Installation

Metered Rack Power Distribution Unit
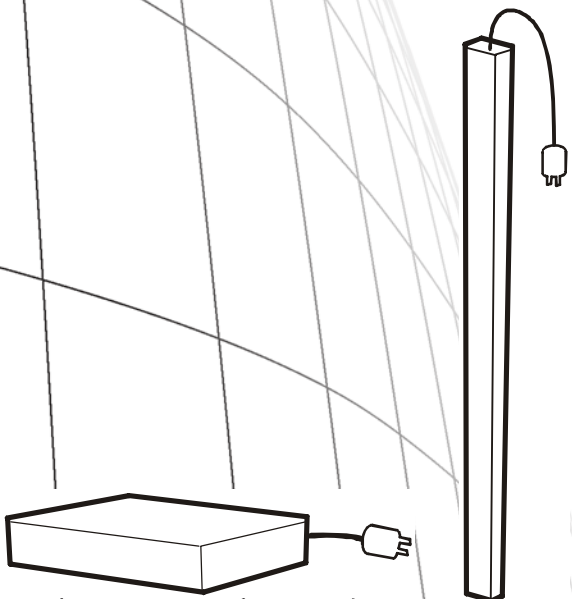
Contents

Preliminary Information

Features

This booklet provides information on installing and operating Metered Rack Power Distribution Units (PDUs). Each PDU has a sensor that measures the current being used by the PDU and its attached devices, and can be monitored through the Web, Telnet, SSH, SNMP, or InfraStruXure Manager interfaces.

Display interface

The display interface on the PDU shows the aggregate current being used by the PDU and its attached devices. An alarm occurs if the aggregate current is above the high threshold value or below the low threshold value that you configure.

Receiving inspection

Inspect the package and contents for shipping damage, and make sure that all parts were sent. Report any damage immediately to the shipping agent, and report missing contents, damage, or other problems immediately to reseller.

Please recycle

The shipping materials are recyclable. Please save them for later use, or dispose of them appropriately.

Install the PDU

Attach the cord retention trays

Attach the cord retention trays to the PDU, using four flat-head screws (provided) per tray.
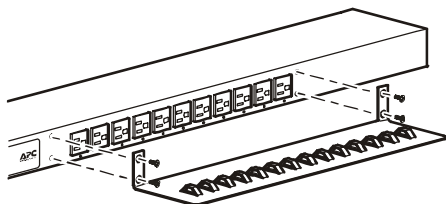
Attach cords to the tray

Attach a cord to the tray by looping the cord and securing it to the tray, using a wire tie (provided).
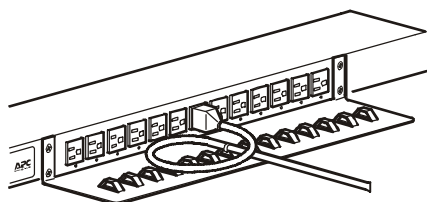
> **Note**
>
> Each cord must be secured to the tray so that you can unplug it from the PDU without removing the wire tie.

> **Note**
>
> When installing the PDUs, ensure that the power cord plug is accessible and that the PDU is connected to a grounded outlet.

Mounting options

You can install the PDU in one of two ways: using toolless mounting pegs (provided) or mounting brackets (provided). The 1-U and 2-U horizontal PDUs must be mounted using the horizontal mounting brackets.

Vertical mounting.

- To install the PDU using the toolless mounting method, install it in the rear of the NetShelter® VX or SX Enclosure, in the cable channel directly behind the rear vertical mounting rails.

- To install the PDU using the mounting brackets, install it on a vertical mounting rail on your rack or enclosure.

Horizontal mounting.

To install the PDU using the horizontal mounting brackets, install the brackets on the PDU and then attach the PDU to the rack using cage nuts (provided with your enclosure).

Toolless mounting

1. Slide both mounting pegs into the holes located in the channel in the rear panel of the enclosure.

2. Snap the PDU into place by pushing it down-ward until it locks into position.

pdu0119b
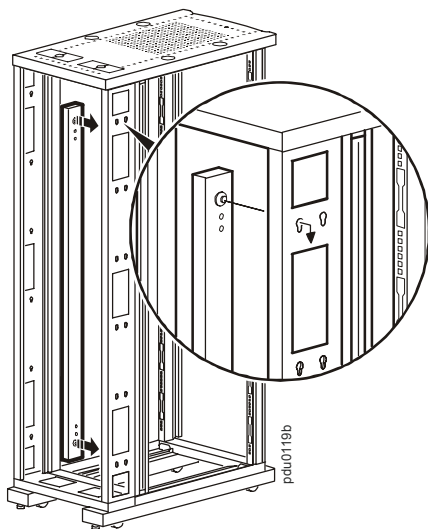
Note

You can mount two PDUs on one side of the enclosure by using the toolless mounting method.

Bracket mounting

Vertical mounting. To mount the PDU vertically in a NetShelter or any standard EIA-310 rack or enclosure:
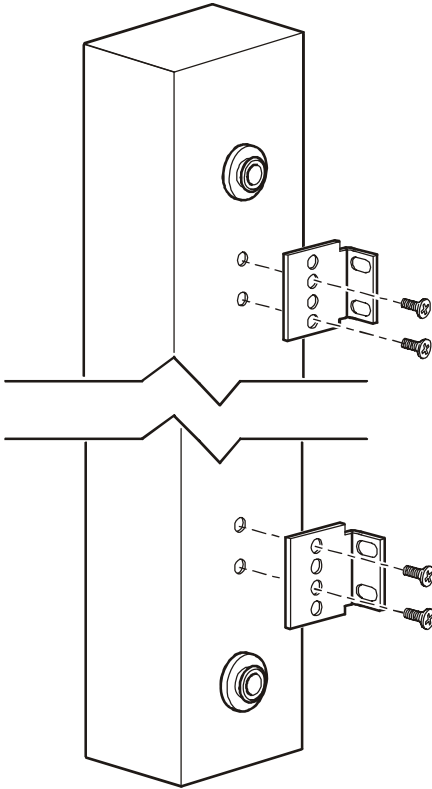
1. Attach the vertical-mounting brackets to the PDU.

Use only the supplied screws.

Caution

2. Install the PDU on a vertical mounting rail in your rack or enclosure using the screws and cage nuts supplied with your enclosure.
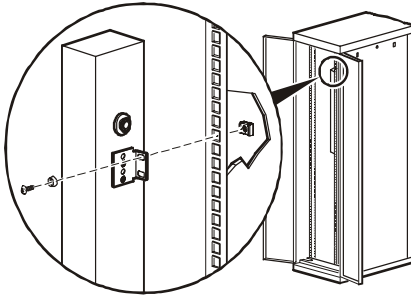
Horizontal mounting. You can mount the PDU in a 19-inch NetShelter or other EIA-310-D standard 19-inch rack:

1. Choose a mounting position for the PDU with either the display or the rear facing out of the enclosure.

2. Attach the mounting brackets to the PDU, using the flat-head screws (provided).
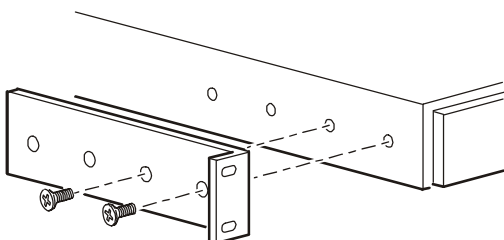
3. Choose a location for the unit:

Note
The unit occupies one U-space. A notched hole (or a number, on newer enclosures) on the enclosure's vertical rail indicates the middle of a U-space.

   a. Insert cage nuts (provided with the enclosure) above and below a notched hole on each vertical mounting rail in your chosen location.

   b. Align the mounting holes of the brackets with the installed cage nuts. Insert and tighten screws.
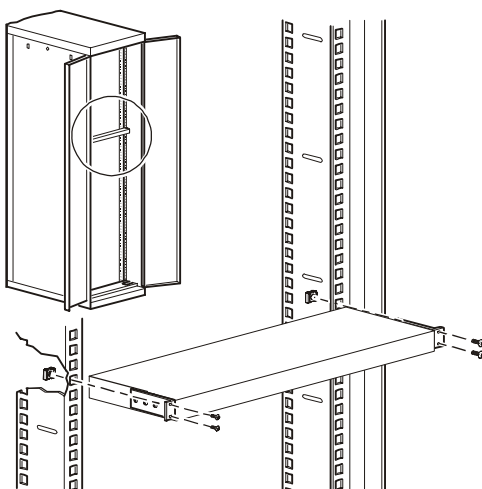
Recessed horizontal mounting. You can mount the PDU in a recessed configuration by attaching the brackets as shown in the following illustration of the PDU.
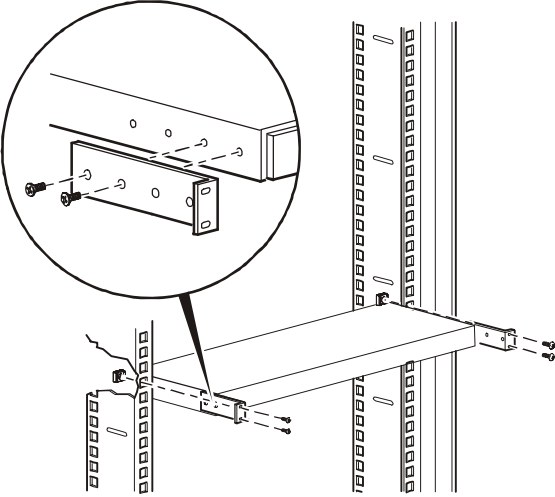
Display Interface Operation

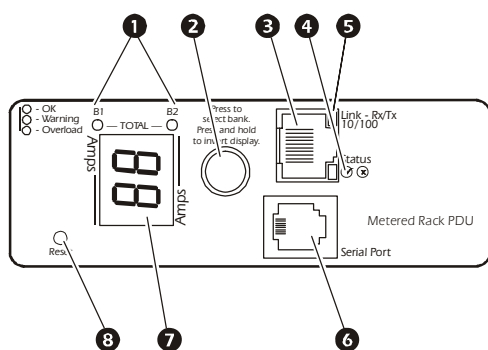|	
❶	Bank/phase indicator LEDs: • Indicate the bank/phase corresponding to the current listed in the digital display. • Indicate normal (green), warning (yellow), or alarm (red) condition. **NOTE:** If all indicator LEDs are lit, the Rack PDU is in use at its maximum capacity.
❷	Control button: • Press to change the bank/phase of the current displayed on the digital display. • Press and hold for five seconds to view the orientation of the display; hold for an additional five seconds to change the orientation.
❸	Ethernet port: Connects the PDU to your network, using a CAT5 network cable.
❹	Status LED: Indicates the status of the Ethernet LAN connection and the state of the PDU. • **Off**–The PDU has no power. • **Solid green**–The PDU has valid TCP/IP settings. • **Flashing green**–The PDU does not have valid TCP/IP settings. • **Solid orange**–A hardware failure has been detected in the PDU. Contact Customer Support at a phone number on the back cover of this manual. • **Flashing orange**–The PDU is making BOOTP requests.
❺	Link LED: Indicates whether there is activity on the network.
❻	Serial port: Access internal menus by connecting this port (RJ-11 modular port) to a serial port on your computer, using the supplied serial cable (part number 940-0144).
❼	Display of the current used by the PDU and attached devices: • Shows the aggregate current for the bank/phase corresponding to the Bank/Phase Indicator LED that is illuminated. • Cycles through the banks/phases in 3-second intervals.
❽	Reset switch: Resets the PDU without affecting the outlets.

See "Front Panel" in the "Introduction" of the *User's Guide* for more detailed display information on single-phase and three-phase PDUs.

See also

Quick Configuration

Caution Disregard the procedures in this section if you have InfraStruXure Manager as part of your system. See the InfraStruXure Manager's documentation for more information.

Overview

You must configure the following TCP/IP settings before the PDU can operate on a network:

- IP address of the PDU
- Subnet mask
- Default gateway

Note If a default gateway is unavailable, use the IP address of a computer that is located on the same subnet as the PDU and that is usually running. The PDU uses the default gateway to test the network when traffic is very light.

Caution Do not use the loopback address (127.0.0.1) as the default gateway address. It disables the PDU's network connection and requires you to reset TCP/IP settings to their defaults using a local serial login.

See also See "Watchdog Features" in the "Introduction" of the *User's Guide* for more information about the watchdog role of the default gateway.

TCP/IP configuration methods

Use one of the following methods to define the TCP/IP settings:

Device IP Configuration Wizard (See " Device IP Configuration Wizard" on page 9)

- BOOTP or DHCP server (See "BOOTP & DHCP configuration" on page 9.)
- Local computer (See "Local access to the control console" on page 12.)
- Networked computer (See "Remote access to the control console" on page 13.)

Device IP Configuration Wizard

You can use the Device IP Configuration Wizard at a computer running Microsoft® Windows® 2000, Windows 2003, or Windows XP to configure the basic TCP/IP setting of a Rack PDU.

> **Note**
> Most software firewalls must be temporarily disabled for the Wizard to discover unconfigured PDUs

1. Insert the Metered and Switched Rack Power Distribution Units *Utility* CD into a computer on your network.

2. Launch the Wizard, when prompted, or, if prompted to restart the computer, access the Wizard from the **Start** menu after the computer has restarted.

3. Wait for the Wizard to discover the unconfigured PDU, then follow the on-screen instructions.

> **Note**
> If you leave the **Start a Web browser when finished** option enabled, you can use **apc** for both the user name and password to access the Metered Rack PDU through your browser.

BOOTP & DHCP configuration

The **TCP/IP** option in the **Network** menu, under the **Administration** tab of the Web interface identifies how TCP/IP settings will be defined. The possible settings are **Manual**, **DHCP**, **BOOTP**, and **DHCP & BOOTP** (the default setting).

The **DHCP & BOOTP** setting assumes that a properly configured DHCP or BOOTP server is available to provide TCP/IP settings to the PDU.

> If these servers are unavailable, see " Device IP Configuration Wizard" on this page, "Local access to the control console" on page 12, or "Remote access to the control console" on page 13 to configure the TCP/IP settings.

With **TCP/IP** configuration set to **DHCP & BOOTP**, the PDU attempts to discover a properly configured server. It first searches for a BOOTP server, and then a DHCP server. It repeats this pattern until it discovers a BOOTP or DHCP server.

> For more information, see "BOOTP" on page 10 or "DHCP" on page 11.

BOOTP. You can use an RFC951-compliant BOOTP server to configure the TCP/IP settings for the PDU. If the BOOTP server is properly configured, the PDU's default setting (**DHCP & BOOTP**) for **TCP/IP** configuration causes it to discover the BOOTP server.

> If a BOOTP server is unavailable, see " Device IP Configuration Wizard" on page 9, "Local access to the control console" on page 12, or "Remote access to the control console" on page 13 to configure TCP/IP settings.

1. Enter the PDU's MAC and IP addresses, the subnet mask and default gateway settings, and an optional bootup file name in the BOOTPTAB file of the BOOTP server.

> For the MAC address, look on the back of the PDU or on the Quality Assurance slip included in the package.

2. When the PDU reboots, the BOOTP server provides it with the TCP/IP settings.

   – If you specified a bootup file name, the PDU attempts to transfer that file from the BOOTP server using TFTP or FTP. The PDU assumes all settings specified in the bootup file.

   – If you did not specify a bootup file name, the PDU can be configured remotely by using Telnet or by using the Web interface: **user name** and **password** are both **apc**, by default.

> To create a bootup file, see your BOOTP server documentation.

See also

DHCP. You can use a RFC2131/RFC2132-compliant DHCP server to configure the TCP/IP settings for the PDU.

This section summarizes the PDU communication with a DHCP server. For more detail about how a DHCP server is used to configure the network settings for the PDU, see "DHCP Configuration Settings" in the *User's Guide*.

See also

1. The PDU sends a DHCP request that uses the following to identify itself:

   – Vendor Class Identifier

   – Client Identifier (by default, the PDU's MAC address)

   – User Class Identifier (by default, the identification of the PDU's application firmware)

2. A properly configured DHCP server responds with a DHCP offer that includes all of the settings that the PDU needs for network communication. The DHCP offer also includes the **Vendor Specific Information** option (DHCP option 43). By default, the PDU ignores DHCP offers that do not encapsulate the APC cookie in the **Vendor Specific Information** option using the following hexidecimal format:

   ```
   Option 43 = 01 04 31 41 50 43
   ```

   where

   – The first byte (01) is the code

   – The second byte (04) is the length

   – The remaining bytes (31 41 50 43) are the cookie

See your DHCP server documentation to add code to the Vendor Specific Information option.

See also

You can use a local computer to disable the cookie requirement. To use a local computer, see "Local access to the control console" on page 12. To change the control console's **DHCP Cookie Is** setting, an **Advanced** option in the **TCP/IP** menu, use Telnet or another remote accessing method. To access the control console, see "Remote access to the control console" on page 13.

Local access to the control console

You can use a local computer to connect to the PDU to access the control console.

1. Select a serial port at the local computer, and disable any service which uses that port.

2. Use the serial cable (940-0144) to connect the selected port to the serial port on the front panel of the PDU.

3. Run a terminal program (such as HyperTerminal®) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, no flow control, and save the changes.

4. Press ENTER to display the **User Name** prompt.

5. Use **apc** for the user name and password.

6. See "Control console" on page 14 to finish the configuration.

Remote access to the control console

From any computer on the same subnet as the PDU, you can use ARP and Ping to assign an IP address to the PDU, and then use Telnet to access that PDU's control console and configure the needed TCP/IP settings.

> **(!) Note**
> After the PDU has its IP address configured, you can use Telnet, without first using ARP and Ping, to access that PDU.

1. Use ARP to define an IP address for the PDU, and use the PDU's MAC address in the ARP command. For example, to define an IP address of 156.205.14.141 for the PDU that has a MAC address of 00 c0 b7 63 9f 67, use one of the following commands:

   – Windows command format:

   ```
   arp -s 156.205.14.141 00-c0-b7-63-9f-67
   ```

   – LINUX command format:

   ```
   arp -s 156.205.14.141 00:c0:b7:63:9f:67
   ```

> **(!) Note**
> The MAC address is on the back of the PDU and on the Quality Assurance slip included in the package.

2. Use Ping with a size of 113 bytes to assign the IP address defined by the ARP command. For example:

   – Windows command format:

   ```
   ping 156.205.14.141 -l 113
   ```

   – LINUX command format:

   ```
   ping 156.205.14.141 -s 113
   ```

3. Use Telnet to access the PDU at its newly assigned IP address. For example:

   ```
   telnet 156.205.14.141
   ```

4. Use **apc** for both **user name** and **password**.

5. See "Control console" on page 14 to finish the configuration.

Control console

After you log on at the control console, as described in "Local access to the control console" on page 12 or "Remote access to the control console" on page 13:

1. Choose **Network** from the **Control Console** menu.

2. Choose **TCP/IP** from the **Network** menu.

3. If you are not using a BOOTP or DHCP server to configure the TCP/IP settings, select the **Boot Mode** menu. Select **Manual boot mode**, and then press ESC to return to the **TCP/IP** menu. Set the **System IP**, **Subnet Mask**, and **Default Gateway** address values.(Changes will take effect when you log off.)

4. Press CTRL+C to exit to the **Control Console** menu.

5. Log off (option 4 in the **Control Console** menu).

> **Note** If you disconnected a cable during the procedure described in "Local access to the control console" on page 12, reconnect that cable and restart the associated service.

Access a Configured PDU

Overview

After the PDU is running on your network, you can use the interfaces summarized here to access the unit.

See also

For more information on the interfaces, see the *User's Guide*.

Web interface

Use Microsoft® Internet Explorer (IE) 5.5 or higher (on Windows operating systems only), Firefox, version 1.*x*, by Mozilla Corporation (on all operating systems), or Netscape® 7.*x* or higher (on all operating systems) to access the PDU through its Web interface. Other commonly available browsers also may work but have not been fully tested.

To use the Web browser to configure PDU options or to view the event log, you can use either of the following:

- The HTTP protocol (enabled by default), which provides authentication by user name and password but no encryption.

- The more secure HTTPS protocol, which provides extra security through Secure Socket Layer (SSL) and encrypts user names, passwords, and data being transmitted. It also provides authentication of PDUs by means of digital certificates.

To access the Web interface and configure the security of your device on the network:

1. Address the PDU by its IP address or DNS name (if configured).

2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager).

3. Select and configure the type of security you want. (This option is available only for Administrators.)

See also

See the *Security Handbook: Network-Enabled Devices*, available on the Metered/Switched Rack PDU *Utility CD* , for more information on selecting and configuring network security.

Telnet and SSH

You can access the control console through Telnet or Secure SHell (SSH), depending on which is enabled. (On the **Administration** tab, select **Network** on the top menu bar and select **Access** under the **Console** heading on the left navigation menu to enable these access methods.) By default, Telnet is enabled. Enabling SSH automatically disables Telnet.

Telnet for basic access. Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption. To use Telnet to access a PDU control console from any computer on the same subnet:

1. At a command prompt, use the following command line, and press ENTER:

   telnet *address*

   As *address*, use the PDU's IP address or DNS name (if configured).

2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager).

SSH for high-security access. If you use the high security of SSL for the Web interface, use Secure SHell (SSH) for access to the control console. SSH encrypts user names, passwords, and transmitted data.

The interface, user accounts, and user access rights are the same whether you access the control console through SSH or Telnet, but to use SSH, you must first configure SSH and have an SSH client program installed on your computer.

> See also
>
> See the *User's Guide* for more information on configuring and using SSH.

SNMP

After you add the PowerNet MIB to a standard SNMP MIB browser, you can use that browser for SNMP access to the PDU. The default read community name is **public**; the default read/write community name is **private**.

To use InfraStruXure Manager to manage a PDU on the public network of an InfraStruXure system, you must have SNMP enabled in the PDU interface.

To enable or disable SNMP access, you must be an Administrator. Select the **Administrator** tab, select the **Network** menu on the top menu bar, and use the **access** option under **SNMP** on the left navigation menu.

FTP and SCP

You can use FTP (enabled by default) or Secure CoPy (SCP) to transfer downloaded firmware to the PDU, or to access a copy of the PDU's event or data logs.

To use InfraStruXure Manager to manage a PDU, you must have **FTP Server** enabled in the PDU interface.

To enable or disable **FTP Server** access, you must be an Administrator. Select the **Administration** tab, select the **Network** menu on the top menu bar, and use the **FTP Server** option on the left navigation menu.

> **See also**
>
> In the Metered Rack PDU *User's Guide*, see the following sections:
>
> • To transfer firmware, see "File Transfers."
>
> • To retrieve a copy of the event or data log, see "How to use FTP or SCP to retrieve log files."

Managing the security of your system

> **See also**
>
> For detailed information on enchancing the security of your system after installation and initial configuration, see the Security Handbook, available on the Metered / Switched Rack PDU *Utility* CD

How to Recover From a Lost Password

You can use a local computer, a computer that connects to the PDU or other device through the serial port, to access the control console.

1. Select a serial port at the local computer, and disable any service that uses that port.

2. Connect the serial cable (940-0144) to the selected port on the computer and to the configuration port at the PDU.

3. Run a terminal program (such as HyperTerminal) and configure the selected port as follows:

   – 9600 bps

   – 8 data bits

   – no parity

   – 1 stop bit

   – no flow control

4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. If you are unable to display the **User Name** prompt, verify the following:

   – The serial port is not in use by another application.

   – The terminal settings are correct as specified in step 3.

   – The correct cable is being used as specified in step 2.

5. Press the **Reset** button. The Status LED will flash alternately orange and green. Press the **Reset** button a second time immediately while the LED is flashing to reset the user name and password to their defaults temporarily.

6. Press ENTER as many times as necessary to redisplay the **User Name** prompt, then use the default, **apc,** for the user name and password. (If you take longer than 30 seconds to log on after the **User Name** prompt is redisplayed, you must repeat step 5 and log on again.)

7. From the **Control Console** menu, select **System**, then **User Manager**.

8. Select **Administrator**, and change the **User Name** and **Password** settings, both of which are now defined as **apc**.

9. Press CTRL+C, log off, reconnect any serial cable you disconnected, and restart any service you disabled.

How to Update Firmware

To obtain firmware for your PDU, download the latest firmware revision from www.rackmountmart.com/downloads

See also

For a complete description on how to transfer a downloaded firmware upgrade to your PDU, see "File Transfers" in the Metered Rack PDU *User's Guide* on the provided Metered and Switched Rack Power Distribution Units *Utility* CD

Caution

Do not interrupt the transfer. The PDU will reboot when the transfer is complete.

Note

Upgrading the firmware will not interfere with the operation of the outlets.