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Introduction

Product Description

Features of the PDU

The APC® Switched Rack Power Distribution Unit (PDU) is a stand-alone, network-manageable device that allows programmable control of eight, sixteen, or twenty-four power outlets (depending on the model).

You can control a PDU remotely through its Web, control console (serial or telnet), or SNMP interfaces.

PDU's have these additional features:

- Independent outlet control
- Power sequencing
- 24 independent Outlet User accounts
- Three levels of user access accounts:
 - Administrator
 - Device Manager
 - Outlet User
- Event Log accessible by Telnet, FTP, serial connection, or a Web browser
- E-mail notifications for PDU events and system events
- SNMP traps and e-mail notifications based on the severity level of PDU and system events
- Basic and MD5 authentication for password security



Note

The PDU does not provide power protection. Therefore, APC does not recommend plugging a unit directly into any unprotected power source, such as a wall outlet.

Initial setup

You must define three TCP/IP settings for the Switched Rack PDU before it can operate on the network.

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



To configure the TCP/IP settings, see the Switched Rack PDU *Installation and Quick Start Manual*, provided in PDF on the APC Switched Rack Power Distribution Unit *Utility* CD and in printed form.

Access Procedures

Overview

The PDU has two internal interfaces (control console and Web interface) which provide menus with options that allow you to manage the PDU. The SNMP interface also allows you to use an SNMP browser with the PowerNet® Management Information Base (MIB) to manage the PDU.



For more information about the internal user interfaces, see **Control Console** and **Web Interface**. To use the PowerNet MIB with an SNMP browser, see the *PowerNet® SNMP Management Information Base (MIB) Reference Guide* (\doc\mibgde.pdf), which is provided on the APC Switched Rack Power Distribution Unit *Utility* CD.

Access priority for logging on

Only one user at a time can log on to the PDU to use its internal user interface features. The priority for access is as follows:

- Local access to the control console from a computer with a direct serial connection to the PDU always has the highest priority.
- Telnet access to the control console from a remote computer has priority over Web access.
- Web access has the lowest priority.

Types of user accounts

The PDU has three levels of access (Administrator, Device Manager, and Outlet user), all of which are protected by password and user name requirements.

- An Administrator can use all of the management menus available in the control console and the Web interface. The Administrator's default user name and password are both **apc**.
- A Device Manager can use only the following menus (the default user name is **device** and the password is **apc**):
 - the **Device Manager** menu and its sub-menus in the control console, and all menus in the top section of the navigation panel of the Web Interface (**Switched Rack PDU** and **Outlets**)
 - the **Log** option in the **Events** menu in the Web interface (A Device Manager can also access the event log in the control console by pressing CTRL-L.)
- An Outlet User can access only the following menus:
 - the **Control** option of the **Outlets** menu on the web interface
 - the **Device Manager** menu and the **Phase Monitor**, **Outlet Control**, and **Power Supply Status** sub-menus in the control console



To set the Administrator, Device Manager, or Outlet user **User Name** and **Password** settings, see [User Manager](#) or [Outlet 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 panel of the unit.

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

Upgrading Firmware



For a complete description of how to download a firmware upgrade for your PDU, see the *Management Card Addendum* (.doc\Addendum.pdf) on the provided APC PDU *Utility CD*.

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

1. Select a serial port at the local computer, and disable any service which uses that port.
2. Use the supplied serial 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 the ENTER key.
6. From the **Control Console** menu, select **System**, then **Tools**, then **XMODEM**.
7. At the prompt `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 Switched Rack PDU to accept the download.

- 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.

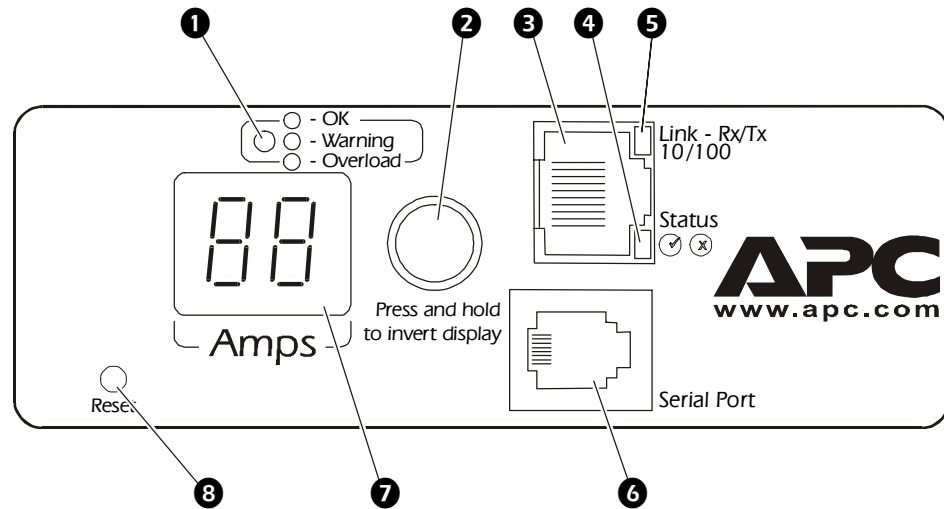


Note

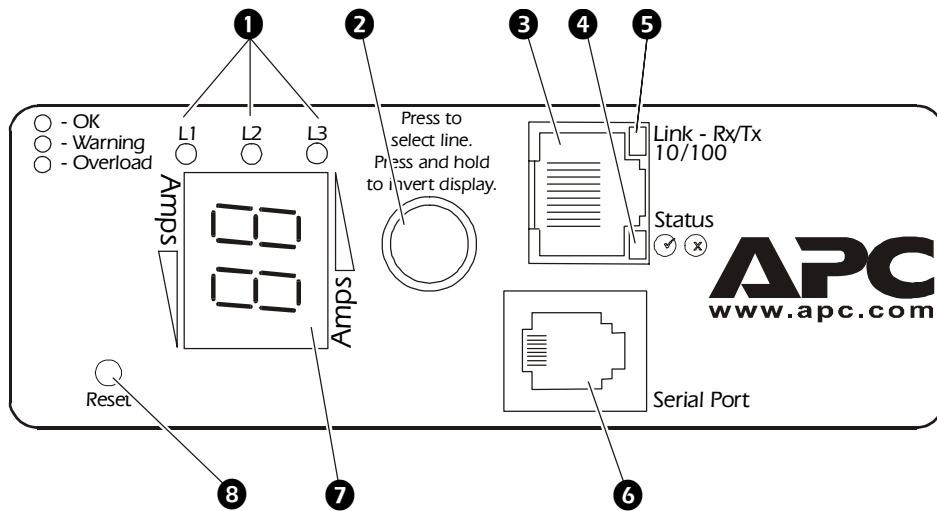
Upgrading the firmware will not interfere with the operation of the outlets.

Front Panel

Single-phase



Three-phase



Item	Function
❶ Load Indicator LED	Identifies overload and warning conditions for the displayed phase. See Load indicator LED .
❷ Input Selector	On three-phase models, press the input selector to monitor the current of the next phase. For either 1- or 3-phase units, press and hold the input selector to invert the display. At five seconds, an AA is displayed, at ten seconds the displayed numbers invert.
❸ 10/100 Base-T connector	Connects the PDU to the network.
❹ Status LED	See Status LED .
❺ Link-RX/TX LED	See Link-RX/TX (10/100) LED .
❻ RJ-12 Serial Port	Connects the PDU to a terminal emulator program for local access to the control console (use the supplied serial cable 940-0144).
❼ Current Meter	Displays the current (amps) for the phase indicated by the illuminated Load Indicator LED. On 3-phase units, the meter will cycle through the phases, displaying the current for each phase for 3 seconds. If an internal communication failure or power supply failure occurs, the meter will display an "Er," which can be cleared by pressing the input selector.
❽ Reset Button	Resets the PDU without affecting the outlet status.

Link-RX/TX (10/100) LED

This LED indicates the network status.

Condition	Description
Off	The device which connects the PDU to the network is off or not operating correctly.
Flashing Green	The PDU is receiving data packets from the network at 10 Megabits per second (Mbps).
Flashing Orange	The PDU is receiving data packets from the network at 100 Megabits per second (Mbps).
Solid Green or Orange	The Switched Rack PDU is receiving no network traffic.

Status LED

This LED indicates the network status of the PDU.

Condition	Description
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. ¹
Solid Orange	A hardware failure has been detected in the PDU. Contact APC Worldwide Customer Support .
Flashing Orange	The PDU is making BOOTP ² requests.

1 If you do not use a BOOTP server, see the Switched Rack PDU *Installation and Quick Start Manual* provided in PDF on the APC Switched Rack Power Distribution Unit *Utility* CD and in printed format to configure the TCP/IP settings.
2 To use a BOOTP server, see the *Management Card Addendum (.doc\Addendum.pdf)* on the APC Switched Rack Power Distribution Unit *Utility* CD.

Load indicator LED

The load indicator LED identifies overload and warning conditions for the displayed phase.

Condition	Description
Solid Green	The displayed phase is below the current overload thresholds.
Yellow	The displayed phase is in a Near Overload Warning condition. The current is above the Near Overload Warning threshold.
Red	The displayed phase is in an Overload condition. The current is above the Overload Alarm threshold.

Watchdog Features

Overview

To detect internal problems and recover from unanticipated inputs, the PDU uses internal, system-wide watchdog mechanisms. When it restarts itself to recover from an internal problem, a **System: Warmstart** event is recorded in the Event Log.

Network interface watchdog mechanism

The PDU implements internal watchdog mechanisms to protect itself from becoming inaccessible over the network. For example, if the PDU does not receive any network traffic for 9.5 minutes (either direct traffic, such as SNMP, or broadcast traffic, such as an Address Resolution Protocol [ARP] request), it assumes that there is a problem with its network interface and restarts itself.

Resetting the network timer

To ensure that the PDU does not restart if the network is quiet for 9.5 minutes, the PDU attempts to contact the Default Gateway every 4.5 minutes. If the gateway is present, it responds to the PDU, and that response restarts the 9.5-minute timer. If your application does not require or have a gateway, specify the IP address of a computer that is running on the network most of the time and is on the same subnet. The network traffic of that computer will restart the 9.5-minute timer frequently enough to prevent the PDU from restarting.

Control Console

How to Log On

Overview

You can use either a local (serial) connection, or a remote (Telnet) connection to access the control console.

Use case-sensitive **User Name** and **Password** entries to log on (by default, **apc** and **apc**, for an Administrator, or **device** and **apc**, for a Device Manager).



If you cannot remember your user name or password, see [How to Recover From a Lost Password](#).

Remote access to the control console

You can use Telnet to log on to the control console.

1. At a command prompt, type `telnet` and the System IP address for the Switched Rack PDU (when the PDU uses the default telnet port of 23), and then press ENTER. For example:

```
telnet 139.225.6.133
```

2. Enter your user name and password.



Note

If the PDU uses a non-default port number (between 5000 and 32767), you need to include a colon or a space (depending on your telnet client) after the IP address and then the port number.

Local access to the control console

You can use a local computer that connects to the Switched 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 which uses that port.
2. Use the supplied serial cable (940-0144) to connect the selected port to the RJ-12 serial port on the front of the Switched 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.

Main Screen

Example main screen

The main screen that is displayed when you log on to the control console of a Switched Rack PDU.

```
User Name : apc
Password  : ***
```

```
American Power Conversion          Network Management Card AOS    v1.1.6
(c) Copyright 2002 All Rights Reserved Rack PDU APP                    v1.0.0
-----
Name       : MS3 Test Unit                               Date : 2/10/2003
Contact    : Bill Cooper                                 Time  : 10:16:58
Location   : Testing Lab                                User  : Administrator
Up Time    : 0 Days 0 Hours 43 Minutes                   Stat  : P+ N+ A+
```

```
Switched Rack PDU: Communication Established
```

```
----- Control Console -----
```

```
1- Device Manager
2- Network
3- System
4- Logout
```

```
<ESC>- Main Menu, <ENTER>- Refresh, <CTRL-L>- Event Log
```

Information and status fields

Main screen information fields.

- Two fields identify the APC operating system (AOS) and application (APP) firmware versions. The application firmware uses a name that identifies the type of device that connects to the network. In the [Example main screen](#), the application firmware for the Switched Rack PDU is displayed.

```
Network Management Card AOS    v1.1.6
Rack PDU APP                    v1.0.0
```

- Three fields identify the system **Name**, **Contact**, and **Location** values.

Name : MS3 Test Unit
Contact : Bill Cooper
Location : Testing Lab



To set the **Name**, **Contact**, and **Location** values, see **System Menu**.

- An **Up Time** field reports how long the Switched Rack PDU has been running since it was last reset or since power was applied.

Up Time : 0 Days 0 Hours 43 Minutes

- Two fields identify when you logged on, by **Date** and **Time**.

Date : 2/24/2003

Time : 10:16:58

- A **User** field identifies whether you logged on as Administrator, Device Manager, or Outlet User.

User : Administrator

Main screen status fields.

- A **Stat** field reports the Switched Rack PDU status.

Stat : P+ N+ A+

P+	The APC operating system (AOS) is functioning properly.
N+	The network is functioning properly.
N?	A BOOTP request cycle is in progress.
N-	The Switched Rack PDU failed to connect to the network.
N!	Another device is using the IP address of the Switched Rack PDU.
A+	The application is functioning properly.
A-	The application has a bad checksum.
A?	The application is initializing.
A!	The application is not compatible with the AOS.



Note

If the AOS status is not P+, contact [APC Worldwide Customer Support](#), even if you can still access the Switched Rack PDU.

- A Switched Rack PDU model and name field reports the status of the Switched Rack PDU. For example:

Switched Rack PDU: Communication Established

Control Console Menus

Menu structure

The menus in the control console list options by number and name. To use an option, type the corresponding number and press ENTER, then follow any on-screen instructions.

For menus that allow you to change a setting, you must use the **Accept Changes** option to save the changes you made.

While in a menu, you can also do the following:

- Type ? and press ENTER to access brief menu option descriptions (if the menu has help available)
- Press ENTER to refresh the menu
- Press ESC to go back to the menu from which you accessed the current menu
- Press CTRL-C to return to the main (control console) menu
- Press CTRL-L to access the event log (Administrator and Device Manager only)



For information about the event log, see [Event-Related Menus](#).

Main menu

The main control console menu has options that provide access to the management features of the control console:

- 1- Device Manager
- 2- Network
- 3- System
- 4- Logout



Note

When you log on as Device Manager or as an Outlet User, you will not have access to the System or Network menus.

Device Manager option

This option accesses the **Device Manager** menu. Select the components you want to manage from this menu. To do any of the following tasks, see [Device Manager Menus](#):

- 1- Phase Monitor/Configuration
- 2- Phase Outlet Restriction Configuration
- 3- Outlet Control/Config
- 4- Power Supply Status

Option four not available to outlet users.

Network option

To do any of the following tasks, see [Network Menu](#):

- Configure the TCP/IP settings for the Switched Rack PDU
- Use the Ping utility
- Define settings that affect the FTP, Telnet, Web interface, SNMP, e-mail, and DNS features of the Switched Rack PDU

System option

To do any of the following tasks, see [System Menu](#):

- Control **Administrator**, **Device Manager**, and **Outlet User** access
- Define the system **Name**, **Contact**, and **Location** values
- Set the date and time used by the Switched Rack PDU
- Restart the Switched Rack PDU
- Reset control console settings to their default values
- Access system information about the Switched Rack PDU

Web Interface

How to Log On

Overview

You can use the DNS name or System IP address of the Switched Rack PDU for the URL address of the Web interface. Use your case-sensitive **User Name** and **Password** settings to log on (by default, **apc** and **apc**, for an Administrator, or **device** and **apc**, for a Device Manager).



For information about the Web page that appears when you log on to the Web interface, see [Summary Page](#).



Note

If you use MD5 authentication, you will need to enter your 15–32 character authentication phrase to log on.

Supported Web browsers

You can use the Microsoft® Internet Explorer (IE) browser (5.0 or higher) or the Netscape® browser (4.0.8 or higher) to access the Switched Rack PDU through its Web interface.

Some Web interface features (data verification and event log) require that you enable the following for your Web browser:

- JavaScript
- Java
- Cookies

In addition, the PDU cannot work with a proxy server. Therefore, before you can use a Web browser to access its Web interface, you must do one of the following:

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

URL address formats

Type the DNS name or IP address of the Switched Rack PDU in the Web browser's URL address field and press ENTER. Except as noted below, `http://` is automatically added by the browser.



Note

If the error "You are not authorized to view this page" occurs (Internet Explorer only), someone is logged on to the Web interface or control console. If the error "No Response" (Netscape) or "This page cannot be displayed" (Internet Explorer) occurs, Web access may be disabled, or the PDU may use a non-default Web-server port that you did not specify correctly in the address.

For more information, see [FTP Server, and Telnet & Web options](#).

- For a DNS name of Web1, the entry would be:

```
http://Web1
```

- For a System IP address of 158.205.12.114, when the PDU uses the default port (80) at the Web server, the entry would be:

```
http://158.205.12.114
```

- For a System IP address of 158.205.12.114, when the PDU uses a non-default port (5000, in this example) at the Web server, the entry would be:

```
http://158.205.12.114:5000
```



Note

For Internet Explorer, you must type `http://` as part of the address when any port other than 80 is used. Omitting `http://` causes the error "This page cannot be displayed." For more information, see [FTP Server, and Telnet & Web options](#).

Summary Page

When you log on to the web interface at the Switched Rack PDU, the status view is displayed at the right side of the screen, the quick status tab is displayed at the upper right, and the navigation menu is displayed at the left.

Status

The **Status** view has three sections:

- The **Device Status** section reports any active alarm or warning conditions and displays the load for each phase, including a graphic representation of the load thresholds.
- The **Outlet Status** section shows the number, phase (for 3-phase models), state (on, off), and name of the outlet.
- The **Switched Rack PDU Parameters** section shows the following:
 - The **Name**, **Contact**, and **Location** information for the PDU
 - The date and time you logged on
 - The Type of User (**Administrator**, **Device Manager**, or **Outlet User**)
 - The time(**Up Time**) the PDU has been running continuously since it was last reset or power was applied
 - The rating of the PDU (1- or 3-phase, and the maximum rated amps per phase)

Quick status tab

The quick status tab is displayed at the upper right on every page in the Web interface. The tab shows active alarms and warnings, and a link to the online help.

- Click the question mark (?) icon to access the online help for the displayed page
- Click the green “device operating normally” icon to return to the status screen where the current for each phase is displayed
- Click the warning icon to return to the status screen where active warnings are displayed. Put the mouse cursor on the icon to view details of the warning
- Click the alarm icon to return to the status screen where active alarms are displayed. Put the mouse cursor on the icon to display details of the alarm

Navigation menu

Provides access to the available PDU management options.



See [Navigation Menu](#)

Navigation Menu

Overview

On the Web interface, the navigation menu (left frame) has the following elements:

- IP address of the PDU
- Switched Rack PDU menus to manage the PDU and its components
 - **Switched Rack PDU** menu with a **Configuration** option
 - **Outlets** menu with **Control** and **Configuration** as options
- Menus to manage the event log, network connection, and system parameters
 - **Events** menu
 - **Network** menu
 - **System** menu



Note

When you log on as a Device Manager, the **Network** and **System** menus are not displayed.

When you log on as an Outlet User, the **Switched Rack PDU**, **Events**, **Network**, and **System** menus are not displayed.

- **Logout** option
- **Help** menu
- **Links** menu

Selecting a menu to perform a task

- To do the following, see [Switched Rack PDU Settings](#):
 - Configure the overload thresholds for each phase
 - Configure the **Overload Outlet Restriction** for each phase
 - Set the **Name**, **Location**, and **Coldstart Delay** for this device
- To do the following, see [Outlet Settings](#):
 - Apply power to and remove power from the outlets
 - Set **Power On Delay**, **Power Off Delay**, and **Reboot Duration** for the outlets
 - Set the names and associated web links for the outlets
- To do the following, see [Event-Related Menus](#):
 - Access the event log
 - Configure the actions to be taken based on the severity level of an event
 - Configure **SNMP Trap Receiver** settings for sending event-based traps
 - Define who will receive e-mail notifications of events
 - Test e-mail settings
- To do the following, see [Network Menu](#):
 - Configure new TCP/IP settings for the PDU
 - Identify the Domain Name Service (DNS) Server and test the network connection to that server
 - Define settings that affect FTP, Telnet, the Web interface, SNMP, and e-mail
- To do the following, see [System Menu](#):
 - Control **Administrator** and **Device Manager** access
 - Manage **Outlet User** access

- Define the system **Name**, **Contact**, and **Location** values
- Set the date and time used by the PDU
- Restart the Switched Rack PDU
- Reset control console settings to default settings
- Define the URL addresses of the user links and APC logo links in the Web interface, as described in [Links menu](#)

Help menu

When you click **Help**, the **Contents** for all of the online help is displayed. However, from any Web interface pages, you can use the question mark (?) in the quick status bar to link to the section of the online help for that page.

The **Help** menu also has an **About System** option you can use to view the **Model Number**, **Serial Number**, **Hardware Revision**, **Manufacture Date**, **MAC Address**, **Application Module**, **APC OS (AOS) Module** of the Switched Rack PDU, and the date and time each of the two modules were created.



Note

In the control console, the **About System** option, which is a **System** menu option, has the **Flash Type** value.

Links menu

Provides three user-definable URL link options. By default, these links access the following APC Web pages:

- **APC's Web Site** accesses the APC home page.
- **Testdrive Demo** accesses a demonstration page where you can use samples of APC web-enabled products.
- **APC Monitoring** accesses the "APC Remote Monitoring Service" page about pay-for-monitoring services available from APC.

To redefine these links so that they point to other URLs:

1. Click on **Links** in the **System** menu.
2. Define any new names for **User Links**.
3. Define any new URL addresses that you want **User Links** to access. Only HTTP links may be defined.
4. Click **Apply**.



Note

The link associated with the APC logo is also definable.

Device Manager Menus

Outlet Settings

Control outlets

Web interface. To control the outlets on your Switched Rack PDU individually or as a group, select the check boxes next to the outlet numbers or the **Apply to all Outlets** check box in the **Outlets** menu. Select a **Control Action** from the list and press the **Next >>** button to go to a confirmation page that explains the action and prompts you to execute or cancel the action.

Control Console. Select **Outlet Control/Config** from the **Device Manager** menu to display a list of outlets. You can control each outlet separately or configure all of the outlets simultaneously, but you cannot control small groups of outlets as you can in the Web interface. Choose the number of each outlet you want to control and press ENTER. Choose option 1, **Control Outlet**, and select a control action. On the confirmation screen that outlines the action to be executed, type `Yes` at the prompt to perform the action.

Option	Description
No Action (Web interface only)	Do nothing.
On Immediate	Apply power to the selected outlets.
On Delayed	Apply power to each selected outlet according to its value for Power On Delays .
Off Immediate	Remove power from the selected outlets.

Option	Description
Off Delayed	Remove power from each selected outlet according to its value for Power Off Delay .
Reboot Immediate	Remove power from each selected outlet. Then apply power to each of these outlets according to its value for Reboot Duration .
Reboot Delayed	Remove power from each selected outlet according to its value for Power Off Delay . Wait until all outlets are off (the highest value for Reboot Duration), and then apply power to each outlet according to its value for Power On Delay .
Cancel Pending Commands	Cancel all commands pending for the selected outlets and keep them in their present state.

Configure outlet settings and outlet name

Web Interface. To configure the outlet settings and outlet name:

1. Select the **Configuration** option of the **Outlets** menu, and click the **Configure** button.
2. Select the check boxes next to the numbers of the outlets you want to modify or select the **All Outlets** checkbox.
3. Enter values for **Power On Delay**, **Power Off Delay**, or **Reboot Duration** and click the **Apply** button below the list to apply the changes to the selected outlets.

On the same menu, select the outlets you want to rename, and enter a **Name** and **Link** for the selected outlets. Click the **Apply** button to accept the changes.



Note

Some screens have more than one **Apply** button. Click the button immediately below the list to which you made changes.

Control Console. To configure the outlet settings and outlet name:

1. Select **Outlet Control/Config** from the **Device Manager** menu.
2. Choose the number of the outlet you want to control, and press ENTER.
3. Choose option 2, **Configure Outlet**, to display and change the **Outlet name, Power on delay, Power off delay, and Reboot duration.**

Setting	Description
Power On Delay	Set the number of seconds that the PDU waits after a command is issued before applying power to an outlet.
Power Off Delay	Set the number of seconds that the PDU waits after the command is issued before removing power from an outlet.
Reboot Duration	Set the number of seconds an outlet remains off before restarting.
Name	Set the name for an individual outlet or a group of outlets. The name is displayed next to the outlet number on status screens.
Link (Web interface only)	Defines HTTP links to relevant Web sites.

Switched Rack PDU Settings

Configure Load Thresholds

Web interface. Select **Switched Rack PDU** from the navigation menu and click the **Configure** button in the **Load Management** section. Set the **Overload Alarm** thresholds, **Near Overload Warning** thresholds, **Low Load Warning** thresholds, and **Outlet Restrictions** for each phase. Press the **Apply** button in that section to set the selected values.

Control console. Select **Phase Monitor/Configuration** on the **Device Manager** menu. Select a phase (for 3-phase units). Select **Low Threshold (amps)**, **Warning Threshold (amps)**, or **High Threshold (amps)** and press ENTER.

To set the overload outlet restriction, select **Outlet Restriction Configuration** on the **Device manager** menu. For 3-phase units, select a phase to display and change the **Outlet Phase Restriction**.

Setting	Description
Overload Alarm Threshold	Set the number of amps that will cause an overload of this phase.
Near Overload Warning Threshold	Set the number of amps at which to generate a warning that the PDU is nearing overload of a phase.
Low Load Warning Threshold	Set the low threshold, in amps, for the current drawn from this phase during normal operation. A load at or below this level generates a warning.

Setting	Description
Overload outlet restriction	<p>Prevent users from applying power to outlets during an overload condition. You can set the following restrictions for each outlet:</p> <ul style="list-style-type: none">• None: You can apply power to outlets regardless of an Overload Alarm or Near Overload Warning.• On Warning: You cannot apply power to an outlet on the selected phase if the current for that phase has exceeded the Near Overload Warning threshold.• On Overload: You cannot apply power to an outlet on the selected phase if the current for that phase has exceeded the Overload Alarm threshold.

Configure Device Settings

Web interface. Select **Device Settings** on the **Switched Rack PDU** menu, click the **Configure** button and configure the **Name** and **Location** fields for the PDU, and set the **Coldstart Delay**.

Control console.

1. Select **Outlet Control/Config** from the **Device Manager** menu.
2. Select **Master Control/Config** from the displayed list.
3. Select **Master Outlet Configuration** from the next menu displayed.
4. Change the **Name**, **Location**, or **Coldstart Delay** from this menu.



To change the **Name**, **Location**, and **Contact** fields in the control console, see [Identification](#).

Setting	Description
Name	Set the name of the PDU.
Location	Set the location of the PDU.
Coldstart Delay	The time that the Switched Rack PDU delays applying power to the outlets after AC power has been applied to the PDU.

Event-Related Menus

Introduction

Overview

The **Events** menu provides access to the options that you use to do the following tasks:

- Access the event log
- Define the actions to be taken when an event occurs, based on the severity level of that event
 - Event logging
 - SNMP trap notification
 - E-mail notification



Note

You can use only the Web interface to define which events will use which actions, as described in [Event Log](#) and [How to Configure Individual Events](#).

- Define up to four SNMP trap receivers, by NMS-specific IP address, for event notifications by SNMP traps.
- Define up to four recipients for event notifications by e-mail.

Menu options

In the Web interface, all of the events options are accessed through the **Events** menu. In the control console, access the available events-related options as follows:

- Use the **Email** option in the **Network** menu to define the SMTP server and e-mail recipients.
- Use the **SNMP** option in the **Network** menu to define the SNMP trap receivers.
- Use `Ctrl-L` to access the Event Log from any menu.

For information about the settings available from the **Events** menu options, and about the e-mail feature, see the following descriptions:

- [Event Log](#)
- [Event Actions \(Web Interface Only\)](#)
- [Event Recipients](#)
- [E-mail Feature](#)
- [How to Configure Individual Events](#)

Event Log

Overview

The Switched Rack PDU supports event-logging for all embedded management card application firmware modules. To record and display embedded management card and Switched Rack PDU events, you can use any of the following to view the Event Log:

- Web interface
- Control console
- FTP

Logged events

By default, any event which causes an SNMP trap will be logged, except for SNMP authentication failures. Additionally, the Switched Rack PDU will log its abnormal internal system events. However, you can use the **Actions** option in the Web interface's **Events** menu to disable the logging of events based on their assigned severity level, as described in [Event Actions \(Web Interface Only\)](#).



Note

Some System (embedded management card) events do not have a severity level. Even if you disable the event log for all severity levels, events with no severity level will still be logged.



To access a list of the System (embedded management card) and Switched Rack PDU (Device) events, see [Event List page](#).

Web interface

The **Log** option in the **Events** menu accesses the event log. This log displays all of the events that have been recorded since the log was last deleted, in reverse chronological order. The **Delete Log** button clears all events from the log.

Control console

Press CTRL-L to display up to 300 events from the event log, in reverse chronological order. Use the SPACE BAR to scroll through the recorded events. While viewing the log, type `d` and press ENTER to clear all events from the log.



Note

After events are deleted, they cannot be retrieved.

How to use FTP to retrieve log files

You can use FTP to retrieve a tab-delineated event log (*event.txt*) file that you can import into a spreadsheet application.

- The file reports all of the events (*event.txt*) recorded since the log was last deleted.
- The file includes information that the event log does not display.
 - The version of the file format (first field)
 - The date and time the file was retrieved
 - The **Name**, **Contact**, and **Location** values, and the IP address of the Switched Rack PDU
 - In the *event.txt* file, the unique event code for each recorded event



Note

The Switched Rack PDU uses a 4-digit year for log entries. You may need to select a four-digit date format in your spreadsheet application to display all four digits of the year.

To use FTP to retrieve the *event.txt* file:

1. At a command prompt, type `ftp` and the IP address of the Switched Rack PDU, and press ENTER. If the **Port** setting for **FTP Server** in the **Network** menu has been changed from its default value (21), you must use the non-default value in the FTP command. For some FTP clients, you must use a colon to add the port number to the end of the IP address. For Windows FTP clients, use the following command (including spaces):

```
ftp>open ip_address port_number
```

2. Use your case-sensitive user name and password to log on as either

an Administrator or a Device Manager User.

- For Administrator, **apc** is the default for **User Name** and **Password**.
- For Device Manager, **device** is the default for **User Name**, and **apc** is the default for **Password**.

3. Use the **get** command to transmit the text version of the event log to your local drive.

```
ftp>get event.txt
```

4. You can use the **del** command to clear the contents of the event log.

```
ftp>del event.txt
```

You will not be asked to confirm the deletion.



If you clear the event log, a new *event.txt* file will be created to record the Deleted Log event.

Note

5. Type `quit` at the `ftp>` prompt to exit from FTP.

Event Actions (Web Interface Only)

Overview

The **Actions** option is available only on the Web interface's **Events** menu. This option allows you to select which actions will occur for events that have a specified severity level:

- **Event Log** selects which severity levels cause an event to be recorded in the event log. See [Event log action](#).
- **SNMP Traps** selects which severity levels cause SNMP traps to be generated. See [SNMP traps action](#).
- **Email** selects which severity levels cause e-mail notifications to be sent. See [Email action](#).

Click **Details** to access a complete list of the System (embedded management card) and Device (Switched Rack PDU) events that can occur, and then edit the actions that will occur for an individual event, as described in [How to Configure Individual Events](#). Click **Hide Details** to return to the **Actions** option.



Note

Modifying events on the **Configure Event Action by Severity Level** page, will override any changes you have made to individual events on the **Details** page.

Severity levels

Except for some System (embedded management card) events that do not have a severity level, events are assigned a default severity level based on their seriousness.

- **Informational:** Indicates an event that requires no action, such as a notification of a return from an abnormal condition.
- **Warning:** Indicates an event that may need to be addressed if the condition continues, but does not require immediate attention.
- **Severe:** Indicates an event that requires immediate attention. Unless resolved, severe Device and System events can cause incorrect operation of the Switched Rack PDU or its embedded management card.

Event log action

You can disable the recording of events in the event log. By default, all events are recorded, even events that have no severity level assigned.



Even if you disable the event log action for all severity levels, system (embedded management card) events that have no severity level assigned will still be logged.



For more information about this log, see [Event Log](#).

SNMP traps action

By default, the **SNMP Traps** action is enabled for all events that have a severity level assigned. However, before you can use SNMP traps for event notifications, you must identify the network management stations (NMSs) that will receive the traps by their IP addresses.



To define up to four NMSs as trap receivers, see [Event Recipients](#).

Email action

By default, the **Email** action is enabled for all events that have a severity level assigned. However, before you can use e-mail for event notifications, you must define the e-mail recipients.



See [E-mail Feature](#).

Event Recipients

Overview

The Web interface and control console both have options that allow you to define up to four trap receivers and up to four e-mail addresses to be used when an event occurs that has the SNMP traps or e-mail enabled.



See [Event Actions \(Web Interface Only\)](#)

Trap receiver settings

To define which NMSs will receive traps:

- In the Web interface, use the **Recipients** option of the **Events** menu.
- In the control console, use the **SNMP** option in the **Network** menu. Choose one of the trap receivers to modify, or select **Settings** and enable SNMP access for all trap receivers.

Item	Definition
Community Name	This setting defines the password (maximum of 15 characters) used when traps are sent to the NMS identified by the Receiver NMS IP setting.
Receiver NMS IP	Identifies by IP address the NMS that will receive traps. If this setting is 0.0.0.0 (the default value), traps will not be sent to any NMS.
Generation (Web interface) Trap Generation (control console)	Enables (by default) or disables the sending of any traps to the NMS identified by the Receiver NMS IP setting.
Authentication Traps	Enables or disables the sending of authentication traps to the NMS identified by the Receiver NMS IP setting.

E-mail Feature

Overview

You can use the Simple Mail Transfer Protocol (SMTP) to send e-mail to up to four recipients when an event occurs.

To use the e-mail feature, you must define the following settings:

- The IP addresses of the primary and secondary Domain Name Service (DNS) servers, as described in [DNS servers](#)
- The DNS name of the SMTP server and the **From Address** setting for SMTP, as described in [SMTP settings](#)
- The e-mail addresses for a maximum of four recipients, as described in [Email Recipients](#)

DNS servers

The Switched Rack PDU cannot send any e-mail messages unless the IP address of the primary DNS server is defined (see [DNS servers](#)).

The Switched Rack PDU will wait a maximum of 15 seconds for a response from the primary or (if specified) the secondary DNS server. If the Switched Rack PDU does not receive a response within that time, e-mail cannot be sent. Therefore, use DNS servers that are on the same segment as the Switched Rack PDU or on a nearby segment (but not across a WAN).

Once you define the IP addresses of the DNS servers, verify that DNS is working correctly. Enter the DNS name of a computer on your network to test whether you can look up the IP address for that DNS name.

SMTP settings

The **Email** option in the **Network** menu accesses the following settings:

Setting	Description
SMTP Server	Defines the SMTP server by its DNS name. Note: This definition is required only when the SMTP Server option (see Email Recipients) is set to Local .
From Address	Defines the contents of the From field in the e-mail messages sent by the Switched Rack PDU. Note: The SMTP server's configuration may require that you use a valid user account on the server for this setting. See the server's documentation for more information.

Email Recipients

In the Web interface, the **Recipients** option of the **Events** menu or the **Configure the Email recipients** link in the “Email Configuration” page accesses the settings you use to identify up to four e-mail recipients.

In the Web interface, use the **Email Test** option to send a test message to a configured recipient.

In the control console, the **Email** option of the **Network** menu accesses the e-mail recipients settings.

Setting	Description
To Address	<p>Defines the user and domain names of the recipient.</p> <ul style="list-style-type: none">• To bypass the DNS lookup of the mail server’s IP address, use the IP address in brackets instead of the e-mail domain name. For example, use <code>jsmith@[xxx.xxx.xxx.xxx]</code> instead of <code>jsmith@company.com</code>. This is useful when DNS lookups are not working correctly.• To use e-mail for paging, use the e-mail address for that recipient’s pager gateway account (for example, <code>myacct100@skytel.com</code>). The pager gateway pages the recipient. The recipient’s pager must be able to use text-based messaging.

Setting	Description
Generation	Enables (by default) or disables sending e-mail to the recipient.
Format	<p>Selects the format used for e-mail messages:</p> <p>Short: Identifies only the event that occurred. For example: Switched Rack PDU: Near Overload On phase 1</p> <p>Long: Includes information about the Switched Rack PDU, and the event. For example:</p> <p>Name: TestLab Location: Building 3 Contact: DonAdams http://139.225.6.133 Switched Rack PDU Ser #: WS0131005294 Date: 2/26/2003 Time: 16:09:48 Code: 0x120C Warning - Switched Rack PDU: Near Overload On phase 1</p>

How to Configure Individual Events

Event List page

The **Actions** option in the **Events** menu opens the “Event Action Configuration” page on the Web interface. Use the **Details** button in this page to access a complete list of the events that can be reported by your Switched Rack PDU.



Note

Modifying events on the **Configure Event Action by Severity Level** page, will override any changes you have made to individual events on the **Details** page.

Each event is identified by its unique code, its description, and its assigned severity level. For example:

Code	Description	Severity
0x0008	System: Warmstart.	Severe
0x120C	Switched Rack PDU: Near overload On phase 1	Warning



For information about severity levels and how they define the actions associated with events, see [Event Actions \(Web Interface Only\)](#).

Detailed Event Action Configuration page

The event codes provide a link to a page that allows you to do the following:

- Change the selected event’s severity level
- Enable or disable whether the event uses the event log, SNMP traps, or e-mail notifications

System Menu

Introduction

Overview

Use the **System** menu to do the following tasks:

- Configure system identification, date and time settings, and Administrator, Device manager, and Outlet user access
- Synchronize the real-time clock for the Switched Rack PDU with a Network Time Protocol (NTP) server
- Reset or restart the Switched Rack PDU
- Define the URL links available in the Web interface
- Access hardware and firmware information about the Switched Rack PDU
- Download configuration files (control console only)



Note

Only an Administrator has access to the **System** menu.

Menu options

Unless noted, the following menu options are available in the control console and Web interface:

- User Manager
- Outlet Manager
- Identification
- Date & Time
- Tools
- Links (Web interface)
- About System



Note

The **About System** option is a **Help** menu option in the Web interface.

Option Settings

User Manager

Use this option to define the access values shared by the control console and the Web interface, and the authentication used to access the Web interface.

Setting	Definition
Auto Logout	The number of minutes (3, by default), before a user is automatically logged off because of inactivity.
Authentication	The Basic setting (default) causes the Web interface to use standard HTTP 1.1 login (base64-encoded passwords); MD5 causes the Web interface to use an MD5-based authentication login. NOTE: Cookies must be enabled at a browser before it can be used with MD5 authentication.
Administrator and Device Manager User	
User Name	The case-sensitive name (maximum of 10 characters) used to log on at the control console or Web interface (apc , by default, for Administrator , and device , by default, for Device Manager User).
Password	The case-sensitive password (maximum of 10 characters) always used to log on at the control console, but used to log into the Web interface only when Basic is selected for the Authentication setting (apc is the default for both Password settings).
Authentication Phrase	The case-sensitive, 15–32 character phrase used to log onto the Web interface when MD5 is the Authentication setting. Admin user phrase is the default for Administrator ; device user phrase is the default for Device Manager User .

Outlet Manager

Use the **Outlet User Manager** option to set up user accounts that have access only to certain outlets. **Web interface**. Choose a user name, or choose **Add New User** to edit accounts.

Setting	Definition
User Name	The name of this user account Note: A user name in orange indicates that the user account has been disabled.
Password	Case-sensitive password for this user account
Authentication Phrase	Outlet user authentication phrase for use with MD5 Web authentication. This string must be 15–32 characters long.
User Description	Identification or description of the outlet user
Account Status	Enables, disables, or deletes this user
Outlet Access	Selects the outlets to which users have access
Delete User	Delete this user account

Control console. Select **System** from the **control console** menu. Then select **Manage Outlet Users** from the **User Manager** menu.

Setting	Definition
Add Outlet User Account	User Name: The name of this user account Password: Case-sensitive password for this user account Description: Identification or description of the outlet user
Edit Outlet User Account	Authentication Phrase: Outlet user authentication phrase for use with MD5 Web authentication. This string must be 15–32 characters long.
Delete Outlet User Account	Enter the name of the outlet user account you want to delete.
Disable Outlet User Account	Enter the name of the outlet user account to disable.

Setting	Definition
Enable Outlet User Account	Enter the name of the outlet user account to enable.
Edit Users Outlet Access	<p>Select the outlets to which users have access:</p> <ol style="list-style-type: none"> 1. Enter the outlet user name you want to modify. 2. Select the numbers of the outlets to which the outlet user will have access: <ul style="list-style-type: none"> • Add outlet access by entering each number and pressing ENTER after each one. Enter a blank when finished. • Remove outlet access by entering each number preceded by a - (minus sign) and pressing ENTER after each one. Enter a blank when finished.
List Outlet Users Accounts	Displays outlet user name, status, description, and outlet access for each outlet user account.

Identification

Use this option to define the System **Name**, **Contact**, and **Location** values used by the SNMP agent for the Switched Rack PDU. The option's settings provide the values used for the MIB-II **sysName**, **sysContact**, and **sysLocation** Object Identifications (OIDs).



For more information about the MIB-II OIDs, see the PowerNet® *SNMP Management Information Base (MIB) Reference Guide* (.doc\mibguide.pdf) provided on the APC Switched Rack Power Distribution Unit *Utility CD*.

Date & Time

Use this option to set the date and time used by the Switched Rack PDU. The option displays the current settings and allows you to change those settings manually or through a Network Time Protocol (NTP) Server.

Set Manually. Use this option in the Web interface, or **Manual** in the control console, to set **Date** and **Time** for the Switched Rack PDU.



Note

An **Apply Local Computer Time to Switched Rack PDU** option, which is available in the Web interface only, sets these values to match the date and time settings of the computer you are using to access the Web interface.

Synchronize with Network Time Protocol (NTP) Server. Use this option on the web interface, or **Network Time Protocol (NTP)** on the control console, to have an NTP Server automatically update the **Date** and **Time** settings for the Switched Rack PDU.



Note

In the control console, use the **NTP Client** option to enable or disable the NTP Server updates. In the Web interface, use the **Set Manually** option. The updates are disabled by default.

Setting	Definition
Primary NTP Server	Identifies the IP address of the primary NTP server.
Secondary NTP Server	Identifies the IP address of the secondary NTP server when a secondary server is available.
Time Zone	Defines the offset to be used from Greenwich Mean Time (GMT) based on the time zone in which the Switched Rack PDU is located.
Update Interval	Defines how often, in weeks, the Switched Rack PDU will access the NTP Server for an update (1 week minimum, 52 weeks maximum). Use Update Using NTP Now to initiate an immediate update as well.

Tools

Use this option to restart the Switched Rack PDU or to reset some or all of its configuration settings to their original default values.

Action	Definition
No Action (Web Interface only).	No change to the Switched Rack PDU.
Reboot	Restarts the Switched Rack PDU.

Action	Definition
Reset to Defaults	Resets all configuration settings. This option will reset the TCP/IP settings and enable DHCP and BOOTP.
Reset to Defaults Except TCP/IP	Resets all configuration settings except the TCP/IP settings.
Reset Only TCP/IP to Defaults	Resets the TCP/IP settings only. This option will not enable DHCP and BOOTP.
XMODEM (serial connection only)	Allows you to download firmware using a terminal-emulation program when you use a local connection to the control console. To connect to the control console locally, see Local access to the control console .

Links (Web interface)

Use this option to modify the links to APC Web pages.

Setting	Definition
User Links	
Name	Defines the link names that appear in the Links menu (by default, APC's Web Site , Testdrive Demo , and Remote Monitoring).
URL	<p>Defines the URL addresses used by the links. By default, the following URL addresses are used:</p> <ul style="list-style-type: none"> • http://www.apc.com (APC's Web Site) • http://testdrive.apc.com (Testdrive Demo) • http://rms.apc.com (Remote Monitoring) <p>Note: Only links of type http:// can be used in these fields. For information about these pages see Links menu.</p>
Access Links	
APC Home Page	Defines the URL address used by the APC logo at the top of all Web interface pages (by default, http://www.apc.com).

About System

This option identifies the following hardware information for the Switched Rack PDU: **Model Number**, **Serial Number**, **Hardware Revision**, **Manufacture Date**, and **MAC Address**.

This screen also displays the **Name**, **Version**, **Date**, and **Time** for the Application Module and AOS.

This information is set at the factory and cannot be changed.

The control console also includes fields for system **Flash Type**, and the **Type**, **Sector**, and **CRC 16** for each module.



Note

In the Web interface, except for **Flash Type**, this hardware information is reported by the **About System** option in the **Help** menu.

Network Menu

Introduction

Overview

Use the **Network** menu to do the following tasks:

- Define TCP/IP settings, including BOOTP server settings, when a BOOTP server is used to provide the needed TCP/IP values
- Use the Ping utility
- Define settings that affect the FTP, Telnet, Web interface, SNMP, E-mail, and DNS features of the Switched Rack PDU.



Note

Only an Administrator has access to the **Network** menu.

Menu options

Unless noted, the following menu options are available in the control console and Web interface:

- TCP/IP
- DNS
- Send DNS Query (Web interface only)
- Ping utility (control console)
- FTP Server, and Telnet & Web options
- SNMP
- Email

Option Settings

TCP/IP

Use this option to enable or disable BOOTP, and when BOOTP is disabled, to define the three TCP/IP settings that the Switched Rack PDU needs to operate on the network.

- System IP address for the Switched Rack PDU
- Subnet mask value
- IP address of the default gateway



For information about the watchdog role of the default gateway, see [Resetting the network timer](#).

When BOOTP is enabled (the default setting), you can affect only the BOOTP setting. A BOOTP server will provide the Switched Rack PDU with its TCP/IP settings whenever the PDU is started, reset, or restarted.



See also

To use BOOTP, see the *Addendum* (.\\doc\\addendum.pdf) provided on the APC Switched Rack Power Distribution Unit *Utility* CD.

Current TCP/IP settings fields. The current values for **System IP**, **Subnet Mask**, **Default Gateway**, the **MAC Address**, **Host Name**, and the **Domain Name** for the Switched Rack PDU are displayed with the TCP/IP settings in the control console and Web interface. The **Ethernet Port Speed** is displayed on the Web Interface only.



See also

For more information about how to use BOOTP, see the *Addendum* provided on the APC Switched Rack Power Distribution Unit *Utility CD*.



For more information on using BOOTP and DHCP, see **Boot Mode**.

DNS

Configure Domain Name Service Settings fields. Use these fields to define the IP addresses of the primary and secondary Domain Name Servers (DNS) used by the Switched Rack PDU e-mail feature.



See **E-mail Feature and DNS servers.**

Send DNS Query (Web interface only). Use this option, available only through the **TCP/IP & DNS** menu in the Web interface, to send a DNS query that tests the setup of your DNS servers.

Use the following settings to define the parameters for the test DNS request. View the result of the test DNS request in the **Last Query Response** field (**Passed**, **Failed**, or **Not Responding**).

- Use the **Query Type** setting to select the method to use for the DNS query:
 - URL name of the server (**By Name**)
 - IP address of the server (**By IP**)
 - Mail Exchange used by the server (**By MX**)
- Use the **Query Question** text field to specify the value to be used for the selected Query Type:
 - For **Name**, specify the URL.
 - For **IP**, specify the IP address.
 - For **MX**, specify the Mail Exchange address.
- Use **DNS Server to Query** to select whether you want to query the **Primary DNS Server** or the **Secondary DNS Server**.

Ping utility (control console)

Select this option, available only in the control console, to check the network connection by testing whether a defined IP address responds to the Ping network utility.

By default, the IP address of the default gateway is used. However, you can use the IP address of any device known to be running on the network.

FTP Server, and Telnet & Web options



Note

The **Telnet** and **Web** options are combined in the Web interface but separate in the control console.

Each of these options has a setting which enables (by default) or disables **Access**, and a **Port** setting that identifies the TCP/IP port used for communications with the Switched Rack PDU. The default **Port** settings are **21** (FTP), **23** (Telnet), and **80** (Web interface).

To enhance the protection provided by **User Name** and **Password** settings, change the **Port** setting to a unique port number from 5000 to 32767. After this change, when you log on, you must add a colon (:) (or a space, depending on your telnet client) and the non-default Port number to the IP address used. The following examples show the FTP, Telnet, and Web interface commands needed when the Port numbers have been changed to 5000 for FTP, 16512 for Telnet, and 32740 for HTTP at a management card with a System IP address of 159.215.12.114:

```
ftp 159.215.12.114:5000
```

```
telnet 159.215.12.114:16512
```

```
http://159.215.12.114:32740
```



See also

To use FTP to download configuration files, see the *Addendum* (.doc\addendum.pdf) on the APC Switched Rack Power Distribution Unit *Utility* CD.



To use FTP to access a text version of the management card's event log, see [How to use FTP to retrieve log files](#).

SNMP

An **Access** option (the **Settings** option in the control console) enables (by default) or disables SNMP. When SNMP is enabled, the **Access Control** settings allow you to control how each of the four available SNMP channels is used.



To define up to four NMSs to serve as trap receivers, see [Trap receiver settings](#).

Setting	Definition	
Community Name	Defines the password (maximum of 15 characters) that an NMS defined by the NMS IP setting uses to access the channel.	
NMS IP	Limits access to the NMS or NMSs specified by the format used for the IP address. <ul style="list-style-type: none">• 159.215.12.1 allows only the NMS with that IP address to have access.• 159.215.12.255 allows access for any NMS on the 159.215.12 segment.• 159.215.255.255 allows access for any NMS on the 159.215 segment.• 159.255.255.255 allows access for any NMS on the 159 segment.• 0.0.0.0 or 255.255.255.255 allows access for any NMS.	
Access Type	Selects how the NMS defined by the NMS IP setting can use the channel when that NMS uses the correct value for Community Name .	
	Read	The NMS can use GETs at any time, but it can never use SETs.
	Write	The NMS can use GETs at any time, and can use SETs when no one is logged onto either the control console or Web interface.
	Disabled	The NMS cannot use GETs or SETs.
Write+	The NMS can use GETs and SETs at any time, even when someone is logged onto the control console or Web interface.	

Email

Use this option to define two SMTP settings (**SMTP Server** and **From Address**) used by the e-mail feature of the Switched Rack PDU.



For more information about these settings, see [SMTP settings](#); for more information about the e-mail capability of the Switched Rack PDU, see [E-mail Feature](#).

Boot Mode

Introduction

Overview

In addition to using a BOOTP server or manual settings, the Switched Rack PDU can use a dynamic host configuration protocol (DHCP) server to provide the settings that it needs to operate on a TCP/IP network.

The method used to provide the network settings for the PDU depends on **Boot mode**, a **TCP/IP** option in the **Network** menu. To use a DHCP server to provide the network assignment for the PDU, **Boot mode** must be set to either **DHCP & BOOTP**, its default setting, or **DHCP only**.



See also

For more details on DHCP and DHCP options, see RFC2131 and RFC2132.

DHCP & BOOTP boot process

When **Boot mode** is set to its default **DHCP & BOOTP** setting, the following occurs when the Switched Rack PDU is started or reset:

1. The Switched Rack PDU makes up to five requests for its network assignment from any BOOTP server. If a valid BOOTP response is received, the PDU starts the network services and sets **Boot mode** to **BOOTP Only**.
2. If the Switched Rack PDU fails to receive a valid BOOTP response after five BOOTP requests, the PDU makes up to five requests for its network assignment from any DHCP server. If a valid DHCP response is received, the PDU starts the network services and sets **Boot mode** to **DHCP Only**.



Note

To configure the Switched Rack PDU so that it always uses the **DHCP & BOOTP** setting for **Boot mode**, enable the **Remain in DHCP & BOOTP mode after accepting TCP/IP settings** option, which is disabled by default.

See [Switched Rack PDU settings](#).

3. If the Switched Rack PDU fails to receive a valid DHCP response after five DHCP requests, it repeats BOOTP and DHCP requests until it receives a valid network assignment. First it sends a BOOTP request every 32 seconds for 12 minutes, then it sends one DHCP request with a time-out of 64 seconds, and so forth.



Note

If a DHCP server responds with an invalid offer (e.g., without the APC Cookie), the Switched Rack PDU accepts the lease from that server on the last request of the sequence and immediately releases that lease. This prevents the DHCP server from reserving the IP Address associated with its invalid offer.

For more information on what a valid response requires, see [DHCP response options](#).

DHCP Configuration Settings

Switched Rack PDU settings

The **TCP/IP** option in the **Network** menu of the Web interface and control console accesses the network settings for the Switched Rack PDU.

Three settings (**Port Speed**, **Host Name**, and **Domain Name**) are available regardless of the **TCP/IP** option's **Boot mode** selection, and three settings (**Vendor Class**, **Client ID**, and **User Class**) are available for any **Boot mode** selection except **Manual**.

When **Boot mode** is set to **DHCP & BOOTP**, two options are available:

- **After IP Assignment** in the control console (or **Remain in DHCP & BOOTP mode after accepting TCP/IP settings** in the Web interface): By default, this option switches **Boot mode** to the selection that reflects the server that provided the TCP/IP settings (**DHCP Only** or **BOOTP Only**).
- **DHCP Cookie Is** in the control console (or **Require vendor specific cookie to accept DHCP Address** in the Web interface): By default, this option requires that the DHCP responses include the APC cookie in order to be valid.



For more information about the APC cookie, see **DHCP response options**.

When **Boot mode** is set to **DHCP Only**, two options are available:

- **DHCP Cookie Is** in the control console (or **Require vendor specific cookie to accept DHCP Address** in the Web interface): By default, this option requires that the DHCP responses include the APC cookie in order to be valid.



For more information about the APC cookie, see [DHCP response options](#)

- **Retry Then Stop** in the control console (or **Maximum # of Retries** in the Web interface): This option sets the number of times the Switched Rack PDU will repeat the DHCP request if it does not receive a valid response. By default, the number of retries is 0, which sets the Switched Rack PDU to continue repeating the DHCP request indefinitely.

DHCP response options

Each valid DHCP response contains options that provide the TCP/IP settings that the Switched Rack PDU needs to operate on a network, and other information that affects the operation of the PDU.

The PDU uses the Vendor Specific Information option (option 43) in a DHCP response to determine whether the DHCP response is valid.

Vendor Specific Information (option 43). The Vendor Specific Information option contains up to two APC specific options encapsulated in a TAG/LEN/DATA format: the APC Cookie and the Boot Mode Transition.

APC Cookie. Tag 1, Len 4, Data “1APC”

Option 43 notifies the PDU that a DHCP server has been configured to service APC devices. By default, the APC Cookie must be present in this DHCP response option before the PDU can accept the lease.



Note

Use the **DHCP Cookie Is** setting described in [Switched Rack PDU settings](#) to disable the APC cookie requirement.

Following, in hexadecimal format, is an example of a Vendor Specific Information option that contains the APC cookie:

```
Option 43 = 0x01 0x04 0x31 0x41 0x50 0x43
```

Boot Mode Transition. Tag 2, Len 1, Data 1/2

This option 43 setting enables or disables the **After IP Assignment** option which, by default, causes the **Boot mode** option to use the setting that reflects the server that provided the TCP/IP settings (**DHCP Only** or **BOOTP Only**):

- For a data value of 1, the **After IP Assignment** option is disabled, and the **Boot mode** option remains in its **DHCP & BOOTP** setting after successful network assignment. Whenever the Switched Rack PDU restarts, it will request its network assignment first from a BOOTP server, and then, if necessary, from a DHCP server.



See **DHCP & BOOTP** boot process.

- For a data value of 2, the **After IP Assignment** option is enabled and the **Boot mode** option switches to **DHCP Only** when the management card accepts the DHCP response. Whenever the PDU restarts, it will request its network assignment (TCP/IP settings) from a DHCP server only.



For more information about the **After IP Assignment**, see **Switched Rack PDU settings**.

Following, in hexadecimal format, is an example of a Vendor Specific Information option that contains the APC cookie and the disable Boot Mode Transition setting:

```
Option 43 = 0x01 0x04 0x31 0x41 0x50 0x43 0x02 0x01 0x01
```

TCP/IP options. The Switched Rack PDU uses the following options within a valid DHCP response to define its TCP/IP settings:

- **IP Address** (from the **yiaddr** field of the DHCP response): Provides the IP address that the DHCP server is leasing to the PDU.
- **Subnet Mask** (option 1): Provides the subnet mask value needed by the PDU to operate on the network.
- **Default Gateway** (option 3): Provides the default gateway address needed by the PDU to operate on the network.
- **Address Lease Time** (option 51): Identifies the length of time for the lease associated with the identified **IP Address**.
- **Renewal Time, T1** (option 58): Identifies how long the PDU must wait after an IP address lease is assigned before it can request a renewal of that lease.
- **Rebinding Time, T2** (option 59): Identifies how long the PDU must wait after an IP address lease is assigned before it can seek to rebind that lease.

Miscellaneous options. The Switched Rack PDU uses the following options within a valid DHCP response to define NTP, DNS, hostname, and domain name settings:

- **NTP Server, Primary and Secondary** (option 42): Identifies up to two NTP servers that can be used by the PDU.
- **NTP Time Offset** (option 2): Specifies the offset, in seconds, of the subnet for the PDU from Coordinated Universal Time (UTC).
- **DNS Server, Primary and Secondary** (option 6): Identifies one or two DNS servers that can be used by the PDU.
- **Host Name** (option 12): Identifies the hostname (maximum length of 32 characters) to be used by the PDU.
- **Domain Name** (option 15): Identifies the domain name (maximum length of 64 characters) to be used by the PDU.

Security

Security Features

Planning and implementing security features

As a network device that passes information across the network, the Switched Rack PDU is subject to the same exposure as other devices on the network.

Use the information in this section to plan and implement the security features appropriate for your environment.

Port assignments

If a Telnet, FTP, or Web server uses a non-standard port, a user must specify the port when using the client interface, such as a Web browser. The non-standard port address becomes an extra “password,” hiding the server to provide an additional level of security. The TCP ports for which the Telnet, FTP, and Web servers listen are initially set at the standard “well known ports” for the protocols. To hide the interfaces, use any port numbers from 5000 to 32768.

User names, passwords, community names

All user names, passwords, and community names for SNMP are transferred over the network as plain text. A user who is capable of monitoring the network traffic can determine the user names and passwords required to log in to the accounts of the Control Console or Web interface of the Switched Rack PDU. This security limitation of the protocols affects any device using Telnet, a Web server, or an SNMP version 1 agent.

Summary of access methods

Interface	Security Access	Notes
Serial Control Console	Access is by user name and password.	Always enabled.
Telnet Control Console	These methods are available: <ul style="list-style-type: none"> • User name and password • Selectable server port • Server Enable/Disable 	The user name and password are transmitted as plain text.
SNMP	These methods are available: <ul style="list-style-type: none"> • Community Name • NMS IP filters • Agent Enable/Disable • Four access communities with read/write/disable capability 	The NMS IP filters allow access from designated IP addresses. <ul style="list-style-type: none"> • 159.215.12.1 allows only the NMS with that IP address to have access. • 159.215.12.255 allows access for any NMS on the 159.215.12 segment. • 159.215.255.255 allows access for any NMS on the 159.215 segment. • 159.255.255.255 allows access for any NMS on the 159 segment. • 0.0.0.0 or 255.255.255.255 allows access for any NMS.
FTP Server	These methods are available: <ul style="list-style-type: none"> • User name and password • Selectable server port • Server Enable/Disable 	Only the Administrator account has access.

Interface	Security Access	Notes
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Authentication

Authentication versus encryption

You can select to use security features for the Switched Rack PDU that control access by providing basic authentication through user names, passwords, and IP addresses, without using encryption. These basic security features are sufficient for most environments, in which sensitive data is not being transferred.

Firewalls

Although some methods of authentication provide a higher level of security than others, complete protection from security breaches is almost impossible to achieve. Well-configured firewalls are an essential element in an overall security scheme.

USER'S GUIDE

switched rack pdu



Product Information

Warranty and Service

Limited warranty

APC warrants the Switched Rack 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 Switched Rack PDU:

1. Note the serial number and date of purchase. To find the serial number of the Switched Rack PDU, use the **About System** menu option.
2. Contact Customer Support at a phone number located at the end of this manual. 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.

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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:

APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702020 (Ireland)
Japan	(0) 35434-2021

- 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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