

# Modular HE with Smartpack2

## DC Power System

### Overview

Eltek's Modular DC power system, powered by the Flatpack2 line of power modules, delivers up to 1200A in a compact, rack-mount unit. Use of the highly-efficient and reliable Flatpack2 rectifier, a variety of configurable distribution layouts, and the advanced Smartpack2 controller make for optimal system design and cost-effective deployment.



Modular with Smartpack2 Controller

# MODULAR HE WITH SMARTPACK2

## DC POWER SYSTEM

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### APPLICATIONS

Eltek's Modular system is a high-efficiency power solution with an optimal 23" rack-mount footprint. It is designed for applications between 600A and 1200A at both 48 Vdc and 24 Vdc output.

The Modular system can power both single-voltage telecommunication infrastructure (such as -48V LTE or +24V legacy TDMA) as well as dual-voltage sites (e.g., where both -48V and +24V equipment coexist). DC-to-DC converters are available for converting 24V to 48V (or vice-versa) within a single Modular system.

### PRODUCT DESCRIPTION

The Modular system is designed for use in standard 23" telecommunication racks.

Powered by Flatpack2 HE rectifier modules, typical efficiency exceeds 95% at both 24 Vdc and 48 Vdc output. Flatpack2 DC-to-DC converters can also be added within the same system footprint and be fed to dedicated circuits in the distribution panels.

The distribution section is 15U high and incorporates the AC input junction box. The available 15U distribution space accommodates a variety of circuit breakers and fuses. Bulk cable connections are also available, along with shunt and LVD options. All cabling is vertical, and distribution panels are tiered for convenient cabling and access.

### KEY FEATURES

- **CONFIGURABLE DISTRIBUTION**  
Both large and small breakers and fuses can be utilized by configuring up to four distribution panels, potentially using up to 96 small breakers and fuses.
- **INTEGRATED AC INPUT BOX**  
AC input terminals options include compression terminals (for bare wire) and barrier strips (for one-hole lugs).
- **DIGITAL CONTROLLERS**  
The Smartpack2 digital controller system provides comprehensive monitoring and regulation by utilizing a variety of specialized data collection devices.
- **HEAT MANAGEMENT**  
Flatpack2 modules feature front-to-back airflow and chassis-integrated heat-sinks, supplementing high-efficiency energy conversion with excellent heat management.
- **COST-EFFICIENCY**  
A true plug-and-play system, the Modular system reduces both time-to-install and overall costs.

## SMARTPACK2 CONTROLLERS

The Smartpack2 controller system handles plant control and monitoring. A variety of modules are used to collect a large variety of metrics to provide comprehensive system regulation and alarming.

The following three units make up a complete *Smartpack2* control system:

- **Smartpack2 Master** is the master controller and contains the interactive display.
- **Smartpack2 Basic** handles internal data aggregation and housekeeping.
- **I/O Monitor2 (Type 2)** handles external alarm inputs and outputs.

The system can be expanded with additional *Basic* controllers, I/O units and other CAN nodes in the *Smartpack2* family. All control and monitoring devices interconnect via the CAN bus.

A single Smartpack2 Master controller is used for the entire system; it is installed in the distribution door. The Smartpack2 Master controller contains an Ethernet port, which can be connected either directly to a computer or to a network (e.g., an office LAN). The Smartpack2 Basic controller is located in the controller tray at the bottom of the distribution section. The controller tray also houses the I/O Monitor2 unit, which provides a total of 6 alarm inputs and 6 alarm output relays.

## SMARTPACK2 CONTROL SYSTEM



**Smartpack2 Master**  
(interface unit)



**Smartpack2 Basic**  
(data aggregation unit)



**I/O Monitor2**  
(alarm I/O unit)

## SUPPORTED CAN NODES

In addition to the devices discussed above, other CAN nodes are available for use with the Smartpack2 control system:

- **Battery Monitor** contains an internal temperature probe to measure battery temperature. It also has monitor inputs for one shunt and one breaker.
- **Load Monitor** can monitor up to eight shunts and eight fuses. Additional Load Monitors can be ordered to monitor external distribution devices or shunts.
- **CAN Power** provides CAN bus isolation and can be used to supplement the available power in the control system.

## FLATPACK2 HE RECTIFIERS AND DC-DC CONVERTERS

Flatpack2 HE rectifiers provide primary output power for the Modular systems. There are three module options available, identified by DC voltage and power output:

- 24V/1800W
- 48V/2000W (Energy Star compliant)
- 48V/3000W (Energy Star compliant)



(48V units only)

**Flatpack2 HE Rectifier**

HE rectifiers feature typical efficiencies higher than 95% (the 48V/2000W module typically performs higher than 96%). See the respective datasheets for more detailed specifications.

Flatpack2 DC-DC converters provide optional, secondary output power for the Modular systems. There are two module options available, identified by input voltage range and nominal output voltage:

- 18-75V/24V
- 18-75V/48V

Both Flatpack2 DC-DC converter modules output up to 1350W. Please refer to the datasheet for more detailed specifications.

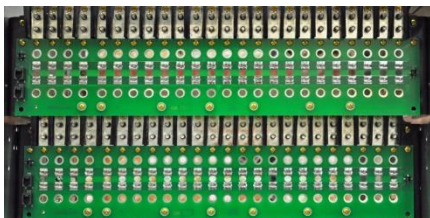
## CONFIGURABLE DISTRIBUTION

The Modular distribution section features 12U of space that can be configured for the following devices:

- Plug-in, bullet-style circuit breakers (1-, 2-, and 3-pole sizes available, up to 250A)
- TPS-style fuses with plug-in adapter (up to 125A)
- GMT-style fuses (Eltek’s “BG” module required)
- Large GJ-style breakers (1-, 2-, and 3-pole sizes available, up to 600A); shunt option available
- TPL-style fuses (up to 600A); shunt included

There are three styles of distribution panels that can be installed (below), and any combination of panels can be configured within the space available. The panels are tiered to accommodate cabling.

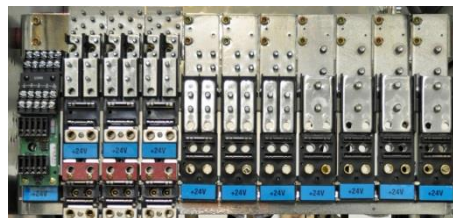
### 24-POSITION BULLET BREAKER PANEL



Accommodates up to 24 one-pole, plug-in, bullet-style circuit breakers and TPS-style fuses with plug-in adapters. Kits are available for multi-pole circuit breakers.

Up to two panels can be installed per tier, for a maximum of four panels in one Modular plant.

### 11-POSITION BG MODULE PANEL

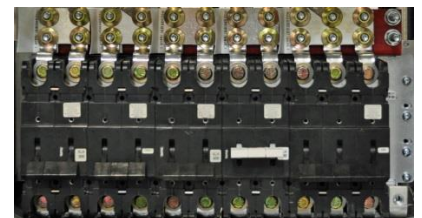


Provides up to 11 positions for “BG” modules, which are designed for the following devices:

- Two one-pole circuit breakers
- Four one-pole circuit breakers
- One two-pole circuit breaker
- Ten GMT fuses

Up to two panels can be configured for one Modular plant.

### GJ BREAKER/TPL FUSE PANEL



Provides up to 12 positions for GJ-style circuit breakers and TPL-style fuses.

Up to two panels can be configured for one Modular plant.

Bulk battery cable landings are available in the rear of the distribution.

## AC INPUT

Nominal Input Voltage	208/240 Vac (24V/1800W, 48V/2000W rectifiers) 208/240/277 Vac (48V/3000W rectifier only)
Rated Input Voltage Range	100-250 Vac (24V/1800W, 48V/2000W rectifiers) 100-277 Vac (48V/3000W rectifier only)
AC Connectors	Compression terminals: Individual or dual-feed options, bare wire Barrier strip: Individual-feed, one-hole lugs
Input Protection	MOVs and fuses in the rectifier modules

## DC OUTPUT

	24 Vdc Systems	48 Vdc Systems
Nominal Voltage	o 24 Vdc	o 48 Vdc
Adjustable Range	o 21.7 – 28.8 Vdc	o 43.2 – 57.6 Vdc
Maximum Power	o 30 kW	o 50 kW
Maximum Current	o 1200A	o 1000A
Converter Option	o 48Vdc, 108A (5400W) max	o 24Vdc, 216A (5400W) max

## MONITORING

Monitoring Unit	Smartpack2 control and monitoring devices	
Local Operation	Interactive Display (Smartpack2 Master unit)	
Remote Operation	WebPower (WEB Interface, SNMP protocol and email)	
Alarm Relays	6 x Form-C dry contact relays (NO, NC, C) on I/O Monitor2	
Visual Indications	o Green LED – System ON o Yellow LED – Warnings and Minor alarm(s)	o Red LED – Major alarm(s)
Controller Inputs	6 x multipurpose digital inputs configurable as digital / analog, or temperature measurement (I/O Monitor2)	
Current Measurements	o Battery current	o Rectifier current
Alarms	o Load fuse alarm o Battery fuse alarm o LVD operated o Low output voltage alarms (2 individual alarm levels)	o High output voltage alarms (2 individual alarm levels) o Battery capacity o Temperature alarm o Symmetry alarm and more

## DC DISTRIBUTION OPTIONS

24-position Bullet Breaker Panel	24 positions for one-, two-, and three-pole plug-in circuit breakers and TPS-style fuses (with plug-in adapters). Up to four panels can be installed in one system.
11-position BG Module Panel	Up to 11 positions for Eltek's "BG" modules, which accommodate one- and two-pole plug-in circuit breakers or up to ten GMT fuses. Up to two panels can be installed in one system.
GJ Breaker/TPL Fuse Panel	Up to 12 positions for GJ-style circuit breakers and TPL-style fuses; shunt option available for each device. Up to two panels can be installed in one system.
Bulk connections	Up to 15 connections, 3/8" studs on 1" centers
Programmable LVD	Up to one LVD per system

## ALARM CONNECTIONS

I/O Monitor2	Pluggable terminal blocks, up to 1.5 mm <sup>2</sup> [AWG 12]
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## OTHER SPECIFICATIONS

Operating temp.	-40 to +45°C (-40 to +113°F)
Storage temp.	-40 to +70°C (-40 to +158°F)
Nominal rack size	Standard 23" rack
Dimensions	Overall depth: 570.8 mm (22.47") Maximum height: 932.90 mm (38.41"/22U), with up to 5 power shelves (1U each)
Weight (excluding rectifiers and rack)	Approx. 102 [225 lbs], depending on distribution panels and number of power shelves installed

## APPLICABLE STANDARDS

Electrical Safety	UL/CSA 60950-1, 2 <sup>nd</sup> Edition EN/IEC 60950-1, 2 <sup>nd</sup> Edition
EMI/EMC	GR-1089-CORE EN 61000-6-1 EN 61000-6-2 EN 61000-6-3 EN 61000-6-4
Environment	GR-63-CORE