EAT•N | Powerware

Power Distribution Units for Enclosures (ePDU)
Product Focus

Features
- Reliably distributes power throughout low, medium or high-density racks
- High quality fault tolerant designs built for mission critical applications
- Flexible for mixed IT environments including blade servers, network and storage applications
- Saves valuable enclosure space with flexible mounting options, including horizontal, vertical (0U), wall and floor mounting
- Options available for single-phase and three-phase applications up to 17 kilowatts (KW) per ePDU
- Protects against overload conditions and tripped breakers with continuous monitoring
- Supports remote monitoring and management at the outlet, branch circuit and ePDU level
- Supports scheduled or on-demand turn-on/off of individual outlets to start/reboot remote servers

With data center IT equipment smaller than ever—often served by dual or triple power supplies—a single rack of equipment might have 80 or more power cords to manage.

Today's blade servers reply 600-1000 watts per U, and growing. Power consumption may soon reach up to 20 kW per rack.

Furthermore, power demands can easily double or triple during peak periods, and it fluctuates with every move, add or change in the enclosure. Adding a 1U or 2U server used to mean drawing 300 to 500 more watts from the branch circuit; now a new blade server consumes 10 times as much current. That means the power distribution system is more easily stressed by even the simplest changes in your data center.

Traditional power strips are not delivering enough power or flexibility for today's realities. Data center managers need an effective way to manage numerous power cords, deliver the required power without taking up valuable rack space, and have visibility into current draw at any time.

ePDU family delivers broadest choice in the market today
Eaton provides a complete suite of power distribution products to help IT managers meet these power requirements. Our rack-mount and floor UPSs provide reliable, quality power for a wide range of applications. Powerware® Enclosure Power Distribution Units (ePDUs) complement your UPS systems, distributing power in high-density rack environments—or anywhere power must be distributed to multiple pieces of equipment.

Eaton is unique in the industry for providing a tiered set of ePDU product families along two dimensions—tiered both in power capacity and in functionality. Choose the combination of features and power rating you need to best suit each application.

	Number of servers supported by one power strip			Number of power strips needed for fully populated 42U rack		
	1U server, 0,35 kW avg. power	2U server, 0,55 kW avg. power	Blade Chassis, 4 kW avg. power	For 42 1U servers	For 21 2U servers (each)	For 6 x 7U Blade Chassis (each)
Standard power (0 to 4kW)	8-10	5-6	N/A	4-5	4	N/A
	10	6	N/A	4	4	N/A
Mid-range power (4 to 10 kW)	21	13	1	2	2	4
	21	13	1	4	4	4
High power (10 to 15 kW)	31	20	2	2	2	3
	41	26	3	1	1	2
	42	26	3	2	2	2
Ultra power (15 kW and above)	63	40	5	1	1	2
	63	40	5	2	2	2

Powerware ePDU families by power rating

Within the four ePDU families described below, select the power rating that best suits each application:

• A **Standard Power** ePDU (for applications less than 4 kW) will support up to six 1U/2U servers or peripherals, such as network switches, environmental monitors, KVM devices and rack accessories.

• A **Mid-Range Power** ePDU (4 to 10 kW) supports up to sixteen 1U/2U servers or two blade server chassis, offering both ICE-320 and NEMA receptacles.

• A **High-Range Power** ePDU (10 to 15 kW) for high-density applications can support up to twenty five 1U/2U servers or three blade server chassis, offering up to 45 receptacles in several form factors.

• An **Ultra-Power** ePDU (15 kW and up) is designed for a rack that will be loaded with up to four blade server chassis and other power-hungry pieces of IT equipment.

Powerware ePDU families by functionality

The suite of Powerware ePDUs helps IT managers manage power distribution while meeting their unique needs for metering, monitoring and management:

• **Powerware Basic ePDUs** provide reliable and economical power distribution in the rack from the utility source or UPS with up to 24 receptacles in each ePDU, substantially reducing the number of plenum cables from the input source to each rack.

• **Powerware Metered ePDUs** also monitor the electrical current passing through the unit. A bright, backlit Easy Read™ LED displays utilization on any receptacle, circuit branch or the entire unit, so you can prevent overload conditions and tripped circuits.

• **Powerware Monitored ePDUs** enable you to securely view the status of each circuit from anywhere on your company intranet or the Internet, and receive automated alerts of potential trouble. Combine this ePDU with power management software, such as Eaton® Foreseer™ or Eaton PowerXpert™, and you can aggregate and monitor information from thousands of ePDUs in one location.

• **Powerware Managed ePDUs** offer all the features of the other three product families plus advanced Revelation™ technology to manage and monitor receptacles at a granular level. User-defined sequencing of outlets and time delays permits controlled, remote boot-up of servers. Virtual grouping of outlets permits single-click reboot of multi-corded servers, entire racks or grouped loads. Electronically lock designated receptacles to prevent unauthorized use.

Eaton is unique in providing a full complement of ePDUs that combine the required functionality for any power range you need. You are not forced into a high-capacity solution just because you need remote monitoring or other high-end features. Nor are you constrained to buy high-end functionality where you only need basic power distribution. The choice is yours. Eaton thinks power distribution should be as adaptable as your data center needs to be.

A closer look at Powerware ePDUs features and options

Powerware ePDUs offer features and options to match the unique requirements of your data center, from mounting options to remote monitoring to individual control of receptacles. Here's a preview of the key features available for your ePDU.

Space-saving mounting options

Installing your new ePDU is quick and easy. Models mount horizontally in minimal rack space (1U or 2U), or vertically (0U) in rack side pockets or rear channels—or on a wall or floor, saving traditional rack U space for IT equipment.

The units come with all mounting hardware included, ready to install. There's no need to purchase additional mounting hardware or accessories. Some units use the new tool-less button-mount system and can be mounted in keyhole-type openings in popular racks, with no tools required.

Branch circuit protection

UL-489-listed circuit breakers provide branch circuit protection and on/off operation for groups of receptacles. Cable retention brackets prevent power cords from being accidentally disconnected. And with visual indication of available incoming power, current draw and tripped circuits, you never have to guess the unit's operational state.

Choice of power input sources and output receptacles

The Powerware ePDU family includes a variety of power inputs and outputs to fit most

power requirements. Select from NEMA and IEC inputs from 10A to 60A, 110 or 208V, single- or three-phase.

On the output side, you can select a mix of NEMA- and IEC-type output receptacles (4 to 45 receptacles per ePDU in various combinations). High-density, high amperage receptacles support blade servers, network switches, and other power-hungry IT equipment. Clearly labeled circuits simplify load balancing.

On-board power metering

Powerware Metered, Monitored and Managed ePDUs can continuously measure the current at either receptacles, branch circuits or the entire ePDU. The large, bright, backlit ammeter can be easily read from up to 12 feet away.

Armed with detailed information, you always know how close a circuit is to exceeding its overall rating—and whether or not a device can be added to a branch circuit or ePDU. Data center and facilities managers can more effectively manage energy consumption to prevent overload conditions, optimize power distribution, and, when applicable, accurately bill internal customers for power usage.

Time-stamped activity logging
It is important to be able to assess the historical power consumption of a branch circuit or ePDU, to consider past trends before adding new loads. Powerware managed ePDUs assess circuit activity 24/7 and provide time-stamped metering, alarm and statistical information down to the outlet level. This information is shown for individual circuits and summarized for the entire ePDU. To allow visibility at all levels within one unit.

Remote monitoring

On Powerware Monitored and Managed ePDUs, all the available circuit-level and ePDU-level information can be accessed any place in the world via most common communication interfaces. Information can be automatically sent to your existing building management system, or a power management system, such as Eaton's Foreseer or PowerXpert.

Similarly, notifications of warnings and alarms are displayed locally and sent remotely. This is especially helpful while managing large data centers with hundreds of ePDUs.

With the Powerware Managed ePDU, Eaton offers the only ePDU on the market that supports 256-bit AES encryption to protect network communications.

Remote shutdown and reboot of connected servers
Eaton's premier managed ePDUs are equipped with advanced Revelation technology. These ePDUs support a range of communication protocols including Intelligent Platform Management Interface (IPMI), a specification that enables system administrators to monitor and manage the health of IT equipment and ePDU using the same protocol.

With Revelation, ePDUs become intelligent devices that enable you to not just monitor power and temperature in the data center, but also to reboot remote servers and other network devices from the office or anywhere via the Internet.

The user defines the sequencing of this receptacle control feature, to ensure that both sides of dual-power supply servers receive power simultaneously, and that cumulative inrush does not trip upstream circuit breakers. Sequencing features safely restore servers to the desired state after a power loss or during start-up.

Managers can truly manage what is going on, have valid information about specific key demands of server processes, turn servers off when idle or under-utilized, and prevent "rogue overloading" caused by unauthorized plug-ins.

Rugged, reliable performance
All Powerware ePDUs meet applicable industry standards for IT equipment safety: UL 60950, Safety of Information Technology Equipment including Electrical Business Equipment, 3rd Edition; CSA/cUL 60950; and

EN 60950. All units are CE-certified and for appropriate regional electrical requirements. Further all ePDU are fully tested down to the outlet level to ensure the products are of the highest quality.

Datacenter-grade components increase structural strength, product reliability and fault-tolerance. On the managed ePDU the circuit boards are mechanically isolated from the electrical outlets. This increases the longevity of the unit and prevents damage to the circuit board from repeated plugging and unplugging.

Powerware ePDU Families	Standard Up to 4 kW	Mid-Range 4-10 kW	High-Range 10-15 kW	Ultra 15 kW+
Powerware Basic Rackmount ePDU	•	•	•	
Powerware Metered Rackmount ePDU	•	•	•	•
Powerware Monitored ePDU	•	•	•	
Powerware Managed ePDU		•		

A summary of key features by ePDU family

A new level of confidence.
Eaton is a global leader in power quality and management solutions—named by Frost & Sullivan as "Power Quality Company of the Year" for three years in a row (October 2006). Our rugged ePDUs reflect more than 40 years of expertise in industrial-strength power quality solutions for the data center market.

Powerware ePDUs from Eaton deliver confidence—confidence that the power circuits serving your blade servers and other essential hardware are appropriately loaded, capable of supporting the high availability you demand. For more information, visit our Web site at **www.powerware.com**, or contact us at 1-800-356-5794.

A SUMMARY OF KEY FEATURES BY EPDU FAMILY

Feature	Benefit	Basic	Metered	Monitored	Managed
Single- and dual-circuit chassis design	Options for high-density environments	●	●	●	●
Circuit-breaker branch protection (not fuses)*	Return to service more quickly and safely	●	●	●	●
Individual outlet fuse protection*	Isolates overload fault to only one outlet	●	●	●	●
Worldwide output and input connectors	Flexible configuration options	●	●	●	●
Fully earth bonded	Safer design	●	●	●	●
Fully protected circuit breakers and switches	Prevents accidental operation	●	●	●	●
Large, Easy-Read Digital Ammeter	Large, local LED to aid provisioning of servers		●	●	●
RS-232 serial communication port	Remote monitoring of ePDUs over serial connections			●	●
Ethernet port	Remote monitoring over Ethernet				●
Switch outlets on/off remotely	Enables remote, "lights-out" data center operations				●
Lock outlets using software	Prevents unauthorized powering of servers				●
Create virtual groups of outlets	Eases management of similar types of equipment and multi-corded servers				●
Comprehensive monitoring at the outlet level of volts, amps, watts, kVA	Enables better power management and promotes efficiency				●
User-definable sequencing of outlet turn-off/on (outlet order and time delay)	Permits controlled boot-up based on equipment power draw				●
Flash-upgradeable firmware	Easily receive and update to new software				●
SNMP traps and email functionality	Various notification options				●
IPMI2 and SMASH compatible	Harmonize user access to computer and ePDU				●
256-bit AES encryption (HTTPS, SSL, SSH, SSH2) and built-in firewall	Provides secure communication platform				●

*Where required by electrical code

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