

# Trusted Power System

## Product Overview

The Trusted® Power System is a high density flexible power supply designed to convert main line voltages of either 110 Vac or 240 Vac. Outputs are either 24 Vdc for Trusted product or 28 Vdc adjustable field power.

The Trusted Power System consists of a 1U Power Shelf with mechanical support, containing up to three 750 W Power Packs. The Power Packs load share in configurations using one or more Power Shelves. Each Power Pack has an individual supply connection via a mechanically retained IEC 60320 type connector. Each Power Shelf can supply 2250 W of power or 1500 W with n+1 redundancy from a single source. Multiple units can be connected for further capacity or redundancy requirements.

Diagnostic information of Power Pack status is provided via the Power Port, which connects to the rear of the Power Shelf. This device monitors input and output conditions and reports out of range faults and over-temperature/fan failure using relay contacts. The Power Port also allows connection of the optional rack mounted Power Controller for live configuration, of output voltage and current, monitoring up to 12 Power Packs in 4 Power Shelves.

## Features:

- Redundant and N+1 configurations.
- Hot replaceable Power Packs.
- Current sharing.
- Current limiting.
- Power factor correction.
- Diagnostic contacts.
- Configurable output voltage.
- Input/output fail diagnostics per power pack.

## 1. Product Range

Catalogue No.	Product name	Description
T8230	Power Shelf	19 inch x 1U chassis for up to 3 Power Packs. Includes 4U fixing kit, Power Port (with push fit BLZF 3.5/10 connector), mains plugs and retaining clips.
T8231	Power Pack 24 Vdc	750 W, universal input, 24 Vdc out.
T8232	Power Pack 28 Vdc	750 W, universal input, 28 Vdc out.
T8233	Power Port	Plug in diagnostic interface.
T8234	Power Controller	For live adjustment of output voltage. 19 inch x 1U.
T8235	Power Shield	Covers unused Power Pack positions.
TC-323	Power Shelf Interconnect	For connection to a Power Controller or for current sharing.

**Table 1 T823X Power System Product Range**



Figure 1 Front View - Power Shelf with Power Packs



Figure 2 Rear View - Power Shelf, Power Port (uncovered) and 4U Mounting Brackets

## 2. Assembly

A pair of brackets mounted in to a 19 inch frame supports up to 4 Power Shelves and are required to provide support at the rear of the Power Shelf.

The brackets supplied mount the equipment by its 19 inch rack ears and provide a box structure to brace the power supplies. The back of the power supplies are fixed using M3.5 screws that are fixed via tapped holes in the Power Shelf. The front of the Power Shelf is located and supported via screws through the lugs of the Power Shelf.

The mounting bracket occupies 4U and can accommodate up to 4 Power Shelves. The design is such that no space outside the 4U aperture is required. When installed it is possible to remove individual Power Shelves should this be required. The design of the mounting bracket does not obstruct access to the front or back of the Power Tray.

Power Packs are slotted into the 1U Power Shelf with the first Power Pack in the right hand slot, as shown in Figure 4. Each Power Pack provides 750 W (31.25 A at 24 Vdc) to the DC output on the Power Shelf.

The standard AC input connection to the Power Shelf is through IEC 60320 type connectors rated at 10 A/250 Vac in Europe/Asia and 15A/120 Vac in North America.



Figure 3 AC Power Connectors and Retaining Clips

Output terminal blocks on each Power Shelf have three M4 screw connections. Ring type connectors should be used when connecting from the Power Shelf to system power distribution busbars.

The Power Port plugs into the back of the Power Shelf and requires a 24 V supply. The Power Port can provide monitoring and control via a 25 way D connector when connected to a Power Controller. A separate connector (CON3) via a push fit connector (supplied), provides DC and AC fail contacts. When more than one Power Shelf is used, Power Ports are linked via the CS terminal, using a Power Shelf Interconnect cable to enable current sharing.

Spare slots in the Power Shelf are covered by Power Shields.

The 1U Power Controller is connected via the Power Port, using a TC-323 Power Shelf Interconnect ribbon cable, and allows live configuration of output voltage. The Power Controller can monitor up to 12 Power Packs in 4 Power Shelves. Each Power Shelf is identified by the Power Controller by selecting addresses on the Power Port as described in paragraph 5.2.4.

Unused slots in the 4U brackets may be used for other equipment or fitted with blanking plates.

Unused connectors on the TC-323 ribbon cable should be tied back and left unused.

### 3. Power Shelf Specification

The Power Shelf is designed to operate as a key element in a complete distributed Power System.

This Power Shelf can house up to three Power Packs, provides physical protection and a number of alarm and control features.

The Power Shelf can supply up to 1500 W of n+1 redundant power or up to 2250 W of total power depending on configuration of Power Packs. Four stacked Power Shelves can provide up to 9000 W total power.

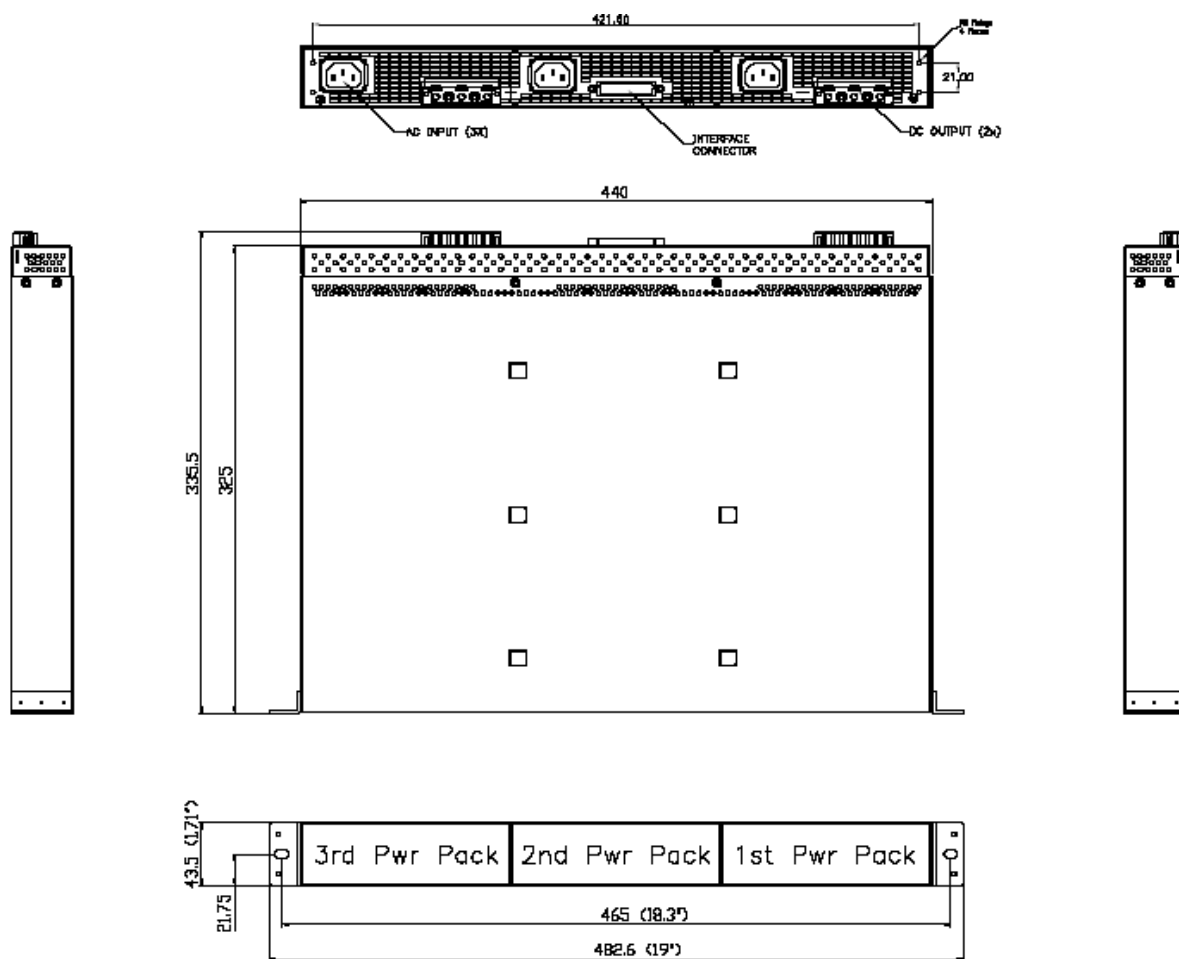


Figure 4 1U Power Shelf Mechanical Outline

#### 3.1. Input Connector

The Power Shelf can be used with any standard global line voltages. The standard AC input connection to the Power Shelf is through three clip retained IEC 60320 type connectors rated at 10 A / 250 Vac in Europe/Asia and 15 A / 120 Vac in North America.

## 3.2. Output Connector

The Power Shelf has two terminal blocks for DC output (each with three M4 screws). The V+ and V- are floating with respect to frame GND, either of which can be connected to GND as required.

## 3.3. Current Sharing

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**Note:** If there is a low load on a Power Shelf (less than 2 A per Power Pack) then the current sharing circuit may not work correctly and the 'PWR OK' LED may not illuminate on the Power Packs.

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In systems where more than one Power Shelf is being used, Shelves should connect their CS terminals by using a Power Shelf Interconnect cable TC-323. This ensures that the Power Shelves current share.

Do not connect the TC-323 cable between 'A' and 'B' supplies or between two sets of Shelves which connect to separate busbars. The supplies will attempt to share current between the two busbars, which may damage the power packs and shelves' sensing circuits.

Unused connectors on the TC-323 cable should be tied back and left unused.

## 3.4. Interface Connector

The Power Shelf has an optional DSB, 25-pin, female interface connector on the back. The Power System can be monitored and controlled through this interface, by a Power Controller, using a Power Shelf Interconnect. AC and DC fail alarms are available from a separate connector on the Power Port.

Pin Number	Signal Name	Description
1	DC Fail_2	DC Fail signal of the second Power Pack
2	A2	I <sup>2</sup> C address bit 2
3	A3	I <sup>2</sup> C address bit 3
4	ON SYNC	Not Used
5	SDA	I <sup>2</sup> C Serial data bus
6	SCL	I <sup>2</sup> C Clock
7	NC	No connection
8	On/Off_1	Remote on off control for the first Power Pack - Not Used
9	OTP_1	Fan Fail or Over-temperature signal for the first Power Pack

Pin Number	Signal Name	Description
10	On/Off_2	Remote on off control for the second Power Pack - Not Used
11	V <sub>aux</sub>	Not Used
12	DC Fail_1	DC Fail signal of the first Power Pack
13	AC Fail_3	AC Fail signal of the third Power Pack
14	OTP_3	Fan Fail or Over-temperature signal of the third Power Pack
15	DC Fail_3	DC Fail signal of the third Power Pack
16	INT BUS	Not used
17	AC Fail_1	AC Fail signal of the first Power Pack
18	On/Off_3	Remote on off control for third Power Pack - Not Used
19	SRTN	Signal return and V <sub>aux</sub> return
20	RS-	Remote sense for V-
21	OTP_2	Fan Fail or Over-temperature signal of the second Power Pack
22	RS+	Remote sense for V+
23	AC Fail_2	AC Fail signal of the second Power Pack
24	CS	A single wire interface for current sharing
25	V-	V-

**Table 2 Pin Assignment of the Interface Connector**

Refer to Figure 4 - 1U Power Shelf Mechanical Outline for the locations of Power Pack 1, 2 and 3.

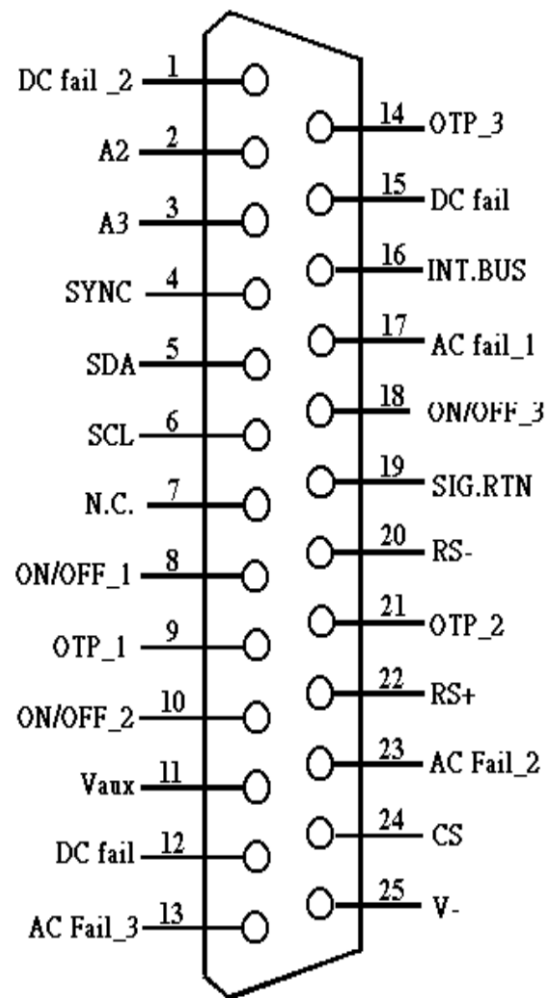


Figure 5 Interface Connector

### 3.5. Stacked-up Assembly

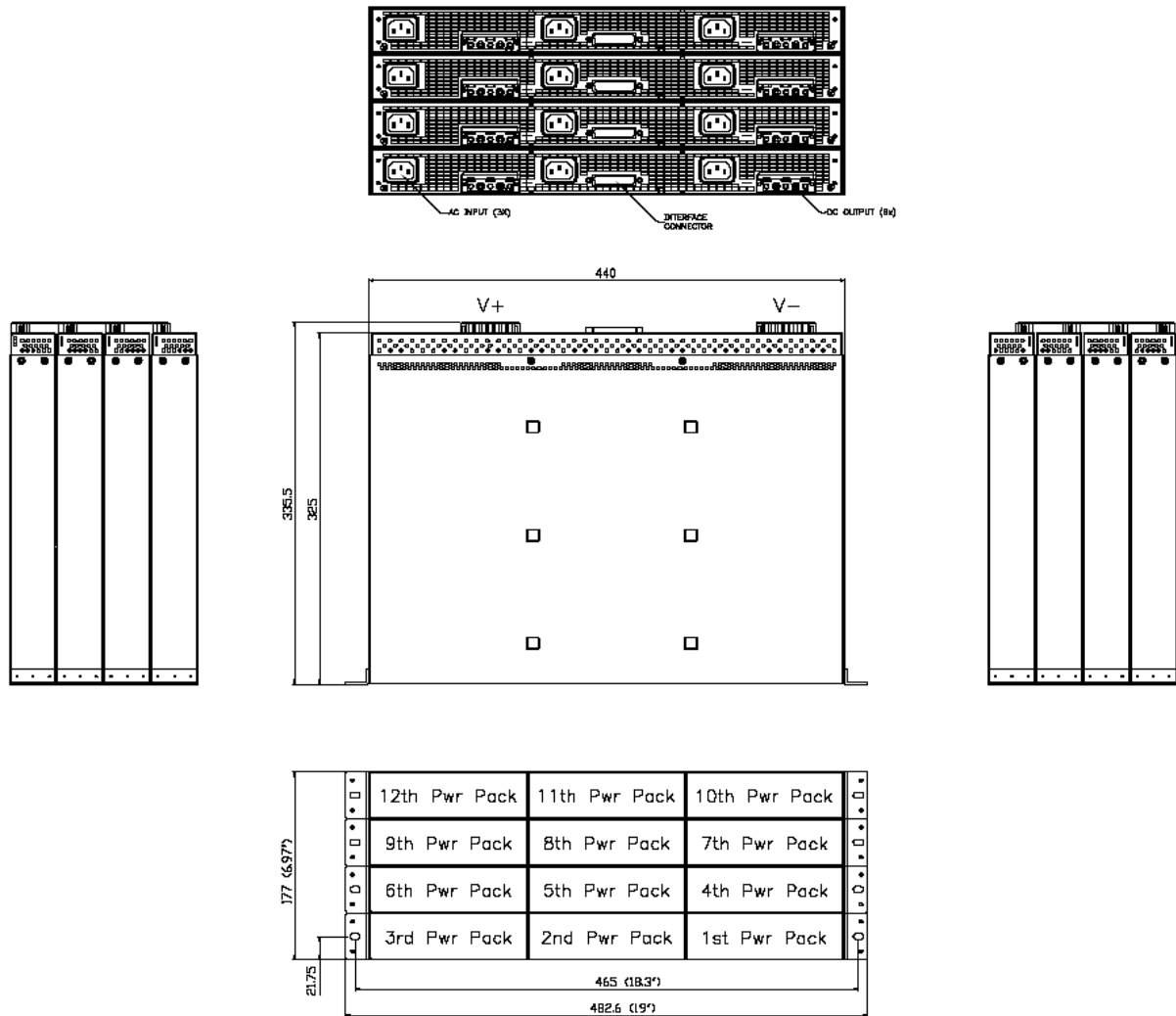


Figure 6 4U Stacked-up Assembly

## 9. Power System Specification

<b>Voltage Range</b>	
Input	90 Vac to 264 Vac
Output	24 Vdc to 28 Vdc
Frequency Range	47 Hz to 63 Hz
Inrush Current	50 A Max per Pack
Power Factor	0.95 min, 0.99 typical
Efficiency	78 % – 84 %
Output Power	750 W per Power Pack
Power Hold-up Time	20 ms
Operating Temperature	0 °C to +60 °C (+32 °F to +140 °F)
Relative Humidity range (operating, storage & transport)	10 % – 95 %, non-condensing
Environmental Specifications	<a href="#">Refer to Document 552517</a>
<b>Power Shelf Dimensions</b>	
Height:	43 mm (1.71 in)
Width:	483 mm (19 in)
Depth:	340 mm (13.36 in)
<b>Weight Data</b>	
T8231,T8232 Power Pack	2.7 kg
T8230 Shelf (without supports)	4.4 kg
<b>UL Approvals</b>	
Power Supplies, Information Technology Equipment Including Electrical Business Equipment - Component	E223750
Power Supplies, Medical and Dental - Component	E223749