Schneider Electric

User's Guide

UPS Network Management Card 2

AP9630, AP9631

本マニュアル＜各国の言語に対応する＞はウェブサイト (www.apc.com) からダウンロードできます。

This manual is available in English on the Web site (www.apc.com).

Dieses Handbuch ist in Deutsch auf der Webseite (www.apc.com) verfügbar.

Este manual está disponible en español en la página web (www.apc.com).

Ce manuel est disponible en français sur le site internet (www.apc.com).

Questo manuale è disponibile in italiano sul sito web (www.apc.com).

Este manual está disponível em português no site (www.apc.com).

Данное руководство на русском языке доступно на сайте (www.apc.com)

在公司的网站上（www.apc.com）有本手册的中文版。

웹싸이트 (www.apc.com) 에 한국어 매뉴얼 있습니다 .

This manual is available in English on the enclosed CD.

Dieses Handbuch ist in Deutsch auf der beiliegenden CD-ROM verfügbar.

Este manual está disponible en español en el CD-ROM adjunto.

Ce manuel est disponible en français sur le CD-ROM ci-inclus.

Questo manuale è disponibile in italiano nel CD-ROM allegato.

Este manual está disponível em português no CD fornecido.

Данное руководство на русском языке имеется на прилагаемом компакт-диске.

本マニュアルの日本語版は同梱の CD-ROM からご覧になれます。

동봉된 CD 안에 한국어 매뉴얼이 있습니다 .

您可以从包含的 CD 上获得本手册的中文版本。

Introduction

Product Description

Features

The two Schneider Electric UPS Network Management Cards (NMC) mentioned below are Web-based, IPv6 Ready products that manage supported devices using multiple open standards such as:

- Hypertext Transfer Protocol (HTTP)
- Simple Network Management Protocol versions 1 and 3 (SNMPv1, SNMPv3)
- File Transfer Protocol (FTP)
- Telnet
- Secure SHell (SSH)
- Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)
- Secure Copy (SCP)

The **AP9630** Network Management Card 2:

- Provides UPS control and self-test scheduling features
- Provides data and event logs
- Provides support for the PowerChute® Network Shutdown utility
- Supports using a Dynamic Host Configuration Protocol (DHCP) or BOOTstrap Protocol (BOOTP) server to provide the network (TCP/IP) values of the NMC
- Supports using the Remote Monitoring Service (RMS)
- Enables you to configure notification through event logging (by the NMC and Syslog), e-mail, and SNMP traps. You can configure notification for single events or groups of events, based on the severity level or category of events
- Provides the ability to export a user configuration (.ini) file from a configured card to one or more unconfigured cards without converting the file to a binary file
- Provides a selection of security protocols for authentication and encryption
- Communicates with InfraStruxure® Central or InfraStruxure Manager

The **AP9631** Network Management Card includes all AP9630 Network Management Card features and the following:

- Provides two USB ports
- Supports two universal input/ output ports, to which you can connect:
  - Temperature (AP9335T) or temperature/humidity sensors (AP9335TH)
  - Relay input/output connectors that support two input contacts and one output relay (using AP9810 Dry Contact I/O Accessory)

Devices in which you can install the Network Management Card 2. The NMC can be installed in:

- Any Smart-UPS® model that has an internal expansion slot, or any Symmetra® UPS except the Symmetra PX 250 or Symmetra PX 500 UPS
- MGE® Galaxy® 300, 3500, or 7000
- Expansion Chassis (AP9600)
- Triple Expansion Chassis (AP9604)

IPv4 initial setup

You must define two TCP/IP settings for the NMC before it can operate on the network:

- IP address of the NMC
- IP address of the default gateway (only needed if you are going off segment)

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

To configure the TCP/IP settings, see the Network Management Card *Installation Manual*, available on the Network Management Card *Utility* CD and in printed form.

For detailed information on how to use a DHCP server to configure the TCP/IP settings at an NMC, see “TCP/IP and Communication Settings” on page 54.

IPv6 initial setup

IPv6 network configuration provides flexibility to accommodate the user's requirements. To configure the TCP/IP settings for IPv6, see the user interface online help for details on the options: **Manual**, **Auto Configuration**, **DHCPv6 Mode** under this menu: **Administration** > **Network** > **TCP/IP** > **IPv6 settings**.

Network management features

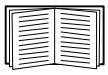
These applications and utilities work with a UPS that connects to the network through an NMC.

- PowerChute Network Shutdown — Provide unattended remote graceful shutdown of computers that are connected to UPS devices
- PowerNet® Management Information Base (MIB) with a standard MIB browser — Perform SNMP SETs and GETs and use SNMP traps
- InfraStruxure Central — Provide enterprise-level power management and management of agents, UPS devices, and environmental monitors.
- Device IP Configuration Wizard — Configure the basic settings of one or more NMCs over the network
- Security Wizard — Create components needed for high security for the NMC when you are using Secure Sockets Layer (SSL) and related protocols and encryption routines

Internal Management Features

Overview

Use the user interface or the command line interface to view the status of the UPS and manage the UPS and the NMC. You can also use SNMP to monitor the status of the UPS.



For more information about the internal user interfaces, see “Web User Interface” on page 28 and “Command Line Interface (CLI)” on page 8. See “SNMP” on page 58 for information about how SNMP access to the NMC is controlled.

Access priority for logging on

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

1. Local access to the command line interface from a computer with a direct serial connection to the Management Card
2. Telnet or SSH access to the command line interface from a remote computer
3. Web access, either directly or through InfraStruXure Central

Note: SNMP has **Write +** and **Write** access. Write + has top access and enables logging on when another user is already logged on. Write access is equivalent to Web access.

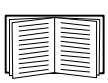
Types of user accounts

The NMC has three levels of access — Administrator, Device User, and Read-Only User — and these are protected by user name and password requirements.

- An Administrator can use all of the menus in the user interface and all of the commands in the command line interface. The default user name and password are both **apc**.
- A Device User can access only the following:
  - In the user interface, recent events on the **Home** tab; the menus on the **UPS** tab; and the menus of the **Logs** tab including the event and data logs, accessible under the **Events** and **Data** headings. (The event and data logs display no button for this user to clear the log).
  - In the command line interface, the equivalent features and options.

  The default user name is **device**, and the default password is **apc**.
- A Read-Only User has the following restricted access:
  - Access through the user interface only.
  - Access to the same tabs and menus as a Device User above, but without the capability to change configurations, control devices, delete data, or use file transfer options. Links to configuration options are visible but disabled. (The event and data logs display no button for this user 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” on page 51.

How to Recover from a Lost Password

You can use a local computer that connects to the Management Card through the serial port to access the command line interface.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Connect the provided serial cable (part number 940-0299) to the selected port at the computer and to the configuration port at the Management Card.
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, repeatedly if necessary, to display the **User Name** prompt again, 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. At the command line interface, use the following commands to change the **User Name** and **Password** settings, both of which are now **apc**:

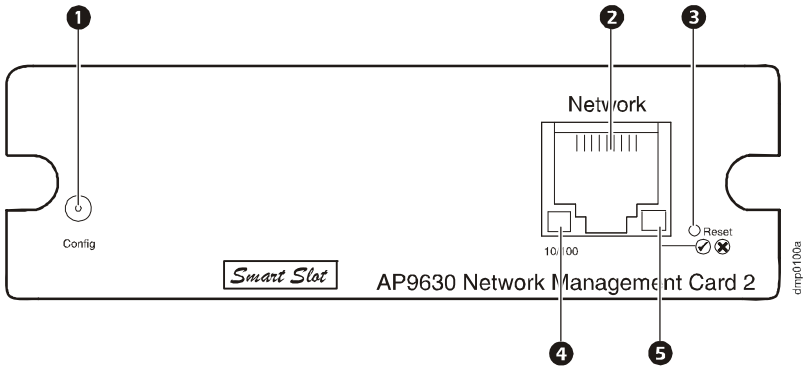
   ```
   user -an yourAdministratorName

   user -ap yourAdministratorPassword
   ```

   For example, to change the Administrator user name to **Admin**, type:

   ```
   user -an Admin
   ```

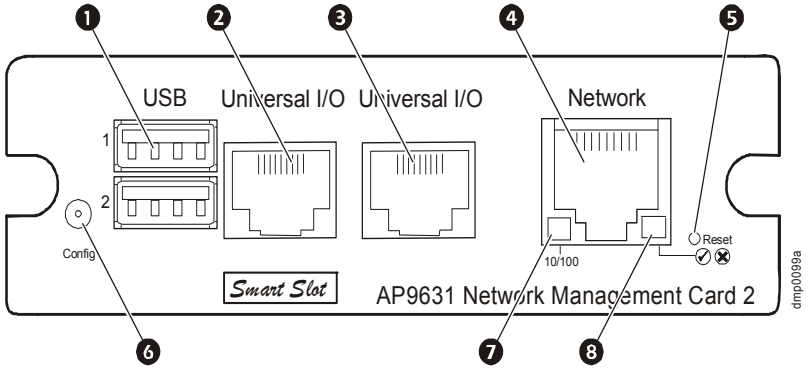
8. Type `quit` or `exit` to log off, reconnect any serial cable you disconnected, and restart any service you disabled.

Front Panel (AP9630)



	Item	Description
❶	Serial configuration port	Connects the NMC to a local computer to configure initial network settings or access the command line interface (CLI).
❷	10/100 Base-T connector	Connects the NMC to the Ethernet network.
❸	Reset button	Resets the NMC while power remains on.
❹	Link-RX/TX (10/100) LED	See “Link-RX/TX (10/100) LED”.
❺	Status LED	See “Status LED”.

Front Panel (AP9631)



	Item	Description
❶	USB ports	Supports NMC firmware upgrades, see “File Transfers”.
❷ ❸	Sensor ports	Connect temperature sensors, temperature/humidity sensors, or relay input/output connectors that support two input contacts and one output relay.
❹	10/100 Base-T connector	Connects the NMC to the Ethernet network.
❺	Reboot button	Reboots (resets) the NMC while power remains on.
❻	Serial configuration port	Connects the NMC to a local computer to configure initial network settings or access the command line interface (CLI).
❼	Link-RX/TX (10/100) LED	See “Link-RX/TX (10/100) LED”.
❽	Status LED	An LED (light-emitting diode) is a light source. See “Status LED”.

LED Descriptions

Status LED

This LED (light-emitting diode) indicates the status of the NMC.

Condition	Description
Off	One of the following situations exists: • The NMC is not receiving input power. • The NMC is not operating properly. It may need to be repaired or replaced. Contact Customer Support. See “APC Worldwide Customer Support”.
Solid green	The NMC has valid TCP/IP settings.
Solid orange	A hardware malfunction has been detected in the NMC. Contact Customer Support. See “APC Worldwide Customer Support”.
Flashing green	The NMC does not have valid TCP/IP settings.[1]
Flashing orange	The NMC is making BOOTP requests.[1]
Alternately flashing green and orange	If the LED is flashing slowly, the NMC is making DHCP[2] requests.[1] If the LED is flashing rapidly, the NMC is starting up.

1. If you do not use a BOOTP or DHCP server, see the Network Management Card Installation Manual provided in printed format and on the Network Management Card *Utility* CD in PDF to configure the TCP/IP settings of the NMC.
2. To use a DHCP server, see “DHCP response options”.

Link-RX/TX (10/100) LED

This LED indicates the network status of the NMC.

Condition	Description
Off	One or more of the following situations exist: • The NMC is not receiving input power. • The cable that connects the NMC to the network is disconnected or not functioning properly. • The device that connects the NMC to the network is turned off or not operating correctly. • The NMC itself is not operating properly. It may need to be repaired or replaced. Contact Customer Support. See “APC Worldwide Customer Support”
Solid green	The NMC is connected to a network operating at 10 Megabits per second (Mbps).
Solid orange	The NMC is connected to a network operating at 100 Mbps.
Flashing green	The NMC is receiving or transmitting data packets at 10 Mbps.
Flashing orange	The NMC is receiving or transmitting data packets at 100 Mbps.

Watchdog Features

Overview

To detect internal problems and recover from unanticipated inputs, the NMC uses internal, system-wide watchdog mechanisms. When it restarts to recover from an internal problem, a **System: Network Interface restarted** event is recorded in the event log.

Network interface watchdog mechanism

The NMC implements internal watchdog mechanisms to protect itself from becoming inaccessible over the network. For example, if the NMC 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.

Resetting the network timer

To ensure that the NMC does not restart if the network is quiet for 9.5 minutes, the NMC attempts to contact the default gateway every 4.5 minutes. If the gateway is present, it responds to the NMC, 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 and is on the same subnet. The network traffic of that computer will restart the 9.5-minute timer frequently enough to prevent the NMC from restarting.

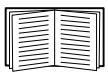
Command Line Interface (CLI)

How To Log On

Overview

To access the command line interface, you can use either a local, serial connection, or a remote connection (Telnet or SSH) with a computer on the same network as the Network Management Card (NMC).

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 User). A Read-Only User cannot access the command line interface.



If you cannot remember your user name or password, see “How to Recover from a Lost Password” on page 4.

Remote access to the command line interface

You can access the command line interface through Telnet or SSH. Telnet is enabled by default. Enabling SSH disables Telnet.

To enable or disable these access methods, use 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.

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 command line interface:

1. From a computer that has access to network on which the NMC is installed, at a command prompt, type `telnet` and the IP address for the NMC (for example, `telnet 139.225.6.133`, when the NMC uses the default Telnet port of 23), and press ENTER.

   If the NMC 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. (These are commands for general usage: some clients don’t allow you to specify the port as an argument and some types of Linux might want extra commands).

2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device User).

SSH for high-security access. If you use the high security of SSL for the Web interface, use SSH for access to the command line interface. SSH encrypts user names, passwords, and transmitted data. The interface, user accounts, and user access rights are the same whether you access the command line interface 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 command line interface

For local access, use a computer that connects to the Network Management Card through the serial port to access the command line interface:

1. Select a serial port at the computer and disable any service that uses the port.
2. Connect the provided serial cable (part number 940-0299) from the selected port on the computer to the configuration port at the NMC.
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. At the prompts, enter your user name and password.

Main Screen

Sample main screen

Following is an example of the screen displayed when you log on to the command line interface at the Network Management Card (NMC).

```
 American Power Conversion            Network Management Card AOS  vx.x.x
(c)Copyright 2010 All Rights Reserved Symmetra APP                 vx.x.x
-------------------------------------------------------------------------------
Name      : Test Lab                                   Date : 10/30/2010
Contact   : Don Adams                                  Time : 5:58:30
Location  : Building 3                                 User : Administrator
Up Time   : 0 Days, 21 Hours, 21 Minutes               Stat : P+ N+ A+

APC>
```

Information and status fields

Main screen information fields.

- Two fields identify the American Power Conversion operating system (AOS) and application (APP) firmware versions. The application firmware name identifies the device that connects to the network through this NMC. In the example above, the NMC uses the application firmware for a Symmetra UPS.

  ```
  Network Management Card AOS    vx.x.x
  Symmetra APP                   vx.x.x
  ```

- Three fields identify the system name, contact person, and location of the NMC. (In the user interface, select the **Administration** tab, **General** in the top menu bar, and **Identification** in the left navigation menu to set these values.)

  ```
  Name   : Test Lab
  Contact: Don Adams
  Location: Building 3
  ```

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

```
Up Time: 0 Days 21 Hours 21 Minutes
```

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

```
Date : 10/30/2009
Time : 5:58:30
```

- The **User** field reports whether you logged in through the **Administrator** or **Device Manager** account. (The **Read Only User** account cannot access the command line interface.)
  When you log on as Device Manager (equivalent to Device User in the user interface), you can access the event log, configure some UPS settings, and view the number of active alarms.

```
User : Administrator
```

Main screen status fields.

- The **Stat** field reports the NMC status. The middle status varies according to whether you are running IPv4, IPv6, or both, as indicated in the second table below.

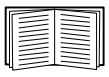
```
Stat : P+ N+ A+
```

P+	The operating system (AOS) is functioning properly.

IPv4 only	IPv6 only	IPv4 and IPv6*	Description
N+	N6+	N4+ N6+	The network is functioning properly.
N?	N6?	N4? N6?	A BOOTP request cycle is in progress.
N–	N6–	N4- N6-	The NMC failed to connect to the network.
N!	N6!	N4! N6!	Another device is using the IP address of the NMC.

* The N4 and N6 values can be different from one another: you could, for example, have N4– N6+.

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.



If P+ is not displayed, contact Customer Support. See “APC Worldwide Customer Support” on page 89.

How to Use the Command Line Interface

Overview

The command line interface provides options to configure the network settings and manage the UPS and its Network Management Card (NMC).

How to enter commands

At the command line interface, use commands to configure the NMC. To use a command, type the command and press ENTER. Commands and arguments are valid in lowercase, uppercase, or mixed case. Options are case-sensitive.

While using the command line interface, you can also do the following:

- Type `?` and press ENTER to view a list of available commands, based on your account type.

  To obtain information about the purpose and syntax of a specified command, type the command, a space, and `?` or the word `help`. For example, to view RADIUS configuration options, type:
  `radius ?`
  or
  `radius help`
- Press the UP arrow key to view the command that was entered most recently in the session. Use the UP and DOWN arrow keys to scroll through a list of up to ten previous commands.
- Type at least one letter of a command and press the TAB key to scroll through a list of valid commands that match the text you typed in the command line.
- Type `ups -st` to view the status of the UPS.
- Type `exit` or `quit` to close the connection to the command line interface.

Command syntax

Item	Description
-	Options are preceded by a hyphen.
< >	Definitions of options are enclosed in angle brackets. For example: `-dp <device password>`
[ ]	If a command accepts multiple options or an option accepts mutually exclusive arguments, the values may be enclosed in brackets.
|	A vertical line between items enclosed in brackets or angle brackets indicates that the items are mutually exclusive. You must use one of the items.

Syntax examples

A command that supports multiple options:

```
user [-an <admin name>] [-ap <admin password>]
```

In this example, the `user` command accepts the option `-an`, which defines the Administrator user name, and the option `-ap`, which defines the Administrator password. To change the Administrator user name and password to XYZ:

1. Type the `user` command, one option, and the argument XYZ:
   `user -ap XYZ`
2. After the first command succeeds, type the `user` command, the second option, and the argument XYZ:
   `user -an XYZ`

A command that accepts mutually exclusive arguments for an option:

```
alarmcount -p [all | warning | critical]
```

In this example, the option `-p` accepts only three arguments: `all`, `warning`, or `critical`. For example, to view the number of active critical alarms, type:

```
alarmcount -p critical
```

The command will fail if you type an argument that is not specified.

Command Response Codes

The command response codes enable scripted operations to detect error conditions reliably without having to match error message text.

The CLI reports all command operations with the following format:

```
E [0-9][0-9][0-9]: Error message
```

Code	Error message
E000	Success
E001	Successfully Issued
E002	Reboot required for change to take effect
E100	Command failed
E101	Command not found
E102	Parameter Error
E103	Command Line Error
E104	User Level Denial
E105	Command Prefill
E106	Data Not Available
E107	Serial communication with the UPS has been lost

Command Descriptions

The availability of the commands and options below can vary between UPS devices.

?

Access: Administrator, Device User

Description: View a list of all the CLI commands available to your account type. To view help text for a specific command, type the command followed by a question mark.

Example: To view a list of options that are accepted by the `alarmcount` command, type:
`alarmcount ?`

about

Access: Administrator, Device User

Description: View hardware and firmware information. This information is useful in troubleshooting and enables you to determine if updated firmware is available at the website.

alarmcount

Access: Administrator, Device User

Description:

Option	Arguments	Description
-p	all	View the number of active alarms reported by the NMC. Information about the alarms is provided in the event log.
	warning	View the number of active warning alarms.
	critical	View the number of active critical alarms.

Example: To view all active warning alarms, type:
`alarmcount -p warning`

boot

Access: Administrator only

Description: Define how the NMC will obtain its network settings, including the IP address, subnet mask, and default gateway. Then configure the BOOTP or DHCP server settings.

Option	Argument	Description
-b <boot mode>	dhcp | bootp | manual	Define how the TCP/IP settings will be configured when the NMC turns on, resets, or restarts. See “TCP/IP and Communication Settings” on page 54 for information about each boot mode setting.
-c	enable | disable	`dhcp` boot modes only. Enable or disable the requirement that the DHCP server provide the APC cookie.
The default values for these three settings generally do not need to be changed: -v <vendor class>: APC -i <client id>: The MAC address of the NMC, which uniquely identifies it on the network -u <user class>: The name of the application firmware module		

Example: To use a DHCP server to obtain network settings:

1. Type `boot -b dhcp`
2. Enable the requirement that the DHCP server provide the APC cookie:
   `boot -c enable`

cd

Access: Administrator, Device User

Description: Navigate to a folder in the directory structure of the NMC.

Example 1: To change to the `ssh` folder and confirm that an SSH security certificate was uploaded to the NMC:

1. Type `cd ssh` and press ENTER.
2. Type `dir` and press ENTER to list the files stored in the SSH folder.

Example 2: To return to the main directory folder, type:
`cd ..`

cfgshutdn

Access: Administrator only, Device User

Description: Configure the shutdown parameters: this enables you to show and configure UPS Shutdown Delay, UPS Return Delay, UPS Low Battery Duration, UPS Sleep Time, and UPS Min Return Runtime.

These options are not available with all UPS devices.

Option	Argument	Description
-all		Show all applicable shutdown parameters for this UPS.
-sd	000 | 090 | 180 | 270 | 360 | 450 | 540 | 630	Set the shutdown delay in seconds.
-lo	02 | 05 | 08 | 11 | 14 | 17 | 20 | 23	Set the low battery duration in minutes.
-rd	000 | 060 | 120 | 180 | 240 | 300 | 360 | 420	Set the UPS return delay in seconds, that is, the delay time before the UPS turns on again.
-rrt	0–3600	Set the minimum return runtime in seconds, that is, the battery runtime to support the load must reach this value before the UPS turns on again.
-sl	0.0–359.9	Set the sleep time, in hours. The argument can have any number between 0.0 and 359.9.
-rsc	00 | 15 | 30 | 45 | 60 | 75 | 90	Set the minimum battery charge, as a percentage of the total capacity.

cfgpower

Access: Administrator only, Device User

Description: Configure the power parameters: this enables you to show and configure transfer points, sensitivity and output voltage.

These options are not available with all UPS devices.

Option	Argument These values can vary with different devices.	Description
-all		Show all applicable power parameters for this UPS.
-l	97–106	Set the low transfer point, in VAC.
-h	127–136	Set the high transfer point, in VAC.
-ov	100 | 120 | 110 |	Set the outlet voltage, in VAC.
-s	Normal | Reduced | Low	Set the sensitivity, using one of the three arguments.
-bu	127 | 130 | 133 | 136 | 139 | 142 | 145 | 148	Set the bypass upper voltage in VAC; when the voltage rises above this value, the device goes into bypass.
-bl	086 | 088 | 090 | 092 | 094 | 096 | 098 | 100	Set the bypass lower voltage in VAC; when the voltage drops below this value, the device goes into bypass.

console

Access: Administrator only

Description: Define whether users can access the command line interface using Telnet, which is enabled by default, or Secure SHell (SSH), which provides protection by transmitting user names, passwords, and data in encrypted form. You can change the Telnet or SSH port setting for additional security. Alternately, disable network access to the command line interface.

Option	Argument	Description
-S	disable | telnet | ssh	Configure access to the command line interface, or use the `disable` command to prevent access. Enabling SSH enables SCP and disables Telnet.
-pt	<telnet port n>	Define the Telnet port used to communicate with the NMC (23 by default).
-ps	<SSH port n>	Define the SSH port used to communicate with the NMC (22 by default).
-b	2400 | 9600 | 19200 | 38400	Configure the speed of the serial port connection (9600 bps by default).

Example 1: To enable SSH access to the command line interface, type:

```
console -S ssh
```

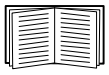
Example 2: To change the Telnet port to 5000, type:

```
console -pt 5000
```

date

Access: Administrator only

Definition: Configure the date used by the NMC.



To configure an NTP server to define the date and time for the NMC, see “Set the Date and Time” on page 68.

Option	Argument	Description
-d	<“datestring”>	Set the current date. Use the date format specified by the `date -f` command.
-t	<00:00:00>	Configure the current time, in hours, minutes, and seconds. Use the 24-hour clock format.
-f	mm/dd/yy | dd.mm.yyyy | mmm-dd-yy | dd-mmm-yy | yyyy-mm-dd	Select the numerical format in which to display all dates in this user interface. 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.
-z	<time zone offset>	Set the difference with GMT in order to specify your time zone. This enables you to synchronize with other people in different time zones.

Example 1: To display the date using the format yyyy-mm-dd, type:

```
date -f yyyy-mm-dd
```

Example 2: To define the date as October 30, 2009, using the format configured in the preceding example, type:

```
date -d "2009-10-30"
```

Example 3: To define the time as 5:21:03 p.m., type:

```
date -t 17:21:03
```

delete

Access: Administrator only

Description: Delete a file in the file system. (To delete the event log, see “eventlog,” beginning on page).

Argument	Description
<file name>	Type the name of the file to delete.

Example: To delete a file:

1. Navigate to the folder that contains the file. For example, to navigate to the `logs` folder, type:
   `cd logs`
2. To view the files in the `logs` folder, type:
   `dir`
3. Type
   `delete <file name>`.

detstatus

Access: Administrator, Device User

Description: View the detailed status of the UPS. See also the -st option in “ups” on page 23.

Option	Arguments	Description
-all		Show all applicable status information for this UPS.

Option	Arguments	Description
-rt		Runtime remaining, in hours and minutes.
-ss		UPS status summary: on line, on battery, etc.
-soc		UPS battery charge, as a percentage of the total capacity.
-om		Output measurements: voltage, frequency, watts percentage, VA percentage, current.
-im		Input measurements: voltage and frequency.
-bat		Battery voltage
-tmp		Internal temperature of the UPS
-dg		Diagnostic test results: self-test result and date, calibration result and date.

dir

Access: Administrator, Device User

Description: View the files and folders stored on the NMC.

dns

Access: Administrator

Description: Configure the manual Domain Name System (DNS) settings.

Parameter	Argument	Description
-OM	enable | disable	Override the manual DNS.
-p	<primary DNS server>	Set the primary DNS server.
-s	<secondary DNS server>	Set the secondary DNS server.
-d	<domain name>	Set the domain name.
-n	<domain name IPv6>	Set the domain name IPv6.
-h	<host name>	Set the host name.

eventlog

Access: Administrator, Device User

Description: View the date and time you retrieved the event log, the status of the UPS, and the status of sensors connected to the NMC. View the most recent device events, and the date and time they occurred. Use the following keys to navigate the event log:

Key	Description
ESC	Close the event log and return to the command line interface.
ENTER	Update the log display. Use this command to view events that were recorded after you last retrieved and displayed the log.

Key	Description
SPACEBAR	View the next page of the event log.
B	View the preceding page of the event log. This command is not available at the main page of the event log.
D	Delete the event log. Follow the prompts to confirm or deny the deletion. Deleted events cannot be retrieved.

exit

Access: Administrator, Device User

Description: Exit from the command line interface session.

format

Access: Administrator only

Description: Reformat the file system of the NMC and erase all security certificates, encryption keys, configuration settings, and the event and data logs. Be careful with this command.

To reset the NMC to its default configuration, use the `resetToDef` command.

ftp

Access: Administrator only

Description: Enable or disable access to the FTP server. Optionally, change the port setting to the number of any unused port from 5001 to 32768 for added security.

Option	Argument	Definition
-p	<port number>	Define the TCP/IP port that the FTP server uses to communicate with the NMC (21 by default). The FTP server uses both the specified port and the port one number lower than the specified port.
-S	enable | disable	Configure access to the FTP server.

Example: To change the TCP/IP port to 5001, type:
`ftp -p 5001`

help

Access: Administrator, Device User

Description: View a list of all the CLI commands available to your account type. To view help text for a specific command, type the command followed by `help`.

Example 1: To view a list of commands available to someone logged on as a Device User, type:
`help`

Example 2: To view a list of options that are accepted by the `alarmcount` command, type:
`alarmcount help`

netstat

Access: Administrator, Device User

Description: View the status of the network and all active IPv4 and IPv6 addresses.

ntp

Access: Administrator, Device User

Description: View and configure the network time protocol parameters.

Option	Argument	Definition
-OM	enable | disable	Override the manual settings.
-p	<primary NTP server>	Specify the primary server.
-s	<secondary NTP server>	Specify the secondary server.

Example 1: To enable the override of manual setting, type:
`ntp -OM enable`

Example 2: To specify the primary NTP server, type:
`ntp -p 150.250.6.10`

ping

Access: Administrator, Device User

Description. Determine whether the device with the IP address or DNS name you specify is connected to the network. Four inquiries are sent to the address.

Argument	Description
<IP address or DNS name>	Type an IP address with the format *xxx.xxx.xxx.xxx*, or the DNS name configured by the DNS server.

Example: To determine whether a device with an IP address of 150.250.6.10 is connected to the network, type:
`ping 150.250.6.10`

portspeed

Access: Administrator

Description:

Option	Arguments	Description
-s	auto | 10H | 10F | 100H | 100F	Define the communication speed of the Ethernet port. The `auto` command enables the Ethernet devices to negotiate to transmit at the highest possible speed. See “Port Speed” on page 55 for more information about the port speed settings.

Example: To configure the TCP/IP port to communicate using 100 Mbps with half-duplex communication (communication in only one direction at a time), type:
`portspeed -s 100H`

prompt

Access: Administrator, Device User

Description: Configure the command line interface prompt to include or exclude the account type of the currently logged-in user. Any user can change this setting; all user accounts will be updated to use the new setting.

Option	Argument	Description
-s	long	The prompt includes the account type of the currently logged-in user.
	short	The default setting. The prompt is four characters long: `APC>`

Example: To include the account type of the currently logged-in user in the command prompt, type:
`prompt -s long`

quit

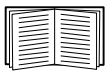
Access: Administrator, Device User

Description: Exit from the command line interface session (this works the same as the exit command).

radius

Access: Administrator only

Description: View the existing RADIUS settings, enable or disable RADIUS authentication, and configure basic authentication parameters for up to two RADIUS servers.



For a summary of RADIUS server configuration and a list of supported RADIUS servers, see “Configuring the RADIUS Server” on page 52.

Additional authentication parameters for RADIUS servers are available at the user interface of the NMC. See “RADIUS” on page 52 for more information.

For detailed information about configuring your RADIUS server, see the *Security Handbook*, available on the Network Management Card *Utility* CD and at the website, **www.apc.com**.

Option	Argument	Description
-a	local | radiusLocal | radius	Configure RADIUS authentication: `local` — RADIUS is disabled. Local authentication is enabled. `radiusLocal` — 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` — RADIUS is enabled. Local authentication is disabled.
-p1 -p2	<server IP>	The server name or IP address of the primary or secondary 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.
-s1 -s2	<server secret>	The shared secret between the primary or secondary RADIUS server and the NMC.
-t1 -t2	<server timeout>	The time in seconds that the NMC waits for a response from the primary or secondary RADIUS server.

Example 1:

To view the existing RADIUS settings for the NMC, type `radius` and press ENTER.

Example 2: To enable RADIUS and local authentication, type:
`radius -a radiusLocal`

Example 3: To configure a 10-second timeout for a secondary RADIUS server, type:
`radius -t2 10`

reboot

Access: Administrator

Description: Restart the interface of the NMC.

resetToDef

Access: Administrator only

Description: Reset all parameters to their default.

Option	Arguments	Description
-p	all | keepip	Reset all configuration changes, including event actions, device settings, and, optionally, TCP/IP configuration settings.

Example: To reset all of the configuration changes *except* the TCP/IP settings for the NMC, type:
`resetToDef -p keepip`

snmp, snmpv3

Access: Administrator only

Description: Enable or disable SNMP 1 or SNMP 3.

Option	Arguments	Description
-S	enable | disable	Enable or display the respective version of SNMP, 1 or 3.

Example: To enable SNMP version 1, type:
`snmp -S enable`

system

Access: Administrator only

Description: View and set the system name, the contact, the location and view up time as well as the date and time, the logged-on user, and the high-level system status P, N, A (see “Main screen status fields”).

Option	Argument	Description
-n	<system name>	Define the device name, the name of the person responsible for the device, and the physical location of the device. Note: If you define a value with more than one word, you must enclose the value in quotation marks. These values are also used by InfraStruxure Central and the NMC’s SNMP agent.
-c	<system contact>	
-l	<system location>	

Example 1: To set the device location as `Test Lab`, type:
`system -l “Test Lab”`

Example 2: To set the system name as `Don Adams`, type:
`system -n "Don Adams"`

tcpip

Access: Administrator only

Description: View and manually configure these network settings for the NMC:

Option	Argument	Description
-S	enable | disable	Enable or disable TCP/IP.
-i	<IP address>	Type the IP address of the NMC, using the format *xxx.xxx.xxx.xxx*
-s	<subnet mask>	Type the subnet mask for the NMC.
-g	<gateway>	Type the IP address of the default gateway. **Do not** use the loopback address (127.0.0.1) as the default gateway.
-d	<domain name>	Type the DNS name configured by the DNS server.
-h	<host name>	Type the host name that the NMC will use.

Example 1: To view the network settings of the NMC, type `tcpip` and press ENTER.

Example 2: To manually configure an IP address of `150.250.6.10` for the NMC, type:
`tcpip -i 150.250.6.10`

tcpip6

Access: Administrator only

Description: Enable IPv6 and view and manually configure these network settings for the NMC (NMC):

Option	Argument	Description
-S	enable | disable	Enable or disable IPv6.
-man	enable | disable	Enable manual addressing for the IPv6 address of the NMC.
-auto	enable | disable	Enable the NMC to automatically configure the IPv6 address.
-i	<IPv6 address>	Set the IPv6 address of the NMC.
-g	<IPv6 gateway>	Set the IPv6 address of the default gateway.
-d6	router | statefull | stateless | never	Set the DHCPv6 mode, with parameters of router controlled, statefull (for address and other information, they maintain their status), stateless (for information other than address, the status is not maintained), never.

Example 1: To view the network settings of the NMC, type `tcpip6` and press ENTER.

Example 2: To manually configure an IPv6 address of 2001:0:0:0:0:FFD3:0:57ab for the NMC, type:
`tcpip -i 2001:0:0:0:0:FFD3:0:57ab`

uio

Access: Administrator, Device User

Description: This command is available for an AP9631 Network Management Card 2 with a connected Dry Contact I/O Accessory (AP9810).

Option	Argument	Description
-rc <UIO port #>	open | close	Change the state of a connected output, and specify the UIO (universal input/ output) port number.
-st	<UIO port #> | <UIO port #>, <UIO port #> | <UIO port #>–<UIO port #>	View the status of the sensors connected to the Dry Contact I/O Accessory. To view the status of a specific sensor or several sensors, type their UIO port numbers.
-disc	<UIO port #> | <UIO port #>, <UIO port #> | <UIO port #>–<UIO port #>	Identify new input contact or output relay connections.

Example 1: To open the output, type:

```
uio -rc 2 open
```

Example 2: To view the status of the devices connected to a Dry Contact I/O Accessory that is installed in universal input/ output port 2, type:

```
uio -st 2
```

ups

Some **ups** options are dependant on the UPS model. Not all configurations may support all options of the **ups** command.

Access: Administrator, Device User

Description: Control the UPS and view status information.

Option	Arguments	Description
-c	off | graceoff | on | reboot | gracereboot | sleep | gracesleep	Configure UPS actions. See “Actions (for a single UPS and Synchronized Control Groups)” on page 32 for detailed information.
-r	start | stop	Initiate or end a runtime calibration. A calibration recalculates remaining runtime and requires the following: • Because a calibration temporarily depletes the UPS batteries, you can perform a calibration only if battery capacity is at 100%. • For some UPS devices, the load must be at least 7% to perform a calibration.
-s	start	Initiate a UPS self-test.
-b	enter | exit	Control the use of bypass mode. This command is model-specific and may not apply to your UPS. See “Actions (for a single UPS and Synchronized Control Groups)” on page 32 for detailed information.

Option	Arguments	Description
-o#	Off | DelayOff | On | DelayOn | Reboot | DelayReboot| Shutdown | DelayShutdown | Cancel	Control any of three outlet groups at a Smart-UPS XLM. Specify the outlet group with #. For information about outlet groups, see “What are Outlet Groups?” on page 36. When the state of the outlet group is **on**, the option accepts three arguments: • `Off` — Turn off the group immediately. • `DelayOff` — Turn off the group after the number of seconds configured as **Power Off Delay**. • `Reboot` — Turn off the group immediately, then turn it on after the number of seconds configured as **Reboot Duration** and **Power On Delay**. • `DelayReboot` — Turn the outlet group off after the number of seconds configured as **Power Off Delay**, then turn it on after the number of seconds configured as **Reboot Duration** and **Power On Delay**. • `Shutdown` — If the UPS is online, this reboots the outlet group. If the UPS is on battery, this shuts down the group and waits for AC utility power before turning on the group again. • `DelayShutdown` — Shut down the outlet group after the number of seconds configured as **Power Off Delay**. • `Cancel` — Cancel your previous commands, e.g. turning off. When the state of the outlet group is **off**, the option accepts two arguments: • `On` — Turn on the group immediately. • `DelayOn` — Turn on the group after the number of seconds configured as **Power On Delay**. The **Power On Delay**, **Power Off Delay**, and **Reboot Duration** must be configured at the user interface. See “The outlet groups option (including automatic load-shedding)” on page 37 for more information.
-os#		View the status (on, off, or rebooting) of all the outlet groups. To view the status of a specific outlet group, specify its number. For example, type `ups -os1` to view the status of outlet group 1, see note below. Note:When you use this option on a UPS with a main outlet group: 1 identifies the main outlet group, 2 identifies Switched Outlet Group 1, 3 identifies Switched Outlet Group 2, etc. On a UPS with NO main outlet group: 1 identifies Switched Outlet Group 1, etc.
-st		View the status of the UPS.
-a	start	Test the UPS audible alarm.

The ups command options for MGE Galaxy-specific UPS devices:

|
These commands are only available on the MGE Galaxy 300 and MGE Galaxy 7000 UPS. Some options may only be available based on the individual UPS model.

Option	Argument	Description
-input	<phase#> | all	Display the input measurements for the chosen phase of the UPS. Typing “all” displays the information for all phases of the UPS.
	voltage | current | frequency | all	Specify the input measurement for the `ups` command. **Example:** `ups -input 2 frequency` Displays the frequency for phase 2 of the UPS.
-bypass	<phase#> | all	Display the input measurements for the chosen phase of the bypass main. Typing “`all`” displays all phases of the bypass main.
	voltage | current | frequency | all	Specify the input measurement for the `ups` command. **Example:** `ups -bypass 2 current` Displays the current for phase 2 of the bypass main.
-output	<phase#> | all	Display the output measurements for the chosen phase of the UPS. Typing “all” displays the information for all phases of the UPS.
	voltage | current | load | power | percload | pf | frequency | all	Specify the output measurement for the ups command. **Example:** `ups -output 2 percload` Displays the percentage of load for phase 2 of the UPS.
-batt		Display the battery status of the UPS
-about		Displays information about the UPS.
-al	<c | w>	Display all existing alarms. Specifying “c” or “w” limits the display to either Critical (c) or Warning (w) alarms.

Example 1: To initiate a runtime calibration, type:

```
ups -r start
```

Example 2: To immediately turn off outlet group 2 at a Smart-UPS XLM, type:

```
ups -o2 off
```

upsfwupdate

This command might not be available for all UPS devices.

Access. Administrator, Device User.

Description: Initiate an update of the UPS firmware. The firmware update file must have been previously sent using FTP to the NMC and stored in the /upsfw/ directory.

Option	Argument	Description
-apply		Start the firmware update.
-status		Check the status of a firmware update that is already initiated.
-lastresult		View the result of the last attempted firmware update.

Option	Argument	Description
-fileinfo		View information about the firmware update file present on your NMC, including its name, whether it is compatible with the UPS, and its version.

user

Access: Administrator only

Description: Configure the user name and password for each account type, and configure the inactivity timeout.

For information on the permissions granted to each account type (Administrator, Device User, and Read-Only User), see “Types of user accounts” on page 3.

Option	Argument	Description
-an -dn -rn	<admin name> <device name> <read-only name>	Set the case-sensitive user name for each account type. The maximum length is 10 characters.
-ap -dp -rp	<admin password> <device password> <read-only password>	Set the case-sensitive password for each account type. The maximum length is 32 characters. Null/ blank passwords are not allowed.
-t	<minutes>	Set the time that the system waits before logging off an inactive user. Three minutes is the default, with a maximum of ten.

Example 1: To change the Administrator user name to XYZ, type:

```
user -an XYZ
```

Example 2: To change the log off time to 10 minutes, type:

```
user -t 10
```

web

Access: Administrator

Description: Enable access to the user interface using HTTP or HTTPS.

For additional security, you can change the port setting for HTTP and HTTPS to any unused port from 5000 – 32768. 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
```

Option	Argument	Definition
-S	disable | http | https	Configure access to the user interface. When HTTPS is enabled, data is encrypted during transmission and authenticated by digital certificate.
-ph	<http port #>	Specify the TCP/IP port used by HTTP to communicate with the NMC (80 by default).
-ps	<https port #>	Specify the TCP/IP port used by HTTPS to communicate with the NMC (443 by default).

Example: To prevent all access to the user interface, type:

```
web -S disable
```

xferINI

Access: Administrator only. This command only works through serial CLI.

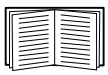
Description: Use XMODEM to upload an .ini file while you are accessing the command line interface through a serial connection. After the upload completes:

- If there are any system or network changes, the command line interface restarts, and you must log on again.
- If you selected a baud rate for the file transfer that is not the same as the default baud rate for the NMC, you must reset the baud rate to the default to re-establish communication with the NMC.

xferStatus

Access: Administrator only

Description: View the result of the last file transfer.



See “Verifying Upgrades” on page 80 for descriptions of the transfer result codes.

Web User Interface

Introduction

Overview

The Web user interface provides options to manage the UPS and the UPS Network Management Card 2 (NMC) and to view the status of the UPS.

See “Web” on page 57 for information on how to select, enable, and disable the protocols that control access to the user interface and to define the Web-server ports for the protocols.

Supported Web browsers

You can use Microsoft® Internet Explorer® (IE) 7.x or higher (on Windows® operating systems only) or Mozilla® Firefox® 3.0.6 or higher (on all operating systems) to access the NMC through its user interface. Other commonly available browsers might work but have not been fully tested.

The NMC cannot work with a proxy server. Before you can use a browser to access the user interface of the NMC, you must do one of the following:

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

How to Log On

Overview

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

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

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

You can set your user interface language as you log on by choosing a language from the **Language** drop-down box. See “Adding and Changing Language Packs” on page 80.

When HTTPS is enabled, the NMC generates its own certificate. This certificate negotiates encryption methods with your browser. Refer to the Security Guide on the CD or on the **www.apc.com** website for more details.

URL address formats

Type the DNS name or IP address of the NMC 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	Browser	Cause of the Error
“You are not authorized to view this page” or “Someone is currently logged in...”	Internet Explorer, Firefox	Someone else is logged on.
“This page cannot be displayed.”	Internet Explorer	Web access is disabled, or the URL was not correct.
“Unable to connect.”	Firefox	

URL format examples.

Example and Access Mode	URL Format
DNS name of `Web1`	
HTTP	`http://Web1`
HTTPS	`https://Web1`
System IP address of `139.225.6.133` and a default Web server port (80)	
HTTP	`http://139.225.6.133`
HTTPS	`https://139.225.6.133`
System IP address of `139.225.6.133` and a non-default Web server port (5000)	
HTTP	`http://139.225.6.133:5000`
HTTPS	`http://139.225.6.133:5000`
System IPv6 address of `2001:db8:1::2c0:b7ff:fe00:1100` and a non-default Web server port (5000)	
HTTP	`http://[2001:db8:1::2c0:b7ff:fe00:1100]:5000`

Home Page

Overview

Path: Path: Home

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

Quick status icons

One or more icons and accompanying text indicate the current operating status of the UPS:

Symbol	Description
	**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 UPS and NMC are operating normally.

At the upper right corner of every page, the same icons report the UPS Status. If any **Critical** or **Warning** alarms exist, the number of active alarms also displays.

To return to the **Home** page click on one of the quick status icon on any page of the interface.

Recent Device Events

Recent UPS events are listed with the more recent first. To view the entire event log, click **More Events**.

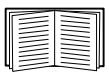
Tabs, Menus, and Links

The **Environment** tab displays only when a temperature sensor, temperature and humidity sensor, input contact, or output relay is present.

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

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 Knowledge Base page of the **www.apc.com** website
- **Link 2**: the Product Information page of the **www.apc.com** website
- **Link 3**: the downloads page of the **www.apc.com** website



To reconfigure the links, see “Configure Links” on page 71.

Monitor and Configure the UPS

For an AP9631 UPS Network Management Card 2 with a connected Dry Contact I/O Accessory (AP9810), the **UPS** tab displays two top menu bar options, **UPS** and **Control Policy**. Use the **UPS** option to complete the tasks described in this chapter.

For information about the **Control Policy** option, see “Configuring the Control Policy” on page 47.

Overview Page

Path: UPS > Overview

The **Overview** page is displayed by default when you click the **UPS** tab.

Operating state

Below the UPS model name and configured UPS name, icons and accompanying text indicate the operating status of the UPS. See “Quick status icons” on page 30 for a description of the icons.

Quick Status

This shows you the UPS load, battery charge, voltage, and other useful information.

To view detailed information about status items specific to the UPS model associated with the NMC, see the online help.

Recent UPS Events

Recent UPS events are listed with the more recent first. To view the entire event log, click **More Events**.

Detailed Status/ Status Page

To display detailed UPS status, click an option under the **Detailed Status** option on the left navigation menu of the **UPS** tab.

Path: UPS > Detailed Status/ Status

This page is not available for all UPS devices.

measurements option

The reason for the last battery transfer, the UPS temperature, and the runtime remaining always display. The types of model-specific information displayed include voltage, load, redundant power, battery, and internal and external components.

To view detailed information about status items specific to the UPS model associated with the NMC, see the online help.

outlet groups option

This option is not available for all UPS devices.

This screen shows you the **name** and present **status** of any Switched Outlet on your UPS.

energy usage option

This option is not available for all UPS devices.

Energy usage enables you to monitor the energy consumption of equipment attached to your UPS. In addition it gives you energy-related data like your carbon dioxide emissions and your energy costs.

Energy Usage: Your estimated electricity consumed since you installed the NMC in kilowatts per hour (kWh). For example, a UPS powering a 350 W light bulb for 1000 hours consumes 350 kWh of energy.

Total Cost: Your estimated electricity cost of energy used, in your local currency. For example, a light bulb consuming 350 kWh of energy over 1000 hours with a price of $0.10 per kWh costs $35 over that period of time.

CO2 Emissions: Your estimated total emission of carbon dioxide (CO_2) in kilograms or pounds used thus far.

Total cost and CO_2 emissions vary greatly by energy source and distribution network. Obtain a rough estimate by choosing your country from the drop-down **Location** list.

To input your own values, click on the **(edit)** link.

Control page

To perform actions to control the functioning of a UPS, select **UPS** or **outlet groups** under Control.

Path: UPS > Control

This page is not available for all UPS devices.

UPS option

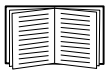
This option applies both to individual UPS models and to Synchronized Control Groups. For background information on Synchronized Control Groups, see “The sync control option” on page 41

Actions (for a single UPS and Synchronized Control Groups). Use the actions described in the following table for single UPS models and for Synchronized Control Groups.

Follow these guidelines:

- The actions **Put UPS in Bypass** and **Take UPS Off Bypass** are supported:
  - Only for single UPS models, NOT for Synchronized Control Groups
  - Only for Symmetra UPS and some Smart-UPS models
- All other actions are supported:
  - For Smart-UPS models, including those in Synchronized Control Groups
  - For single UPS models, including single Symmetra models

When you select **Initiate PowerChute Network Shutdown** in the user interface, initiating a **Turn UPS Off**, **Reboot UPS**, or **Put UPS To Sleep** action is equivalent to selecting `GraceOff` (turn off the UPS gracefully), `GraceReboot` (reboot UPS gracefully), or `GraceSleep` (put the UPS to sleep gracefully) in the command line interface.



For more information about the delays and settings in the following table, see “Configuration Pages” on page 36 and “The sync control option” on page 41.

To apply **UPS Alarm Test** to a Synchronized Control Group, see “Diagnostics page” on page 42.

Action	Definition
Turn UPS On (user interface) `ups -c On` (command line interface)	Turns on power at the UPS. • For a UPS model with Switched Outlet groups, this action then turns on the outlet groups according to the value for **Power On Delay** for each group. See “The outlet groups option (including automatic load-shedding)” on page 37. • For a Synchronized Control Group, after a delay of a few seconds, the action turns on all enabled group members that have input power.
Turn UPS Off (user interface) `ups -c Off` (command line interface)	Turns off the output power of the UPS and (for Switched Outlet groups) of all its outlet groups immediately, without a shutdown delay. The UPS and all its outlet groups remain off until you turn on its power again. For a Synchronized Control Group, this action turns off power at all enabled members of the group. No **Shutdown Delay** value is used. The UPSs turn off after a few seconds and remain off until you turn on their power. See “The shutdown option” on page 38. Note**:** For a synchronized turn-off action that uses the value of the **Shutdown Delay** of the initiating UPS, use SNMP. For the **upsAdvControlUpsOff** OID, set the value to **turnUpsSyncGroupOffAfterDelay (5)**.
`ups -c GraceOff` (command line interface)	Turns off outlet power of the UPS and (for a UPS model with outlet groups) all its outlet groups after the **Maximum Required Delay** and the configured **Shutdown Delay**. See “The PowerChute clients option” on page 41.

Action	Definition
Reboot UPS (user interface) `ups -c Reboot` (command line interface)	Restarts the attached equipment by doing the following: • Turns off power at the UPS after **Shutdown Delay**. • Turns on power at the UPS after the UPS battery capacity returns to at least the percentage configured for **Minimum Battery Capacity** or can support the load for the time configured for **Return Runtime Duration**. (The parameter differs by UPS model.) The UPS then waits the time specified as **Return Delay**. See “The shutdown option” on page 38. • For a UPS with outlet groups, **Power On Delay** occurs after the UPS turns on and before an outlet group turns on. On the **UPS** tab, configure **Power On Delay** for each outlet group by using the **settings** option under **Outlet Groups**. See “The outlet groups option (including automatic load-shedding)” on page 37. For a Synchronized Control Group action: 1. This option turns off power at the UPS models that are enabled group members after waiting the time configured as **Shutdown Delay** for the initiating UPS models. See “The shutdown option” on page 38. 2. The initiating UPS waits up to the number of seconds specified as **Power Synchronized Delay** to allow time for group members to regain input power. If all group members already regained input power, this delay is omitted. If all group members regain input power during the delay, the rest of the delay is cancelled. See the online help for information configuring the fields used in synchronizing an SCG. 3. **Return Delay** starts when the initiating UPS is at its configured **Minimum Battery Capacity** (or **Return Runtime Duration**). See “The shutdown option” on page 38. **Minimum Battery Capacity** (or **Return Runtime Duration**) of the initiating UPS is also required of group members. However, you can reduce a group member’s requirement by configuring that member’s **Minimum Battery Capacity Offset** (or **Return Runtime Duration Offset**), e.g., if the initiator’s **Minimum Battery Capacity** is 50%, and a member’s **Minimum Battery Capacity Offset** is 5%, that member needs battery capacity of 45% to reboot. See the online help for information configuring the fields used in synchronizing an SCG.
`ups -c GraceReboot` (command line interface)	• This action is similar to **Reboot UPS**, but with an additional delay before the shutdown. Attached equipment shuts down only after the UPS (or the initiating UPS, for a Synchronized Control Group action) waits the **Maximum Required Delay**, which is calculated as described in “You can also decide whether the UPS turns back on, or not, after AC utility power is restored.” on page 39. • For a UPS with outlet groups, **Power On Delay** occurs after the UPS turns on and before an outlet group turns on. On the **UPS** tab, you configure **Power On Delay** for each outlet group through the **settings** option under **Outlet Groups**. See “The outlet groups option (including automatic load-shedding)” on page 37.
Put UPS To Sleep (user interface) `ups -c Sleep` (command line interface)	Puts the UPS into sleep mode by turning off its output power for a defined period of time: • The UPS turns off output power after waiting the time configured as **Shutdown Delay**. See “The shutdown option” on page 38. • When input power returns, the UPS turns on output power after two configured periods of time: **Sleep Time** and **Return Delay**. See “The shutdown option” on page 38. • For a synchronized control group action, the NMC of the initiating UPS waits up to the number of seconds configured as **Power Synchronized Delay** for enabled group members to regain input power before it starts the **Return Delay**. If all group members already regained input power, the **Power Synchronized Delay** is omitted. If all group members regain input power during the delay, the rest of the delay is cancelled. See the online help for information configuring the fields used in synchronizing an SCG.

Action	Definition
`ups -c GraceSleep` (command line interface)	Puts the UPS into sleep mode (turns off power for a defined period of time): • The UPS turns off output power after waiting the **Maximum Required Delay** to allow time for PowerChute Network Shutdown to shut down its server safely, and its **Shutdown Delay**. See "The shutdown option" on page 38. • When input power returns, the UPS turns on output power after two configured periods of time: its **Sleep Time** and **Return Delay Time**. See "The shutdown option" on page 38. • For a synchronized control group action, the Management Card of the UPS initiating the action waits up to the number of seconds configured as its **Power Synchronized Delay** for enabled group members to regain input power before it starts the **Return Delay**. If all group members have already regained input power, the **Power Synchronized Delay** is omitted. If all group members regain input power during the delay, the remainder of the delay is cancelled. See the online help for information configuring the fields used in synchronizing an SCG.

Put UPS In Bypass and **Take UPS Off Bypass** (user interface)
`ups -b Enter`
`ups -b Exit`
(command line interface)
	Controls the use of bypass mode, which allows maintenance to be performed at a Symmetra UPS and some Smart-UPS models without turning off power at the UPS.

outlet groups option

Turn on, turn off, or restart outlet groups with this option.

Path: UPS > Control > outlet groups

(This screen page lists by name and state each outlet group that has been configured through the **Configuration - outlet groups** option).

You can select any of the following actions (or no action) for each group. These are one-time actions.

- When the state of the outlet group is **off**:
  - **On Immediately**
  - **On with Delay**: Turn on the group after the number of seconds configured as **Power On Delay**. (see "Power On Delay").
- When the state of the outlet group is **on**:
  - **Off Immediately**
  - **Off with Delay:** Turn off the group after the number of seconds configured as **Power Off Delay** (see "Power Off Delay").
  - **Reboot Immediately**: Turn off the group immediately, then turn it on after the number of seconds configured as **Reboot Duration** (see "Reboot Duration") and **Power On Delay**.
  - **Reboot with Delay**: Turn the outlet group off after the number of seconds configured as **Power Off Delay**, then turn it on after the number of seconds configured as **Reboot Duration** and **Power On Delay**.

- For some UPS models, when the state of the outlet group is **on** and the UPS is on battery:
  - **Shutdown Immediately, AC Restart**: Turn off the group immediately. After the number of seconds configured as **Reboot Duration** and **Power On Delay**, check that AC utility power has returned and the UPS can support the minimum return runtime demand, then turn on the group.
  - **Shutdown with Delay, AC Restart**: Turn off the group after the number of seconds configured as **Power Off Delay**. After the number of seconds configured as **Reboot Duration** and **Power On Delay**, check that AC utility power has returned and the UPS can support the minimum return runtime demand, then turn on the group.

After you select an action, click **Next>>** to view a detailed description of the action, including the duration of any delays. Click **Apply** to commence the action.

Configuration Pages

Configure your shutdowns, your upper and lower limit power settings, your Switched Outlet groups (if relevant) and other parameters with these menu options.

Path: UPS > Configuration

This page is not available for all UPS devices.

What are Outlet Groups?

Outlet grouping is available on some UPS models only. To determine whether your UPS model supports outlet groups, see your UPS documentation.

The available settings differ based on the UPS model. For detailed information about fields and values specific to your UPS model, see the online help.

Main outlet groups . Some UPS models provide AC power to one Main Outlet group. The Main Outlet group controls the distribution of power to all Switched Outlet groups for the UPS.

- If the Main Outlet group is off, the Switched Outlet groups cannot be turned on.
- If you turn off the Main Outlet group, the UPS turns off the Switched Outlet groups first, then turns off the Main Outlet group.
- To turn on a Switched Outlet group, the UPS must turn on the Main Outlet group first, and then turn on the Switched Outlet group.

Switched outlet groups . Some UPS models provide power to Switched Outlet groups. Each group can perform actions independently of the other groups. By controlling each outlet group remotely, you can start or stop models sequentially and also restart locked models.

The way outlet groups turn on and off depends on their configuration and how you turn the UPS on or off:

- Before you configure the delays for actions described in “Actions (for a single UPS and Synchronized Control Groups)” and “Sequencing settings”, when you turn on the UPS output, any outlet group that is off turns on by default and applies power to all models attached to the outlets in that group.
- After you configure the actions and delays, they control how outlet groups turn on and off when you turn the UPS on or off from the user interface of the NMC or the display interface at the UPS.

The outlet groups option (including automatic load-shedding)

Path: UPS > Configuration > outlet groups

Outlet group name and status. View the name and state of existing outlet groups on this screen page. Click the name of an outlet group to view or configure its name, sequencing through delays, and load shedding settings. See “Sequencing settings” and .“Load-shedding options”.

Setting or Field	Description
Name	A name for the outlet group displayed with the outlet group number wherever the interface displays that outlet group number.
State	Displays the state of the outlet group (on or off).

Sequencing settings. Settings vary by UPS model. Use the sequencing options to define how the UPS will respond to user-issued commands.

Setting or Field	Description
Power On Delay	When this outlet group is off, it waits this delay (in seconds, the value varies with different UPS models) before turning on when **Delayed On**, **Reboot**, or **Delayed Reboot** is selected as the action. **Never** check box (only available with some UPS models): To override **Power On Delay**, select the **Never** check box. (Only the **Immediate On** action will turn on outlets when **Never** is selected).
Power Off Delay	When this outlet group is on, it waits this delay (in seconds, the value varies with different UPS models) before turning off when **Delayed Off**, **Reboot**, or **Delayed Reboot** is selected as the action. (During a delayed reboot, the outlet group then waits the number of seconds configured as **Reboot Duration** and **Power On Delay** before it turns on.) **Never** check box (only available with some UPS models): To override the **Power Off Delay**, select the **Never** check box. Only the **Immediate Off** action will turn off outlets when **Never** is marked.
Reboot Duration	When this outlet group is on: • If **Reboot** is selected as the action, the outlet group turns off immediately and then waits this delay (in seconds, the value varies with different UPS models) before turning on • If **Delayed Reboot** is selected as the action, the outlet group waits these three delays: **Power Off Delay** before turning off, and **Reboot Duration** followed by **Power On Delay** before turning on.
Min Return Runtime	The minimum amount of time the UPS must be able to support the load before it can turn on again.

Load-shedding options. Settings vary by UPS model. Use the load-shedding options to define how the UPS will respond to alarms. The UPS provides automatic, sequenced, load shedding when a problem occurs with input voltage or battery capacity and provides automatic sequenced start-up of outlet groups when the problem is resolved.

Setting	Description
Settings that turn off this outlet group (some of these are not available with all outlet groups)	• When a power failure is longer than the number of seconds you specify. • When the remaining UPS runtime is less than the number of seconds you specify. • The UPS is overloaded (the power demand of the models connected to the UPS exceeds the amount of power the UPS can provide). • Skip outlet off delays. (Turn the outlet group off immediately, without waiting the number of seconds configured as **Power Off Delay**. By default, this option is disabled.) • Stay off after power returns. (Remain off when AC utility power returns. By default, this option is disabled, and the UPS waits the number of seconds configured as **Power On Delay**, then turns on the outlet groups.)
Settings that turn on this outlet group	• The outlet group has waited the number of seconds you specify. • The battery recharges to the percentage of full capacity you specify.

Outlet group events and traps. A change in the state of an outlet group generates the event **UPS: Outlet Group turned on** with a severity of Informational, or **UPS: Outlet Group turned off** with a severity of Warning. The format of event messages is "UPS: Outlet Group *group_number*, *group_name*, *action* due to *reason*". For example:

```
UPS: Outlet Group 1, Web Server, turned on.
UPS: Outlet Group 3, Printer, turned off.
```

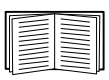
By default, the event generates an event log entry, e-mail, and a Syslog message.

If you configure trap receivers for the events, trap 298 is generated when an outlet group turns on, and trap 299 is generated when an outlet group turns off. The event message is the trap argument. The default severity level is the same as for the event.

The power settings option

Path: UPS > Configuration > power settings

This option is not available for all UPS devices.



The available settings differ based on the UPS model. For detailed information about any fields available through the **power setting** option and specific to your UPS model, see the online help.

You can configure the following types of model-specific items:

- **Voltage** settings that determine the voltage at which the UPS begins to use automatic voltage regulation or switches to battery operation and that determine how sensitive the UPS is to voltage variation
- **Bypass** settings define conditions under which the UPS can switch to bypass mode
- **Alarm thresholds** based on available runtime and redundant power and on UPS load

The shutdown option

Path: UPS > Configuration > shutdown

Use this option to configure your shutdowns by specifying durations on battery, delays before shutting down and restarting, minimum runtime and charge before restarting, etc.

This option enables you to use the PowerChute Network Shutdown utility to shut down a maximum of 50 servers on the network that use a client version of the utility.

Controlled Early Shutdown. These options are not available with all UPS devices. They enable you to shut down a UPS device that is on battery, when conditions that you specify are met:

- When the time on battery exceeds a set number of minutes.
- When the runtime remaining of the UPS is less than a set number of minutes.
- When the load on the UPS output is less than a set percentage.

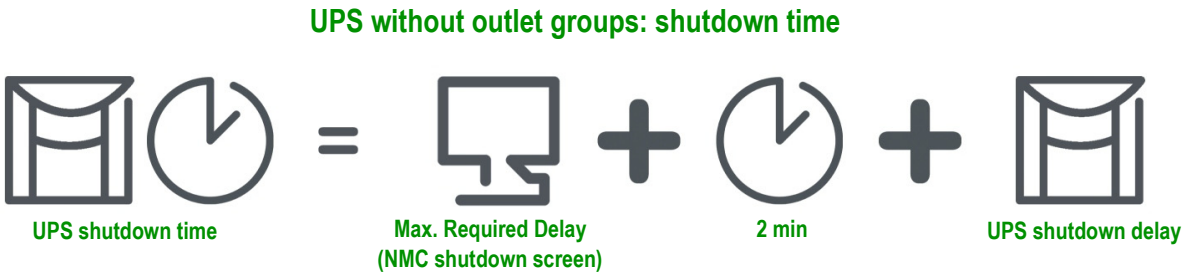
If you enable these conditions, the UPS is shut down when *any* of the conditions is met.

You can also decide whether the UPS turns back on, or not, after AC utility power is restored.

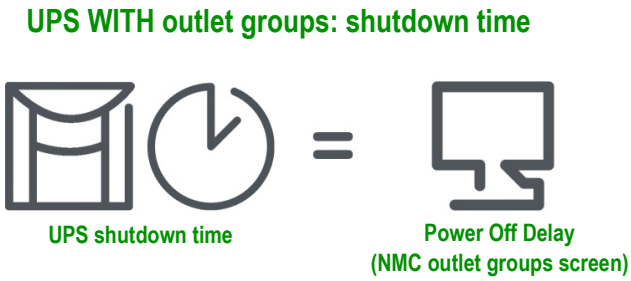
We recommend that you don't use these options with software controlling your server shutdowns. For example, you could select **Ignore PCNS shutdown commands** under **On-Battery Shutdown Behavior** (lower on this screen). Doing this means that the NMC determines the on-battery shutdown behavior for the UPS, *not* PowerChute Network Shutdown.

Shutdown delays and forcing negotiations. A shutdown time for the UPS is calculated differently for a UPS device *without* outlet groups compared to a UPS *with* outlet groups.

1. For a UPS without outlet groups, the shutdown time is the **Maximum Required Delay** value on the NMC **shutdown** screen *plus* 2 minutes *plus* the shutdown delay for the UPS.



2. For a UPS with outlet groups, the shutdown time is the **Power Off Delay** value on the NMC **outlet groups** screen. (This option is not available with all UPS devices).



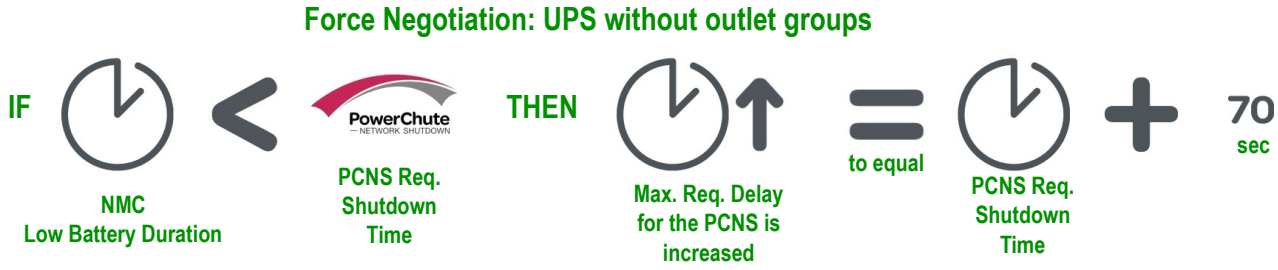
Note that devices wth the prefix SUM behave like #1 above, not #2.

For both types of UPS, the shutdown time is negotiated by the NMC interacting with PowerChute Network Shutdown (PCNS).

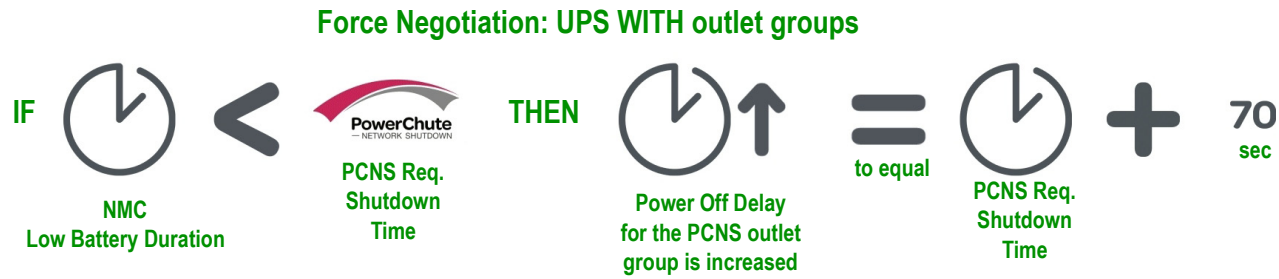
Use the **Force Negotiation** option to re-gauge the time when you change or add a PCNS client. When you choose it and click Apply, the procedure is automatic; the details are discussed below.

PCNS starts with the NMC **Low Battery Duration** value, compares it to its own shutdown time and, if the battery duration time is too low, tells the NMC to increase the values in #1 and #2 below to the PCNS SHUTDOWN REQUIRED TIME* *plus* 70 sec.

1. Without outlet groups, the **Maximum Required Delay**.



2. With outlet groups, the **Power Off Delay** for the outlet group supplying power to the PCNS client.



*The PCNS SHUTDOWN REQUIRED TIME = the shutdown delay + the shutdown command duration. When the default of 70 seconds is added, the time is always rounded up to nearest minute. E.g., a total here of 3 min 50 sec is rounded up to 4 min; a total of 2 min is still rounded up to 3 min.

Notes:
The 70 sec. mentioned is the default OS shutdown time for PCNS.
PCNS never changes the NMC **Low Battery Duration** field value.
With PCNS v3.x, the **Maximum Required Delay** value is never used by the NMC for a UPS with outlet groups.

The general option

Path: UPS > Configuration > general

Settings vary by UPS model. Each UPS model supports only some of the following:

Setting	Definition
UPS Name	A name to identify the UPS.
UPS Position	The physical orientation of the UPS, rack or tower.
Audible Alarm	Enable or disable the audible alarm of the UPS, and, for some UPS models, define the condition that will cause the alarm to sound.

Setting	Definition
Last Battery Replacement	The month and year of the most recent battery replacement.
Number of Batteries or External Batteries	The number of batteries, excluding built-in batteries, that the UPS has. Some models that have more than 16 batteries must add batteries in quantities of 16 (e.g., 16, 32, 48, etc.), but can then be adjusted to the correct value.
External Battery Cabinet	The battery cabinet Amp-Hour rating of an external battery source.

The self-test schedule option

Path: UPS > Configuration > self-test schedule

Use this option to define when the UPS will initiate a self-test.

The firmware update option

Path: UPS > Configuration > firmware update

This option is not available for all UPS models.

Use this option to upgrade the UPS firmware. The firmware update file must have been previously sent using FTP to the NMC and stored in the `/upsfw/` directory.
Don't confuse this with an NMC firmware upgrade (see "File Transfers" on page 76)!

The PowerChute clients option

Path: UPS > Configuration > PoewrChute clients

When you install a PowerChute Network Shutdown client on your network, it is added to this list automatically. When you uninstall a PowerChute Network Shutdown client, it is removed automatically.

Click **Add Client** to enter the IP address of a new PowerChute Network Shutdown client. To delete a client, click the IP address of that client in the list, and then click **Delete Client**. The list can contain the IP addresses of up to 50 clients.

The sync control option

Path: UPS > Configuration > sync control

This option is not available for all UPS devices.

What is the synchronization process? If you apply an action to a Synchronized Control Group (SCG), enabled members of the group behave as follows:

- Each UPS receives the command regardless of its output status (e.g., even if on a low battery).
- The action uses the delay periods (such as **Shutdown Delay**, **Synchronized**, and **Return Delay**) configured *for the initiating UPS.*
- When the action begins, a UPS that is unable to participate retains its present output status while the other UPS models perform the action. If a UPS is already in an output state that the action requires

(e.g., a UPS is already off when the Reboot UPS action starts), that UPS logs an event, but performs the rest of the action, if any.

- All participating UPS models synchronize their performance of the action (within a one-second time period under ideal conditions for Smart-UPS, but sometimes longer.
- In reboot and sleep actions:
  - Immediately before the initiating UPS begins waiting the time specified as **Return Delay**, by default it waits up to 120 seconds (its configurable **Power Synchronized Delay**) for any UPS that does not have input power to regain that power. Any UPS that fails to regain input power during that delay does not participate in the synchronized restart, but waits until its own input power returns before restarting.
  - The LEDs on the front of the UPS do not sequence their lights as they do for a normal (not synchronized) reboot or sleep action.
- UPS status and events are reported in the same way for synchronized actions as for actions on individual UPS models.

Guidelines for Synchronized Control Groups. Before you configure this UPS as a Synchronized Control Group (SCG) member, review these guidelines:

- All UPS models in an SCG must be the same model.
- SCGs are supported for any Smart-UPS with a card slot that accepts a Network Management Card.
- When its membership in an SCG is enabled, the NMC blocks UPS communications from a connected management model on the serial communications port. However, the NMC still allows access to the command line interface on the serial communications port.
- See also the Knowledge Base article 11135, on the support page of the **www.apc.com** website.

Display status of a Synchronized Control Group member. When SCG is enabled, the following additional information is displayed about the SCG membership of this group member: its **IP address**, its **Input Status good** (acceptable) or **bad** (not acceptable); and its **Output Status** (**On** or **Off**).

See the online help for information configuring the fields used in synchronizing an SCG.

The parallel units option (Smart-UPS VT UPS devices)

This option only displays with Smart-UPS VT devices when you have set up a parallel configuration. It lists all parallel units (UPS devices that share a load, continuing to provide power to the load if a parallel unit fails). The UPS to which you are logged on is listed first. Use Add Unit to add a parallel UPS, and specify its name and IP address.

Diagnostics page

Path: UPS > Diagnostics

This page is not available for all UPS devices.

You can run a self-test or a runtime calibration for any UPS. The **Self-Test** and **Calibration** fields display the results of the most recent test and calibration.

Select a radio button, and click Apply to perform either of these actions, or to test an alarm. However, the UPS audible alarm test is model-specific and might not be available for your UPS.

Scheduling page (for shutdowns)

Path: UPS > Scheduling

This page is not available for all UPS devices.

For both the UPS and outlet group options

You can schedule a shutdown for a UPS model under **UPS** or for an individual Switched Outlet group (if applicable) under **outlet groups**.

Any configured shutdown schedules display along the top of the page when you select **UPS** or **outlet groups**, with relevant details, including whether they are currently enabled or disabled.

Edit, Enable, Disable, or Delete a Scheduled Shutdown. Click the schedule name in the list of schedules along the top of either the **UPS** or **outlet groups** page. This displays the complete details where you can edit the parameters. This includes disabling it temporarily by clearing the **Enable** check box, or deleting it permanently.

Creating a UPS or a Switched Outlet group shutdown schedule.

1. Select either **UPS** or **outlet group** under **Scheduling**.
2. Use the radio buttons to select the type of shutdown to schedule, **One-time Shutdown**, **Daily Shutdown**, or **Weekly Shutdown**, and click the **Next** button.
3. To disable a schedule temporarily, clear the **Enable** button.
4. Specify a name, and a schedule date and time.
   For a weekly shutdown, specify the frequency using the drop-down box.
5. Specify whether the model or outlet group should turn back on after the shutdown:

   Turn back on: Specify whether the UPS will turn on at a specific day and time, **Never** (the UPS must be turned on manually), or **Immediately** (the UPS will turn on after waiting 6 minutes and the time specified as the Return Delay).

   To configure the Return Delay, see the online help.

6. For an outlet group only, specify the group by selecting the appropriate button.
7. **Signal PowerChute Network Shutdown Clients**: Specify whether to notify clients listed as “The PowerChute clients option”.

For the UPS option only: synchronized shutdowns

Schedule a synchronized shutdown. When the UPS which initiates the shutdown is an enabled member of a Synchronized Control Group (SCG), then all members of the SCG shut down.

Always schedule the shutdowns through the same member of the SCG. Each UPS in the SCG must have a network connection at the time of the shutdown.

Caution: Do NOT schedule shutdowns t*hrough more than one group member.* Such scheduling may cause unpredictable results.

About page

Path: UPS > About

This option provides the information about the UPS and the firmware of its Network Management Card, including the device name of the UPS, its serial number and firmware version, and manufacture date.

Position tells you the physical orientation of the UPS, **rack** or **tower** (only for rack- or tower-mounted UPS models). This field is not available for all UPS models.

Some UPS models report the following additional information: Technical Level, Manufacturer Name, and UPS Time (The local time at the location of the UPS).

Environmental Monitoring

The **Universal I/O** menu tab displays when you have installed the temperature and humidity sensors AP9335T/ TH or the Dry Contact I/O Accessory (AP9810).

The **Environment** menu options display only when an External Environmental Monitoring card (AP9612TH) is connected to a UPS with the AP9631 NMC.

The **Environmental Monitor Card** menu tab displays with a UPS that has the AP9630 NMC.

Overview Page

Path: Environment > Overview

The **Overview** page lists the status of any environmental monitoring device associated with the AP9631 NMC.

Heading	Displayed Information
Temperature and Humidity	Lists all sensors and, for each sensor, the alarm status, temperature currently recorded, and humidity (if supported) currently recorded. For detailed status or to reconfigure a sensor's parameters, click the sensor's name.
Input Contacts	Lists each enabled input contact and its alarm status and current state (open or closed). For detailed status or to configure a contact's parameters, click its name.
Output Relay	Lists the alarm status and the current state (open or closed) of the output relay of the integrated Environmental Monitor. For detailed status or to configure a contact's parameters, click its name.
Recent Environmental Events	The **Recent Environmental Events** field lists, in reverse chronological order, the most recent environmental events. To view the entire event log, click **More Events** at the lower right.

Temperature and Humidity Page

Path: Environment > Overview>Temp & Humidity

This displays the name, alarm status, temperature, and humidity (if supported) for each sensor. Click the name of a sensor to edit the name and location and to configure its thresholds and its hysteresis.

Thresholds. For each sensor, you set the thresholds for temperature and (if supported) humidity measured at the sensor. When a threshold is breached (passed), the alarm signals.

Hysteresis. Use the Hysteresis value to avoid getting alarms repeatedly for the same violation of the temperature or humidity threshold.

When the temperature or humidity that causes a violation tends to waver slightly up and down, it can repeatedly trigger the alarm. A higher hysteresis value can prevent this.

If the hysteresis value is too low, the wavering can first cause a threshold violation and then clear it, meaning the alarm can be triggered several times. See the examples below, after noting the following.

- For maximum and high threshold violations, the clearing point for the alarm is the threshold *minus* the hysteresis value you input.
- For minimum and low threshold violations, the clearing point is the threshold *plus* the hysteresis value.

Example of rising but wavering humidity: Say the *maximum* humidity threshold is 65%, and the humidity hysteresis is 10%. Then, the humidity rises above 65%, causing an alarm. It then wavers down to 60% and up

to 70% repeatedly, but — because of the 10% hysteresis value — the alarm is not cleared and therefore no new alarm occurs. For the existing alarm to clear, the humidity would have to drop below 55% (which is 65% *minus* 10%).

Example of falling but wavering temperature: Say the *minimum* temperature threshold is 12°C, and the temperature hysteresis is 2°C. Then the temperature drops below 12°C, causing an alarm. It then wavers back up to 13°C and then down to 11°C repeatedly, but — because of the 2°C hysteresis value — the alarm is not cleared and therefore no new alarm occurs. For the existing alarm to clear, the temperature would have to rise above 14°C (which is 12°C *plus* 2°C).

Input Contacts Page

This page is not available for all UPS devices.

Path: Environment >Input Contacts

Input Contacts on the left menu displays the name, alarm status, and state (open or closed) of each contact.

Click the name of an input contact for detailed status or to configure its values. Use the **Input Contact** check box to enable or disable it. When disabled, the contact generates no alarm even when it is in the abnormal position. Other fields are discussed below:

Parameter	Description
Alarm Status	**Normal** if this input contact is not reporting an alarm, or the severity of the alarm if this input contact is reporting an alarm
State	The current state of this input contact: **Closed** or **Open**.
Normal State	The normal (non-alarm) state of this input contact: **Closed** or **Open**.
Severity	The severity of the alarm that the abnormal state of this input contact generates: **Warning** or **Critical**.

Output Relay Page

Path: Environment >Output Relay

This option is only available for devices with installed Dry Contact I/O Accessories. Select the Environment tab, then **Universal I/O** from the top menu bar. Click **Output Relay** to display the status of the output relay and configure its values.

Parameter	Description
Alarm Status	**Normal** if this output relay is not reporting an alarm, or the severity of the alarm if this output relay is reporting an alarm.
State	The current state of this output relay: **Closed** or **Open**.
Normal State	The normal (non-alarm) state of this output relay: **Closed** or **Open**.
Control	To change the current state of this output relay, check-mark the setting.
Delay	The number of seconds a selected alarm condition must exist before the output relay is activated. Use this setting to avoid activating an alarm for brief transient conditions. Note: If additional mapped alarms occur after the delay begins, the delay does not restart but continues counting down until the output relay is activated.

Parameter	Description
Hold	The minimum number of seconds the output relay remains activated after the alarm occurs. Even if the activating alarm condition is corrected, the output relay remains activated until this time period expires.

About Page

Click **About** on the left navigation menu of the **Environment** tab to display what environmental monitoring devices are in use with this UPS and their firmware versions.

Configuring the Control Policy

Path: UPS > Control Policy > Event Actions

On an AP9631 NMC with up to two connected Dry Contact I/O Accessories (AP9810), you can configure the outputs to respond to events. You can also configure both the UPS and outputs to respond to input alarms.

Not all UPS devices can be configured to respond to input alarms.

Configuring an output to respond to an event

1. Select the **UPS** tab, **Control Policy** in the top menu bar, and **by event** under **Event Actions** on the left navigation menu.
2. Click a category name to view all of the events in the category, or click a sub-category name to view the events there.
3. In the list of events, review the marked columns to see whether which events are already configured to change the state of the output relay.
4. To configure, click an event name, select the output relay that will change state when this event occurs, and click **Apply**.

Configuring the UPS or output to respond to an input alarm

1. Select the **UPS** tab, **Control Policy** in the top menu bar, and **by event** under **Event Actions** on the left navigation menu.
2. Click **I/O Contact**, then click the name of the event whose alarm should provoke responses.
3. The NMC supports up to four inputs. You must specify the input that will be associated with this event.
    a. In the **Port** drop-down list, select the Universal Sensor Port number (**1** or **2**) to which the Dry Contact I/O Accessory is installed.
    b. In the **Zone** drop-down list, select the zone letter (**A** or **B**) of the contact to which the input is installed.
4. Define the action the UPS will perform when the input changes state, and select the output that will change state when this event is detected.
5. Click **Apply**.

The action you configure occurs once. If you restore the input to its normal state before the alarm condition clears, the output will not change state unless the alarm condition clears and then reoccurs.

Logs

Using the Event and Data Logs

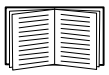
Event log

Path: Logs > Events > *options*

By default, the log displays all events recorded during the last two days, starting with the latest events. See “Configuring by event” on page 63

To display the event log (Logs > Events > log):

By default, the event log displays the most recent events first. To see the events listed together on a Web page, click the **Launch Log in New Window** button. JavaScript must be enabled in your browser to do this.



You can also use FTP or Secure CoPy (SCP) to view the event log. See “How to use FTP or SCP to retrieve log files” on page 49

To filter the log (Logs > Events > log):

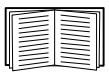
Filtering the log by date or time: Use the **Last** or **From** radio buttons. (The filter configuration is saved until the NMC restarts).

Filtering the log by event: Click **Filter Log**. Clear a check box to remove it from view. Text at the upper right corner of the event log page indicates that a filter is active after you click **Apply**. Tthe filter is active until you clear it or until the NMC restarts. To remove an active filter, click **Filter Log**, then **Clear Filter (Show All)**. As Administrator, click **Save As Default** to save this filter as the new default log view for all users.

See these important points on filtering:

- Events are processed through the filter using OR logic.
- Events that you cleared in the **Filter By Severity** list never display in the filtered event log, even if the selected in the **Filter by Category** list.
- Similarly, events that you clear in the **Filter by Category** list never display in the filtered event log.

To delete the log (Logs > Events > log): To delete all events, click **Clear 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” on page 63.

To configure reverse lookup (Logs > Events > reverse lookup):

With reverse lookup enabled, when a network-related event occurs, both the IP address *and* the domain name for the networked device 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.

Reverse lookup is disabled by default. Enable it *unless* you have no DNS server configured or have poor network performance because of heavy network traffic.

To resize the event log (Logs > Events > size):

When you resize the event log in order to specify a maximum size, all existing log entries are deleted. To avoid losing log data, use FTP or SCP to retrieve the log first, see “How to use FTP or SCP to retrieve log files” on page 49. When the log subsequently reaches the maximum size, the older entries are deleted.

Data log

Path: Path: Logs > Data > *options*

View a log of measurements about the UPS, the power input to the UPS, and the ambient temperature of the UPS and batteries.

The steps to display and resize the data log are the same as for the event log, except that you use menu options under **Data** instead of **Events**. See “To display the event log (Logs > Events > log):” and “To resize the event log (Logs > Events > size):”

To filter the data log by date or time, use the **Last** or **From** radio buttons. (The filter configuration is saved until the NMC restarts).To delete all data recorded in the data log, click **Clear Data Log**. Deleted data cannot be retrieved.

To set the data collection interval (Logs > Data > interval): Define, in the **Log Interval** setting, how frequently data is sampled and stored in the data log. When you click Apply, the number of possible storage days is recalculated and display at the top of the screen.

When the log is full, the oldest entries are deleted. To avoid automatic deletion of older data, see “To configure data log rotation (Logs > Data > rotation):”.

To configure data log rotation (Logs > Data > rotation):

Rotation causes the contents of the data log to be appended to the file you specify by name and location. This means you can store the data before it is deleted, see “To set the data collection interval (Logs > Data > interval):”

Use this option to set up password-protection, to specify an FTP Server Address, and other parameters.

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 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 NMC
  - The unique **Event Code** for each recorded event (*event.txt* file only)

The NMC 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, see “To use SCP to retrieve the files”. If you are using unencrypted authentication methods for security, see “To use FTP to retrieve the files”.

See the *Security Handbook*, available on the Network Management Card *Utility* CD and on the website (**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. Enable SSH on the NMC.

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

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

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

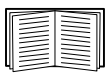
```
scp username@hostname_or_ip_address:data.txt ./data.txt
```

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 IP address of the NMC, 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 “FTP Server” on page 61.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
   ```

4. 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.

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

Administration: Security

Local Users

Setting user access

Path: Administration > Security > Local Users > *various options*

For background information on accounts see “Types of user accounts” on page 3.

The Device User and Read-Only User accounts are enabled by default. To disable them, select **device** or **read-only** from the left navigation menu, then clear the **Enable** check box.

Set the case-sensitive user name and password for each account type in the same manner. Maximum length is 64 characters for a user name and 64 characters for a password. Blank passwords (passwords with no characters) are not allowed.

Remote Users

Authentication

Path: Administration > Security > Remote Users > authentication

Use this option to select how to administer remote access to the NMC.

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

The authentication and authorization functions of RADIUS (Remote Authentication Dial-In User Service) are supported.

- When a user accesses the Network Management Card or other network-enabled device 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 Network Management Card are limited to 32 characters.

Select one of the following:

- **Local Authentication Only**: RADIUS is disabled.
- **RADIUS, then Local Authentication**: Both 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.

If **RADIUS Only** is selected, and the RADIUS server is unavailable, improperly identified, or improperly configured, remote access is unavailable to all users. To regain access, you must use a serial connection to the command line interface and change the **access** setting to **local** or **radiusLocal**.

For example, the command to change the access setting to **local** would be: `radius -a local`

RADIUS

Path: Administration > Security > Remote Users > RADIUS

Use this option to do the following:

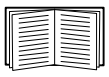
- List the RADIUS servers (a maximum of two) available to the NMC and the time-out period for each.
- Configure the authentication parameters for a new or existing RADIUS server by clicking a link.

RADIUS Setting	Definition
RADIUS Server	The server name or IP address (IPv4 or IPv6). 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.
Secret	The shared secret between the RADIUS server and the NMC.
Timeout	The time in seconds that the NMC 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.

Configuring the RADIUS Server

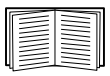
Summary of the configuration procedure

You must configure your RADIUS server to work with the NMC, see the steps below.



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 *Security Handbook*.

1. Add the IP address of the NMC 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 user interface only).

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

3. VSAs can be used instead of the Service-Type attributes provided by the RADIUS server.
   VSAs require a dictionary entry and a RADIUS user's 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

FreeRADIUS and Microsoft IAS 2003 are supported. Other commonly available RADIUS applications may work but have not been fully tested.

Inactivity Timeout

Path: Administration > Security > Auto Log Off

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

This timer continues to run if you close the browser window without first logging off (by clicking **Log Off** at the upper right). In that circumstance, no one else can log on until the time specified as **Minutes of Inactivity** expires.

For example, with **Minutes of Inactivity** at 10 minutes, if you close the browser window without logging off, no one else can log on for 10 minutes.

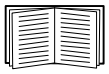
Administration: Network Features

TCP/IP and Communication Settings

TCP/IP settings for IPv4

Path: Administration > Network > TCP/IP > IPv4 settings

The **TCP/IP** option on the left navigation menu displays the current IPv4 address, subnet mask, default gateway, MAC address, and boot mode of the UPS Network Management Card 2 (NMC).



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

See the user interface online help for details on the options: **Manual**, **BOOTP**, **DHCP**.

DHCP response options

Each valid DHCP response contains options that provide the TCP/IP settings that the NMC needs in order to operate on a network. Each response also has other information that affects the operation of the NMC.

Vendor Specific Information (option 43). The NMC uses this option in a DHCP response to determine whether the DHCP response is valid. This option contains an option in a TAG/LEN/DATA format, called the APC Cookie. This is disabled by default.

- **APC Cookie. Tag 1, Len 4, Data "1APC"**

  Option 43 communicates to the NMC that a DHCP server is configured to service devices.

  The 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
  ```

TCP/IP options. The NMC uses the following options within a valid DHCP response to define its TCP/IP settings. All of these options except the first are described at **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 NMC.
- **Subnet Mask** (option 1): The Subnet Mask value that the NMC needs to operate on the network.
- **Router,** i.e., Default Gateway (option 3): The default gateway address that the NMC needs to operate on the network.
- **IP Address Lease Time** (option 51): The time duration for the lease of the IP Address to the NMC.
- **Renewal Time, T1** (option 58): The time that the NMC 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 NMC must wait after an IP address lease is assigned before it can seek to rebind that lease.

Other options. The NMC 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 NTP servers (primary and secondary) that the NMC can use.

- **Time Offset** (option 2): The offset of the NMC'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 NMC can use.
- **Host Name** (option 12): The host name that the NMC will use (32-character maximum length).
- **Domain Name** (option 15): The domain name that the NMC 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 a user configuration file (.ini file) to download. The **siaddr** field of the DHCP response specifies the IP address of the server from which the NMC will download the .ini file. After the download, the NMC uses the .ini file as a boot file to reconfigure its settings.

TCP/IP settings for IPv6

Path: Administration > Network > TCP/IP > IPv6 settings

See the user interface online help for details on the options: **Manual**, **Auto Configuration**, **DHCPv6 Mode**.

Ping Response

Path: Administration > Network > Ping Response

Select the Enable check box for **IPv4 Ping Response** to allow the Network Management Card 2 to respond to network pings. Clear the check box to disable an NMC response. This does not apply to IPv6.

Port Speed

Path: 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

Path: Administration > Network > DNS > *options*

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

- Select **Primary DNS Server** or **Secondary DNS Server** to specify the IPv4 or IPv6 addresses of the primary and optional secondary DNS server. For the NMC to send e-mail, you must at least define the IP address of the primary DNS server.
  - The NMC 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 NMC does not receive a response

within that time, e-mail cannot be sent. Therefore, use DNS servers on the same segment as the NMC or on a nearby segment (but not across a wide-area network [WAN]).

  – After you define the IP addresses of the DNS servers, verify that DNS is working correctly by entering the DNS name of a computer on your network to look up the IP address for that computer.

- **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 NMC interface (except e-mail addresses) that accepts a domain name.
- **Domain Name (IPv4)**: You need to configure the domain name here only. In all other fields in the NMC interface (except e-mail addresses) that accept domain names, the NMC 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 NMC 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.
- **Domain Name (IPv6)**: Specify the IPv6 domain name here.
- 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, see table below
  – As **Query Question**, identify the value to be used for the selected query type:

Query Type Selected	Query Question to Use
by Host	The host name
by FQDN	The fully-qualified domain name, *`my_server.my_domain`*.
by IP	The IP address of the server
by MX	The Mail Exchange address

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

Web

Path: Path: Administration > Network > Web > *options*

Option	Description

access	To activate changes to any of these selections, log off from the NMC:
	• **Disable**: Disables access to the user interface. (To re-enable access, log in to the command line interface, then type the command `http -S enable`. For HTTPS access, type `https -S enable`.)
	• **Enable HTTP/ Enable HTTPS**: HTTP does not encrypt user names, passwords, and data during transmission whereas HTTPS does. It also authenticates the NMC by digital certificate.
	See "Creating and Installing Digital Certificates" in the *Security Handbook* on the Network Management Card *Utility* CD to choose among the several methods for using digital certificates.
	For the HTTP and HTTPS 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 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, **/ssl** on the Network Management Card. • **Generating**: The Network Management Card is generating a certificate because no valid certificate was found. • **Loading**: A certificate is being activated on the NMC. • **Valid certificate**: A valid certificate was installed or was generated by the NMC. Click on this link to view the contents of the certificate. *If you install an invalid certificate, or if no certificate is loaded when you enable SSL, the NMC generates a default certificate, a process which delays access to the interface for up to one minute.* 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 Network Management Card *Utility* CD to choose a method for using digital certificates created by the Security Wizard or generated by the NMC. **Remove**: Delete the current certificate.

Console

Path: Path: Administration > Network > Console > *options*

A Console session means you're using the command line interface, see Command Line Interface (CLI).

Option	Description

access	Choose one of the following for access by Telnet or Secure SHell (SSH):
	• **Disable**: Disables all access to the command line interface.
	• **Enable Telnet** (the default): Telnet transmits user names, passwords, and data without encryption.
	• **Enable SSH**: SSH transmits user names, passwords, and data in encrypted form, providing protection from attempts to intercept, forge, or alter data during transmission.
	Configure the ports to be used by these protocols:
	• **Telnet Port**: The Telnet port used to communicate with the NMC (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 NMC (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 host key	**Status** indicates the status of the host key (private key). • **SSH Disabled: No host key in use.** • **Generating**: The NMC is creating a host key because no valid host key was found. • **Loading**: A host key is being activated on the NMC. • **Valid**: One of the following valid host keys is in the **/ssh** directory (the required location on the Network Management Card): •A 1024-bit or 2048-bit host key created by the Security Wizard •A 2048-bit RSA host key generated by the Network Management Card **Add or Replace**: Upload a host key file created by the Security Wizard. To use the Security Wizard, see the *Security Handbook* on the Network Management Card *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 NMC takes up to one minute to create a host key, and the SSH server is not accessible during that time.*

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

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 Central** to manage a UPS on the public network of an InfraStruxure system, you must have SNMP enabled in the NMC interface. Read access will allow the InfraStruxure device to receive traps from the NMC, but Write access is required while you use the interface of the NMC to set the InfraStruxure device as a trap receiver.

For detailed information on enhancing and managing the security of your system, see the *Security Handbook*, available on the Network Management Card *Utility* CD or from the website, **www.apc.com**.

SNMPv1

Path: Path: Administration > Network > SNMPv1 > *options*

Enable SNMPv1 access under **access** enables SNMP version 1 as a method of communication with this device.

access control. You can configure up to four access control entries to specify which Network Management Systems (NMSs) 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 IPv4 and IPv6 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 IPv4 or IPv6 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 user interface or command line interface.
- **Write+**: GETS and SETS at any time.
- **Disable**: No GETS or SETS at any time.

SNMPv3

Path: Path: 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.

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

The NMC supports SHA or MD5 authentication and AES or DES encryption.

Enable SNMPv3 access under **access** enables SNMP version 3 as a method of communication with this device.

Option	Description
user profiles	By default, lists the settings of four user profiles, configured with the user names **apc snmp profile1** through **apc snmp profile4**, and no authentication and no privacy (no encryption). 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 (`apc auth passphrase`, by default) 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 (`apc crypt passphrase`, by default) 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 SNMPv3. **Authentication Protocol:** The implementation of SNMPv3 supports SHA and MD5 authentication. Authentication will not occur unless an authentication protocol is selected. **Privacy Protocol:** The implementation of SNMPv3 supports AES and DES as the protocols for encrypting and decrypting data. Privacy of transmitted data requires that a privacy protocol is selected and that a privacy passphrase is provided in the request from the NMS. When a privacy protocol is enabled but the NMS does not provide a privacy passphrase, the SNMP request is not encrypted. 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:** From the drop-down list, select 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

Path: Path: Administration > Network > FTP Server

The **FTP Server** settings enable 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 NMC. 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`.

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

At any time that you want a UPS to be accessible for management by InfraStruxure Central, FTP Server must be enabled in the NMC interface of that UPS.

For detailed information on enhancing and managing the security of your system, see the *Security Handbook*, available on the Network Management Card *Utility* CD or from the **www.apc.com** website.

Administration: Notification

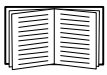
Event Actions

Path: Administration > Notification > Event Actions > *options*

Types of notification

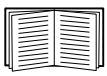
You can configure notification actions to occur in response to an event or a group of events. You can notify users of an event in any of several ways:

- Active, automatic notification. The specified users or monitoring devices are contacted directly.
  - E-mail notification
  - SNMP traps
  - Remote Monitoring Service
  - Syslog notification
- Indirect notification
  - Event log. If no direct notification is configured, users must check the log to determine which events have occurred

    You can also log system performance data to use for device monitoring. See “Data log” on page 49 for information on how to configure and use this data logging option.

  - Queries (SNMP GETs)

    For more information, see “SNMP” on page 58. SNMP enables an NMS to perform informational queries. For SNMPv1, which does not encrypt data before transmission, configuring the most restrictive SNMP access type (READ) enables informational queries without the risk of allowing remote configuration changes.

The NMC supports the use of the **RFC1628 MIB** (Management Information Base). See “SNMP traps” for information on how you can set up a trap receiver. The **1628 MIB** group of three events only work with that MIB, not the alternative Powernet MIB. They can be configured like any event (see “Configuring event actions” below).

Configuring event actions

Notification parameters. See “Configuring by event” and “Configuring by group”. For events that have an associated clearing event, you can also set these additional parameters. 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.

Parameter	Description
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, click on a column heading like Power Event or System Events to see whether the action you want is already configured. (By default, logging is configured for all events.)
3. Click on the event name 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.

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 or trap receivers, but you cannot add or remove recipients or receivers. To add or remove recipients or receivers, see the following:

• "Identifying Syslog servers" on page 66

• "E-mail recipients" on page 64

• "Trap Receivers" on page 65

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.

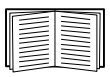
Active, Automatic, Direct Notification

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” on page 55.)
- The IP address or DNS name for **SMTP Server** and **From Address**. (See “SMTP” on page 64.)
- The e-mail addresses for a maximum of four recipients. (See “E-mail recipients” on page 64.)



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

SMTP.

Path: Administration > Notification > E-mail > server

Setting	Description
Local SMTP Server	The IPv4/ IPv6 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” on page 64.
From Address	The contents of the **From** field in e-mail messages sent by the NMC: • In the format *user@* [*IP_address*] (if an IP address is specified as **Local SMTP Server**) • In the format *user@domain* (if DNS is configured and the DNS name is specified as **Local SMTP Server**) in the e-mail messages. 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.

Path: 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.
E-mail Generation	Enables (default) or disables sending e-mail to the recipient.
SMTP Server	Select one of the following methods for routing e-mail: • **Local**: Through the site-local SMTP server. This recommended setting ensures that the e-mail is sent using the site-local SMTP server. • **Recipient**: Through the recipient's SMTP server. The NMC performs an MX record look-up on the recipients e-mail address and uses that as its SMTP server.
Format	The long format contains Name, Location, Contact, IP address, serial number of the device, date and time, event code, and event description. The short format provides only the event description.
Language	Chose a language from the drop-down list and any mails will be sent in that language. It is possible to use different languages for different users. See “Adding and Changing Language Packs” on page 80.

Setting	Description
User Name Password Confirm Password	If your mail server requires authentication, type your user name and password here. This performs a simple authentication, not SSI.
Port	The SMTP port number, with a default of 25.

E-mail test.

Path: Administration > Notification > E-mail > test

Send a test message to a configured recipient.

SNMP traps

Trap Receivers.

Path: Administration > Notification > SNMP Traps > trap receivers

The trap receivers are displayed by NMS IP/Host Name, where NMS stands for Network Management System. You can configure up to six trap receivers.

To configure a new trap receiver, click **Add Trap Receiver**. To edit (or delete) one, click its IP address/ host name.

If you delete a trap receiver, all notification settings configured under “Event Actions” for the deleted trap receiver are set to their default values.

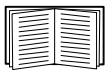
Select either the **SNMPv1** or **SNMPv3** radio button to specify the trap type. For an NMS to receive *both* types of traps, you must seperately configure two trap receivers for that NMS, one for each trap type.

Item	Definition
Trap Generation	Enable (the default) or disable trap generation for this trap receiver.
Powernet MIB Trap Generation/ RFC1628 "	Choose between these two MIB trap generation types for each trap created. The RFC1628 is the generic, standard Management Information Base (MIB) for UPS devices. The Powernet option is customized for Schneider Electric and contains many additional variables relevant to the company’s products. If you use the RFC1628 MIB, you can also use the three RFC1628 event notifications (see “Event Actions”). They can be used to avoid having to configure notification events outside the NMC environment, see RFC1628 MIB.
NMS IP/Host Name	The IPv4/ IPv6 address or host name of this trap receiver. The default, 0.0.0.0, leaves the trap receiver undefined.
Language	Chose a language from the drop-down list. This can differ from the UI and from other trap receivers.

SNMPv1 option.

Item	Definition
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).

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” on page 59 for information on creating user profiles and selecting authentication and encryption methods.

SNMP Trap Test

Path: 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 all of the following are true:

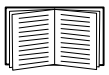
- The SNMP version (SNMPv1 or SNMPv3) configured for the selected trap receiver is enabled on this device.
- The trap receiver is enabled.
- If a host name is selected for the **To** address, that host name can be mapped to a valid IP address.

To. Select the IP address or host name to which a test SNMP trap will be sent. If no trap receiver is configured, a link to the **Trap Receiver** configuration page is displayed.

Remote Monitoring Service

Path: Administration > Notification > Remote Monitoring

The Remote Monitoring Service (RMS) is an optional service that monitors your system from a remote operation center 24 hours a day, 7 days a week, and notifies you of device and system events.



To purchase the RMS service, contact your vendor or click on the link on the top part of this screen page: **RMS website**.

Registration. To activate RMS for the NMC, select **Enable Remote Monitoring Service**., choose between **Register Company and Device** and **Register Device Only**, complete the form, and click **Send RMS Registration**.

Use the **Reset Remote Monitoring Service Registration** check box to discontinue the service, whether permanently or temporarily (for example, if you are moving an NMC).

Syslog

Path: Logs > Syslog > *options*

The NMC 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. See **RFC3164** for more information about Syslog.

Identifying Syslog servers.

Path: Logs > Syslog > servers

Setting	Definition
Syslog Server	Uses IPv4/ IPv6 addresses or host names to identify from one to four servers to receive Syslog messages sent by the NMC.

Setting	Definition
Port	The user datagram protocol (UDP) port that the NMC will use to send Syslog messages. The default is **514**, the UDP port assigned to Syslog.
Protocol	Choose between UDP and TCP.
Language	Choose the language for any Syslog messages.

Syslog settings.

Path: Logs > Syslog > settings

Setting	Definition
Message Generation	Enables (by default) or disables the Syslog feature.
Facility Code	Selects the facility code assigned to the NMC's Syslog messages (**User**, by default). Note: **User** best defines the Syslog messages sent by the NMC. *Do not* change this selection unless advised to do so by the Syslog network or system administrator.
Severity Mapping	Maps each severity level of NMC or Environment 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" on page 62.

Syslog test and format example.

Path: Logs > Syslog > test

Send a test message to the Syslog servers (where were configured through the **servers** option).

Select a severity to assign to the test message and then define the test message:

- The priority (PRI): the Syslog priority assigned to the message's event, and the facility code of messages sent by the NMC.
- The Header: a time stamp and the IP address of the NMC.
- 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.

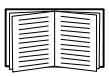
  For example, `APC: Test Syslog` is valid.

Administration: General Options

Identification

Path: Administration > General > Identification

Define the **Name** (the device name), **Location** (the physical location), and **Contact** (the person responsible for the device) used by InfraStruxure Central, InfraStruxure Manager, and the SNMP agent of the UPS Network Management Card 2 (NMC). 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 Network Management Card *Utility* CD and the website, **www.apc.com**.

The **Name** and **Location** fields also identify the device when you register for the Remote Monitoring Service. See “Remote Monitoring Service” on page 66 for more information.

Set the Date and Time

Mode

Path: Administration > General > Date & Time > mode

Set the time and date used by the NMC. 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 NMC.
  - Mark the check box **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 NMC.

By default, any NMC on the private side of an InfraStruxure Central obtains its time settings by using InfraStruxure Central as an NTP server.

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.
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 NMC accesses the NTP Server for an update. *Minimum*: 1; *Maximum*: 8760 (1 year).
Update Using NTP Now	Initiate an immediate update of the date and time by the NTP Server.

Daylight saving

Path: 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

Path: Administration > General > Date & Time > date format

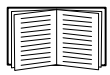
Select the numerical format in which to display all dates in this user interface. In the selections, each letter m (for month), d (for day), and y (for year) represents one digit. Single-digit days and months are displayed with a leading zero.

Use an .ini File

Path: Administration > General > User Config File

Use the settings from one NMC to configure another. Retrieve the config.ini file from the configured NMC, customize that file (e.g., to change the IP address), and upload the customized file to the new NMC. 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 NMC can use it to set its own configuration.



To retrieve and customize the file of a configured NMC, see “How to Export Configuration Settings” on page 73.

Instead of uploading the file to one NMC, you can export the file to multiple NMCs by using an FTP or SCP script or a batch file and the .ini file utility, available from **www.apc.com/tools/download**.

Event Log, Temperature Units, Language, and Logon Page

Path: Administration > General > Preferences

Color-code event log text

This option is disabled by default. Mark the **Event Log Color Coding** check box 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	Alarm Severity
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.
Green	**Alarm Cleared**: The conditions that caused the alarm have improved.
Black	**Normal**: No alarms are present. The Network Management Card and all connected devices are operating normally.

Change the default temperature scale

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

Specify the UI language

You can specify the default language for the user interface with the **Language** field. This can be set when you log on also. From the drop-down box, select one of the languages displayed.

You can also specify different languages for e-mail recipients and SNMP trap receivers. See “E-mail recipients” on page 64 and “Trap Receivers” on page 65.

Specify a default logon page

Configure the Web page that will display by default when you log on.

Reset the Network Management Card 2

Path: Administration > General > Reset/Reboot

Action	Definition
Reboot Management Interface	Restarts the interface of the NMC.
Reset All[1]	Clear the **Exclude TCP/IP** check box to reset all configuration values; mark the **Exclude TCP/IP** check box to reset all values except TCP/IP
1. Resetting may take up to a minute. The UPS name will not be reset.	

Action	Definition
Reset Only[1]	**TCP/IP settings**: Set TCP/IP Configuration to **DHCP & BOOTP**, its default setting, requiring that the NMC receive its TCP/IP settings from a DHCP or BOOTP server. See “TCP/IP and Communication Settings” on page 54.
	Event configuration: Reset all changes to event configuration, by event and by group, to their default settings.
	UPS to Defaults: Reset only UPS settings, not network settings, to their defaults.
	Lost Environmental Communication Alarms: Clear any environmental alarms that are caused by lost communication with an external sensor. For example, if a temperature sensor is disconnected and therefore causes an alarm, resetting lost environmental alarms returns the alarm status for that sensor to Normal. Note: To clear alarms for a sensor that is connected to the universal sensor port of an AP9631 NMC, reconnect the sensor or restart the NMC.
	Control Policy: Reset the settings that define how the NMC will respond to alarms that are detected at the Dry Contact I/O Accessory.
1. Resetting may take up to a minute. The UPS name will not be reset.	

Configure Links

Path: 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 Knowledge Base page of the **www.apc.com** website
- **Link 2**: the Product Information page of the **www.apc.com** website
- **Link 3**: the downloads page of the **www.apc.com** website

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 Network Management Card 2

Path: Administration > General > About

The hardware information is useful to Customer Support for troubleshooting problems with the NMC. The serial number and MAC address are also available on the NMC itself.

Firmware information for the Application Module, American Power Conversion OS (AOS), and Boot Monitor 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 **www.apc.com** website.

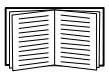
Management Uptime is the length of time the interface has been running continuously.

Device IP Configuration Wizard

Capabilities, Requirements, and Installation

How to use the Wizard to configure TCP/IP settings

The Device IP Configuration Wizard configures the IP address, the subnet mask, and the default gateway of one or more Network Management Cards or network-enabled devices (devices containing an embedded UPS Network Management Card 2 (NMC)).



The Wizard is for IPv4 only. For detailed information on the Wizard, see the Knowledge Base on the support page of the **www.apc.com** website and search for 3061 (the ID of the relevant article).

To use the DHCP Option 12 (AOS 5.1.5 or higher), see Knowledge Base ID 8853.

System requirements

The Wizard runs on Microsoft Windows 2000, Windows Server® 2003, and on both 32- and 64-bit versions of Windows XP, Windows Vista, Windows 2008, and Windows 7 operating systems.

Installation

To install the Wizard from the *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.com/tools/download**.
2. Download the Device IP Configuration Wizard.
3. Run the executable file in the folder to which you downloaded it.

How to Export Configuration Settings

Retrieving and Exporting the .ini File

Summary of the procedure

An Administrator can retrieve the .ini file of a UPS Network Management Card 2 (NMC) and export it to another NMC or to multiple NMCs.

1. Configure an NMC to have the settings you want to export.
2. Retrieve the .ini file from that NMC.
3. Customize the file to change at least the TCP/IP settings.
4. Use a file transfer protocol supported by the NMC to transfer a copy to one or more other NMCs. For a transfer to multiple NMCs, use an FTP or SCP script or the .ini file utility.

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

Contents of the .ini file

The config.ini file you retrieve from an NMC contains the following:

- *section headings* and *keywords* (only those supported for the device from which you retrieve the file)*:* Section headings are category names enclosed in brackets ([ ]). Keywords, under each section heading, are labels describing specific NMC settings. Each keyword is followed by an equals sign and a value (either the default or a configured value).
- The `Override` keyword: With its default value, this keyword prevents the exporting of one or more keywords and their device-specific values. For example, in the `[NetworkTCP/IP]` section, the default value for `Override` (the MAC address of the NMC) blocks the exporting of values for the `SystemIP`, `SubnetMask`, `DefaultGateway`, and `BootMode`.

Detailed procedures

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

1. If possible, use the interface of an NMC to configure it with the settings to export. Directly editing the .ini file risks introducing errors.
2. To use FTP to retrieve config.ini from the configured NMC:
   a. Open a connection to the NMC, using its IP address:

      ```
      ftp> open ip_address
      ```

   b. Log on using the Administrator user name and password.
   c. Retrieve the config.ini file containing the NMC's settings:

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

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

To retrieve configuration settings from multiple NMCs and export them to other NMCs, see *Release Notes: ini File Utility, version 1.0,* available on the Network Management Card *Utility* CD and at **www.apc.com**.

Customizing. You must customize the file 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.

– Enclose in quotation marks any values that contain leading or trailing spaces or are already enclosed in quotation marks.

– To export scheduled events, configure the values directly in the .ini file.

– To export a system time with the greatest accuracy, if the receiving NMCs can access a Network Time Protocol server, configure `enabled` for `NTPEnable`:

```
NTPEnable=enabled
```

Alternatively, reduce transmission time by exporting the `[SystemDate/Time]` section as a separate .ini file.

– To add comments, start each comment line with a semicolon (`;`).

2. Copy the customized file to another file name in the same folder:

   – The file name can have up to 64 characters and must have the .ini suffix.

   – Retain the original customized file for future use. **The file that you retain is the only record of your comments.**

Transferring the file to a single NMC. To transfer the .ini file to another Network Management Card, do either of the following:

- From the user interface of the receiving NMC, 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 Network Management Cards, 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 NMC 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 NMC:

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

Exporting the file to multiple NMCs. To export the .ini file to multiple Network Management Cards:

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

To create the batch file and use the utility, see *Release Notes: ini File Utility, version 1.0* on the Network Management Card *Utility* CD.

The Upload Event and Error Messages

The event and its error messages

The following event occurs when the receiving Network Management Card completes using the .ini file to update its settings.

`Configuration file upload complete, with number valid values`

If a keyword, section name, or value is invalid, the upload by the receiving NMC succeeds, and additional event text states the error.

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, an incomplete upload occurs. Reduce the size of the file, or divide it into two files, and try uploading again.

Messages in config.ini

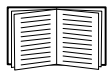
A device associated with the NMC from which you download the config.ini file must be discovered successfully in order for its configuration to be included. If the device (such as a UPS) is not present or is not discovered, the config.ini file contains a message under the appropriate section name, instead of keywords and values. For example:

```
UPS not discovered

IEM not discovered
```

If you did not intend to export the configuration of the device as part of the .ini file import, ignore these messages.

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.

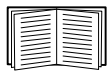


See “Contents of the .ini file” on page 73 for information about which values are overridden.

Because the overridden values are device-specific and not appropriate to export to other NMCs, ignore these error messages. To prevent these error messages, 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 Device IP Configuration Wizard to update the basic TCP/IP settings of the NMC and configure other settings through its user interface.



See “Device IP Configuration Wizard” on page 72.

File Transfers

Upgrading Firmware

When you upgrade the firmware on the UPS Network Management Card 2 (NMC), you obtain the latest new features, performance improvements, and bug fixes.

Upgrading here means simply placing the module files on the NMC, there is no installation as such. Check regularly on **www.apcc.com/tools/download** for any new upgrades.

Firmware module files (Network Management Card 2)

A firmware version has three modules, and they *must* be upgraded (that is, placed on the NMC) in this order:

- a boot monitor (**bootmon**) module
- an American Power Conversion Operating System (**AOS**) module
- an **application** module

(Each module contains one or more Cyclical Redundancy Checks (CRCs) to protect its data from corruption).

The boot monitor module, the AOS, and the application file names share the same basic format:

`apc_hardware-version_type_firmware-version.bin`

- `apc`: Indicates the context.
- `hardware-version: hw0n` where n identifies the hardware version on which you can use this file.
- `type`: Identifies which module.
- `version`: The version number of the file.
- `bin`: Indicates that this is a binary file.

Firmware File Transfer Methods

Upgrade the bootmon module first, then the AOS module, and finally, the application module by placing them on the NMC in that order.

Obtain the free, latest firmware version from **www.apcc.com/tools/download**. To upgrade the firmware of one or more NMCs, use one of these five methods:

- On a Windows operating system, use the **Firmware Upgrade Utility** downloaded from the **www.apc.com** website. See “Using the Firmware Upgrade Utility”.
- On any supported operating system, use **FTP or SCP** to transfer the individual AOS and application firmware modules. See “Use FTP or SCP to upgrade one Network Management Card”.
- For a Network Management Card that is NOT on your network, use **XMODEM** through a serial connection to transfer the individual firmware modules from your computer to the NMC. See “Use XMODEM to upgrade one NMC”.
- Use a **USB drive** to transfer the individual firmware modules from your computer (AP9631 only). See “Use a USB drive to transfer and upgrade the files (AP9631 only)”.
- For upgrades to **multiple NMCs**, see “Upgrading the firmware on multiple Network Management Cards” and “Using the Firmware Upgrade Utility for multiple upgrades on Windows”.

Using the Firmware Upgrade Utility

This Firmware Upgrade Utility is part of the firmware upgrade package available on the **www.apc.com** website. (*Never* use an Upgrade Utility designated for one product to upgrade the firmware of another product).

Using the Utility for upgrades on Windows systems. On any supported Windows operating system, the Firmware Upgrade Utility automates the transferring of the firmware modules, *in the correct module order.* The utility only works with an NMC that has an IPv4 address.

Unzip the downloaded firmware upgrade file and double-click the .exe file. Then enter the IP address, the user name, and the password in the dialog fields and click **Upgrade Now**. You can use the **Ping** button to test your entered details. See also "Using the Firmware Upgrade Utility for multiple upgrades on Windows".

Using the Utility for manual upgrades, primarily on Linux. On non-Windows operating systems, the Firmware Upgrade Utility extracts the individual firmware modules, but does not upgrade the NMC. See "Firmware File Transfer Methods" for the different upgrade methods after extraction.

To extract the firmware files:

1. After obtaining the files from the downloaded firmware upgrade file, run the **Firmware Upgrade Utility** (the .exe file).
2. At the prompts, click **Next**>, and then specify the directory location to which the files will be extracted.
3. When the **Extraction Complete** message displays, close the dialog box.

Use FTP or SCP to upgrade one Network Management Card

FTP. To use FTP to upgrade an NMC over the network:

- The NMC must be on the network, with its system IP, subnet mask, and default gateway configured.
- The FTP server must be enabled at the NMC, see "FTP Server" on page 61.

To transfer the files, perform these steps (this procedure assumes bootmon does not need upgrading, it is always necessary to upgrade the other two though):

1. The firmware module files must be extracted, see "To extract the firmware files:".
2. At a computer on the network, open a command prompt window. Go to the directory that contains the firmware files, and list the files:

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

   For file information, see "Firmware module files (Network Management Card 2)" on page 76.
3. Open an FTP client session:

   ```
   C:\apc>ftp
   ```
4. Type `open` with the **IP address** of the NMC, 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 (showing a space before 21000):
     ```
     ftp> open 150.250.6.10 21000
     ```
   - Some FTP clients require a colon instead before the port number.
5. Log on as Administrator (**apc** is the default user name and password).
6. Upgrade the AOS. (Always upgrade the AOS before the application module).

```
ftp> bin
ftp> put apc_hw05_aos_nnn.bin
```
(where *nnn* is the firmware version number)

7. When FTP confirms the transfer, type `quit` to close the session.
8. After 20 seconds, repeat step 3 through step 7, using the application module file name at step 6, .

SCP. To use Secure CoPy (SCP) to upgrade firmware for the NMC, follow these steps (this procedure assumes bootmon does not need upgrading, it is always necessary to upgrade the other two though):

1. Locate the firmware modules, see "Using the Utility for manual upgrades, primarily on Linux.".
2. Use an SCP command line to transfer the AOS firmware module to the NMC. The following example uses *nnn* to represent the version number of the AOS module:

   `scp apc_hw05_aos_nnn.bin apc@158.205.6.185:apc_hw05_aos_nnn.bin`
3. Use a similar SCP command line, with the name of the application module, to transfer the application firmware module to the NMC. (Always upgrade the AOS before the application module).

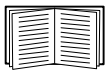
Use XMODEM to upgrade one NMC

To use XMODEM to upgrade one NMC that is not on the network, you must extract the firmware files with the Firmware Upgrade Utility (see "To extract the firmware files:").

To transfer the files (this procedure assumes bootmon does not need upgrading, it is always necessary to upgrade the other two though):

1. Select a serial port at the local computer and disable any service that uses the port.
2. Connect the provided serial configuration cable (part number 940-0299) to the selected port and to the serial port at the NMC.
3. Run a terminal program such as HyperTerminal, and configure the selected port for 57600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
4. Press the **Reset** button on the NMC, then immediately press the **Enter** key twice, or until the Boot Monitor prompt displays: `BM>`
5. Type `XMODEM`, then press `ENTER`.
6. From the terminal program's menu, select XMODEM, then select the binary AOS firmware file to transfer using XMODEM. After the XMODEM transfer is complete, the Boot Monitor prompt returns.

   (Always upgrade the AOS before the application module).
7. To install the application module, repeat step 5 and step 6. In step 6, use the application module file name.
8. Type `reset` or press the **Reset** button to restart the NMC.



For information about the format used for firmware modules, see "Firmware module files (Network Management Card 2)" on page 76.

Use a USB drive to transfer and upgrade the files (AP9631 only)

Before starting the transfer, make sure the USB drive is formatted in FAT32.

1. Download the firmware upgrade files and unzip them.
2. Create a folder named **apcfirm** on the USB flash drive.
3. Place the extracted module files in the **apcfirm** directory.
4. Use a text editor to create a file named **upload.rcf.** (The file extension must be .rcf, not .txt for example.)

5. In **upload.rcf**, add a line for each firmware module that you want to upgrade. For example, to upgrade to **bootmon** version 1.0.2, **AOS** v5.1.5 and Smart-UPS **application** version v5.1.4, type:

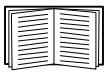
   BM=apc_hw05_bootmon_102.bin
   AOS=apc_hw05_aos_515.bin
   APP=apc_hw05_sumx_514.bin

6. Place upload.rcf in the **apcfirm** folder on the flash drive.
7. Insert the USB drive into a USB port on the UPS that has the NMC to upgrade.
8. Reset the NMC and wait for the card to reboot fully.
9. Check that the upgrade was completed successfully using the procedures in "Verifying Upgrades" on page 80.

Upgrading the firmware on multiple Network Management Cards

Use one of these three methods:

- **NMC2 Firmware Upgrade Utility on Windows**. See "Using the Firmware Upgrade Utility for multiple upgrades on Windows".
- **Use FTP or SCP**. To upgrade multiple NMCs using an FTP client or using SCP, write a script which automatically performs the procedure.
- **Export configuration settings**. You can create batch files and use a utility to retrieve configuration settings from multiple NMCs and export them to other NMCs.



See *Release Notes: ini File Utility, version 1.0,* available on the Network Management Card *Utility* CD.

Using the Firmware Upgrade Utility for multiple upgrades on Windows. After downloading the Upgrade Utility from the NMC downloads page on the **www.apc.com** website, double click on the exe file to run the utility (which ONLY works with IPv4) and follow these steps to upgrade your NMC firmware:

1. In the utility dialog, type in an IP address, a user name, and a password, and choose the **Ping** button if you need to verify the IP address.
2. Choose the **Device List** button to open the `iplist.txt` file. Here you should type all UPS devices to upgrade with the necessary information: IP, user name, and password.

   For example,
   SystemIP=192.168.0.1
   SystemUserName=apc
   SystemPassword=apc

   You can use an existing `iplist.txt` file if it already exists.

3. Select the **Upgrade From Device List** check box to use the `iplist.txt` file.
4. Choose the **Upgrade Now** button to start the firmware version upgrade(s).
5. Choose **View Log** to verify any upgrade.

Verifying Upgrades

Verify the success or failure of the transfer

To verify whether a firmware upgrade succeeded, you can use the `xferStatus` command in the command line interface to view the last transfer result. Alternatively, you can use an SNMP GET to the **mfiletransferStatusLastTransferResult** OID.

Last Transfer Result codes

Possible transfer errors include the TFTP or FTP server not being found, or the server refusing access, the server not finding or not recognizing the transfer file, or a corrupt transfer file.

Verify the version numbers of installed firmware

Use the Web user 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. In the command line interface, use the **about** command.

Adding and Changing Language Packs

Using the Network Management Card 2 language pack files you can display the user interface in different languages. Each individual language pack contains up to five languages (this is why the **Language** drop-down box has five languages to choose from when you log on).

The user interface has nine languages available in all: French, Italian, German, Spanish, Brazilian Portuguese, Russian, Korean, Japanese, and Simplified Chinese.

The language pack files are available on the Network Management Card firmware download area on the website, **www.apc.com**. The language packs are included in the firmware upgrade package.

The downloaded files all have an .lpk extension and the file naming convention is:

```
<app name>_<app version>_<language codes>.lpk
```

For example, for a Symmetra 3-phase application, the filename would be something like:

```
sy3p_510_esESzhCnjaJAptBrkoKo.lpk
```

where `esESzhCnjaJAptBrkoKo`
represents Spanish, Chinese, Japanese, Portuguese Brazilian, and Korean.

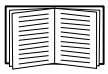
You might want to change the user interface language to one that is not currently available to you. To do this, download the language pack from the website, and follow these steps:

1. Connect to your NMC using FTP.
2. Change to the **lang** folder of the NMC:
   `cd lang`
3. Transfer the required language pack to the NMC:
   `put <full path/language pack name>.lpk`
4. When the file finishes the transfer, log off FTP and the NMC will reboot.
5. When the reboot is complete, the new language pack is ready for use.

Any current language pack on the card is *deleted* before the new pack is transferred. Any problem with the pack transfer leaves the NMC with no language pack. Only English is available in that circumstance. If this happens, try re-loading the new language pack.

Troubleshooting

Network Management Card Access Problems



For problems that are not described here, see the troubleshooting flowcharts on the Network Management Card *Utility* CD. Click the **Troubleshooting** link in the CD interface.

If the problem still persists, see See “APC Worldwide Customer Support” on page 89..

Problem	Solution
Unable to ping the NMC	If the NMC’s Status LED is green, try to ping another node on the same network segment as the NMC. If that fails, it is not a problem with the NMC. If the Status LED is not green, or if the ping test succeeds, perform the following checks: • Verify that the NMC is properly seated in the UPS. • Verify all network connections. • Verify the IP addresses of the NMC and the NMS. • If the NMS is on a different physical network (or subnetwork) from the NMC, verify the IP address of the default gateway (or router). • Verify the number of subnet bits for the NMC’s subnet mask.
Cannot allocate the communications port through a terminal program	Before you can use a terminal program to configure the NMC, you must shut down any application, service, or program using the communications port.
Cannot access the command line interface through a serial connection	Make sure that you did not change the baud rate. Try 2400, 9600, 19200, or 38400.
Cannot access the command line interface remotely	• Make sure you are using the correct access method, Telnet or Secure SHell (SSH). An Administrator can enable these access methods. By default, Telnet is enabled. Enabling SSH automatically disables Telnet. • For SSH, the NMC may be creating a host key. The NMC can take up to one minute to create the host key, and SSH is inaccessible for that time.
Cannot access the user interface	• Verify that HTTP or HTTPS access is enabled. • Make sure you are specifying the correct URL — one that is consistent with the security system used by the NMC. SSL requires **https**, not **http**, at the beginning of the URL. • Verify that you can ping the NMC. • Verify that you are using a Web browser supported for the NMC. See “Supported Web browsers” on page 28. • If the NMC has just restarted and SSL security is being set up, the NMC may be generating a server certificate. The NMC can take up to one minute to create this certificate, and the SSL server is not available during that time.

SNMP Issues

Problem	Solution
Unable to perform a GET	• Verify the read (GET) community name (SNMPv1) or the user profile configuration (SNMPv3). • Use the command line interface or user interface to ensure that the NMS has access. See “SNMP” on page 58.
Unable to perform a SET	• Verify the read/write (SET) community name (SNMPv1) or the user profile configuration (SNMPv3). • Use the command line interface or user interface to ensure that the NMS has write (SET) access (SNMPv1) or is granted access to the target IP address through the access control list (SNMPv3). See “SNMP” on page 58.
Unable to receive traps at the NMS	• Make sure the trap type (SNMPv1 or SNMPv3) is correctly configured for the NMS as a trap receiver. • For SNMP v1, query the **mconfigTrapReceiverTable** MIB OID to verify that the NMS IP address is listed correctly and that the community name defined for the NMS matches the community name in the table. If either is not correct, use SETs to the **mconfigTrapReceiverTable** OIDs, or use the command line interface or user interface to correct the trap receiver definition. • For SNMPv3, check the user profile configuration for the NMS, and run a trap test. See “SNMP” on page 58, “Trap Receivers” on page 65, and “SNMP Trap Test” on page 66.
Traps received at an NMS are not identified	See your NMS documentation to verify that the traps are properly integrated in the alarm/trap database.

Synchronization Problems

Problem	Solution
A Synchronized Control Group member does not participate in a synchronized action.	Make sure the group member’s status is set to **Enabled**. Also check the group member’s battery capacity, if the synchronized action required UPSs to turn on.
An attempt to add a member to a Synchronized Control Group fails.	The values for **Multicast IP Address**, **Synchronized Control Group Number**, and firmware version must match those of other members of the group.

Appendix A: List of Supported CLI Commands

?

about

alarmcount
[-p [all | warning | critical]]

boot
[-b <dhcp | bootp | manual>]
[-c <dhcp cookie> [enable | disable]]
[-v <vendor class>]
[-i <client id>]
[-u <user class>]

cd

console
[-S <disable | telnet | ssh>]
[-pt <telnet port #>]
[-ps <ssh port #>]
[-b <baud rate> [2400 | 9600 | 19200 | 38400]]

date
[-d <“datestring”>]
[-t <00:00:00>]
[-f [mm/dd/yy | dd.mm.yyyy | mmm-dd-yy |
dd-mmm-yy | yyyy-mm-dd]]
[-z <time zone offset>]

delete

dir

dns
[-OM [enable | disable]]
[-p <primary DNS server>]
[-s <secondary DNS server>]
[-d <domain name>]
[-n <domain name IPv6>]
[-h <host name>]

eventlog

exit

format

ftp
[-p <port number>]
[-S <enable | disable>]

help

netstat

ntp
[-OM [enable | disable]]
[-p <primary NTP server>]
[-s <secondary NTP server>]

ping
[<IP address or DNS name>]

portspeed
[-s [auto | 10H | 10F | 100H | 100F]]

prompt
[-s [long | short]]

quit

radius
[-a <access> [local | radiusLocal | radius]]
[-p# <server IP>]
[-s# <server secret>]
[-t# <server timeout>]

reboot

resetToDef
[-p [all | keepip]]

snmp, snmp3
[-S [enable | disable]]

system
[-n <system name>]
[-c <system contact>]
[-l <system location>]

tcpip
[-S [enable | disable]]
[-i <IP address>]
[-s <subnet mask>]
[-g <gateway>]
[-d <domain name>]
[-h <host name>]

tcpip6
[-S [enable | disable]]
[-man [enable | disable]]
[-auto [enable | disable]]
[-i <IPv6 address>]
[-g <IPv6 gateway>]
[-d6 [router | stateful | stateless | never]]

uio
[-rc <dI> [open | close]
[-st <port # | port #]]
[-disc <port # | port #]]

ups
[-c <off | graceoff | on | reboot | gracereboot | sleep | gracesleep>]
[-r <start | stop>]
[-s <start>]
[-b <enter | exit>]
[-o# <off | delayoff | on | delayon | reboot>]
[-os#]
[-st]
[-input [<phase#> | all] [voltage | current | frequency | all]]
[-bypass [<phase#> | all] [voltage | current | frequency | all]]
[-output [<phase#> | all] [voltage | current | frequency | load | percload | pf | power | all]]
[-batt]
[-about]
[-al [c | w]]

user
[-an <Administrator name>]
[-dn <Device User name>]
[-rn <Read-Only User name>]
[-ap <Administrator password>]
[-dp <Device User password>]
[-rp <Read-Only User password>]
[-t <inactivity timeout in minutes>]

web
[-S <disable | http | https>]
[-ph <http port #>]
[-ps <https port #>]

xferINI

xferStatus

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.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, OF PRODUCTS SOLD, SERVICED OR FURNISHED UNDER THIS AGREEMENT OR IN CONNECTION HEREWITH. APC DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY, SATISFACTION AND FITNESS FOR A PARTICULAR PURPOSE. APC EXPRESS WARRANTIES WILL NOT BE ENLARGED, DIMINISHED, OR AFFECTED BY AND NO OBLIGATION OR LIABILITY WILL ARISE OUT OF, APC RENDERING OF TECHNICAL OR OTHER ADVICE OR SERVICE IN CONNECTION WITH THE PRODUCTS. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND REMEDIES. THE WARRANTIES SET FORTH ABOVE CONSTITUTE APC'S SOLE LIABILITY AND PURCHASER'S EXCLUSIVE REMEDY FOR ANY BREACH OF SUCH WARRANTIES. APC WARRANTIES EXTEND ONLY TO PURCHASER AND ARE NOT EXTENDED TO ANY THIRD PARTIES.

IN NO EVENT SHALL APC, ITS OFFICERS, DIRECTORS, AFFILIATES OR EMPLOYEES BE LIABLE FOR ANY FORM OF INDIRECT, SPECIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, ARISING OUT OF THE USE, SERVICE OR INSTALLATION, OF THE PRODUCTS, WHETHER SUCH DAMAGES ARISE IN CONTRACT OR TORT, IRRESPECTIVE OF FAULT, NEGLIGENCE OR STRICT LIABILITY OR WHETHER APC HAS BEEN ADVISED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES. SPECIFICALLY, APC IS NOT LIABLE FOR ANY COSTS, SUCH AS LOST PROFITS OR REVENUE, LOSS OF EQUIPMENT, LOSS OF USE OF EQUIPMENT, LOSS OF SOFTWARE, LOSS OF DATA, COSTS OF SUBSTITUENTS, CLAIMS BY THIRD PARTIES, OR OTHERWISE.

NO SALESMAN, EMPLOYEE OR AGENT OF APC IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY. WARRANTY TERMS MAY BE MODIFIED, IF AT ALL, ONLY IN WRITING SIGNED BY AN APC OFFICER AND LEGAL DEPARTMENT.

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.

Radio Frequency Interference

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

USA—FCC

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

Canada—ICES

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

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

Japan—VCCI

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

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

Taiwan—BSMI

警告使用者：
這是甲類的資訊產品，在居住的
環境中使用時，可能會造成射頻
干擾，在這種情況下，使用者會
被要求採取某些適當的對策。

Australia and New Zealand

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

European Union

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. APC cannot accept responsibility for any failure to satisfy the protection requirements resulting from an unapproved modification of the product.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide a reasonable protection against interference with licensed communication equipment.

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

Korean 한국

A 급 기기 (업무용 방송통신기기)

이 기기는 업무용 (A 급) 으로 전자파적합등록을 한 기기이오니판매자 또는 사용자는 이 점을 주의하시기 바라며 , 가정외의지역에서 사용하는 것을 목적으로 합니다 .

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 the APC Customer Support Center by telephone or e-mail.
  - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

For information on how to obtain local customer support, contact the APC representative or other distributors from whom you purchased your APC product.

990-3402D-001 **3/2012**