USER'S GUIDE
Metered Rack PDU

APC

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Introduction

Product Description

Features of the Rack PDU

The American Power Conversion (APC®) Metered Rack Power Distribution Unit (PDU) is a stand-alone, network-manageable power distribution device that monitors the total current drawn from its power outlets.

You can manage a Rack PDU through its Web interface, its control console interface, InfraStruXure® Manager or Central, or Simple Network Management Protocol (SNMP):

- Access the Web interface using Hypertext Transfer Protocol, or using secure HTTP (HTTPS) with Secure Sockets Layer (SSL).
- Access the control console through a serial connection, Telnet, or Secure SHell (SSH).
- Use InfraStruXure Manager or Central to monitor and manage your Rack PDU.
- Use an SNMP browser and the APC PowerNet® Management Information Base (MIB) to manage your Rack PDU.

Rack PDUs have these additional features:

- Current monitoring per phase and bank.
- Configurable alarm thresholds that provide network and visual alarms to help avoid overloaded circuits.
- Three levels of user access accounts: Administrator, Device User, and Read-Only User.

- 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, or using HTTP access). The data log is accessible by Web browser, SCP, or FTP.
- E-mail notifications for Rack PDU and system events.
- SNMP traps, Syslog messages, and e-mail notifications based on the severity level or category of the Rack PDU and system events.
- Security protocols for authentication and encryption.

The Rack PDU does not provide power surge protection. To ensure that the device is protected from power failure or power surges, connect the Rack PDU to an APC Uninterruptible Power Supply (UPS).

Initial setup

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

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

Do not use the loopback address (127.0.0.1) as the default gateway address. Doing so disables the Rack PDU. You must then log on using a serial connection and reset TCP/IP settings to their defaults.

To configure the TCP/IP settings, see the *Installation and Quick Start* manual provided as a PDF on the Metered Rack PDU *Utility* CD, and as a printed manual.

To use a DHCP server to configure the TCP/IP settings at a Rack PDU, see TCP/IP and Communication Settings.

Access Procedures

Overview

The Rack PDU has two internal interfaces (control console and Web interface) that allow you to manage the Rack PDU.

For more information about the internal user interfaces, see Control Console and Web Interface.

The SNMP interface also allows you to use an SNMP browser with the PowerNet Management Information Base (MIB) to manage the Rack PDU.

To use the PowerNet MIB with an SNMP browser, see the *PowerNet SNMP Management Information Base (MIB) Reference Guide*, which is provided on the Metered Rack PDU *Utility* CD.

Access priority for logging on

Only one user at a time can log on to the Rack PDU. The priority for access, beginning with the highest priority, is as follows:

- Local access to the control console from a computer with a direct serial connection to the Rack PDU.
- Telnet or Secure SHell (SSH) access to the control console from a remote computer.
- Web access, either directly or through the InfraStruXure Manager.

See SNMP for information about how SNMP access to the Rack PDU is controlled.

Types of user accounts

The Rack PDU has three levels of access (Administrator, Device User, and Read-Only User), which are protected by user name and password requirements.

- An Administrator can use all of the menus in the Web interface and control console. The default user name and password are both **apc**.
- A Device User can access only the following:
  - In the Web interface, the menus on the **Device Manager** tab and the event and data logs, accessible under the **Events** and **Data** headings on the left navigation menu of the **Logs** tab.
  - In the control console, the equivalent features and options. A Device User can also access the event log in the control console by pressing CTRL+L.

  The default user name is **device**, and the default password is **apc**.
- A Read-Only User has the following restricted access:
  - Access through the Web interface only.
  - Access to the same menus as a Device User, but without the capability to change configurations, control devices, delete data, or use file transfer options. Links to configuration options are visible but are disabled, and the event and data logs display no button to clear the log.

  The default user name is **readonly**, and the default password is **apc**.

To set **User Name** and **Password** values for the three account types, see Setting user access (Administration>Security>Local Users>options).

You must use the Web interface to configure values for the Read-Only User.

Recover from a Lost Password

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

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Connect the serial cable (APC part number 940-0144A) to the selected port on the computer and to the configuration port at the Rack PDU.
3. Run a terminal program (such as HyperTerminal®) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. If you are unable to display the **User Name** prompt, verify the following:
   – The serial port is not in use by another application.
   – The terminal settings are correct as specified in step 3.
   – The correct cable is being used as specified in step 2.
5. Press the **Reset** button. The Status LED will flash alternately orange and green. Press the **Reset** button a second time immediately while the LED is flashing to reset the user name and password to their defaults temporarily.
6. Press ENTER as many times as necessary to redisplay the **User Name** prompt, then use the default, **apc,** for the user name and password. (If you take longer than 30 seconds to log on after the **User Name** prompt is redisplayed, you must repeat step 5 and log on again.)
7. From the **Control Console** menu, select **System**, then **User Manager**.
8. Select **Administrator**, and change the **User Name** and **Password** settings, both of which are now defined as **apc**.
9. Press CTRL+C, log off, reconnect any serial cable you disconnected, and restart any service you disabled.
10. Select **Accept changes**.

Upgrade Firmware Through a Serial Connection

For a complete description of how to download a firmware upgrade for your Rack PDU, see Upgrade Firmware. That section also explains how to use network-based file transfer tools, which complete a firmware upgrade more quickly than the XMODEM protocol, which uses a serial connection.

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

1. Obtain the individual firmware modules (the AOS module and the application module) from **www.apc.com/tools/download**.
2. Select a serial port at the local computer and disable any service that uses that port.
3. Connect the provided serial cable (APC part number 940-0144A) to the selected port and to the serial port at the Rack PDU.
4. 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.
5. Press ENTER, repeatedly if necessary, to display the **User Name** prompt.
6. Enter the Administrator user name and password (**apc** by default for both).
7. From the **Control Console** menu, select **System**, then **Tools**, then **File Transfer**, then **XMODEM**; type `Yes` at the prompt to continue.
8. Change the terminal program's baud rate to match your selection, and press ENTER. A higher baud rate causes faster upgrades.
9. From the terminal program's menu, select the binary AOS file to transfer using XMODEM-CRC. After the XMODEM transfer is complete, set the baud rate to 9600. The Rack PDU automatically restarts.

10. Repeat step 4 through step 9 to install the application module. In step 9, use the application module file name, not the AOS module file name.

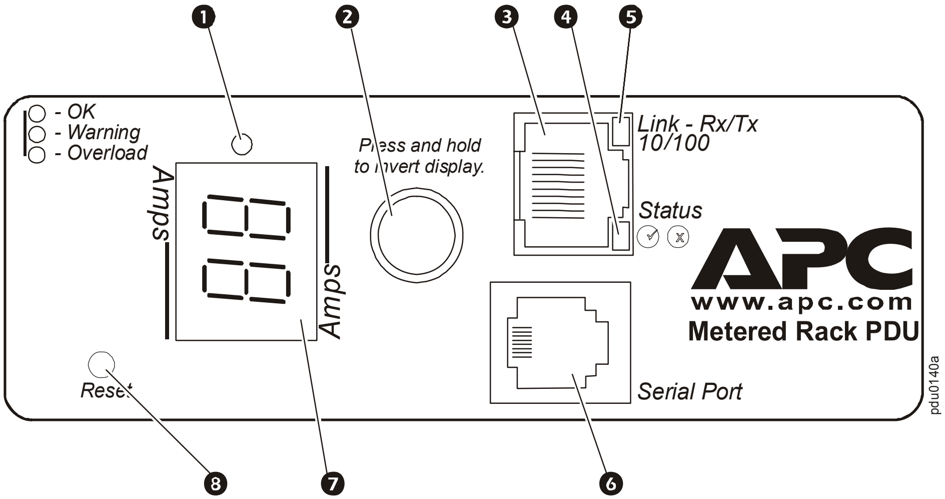
⚠ Do not interrupt the download.

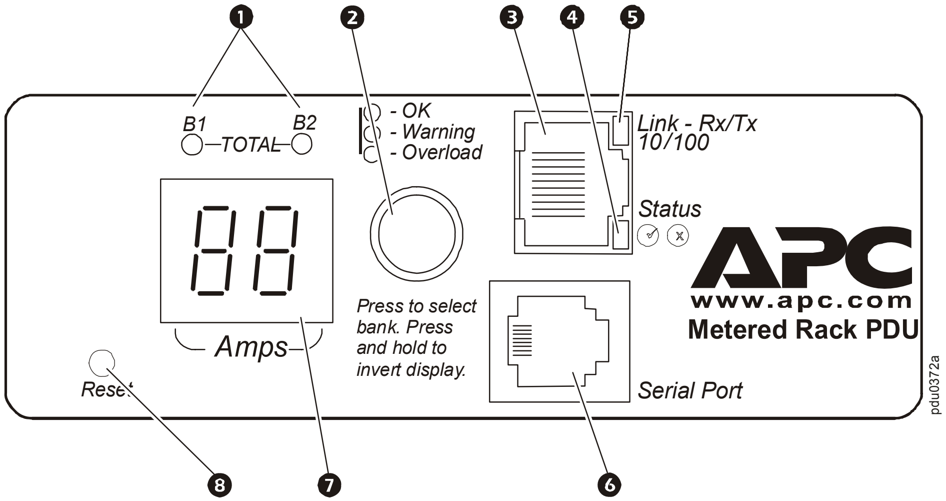
ⓘ Upgrading the firmware will not interfere with the operation of the outlets.

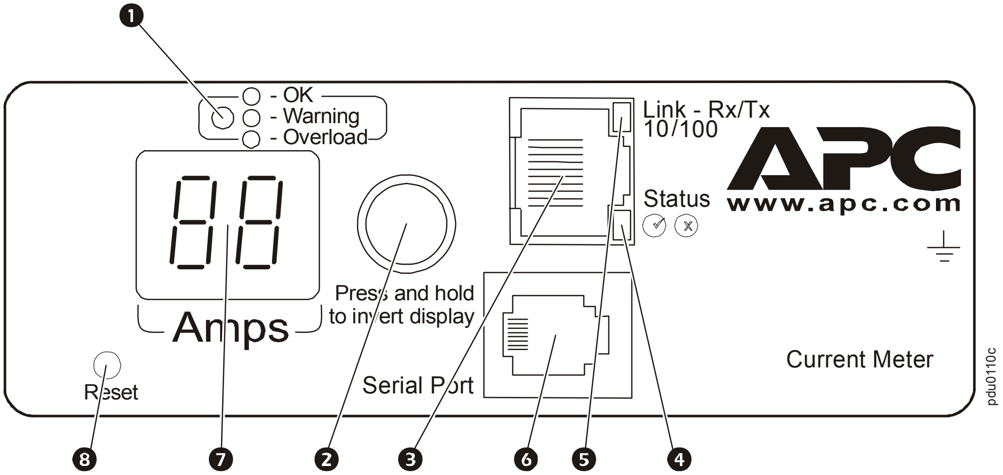
Front Panel

Single-phase

Single-phase Rack PDUs have one of the following front panels.

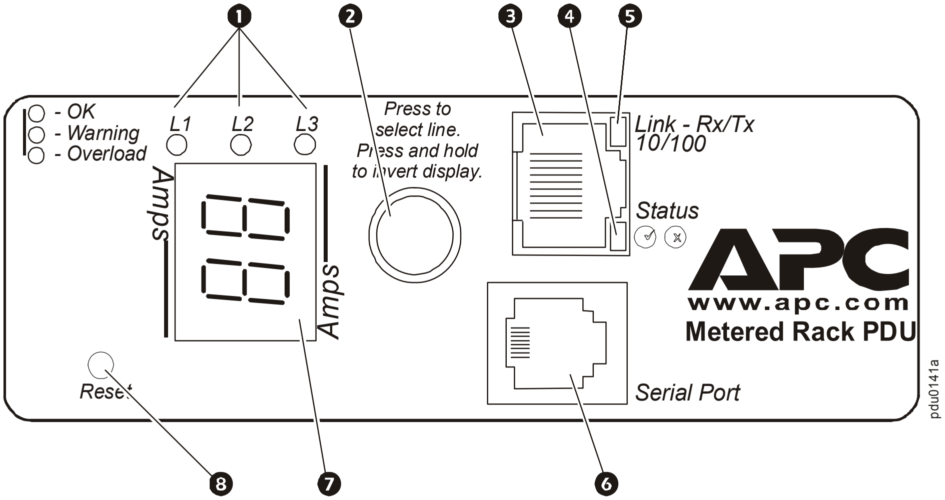


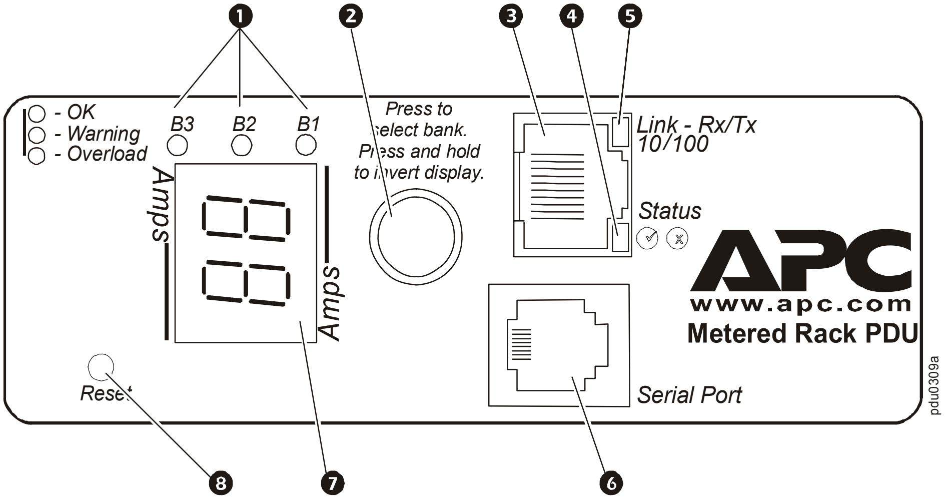

1
2
3
4
5
B1
B2
TOTAL
- OK
- Warning
- Overload
Link - Rx/Tx
10/100
Status
88
Amps
Press to select bank. Press and hold to invert display.
APC
www.apc.com
Metered Rack PDU
Serial Port
Reset
pdu0372a
8
7
6

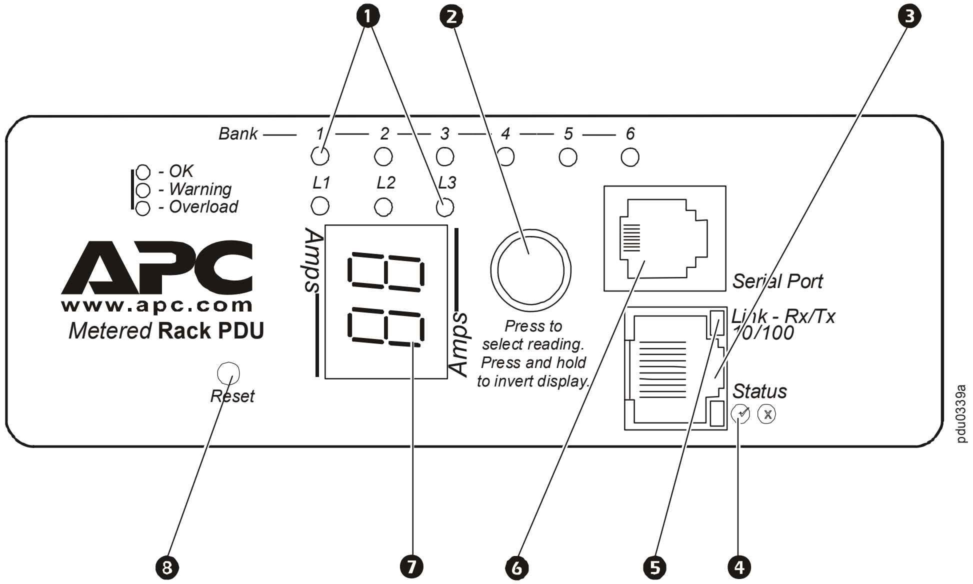

1
- OK
- Warning
- Overload
Link - Rx/Tx
10/100
Status
88
Amps
Press and hold to invert display
APC
www.apc.com
Serial Port
Current Meter
Reset
pdu0110c
8
7
2
3
6
5
4

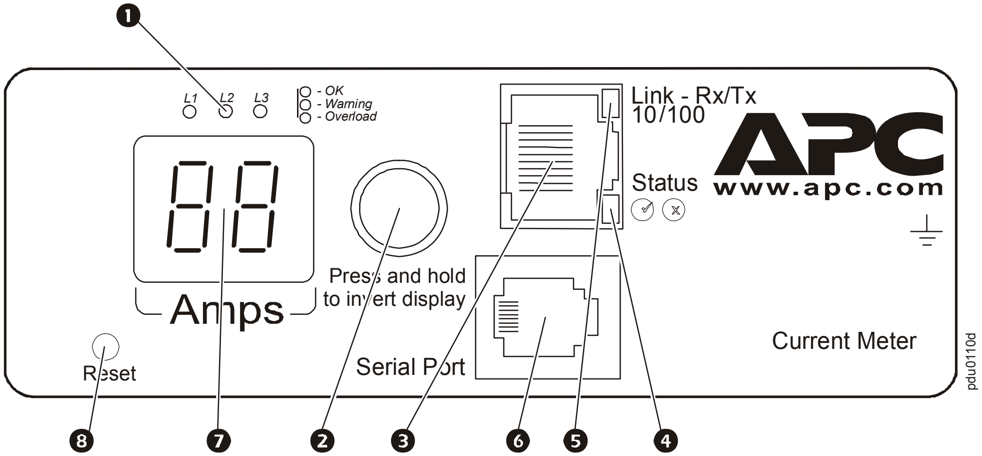
Three-phase

Three-phase Rack PDUs have one of the following front panels.






1
2
3
Bank
1
2
3
4
5
6
- OK
- Warning
- Overload
L1
L2
L3
APC
www.apc.com
Metered Rack PDU
Amps
Amps
Press to select reading. Press and hold to invert display.
Serial Port
Link - Rx/Tx 10/100
Status
Reset
pdu0339a
8
7
6
5
4


1
L1
L2
L3
- OK
- Warning
- Overload
Link - Rx/Tx 10/100
Status
APC
www.apc.com
Amps
Press and hold to invert display
Serial Port
Current Meter
Reset
pdu0110d
8
7
2
3
6
5
4

Item		Function
❶	Load Indicator LED	Identifies overload and warning conditions for the displayed phase or bank. See Load indicator LED.
❷	Input Selector	On 3-phase models, press the input selector to monitor the current of the next phase or bank. For either 1- or 3-phase units, press and hold the input selector to display the IP address of the Rack PDU or to invert the display. At five seconds, the IP address is displayed; at ten seconds, the displayed numbers invert.
❸	10/100 Base-T Connector	Connects the Rack 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 Rack PDU to a terminal emulator program for local access to the control console. Use the supplied serial cable (APC part number 940-0144A).
❼	Digital Display	Displays the current (amps) for the phase or bank indicated by the illuminated Load Indicator LED. On 3-phase models, the Digital Display will cycle through the phases or banks, displaying the current for each phase or bank for 3 seconds. If an internal communication failure occurs (for either a 1- or 3-phase model), the Digital Display displays **Er**, which you can clear by pressing the input selector.
❽	Reset Button	Resets the Rack PDU without affecting the outlet status.

Link-RX/TX (10/100) LED

This LED indicates the network status.

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

Status LED

This LED indicates the network status of the Rack PDU.

Condition	Description
Off	The Rack PDU is connected to an unknown network.
Solid Green	The Rack PDU has valid TCP/IP settings.
Flashing Green	The Rack PDU does not have valid TCP/IP settings.†
Solid Orange	A hardware failure has been detected in the Rack PDU. Contact APC Worldwide Customer Support.
Flashing Orange	The Rack PDU is making BOOTP requests.
Flashing Orange and Green (alternating)	The Rack PDU is making DHCP requests.

† If you do not use a BOOTP or DHCP server, see the *Installation and Quick Start* provided as a PDF on the Metered Rack PDU *Utility* CD to configure the TCP/IP settings.

Load indicator LED

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

Condition	Description
Solid Green	The current of the displayed phase or bank is below the **Current Overload** threshold.
Yellow	The displayed phase or bank is in a **Near Overload Warning** condition. The current is above the **Near Overload Warning** threshold.
Red	The displayed phase or bank 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 Rack PDU uses internal, system-wide watchdog mechanisms. When it restarts to recover from an internal problem, a **System: Warmstart** event is recorded in the event log.

Network interface watchdog mechanism

The Rack PDU implements internal watchdog mechanisms to protect itself from becoming inaccessible over the network. For example, if the Rack 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 Rack PDU does not restart if the network is quiet for 9.5 minutes, the Rack PDU attempts to contact the Default Gateway every 4.5 minutes. If the gateway is present, it responds to the Rack 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 Rack PDU from restarting.

Control Console

How to Log On

Overview

You can use either a local (serial) connection, or a remote (Telnet or SSH) 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, which is the same user account as Device User in the Web interface). A Read-Only User has no access to the control console.

If you cannot remember your user name or password, see Recover from a Lost Password.

Remote access to the control console

You can access the control console through Telnet or Secure SHell (SSH). Telnet is enabled by default. Enabling SSH disables Telnet.

To enable or disable these access methods:

- In the Web interface, on the **Administration** tab, select **Network** on the top menu bar, and then the **access** option under **Console** on the left navigation menu.
- In the control console, use the **Telnet/SSH** option of the **Network** menu.

Telnet for basic access. Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption. To use Telnet to access the control console:

1. From a computer on the same network as the Rack PDU, at a command prompt, type **`telnet`** and the System IP address for the Rack PDU (for example `telnet 139.225.6.133`, when the Rack PDU uses the default Telnet port of 23), and press ENTER.
   If the PDU uses a non-default port number (from 5000 to 32768), you must include a colon or a space, depending on your Telnet client, between the IP address (or DNS name) and the port number.
2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager, which is the same user account as Device User in the Web interface).

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

Local access to the control console

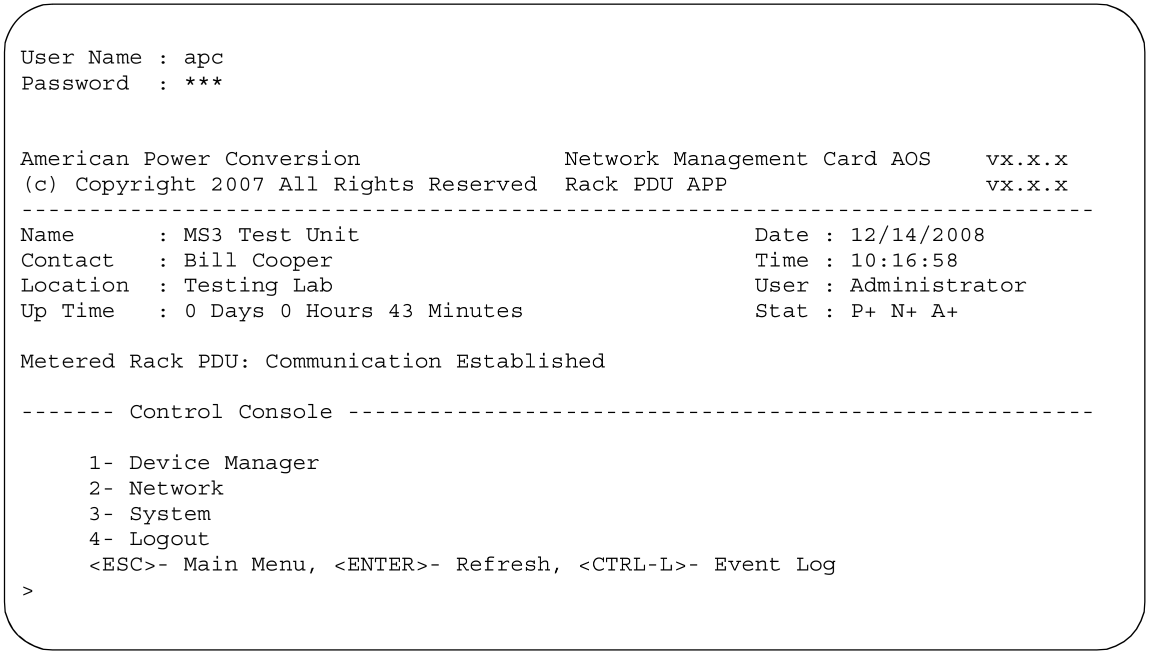
For local access, use a computer connected by serial cable to the Rack PDU through the serial port on the front panel of the unit.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Use the supplied serial cable (APC part number 940-0144A) to connect the selected port to the serial port on the front panel of the Rack PDU.
3. Run a terminal program (e.g., HyperTerminal), and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
4. Press ENTER, and at the prompts, enter your user name and password.

Main Screen

Example main screen

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



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


American Power Conversion               Network Management Card AOS    vx.x.x
(c) Copyright 2007 All Rights Reserved  Rack PDU APP                   vx.x.x
-------------------------------------------------------------------------------
Name       : MS3 Test Unit                            Date : 12/14/2008
Contact    : Bill Cooper                              Time : 10:16:58
Location   : Testing Lab                              User : Administrator
Up Time    : 0 Days 0 Hours 43 Minutes                Stat : P+ N+ A+

Metered 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 name identifies the type of device that connects to the network. In the preceding example, the application firmware for the Rack PDU is displayed.

```
Network Management Card AOS      vx.x.x
Rack PDU APP                     vx.x.x
```

- Three fields identify the system name, contact person, and location of the Rack PDU. (In the control console, use the **System** menu to set these values.)

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

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

```
Up Time      : 0 Days 0 Hours 43 Minutes
```

- Two fields identify when you logged in, by date and time.

```
Date: 12/14/2008
Time: 10:16:58
```

- A **User** field identifies whether you logged in through the **Administrator** or **Device Manager** user account. (The **Read-Only User** account cannot access the control console.)

```
User : Administrator
```

Main screen status fields.

- A **Stat** field reports the 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 Rack PDU failed to connect to the network.
N!	Another device is using the Rack PDU IP address.
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 P+ is not displayed, contact APC support staff. See APC Worldwide Customer Support.

- The field that indentifies the Rack PDU model and name also reports the operating status of the Rack PDU.

```
Metered Rack PDU: Communication Established
```

Control Console Menus

How to use control console menus

The menus in the control console list options by number and name. To use an option, type the option's number, press ENTER, and follow any on-screen instructions. If you use an option that changes a setting or value, select **Accept Changes** to save your change before you exit the menu.

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.

For information about the event log, see Indirect Notification Through Logs or Queries.

Main Menu

Use the main **Control Console** menu to access the management features of the control console:

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

Note

When you log on as Device Manager (equivalent to Device User in the Web interface), you can access only the **Device Manager** menus, event log, and the **Logout** menu.

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:

- Configure the load thresholds for each phase or bank.
- View the status of the power supply.

Network option

To perform the following tasks, see Administration: Network Features:

- Configure the TCP/IP settings for the Rack PDU or, when the Rack PDU will obtain its TCP/IP settings from a server, configure the settings for the type of server (DHCP or BOOTP) to be used.
- Use the Ping utility.
- Define settings that affect the FTP, Telnet, Web interface and SSL, SNMP, e-mail, DNS, and Syslog features of the Rack PDU.
- Enable or disable the ISX Protocol.

System option

To perform these tasks, see Administration: General Options:

- Control **Administrator** and **Device Manager** access. (You can control **Read-Only User** access by using the Web interface only.)
- Define the **Name**, **Contact**, and **Location** values for the system.
- Set the date and time used by the Rack PDU.
- Through the **Tools** option:
  - Restart the Rack PDU.
  - Reset parameters to their default values.
  - Delete SSH host keys and SSL certificates.

  - Upload an initialization file (.ini file) that has been downloaded from another Rack PDU. The current Rack PDU then uses the values in that .ini file to configure its own settings.
- Access and configure RADIUS information.
- Access system information about the Rack PDU.

Web Interface

Introduction

Supported Web browsers

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

Data verification, the event log, and the data log require that you enable the following for your Web browser:

- JavaScript®
- Java
- Cookies

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

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

How to Log On

Overview

You can use the DNS name or IP address of the Metered Rack for the URL address of the Web interface. Use your case-sensitive user name and password to log on. The default user name differs by account type:

- **apc** for an Administrator
- **device** for a Device Manager
- **readonly** for a Read-Only User

The default password is **apc** for all three account types.

Note If you are using HTTPS as your access protocol, your login credentials are compared with information in a server certificate. If the certificate was created with the APC Security Wizard, and an IP address was specified as the common name in the certificate, you must use an IP address to log on to the Rack PDU. If a DNS name was specified as the common name on the certificate, you must use a DNS name to log on.

See Web (Administration>Network>Web>options) to select, enable, and disable the protocols that control access to the Web interface and to define the Web-server ports for the protocols.

For information about the Web page that appears when you log on to the Web interface, see Home Page.

URL address formats

Type the DNS name or IP address of the Rack PDU in the Web browser's URL address field and press ENTER. When you specify a non-default Web server port in Internet Explorer, you must include `http://` or `https://` in the URL.

Common browser error messages at log-on.

Error Message	Cause of the Error	Browser
"You are not authorized to view this page" or "Someone is currently logged in..."	Someone else is logged on	Internet Explorer, Netscape, Firefox
"The connection was refused..."	Web access is disabled, or the URL was not correct	Netscape
"This page cannot be displayed."		Internet Explorer
"Unable to connect."		Firefox

URL format examples.

- For a DNS name of Web1:
  - `http://Web1` if HTTP is your access mode.
  - `https://Web1` if HTTPS is your access mode.
- For a System IP address of 139.225.6.133 and the default Web server port (80):
  - `http://139.225.6.133` if HTTP is your access mode.
  - `https//139.225.6.133` if HTTPS is your access mode.
- For a System IP address of 139.225.6.133 and a non-default Web server port (5000):
  - `http://139.225.6.133:5000` if HTTP is your access mode.
  - `https://139.225.6.133:5000` if HTTPS is your access mode.

How to Use the Tabs, Menus, and Links

Tabs

In addition to the tab for the **Home** page, the following tabs are displayed. Click a tab to display a set of menu options:

- **Device Manager**: Display Rack PDU status, issue Rack PDU control commands, configure Rack PDU parameters, run diagnostic tests, and view information about the Rack PDU.
- **Logs**: View and configure event and data logs.
- **Administration**: Configure security, network connection, notification, and general settings.

Menus

Left navigation menu. Each tab (except the tab for the home page) has a left navigation menu, consisting of headings and options:

- If a heading has indented option names below it, the heading itself is not a navigational link. Click an option to display or configure parameters.
- If a heading has no indented option names, the heading itself is the navigational link. Click the heading to display or configure parameters.

Top menu bar. The **Home** and **Administration** tabs have a selection of menu options on the top menu bar. The **Security** option is selected by default when you click the **Administration** tab and the **Overview** option is selected when you click the **Home** tab.

Clicking an option on the top menu bar displays the left navigation menu for that option, with the first menu item selected by default.

Quick Links

At the lower left on each page of the interface, there are three configurable links. By default, the links access the URLs for these Web pages:

- **Link 1**: The home page of the APC Web site.
- **Link 2**: Demonstrations of APC Web-enabled products.
- **Link 3:** Information on APC Remote Monitoring Services.

To reconfigure the links, see Configure Links (Administration>General>Quick Links).

Home Page

Overview

On the **Home** page of the interface, displayed when you log on, you can view active alarm conditions and the most recent events recorded in the event log.

Quick status icons

At the upper right corner of every page, one or more icons and accompanying text indicate the current operating status of the Rack PDU:

✖	**Critical**: A critical alarm exists, which requires immediate action.
⚠	**Warning**: An alarm condition requires attention and could jeopardize your data or equipment if its cause is not addressed.
✓	**No Alarms**: No alarms are present, and the Rack PDU is operating normally.

At the upper right corner of every page, the Web interface displays the same icons currently displayed on the **Home** page to report Rack PDU status:

- The **No Alarms** icon if no alarms exist.
- One or both of the other icons (**Critical** and **Warning)** if any alarms exist, and after each icon, the number of active alarms of that severity.

To return to the **Home** page to view its summary of Rack PDU status, including the active alarms, click a quick status icon on any page of the interface.

Active Alarms

The **Active Alarms** section displays any alarms present. If no alarms are present, “No Device-Level Alarms Present” will be displayed. If an alarm is present, the alarm and its description will be displayed. Click the displayed alarm to view the **Device Alarm Status** page which includes a description and severity level for each alarm present. Alternately, access the **Device Alarm Status** page by selecting the **Home** tab, then the top menu bar option **Alarm Status**.

Load Status

On the **Home** page, **Load Status** displays a graph depicting the current load status of the Rack PDU. The colors green, yellow, and red signify the **Load Thresholds** set by the user. The graphic is accompanied by the measurement of the load in Amps, and a link to **Load Management** in the **Device Manager** tab.

Metered Rack PDU Parameters

The **Metered Rack PDU Parameters** section displays the name, contact information, location, current rating, type of user account accessing the Rack PDU, and the amount of time the Rack PDU has been operating.

Recent Device Events

On the **Home** page, **Recent Device Events** displays, in reverse chronological order, the events that occurred most recently and the dates and times they occurred. A maximum of five events are shown at one time. Click **More Events** to view the entire event log.

Additional information on the Home page

The IP address displays in the upper left corner.

A context-sensitive **Help** link and **Log off** link are displayed in the upper right corner of the **Home** page.

Selecting a menu to perform a task

- To do the following, see Rack PDU Settings:
  - Configure the overload thresholds for each phase or bank.
  - Set the **Name** and **Location** of the Rack PDU.
  - Set the names and associated Web links for the banks.
- To do the following, see Configuring event actions:
  - 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 receives e-mail notification and Syslog messages for events.
  - Test e-mail settings.
- To do the following, see Data log (Logs>Data>options):
  - Access the data log.
  - Define the log interval (how often data will be sampled and recorded) for the data log.
- To do the following, see Administration: Network Features:
  - Configure new TCP/IP settings for the Rack PDU.
  - Identify the Domain Name System (DNS) Server, test its network connection, and enable or disable DNS Reverse Lookup Event Logging (which logs the domain name of the device associated with each event).
  - Define settings for FTP, Telnet, SSH, the Web interface (HTTP and HTTPS), SNMP, and e-mail.
  - Configure the Rack PDU's Syslog message feature.

- To do the following, see Administration: General Options:
  - Control **Administrator**, **Device User**, and **Read-Only User** access.
  - Define the system **Name**, **Contact**, and **Location** values.
  - Set the date and time used by the Rack PDU.
  - Restart the 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 Configure Links (Administration>General>Quick Links).

Device Manager Menus

Device Manager Tab

The **Device Manager** tab contains load and outlet configurations and settings for your Rack PDU. The **Load Management** menu item displays by default.

Load management

The left navigation menu option **Load Management**, under the **Device Manager** tab, displays both the load status the Rack PDU is supporting and configurable fields to set the **Load Thresholds** for the banks or phases of the Rack PDU.

The graph displays the load the Rack PDU is supporting. The graph is accompanied by the measurement of the load in Amps. Alarms associated with the load are displayed next to the graph.

The following alarms can be set through the **Load Management** menu: **Overload Alarm**, **Near Overload Warning**, and **Low Load Warning**.

Outlet Current Management (High Density PDUs only)

Use the **Outlet Current Management** menu to specify **Overload**, **Nearload**, and **Lowload** thresholds for each outlet. The outlets are listed by their phase, name and load.

To configure outlet names, see Outlet Name Configuration (High Density PDUs only).

Change the outlets to the preferred load and click **Apply** to save changes or **Cancel** to exit without saving the changes.

Outlet Name Configuration (High Density PDUs only)

Edit the name of each outlet and click **Apply** to save changes or **Cancel** to exit without saving the changes.

Rack PDU Settings

Configuring load thresholds

Web interface.

1. Select the **Device Manager** tab from the navigation menu. The **Load Management** left navigation menu option opens by default when the **Device Manager** tab is selected.
2. Set the thresholds for each phase or bank. The configurable thresholds are **Overload Alarm Threshold**, **Near Overload Warning Threshold**, and **Low Load Warning Threshold** for each phase or bank.
3. Click **Apply** to set the selected values.

Control console.

1. From the **Device Manager** menu, select **Phase Management/Bank Management**.
2. Select a phase or bank (for 3-phase units).
3. Select a threshold to configure: **Overload Alarm Threshold (amps)**, **Near Overload Warning Threshold (amps)**, or **Low Load Warning Threshold (amps)**.

To set the low load warning threshold, see Setting the Low Load Warning Threshold.

4. Select **Accept Changes**.

Setting	Description
Overload Alarm Threshold	Set the number of amps that will cause an overload of this phase or bank.

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

Setting the Low Load Warning Threshold

Note

With factory default settings, the Rack PDU generates a warning alarm when any bank exceeds 16 Amps, and generates a critical alarm when any bank exceeds 20 Amps. However, if a circuit breaker trips, there is no definitive indication that the circuit breaker is open, other than that the current for that bank will drop. Set the **Low Load Warning Threshold** to **2 Amps** for these reasons:

- The default setting for the **Low Load Warning Threshold** is 0 Amps. This effectively disables the warning. With a setting of 0 Amps for the **Low Load Warning Threshold**, the Web interface will not indicate that a circuit breaker may have tripped.
- A 2-Amp detection threshold will help to indicate that a circuit breaker may have tripped.

Web interface.

1. Select the **Device Manager** tab, or click **More** in the **Load Status** section of the **Home** page.
2. Set the **Low Load Warning Threshold** for each bank or phase to **2 Amps.**
3. Click **Apply** in each bank or phase section to set the selected values.

Configuring device settings

To configure device settings, see Administration: General Options.

Web interface. Select the **Administration** tab from the navigation menu, and select **General** from the top menu bar. Select **Identification** from the left navigation menu to configure the **Device Name**, **Device Contact**, and **Device Location** fields for the Rack PDU (which are equivalent to the **Name** and **Location** fields in the control console).

Control console.

To change the **Contact** field in addition to the **Name** and **Location** fields in the control console, see System option.

Setting	Description
Name	Set the name of the Rack PDU.
Location	Set the location of the Rack PDU.
Contact	Set the name of the person to contact about the Rack PDU.

View Internal Power Supply Status (control console only)

Select **Power Supply Status** from the **Device Manager** menu to display the status of the power supply for the Rack PDU.

Administration: Security

Local Users

Setting user access (Administration>Security>Local Users>*options*)

You set the case-sensitive user name and password for each account type in the same manner. Maximum length for the user name and password is 32 characters.

For information on the permissions granted to each account type (Administrator, Device User, and Read-Only User), see Types of user accounts.

Account Type	Default User Name	Default Password	Permitted Access
Administrator	apc	apc	Web Interface and Control Console
Device User	device	apc	
Read-Only User	readonly	apc	Web Interface only

Remote Users

Authentication (Administration>Security>Remote Users>Authentication Method)

Use this option to select how to administer remote access to the Rack PDU.

See also

For information about local authentication (not using the centralized authentication of a RADIUS server), see the *Security Handbook,* available on the APC Metered Rack PDU *Utility* CD and on the APC Web site at **www.apc.com**.

APC supports the authentication and authorization functions of RADIUS (Remote Authentication Dial-In User Service).

- When a user accesses the Rack PDU that has RADIUS enabled, an authentication request is sent to the RADIUS server to determine the user's permission level.
- RADIUS user names used with the Rack PDU are limited to 32 characters.

Select one of the following:

- **Local Authentication Only**: RADIUS is disabled. Local authentication is enabled.
- **RADIUS, then Local Authentication**: RADIUS and local authentication are enabled. Authentication is requested from the RADIUS server first. If the RADIUS server fails to respond, local authentication is used.
- **RADIUS Only**: RADIUS is enabled. Local authentication is disabled.

Caution If **RADIUS Only** is selected, and the RADIUS server is unavailable, improperly identified, or improperly configured, you must use a serial connection to the control console and change the **Access** setting to **Local Authentication Only** or **RADIUS, then Local Authentication** to regain access.

RADIUS (Administration>Security>Remote Users>RADIUS)

Use this option to do the following:

- List the RADIUS servers (a maximum of two) available to the Rack PDU, and the time-out period for each.
- Click **Add Server**, and configure the parameters for authentication by a new RADIUS server.
- Click a listed RADIUS server to display and modify its parameters.

RADIUS Setting	Definition
RADIUS Server	The server name or IP address of the RADIUS server. **NOTE:** RADIUS servers use port 1812 by default to authenticate users. To use a different port, add a colon followed by the new port number to the end of the RADIUS server name or IP address.

RADIUS Setting	Definition
Secret	The shared secret between the RADIUS server and the Rack PDU.
Timeout	The time, in seconds, that the Rack PDU waits for a response from the RADIUS server.
Test Settings	Enter the Administrator user name and password to test the RADIUS server path that you have configured.
Skip Test and Apply	Do not test the RADIUS server path.
Switch Server Priority	Change which RADIUS server will authenticate users if two configured servers are listed and **RADIUS, then Local Authentication** or **RADIUS Only** is the enabled authentication method.

Configure the RADIUS Server

Summary of the configuration procedure

You must configure your RADIUS server to work with the Rack PDU.

See also

For examples of the RADIUS users file with Vendor Specific Attributes (VSAs) and an example of an entry in the dictionary file on the RADIUS server, see the APC *Security Handbook*.

1. Add the IP address of the Rack PDU to the RADIUS server client list (file).
2. Users must be configured with Service-Type attributes unless Vendor Specific Attributes (VSAs) are defined. If no Service-Type attributes are configured, users will have read-only access (on the Web interface only).

   See also

   See your RADIUS server documentation for information about the RADIUS users file, and see the APC *Security Handbook* for an example.

3. Vendor Specific Attributes (VSAs) can be used instead of the Service-Type attributes provided by the RADIUS server. VSAs require a dictionary entry and a RADIUS users file. In the dictionary file, define the names for the ATTRIBUTE and

VALUE keywords, but not for the numeric values. If you change numeric values, RADIUS authentication and authorization will fail. VSAs take precedence over standard RADIUS attributes.

Configuring a RADIUS server on UNIX® with shadow passwords

If UNIX shadow password files are used (/etc/passwd) with the RADIUS dictionary files, the following two methods can be used to authenticate users:

- If all UNIX users have administrative privileges, add the following to the RADIUS “user” file. To allow only Device Users, change the APC-Service-Type to **`Device`**.

```
DEFAULT      Auth-Type = System
             APC-Service-Type = Admin
```

- Add user names and attributes to the RADIUS “user” file, and verify the password against /etc/passwd. The following example is for users **`bconners`** and **`thawk`**:

```
bconners      Auth-Type = System
              APC-Service-Type = Admin
thawk         Auth-Type = System
              APC-Service-Type = Device
```

Supported RADIUS servers

APC supports FreeRADIUS and Microsoft IAS Server. Other commonly available RADIUS applications may work but have not been fully tested by APC.

Inactivity Timeout (Administration>Security>Auto Log Off)

Use this option to configure the time (3 minutes by default) that the system waits before logging off an inactive user. If you change this value, you must log off for the change to take effect.

Note

This timer continues to run if a user closes the browser window without first logging off by clicking **Log Off** at the upper right. Because that user is still considered to be logged on, no user of that account type can log on until the time specified as **Minutes of Inactivity** expires. For example, with the default value for **Minutes of Inactivity**, if a Device User closes the browser window without logging off, no Device User can log on for 3 minutes.

Administration: Network Features

TCP/IP and Communication Settings

TCP/IP settings (Administration>Network>TCP/IP)

The **TCP/IP** option on the left navigation menu, selected by default when you choose **Network** on the top menu bar, displays the current IP address, subnet mask, default gateway, and MAC address of the Rack PDU.

On the same page, **TCP/IP Configuration** provides the following options for how the TCP/IP settings will be configured when the Rack PDU turns on, resets, or restarts: **Manual**, **BOOTP**, **DHCP**, and **DHCP & BOOTP**.

See also

For information on DHCP and DHCP options, see **RFC2131** and **RFC2132**.

Setting	Description
Manual	The IP address, subnet mask, and default gateway must be configured manually. Click **Next>>**, and enter the new values.
BOOTP	A BOOTP server provides the TCP/IP settings. At 32-second intervals, the Rack PDU requests network assignment from any BOOTP server: • If it receives a valid response, it starts the network services. • If it finds a BOOTP server, but a request to that server fails or times out, the Rack PDU stops requesting network settings until it is restarted. • By default, if previously configured network settings exist, and the Rack PDU receives no valid response to five requests (the original and four retries), it uses the previously configured settings so that it remains accessible. Click **Next>>** to access the BOOTP Configuration page to change the number of retries or the action to take if all retries fail [1]: • **Maximum retries**: Enter the number of retries that will occur when no valid response is received, or zero (0) for an unlimited number of retries. • **If retries fail**: Select **Use prior settings** (the default) or **Stop BOOTP request**.
DHCP	At 32-second intervals, the Rack PDU requests a network assignment from any DHCP server. By default, the number of retries is unlimited. • If the Rack PDU receives a valid response, by default it requires the APC cookie from the DHCP server in order to accept the lease and start the network services. • If it finds a DHCP server, but the request to that server fails or times out, the Rack PDU stops requesting network settings until it is restarted. To change these values, click **Next>>** for the **DHCP Configuration** page[1]: • **Require vendor specific cookie to accept DHCP Address**: Disable or enable the requirement that the DHCP server provide the APC cookie. • **Maximum retries**: Enter the number of retries that will occur when no valid response is received, or zero (0) for an unlimited number of retries.
1. The default values for these three settings on the configuration pages generally do not need to be changed: •**Vendor Class**: APC •**Client ID**: The MAC address of the Rack PDU, which uniquely identifies it on the local area network (LAN) •**User Class**: The name of the application firmware module	

Setting	Description
DHCP & BOOTP	The default setting. The Rack PDU tries to obtain its TCP/IP settings from a BOOTP server first, and then, if it cannot discover a BOOTP server, from a DHCP server. If it obtains its TCP/IP settings from either server, it switches this setting to **BOOTP** or **DHCP**, depending on the type of server that supplied the TCP/IP settings to the Rack PDU. Click **Next>>** to configure the same settings that are on the **BOOTP Configuration** and **DHCP Configuration** pages[1] and to specify that the **DHCP and BOOTP** setting be retained after either type of server provides the TCP/IP values.

[1] The default values for these three settings on the configuration pages generally do not need to be changed:
•**Vendor Class**: APC
•**Client ID**: The MAC address of the Rack PDU, which uniquely identifies it on the local area network (LAN)
•**User Class**: The name of the application firmware module

DHCP response options

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

Vendor Specific Information (option 43). The Rack PDU uses this option in a DHCP response to determine whether the DHCP response is valid. This option contains up to two APC-specific options in a TAG/LEN/DATA format: the APC Cookie and the Boot Mode Transition.

- **APC Cookie. Tag 1, Len 4, Data "1APC"**
  Option 43 communicates to the Rack PDU that a DHCP server is configured to service APC devices. By default, this DHCP response option must contain the APC cookie for the Rack PDU to accept the lease.

To disable the requirement of an APC cookie, see DHCP.

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 option **Remain in DHCP & BOOTP mode after accepting TCP/IP settings**, which, by default, is disabled.
  - A data value of 1 enables the option **Remain in DHCP & BOOTP mode after accepting TCP/IP settings**. Whenever the Rack PDU reboots, it will request its network assignment first from a BOOTP server, and then, if necessary, from a DHCP server.
  - A data value of 2 disables the option **Remain in DHCP & BOOTP mode after accepting TCP/IP settings**. The **TCP/IP Configuration** setting option switches to **DHCP** when the Rack PDU accepts the DHCP response. Whenever the Rack PDU reboots, it will request its network assignment from a DHCP server only.

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

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

TCP/IP options. The Rack PDU uses the following options within a valid DHCP response to define its TCP/IP settings. All of these options except the first are described in **RFC2132**.

- **IP Address** (from the **yiaddr** field of the DHCP response, described in **RFC2131)**: The IP address that the DHCP server is leasing to the Rack PDU.
- **Subnet Mask** (option 1): The Subnet Mask value that the Rack PDU needs to operate on the network.
- **Router,** i.e., Default Gateway (option 3): The default gateway address that the Rack PDU needs to operate on the network.
- **IP Address Lease Time** (option 51): The time duration for the lease of the IP Address to the Rack PDU.
- **Renewal Time, T1** (option 58): The time that the Rack PDU must wait after an IP address lease is assigned before it can request a renewal of that lease.

- **Rebinding Time, T2** (option 59): The time that the Rack PDU must wait after an IP address lease is assigned before it can seek to rebind that lease.

Other options. The Rack PDU also uses these options within a valid DHCP response. All of these options except the last are described in **RFC2132**.

- **Network Time Protocol Servers** (option 42): Up to two Network Time Protocol Servers (NTP) (primary and secondary) that the Rack PDU can use.
- **Time Offset** (option 2): The offset of the Rack PDU's subnet, in seconds, from Coordinated Universal Time (UTC).
- **Domain Name Server** (option 6): Up to two Domain Name System (DNS) servers (primary and secondary) that the Rack PDU can use.
- **Host Name** (option 12): The host name that the Rack PDU will use (32-character maximum length).
- **Domain Name** (option 15): The domain name that the Rack PDU will use (64-character maximum length).
- **Boot File Name** (from the **file** field of the DHCP response, described in **RFC2131**): The fully qualified directory-path to an APC user configuration file (.ini file) to download. The **siaddr** field of the DHCP response specifies the IP address of the server from which the Rack PDU will download the .ini file. After the download, the Rack PDU uses the .ini file as a boot file to reconfigure its settings.

Port Speed (Administration>Network>Port Speed)

The **Port Speed** setting defines the communication speed of the TCP/IP port.

- For **Auto-negotiation** (the default), Ethernet devices negotiate to transmit at the highest possible speed, but if the supported speeds of two devices are unmatched, the slower speed is used.
- Alternatively, you can choose 10 Mbps or 100 Mbps, each with the option of half-duplex (communication in only one direction at a time) or full-duplex (communication in both directions on the same channel simultaneously).

DNS (Administration>Network>DNS>*options*)

Use the options under **DNS** on the left navigation menu to configure and test the Domain Name System (DNS):

Servers. Select **servers** to specify the IP addresses of the primary and optional secondary DNS server. For the Rack PDU to send e-mail, at least the IP address of the primary DNS server must be defined.

- The Rack PDU waits up to 15 seconds for a response from the primary DNS server or the secondary DNS server (if a secondary DNS server is specified). If the Rack PDU does not receive a response within that time, e-mail cannot be sent. Therefore, use DNS servers on the same segment as the Rack PDU or on a nearby segment (but not across a wide-area network [WAN]).

To verify that DNS is working correctly after you define the IP addresses of the DNS servers, see Test.

Naming. Select **naming** to define the host name and domain name of the Rack PDU:

- **Host Name**: After you configure a host name here and a domain name in the **Domain Name** field, users can enter a host name in any field in the Rack PDU interface (except e-mail addresses) that accepts a domain name.
- **Domain Name**: You need to configure the domain name here only. In all other fields in the Rack PDU interface (except e-mail addresses) that accept domain names, the Rack PDU adds this domain name when only a host name is entered.
  - To override all instances of the expansion of a specified host name by the addition of the domain name, set the domain name field to its default, `somedomain.com`, or to `0.0.0.0`.
  - To override the expansion of a specific host name entry (for example, when defining a trap receiver), include a trailing period. The Rack PDU recognizes a host name with a trailing period (such as *`mySnmpServer.`*) as if it were a fully qualified domain name and does not append the domain name.

Test. Select **test** to send a DNS query that tests the setup of your DNS servers:

- As **Query Type**, select the method to use for the DNS query:
  - **by Host**: the URL name of the server
  - **by FQDN**: the fully qualified domain name
  - **by IP**: the IP address of the server
  - **by MX**: the Mail Exchange used by the server
- As **Query Question**, identify the value to be used for the selected query type:

Query Type Selected	Query Question to Use
by Host	The URL
by FQDN	The fully qualified domain name, *my_server.my_domain*.com.
by IP	The IP address
by MX	The Mail Exchange address

- View the result of the test DNS request in the **Last Query Response** field.

Web (Administration>Network>Web>*options*)

Option	Description

access	To activate changes to any of these selections, log off from the Rack PDU:
	• **Disable**: Disables access to the Web interface. (You must use the control console to re-enable access. Select **Network** and **Web/SSL/TLS**. Then for HTTP, select **Access** and **Enabled**. For HTTPS access, also select **Web/SSL** and **Enabled**.)
	• **Enable HTTP** (the default): Enables Hypertext Transfer Protocol (HTTP), which provides Web access by user name and password, but does not encrypt user names, passwords, and data during transmission.
	• **Enable HTTPS**: Enables Hypertext Transfer Protocol (HTTPS) over Secure Sockets Layer (SSL). SSL encrypts user names, passwords, and data during transmission, and authenticates the Rack PDU by digital certificate. When HTTPS is enabled, your browser displays a small lock icon.
	See “Creating and Installing Digital Certificates” in the *Security Handbook* on the Metered Rack PDU *Utility* CD to choose among the several methods for using digital certificates.
	HTTP Port: The TCP/IP port (80 by default) used to communicate by HTTP with the Rack PDU.
	HTTPS Port: The TCP/IP port (443 by default) used to communicate by HTTPS with the Rack PDU.
	For either of these ports, you can change the port setting to any unused port from 5000 to 32768 for additional security. Users must then use a colon (:) in the address field of the browser to specify the port number. For example, for a port number of 5000 and an IP address of 152.214.12.114:
	`http://152.214.12.114:5000`
	`https://152.214.12.114:5000`

ssl cipher suites	Enable or disable any of the SSL encryption ciphers and hash algorithms: • **DES**: A block cipher that provides authentication by Secure Hash Algorithm. • **RC4_MD5** (enabled by default): A stream cipher that provides authentication by MD5 hash algorithm. • **RC4_SHA** (enabled by default): A stream cipher that provides authentication by Secure Hash Algorithm. • **3DES**: A block cipher that provides authentication by Secure Hash Algorithm.

Option	Description
ssl certificate	Add, replace, or remove a security certificate. **Status**: • **Not installed**: A certificate is not installed, or was installed by FTP or SCP to an incorrect location. Using **Add or Replace Certificate File** installs the certificate to the correct location, **/sec** on the Rack PDU. • **Generating**: The Rack PDU is generating a certificate because no valid certificate was found. • **Loading**: A certificate is being activated on the Rack PDU. • **Valid certificate**: A valid certificate was installed or was generated by the Rack PDU. Click on this link to view the certificate's contents. **If you install an invalid certificate, or if no certificate is loaded when you enable SSL, the Rack PDU generates a default certificate, a process which delays access to the interface for up to five minutes.** You can use the default certificate for basic encryption-based security, but a security alert message displays whenever you log on. **Add or Replace Certificate File**: Enter or browse to the certificate file created with the Security Wizard. See "Creating and Installing Digital Certificates" in the *Security Handbook* on the Metered Rack PDU *Utility* CD to choose a method for using digital certificates created by the Security Wizard or generated by the Rack PDU. **Remove**: Delete the current certificate.

Console (Administration>Network>Console>*options*)

Option	Description

access	Choose one of the following for access by Telnet or SSH:
	• **Disable**: Disables all access to the control console.
	• **Enable Telnet** (the default): Telnet transmits user names, passwords, and data without encryption.
	• **Enable SSH v1 and v2**: Do not enable both versions 1 and 2 of SSH unless you require both. They use extensive processing power.
	• **Enable SSH v1 only**: SSH version 1 encrypts user names, passwords, and data for transmission. There is little or no delay as you log on.
	• **Enable SSH v2 only**: SSH version 2 transmits user names, passwords, and data in encrypted form with more protection than version 1 from attempts to intercept, forge, or alter data during transmission. There is a noticeable delay as you log on.
	Configure the ports to be used by these protocols:
	• **Telnet Port**: The Telnet port used to communicate with the Rack PDU (23 by default). You can change the port setting to any unused port from 5000 to 32768 for additional security. Users must then use a colon (:) or a space, as required by your Telnet client program, to specify the non-default port. For example, for port 5000 and an IP address of 152.214.12.114, your Telnet client requires one of the these commands:
	`telnet 152.214.12.114:5000`
	`telnet 152.214.12.114 5000`
	• **SSH Port**: The SSH port used to communicate with the Rack PDU (22 by default). You can change the port setting to any unused port from 5000 to 32768 for additional security. See the documentation for your SSH client for the command line format required to specify a non-default port.

ssh encryption	Enable or disable encryption algorithms (block ciphers) compatible with SSH version 1 or version 2 clients: If your SSH v1 client cannot use **Blowfish**, you must also enable **DES**. Your SSH v2 client selects the enabled algorithm that provides the highest security. If the client cannot use the default algorithms (**3DES** or **Blowfish**), enable an AES algorithm that it can use (**AES 128** or **AES 256**).

Option	Description
ssh host key	**Status** indicates the status of the host key (private key): • **SSH Disabled: No host key in use:** When disabled, SSH cannot use a host key. • **Generating**: The Rack PDU is creating a host key because no valid host key was found. • **Loading**: A host key is being activated on the Rack PDU. • **Valid**: One of the following valid host keys is in the **/sec** directory (the required location on the Rack PDU): •A 1024-bit host key created by the APC Security Wizard. •A 768-bit RSA host key generated by the Rack PDU. **Add or Replace**: Browse to and upload a host key file created by the Security Wizard: If you use FTP or SCP instead to transfer the host key file, you must specify the **/sec** directory as the target location in the command. To use the APC Security Wizard, see the *Security Handbook* on the Metered Rack PDU *Utility* CD. **NOTE:** To reduce the time required to enable SSH, create and upload a host key in advance. **If you enable SSH with no host key loaded, the Rack PDU takes up to 5 minutes to create a host key, and the SSH server is not accessible during that time.** **Remove**: Remove the current host key.

Note

To use SSH, you must have an SSH client installed. Most Linux and other UNIX® platforms include an SSH client, but Microsoft Windows operating systems do not. Clients are available from various vendors.

SNMP

SNMPv1 (Administration>Network>SNMPv1>*options*)

All user names, passwords, and community names for SNMP are transferred over the network as plain text. If your network requires the high security of encryption, disable SNMP access or set the access for each community to Read. (A community with Read access can receive status information and use SNMP traps.)

When using InfraStruXure Manager or Central to manage a Rack PDU on the public network of an InfraStruXure system, you must have SNMP enabled in the Rack PDU interface. Read access will allow InfraStruXure Manager or Central to receive traps from a Rack PDU, but Write access is required while you use the interface of the Rack PDU to set InfraStruXure Manager or Central as a trap receiver.

See also

For detailed information on enhancing and managing the security of your system, see the *Security Handbook*, available on the Metered Rack PDU *Utility* CD or from the APC Web site, **www.apc.com**.

Option	Description
access	**Enable SNMPv1 Access:** Enables SNMP version 1 as a method of communication with this device.

Option	Description
access control	You can configure up to four access control entries to specify which Network Management Systems (NMS) have access to this device. The opening page for access control, by default, assigns one entry to each of the four available SNMPv1 communities, but you can edit these settings to apply more than one entry to any community to grant access by several specific IP addresses, host names, or IP address masks. To edit the access control settings for a community, click its community name. • If you leave the default access control entry unchanged for a community, that community has access to this device from any location on the network. • If you configure multiple access control entries for one community name, the limit of four entries requires that one or more of the other communities must have no access control entry. If no access control entry is listed for a community, that community has no access to this device. **Community Name:** The name that an NMS must use to access the community. The maximum length is 15 ASCII characters, and the default community names for the four communities are "public," "private," "public2," and "private2." **NMS IP/Host Name:** The IP address, IP address mask, or host name that controls access by NMSs. A host name or a specific IP address (such as 149.225.12.1) allows access only by the NMS at that location. IP addresses that contain 255 restrict access as follows: • 149.225.12.255: Access only by an NMS on the 149.225.12 segment. • 149.225.255.255: Access only by an NMS on the 149.225 segment. • 149.255.255.255: Access only by an NMS on the 149 segment. • 0.0.0.0 (the default setting) which can also be expressed as 255.255.255.255: Access by any NMS on any segment. **Access Type**: The actions an NMS can perform through the community. • **Read**: GETS only, at any time • **Write**: GETS at any time, and SETS when no user is logged onto the Web interface or Control Console. • **Write+**: GETS and SETS at any time. • **Disabled**: No GETS or SETS at any time.

SNMPv3 (Administration>Network>SNMPv3>*options*)

For SNMP GETs, SETs, and 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.

Note

To use SNMPv3, you must have a MIB program that supports SNMPv3.

The Rack PDU supports only MD5 authentication and DES encryption.

Option	Description
access	**SNMPv3 Access:** Enables SNMPv3 as a method of communication with this device.
user profiles	By default, lists the settings of four user profiles, configured with the user names "apc snmp profile1" through "apc snmp profile 4," and no authentication and no privacy (no encryption of data). To edit the following settings for a user profile, click a user name in the list. **User Name:** The identifier of the user profile. SNMP version 3 maps GETs, SETs, and traps to a user profile by matching the user name of the profile to the user name in the data packet being transmitted. A user name can have up to 32 ASCII characters. **Authentication Passphrase:** A phrase of 15 to 32 ASCII characters that verifies that the NMS communicating with this device through SNMPv3 is the NMS it claims to be, that the message has not been changed during transmission, and that the message was communicated in a timely manner, indicating that it was not delayed and that it was not copied and sent again later at an inappropriate time. **Privacy Passphrase:** A phrase of 15 to 32 ASCII characters that ensures the privacy of the data (by means of encryption) that an NMS is sending to this device or receiving from this device through SNMP v3. **Authentication Protocol**: The APC implementation of SNMPv3 supports MD5 authentication. Authentication will not occur unless MD5 is selected here. **Privacy Protocol:** The APC implementation of SNMPv3 supports DES as the protocol for encrypting and decrypting data. Privacy of transmitted data requires that DES is selected here. **Note:** You cannot select the privacy protocol if no authentication protocol is selected.

Option	Description
access control	You can configure up to four access control entries to specify which NMSs have access to this device. The opening page for access control, by default, assigns one entry to each of the four user profiles, but you can edit these settings to apply more than one entry to any user profile to grant access by several specific IP addresses, host names, or IP address masks. • If you leave the default access control entry unchanged for a user profile, all NMSs that use that profile have access to this device. • If you configure multiple access entries for one user profile, the limit of four entries requires that one or more of the other user profiles must have no access control entry. If no access control entry is listed for a user profile, no NMS that uses that profile has any access to this device. To edit the access control settings for a user profile, click its user name. **Access:** Mark the **Enable** checkbox to activate the access control specified by the parameters in this access control entry. **User Name:** Select from the drop-down list the user profile to which this access control entry will apply. The choices available are the four user names that you configure through the **user profiles** option on the left navigation menu. **NMS IP/Host Name:** The IP address, IP address mask, or host name that controls access by the NMS. A host name or a specific IP address (such as 149.225.12.1) allows access only by the NMS at that location. An IP address mask that contains 255 restricts access as follows: • 149.225.12.255: Access only by an NMS on the 149.225.12 segment. • 149.225.255.255: Access only by an NMS on the 149.225 segment. • 149.255.255.255: Access only by an NMS on the 149 segment. • 0.0.0.0 (the default setting) which can also be expressed as 255.255.255.255: Access by any NMS on any segment.

FTP Server (Administration>Network>FTP Server)

The **FTP Server** settings enable (by default) or disable access to the FTP server and specify the TCP/IP port (21 by default) that the FTP server uses to communicate with the Rack PDU. The FTP server uses both the specified port and the port one number lower than the specified port.

You can change the **Port** setting to the number of any unused port from 5001 to 32768 for added security. Users must then use a colon (:) to specify the non-default port number. For example, for port 5001 and IP address 152.214.12.114, the command would be `ftp 152.214.12.114:5001`.

Note

FTP transfers files without encryption. For higher security, disable the FTP server, and transfer files with SCP. Selecting and configuring SSH enables SCP automatically.

At any time that you want a Rack PDU to be accessible for management by InfraStruXure Manager or Central, FTP Server must be enabled.

See also

For detailed information on enhancing and managing the security of your system, see the *Security Handbook*, available on the Metered Rack PDU *Utility* CD or from the APC Web site, **www.apc.com**.

WAP (Administration>Network>WAP)

Wireless Application Protocol (WAP) allows the monitoring of the Rack PDU with cellular phones, pagers, and other handheld devices. It is a standard for providing cellular phones, pagers, and other handheld devices with secure access to e-mail and text-based Web pages. WAP runs on all major wireless networks and is device-independent so that it can be used with many phones and handheld devices.The **Enable WAP Access** checkbox (enabled by default) enables or disables the WAP access of the Rack PDU**.**

Administration: Notification and Logging

Event Actions (Administration>Notification>Event Actions>*options*)

Types of notification

You can configure event actions to occur in response to an event or group of events. These actions notify users of the event in any of several ways:

- Active, automatic notification. The specified users or monitoring devices are contacted directly.
  - E-mail notification
  - SNMPv1 and SNMPv3 traps
  - Syslog notification
- Indirect notification in the event log. If no direct notification is configured, users must check the log to determine which events have occurred.

For another method of indirect notification, see SNMP for SNMPv1 and SNMPv3 setup and configuration. SNMPv1 enables an NMS to perform informational queries. Configuring the most restrictive SNMP access type, READ, enables informational queries without the risk of allowing remote configuration changes. SNMPv3 uses a system of user profiles to communicate with a MIB software program to perform GETs, SETs, and receive traps.

You can also log system performance data to use for device monitoring. See Data log (Logs>Data>options) for information on how to configure and use this data logging option.

Configuring event actions

Notification parameters. For events that have an associated clearing event, you can also set the following parameters as you configure events individually or by group, as described in the next two sections. To access the parameters, click the receiver or recipient name.

Parameter	Description
Delay x time before sending	If the event persists for the specified time, notification is sent. If the condition clears before the time expires, no notification is sent.
Repeat at an interval of *x* time	The notification is sent at the specified interval (e.g., every 2 minutes).
Up to *x* times	During an active event, the notification repeats for this number of times.
Until condition clears	The notification is sent repeatedly until the condition clears or is resolved.

Configuring by event. To define event actions for an individual event:

1. Select the **Administration** tab, **Notification** on the top menu bar, and **by event** under **Event Actions** on the left navigation menu.
2. In the list of events, review the marked columns to see whether the action you want is already configured. (By default, logging is configured for all events.)
3. To view or change the current configuration, such as recipients to be notified by e-mail or paging, or Network Management Systems (NMSs) to be notified by SNMP traps, click on the event name.

❗ If no Syslog server is configured, items related to Syslog configuration are not displayed.

When viewing details of an event's configuration, you can change the configuration, enable or disable event logging or Syslog, or disable notification for specific e-mail recipients, trap receivers, or paging recipients, but you cannot add or remove recipients or receivers. To add or remove recipients or receivers, see the following:

- Identifying Syslog Servers (Logs>Syslog>servers)
- E-mail recipients (Administration>Notification>E-mail>recipients)
- Indirect Notification Through Logs or Queries
- Trap Receivers (Administration>Notification>SNMP Traps>trap receivers)

Configuring by group. To configure a group of events simultaneously:

1. Select the **Administration** tab, **Notification** on the top menu bar, and **by group** under **Event Actions** on the left navigation menu.
2. Choose how to group events for configuration:

   –Choose **Grouped by severity**, and then select all events of one or more severity levels. You cannot change the severity of an event.

   –Choose **Grouped by category**, and then select all events in one or more pre-defined categories.
3. Click **Next>>** to move from page to page to do the following:

   a. Select event actions for the group of events.

   •To choose any action except **Logging** (the default), you must first have at least one relevant recipient or receiver configured.

   •If you choose **Logging** and have configured a Syslog server, select **Event Log** or **Syslog** (or both) on the next page.

   b. Select whether to leave the newly configured event action enabled for this group of events or to disable the action.

Active, Automatic, Direct Notification

E-mail notification

Overview of setup. 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, optionally, the secondary Domain Name System (DNS) servers.

See DNS (Administration>Network>DNS>options).

- The IP address or DNS name for **SMTP Server** and **From Address.**

See SMTP (Administration>Notification>E-mail>server).

- The e-mail addresses for a maximum of four recipients.

See E-mail recipients (Administration>Notification>E-mail>recipients).

You can use the **To Address** setting of the **recipients** option to send e-mail to a text-based pager.

SMTP (Administration>Notification>E-mail>server).

Setting	Description
Local SMTP Server	The IP address or DNS name of the local SMTP server. **NOTE:** This definition is required only when **SMTP Server** is set to **Local**. See E-mail recipients (Administration>Notification>E-mail>recipients).
From Address	The contents of the **From** field in e-mail messages sent by the Rack PDU: • In the format *user@* [*IP_address*] (if an IP address is specified as **Local SMTP Server**). • In the format *user@domain*.com (if DNS is configured and the DNS name is specified as **Local SMTP Server**). **NOTE:** The local SMTP server may require that you use a valid user account on the server for this setting. See the server's documentation.

E-mail recipients (Administration>Notification>E-mail>recipients). Identify up to four e-mail recipients.

Setting	**Description**
To Address	The user and domain names of the recipient. To use e-mail for paging, use the e-mail address for the recipient's pager gateway account (for example, `myacct100@skytel.com`). The pager gateway will generate the page. 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, e.g., use jsmith@[xxx.xxx.x.xxx] instead of jsmith@company.com. This is useful when DNS lookups are not working correctly. **NOTE:** The recipient's pager must be able to use text-based messaging.
SMTP Server	Select one of the following methods for routing e-mail: • **Local**: Through the Rack PDU's SMTP server. This setting (recommended) ensures that the e-mail is sent before the Rack PDU's 20-second time-out, and, if necessary, is retried several times. Also do one of the following: • Enable forwarding at the Rack PDU's SMTP server so that it can route e-mail to external SMTP servers. Typically, SMTP servers are not configured to forward e-mail. Check with the administrator of your SMTP server before changing its configuration to allow forwarding. • Set up a special e-mail account for the Rack PDU to forward e-mail to an external mail account. • **Recipient**: Directly to the recipient's SMTP server. With this setting, the Rack PDU tries to send the e-mail only once. On a busy remote SMTP server, the time-out may prevent some e-mail from being sent. When the recipient uses the Rack PDU's SMTP server, this setting has no effect.
E-mail Generation	Enables (by default) or disables sending e-mail to the recipient.

E-mail test (Administration>Notification>E-mail>test). Send a test message to a configured recipient.

SNMP traps

Trap Receivers (Administration>Notification>SNMP Traps>trap receivers). This option lists, by NMS IP/Host Name, up to the maximum number (six) of trap receivers allowed.

- To open the page for configuring a new trap receiver, click **Add Trap Receiver**.
- To modify or delete a trap receiver, first click its IP address or host name to access its settings. (If you delete a trap receiver, all notification settings configured under Event Actions for the deleted trap receiver are set to their default values.)
- To specify the trap type for a trap receiver, select either the SNMPv1 or SNMPv3 radio button. For an NMS to receive both types of traps, you must configure two trap receivers for that NMS, one for each trap type.

Item	Definition
Trap Generation	Enable (the default) or disable trap generation for this trap receiver.
NMS IP/Host Name	The IP address or host name of this trap receiver. The default, 0.0.0.0, leaves the trap receiver undefined.

SNMPv1 option.

Community Name	The name ("public" by default) used as an identifier when SNMPv1 traps are sent to this trap receiver.
Authenticate Traps	When this option is enabled (the default), the NMS identified by the NMS IP/Host Name setting will receive authentication traps (traps generated by invalid attempts to log on to this device). To disable that ability, unmark the checkbox.

SNMPv3 option. Select the identifier of the user profile for this trap receiver. (To view the settings of the user profiles identified by the user names selectable here, choose **Network** on the top menu bar and **user profiles** under **SNMPv3** on the left navigation menu.)

See SNMPv3 (Administration>Network>SNMPv3>options) for information on creating user profiles and selecting authentication and encryption methods.

SNMP Trap Test (Administration>Notification>SNMP Traps>test)

Last Test Result. The result of the most recent SNMP trap test. A successful SNMP trap test verifies only that a trap was sent; it does not verify that the trap was received by the selected trap receiver. A trap test succeeds if both of the following are true:

- The SNMP version (SNMPv1 or SNMPv3) configured for the selected trap receiver is enabled on this device.
- The trap receiver is enabled.
- If a host name is selected for the **To** address, that host name can be mapped to a valid IP address.

To. Select the IP address or host name to which a test SNMP trap will be sent. If no trap receiver was ever configured, a link to the **Trap Receiver** configuration page is displayed. (If a trap receiver was deleted, or was reset to its default values by this or any other management application, the default values for its trap type are listed.)

Remote Monitoring

You can register online for the APC Remote Monitoring Service (RMS). APC RMS is a professional service that monitors your power systems and surrounding environment from a remote operation center, 24 hours a day, 7 days a week. Through the **APC RMS Web Site**, you can instantaneously modify the way APC responds to your device events. The APC RMS Web site can also be used to retrieve information concerning your equipment and system events at any time from any place where you can access the Internet.

Syslog (Logs>Syslog>*options*)

The Rack PDU can send messages to up to four Syslog servers when an event occurs. The Syslog servers record events that occur at network devices in a log that provides a centralized record of events.

This user's guide does not describe Syslog or its configuration values in detail. For more information about Syslog, see **RFC3164**.

Identifying Syslog Servers (Logs>Syslog>servers).

Setting	Definition
Syslog Server	Uses IP addresses or host names to identify from one to four servers to receive Syslog messages sent by the Rack PDU.
Port	The user datagram protocol (UDP) port that the Rack PDU will use to send Syslog messages. The default is **514**, the UDP port assigned to Syslog.

Syslog Settings (Logs>Syslog>settings).

Setting	Definition
Message Generation	Enables (by default) or disables the Syslog feature.
Facility Code	Selects the facility code assigned to the Rack PDU's Syslog messages (**User**, by default). **NOTE: User** best defines the Syslog messages sent by the Rack PDU. **Do not** change this selection unless advised to do so by the Syslog network or system administrator.

Setting	**Definition**
Severity Mapping	Maps each severity level of Rack PDU events to available Syslog priorities. You should not need to change the mappings. The following definitions are from RFC3164: • **Emergency**: The system is unusable • **Alert**: Action must be taken immediately • **Critical**: Critical conditions • **Error**: Error conditions • **Warning**: Warning conditions • **Notice**: Normal but significant conditions • **Informational**: Informational messages • **Debug**: Debug-level messages Following are the default settings for the **Local Priority** settings: • **Severe** is mapped to **Critical** • **Warning** is mapped to **Warning** • **Informational** is mapped to **Info** **NOTE:** To disable Syslog messages, see Configuring event actions.

Syslog Test and Format Example (Logs>Syslog>test). Send a test message to the Syslog servers configured through the **servers** option.

1. Select a severity to assign to the test message.
2. Define the test message, according to the required message fields.

– The priority (PRI): the Syslog priority assigned to the message's event, and the facility code of messages sent by the Rack PDU.

– The Header: a time stamp and the IP address of the Rack PDU.

– The message (MSG) part:

- The TAG field, followed by a colon and space, identifies the event type.
- The CONTENT field is the event text, followed (optionally) by a space and the event code.

For example, **`APC: Test Syslog`** is valid.

Indirect Notification Through Logs or Queries

Event log (Logs>Events>*options*)

Displaying and using the event log (Logs>Events>log). View or delete the event log. By default, the log displays all events recorded during the last two days, in reverse chronological order.

- **Displaying the event log:** You can view the event log as a page of the Web interface (the default view) or, to see more of the listed events without scrolling, click **Launch Log in New Window** from that page to display a full-screen view of the log.

  In your browser's options, JavaScript® must be enabled for you to use the **Launch Log in New Window** button.

  You can also use FTP or SCP to view the event log. See How to use FTP or SCP to retrieve log files.

- **Filtering the log by date or time:** To display the entire event log, or to change the number of days or weeks for which the log displays the most recent events, select **Last**. Select a time range from the drop-down menu, then click **Apply**. The filter configuration is saved until the device restarts.
  To display events logged during a specific time range, select **From**. Specify the beginning and ending times (using the 24-hour clock format) and dates for which to display events, then click **Apply**. The filter configuration is saved until the device restarts.
- **Filtering the log by event**: To specify the events that display in the log, click **Filter Log**. Unmark the checkbox of an event category or alarm severity level to remove it from view. Text at the upper right corner of the event log page indicates that a filter is active. The filter is active until you clear it or the device restarts. To remove an active filter, click **Filter Log**, then **Clear Filter (Show All)**.

Events are processed through the filter using **OR** logic.

- Events that you do not select from the Filter By Severity list never display in the filtered event log, even if the event occurs in a category you selected from the Filter by Category list.
- Events that you do not select from the Filter by Category list never display in the filtered event log, even if devices in the category enter an alarm state you selected from the Filter by Severity list.

- **Deleting the event log**: To delete all events recorded in the log, click **Clear Event Log** on the Web page that displays the log. Deleted events cannot be retrieved.

To disable the logging of events based on their assigned severity level or their event category, see Configuring by group.

For lists of all configurable events and their current configuration, select the **Administration** tab, **Notification** on the top menu bar, and **by event** under **Event Actions** on the left navigation menu.

See Configuring by event.

Reverse Lookup (Logs>Events>reverse lookup). Reverse lookup is disabled by default. Enable this feature unless you have no DNS server configured or have poor network performance because of heavy network traffic.

With reverse lookup enabled, when a network-related event occurs, both the IP address and the domain name for the networked device associated with the event are logged in the event log. If no domain name entry exists for the device, only its IP address is logged with the event. Since domain names generally change less frequently than IP addresses, enabling reverse lookup can improve the ability to identify addresses of networked devices that are causing events.

Data log (Logs>Data>*options*)

Displaying and using the data log (Logs>Data>log). View a log of measurements of the present load, including the minimum and maximum load current for each bank. Each entry is listed by the date and time the data was recorded.

- **Displaying the data log**: You can view the data log as a page of the Web interface (the default view) or, to see more of the data without scrolling, click **Launch Log in New Window** from that page to display a full-screen view of the log.
- The values displayed are I, IMax, and IMin.

In your browser's options, JavaScript must be enabled for you to use the **Launch Log in New Window** button.

Alternatively, you can use FTP or SCP to view the data log. See How to use FTP or SCP to retrieve log files.

- **Filtering the log by date or time**: To display the entire data log, or to change the number of days or weeks for which the log displays the most recent events, select **Last**. Select a time range from the drop-down menu, then click **Apply**. The filter configuration is saved until the device restarts.
  To display data logged during a specific time range, select **From**. Specify the beginning and ending dates and times for which to display data, then click **Apply**. The filter configuration is saved until the device restarts.

Enter the time using the 24-hour clock format.

- **Deleting the data log**: To delete all data recorded in the log, click **Clear Data Log** on the Web page that displays the log. Deleted data cannot be retrieved.

Setting the data collection interval (Logs>Data>interval). Define, in the **Log Interval** setting, how frequently data is sampled and stored in the data log, and view the calculation of how many days of data the log can store, based on the interval you selected. When the log is full, the older entries are deleted. To avoid automatic deletion of older data, enable and configure data log rotation, described in the next section.

Configuring data log rotation (Logs>Data>rotation). Set up a password-protected data log repository on a specified FTP server. Enabling rotation causes the contents of the data log to be appended to the file you specify by name and location. Updates to this file occur at the upload interval you specify.

Parameter	Description
Data Log Rotation	Enable or disable (the default) data log rotation.
FTP Server Address	The location of the FTP server where the data repository file is stored.
User Name	The user name required to retrieve data from the repository file.
Password	The password required to retrieve data from the repository file.
File Path	The path to the repository file.
File Name	The name of the repository file (an ASCII text file).
Automatically Upload Every	The number of hours between uploads of data to the file.
Maximum Retries	The maximum number of times the upload will be attempted after initial failure.
Failure Wait Time	How long in minutes before an attempt to upload data times out.

How to use FTP or SCP to retrieve log files

An Administrator or Device User can use FTP or SCP to retrieve a tab-delineated event log file (*event.txt*) or data log file (*data.txt*) and import it into a spreadsheet.

- The file reports all events or data recorded since the log was last deleted or (for the data log) truncated because it reached maximum size.
- The file includes information that the event log or data 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 IP address of the Rack PDU.
- The unique **Event Code** for each recorded event (*event.txt* file only).

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

If you are using the encryption-based security protocols for your system, use SCP to retrieve the log file.

If you are using unencrypted authentication methods for the security of your system, use FTP to retrieve the log file.

See the *Security Handbook*, available on the Metered Rack PDU *Utility* CD and on the APC Web site (**www.apc.com**) for information on available protocols and methods for setting up the type of security you need.

To use SCP to retrieve the files. To use SCP to retrieve the *event.txt* file, use the following command:

```
scp username@hostname_or_ip_address:event.txt ./event.txt
```

To use SCP to retrieve the *data.txt* file, use the following command:

```
scp username@hostname_or_ip_address:data.txt ./data.txt
```

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

1. At a command prompt, type `ftp` and the Rack PDU's IP address, and press ENTER.

   If the **Port** setting for the **FTP Server** option (set through the **Network** menu of the **Administration** tab) has been changed from its default (**21**), you must use the non-default value in the FTP command. For Windows FTP clients, use the following command, including spaces. (For some FTP clients, you must use a colon instead of a space between the IP address and the port number.)

   ```
   ftp>open ip_address port_number
   ```

   📖 To set a non-default port value to enhance security for the FTP Server, see File Transfers. You can specify any port from 5001 to 32768.

2. Use the case-sensitive **User Name** and **Password** for Administrator or Device User to log on. For Administrator, **apc** is the default for **User Name** and **Password**. For the Device User, the defaults are **device** for **User Name** and **apc** for **Password**.
3. Use the **get** command to transmit the text of a log to your local drive.

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

   or

   ```
   ftp>get data.txt
   ```

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

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

   or

   ```
   ftp>del data.txt
   ```

   You will not be asked to confirm the deletion.

   –If you clear the data log, the event log records a deleted-log event.

   –If you clear the event log, a new *event.txt* file records the event.
4. Type `quit` at the `ftp>` prompt to exit from FTP.

Queries (SNMP GETs)

See SNMP for a description of SNMP access types that enable an NMS to perform informational queries. Configuring the most restrictive SNMP access type, READ, enables informational queries without allowing remote configuration changes.

Administration: General Options

Identification (Administration>General>Identification)

Define values for **Name** (the device name), **Location** (the physical location), and **Contact** (the person responsible for the device) used by the Rack PDU's SNMP agent. These settings are the values used for the MIB-II **sysName**, **sysContact**, and **sysLocation** Object Identifiers (OIDs).

For more information about MIB-II OIDs, see the *PowerNet*® *SNMP Management Information Base (MIB) Reference Guide,* available on the Metered Rack PDU *Utility* CD and the APC Web site, **www.apc.com**.

Set the Date and Time

Method (Administration>General>Date & Time>mode)

Set the time and date used by the Rack PDU. You can change the current settings manually or through a Network Time Protocol (NTP) Server:

- **Manual Mode**: Do one of the following:
  - Enter the date and time for the Rack PDU.
  - Mark the checkbox **Apply Local Computer Time** to match the date and time settings of the computer you are using.
- **Synchronize with NTP Server**: Have an NTP Server define the date and time for the Rack PDU.

Setting	Definition
Primary NTP Server	Enter the IP address or domain name of the primary NTP server.
Secondary NTP Server	Enter the IP address or domain name of the secondary NTP server when a secondary server is available.

Setting	Definition
Time Zone	Select a time zone. The number of hours preceding each time zone in the list is the offset from Coordinated Universal Time (UTC), formerly Greenwich Mean Time.
Update Interval	Define how often, in hours, the Rack PDU accesses the NTP Server for an update. *Minimum*: 1; *Maximum*: 8760 (1 year).
Update Using NTP Now	Initiate an immediate update of date and time by the NTP Server.

Daylight saving (Administration>General>Date & Time>daylight saving)

Enable traditional United States Daylight Saving Time (DST) or enable and configure a customized daylight saving time to match how Daylight Saving Time is implemented in your local area. DST is disabled by default.

When customizing Daylight Saving Time (DST):

- If the local DST always starts or ends on the fourth occurrence of a specific weekday of a month (e.g, the fourth Sunday), choose Fourth/Last. If a fifth Sunday occurs in that month in a subsequent year, the time setting still changes on the fourth Sunday.
- If the local DST always starts or ends on the last occurrence of a specific weekday of a month, whether it is the fourth or the fifth occurrence, choose Fifth/Last.

Format (Administration>General>Date & Time>date format)

Select the numerical format in which to display all dates in this user interface. In the selections, each letter m (for month), d (for day), and y (for year) represents one digit. Single-digit days and months are displayed with a leading zero.

Use an .ini File (Administration>General>User Config File)

Use the settings from one Rack PDU to configure another. Retrieve the config.ini file from the configured Rack PDU, customize that file (e.g., to change the IP address), and upload the customized file to the new Rack PDU. The file name can be up to 64 characters, and must have the.ini suffix.

Status	Reports the progress of the upload. The upload succeeds even if the file contains errors, but a system event reports the errors in the event log.
Upload	Browse to the customized file and upload it so that the current Rack PDU can use it to set its own configuration.

To retrieve and customize the file of a configured Rack PDU, see How to Export Configuration Settings.

Instead of uploading the file to one Rack PDU, you can export the file to multiple Rack PDUs by using an FTP or SCP script or a batch file and the APC .ini file utility, available on the Metered Rack PDU *Utility* CD and the APC Web site **www.apc.com/tools/download**.

System Preferences (Administration>General>Preferences)

Color-coding events in the event log

This option is disabled by default. Mark the Event Log Color Coding checkbox to enable color-coding of alarm text recorded in the event log. System-event entries and configuration-change entries do not change color.

Text color	**Definition**
Red	**Critical:** A critical alarm exists, which requires immediate action.
Orange	**Warning:** An alarm condition requires attention and could jeopardize your data or equipment if its cause is not addressed.
Black	Informational event
Green	**Normal:** No alarms are present.

Changing the default temperature scale

Select the temperature scale (Fahrenheit or Celsius) in which to display all temperature measurements in this user interface.

Reset the Interface (Administration>General>Reset/Reboot)

Action	Definition
Reboot Management Interface	Restarts the interface of the Rack PDU.
Reset All[1]	Check-mark **Include TCP/IP** to reset all configuration values; unmark **Include TCP/IP** to reset all values except TCP/IP.
Reset Only[1]	**TCP/IP settings**: Set TCP/IP Configuration to **DHCP & BOOTP**, its default setting, requiring that the Rack PDU receive its TCP/IP settings from a DHCP or BOOTP server. See TCP/IP settings (Administration>Network>TCP/IP).
	Event configuration: Reset all changes to event configuration, by event and by group, to their default settings.
	Rack PDU to defaults: Reset only Rack PDU settings, not network settings, to their defaults.
	Lost Environmental Communication Alarms: Clears any environmental alarms caused by lost communication with a sensor, e.g., if a sensor is disconnected, this setting returns the alarm status for that sensor to Normal.

[1] Resetting may take up to a minute. The Rack PDU name and output voltage settings will not be reset.

Configure Links (Administration>General>Quick Links)

Select the **Administration** tab, **General** on the top menu bar, and **Quick Links** on the left navigation menu to view and change the URL links displayed at the bottom left of each page of the interface.

By default, these links access the following Web pages:

- **Link 1**: The home page of the APC Web site.
- **Link 2**: A page where you can use samples of APC Web-enabled products.
- **Link 3**: The home page of the APC Remote Monitoring Service.

To reconfigure any of the following, click the link name in the **Display** column:

- **Display**: The short link name displayed on each interface page.
- **Name**: A name that fully identifies the target or purpose of the link.
- **Address**: Any URL — for example, the URL of another device or server.

About the Rack PDU (Administration>General>About)

The hardware information is useful to APC Customer Support to troubleshoot problems with the Rack PDU. The serial number and MAC address are also available on the Rack PDU itself.

Firmware information for the Application Module and APC OS (AOS) indicates the name, the firmware version, and the date and time each firmware module was created. This information is also useful in troubleshooting and enables you to determine if updated firmware is available at the APC Web site.

Management Uptime is the length of time the interface has been running continuously.

APC Device IP Configuration Wizard

Capabilities, Requirements, and Installation

How to use the Wizard to configure TCP/IP settings

The APC Device IP Configuration Wizard configures the IP address, subnet mask, and default gateway of one or more Rack PDUs. You can use the Wizard in either of the following ways:

- Remotely over your TCP/IP network to discover and configure unconfigured Rack PDUs or devices on the same network segment as the computer running the Wizard.
- Through a direct connection from a serial port of your computer to a Rack PDU or device to configure or reconfigure it.

System requirements

The Wizard runs on Microsoft Windows 2000, Windows Server 2003, and Windows XP operating systems.

Installation

To install the Wizard from the APC Metered Rack PDU *Utility* CD:

1. If autorun is enabled, the user interface of the CD starts when you insert the CD. Otherwise, open the file **contents.htm** on the CD.
2. Click **Device IP Configuration Wizard** and follow the instructions.

To install the Wizard from a downloaded executable file:

1. Go to **www.apc/tools/download**.
2. Download the Device IP Configuration Wizard.
3. Run the executable file in the folder to which you downloaded it.

Use the Wizard

Note

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

Launch the Wizard

The installation creates a shortcut link in the **Start** menu to launch the Wizard.

Configure the basic TCP/IP settings remotely

Prepare to configure the settings. Before you run the Wizard:

1. Contact your network administrator to obtain valid TCP/IP settings.
2. If you are configuring multiple unconfigured Rack PDUs, obtain the MAC address of each one to identify it when the Wizard discovers it. (The Wizard displays the MAC address on the screen on which you then enter the TCP/IP settings.)
   – For a Rack PDU, the MAC address is on a label on the device.

     You can also obtain the MAC address from the Quality Assurance slip that came with the Rack PDU or device.

Run the Wizard to perform the configuration. To discover and configure unconfigured Rack PDUs:

1. From the **Start** menu, launch the Wizard. The Wizard detects the first Rack PDU that is not configured.
2. Select **Remotely (over the network)**, and click **Next >**.
3. Enter the system IP, subnet mask, and default gateway for the Rack PDU or device identified by the MAC address. Click **Next >**.

   On the **Transmit Current Settings Remotely** screen, if you check-mark **Start a Web browser when finished**, the default Web browser connects to the Rack PDU or device after the Wizard transmits the settings.
4. Click **Finish** to transmit the settings. If the IP address you entered is in use on the

network, the Wizard prompts you to enter an IP address that is not in use. Enter a correct IP address, and click **Finish**.

5. If the Wizard finds another unconfigured Rack PDU, it displays the screen to enter TCP/IP settings. Repeat this procedure beginning at step 3, or to skip the Rack PDU or device whose MAC address is currently displayed, click **Cancel**.

Configure or reconfigure the TCP/IP settings locally

1. Contact your network administrator to obtain valid TCP/IP settings.
2. Connect the provided serial configuration cable from an available communications port on your computer to the serial port of the card or device. Make sure no other application is using the computer port.
3. From the **Start** menu, launch the Wizard application.
4. If the Rack PDU is not configured, wait for the Wizard to detect it. Otherwise, click **Next>**.
5. Select **Locally (through the serial port)**, and click **Next >**.
6. Enter the system IP, subnet mask, and default gateway for the Rack PDU or device, and click **Next >**.
7. On the **Transmit Current Settings Remotely** screen, if you check-mark **Start a Web browser when finished**, the default Web browser connects to the Rack PDU or device after the Wizard transmits the settings.
8. Click **Finish** to transmit the TCP/IP settings. If the IP address you entered is in use on the network, the Wizard prompts you to enter an IP address that is not in use. Enter a correct IP address, and click **Finish**.
9. If you selected **Start a Web browser when finished** in step 7, you can now configure other parameters through the Web interface of the card or device.

How to Export Configuration Settings

Retrieve and Export the .ini File

Summary of the procedure

An Administrator can retrieve the .ini file of one Rack PDU and export it to another Rack PDU or to multiple Rack PDUs.

1. Configure the Rack PDU to have the settings you want to export.
2. Retrieve the .ini file from that Rack PDU.
3. Customize the .ini file (to change at least the TCP/IP settings) and make a copy to export.
4. Use any of the file transfer protocols supported by the Rack PDU to transfer the copied file to one or more additional Rack PDUs. (To transfer the file to multiple Rack PDUs simultaneously, write an FTP or SCP script that repeats the steps for transferring the file to a single Rack PDU.)

Each receiving Rack PDU uses the file to reconfigure its own settings and then deletes it.

Contents of the .ini file

The config .ini file that you retrieve from the Rack PDU contains the following:

- *Section headings*, which are category names enclosed in brackets ([ ]), and under each section heading, *keywords,* which are labels describing specific Rack PDU settings.

Note: Only section headings and keywords supported for the specific Rack PDU from which you retrieve the file are included.

- Each keyword is followed by an equals sign and the current *value* for that parameter's setting, either the default value (if the value has not been specifically configured) or the configured value.
  - The **`Override`** keyword, with its default value, prevents one or more keywords and their device-specific values from being exported. In the **`[NetworkTCP/IP]`** section, the default value for **`Override`** (the MAC address of the Rack PDU) blocks the exporting of the values for the keywords **`SystemIP`**, **`SubnetMask`**, **`DefaultGateway`**, and **`BootMode`**.
  - You must edit the section **`[SystemDate/Time]`** if you want to set the system date and time of a receiving Rack PDU or cause that Rack PDU to use an NTP Server to set its date and time.

See Customizing for configuration guidelines for date and time settings.

Detailed procedures

Use the following procedures to retrieve the settings of one Rack PDU and export them to one or more other Rack PDUs.

Retrieving. To set up and retrieve an .ini file to export:

1. Configure a Rack PDU with the settings you want to export.

   Note: To avoid errors, configure the Rack PDU by using its Web interface or control console whenever possible. Directly editing the .ini file risks introducing errors.

2. Use FTP to retrieve the file config.ini from the Rack PDU you configured:

   a. Open a connection to the Rack PDU, using its IP Address. For example:

   ```
   ftp> open 158.165.2.132
   ```

   b. Log on, using the Administrator user name and password configured for the Rack PDU.

   c. Retrieve the config.ini file containing the Rack PDU’s current settings:

   ```
   ftp> get config.ini
   ```

   The file is written to the folder from which you launched FTP.

See also: To create batch files and use an APC utility to retrieve configuration settings from multiple Rack PDUs and export them to other Rack PDUs, see *Release Notes: ini File Utility, version 1.0* on the APC Metered Rack PDU *Utility* CD and from **www.apc.com**.

Customizing. You must customize the file to change at least the TCP/IP settings before you export it.

1. Use a text editor to customize the file.
   - Section headings, keywords, and pre-defined values are not case-sensitive, but string values that you define are case-sensitive.
   - Use adjacent quotation marks to indicate no value. For example, `LinkURL1=""` indicates that the URL is intentionally undefined.
   - To define values, opening and closing quotation marks are optional, except to enclose values that contain leading or trailing spaces or values which are already enclosed in quotation marks. (Leading or trailing spaces not within the opening and closing quotation marks are ignored.)
   - To export a specific system date and time or any scheduled events, you must configure the values directly in the .ini file.
     - To export a specific system time, export only the configured `[SystemDate/Time]` section as a separate .ini file. (The time necessary to export a large file would cause the configured time to be significantly inaccurate.)
     - For greater accuracy, if the Rack PDUs receiving the file can access a Network Time Protocol (NTP) Server, set the value for the `NTPEnable` keyword as follows:

       ```
       NTPEnable=enabled
       ```
   - Add comments about changes that you made. The first printable character of a comment line must be a semicolon (`;`).
2. Copy the customized file to another file name in the same folder:
   - The copy, which you will export to other Rack PDUs, can have any file name up to 64 characters and must have the .ini file suffix.
   - Retain the original customized file for future use. **The file that you retain is the only record of your comments.** They are removed automatically from the file that you export.

Exporting the file to a single Rack PDU. To export the .ini file to another Rack PDU, do either of the following:

- From the Web interface of the receiving Rack PDU, select the **Administration** tab, **General** on the top menu bar, and **User Config File** on the left navigation menu. Enter the full path of the file, or use **Browse**.
- Use any file transfer protocol supported by Rack PDUs, i.e., FTP, FTP Client, SCP, or TFTP. The following example uses FTP:

  a. From the folder containing the copy of the customized .ini file, use FTP to log in to the Rack PDU to which you are exporting the .ini file:

  ```
  ftp> open ip_address
  ```

  b. Export the copy of the customized .ini file to the root directory of the receiving Rack PDU:

  ```
  ftp> put filename.ini
  ```

Exporting the file to multiple Rack PDUs. To export the .ini file to multiple Rack PDUs:

- Use FTP or SCP, but write a script that incorporates and repeats the steps used for exporting the file to a single Rack PDU.
- Use a batch processing file and the APC .ini file utility.

See also

To create the batch file and use the utility, see *Release Notes: ini File Utility, version 1.0* on the APC Metered Rack PDU *Utility* CD and from **www.apc.com**.

The Upload Event and Error Messages

The event and its error messages

The following system event occurs when the receiving Rack PDU completes using the .ini file to update its settings.

```
Configuration file upload complete, with number valid values
```

This event has no default severity level.

If a keyword, section name, or value is invalid, the event text is extended to include notification of the following errors.

Event text	Description
Configuration file warning: Invalid keyword on line *number*. Configuration file warning: Invalid value on line *number*.	A line with an invalid keyword or value is ignored.
Configuration file warning: Invalid section on line *number.*	If a section name is invalid, all keyword/value pairs in that section are ignored.
Configuration file warning: Keyword found outside of a section on line *number*.	A keyword entered at the beginning of the file (i.e., before any section headings) is ignored.
Configuration file warning: Configuration file exceeds maximum size.	If the file is too large, the Rack PDU stores and processes what it can, but ignores what it cannot. Reduce the size of the file, or divide it into two files, and try uploading again.

Note

The export to and the subsequent upload by the receiving Rack PDU succeeds even if there are errors.

Errors generated by overridden values

The `Override` keyword and its value will generate error messages in the event log when it blocks the exporting of values.

See Contents of the .ini file for information about which values are overridden.

Because the overridden values are device-specific and not appropriate to export to other Rack PDUs, ignore these error messages. To prevent these error messages, you can delete the lines that contain the `Override` keyword and the lines that contain the values that they override. Do not delete or change the line containing the section heading.

Related Topics

On Windows operating systems, instead of transferring .ini files, you can use the APC Device IP Configuration Wizard to update the basic TCP/IP settings of the Rack PDU and configure other settings through its user interface.

See APC Device IP Configuration Wizard.

File Transfers

Upgrade Firmware

Benefits of upgrading firmware

When you upgrade the firmware on the Rack PDU:

- You obtain the latest bug fixes and performance improvements.
- New features become available for immediate use.

Keeping the firmware versions consistent across your network ensures that all Rack PDUs support the same features in the same manner.

Firmware files (Rack PDU)

A firmware version consists of two modules: An APC Operating System (AOS) module and an application module. Each module contains one or more Cyclical Redundancy Checks (CRCs) to protect its data from corruption during transfer.

The APC Operating System (AOS) and application module files used with the Rack PDU share the same basic format:

`apc_`***`hardware-version`***`_`***`type`***`_`***`firmware-version`***`.bin`

- **`apc`**: Indicates that this is an APC file.
- ***`hardware-version`***: **`hw0`***x* identifies the version of the hardware on which you can use this binary file.
- ***`type`***: Identifies whether the file is for the APC Operating System (AOS) or the application module for the Rack PDU.
- ***`version`***: The version number of the file.
- **`bin`**: Indicates that this is a binary file.

Obtain the latest firmware version

Automated upgrade tool for Microsoft Windows systems. An upgrade tool automates the transferring of the firmware modules on any supported Windows operating system. Obtain the latest version of the tool at no cost from **www.apc.com/tools/download**. At this Web page, find the latest firmware release for your APC product (in this case, your Rack PDU) and download the automated tool. **Never** use the tool for one APC product to upgrade firmware of another.

Manual upgrades, primarily for Linux systems. If no computer on your network is running a Microsoft Windows operating system, you must upgrade the firmware of your Rack PDUs by using the separate AOS and application firmware modules.

Obtain the individual firmware modules for your firmware upgrade from **www.apcc.com/tools/download**.

Firmware File Transfer Methods

To upgrade the firmware of a Rack PDU, use one of these methods:

- From a networked computer running a Microsoft Windows operating system, use the firmware upgrade tool downloaded from the APC Web site.
- From a networked computer on any supported operating system, use FTP or SCP to transfer the individual AOS and application firmware modules.
- For a Rack PDU that is not on your network, use XMODEM through a serial connection to transfer the individual firmware modules from your computer to the Rack PDU.

Note

When you transfer individual firmware modules, **you must** transfer the APC Operating System (AOS) module to the Rack PDU before you transfer the application module.

Use FTP or SCP to upgrade one Rack PDU

FTP. For you to use FTP to upgrade one Rack PDU over the network:

- The Rack PDU must be connected to the network, and its system IP, subnet mask, and default gateway must be configured.
- The FTP server must be enabled at the Rack PDU.

To transfer the files:

1. Open a command prompt window of a computer on the network. Go to the directory that contains the firmware files, and list the files:

   ```
   C:\>cd\apc
   C:\apc>dir
   ```

   For the listed files, *xxx* represents the firmware version number:

   – **apc_hw03_aos_*xxx*.bin**

   – **apc_hw03_*application*_*xxx*.bin**

2. Open an FTP client session:

   ```
   C:\apc>ftp
   ```

3. Type **open** and the Rack PDU's IP address, and press ENTER. If the **port** setting for the FTP Server has changed from its default of **21**, you must use the non-default value in the FTP command.

   – For Windows FTP clients, separate a non-default port number from the IP address by a space. For example:

   ```
   ftp> open 150.250.6.10 21000
   ```

   – Some FTP clients require a colon instead before the port number.

4. Log on as Administrator; **apc** is the default user name and password.
5. Upgrade the AOS. (In the example, *xxx* is the firmware version number:

   ```
   ftp> bin
   ftp> put apc_hw03_aos_xxx.bin
   ```

6. When FTP confirms the transfer, type **quit** to close the session.
7. After 20 seconds, repeat step 2 through step 5. In step 5, use the application module file name.

SCP. To use Secure CoPy (SCP) to upgrade firmware for a Rack PDU:

1. Identify and locate the firmware modules described in the preceding instructions for FTP.
2. Use an SCP command line to transfer the AOS firmware module to the Rack PDU. The following example uses *xxx* to represent the version number of the AOS module:

```
scp apc_hw03_aos_xxx.bin apc@158.205.6.185:apc_hw03_aos_xxx.bin
```

3. Use a similar SCP command line, with the name of the application module, to transfer the second firmware module to the Rack PDU.

How to upgrade multiple Rack PDUs

Export configuration settings. You can create batch files and use an APC utility to retrieve configuration settings from multiple Rack PDUs and export them to other Rack PDUs.

See also

See *Release Notes: ini File Utility, version 1.0,* available on the APC Metered Rack PDU *Utility* CD.

Use FTP or SCP to upgrade multiple Rack PDUs. To upgrade multiple Rack PDUs using an FTP client or using SCP, write a script which automatically performs the procedure.

Use XMODEM to upgrade one Rack PDU

To upgrade the firmware for a Rack PDU that is not on the network:

1. Obtain the individual firmware modules (the AOS module and the application module) from **www.apc.com/tools/download**.
2. Select a serial port at the local computer and disable any service that uses the port.
3. Connect the provided serial cable (APC part number 940-0144) to the selected port and to the serial port at the Rack PDU.

4. 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.
5. Press ENTER to display the **User Name** prompt.
6. Enter the Administrator user name and password (**apc** by default for both).
7. From the **Control Console** menu, select **System**, then **Tools**, then **File Transfer**, then **XMODEM**; and type `Yes` at the prompt to continue.
8. Select a baud rate, change the terminal program's baud rate to match your selection, and press ENTER. A higher baud rate causes faster upgrades.
9. From the terminal program's menu, select the binary AOS file to transfer using XMODEM-CRC. After the XMODEM transfer is complete, set the baud rate to 9600. The Rack PDU automatically restarts.
10. Repeat step 4 through step 4 to install the application module. In step 9, use the application module file name, not the AOS module file name.

For information about the format used for firmware modules, see Firmware files (Rack PDU).

Verify Upgrades and Updates

Verify the success or failure of the transfer

To verify whether a firmware upgrade succeeded, use the **Network** menu in the control console and select the **FTP Server** option to view **Last Transfer Result**, or use an SNMP GET to the **mfiletransferStatusLastTransferResult** OID.

Last Transfer Result codes

Code	Description
Successful	The file transfer was successful.
Result not available	There are no recorded file transfers.
Failure unknown	The last file transfer failed for an unknown reason.
Server inaccessible	The TFTP or FTP server could not be found on the network.
Server access denied	The TFTP or FTP server denied access.
File not found	The TFTP or FTP server could not locate the requested file.
File type unknown	The file was downloaded but the contents were not recognized.
File corrupt	The file was downloaded but at least one Cyclical Redundancy Check (CRC) failed.

Verify the version numbers of installed firmware.

Use the Web interface to verify the versions of the upgraded firmware modules by selecting the **Administration** tab, **General** on the top menu bar, and **About** on the left navigation menu, or use an SNMP GET to the MIB II **sysDescr** OID.

Product Information

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 warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. APC 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 Web site, **www.apc.com**.

Exclusions

APC 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 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 recommendations or specifications or in any event if the APC 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 customer support network through the Support page of the APC Web site, **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

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 APC 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 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 searching APC Knowledge Base and using e-support.
- Contact an APC Customer Support center by telephone or e-mail.

Direct InfraStruXure Customer Support Line	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702000 (Ireland)
Western Europe (inc. Scandinavia)	+800 0272 0272
Japan	(0) 36402-2001
Australia, New Zealand, South Pacific area	(61) (2) 9955 9366 (Australia)

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

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

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