

Installation Manual

UPS Network Management Card 2

AP9630, AP9631, AP9635

990-3404F-001

Publication Date: January 2020



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在 APC 公司的网站上 (www.apc.com) 有本手册的中文版。

Contents

- Preliminary Information 1**
 - Features 1
 - Devices in which you can install the NMC 2 2
 - Related documents 3
 - Inventory 3
 - Disclaimer 3
 - Language Packs 4
- Installation in a UPS 5**
 - How to install the card for different UPS models 5
 - Step 1: Install the Network Management Card 5
 - Step 2: Configure the Network Management Card 6
- Expansion/Triple Chassis Installation 7**
 - When to use an Expansion Chassis 7
 - When to use the AC adapter (AP9505) 7
 - Step 1: Disconnect the chassis from all power 7
 - Step 2: Install the Network Management Card 7
- Quick Configuration 9**
 - Overview 9
 - TCP/IP configuration methods 9
 - Device IP Configuration Wizard 10
 - DHCP and BOOTP configuration 10
 - Local access to the command line interface 13
 - Remote access to the command line interface 14
 - Command line interface 15
 - .INI file utility 15
 - UPS User Interface Display 16
- How to Recover from a Lost Password 17**
- How to Access a Configured Network Management Card 18**
 - Overview 18
 - Web interface 18

Command Line Interface access - SSH, Telnet, and	
Dial-in Access	19
Simple Network Management Protocol (SNMP)	20
SCP and FTP	20
Manage the security of your system	21
How to Install Multiple Management Cards	22
Overview	22
Before you start	22
Two models of expansion chassis	23
Installing cards in an expansion chassis	23
Installing cards in an expansion chassis set up serially ...	23
Installing cards in a Symmetra UPS	24
Specifications AP9630, AP9631	26
Specifications AP9635	27

Preliminary Information

Features

The Schneider Electric UPS Network Management Cards (AP9630, AP9631 and AP9635) discussed in this document are Web-based, IPv6 Ready products. Devices with the NMC installed can be managed using multiple open standards such as:



Hypertext Transfer Protocol (HTTP)	Secure Shell (SSH)
Simple Network Management Protocol versions 1, 2c and 3	Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)
File Transfer Protocol (FTP)	Secure Copy (SCP)
Telnet	Syslog
RADIUS	Modbus
BACnet	Extensible Authentication Protocol (EAP) over LAN (EAPoL)

The **AP9630** Network Management Card:

- Provides UPS control and self-test scheduling features.
- Provides data and event logs.
- Enables you to set up notifications through event logging, e-mail, Syslog and SNMP traps.
- Provides support for PowerChute® Network Shutdown.
- Supports using a Dynamic Host Configuration Protocol (DHCP) or BOOTstrap Protocol (BOOTP) server to provide the network (TCP/IP) values of the NMC 2.
- Supports EcoStruxure™ Asset Advisor.
- 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 StruxureWare Data Center Expert or StruxureWare Operations.
- Supports Modbus TCP/IP.

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

- Provides two USB ports, which support upgrading the NMC 2 firmware from a USB flash drive.
- 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 the AP9810 Dry Contact I/O Accessory, which is an optional add-on)

The **AP9635** Network Management Card includes all AP9630 Network Management Card features and the following:

- Provides two USB ports, which support upgrading the NMC 2 firmware from a USB flash drive.
- Supports one universal input/output port, 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 the AP9810 Dry Contact I/O Accessory, which is an optional add-on)
- Supports Out of Band Management, with dial-in access via modem to the Management Card's Console Interface.
- Supports Modbus RTU via the serial RS485 port, in addition to Modbus TCP/IP.

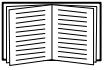
Devices in which you can install the NMC 2

The Network Management Card 2 can be installed in any compatible device that has a Smart Slot, including:

- Any Smart-UPS[®] UPS
- Any Symmetra[®] UPS - the Symmetra PX 250 or Symmetra PX 500 UPS are compatible with AP9635 only.
- MGE[®] Galaxy[®] 300, 3500, or 7000
- Expansion Chassis (AP9600)*
- Triple Expansion Chassis (AP9604)*



The Single or Triple Expansion Chassis are only compatible with UPS that have a DB9 serial port. They are only compatible with following UPS models: SURT, SURTA, Symmetra[®] Power Array/RM/LX/PX (excluding PX 250/500), SU, SUA, and SUM.



To view the full list of compatible UPS in which an NMC 2 can be installed, see Knowledge Base article FA237786 on the APC website (www.apc.com/support).

Related documents

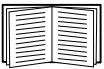
The following documentation is available on the APC website (www.apc.com/upsnmc).

- *UPS Network Management Card 2 User Guide*
- *UPS Network Management Card 2 Command Line Interface Guide*
- *UPS Network Management Card 2 Modbus Documentation Addendum (AP9635 only)*
- *UPS Network Management Card 2 Modbus Register Maps*
- *Network Management Card Upgrade Utilities*
- *Security Handbook*
- *PowerNet[®] Management Information Base (MIB) Reference Guide*
- *Declaration of Conformity*

Inventory

The Network Management Card package includes the following items:

- This *Installation Manual*
- UPS Network Management Card 2 Modbus Documentation Addendum (AP9635 only)
- UPS Network Management Card 2
- Serial configuration cable (940-0299)
- Temperature sensor (AP9335T)—AP9631 and AP9635 Network Management Cards only
- Network Management Card quality assurance test slip
- Warranty registration form



The quality assurance test slip contains the MAC address that you may need when performing the procedures in “Device IP Configuration Wizard” on page 10. You can also find the MAC address on the bottom of your NMC 2.

Disclaimer

Schneider Electric is not responsible for damage sustained during reshipment of this product.



The Network Management Card 2 (NMC 2) is sensitive to static electricity. When handling the NMC 2, touch only the end plate while using one or more of these electrostatic-discharge devices (ESDs): wrist straps, heel straps, toe straps, or conductive shoes. Please recycle

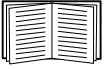


The shipping materials are recyclable. Save them for later use, or dispose of them appropriately.



Management products, including the NMC 2, contain removable, lithium coin-cell batteries. When discarding these batteries, you must follow local rules for recycling.

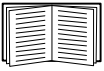
Language Packs



If the language you want to use with the NMC 2 Web interface is not available, you should download a language pack. See “Adding and Changing Language Packs” in the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN). (Language packs are not available for all UPS devices).

Installation in a UPS

How to install the card for different UPS models



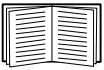
To view the full list of compatible UPS in which an NMC 2 can be installed, see Knowledge Base article FA237786 on the APC website (www.apc.com/support).



Only the AP9635 NMC 2 can be installed in a Symmetra PX 250 or Symmetra PX 500 UPS.

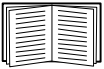


In a Symmetra UPS that uses more than one management product, you *must* install the management products in the correct order for them to operate properly.



See “How to Install Multiple Management Cards” on page 22.

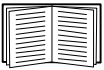
Step 1: Install the Network Management Card



You do not need to turn off power to install the NMC 2 in a supported Smart-UPS, Galaxy or Symmetra UPS. If you want to turn off your UPS before installing the Network Management Card, see Knowledge Base article FA156132 on the APC website (www.apc.com/support).

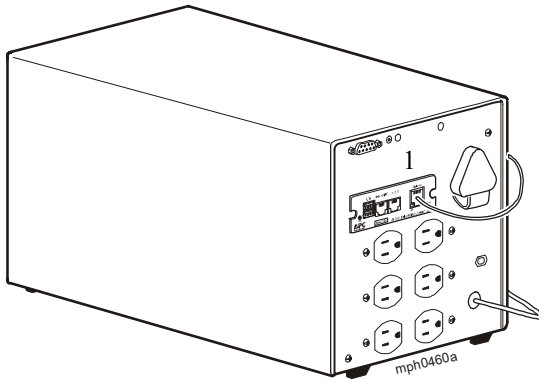


The NMC 2 is sensitive to static electricity. When handling the NMC 2, touch only the end plate while using one or more of these electrostatic-discharge devices (ESDs): wrist straps, heel straps, toe straps, or conductive shoes.



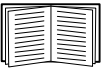
For the location of the UPS card slot, see the UPS documentation.

1. Locate the UPS card slot.
2. Use the same screws that hold the slot cover in place to secure the NMC 2 in the UPS card slot.
3. Connect a network interface cable to the 10/100Base-T network connector 1 on the NMC 2.



When the network interface cable is connected, the NMC will attempt to obtain an IP address via DHCP. See “TCP/IP configuration methods” on page 9.

Step 2: Configure the Network Management Card



See “Quick Configuration” on page 9.

Expansion/Triple Chassis Installation

When to use an Expansion Chassis

Use an Expansion Chassis or a Triple Expansion Chassis if the UPS has no card slot available.



The Single (AP9600) or Triple Expansion Chassis (AP9604) are only compatible with UPS models that have a DB9 serial port. They are compatible with following UPS models only: SURT, SURTA, Symmetra® Power Array/RM/LX/PX (excluding PX 250/500), SU, SUA, and SUM.

When you install the UPS Network Management Card 2 (NMC 2) in the chassis, the NMC 2 communicates with the UPS through the cable connection between the chassis and the UPS.

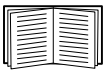
When to use the AC adapter (AP9505)

Use the optional AC adapter with a chassis under the following circumstances:

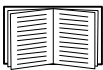
- To connect the chassis to an independent AC input so that the NMC 2 can continue to operate if the UPS is turned off or not operating.
- To provide the management products mounted in a Triple Expansion Chassis with more current than the UPS can provide through the UPS-to-chassis cable.



A Smart-UPS or Symmetra UPS can provide up to 200 mA.



See the chapter entitled “Power Considerations” in the AP9604 *Installation Guide* for more information on when to use the AC adapter, available on the APC website (www.apc.com).



For information about the current requirements for management products, see “How to Install Multiple Management Cards” on page 22.

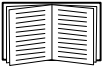
Step 1: Disconnect the chassis from all power

Make sure that the Expansion Chassis or Triple Expansion Chassis is disconnected from any power source:

1. Disconnect the chassis cable from the UPS.
2. If the chassis uses an AC adapter (AP9505), disconnect that adapter from the chassis.

Step 2: Install the Network Management Card

If the UPS uses multiple management products, you must install them in the correct order for them to operate properly.



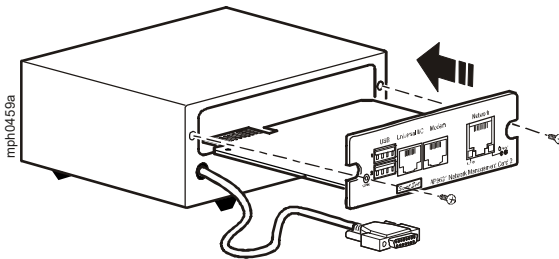
See “How to Install Multiple Management Cards” on page 22.



The UPS Network Management Card (NMC 2) is sensitive to static electricity. When handling the NMC 2, touch only the end plate while using one or more of these electrostatic-discharge devices (ESDs): wrist straps, heel straps, toe straps, or conductive shoes.

If a cable is connected to the serial port at the UPS or chassis, stop the APC service that uses that serial connection, and disconnect the cable.

1. If you are installing a chassis, connect the chassis to the UPS serial port.
2. Use the same screws that hold the expansion slot cover in place to secure the NMC 2 in the chassis slot.



3. Connect a network interface cable to the 10/100Base-T network connector on the front panel of the NMC 2.
4. If you are using the AC Adapter (AP9505), connect the adapter to the chassis. Then connect the adapter to an independent AC input so that the NMC 2 can continue to operate if the UPS is turned off or not operating.
5. If you disconnected a cable in step 1, reconnect that cable to the serial port at the chassis, and restart the associated APC service.
6. See “Quick Configuration” on page 9.

Quick Configuration

Overview



Disregard the procedures described in this chapter if you have StruxureWare Data Center Expert as part of your system. See the documentation for your StruxureWare device for more information.

You must configure the following TCP/IP settings before the UPS Network Management Card (NMC 2) can operate on a network:

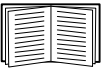
- IP address of the NMC 2
- Subnet mask
- Default gateway



If a default gateway is unavailable, use the IP address of a computer that is located on the same subnet as the NMC 2 and that is usually running. The NMC 2 uses the default gateway to test the network when traffic is very light.



Do not use the loopback address (127.0.0.1) as the default gateway address for the NMC 2. It disables the card and requires you to reset TCP/IP settings to their defaults using a local serial login.



See “Watchdog Features” in the NMC 2 *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN) for more information about the watchdog role of the default gateway.

TCP/IP configuration methods

Use one of the following methods to define the TCP/IP settings needed by the Network Management Card for IPv4:

- “Device IP Configuration Wizard” on page 10
- “DHCP and BOOTP configuration” on page 10
- “How to Recover from a Lost Password” on page 17
- Networked computer:
 - “Local access to the command line interface” on page 13
 - “Remote access to the command line interface” on page 14

Device IP Configuration Wizard

The Device IP Configuration Wizard can discover Network Management Cards (NMC 2) that do not have an IP address assigned. Once discovered, you can configure the IP address settings for the cards.

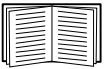
You can also search for devices already on the network by entering an IP range to define the search. The Wizard scans the IP addresses in the defined range and discovers cards that already have a DHCP-assigned IP address.



NOTES:

In firmware version 6.8.0 and higher:

- The Device IP Configuration Wizard only supports the discovery of unassigned devices.
- You cannot search for assigned devices already on the network using an IP range unless you enable SNMPv1 and set the **Community Name** to “public”. For more information on SNMPv1, see the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN).
- When the NMC IP address settings are configured, to access the NMC Web UI in a browser, you must update the URL from `http` to `https`.



For detailed information on the Wizard, see Knowledge Base article FA156064 on the APC website (www.apc.com/support).

To use the DHCP Option 12 (AOS 5.1.5 or higher), see Knowledge Base article FA156110 on the APC website (www.apc.com/support).

System requirements. The Wizard runs on Microsoft Windows 2000, Windows Server® 2003, Windows Server 2012 and on both 32- and 64-bit versions of Windows XP, Windows Vista, Windows 2008, Windows 7, Windows 8 and Windows 10 operating systems.

The Wizard supports cards that have firmware version 3.0.x or higher and is for IPv4 only.

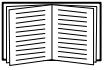
Installation. To install the Wizard from a downloaded executable file:

1. Go to www.apc.com/shop/tools/software-firmware.
2. Filter by Software / Firmware > Wizards and Configurators.
3. Select and download the Network Management Device IP Configuration Wizard.
4. Open the folder where you downloaded the Wizard, and run the executable file.

When installed, the Wizard is available through the Windows “Start Menu” option.

DHCP and BOOTP configuration

The default TCP/IP configuration setting, **DHCP**, assumes that a properly configured DHCP server is available to provide TCP/IP settings to Network Management Cards. You can also configure the setting for **BOOTP**.



A user configuration (.ini) file can function as a BOOTP or DHCP boot file. For more information, see the TCP/IP configuration section of the Network Management Card *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN).



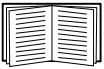
If neither of these servers is available, see “Device IP Configuration Wizard” on page 10, “Local access to the command line interface” on page 13, “Remote access to the command line interface” on page 14 or “UPS User Interface Display” on page 16 to configure the needed TCP/IP settings.

BOOTP. For the Network Management Card to use a BOOTP server to configure its TCP/IP settings, it must find a properly configured RFC951-compliant BOOTP server.

In the BOOTPTAB file of the BOOTP server, enter the Network Management Card's MAC address, IP address, subnet mask, and default gateway, and, optionally, a bootup file name. Look for the MAC address on the bottom of the Network Management Card or on the Quality Assurance slip included in the package.

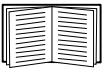
When the Network Management Card reboots, the BOOTP server provides it with the TCP/IP settings.

- If you specified a bootup file name, the Network Management Card attempts to transfer that file from the BOOTP server using TFTP or FTP. The Network Management Card assumes all settings specified in the bootup file.
- If you did not specify a bootup file name, you can configure the other settings of the Network Management Card remotely through its Web interface or command line interface; the **user name** and **password** are both **apc**, by default.



To create a bootup file, see your BOOTP server documentation.

DHCP. You can use an RFC2131/RFC2132-compliant DHCP server to configure the TCP/IP settings for the Network Management Card (NMC 2).



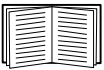
This section summarizes the NMC's communication with a DHCP server. For more detail about how a DHCP server can configure the network settings for a Network Management Card, see the *NMC 2 User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN).

1. The NMC 2 sends out a DHCP request that uses the following to identify itself:
 - A Vendor Class Identifier (APC by default)
 - A Client Identifier (by default, the MAC address of the NMC 2)
 - A User Class Identifier (by default, the identification of the application firmware installed on the NMC 2)
2. A properly configured DHCP server responds with a DHCP offer that includes all the settings that the NMC 2 needs for network communication. The DHCP offer also includes the Vendor Specific Information option (DHCP option 43). The NMC 2 can be configured to ignore DHCP offers that do not encapsulate the APC cookie in DHCP option 43 using the following hexadecimal format. (The card does not require this cookie by default).

Option 43 = 01 04 31 41 50 43

where

- the first byte (01) is the code
- the second byte (04) is the length
- the remaining bytes (31 41 50 43) are the APC cookie.



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



The NMC 2 Web interface has options to utilize vendor-specific data to require the DHCP server to provide an “APC” cookie which will supply information to the NMC 2. See the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN) for information.

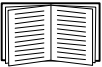
Local access to the command line interface

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 that 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. 3rd party terminal emulator programs like HyperTerminal, PuTTY, or Tera Term) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control. Save the changes.
4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt.
5. Use **apc** for the **user name** and **password**.



In firmware version 6.8.0 and higher, you will be prompted to enter a new password for the Super User account at first log in.



See “Command line interface” on page 15 to finish the configuration.

Remote access to the command line interface

From any computer on the same network as the Network Management Card, you can use ARP and Ping to assign an IP address to the Network Management Card, and then use Telnet to access its command line interface and configure the other TCP/IP settings.



After the Network Management Card has its IP address configured, you can use Telnet, without first using ARP and Ping, to access that Network Management Card.

1. Use the MAC address of the Network Management Card in the ARP command to define the IP address.

Note: Look for the MAC address on the bottom of the Network Management Card or on the Quality Assurance slip included in the package.

For example, to define 156.205.14.141 as the IP address of a Network Management Card with 00 c0 b7 63 9f 67 as its MAC address, use one of the following commands:

- Windows command format:

```
arp -s 156.205.14.141 00-c0-b7-63-9f-67
```

- LINUX command format:

```
arp -s 156.205.14.141 00:c0:b7:63:9f:67
```

2. Use Ping with a size of 113 bytes to assign the IP address defined by the ARP command. For the IP address defined in step 1, use one of the following commands:

- Windows command format:

```
ping 156.205.14.141 -l 113
```

- LINUX command format:

```
ping 156.205.14.141 -s 113
```

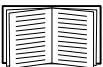
3. Use SSH to access the Network Management Card at its newly assigned IP address. For example:

```
ssh -c 3des-cbc apc@156.205.14.141
```

NOTE: This SSH command is for OpenSSH. The command may differ depending on the SSH tool used.

4. Use **apc** for both **user name** and **password**.

NOTE: This user name will be “apc” at first log in for the Super User account. You will be prompted to enter a new password after you log in.



See “Command line interface” on page 15 to finish the configuration.

Command line interface

After you log on at the command line interface, as described in “Local access to the command line interface” on page 13 or “Remote access to the command line interface” on page 14, you can manually configure network settings.

1. Contact your network administrator to obtain the IP address, subnet mask, and default gateway for the Network Management Card.
2. Use this command to configure network settings. (Text in *italics* indicates a variable.)

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

For each variable, type a numeric value that has the format *xxx.xxx.xxx.xxx*.

The command can be entered on one line. For example, to set a system IP address of 156.205.14.141, a Subnet Mask of 255.255.255.0 and a default gateway of 156.205.14.1, type the following command and press ENTER:
tcpip -i 156.205.14.141 -s 255.255.255.0 -g 156.205.14.1

3. Type `reboot`. The Network Management Card restarts to apply the changes.

.INI file utility

You can use the .INI file export utility to export .INI file settings from configured NMCs to one or more unconfigured NMCs. The utility and documentation are available in Knowledge Base article FA156117 on the APC website (www.apc.com/support).

UPS User Interface Display



Configuration of the NMC IP address through the UPS user interface display is not available for all UPS models.

For Smart-UPS model UPS with the prefix SMT, SMX, or SRT, the NMC IP address can be configured at the user interface of the UPS:

1. If you plan to manually assign the network settings, contact your system administrator to obtain a valid IP address, subnet mask, and default gateway for the Network Management Card.
2. At the user interface display, press the **Home** icon.
3. Select **Configuration > Network**.
4. At the prompt, enter the **user** password for your UPS (**apc**, by default), then select **NMC Settings**.
5. For the Network Management Card you are configuring, select **Configure NMC Settings**.
6. In the Network settings mode drop-down list, select the network configuration option for your system: **Manual**, **BootP**, **DHCP**, or **DHCP & BootP**.
 - If you select **Manual**, enter the IP address, subnet mask, and default gateway you obtained in step 1.
 - If you select **BootP**, **DHCP**, or **DHCP & BootP**, a DHCP or BOOTP server will assign the IP address, subnet mask, and default gateway for the Network Management Card.
7. Press **Apply** to save your changes.

How to Recover from a Lost Password

You can use a local 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 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 Network Management Card.
3. Run a terminal program (such as HyperTerminal, Tera Term or PuTTY) 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 **Password** setting, which is **apc** at this stage:

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

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

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



For security reasons, it is possible to disable the Super User account. To verify that the Super User account is enabled, type:

```
user -n <user name>
```

If **Access: Disabled** is returned, you can re-enable the Super User by typing:

```
user -n <user name> -e enable
```

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

How to Access a Configured Network Management Card

Overview

After the UPS Network Management Card (NMC 2) is running on your network, you can use the interfaces summarized here: Web interface, Telnet, SSH, Dial-in access (AP9635 only), SNMP, FTP, and SCP.

For more information about the interfaces, see the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN).

Web interface

The Network Management Card 2 Web interface is compatible with:

- Windows® operating systems:
 - Microsoft® Internet Explorer® (IE) 8.x or higher, with compatibility view turned on.
 - The latest release of Microsoft® Edge®
- All operating systems:
 - The latest releases of Mozilla® Firefox® or Google® Chrome®

Other commonly available browsers may work but have not been fully tested by APC by Schneider Electric.

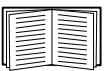
You can use either of the following protocols when you use the Web interface:

- The HTTPS protocol, which provides extra security through Secure Socket Layer (SSL); encrypts user names, passwords, and data being transmitted; and authenticates Network Management Cards by means of digital certificates.
- The HTTP protocol (disabled by default), which provides authentication by user name and password but no encryption.

NOTE: In firmware version 6.8.0 and higher, HTTP is disabled by default. The first log in to the Web UI must be using the HTTPS protocol.

To access the Web interface and configure the security of your device on the network:

1. Address the Network Management Card by its IP address (or its DNS name, if a DNS name is configured).
2. Enter the user name and password.
3. To disable HTTPS or enable HTTP, use the NMC 2 Web interface.



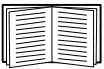
See the *Security Handbook* (www.apc.com/us/en/download/document/SPD_LFLG-9VYK3D_EN) for more information on selecting and configuring network security.

Command Line Interface access - SSH, Telnet, and Dial-in Access

You can access the command line interface through Secure SHell (SSH) or Telnet, depending on which is enabled. To enable these access methods, use the NMC 2 Web interface. In firmware version 6.8.0 and higher, only SSH is enabled by default.

SSH for high-security access. If you use the high security of SSL for the Web interface, use Secure SHell (SSH) for access to the 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.



See the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN) for more information on configuring and using SSH.

To access the command line interface using SSH, at a command prompt enter:

```
ssh -c 3des-cbc <username>@<IP address>
```

NOTE: This SSH command is for OpenSSH. The command may differ depending on the SSH tool used.

Telnet for basic access. Telnet provides the basic security of authentication by user name and password, but not the high-security benefits of encryption. In firmware version 6.8.0 and higher, Telnet is disabled by default. To use Telnet to access the command line interface of the Network Management Card from any computer on the same subnet:

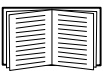
1. At a command prompt, use the following command line, and press ENTER:

```
telnet address
```

As *address*, use the Network Management Card's IP address (or DNS name, if configured).

2. Enter the user name and password.

Dial-in access via a modem (AP9635 only). You can use a modem to dial in to the command line interface of the AP9635 NMC for Out of Band Management of the UPS, when standard Internet access is not available. Once connected, the interface, user accounts and user access rights are the same as Telnet or SSH access.



See the *Command Line Interface Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDQ9_EN) for more information on configuring the AP9635 NMC modem for Out of Band Management access.

Simple Network Management Protocol (SNMP)



In firmware version 6.8.0 and higher, SNMPv1, SNMPv2c, and SNMPv3 are all disabled by default. You must configure community names and passphrases before you can establish SNMP communications. For more information, see the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN).

To enable or disable SNMP access, you must be an Administrator. Use the NMC Web interface or Command Line interface to set it up.

SNMPv1 only. After you add the PowerNet[®] MIB to a standard SNMP MIB browser, you can use that browser to access the Network Management Card. All user names, passwords, and community names for SNMP are transferred over the network as plain text.



Use of SNMPv2c is supported by the SNMPv1 options.

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



To use SNMPv3, you must have a MIB program that supports SNMPv3. The Network Management Card supports SHA or MD5 authentication and AES or DES encryption.

SNMPv1 and SNMPv3. To use StruxureWare Data Center Expert to manage the Network Management Card on the public network of an StruxureWare system, you must have SNMPv1 enabled in the unit interface. Read access allows StruxureWare Data Center Expert to receive traps from the Network Management Card. Write access is required while you set StruxureWare Data Center Expert as a trap receiver.

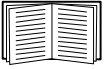
SCP and FTP

You can use SCP (enabled by default) or FTP to transfer downloaded firmware to the Network Management Card, or to access a copy of the Network Management Card's event or data logs.

NOTE: In firmware version 6.8.0 and higher, only SCP is enabled by default. You can use SCP once you have used SSH or HTTPS to create a user password.

To use StruxureWare Data Center Expert to manage the UPS, you must have the **FTP Server** option enabled in the Network Management Card interface.

To enable or disable FTP server access, you must be an Administrator. Use the NMC 2 Web interface or Command Line interface to set it up.

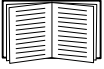


To transfer firmware, see the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN).

The SCP interface is enabled when SSH is enabled, as they are part of the same protocol suite. See the *User Guide* for more information on configuring and using SSH.

To retrieve a copy of the event or data log, see the *User Guide* (www.apc.com/us/en/download/document/SPD_LFLG-ACVDHV_EN).

Manage the security of your system



For detailed information on enhancing the security of your system after installation and initial configuration, see the *Security Handbook* (www.apc.com/us/en/download/document/SPD_LFLG-9VYK3D_EN).

How to Install Multiple Management Cards

Overview

When installing more than one management card, such as the Network Management Card 2 (NMC 2), the Out of Band Management Card, etc., you must install the cards in the order described in this document. This is because they share a serial link with the UPS. Installing the cards in any other order might result in operational failure.

Before you start

The following table identifies the priority of the cards you will be installing. Management cards that have more control over the UPS have higher priority.

- Level 6: Exerts total control
- Level 5: Exerts wide, but not total, control
- Level 4: Exerts limited control
- Level 3: Passes commands to the UPS
- Level 2: Exerts no control
- Level 1: Exerts no control and must be installed closest to the UPS

Management Card	Priority
Network Management Card 2 (AP9630, AP9631, AP9635) ¹ Network Management Card 1 (AP9617, AP9618, AP9619) ²	Level 6
Out of Band Management Card (AP9608) ³	Level 5
Relay I/O Module (AP9613, AP9610)	Level 4
Interface Expander Card (AP9607 ⁴ , AP9624)	Level 3
Building Management Integration Card (AP9622) ⁵	Level 2
Environmental Monitoring Card	Level 1
<p>1. Attach no more than two Network Management Cards to a UPS.</p> <p>2. Network Management Cards AP9617, AP9618, and AP9619 are discontinued and replaced by AP9630, AP9635 and AP9631, respectively.</p> <p>3. The AP9608 is discontinued and replaced by AP9635.</p> <p>4. The AP9607 is discontinued and replaced by AP9624.</p> <p>5. Attach only one Building Management Integration Card to a UPS. The AP9622 card is discontinued and replaced by AP9635.</p>	

Two models of expansion chassis

If you need management card slots in addition to those in your UPS, use one or more expansion chassis available.

Chassis	Compatible UPS Devices
Expansion Chassis (AP9600), one slot	UPS devices that have a DB9 port and that are not installed in a rack or enclosure.
Triple Expansion Chassis (AP9604BLK), three slots	UPS devices that have a DB9 port.

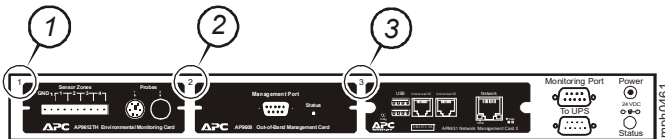


The Single (AP9600) or Triple Expansion Chassis (AP9604BLK) are only compatible with UPS models that have a DB9 serial port. They are only compatible with following UPS models: SURT, SURTA, Symmetra® Power Array/RM/LX/PX (excluding PX 250/500), SU, SUA, and SUM.

Installing cards in an expansion chassis

Install the lowest-priority cards in any available card slots in the UPS, and then use an expansion chassis for remaining higher-priority cards. In a Triple Expansion Chassis:

- Install each card, starting with the lowest priority (see “Before you start” on page 22) in the lowest-numbered slot.
- If you are installing an NMC, install it in slot 3, even if you are leaving another slot empty.



Installing cards in an expansion chassis set up serially

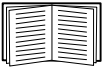
If you have increased your management card capacity by connecting multiple expansion chassis serially (in a cascading setup), install the NMC in the highest-numbered slot, and the Out-of-Band Management Card in the second-highest-numbered slot of the chassis installed farthest from the UPS.



Warning: Do not attach more than two NMCs or one Building Management Integration Card to a UPS.

If the NMC is pre-installed in the UPS, refer instead to “When an NMC has been pre-installed.” on page 25.

Installing cards in a Symmetra UPS



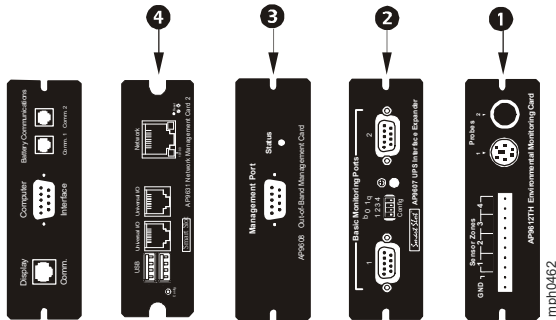
For more information on Symmetra UPS models that are compatible with your NMC 2, see Knowledge Base article FA237786 on the APC website (www.apc.com/support).

If you are installing an NMC without an attached expansion chassis, install that card in the highest numbered slot, even if you are leaving other slots empty. If you are using an expansion chassis, see “Installing cards in an expansion chassis” on page 23.

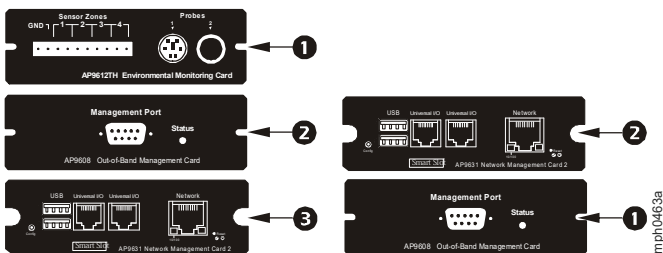
For Symmetra models with 4, 3, or 2 slots, install each card, starting with the lowest priority (as listed in the table on page 22) in the lowest numbered slot. Use the following illustrations to determine model-specific slot numbering.

NOTE: The AP9612TH and AP9608 cards shown in the following illustrations are discontinued. The AP9608 is replaced by AP9635.

- When 4 slots are available, arranged in a horizontal row, the lowest-numbered slot is at the right.



- When slots are arranged in a vertical column:
 - If 3 slots are available, the lowest-numbered slot is at the top (as shown in the following illustration).
 - If 2 slots are available, the lowest-numbered slot is at the bottom (as shown in the following illustration).



When an NMC has been pre-installed. For Symmetra UPS models that are shipped with a Network Management Card already installed (such as Symmetra RM and LX models), the UPS itself may have only one remaining card slot available. Referring to the table on page 22, install the lowest priority card in the UPS and use one or more expansion chassis for any other cards, as described beginning on page 23.

Specifications AP9630, AP9631

Physical

Size (H x W x D)	38.1 x 120.7 x 108.0 mm (1.50 x 4.75 x 4.25 in)
Weight	0.14 kg (0.30 lb)
Shipping weight	0.91 kg (2.00 lb)

Environmental

Elevation (above MSL)	
Operating	0 to 3000 m (0 to 10,000 ft)
Storage	0 to 15 000 m (0 to 50,000 ft)
Temperature	
Operating	0 to 45°C (32 to 113°F)
Storage	-5 to 45°C (23 to 113°F)
Operating humidity	0 to 95%, non-condensing

Regulatory compliance

Radiated emissions	FCC Class A, VCCI Class A, ICES-003 Class A, EN 55022 Class A, AS/NZS CISPR 22, GOST-R 51318.22
Radiated immunity	GOST-R 51318.24, EN 55024

Specifications AP9635

Physical

Size (H x W x D)	38.1 x 120.7 x 108.0 mm (1.50 x 4.75 x 4.25 in)
Weight	0.14 kg (0.30 lb)
Shipping weight	0.91 kg (2.00 lb)

Environmental

Elevation (above MSL)	
Operating	0 to 3000 m (0 to 10,000 ft)
Storage	0 to 15 000 m (0 to 50,000 ft)
Temperature	
Operating	-5 to 45°C (23 to 113°F)
Storage	-15 to 65°C (5 to 149°F)
Operating humidity	0 to 95%, non-condensing

Regulatory compliance

Radiated emissions	FCC Class A, VCCI Class A, ICES-003 Class A, EN 55022 Class A, AS/NZS CISPR 22, GOST-R 51318.22
Radiated immunity	GOST-R 51318.24, EN 55024

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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.

Canada—ICES

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

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

Japan—VCCI

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

Taiwan—BSMI

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Australia and New Zealand

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

European Union

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

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

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

APC Worldwide Customer Support

Customer support for this or any other product is available at no charge in any of the following ways:

- Visit the APC Web site to access documents in the APC Knowledge Base and to submit customer support requests.
 - www.apc.com (Corporate Headquarters)
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
 - www.apc.com/support/
Global support searching APC Knowledge Base and using e-support.
- Contact the APC Customer Support Center by telephone or e-mail.
 - Local, country-specific centers: go to www.apc.com/support/contact for contact information.

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

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