ELTEK
A Delta Group Company

User's Guide

Flatpack2 Integrated 2U

24 – 220V, 8-12kW DC Power System

356827.013

356800.183, 3v6

SAFETY and ENVIRONMENTAL PRECAUTIONS

The **product warranty** becomes invalid if the following safety precautions are not followed during handling, installation, commissioning and general use/operation of *Eltek* power supply systems.

General Precautions


Device Hazard

CAUTION: Even though the product incorporates protection circuitry and other safeguards, it can be **damaged, perform poorly or have a reduced lifetime** if it is exposed to **incorrect treatment** during transport, installation or service. Always handle the equipment using proper lifting techniques, do not roll, climb or drill hole in the cabinets or enclosures. G1


Electric Shock

WARNING: Opening the equipment may cause personal injury — even if the mains AC supply is disconnected. Hazardous voltages may be present inside, as large capacitors may still be charged. G2

Environmental Precautions

Ventilated Hot Surface

CAUTION: To avoid damage the equipment, **keep objects clear of system ventilation inlets, outlets and system fans**, if any, ensuring the **airflow** through the units is **not obstructed**, and that the fans rotate freely. Use caution with power modules, as they can reach **extreme temperatures** under load and normal operation. E1


Current Surge Protection

WARNING: The installer/user is responsible for ensuring that the power system is not damaged by current surges, over-voltages, etc. caused by external transients, lightning, electrostatic discharge, etc. To avoid damage and obtain the expected system reliability, it is mandatory to always install SPDs in Eltek's power supply systems. Follow the instructions given in "Requirements for Surge Protection", doc. 2024623. E2


Humidity & Dust Protection

WARNING: The electronics in the power supply system are designed for indoor, clean environment. When installed in outdoor enclosures — using heat sinks or closed loop heat management systems — it is important to maintain the equipment closed and tight during operation, to avoid external air entering the enclosure. Also, when using open loop heat management systems, it is important to replace the filters on a regular basis. Indoor installations in dusty or humid areas require appropriate air filtering of the room, or filtering of the air entering the power system. Follow the instructions given in "Generic Guidelines Environmental Protection.", doc. 2038879 E3

Precautions during Installation


Qualified Personnel

CAUTION: Read the user documentation carefully before installing and using the equipment, as installation and operation is to be performed as described in it. Always tighten screws and bolts with the **torque values recommended** in the documentation. For safety reasons, the **commissioning and configuration of the equipment is only to be performed** by *Eltek*'s personnel or by authorized and qualified persons. I1


EMC, NEC/CEC Regard

CAUTION: This product is tested and verified according to international safety, environmental and EMC standards. Any **non-*Eltek* equipment** installed into this product after delivery might influence the performance and **could infringe the original approvals**. The **installer is responsible** for ensuring that the environmental properties of this product/ system do not deteriorate during installation, and that it is performed in accordance with applying regulations.

Installations in USA and Canada must comply with NEC/CEC requirements. I2


Device Hazard

CAUTION: Before you start the electrical installation, you must **always disconnect** all external supply fuses, as well as internal battery and load fuses/ breakers, if any. I3


Electric Shock

WARNING: For safety reasons (high leakage current / high touch current) you must always connect the AC earth wire (PE) to the terminals, before you connect the AC input cable(s).

The batteries, if any, represent a major energy hazard. To avoid short-circuit of battery poles, you must always remove metallic objects — uninsulated tools, rings, watches, etc. — from the vicinity of the batteries. I4


Electric Shock

WARNING: 60V power systems, and higher voltage systems, are only to be installed in Restricted Access Locations (RAL). Access must be limited by use of tool, i.e. lock and key. I5

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1. Safety and Practices

The Flatpack2 Integrated DC power system is rated for an AC input voltage range of 100 Vac – 250 Vac, or 85-300Vdc. It has an ambient operating temperature range of -40°C to +55°C (de-rating above +45°C).

Table below lists all available rectifiers for use with these systems and how their specifications affect shelf output ratings.

24 - 125VDC-12 kW System

Part Number	Description	Output Voltage Range (DC)	Default Output Voltage (DC)	Maximum Output Current (DC)	Total Output for Shelf (DC)
241115.205	Flatpack2 24V/1800W HE*	21.7 - 28.8 V	26.7 V	75V	300A
241115.250	Flatpack2 24V/2000W WOR**	21.5 - 36.0 V	26.7 V	70A	280A
241115.105	Flatpack2 48V/2000W HE	43,2-57,6 V	53,5 V	41,7 A	167 A
241119.105	Flatpack2 48V/3000W HE	43,5-57,6 V	53,5 V	62,5 A	250 A
241119.106	Flatpack2 48V/3000W SHE	43,2-57,6 V	53,5 V	62,5 A	250 A
241115.705	Flatpack2 48-60V/2000W HE WOR	39.9 - 72.0 V	53.5V (48V mode) 67.0V (60V mode)	41.6A	166.4A
241115.805	Flatpack2 110V/2000W HE WOR	89.2 - 171.6 V	122.6V	16.8A	67.2A

110-220V-8 kW System

Part Number	Description	Output Voltage Range (DC)	Default Output Voltage (DC)	Maximum Output Current (DC)	Total Output for Shelf (DC)
241115.805	Flatpack2 110V/2000W HE WOR	89.2 - 171.6 V	122.6V	16.8A	67.2A
241115.815	Flatpack2 220/2000 HE	178.5 - 297V	245.3V	9.16A	36.64A

WARNING:
HAZARDOUS VOLTAGE AND ENERGY LEVELS CAN PRODUCE SERIOUS SHOCKS AND BURNS. Only authorized, qualified, and trained personnel should attempt to work on this equipment. Refer to datasheets for full product specifications.

WARNING:
For safety, the power supply is required to be reliably connected to EARTH GROUND. The equipment is to be connected to supply mains by qualified personnel in accordance with local and national codes (e.g., NEC, CEC, etc).
Do not disconnect and reconnect I/O power connectors during lightning storms.
The output of the power supply is not intended to be accessible due to energy hazards. Rack mounting must be performed in accordance with instructions provided by the manufacturer to avoid potential hazards.

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

CAUTION:
Flatpack2 rectifiers employ internal double pole/neutral fusing. Fuses are not field-replaceable.

*"HE" means "high efficiency"

**"WOR" means "wide output range"

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

Each power shelf should be fed from a dedicated AC branch (or DC) circuit of a terra neutral (TN) or

isolated terra (IT) power system.

A readily accessible disconnect device shall be incorporated in the building installation wiring for all AC connections. Select wall breakers according to national and local electric codes.

If the plug end of an AC line cord is considered to be the primary disconnection means, reasonable access must be given to the plug and receptacle area.

Wire rated for 90°C is recommended for all DC connections. In practice, wires of a size larger than the minimum safe wire size are selected for loop voltage drop considerations.

Alarm contacts are rated for a maximum voltage of 60 V, SELV (Safety Extra Low Voltage) and a maximum continuous current of 1A for standard type 2, I/O monitor included into the 24-125 VDC power system. For 110-220 VDC power system please refer to 351535.033: User's Guide – Fleximonitor Multipurpose I/O Monitor, CAN Bus Nod with relay box

Heat dissipation greater than the objectives listed in GR-63-CORE may occur. Additional equipment room cooling may be required. To cope with high heat release, aisle spacing may be increased and high heat-dissipating equipment may be located adjacent to equipment generating less heat.

It is recommended practice to ensure that all circuit breakers (including those for DC distribution) are in the OFF position during both installation and removal.

Eltek does not recommend shipping the power shelf with rectifiers installed. Rectifiers should be shipped in separate boxes provided by Eltek.

WARNING:

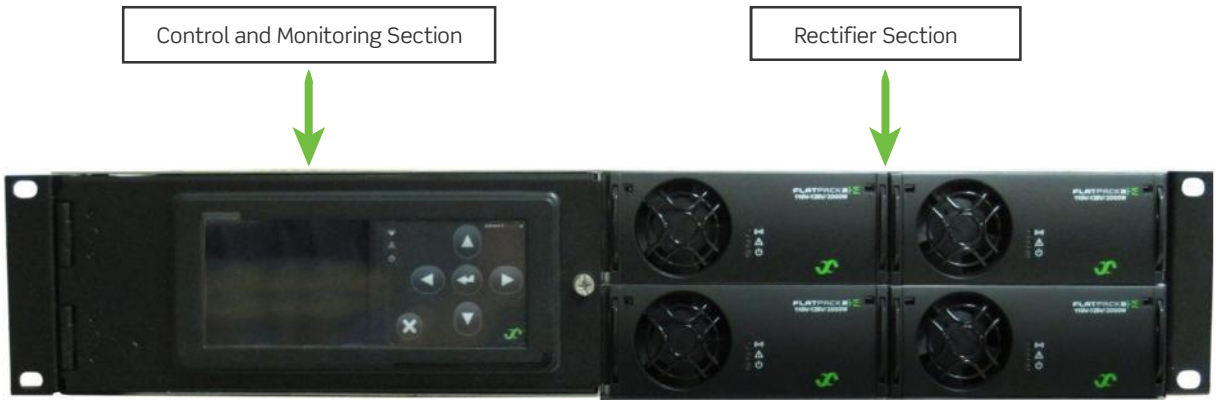
Protecting personnel against electrical shocks: The power system cabling must be done by qualified personnel in conformance with local and national electrical codes. Input voltages to rectifiers are at a dangerous level. Ensure that circuit breakers are locked in the OFF position at the AC service panel before attempting to work on the power system. Dangerous voltages may still be present at the terminals even if the rectifiers are OFF. Use a voltmeter to verify the presence of such voltages. Do not switch circuit breakers to ON until the entire system has been assembled and you have been instructed to do so according to the appropriate procedure. Improper wiring can cause bodily harm and equipment damage. Turn off all power sources before servicing units.

2. Overview

The Flatpack2 Integrated power system is designed for industrial applications requiring 24 – 220 Vdc output. It is powered by Flatpack2 rectifiers. The rectifier section can accommodate up to four rectifiers total.

The entire system is 2U in height, 432-470 mm in depth, and is designed for a standard 19" telecommunications rack. It is not, however, intended for stand-alone, open rack installation. There are no provisions for conduit landing, nor are there appropriate safety covers for open rack applications. System alignment with the rack is flush-mount.

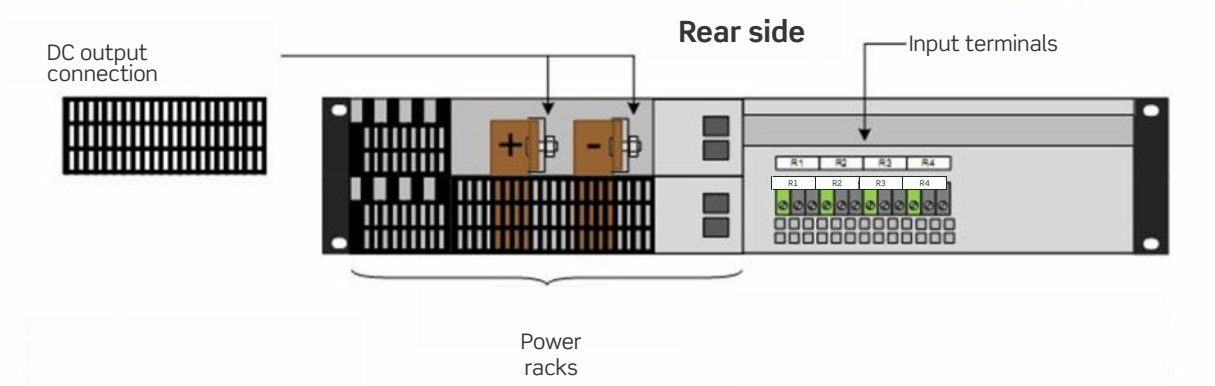
There are two sections to the Flatpack2 Integrated power system: control and monitoring, and rectifiers.



Power Connections

AC input connections are made to the rear of the shelf, in the far right side. Full operating range is 85 – 275 Vac or 85-300 Vdc, depending on the rectifier used. DC output connections are made to the rear of the shelf, immediately to the left of the AC or DC input.

Alarm connections are made to the alarm blocks located within the control and monitoring section.



Control and Monitoring

The primary control unit is the Smartpack2 Master, which is mounted in the door of the control and monitoring box. When the door is open, two other units are visible: the Smartpack2 Basic and the I/O Monitor2.

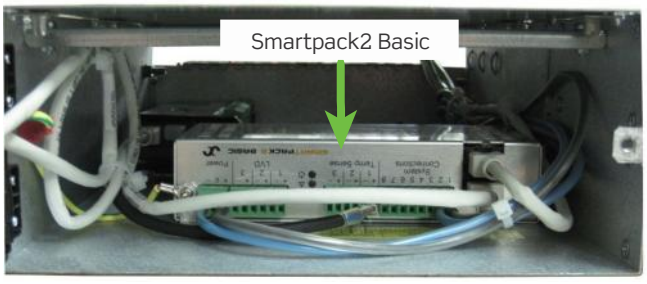
Smartpack2

The Smartpack2 control system consists of at least two units:

Smartpack2 Master and Smartpack2 Basic Industrial. The Smartpack2 Master is mounted in the door of the control and monitoring box. The Smartpack2 Basic Industrial is inside the box, mounted to a DIN rail.

- Smartpack2 Master—primary control unit located in the front door. It consists of a color display and keypad, as well as an SD card slot and Ethernet port. Through it, most system status information and parameters can be viewed and modified. The display can be opened by sliding the lever at the bottom right from the right to the left.
- Smartpack2 Basic / Basic Industrial—unit that monitors and controls the power system's internal functions and supplies power for connected CAN nodes.

To open, slide lever from right to left



Fuse 2x 2A Type 5x20 for SP2 BI-Power
Fuse 2x 2A Type 5x20 for SP2 BI-Voltage Sense

I/O Monitor

The I/O Monitor2 unit facilitates alarm output. Alarms can be mapped to the relays as desired through the Smartpack2 unit.

Flexi Monitor (Optional 110-220 VDC-8 kW system)

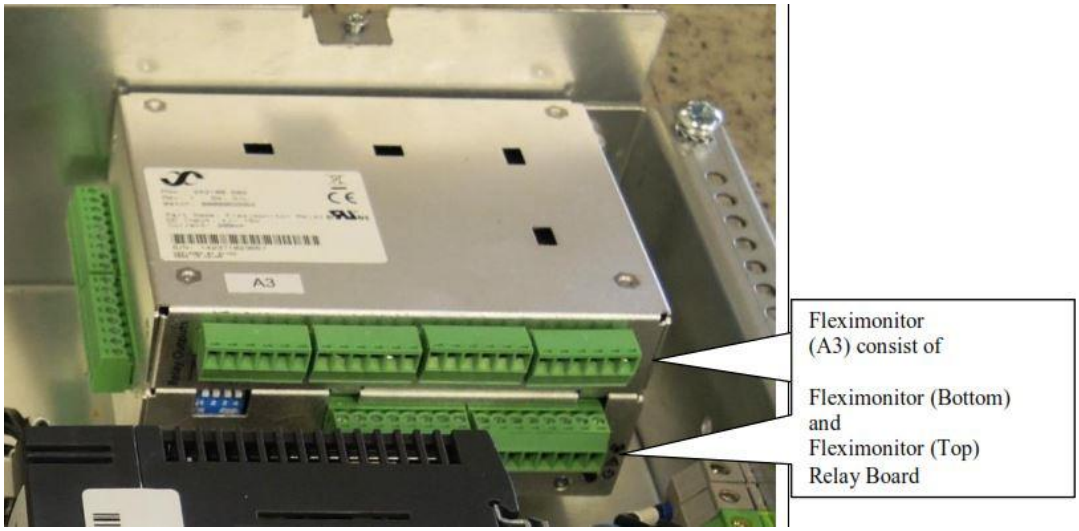
The FlexiMonitor CAN bus node is a versatile and multipurpose I/O monitor used in the distributed control systems of Smartpack S- and Smartpack2-based power systems.

The great flexibility of the FlexiMonitor CAN node makes it suitable to be used for input monitoring and output controlling tasks in typical power supply applications for industrial, offshore, telecom, data centers, etc.

The FlexiMonitor incorporates many advanced features, and any of the 16 configurable multipurpose inputs may be used for monitoring temperature, current, voltage, switch positions and pulse frequencies. Also, the FlexiMonitor is equipped with a 20 pins Expansion Port used to implement NC-C-NO relay outputs.

Flexi Monitor Relay Expansion Kits (Optional)

The Expansion Kits need no coding, as the FlexiMonitor will automatically identify the type of kit connected the Expansion Port.



Rectifiers

DC output is determined by the model and quantity of Flatpack2 rectifiers that are deployed. There are several models that are compatible with the system.

24 - 125VDC-12 kW System

Rectifier Models (Overview)

Part Number	Description	Output Voltage Range (DC)	Default Output Voltage (DC)	Maximum Output Current (DC)	Total Output for Shelf (DC)
241115.205	Flatpack2 24V/1800W HE*	21.7 - 28.8 V	26.7 V	75V	300A
241115.250	Flatpack2 24V/2000W WOR**	21.5 - 36.0 V	26.7 V	70A	280A
241115.105	Flatpack2 48V/2000W HE	43,2-57,6 V	53,5 V	41,7 A	167 A
241119.105	Flatpack2 48V/3000W HE	43,5-57,6 V	53,5 V	62,5 A	250 A
241119.106	Flatpack2 48V/3000W SHE	43,2-57,6 V	53,5 V	62,5 A	250 A
241115.705	Flatpack2 48-60V/2000W HE WOR	39.9 - 72.0 V	53.5V (48V mode) 67.0V (60V mode)	41.6A	166.4A
241115.805	Flatpack2 110V/2000W HE WOR	89.2 - 171.6 V	122.6V	16.8A	67.2A

Following rectifiers can be used as DC/DC Converter (DC input)

Part Number	Description	Output Voltage (DC)	DC/DC Converter Capacity 220 VDC Input	DC/DC Converter Capacity 110 VDC Input
241115.205	Flatpack2 24V/1800W HE*	21.7 - 28.8V	1800 Watts	1030 Watts
241115.105	Flatpack2 48V/2000W HE	43,2-57,6 V	2000 Watts	1090Watts
241115.705	Flatpack2 48-60V/2000W HE WOR	39,9 - 72V	2000 Watts	1090 Watts
241115.805	Flatpack2 110V/2000W HE WOR	89.2 - 171.6V	2000 Watts	1130 Watts

110 - 220VDC-8 kW System

Rectifier Models (Overview)

Part Number	Description	Output Voltage Range (DC)	Default Output Voltage (DC)	Maximum Output Current (DC)	Total Output for Shelf (DC)
241115.805	Flatpack2 110V/2000W HE WOR	89.2 - 171.6 V	122.6V	16.8A	67.2A
241115.815	Flatpack2 220/2000 HE	178.5 - 297V	245.3V	9.16A	36.64A

Following rectifiers can be used as DC/DC Converter (DC input)

Part Number	Description	Output Voltage (DC)	DC/DC Converter Capacity 220 VDC Input	DC/DC Converter Capacity 110 VDC Input
241115.805	Flatpack2 110V/2000W HE WOR	89.2 - 171.6V	2000 Watts	1130 Watts
241115.815	Flatpack2 220/2000 HE	178.5 - 297V	2000 Watts	1130 Watts

*"HE" means "high efficiency"

**"WOR" means "wide output range"

System Specifications

24 - 125VDC-12 kW System

Mechanical	Dimmensions	Height Width Depth	2U (82 mm) Fits standard 19" rack 432 mm
	Weights	System	System weight (w/o rectifiers): 5.9 kg
		Rectifier	1.95 kg each
	Clearances		Zero clearance needed below, left or right of unit. At least 6" rear clearance required for proper airflow. Cable egress from top / rear. Vertical clearance dependent on load cable size/bend radius. Notice: Local codes may require additional clearance for equipment connected to 208 VAC.
Electrical	Input	Voltage	Full power output : 185 – 275 Vac Or 85-300 V dc Tolerance: 85 – 300 Vac or dc
		Current (per rectifier)	See table "Rectifier Specifications" on page 11
	Output	Voltage Range	See table "Rectifier Specifications" on page 11
		Power (per rectifier)	See table "Rectifier Specifications" on page 11
		Current (per rectifier)	See table "Rectifier Specifications" on page 11
Connections	AC Input		Individual screw terminal max 6 mm^2 Max. wire size: 6mm^2 Strip length: 6 - 7 mm
	DC Output		Stud size: M5
	Alarm Output Relays		Screw terminals Max. wire size: 0,5 mm^2 Strip length 6 - 7 mm
Environmental	Operating Temperature		-40° to +55° C (-40° to +158° F), de-rating above 45°C (+113°F), depending on the model
	Storage Temperature		-40° to +60° C (-40° to +158° F)
	Relative Humidity		5-95%, non-condensing
	Cooling - Rectifier		Fan (front-to-back airflow)
Interface	TCP/IP		Ethernet interface, using standard Web Browser
	Alarm I/O		6x configurable form-C output relays 6x configurable inputs
Applicable Standards	Electrical safety (shelf and rectifiers)		IEC 60950-1, UL 60950-1 Approved for maritime use

110-220VDC-8 kW System

Mechanical	Dimmensions	Height Width Depth	2U (82 mm) Fits standard 19” rack 470 mm
	Weights	System	System weight (w/o rectifiers): 9 kg
		Rectifier	1.95 kg each
	Clearances		Zero clearance needed below, left or right of unit. At least 6” rear clearance required for proper airflow. Cable egress from top / rear. Vertical clearance dependent on load cable size/bend radius. Notice: Local codes may require additional clearance for equipment connected to 208 VAC.
Electrical	Input	Voltage	Full power output : 185 – 275 Vac Or 85-300 Vdc Tolerance: 85 – 300 Vac or Vdc
		Current (per rectifier)	See table “Rectifier Specifications” on page 11
	Output	Voltage Range	See table “Rectifier Specifications” on page 11
		Power (per rectifier)	See table “Rectifier Specifications” on page 11
		Current (per rectifier)	See table “Rectifier Specifications” on page 11
Connections	AC Input		Individual screw terminal max 6 mm^2 Max. wire size: 6mm^2 Strip length: 6 - 7 mm
	DC Output		Stud size: M5
	Alarm Output Relays		Screw terminals Max. wire size: 0,5 mm^2 Strip length 6 - 7 mm
Environmental	Operating Temperature		-40° to +60° C (-40° to +158° F), de-rating above 45°C (+113°F), depending on the model
	Storage Temperature		-40° to +60° C (-40° to +158° F)
	Relative Humidity		5-95%, non-condensing
	Cooling - Rectifier		Fan (front-to-back airflow)
Interface	TCP/IP		Ethernet interface, using standard Web Browser
	Alarm I/O		16 x multipurpose inputs (Optional) 4 x configurable inputs (Optional) 8x configurable inputs (Optional)

References

This manual provides a comprehensive overview of and installation guidelines for Flatpack2 Integrated power systems. Additional information regarding system components is found in the following documents:

- 350002.013: User's Guide - Flatpack2 Rectifiers
- 350020.013: User's Guide - Smartpack2 Master Controller
- 350021.013: User's Guide—Smartpack2 Basic Controller
- 350025.013: User's Guide Smartpack2 Basic Industrial Controller
- 351535.033: User's Guide – Fleximonitor Multipurpose I/O Monitor, CAN Bus Nod
- 351509.033, Installation Guide I/O Monitor2 CAN Node

For generic power system functionality, refer to WebPower Online Help and PowerSuite Online Help.

3. Installation

NOTICE:
The system is to be mounted over a non-combustible surface only and installed in Restricted Access Locations (RAL). Access must be limited by use of tool, e.g. lock and key.

Recommended Tools

NOTICE:
Use of fully insulated tools is required when working with any powered circuits.

The following tools are recommended for installation:

- Standard wrench and/or socket set
- Torque wrench
- Small flat blade screwdriver
- Standard blade screwdriver and Phillips tip screwdriver
- Wire cutters / strippers
- Multimeter

Mechanical - Rack Mounting

Concrete expansion anchors should meet the following requirements:

CAUTION:
Never install a power system without capable assistance. Use capable assistance when lifting and mounting the system. Eltek recommends mounting the system on a floor made of a non-combustible material and of sufficient strength to withstand an earthquake. There should be adequate clearance above the system for the input feeds, as well as adequate free space in front of and behind the rack for air flow.

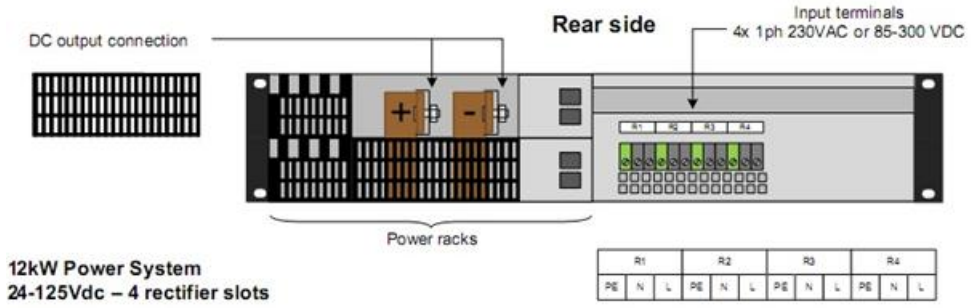
NOTICE:
This system is not intended for stand-alone, open-rack installation.
There are no provisions for conduit landing, nor are there appropriate safety covers for open rack applications.

- A maximum embedment depth of 90 mm (3.5”)
- A maximum bolt diameter of 13 mm (0.5”)
- Use steel construction
- Be suitable for earthquake zones

Electrical Connections

WARNING:
Protection in PRIMARY CIRCUITS against overcurrents, short-circuits and earth faults shall be provided, either as an integral part of the equipment or as part of the building installation

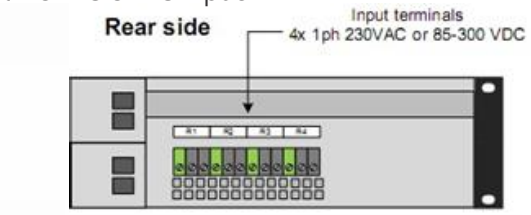
Both AC and DC terminals are located on the rear of the shelf.



CAUTION:
Ensure that the AC or DC supply is OFF or DISCONNECTED before making connections!

Electrical - AC or DC Input

AC or DC input connections are made to the right side of the shelf (when facing the rear). Input is individual-feed (one feed per rectifier) Twelve screw terminals connectors are provided with the shelf for AC or DC input.



INPUT	R1			R2			R3			R4		
AC	PE	N	L	PE	N	L	PE	N	L	PE	N	L
DC	PE	-	+	PE	-	+	PE	-	+	PE	-	+

External AC Output Wires Recommended Ratings		
Max. Current (A)	Wire Section (mm^2)	AWG
6	0.75	18
10	1.0	16
13	1.5	14
16	1.5	14
20	4	10
25	6	8
32	6	8

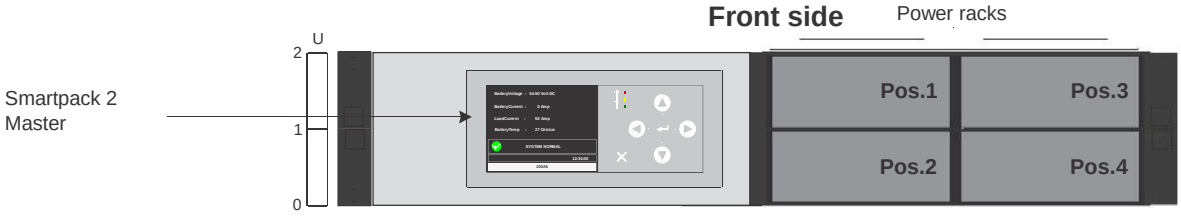
From left to right, the terminals are as follows:

- Ground (⏚)
- N (For DCconnection –negative)
- L (For DC connection +positive)

Tightening torque value for AC input terminals 0,6-0,8 Nm

NOTICE:
Always connect ground first!

The rectifiers or DC/DC converters are positioned as below

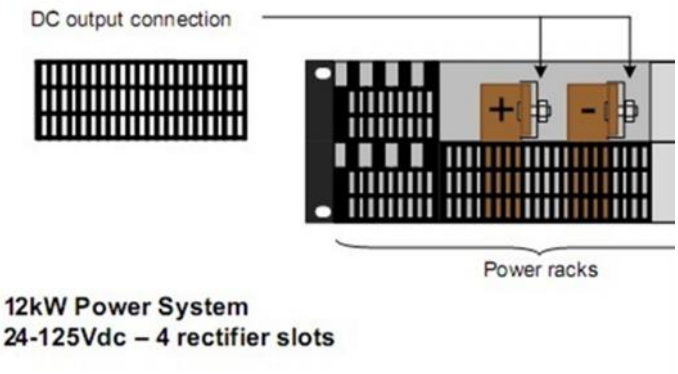


Electrical - DC Output

The DC output of the system is bulk, meaning that there are no breakers or fuses in line with the output. When facing the rear of the shelf, the left terminal is positive (+), and the right terminal is negative (–).

Stud size: M5 (equivalent to 1/4")

Maximum torque: 4 ft.-lbs.



CAUTION
Double-check polarity before terminating DC connections!

NOTICE:
Make sure that the DC circuit breaker is OFF.

Alarm Connections

24 - 125VDC-12 kW System

Alarms are controlled by the I/O Monitor2 unit, which provides a total of six alarm input terminals and six output relays. The I/O Monitor2 is located in the control and monitoring section, near the rear of the shelf. To access the I/O Monitor2, remove the six screws from the cover on top of the control and monitoring section. Wire access is from the rear of the shelf.

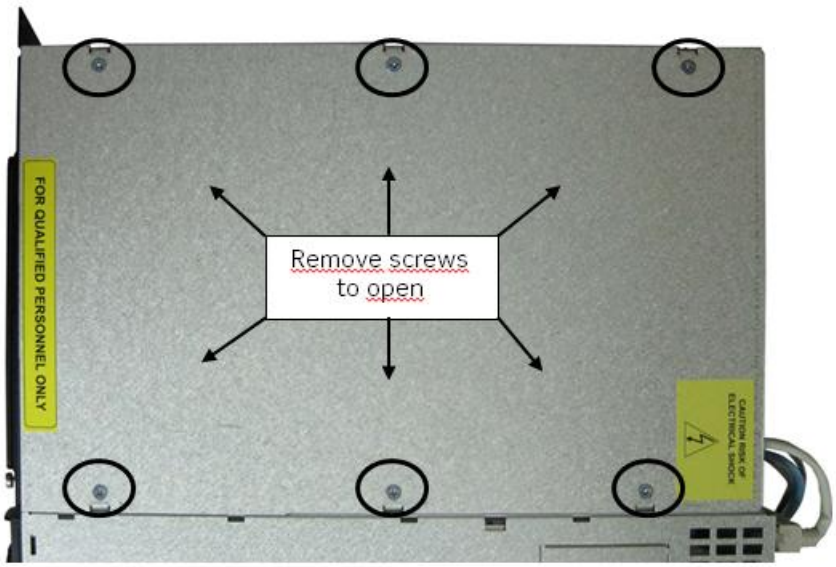


Figure 10 - Control and Monitoring Section Cover

Maximum wire size: 0,5 mm

Strip length: 6-7 mm

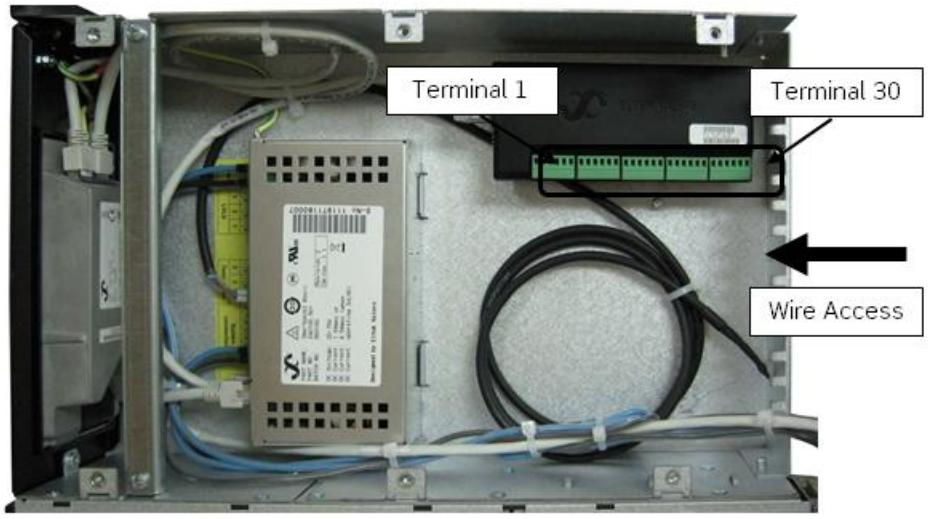
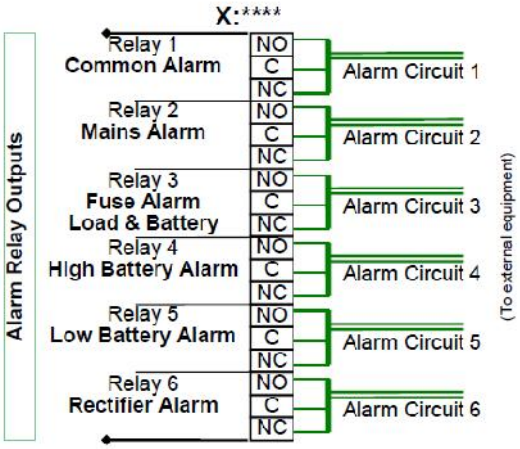


Figure 11 - Alarm Connections (TB4)

The terminals for the I/O Monitor2 are identified in

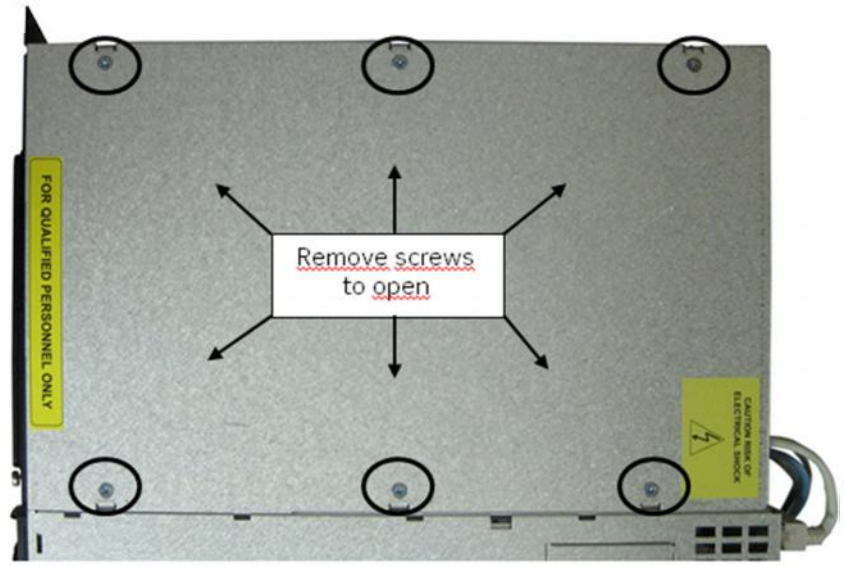
Terminal Block	Terminal	Designation
1	1	Input 1 (-)
	2	Input 1 (+)
	3	Input 2 (-)
	4	Input 2 (+)
	5	Input 3 (-)
	6	Input 3 (+)
2	7	Input 4 (-)
	8	Input 4 (+)
	9	Input 5 (-)
	10	Input 5 (+)
	11	Input 6 (-)
	12	Input 6 (+)
3	13	Output Relay 1 (NC)
	14	Output Relay 1 (C)
	15	Output Relay 1 (NO)
	16	Output Relay 2 (NC)
	17	Output Relay 2 (C)
	18	Output Relay 2 (NO)
4	19	Output Relay 3 (NC)
	20	Output Relay 3 (C)
	21	Output Relay 3 (NO)
	22	Output Relay 4 (NC)
	23	Output Relay 4 (C)
	24	Output Relay 4 (NO)
5	25	Output Relay 5 (NC)
	26	Output Relay 5 (C)
	27	Output Relay 5 (NO)
	28	Output Relay 6 (NC)
	29	Output Relay 6 (C)
	30	Output Relay 6 (NO)



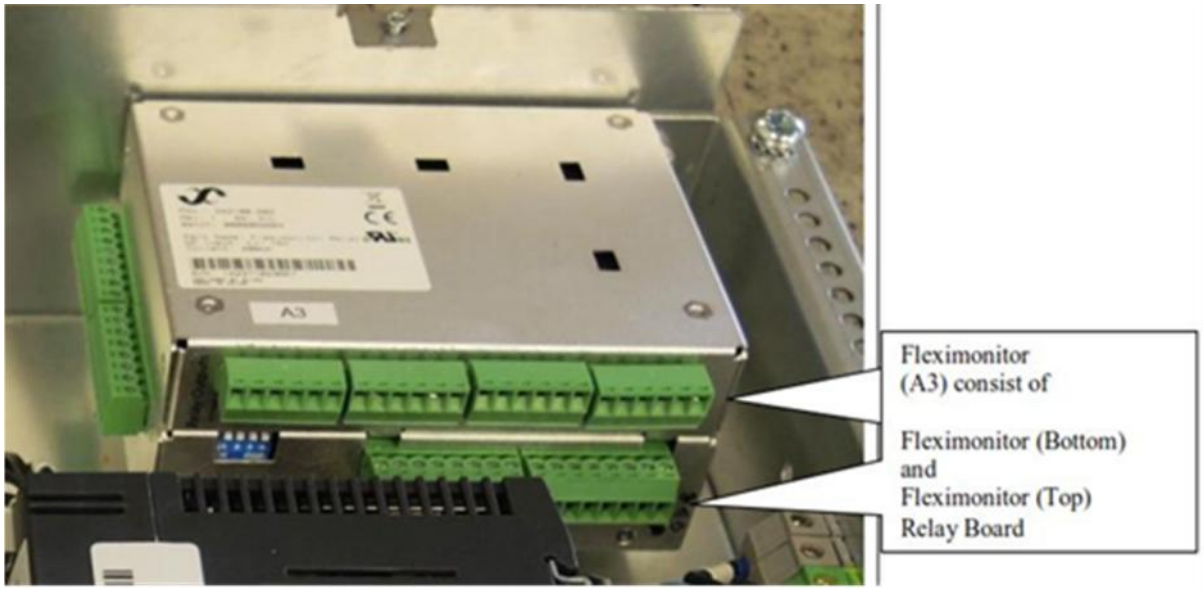
Standard Settings

110-220VDC-8kW System

Alarms are controlled by the Flexi Monitor unit, which provides a total of sixteen configurable multipurpose inputs. The fleximonitor and relay board is located in the control and monitoring section, near the rear of the shelf. To access the fleximonitor and relay board, remove the six screws from the cover on top of the control and monitoring section. Wire access is from the rear of the shelf.



Maximum wire size: 0,5 mm
Strip length: 6 - 7 mm



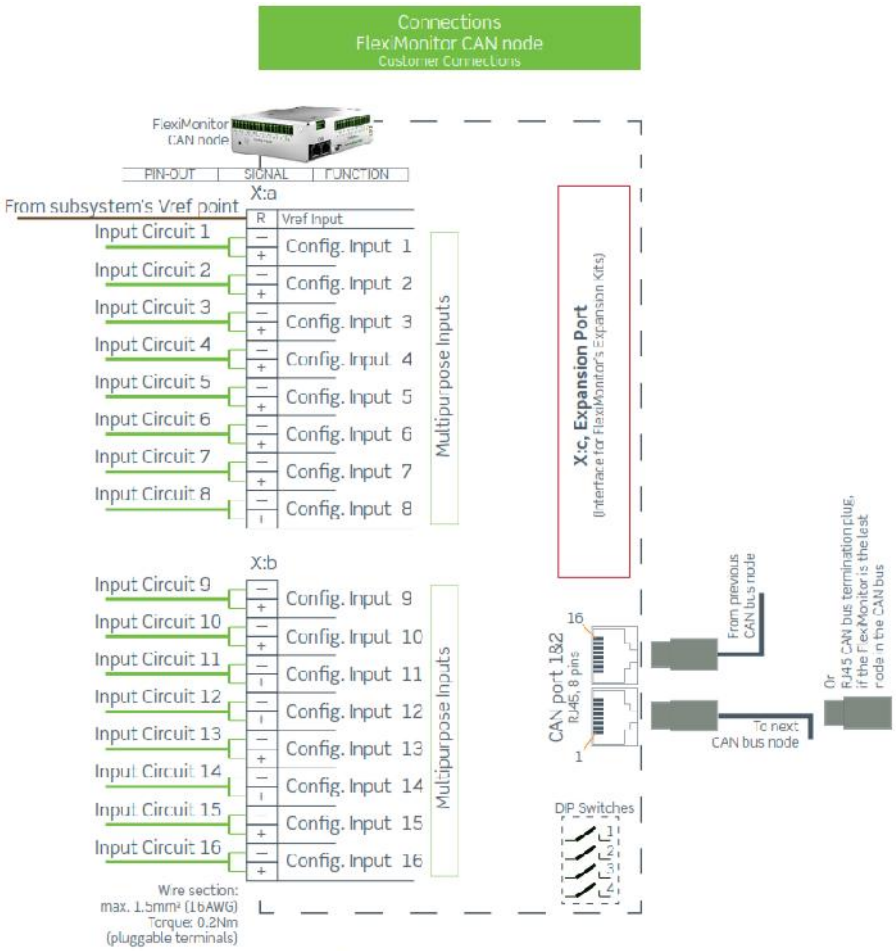


Figure 7. Connection Drawing for FlexiMonitor CAN node

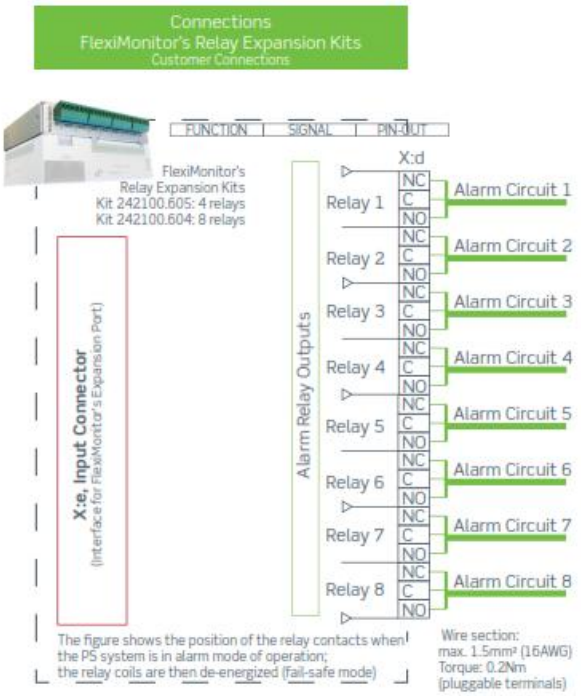


Figure 21. Connection Drawing for FlexiMonitor's Relay Expansion Kits: kit 242100.604 (8 relays) and kit 242100.605 (4 relays)

NOTICE:
Replace the cover with the six screws when installation is complete.

Rectifier/Converter Installation

WARNING:
Do not attempt to open or otherwise service rectifiers! Return defective units to Eltek.

CAUTION:
DO NOT carry rectifiers by the latches.

NOTICE:
It is recommended that the rectifiers NOT be installed until system turn-up (section 3).

NOTICE:
Install rectifiers according to the numbering order preferred by the customer or site. This facilitates orderly numbering of the rectifiers rather than random ID assignment.

1. Use a small flat-blade screwdriver to release and extend latches. The latches are only for installation and extraction; do not carry the rectifier by the latches.
2. Starting from the rectifier slot considered to be #1 (depending on customer or site numbering conventions), insert the module into the power shelf. Slide it in until it connects to the backplane.
3. Retract latches to lock it in place.
4. Allow a 2 second delay before inserting the next module.

4. Turn-up

WARNING:
Hazardous energy is present in the cabinet once the DC input circuit breakers are activated. Exercise caution when opening cabinet doors and accessing equipment when the system is powered.

The following procedure outlines the basic rectifier and controller installation startup procedure:

1. Apply AC or DC input power to system by turning ON the AC or DC input feed breakers.
2. Beginning with the rectifier position that will be considered #1, install the rectifier and lock the latches. If necessary, refer to the rectifier installation instructions beginning on page 18.
3. Verify proper rectifier startup with green LED illumination on each.
4. Verify proper startup of the Smartpack2 Master controller after brief boot-up delay.

Setting of the Charging Voltage

4.1 Before adjusting the charging voltage check if the powercore has a connected temperature sensor, which regulates the charging voltage according to ambient temperature.

4.2 If the powercore have a connected temperature sensor, switch the temperature compensation off as described below.

4.3 Press the following keys to enter the main menu 

4.4 Choose menu Sys Config 

4.5 Choose menu Power Systems 

4.6 Choose menu System Voltage levels 

4.7 Choose Reference Voltage

4.8 Press  and indicate PIN-Code 0003 by pressing  three times, press

4.9 Adjust to the desired charging voltage with the arrow keys 

4.10 Confirm by pressing 

On / Off Temperature Compensated Charging Voltage

4.11 Press the following keys to enter the main menu , , ,

4.12 Choose menu General Sys Config , ,

4.13 Choose menu Battery , ,

4.14 Choose menu General Battery Config

4.15 Choose Temp Compensation on/off

4.16 Press and indicate PIN-Code 0003 by pressing three times, press

4.17 Press the following keys to shut off the temperature compensation , ,

4.18 After setting the charging voltage, repeat from 4.11 to activate again.

5. Verify proper DC output voltage on the display of the Smartpack2 controller.

6. The reference voltage and number of battery cells can also be setup from the Web interface built into the controller.

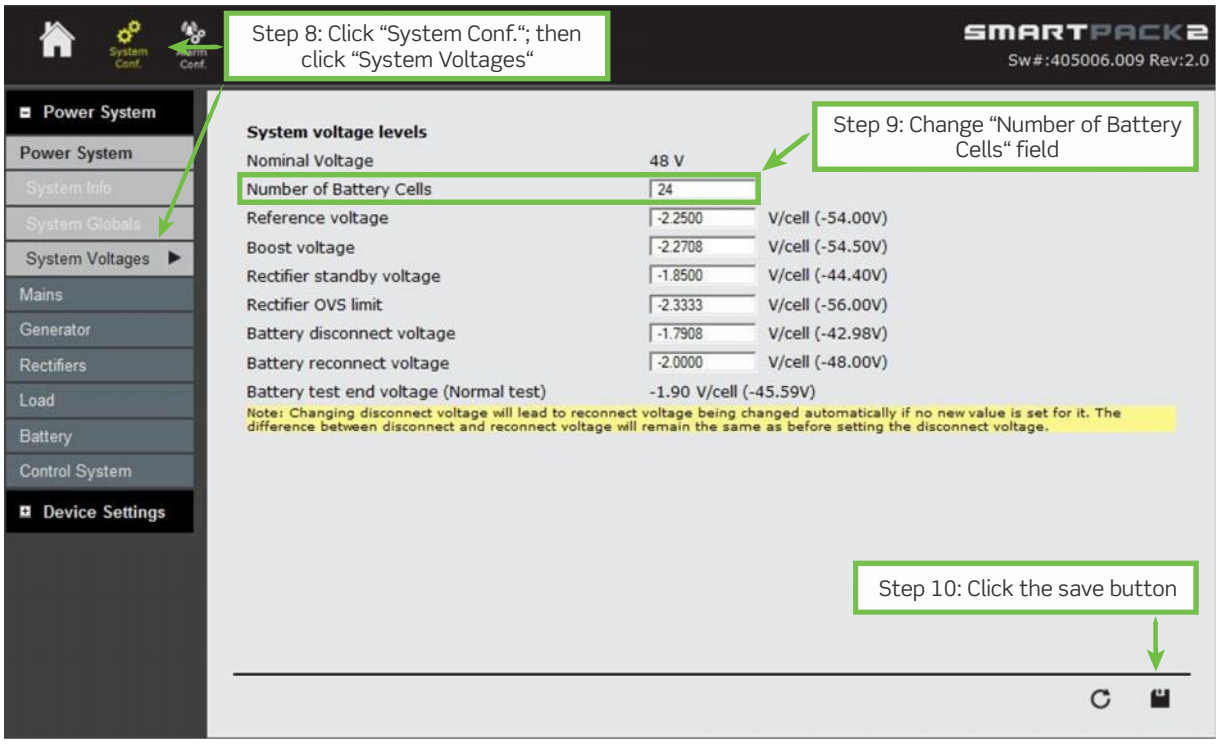
7. Open the controller by pushing the handle toward you with your finger or pen. Connecting the LAN cable via RJ-45 socket into the controller.

Open your web browser on your computer and insert the default

IP address: 192.168.10.20

Username: **admin**

Password: **admin**



8. When access is granted, click on the “System Conf.” icon in the top row of icons. Then, locate the “Power System” menu (on the left) and click on “System Voltages”.

9. Locate the field “Number of Battery Cells” and change the value as follows:

“12” for a 24V system
“24” for a 48V system
“30” for a 60V system
“54” for a 110V system
“60” for a 125V system
“108“ for a 220V system

10. Click the “save” button (diskette icon) to save changes.

11. If desired, log out of the interface by clicking the “Logout” icon in the top row of icons.

Continue with System Turn-Up

12. Continue installing rectifiers one at a time, in the order desired. Rectifier ID is determined by installation order.

13. Verify proper startup and operation of load devices.

14. Test the external alarm connectivity by using the relay test function of the Smartpack2 controller (see page 26).

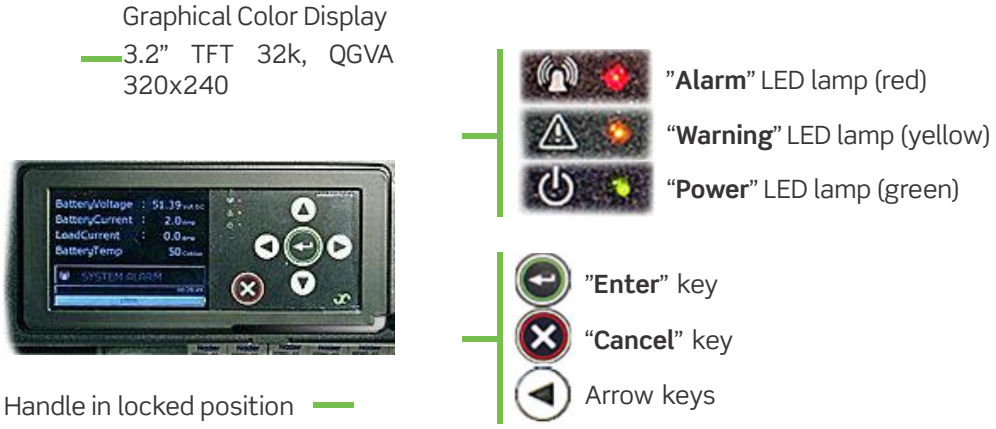
NOTICE:
If the system is running and the Smartpack2 controller LEDs are illuminated but the display has gone dark, this indicates that the display is in sleep mode. Simply press any key to wake the display.

Access Alarm Setup Menu

To setup alarm parameters through the display:

1. Unlock the display by pressing the UP key, and then the DOWN key.
2. Press the ENTER key to access the menu.
3. Use the navigation keys to highlight the “Alarm Config.” symbol, and then press the ENTER key.
4. Use the navigation keys to highlight either the “Inputs” or the “Outputs” symbols, depending on which connections are to be configured. Press the ENTER key to select.

Test of Alarm Relay



5.1 Press the following keys to enter the main menu , , ,

5.2 Choose men Commands ,

5.3 Choose menu Output Test ,

5.4 Choose the relay to be tested

5.5 Press and indicate PIN-Code 0003 by pressing three times, press

5.6 Press the following keys to test the relay ,

5.7 The alarm relay automatically returns to normal after 10 seconds

NOTICE:
To configure alarms through the Ethernet connection, see the instructions found in document #350020.013—Smartpack2 Master User’s Guide.

5. Turn-Up Checklist

Quick Start Turn-up Checklist	
Pre-start Check (Power is OFF)	
☐	Installation site prepared • Mounting location is well-ventilated and provides adequate room for airflow • Floor is level and capable of supporting the system (individual system weights vary; see product flyer for more information) • Suitable insulated tools available
☐	AC input supply prepared • AC supply is compatible with rectifier shelves • Supply fuses and/or circuit breakers and wires are properly rated
☐	System components inspected • All parts, equipment, documentation, etc. are accounted for • Components checked for damage; if damaged, contact Eltek
☐	Rack/cabinet anchored to suitable location (if applicable)
☐	Distribution circuit open • Circuit breaker actuator switched OFF
☐	Make AC input connections (power is OFF) • AC supply lines are correctly configured to the terminal blocks
☐	Make DC connections • Cables properly connected to system output and return bus
☐	Alarm cables connected to terminal blocks
☐	External devices connected to controller (if applicable)
Turn-up Procedure	
☐	Turn on AC input breaker and verify proper input voltage
☐	Verify system turn-up • Controller display turns on • Controller and rectifier LEDs turn on • Rectifier fans activate
☐	Check controller interface • Check display functionality • Connect PC to controller • Insert provided CD into laptop (program will automatically start) • Verify controller appears in LAN Configuration Utility (no need to log in at this time)
☐	Once alarms are cleared, run relay/alarm tests

6. Basic Troubleshooting

In case of alarm conditions, verify the following:

- All electrical connections are secured properly.
- All rectifiers are installed and seated properly.
- The controller is installed and seated properly.

Specific rectifier and controller alarm conditions can be found in the following documents:

- 350002.013: User's Guide—Flatpack2 Rectifiers
- 350020.013: User's Guide—Smartpack2 Master Controller
- 350021.013: User's Guide—Smartpack2 Basic Controller
- 350025.013: User's Guide Smartpack2 Basic Industrial Controller
- 351535.033: User's Guide – Fleximonitor Multipurpose I/O Monitor, CAN Bus Nod
- 351509.033, Installation Guide I/O Monitor2 CAN Node

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