FPRA IP20
Flexi Power Rectifier

User Manual

Version A

.

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Authors:

Daniel Kreuzer

Abbreviations:

tbd	to be done
GUI	Web-based User Interface
MAC	Media Access Control
IP	Internet Protocol
LCD	Liquid Crystal Display
CU	Control
PID	Product Information Data
VPN	Virtual Private Network
LVD	Low Voltage Disconnect

Related Documents:

Installation Manual

Content

1 Overview

This document is a “how to use” guide for the Web-based User Interface and for the LCD Front-Panel Display. The structure of this document follows the structure of the GUI, which means it is divided into main menus, sub menus and sections. Please consider the red-boxed Notes at any time.

Please consider also Appendix C in section 9 for a typical system setup.

2 Set up PC and connect to Web GUI

2.1 General

This chapter describes how to set up the FPRA Control Unit and the User's PC, and to be able to connect to the FPRA Control Unit via the Web-based Graphical User Interface.

The web-based GUI is optimized for a resolution of 1024 x 768 pixels or higher. Both Microsoft Internet Explorer and Mozilla Firefox browsers are supported. Both are free of charge and actual version can be downloaded:
Microsoft Internet Explorer: www.microsoft.com[1]
Mozilla Firefox: www.mozilla.com[2]

The Control Unit provides boundless connectivity within private intranets, which includes connections via VPN. It also supports direct connection between User PC and FPRA. Following the IEEE rules, each CU has its own unique MAC address.

[1] [2] Disclaimer: Links to Third-Party web sites or third party tools are provided for user convenience only. Emerson Network Power does not endorse nor support the content of third party links or tools. Emerson Network Power is not responsible for the content or the functionality of a third-party web sites or a third party tools. Privacy, security and quality policies may differ from those practiced by Emerson Network Power. Emerson Network Power does not represent any third party or third party tool.

2.2 Set up the FPRA Control Unit

In order to connect to the FPRA CU it may be necessary to change the IP-address of the CU. For connections through a private Intranet, it is required to allocate a unique IP-address to each Intranet-connected CU. This IP-address must be within the specified Intranet IP-Range. There are two different ways to change the IP-address of the FPRA CU.

2.2.1 Change Control Unit IP-Address via GUI

To change the IP-address of the CU via the Web-based GUI it is necessary to connect with the “root-user” (see also section “Connect to the Graphical User Interface”).

Under main menu “Maintenance” and within the submenu “Access” it is possible to change the IP-address. After updating the IP-address it is required to reconnect with the new IP-address.

2.2.2 Change Control Unit IP-Address via LCD Display

Changing the IP-address via the LCD Display is most likely to be used during the first start-up, as it is not possible to connect to the CU. The CU will retain its default IP-address:

- In order to change the IP-address on the LCD Display go to the main menu and select “Settings”.
- In the IP-submenu hold the Enter Button (the middle one), until the question for activating DHCP appears
    - Choosing “yes” will activate the DHCP functionality and the CU will get an IP address from the network
    - Choosing “no” will lead to the next menu-step, where the IP-address can be changed manually
        - Use the Up- and Down- Button to change the value of this digit.
        - By holding the button the count-speed will increase.
        - Use the Enter-Button to accept the value for the actual digit and jump to the next 8-bit digit.
        - Using the Enter-Button after the fourth digits will lead to a new window, which asks to confirm or to cancel the update of the IP-address.
        - After confirming the update, the CU will restart.

2.3 Set up the User PC

2.3.1 Connection to Control Unit via Intranet

In order to connect to the Control Unit via Intranet there are no changes required.

2.3.2 Direct Connection to Control Unit

In order to direct connect to the FPRA CU there are two possibilities how the User PC can be set up.

2.3.3 Set IP-address

There are two possibilities to set the systems IP-address:

- Allocate fixed IP-address (see section 2.3.3.1)
- Alternate IP-address (see section 2.3.3.2)

2.3.3.1 Allocate fixed IP-address

1. Go to the Network-Settings and to the “Properties” menu of the active TCP/IP connection (see also Figure 2.1).

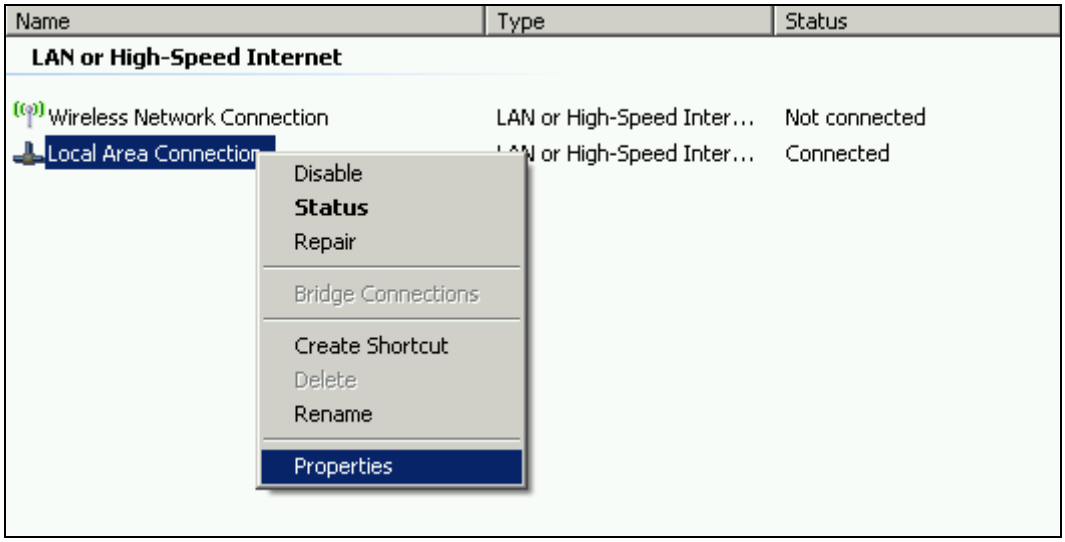


Figure 2-1 - Local Area Connection - Properties

2. Choose the Internet Protocol (TCP/IP) menu and choose the “Properties” menu (see also Figure 2.2).

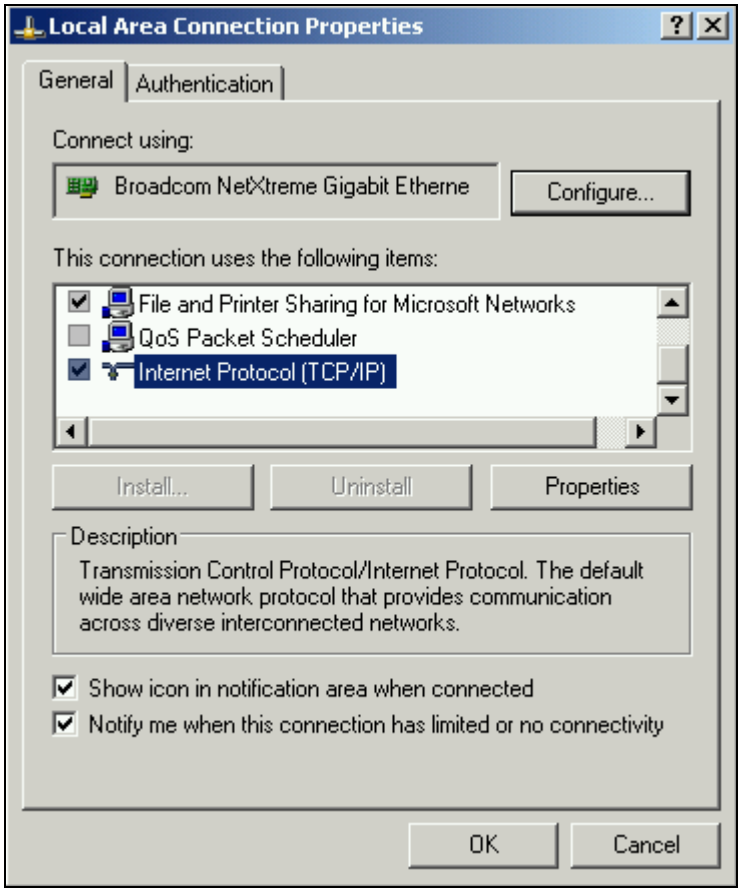


Figure 2-2 - Internet Protocol (TCP/IP) – Properties

3. Within the “General” menu choose the “Use the following IP address” option. The IP-address is bound to the IP-address of the CU and the “Subnet mask”. (e.g.: with the subnet mask “255.255.255.0” the first 3 digits of the IP-address of the User PC have to be same as the first 3 digits of the CU IP-address. The value of the last digit does not matter, but has to be a different to the last digit of the IP-address of the CU.

   See Figure 2.3. As an example, in this case the CU has the IP-address “192.168.100.100.”

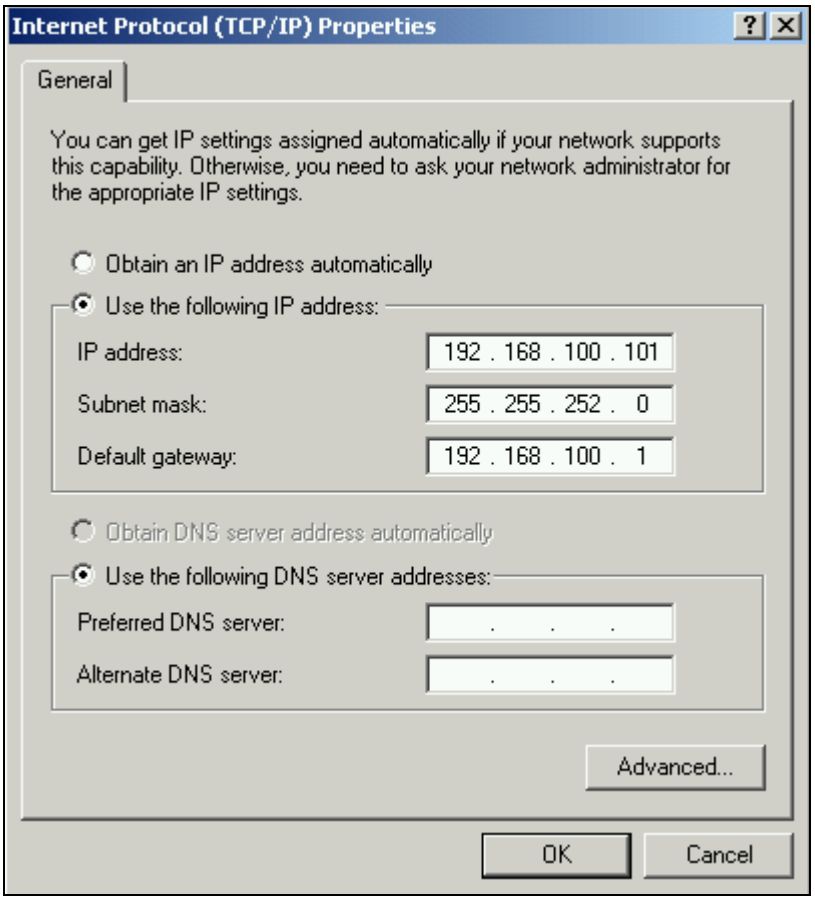


Figure 2-3 - allocate fix IP-Address

With this set up the PC is able to open a direct connection between PC and CU. Building other connections will not be possible.
To use the new settings click on OK. Then click on Close (or OK). For Windows 2000[3], re-start the PC for the new settings to take effect. For Windows XP[4], the new settings are ready immediately, without re-starting

[3] [4] Disclaimer: Links to Third-Party web sites or third party tools are provided for user convenience only. Emerson Network Power does not endorse nor support the content of third party links or tools. Emerson Network Power is not responsible for the content or the functionality of a third-party web sites or a third party tools. Privacy, security and quality policies may differ from those practiced by Emerson Network Power. Emerson Network Power does not represent any third party or third party tool.

2.3.3.2 Alternate IP-address

4. Repeat steps 1 and 2 of section “Allocate fix IP-address”. Choose the option “Obtain and IP address automatically” (which is the default setting). Change to the menu “Alternate Configuration” (see also Figure 2.4) and choose the option “User configured”. Follow the rules of step 3 in section “Allocate fix IP-address” to fill out the IP address and Subnet mask.

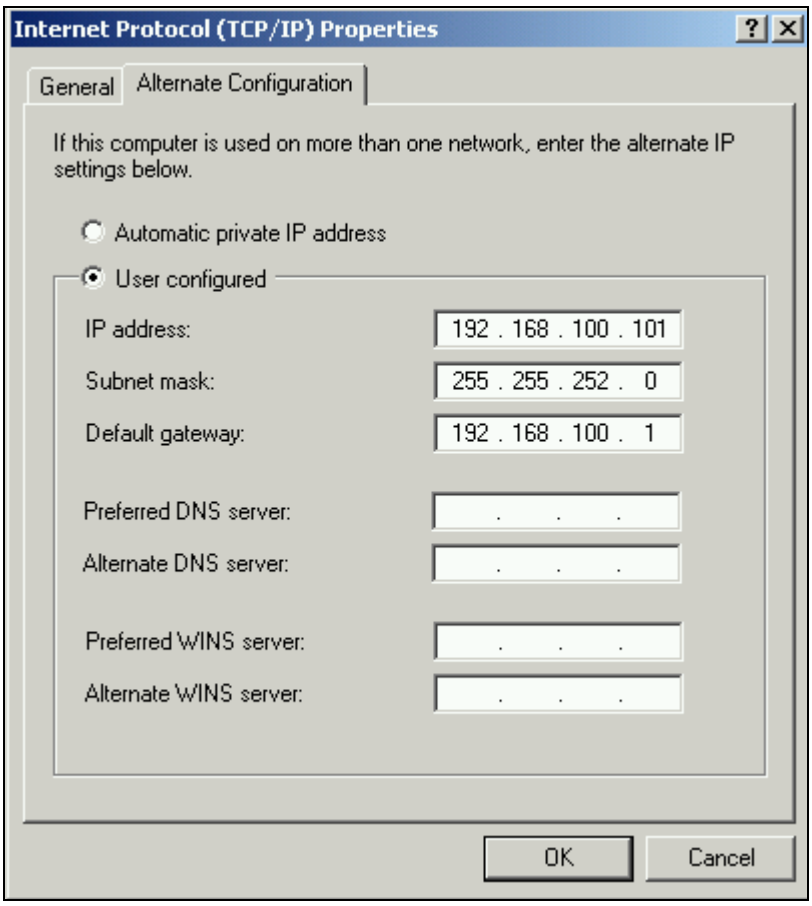


Figure 2-4 - IP Alternate Configuration

With this set up, the PC is able to open a direct connection between PC and CU. The PC also will be able to switch automatically between direct connection to the CU and connection to the Intranet/Internet depending on which connection is attached to the PC.

- Alternate IP-address settings are only available for Windows XP and later versions.

2.4 Connect to the Graphical User Interface

In order to connect to the FPRA System, open the Web-browser and type the IP-address of the CU in the address field of the browser. The GUI will ask for a “username” and “password”. Following User are supported:

- **Root User**: Full Access to all functionality of the FPRA System
  - Username: “root”
  - Password: “default”
- **Admin User**: Reset Password of the Root User and the IP-address of the FPRA CU to its default values
  - Username: “resetpassword”
  - Password: “76z5g4v”

2.5 Change Browser Settings

In order to have the expected functionality, check the default location for downloaded data within your browser. This setting may get disturbed while using the configuration upload and download functions.
To change the default download location use the browser help function.

3 The Graphical User Interface

3.1 Overview – Home

After user-login, the Overview page is shown (see Figure 3.1). To return to the Overview page at any time, click on Home in the Main Menu. The Overview (Home) page has no Sub Menu options and so the Sub Menu field remains blank until you choose a Main Menu option.

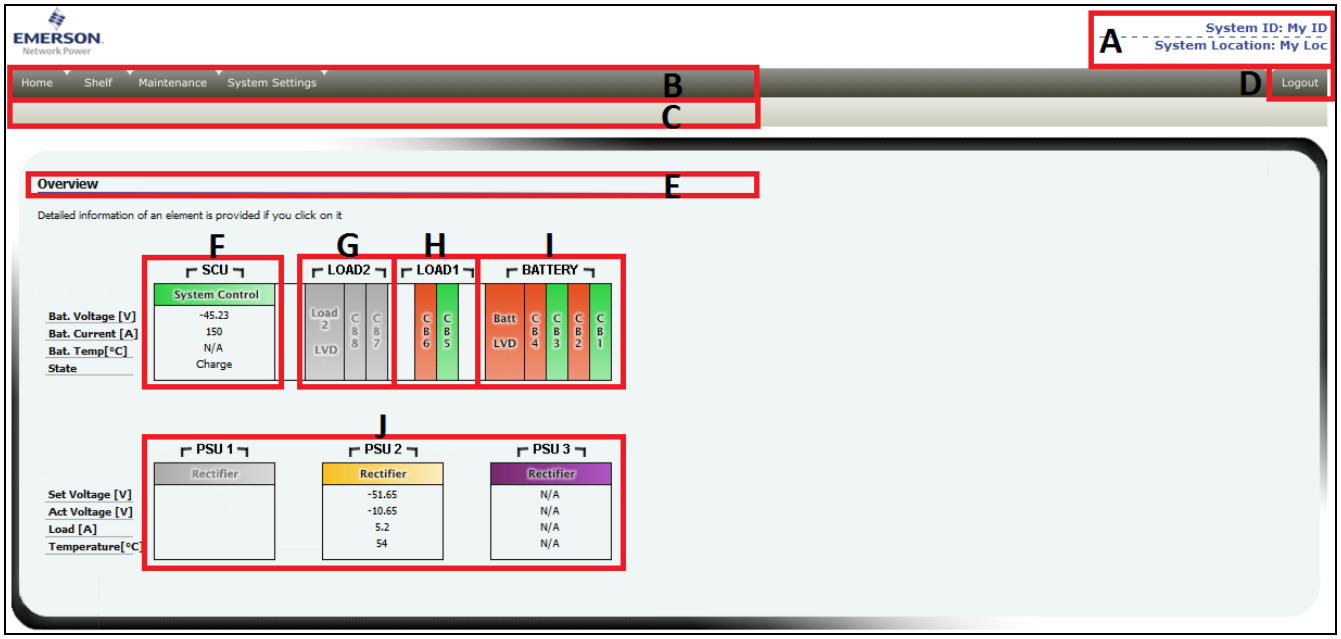


Figure 3-1 - Home/Overview Page

The Overview Page is divided into seven different areas:

- **A - System ID & System Location**: displays the System ID and System Location
- **B - Main Menu**: used for the top-level navigation and drives the Sub Menu page
- **C - Sub Menu**: depending on the chosen Main Menu, the Sub Menu changes
- **D - Logout**: end the actual session in order to change to a different user
- **E** - **Page Name**: always shows the actual location, or in other words, the actual chosen Sub Menu
- **F - CU**: Control Unit
- **G – Optional LVD:** optional equipped LVD + Circuit Breaker
- **H – Load CB:** Load Circuit Breaker
- **I – Battery LVD:** Battery LVD + Circuit Breaker
- **J - Rectifier**: Power Supply Units

The Overview Page is an overview over the most important items and values of all elements of the system. The following indication colours are used:

- **Green**: error free element
- **Yellow**: warning or a minor error
- **Red**: major or critical error
- **Purple**: Element Loss error
- **Gray**: Element not present/ not equipped

- All indication colours depend on the Alarm Configuration settings of each element (see section 3.2.1.2 and section 3.2.3.3).
- The Element Loss fault is signalled by a purple colour at any time, regardless the Alarm Configuration settings.
- Element Loss only will be displayed if there was a previous communication between the elements. A faulty communication between elements at start up of the system will not be recognized as a fault, and the faulty element will be shown as not present.
- A absent temperature sensor will be displayed as “N/A”, if the correct setting in the “System Settings” is chosen

3.2 Shelf

The following Shelf Sub Menus are available:

- CU – Control Unit
- Rectifier 1
- Rectifier 2
- Rectifier 3

3.2.1 CU

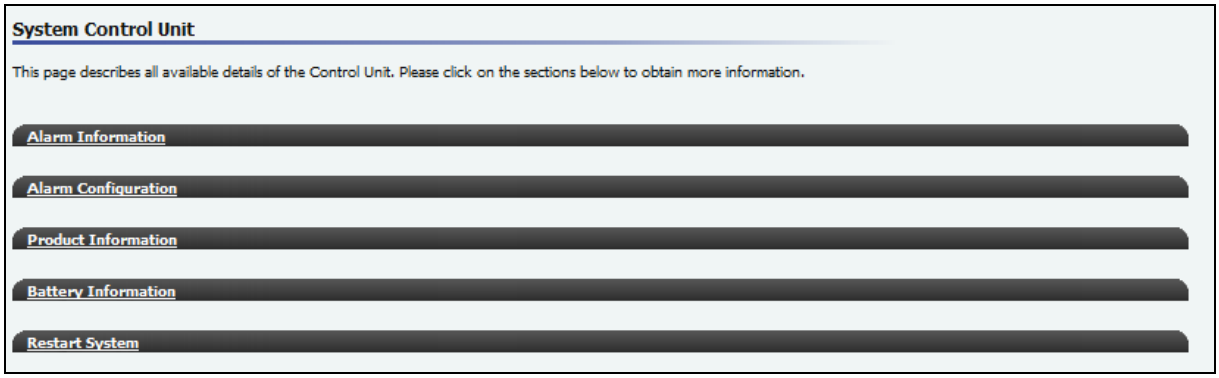


Figure 3-2 - CU Overview

The Control Unit overview page gives access to more detailed information about the Control Unit.
To access this detailed information, select Shelf from the Main Menu and select CU from the Sub Menu or just click on the SCU element in the Overview (Home) page.

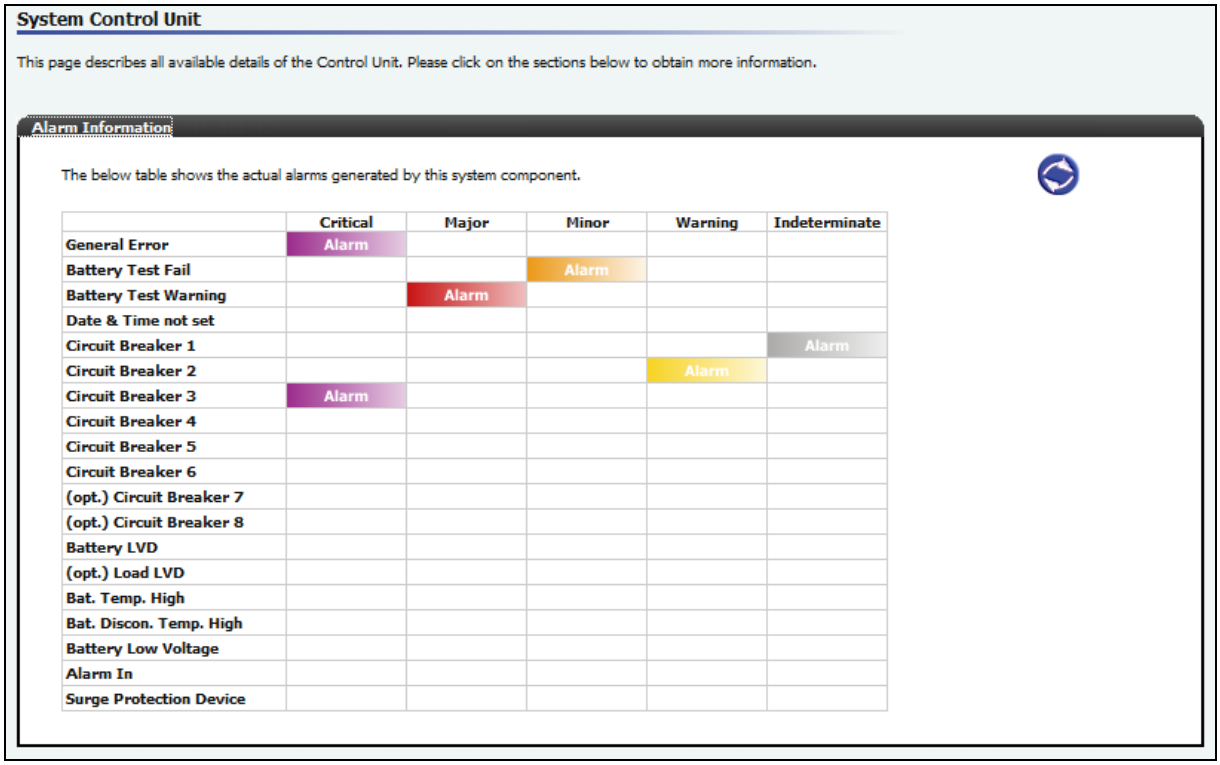
Sections:

- Alarm Information
- Alarm Configuration
- Product Information
- Battery Information
- Restart System

Click on the name of the sub section to expand it.

3.2.1.1 Alarm Information

The Alarm Information section shows the alarms that are currently active for the Control Unit. To view the active alarms click on Alarm Information in the unit page (see Figure 3.3).



	Critical	Major	Minor	Warning	Indeterminate
General Error	Alarm				
Battery Test Fail			Alarm		
Battery Test Warning		Alarm			
Date & Time not set					
Circuit Breaker 1					Alarm
Circuit Breaker 2				Alarm	
Circuit Breaker 3	Alarm				
Circuit Breaker 4					
Circuit Breaker 5					
Circuit Breaker 6					
(opt.) Circuit Breaker 7					
(opt.) Circuit Breaker 8					
Battery LVD					
(opt.) Load LVD					
Bat. Temp. High					
Bat. Discon. Temp. High					
Battery Low Voltage					
Alarm In					
Surge Protection Device					

Figure 3-3 - CU Alarm Information

The Alarm Information section shows all active alarms according to their set severity. Non-active alarms and turned off alarms do not have an alarm sign displayed.

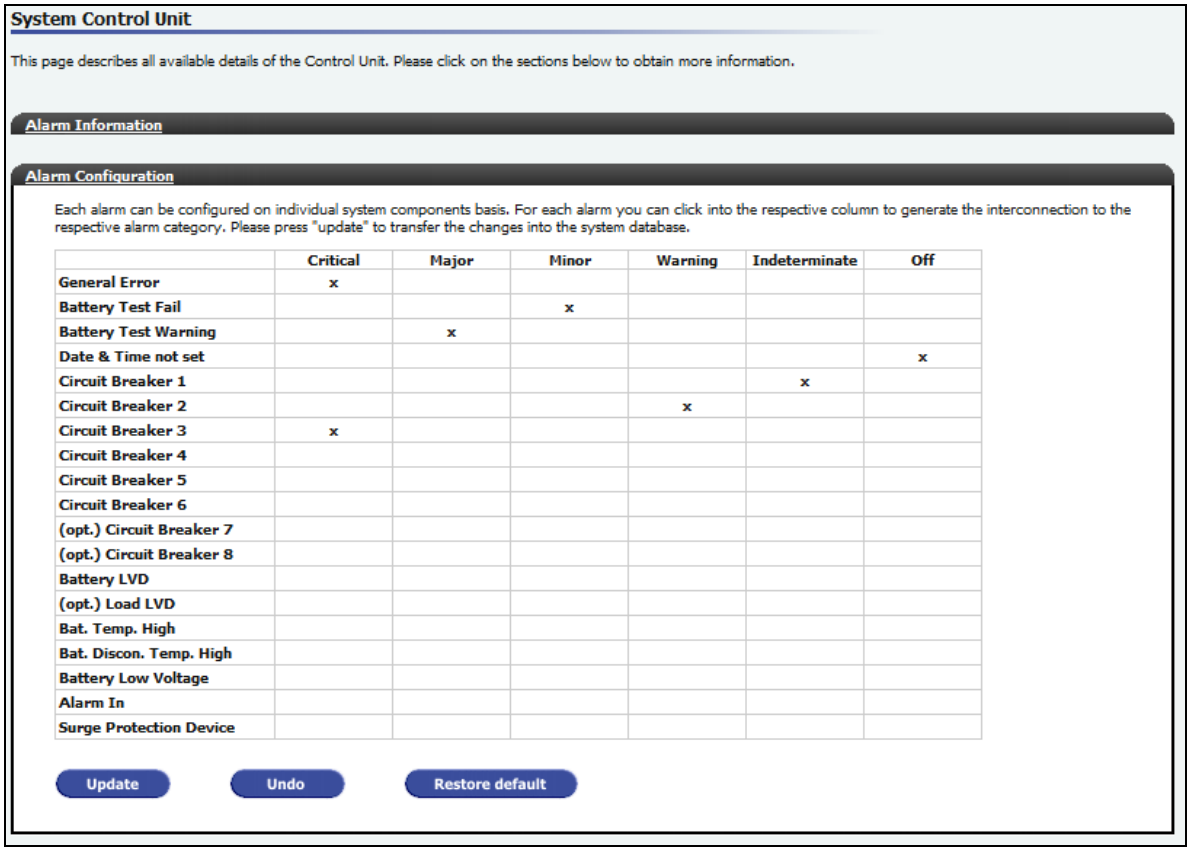
Depending on severity the following colours are used:

- **Critical**: Purple
- **Major**: Red
- **Minor**: Orange
- **Warning**: Yellow
- **Indeterminate**: Gray

Click the “Reload Button” on the upper right of the section to reload the “Alarm Information” page.

3.2.1.2 Alarm Configuration

The Alarm Configuration section shows the severity-settings for the alarms available in the Control Unit. To view or change the severity of the alarms click on Alarm Configuration in “The Unit” page (see Figure 3.4).



	Critical	Major	Minor	Warning	Indeterminate	Off
General Error	x					
Battery Test Fail			x			
Battery Test Warning		x				
Date & Time not set						x
Circuit Breaker 1					x	
Circuit Breaker 2				x		
Circuit Breaker 3	x					
Circuit Breaker 4						
Circuit Breaker 5						
Circuit Breaker 6						
(opt.) Circuit Breaker 7						
(opt.) Circuit Breaker 8						
Battery LVD						
(opt.) Load LVD						
Bat. Temp. High						
Bat. Discon. Temp. High						
Battery Low Voltage						
Alarm In						
Surge Protection Device						

Figure 3-4 - CU Alarm Configuration

Set the preferred severity of each alarm or restore all settings to their default value. The chosen severity the alarm is shown on the Overview page and on the Front Panel LEDS:

- **Critical**: Shows the Alarm in the Alarm Information table as Critical. Activates the red LED on the front panel and displays the unit on the overview page with a red background
- **Major**: Shows the Alarm in the Alarm Information table as Major. Activates the red LED on the front panel and displays the unit on the overview page with a red background
- **Minor**: Shows the Alarm in the Alarm Information table as Minor. Activates the yellow LED on the front panel and displays the unit on the overview page with a yellow background
- **Warning**: Shows the Alarm in the Alarm Information table as Warning. Activates the yellow LED on the front panel and displays the unit on the overview page with a yellow background
- **Indeterminate:** Shows the Alarm in the Alarm Information table as Indeterminate. Does not activate any LED on the front panel and does not change the background color of the unit on the overview page.
- **Off:** Shows no Alarm in the Alarm Information table. Does not activate any LED on the front panel and does not change the background color of the unit on the overview page.

Buttons:

- **Update**: stores the configuration to the system
- **Undo**: restores the settings to the last updated configuration
- **Restore default**: restores the default configuration. Click update to store the default configuration

Example:

Set the General Error Alarm to Critical or Major and the unit will be displayed with a red background on the overview page as long as General Error Alarm is active.
Set it to Minor or Warning and the unit is displayed with a yellow background, while Indeterminate and Off do not change the units background color on the overview page (stays green).

3.2.1.3 Product Information

The Product Information section shows product-specific data for the Control Unit. To view the product data click on Product Information in the unit page (see Figure 3.5).

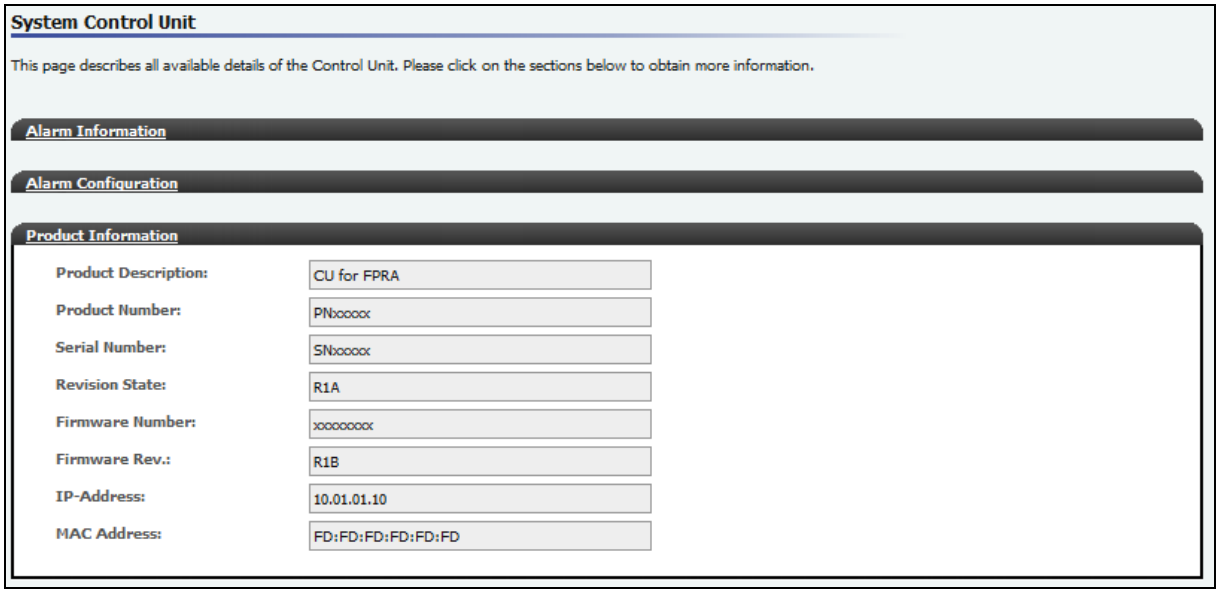


Figure 3-5 - CU Product Information

Review the CU PID-, Factory- and Connection-Data within the Production Information Section.

3.2.1.4 Battery Information

To view the Battery Information click on Battery Information in the Control Unit page (see Figure 3.6).

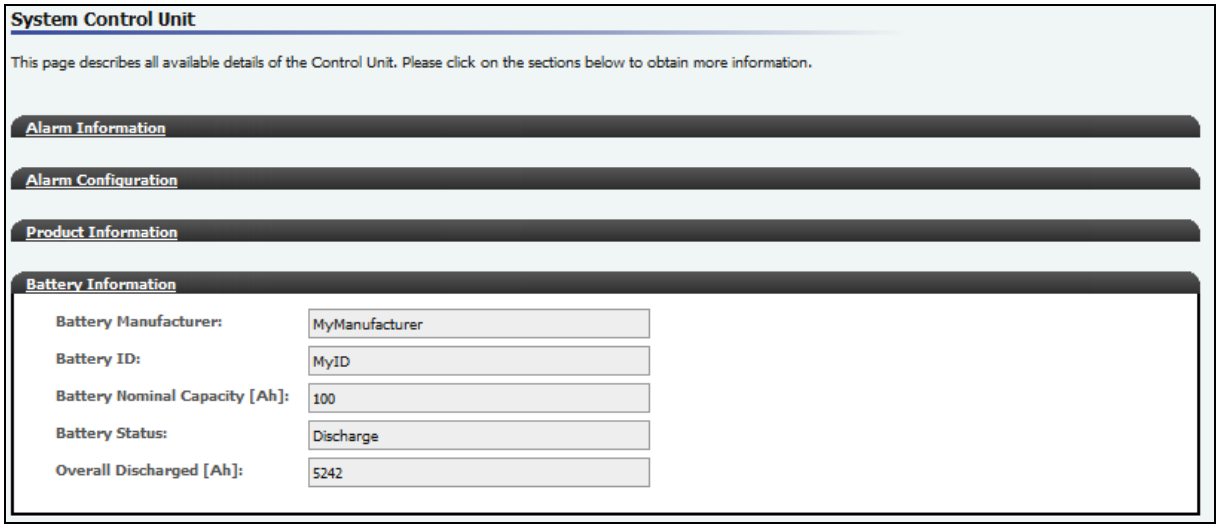


Figure 3-6 - CU Battery Information

The Battery Information section shows all relevant Battery Data. To change Manufacturer, ID and Capacity see also section 3.4.1.

3.2.1.5 Restart System

To restart the system click on Restart System in the Control Unit page then click on Restart in the expanded page when that opens (see Figure 3.7).

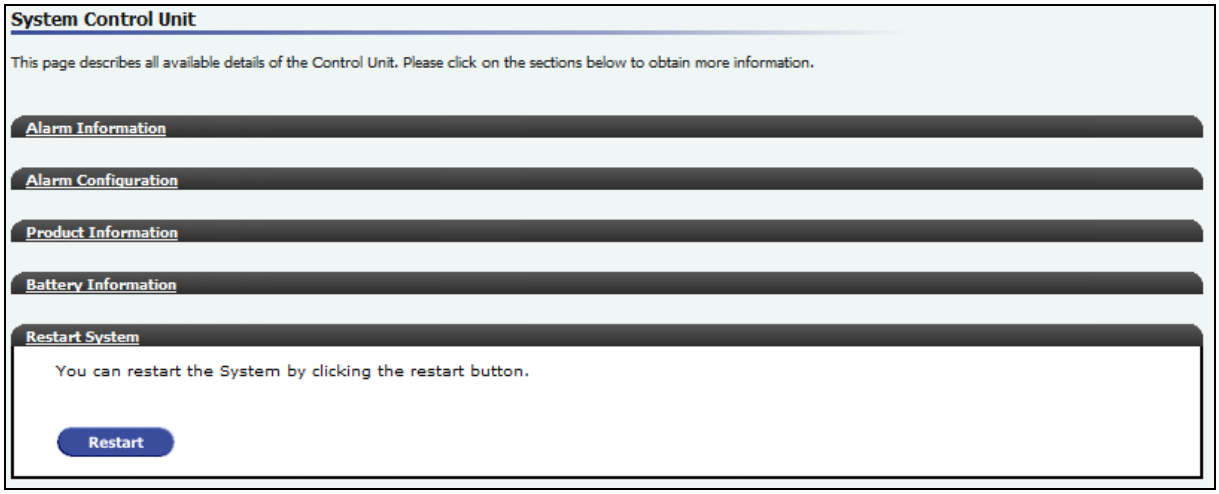


Figure 3-7 - CU Restart System

Click the restart button to perform a system restart.

A restart of the system has following consequences:

- The system restarts with the initial charge state. No battery test is possible during the initial charge.

3.2.2 Rectifier

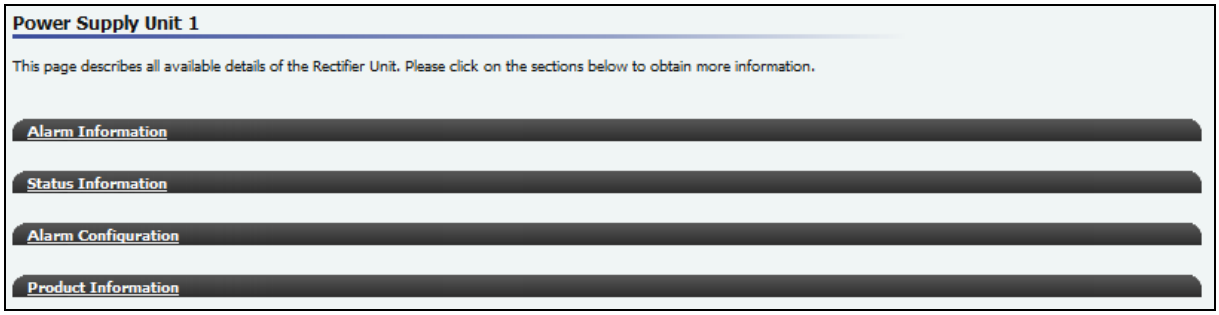


Figure 3-8 - Rectifier Overview

Rectifier Sections:

- Alarm Information
- Status Information
- Alarm Configuration
- Product Information

To view detailed information about a rectifier unit, click on the appropriate Section Heading for that Rectifier unit.

3.2.2.1 Alarm Information

The Alarm Information section shows the alarms that are currently active for the Rectifier. To view the active alarms click on Alarm Information in the Rectifier page (see Figure 3.9).

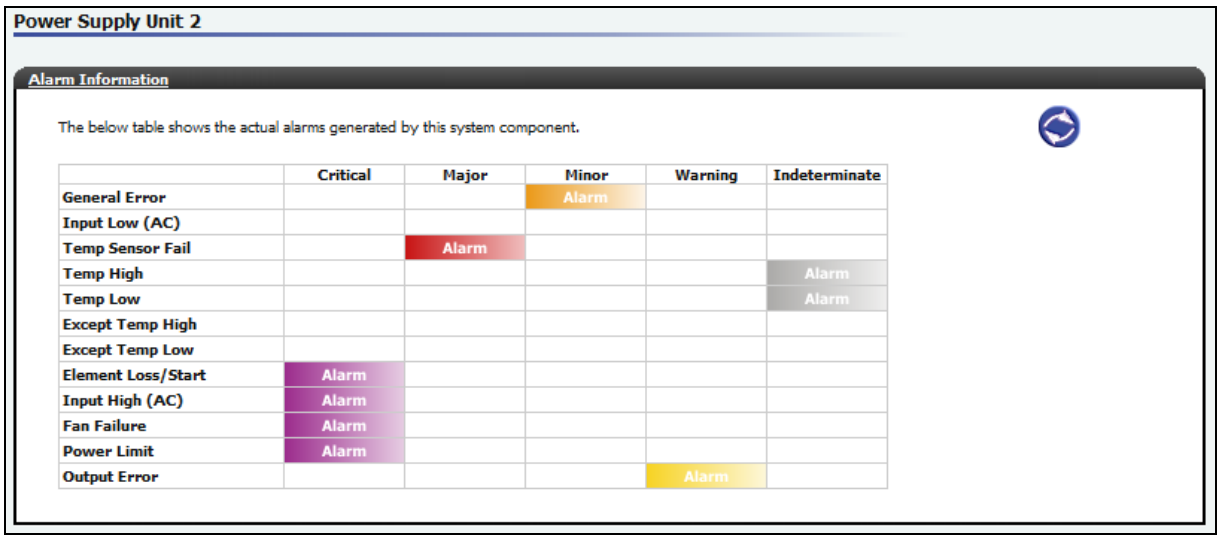


Figure 3-9 - Rectifier Alarm Information

The Alarm Information Sub Section shows all active alarms according to their set severity. Non-active alarms and turned off alarms do not have an alarm sign displayed.

Depending on severity the following colours are used:

- **Critical**: Purple
- **Major**: Red
- **Minor**: Orange
- **Warning**: Yellow
- **Indeterminate**: Gray

Click the “Reload Button” on the upper right of the section to reload the “Alarm Information” page.

3.2.2.2 Status Information

The Status Information section shows the operational state of a rectifier. To view the information click on Status Information in the appropriate Rectifier page (see Figure 3.10).

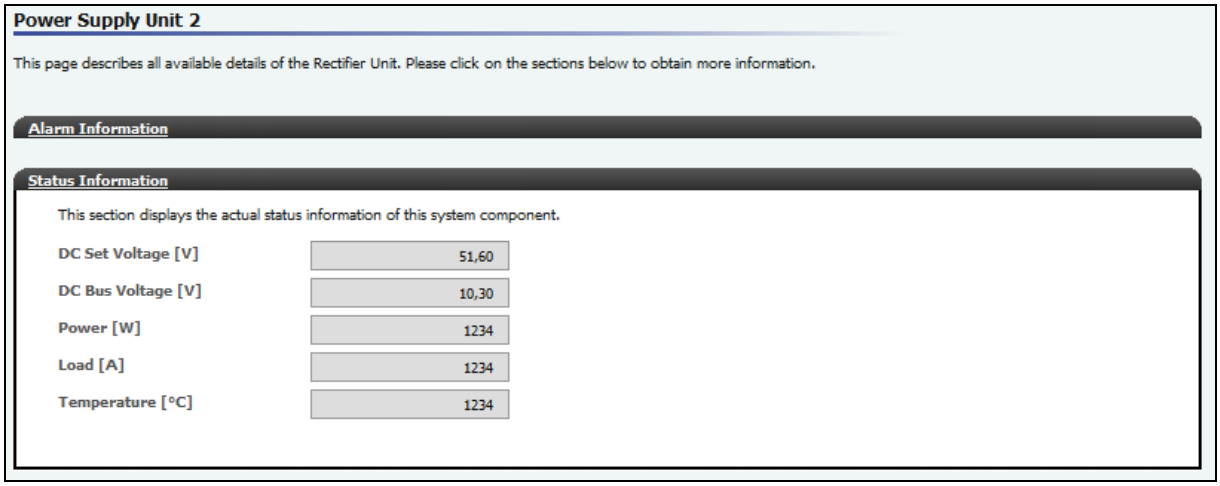


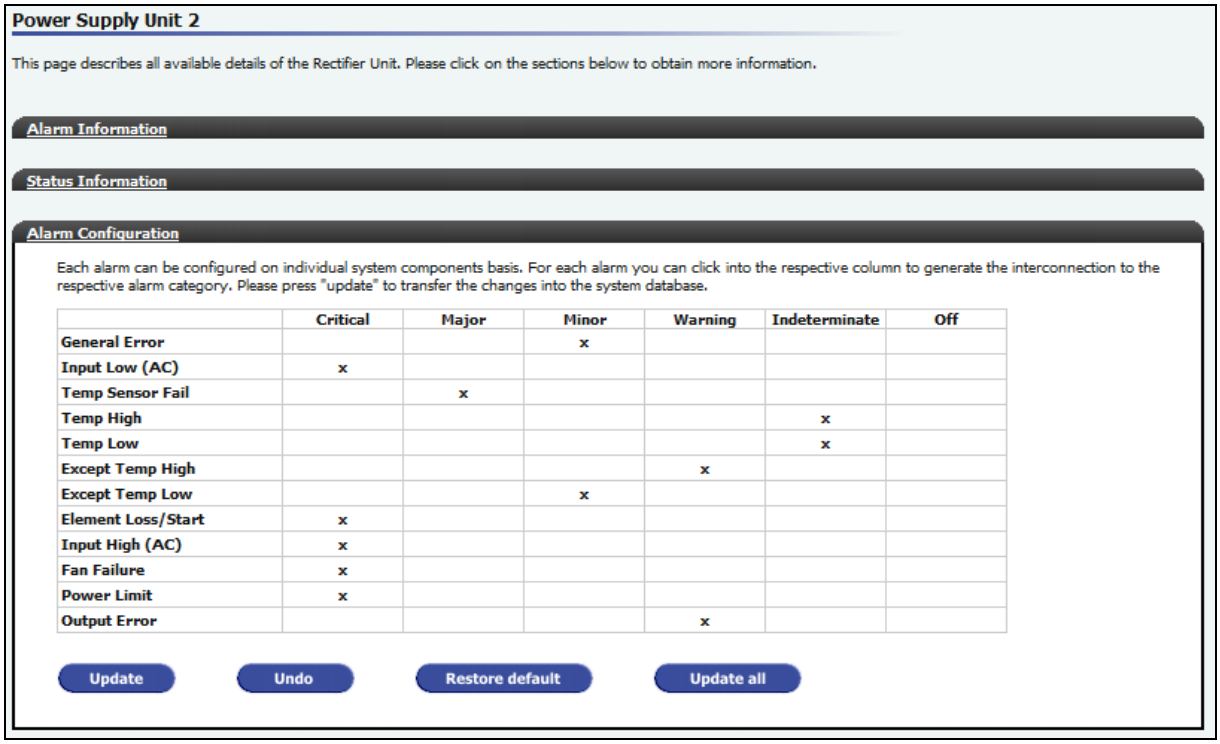
Figure 3-10 - Rectifier Status Information

Review the most important Rectifier status values within the Status Information sub section:

- **DC Set Voltage**
- **DC Bus Voltage**
- **Power Output**
- **Rectifier Load**
- **Rectifier Temperature**

3.2.2.3 Alarm Configuration

The Alarm Configuration section shows the severity-settings for the alarms available in the Rectifier. To view or change the severity of the alarms click on Alarm Configuration in the Rectifier page (see Figure 3.11).



	Critical	Major	Minor	Warning	Indeterminate	Off
General Error			x			
Input Low (AC)	x					
Temp Sensor Fail		x				
Temp High					x	
Temp Low					x	
Except Temp High				x		
Except Temp Low			x			
Element Loss/Start	x					
Input High (AC)	x					
Fan Failure	x					
Power Limit	x					
Output Error				x		

Figure 3-11 - Rectifier Alarm Configuration

Set the preferred severity of each alarm or restore all settings to their default value. Depending on the chosen severity the alarm is shown on the Overview page and on the Front Panel LEDS:

- **Critical**: shows the Alarm in the Alarm Information table as Critical. Activates the red LED on the front panel and displays the unit on the overview page with a red background
- **Major**: shows the Alarm in the Alarm Information table as Major. Activates the red LED on the front panel and displays the unit on the overview page with a red background
- **Minor**: shows the Alarm in the Alarm Information table as Minor. Activates the yellow LED on the front panel and displays the unit on the overview page with a yellow background
- **Warning**: shows the Alarm in the Alarm Information table as Warning. Activates the yellow LED on the front panel and displays the unit on the overview page with a yellow background
- **Indeterminate:** shows the Alarm in the Alarm Information table as Indeterminate. Does not activate any LED on the front panel and does not change the background color of the unit on the overview page.
- **Off:** shows no Alarm in the Alarm Information table. Does not activate any LED on the front panel and does not change the background color of the unit on the overview page.

Buttons:

- **Update**: stores the configuration to the system
- **Undo**: restores the settings to the last updated configuration
- **Restore default**: restores the default configuration. Click update to store the default configuration
- **Update all**: stores the configuration for all Rectifiers to the system

Example:

Set the General Error Alarm to Critical or Major and the unit will be displayed with a red background on the overview page, as long as General Error Alarm is active.
Set it to Minor or Warning and the unit is displayed with a yellow background, while Indeterminate and Off do not change the units background color on the overview page (stay green).

3.2.2.4 Product Information

The Product Information section shows product-specific data for the Rectifier. To view the product data click on Product Information in the Rectifier page (see Figure 3.12).

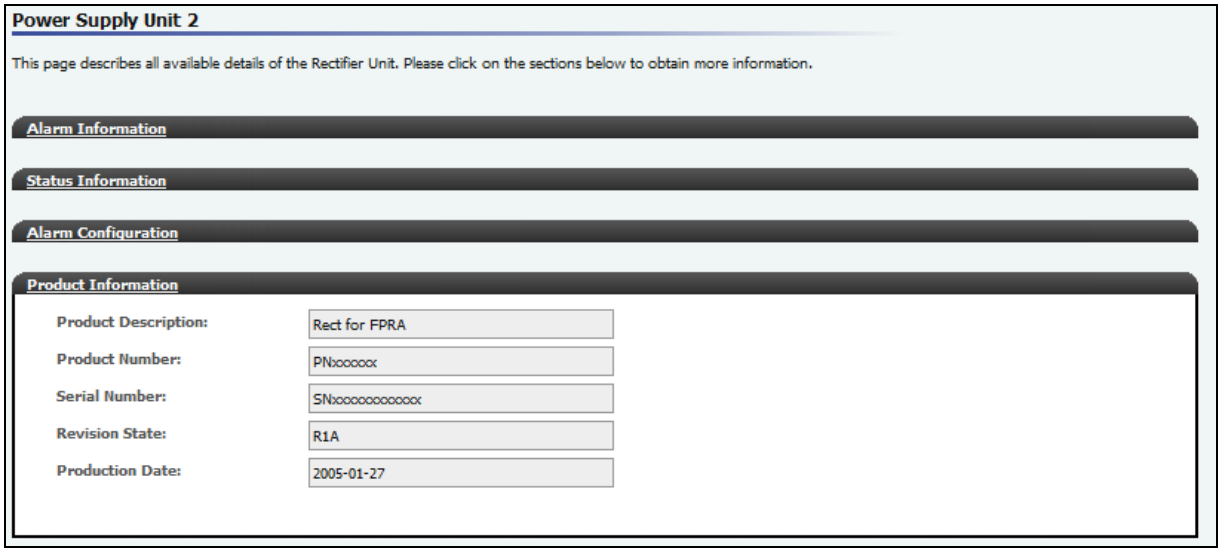


Figure 3-12 - Rectifier Product Information

3.3 Maintenance

3.3.1 Time

The date and time for the FPRA are maintained by an internal Real Time Clock. To view or set the date and time information for the FPRA select “Maintenance” from the Main Menu and select “Time” from the Sub Menu (see Figure 3.13).

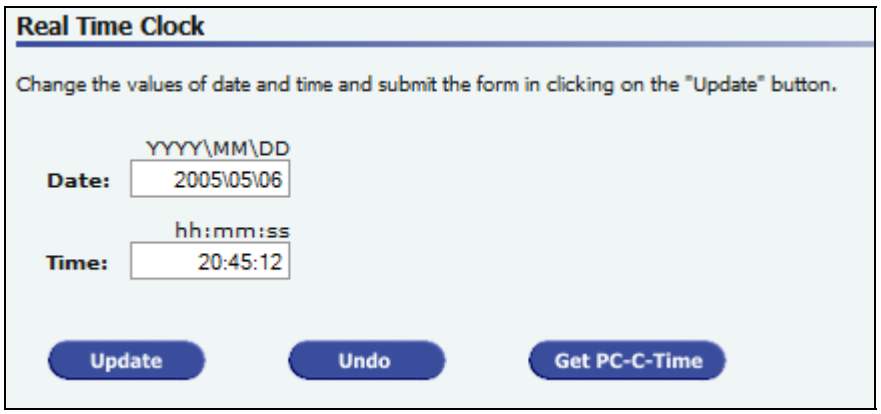


Figure 3-13 - Maintenance Time

Set the local time and date within the Time Section:

- **Enter Data and Time manually**: follow the given format above the data fields
- **Get PC-Time**: copies the local time and date from the PC to the system
- **Undo**: recovers date and time to previous values
- **Update**: stores the new values to the system

- After updating the system with new values it is not possible to return to the old ones.
- Please note the data from the Real Timer Clock is used for the Battery Test Data and scheduled Battery Tests. An incorrectly set time may cause unexpected scheduled battery tests.
- The time is stored in an internal RTC device, which has its own battery back-up. Due to this it is possible to keep the actual time during a power loss or reset event.

3.3.2 Firmware Upgrade

The user can upgrade the firmware for the Control Unit. To access the Firmware Upgrade feature select Maintenance from the Main Menu and select Firmware Upgrade from the Sub Menu (see Figure 3.14).

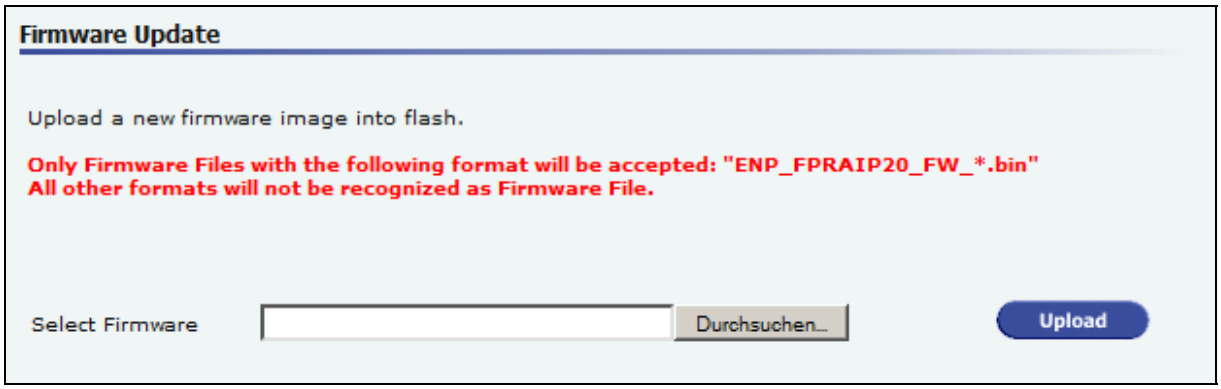


Figure 3-14 - Maintenance Firmware Upgrade

Upload new Firmware

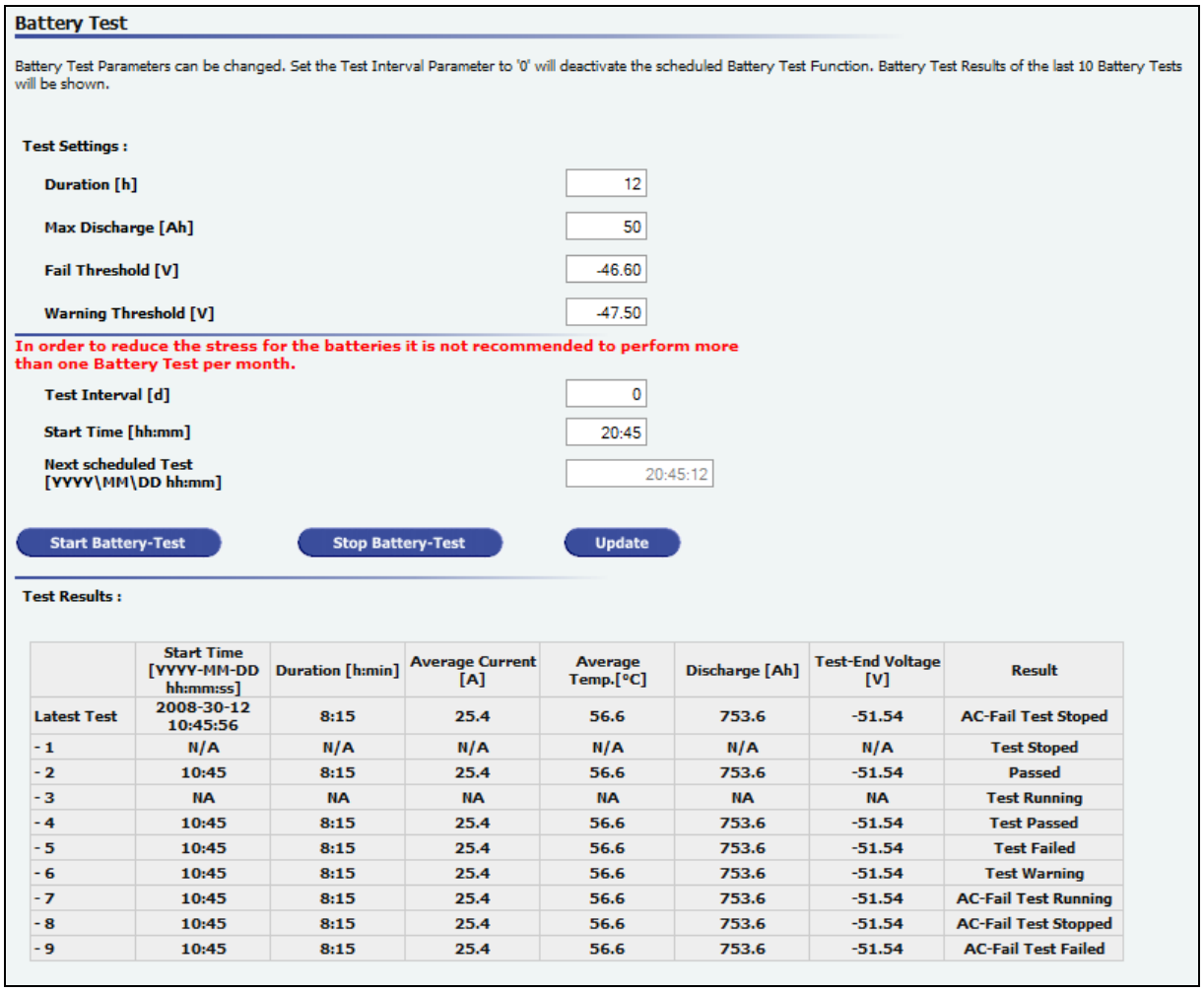
Browse the PC and choose the location of the authorized firmware file. The filename has to start with ENP_FPRAIP20_FW_" and will be provided in correct format.

Click the "Upload" Button to send the chosen file to the system. The system will check if the uploaded file is a valid firmware file, then it will program it to the intended memory location and then restarts the systems.

During the upgrade, a loading screen is displayed and the system restarts on its own.

3.3.3 Battery Test

To verify the health status of the battery, a battery test can be performed. To access settings or the results for the battery test select Maintenance from the Main Menu and Battery Test from the Sub Menu



	Start Time [YYYY-MM-DD hh:mm:ss]	Duration [h:min]	Average Current [A]	Average Temp.[°C]	Discharge [Ah]	Test-End Voltage [V]	Result
Latest Test	2008-30-12 10:45:56	8:15	25.4	56.6	753.6	-51.54	AC-Fail Test Stoped
- 1	N/A	N/A	N/A	N/A	N/A	N/A	Test Stoped
- 2	10:45	8:15	25.4	56.6	753.6	-51.54	Passed
- 3	NA	NA	NA	NA	NA	NA	Test Running
- 4	10:45	8:15	25.4	56.6	753.6	-51.54	Test Passed
- 5	10:45	8:15	25.4	56.6	753.6	-51.54	Test Failed
- 6	10:45	8:15	25.4	56.6	753.6	-51.54	Test Warning
- 7	10:45	8:15	25.4	56.6	753.6	-51.54	AC-Fail Test Running
- 8	10:45	8:15	25.4	56.6	753.6	-51.54	AC-Fail Test Stopped
- 9	10:45	8:15	25.4	56.6	753.6	-51.54	AC-Fail Test Failed

Figure 3-15 - Maintenance Battery Test

The Battery Test checks the health status of a battery block.

The following conditions will start a battery test:

- Manually started test
- Automatically started test (scheduled test)
- AC-Fail test
- Alarm-In Battery Test

The goal of a battery test is to discharge a specified amount of Ampere Hours [Ahs] within a maximum duration [h], without reaching the warning or even the fail threshold Voltage [V].

3.3.3.1 Set Battery Test Parameters

The battery test requires five different input parameters:

- **Duration [h]**: specifies the maximum duration of a battery test
- **Ahs to Discharge [Ahs]**: specifies the maximum Ampere Hours, which have to be discharged during a battery test
- **Fail Threshold [V]**: specifies the maximum battery voltage during a battery test. If reached the battery test will stop with a fail as result. A failing battery test also raises an alarm on the CU. The alarm will be active until restart of the system or a successful performed battery test.
- **Warning Threshold [V]**: specifies a threshold, which, if reached during the test, gives a warning as result. Reaching this threshold does not stop the battery test.
- **Test Interval [d]**: specifies the time between automatically performed battery tests. Each successful finished test will restart this interval, which means that even passed AC-Fail tests will restart the interval. Setting this parameter to zero will deactivate this functionality.
- **Start Time [hh:mm]:** specifies the start time for a periodic battery test.

To update changed input parameters click the Update button. To update changed input parameters and start a battery test at once click the Start Battery-Test button.

- Since each discharge lowers the life time of the batteries it is not recommended to perform more than one battery test per month.
- The smaller the load which has to be powered from the batteries the higher the “Fail Threshold” should be set.
- Deep discharges are extremely unhealthy for batteries.
- It is recommended not to discharge more than 80% of the total battery capacity.

3.3.3.2 Manually started test

To start a Battery Test manually on the GUI, click the Start Battery-Test Button. If the system is in a state which allows a battery test to be started, the test will start immediately. If the system is not in a state which allows a battery test to be started, the test will be queued and started as soon, as possible.

3.3.3.3 Automatically started test (scheduled test)

If a Battery Test is required periodically, set the Interval to the preferred period. The Battery Test starts automatically when the amount of days since the last “passed” test has elapsed.

Example 1:

- *Test Interval of 30 days*
- *The last “passed” Battery Test is 29 days ago. So the next scheduled Test should be “tomorrow”.*
- *An AC-Fail occurs, which starts a Battery Test. This AC-Fail Test finishes with the result “passed”.*
- *The next scheduled test will be in 30 days, instead of 1 day*

Example 2:

- *Test Interval of 30 days*
- *The last “passed” Battery Test is 30 days ago. So the next scheduled Test starts*

Example 3:

- *Test Interval of 30 days*
- *The last "passed" Battery Test is 29 days ago. So the next scheduled Test should be "tomorrow".*
- *An AC-Fail occurs, which starts a Battery Test. This AC-Fail Test stops because the duration of the AC-Fail is too short (result of the test is "stopped").*
- *The next scheduled test still will be in 1 day*

3.3.3.4 AC-Fail test

On each AC-Fail/Mains Fail the system starts a AC-Fail battery test. If the AC supply is back before the requested duration, or, the requested amount of discharge is reached, the test result is "AC-Fail Test Stopped". Reaching one of the two parameters (duration or discharge) the test finishes with the according result.

3.3.3.5 Alarm-In Battery Test

Depending on the Alarm-In Setting (see also section 3.4.3.3) a Battery Test starts on Alarm-In activation or deactivation. If the system is in a state, which allows a battery test to be started, the test will start immediately. If the system is not in a state, which allows a battery test to be started, the test will be queued and started as soon, as possible.

3.3.3.6 View Battery Test Results

Review the results of the past 10 battery tests within the table below the battery test settings. Click the "Clear Test Records" button to clear all records.

3.3.4 Config. Ex-/Import

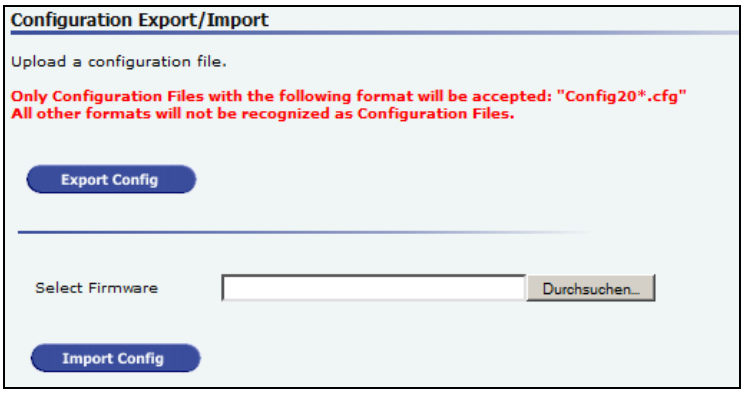


Figure 3-16 - Maintenance Configuration Import-Export

Click the “Export” Button to download the System Configuration. Use the same file to import the configuration to another system. Use the export and import functionality to clone system configuration to several other systems.

- For import of configuration only the following naming for the file is accepted: **Config20*.bin.**
- Read section 2.5 to change the browsers default download location. Depending on the used browser and settings, the download location of the configuration file can change. Before downloading configuration data check the default download location of the browser and change browser settings according to the requirements.

3.3.5 System Notes & System ID & System logs

To read or add notes, or to change the System ID and location, select Maintenance from the Main Menu and System Notes & System ID & Systemlogs from the Sub Menu.

3.3.5.1 System Notes

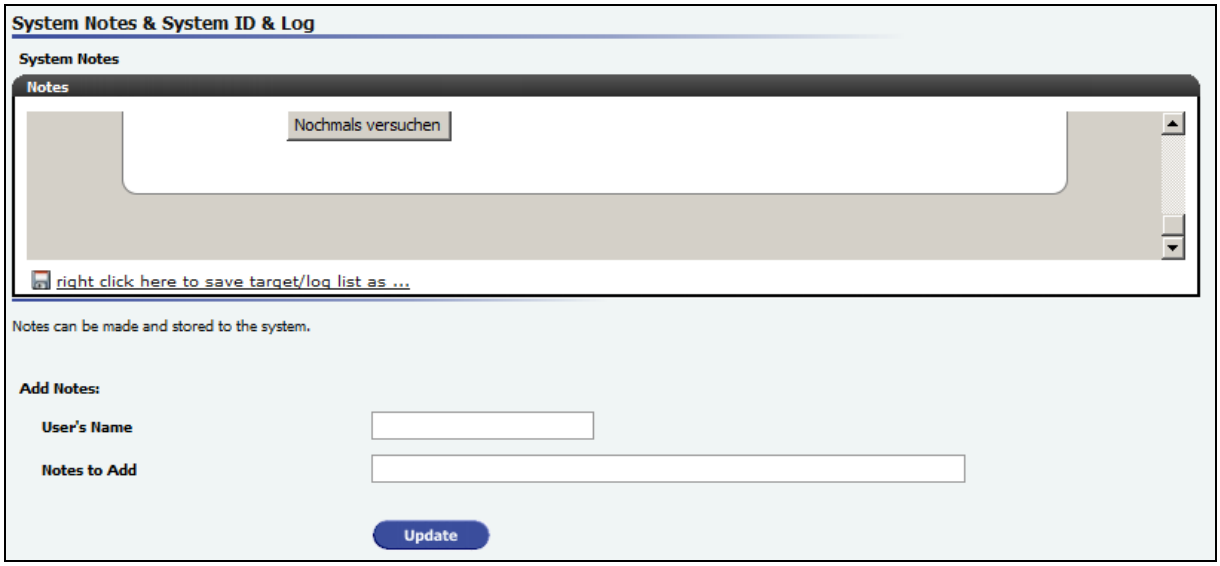


Figure 3-17 - System Notes

To add new notes enter your name and the notes you want to add. Click the Update button to save the notes. To download the note file right click on the disc symbol or the text below the notes and chose “Save Target As”.

3.3.5.2 System ID

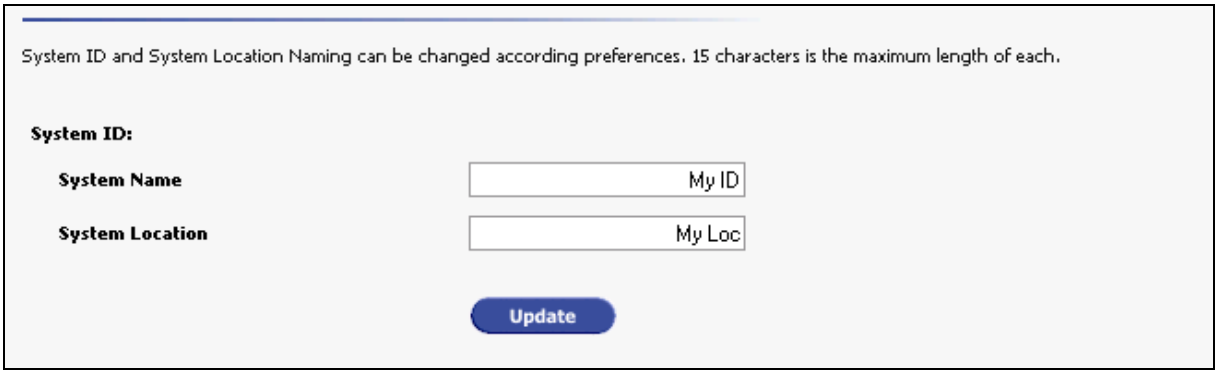


Figure 3-18 - System ID and System Location

To change the System ID/Name and/or the System Location enter the required names and click the update button. The names shown at the upper right of the GUI will change immediately.

3.3.5.3 Systemlogs

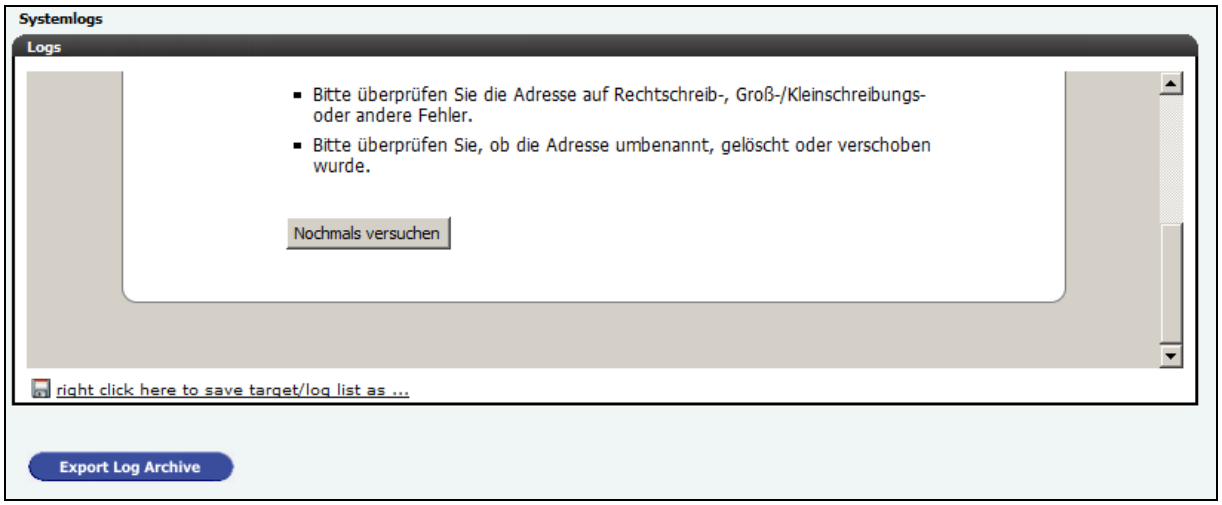


Figure 3-19 - Systemlogs

The latest Alarms/Actions can be reviewed. To see a list of archived Alarms/Actions click the button below.

3.4 System Settings

3.4.1 Battery Related Settings

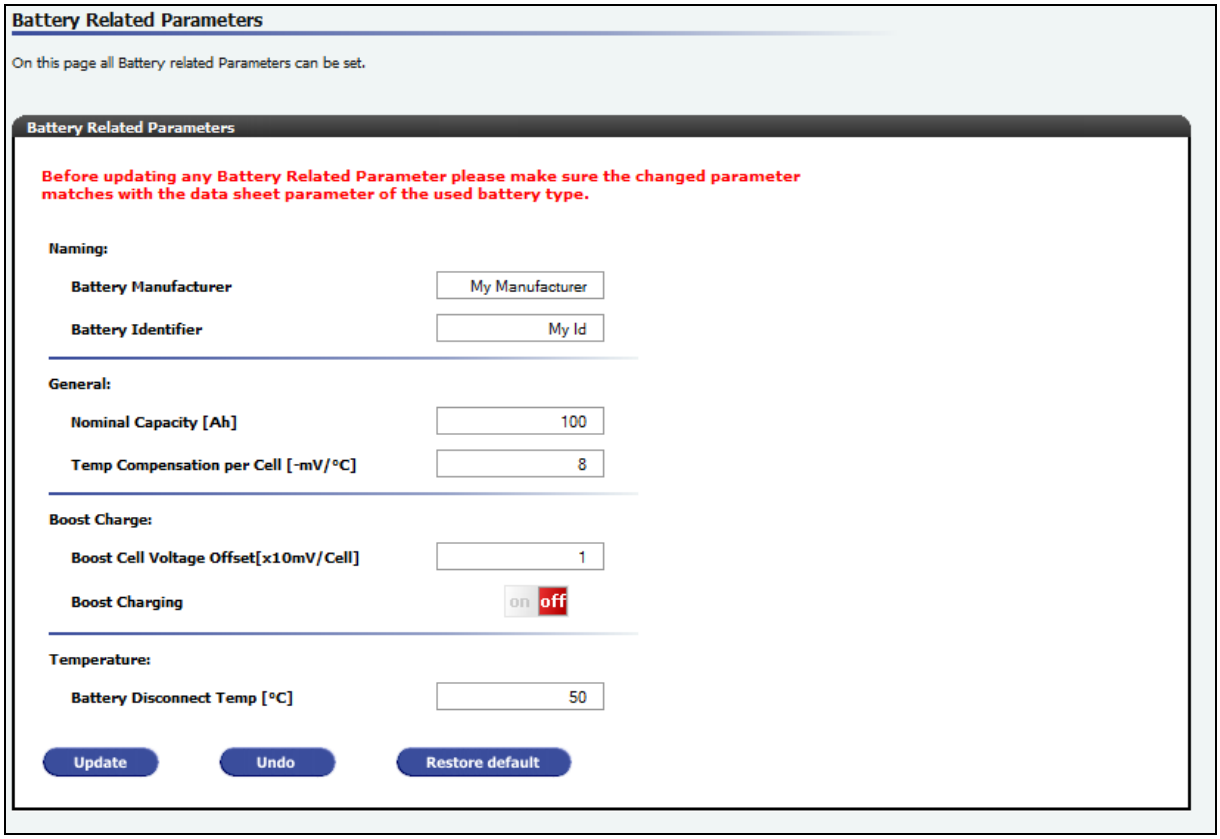


Figure 3-20 - Battery Related Settings

The Battery Related Settings define the overall system behaviour:

- **Battery Manufacturer:** manufacturer of the used battery. Just for information.
- **Battery Identifier:** Identifier/Name of the used battery. Just for information.
- **Nominal Capacity [Ah]:** Overall Capacity of the used battery block
- **Temperature Compensation per Cell [mV/°C]:** specifies the applied Temperature Compensation. This setting should be according to the battery manufacturer's data.
- **Boost Cell Voltage Offset [x10mV/Cell]:** specifies the applied Boost Voltage during Boost Charge. This setting should be according to the battery manufacturer's data.
- **Boost Charging:** activates or deactivates the boost functionality
- **Battery Disconnect Temp. [°C]:** specifies the highest allowed temperature for the used type of battery. Higher temperatures will virtually disconnect the battery from the system. (Charge Limit is set to 5A internally, as long as the Battery Temperature is above the Battery Disconnect Temperature)

- Set the Battery Related Parameters carefully to the values specified from the battery vendor.
- Set the Battery Related Parameters after installation of the system or after equipping the battery with a new type of batteries. **Wrong settings may damage the batteries.**
- Since not all types of batteries support boost voltage it is recommended to keep the Boost Cell Voltage at 0.
- Boost Cell Voltage Offset and Temperature Compensation per Cell values are per Cell. Lead acid battery blocks with an operating voltage of –48 V have 24 cells.
- Always check the Manufacturer's data for the specified battery values

3.4.2 System Related Settings

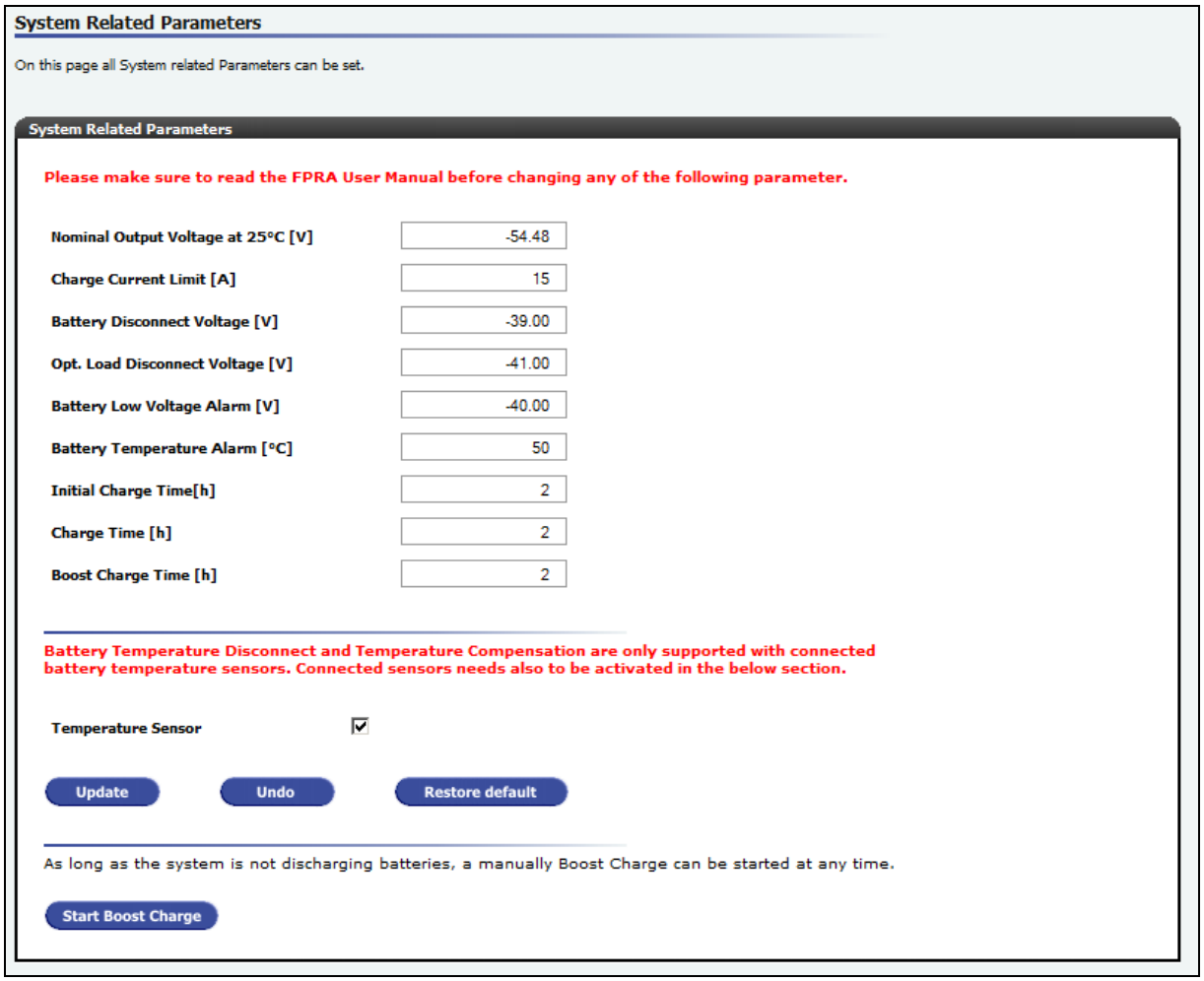


Figure 3-21 - System Related Settings

The System Related Settings define the overall system behaviour (see also Appendix A on section 7):

- **Nominal Output Voltage [V]**: defines the system target voltage without boost voltage offset and without temperature compensation.
- **Charge Current Limit [A]**: defines the maximum battery charge current. This setting should be according to the battery manufacturer's data.
- **Battery Disconnect Voltage [V]**: defines maximum battery voltage before disconnecting the batteries from the system. This setting should be according to the battery manufacturer's data.
- **Opt. Load Disconnect Voltage [V]**: defines maximum battery voltage before disconnecting the optional load from the system.
- **Battery Low Voltage Alarm [V]**: defines the threshold for battery low voltage alarm activation and deactivation.
- **Battery Temperature Alarm [°C]**: defines the threshold for battery temperature high alarm activation and deactivation. (As long as this alarm is active the charge limit is reduced to 50% of the set value.)

- **Initial Charge Time [h]**: defines the duration of the initial charge. (See also Appendix A on section 7)
- **Charge Time [h]**: defines the charge duration after a battery discharge. (See also Appendix A on section 7)
- **Boost Charge Time [h]**: defines the duration after a battery boost discharge. (See also Appendix A on section 7)
- **Temperature Sensor**: defines if a temperature sensor is connected or not. The field have to be empty if no temperature sensor is connected. If no temperature sensor is connected, no temperature will be shown on the overview page. If no temperature sensor is connected the temperature disconnect and the temperature compensation are disabled.

- The smaller the load, which has to be powered from the batteries, the higher the "Battery Disconnect Voltage" should be set. Slow deep discharges are extremely unhealthy for batteries.
- The smaller the overall battery capacity, the smaller the Charge Current Limit should be set. It is recommend the set the Charge Current Limit not higher than 50% of the overall battery capacity (e.g.: 100Ahs battery capacity = max. Current Limit not above 50A)
- Always check the Manufacturer's data for the specified battery values

3.4.3 Signal Out Settings

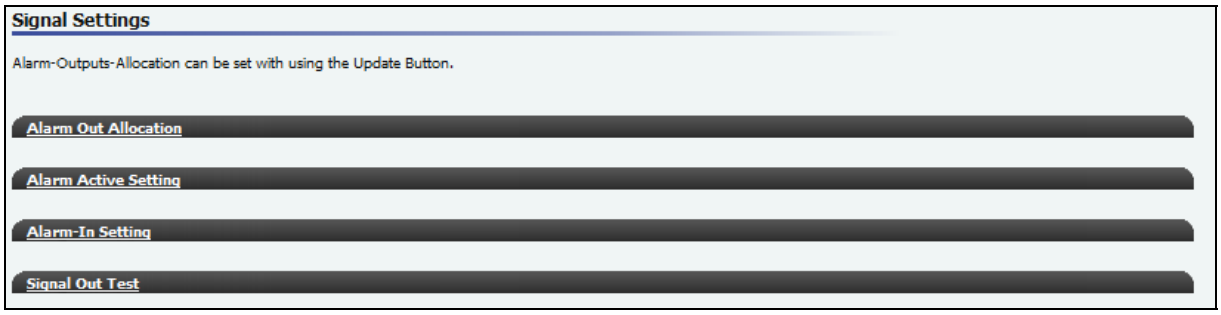


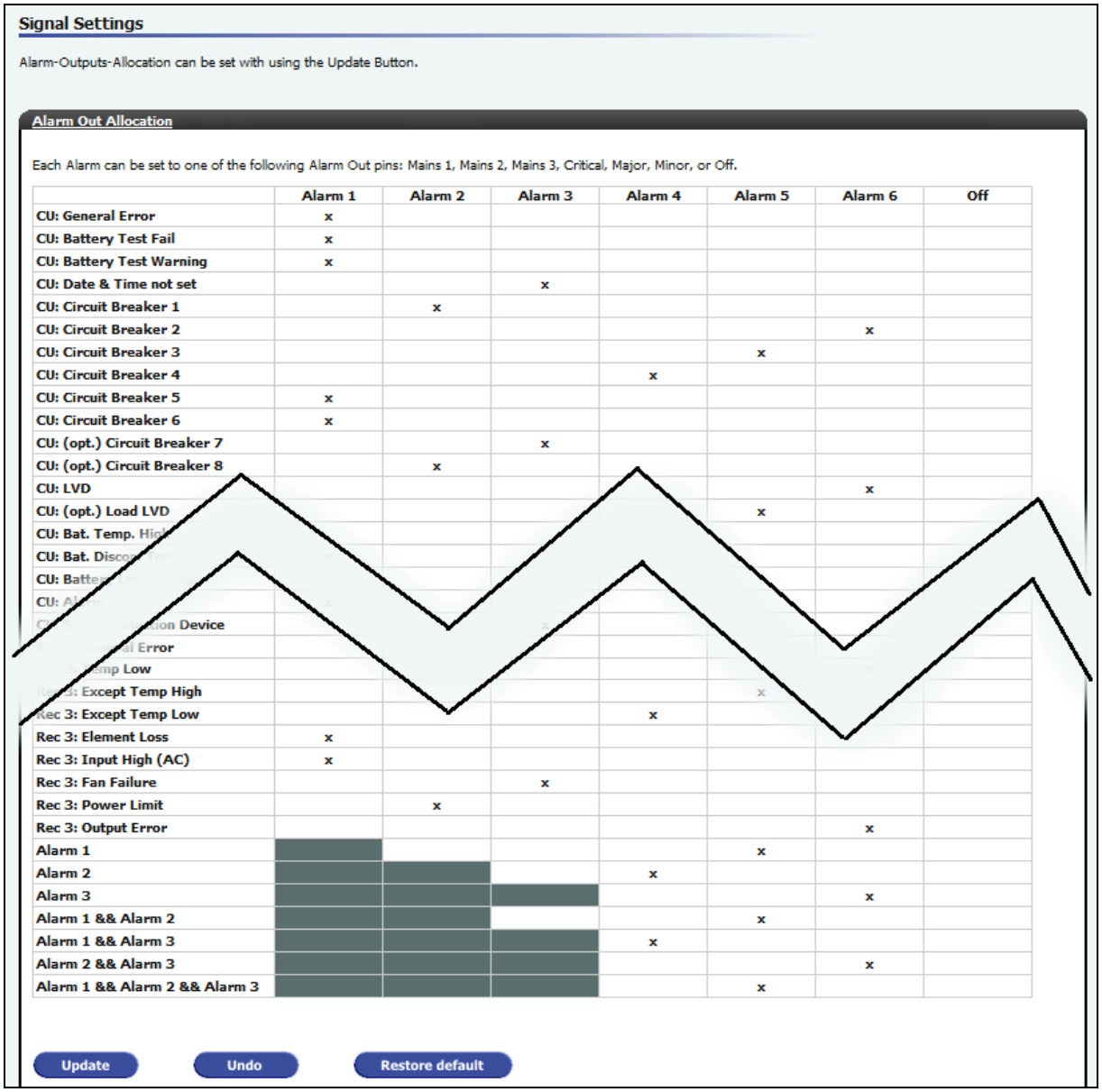
Figure 3-22 - Signal Out Settings

Signal Out Sections:

- Alarm Out Allocation
- Alarm Active Setting
- Alarm-In Setting
- Signal Out Test

Click on the name of the sub section to expand it.

3.4.3.1 Alarm Out Allocation



	Alarm 1	Alarm 2	Alarm 3	Alarm 4	Alarm 5	Alarm 6	Off
CU: General Error	x						
CU: Battery Test Fail	x						
CU: Battery Test Warning	x						
CU: Date & Time not set			x				
CU: Circuit Breaker 1		x					
CU: Circuit Breaker 2						x	
CU: Circuit Breaker 3					x		
CU: Circuit Breaker 4				x			
CU: Circuit Breaker 5	x						
CU: Circuit Breaker 6	x						
CU: (opt.) Circuit Breaker 7			x				
CU: (opt.) Circuit Breaker 8		x					
CU: LVD						x	
CU: (opt.) Load LVD					x		
CU: Bat. Temp. Hig							
CU: Bat. Disco							
CU: Batte							
CU: Al							
C on Device			x				
l Error							
mp Low						x	
3: Except Temp High					x		
Rec 3: Except Temp Low				x			
Rec 3: Element Loss	x						
Rec 3: Input High (AC)	x						
Rec 3: Fan Failure			x				
Rec 3: Power Limit		x					
Rec 3: Output Error						x	
Alarm 1					x		
Alarm 2				x			
Alarm 3						x	
Alarm 1 && Alarm 2					x		
Alarm 1 && Alarm 3				x			
Alarm 2 && Alarm 3						x	
Alarm 1 && Alarm 2 && Alarm 3					x		

Figure 3-23 - Alarm Out Allocation

It is possible to allocate each possible alarm to one of the signal-out pins:

- Alarm 1
- Alarm 2
- Alarm 3
- Alarm 4
- Alarm 5
- Alarm 6
- Off: set an alarm to off no signal will be activated on activation of the alarm

It is also possible to activate signal out pins on combinations of active pins. Dark-grey fields are forbidden fields, which cannot be used.

3.4.3.2 Alarm Active Setting

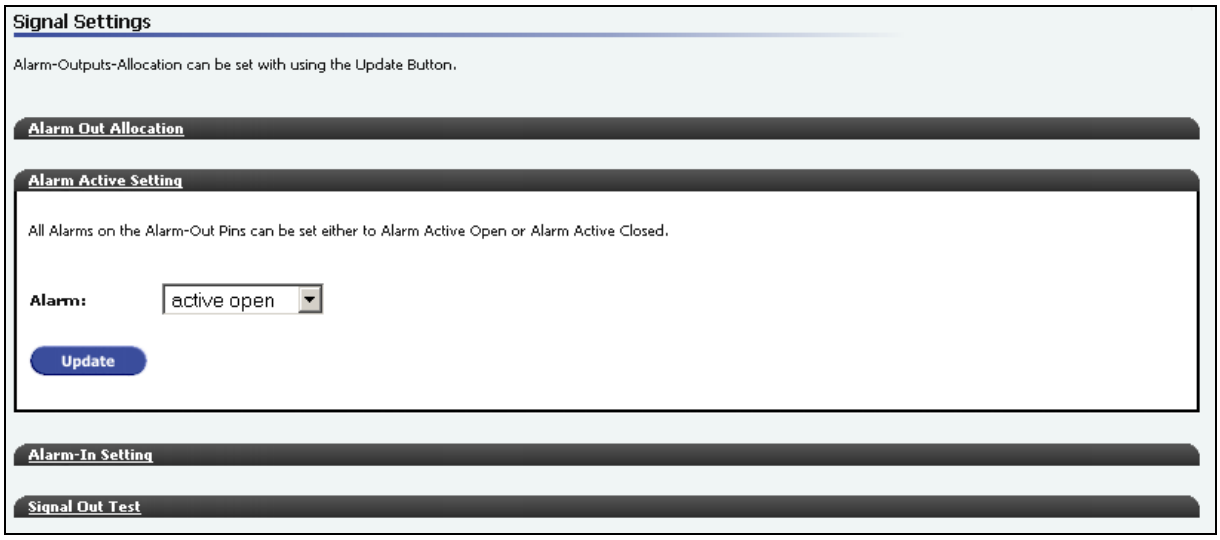


Figure 3-24 - Alarm Active Settings

Set the activation type to the preferred handling:

- Active open
- Active closed

3.4.3.3 Alarm-In Setting

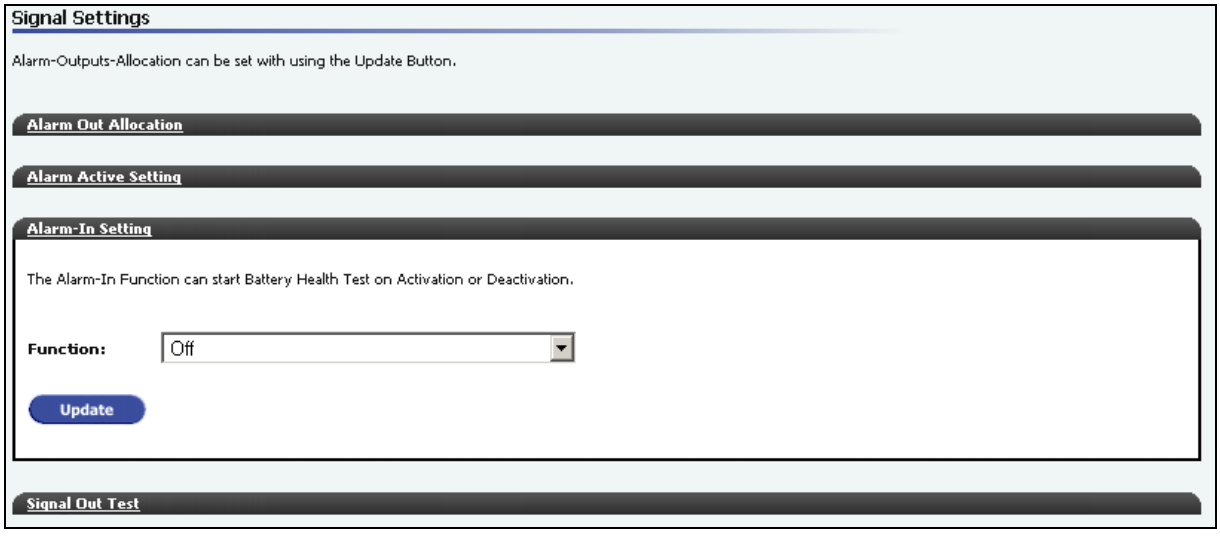


Figure 3-25 - Alarm In Settings

Set the functionality of the Alarm-In pin:

- Start battery test on alarm in activation
- Start battery test on alarm in deactivation
- ERPS Boost Charge
- Turn this functionality off

3.4.3.4 Signal Out Test

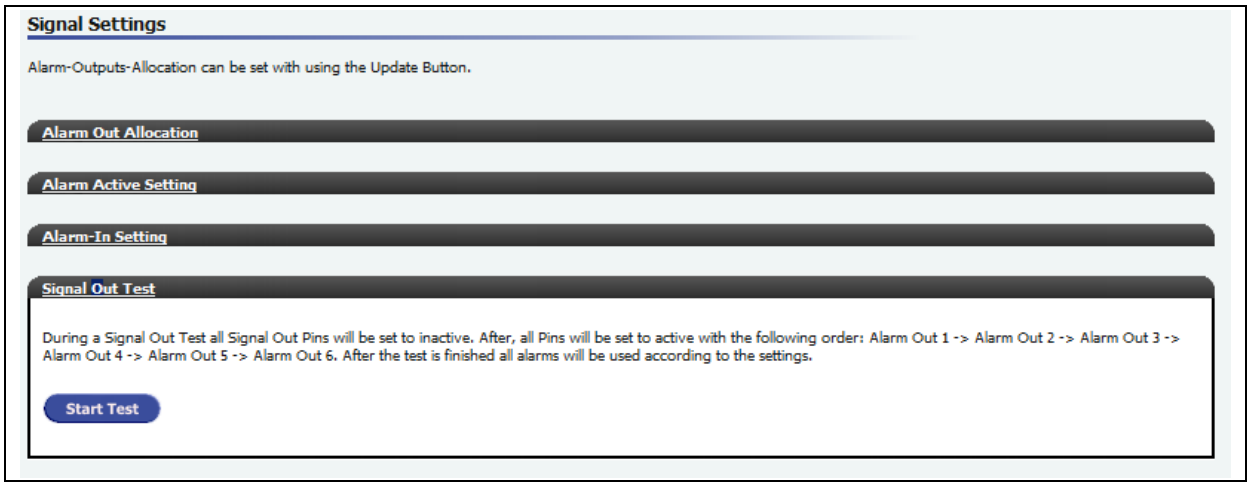


Figure 3-26 - Signal Out Test

To perform a Signal Out Test click the Start Test Button. All alarms on the signal pins will turn off for 10 seconds before turning on each alarm for 10 seconds.

The Following order is used for turning on the signal pins:

Time	Alarm 1	Alarm 2	Alarm 3	Alarm 4	Alarm 5	Alarm 6
0s – 10s	Off	Off	Off	Off	Off	Off
10s – 20s	**ON**	Off	Off	Off	Off	Off
20s – 30s	Off	**ON**	Off	Off	Off	Off
30s – 40s	Off	Off	**ON**	Off	Off	Off
40s – 50s	Off	Off	Off	**ON**	Off	Off
50s – 60s	Off	Off	Off	Off	**ON**	Off
60s – 70s	Off	Off	Off	Off	Off	**ON**

After the test is finished the signals will be set according settings and active alarms.

- During a Signal Out Test no alarms will be reported via the signal pins.

3.4.4 Access

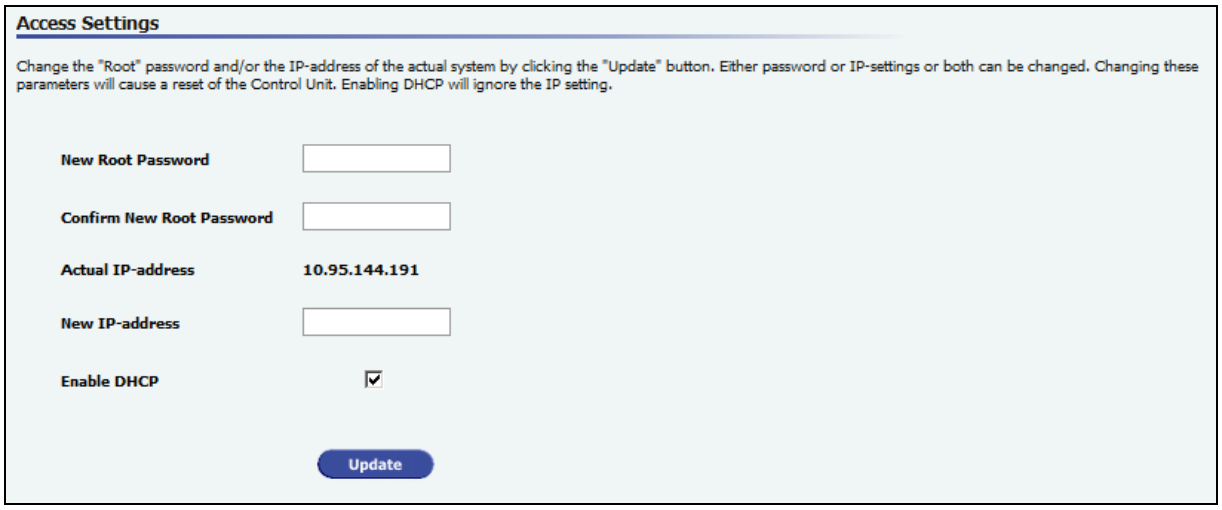


Figure 3-27 – Access

For security and/or connection reasons, change the root password and/or the connection IP address. After updating the system will perform a restart.

- After changing the IP-address of the system, reconnect manually while using the new connection IP-address.

4 Front Panel LCD Display

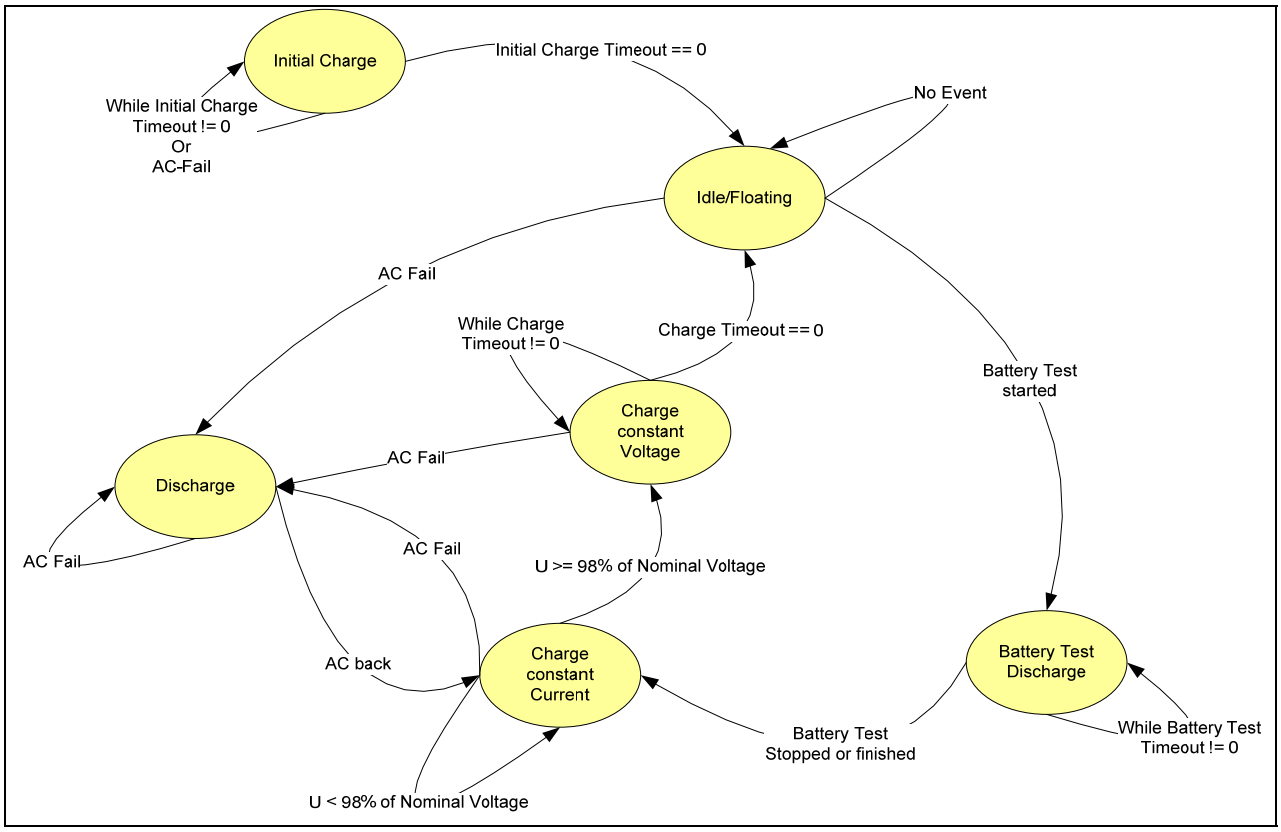
The Front Panel LCD Display gives basic functionality for controlling and monitoring the system. It can;

- Monitor all active alarms
- Monitor voltages and currents
- Monitor system PID data
- Monitor battery test results
- Monitor and change the connection IP address

Since the LCD Display only supports basic functionality of the system this is not the main User Interface. For a detailed menu structure see also Appendix B on section 8).

5 Table of Figures

6 Appendix A – Battery Charge/Discharge/Recharge Concept

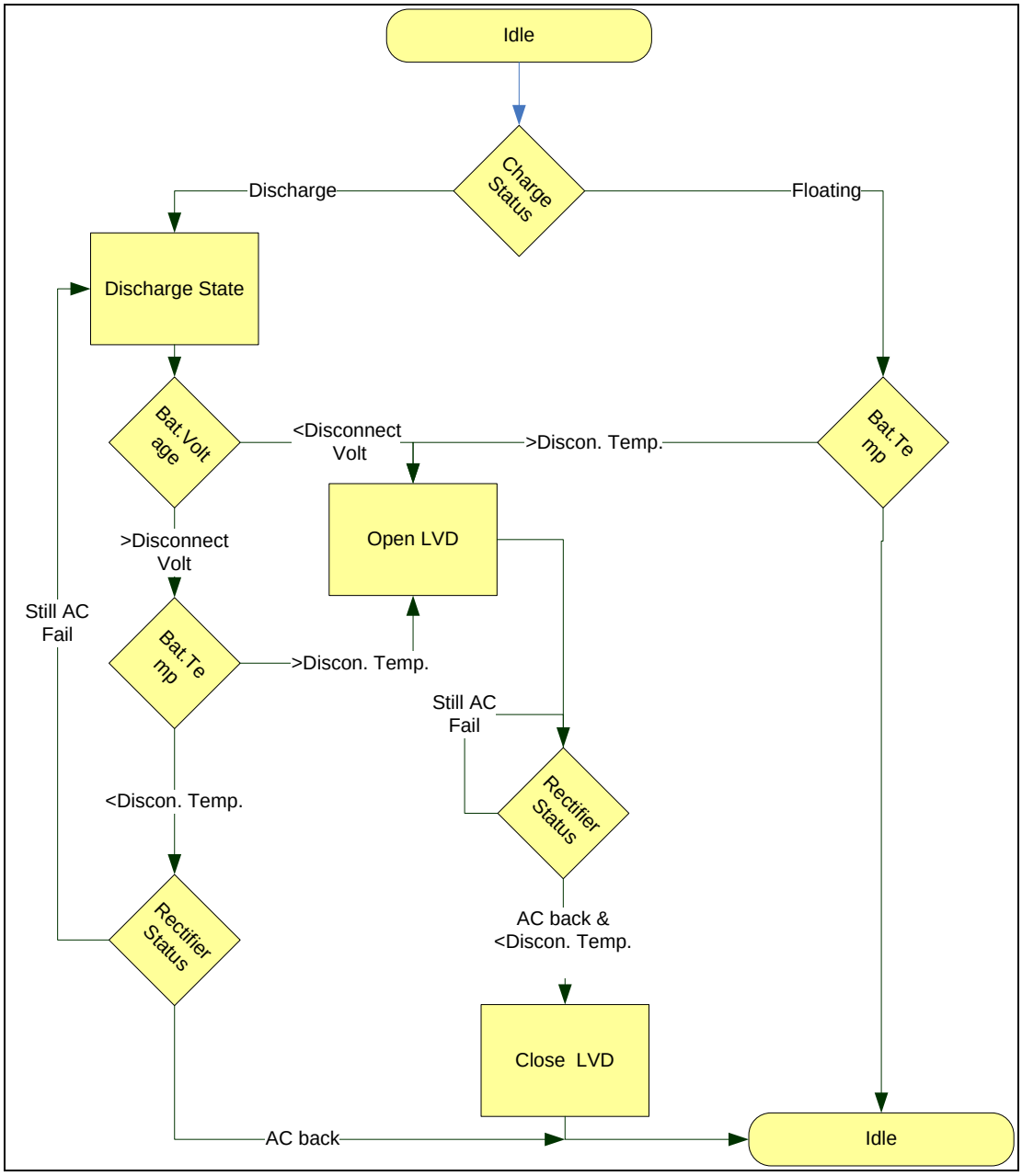


The Battery state machine mainly consists of five different parts:

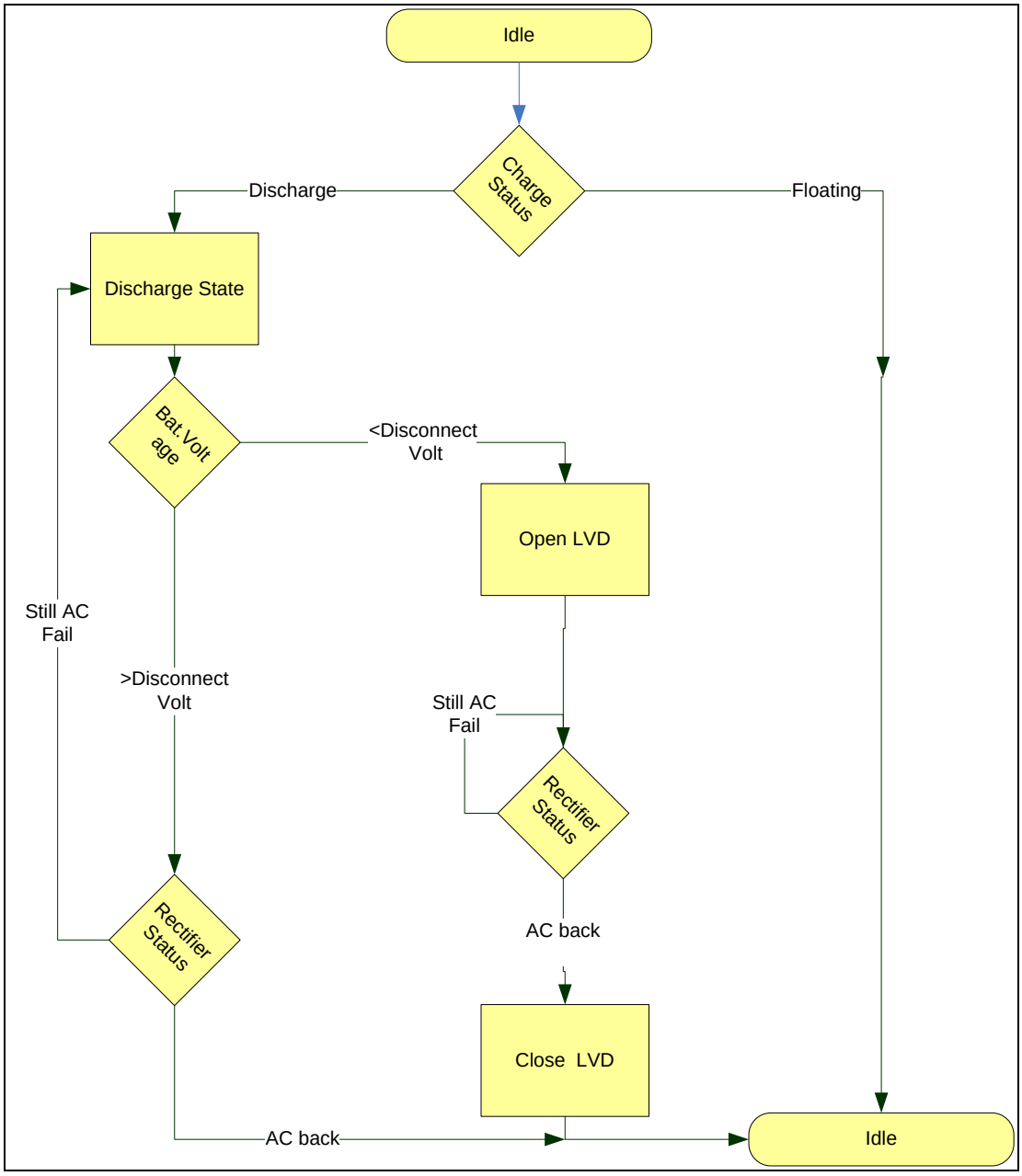
1. **Initial Charge/Charge Start**: after start-up the system is in initial charge state. This state guarantees fully charged batteries before changing to the default operational state. During this time it is not possible to start a battery test. The duration for the initial charge time is user settable and can be changed under “System Related Settings” – “Start Charge Time”. (see also section 3.4.2). It is not possible to stop the initial charge cycle in order to start a battery test, but it is possible to schedule a battery test, which starts directly after the initial charge.
2. **Charge Off/Idle State**: this is the default operational state. This is the only state, which allows a battery test to be started.
3. **Battery Test**: battery test is a simulated AC-Fail/Discharge State. After a battery test, the system will change to discharge state in order to recharge the batteries.
4. **Discharge State**: Discharging more than 1% and less than 10% of total battery capacity will result in the Discharge State. If the AC/Mains returns before discharging more than 10% of total capacity of the batteries, the batteries will be recharged without boost voltage. The duration for the recharge is user settable and can be changed under “System Related Settings” – “Charge Time” (see also section3.4.2)
5. **Boost Discharge State**: Discharging to more than 10% of total battery capacity will result in the Boost Discharge State. After AC/Mains returns, the batteries will be recharged with boost voltage. The duration for the boost recharge is user settable and can be changed under “System Related Settings” – “Boost Charge Time” (see also section 3.4.2)
6. **Manual Boost Charge State**: A manually started Boost Charge can be performed during a normal charge or during Charge Off State.

- State changes from “Charging States” or “Charge Off State” requires a discharge of more than 1% of overall battery capacity. Depending on the overall battery capacity this may take several minutes.

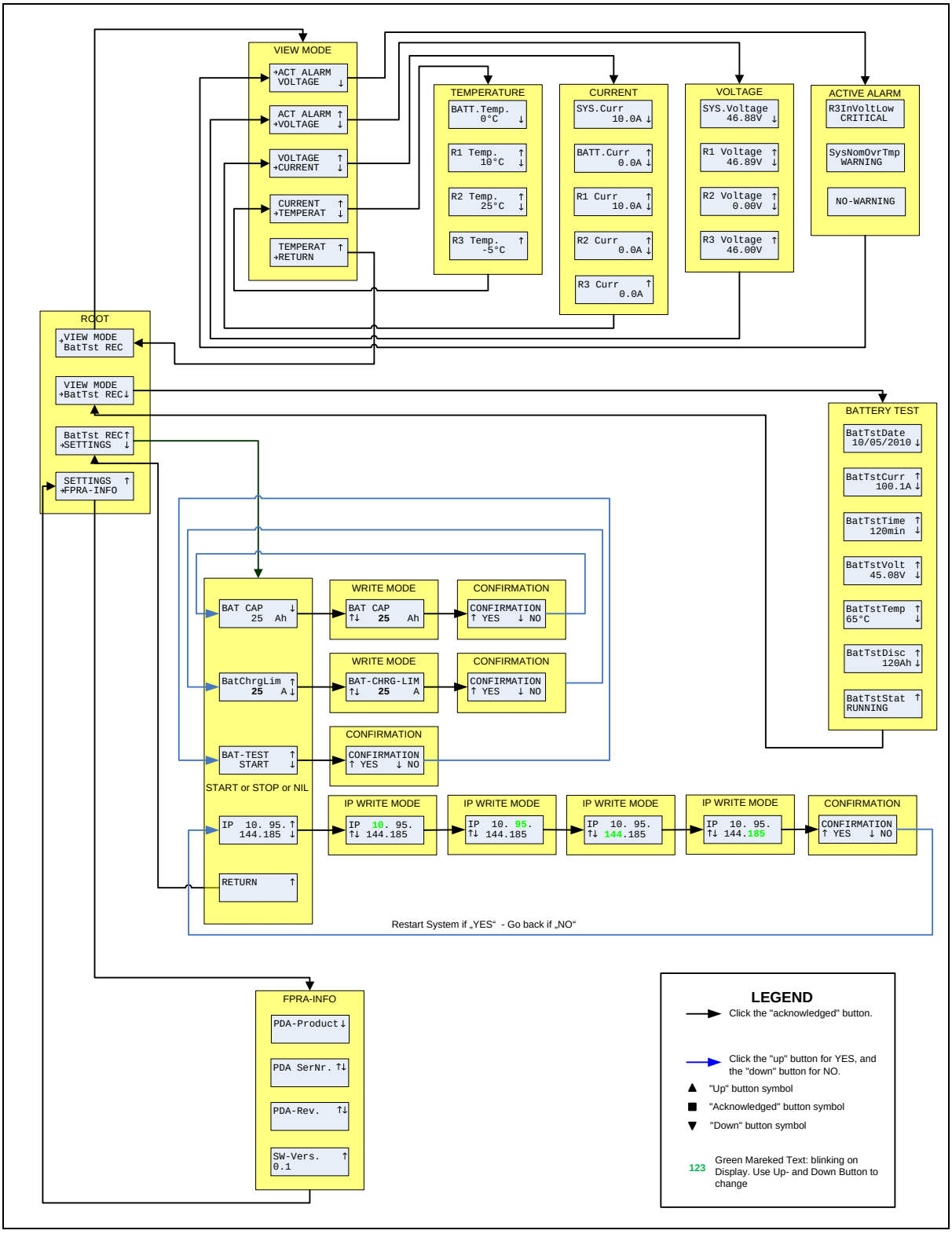
7 Appendix B – Battery LVD Handling



8 Appendix C – optional Load LVD Handling



9 Appendix D – Front Panel Display Menu



10 Appendix E – System Efficiency Increasing Functionality

To increase the overall System efficiency rectifiers, which are not needed, are turned off. This functionality cannot be disabled and its behaviour cannot be changed.

If any of the following alarms is active, this functionality is disabled (all Rectifier ON) at all:

- Any Circuit Breaker Alarm
- Any LVD Alarm
- Rectifier Input Voltage Low
- Rectifier General Error
- Rectifier Power Limit
- Rectifier Fan Error
- Rectifier Exceptional Temperature
- Rectifier Output Error

During a Battery Test this functionality is disabled as well.

The following thresholds are required to turn on/turn off additional Rectifier:

1. NO Rectifier is ON:
    a. All Rectifier will be set to ON
2. 1 Rectifier is ON:
    a. Turn ON a second Rectifier, if average output Power of the running Rectifier is above 85%
3. 2 Rectifier are ON:
    a. Turn ON a third Rectifier, if average output Power of the running Rectifier is above 85%
    b. Turn OFF a Rectifier, if average output Power of the running Rectifier is below 35%
4. 3 Rectifier are ON:
    a. Turn OFF a Rectifier, if average output Power of the running Rectifier is below 50%

11 Appendix F – Typical System Set Up

The following settings should give an idea of how to set up the system. These are not mandatory settings and should be considered a guide only as help, especially for inexperienced user. **Please consider the Battery Manufacturer's data at any time**

	500 (10A @ -50V)			1500 (30A @ -50V)			3000 (60A @ -50V)		
Battery Capacity [Ahs]	**100**	**200**	**500**	**100**	**200**	**500**	**100**	**200**	**500**
Battery Related Parameters									
Nominal Capacity [Ah]	100	200	500	100	200	500	100	200	500
Boost Cell Voltage [x10mV/Cell][5]	0	0	0	0	0	0	0	0	0
Temperature Compensation per Cell [mV/°C][3]	according Battery Manufacturer's Data								
Min. Battery Temp [°C]	according Battery Manufacturer's Data								
Max. Battery Temp [°C]	according Battery Manufacturer's Data								
System Related Parameter									
Nominal Output Voltage [V]	-53,5	-53,5	-53,5	-53,5	-53,5	-53,5	-53,5	-53,5	-53,5
Charge Current Limit [A][3]	50	100	100	50	100	100	50	100	100
Battery Disconnect Voltage [V][3]	-43	-43	-43	-43	-43	-43	-43	-43	-43
Battery Low Voltage Alarm [V]	-46,3	-46,3	-46,3	-46,3	-46,3	-46,3	-46,3	-46,3	-46,3
Initial Charge Time [h]	12	12	12	12	12	12	12	12	12
Charge Time [h]	4	6	8	6	8	10	8	10	12
Boost Charge Time [h]	3	5	7	5	7	9	7	9	11
Battery Test Settings									
Duration [h]	6	12	30	2	4	10	1	2	5
Ahs to Discharge [Ahs]	60	120	300	60	120	300	60	120	300
Fail Threshold [V]	-46,6	-46,6	-46,6	-46,4	-46,6	-46,6	-46,2	-46,4	-46,6
Warning Threshold [V]	-47,5	-47,5	-47,5	-47,3	-47,5	-47,5	-47,1	-47,3	-47,5
Test Interval [d]	50	50	50	50	50	50	50	50	50

[3] [4] [5] Should also be according to the Battery Manufacturer's Data.

12 Appendix G – Minimum Recommended Hardware Requirements

- Windows XP Operating System
- PC with 300 megahertz or higher processor clock speed recommended; Intel Pentium/Celeron family, or AMD K6/Athlon/Duron family, or compatible processor recommended
- 128 megabytes (MB) of RAM or higher recommended
- Ethernet 10/100 Base TX device or higher recommended
- Super VGA (800 x 600) or higher-resolution video adapter and monitor
- Keyboard and Mouse or compatible pointing device