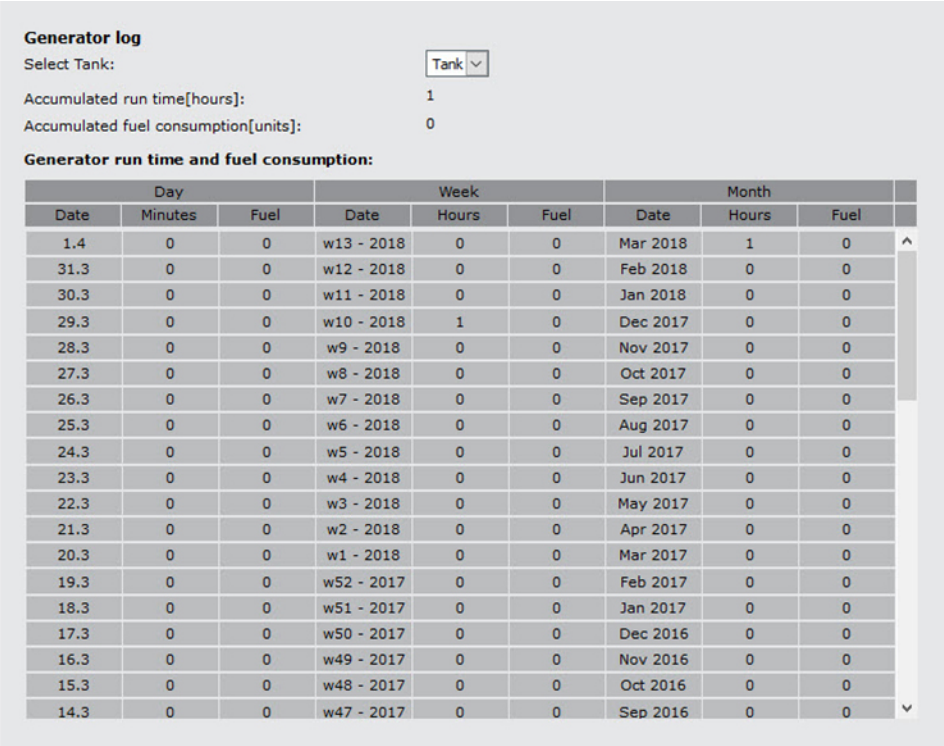


Day		Week		Month	
Date	Minutes	Date	Hours	Date	Hours
18.9	0	w37 - 2018	0	Aug 2018	0
17.9	0	w36 - 2018	0	Jul 2018	0
16.9	0	w35 - 2018	0	Jun 2018	0
15.9	0	w34 - 2018	0	May 2018	0
14.9	0	w33 - 2018	0	Apr 2018	0
13.9	0	w32 - 2018	0	Mar 2018	0
12.9	0	w31 - 2018	0	Feb 2018	0
11.9	0	w30 - 2018	0	Jan 2018	0
10.9	0	w29 - 2018	0	Dec 2017	0
9.9	0	w28 - 2018	0	Nov 2017	0
8.9	0	w27 - 2018	0	Oct 2017	0
7.9	0	w26 - 2018	0	Sep 2017	0
6.9	0	w25 - 2018	0	Aug 2017	0
5.9	0	w24 - 2018	0	Jul 2017	0
4.9	0	w23 - 2018	0	Jun 2017	0
3.9	0	w22 - 2018	0	May 2017	0
2.9	0	w21 - 2018	0	Apr 2017	0
1.9	0	w20 - 2018	0	Mar 2017	0
31.8	0	w19 - 2018	0	Feb 2017	0
30.8	0	w18 - 2018	0	Jan 2017	0

Figure 6.11 – Mains 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.



Generator log

Select Tank: Tank

Accumulated run time[hours]: 1

Accumulated fuel consumption[units]: 0

Generator run time and fuel consumption:

Day			Week			Month		
Date	Minutes	Fuel	Date	Hours	Fuel	Date	Hours	Fuel
1.4	0	0	w13 - 2018	0	0	Mar 2018	1	0
31.3	0	0	w12 - 2018	0	0	Feb 2018	0	0
30.3	0	0	w11 - 2018	0	0	Jan 2018	0	0
29.3	0	0	w10 - 2018	1	0	Dec 2017	0	0
28.3	0	0	w9 - 2018	0	0	Nov 2017	0	0
27.3	0	0	w8 - 2018	0	0	Oct 2017	0	0
26.3	0	0	w7 - 2018	0	0	Sep 2017	0	0
25.3	0	0	w6 - 2018	0	0	Aug 2017	0	0
24.3	0	0	w5 - 2018	0	0	Jul 2017	0	0
23.3	0	0	w4 - 2018	0	0	Jun 2017	0	0
22.3	0	0	w3 - 2018	0	0	May 2017	0	0
21.3	0	0	w2 - 2018	0	0	Apr 2017	0	0
20.3	0	0	w1 - 2018	0	0	Mar 2017	0	0
19.3	0	0	w52 - 2017	0	0	Feb 2017	0	0
18.3	0	0	w51 - 2017	0	0	Jan 2017	0	0
17.3	0	0	w50 - 2017	0	0	Dec 2016	0	0
16.3	0	0	w49 - 2017	0	0	Nov 2016	0	0
15.3	0	0	w48 - 2017	0	0	Oct 2016	0	0
14.3	0	0	w47 - 2017	0	0	Sep 2016	0	0

Figure 6.12 – Generator Log Page

- **Select Tank** – menu 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 130), in total and over time intervals.

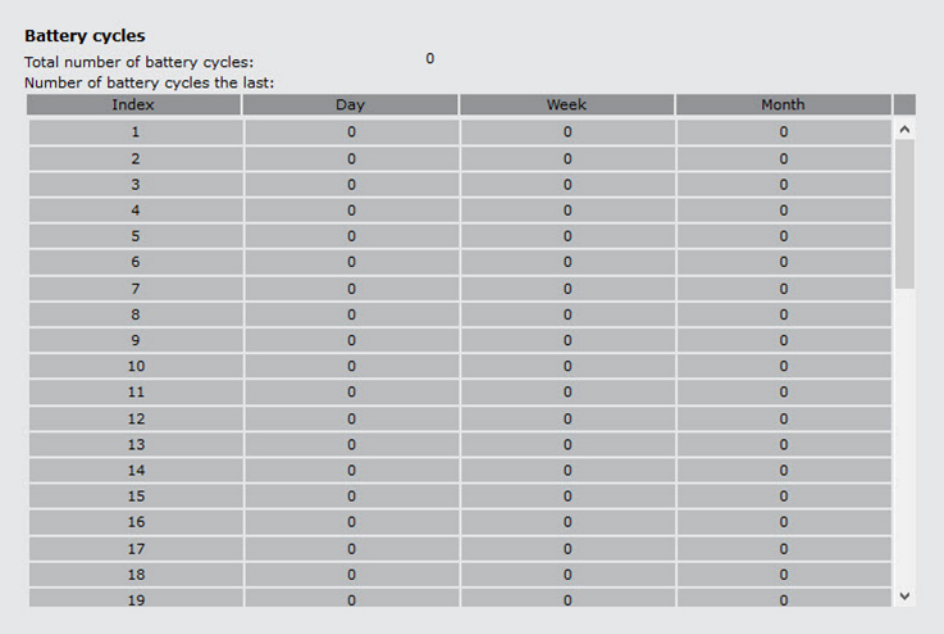


Figure 6.13 - Battery Cycles Log

- **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.

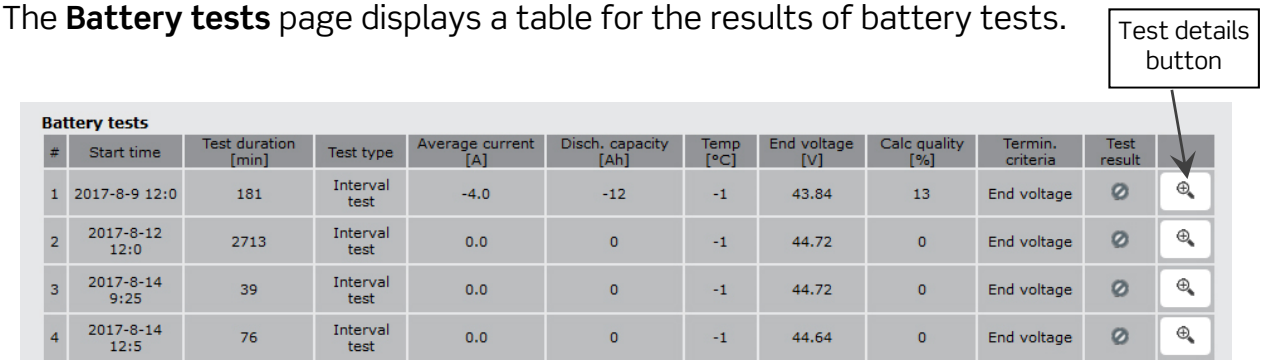


Figure 6.14 – Battery Test Results Log

- **#** – 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 button** – clicking the button 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.

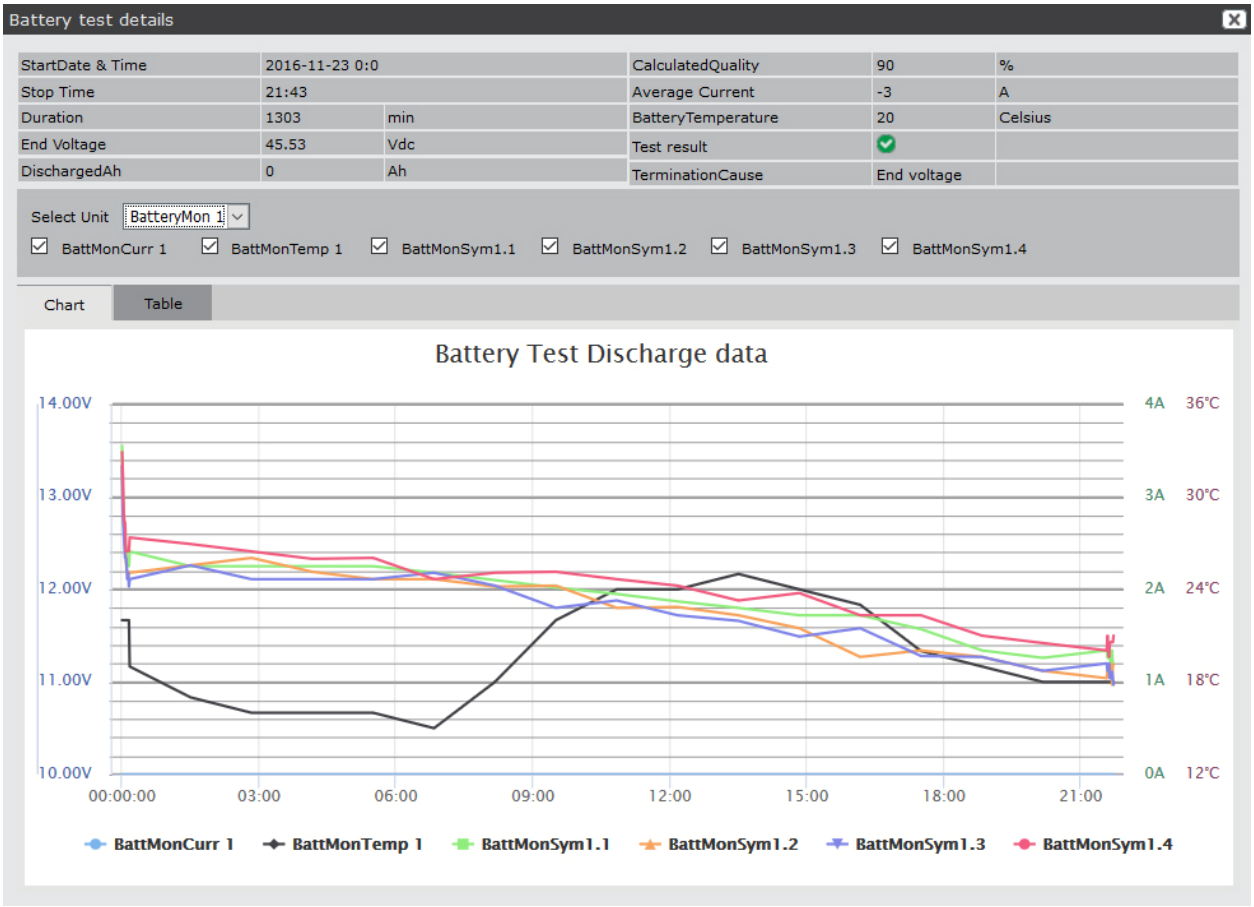


Figure 6.15 – Battery Test Details Window (and Chart)

- **Chart** – tab for the **Battery Test Discharge data** graph.
  - **Battery Test Discharge data** – line graph of battery test data form 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.

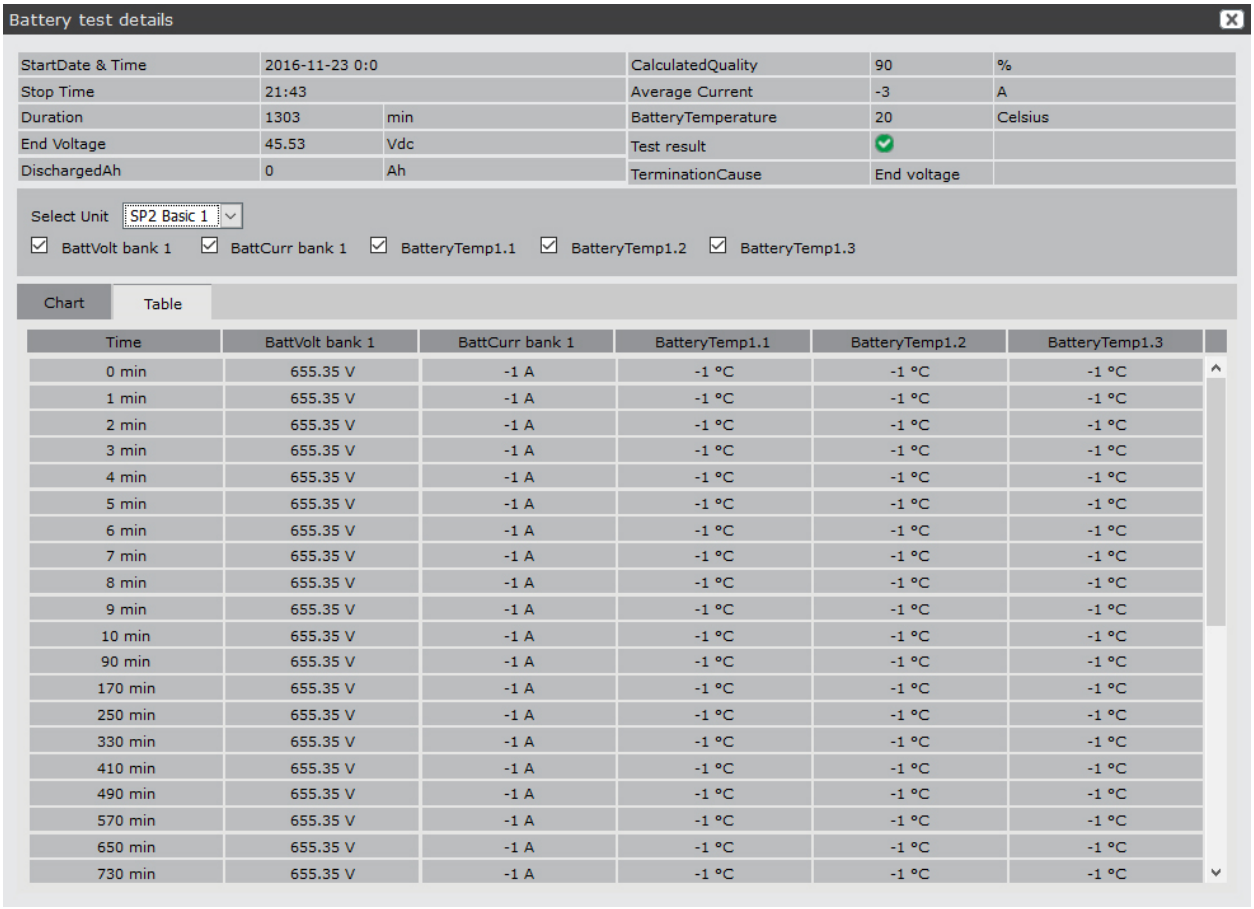
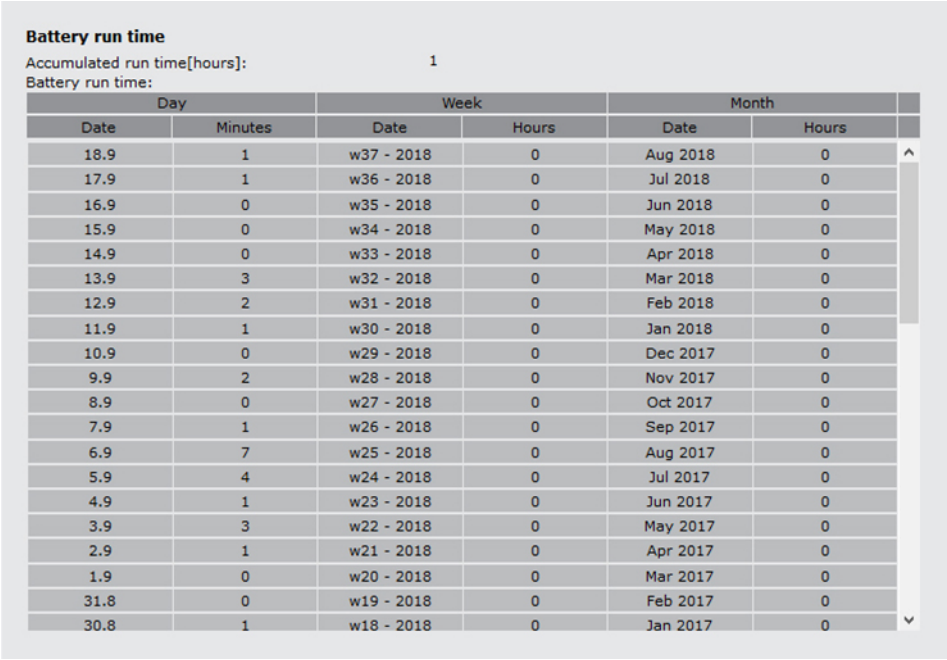


Figure 6.16 – Battery Test Details Window with Table Tab

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.



Battery run time

Accumulated run time[hours]: 1

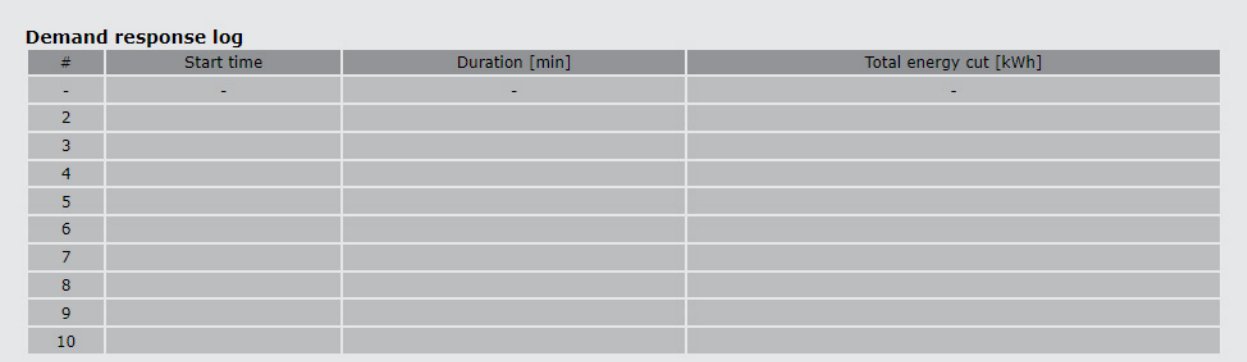
Battery run time:

Day		Week		Month	
Date	Minutes	Date	Hours	Date	Hours
18.9	1	w37 - 2018	0	Aug 2018	0
17.9	1	w36 - 2018	0	Jul 2018	0
16.9	0	w35 - 2018	0	Jun 2018	0
15.9	0	w34 - 2018	0	May 2018	0
14.9	0	w33 - 2018	0	Apr 2018	0
13.9	3	w32 - 2018	0	Mar 2018	0
12.9	2	w31 - 2018	0	Feb 2018	0
11.9	1	w30 - 2018	0	Jan 2018	0
10.9	0	w29 - 2018	0	Dec 2017	0
9.9	2	w28 - 2018	0	Nov 2017	0
8.9	0	w27 - 2018	0	Oct 2017	0
7.9	1	w26 - 2018	0	Sep 2017	0
6.9	7	w25 - 2018	0	Aug 2017	0
5.9	4	w24 - 2018	0	Jul 2017	0
4.9	1	w23 - 2018	0	Jun 2017	0
3.9	3	w22 - 2018	0	May 2017	0
2.9	1	w21 - 2018	0	Apr 2017	0
1.9	0	w20 - 2018	0	Mar 2017	0
31.8	0	w19 - 2018	0	Feb 2017	0
30.8	1	w18 - 2018	0	Jan 2017	0

Figure 6.17 – Battery Run Time Window

Demand Response Log

The **Demand response** log displays start time, duration, and total energy cut while using the Demand Response feature. For additional information on this feature, see “Demand Response,” page 111.



Demand response log

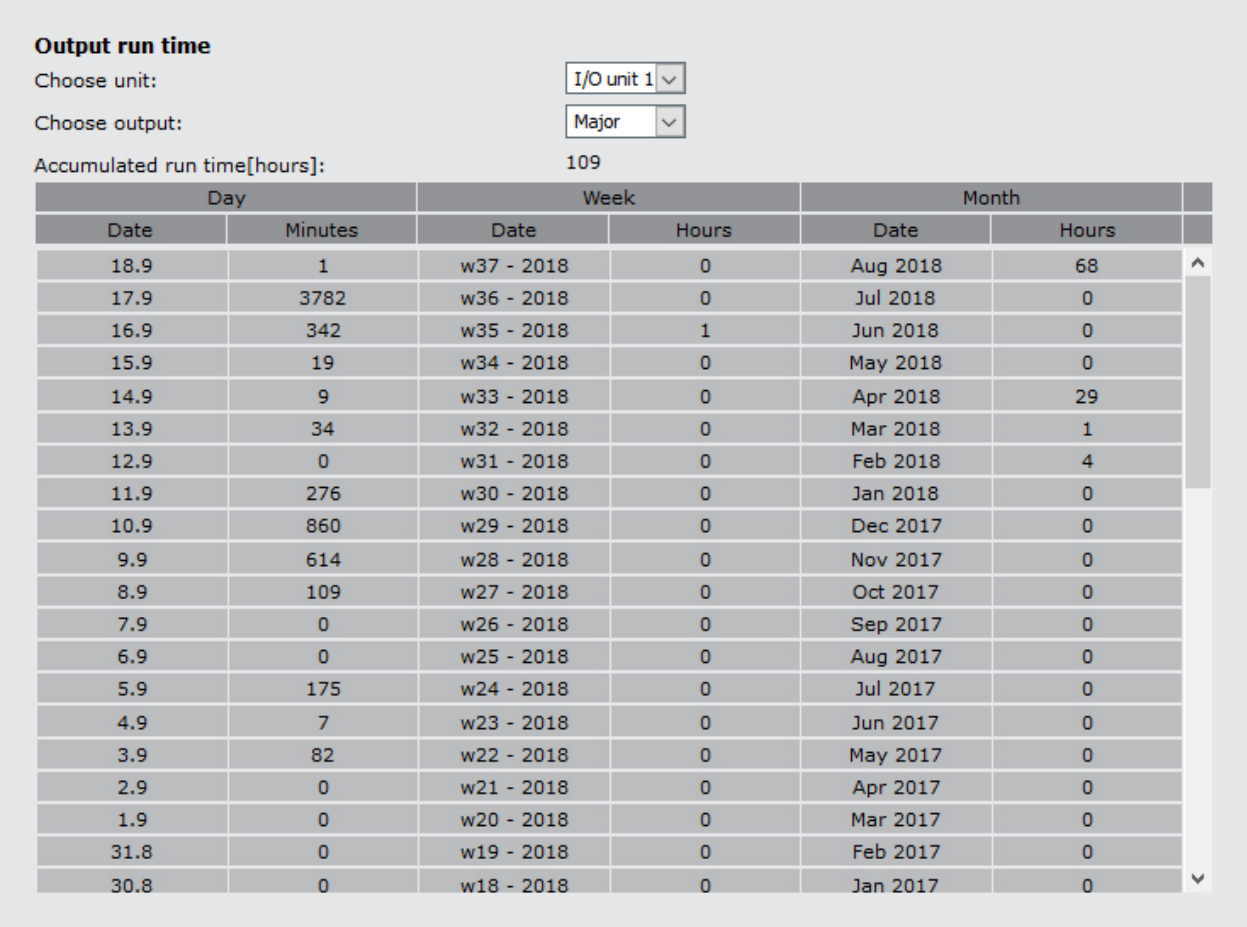
#	Start time	Duration [min]	Total energy cut [kWh]
-	-	-	-
2			
3			
4			
5			
6			
7			
8			
9			
10			

Figure 6.18 – Demand Response Log Window

Output Run Time

The **Output Run Time** log displays te amount of time a relay is active in minutes per day, hours per week, hours per month, and accumulated hours.

- **Choose unit** – choose I/O Monitor.
- **Choose output** – choose the relay.
- **Accumulated run time[hours]** – total time that the selected relay has been active, in hours.

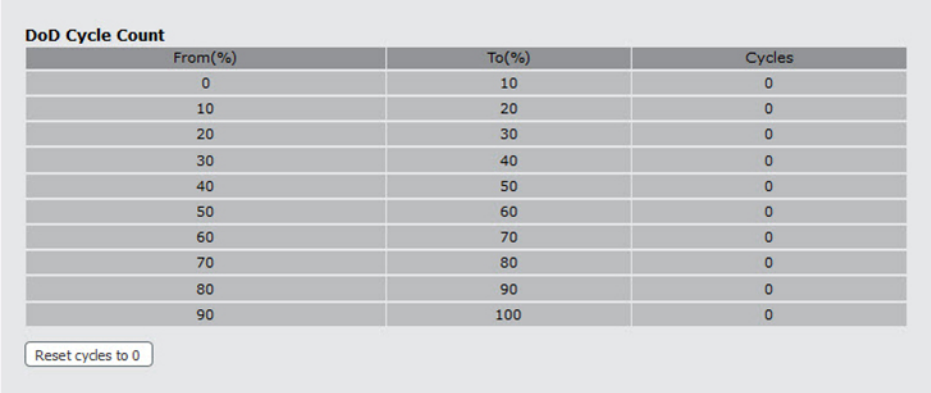


Day		Week		Month	
Date	Minutes	Date	Hours	Date	Hours
18.9	1	w37 - 2018	0	Aug 2018	68
17.9	3782	w36 - 2018	0	Jul 2018	0
16.9	342	w35 - 2018	1	Jun 2018	0
15.9	19	w34 - 2018	0	May 2018	0
14.9	9	w33 - 2018	0	Apr 2018	29
13.9	34	w32 - 2018	0	Mar 2018	1
12.9	0	w31 - 2018	0	Feb 2018	4
11.9	276	w30 - 2018	0	Jan 2018	0
10.9	860	w29 - 2018	0	Dec 2017	0
9.9	614	w28 - 2018	0	Nov 2017	0
8.9	109	w27 - 2018	0	Oct 2017	0
7.9	0	w26 - 2018	0	Sep 2017	0
6.9	0	w25 - 2018	0	Aug 2017	0
5.9	175	w24 - 2018	0	Jul 2017	0
4.9	7	w23 - 2018	0	Jun 2017	0
3.9	82	w22 - 2018	0	May 2017	0
2.9	0	w21 - 2018	0	Apr 2017	0
1.9	0	w20 - 2018	0	Mar 2017	0
31.8	0	w19 - 2018	0	Feb 2017	0
30.8	0	w18 - 2018	0	Jan 2017	0

Figure 6.19 – Output Run Time Window

DoD Cycle Count

The **DoD cycle counts** page displays the number of cycles that the batteries have discharged within a certain percentage bracket. Click the **Reset cycles to 0** button when replacing batteries.


DoD Cycle Count

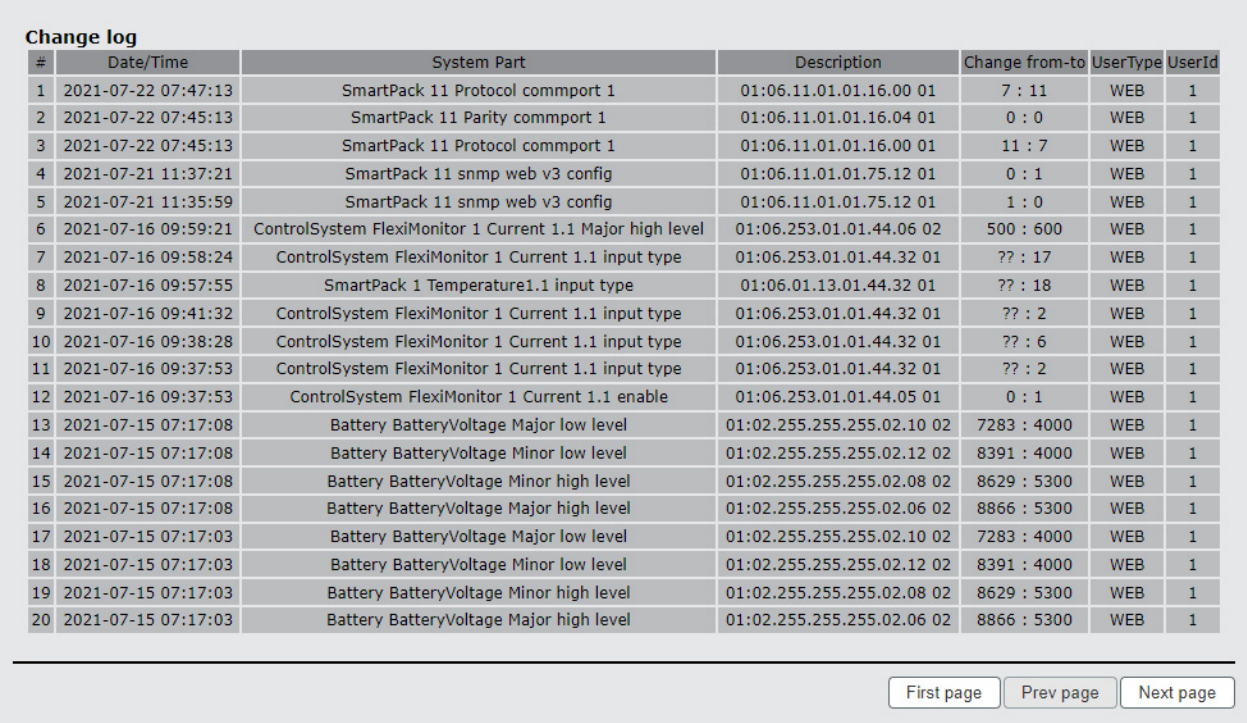
From(%)	To(%)	Cycles
0	10	0
10	20	0
20	30	0
30	40	0
40	50	0
50	60	0
60	70	0
70	80	0
80	90	0
90	100	0

Reset cycles to 0

Figure 6.20 – Depth of Discharge (DoD) Log Page

Change Log

The **Change log** page lists system-level changes for technical support purposes.



Change log

#	Date/Time	System Part	Description	Change from-to	UserType	UserId
1	2021-07-22 07:47:13	SmartPack 11 Protocol commport 1	01:06.11.01.01.16.00 01	7 : 11	WEB	1
2	2021-07-22 07:45:13	SmartPack 11 Parity commport 1	01:06.11.01.01.16.04 01	0 : 0	WEB	1
3	2021-07-22 07:45:13	SmartPack 11 Protocol commport 1	01:06.11.01.01.16.00 01	11 : 7	WEB	1
4	2021-07-21 11:37:21	SmartPack 11 snmp web v3 config	01:06.11.01.01.75.12 01	0 : 1	WEB	1
5	2021-07-21 11:35:59	SmartPack 11 snmp web v3 config	01:06.11.01.01.75.12 01	1 : 0	WEB	1
6	2021-07-16 09:59:21	ControlSystem FlexiMonitor 1 Current 1.1 Major high level	01:06.253.01.01.44.06 02	500 : 600	WEB	1
7	2021-07-16 09:58:24	ControlSystem FlexiMonitor 1 Current 1.1 input type	01:06.253.01.01.44.32 01	?? : 17	WEB	1
8	2021-07-16 09:57:55	SmartPack 1 Temperature1.1 input type	01:06.01.13.01.44.32 01	?? : 18	WEB	1
9	2021-07-16 09:41:32	ControlSystem FlexiMonitor 1 Current 1.1 input type	01:06.253.01.01.44.32 01	?? : 2	WEB	1
10	2021-07-16 09:38:28	ControlSystem FlexiMonitor 1 Current 1.1 input type	01:06.253.01.01.44.32 01	?? : 6	WEB	1
11	2021-07-16 09:37:53	ControlSystem FlexiMonitor 1 Current 1.1 input type	01:06.253.01.01.44.32 01	?? : 2	WEB	1
12	2021-07-16 09:37:53	ControlSystem FlexiMonitor 1 Current 1.1 enable	01:06.253.01.01.44.05 01	0 : 1	WEB	1
13	2021-07-15 07:17:08	Battery BatteryVoltage Major low level	01:02.255.255.255.02.10 02	7283 : 4000	WEB	1
14	2021-07-15 07:17:08	Battery BatteryVoltage Minor low level	01:02.255.255.255.02.12 02	8391 : 4000	WEB	1
15	2021-07-15 07:17:08	Battery BatteryVoltage Minor high level	01:02.255.255.255.02.08 02	8629 : 5300	WEB	1
16	2021-07-15 07:17:08	Battery BatteryVoltage Major high level	01:02.255.255.255.02.06 02	8866 : 5300	WEB	1
17	2021-07-15 07:17:03	Battery BatteryVoltage Major low level	01:02.255.255.255.02.10 02	7283 : 4000	WEB	1
18	2021-07-15 07:17:03	Battery BatteryVoltage Minor low level	01:02.255.255.255.02.12 02	8391 : 4000	WEB	1
19	2021-07-15 07:17:03	Battery BatteryVoltage Minor high level	01:02.255.255.255.02.08 02	8629 : 5300	WEB	1
20	2021-07-15 07:17:03	Battery BatteryVoltage Major high level	01:02.255.255.255.02.06 02	8866 : 5300	WEB	1

Figure 6.21 – Change Log Page

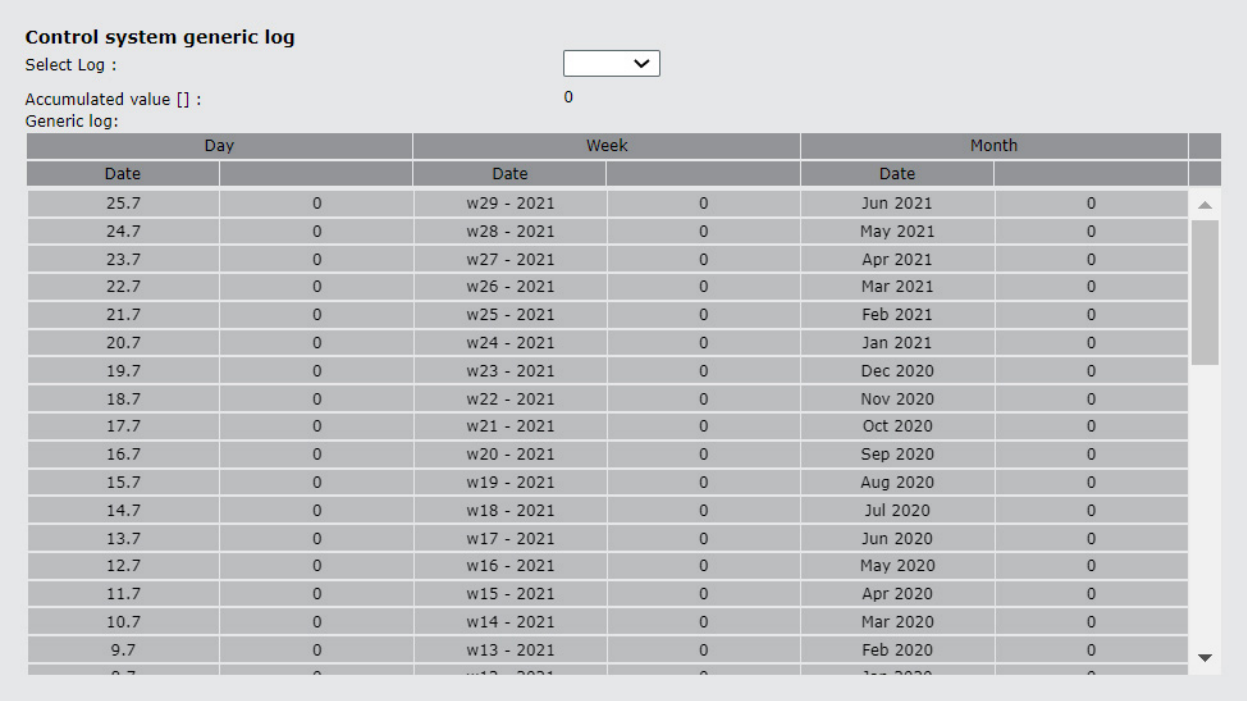
Note: This page is only viewable with **admin** login.

There are three navigation buttons in the bottom right corner: **First page**, **Previous page**, and **Next page**. Each page lists 20 events.

Control Systems Generic Logs

The **Control systems generic logs** page provides a log of data from an external device communicating through Modbus. For additional details, see “Generic Modbus status” on page 80.

- **Select Log** – Use the menu list to select the desired log.
- **Accumulated value [ ]** – The total value of the data from the selected log.
- **Generic log** – displays data from the selected log on a daily, weekly, and monthly basis.

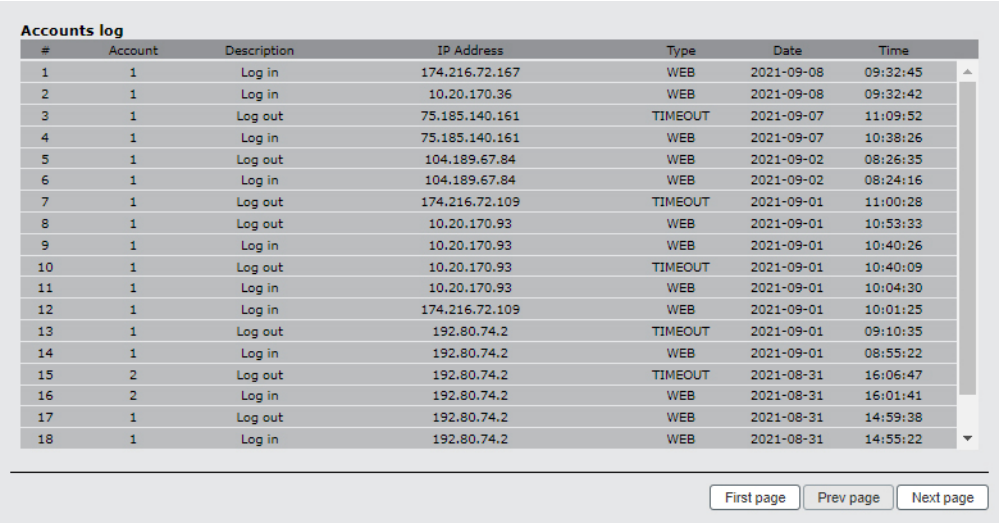


Day		Week		Month	
Date		Date		Date	
25.7	0	w29 - 2021	0	Jun 2021	0
24.7	0	w28 - 2021	0	May 2021	0
23.7	0	w27 - 2021	0	Apr 2021	0
22.7	0	w26 - 2021	0	Mar 2021	0
21.7	0	w25 - 2021	0	Feb 2021	0
20.7	0	w24 - 2021	0	Jan 2021	0
19.7	0	w23 - 2021	0	Dec 2020	0
18.7	0	w22 - 2021	0	Nov 2020	0
17.7	0	w21 - 2021	0	Oct 2020	0
16.7	0	w20 - 2021	0	Sep 2020	0
15.7	0	w19 - 2021	0	Aug 2020	0
14.7	0	w18 - 2021	0	Jul 2020	0
13.7	0	w17 - 2021	0	Jun 2020	0
12.7	0	w16 - 2021	0	May 2020	0
11.7	0	w15 - 2021	0	Apr 2020	0
10.7	0	w14 - 2021	0	Mar 2020	0
9.7	0	w13 - 2021	0	Feb 2020	0

Figure 6.22 – Control Systems Generic Logs

Accounts Log

The **Accounts log** page displays login and logout attempts of all users, as well as failed login attempts.



#	Account	Description	IP Address	Type	Date	Time
1	1	Log in	174.216.72.167	WEB	2021-09-08	09:32:45
2	1	Log in	10.20.170.36	WEB	2021-09-08	09:32:42
3	1	Log out	75.185.140.161	TIMEOUT	2021-09-07	11:09:52
4	1	Log in	75.185.140.161	WEB	2021-09-07	10:38:26
5	1	Log out	104.189.67.84	WEB	2021-09-02	08:26:35
6	1	Log in	104.189.67.84	WEB	2021-09-02	08:24:16
7	1	Log out	174.216.72.109	TIMEOUT	2021-09-01	11:00:28
8	1	Log out	10.20.170.93	WEB	2021-09-01	10:53:33
9	1	Log in	10.20.170.93	WEB	2021-09-01	10:40:26
10	1	Log out	10.20.170.93	TIMEOUT	2021-09-01	10:40:09
11	1	Log in	10.20.170.93	WEB	2021-09-01	10:04:30
12	1	Log in	174.216.72.109	WEB	2021-09-01	10:01:25
13	1	Log out	192.80.74.2	TIMEOUT	2021-09-01	09:10:35
14	1	Log in	192.80.74.2	WEB	2021-09-01	08:55:22
15	2	Log out	192.80.74.2	TIMEOUT	2021-08-31	16:06:47
16	2	Log in	192.80.74.2	WEB	2021-08-31	16:01:41
17	1	Log out	192.80.74.2	WEB	2021-08-31	14:59:38
18	1	Log in	192.80.74.2	WEB	2021-08-31	14:55:22

Figure 6.23 – Accounts Log Page

Note: This page is only viewable with **admin** login.

- **#** - record number; up to 20 records are shown on each page.
- **Account** – the user associated with the activity, as indicated by the account number listed in the **Local Accounts Settings** page (**System Conf. › Device Settings › User Accounts › Local Accounts**).

  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
- **Type** – indicates the nature of login/logout. WEB refers to user logins and logouts; TIMEOUT refers to a system logout due to inactivity.
- **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.

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.

Note: Not all options appear on all controller models. The following screenshot shows the options for the Smartpack2 Touch Controller.

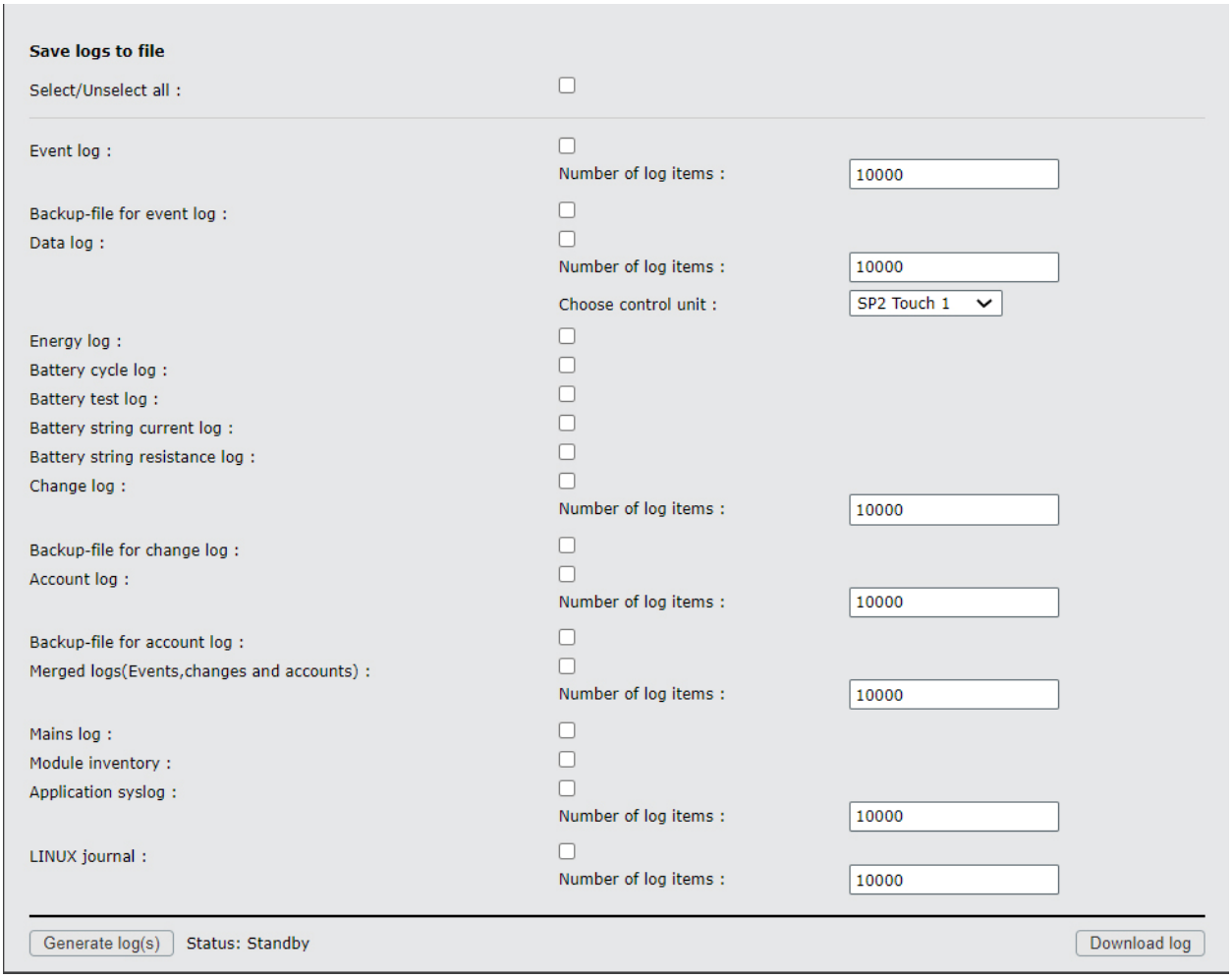


Figure 6.24 – Save Logs to File Page

- **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.
  - **Backup-file for event log** – When enabled, the controller saves a backup file (eventbackuplog.csv) when the log is full. The file is saved in the Logs folder in the memory of the controller.

- **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** – menu 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**.
- **Battery string current log** – check the box to generate a file for the **Battery string current log**.
- **Battery string resistance log** – check the box to generate a file for the **Battery string resistance 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.
- **Back-up file for change log** – When enabled, the controller saves a backup file (changebackuplog.csv) when the log is full. The file is saved in the Logs folder in the memory of the controller.
- **Account log** – check this box to generate a file for the account log.
- **Number of log items** – enter the number of lines to save to the account log file.
- **Back-up file for account log** – When enabled, the controller saves a backup file (accountbackuplog.csv) when the log is full. The file is saved in the Logs folder in the memory of the controller.
- **Merged logs (Events, changes and accounts)** – check this box to merge the event log, the change log, and account log into a single file.
- **Number of log items** – enter the number of lines to save to the merged logs file.
- **Mains log** – check this box to generate a file with the **Mains log**.
- **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.

  - **Application syslog** – These files are used for troubleshooting purposes.
  - **Number of log items** – enter the number of events to include in the log file.
  - **LINUX journal** – These files are used for troubleshooting purposes.
  - **Number of log items** – enter the number of events to include in the log file.

- **Generate log(s)** – after checking one or more log boxes, press the **Generate log(s)** button 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.

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.

Note: Not all options appear on all controller models. The following screenshot shows the options for the Smartpack2 Touch Controller.

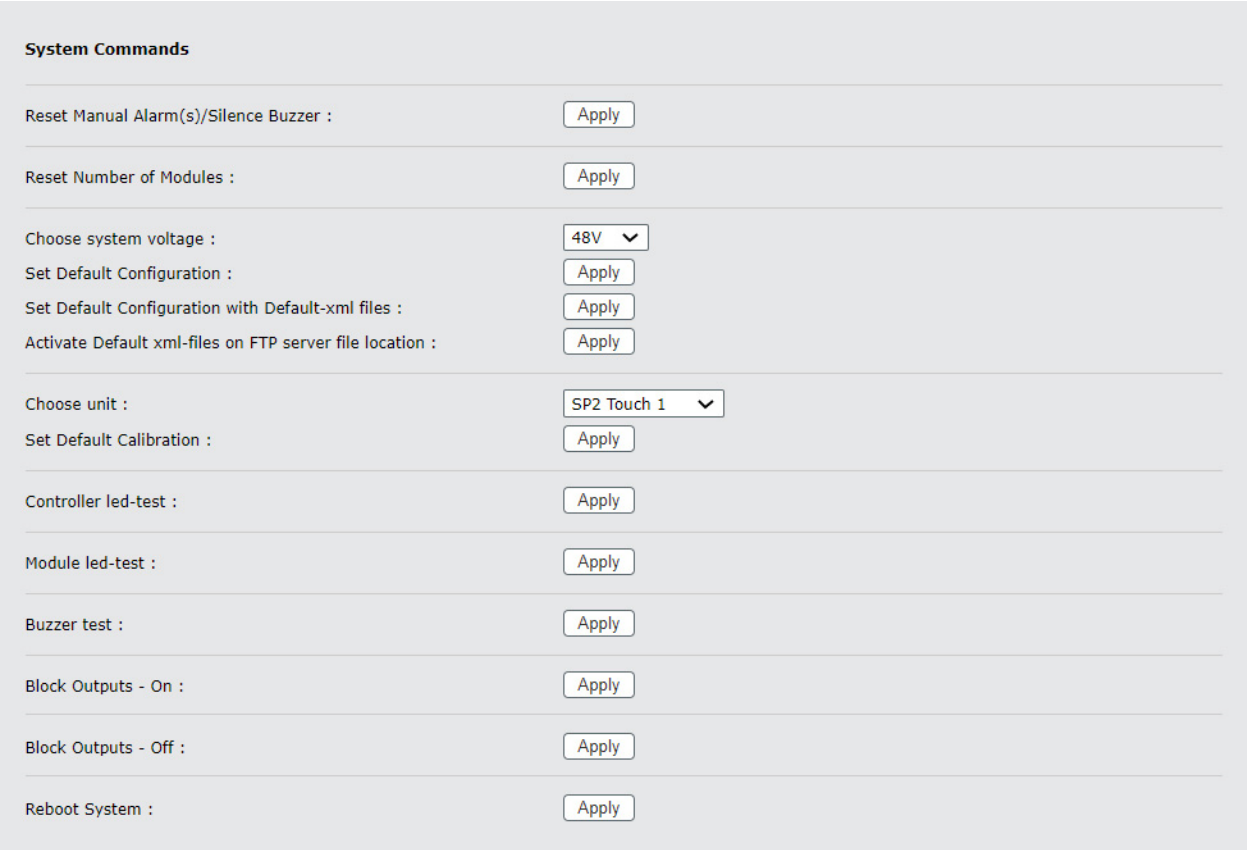


Figure 7.1 – System Commands Page

- **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). Available on Smartpack2 Master, Smartpack S, and the Compack controllers only.
- **Choose system voltage** – menu list of nominal DC system voltages.
- **Set Default Configuration** – resets controller configuration to the default values for the selection made on the **Choose system voltage** menu list to the right.

  CAUTION: This action is a complete reset of the controller, removing system-specific configurations, by restoring default values. It returns the controller to a generic state to allow reconfiguration of the controller for use in another system.
- **Set Default Configuration with Default-xml files** – resets controller configuration, and then loads the system-specific XML file(s) located in the default folder of the controller memory. This option can be used to restore the controller to a state before any manual changes were made, but still maintain system-specific values.
- **Activate Default xml-files on FTP server file location** – loads the system-specific XML file(s) located in the default folder of the controller memory. This option can be used to load the system-specific XML file(s) without performing a reset of the controller configuration.
- **Set Default Calibration** – resets controllers and CAN Nodes to default calibration values. The unit to be reset is selected in the **Choose unit** menu list to the right. This is useful when manual calibration was unsuccessful, possibly triggering measurement and calculation problems.
  - **Choose unit** – menu list of connected controllers and CAN Nodes that have calibration reset.
- **Controller led-test** – command to test the notification LEDs on the controller.
- **Module led-test** – command to test the notification LEDs on all modules
- **Buzzer test** – command to test the buzzer in the controller.

- **[Rectiverter AC bypass mode]** – This function activates the command "Rectiverter AC Bypass Mode" so that the Rectiverter system can adjust the AC output voltage amplitude to match the actual AC mains input voltage amplitude (within 10 seconds), before activating the manual switch and powering the AC load directly from the AC mains input.

  This function is useful in rectiverter systems when doing maintenance, such as replacing rectiverter modules with new ones, without interrupting the supply to the AC load.
- **Block Outputs – On** – command to keep alarm relays from activating during system service, to prevent false alarms from being transmitted. This command will timeout if there is no user activity.
- **Block Outputs – Off** – command to resume alarm relays after system service.
- **Reboot System** – command to reboot the controller.

Battery

The **Battery** page features commands for battery actions.

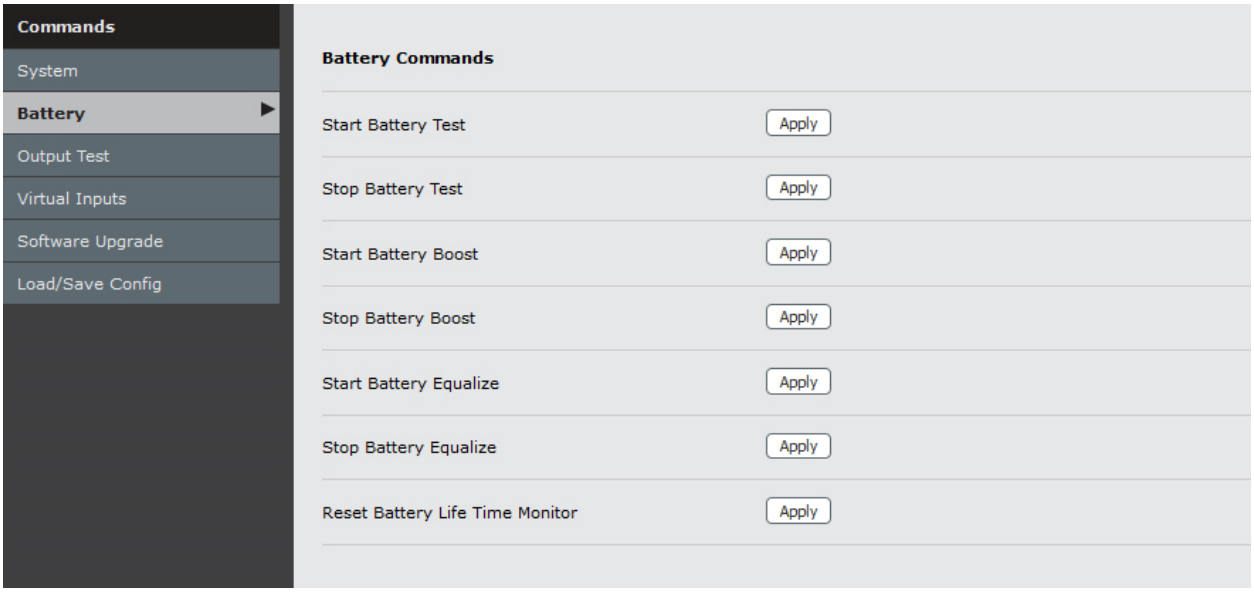


Figure 7.2 – Battery Commands Page

- **Start Battery Test** – starts a manual battery test based on the configuration on the **Test** page.

  System Conf. › 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. › 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. › Battery › Equalize

- **Stop Battery Equalize** – stops battery equalize charging.
- **Reset Battery Life Time Monitor** – resets the counter for the battery lifetime monitor when new batteries are installed.

Output Test

The **Output Test** page has commands for testing output channels on controllers and CAN Nodes.

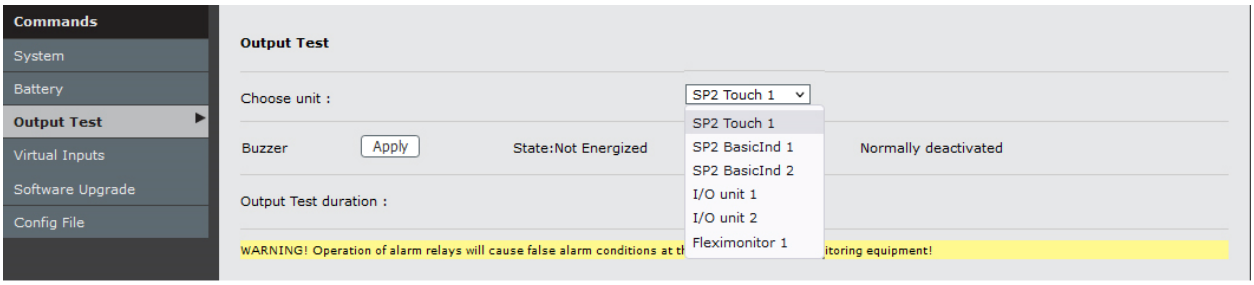


Figure 7.3 – Output Test Page (Admin login)

Note: Activating output channels triggers alarm notifications.

Note: Output tests require **admin** login.

- **Choose unit** – menu 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. › 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 Touch 1 (Smartpack2 Touch)	Buzzer Virtual 1–4
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 R 1	Alarm output 1–6 Batt contactor Load contactor Buzzer Virtual 1–4
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.

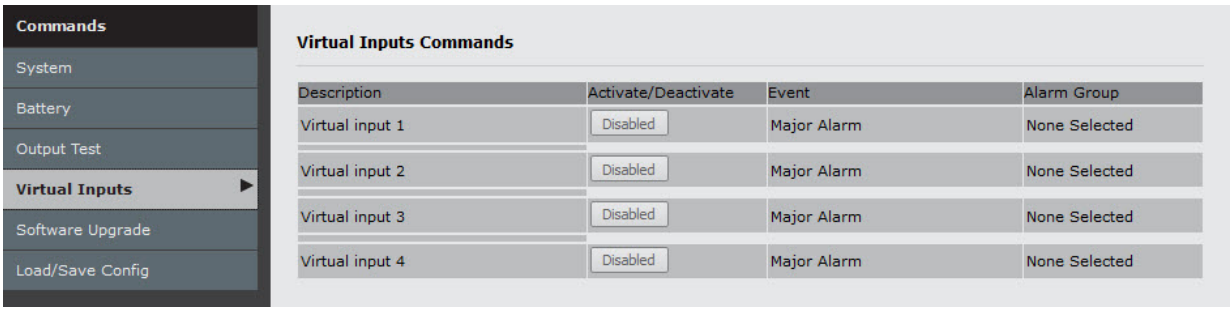


Figure 7.4 – Virtual Inputs Commands Page

- **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. › 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 the upgrade document for your controller:

- *Software Upgrade Procedure: Smartpack2*, Doc. No. 370036.063.
- *Software Upgrade Procedure: Smartpack S*, Doc. No. 370058.063.

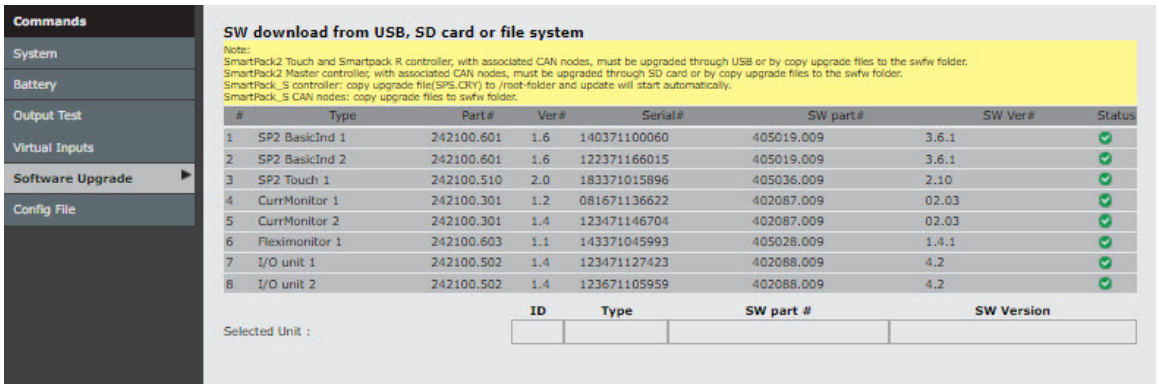


Figure 7.5 – Software Upgrade Page

Note: This feature 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

  Note: The software file must be loaded on the controller's memory (or SD card, if using Smartpack2 Master). If using a Smartpack Touch or Smartpack R, the file can be loaded from a file on a USB stick. Alternatively, software can be upgraded from a file on the computer by using the Eltek Network Utility.

Config File

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: These files are good only for the controller and software revision for which it was saved. This means that these backup files should not be used on replacement controllers, and need to be redownloaded after any software upgrade.

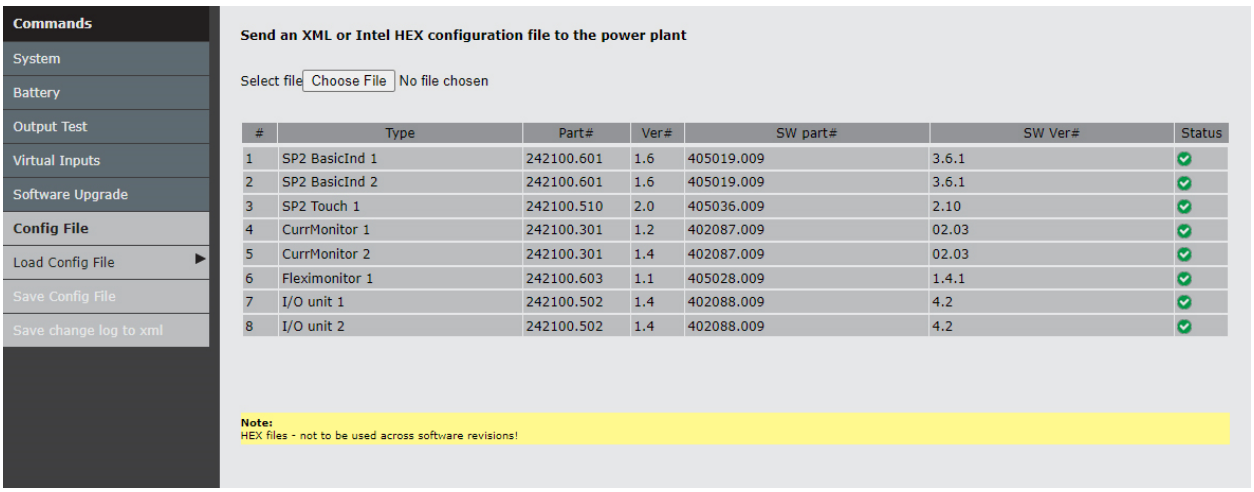


Figure 7.6 – Load Config File Page

- **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. After it is chosen, 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.

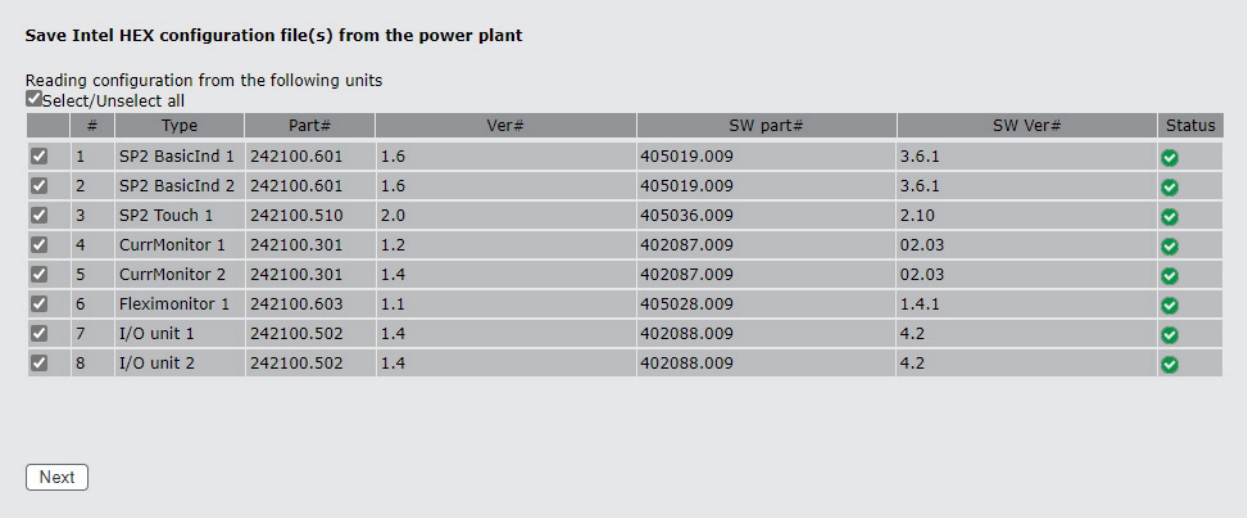


Figure 7.7 – Save Config File (First Page)

- **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. The **Next** button brings up a second page to save files from the power plant.

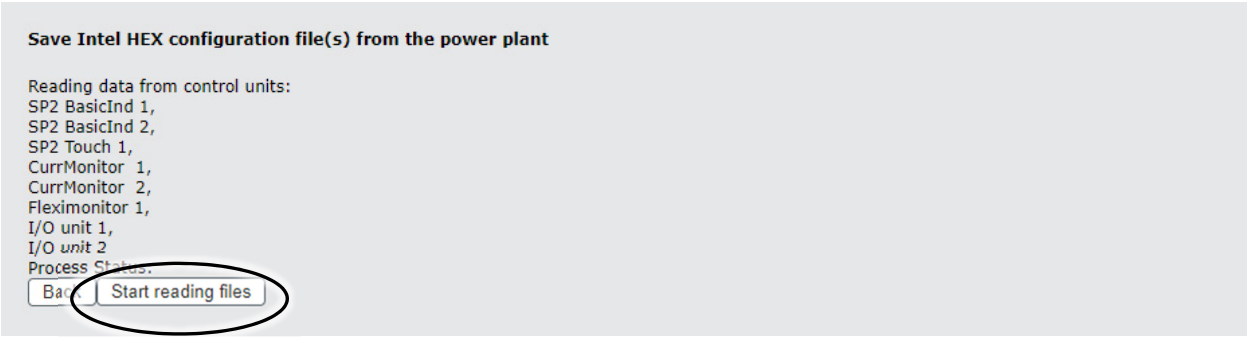


Figure 7.8 – Save Config File (Second Page)

- **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.

If you select multiple files for download, you must click the **Start reading files** *button before each file. A new dialog box appears to confirm your action,* **Loading... The next selected file will be read!**

(Click the **Cancel** *button to cancel the download of the rest of the files.)*

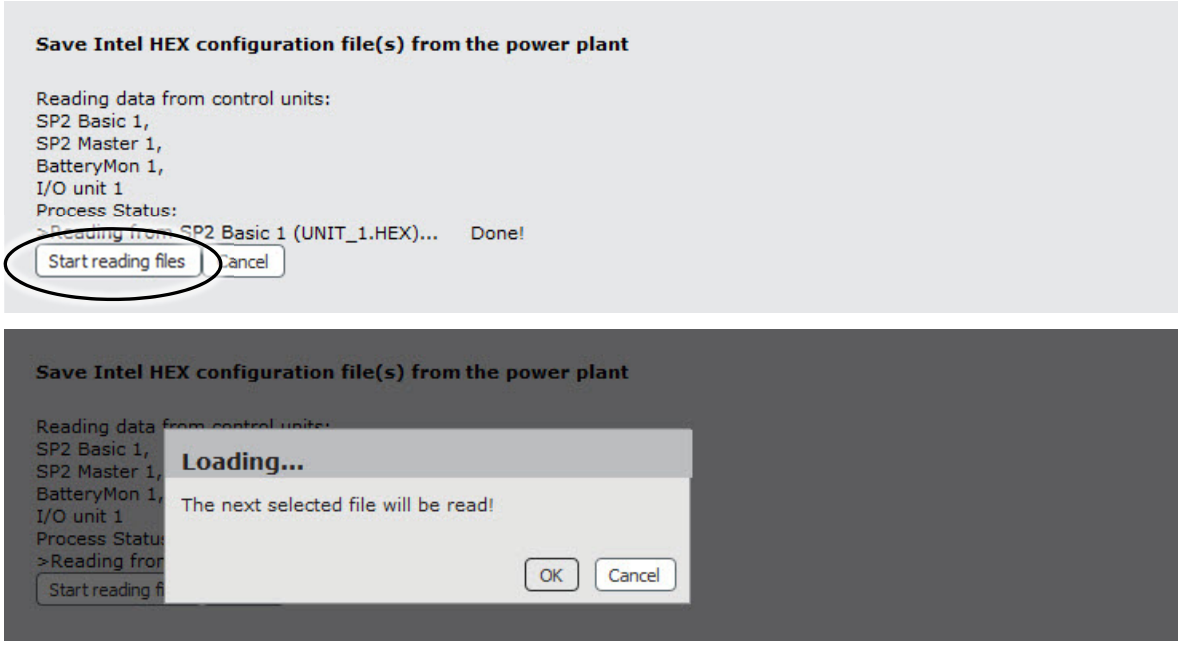


Figure 7.9 –Saving Next File and Confirmation Dialog

- **Cancel** – this button appears after the **Start reading files** button has been clicked. Click the **Cancel** button to terminate the reading progress. A progress bar appears below this button showing the progress of generating the configuration file.

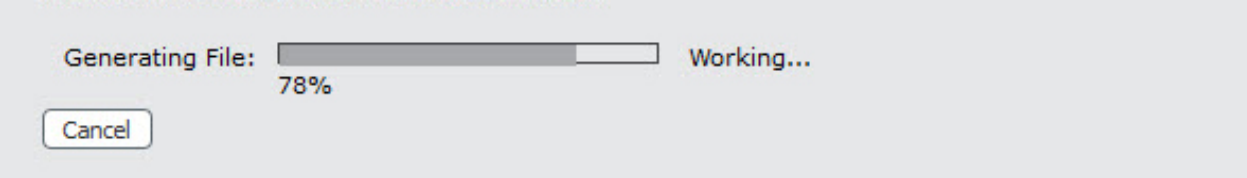


Figure 7.10 – Progress Bar for Configuration File(s)

Once the configuration file is created, a dialog box prompting you to save the file. Choose **Save File**, and click **OK**. By default, the file is saved to your Windows **Downloads** folder.

In 2.10 using Microsoft Edge, the file is automatically saved to the Windows Downloads folder.

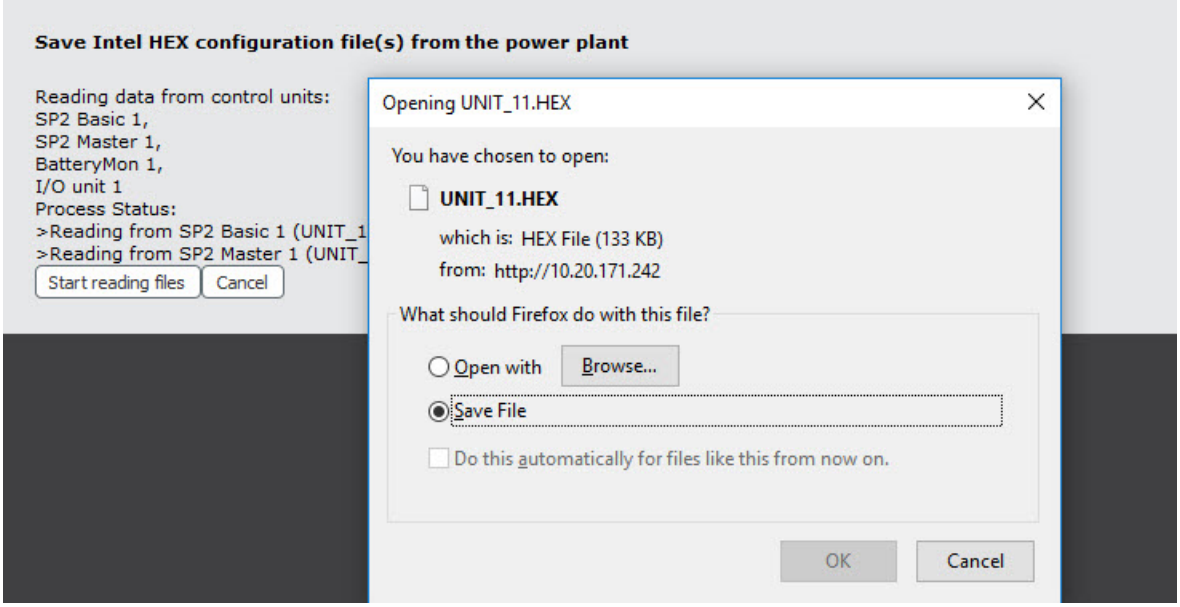


Figure 7.11 – Safe Config Page (Reading File)

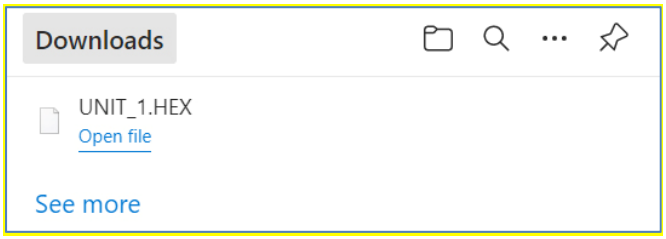


Figure 3.12 – Downloaded File Saved Automatically (Edge/Windows 10)

After the file is saved, the screen returns to the previous page, and you are given options based upon your original choice(s) of which file(s) to save. If all of your selected files (Figure 7.7) have been saved, click the **Back** button. If you previously selected multiple configuration files, and there are any remaining files yet to be saved, click the **Start reading files** button again, to begin saving the next file. Click **Back** after the last file has been saved.

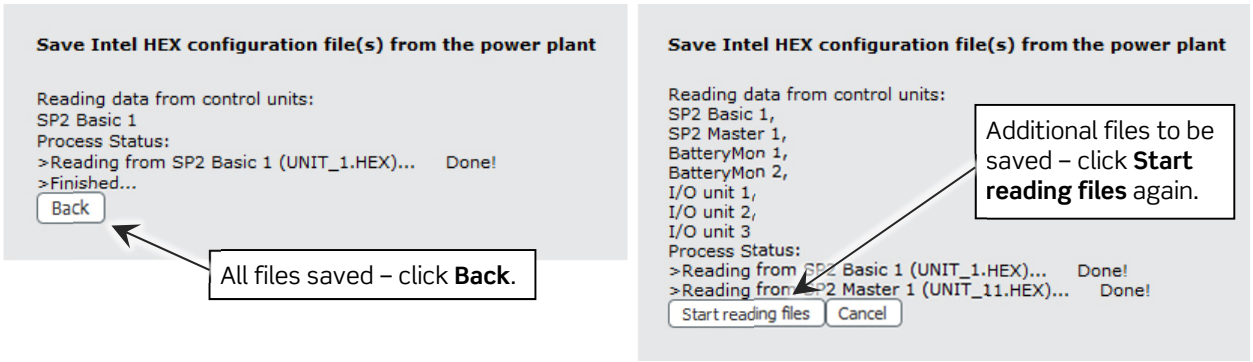


Figure 7.13 – Options After Saving Files(s)

After you click the **Back** button, the screen returns to the **Save Intel HEX configuration files(s)...** page (see Figure 7.7, page 319). From there you can quit or navigate to other portions of the web browser interface.

Save change log to xml

This command downloads an XML file based on changes recorded in the controller's change log. This file can be used to configure a controller after a replacement has been installed, or configure multiple controllers in similar systems. Since the XML file contains only the changes, the controller must be programmed with the factory default XML first. Factory XML files are system-dependent and can be obtained from Eltek Technical Support.

This process is very quick, and gives you a single file, with an extension of .XML (Changelog.XML) for all controller pieces (Master, Basic, Basic Industrial, Smartpack S, or Compack, and CAN Nodes). This file can be used for replacement controllers, even if the software has been updated since the file was generated.

Click the **download** button to save the change log as an XML file.

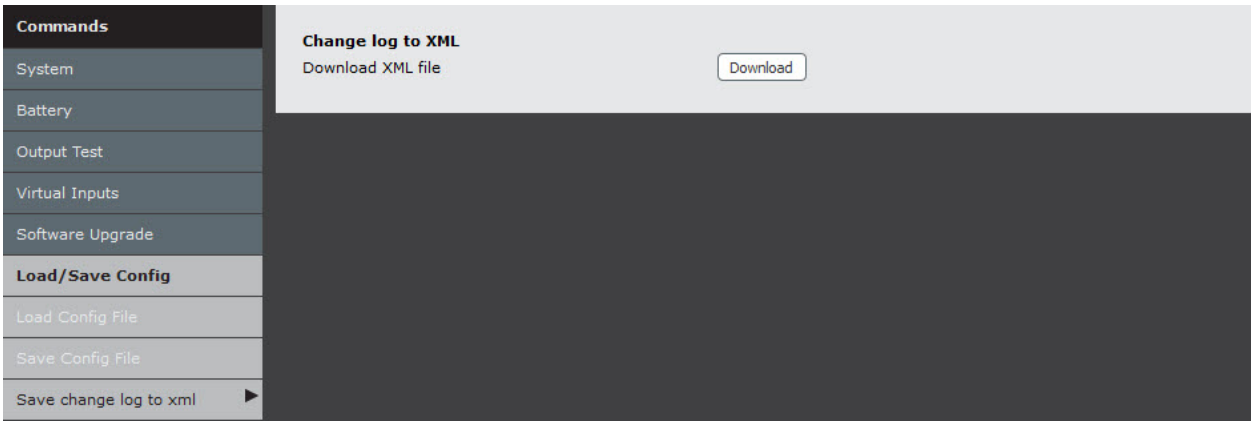


Figure 7.14 – Save Change Log to XML Page

After the log file has been generated, you are prompted to save the file. Choose **Save File**, and click **OK**. By default, the file is saved to your Windows **Downloads** folder.

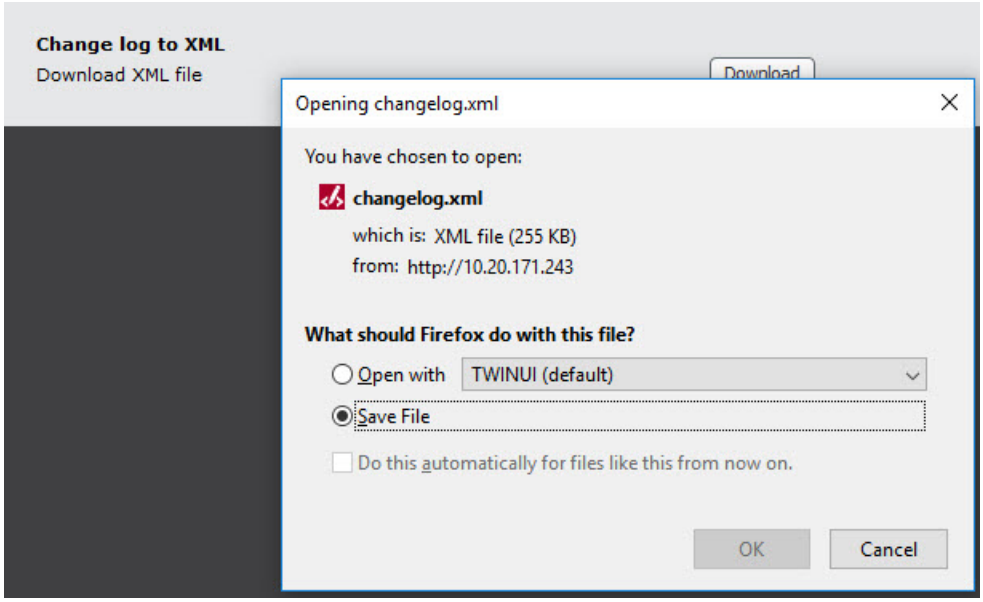


Figure 7.15 – Save Change Log Page

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.



For statistics to be available:

- This feature must be enabled; see **"Store statistics"** on page 97.
- On the Smartpack2 Master Controller, the SD card must be installed in order to store the statistics.
- This **Store Statistics** option is not available on the Compact controller.

Statistics files are stored in comma-separated values (CSV) format and use semicolons (;) as delimiters. Typical spreadsheet applications can open CSV files.

CAN Bus Monitor

The CAN Bus Monitor page displays a statistical graph reflecting the number of CAN messages, transmitted (Tx) and received (Rx), per module.

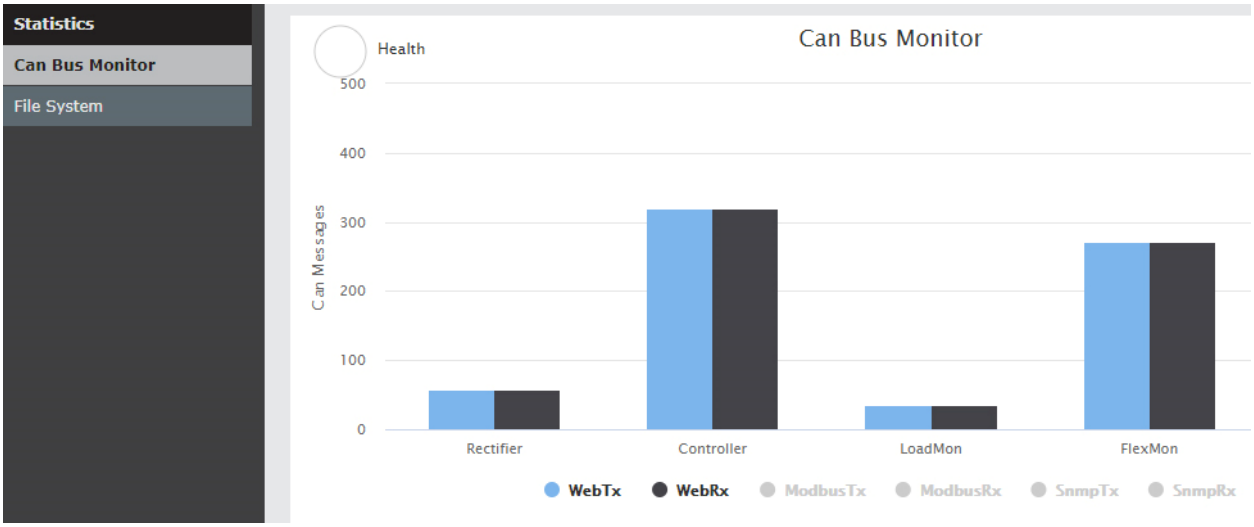


Figure 8.1 – CAN Bus Monitor Page

File System (or Browse SD Card)

Note: This feature previously used FTP to communicate with the controllers. Because security protocols on browsers no longer support FTP, this feature has been deprecated. If your browser window is empty, you cannot use this feature. If your browser allows FTP connections, the following procedure applies.

The **File System** (or **Browse SD Card**) page displays the statistics files from a controller's file system (or **SD card**, for Smartpack2 Master controller).



Figure 8.2 – Browse SD Card Page

On the **File System** page, click the **Open the file list in a new browser window** button. You may be required to enter your credentials as you navigate within the directory and subdirectories.

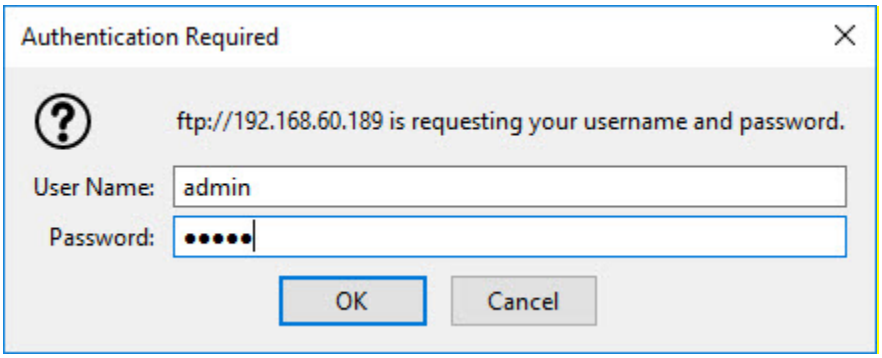


Figure 8.3 – Entering Credentials

The root directory may include subdirectories and controller update files (HEX, S19, or BIN).

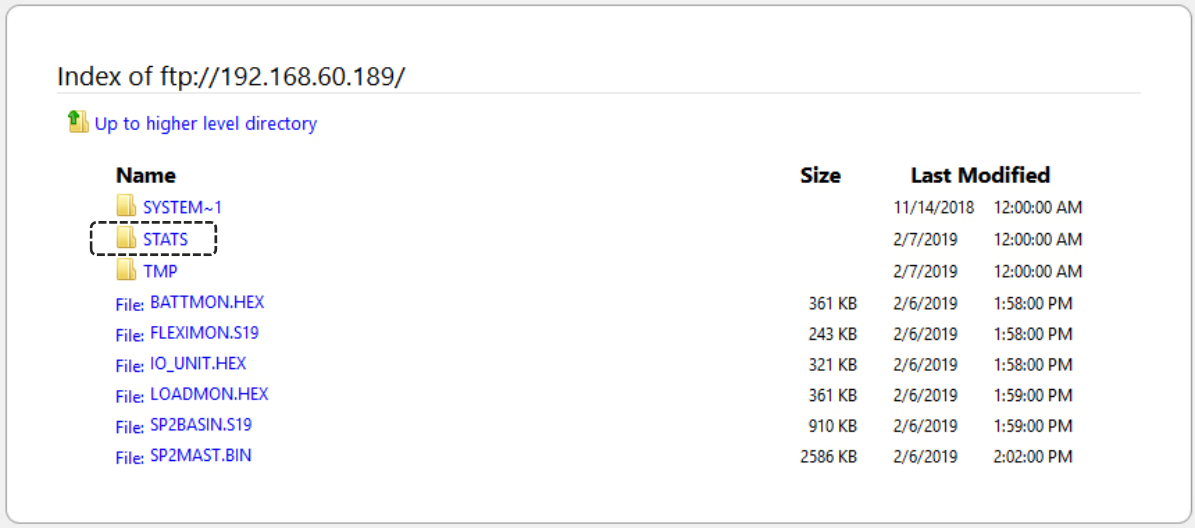


Figure 8.4 – Controller Root Directory

In order to view statistics files, choose the **STATS** folder from the root directory. Within the **STATS** folder, choose the sub-directory that includes the year for the statistics you want to retrieve.



Figure 8.5 – Choosing the Stats Year

Locate the statistics file(s) (in CSV format) that you want to download. To download an individual file, click the name of that file.

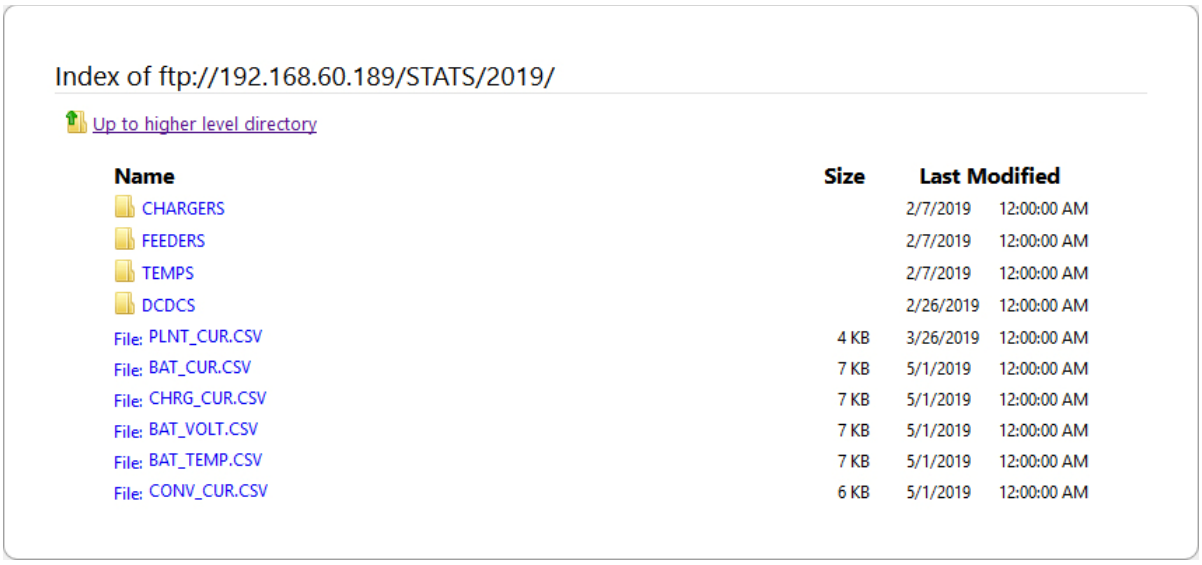


Figure 8.6 – Choosing the Stats Sub-Directory

After clicking the name of a statistics (CSV) file, you will see a dialog, inquiring whether you wish to open the file in a default application, or save it to your **Downloads** folder. Choose **Save File** and **OK** to download the file.

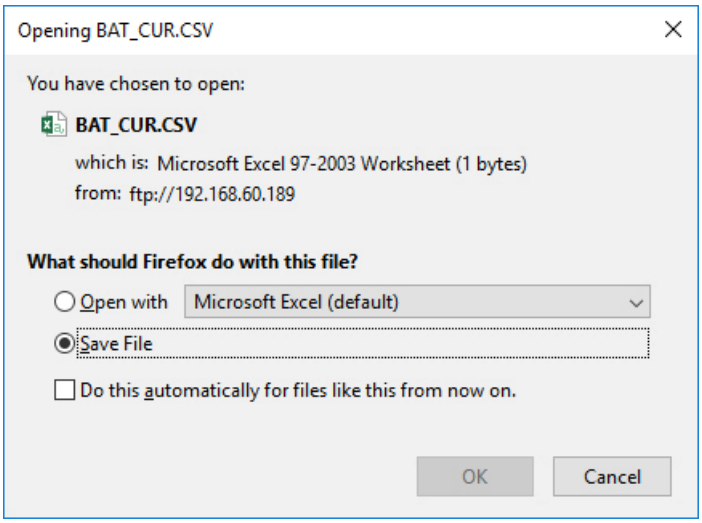


Figure 8.7 – Saving a Statistics File

Note: Not all browsers support secure FTP. As an alternate method, you can access the controller directory remotely by using an FTP client application. Using a third-party FTP client application, enter the address for the controller. Within the application, locate the statistics directory on the controller, and download the desired file(s).

Within the STATS directory, there are various files and sub-directories with specific files, sorted by year. The contents may include:

- Files for controller and CAN Node units connected to the system.

- Files for chargers, individual input feeds, temperature inputs, and DC-to-DC inputs are also available (under the **CHARGERS**, **FEEDERS**, **TEMPS**, and **DCDCS** sub-directories, respectively).

9. Help

The **Help** button ( ) provides options for online documentation and information about the controller.

Online Documentation

Online Documentation provides a path for web-based help for using the web browser interface with Eltek Controllers.

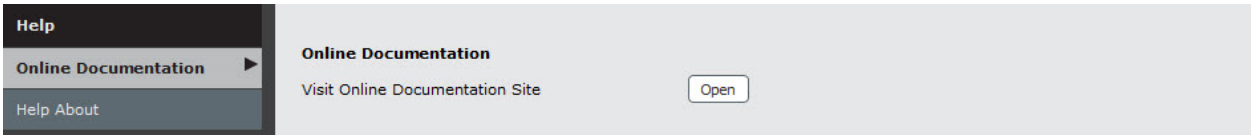


Figure 9.1 – Accessing Online Documentation

Click the **Open** button to navigate to the home page for online documentation. The first time you click the Open button, you will be prompted to login. If you do not have login information, please contact Eltek for the latest access credentials.



Figure 9.2 – Online Help Login

After successful login, you will see the home page for the online controller help system.



Figure 9.3 – Online Help for Eltek Controllers

About

The **Help › About** page provides information about the hardware and firmware associated with your controller.



Figure 9.4 – Controller Information

Licenses

The **Help › Licenses** page displays a list of licenses used within your controller system.

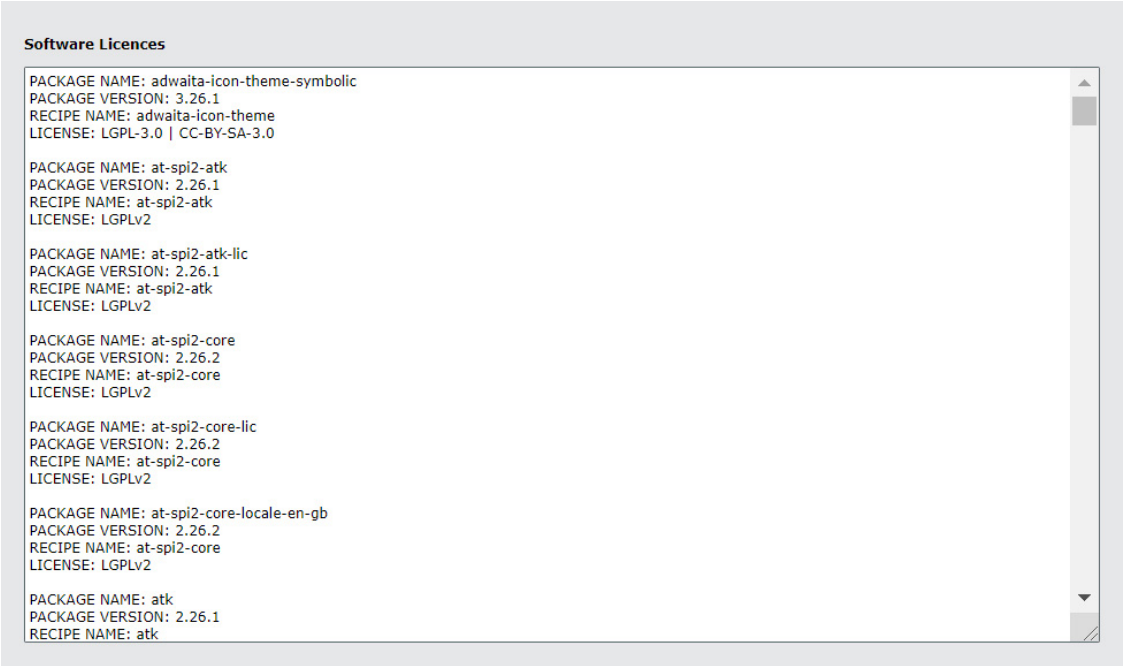


Figure 9.5 – Software Licenses Page

10. Logout

The **Logout** button ends the current session, logging out of the user account and returning to the landing page.

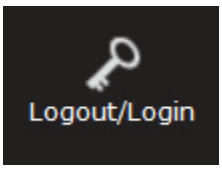


Figure 9.1 – Logout Button

Procedures

1. Procedures Overview

Setup of controller functions often requires configuring parameters in several areas of the browser 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 browser 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.

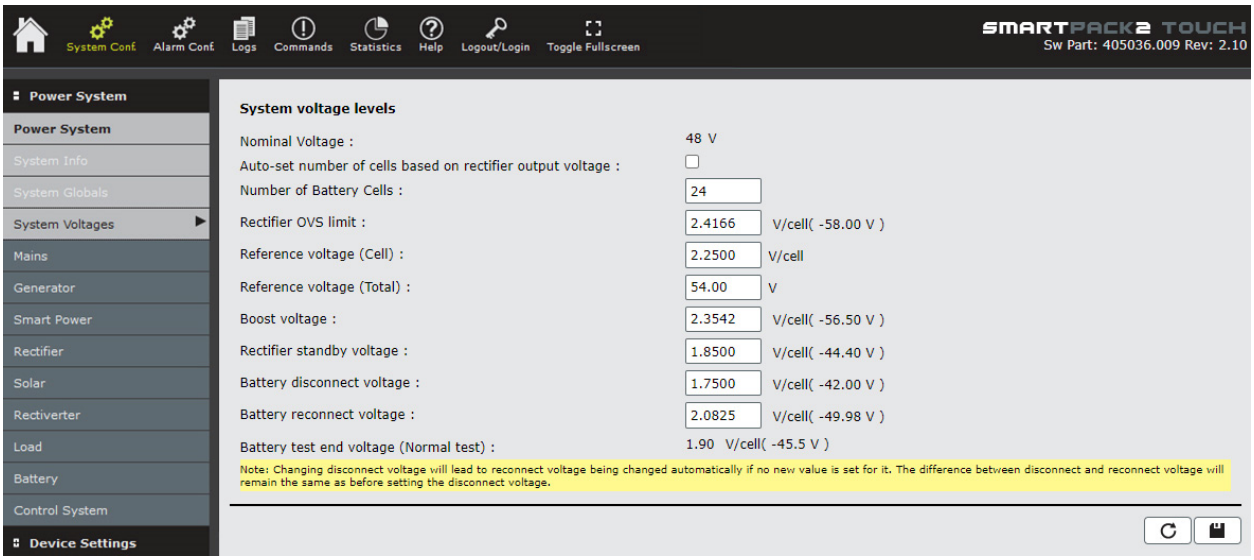


Figure 2.1 – Setting Float Voltage

To set float voltage through the browser interface:

1. Click on the **System Conf.** button 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 field called **Reference voltage (Cell)**.
4. Enter the voltage per cell required.
   Alternately, you can enter total reference voltage in the corresponding field, **Reference voltage (Total)**, and the per-cell voltage adjusts automatically.
5. Click the **Save** (diskette) button to preserve your changes. The voltage value in parentheses updates to reflect the new float voltage value.

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 browser interface:

1. Click on the **System Conf.** button in the top menu bar.
2. In the left menu bar, click on **Rectifier › Configuration** (below the **Power System** heading). The **Rectifier configuration** page appears by default.

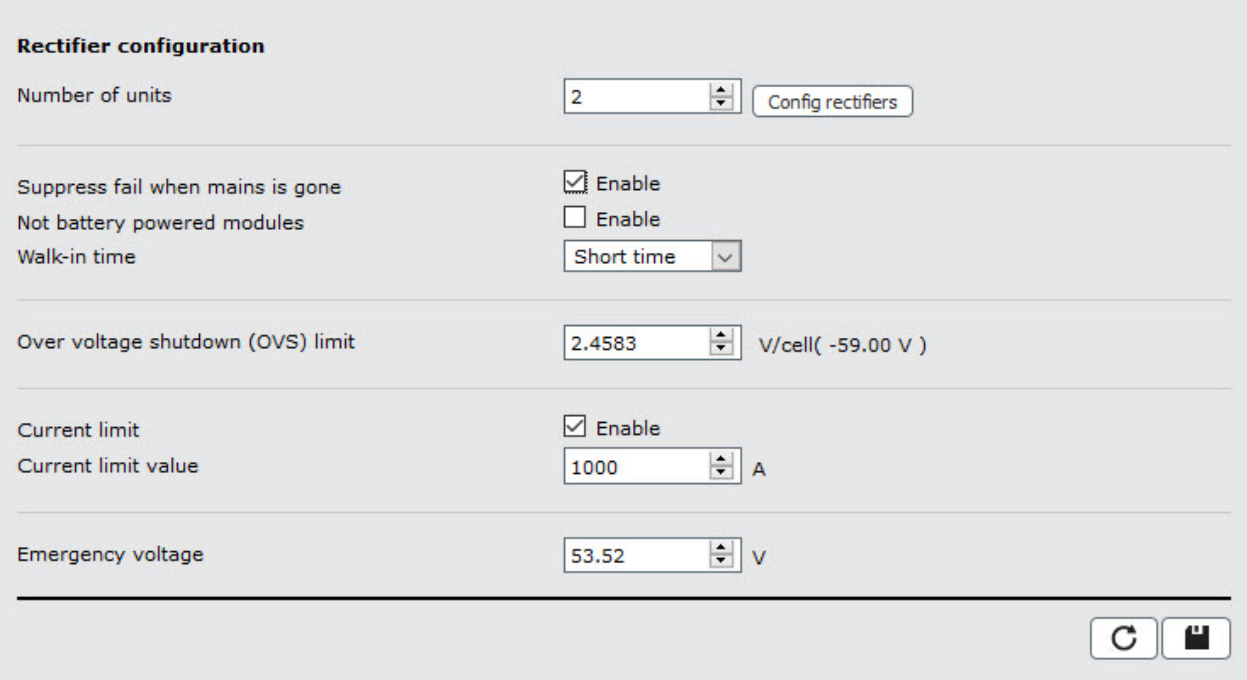


Figure 2.2 – Setting Rectifier Current Limit

3. To turn on rectifier current limit, locate the **Current limit** line and click the 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 **Save** button (diskette) to preserve your changes.

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.** button 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).

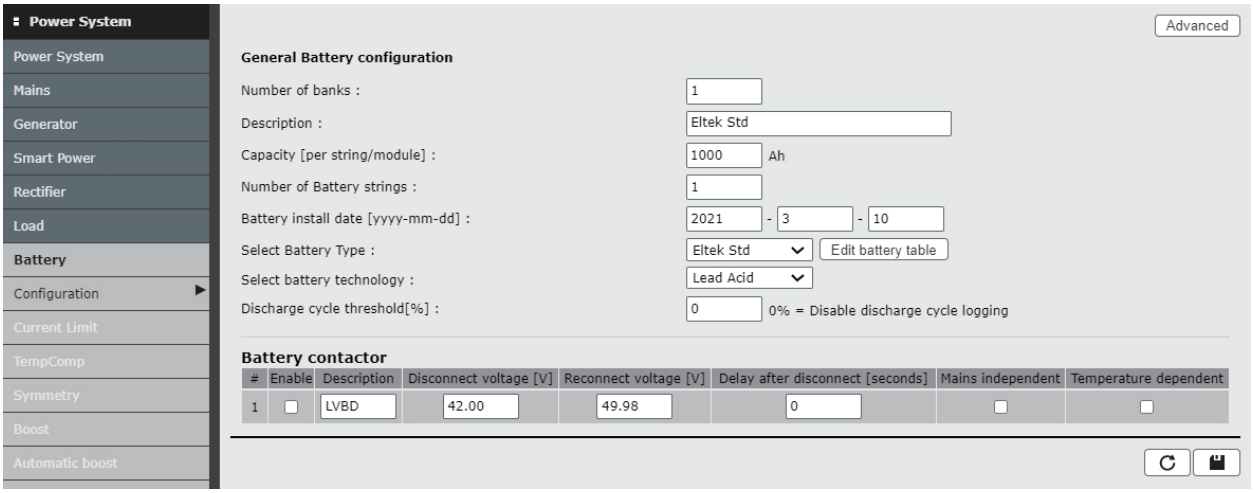


Figure 2.3 – General Battery Configuration Page

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.

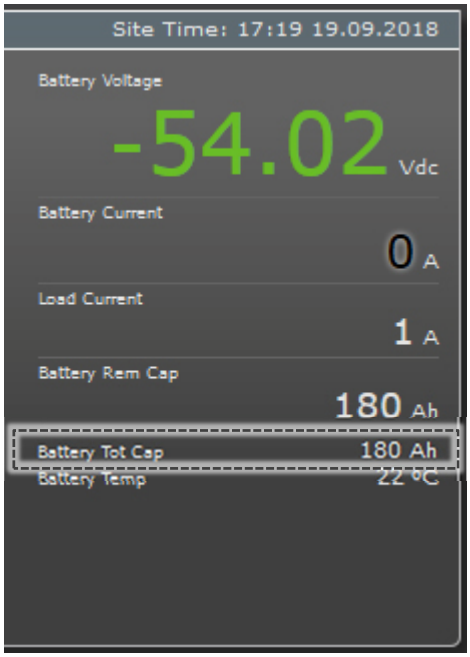


Figure 2.4 – Battery Capacity on Home Page

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. From the browser interface, choose **System Config. › Battery › Configuration**.
2. On the **General Battery configuration** page, click the **Edit Battery Table** in the **Battery Type** line.

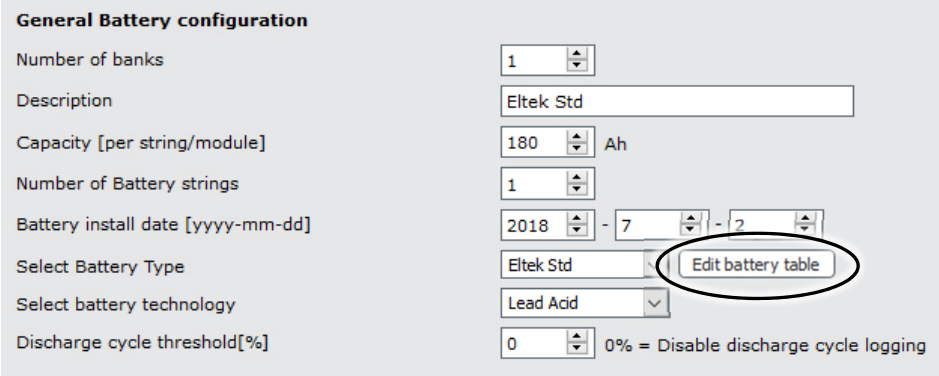


Figure 2.5 – Edit Battery Table Button

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.

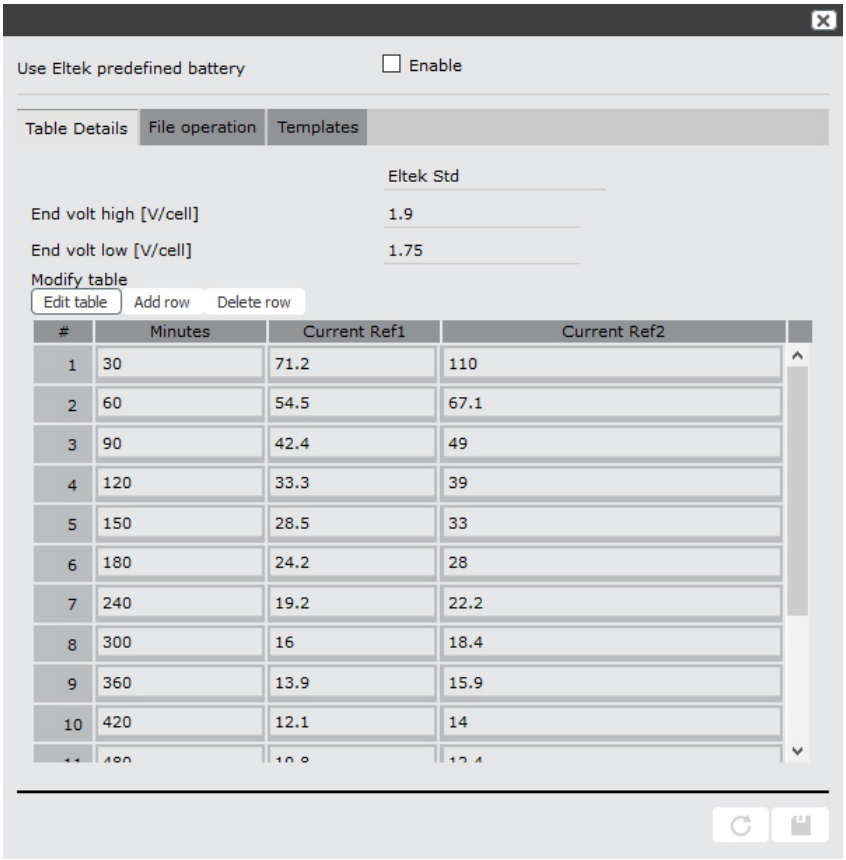


Figure 2.6 – Enable/Disable Predefined Battery Table

4. Choose the tabs **Table Details**, **File operation**, or **Templates** to make changes. If any changes are made, be sure to click **Save** (the diskette button) to preserve your changes.

The following actions can be taken, within the tab options:

- To edit the loaded table, use the **Table Details** tab, select the **Edit table** button in the left side of the window. You can also use the buttons to add or delete rows.

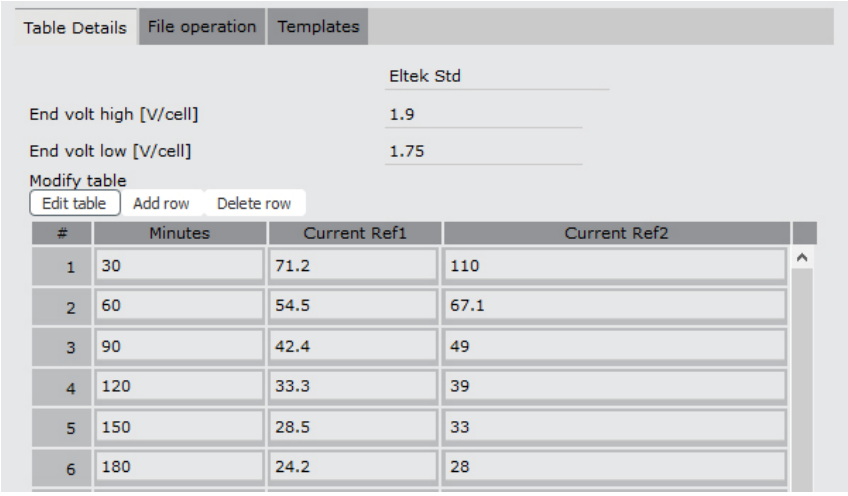


Figure 2.7 – Table Details Tab

- To upload a battery table file, or to save the current table to a file, click the **File operation** tab.

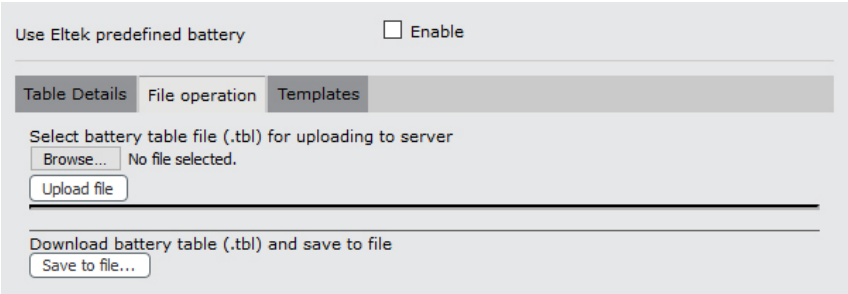


Figure 2.8 – File operation tab

  - 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.
- To load a table available in the controller system (usually just the *Eltek Standard* table), click the **Templates** tab and choose the table from the

Template Options menu list. Then click the **Load Table** button. The table and values load into the **Table Details** box in right side of the window.

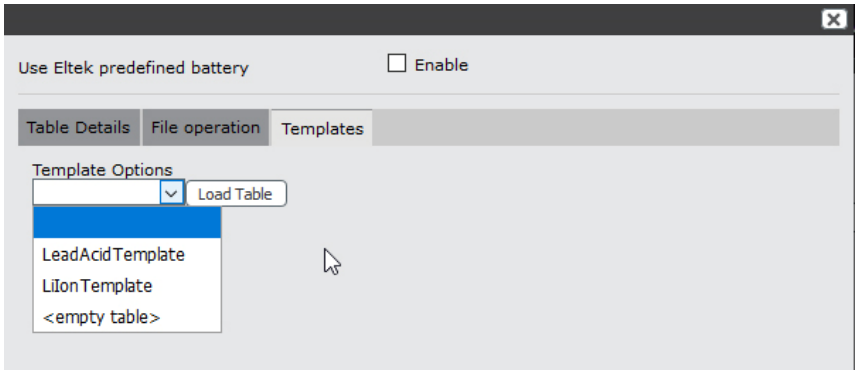


Figure 2.9 – Battery Table Templates Tab

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 browser interface:

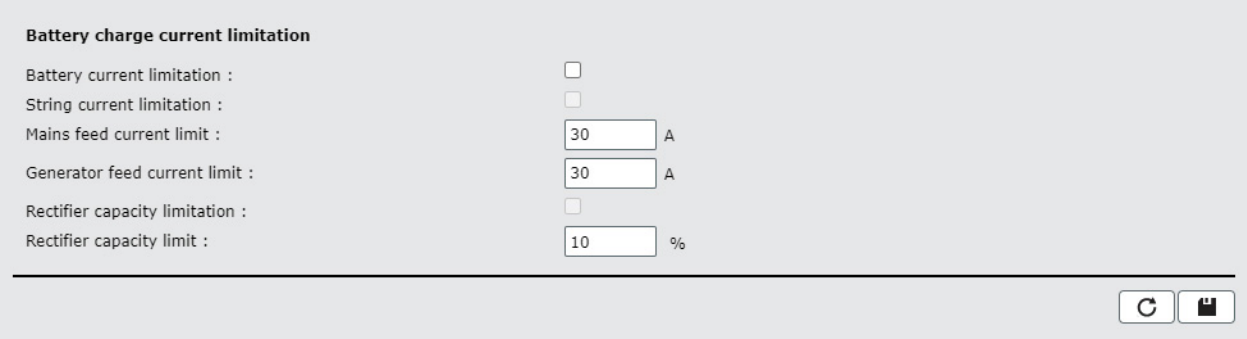


Figure 2.10 – Setting Battery Charging Current Limit

1. Go to **System Conf › Battery › Current Limit.**
2. To turn on battery current limit, locate the **Battery current limitation** line and check the box next to the word **Enable**.
3. 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**.

4. Click **Save** (the diskette button) to preserve your changes.

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 339); 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.
- **Automatic test** initiates testing when AC input power is lost. Data is recorded only if **End voltage** is reached.

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:

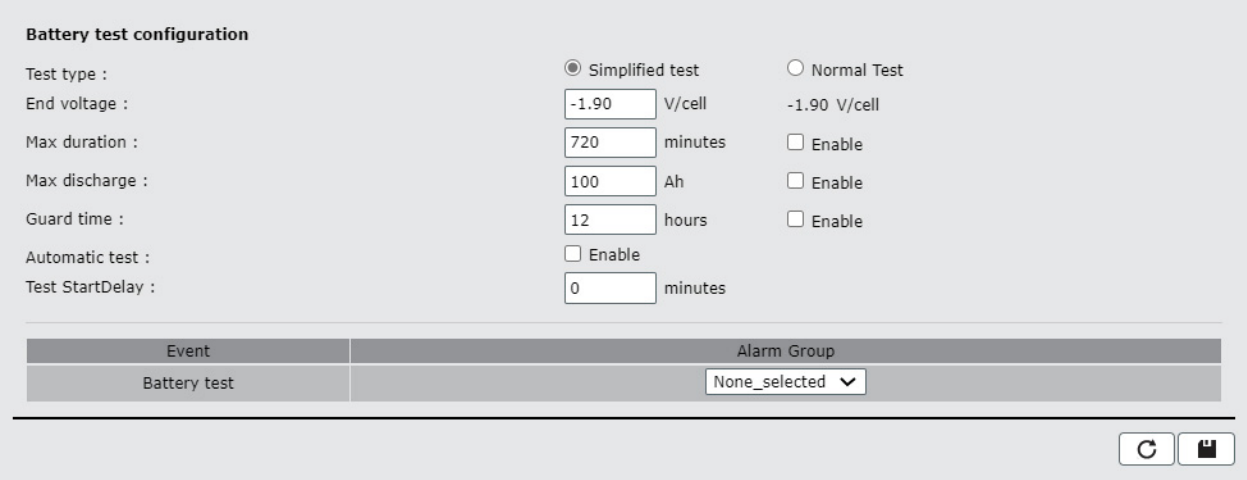


Figure 2.11 – Battery Test Page (Simplified test selected)

The following figure shows which fields are not configurable when set for a **Normal** battery test:

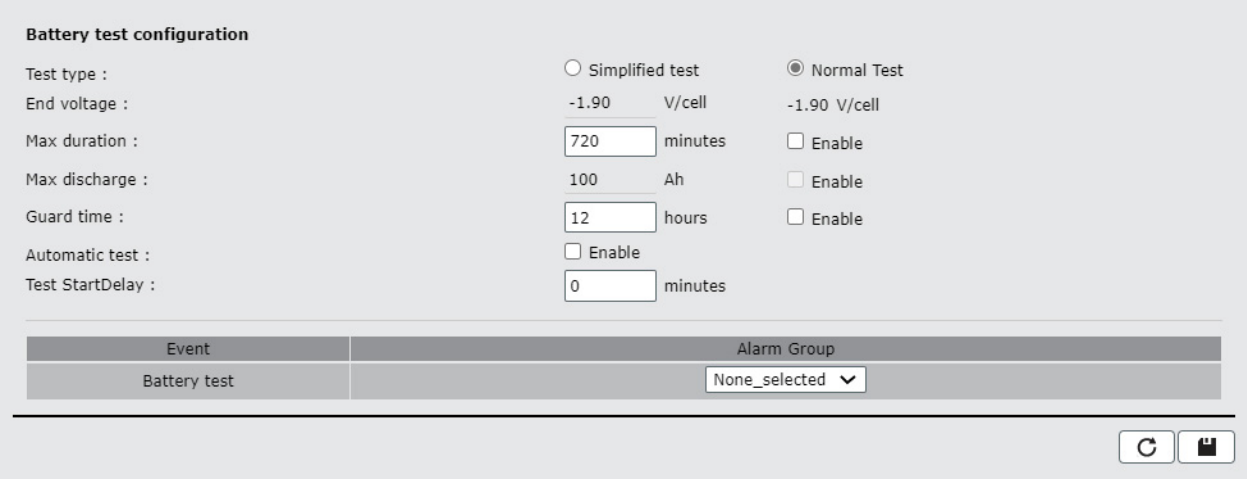


Figure 2.12 – Battery Test Page (Normal test selected)

To set battery discharge testing through the browser interface:

1. Go to **System Conf. › Battery ›Test**.
2. Enter settings as required for the batteries. Refer to the descriptions of the fields above.
3. Click **Save** (the diskette button) to preserve your changes.

Note: The battery table is located under the **Configuration** menu. To access the battery table, choose **System Conf. › Battery › Configuration › [Edit battery table]**.

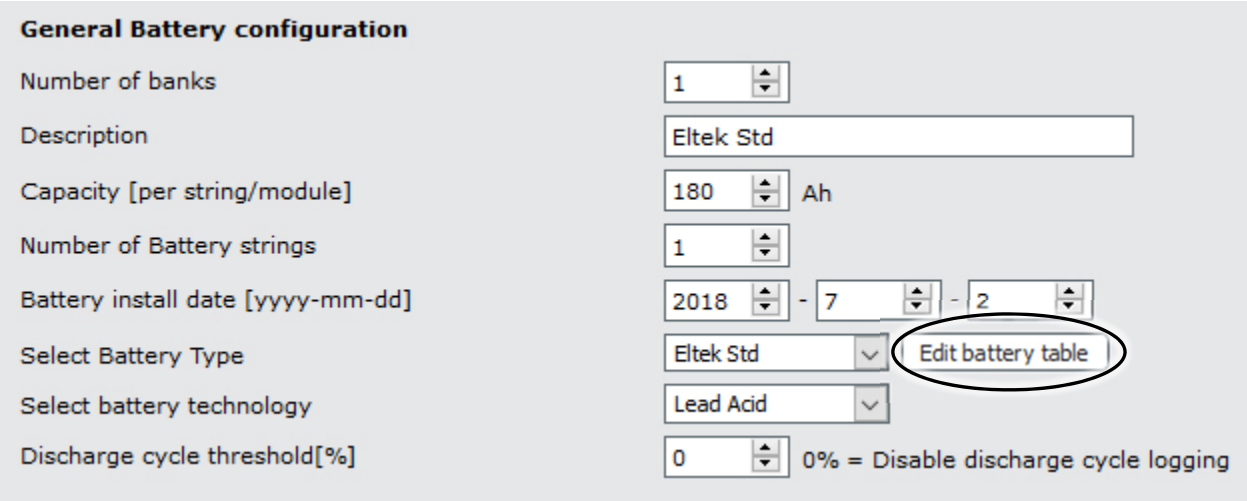


Figure 2.13 – Edit Battery Discharge Table

Note: The battery table can be adjusted only through the browser interface. It cannot be changed through the display. For additional information, see “Battery Table” on page 339 for more details.

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 located the parameters for battery temperature compensation, choose **System Conf. › Battery › TempComp**.

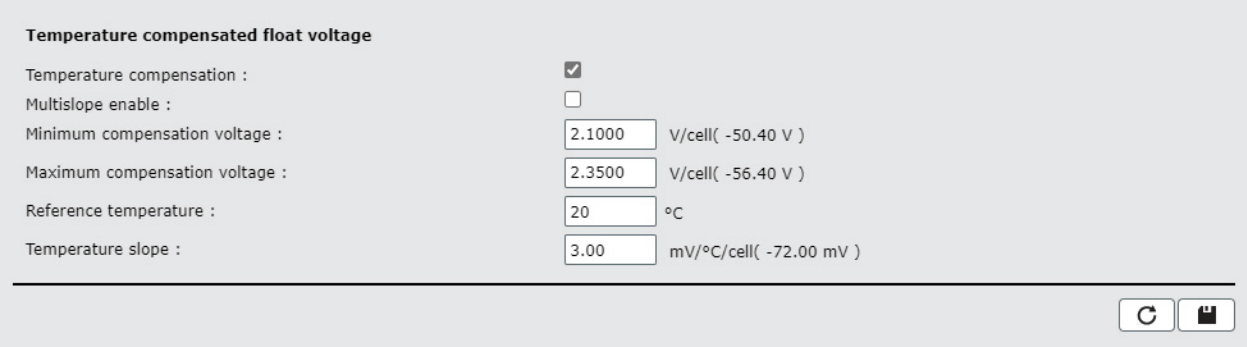


Figure 2.14 – Setting Battery Temperature Compensation

As shown in the preceding figure, the fields include:

- **Temperature compensation** – check the box to enable Temperature Compensated Charging parameters. Clicking again on the box (uncheck) disables the parameters.
- **Multislope enable** – check the box to enable Multislope. When this box is checked, additional parameters appear. See Multislope options on page 137.
- **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 › 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).

To set battery temperature compensation through the browser interface:

1. Go to **System Config. › Battery › TempComp**.

2. Ensure that the **Temperature compensation** option is checked to **Enable**.
3. Enter settings as required for the batteries. See the section “TempComp” beginning on page 136 for detailed descriptions of the fields.
4. Click **Save** (the diskette button) to preserve your changes.

   Note: 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 browser 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 _____".

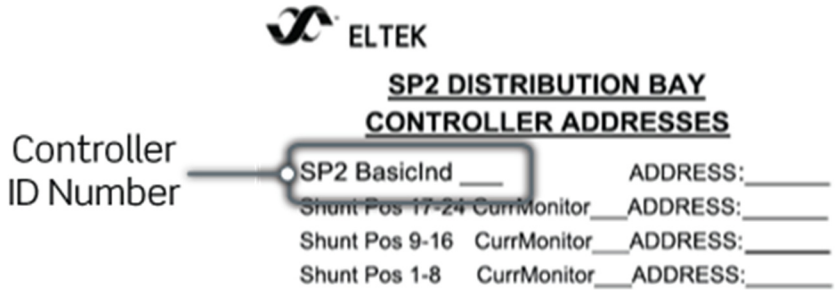


Figure 2.15 – Scalable Bay Controller Address Label (Distribution Bay label shown here)

5. From the navigation page, choose **Alarm Conf.** > **Battery** > **Battery Alarm Configuration**.
6. Locate the **BatteryVoltage** line (usually line #1) and click on the gear button to open the **Edit** window.

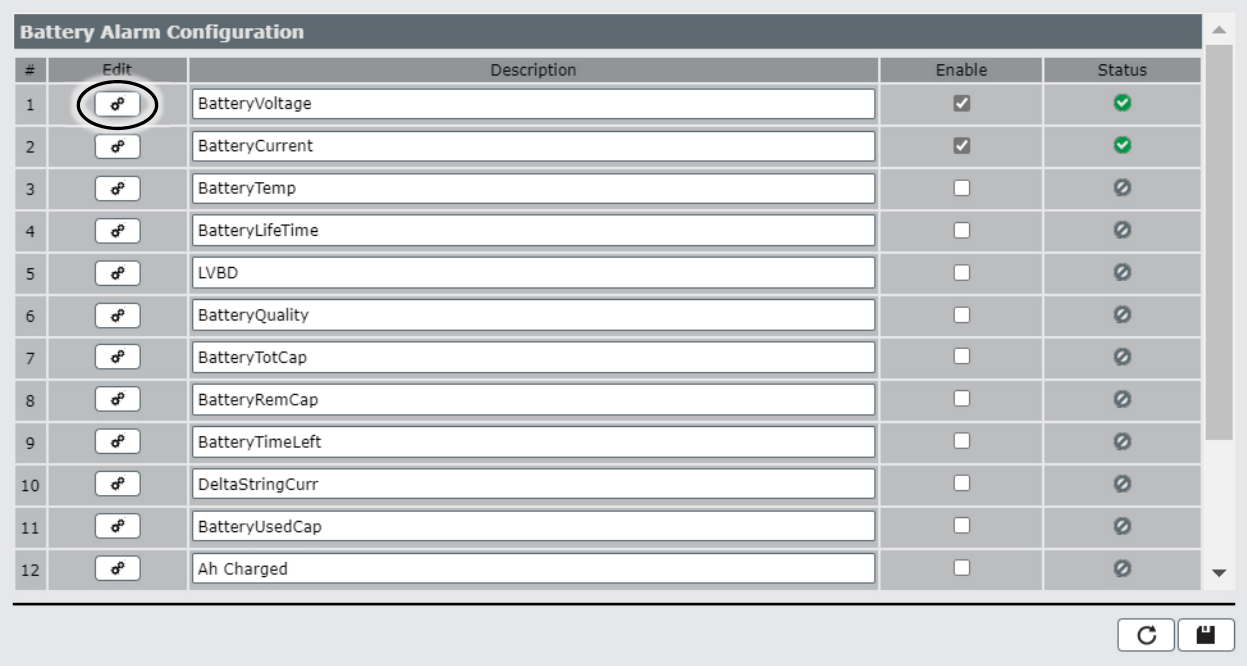


Figure 2.16 –Editing Battery Voltage

7. Locate the **Alarm Monitor** line and check the **Enable** box. This enables battery voltage monitoring, which is required for battery temperature compensation.

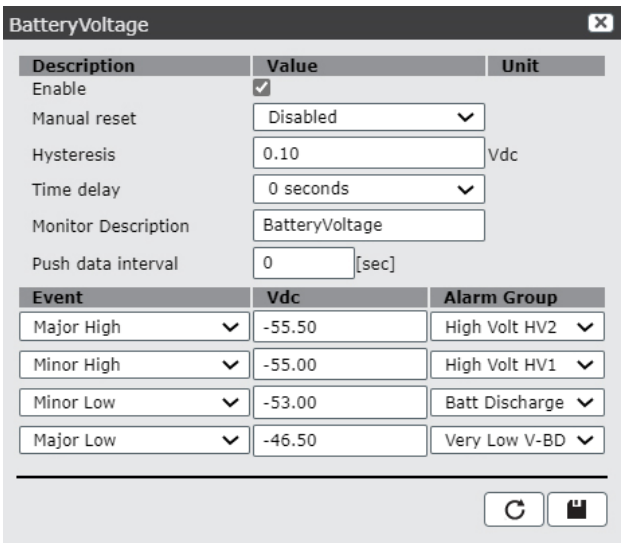


Figure 2.17 – Battery Voltage Alarm Monitor

8. Click **Save** (diskette) to preserve the change.
9. 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, here 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 127 for details.

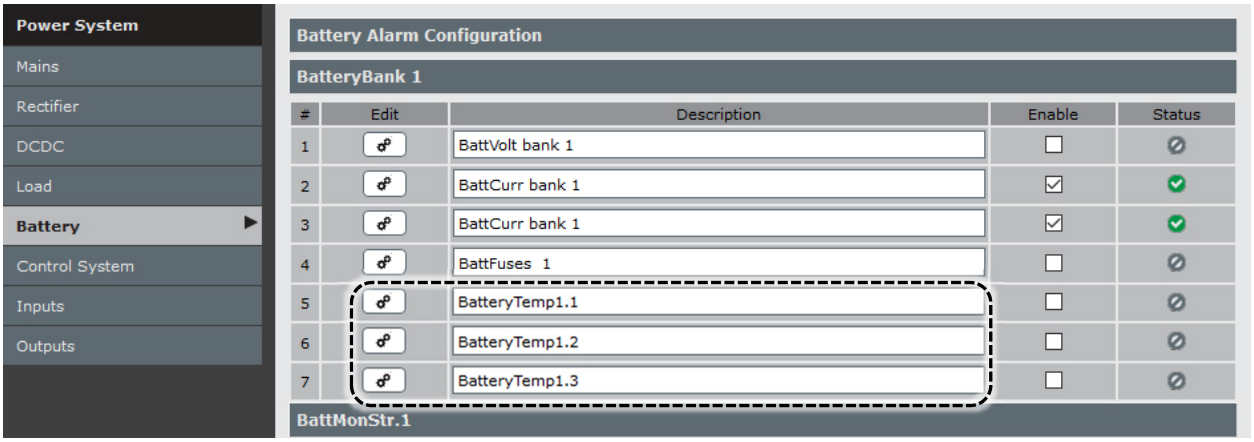


Figure 2.18 – Battery Temperature Probe Inputs (Controller)

10. Locate the **BatteryTempX.X** monitors.

    Note: 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.

11. Click on the **Edit** button (gears) of the first probe input to be enabled.
12. Locate the **Alarm Monitor** line and check the **Enable** box to enable the input.
13. Click **Save** (the diskette button) to preserve your changes.
14. 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 browser 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 Master and Touch 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.

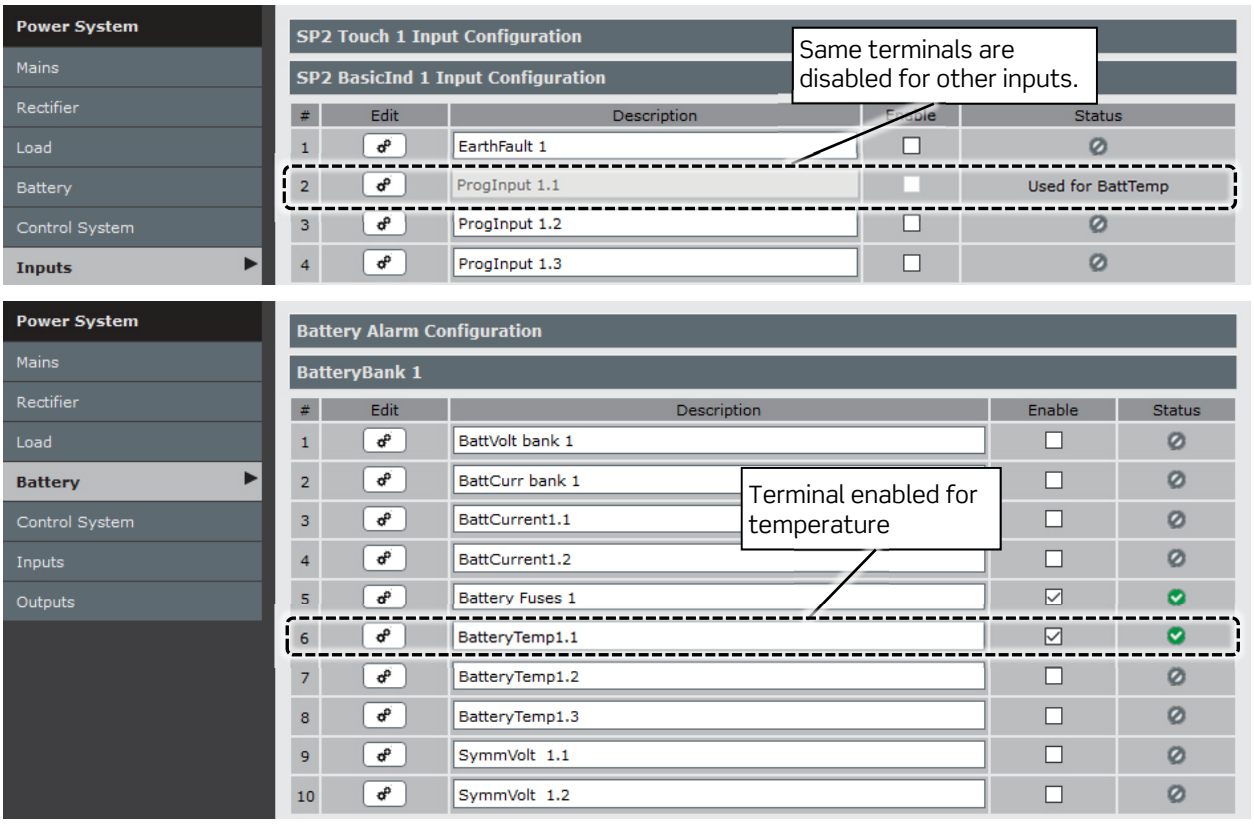


Figure 2.19 – Temp Probe Terminals (Smartpack2 Basic)

Likewise, if a **ProgInput** monitor is enabled, that terminal is disabled for use as a battery temperature probe.

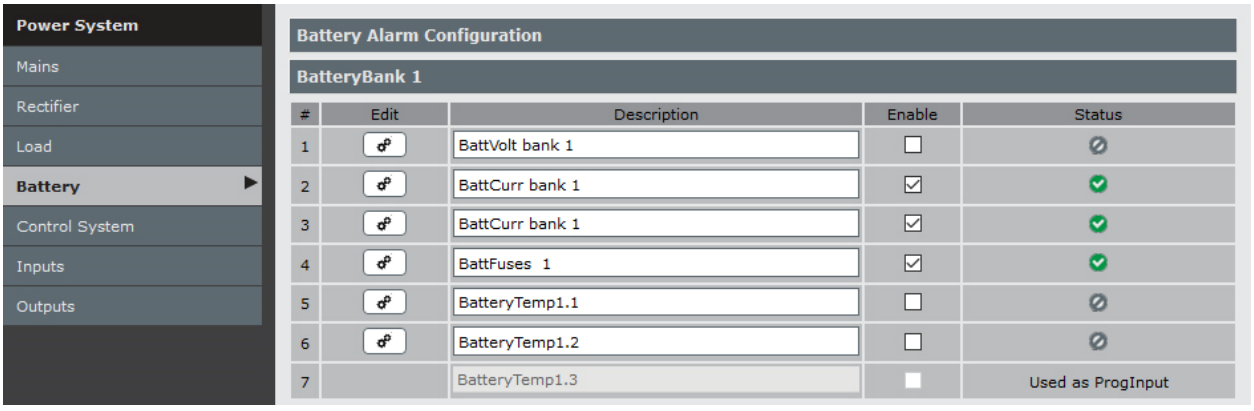


Figure 2.20 – Battery Temp Probe Terminals (Smartpack2 Basic)

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.

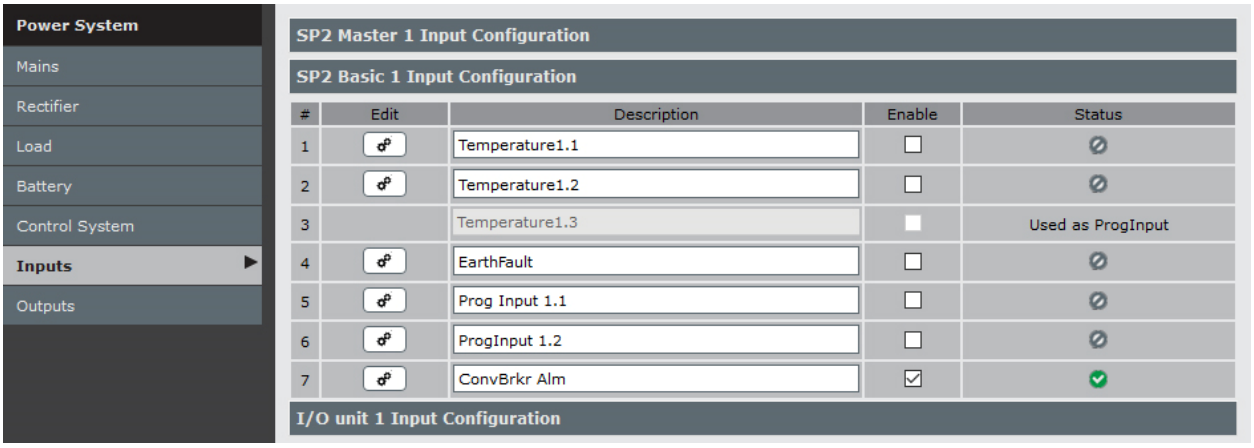


Figure 2.21 – Input 1 Used for BattTemp and Disabled for Temperature and ProgInput

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.

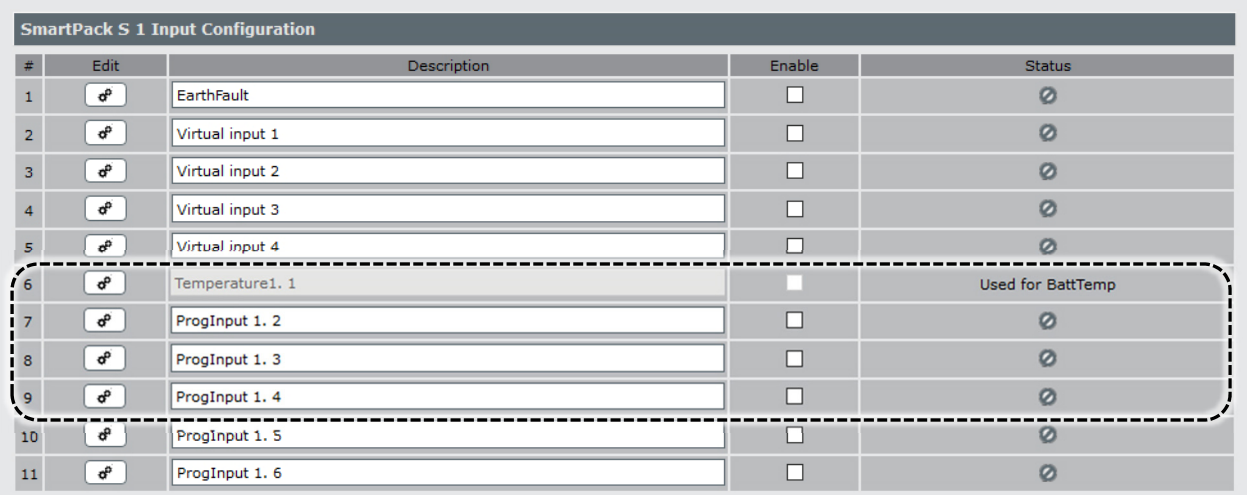


Figure 2.22 – Temperature and Programmable Input Monitors for Smartpack S

Note: For the Smartpack R controller, all input terminals can be used for temperature monitoring. If so utilized, the corresponding **ProgInput** alarms are disabled.

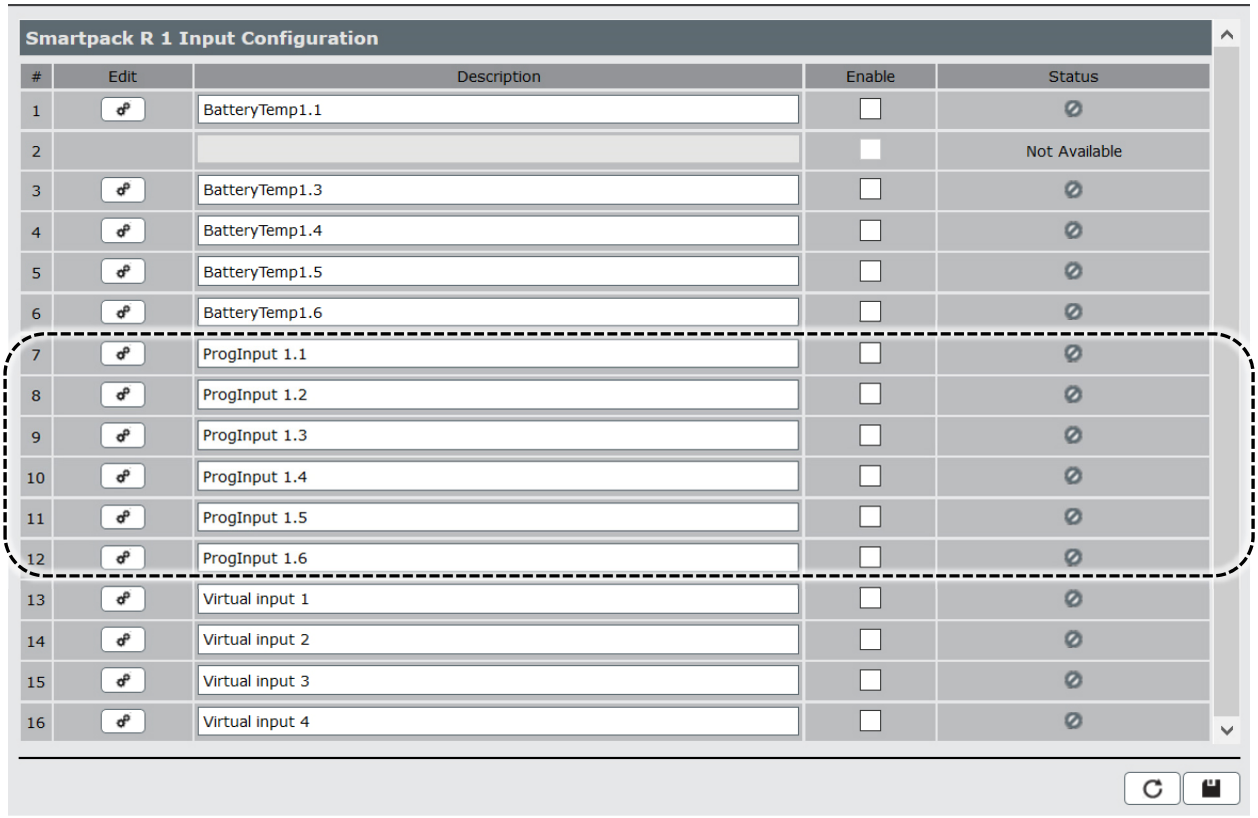


Figure 2.23 – Temperature and Programmable Input Monitors for Smartpack R

Note: For the Compack controller, all three input terminals can be used for temperature monitoring. If so utilized, the corresponding **ProgInput** alarms are disabled.

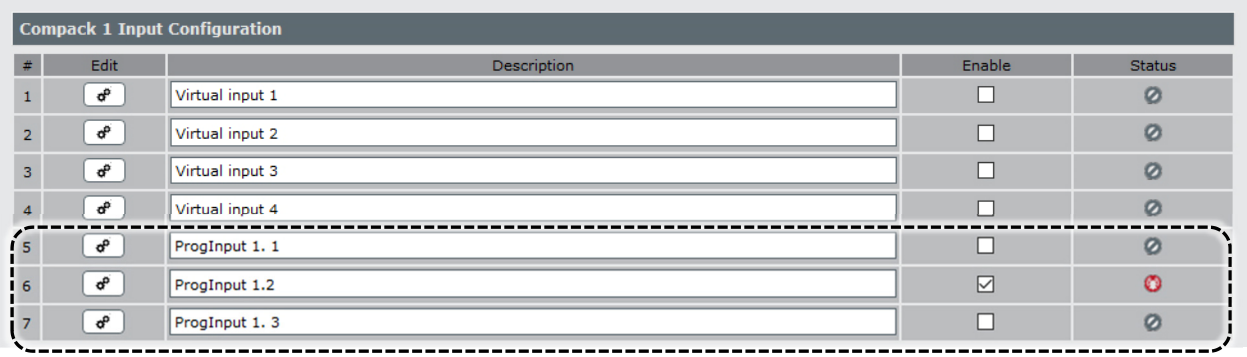


Figure 2.24 – Temperature and Programmable Input Monitors for Compack

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 127 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** button (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 **Save** (the diskette button) to preserve your changes.
9. Repeat steps 4 through 8 for any remaining temperature probes to be set.
10. Click **Save** (the diskette button) to preserve your changes.

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. › 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.

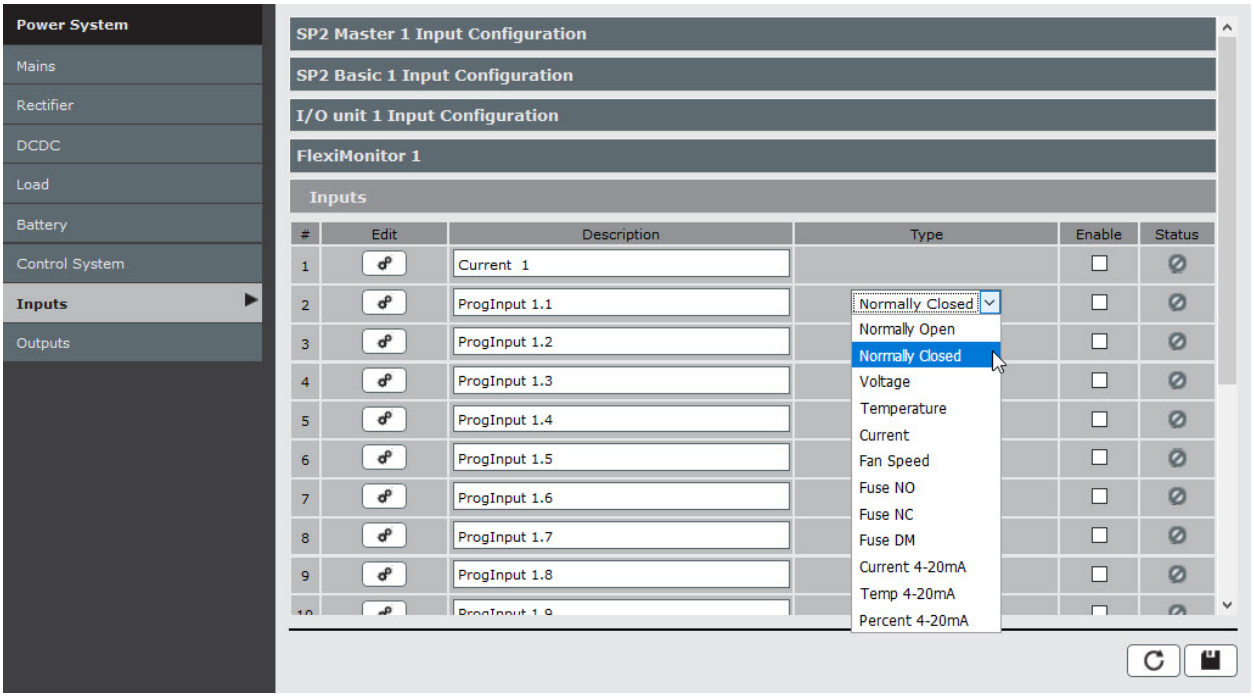


Figure 2.25 –FlexiMonitor Alarm Inputs

3. On the **Alarm Config › Inputs** page, click on the **FlexiMonitor** heading to expand the Flexi Monitor list of alarm monitors.
4. There are 16 channels on the Flexi Monitor. Identify the channel with the temperature probe connected, and click the **Edit** button (gears) 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.

5. When the **Edit** window opens, click on the **Config** tab.

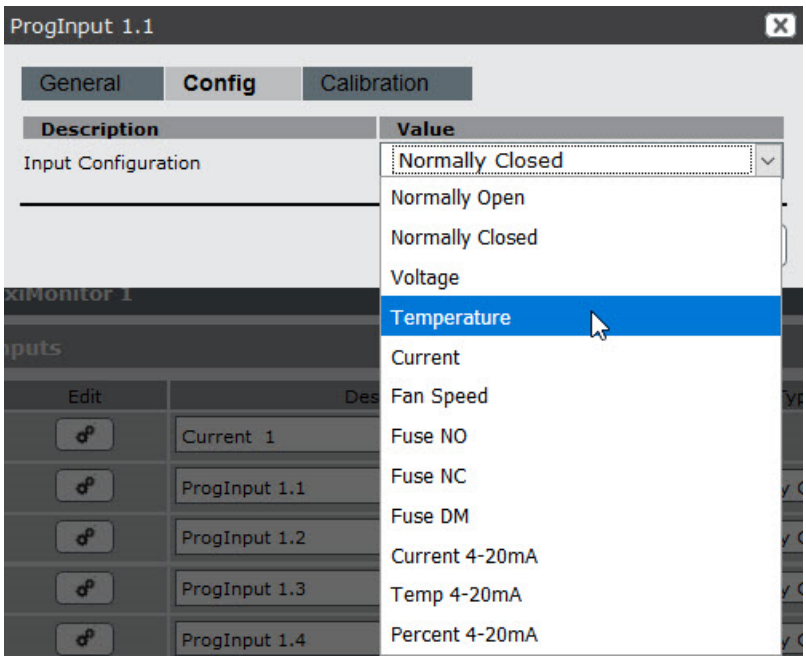


Figure 2.26 – Flexi Monitor Input Configuration

6. On the **Config** page, click on the **Input Configuration** menu list and select **Temperature**.
7. Click **Save** (the diskette button) to preserve your changes. Note that the input description changes to **Temperature X.YY**.
8. Click on the **General** tab.

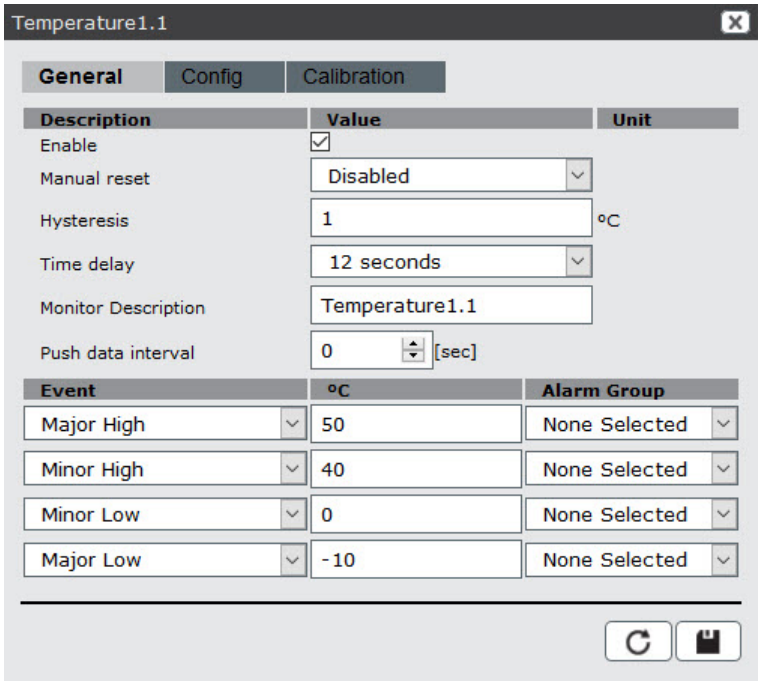


Figure 2.27 – Flexi Monitor Input Configuration

9. Locate the **Enable** line, and check the box. This enables the alarm monitor.
10. Note the alarm events at the bottom of the edit window. Set the temperature thresholds and desired **Alarm Groups** for each **Event**.
11. Click **Save** (the diskette button) to preserve your changes.
12. Click anywhere outside of the Edit window to close it.

Setting Alarms

Alarm settings are configured in the **Alarm Configuration** section of both the browser 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.

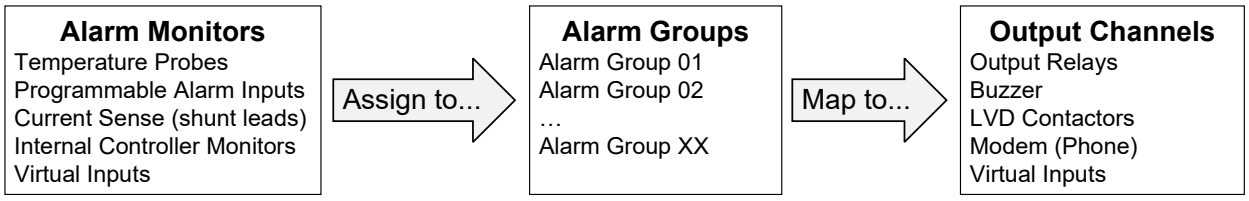


Figure 2.28 – Alarm Assignments Overview

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).
- The Smartpack R controller has six inputs and six output relays; they are located on a controller card (#200625) that is built into the power system, and is connected to the back of the controller using alarm connector cables (10-pin mini and 26-pin D-sub).



Figure 2.29 – 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; three for the Standard Basic and Basic Industrial Controllers). 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. The programmable input designation can be normally open, normally closed, voltage, temperature, or temp 4-20mA.

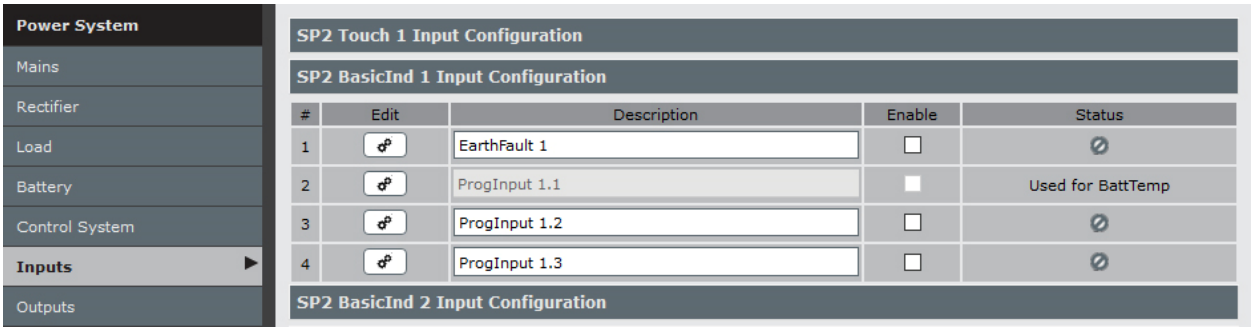


Figure 2.30 – Temperature and ProgInput Monitors on a Smartpack2 Basic Industrial Controller

Note: For the Smartpack2 Basic controller, 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.

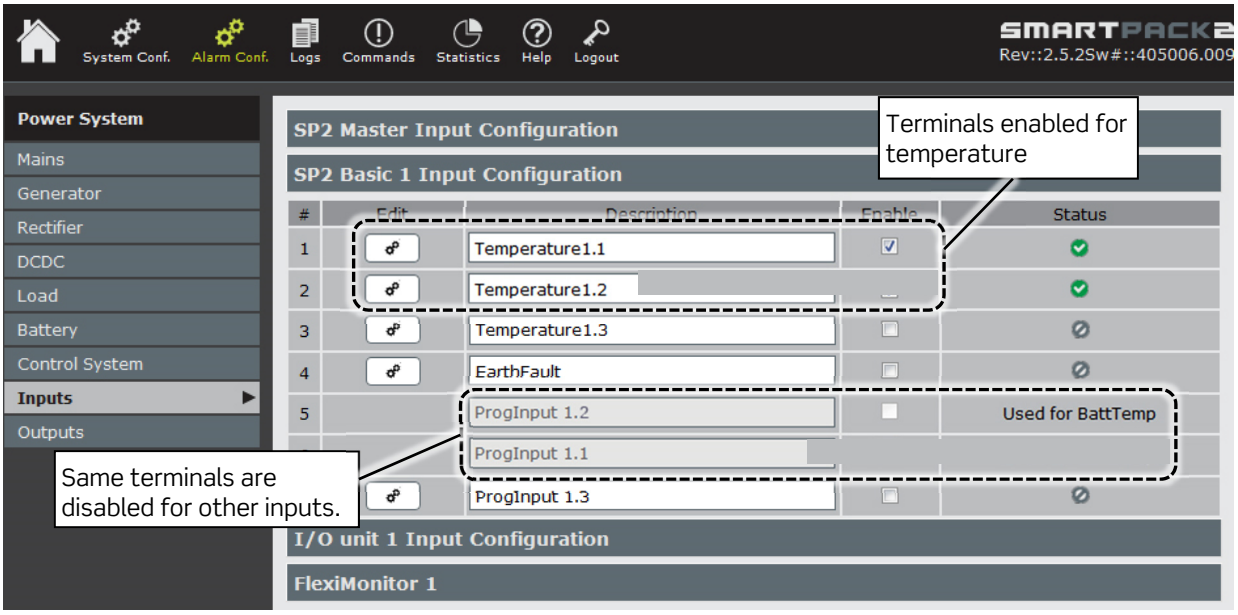
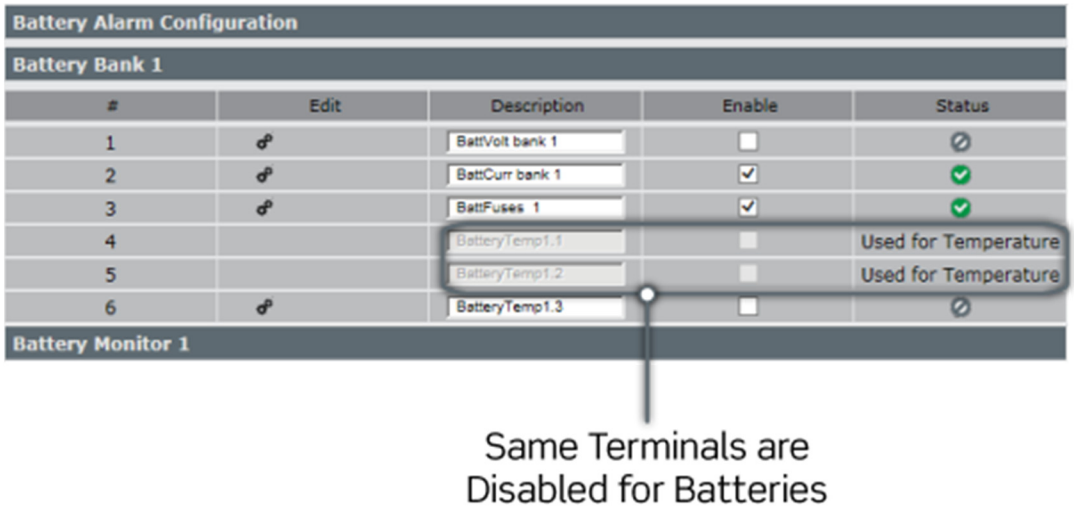


Figure 2.31 – Temp Probe Terminals (Smartpack2 Basic)

The following figure illustrates how the same terminals are disabled for use as battery temperature probes.



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.

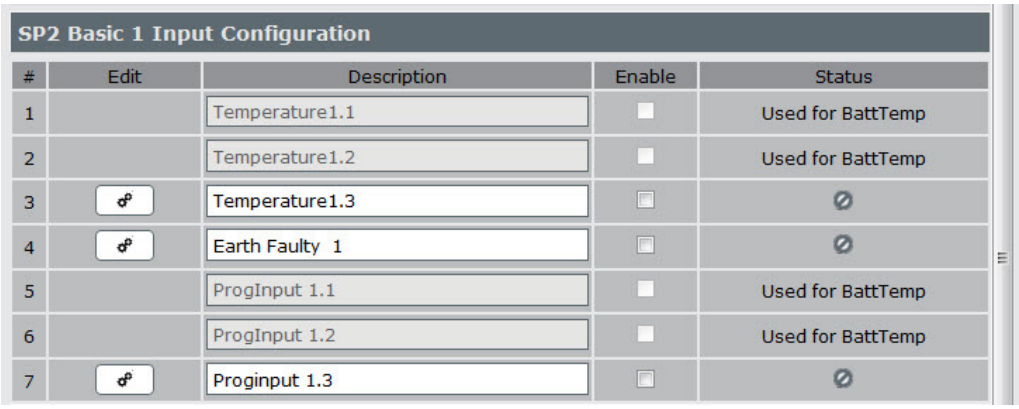


Figure 2.32 – Inputs Used for BattTemp and Disabled for Temperature and ProgInput (Smartpack2 Basic)

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.

Note: For the Smartpack R controller, all six input terminals can be used for temperature monitoring. If so utilized, the corresponding **ProgInput** alarms are disabled.

To setup an input alarm through the browser interface:

1. Go to **Alarm Conf.**> **Inputs** and wait for the list to populate.
2. Find the input to set and click on the **Edit** button (gears). Wait for the edit window to populate.

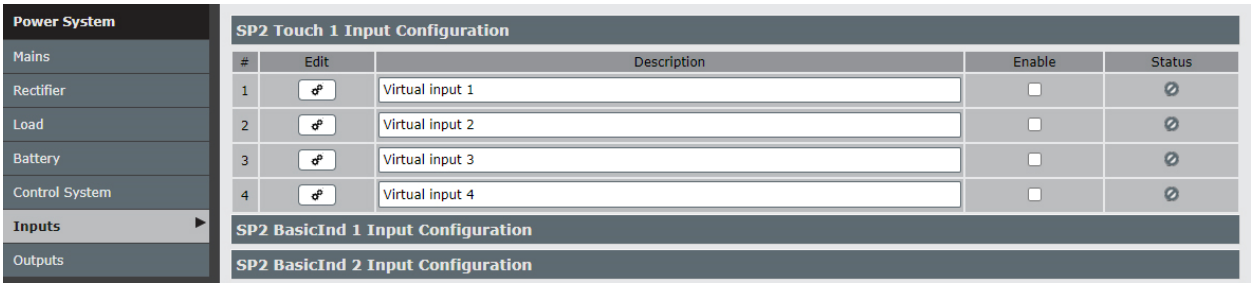


Figure 2.33 – Alarm Inputs Page (Smartpack2 Touch Controller)

3. Check the **Enable** box.

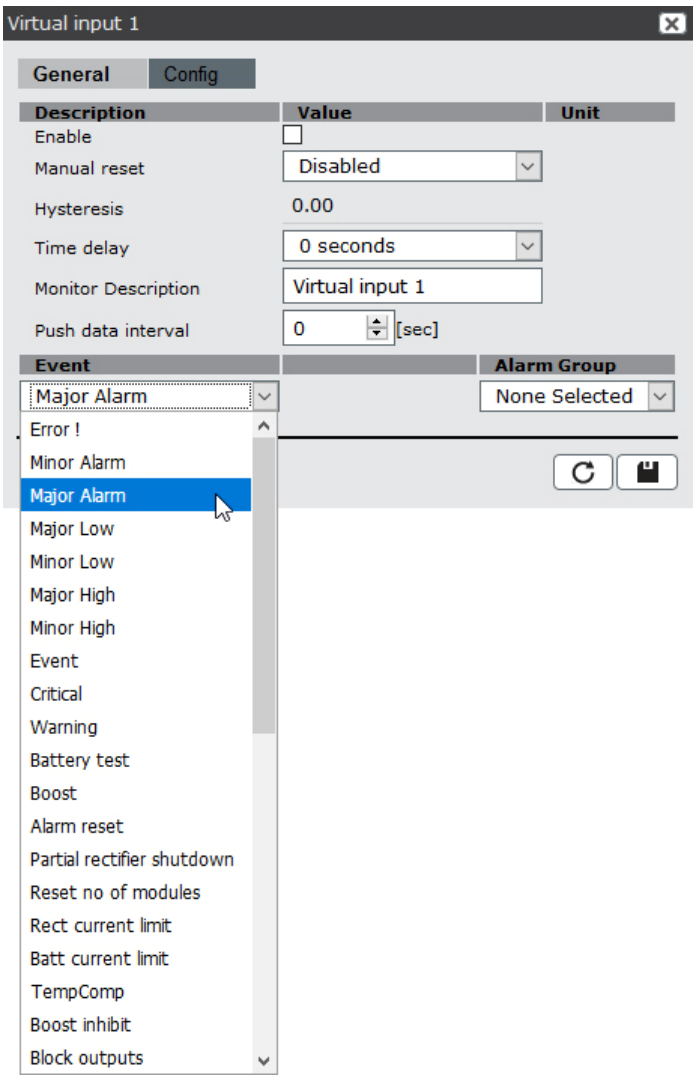


Figure 2.34 – Alarm Input Edit Window

4. Click the **Edit** button (gears) to access the configuration options.
5. Set the **Event** type. For a virtual input, leave **Event** as **Event**.
6. 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.
7. Click **Save** (the diskette button) to preserve your changes.
8. 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 browser interface:

1. Click on the **Alarm Conf.** button 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 menu list 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 and Touch controllers, since these units only have an audible buzzer to assign to the alarm groups. For these controllers, I/O Monitors are required for external alarm input and output; the appropriate I/O Monitor must be selected in the menu 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.

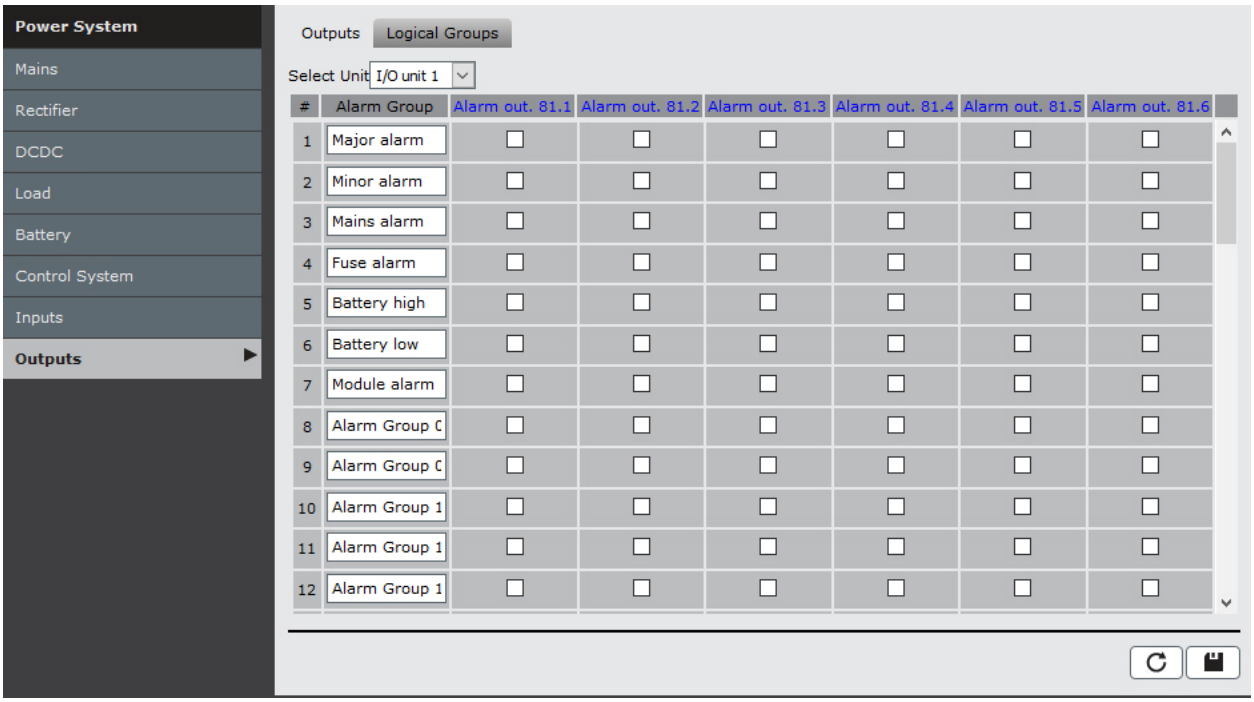


Figure 2.35 – Alarm Outputs Page (Mapping Example Shown)

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** button (diskette symbol) to save changes.

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.

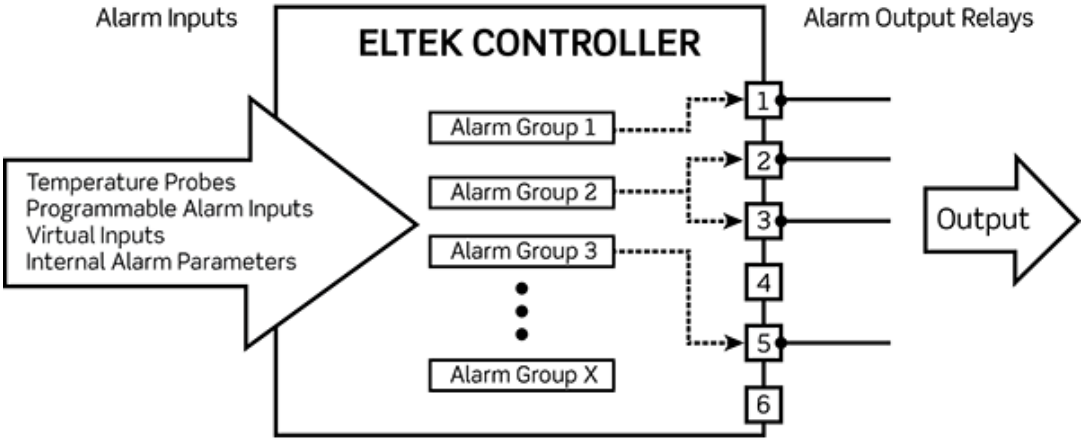


Figure 2.36 – Alarm Groups to Output Relays

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 browser interface as an example.

To set alarm Battery Voltage alarm parameters through the browser interface:

1. Click on the **Alarm Conf.** button in the top menu bar.
2. In the left menu bar, click on the **Battery** and wait for the list to populate.

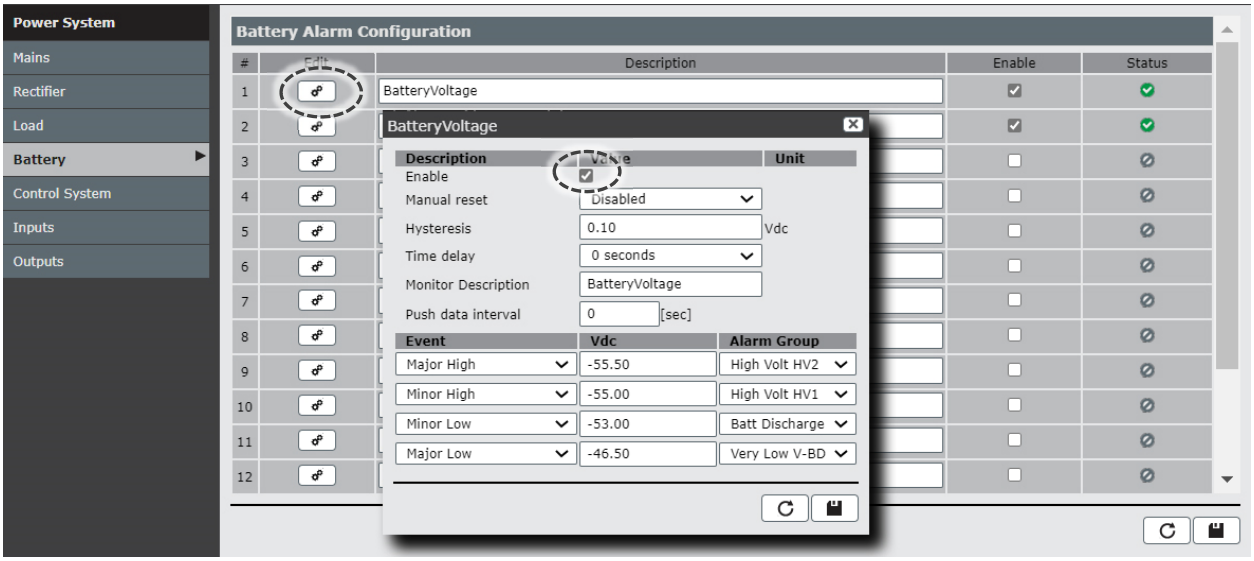


Figure 2.37 – Battery Voltage Alarm Configuration

3. Under the **Battery Alarm Configuration** bar, find **BatteryVoltage** (it should be line #1) and click on the **Edit** button (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.
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 **Save** (the diskette button) to preserve your changes.
6. Note the **Alarm Group** assignments next to each **Event** line. Click on the menu list to see the alarm groups available.

   Note: The output relay assignment of the alarm group and the alarm group name can be changed on the **Outputs** page.
7. Click **Save** (the diskette button) to preserve your changes.

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:

1. Go to the **Alarm Outputs** page (**Alarm Conf. › Outputs**).

2. 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**. If it does not appear, then the I/O Monitor unit requires a software upgrade before proceeding to the next step.

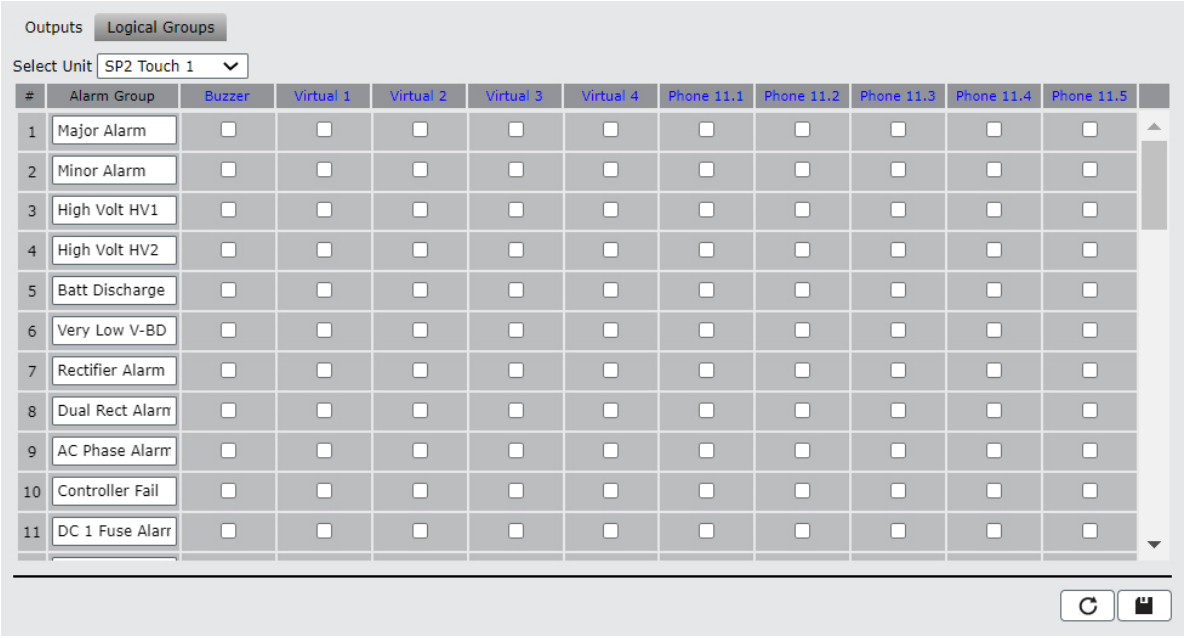


Figure 2.38 – I/O Monitor Outputs Page

3. 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.
4. Click **Save** (diskette button) to preserve your changes.
5. Click on the **Buzzer** heading to open the **Output Config** window.

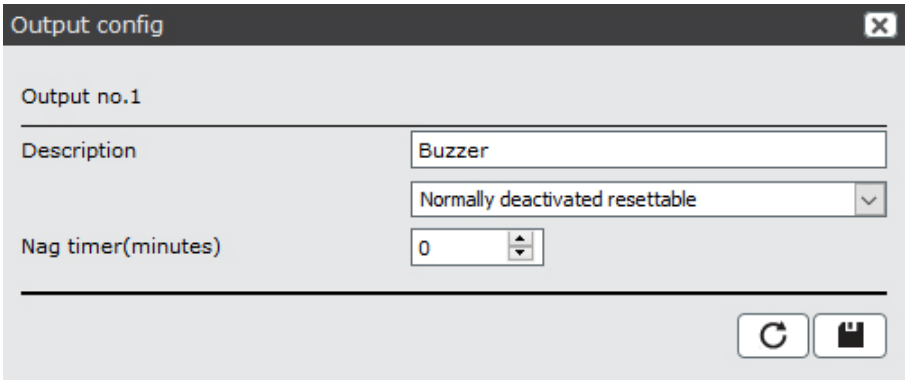


Figure 2.39 – Buzzer Output Configuration Window

6. Locate the **Description** field. To its right is a menu 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 **Save** (the diskette button) to preserve your changes.

Setting Site Information

Note: Site information can be set through the browser 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 browser 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 browser interface:

1. Click on the **System Conf.** button in the top menu bar.
2. In the left menu bar, click on **Power System**.
3. Click on **System Info**.

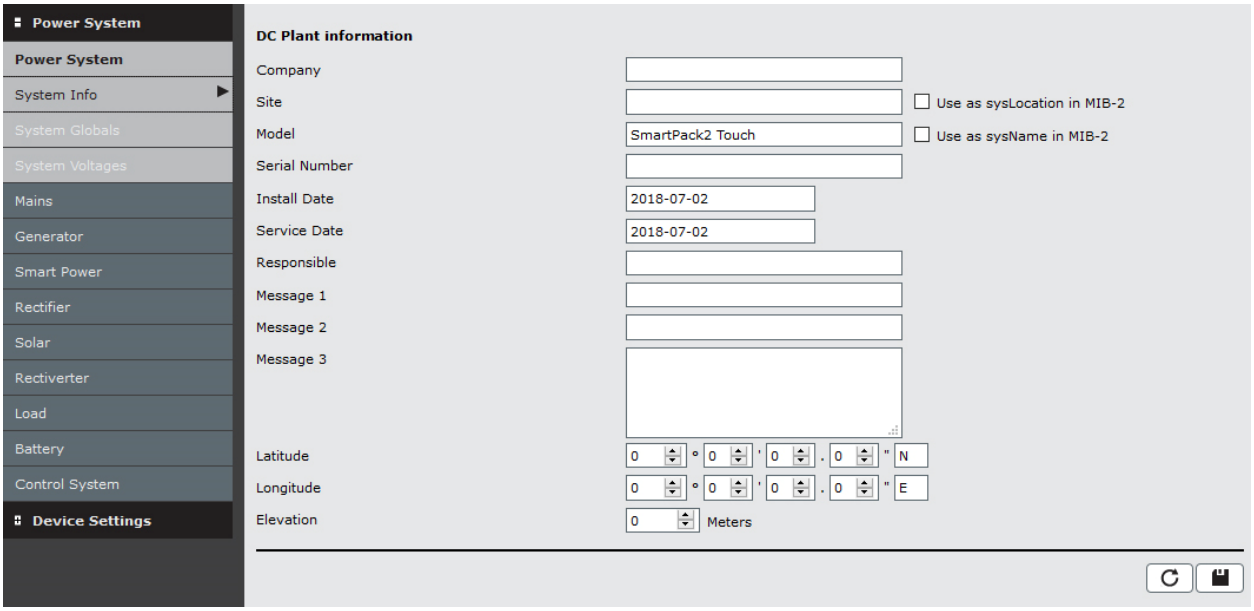


Figure 2.40 – System Information Page

4. Fill in the fields as desired. All fields are optional.
5. Click on the **Save** (the diskette button) to preserve your 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 browser 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
   The **General Generator Configuration** page appears by default.

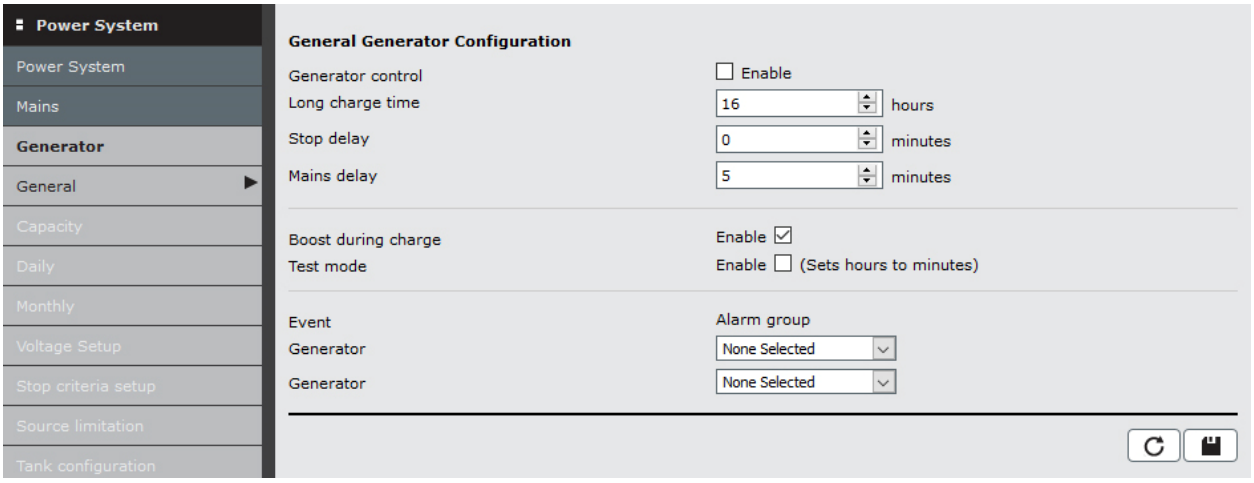


Figure 2.41 – Generator Configuration Settings (Example)

2. Locate **Generator control** and check the **Enable** box.
3. 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.
4. Click **Save** (the diskette button) to preserve your changes.
5. Navigate to the alarm **Outputs** page.

   Alarm Conf. › Output

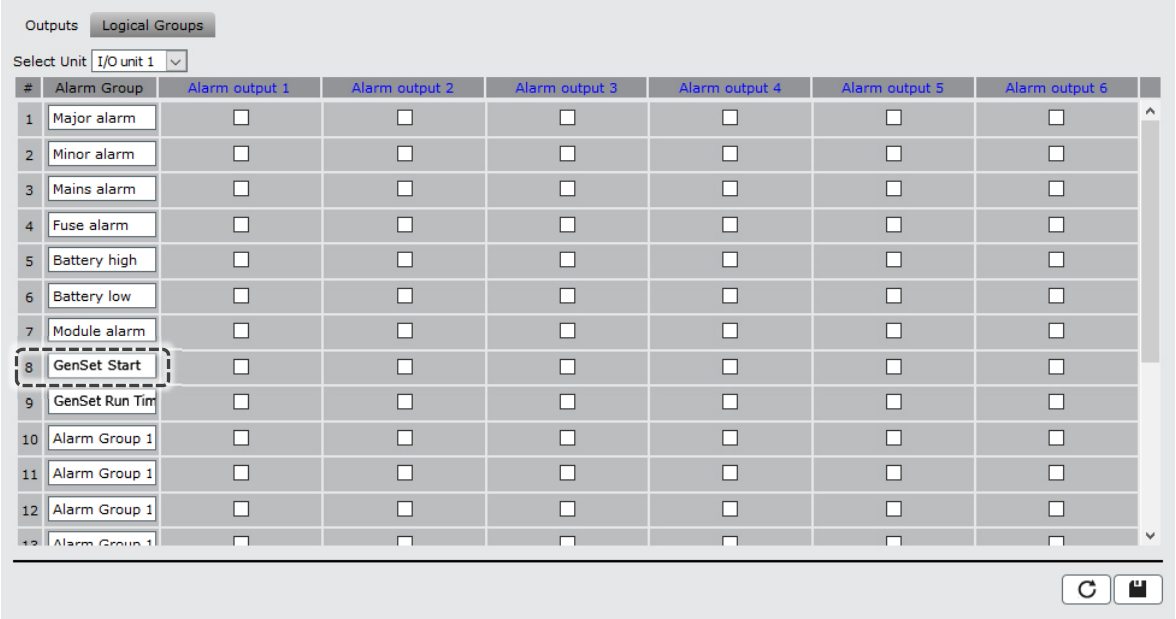


Figure 2.42 – Alarm Outputs Page (Example)

6. Locate **Select Unit** and use the menu list to select the controller or CAN Node with the output relay that is connected to the generator's activation switch.
7. 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 be 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 **Save** (the diskette button) to preserve your changes.
10. Navigate to the **Generator** alarms page.

    Alarm Conf. › Generator
    The **Generator Alarm Configuration** page appears by default.

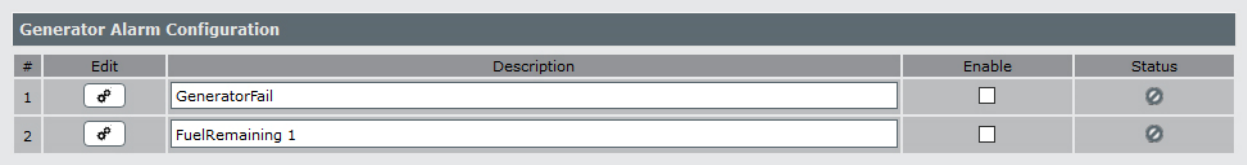


Figure 2.43 – Generator Alarm Configuration

11. Click the **Edit** button 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.

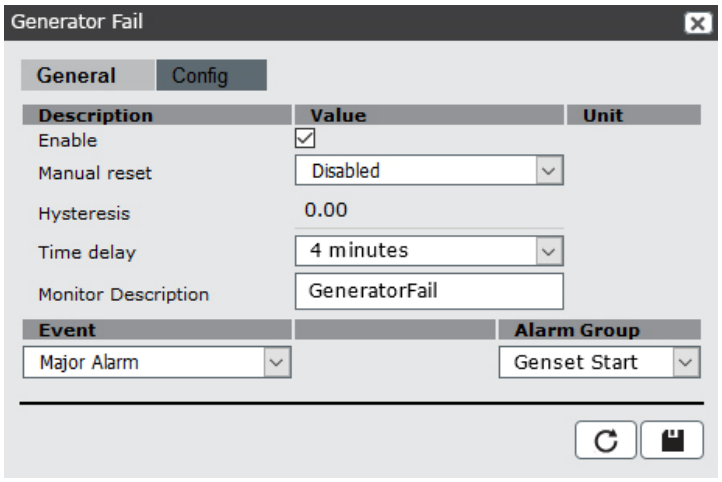


Figure 2.44 – Generator Fail Edit Window

13. Click **Save** (the diskette button) to preserve your 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 102 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** button).

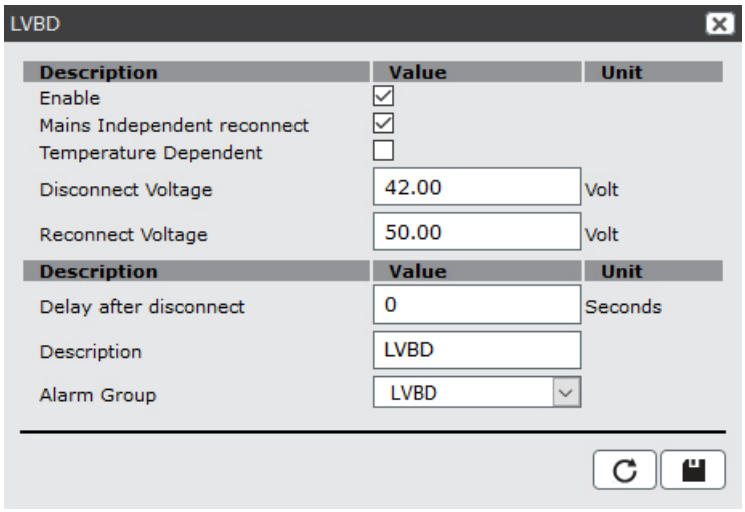


Figure 2.45 – Battery Disconnect Voltage (LVBD Edit Window)

15. Click **Save** (the diskette button) to preserve your changes.

Generator activation is now set.

Setting SNMP Communication

Note: This feature is only available through the browser interface, not through the display. Simple Network Management Protocol (SNMP) settings through the browser 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 browser interface, please refer to the information in the System Configuration section (“SNMP Settings”, beginning on page 186).

SNMP Web-Based Configuration

To access the SNMP Settings pages:

1. Click on the **System Conf.** button 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

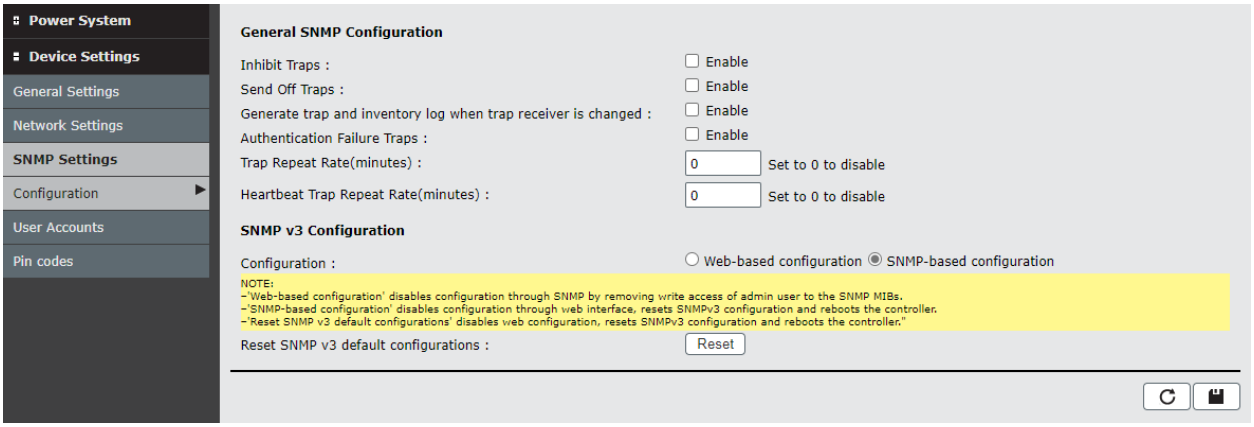


Figure 2.46 – SNMP-based configuration (default)

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 browser interface.

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

- **USM Users**
- **Vacm Access**
- **V1/V2 Community**
- **Traps**

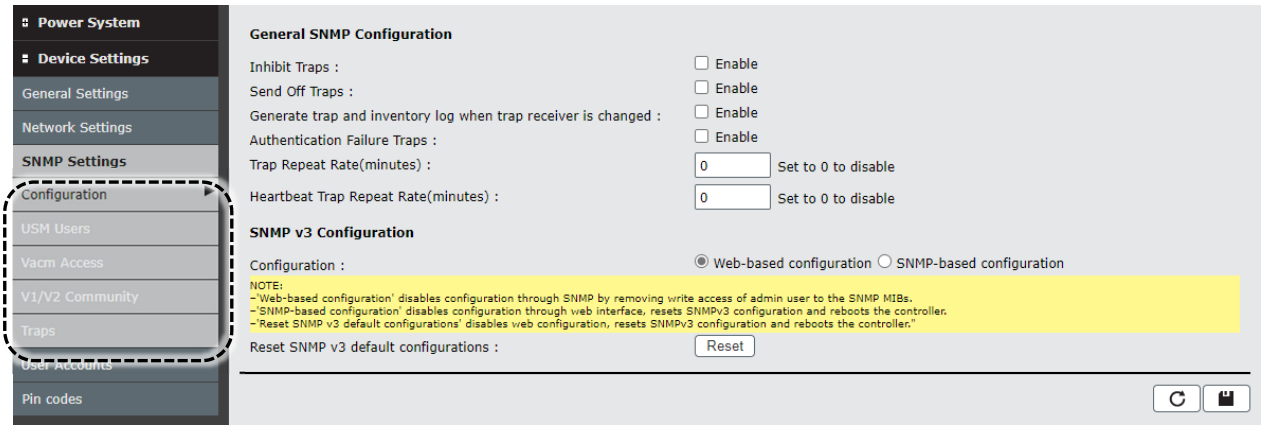


Figure 2.47 – Web-based Configuration Pages

Note: For detailed overviews of each SNMP page in the web browser interface, please refer to the information in the System Configuration section (“SNMP Settings”, beginning on page 186).

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 at: **http://eltek.sharefile.com/**.

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.

Trap	Description
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.
alramInputsTrap	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*.

SNMP Configuration Using XML files

Starting in firmware version 2.9.1, you can program SNMP parameters with XML files. This allows you to easily program multiple controllers without manually entering all the SNMP settings. This is done through editing a special XML configuration provided by Eltek. These special XML file can be downloaded from **eltek.sharefile.com**: **Folders › Controllers and Monitors › SNMP (for Compack-Smartpack2-SmartpackS-Touch-Smartpack R) › SNMP Copy Settings Scripts**.

Once you have downloaded the XML files, you can open them in an XML editor or word to enter your specific company information.

Note: These XML files will only program SNMP settings. No other system settings will be affected.

List of available files:

- **Create community – V1**: An XML file that programs the SNMPv1 community parameters
- **Create v1 trap receiver**: An XML file that programs the SNMPv1 trap receiver parameters
- **Create v1 user**: An XML file that programs the SNMPv1 user parameters
- **Create community – V2**: An XML file that programs the SNMPv2 community parameters
- **Create V2 trap receiver**: An XML file that programs the SNMPv2 trap receiver parameters
- **Create V2 user**: An XML file that programs the SNMPv2 user parameters
- **Create V3 trap receiver**: An XML file that programs the SNMPv3 trap receiver parameters
- **Create V3 user**: An XML file that programs the SNMPv3 user parameters
- **CREATE default snmp config full**: An XML file that includes creating users, communities, and trap receivers all in one combined file
- **DELETE default snmp config full**: An XML file that deletes all default users, communities, and trap receiver IP addresses

To program SNMP parameters with XML files:

1. If this is the first time to configure your controller, you can skip to step 2. If the controller's SNMP settings have previously been programmed, Load the "DELETE default snmp config full.xml" file to delete all default users, communities, and trap receiver IP addresses
2. Create and load **create v# user.xml** to create a user.
3. Create and load **create community – v#.xml** to create community.
4. Create and load **create v# trap receiver.xml** to create trap receiver.

Notes:

Steps 2 – can be combined with one file **CREATE default snmp config full.xml**.

User names, passwords and community names in the given xml files are used as examples and should be changed to the actual names. Items to be modified are followed with comments on the same line in the example xml files

For example, in the full file the passphrase **adminauth** should be changed to an actual password. Similarly, other parameters, as indicated in the code comments, must be set.

Account information is stored in the xml files. Therefore, these xml files should be kept secure.

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. › 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** or **Flexi Monitor** page.

Alarm Conf. › [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 browser interface:

1. Navigate to the following page to set the Monitor Type:

   System Conf. › Control System › Current Monitor

2. Identify the Load Monitor (called **CurrMonitor X** under the first column) to configure.
3. *Under* **Monitor type**, *select the current type the unit is intended to monitor.*
4. Click **Save** (the diskette button) to preserve your changes.

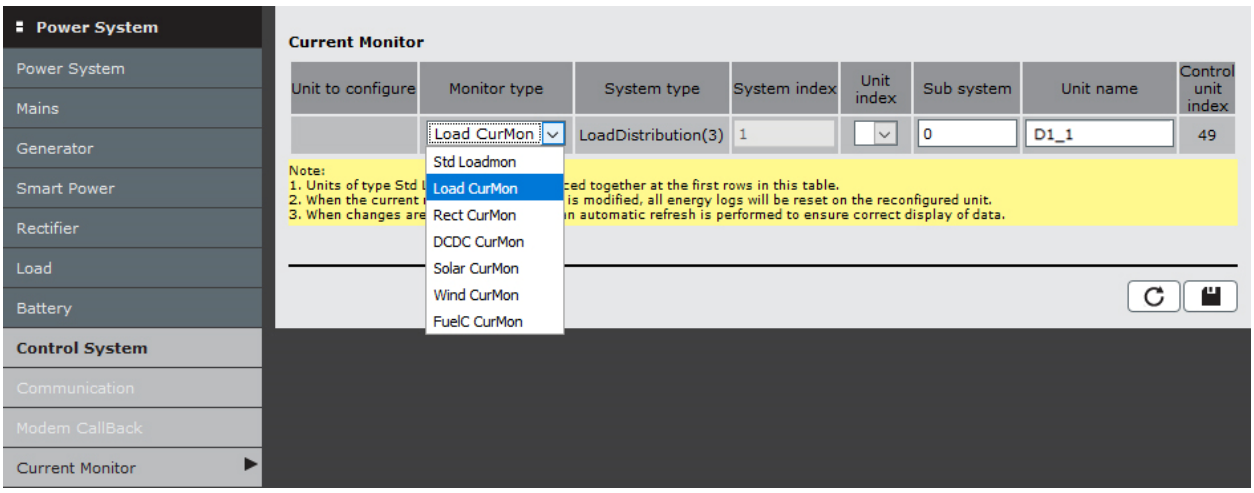


Figure 2.48 – Current Monitor Page (for Configuring Load [Flexi] Monitors)

5. Navigate to the following page to set the alarm monitors:

   Alarm Conf. › [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.

6. 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:

1. Click on the **Currents** sub-heading to expand it.

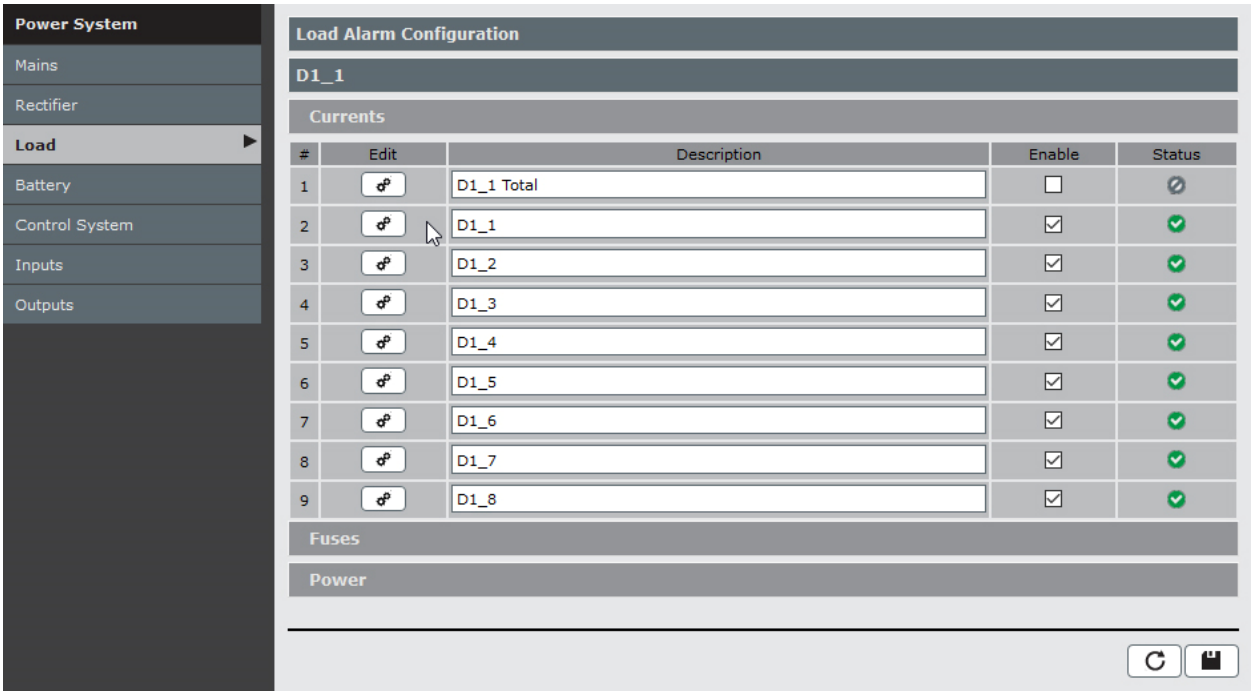


Figure 2.49 – Load Monitor Heading and Sub-headings (Monitor Type: Std Loadmon)

2. Identify the shunt input(s) to configure and click on the **Edit** button.

   Note: The first row is for **D1_1 Total**, an alarm monitor that sums all of the current inputs and generates an alarm if the sum exceeds the specified threshold.

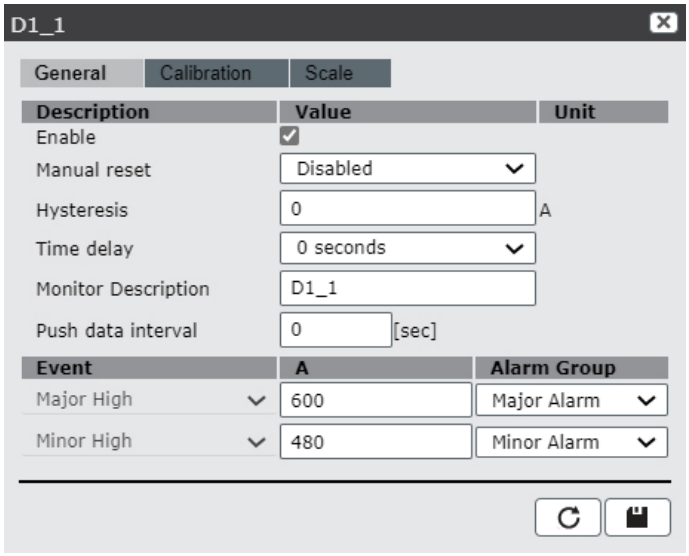


Figure 2.50 – Load Monitor Current Alarm Monitor (General Tab)

3. Click the check box next to **Enable** to enable the alarm monitor.
4. Set the amperage threshold (under **A** [Amp]).
5. Assign alarm groups (if different from the default).
6. Click **Save** to preserve your changes.
7. Click the **Scale** tab.

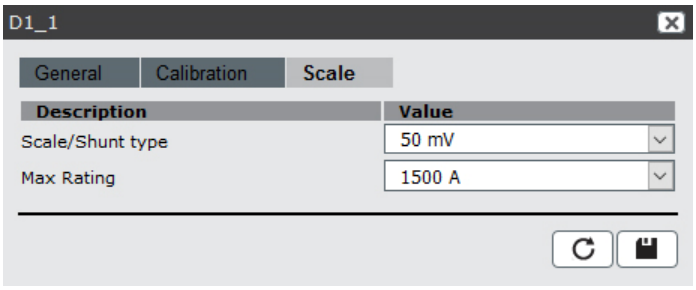


Figure 2.51 – Load Monitor Current Shunt Scale Tab

8. Check that the scale and rating are correct; otherwise, change them by using the menu 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 **Save** to preserve your changes.
10. Repeat the task for any remaining shunt inputs that need to be configured.

Fuse Configuration

To configure a Load Monitor fuse (or circuit breaker) monitor input:

1. Click on the **Fuses** sub-heading to expand it.

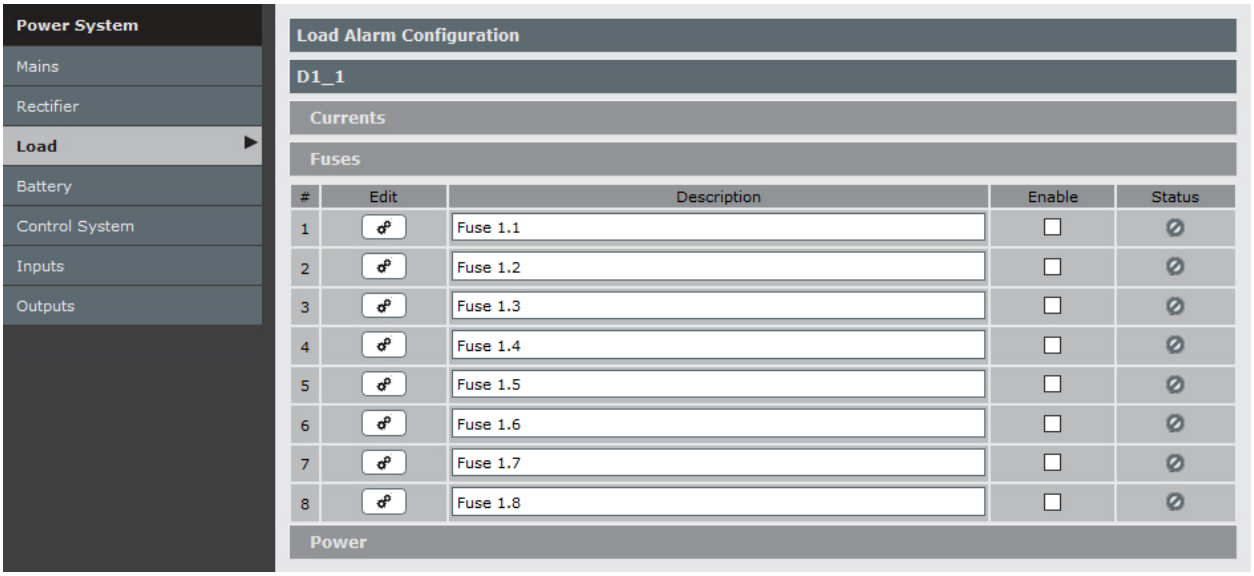


Figure 2.52 – Load Monitor Fuses Sub-Heading (Monitor Type: Std Loadmon)

2. Identify the fuse input(s) to configure and click on the **Edit** button.

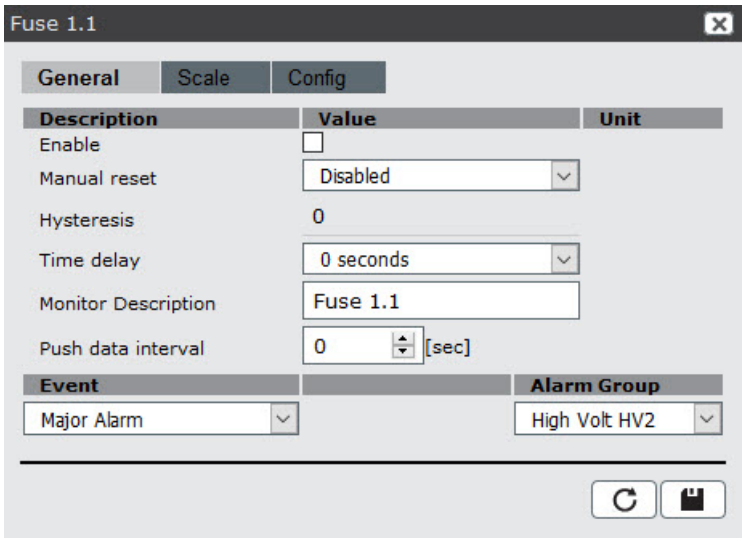


Figure 2.53 – Load Monitor Fuse Monitor General Tab

3. Click the check box next to **Enable** to enable the alarm monitor.
4. 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 **Save** to preserve your changes.
6. Click the **Scale** tab.

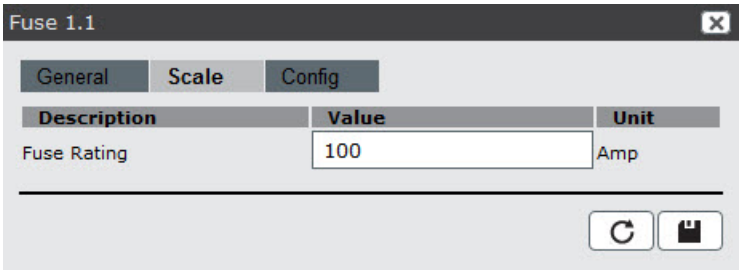


Figure 2.54 – Load Monitor Fuse Monitor Scale Tab

7. Enter the rating of the fuse (or circuit breaker).
8. Click **Save** to preserve your changes.
9. Click the **Config** tab.

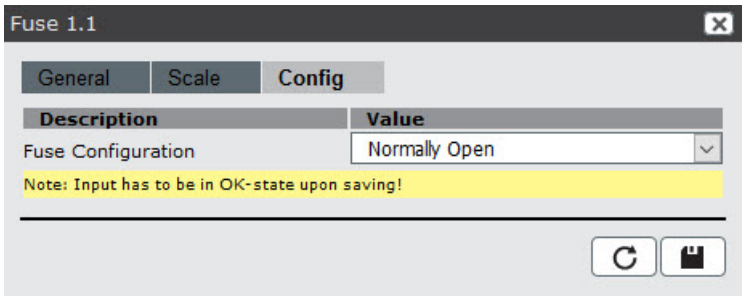


Figure 2.55 – Load Monitor Fuse Configuration Tab

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 **Save** to preserve your changes.

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. › 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. › 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:

1. Go to **System Conf. › 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 **Save** (the diskette button) to preserve your changes.

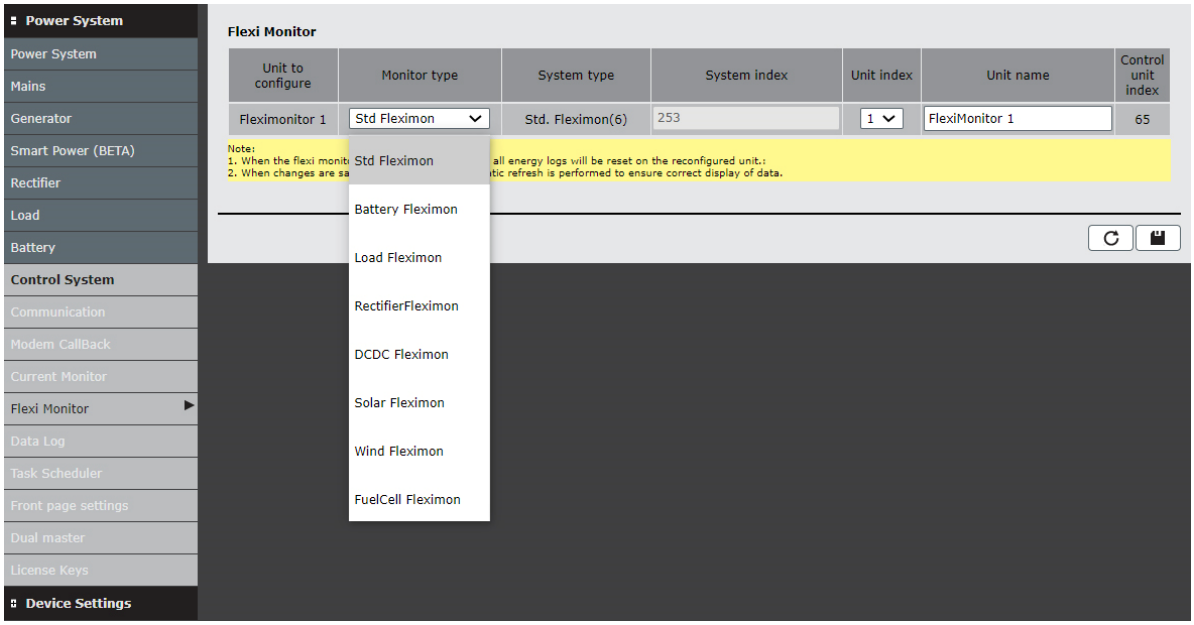


Figure 2.56 – Flexi Monitor Configuration Page

5. Navigate to the following page to set the alarm monitors:

   Alarm Conf. › [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 Monitory 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.

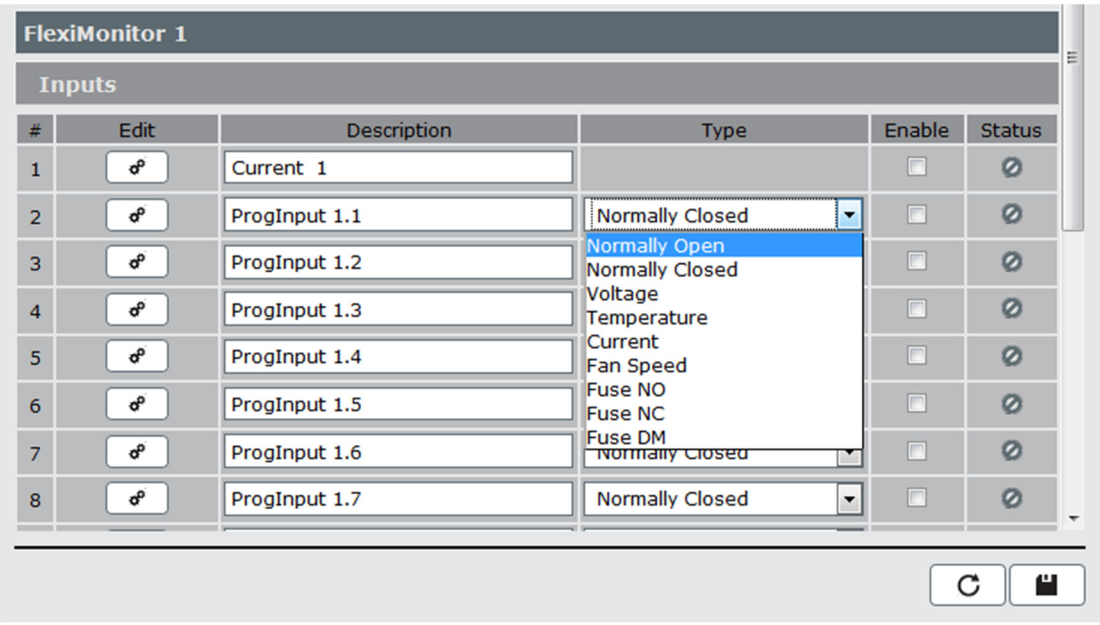


Figure 2.57 – Configuration Section and Options for Flexi Monitor Inputs (Alarm Configuration › Inputs Page)

8. Identify the fuse input(s) to configure and click on the **Edit** button.

   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 **Save** (the diskette button) to preserve your changes.

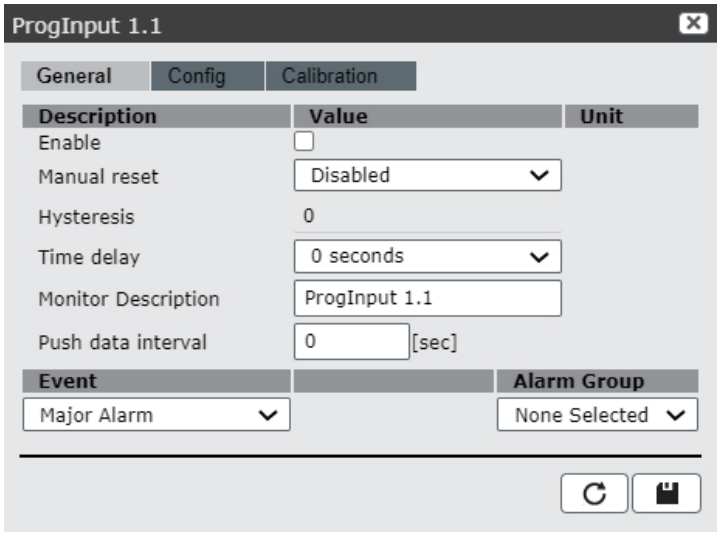


Figure 2.58 – Flexi Monitor Edit Window (General Tab)

11. Click on the **Config** tab.
12. Next to **Input Configuration**, click on the menu list and select the type of input that is connected to the alarm monitor channel.

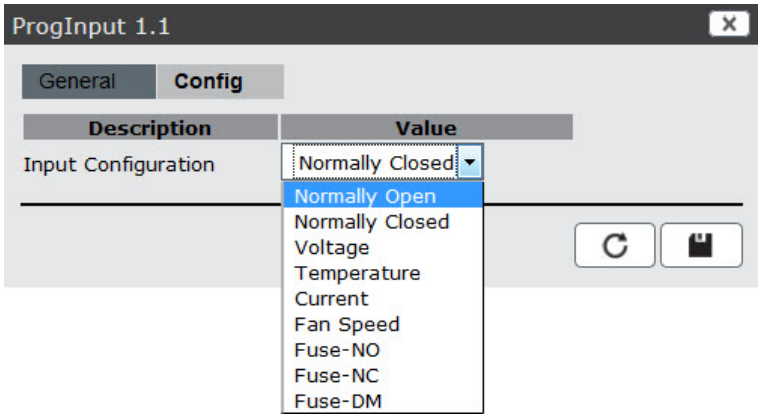


Figure 2.59 – Configuration Tab for Flexi Monitor Inputs (Edit Window)

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 menu list under **Event** to select the alarm event type.
17. Use the menu list under **Alarm Group** to select the alarm group to trigger for alarm output.
18. Click **Save** (the diskette button) to preserve your changes.
19. *Repeat steps 8 to 18 for any remaining inputs to configure.*

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. › Outputs › Logical Groups (tab)

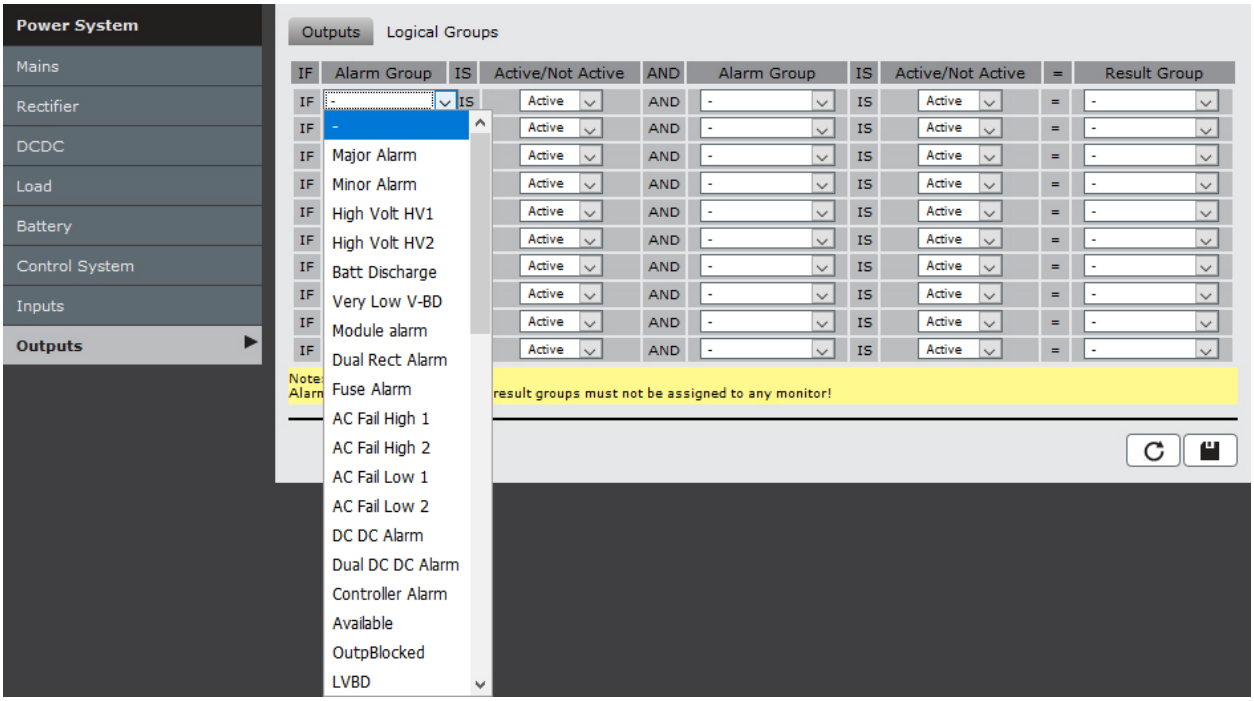


Figure 2.60 – Logical Groups Tab

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 menu 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 menu list for **Active/Not Active** (to the right of the **Alarm Group 1** column).
5. Select an Alarm Group from the menu 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 menu 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 menu 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 **Save** to preserve your 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.

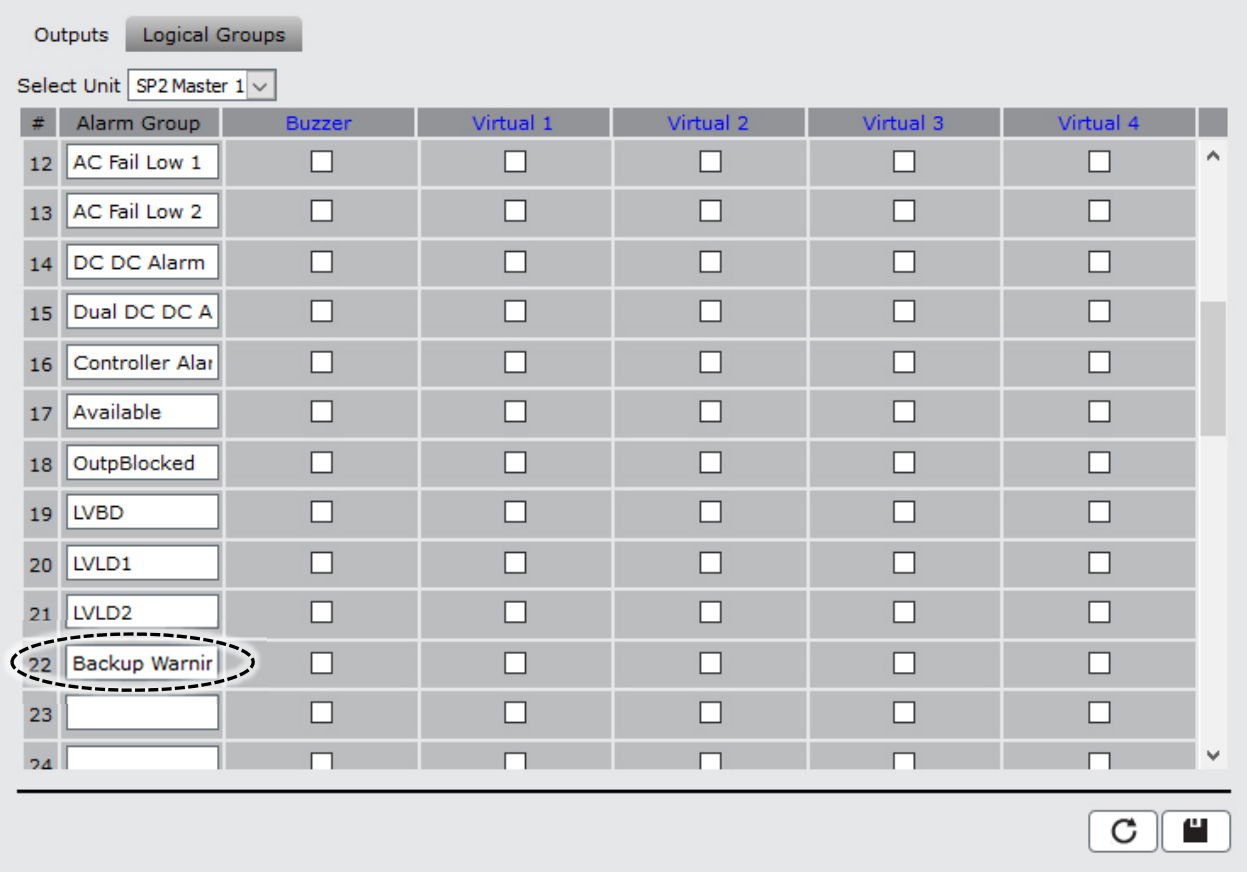


Figure 2.61 – Alarm Group Mapped to Alarm Output Relay (Example)

5. Click **Save** to perserve your changes.
6. Click on the **Logical Groups** tab (at top, next to the **Outputs** tab).
7. In the first available row, select **AC Fail Low 1** 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).

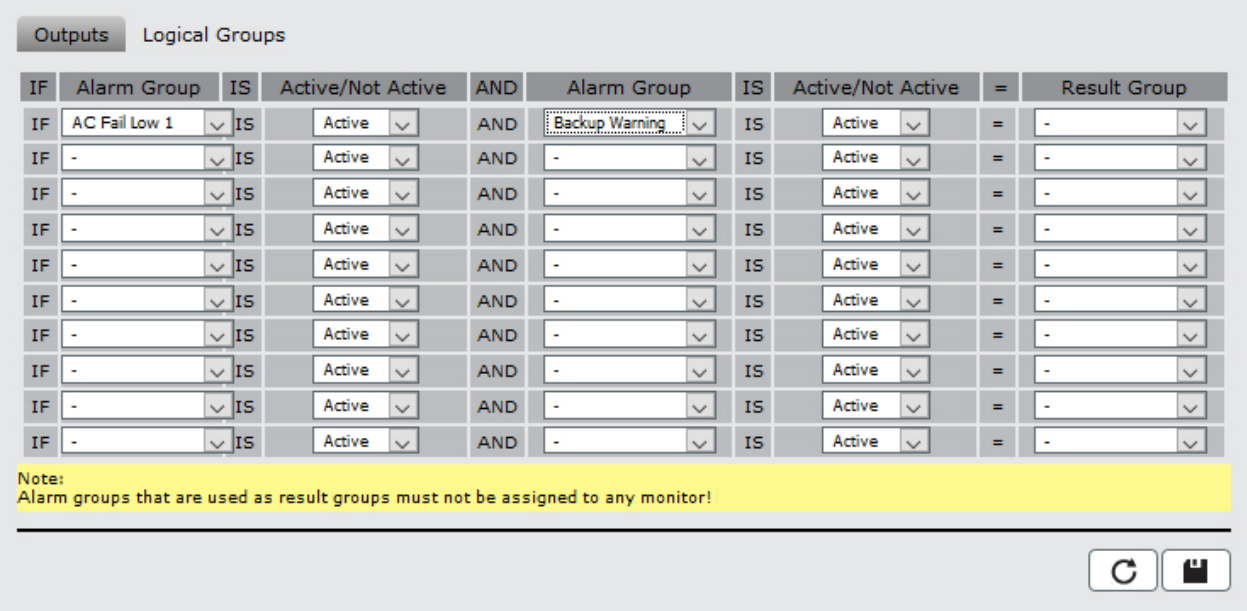


Figure 2.62 – Logic Group Setup Example

12. Click **Save** to preserve your 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.

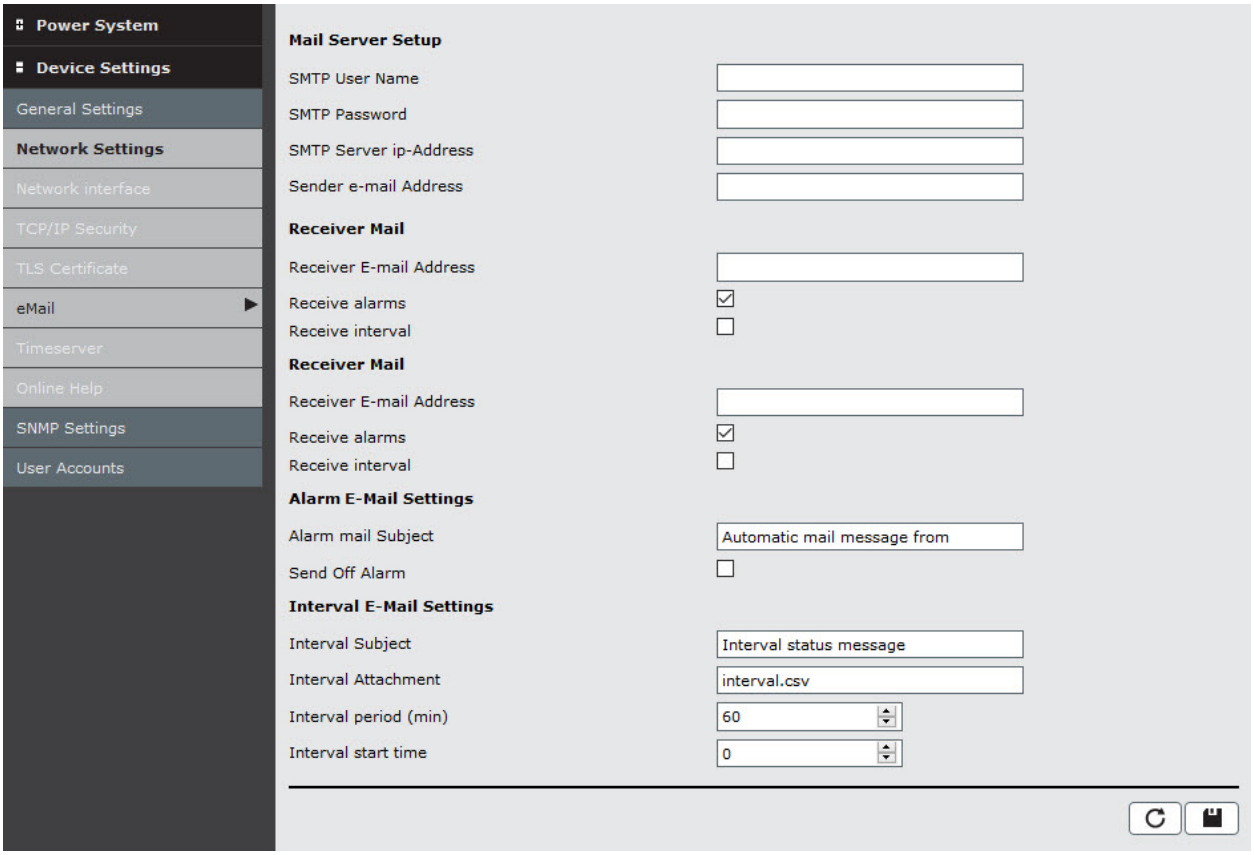


Figure 2.63 – Email (SNMP) Configuration Page

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).



Figure 2.64 – Receiver Mail Sections

6. Select which messages these recipients are to be sent: Alarms, interval messages (data logs).

   Note: The **Receive interval** option requires an additional custom file in the root directory in the controller's memory, named **interval.csv**. Unless you have loaded such a file with the appropriate commands, checking this option has no effect. Additional settings are covered in Step 10 and following, below.

7. If configuring alarm messages, find the **Alarm E-Mail Settings** section.



Figure 2.65 – 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.

   Note: If you are only configuring **Receive alarms** options, your configuration is complete; skip the following steps. Click **Save** to preserve your settings.

10. If configuring interval data messages, find the **Interval E-Mail Settings** section.

    Note: To use this feature, the **Receive interval** option must be selected (Step 6) and an additional custom file (named **interval.csv**) must be loaded in the root directory in the controller's memory.

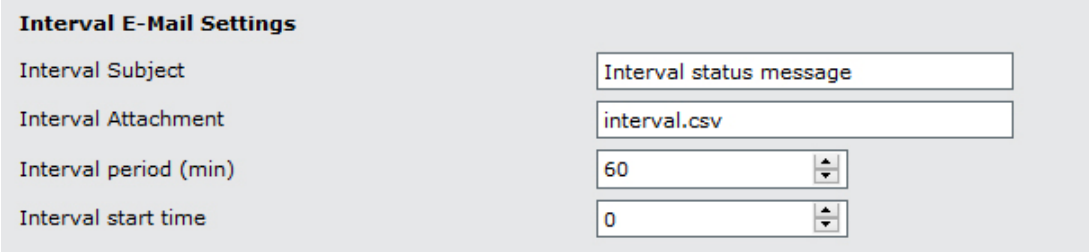


Figure 2.66 – Interval Settings Section

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 **Save** to preserve your settings.

3. Operation

This section describes common operational procedures that can be accomplished through the Controller browser interface.

Using the Commands Buttons

The **Commands** section provides function buttons to quickly execute basic tests and resets. Click on the **Commands** button 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 **Commands** › **System Commands** page.

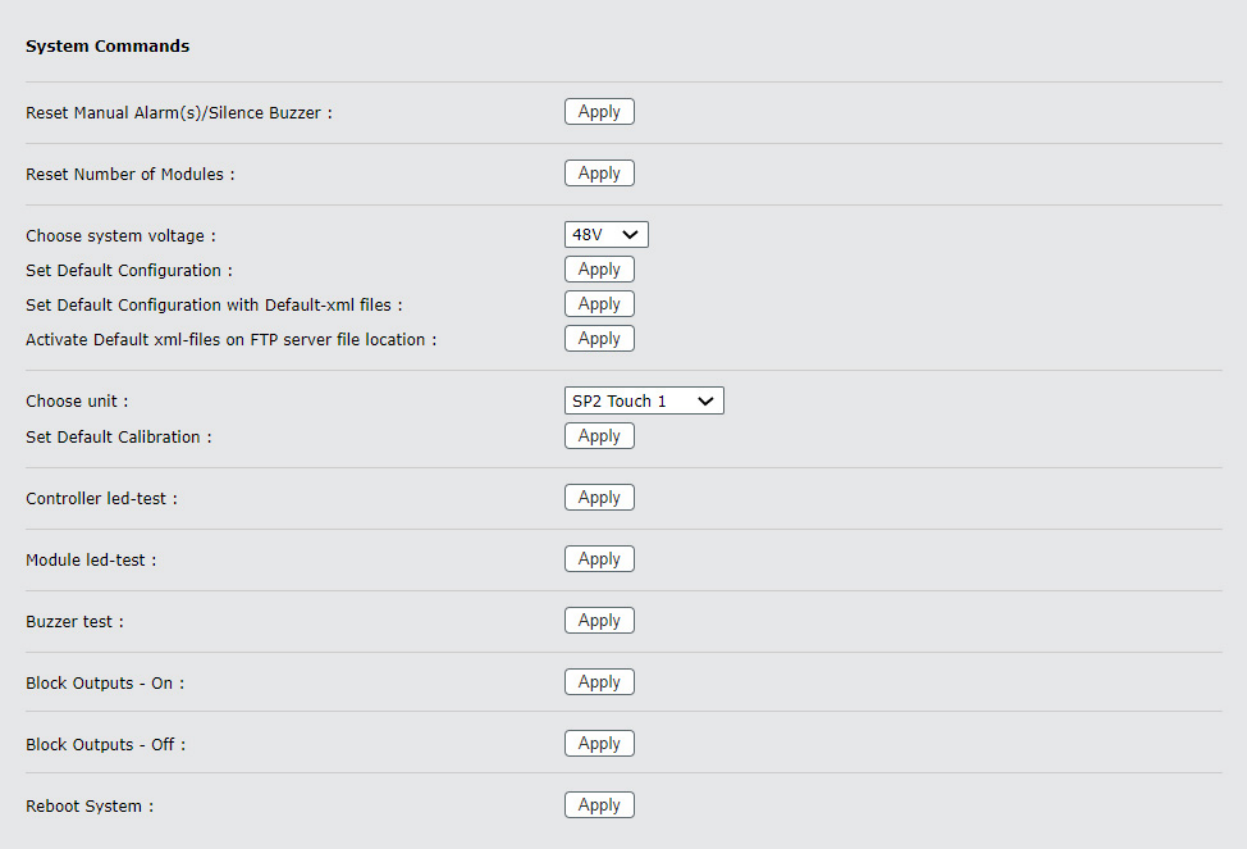


Figure 3.1 – System Commands Page

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.

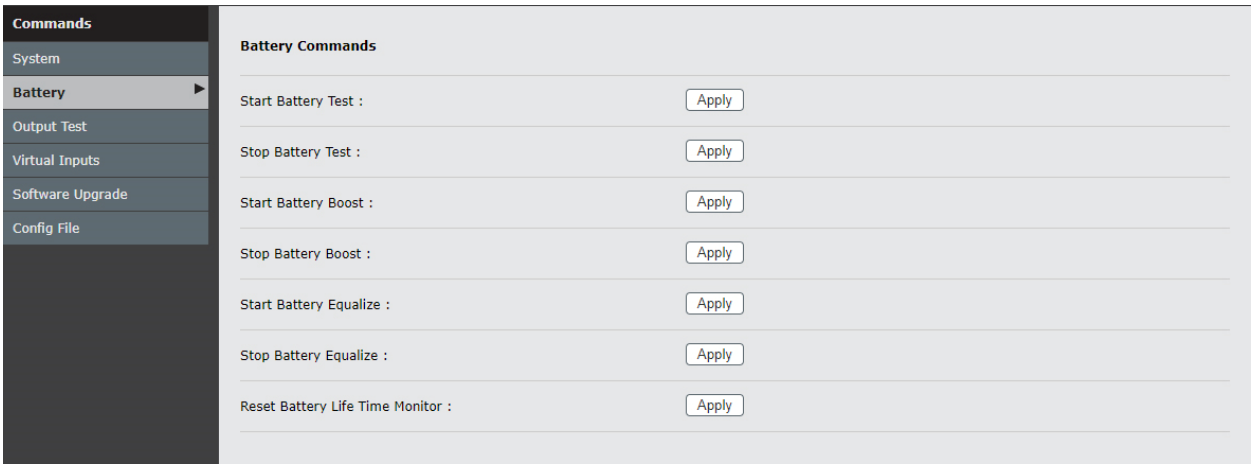


Figure 3.2 – Battery Commands Page

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** menu 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).

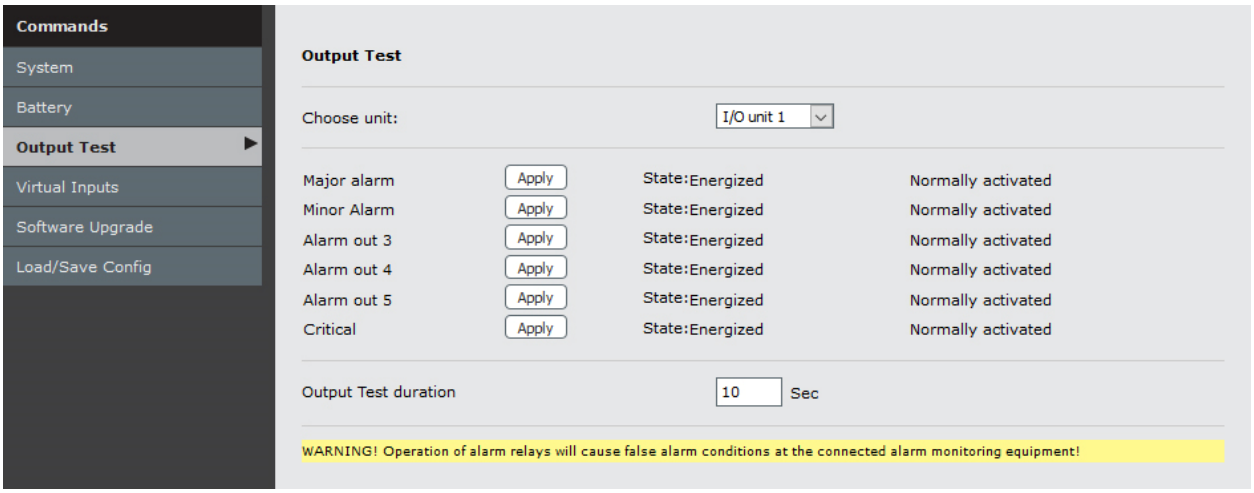


Figure 3.3 – Output Test Page

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. › Inputs › [Controller] Input Configuration**

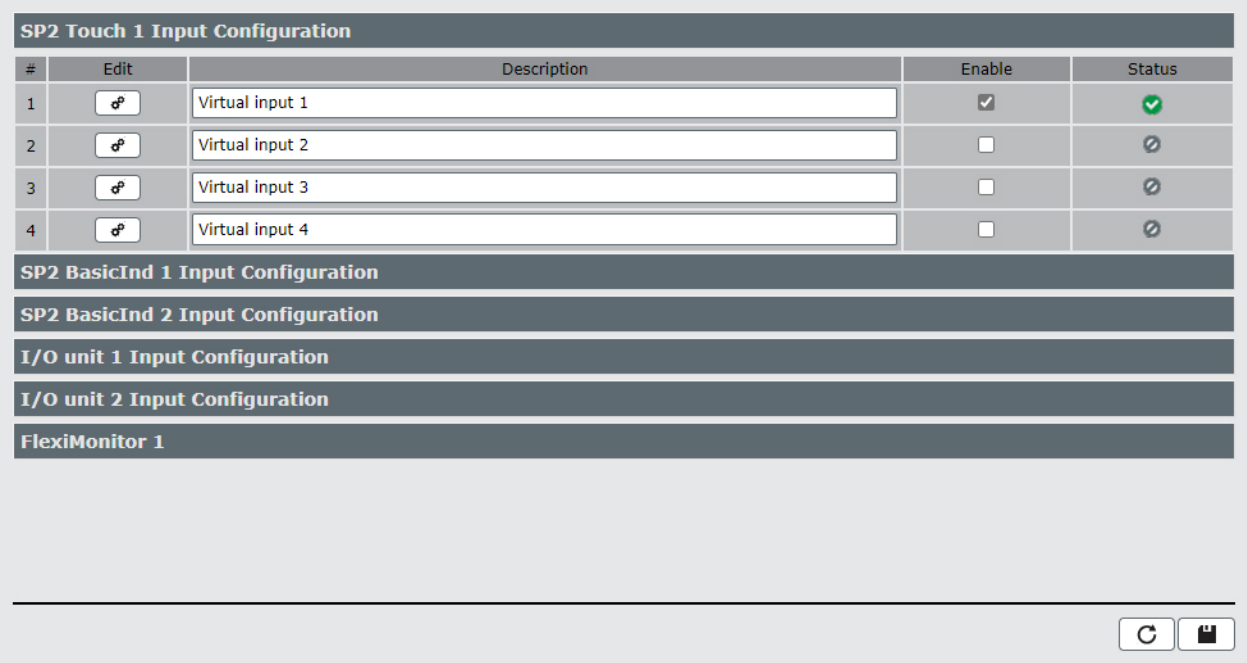


Figure 3.4 – Virtual Inputs (Smartpack2 Touch)

2. Click on the **Edit** button (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** menu list.
5. Click **Save** to preserve your changes. The Virtual Input is now enabled and assigned to an Alarm Group.

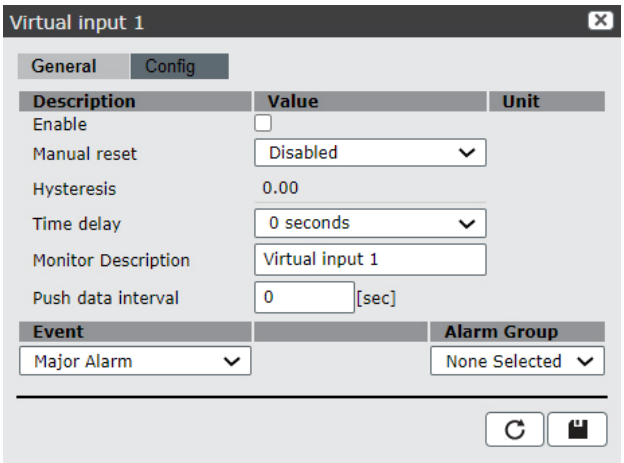


Figure 3.5 – Virtual Input Edit Window

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** menu 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).

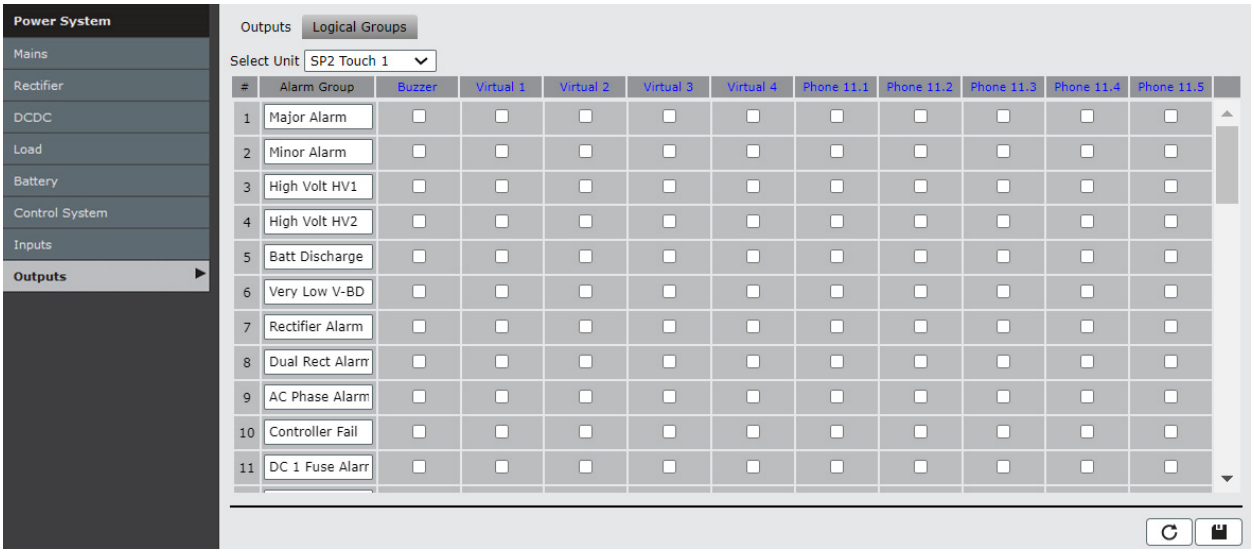


Figure 3.6 – Map Alarm Groups to Output Channels

The Virtual Input is now set up.

The following graphic illustrates the assignments and mappings required to set up a Virtual Input:

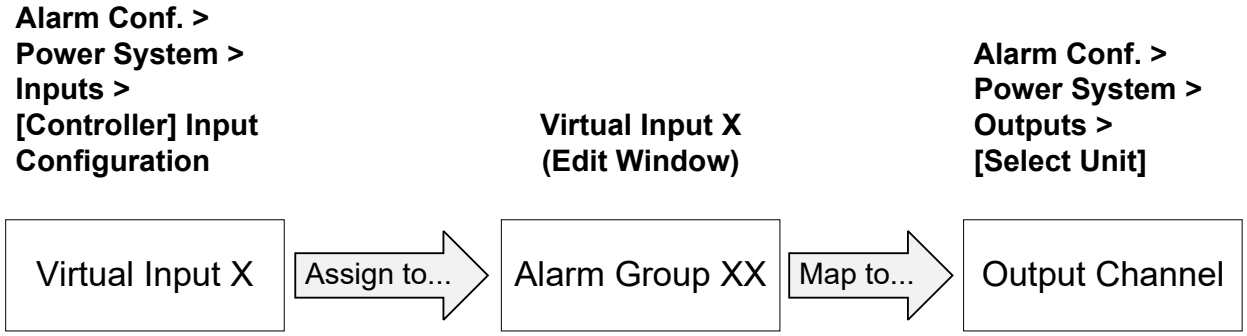


Figure 3.7 – Setup Path for Virtual Inputs

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. Although 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).

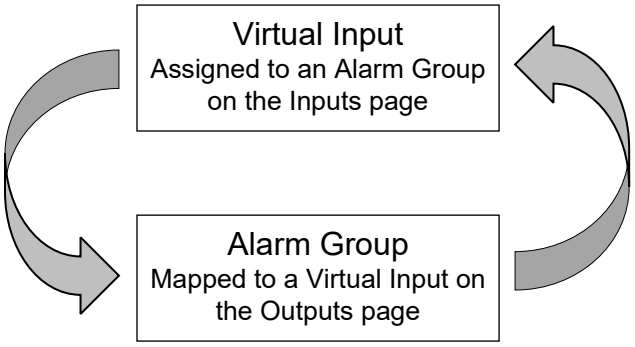


Figure 3.8 – Virtual Input and Alarm Group Assignments

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 Input Commands** page.

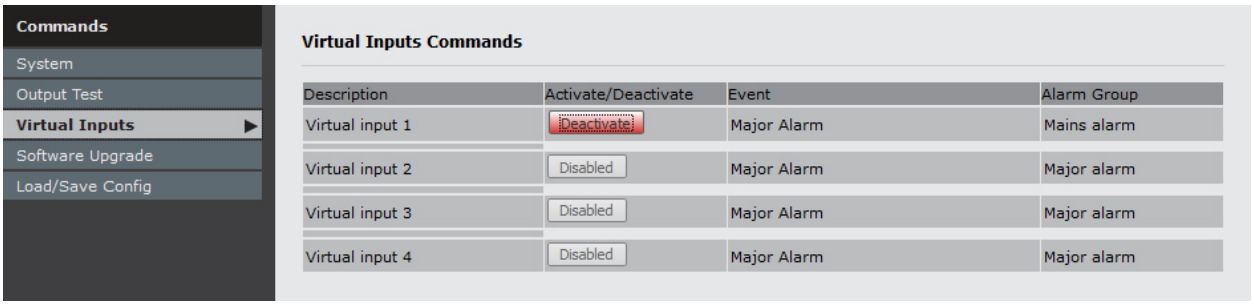


Figure 3.9 – Virtual Inputs (with an Activated Channel)

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.

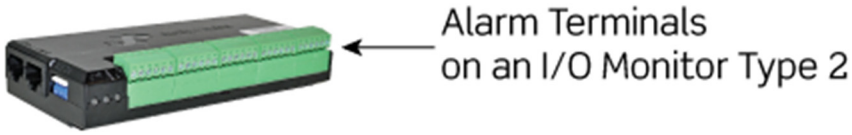


Figure 3.10 – I/O Monitor Type 2

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** menu list. Click the **Apply** button next to an **Alarm Output** line. The lamp activates when the correct relay is activated.

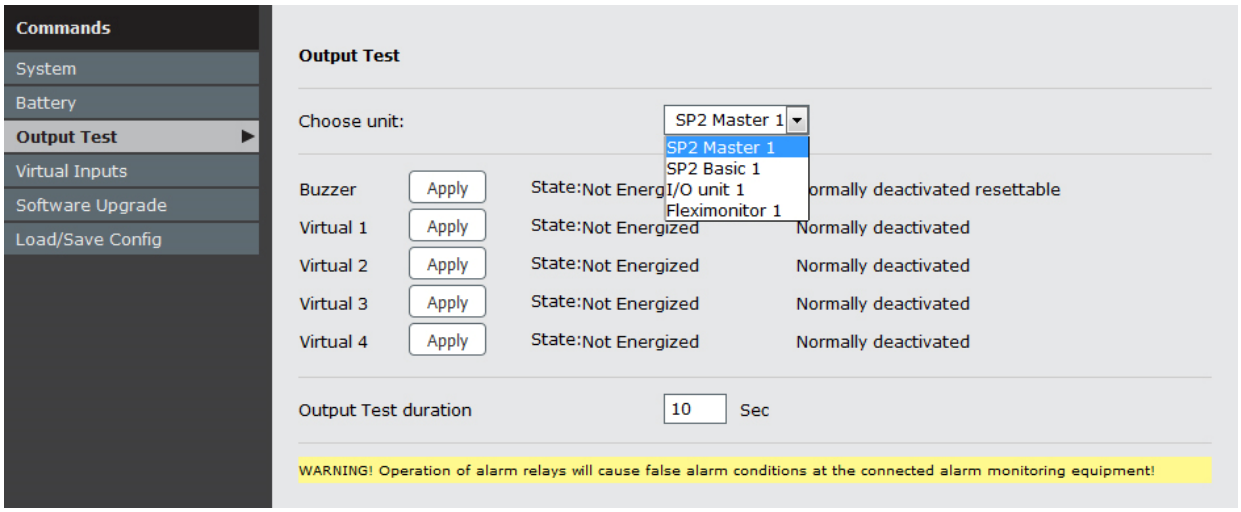


Figure 3.11 – Output Test Page

4. Go to the **Alarm Conf.** › **Outputs** page and select the controller or **I/O Monitor** device from the **Select Unit** menu list.

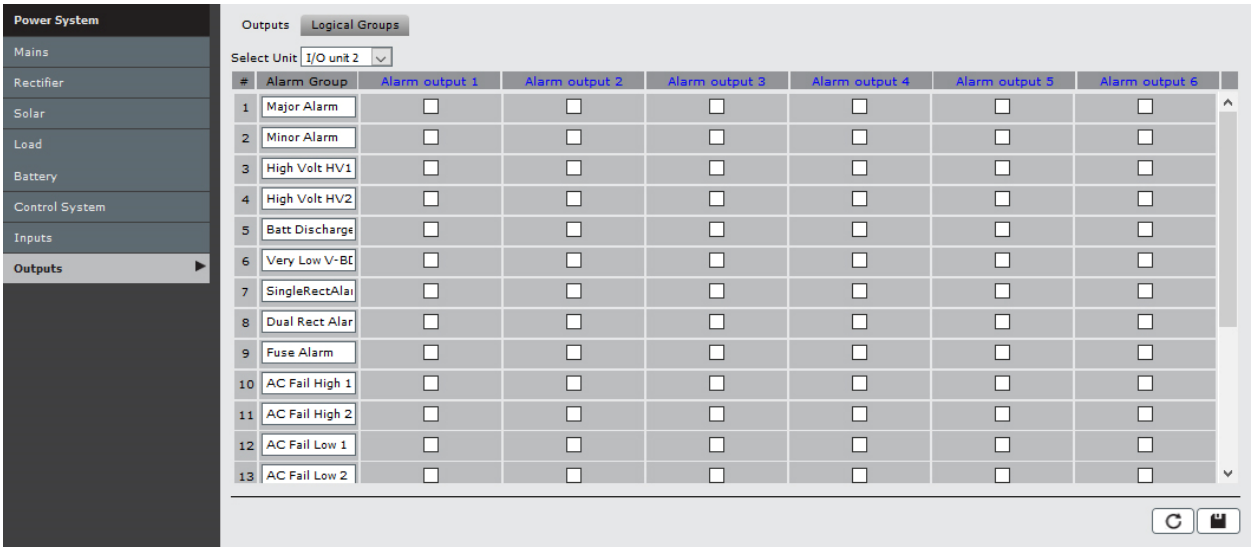


Figure 3.12 – Alarm Outputs Page for an I/O Monitor

5. Locate the Alarm Output in the column headings and click on it (the **Alarm output** heading is a hyperlink). The **Output Config** options appear.

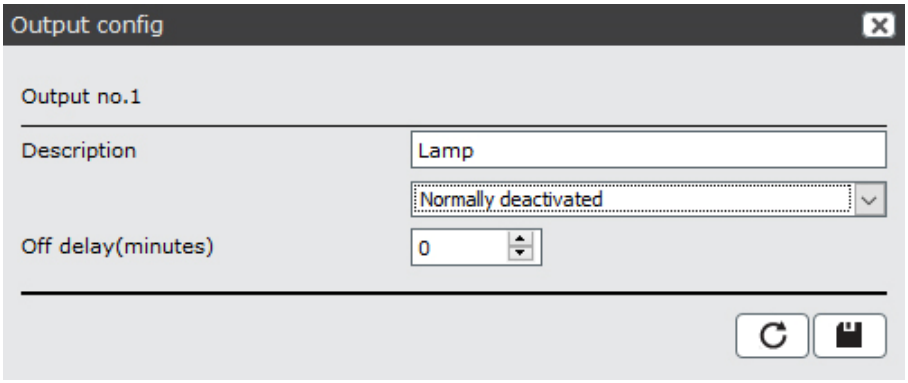


Figure 3.13 – Output Configuration Options for Alarm Output 1

6. Change the text in the **Description** field to something appropriate, like “Lamp”.
7. Make sure **Normally deactivated** is selected in the menu list to the right of the Description field.
8. Click **Save** (the diskette button) to preserve your changes.
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.

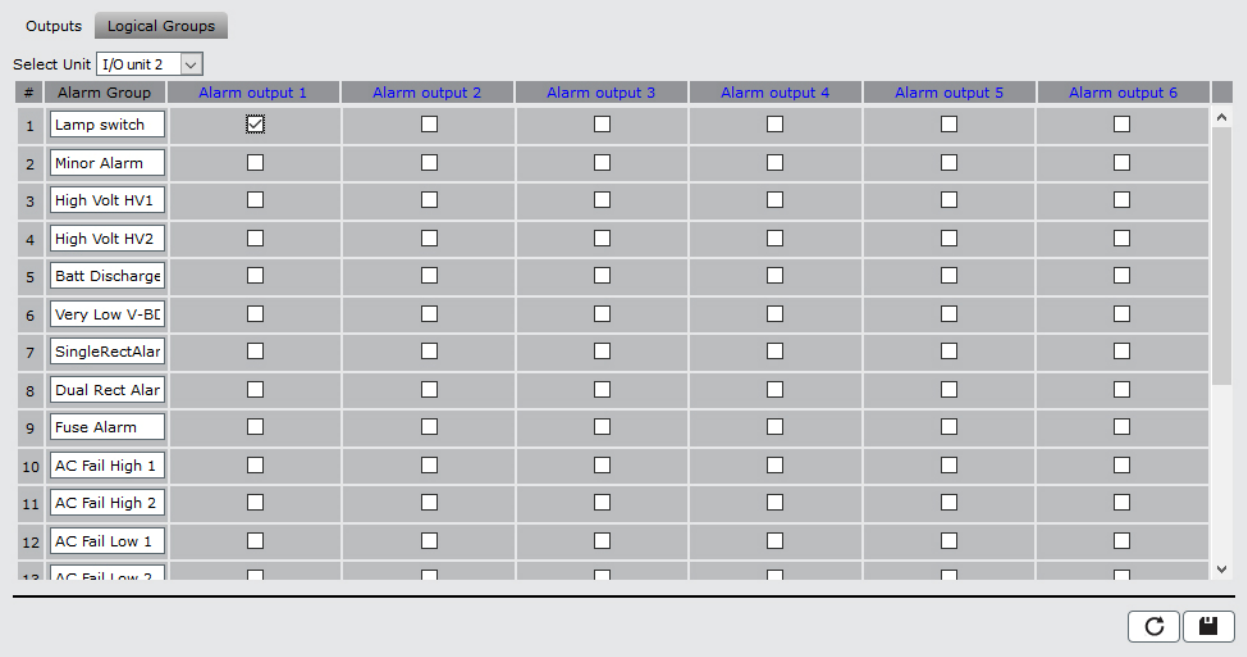


Figure 3.14 – Example of Mapping an Alarm Group to an Output

12. Click **Save** (the diskette button) to preserve your changes.
13. Go to the **Alarm Conf. › Inputs** page and click on the **[Controller] Input Configuration** heading.

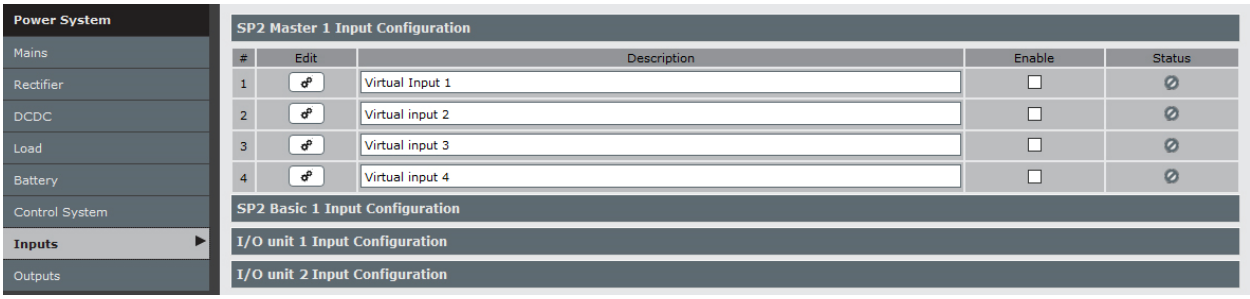


Figure 3.15 – Location of Virtual Inputs

14. Identify an available Virtual Input and click on the **Edit** button to open the **Edit Window**.

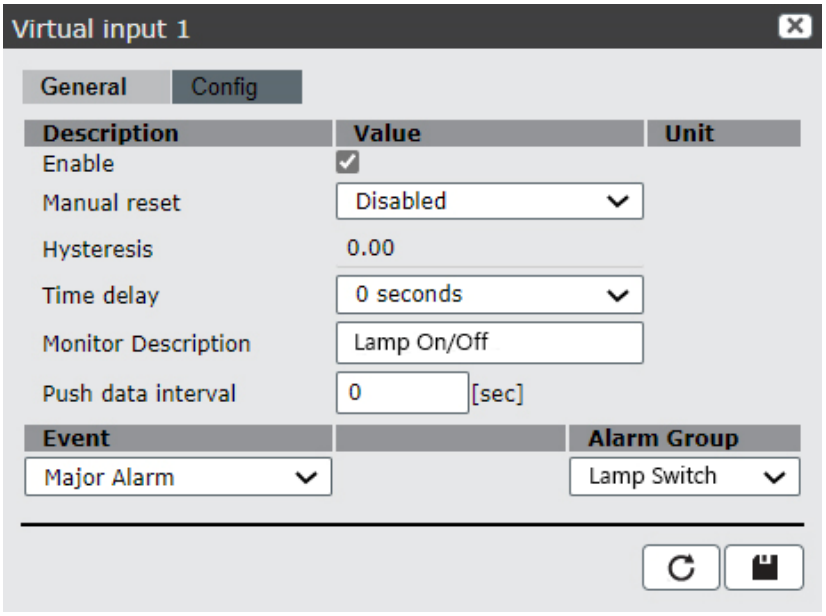


Figure 3.16 – Virtual Input Edit Window

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** menu list.
18. Select the Alarm Group (“Lamp Switch” from step 10 in this example) under the **Alarm Group** menu list.
19. Click **Save** (the diskette button) to preserve your changes.
20. Test functionality on the **Commands › Virtual Inputs** page. Click the **Activate** button next to the Virtual Input selected.

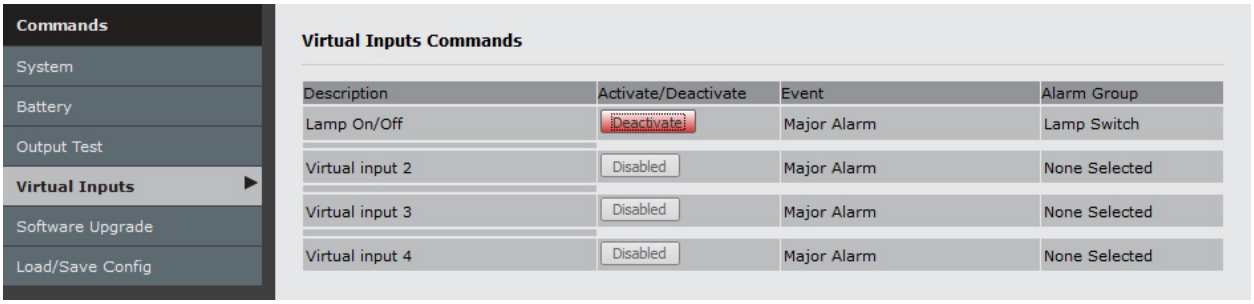


Figure 3.17 – Virtual Inputs Command Page with Input Activated

Setup of a Virtual Input as a lamp switch is complete.

Alarm Relay Test

The alarm relays can be tested the browser interface by going to the **Output Test** page. See the section, “Output Test,” on page 395.

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, click **Save** (the diskette button) to preserve your changes.
3. Go to the **Commands › Battery** page.

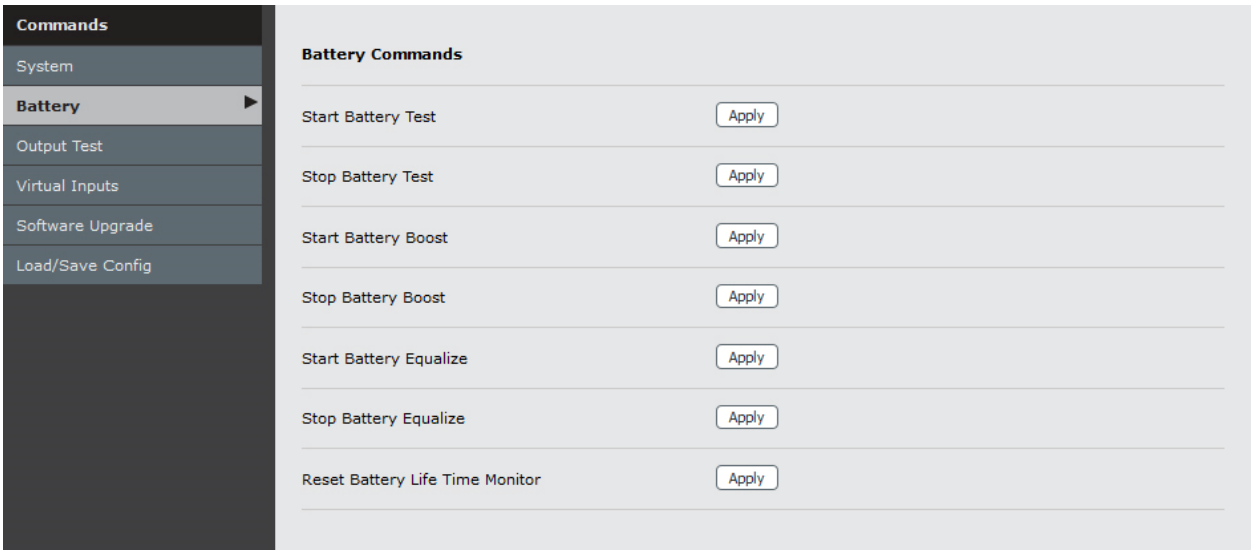


Figure 3.18 – Battery Commands Page

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. (For additional information, see “Event Log,” page 285.)
- **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 browser interface. (For additional information, see “Data Log,” page 286.)
- **Energy log** – A log of energy used for load, rectifier, solar charger, generator, and battery: displayed in watt-hours (total, hourly, daily, and weekly). (For additional information, see “Energy Log,” page 287.)
- **Generator log** – A log of generator run time and fuel consumption (total, daily, weekly, monthly). (For additional information, see “Generator Log,” page 296.)
- **Battery cycle log** – The number of battery cycles (total, daily, weekly, monthly). (For additional information, see “Battery Cycles,” page 297.)

- **Battery test log** – A list of battery discharge tests. (For additional information, see “Battery Tests,” page 298.)
- **Battery string current log** – A log of battery string current values from a battery discontinuance test.
- **Battery string resistance log** – A log of battery resistance values from a battery discontinuance test.
- **Change log** – Parameter change log. (For additional information, see “Change Log,” page 304.)
- **Mains** – A log of AC power run time in minutes per day, hours per week, hours per month, and accumulated hours. (For additional information, see “Energy cost log,” page 294
- **Module inventory** – A list of installed modules.

Logs can be downloaded through the browser interface.

Note: 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 164.

After the datalog has been configured, create and download a log.

To create a log:

1. In the browser interface, choose **Logs › Save logs to file**.

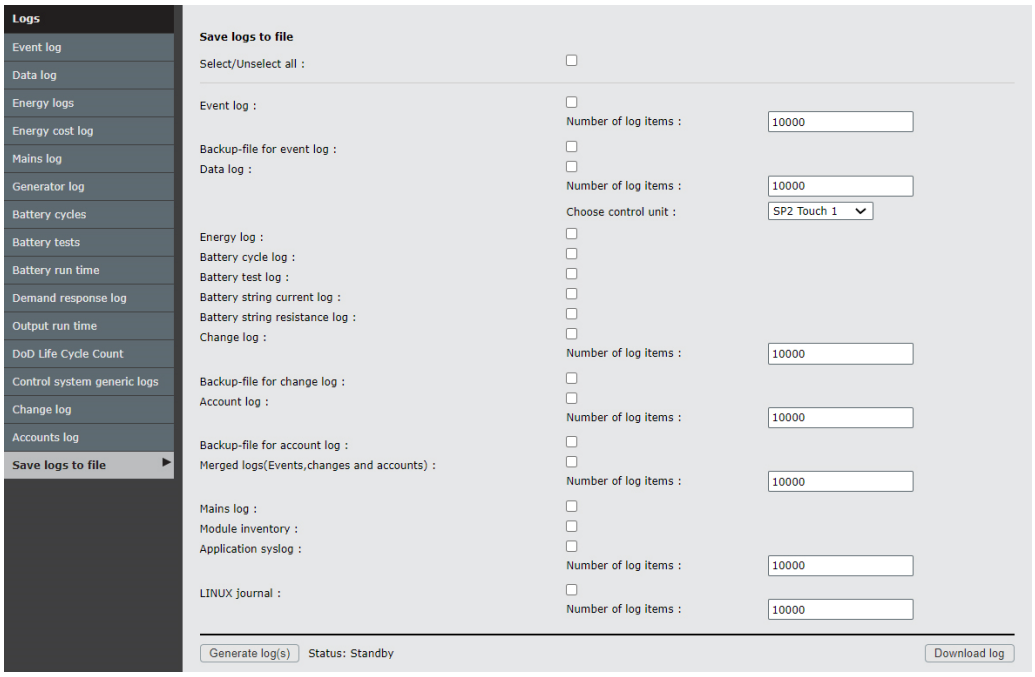


Figure 3.19 – Save Logs Page

2. 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.

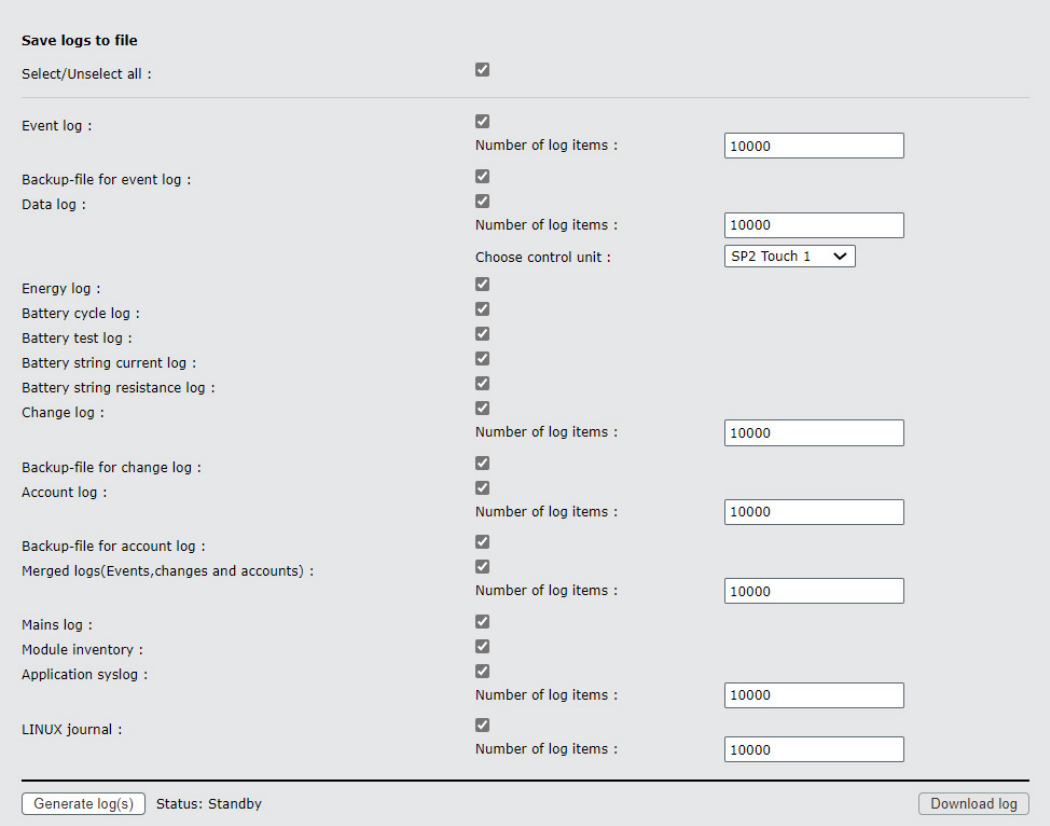


Figure 3.20 – Choosing Logs to Download

3. 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!**

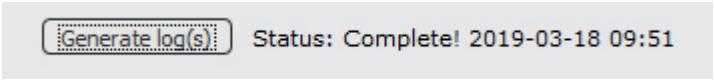


Figure 3.22 – Status: Complete! Message

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.

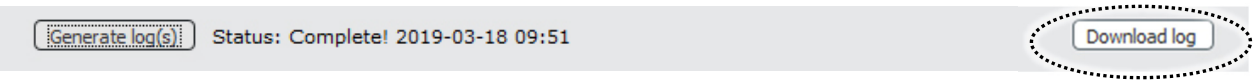


Figure 3.23 – Download Log Button

5. When prompted to open or save the file, choose **Save File**.

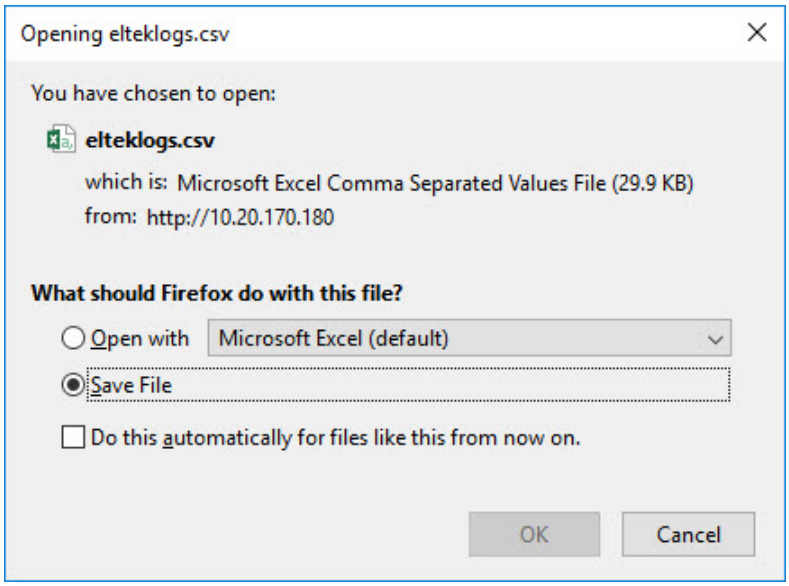


Figure 3.24 – Saving Log

Note: By default, the file is usually saved to your Downloads folder. The exact location. Depending on your operating system and browser, you may have additional options for file location and file type. If given a choice of file type, be sure to choose **Comma Separated Values File (*.csv)**.

After the file has been saved, it can be imported into a spreadsheet program, such as Microsoft Excel, for viewing and analysis.

Configuration Backup

Configuration backup is an important part of system configuration. The configuration file allows you to restore your system to a previous state after a replacement unit is installed, or if unauthorized or undesirable changes have been made.

Eltek programs the controller from the factory with a default configuration, but any changes made in the field need to be saved. Eltek has provided two ways to accomplish this task, but each method has its own limitations.

Overview

The following sections provide a description of the different methods.

- Full Backup
- Save Change Log to XML (ver. 2.5 or later)

Note: Backups do not retain the IP address settings and SNMP configuration.

Full Backup

A full backup downloads a complete “snapshot” of the controller settings and can be used to program a controller that has been reset to factory defaults. This method gives you a file with an extension of .HEX for every piece of the controller (for example, Master controller, Basic controller, and all CAN devices).

These files can be uploaded individually via the browser interface and will restore the controller to the configuration when the file was saved.

Note: These files are good only for the controller and software revision for which it was saved. This means that these backup files should not be used on replacement controllers, and need to be redownloaded after any software upgrade.

Save Change Log to XML (ver. 2.5 or later)

This method downloads an XML file based on changes recorded in the controller’s change log. This file can be used to configure a controller after a replacement has been installed, or configure multiple controllers in similar systems.

This method is very quick, and gives you a single file, with an extension of .XML (Changelog.XML) for all controller pieces (Master, Touch Basic, Basic Industrial, Smartpack S, Smartpack R or Compack, and CAN Nodes).

This file can be used for replacement controllers, even if the software has been updated since the file was generated.

Note: In version 2.11 and later, the change log recording function normally does not include any calibrations changes made to voltage, current, battery breaker, and load breaker inputs. Changes to the battery breaker and load breakers inputs are now classified as “Calibrations” when moving from Normally Closed/Diode Matrix to Normally Open; thus they are not included in the Change log xml. If an xml configuration needs to include changes to battery and load breakers inputs, from Normally Closed/Diode Matrix to Normally Open, the data point entry must be manually added.

Procedures

Note: Backup files are valid only for the system and software version used to create the backup. Never use the backup on another system or different software version.

Different backup procedures apply to various controllers.

- **Smartpack2 Touch** controller – Use the browser interface to save a HEX or an XML file to a computer.
- **Smartpack2 Master** controller – Use the display to save a HEX file to the controller SD card; or use the browser interface to save a HEX or an XML file to a computer.

  Note: Before making a backup with a Smartpack 2 Master, verify that an SD card is present, and properly inserted in the SD card slot. Slide the lever on the front of the controller from right to left, in order to access the SD card slot.
- **Smartpack S** controller – Use the display to save a HEX file to the controller's internal memory; or use the browser interface to save a HEX or an XML file to a computer. (To retrieve a copy of a backup file on the controller's internal memory, you must use an FTP client to copy the file to a computer.)
- **Smartpack R** controller – Use the browser interface to save a HEX or an XML file to a computer.
- **Compack** controller – Use the browser interface to save a HEX or an XML file to a computer.

Making a Full Backup

To make a full backup of controller modules:

1. From the home screen, choose **Commands › Config. File › Save Config. File**.

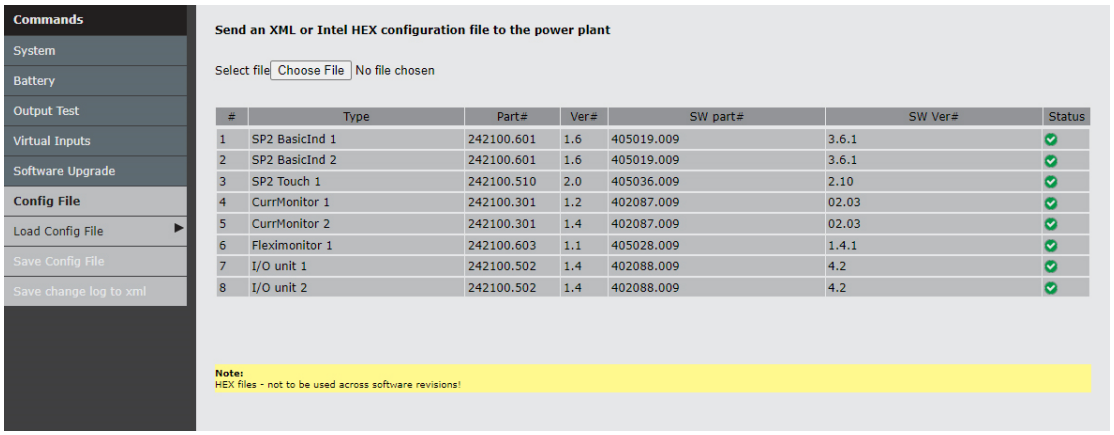


Figure 3.25 – Saving a Configuration File

2. Select (check) all the items for backup.

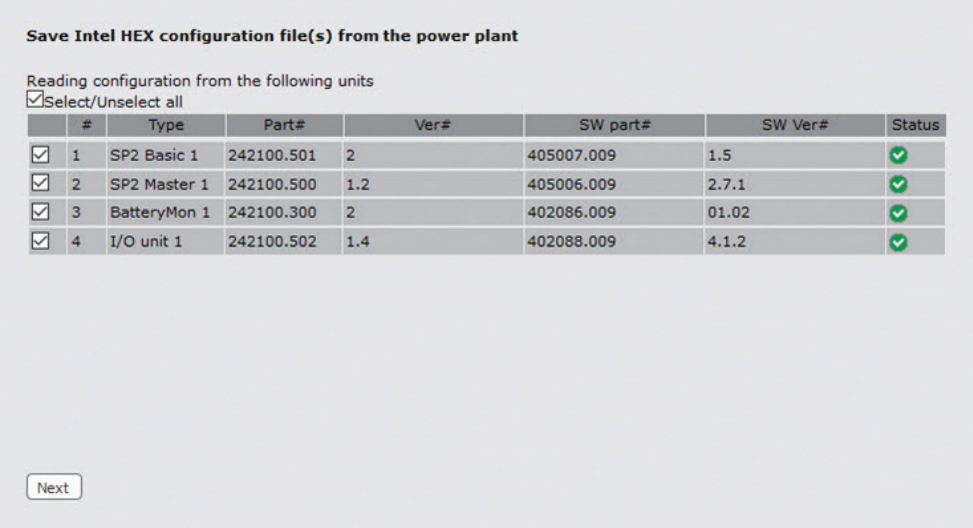


Figure 3.26 – Select Items for Backup

3. After selecting the controller modules, click **Next**.
4. On the next save file(s) page, click **Start reading files**.

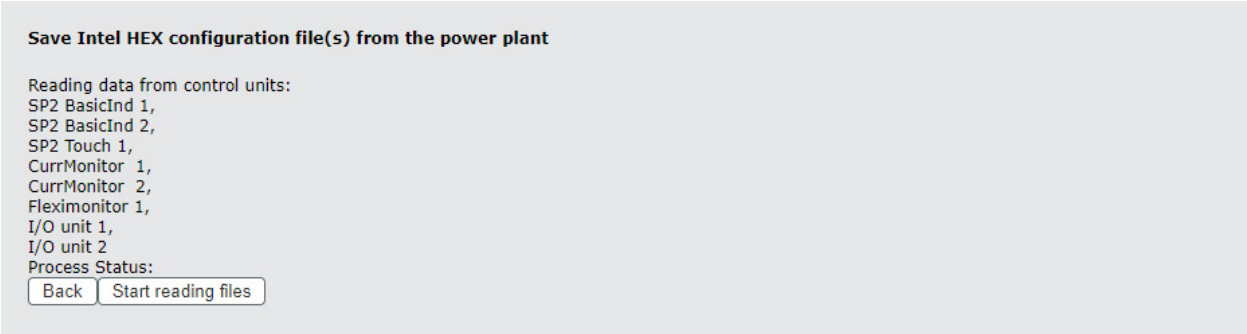


Figure 3.27 – Start Reading Files

5. A message appears: "**Loading...The selected file will be read!**" Click **OK** on this dialog box.

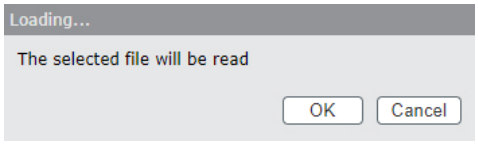


Figure 3.28 – File Loading Message

A progress bar appears, indicating that the file is being generated.

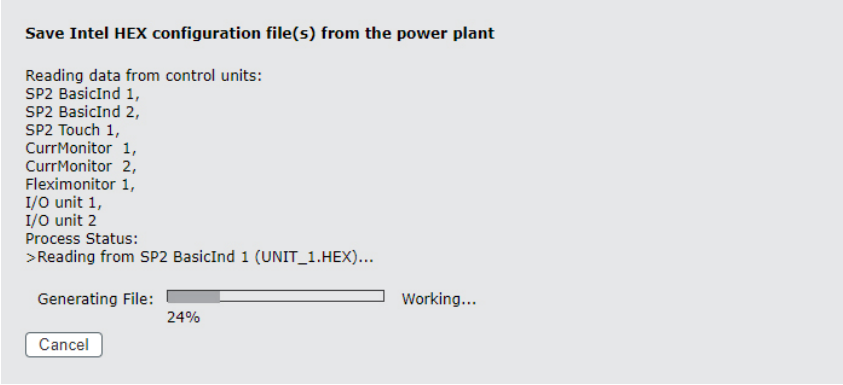


Figure 3.29 – Progress Bar

6. After the file is generated, you will see another dialog, giving you the option to open or save the generated file. Choose the option for **Save File**, then click **OK**.

   In 2.10, using Microsoft Edge browser, the file is automatically downloaded (to the Default Downloads folder; a message appears with options to **Open file** or **See more**. (See second figure below.)

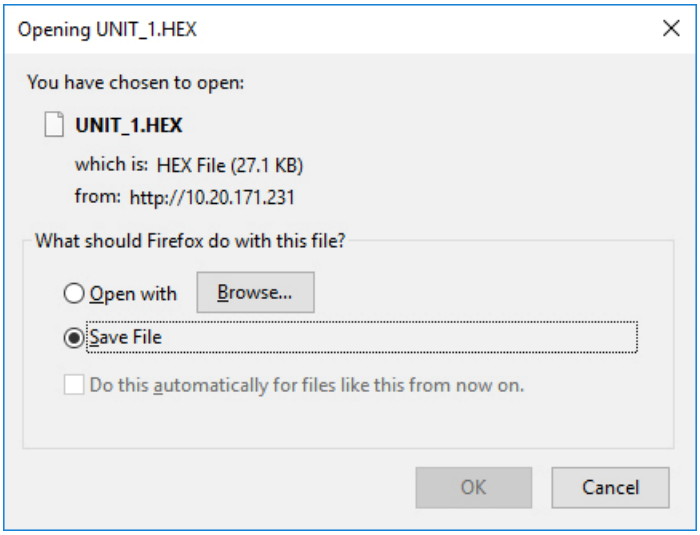


Figure 3.30 – Save File Dialog

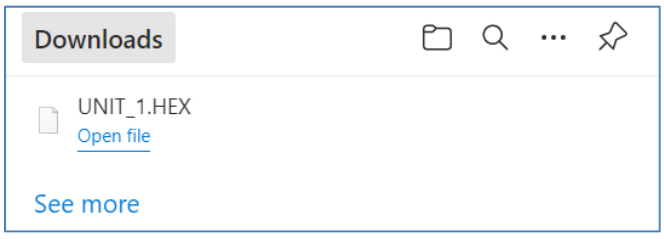


Figure 3.31 – Downloaded File Saved Automatically (Edge/Windows 10)

7. After the configuration file is saved, if you selected more than one file for download, the screen returns to the previous page and you are given options to continue with the next file (click **Start reading files** again), or to **Cancel** any additional downloads. After you click **Start reading files** for subsequent units, a dialog appears, to inform you that **The next selected file will be read** (Figure 3.32, below).

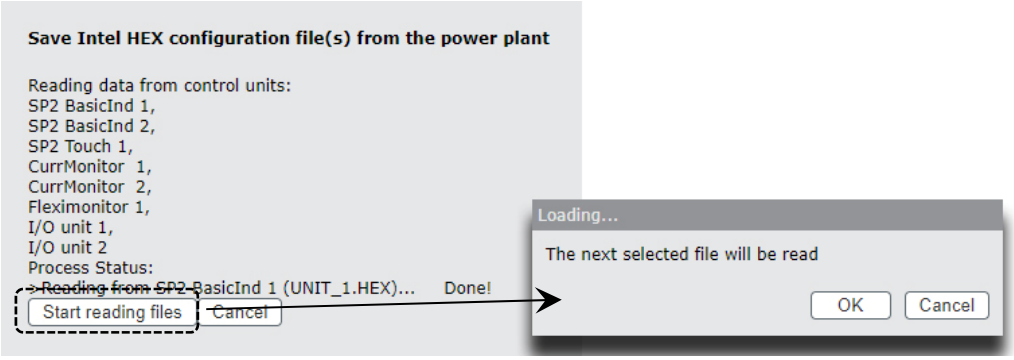


Figure 3.32 – Option to Download Next File

When all of your selected files have been saved, the message “Finished” appears at the bottom of the page. Click the **Back** button to return to the setup page.

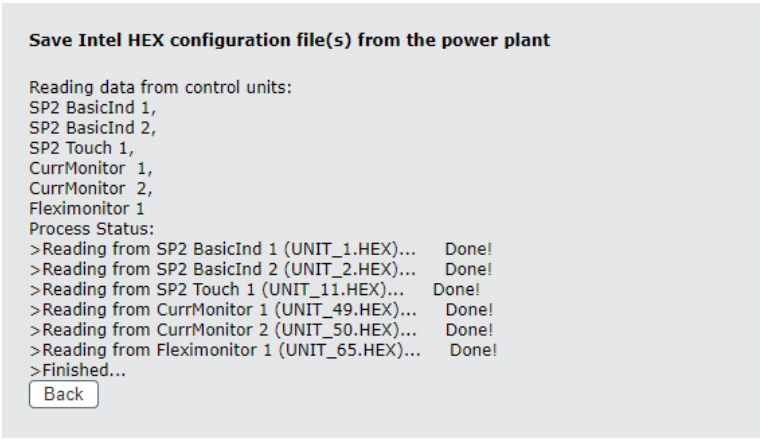


Figure 3.33 – Downloads Finished

After you click the **Back** button, the screen returns to the **Save Intel HEX configuration file(s)** page (Figure 3.26). From there you can quit or navigate to other portions of the web browser interface.

8. Locate the backup files in the **Downloads** folder in the Windows operating system. Copy the files to an archive where they can be retrieved if needed.

For additional details on loading and saving config files, see “Config File,” page 318.

Making an XML Backup from the Change Log

Note: In version 2.11 and later, the change log recording function normally does not include any calibrations changes made to voltage, current, battery breaker, and load breaker inputs. Changes to the battery breaker and load breakers inputs are now classified as “Calibrations” when moving from Normally Closed/Diode Matrix to Normally Open; thus they are not included in the Change log xml. If an xml configuration needs to include changes to battery and load breakers inputs, from Normally Closed/Diode Matrix to Normally Open, the data point entry must be manually added.

To make a backup from the change log (requires version 2.5 or later):

1. From the home screen, choose **Commands › Load/Save Config › Save change log to XML**.

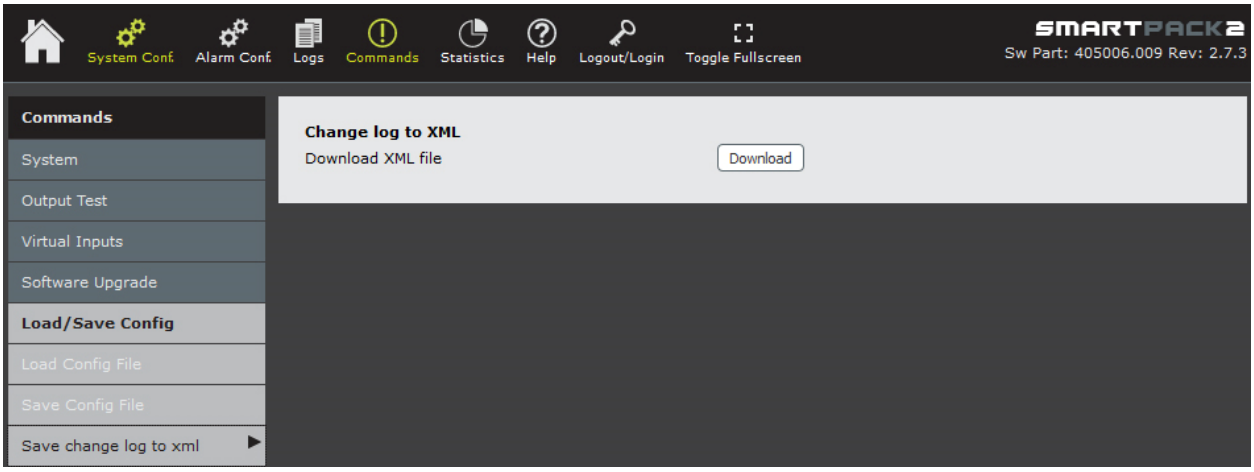


Figure 3.34 – XML Backup from Changelog

2. On the **Change log to XML** page, click the **Download** button.
3. On the **Opening changelog.xml** dialog, **Save File** and then **OK**.

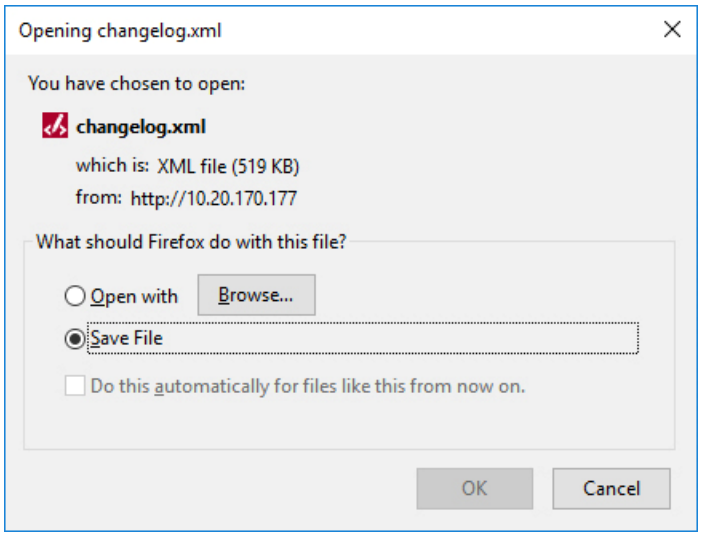


Figure 3.35 – Save File Dialog

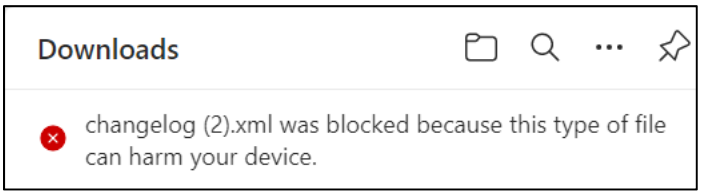


Figure 3.36 – Microsoft Edge Block download

4. Find the file in the **Downloads** folder; it will be called **changelog.xml**. Rename the file with a distinctive name to identify it with your system. Archive the file in a place where it can be easily retrieved if needed.

4. Administration

This section describes common administrative tasks that can be accomplished through the browser interface.

Administering User Accounts

User accounts are administered from the **User Accounts** page:

System Conf. › Device Settings › User Accounts

Note: You must be logged in as an administrator to make changes to the admin password and to edit user account information.

Administrator Password

To change the administrator password:

1. Navigate to the **System Conf. › Device Settings › User Accounts› Change Password**.
2. Enter the old and new passwords in the corresponding fields.
3. Click **Save** to preserve your changes.

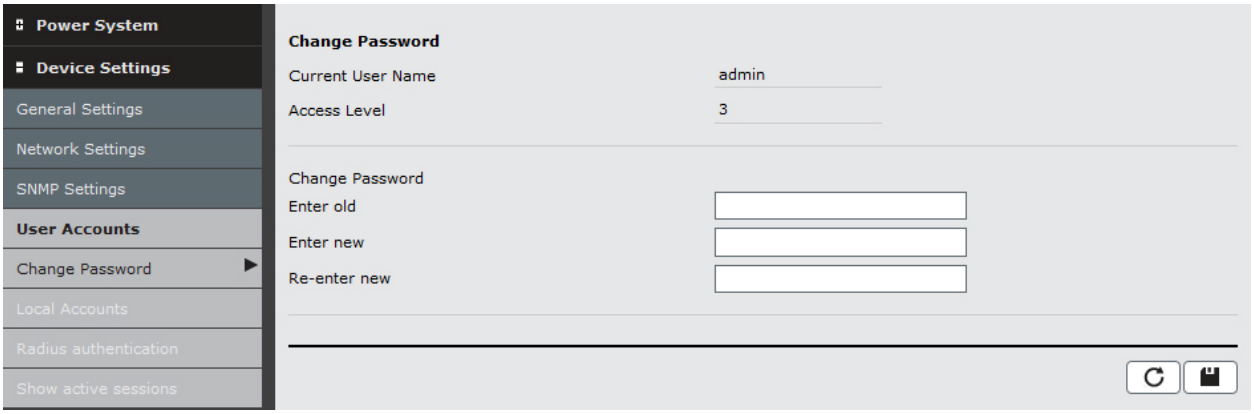


Figure 4.1 – Edit Accounts Button

User Accounts

To edit user account information:

1. While logged in as administrator, navigate to **System Conf. › Device Settings › User Accounts› Local Accounts**.

2. Make edits to local accounts, as described in the following sections.

The **Edit** page is divided into two sections: **Local Accounts Settings** and **User Account Administration**.

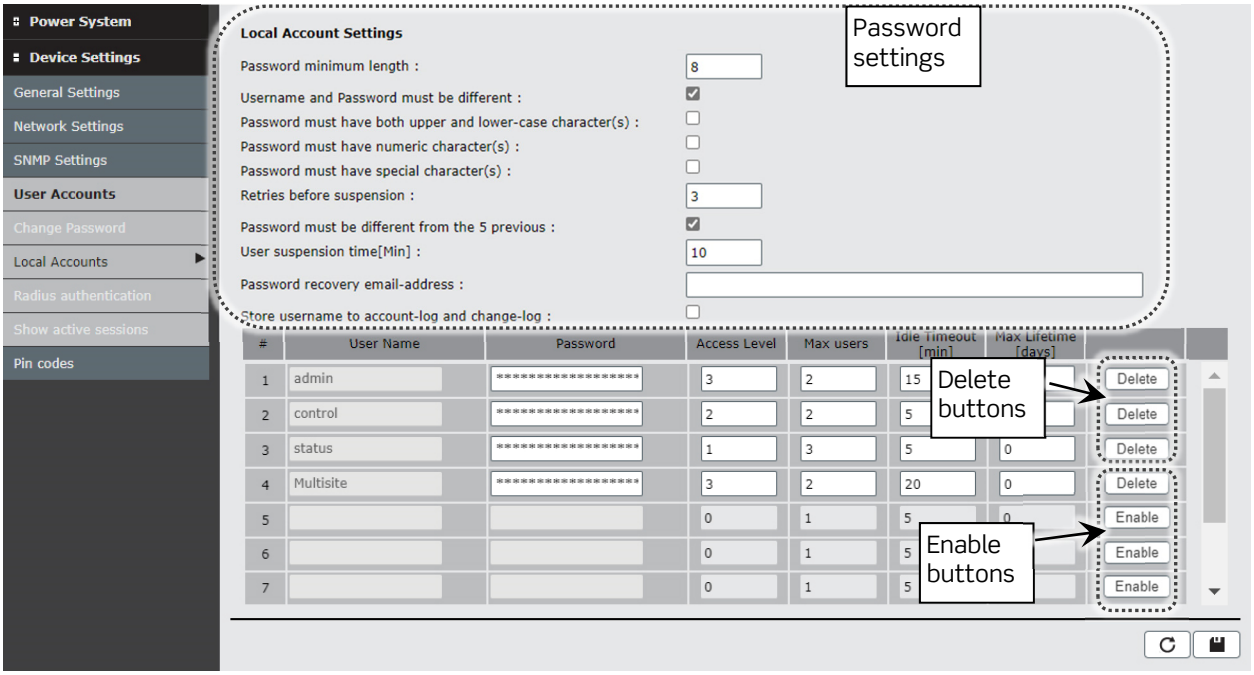


Figure 4.2 – Edit User Accounts Page

- **Global Account Settings** – this section is for specifying password requirements. See User Accounts beginning on page 199 for descriptions of each setting.
- **User Account Administration** – this section is for creating, editing, and deleting user accounts. See User Accounts beginning on page 199 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.

When finished editing accounts, click **Save** (the diskette button) to preserve your changes.

Change Controller Name

The name of the controller is changed under **Network Settings**:

System Conf. › Device Settings › Network Settings › Network Interface

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 **Save** (the diskette button) to preserve your changes.

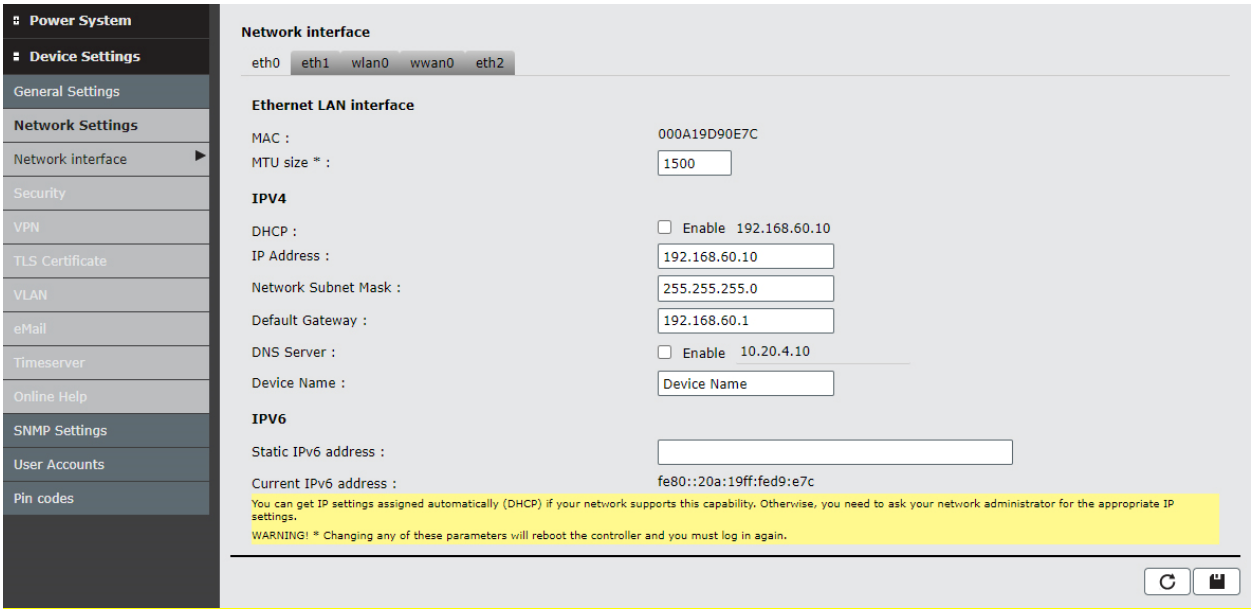


Figure 4.3 – Device Name Field (Touch Controller)

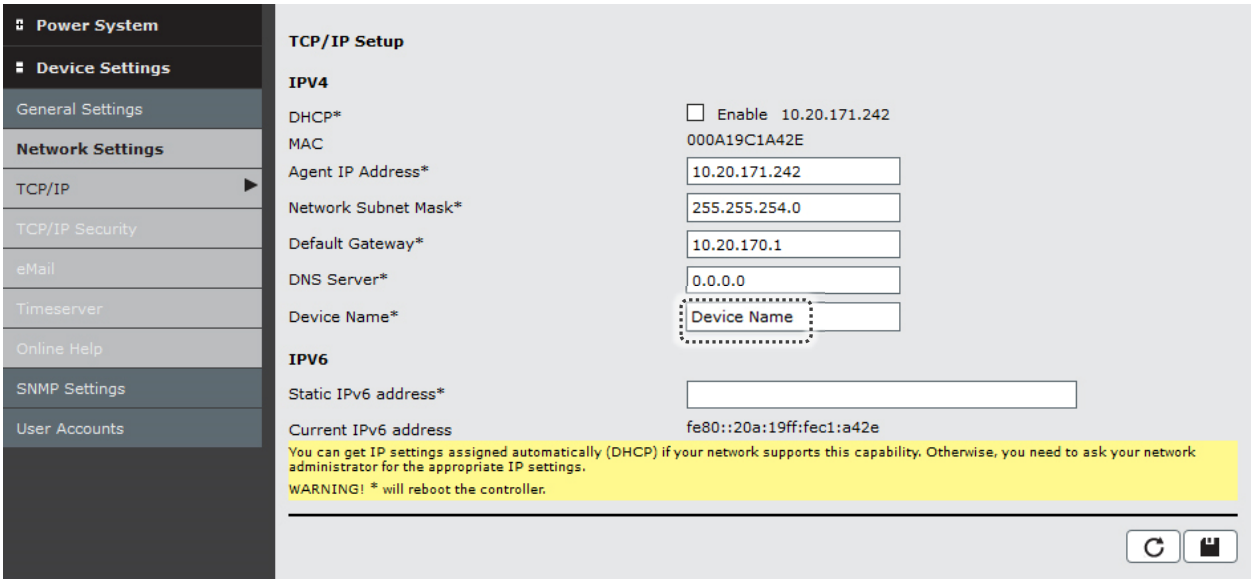


Figure 4.4 – Device Name Field

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 › Network Interface

Of course, if a network connection is not established with the controller, then the web browser 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 browser interface has not been established, then there are two principal 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 (Smartpack2 Master, Smartpack S)

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 application 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 › 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**.

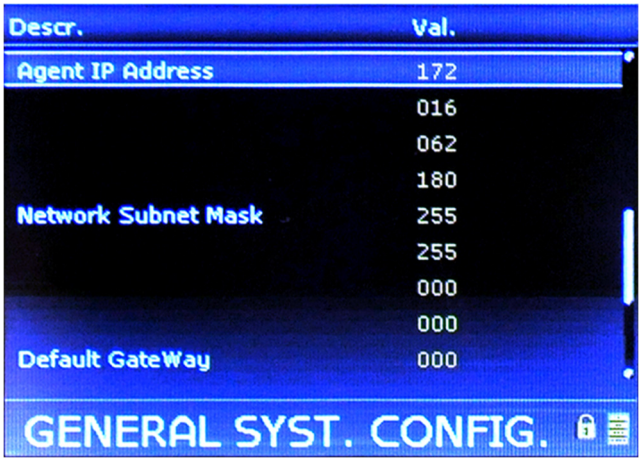


Figure 4.5 – IPv4 Address on Display (each octet is on its own line)

Through the Touch Screen (Smartpack Touch)

To find the IP address of a Smartpack Touch, using the touch screen:

1. On the home menu, choose **Menu** in the upper left corner.

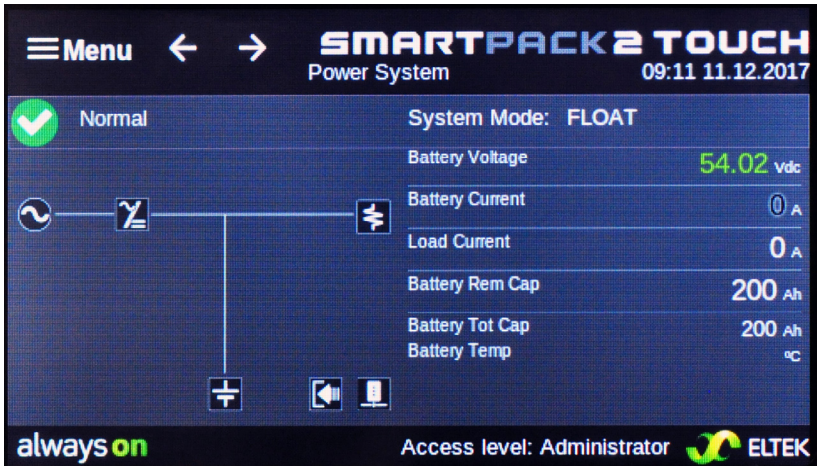


Figure 4.6 – Touch Controller Home Menu

2. On the main menu, choose **System Config**.

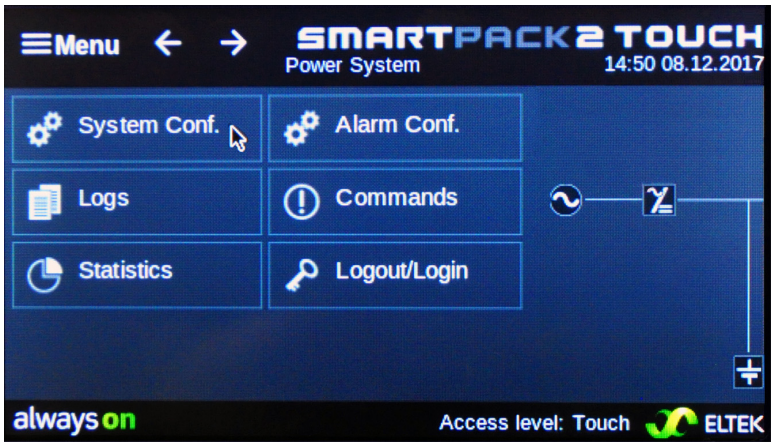


Figure 4.7 – Touch Controller Main Menu

This selection takes you to the top page in the **System Config.** category (in this case the **Power System** page or **DC Plant Information**).

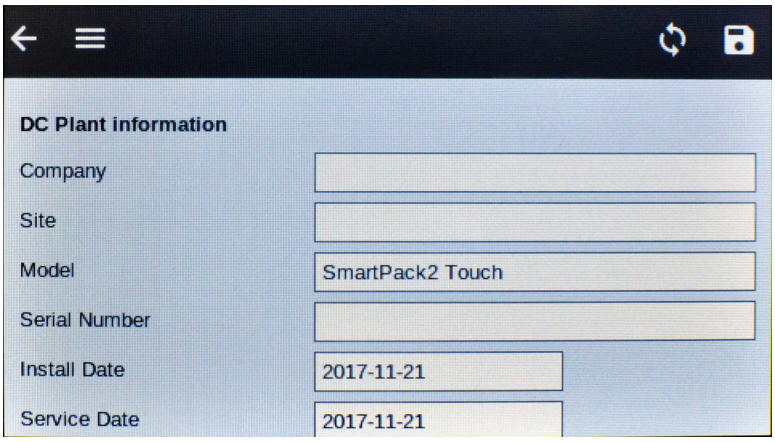


Figure 4.8 – DC Plant Information Page

3. From the **DC Plant Information** page (Figure 4.8), Choose the **Menu button** ( ) to move to the full list in the **Power System** menu (Figure 4.9). This list corresponds to the left navigation bar of the browser interface.

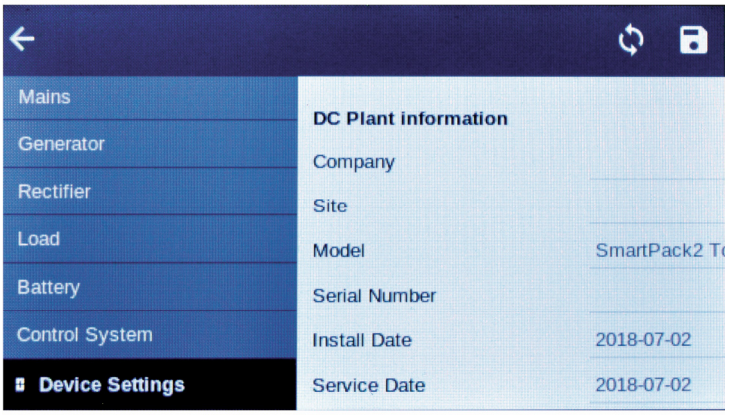


Figure 4.9 – Power System Menu

4. On the **Power System** menu, scroll down the menu and choose **General Settings › Network Settings**.

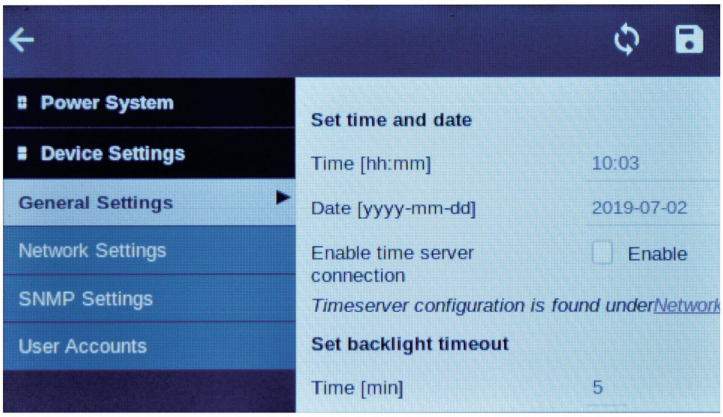


Figure 4.10 – Choosing Network Settings

5. On the **TCP/IP Setup** page, choose the tab for the port used to connect with the controller, and locate **the Agent IP Address** listed there.

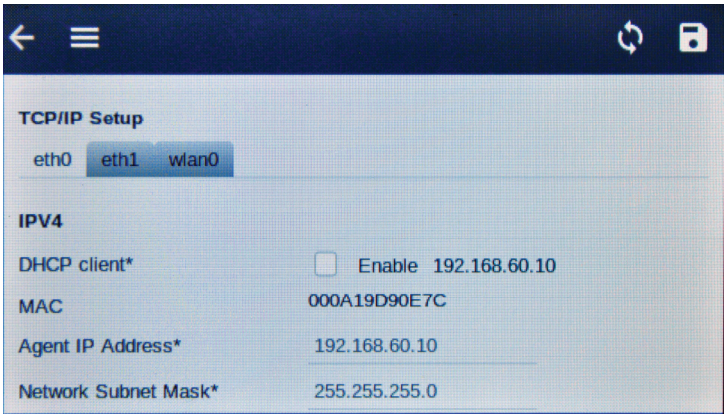


Figure 4.11 – TCP/IP Setup Page

For additional details regarding the different connection ports on the Touch controller, see discussion in “Ethernet Local Area Network (LAN) Settings,” pages 170-176.

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.

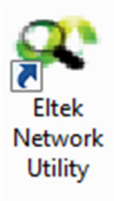


Figure 4.12 - Eltek Network Utility Icon

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

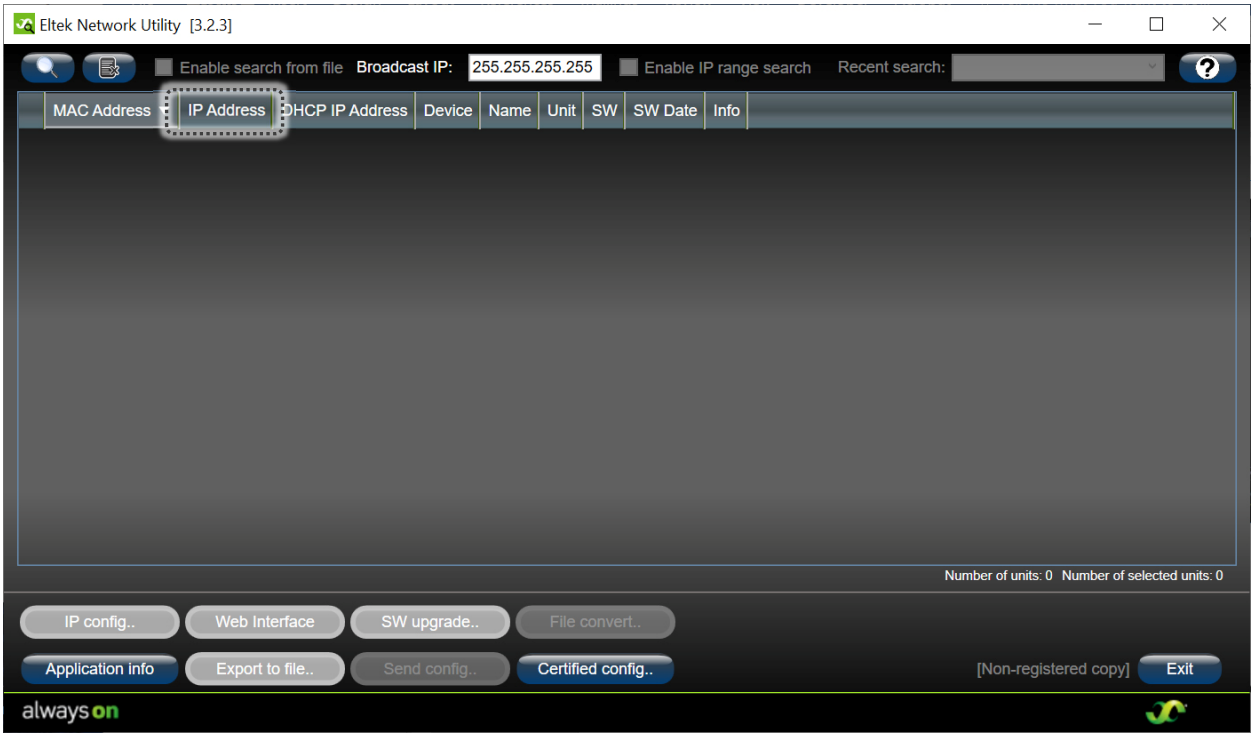


Figure 4.13 – Eltek Network Utility Window

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 browser interface on the **Network Settings** page:

System Conf. › Device Settings › Network Settings › Network Interface

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.

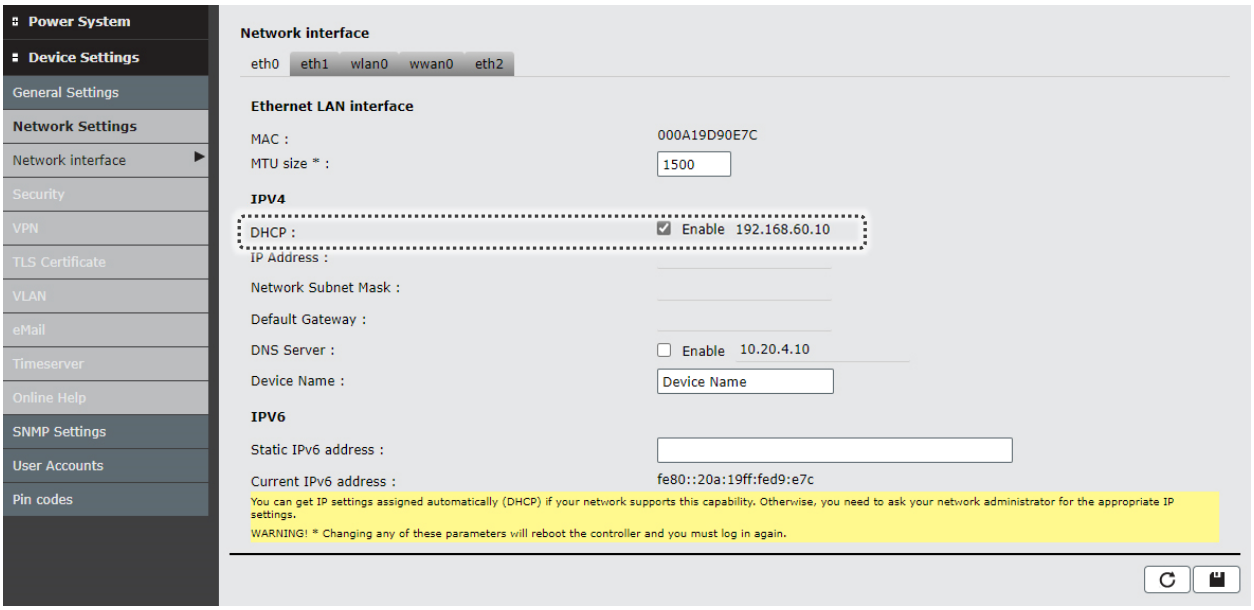


Figure 4.14 – DHCP Configuration (Touch Controller)

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 170 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 **Save** (the diskette button) to preserve your changes.

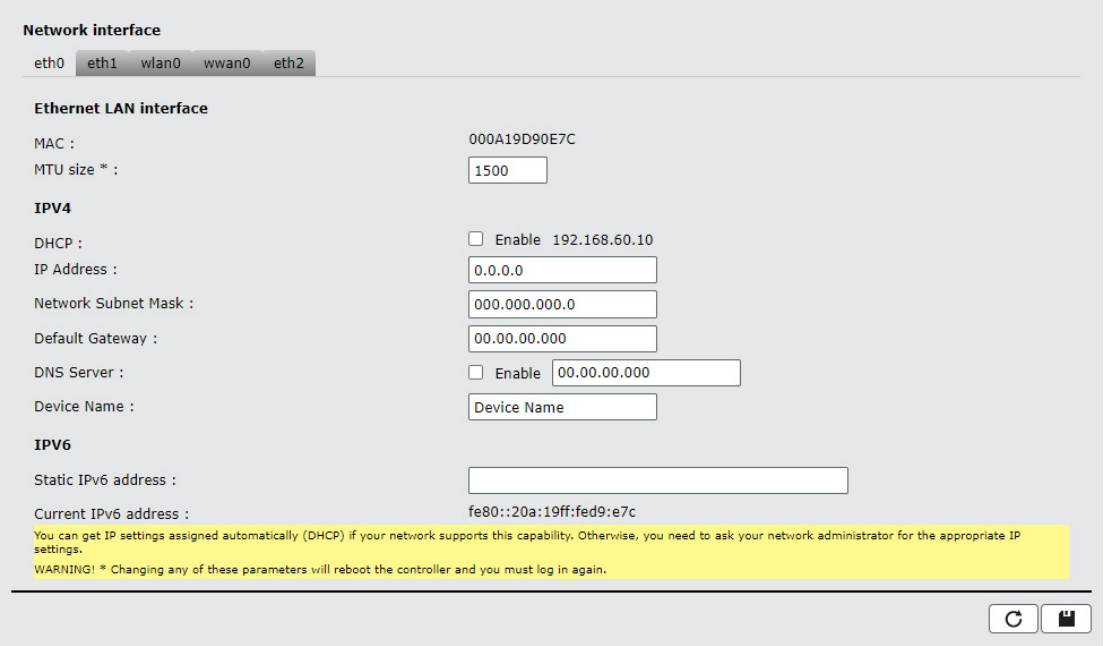


Figure 4.15 – Static IP Configuration (Smartpack2 Touch)

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 browser 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 deviate 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 browser 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 browser 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 browser 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. The Eltek browser 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 browser interface is being expanded to offer all of the same capabilities as PowerSuite, since the browser 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 235; this feature was removed from the Smartpack2 Basic Industrial controller in version 3.3.

SP2 Master (Smartpack2 Master) – the central unit of the Smartpack2 controller system, containing both an interactive display and Ethernet port for the browser 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.

SP2 Touch (Smartpack2 Touch) – An enhanced master controller that utilizes both a touch screen and the web browser interface. This Master unit requires other Smartpack2 units in order to form a complete controller system.

SPR (Smartpack R) – a retrofit controller designed for replacing and enhancing the Smartpack 1 controller. It utilizes both an interactive display and browser interface.

SPS (Smartpack S) – an Eltek controller designed for use with the Flatpack S family of power modules. It contains both an interactive display and browser 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 browser 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

For assistance with technical questions and solutions, please contact Technical Support by email at **techsupport.us@deltaww.com** or by phone at 1-800-435-4872.



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