Installation and Quick Start

Configurable Rack PDU

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by **Schneider** Electric

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General Information

Product Features

The APC by Schneider Electric Rack Power Distribution Unit (PDU) may be used as a stand-alone, network-manageable power distribution device or up to four devices can be connected together using one network connection. The Rack PDU provides real-time remote monitoring of connected loads. User-defined alarms warn of potential circuit overloads. The Rack PDU provides full control over outlets through remote commands and user interface settings.

Your Rack PDU comes with a terminator installed in the display **In** or **Out** port. In stand-alone operation, one terminator must be installed in the display **In** or **Out** port. To use Network Port Sharing between up to four units, a terminator must be installed in the **In** port at one end of the group and another on the **Out** port at the other end of the group.

You can manage your Rack PDU through its Web User Interface (Web UI), its Command Line Interface (CLI), StruxureWare Data Center Expert®, EcoStruxure IT®, or Simple Network Management Protocol (SNMP).
(**NOTE:** To use the PowerNet MIB with an SNMP browser, see the *PowerNet SNMP Management Information Base (MIB) Reference Guide*, available at **www.apc.com**.) Rack PDUs have these additional features depending on the model:

Feature	M	MBO	MBOw/SW	SW
Device power, peak power, apparent power, power factor and energy monitoring	•	•	•	•
Phase voltage, current, peak current, and power monitoring	•	•	•	•
Bank current and peak current (for models that support breaker banks)	•	•	•	•
Outlet current, energy, and power monitoring		•	•	
Individual outlet power control			•	•
Configurable power On or Off delays			•	•
Configurable alarm thresholds that provide network and visual alarms to help avoid overloaded circuits	•	•	•	•
Various levels of access: Super User, Administrator, Device User, Read-Only, Outlet User (MBOw/SW and SW only), and Network-Only User (These are protected by user name and password requirements)	•	•	•	•
Multiple user login feature which allows up to four users to be logged in simultaneously.	•	•	•	•
Event and data logging. The event log is accessible by Telnet, Secure CoPy (SCP), File Transfer Protocol (FTP), serial connection, or web browser (using HTTPS access with SSL/TLS, or using HTTP access). The data log is accessible by web browser, SCP, or FTP.	•	•	•	•
Email notifications for Rack PDU and Network Management Card (NMC) system events.	•	•	•	•
SNMP traps, Syslog messages, and email notifications based on the severity level or category of the Rack PDU and NMC system event.	•	•	•	•
Security protocols for authentication and encryption.	•	•	•	•
Network Port Sharing (NPS). Up to four Rack PDUs of any model can be connected using the In and Out ports so that only one network connection is necessary.	•	•	•	•
NPS guest firmware auto-update feature allows the NPS host to automatically pass a firmware update to its connected guests. This feature will be functional for all guests that have AOS firmware version 6.1.3 or later.	•	•	•	•
RF Code wireless monitoring support via serial port connection.	•	•	•	•
Cisco EnergyWise certified.	•	•	•	•
Log files can be downloaded by inserting a USB Flash drive into the USB port on the Display Interface of the Rack PDU.	•	•	•	•

Additional Resources

A *Rack PDU User Guide,* specific to each model (Metered, Switched, Metered-by-Outlet with Switching, and Metered-by-Outlet) contains complete operation and configuration information. The User Guide plus additional documentation and downloadable software and firmware is available on the applicable product page on the website, **www.apc.com**. To quickly find a product page, enter the product name or part number in the Search field.

Specification sheets

Specification sheets list electric capabilities, recommendations, physical limits, and safety approvals for individual Rack PDUs models.

User Guide

The *User Guide* contains additional information about the following topics related to the Rack PDU firmware:

- Management interfaces
- User accounts
- Customizing setup
- Security

Security Handbook

The *Security Handbook* explains different security settings for the Rack PDU in depth.

Receiving Inspection

Inspect the package and contents for shipping damage, and make sure that all parts were sent. Report any shipping damage immediately to the shipping agent. Report missing contents, damage, or other problems immediately to APC by Schneider Electric Customer Service at **www.apc.com** or your APC by Schneider Electric reseller.

Please Recycle

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

User Comments

We welcome your comments about this document. Contact **www.apc.com/support** to share your experience.

Safety

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

Important Safety Information

⚠ ⚠ DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH • No user-serviceable parts inside. Refer servicing to qualified personnel. • Use indoors only in a dry location. **Failure to follow these instructions will result in death or serious injury.**

NOTICE
The Rack PDU does not provide power surge protection. Plugging the unit directly into any unprotected power source, such as a wall outlet, is not recommended.

Installation

Installation and Configuration

NOTE: Before using the Rack PDU, read and follow all safety information in the *Rack Power Distribution Unit Safety Information* document, included with your device.

The terminator

Your Rack PDU comes with a terminator installed in the display In or Out port. This is required for stand-alone operation if you have a Metered-by-Outlet unit.

If you are utilizing the Network Port Sharing functionality, you will need a terminator in the first and last Rack PDU in the group.

See the *User Guide* for your particular Rack PDU at **www.apc.com** for more instructions.
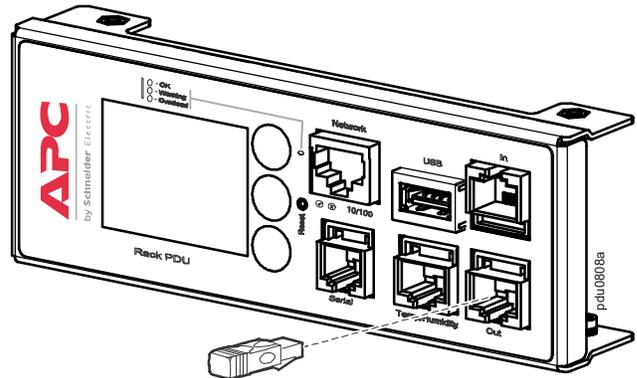
Mounting the Rack PDU in a vertical 0 U accessory channel of a NetShelter® SX rack

In one vertical 0 U accessory channel, you can mount two full-length Rack PDUs using the toolless mounting pegs on the back of the Rack PDU.
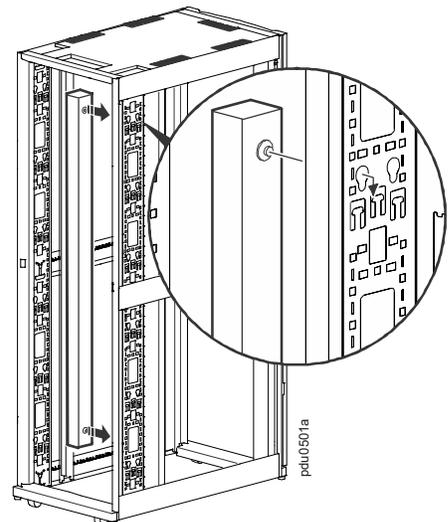
Mounting the Rack PDU on the vertical rails of a standard EIA-310 rack

Secure brackets to the back of the rear vertical rails using hardware included with your enclosure. The location depends on the length of your Rack PDU. Cage nuts are required to properly secure the brackets. See "Cage Nuts" on page 11 for cage nut installation instructions.
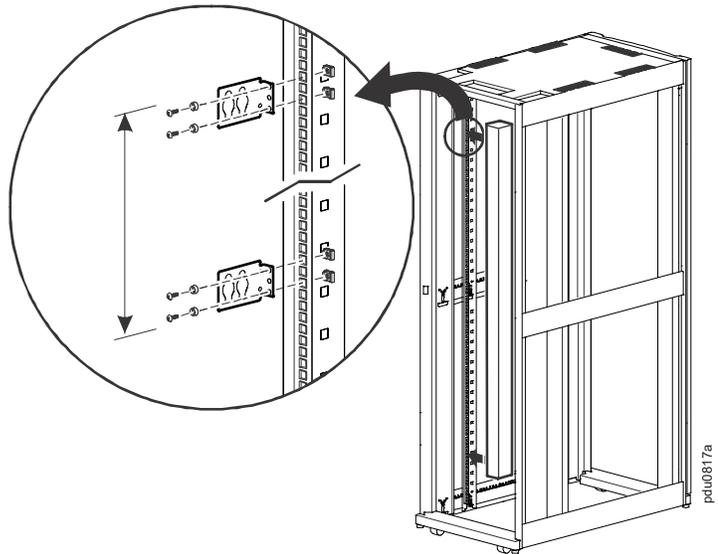
Mounting the Rack PDU in a third-party rack

Secure brackets to the vertical rails using hardware included with your rack. The location of the brackets depends on the distance between the mounting pegs on your Rack PDU.
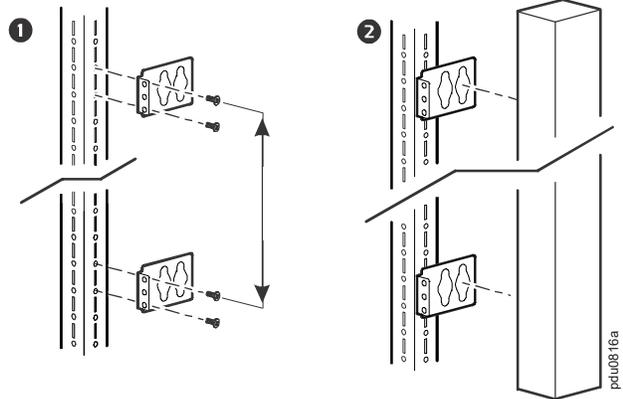
Configuring network settings and accessing the Rack PDU

The Rack PDU is DHCP compatible. Connect the network cable to the network port (❹) and then apply power to the unit. When the status LED (❸) for the network connection is solid green, perform the following to display the IP address.

If your network does not use a DHCP server, see the *User Guide* for your Rack PDU (available at the APC by Schneider Electric website, **www.apc.com**) for details on other methods for configuring the TCP/IP settings.

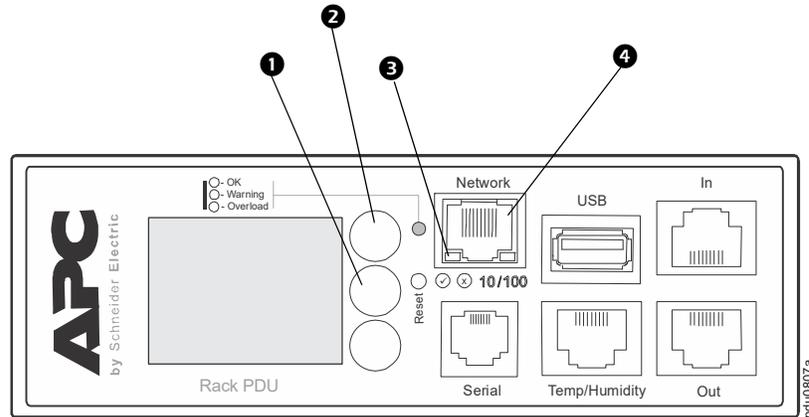1. Press the SCROLL button (❷) until Network is selected.
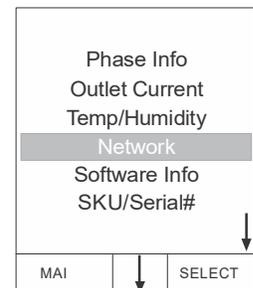
2. Press the SELECT button (❶). The IPv4 address appears. [Press the SCROLL button (❷) again to display the IPv6 address.]

3. To access the Rack PDU Web UI, enter `https://your_IP_address` in the address field of a Web browser on your computer or other Internet connected device. You will be prompted for a user name and password; enter the default **apc** for each, then change the password when prompted.
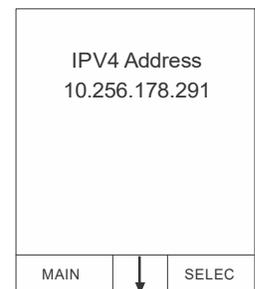
    NOTE: You may receive a message that the Web page is not secure. This is normal, and you can continue to the Web UI. The warning is generated because your Web browser does not recognize the default certificate used for encryption over HTTPS. However, information transmitted over HTTPS is still encrypted. See the *Security Handbook* on **www.apc.com** for more details on HTTPS and instructions to resolve the warning.

Front Panel Overview
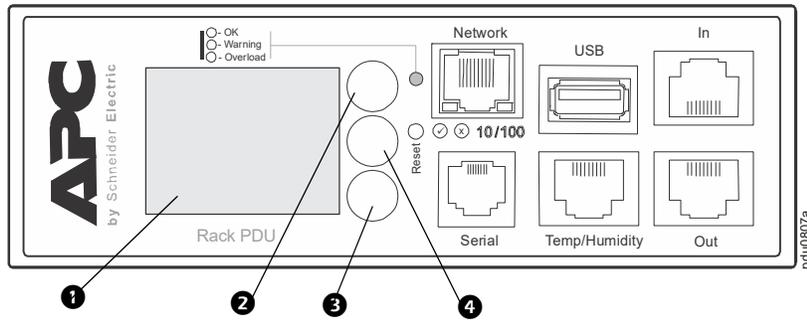
NOTE: Your Rack PDU is configured so the display backlight turns off after 10 minutes of inactivity. Press any display navigation button to illuminate the backlight.

Item		Function
❶	Display	Shows information about the Rack PDU. In normal operation, input voltage, current, and power refreshes every five seconds. To reverse the text, select Display settings, scroll to LCD Orientation and press Select.
❷	Select button	With a menu item highlighted, press the Select button to display Rack PDU information. (Network information is shown at right.)
❸	Main Menu button	Press to view the Rack PDU electrical input.
❹	Scroll button	Press once to display the menu. Press additional times to move the highlight bar down the menu list until you reach the desired item.
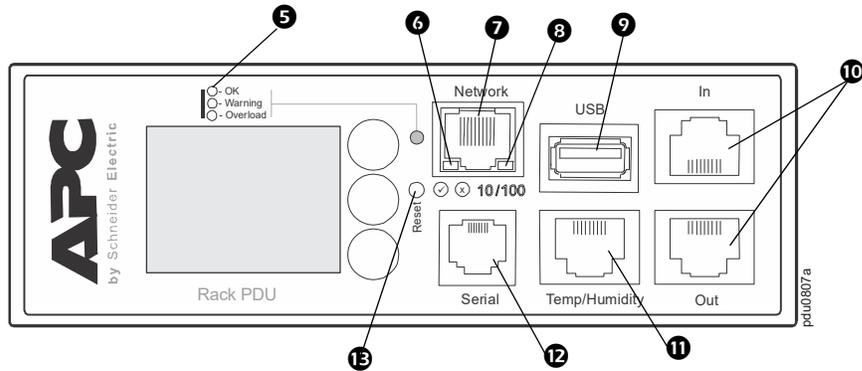
Item		Function
❺	Load Indicator LEDs	Indicates the status of the Rack PDU load and alarm levels.
❻	Network status LED	Indicates the network connection type and condition.
❼	10/100 Base-T Connector	Connects the Rack PDU to the network using a network cable.
❽	10/100 LED	Indicates the network is receiving/transmitting data and at what speed.
❾	USB port	For use with a flash drive for firmware upgrades - 5V @ 100ma. Can also be used to download log files to a flash drive.
❿	In and Out ports	For use with the Network Port Sharing feature.
⓫	Temp/Humidity port	Port for connecting an optional APC by Schneider Electric Temperature Sensor (AP9335T) or an optional APC by Schneider Electric Temperature/Humidity Sensor (AP9335TH).
⓬	RJ-12 Serial Port	Port for connecting the Rack PDU to a terminal emulator program for local access to the CLI. Use the supplied serial cable (APC by Schneider Electric part number 940-0144A).
⓭	Reset button	Resets the management interface without affecting the outlet status.

Network Status LED

Condition	Description
Off	One of the following situations exists: • The Rack PDU is not receiving input power. • The Rack PDU is not operating properly. It may need to be repaired or replaced. Contact Customer Support.
Solid Green	The Rack PDU has valid TCP/IP settings.
Solid Orange	A hardware failure has been detected in the Rack PDU. Contact Customer Support.
Flashing Green	The Rack PDU does not have valid TCP/IP settings.
Flashing Orange	The Rack PDU is making BOOTP requests.
Alternately flashing green and orange	If the LED is flashing slowly, the Rack PDU is making DHCP[2] requests[1]. If the LED is flashing rapidly, the Rack PDU is starting up.
1. If you do not use a BOOTP or DHCP server, see "DHCP and BOOTP configuration" on page 13 for more information on how to configure the TCP/IP settings of the Rack PDU. 2. To use a DHCP server, download the User Guide for complete instructions.	

10/100 LED

Condition	Description
Off	One or more of the following situations exists: • The Rack PDU is not receiving input power. • The cable that connects the Rack PDU to the network is disconnected or defective • The device that connects the Rack PDU to the network is turned off. • The Rack PDU itself is not operating properly. It may need to be repaired or replaced. Contact Customer Support.
Solid Green	The Rack PDU is connected to a network operating at 10 Megabits per second (Mbps).
Solid Orange	The Rack PDU is connected to a network operating at 100 Mbps.
Flashing Green	The Rack PDU is receiving or transmitting data packets at 10 Mbps.
Flashing Orange	The Rack PDU is receiving or transmitting data packets at 100 Mbps.

Load indicator LED

The load indicator LED identifies overload and warning conditions for the Rack PDU.

Condition	Description
Solid Green	OK. No near-overload (warning) or overload (critical) alarms are present.
Solid Yellow	Warning. At least one near-overload (warning) alarm is present, but no overload (critical) alarms are present.
Flashing Red	Overload. At least one overload (critical) alarm is present.

Cage Nuts

APC by Schneider Electric offers a cage nut hardware kit (AR8100) for use with square holes.

Cage nuts are also included with NetShelter racks.

Installation

> ⚠ **CAUTION**
>
> **FALLING EQUIPMENT HAZARD**
>
> Do not install cage nuts vertically with the ears engaging the top and bottom of the square hole.
> **Failure to follow these instructions can result in injury or equipment damage.**

1. Install the cage nuts on the interior of the vertical mounting flange. Install cage nuts horizontally, with the ears engaging the sides of the square hole. Insert the cage nut into the square hole by hooking one ear of the cage nut assembly through the far side of the hole.
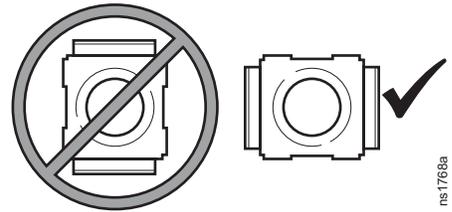
2. Place the cage nut tool on the other side of the cage nut and pull to snap it into position.
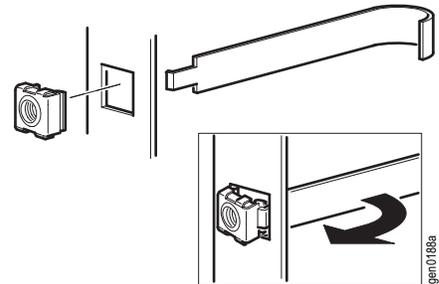
Removal

1. Remove any attached screw.
2. Grasp the cage nut and squeeze the sides to release it from the square hole.

Quick Configuration

NOTE: Disregard the procedures in this section if you have APC by Schneider Electric StruxureWare as part of your system. See the StruxureWare documentation available on **www.apc.com** for more information.

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 (See the *User Guide* on **www.apc.com** for more information about the watchdog role of the 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 is usually running. The Rack PDU uses the default gateway to test the network when traffic is very light.

NOTE: Do not use the IPv4 or IPv6 loopback address (127.0.0.1 or 0:0:0:0:0:0:0:1) as the default gateway address. It disables the network connection of the Rack PDU and requires you to reset TCP/IP settings to their defaults using a local serial login.

TCP/IP Configuration Methods

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

- APC by Schneider Electric Device IP Configuration Wizard (See Device IP Configuration Wizard on this page).
- BOOTP or DHCP server (See "DHCP and BOOTP configuration" on page 13).
- Local computer (See "Local access to the Command Line Interface (CLI)" on page 14).
- Networked computer (See "Remote access to the CLI" on page 14).

Device IP Configuration Wizard

The Device IP Configuration Wizard runs on Microsoft Windows 2000®, Windows Server 2003®, Windows Server 2012®, and on 32- and 64-bit versions of Windows XP®, Windows Vista®, Windows 2008®, Windows 7®, Windows 8®, and Windows 10® operating systems. The Device IP Configuration Wizard supports cards that have firmware v3.0.x or higher and is for **IPv4 only**. (To configure one or more Rack PDUs by exporting configuration settings from a configured Rack PDU, see the *User Guide* on **www.apc.com**.)

NOTE: Most software firewalls must be temporarily disabled for the Wizard to discover unconfigured Rack PDUs.

To install the Device IP Configuration Wizard:

1. Go to **www.apc.com/tools/download**.
2. Select your country.
3. In the **Filter By Software/Firmware** drop-down menu, select **Software Upgrades - Wizards and Configurators**.
4. Download the latest version of the Device IP Configuration Wizard and run the executable file.
5. Click **Device IP Configuration Utility** and follow the configuration prompts.

   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. You will be prompted to change the password on first use.

DHCP and BOOTP configuration

In the Web UI, the **TCP/IP** options are defined under the **Configuration** tab, in the **Network** menu. The possible settings are **Manual**, **BOOTP**, and **DHCP** (the default setting). The default TCP/IP configuration setting, **DHCP**, assumes that a properly configured DHCP server is available to provide TCP/IP settings to the Rack PDU. You can also configure the setting for BOOTP. A user configuration (INI) file can function as a BOOTP or DHCP boot file.

NOTE: If no servers are available, see "Device IP Configuration Wizard" on page 12, "Local access to the Command Line Interface (CLI)" on page 14, or "Remote access to the CLI" on page 14 to configure the TCP/IP settings.

BOOTP: For the Rack PDU to use a BOOTP server to configure its TCP/IP settings, it must find a properly configured RFC951-compliant BOOTP server.

1. In the BOOTPTAB file of the BOOTP server, enter the Rack PDU's MAC address, IP address, subnet mask, and default gateway, and, optionally, a bootup file name. Look for the MAC address on the bottom of the Rack PDU.

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, you can configure the other settings of the Rack PDU remotely through its Web UI (see "Web UI" on page 19) or CLI (see "Remote access to the CLI" on page 14) The default user name and password are **apc** for both interfaces. You will be instructed to change the password after your initial login. To create a bootup file, see your BOOTP server documentation.

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

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

   – A Vendor Class Identifier (APC by default)

   – A Client Identifier (by default, the MAC address of the Rack PDU)

   – A User Class Identifier (by default, the identification of the application firmware installed on the Rack PDU)

   – A Host Name (by default, apcXXYYZZ with XXYYZZ being the last six digits of the PDU serial number). This is known as DHCP Option 12.

2. A properly configured DHCP server responds with a DHCP offer that includes all the settings that the Rack PDU needs for network communication. The DHCP offer also includes the Vendor Specific Information option (DHCP option 43). The Rack PDU can be configured to ignore DHCP offers that do not encapsulate the APC cookie in DHCP option 43 using the following hexadecimal format. (The Rack PDU does not require this cookie by default.)

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

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

   NOTE: By selecting **Require vendor specific cookie to accept DHCP Address** in the Web UI, you can require the DHCP server to provide an "APC" cookie, which supplies information to the Rack PDU.

This section summarizes the Rack PDU's communication with a DHCP server. For more detail about how a DHCP server can configure the network settings for a Rack PDU, see the *User Guide* on **www.apc.com**.

Local access to the Command Line Interface (CLI)

You can use a local computer to connect to the PDU and access the CLI.

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

2. Connect the serial cable (Schneider Electric part number 940-0144A) from the selected serial port on the computer to the **Serial** port on the Rack PDU.

3. Run a terminal program (e.g., Tera Term or HyperTerminal) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.

4. Press ENTER. It may take multiple (up to three) attempts to get a prompt to appear.

5. Use **apc** (the default) for the user name and password.
   NOTE: You will be prompted to change the password on first use.

6. See "Configure TCP/IP settings in the CLI" on page 15 to finish the configuration.

Remote access to the CLI

From any computer on the same network as the Rack PDU, you can use ARP and Ping to assign an IP address to the Rack PDU and then use SSH to access the CLI of that Rack PDU and configure the other TCP/IP settings.

NOTE: After the IP address of the Rack PDU is configured, you can access the Rack PDU using Telnet or SSH, without first using ARP and Ping. You must enable Telnet before using it, so SSH is required for initial CLI configuration.

1. Use ARP to define an IP address for the Rack PDU and use the MAC address of the Rack PDU in the ARP command. For example, to define an IP address of 156.205.14.141 for a 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 can be found on the bottom of the PDU.

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 SSH to access the Rack PDU at its newly assigned IP address. For example:
   ```
   ssh apc@156.205.14.141 -c aes256-cbc
   ```
   where `-c indicates` the cipher (`aes256-cbc` or `3des-cbc`).

   NOTE: For more information, see "SSH for high-security access" on page 15.

4. Use **apc** for both user name and password. You will be prompted to change the password after initial log on.

See "Configure TCP/IP settings in the CLI" on page 15 to finish the configuration.

Configure TCP/IP settings in the CLI

1. Log on to the CLI. See "Local access to the Command Line Interface (CLI)" on page 14 or "Remote access to the CLI" on page 14.

2. Contact your network administrator to obtain the IP address (if needed), subnet mask, and default gateway for the Rack PDU.

3. Use these three commands to configure network settings. (Text in italics indicates a variable.)

   ```
   tcpip -i yourIPaddress
   
   tcpip -s yourSubnetMask
   
   tcpip -g yourDefaultGateway
   ```

   For each variable, type a numeric value that has the format *xxx.xxx.xxx.xxx*.
   For example, to set a system IP address of 156.205.14.141, type the following command and press ENTER:

   ```
   tcpip -i 156.205.14.141
   ```

4. Type `exit`, and then press ENTER. The Rack PDU restarts to apply the changes.

SSH for high-security access

If you use the high security of SSL/TLS for the Web UI, use SSH for access to the CLI. SSH encrypts user names, passwords, and transmitted data. The interface, user accounts, and user access rights are the same whether you access the CLI through SSH or Telnet, but to use SSH, you must first configure SSH and have an SSH client program installed on your computer.

Network Port Sharing (NPS)

About the Network Port Sharing Feature

You can use the Network Port Sharing feature to view the status of and configure and manage up to four Rack PDUs using only one network connection. This is made possible by connecting the Rack PDUs via the In and Out ports on the Rack PDU front panel.

NOTE: All Rack PDUs in the group must be using the same Rack PDU firmware revision, 5.1.5 or later (excluding v6.0.5 EnergyWise), in order to support the Network Port Sharing Feature.

Display ID

The display ID is a number, 1 to 4, used to uniquely identify the Rack PDUs in a group. After two or more Rack PDUs are connected to one another in an NPS group, they can be identified on the various interfaces by the use of this "Display ID". This Display ID is viewable in the top left corner of the display.

Installation Instructions

Connect up to four Rack PDUs via the In and Out ports on the Rack PDU. Insert an RJ45 terminator (included) in the unused In/Out ports on each end of the chain.

NOTE: Failure to use terminators may cause a loss of communication on the Rack PDUs.

NOTE: To reduce the possibility of communication issues, the maximum total length of cabling connecting Rack PDUs in a group should not exceed 10 meters. All Rack PDUs in an NPS group should reside in the same rack enclosure.

Connect the "Network" port of one of the grouped Rack PDUs to a network hub or switch. This unit will be the Host for the Rack PDU group. Guest PDU data will be viewable on the Host PDU. Set up network functionality for this Host Rack PDU as specified in "TCP/IP Configuration Methods" on page 12. The Host will automatically discover any Guest PDUs connected via In/Out ports. The Rack PDU group is now available via the Host's IP address.

NOTE: Only one Rack PDU in an NPS group is allowed to be the host. If two host Rack PDUs are connected together, one will automatically be chosen to be the single host for the NPS group. The user also has the option to select a particular guest to be the host as long as that guest has an active network link.

The host Rack PDU supports many features that are not supported by NPS guests. These include, but are not limited to:
- SNMP rPDU2 Group OIDs
- EnergyWise support
- Initiating AOS/APP firmware updates for Guest Rack PDUs
- Time synchronization for Guest Rack PDUs
- Data logging for the Guest Rack PDUs

RF Tag

The Configurable Rack PDU supports the RF Code sensor tag for APC by Schneider Electric Rack PDUs. The tag enables data center managers to wirelessly monitor power consumption and utilization with the enterprise-class Asset RF Code Zone Manager. The Zone Manager middleware consumes information about power attribute values as reported by the Rack PDU. The RF Code sensor tag for APC by Schneider Electric works in concert with the Configurable Rack PDUs with firmware v6.1.0 or later. To implement an RF Code sensor tag solution, plug the tag into the RJ-12 socket labeled Serial Port. Scroll the LCD menu to highlight the RF Code Control entry, press the **Select** button. Press the **Select** button again to enable. The Rack PDU will immediately reboot and start serial communication with the tag. When an NPS guest RF tag is removed, the NPS host will signal an alarm. In order to clear this alarm, one must replace the tag and disable the tag in the LCD menu. Then the error will be cleared and the NPS guest will auto reboot.

The RF Tag reports per-phase load voltage/amperage/power readings every 10 minutes and device power/energy use, per-outlet watt-hour/switch state/RMS current, and phase outlet voltages/bank overload state readings every hour. Outlet and bank readings are Rack PDU model dependent as all models do not support monitoring. The complete RF solution requires an RF Code reader, an RF Code Zone Manager, or RF Code Asset Manager. For more information see: **www.rfcode.com**.

EnergyWise

The Configurable Rack PDU has the capability of becoming a Cisco EnergyWise Entity. This entity reports power usage and alarms in the EnergyWise Domain.

To exercise this capability, plug the Rack PDU network port into a Cisco switch/router that supports the EnergyWise Domain. Log into the Web UI of the Rack PDU and navigate to the **Configuration**/**RPDU**/**EnergyWise** Web page. Click on the enable radio button to initiate the task. The task will generate unique parent and children names, default roles, keywords and importance values that comply with EnergyWise requirements. Customization of the aforementioned is supported by clicking on any of the underlined entities to navigate to a configuration Web page.

The EnergyWise port, domain name and shared secret may also be modified, but must be coordinated with the same parameters in the Cisco gear.

The Configurable Rack PDU implementation supports a single parent, multiple children hierarchy. The parent may exist as a standalone Rack PDU or as the host Rack PDU for an NPS chain of Rack PDUs. The parent usage reports the power consumed by the Rack PDUs themselves, including any NPS guest Rack PDUs. The children report either inlet power or, in the case of monitored outlets, the power consumed at the outlet. Both parent and children report a usage level (0-10 scale). The parent and inlet usage are always reported as 10 or "On". In the case of switched outlets the actual state of the switch is reported and may also be altered by the Cisco device.

When the parent is the host Rack PDU of an NPS chain, the reported parent power is the sum of the parent and each of the NPS guests. The parent also reports an inlet entity for itself and for each guest as well as an outlet entity for each host outlet and each outlet of every guest.

The remaining configurable items are string variables that may be modified as needed and are retained across power cycles or reboots.

EnergyWise and NPS

Configurable Rack PDUs support Cisco EnergyWise with Rack PDU v6.1.0 firmware or later. The Rack PDU EnergyWise application generates a family tree at startup. This tree is reported to Cisco hardware during the discovery process.

For an initial installation, either establish the NPS chain and enable EnergyWise on the host or enable EnergyWise on the host and then disable and re-enable EnergyWise after the NPS communication is established. Clearly, the first option is simpler.

For Rack PDU replacement, the following procedure should be followed. Power down the Rack PDU – any children associated with this Rack PDU will report EW levels and usage as zero. On the **Status/ Rack PDU/Group** Web page, there should be a check box to allow the user to remove the now non-functioning Rack PDU from the NPS chain. Once removed from the chain, any children associated with that Rack PDU will report ".0." in the display identifier portion of the EW name field. At this time, one can replace the Rack PDU with another of the same model and expect the EnergyWise to function properly again once communication is established. If for some reason the replacement model is different, EnergyWise will have to be disabled and re-enabled after NPS communication is established to update the family tree and the order of data reported. For more information see: **www.cisco.com/en/us/ products/ps10195/index.html**.

How to Access the Rack PDU Interfaces

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 Guide* at **www.apc.com**.

Web UI

To access the Web UI on Windows operating systems, use Microsoft Internet Explorer® (IE) 8.x or higher (with compatibility view turned on), or the latest release of Microsoft Edge®.

To access the Web UI on any operating system, use the latest releases of Mozilla Firefox®, or Google Chrome®. Other commonly available browsers may work but have not been fully tested.

The PDU cannot work with a proxy server. Before accessing the Web UI of the PDU, do one of the following:

- Configure the browser to disable the use of a proxy server for your PDU.
- Configure the proxy server so that it does not proxy the specific IP address of your PDU.

To use the Web browser to configure Rack PDU options or to view the event and data logs, you can use either of the following protocols:

- The HTTP protocol (disabled by default), which provides authentication by user name and password but no encryption.
- The HTTPS protocol (enabled by default), which provides extra security through Secure Sockets Layer (SSL) and encrypts user names, passwords, and data being transmitted. It also provides authentication of Rack PDUs by means of digital certificates.

To access the Web UI and configure the security of your unit on the network:

1. Type the IP address (or DNS name if configured) into your Web browser's address bar.

   You may receive a message that the Web page is not secure. This is normal, and you can continue to the Web UI. The warning is generated because your Web browser does not recognize the default certificate used for encryption over HTTPS. However, information transmitted over HTTPS is still encrypted. See the *Security Handbook* on **www.apc.com** for more details on HTTPS and instructions to resolve the warning.

2. Enter the user name and password (by default, **apc** and **apc** for the Super User).

   NOTE: You will be prompted to change the password on first use.

3. Select and configure the type of security you want by selecting the **Configuration** tab, and then the **Security** or **Network** menu from the top menu bar (This option is only available for Administrators and Super Users).

   See the *Security Handbook* or *User Guide* available at **www.apc.com**, for more information on selecting and configuring network security.

Command Line Interface: Telnet and SSH

To access the CLI, you can use either a local (serial) connection or a remote (Telnet or SSHv2, depending on which is enabled) connection with a computer on the same network as the Rack PDU. A Super User or Administrator can enable these access methods.

Telnet for basic access

Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption. Telnet is disabled by default.

To use Telnet to access the Rack PDU from any computer on the same network:

1. At a command prompt, use the following command line, and then press ENTER until the **User Name** prompt appears (You may have to press ENTER up to 3 times.):

   ```
   telnet address
   ```

   NOTE: For *address*, use the Rack PDU IP address (or DNS name if configured).

2. Enter the user name and password (by default, **apc** and **apc** for the Super User).

   NOTE: You will be prompted to change the password on first use.

SSH for high-security access

If you use the high security of SSL for the Web UI, use Secure SHell (SSH) to access the CLI. SSH encrypts user names, passwords, and transmitted data. The interface, user accounts, and user access rights are the same whether you access the CLI through SSH or Telnet, but to use SSH, you must first configure SSH and have an SSH client program installed on your computer. SSH is enabled by default.

See the *Security Handbook* or the *User Guide* on **www.apc.com** for more information on configuring and using SSH.

SNMP

SNMP is disabled by default. To enable or disable SNMP access, you must be an Administrator or Super User. In the Web UI, click **Configuration**, click **Network**, click either **SNMPv1** or **SNMPv3**, and then click **Access**.

All user names, passwords, and community names for SNMPv1 are transferred over the network as plain text. If your network requires the high security of encryption, disable SNMPv1 access and use SNMPv3 instead.

To use StruxureWare or EcoStruxure IT to manage the Rack PDU, you must have SNMPv1 or SNMPv3 enabled in the unit interface. For SNMPv1, read access allows StruxureWare devices to receive traps from the Rack PDU. Write access is required while you set the StruxureWare device as a trap receiver.

SNMPv1 only

After you add the PowerNet® MIB to a standard SNMP MIB browser, you can use that browser for SNMP access to the Rack PDU.

SNMPv3

NOTE: To use SNMPv3, you must have an MIB program that supports SNMPv3.

For SNMP GETs, SETs, and the trap receivers, SNMPv3 uses a system of user profiles to identify users. An SNMPv3 user must have a user profile assigned in the MIB software program to perform GETs and SETs, browse the MIB, and receive traps.

FTP and SCP

You can use FTP (disabled by default) or Secure CoPy (SCP) to transfer downloaded firmware to the PDU, or to access a copy of the event or data logs of the PDU. See the *User Guide* on the website, **www.apc.com**, for details.

To enable or disable **FTP Server** access, you must be an Administrator. In the Web UI, click **Configuration**, click **Network**, and then click **FTP server**.

NOTE: FTP transfers files without encryption. For higher security, disable the FTP server, and transfer files with SCP. Selecting and configuring Secure SHell (SSH) enables SCP automatically. However, SCP will not allow a file transfer until the Super User default password (**apc**) is changed.

NOTE: You can use FTP or SCP to configure and update the PDU with StruxureWare Data Center Expert as long as the same protocol is enabled on both the PDU and StruxureWare. See your StruxureWare Data Center Expert documentation for details.

Manage the Security of Your System

For detailed information on enhancing the security of your system after installation and initial configuration, see the *Security Handbook*, available on the APC by Schneider Electric website, **www.apc.com**.

Recovering from a Lost Password

You can use a local computer (a computer that connects to the Rack PDU through the serial port) to access the CLI to reset the user name and password:

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

2. Connect the serial communication cable (APC by Schneider Electric part number 940-0144A) to the selected port on the computer and to the Serial port on the Rack PDU.

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

4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. (You may need to press ENTER up to 3 times.) 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 on the PDU. The Status LED will flash alternately orange and green within 5 to 7 seconds of pressing the **Reset** button. When the LED begins flashing, immediately press the **Reset** button a second time to temporarily reset the user name and password to their defaults.

6. Press ENTER, repeatedly if necessary, to display the **User Name** prompt again, then use the default user name and password, **apc**. (If you take longer than 30 seconds to log on after the User Name prompt is re-displayed, you must repeat step 5 and log on again.)

7. At the CLI, use the following commands to change the password from **apc** to a value of your choice:

   ```
   user -n <user name> -pw <user password>
   ```

   For example, to change the **Super User** password to **XYZ** type:

   ```
   user -n apc -cp apc -pw XYZ
   ```

8. Type `quit` or `exit,` and then press ENTER to log off.

9. Reconnect any serial cable you disconnected, and restart any service you disabled.

Two-Year Factory Warranty

This warranty applies only to the products you purchase for your use in accordance with this manual.

Terms of Warranty

APC by Schneider Electric warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. APC by Schneider Electric will repair or replace defective products covered by this warranty. 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. Repair or replacement of a defective product or part thereof does not extend the original warranty period. Any parts furnished under this warranty may be new or factory-remanufactured.

Non-transferable Warranty

This warranty extends only to the original purchaser who must have properly registered the product. The product may be registered at the APC by Schneider Electric website, **www.apc.com**.

Exclusions

APC by Schneider Electric shall not be liable under the warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by end user's or any third person's misuse, negligence, improper installation or testing. Further, APC by Schneider Electric shall not be liable under the warranty for unauthorized attempts to repair or modify wrong or inadequate electrical voltage or connection, inappropriate on-site operation conditions, corrosive atmosphere, repair, installation, exposure to the elements, Acts of God, fire, theft, or installation contrary to APC by Schneider Electric recommendations or specifications or in any event if the APC by Schneider Electric serial number has been altered, defaced, or removed, or any other cause beyond the range of the intended use.

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Warranty Claims

Customers with warranty claims issues may access the APC by Schneider Electric customer support network through the Support page of the APC by Schneider Electric website, **www.apc.com/support**. Select your country from the country selection pull-down menu at the top of the Web page. Select the Support tab to obtain contact information for customer support in your region.

Life-support Policy

General policy

APC by Schneider Electric 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 by Schneider Electric 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 by Schneider Electric will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to APC by Schneider Electric that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of APC by Schneider Electric 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 by Schneider Electric UPS systems. APC by Schneider Electric does not claim that units with these modifications are certified or listed as hospital-grade by APC by Schneider Electric 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 users authority to operate this equipment.

USA.FCC

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.

Canada.ICES

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.

Japan.VCCI

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準 に基づくクラス A 情報技術装置 です。この装置を家庭環境で使用すると、電波 妨害を引き起こすことがあります。この場合には、使用 者が適切な対策を講ず るように要求されることがあります。

Australia and New Zealand

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Union

This product is in conformity with Electromagnetic Compatibility (EMC) requirements set forth by the EU directive 2014/30/EU of the European parliament and of the council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 32/EN 55032:2015 for Emissions and EN 55024:2010+A1:2015 for Immunities.

Attention: This is a Class A product. In a domestic/residential environment this product may cause radio interference in which the user may be required to take adequate measures

Worldwide Customer Support

Customer support for this or any other product is available at **www.apc.com**