Synergy Global Technology Inc

www. RackmountMart.com

Switched Rack
Power Distribution Unit

AS-216-520-30A-L530

Installation and
## Quick Start

Contents

Product Description and Inventory

AS-216-520-30A-L530 is Switched Rack Power Distribution Units (Rack PDUs) that distribute power to devices in the rack. The user can turn on, turn off, or recycle power back to the individually controlled outlets. The Rack PDUs also have a sensor that measures the current being used by the Rack PDUs and their attached devices. The Rack PDUs can be monitored through Web, Telnet, SNMP, or InfraStruXure Manager interfaces.
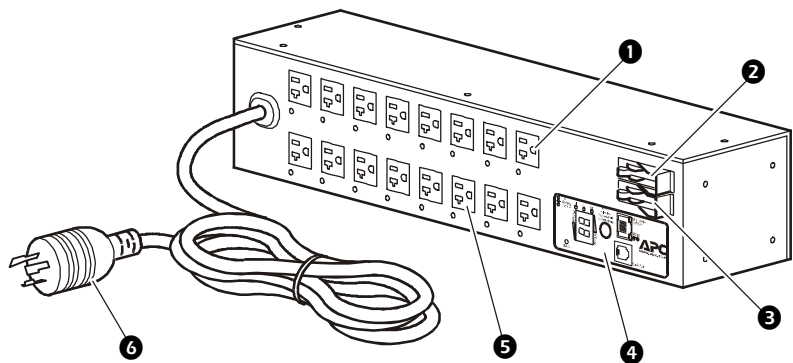
❶ Bank 1 — Eight NEMA 5-20 outlets
❷ 20 A circuit breaker for Bank 1
❸ 20 A circuit breaker for Bank 2
❹ Display interface
❺ Bank 2 — Eight NEMA 5-20 outlets
❻ NEMA L5-30 plug with a 12-foot power cord

Additional documentation

The Rack PDU *User's Guide* and the Rack PDU *Addendum* are available on the supplied CD

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

Quantity	Item
1	Configuration cable (940-0144)
1	Cord retention tray (with 4 flat-head screws and 16 wire ties)
2	Mounting brackets (with 8 flat-head screws)
4	Rubber feet
1	Switched Rack PDU *Utility* 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 your 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 7, does not apply to Rack PDUs that are part of InfraStruXure systems managed by an InfraStruXure Manager.

How to Install the Rack PDU

Installation guidelines

- For a Rack PDU installed in an enclosed communications rack, the recommended maximum ambient temperature is 45° C (113º F).
- Install the Rack PDU so that it does not reduce the air flow required for safe operation of the equipment.
- Install the Rack PDU so that there is an even mechanical load.
- Follow the nameplate ratings when connecting equipment to the supply circuit. Avoid overloading the circuits, which could affect over-circuit protection and supply wiring.
- Maintain reliable earthing of the Rack PDU, especially supply-connections that do not directly connect to the branch circuit.
- Install the Rack PDU so that the power plug is accessible to be disconnected for service.

Attach the cord retention tray

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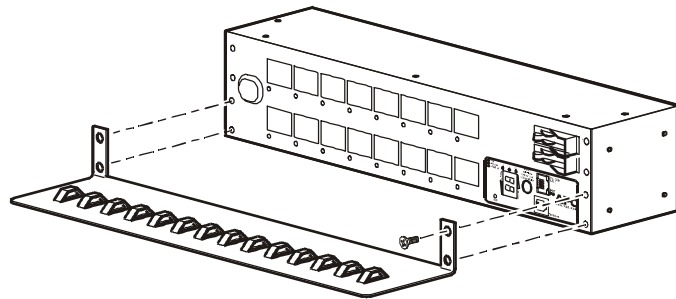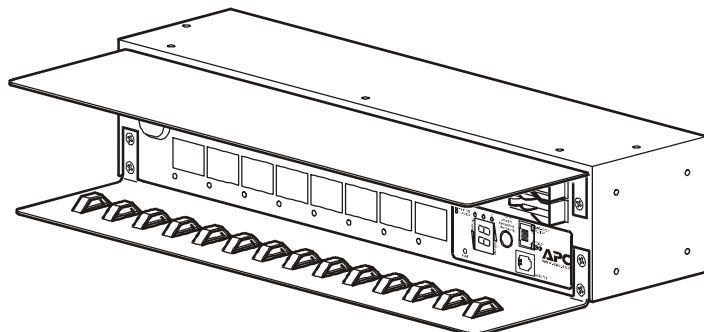

!
Note

Mount an additional cord retention tray to secure cords from the top bank of outlets. Purchase additional tray kits

Additional cord retention tray (optional)

Attach a second cord retention tray to the PDU, with the cord retainers facing down.

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). Cords from both banks of outlets may be secured to the bottom tray, or you may attach an additional tray (shown on the preceding page) to secure cords from the top bank of outlets. Make sure the cords that are attached to the upper tray do not interfere with the operation of the circuit breakers.

> **(!) Note** Each cord must be secured to the tray so that you can unplug it from the Rack PDU without removing the wire tie.
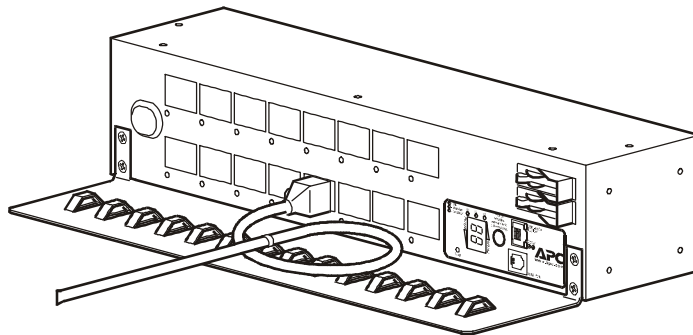
Mounting options

You can install the Rack PDU in one of two ways: flush with the rack, or recessed to allow the use of the cord retention bracket. To mount the Rack Rack PDU horizontally in a NetShelter® or any other standard EIA-310 rack or enclosure:

1. Attach the mounting brackets to the Rack PDU, using the flat-head screws (provided).

> **(!) Note** Some enclosures may require you to recess the Rack PDU so that the back doors of the enclosure will close when other devices are plugged in to the Rack PDU.

For placement flush-to-rack: use four flat-head screws (provided) for each bracket.
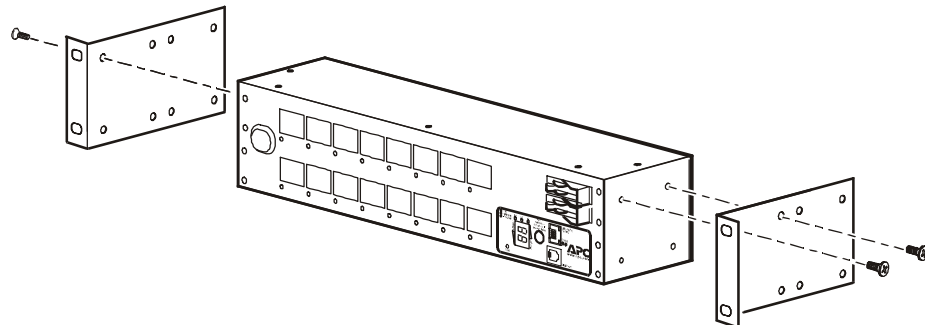
For a recessed placement: use four flat-head screws (provided) through the last four holes of each bracket.
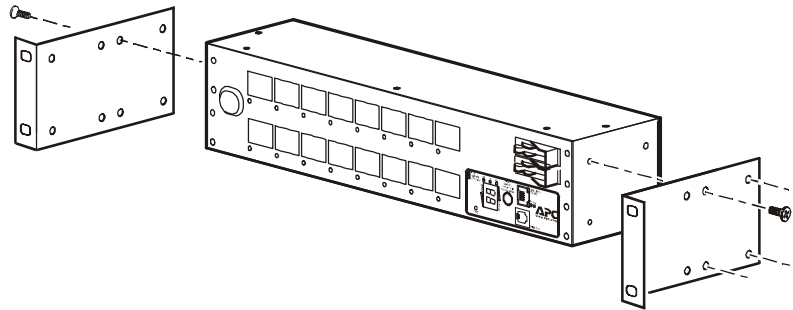
2. Insert caged nuts (provided with the rack) on the vertical mounting rails above a number at the start of two U-spaces in your enclosure and below a number at the lower end of those two U–spaces.
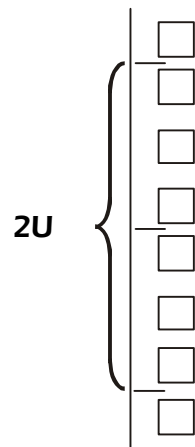
3. Align the mounting holes on the brackets with the caged nuts you installed in step 2, and insert four mounting screws (provided with the rack) to secure the brackets to the enclosure.
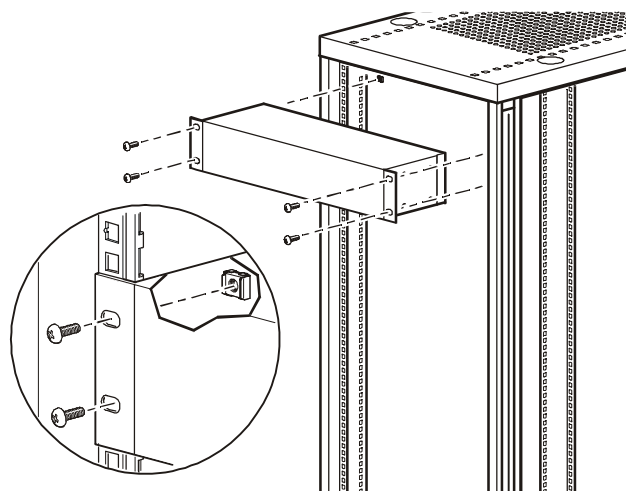
Operation

Display interface

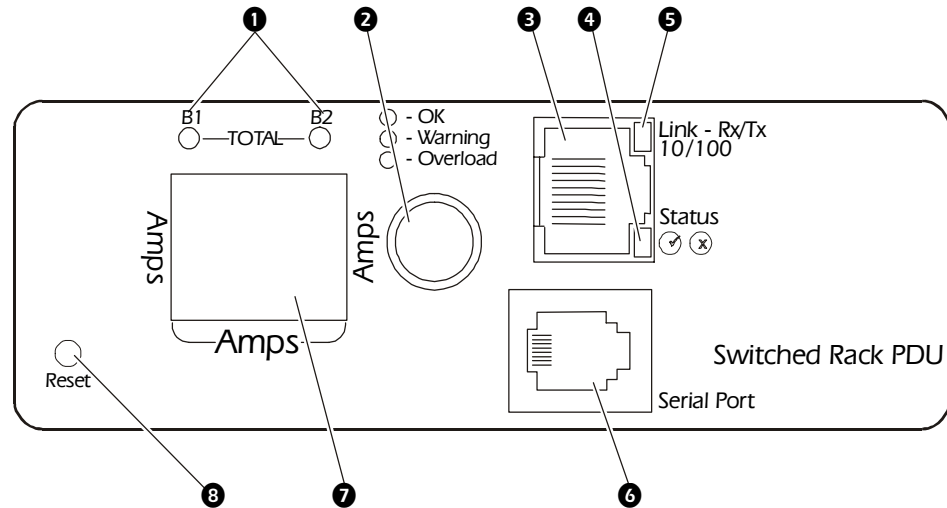|	
❶	Line Indicator LED: Indicates normal (green), warning (yellow), and alarm (red) conditions for bank 1 (B1), bank 2 (B2), or the total of the two banks (both B1 and B2 illuminated).
❷	Control button: • Press and hold for five seconds to view the orientation; hold for an additional five seconds to change the orientation. • Press to change from B1 to B2, B2 to TOTAL, or TOTAL to B1.
❸	Ethernet port: Connects the Rack 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 Rack PDU. • **Off**–The Rack PDU has no power. • **Solid green**–The Rack PDU has valid TCP/IP settings. • **Flashing green**–The Rack PDU does not have valid TCP/IP settings. • **Solid orange**–A hardware failure has been detected in the Rack PDU. Contact Customer Support at a phone number on the back cover of this manual. • **Flashing orange**–The Rack 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	Digital display: Displays the current used by the Rack PDU and attached devices. Shows the aggregate current for the Rack PDU for bank 1 (B1), bank 2 (B2), or the total current of both bank 1 and bank 2 (TOTAL).
❽	Reset switch: Resets the Rack PDU without affecting the outlet status.

Quick Configuration

Warning

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 Rack PDU can operate on a network:
- IP address of the Rack 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 Rack PDU and that is usually running. The Rack 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:
- Management Card Wizard (See " Management Card Wizard" on page 8.)
- BOOTP or DHCP server (See "BOOTP & DHCP configuration" on page 8.)
- Local computer (See "Local access to the control console" on page 11.)
- Networked computer (See "Remote access to the control console" on page 11.)

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

1. Insert the APC Switched Rack PDU *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 Rack 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 Rack PDU through your browser.

| **BOOTP & DHCP configuration** | The **Boot Mode** setting, a **TCP/IP** option in the Rack 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 Rack PDU. If these servers are unavailable, see " Management Card Wizard" on this page, "Local access to the control console" on page 11, or "Remote access to the control console" on page 11 to configure the TCP/IP settings.

With **Boot Mode** set to **DHCP & BOOTP**, the Rack 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 9 or "DHCP" on page 10.

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

> If a BOOTP server is unavailable, see " Management Card Wizard" on page 8, "Local access to the control console" on page 11, or "Remote access to the control console" on page 11 to configure TCP/IP settings.

1. Enter the Rack 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**
>
> The MAC address is on the bottom of the Rack PDU and on the Quality Assurance slip included in the package.

2. When the Rack PDU reboots, the BOOTP server provides it with the TCP/IP settings.
   – If you specified a bootup file name, the Rack PDU attempts to transfer that file from the BOOTP server using TFTP or FTP. The Rack PDU assumes all settings specified in the bootup file.
   – If you did not specify a bootup file name, the Rack 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 11 for configuration instructions.

> **See also**
>
> You must use the 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 Rack PDU.

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

1. The Rack PDU sends a DHCP request that uses the following to identify itself:
   – Vendor Class Identifier (APC by default)
   – Client Identifier (by default, the Rack PDU's MAC address)
   – User Class Identifier (by default, the identification of the Rack PDU's application firmware)

2. A properly configured DHCP server responds with a DHCP offer that includes all of the settings that the Rack PDU needs for network communication. The DHCP offer also includes the Vendor Specific Information option (DHCP option 43). By default, the Rack 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 APC cookie

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

To disable the APC cookie requirement you can use a local computer. See "Local access to the control console" on page 11. 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. See "Remote access to the control console" on page 11.

Local access to the control console

You can use a local computer to connect to the Rack 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 Rack 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 12 to finish the configuration.

Remote access to the control console

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

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

1. Use ARP to define an IP address for the Rack PDU, and use the Rack PDU's MAC address in the ARP command. For example, to define an IP address of 156.205.14.141 for the Rack 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 bottom of the Rack 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 Rack 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 11 or "Remote access to the control console" on page 11:

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 11, reconnect that cable and restart the associated service.

How to Access a Configured Rack PDU

Overview

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

For more information on the interfaces, see the *User's Guide*, located on the supplied CD

See also

Web interface

As your browser, you can use Microsoft® Internet Explorer 5.0 (and higher) or Netscape® 4.0.8 (and higher, except Netscape 6.*x*) to access the Management Card through its Web interface. Other commonly available browsers also may work but have not been fully tested by APC.

To use the Web browser to configure Rack 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 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 Network Management Cards by means of digital certificates.

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

1. Address the Rack 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 Admininistrators.)

See the chapter entitled "Security" in the *User's Guide* for information on choosing and setting up your network security. Use the **Web/SSL/TLS** option of the **Network** menu to enable or disable the HTTP or HTTPS protocols.

See also

Telnet/SSH

You can access the control console through Telnet or Secure SHell (SSH), depending on which is enabled. An Administrator can enable these access methods through the **Telnet/SSH** option of the **Network** menu. 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 Rack 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 Rack 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 Rack PDU. The default read community name is **public**; the default read/write community name is **private**.

Note

If you enable SSL and SSH disable SNMP. Allowing SNMP access compromises the high security environment of SSL and SSH. Administrators can disable SNMP using the **SNMP** option of the **Network** menu.

FTP/SCP

You can use FTP (enabled by default) or Secure CoPy (SCP) to transfer new firmware to the Rack PDU, or to access a copy of the Rack PDU's event logs. SCP provides the higher security of encrypted data transmission and is automatically enabled when you enable SSH.

> **Note**
>
> If you enable SSL and SSH, disable FTP. Allowing file transfers using FTP compromises the high security environment of SSL and SSH. Administrators can disable FTP using the **FTP Server** option of the **Network** menu.

To access the Rack PDU through FTP or SCP, the default user name and password are **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager. In the command line, use the IP address of the unit.

> **See also**
>
> See the Network Management Card *Addendum* to use FTP or SCP to transfer firmware files to the Network Management Card. See the *User's Guide* to use FTP or SCP to retrieve log files from the Network Management Card.

How to Recover From a Lost Password

You can use a local computer, a computer that connects to the Rack 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 smart-signaling cable to the selected port on the computer and to the serial port at the Rack 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 able 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 between red or 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 Download Firmware Updates

See also

For a complete description on how to download a firmware upgrade for your Rack PDU, see the *Addendum* on the provided Switched Rack PDU *Utility* CD.

You can use a local computer that connects to the Rack 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 to connect the selected port to the RJ-12 serial port on the front panel of the Rack 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 Rack 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 Rack PDU will reboot when the download is complete.

Note

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

Specifications

Nominal input voltage	120 V
Acceptable input voltage	± 10% Nominal input voltage
Maximum input current	24 A
Input frequency	47–63 Hz
Cord length	12 ft
Input connectors	NEMA L5-30 plug
Output connectors	Sixteen NEMA 5-20 outlets
Overload protection	20 A

Physical

Size (H × W × D)	3.5 × 17.5 × 4.5 in (88.9 × 444.5 × 114.3 mm)
Weight	9.9 lb (4.49 kg)

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

Compliance

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