

Metered Rack Power Distribution Unit

AP7830
AP7840

Installation and
Quick Start



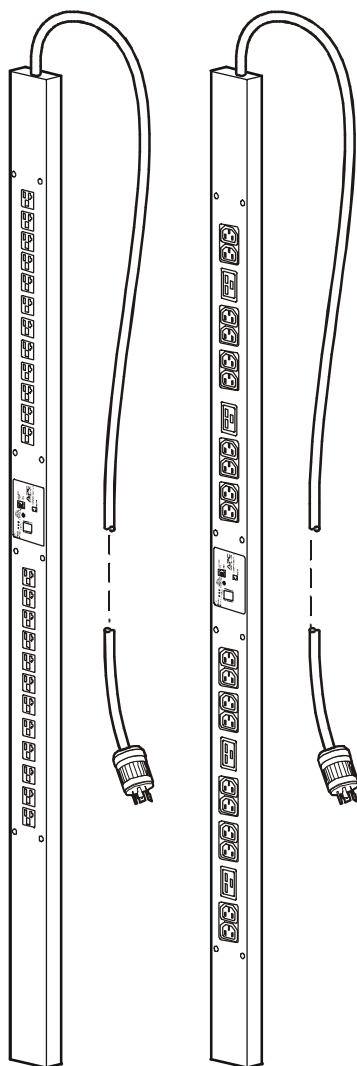
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Product Description and Inventory

AP7830 and AP7840 are Rack Power Distribution Units (PDUs) that distribute power to devices in the rack. They have a sensor that measures the current being used by the PDU and their attached devices and they can be monitored through Web, Telnet, SNMP, or InfraStruXure Manager interfaces.



AP7830

AP7840

Outlets—The outlets connect the PDUs to equipment in your rack or enclosure.

- AP7830 has 24 NEMA 5-20 outlets.
- AP7840 has 24 outlets:
 - 20 IEC 320 C13
 - 4 IEC 320 C19

Display Interface—The display interface on Metered PDUs 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 values that you configure.

Plug—Each PDU has a plug that connects to a variety of APC equipment.

- AP7830 has a NEMA L5-20 plug.
- AP7840 has a NEMA L6-20 plug.

Additional documentation

The PDU *User's Guide* and the PDU *Addendum* are available on the supplied CD and on the APC Web site: www.apc.com.

The *User's Guide* (.doc\eng\usrguide.pdf) contains additional information about the following topics related to the PDU:

- Management interfaces
- User accounts
- Customizing setup
- Security

The *Addendum* (.doc\eng\addendum.pdf) contains additional information about the following topics:

- The Management Card Wizard
- Configuration utilities
- File transfers

Inventory

The PDU is shipped with the following items:

Quantity	Item
1	Configuration cable (940-0144)
2	Mounting brackets (with 4 flat-head screws)
2	Cord retention tray (with 8 flat-head screws and 24 wire ties)
1	APC Basic and Metered Power Distribution Units <i>Utility</i> CD
1	Warranty registration card

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 APC or your APC reseller.

Please recycle



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

InfraStruXure-certified

This product is certified for use in InfraStruXure systems. The Configuration section, beginning on page 8, does not apply to PDUs that are part of InfraStruXure systems that are managed by an InfraStruXure Manager.

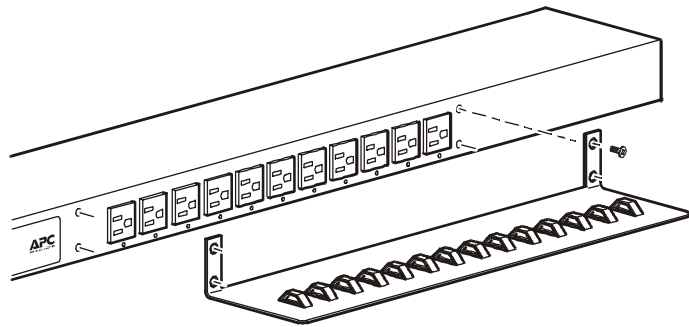
How to Install the PDU

Installation guidelines

- If the PDU is installed in an enclosed communications rack, the recommended maximum ambient temperature is 45° C.
- Install the PDU so that the amount of air flow required for safe operation of the equipment is not compromised.
- Install the PDU so that there is not an uneven mechanical load.
- Follow the nameplate ratings when connecting equipment to the supply circuit. Consider the effect that overloading the circuits might have on over-circuit protection and supply wiring.
- Maintain reliable earthing of the PDU. Give particular consideration to supply-connections that do not directly connect to the branch circuit.
- Install the PDU so that the power plug is accessible to be disconnected for service.

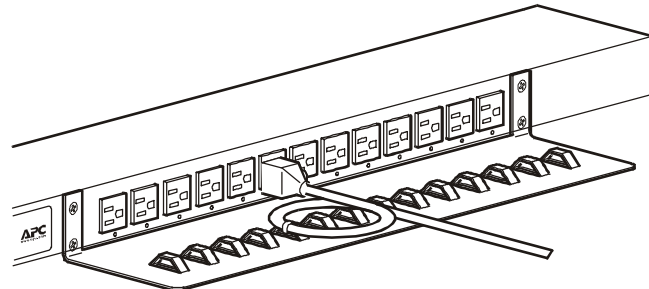
Attach the cord retention trays

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.

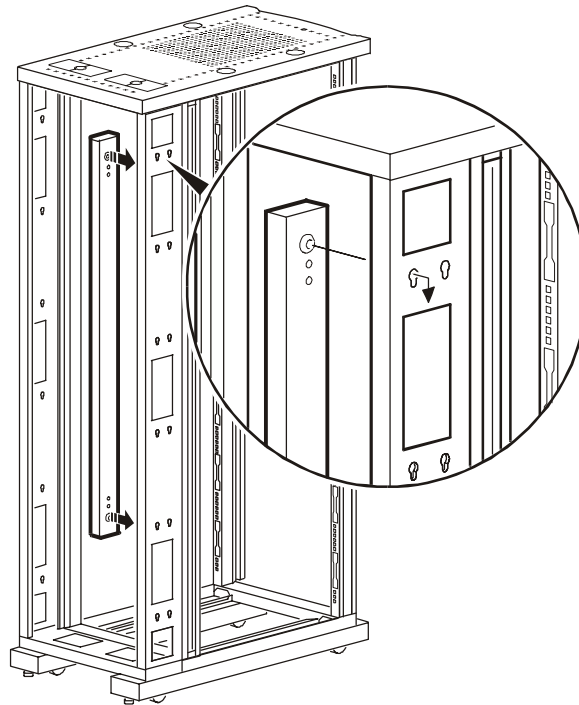
Mounting options

Install the PDU in one of two ways: using toolless mounting pegs (provided) or the mounting brackets (provided).

- To install the PDU using the toolless mounting method, install the PDU in the rear of the NetShelter VX 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.

Toolless mounting

1. Slide the 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 downward until it locks into position.



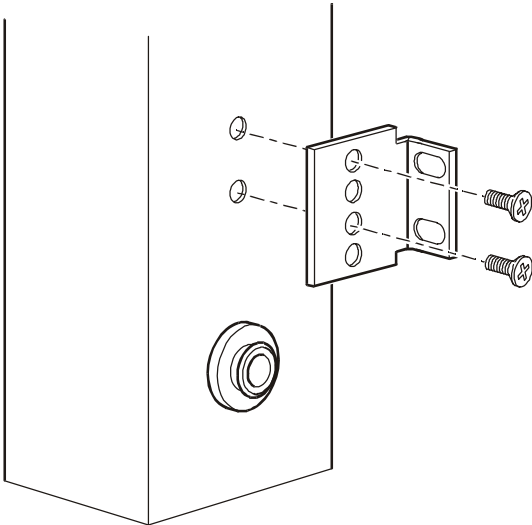
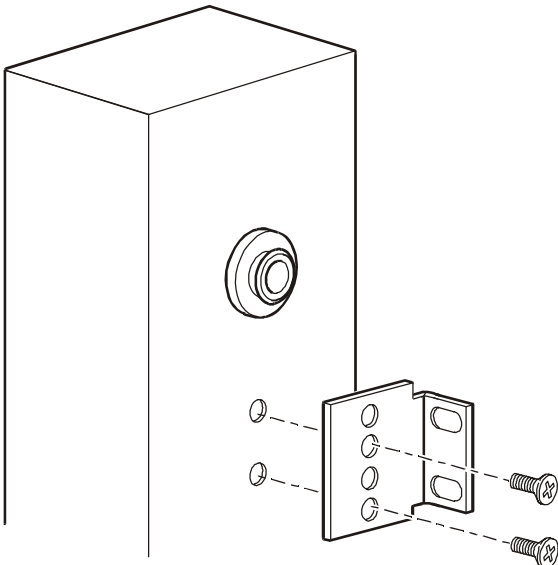
Note

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

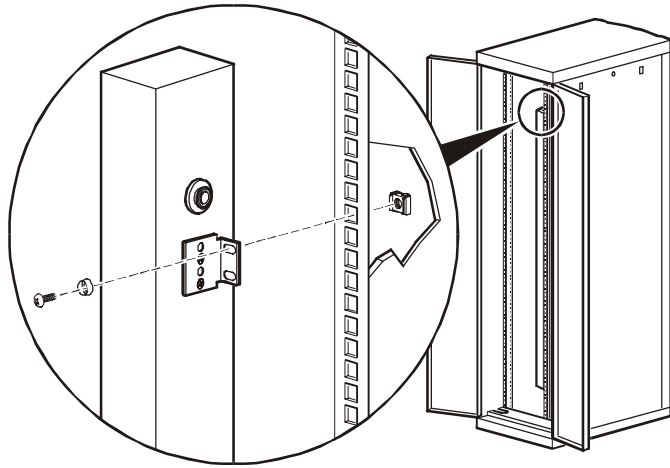
Bracket-mounting

To mount the Rack PDU vertically in a NetShelter® or any standard EIA-310 rack or enclosure:

- 1. Attach the vertical-mounting brackets to the PDU.

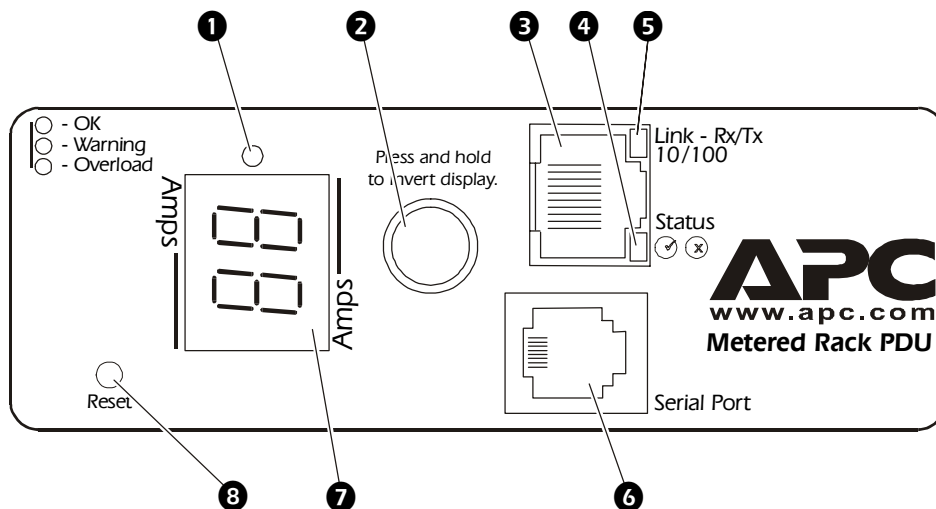


2. Install the PDU on a vertical mounting rail in your rack or enclosure.



Operation

Display interface



❶	Line Indicator LED: Indicates normal (green), warning (yellow), and alarm (red) conditions.
❷	Control button: Press and hold for five seconds to view the orientation; 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 Metered PDU. <ul style="list-style-type: none"> • 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 (940-0144).
❼	Display of the current used by the PDU and attached devices: Shows the aggregate current for the PDU.
❽	Reset switch: Resets the PDU without affecting the outlet status.

Quick Configuration



Disregard the procedures in this section if you have APC 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.



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:

- APC Management Card Wizard (See “APC Management Card 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 12.)

APC Management Card Wizard

You can use the APC Management Card Wizard at a Windows[®] 98, Windows NT[®] 4.0, Windows 2000, or Windows XP computer to configure a PDU.

1. Insert the APC Basic and Metered 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 PDU through your browser.

BOOTP & DHCP configuration

The **Boot Mode** setting, a TCP/IP option in the PDU's **Network** menu, identifies how TCP/IP settings will be defined. The possible settings are **Manual**, **DHCP only**, **BOOTP only**, and **DHCP & BOOTP** (the default setting).



Note

The **DHCP & BOOTP** setting assumes that a properly configured DHCP or BOOTP server is available to provide TCP/IP settings to the APC PDU. If these servers are unavailable, see “APC Management Card Wizard” on this page, “Local access to the control console” on page 12, or “Remote access to the control console” on page 12 to configure the TCP/IP settings.

With **Boot Mode** 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 **BOOT Mode** causes it to discover the BOOTP server.



If a BOOTP server is unavailable, see “APC Management Card Wizard” on page 9, “Local access to the control console” on page 12, or “Remote access to the control console” on page 12 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.



Note

For the MAC address, look on the bottom 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. See “Remote access to the control console” on page 12 for configuration instruction.



See also

You must use the APC Management Card Wizard to create the bootup file. To create a bootup file, see the BOOTP section in the *Addendum*.

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



See also

This section briefly 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” in the *User’s Guide*.

1. The PDU sends a DHCP request that uses the following to identify itself:
 - Vendor Class Identifier (APC by default)
 - Client Identifier (by default, the PDU’s MAC address value)
 - 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 hexadecimal 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 APC cookie



See also

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

You can use a local computer to disable the APC cookie requirement. For instructions on using 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 12.

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 configuration 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, and 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 13 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

For the MAC address, look on the bottom of the PDU or 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 this page 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 12:

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. (Changes will take effect when you log out.)
4. Set the **System IP**, **Subnet Mask**, and **Default Gateway** address values.
5. Press CTRL-C to exit to the **Control Console** menu.
6. Log out (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.

How to Access a Configured PDU

Overview

After the PDU is running on your network, you can use several different interfaces to access the PDU.



Note

To use the interfaces identified here, see the *User's Guide* and the *Addendum*.

Web interface

Use Microsoft® Internet Explorer 5.0 (and higher) or Netscape® 4.0.8 (and higher) to configure PDU options or to view the Event log.

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).

Telnet

You can use Telnet to access a PDU's 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).

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**.

FTP

You can use FTP (enabled by default) to download new firmware to the PDU, or to access a copy of the PDU's event logs.

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

```
ftp <address>
```

As *<address>*, use the PDU's IP address.
2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager).

How to Recover From a Lost Password

You can use a local computer that connects to the PDU through the serial port on the front of the unit.

1. Select a serial port at a local computer, and disable any service that uses the port.
2. Use the configuration 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, and no flow control, and save the changes.
4. Press **ENTER** to display the **User Name** prompt.
5. Press the Reset button on the Switched Rack PDU, which causes the Switched Rack PDU to restart, a process that typically takes approximately 15 seconds.
6. Press **ENTER** as many times as necessary to redisplay the **User Name** prompt, then use **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 start the login procedure again at step 4.)
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** and log off.



Note

Reconnect any cable that you disconnected in step 2 and restart any service that you disabled in step 1.

How to Download Firmware Updates



See also

For a complete description on how to download a firmware upgrade for your PDU, see the *Addendum* on the provided APC Basic and Metered Power Distribution Units *Utility* CD.

You can use a local computer that connects to the PDU through the serial port on the front of the unit.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Use the configuration cable (940-0144) to connect the selected port to the RJ-12 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, and no flow control. Save the changes.
4. Press **ENTER** twice to display the **User Name** prompt.
5. Enter your user name and password (both **apc**, for administrators only) and press **ENTER**.
6. From the **Control Console** menu, select **System**, then **Tools**, then **XMODEM**.
7. The system will prompt you with `Perform transfer with XMODEM -CRC? Type Yes` and press **ENTER**.
8. The system will then prompt you to choose a transfer rate and to change your terminal settings to match the transfer rate. Press **ENTER** to set the PDU to accept the download.
9. In the terminal program, send the file using the XMODEM protocol. Upon completion of the transfer, the console will prompt you to restore the baud rate to normal.



Caution

Do not interrupt the download.

The PDU will reboot when the download is complete.



Note

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

Specifications

AP7830/AP7840

Electrical

	AP7830	AP7840
Nominal input voltage	120 V	208 V
Acceptable input voltage	± 10% Nominal input voltage	
Input frequency	47–63 Hz	
Cord length	10 ft	
Input connectors	NEMA L5-20	NEMA L6-20
Output connectors	(24) NEMA 5-20	(20) IEC C20 C13, (4) IEC C20 C19
Maximum total current draw	16 A	

Physical

Size (H × W × D)	63.75 × 2.19 × 1.73 in (161.93 × 5.56 × 4.39 cm)
Weight	9.5 lb (4.3 kg)
Shipping weight	17 lb (7.7)

Environmental

Elevation (above MSL)	
Operating	0–15,000 ft (0–4500 m)
Storage	0–50,000 ft (0–15 000 m)
Temperature	
Operating	–5 to 45° C (23 to 115° F)
Storage	–25 to 65° C (–13 to 149° F)
Humidity	
Operating	5–95% RH Non-condensing
Storage	5–95% RH Non-condensing

Approvals

EMC verification	FCC Part 15 Class A, ICES-003 Class A
Safety verification	UL, cUL 60950

Warranty and Service

Limited warranty

APC warrants the PDU to be free from defects in materials and workmanship for a period of two years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser.

Warranty limitations

Except as provided herein, APC makes no warranties, express or implied, including warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

Except as provided above, in no event will APC be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of this product, even if advised of the possibility of such damage.

Specifically, APC is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise. This warranty gives you specific legal rights and you may also have other rights, which vary according to jurisdiction.

Obtaining service

To obtain support for problems with your PDU:

1. Note the serial number and date of purchase. The serial number is located on the safety label on the back of the PDU.
2. Contact Customer Support at a phone number located on the back cover. A technician will try to help you solve the problem by phone.
3. If you must return the product, the technician will give you a return material authorization (RMA) number. If the warranty expired, you will be charged for repair or replacement.
4. Pack the unit carefully. The warranty does not cover damage sustained in transit. Enclose a letter with your name, address, RMA number and daytime phone number; a copy of the sales receipt; and a check as payment, if applicable.
5. Mark the RMA number clearly on the outside of the shipping carton.
6. Ship by insured, prepaid carrier to the address provided by the Customer Support technician.

Life-Support Policy

General policy

American Power Conversion (APC) does not recommend the use of any of its products in the following situations:

- In life-support applications where failure or malfunction of the APC product can be reasonably expected to cause failure of the life-support device or to affect significantly its safety or effectiveness.
- In direct patient care.

APC will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to APC that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of American Power Conversion is adequately protected under the circumstances.

Examples of life-support devices

The term *life-support device* includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults and infants), anesthesia ventilators, infusion pumps, and any other devices designated as “critical” by the U.S. FDA.

Hospital-grade wiring devices and leakage current protection may be ordered as options on many APC UPS systems. APC does not claim that units with these modifications are certified or listed as hospital-grade by APC or any other organization. Therefore these units do not meet the requirements for use in direct patient care.

Radio Frequency Interference



Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. The user will bear sole responsibility for correcting such interference.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to find answers to frequently asked questions (FAQs), to access documents in the APC Knowledge Base, and to submit customer support requests.
 - **www.apc.com** (Corporate Headquarters)
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
 - **www.apc.com/support/**
Global support with FAQs, knowledge base, and e-support.
- Contact an APC Customer Support center by telephone or e-mail.
 - Regional centers:

Direct InfraStruXure Customer Support	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702055 (Ireland)
Japan	(0) 3 5434-2021
Australia, New Zealand, South Pacific	(61) (2) 9955 9366 (Australia)

- Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

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