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在公司的网站上 (www.apc.com) 有本手册的中文版。
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Este manual está disponible en español en el CD-ROM adjunto.
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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) - Secure SHell (SSH)
- Simple Network Management Protocol versions 1 and 3 (SNMPv1, SNMPv3) - Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)
- File Transfer Protocol (FTP) - Secure Copy (SCP)
- Telnet

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:
   ```bash
   user -an yourAdministratorName
   user -ap yourAdministratorPassword
   ```
   For example, to change the Administrator user name to Admin, type:
   ```bash
   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)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Serial configuration port</td>
</tr>
<tr>
<td>2.</td>
<td>10/100 Base-T connector</td>
</tr>
<tr>
<td>3.</td>
<td>Reset button</td>
</tr>
<tr>
<td>4.</td>
<td>Link-RX/TX (10/100) LED</td>
</tr>
<tr>
<td>5.</td>
<td>Status LED</td>
</tr>
</tbody>
</table>

Front Panel (AP9631)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>USB ports</td>
</tr>
<tr>
<td>2.</td>
<td>Sensor ports</td>
</tr>
<tr>
<td>3.</td>
<td>10/100 Base-T connector</td>
</tr>
<tr>
<td>4.</td>
<td>Reboot button</td>
</tr>
<tr>
<td>5.</td>
<td>Serial configuration port</td>
</tr>
<tr>
<td>6.</td>
<td>Link-RX/TX (10/100) LED</td>
</tr>
<tr>
<td>7.</td>
<td>Status LED</td>
</tr>
</tbody>
</table>
LED Descriptions

Status LED

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

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>One of the following situations exists:</td>
</tr>
<tr>
<td></td>
<td>• The NMC is not receiving input power.</td>
</tr>
<tr>
<td></td>
<td>• The NMC is not operating properly. It may need to be repaired or replaced. Contact Customer Support. See “APC Worldwide Customer Support”.</td>
</tr>
<tr>
<td>Solid green</td>
<td>The NMC has valid TCP/IP settings.</td>
</tr>
<tr>
<td>Solid orange</td>
<td>A hardware malfunction has been detected in the NMC. Contact Customer Support. See “APC Worldwide Customer Support”.</td>
</tr>
<tr>
<td>Flashing green</td>
<td>The NMC does not have valid TCP/IP settings. ¹</td>
</tr>
<tr>
<td>Flashing orange</td>
<td>The NMC is making BOOTP requests. ¹</td>
</tr>
<tr>
<td>Alternately flashing green and orange</td>
<td>If the LED is flashing slowly, the NMC is making DHCP² requests. ¹</td>
</tr>
<tr>
<td></td>
<td>If the LED is flashing rapidly, the NMC is starting up.</td>
</tr>
</tbody>
</table>

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.

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

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

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+

<table>
<thead>
<tr>
<th>IPv4 only</th>
<th>IPv6 only</th>
<th>IPv4 and IPv6*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N+</td>
<td>N6+</td>
<td>N4+ N6+</td>
<td>The network is functioning properly.</td>
</tr>
<tr>
<td>N–</td>
<td>N6–</td>
<td>N4– N6–</td>
<td>The NMC failed to connect to the network.</td>
</tr>
<tr>
<td>N!</td>
<td>N6!</td>
<td>N4! N6!</td>
<td>Another device is using the IP address of the NMC.</td>
</tr>
</tbody>
</table>

* 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Options are preceded by a hyphen.</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Definitions of options are enclosed in angle brackets. For example: <code>-dp &lt;device password&gt;</code></td>
</tr>
<tr>
<td>[ ]</td>
<td>If a command accepts multiple options or an option accepts mutually exclusive arguments, the values may be enclosed in brackets.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>
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
```

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-p</td>
<td>all</td>
<td>View the number of active alarms reported by the NMC. Information about the alarms is provided in the event log.</td>
</tr>
<tr>
<td></td>
<td>warning</td>
<td>View the number of active warning alarms.</td>
</tr>
<tr>
<td></td>
<td>critical</td>
<td>View the number of active critical alarms.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-b</td>
<td>dhcp</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>bootp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>manual</td>
<td></td>
</tr>
<tr>
<td>-c</td>
<td>enable</td>
<td>dhcp boot modes only. Enable or disable the requirement that the DHCP server provide the APC cookie.</td>
</tr>
<tr>
<td></td>
<td>disable</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-all</td>
<td></td>
<td>Show all applicable shutdown parameters for this UPS.</td>
</tr>
<tr>
<td>-sd</td>
<td>000</td>
<td>090</td>
</tr>
<tr>
<td>-lo</td>
<td>02</td>
<td>05</td>
</tr>
<tr>
<td>-rd</td>
<td>000</td>
<td>060</td>
</tr>
<tr>
<td>-rrt</td>
<td>0–3600</td>
<td>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.</td>
</tr>
<tr>
<td>-sl</td>
<td>0.0–359.9</td>
<td>Set the sleep time, in hours. The argument can have any number between 0.0 and 359.9.</td>
</tr>
<tr>
<td>-rsc</td>
<td>00</td>
<td>15</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-all</td>
<td></td>
<td>Show all applicable power parameters for this UPS.</td>
</tr>
<tr>
<td>-l</td>
<td>97–106</td>
<td>Set the low transfer point, in VAC.</td>
</tr>
<tr>
<td>-h</td>
<td>127–136</td>
<td>Set the high transfer point, in VAC.</td>
</tr>
<tr>
<td>-ov</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>-s</td>
<td>Normal</td>
<td>Reduced</td>
</tr>
<tr>
<td>-bu</td>
<td>127</td>
<td>130</td>
</tr>
<tr>
<td>-bl</td>
<td>086</td>
<td>088</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-S</td>
<td>disable</td>
<td>telnet</td>
</tr>
<tr>
<td>-pt</td>
<td>&lt;telnet port n&gt;</td>
<td>Define the Telnet port used to communicate with the NMC (23 by default).</td>
</tr>
<tr>
<td>-ps</td>
<td>&lt;SSH port n&gt;</td>
<td>Define the SSH port used to communicate with the NMC (22 by default).</td>
</tr>
<tr>
<td>-b</td>
<td>2400</td>
<td>9600</td>
</tr>
</tbody>
</table>

Example 1: To enable SSH access to the command line interface, type:
code
console -S ssh

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d</td>
<td>&lt;&quot;datestring&quot;&gt;</td>
<td>Set the current date. Use the date format specified by the <code>date -f</code> command.</td>
</tr>
<tr>
<td>-t</td>
<td>&lt;00:00:00&gt;</td>
<td>Configure the current time, in hours, minutes, and seconds. Use the 24-hour clock format.</td>
</tr>
<tr>
<td>-f</td>
<td>mm/dd/yy</td>
<td>dd.mm.yyyy</td>
</tr>
<tr>
<td>-z</td>
<td>&lt;time zone offset&gt;</td>
<td>Set the difference with GMT in order to specify your time zone. This enables you to synchronize with other people in different time zones.</td>
</tr>
</tbody>
</table>

**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 ).

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;file name&gt;</td>
<td>Type the name of the file to delete.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-all</td>
<td></td>
<td>Show all applicable status information for this UPS.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-OM</td>
<td>enable</td>
<td>disable</td>
</tr>
<tr>
<td>-p</td>
<td>&lt;primary DNS server&gt;</td>
<td>Set the primary DNS server.</td>
</tr>
<tr>
<td>-s</td>
<td>&lt;secondary DNS server&gt;</td>
<td>Set the secondary DNS server.</td>
</tr>
<tr>
<td>-d</td>
<td>&lt;domain name&gt;</td>
<td>Set the domain name.</td>
</tr>
<tr>
<td>-n</td>
<td>&lt;domain name IPv6&gt;</td>
<td>Set the domain name IPv6.</td>
</tr>
<tr>
<td>-h</td>
<td>&lt;host name&gt;</td>
<td>Set the host name.</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESC</td>
<td>Close the event log and return to the command line interface.</td>
</tr>
<tr>
<td>ENTER</td>
<td>Update the log display. Use this command to view events that were recorded after you last retrieved and displayed the log.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>-p</td>
<td>&lt;port number&gt;</td>
<td>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.</td>
</tr>
<tr>
<td>-S</td>
<td>enable</td>
<td>disable</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>-OM</td>
<td>enable</td>
<td>Override the manual settings.</td>
</tr>
<tr>
<td>-p</td>
<td>&lt;primary NTP server&gt;</td>
<td>Specify the primary server.</td>
</tr>
<tr>
<td>-s</td>
<td>&lt;secondary NTP server&gt;</td>
<td>Specify the secondary server.</td>
</tr>
</tbody>
</table>

**Example 1:** To enable the override of manual setting, type:

```bash
ntp -OM enable
```

**Example 2:** To specify the primary NTP server, type:

```bash
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.

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;IP address or DNS name&gt;</td>
<td>Type an IP address with the format <code>xxx.xxx.xxx.xxx</code>, or the DNS name configured by the DNS server.</td>
</tr>
</tbody>
</table>

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

```bash
ping 150.250.6.10
```

**portspeed**

**Access:** Administrator

**Description:**

<table>
<thead>
<tr>
<th>Option</th>
<th>Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-s</td>
<td>auto</td>
<td>Define the communication speed of the Ethernet port. The <code>auto</code> 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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto</td>
<td>10H</td>
</tr>
</tbody>
</table>

**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:

```bash
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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-s</td>
<td>long</td>
<td>The prompt includes the account type of the currently logged-in user.</td>
</tr>
<tr>
<td></td>
<td>short</td>
<td>The default setting. The prompt is four characters long: APC&gt;</td>
</tr>
</tbody>
</table>

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.


<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-a</td>
<td>local</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>radiusLocal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>radius</td>
<td></td>
</tr>
<tr>
<td>-p1</td>
<td>&lt;server IP&gt;</td>
<td>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.</td>
</tr>
<tr>
<td>-p2</td>
<td>&lt;server IP&gt;</td>
<td></td>
</tr>
<tr>
<td>-s1</td>
<td>&lt;server secret&gt;</td>
<td>The shared secret between the primary or secondary RADIUS server and the NMC.</td>
</tr>
<tr>
<td>-s2</td>
<td>&lt;server secret&gt;</td>
<td></td>
</tr>
<tr>
<td>-t1</td>
<td>&lt;server timeout&gt;</td>
<td>The time in seconds that the NMC waits for a response from the primary or secondary RADIUS server.</td>
</tr>
<tr>
<td>-t2</td>
<td>&lt;server timeout&gt;</td>
<td></td>
</tr>
</tbody>
</table>

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 -t 2 10
```

reboot

Access: Administrator
Description: Restart the interface of the NMC.

resetToDef

Access: Administrator only
Description: Reset all parameters to their default.

<table>
<thead>
<tr>
<th>Option</th>
<th>Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-p</td>
<td>all</td>
<td>keepip</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-S</td>
<td>enable</td>
<td>disable</td>
</tr>
</tbody>
</table>

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”).

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-n</td>
<td>&lt;system name&gt;</td>
<td>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.</td>
</tr>
<tr>
<td>-c</td>
<td>&lt;system contact&gt;</td>
<td></td>
</tr>
<tr>
<td>-l</td>
<td>&lt;system location&gt;</td>
<td></td>
</tr>
</tbody>
</table>
Example 2: To set the system name as Don Adams, type:

```
    system -n "Don Adams"
```

tcipp

Access: Administrator only

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

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

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:

```
tcip -i 150.250.6.10
```

tcip6

Access: Administrator only

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-S</td>
<td>enable</td>
<td>Enable or disable IPv6.</td>
</tr>
<tr>
<td>-man</td>
<td>enable</td>
<td>Enable manual addressing for the IPv6 address of the NMC.</td>
</tr>
<tr>
<td>-auto</td>
<td>enable</td>
<td>Enable the NMC to automatically configure the IPv6 address.</td>
</tr>
<tr>
<td>-i</td>
<td>&lt;IPv6 address&gt;</td>
<td>Set the IPv6 address of the NMC.</td>
</tr>
<tr>
<td>-g</td>
<td>&lt;IPv6 gateway&gt;</td>
<td>Set the IPv6 address of the default gateway.</td>
</tr>
<tr>
<td>-d6</td>
<td>router</td>
<td>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.</td>
</tr>
</tbody>
</table>

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:FFD3:0:57ab for the NMC, type:

```
tcip -i 2001:0:0:0: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).

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-rc</td>
<td>&lt;UIO port #&gt;</td>
<td>open</td>
</tr>
<tr>
<td>-st</td>
<td>&lt;UIO port #&gt;</td>
<td></td>
</tr>
<tr>
<td>-disc</td>
<td>&lt;UIO port #&gt;</td>
<td></td>
</tr>
</tbody>
</table>

**Example 1:** To open the output, type:
```
uiio -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:
```
uiio -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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-c</td>
<td>off</td>
<td>graceoff</td>
</tr>
<tr>
<td>-r</td>
<td>start</td>
<td>stop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-s</td>
<td>start</td>
<td>Initiate a UPS self-test.</td>
</tr>
<tr>
<td>-b</td>
<td>enter</td>
<td>exit</td>
</tr>
</tbody>
</table>
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.

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.

View the status of the UPS.

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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-input</td>
<td>&lt;phase#&gt;</td>
<td>Display the input measurements for the chosen phase of the UPS. Typing “all” displays the information for all phases of the UPS.</td>
</tr>
<tr>
<td>voltage</td>
<td>current</td>
<td>frequency</td>
</tr>
<tr>
<td>-bypass</td>
<td>&lt;phase#&gt;</td>
<td>all</td>
</tr>
<tr>
<td>voltage</td>
<td>current</td>
<td>frequency</td>
</tr>
<tr>
<td>-output</td>
<td>&lt;phase#&gt;</td>
<td>all</td>
</tr>
<tr>
<td>voltage</td>
<td>current</td>
<td>load</td>
</tr>
<tr>
<td>-batt</td>
<td></td>
<td>Display the battery status of the UPS</td>
</tr>
<tr>
<td>-about</td>
<td></td>
<td>Displays information about the UPS.</td>
</tr>
<tr>
<td>-al</td>
<td>&lt;c</td>
<td>w&gt;</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-apply</td>
<td></td>
<td>Start the firmware update.</td>
</tr>
<tr>
<td>-status</td>
<td></td>
<td>Check the status of a firmware update that is already initiated.</td>
</tr>
<tr>
<td>-lastresult</td>
<td></td>
<td>View the result of the last attempted firmware update.</td>
</tr>
</tbody>
</table>
**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.

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

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

```bash
user -an XYZ
```

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

```bash
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
```

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

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

```bash
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.

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Browser</th>
<th>Cause of the Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>“You are not authorized to view this page” or “Someone is currently logged in...”</td>
<td>Internet Explorer, Firefox</td>
<td>Someone else is logged on.</td>
</tr>
<tr>
<td>“This page cannot be displayed.”</td>
<td>Internet Explorer</td>
<td>Web access is disabled, or the URL was not correct.</td>
</tr>
<tr>
<td>“Unable to connect.”</td>
<td>Firefox</td>
<td></td>
</tr>
</tbody>
</table>

URL format examples.

<table>
<thead>
<tr>
<th>Example and Access Mode</th>
<th>URL Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNS name of Web1</td>
<td></td>
</tr>
<tr>
<td>HTTP</td>
<td><a href="http://Web1">http://Web1</a></td>
</tr>
<tr>
<td>HTTPS</td>
<td><a href="https://Web1">https://Web1</a></td>
</tr>
<tr>
<td>System IP address of 139.225.6.133 and a default Web server port (80)</td>
<td></td>
</tr>
<tr>
<td>HTTP</td>
<td><a href="http://139.225.6.133">http://139.225.6.133</a></td>
</tr>
<tr>
<td>HTTPS</td>
<td><a href="https://139.225.6.133">https://139.225.6.133</a></td>
</tr>
<tr>
<td>System IP address of 139.225.6.133 and a non-default Web server port (5000)</td>
<td></td>
</tr>
<tr>
<td>HTTP</td>
<td><a href="http://139.225.6.133:5000">http://139.225.6.133:5000</a></td>
</tr>
<tr>
<td>HTTPS</td>
<td><a href="http://139.225.6.133:5000">http://139.225.6.133:5000</a></td>
</tr>
<tr>
<td>System IPv6 address of 2001:db8:1::2c0:b7ff:fe00:1100 and a non-default Web server port (5000)</td>
<td></td>
</tr>
<tr>
<td>HTTP</td>
<td>http://[2001:db8:1::2c0:b7ff:fe00:1100]:5000</td>
</tr>
</tbody>
</table>
Home Page

Overview

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:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗</td>
<td>Critical: A critical alarm exists, which requires immediate action.</td>
</tr>
<tr>
<td>⚠</td>
<td>Warning: An alarm condition requires attention and could jeopardize your data or equipment if its cause is not addressed.</td>
</tr>
<tr>
<td>✔</td>
<td>No Alarms: No alarms are present, and the UPS and NMC are operating normally.</td>
</tr>
</tbody>
</table>

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](http://www.apc.com) website
- **Link 2**: the Product Information page of the [www.apc.com](http://www.apc.com) website
- **Link 3**: the downloads page of the [www.apc.com](http://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 (CO₂) in kilograms or pounds used thus far.

Total cost and CO₂ 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.

<table>
<thead>
<tr>
<th>Action</th>
<th>Definition</th>
</tr>
</thead>
</table>
| **Turn UPS On** (user interface) <br> `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) <br> `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)`. |
<p>| <code>ups -c GraceOff</code> (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. |</p>
<table>
<thead>
<tr>
<th>Action</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reboot UPS (user interface)</strong>&lt;br&gt;<strong>ups -c Reboot</strong> (command line interface)</td>
<td>Restarts the attached equipment by doing the following:&lt;ul&gt;&lt;li&gt;Turns off power at the UPS after Shutdown Delay.&lt;/li&gt;&lt;li&gt;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.&lt;/li&gt;&lt;li&gt;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.&lt;/li&gt;&lt;/ul&gt;For a Synchronized Control Group action:&lt;ol&gt;&lt;li&gt;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.&lt;/li&gt;&lt;li&gt;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.&lt;/li&gt;&lt;li&gt;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.&lt;/li&gt;&lt;/ol&gt;</td>
</tr>
<tr>
<td><strong>ups -c GraceReboot</strong> (command line interface)</td>
<td>• 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.&lt;br&gt;• 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.</td>
</tr>
<tr>
<td><strong>Put UPS To Sleep (user interface)</strong>&lt;br&gt;<strong>ups -c Sleep</strong> (command line interface)</td>
<td>Puts the UPS into sleep mode by turning off its output power for a defined period of time:&lt;ul&gt;&lt;li&gt;The UPS turns off output power after waiting the time configured as Shutdown Delay. See “The shutdown option” on page 38.&lt;/li&gt;&lt;li&gt;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.&lt;/li&gt;&lt;li&gt;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.</td>
</tr>
</tbody>
</table>
### Action Definition

**Action**

<table>
<thead>
<tr>
<th>Action</th>
<th>Definition</th>
</tr>
</thead>
</table>
| **ups -c** GraceSleep                       | 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** | 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”.

<table>
<thead>
<tr>
<th>Setting or Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>A name for the outlet group displayed with the outlet group number wherever the interface displays that outlet group number.</td>
</tr>
<tr>
<td>State</td>
<td>Displays the state of the outlet group (on or off).</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Setting or Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power On Delay</td>
<td>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).</td>
</tr>
<tr>
<td>Power Off Delay</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 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.
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 with 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.

   ![Diagram](image)

   **Force Negotiation: UPS without outlet groups**

   **IF**  
   NMC Low Battery Duration <  
   **THEN**  
   PCNS Req. Shutdown Time  
   Max. Req. Delay for the PCNS is increased  
   to equal  
   NCMS Req. Shutdown Time + 70 sec

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

   ![Diagram](image)

   **Force Negotiation: UPS WITH outlet groups**

   **IF**  
   NMC Low Battery Duration <  
   **THEN**  
   PCNS Req. Shutdown Time  
   Power Off Delay for the PCNS outlet group is increased  
   to equal  
   PCNS Req. Shutdown Time + 70 sec

*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:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPS Name</td>
<td>A name to identify the UPS.</td>
</tr>
<tr>
<td>UPS Position</td>
<td>The physical orientation of the UPS, rack or tower.</td>
</tr>
<tr>
<td>Audible Alarm</td>
<td>Enable or disable the audible alarm of the UPS, and, for some UPS models, define the condition that will cause the alarm to sound.</td>
</tr>
</tbody>
</table>
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 > PowerChute 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

<table>
<thead>
<tr>
<th>Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last Battery Replacement</td>
<td>The month and year of the most recent battery replacement.</td>
</tr>
<tr>
<td>Number of Batteries or External Batteries</td>
<td>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.</td>
</tr>
<tr>
<td>External Battery Cabinet</td>
<td>The battery cabinet Amp-Hour rating of an external battery source.</td>
</tr>
</tbody>
</table>
(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](http://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 through 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/OAccessory (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.

<table>
<thead>
<tr>
<th>Heading</th>
<th>Displayed Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature and Humidity</td>
<td>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.</td>
</tr>
<tr>
<td>Input Contacts</td>
<td>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.</td>
</tr>
<tr>
<td>Output Relay</td>
<td>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.</td>
</tr>
<tr>
<td>Recent Environmental Events</td>
<td>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.</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alarm Status</strong></td>
<td>Normal if this input contact is not reporting an alarm, or the severity of the alarm if this input contact is reporting an alarm</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td>The current state of this input contact: Closed or Open.</td>
</tr>
<tr>
<td><strong>Normal State</strong></td>
<td>The normal (non-alarm) state of this input contact: Closed or Open.</td>
</tr>
<tr>
<td><strong>Severity</strong></td>
<td>The severity of the alarm that the abnormal state of this input contact generates: Warning or Critical.</td>
</tr>
</tbody>
</table>

## 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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alarm Status</strong></td>
<td>Normal if this output relay is not reporting an alarm, or the severity of the alarm if this output relay is reporting an alarm</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td>The current state of this output relay: Closed or Open.</td>
</tr>
<tr>
<td><strong>Normal State</strong></td>
<td>The normal (non-alarm) state of this output relay: Closed or Open.</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>To change the current state of this output relay, check-mark the setting.</td>
</tr>
<tr>
<td><strong>Delay</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold</td>
<td>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.</td>
</tr>
</tbody>
</table>
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. The 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](http://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:

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

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

```bash
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.)

   ```bash
   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.

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

   or

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

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

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

   or

   ```bash
   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.


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.

<table>
<thead>
<tr>
<th>RADIUS Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>RADIUS Server</td>
<td>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.</td>
</tr>
<tr>
<td>Secret</td>
<td>The shared secret between the RADIUS server and the NMC.</td>
</tr>
<tr>
<td>Timeout</td>
<td>The time in seconds that the NMC waits for a response from the RADIUS server.</td>
</tr>
<tr>
<td>Test Settings</td>
<td>Enter the Administrator user name and password to test the RADIUS server path that you have configured.</td>
</tr>
<tr>
<td>Skip Test and Apply</td>
<td>Do not test the RADIUS server path.</td>
</tr>
</tbody>
</table>

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
• 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.
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:

<table>
<thead>
<tr>
<th>Query Type Selected</th>
<th>Query Question to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>by Host</td>
<td>The host name</td>
</tr>
<tr>
<td>by FQDN</td>
<td>The fully-qualified domain name, my_server.my_domain.</td>
</tr>
<tr>
<td>by IP</td>
<td>The IP address of the server</td>
</tr>
<tr>
<td>by MX</td>
<td>The Mail Exchange address</td>
</tr>
</tbody>
</table>

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

Path: Administration > Network > Web > options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| **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.  
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: Administration > Network > Console > options

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 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:** 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:** 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,
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.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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. |
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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay x time before sending</td>
<td>If the event persists for the specified time, notification is sent. If the condition clears before the time expires, no notification is sent.</td>
</tr>
<tr>
<td>Repeat at an interval of x time</td>
<td>The notification is sent at the specified interval (e.g., every 2 minutes).</td>
</tr>
<tr>
<td>Up to x times</td>
<td>During an active event, the notification repeats for this number of times.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local SMTP Server</td>
<td>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.</td>
</tr>
<tr>
<td>From Address</td>
<td>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.</td>
</tr>
</tbody>
</table>

**E-mail recipients.**

Path: Administration > Notification > E-mail > recipients

Identify up to four e-mail recipients.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Address</td>
<td>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, <a href="mailto:myacct100@skytel.com">myacct100@skytel.com</a>). 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 <a href="mailto:jsmith@company.com">jsmith@company.com</a>. This is useful when DNS lookups are not working correctly. Note: The recipient’s pager must be able to use text-based messaging.</td>
</tr>
<tr>
<td>E-mail Generation</td>
<td>Enables (default) or disables sending e-mail to the recipient.</td>
</tr>
<tr>
<td>SMTP Server</td>
<td>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.</td>
</tr>
<tr>
<td>Format</td>
<td>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.</td>
</tr>
<tr>
<td>Language</td>
<td>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.</td>
</tr>
</tbody>
</table>
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 separately configure two trap receivers for that NMS, one for each trap type.

<table>
<thead>
<tr>
<th>Item</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trap Generation</td>
<td>Enable (the default) or disable trap generation for this trap receiver.</td>
</tr>
</tbody>
</table>
| 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Name</td>
<td>The name (public by default) used as an identifier when SNMPv1 traps are sent to this trap receiver.</td>
</tr>
<tr>
<td>Authenticate Traps</td>
<td>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).</td>
</tr>
</tbody>
</table>
**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

<table>
<thead>
<tr>
<th>Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syslog Server</td>
<td>Uses IPv4/IPv6 addresses or host names to identify from one to four servers to receive Syslog messages sent by the NMC.</td>
</tr>
</tbody>
</table>
Syslog settings.

Path: Logs > Syslog > settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
<td>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.</td>
</tr>
<tr>
<td>Protocol</td>
<td>Choose between UDP and TCP.</td>
</tr>
<tr>
<td>Language</td>
<td>Choose the language for any Syslog messages.</td>
</tr>
</tbody>
</table>

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).


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.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary NTP Server</td>
<td>Enter the IP address or domain name of the primary NTP server.</td>
</tr>
<tr>
<td>Secondary NTP Server</td>
<td>Enter the IP address or domain name of the secondary NTP server, when a secondary server is available.</td>
</tr>
<tr>
<td>Time Zone</td>
<td>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.</td>
</tr>
<tr>
<td>Update Interval</td>
<td>Define how often, in hours, the NMC accesses the NTP Server for an update. Minimum: 1; Maximum: 8760 (1 year).</td>
</tr>
<tr>
<td>Update Using NTP Now</td>
<td>Initiate an immediate update of the date and time by the NTP Server.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Status</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload</td>
<td>Browse to the customized file and upload it so that the current NMC can use it to set its own configuration.</td>
</tr>
</tbody>
</table>

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](http://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.

<table>
<thead>
<tr>
<th>Text Color</th>
<th>Alarm Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Critical: A critical alarm exists, which requires immediate action.</td>
</tr>
<tr>
<td>Orange</td>
<td>Warning: An alarm condition requires attention and could jeopardize your data or equipment if its cause is not addressed.</td>
</tr>
<tr>
<td>Green</td>
<td>Alarm Cleared: The conditions that caused the alarm have improved.</td>
</tr>
<tr>
<td>Black</td>
<td>Normal: No alarms are present. The Network Management Card and all connected devices are operating normally.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Action</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reboot Management Interface</td>
<td>Restarts the interface of the NMC.</td>
</tr>
<tr>
<td>Reset All1</td>
<td>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</td>
</tr>
</tbody>
</table>

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


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:

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:
      
      ```text
      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:
      
      ```text
      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, \texttt{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 \texttt{enabled} for \texttt{NTPEnable}:

\texttt{NTPEnable=enabled}

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

– To add comments, start each comment line with a semicolon (\texttt{;}).

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. \textbf{The file that you retain is the only record of your comments.}

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

\begin{itemize}
  \item 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 \texttt{Browse}.
  \item Use any file transfer protocol supported by Network Management Cards, i.e., FTP, FTP Client, SCP, or TFTP. The following example uses FTP:
    \begin{itemize}
      \item 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:
        \begin{verbatim}
        ftp> open ip_address
        \end{verbatim}
      \item Export the copy of the customized .ini file to the root directory of the receiving NMC:
        \begin{verbatim}
        ftp> put filename.ini
        \end{verbatim}
    \end{itemize}
\end{itemize}

\textbf{Exporting the file to multiple NMCs.} To export the .ini file to multiple Network Management Cards:

\begin{itemize}
  \item Use FTP or SCP, but write a script that incorporates and repeats the steps used for exporting the file to a single NMC.
  \item Use a batch processing file and the .ini file utility.
\end{itemize}

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

\section*{The Upload Event and Error Messages}

\textbf{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.

\texttt{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.

<table>
<thead>
<tr>
<th>Event text</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration file warning: Invalid keyword on line <code>number</code>.</td>
<td>A line with an invalid keyword or value is ignored.</td>
</tr>
<tr>
<td>Configuration file warning: Invalid value on line <code>number</code>.</td>
<td></td>
</tr>
<tr>
<td>Configuration file warning: Invalid section on line <code>number</code>.</td>
<td>If a section name is invalid, all keyword/value pairs in that section are ignored.</td>
</tr>
<tr>
<td>Configuration file warning: Keyword found outside of a section on line <code>number</code>.</td>
<td>A keyword entered at the beginning of the file (i.e., before any section headings) is ignored.</td>
</tr>
<tr>
<td>Configuration file warning: Configuration file exceeds maximum size.</td>
<td>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.</td>
</tr>
</tbody>
</table>

**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:

\[ \text{apc}_\text{hardware-version}_\text{type}_\text{firmware-version}.bin \]

- \text{apc}: Indicates the context.
- \text{hardware-version}: \text{hw0n} where \text{n} identifies the hardware version on which you can use this file.
- \text{type}: Identifies which module.
- \text{version}: The version number of the file.
- \text{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 \url{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”.

76 UPS Network Management Card 2 User’s Guide
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 “APC Worldwide Customer Support” on page 89.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to perform a GET</td>
<td>• Verify the read (GET) community name (SNMPv1) or the user profile configuration (SNMPv3).&lt;br&gt;• Use the command line interface or user interface to ensure that the NMS has access. See “SNMP” on page 58.</td>
</tr>
<tr>
<td>Unable to perform a SET</td>
<td>• Verify the read/write (SET) community name (SNMPv1) or the user profile configuration (SNMPv3).&lt;br&gt;• 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.</td>
</tr>
<tr>
<td>Unable to receive traps at the NMS</td>
<td>• Make sure the trap type (SNMPv1 or SNMPv3) is correctly configured for the NMS as a trap receiver.&lt;br&gt;• For SNMP v1, query the <code>mconfigTrapReceiverTable</code> 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 <code>mconfigTrapReceiverTable</code> OIDs, or use the command line interface or user interface to correct the trap receiver definition.&lt;br&gt;• 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.</td>
</tr>
</tbody>
</table>

Traps received at an NMS are not identified

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traps received at an NMS are not identified</td>
<td>See your NMS documentation to verify that the traps are properly integrated in the alarm/trap database.</td>
</tr>
</tbody>
</table>

Synchronization Problems

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Synchronized Control Group member does not participate in a synchronized action.</td>
<td>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.</td>
</tr>
<tr>
<td>An attempt to add a member to a Synchronized Control Group fails.</td>
<td>The values for Multicast IP Address, Synchronized Control Group Number, and firmware version must match those of other members of the group.</td>
</tr>
</tbody>
</table>
Appendix A: List of Supported CLI Commands

?            ntp
about        [-OM [enable | disable]]
alarmcount  [-p <primary NTP server>]
            [-s <secondary NTP server>]
boot         ping
            [-b <dhcp | bootp | manual>]
            [e <dhcp cookie> [enable | disable]]
            [-v <vendor class>]
            [-i <client id>]
            [-u <user class>]
            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-mm-yy | yyyyy-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
[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
[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 <dl> [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

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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.

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

Japan—VCCI

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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.

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Korean 한국

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  - [www.apc.com/support/](http://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](http://www.apc.com/support/contact) for contact information.

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