

Choosing the Right Power Distribution Unit

A Power Distribution Unit (PDU) is a highly reliable, multiple outlet power strip designed to deliver conditioned power to mission-critical networking, server or telecom equipment. It is often used in conjunction with an uninterruptible power supply (UPS).

In a networking environment, devices need to be powered continuously, either from a whole site generator or rack mounted UPS power source, and since many networking devices in use today are fitted with dual redundant power inputs, the total plug count can approach 80 or more—with many requiring two power sources to further mitigate the risk of power failure.

Types of PDU

There are three main types of PDU systems on the market today that address these issues, each with a graduated set of features as you move up the line.

Basic PDUs

A Basic PDU offers simple but highly reliable power distribution to multiple pieces of equipment in a network application. A PDU of this type is important for the purpose of providing enough outlets for the many devices that are commonly installed into a rack enclosure from a conditioned power source such as a UPS or generator/centralized UPS power distribution scheme.

Metered PDUs

A metered PDU offers the same benefits of a Basic PDU (multiple outlets, long input cord), plus the ability to monitor the total amount of current in amps that flows through the PDU. A metered PDU gives network managers, in charge of ever-growing installations, the ability to know when the current demands of connected equipment approach or exceed the total capacity of the PDU itself, or the UPS power source it connects to, and make necessary upgrades before power failures occur.

Switched PDUs

A switched PDU offers the same benefits of a Basic and Metered PDU (multiple outlets, long input cord, metered power consumption), plus the ability to remotely power each outlet off and back on again, via an Ethernet network connection. The main benefit of this arrangement is that equipment housed in a secure data center, server room, or locked enclosure can be powered off and on again remotely. This keeps network managers from having to travel to each site to manually power cycle equipment. Also, less critical equipment (such as monitors) can be manually powered down during a prolonged power outage so the most critical servers and networking equipment will run as long as possible from backup battery power.

Typical PDU Applications:

PDUs are commonly built for permanent placement inside rack enclosures, either in a zero rack space (0U) 4- to 6-foot vertical format, or horizontally in a one to two rack space (1U, 2U) form factor. Since a PDU generally functions as the entry point for power into a rack, most offer a 10- to 15-foot input cord option so that it can be connected to a distant power source, all the way from the top of a 7-foot rack enclosure if necessary. A PDU unit is meant to pass conditioned power that is sourced from a large centralized UPS or generator installation in large data center applications or from individual UPS systems in a smaller enterprise environment. Since high reliability is critical, features found on standard power strips and surge suppressors, such as power switches, line filtering and surge suppression are left out to eliminate any possibility that the power strip could interrupt the flow of electricity to critical networking gear.

Other Important PDU Features:

There are some additional PDU offerings available that have unique feature combinations. Auto Transfer Switch (ATS): An Auto Transfer Switch is available in both Metered and Switched PDU formats where there are two input power cords, one labeled primary and the other labeled secondary. This allows you to provide dual redundant input power from two separate UPS systems or utility power sources to single corded networking devices that aren't already fitted with redundant power feeds. Power passing through the ATS is normally sourced from the primary input, but if power at this source were to fail or go out of tolerance, it will automatically switch to output sourced from the secondary input cord as controlled by a highly reliable internal switching mechanism.

Dual Circuit PDU:

A Dual Circuit PDU is available in both Basic and Metered formats where there are two color-coded input cords (one white, one black) and the outlets across the PDU are also color-coded (half are white, half are black). This allows network managers to install a single PDU to support servers and other networking equipment that are already equipped with dual redundant inputs. The black outlets source power from the black input cable. The white outlets source power from the white input cable. By plugging the two input cords present on each redundant networking device into an outlet of each color, network managers can build a fault tolerant rack installation with power sourced from two separate UPS systems or generator-supported building circuits.

Why is a PDU Necessary:

Depending on the type of PDU in use, the answer may get more complex. In a Basic PDU application, the product is primarily used to provide enough outlets to reliably power the many server, networking and other electronic devices that require continuous power. In a Metered PDU application, the product is primarily needed so that network managers can keep track of the amount of power their equipment is consuming and to help determine when the time is right to add more electrical capacity or larger UPS systems to support their growing network. In a Switched PDU application, the product is primarily needed as a means to remotely control networking devices in a remote or secure environment.

Tripp Lite Power Distribution Units (PDUs)

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