

MasterSwitch Plus

AP9225
AP9226
AP9225EXP

Installation and
Quick Start



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Preliminary Information

Features of AP9225, AP9225EXP, AP9226

The American Power Conversion (APC®) MasterSwitch Plus™ Power Distribution Unit (PDU) provides many features for managing power to your servers and peripherals, including:

- Sequential turning on or off to limit a surge of current during system startup.
- Automatic shutdown of your loads when your UPS enters an on-battery state, and restart of your loads when utility power returns.
- On-demand outlet control, including:
 - On
 - Delayed On
 - Off
 - Reboot
 - Graceful Shutdown
 - Graceful Reboot
- Seven basic-signaling ports and one port that can be used for basic signaling or for advanced PowerChute® signaling.
- Eight individually manageable outlets. Cascading setup of up to three additional MasterSwitch Plus expansion units provides outlet management for up to 32 connected devices.
- Integration with the Environmental Monitoring Card to initiate graceful shutdowns of connected servers or to toggle power to connected devices when your card generates an alarm.
- Brackets for mounting the unit in an APC NetShelter® enclosure or other 19-inch rack, and rubber feet for placing it on a desktop.
- Event logging of the unit's most recent 300 events.
- Full SNMP support for all unit and outlet properties.

Features of AP9225 only

- Built-in Web interface for remote configuration and control.
- Password-protected Outlet User accounts that restrict users to a specific group of outlets.
- Password-protected Administrator, Device Manager, and Read-only User accounts for configuration and control.
- A fully featured console interface.
- Environmental SNMP traps from APC PowerChute Network Shutdown management software.
- Device IP Configuration Wizard (Windows NT® 4.0, Windows® 2000, Windows 2003, and Windows XP).



Note

These features are also available on expansion units (AP9225EXP) that are cascaded to an AP9225 or AP9226.

Inventory

Item	Part Number	Quantity
MasterSwitch Plus unit or MasterSwitch Plus expansion unit	AP9225 or AP9226	1
	AP9225EXP	1
CD-ROM containing product documentation and the Device IP Configuration Wizard †	991-1055 (with the revision indicated by a one-letter suffix)	1
Cascade cable	940-1000	1
Advanced-signaling cable	940-0024	1
Rack-mount brackets and screws	870-8062	2
Installation and Quick-Start manual	990-6011C	1
Warranty registration card	NA	1

†The AP9225EXP model does not include the Network Management Card.

Safety and grounding

Read the following information before installing or operating your APC MasterSwitch Plus unit:

- The unit has a lithium battery. Do not attempt to replace it.
- If the unit is installed in an enclosed communications rack, the recommended maximum ambient temperature should be no greater than 45°C (113°F).
- Install the unit so that there is air flow to the front and rear face of the unit.
- Install the unit so that there is not an uneven mechanical load.
- Follow the nameplate ratings when connecting equipment to the supply circuit. Consider the effect that overloading the circuits might have on over-circuit protection and supply wiring.
- Maintain reliable earth grounding of the unit. Give particular consideration to supply connections that do not directly connect to the branch circuit.
- The unit does not provide overcurrent protection. Connect it to an appropriately rated branch circuit.
- Install the unit so that the power plug may be disconnected for service.



Risk of electrical shock. Use only the supplied hardware to attach the mounting brackets.

Product names

In this manual, the term *MasterSwitch Plus* refers to the AP9225, AP9225EXP, and AP9226 models, unless otherwise noted.



See also

For detailed information on configuration and operation, see the *MasterSwitch Plus User's Guide* (990-6012D) on the enclosed *Utility* CD or on the APC Web site (www.apc.com).

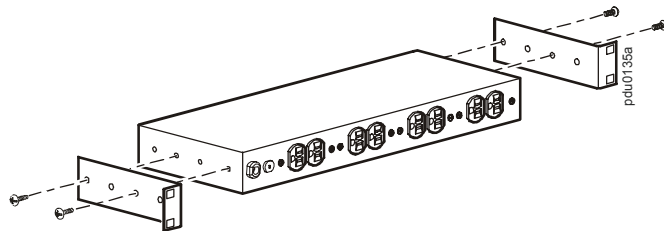
Overview of setup procedure

1. Place the unit on a flat surface, or mount it in a rack. See “Mounting in a NetShelter enclosure” on this page.
2. Connect the unit. See page 5.
3. Install the Environmental Monitoring Card. See page 14.
4. Configure the unit according to the connection procedure you have used.

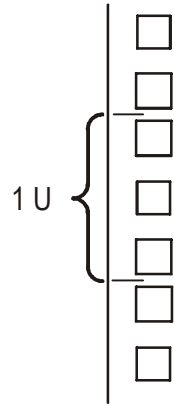
Mounting in a NetShelter enclosure

The MasterSwitch Plus unit comes with brackets for mounting in a NetShelter enclosure or other standard (EIA 310-D) 19-inch rack. To mount the unit in a NetShelter enclosure:

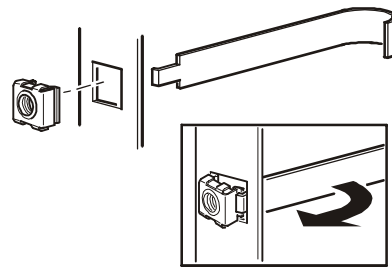
1. Remove the rubber feet from the bottom of the unit.
2. Attach the mounting brackets to the unit in either of the following ways, using two self-tapping Phillips screws (provided) for each bracket:
 - Flush with the face of the unit.
 - Extending beyond the face of the rack.



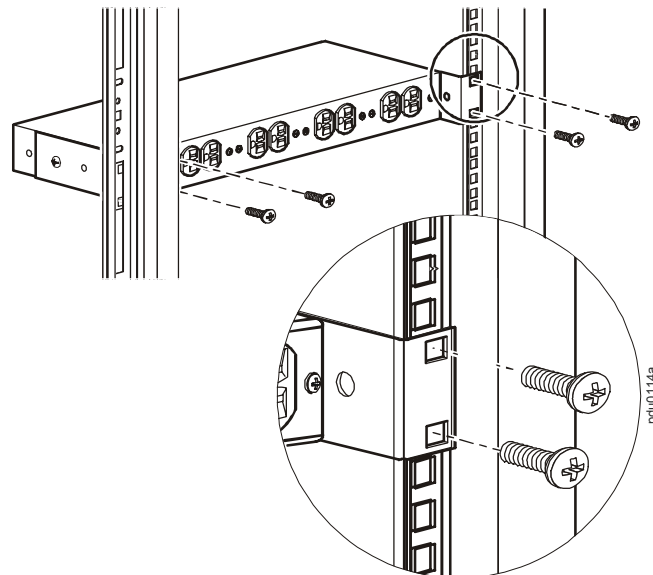
3. Choose a location for the brackets. The numbers on the vertical rail denote the middle of a U-space.



4. Install a caged nut (provided with the enclosure) above and below a notched mounting hole on both vertical mounting rails.



5. Align the mounting holes of the brackets with the installed caged nuts. Insert and tighten the screws.



Connecting MasterSwitch Plus

Configurations that do not use AP9225

If you are connecting one or more MasterSwitch Plus expansion units (AP9225EXP) and the configuration does not include MasterSwitch Plus (AP9225), see “How to Configure Addresses in a Cascade” on page 25.

Overview of setup for configurations that use AP9225

MasterSwitch Plus can be connected in a number of different configurations.

“Connecting for On-Demand-Only Use” on page 6.



“Connecting for Unattended Shutdown” on page 9.

“Connecting with Redundantly Powered Servers” on page 13.

Choosing additional cables

The following table lists some basic-signaling cables you can use with systems supported by MasterSwitch Plus. For a complete list of available cables, go to the APC Web site at www.apc.com.

To connect a basic port to this server or cable	Order this cable or extension	APC Part Number
Windows server	UPS LAN Basic Signaling Cable	940-0020
LINUX server	LINUX Basic Signaling Cable	AP9823
15-ft extension cable	UPS Interface Extension	AP9815 [†]
50-ft extension cable	Isolated Extension Cable	AP9825 [†]

[†] Requires you to use an additional cable for the operating system being used.

If your configuration requires a UPS, use the MasterSwitch Plus only with an APC UPS.



Warning

Use only APC communications cables suitable for your operating system to avoid damage or improper operation of the **MasterSwitch Plus**, the UPS, or the connected equipment.

Connecting for On-Demand-Only Use

Overview

To control outlets by using the On, Off, Shutdown, and Reboot commands:



See “Connecting a single unit (on-demand)” on this page, or “Procedure for connecting multiple units (on-demand)” on page 7.

To connect the MasterSwitch Plus expansion units without the AP9225 model, you must have equipment (DTE), a data terminal, or a computer running terminal emulation software.

Connecting a single unit (on-demand)

1. Connect the power cord of each device to the outlets on the back panel of the unit.
2. To use the graceful shutdown and graceful reboot features of the unit:
 - a. Make sure that the connected server is running PowerChute Network Shutdown (PCNS).
 - b. Connect the basic-signaling cable (not provided) of each server to the corresponding **Basic** port on the front panel of the unit. For example, a server plugged into outlet #3 must be connected to **Basic** port #3. The table on page 5 lists some basic-signaling cables supported by the unit.
3. Connect your 10Base-T network cable to the RJ-45 connector on the front panel of the unit.



Note

If you are connecting the MasterSwitch Plus expansion unit without the AP9225 or AP9226 model, connect one end of the supplied advanced-signaling cable (940-0024) to an available serial port on your equipment (DTE), and connect the other end of the cable to the **Advanced** port on the expansion unit. Set the communications parameters to 2400 bps, 1 stop bit, no parity, and no flow control.

4. Connect the power cord of the unit to a single-phase, 120-VAC, 15-amp outlet.



Warning

Do not exceed the maximum ratings for voltage and current listed on the label on the bottom panel of the unit. The maximum load for each outlet and for the total of all outlets is also listed on the bottom panel.

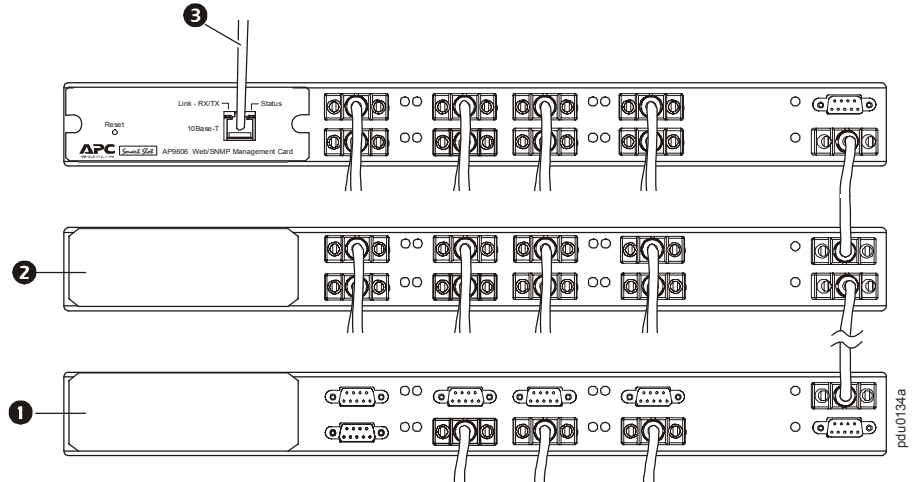
5. Continue with “Quick Configuration” on page 16.

Typical cascaded configuration (on-demand)

The following example shows a cascaded setup for an on-demand-only configuration.



See “Procedure for connecting multiple units (on-demand)” on this page.



1	Unit n
2	Unit 2
3	Cable to Network

Procedure for connecting multiple units (on-demand)

1. Connect the power cord of each device to an outlet on the back panel of the unit.
2. To use the Graceful Shutdown and Graceful Reboot features of the unit:
 - a. Make sure that each connected server is running PowerChute Network Shutdown.
 - b. Connect the basic-signaling cable (not provided) of each server to the corresponding **Basic** port on the front panel of the unit. For example, a server plugged into outlet #3 must be connected to **Basic** port #3. The table on page 5 lists some basic-signaling cables supported by the unit.
3. Connect the supplied cascade cable (940-1000) to the **To UPS** port of each unit and to the **Advanced** port of the succeeding unit, as shown in “Typical cascaded configuration (on-demand)” on this page.



Note

The AP9225 address must be set to Unit 1.

4. Connect your 10Base-T network cable to the RJ-45 connector on the front panel of the unit.



Note

If you are connecting the expansion unit without the AP9225 model, connect one end of the supplied advanced-signaling cable (940-0024) to an available serial port on your equipment (DTE), and connect the other end of the cable to the **Advanced** port on the expansion unit. Set the communications parameters to 2400 bps, 1 stop bit, no parity, and no flow control.

5. Connect the power cord of the unit to a single-phase, 120-VAC, 15-amp outlet.



Warning

Do not exceed the maximum ratings for voltage and current listed on the label on the bottom panel of the unit. The maximum load for each outlet and for the total of all outlets is also listed on the bottom panel.

6. Continue with “Quick Configuration” on page 16.

Connecting for Unattended Shutdown

Overview

Use this connection procedure to be able to shut down servers or peripherals automatically because of UPS events or Environmental Monitoring Card alarms. You will also be able to use on-demand control.



See “Connecting a single unit (unattended shutdown)” on this page or “Connecting multiple units (unattended shutdown)” on page 11.

To connect the MasterSwitch Plus expansion units without the AP9225 model, you must have DTE, a data terminal or a computer running terminal emulation software) for control and configuration of the expansion unit.



Note

To use the unattended shutdown feature of the unit, you must have PowerChute Network Shutdown software, installed and running on your servers and an APC Smart-UPS[®], Matrix-UPS[®], or Symmetra[®] UPS.

Connecting a single unit (unattended shutdown)

1. Connect the power cord of each device to the outlets on the back panel of the unit.
2. Connect the signaling cable of each server to the corresponding port on the front panel of the unit.
 - Basic-signaling: Use the basic-signaling cable associated with each server. Connect the cable to the corresponding **Basic** port of the unit. For example, a server plugged into outlet #3 must be connected to **Basic** port #3.



See “Choosing additional cables” on page 5.

- Advanced-signaling (for advanced reporting features of PowerChute Network Shutdown): Use the supplied advanced-signaling cable (940-0024). Connect one end of the cable to the **Advanced** port of the unit and connect the other end to the server whose power cord is attached to outlet #1.



Note

If you are using advanced-signaling, **Basic** port #1 must remain unused.

3. Connect your 10Base-T network cable to the RJ-45 connector on the front panel of the unit.



Note

If you are connecting the expansion unit without the AP9225 or AP9226 model, connect one end of the supplied advanced-signaling cable (940-0024) to an available serial port on your DTE, and connect the other end of the cable to the **Advanced** port on the expansion unit. Set the communications parameters to 2400 bps, 1 stop bit, no parity, and no flow control.

4. If you are using a UPS, connect one end of the supplied cascade cable (940-1000) to the **To UPS** port on the unit, and connect the other end to the serial port on the UPS.
5. Connect the power cord of the unit according to your configuration:
 - a. If you are using a UPS, plug the power cord into an outlet on the UPS.
 - b. If you are not using a UPS, plug the power cord into a single-phase, 120-VAC, 15-A outlet.



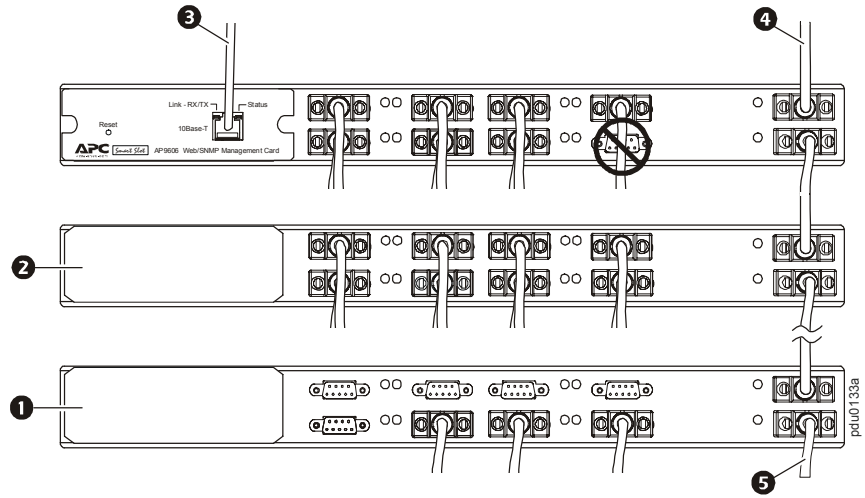
Warning

Do not exceed the maximum ratings for voltage and current listed on the label on the bottom panel of the unit. The maximum load for each outlet and for the total of all outlets is also listed on the bottom panel.

6. If you are using an Environmental Monitoring Card, see “Installing the Environmental Monitoring Card” on page 14.
7. Continue with “Quick Configuration” on page 16.

Connecting multiple units (unattended shutdown)

By cascading as many as three expansion units from a MasterSwitch Plus unit, you can manage power for up to 32 connected devices. To set up a unit in a cascading configuration, see “Procedure for connecting multiple units (on-demand)” on page 7.



1	Unit n
2	Unit 2
3	Cable to Network
4	Cable to server providing PowerChute
5	Cable to UPS

1. Connect the power cord of each device to the outlets on the back panel of the unit.
2. Connect the signaling cable of each server to the corresponding port on the front panel of the unit.
 - Basic-signaling: Use the basic-signaling cable associated with the server. The cable must be connected to the corresponding **Basic** port of the unit. For example, a server plugged into outlet #3 must be connected to **Basic** port #3.



See “Choosing additional cables” on page 5.

- Advanced-signaling (for advanced reporting features of PowerChute Network Shutdown): Use the advanced-signaling cable (940-0024). Connect one end of this cable to the **Advanced** port of the unit, and connect the other end to the server whose power cord is attached to outlet #1.



Note

If you are using advanced-signaling, **Basic** port #1 of Unit 1 must remain unused. Advanced-signaling is available only on Unit 1. The remaining units must use basic signaling for outlet #1.

3. Using the supplied cascade cable (940-1000), connect the **To UPS** port of each unit to the **Advanced** port of the next unit, as described in “Connecting multiple units (unattended shutdown)” on page 11.
4. Connect your 10Base-T network cable to the RJ-45 connector on the front panel of the unit.



Note

If you are connecting the expansion unit without the AP9225 or AP9226 model, connect one end of the supplied advanced-signaling cable (940-0024) to an available serial port on your equipment (DTE) and connect the other end of the cable to the **Advanced** port on the expansion unit. Set the communications parameters to 2400 bps, 1 stop bit, no parity, and no flow control.

5. If you are using an APC UPS, connect one end of a cascade cable (940-1000) to the **To UPS** port on the unit, and connect the other end to the serial port of the UPS.
6. Connect the power cord of each unit according to your configuration:
 - If you are using a UPS, plug the power cord into an outlet on the UPS.
 - If you are not using a UPS, plug the power cord into a single-phase, 120-VAC, 15-amp outlet.



Warning

Do not exceed the maximum ratings for voltage and current listed on the label on the bottom panel of the unit. The maximum load for each outlet and for the total of all outlets is also listed on the bottom panel.

7. If you are using an Environmental Monitoring Card as your environmental monitor, see “Installing the Environmental Monitoring Card” on page 14.
8. Continue with “Quick Configuration” on page 16.

Connecting with Redundantly Powered Servers

Overview

Use the connection procedure on this page to connect the MasterSwitch Plus unit to servers that have redundant input power cords. This configuration provides additional protection by using a separate unit for each input power cord. One of the units must be an AP9225 or AP9226 model of MasterSwitch Plus.



Note

With this configuration, the unattended shutdown features of the unit are not available.

Connection procedure (redundant power)

1. Connect each power cord of the server to an outlet on the back panel of a separate unit.



Note

Connect only one of the server's power cords to each unit.

2. Connect the **To UPS** port of each unit to the **Advanced** port of the succeeding unit as described on page 11, using the supplied cascade cables (940-1000).



Note

The AP9225 or AP9226 unit address must be set to Unit 1.

3. Connect the 10Base-T network cable to the RJ-45 connector on the front panel of the first unit.
4. Connect the power cord of each unit to a separate single-phase, 120-VAC, 15-A outlet.



Warning

Do not exceed the maximum ratings for voltage and current listed on the label on the bottom panel of the unit. The maximum load for each outlet and for the total of all outlets is also listed on the bottom panel.

5. To complete the configuration, you must set up a user account for controlling as a group.



See "Quick Configuration" on page 16.



See also

See also "Outlet User Manager" in the *User Guide* for more information on Outlet User Accounts.

Installing the Environmental Monitoring Card

Environmental Monitoring Card

The Environmental Monitoring Card is a management accessory that monitors the environmental conditions of your rack-mounted equipment.

Choosing a location for the card

Number of devices in your configuration			Required location for the Environmental Monitoring Card
AP9225 or AP9226	AP9225EXP	UPS	
0	1 or more	0	an external chassis
0	1 or more	1 [†]	the UPS
1	0	0	an external chassis
1	0	1 [†]	the UPS
1	1 or more	0	AP9225EXP
1	1 or more	1 [†]	the UPS or AP9225EXP

[†] If one card slot of the UPS is already used by another card, install the Environmental Monitoring Card in the UPS and use an external chassis (or AP9225EXP, if there is also an AP9225 or AP9226 present) for other accessory cards. See the document *Installing Multiple Management Cards* provided with your Environmental Monitoring Card or other accessory card.

Installing the card in a UPS

To install the Environmental Monitoring Card in a UPS, see the Environmental Monitoring Card user's manual.

Powering an external chassis

When installing the Environmental Monitoring Card in an external chassis (AP9600 or AP9604), use an external 24-VDC adapter (AP9505) available from APC to connect the chassis to a secondary source of

115 VAC power in the following cases:

- If your configuration does not contain a UPS.
- If the connection of the external chassis with the UPS does not provide enough power for the Environmental Monitoring Card.
- If you connect the external chassis to a backup source of AC power.



Note

For more information on using a 24-VDC adapter, see the user's manual provided with the Expansion Chassis or the Triple Chassis.

Installing the card in an external chassis

1. Disconnect power and serial connections for the external chassis.
2. Remove the plate covering the card slot, and save the two screws.
3. Insert the Environmental Monitoring Card into the slot by sliding the card along the guides.
4. Use the screws saved in step 2 to secure the Environmental Monitoring Card in the external chassis.
5. If you are using a 24 VDC adapter, connect it to the chassis, and then plug the adapter into a single-phase, 120-VAC, 15-amp outlet.
6. Connect one end of the supplied cascade cable (940-1000) to the **To UPS** port of the MasterSwitch Plus unit, and connect the other end to the **Monitoring** port on the external chassis.
7. If you are using an external chassis with a UPS:
 - For an Expansion Chassis (AP9600), connect the Expansion Chassis cable labeled “UPS” to the serial port of the UPS.
 - For a Triple Chassis (AP9604), connect the supplied cascade cable (940-1000) to the serial port of the UPS.

Quick Configuration



Disregard the procedures in this section if you have APC InfraStruXure Manager as part of your system. See the InfraStruXure Manager’s documentation for more information.

Overview

You must configure the following TCP/IP settings before the MasterSwitch Plus unit can operate on a network:

- IP address of the unit
- 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 unit and that is usually running. The unit uses the default gateway to test the network when traffic is very light. See “Watchdog Features” in the “Introduction” of the MasterSwitch Plus *User’s Guide* 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 unit:

- Device IP Configuration Wizard (See “Device IP Configuration Wizard” on page 17).
- BOOTP or DHCP server (see “BOOTP & DHCP configuration” on page 17).
- Local computer (see “Local access to the control console” on page 20).
- Networked computer (see “Remote access to the control console” on page 20).

Device IP Configuration Wizard

You can use the Device IP Configuration Wizard on a Windows NT 4.0, Windows 2000, Windows 2003, or Windows XP computer to discover an unconfigured MasterSwitch Plus and configure its basic TCP/IP settings.



See also

For detailed information on how to configure one or more units by exporting configuration settings from a configured MasterSwitch Plus, see the *User's Guide* (990-6012D) on the enclosed *Utility* CD or on the APC Web site (www.apc.com).

1. Insert the MasterSwitch *Utility* CD into a computer on your network.
2. Launch the Wizard, when prompted, or, if prompted to restart the computer, access the Wizard from the **Start** menu after the computer has restarted.
3. Wait for the Wizard to discover the first unconfigured unit, then follow the on-screen instructions.



Note

If you leave the **Start a Web browser when finished** option enabled, you can use **apc** for both the **User Name** and **Password** to access the unit through your browser.

BOOTP & DHCP configuration

The **Boot Mode** Setting, a TCP/IP option in the unit's **Network** menu, identifies how the TCP/IP settings will be defined. The possible settings are **Manual**, **DHCP only**, **BOOTP only**, and **DHCP & BOOTP** (the default setting).



Note

The **DHCP & BOOTP** setting (the default setting) assumes that a properly configured DHCP or BOOTP server is available to provide TCP/IP settings to units. If these servers are unavailable, see "Device IP Configuration Wizard" on this page, "Local access to the control console" on page 20, or "Remote access to the control console" on page 20 to configure the needed TCP/IP settings.

With **Boot Mode** set to **DHCP & BOOTP** (the default), the unit attempts to discover a properly configured server. It first searches for a BOOTP server, then a DHCP server, and repeats this pattern until it discovers a BOOTP or DHCP server.



Note

For more information, see "BOOTP" on page 18 or "DHCP" on page 19.

BOOTP. You can use an RFC951-compliant BOOTP server to configure the TCP/IP settings for the unit.



Note

The BOOTP setting assumes that a properly configured BOOTP server is available to provide TCP/IP settings to MasterSwitch Plus units. If a BOOTP server is unavailable, see “Device IP Configuration Wizard” on page 17, “Local access to the control console” on page 20, or “Remote access to the control console” on page 20 to configure the TCP/IP settings.

1. Make sure that the **BOOTP** setting, a **TCP/IP** option in the unit’s **Network** menu, is enabled.
2. Enter the unit’s MAC and IP addresses, the subnet mask and default gateway settings, and an optional Bootup file name in the BOOTPTAB file of the BOOTP server.



See also

For the MAC address, look on the bottom of the unit or on the Quality Assurance slip included in the package.

3. When the unit reboots, the BOOTP server provides it with the TCP/IP settings.
 - If you specified a bootup file name, the unit attempts to transfer that file from the BOOTP server using TFTP or FTP. The unit assumes all settings specified in the bootup file.
 - If you did not specify a bootup file name, the unit can be configured remotely by using the control console or by using the Web interface: **User Name** and **Password** are both **apc**, by default.



See also

To create the 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 unit.



See also

This section briefly summarizes the units communication with a DHCP server. For more detail about how a DHCP server is used to configure the network settings for a unit, see “DHCP Configuration” in the MasterSwitch Plus *User’s Guide* enclosed *Utility CD* or on the APC Web site (www.apc.com).

1. A unit 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 unit’s MAC address value)
 - A User Class Identifier (by default, the identification of the unit’s application firmware)
2. A properly configured DHCP server responds with a DHCP offer that includes all of the settings that the unit needs for network communication. The DHCP offer also includes the Vendor Specific Information option (DHCP option 43). By default, the unit will ignore DHCP offers that do not encapsulate the APC cookie in the Vendor Specific Information option using the following hexadecimal format:

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 cookies



See your DHCP server documentation to add code to the Vendor Specific Information option. To disable the APC cookie requirement, see “Local access to the control console” on page 20.



To change the control console’s **DHCP Cookie Is** setting, use the **Advanced** option in the TCP/IP menu. See “Remote access to the control console” on page 20.

Local access to the control console

You can use a local computer that connects to the unit through the serial port on the front of the unit to access the control console.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Use the configuration cable (940-0103) to connect the selected port to the serial port on the front panel of the unit.
3. Run a terminal program (such as HyperTerminal[®]) on your computer and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control, and save the changes.
4. Press ENTER to display the **User Name** prompt.
5. Use **apc** for the **User Name** and **Password**.
6. See “Control console” on page 21 to finish the configuration.

Remote access to the control console

From any computer on the same subnet as the unit, you can use ARP and Ping to assign an IP address to a unit, and then use Telnet to access that unit’s control console and configure the needed TCP/IP settings.



Note

After a unit has its IP address configured, you can use Telnet, without first using ARP and Ping, to access that unit.

1. Use ARP to define an IP address for the unit, and use the unit’s MAC address in the ARP command. For example, to define an IP address of 156.205.14.141 for a unit that has a MAC address of 00 c0 b7 63 9f 67, 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
```



See also

For the MAC address, look on the bottom of the unit or on the Quality Assurance slip included in the package.

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 Ping commands:
 - Windows command format:


```
ping 156.205.14.141 -l 113
```
 - LINUX command format:


```
ping 156.205.14.141 -s 113
```
3. Use Telnet to access the unit at its newly assigned IP address. For example:


```
telnet 156.205.14.141
```
4. Use **apc** for both **User Name** and **Password**.
5. See “Control console” on this page to finish the configuration.

Control console

After you log on at the control console, as described in “Local access to the control console” on page 20 or “Remote access to the control console” on page 20:

1. Choose **Network** from the **Control Console** menu.
2. Choose **TCP/IP** from the **Network** menu.
3. If you are not using a **BOOTP** or **DHCP** server to configure the **TCP/IP** settings, select the **Boot Mode** menu. Select **Manual boot mode**, and then press ESC to return to the **TCP/IP** menu. (Changes will take effect when you log out.)
4. Set the **System IP**, **Subnet Mask**, and **Default Gateway** address values.
5. Press CTRL-C to exit to the **Control Console** menu.
6. Log out (option 4 in the **Control Console** menu).



Note

If you disconnected a cable during the procedure described in “Local access to the control console” on page 20, reconnect that cable and restart the associated service.

How to Access a Configured Unit

Overview

After the MasterSwitch Plus is running on your network, you can use the interfaces summarized here to access the unit.



See also

For more information on the interfaces, see the *User's Guide* (990-6012D) on the enclosed *Utility CD* or on the APC Web site (www.apc.com).

Web interface

As your browser, you can use Microsoft Internet Explorer® 5.0 (and higher) or Netscape® 7.x (and higher) to access the MasterSwitch Plus through its Web interface. Other commonly available browsers also may work but have not been fully tested by APC.

To use the Web browser to configure and monitor MasterSwitch Plus options or to view the event log, you can use either of the following:

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

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

1. Address the MasterSwitch Plus by its IP address or DNS name (if configured).
2. Enter the user name and password (by default, **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager).
3. Select and configure the type of security you want. (This option is available only for Administrators.)



See also

See the chapter entitled “Security” in the *User's Guide* for information on choosing and setting up your network security. Use the **Web/SSL** option of the **Network** menu to enable or disable the HTTP or HTTPS protocols.

Telnet and SSH

You can access the control console through Telnet or Secure SHell (SSH), depending on which is enabled. (An Administrator can enable these access methods through the **Telnet/SSH** option of the **Network** menu.) By default, Telnet is enabled. Enabling SSH automatically disables Telnet.

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 a MasterSwitch Plus control console 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 MasterSwitch Plus IP address or DNS name (if configured).

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

SSH for high-security access. If you use the high security of SSL for the Web interface, use Secure SHell (SSH) for access to the control console. SSH encrypts user names, passwords, and transmitted data.

The interface, user accounts, and user access rights are the same whether you access the control console through SSH or Telnet, but to use SSH, you must first configure SSH and have an SSH client program installed on your computer.



See also

For more information on configuring and using SSH, see the MasterSwitch Plus *User's Guide* (990-6012D) on the enclosed *Utility CD* or on the APC Web site (www.apc.com).

SNMP

After you add the PowerNet MIB to a standard SNMP MIB browser, you can use that browser for SNMP access to the MasterSwitch Plus. The default read community name is **public**; the default read/write community name is **private**.



Note

If you enable SSL and SSH for their high-security authentication and encryption, disable SNMP. Allowing SNMP access to the MasterSwitch Plus compromises the high security you implement by choosing SSL and SSH. To disable SNMP, you must be an Administrator; use the **SNMP** option of the **Network** menu.

FTP and SCP

You can use FTP (enabled by default) or Secure CoPy (SCP) to transfer new firmware to the MasterSwitch Plus, or to access a copy of the MasterSwitch Plus event logs. SCP provides the higher security of encrypted data transmission and is enabled automatically when you enable SSH.



Note

If you enable SSL and SSH for their high-security authentication and encryption, disable FTP. Allowing file transfer to the MasterSwitch Plus through FTP compromises the high security you implement by choosing SSL and SSH. To disable FTP, you must be an Administrator; use the **FTP Server** option of the **Network** menu.

To access the MasterSwitch Plus through FTP or SCP, the default user name and password are **apc** and **apc** for an Administrator, or **device** and **apc** for a Device Manager. In the command line, use the IP address of the unit.



See also

For information on how to use FTP or SCP to retrieve log files from the MasterSwitch Plus or to transfer firmware files to the MasterSwitch Plus, see the *User's Guide* (990-6012D) on the enclosed *Utility* CD or on the APC Web site (www.apc.com).

How to Configure Addresses in a Cascade



Note

Perform this procedure if you are connecting the MasterSwitch Plus expansion unit without the AP9225 model.

1. If your Data Terminating Equipment is a server, disable any service that may be using the serial port of the server.
2. Run a terminal emulator (such as HyperTerminal) and configure the appropriate serial port to 2400 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
3. From your server, press ENTER.
4. Enter **apc** as the user name and password.
5. From the main menu, select **Unit Properties**.
6. From the **Unit Properties** menu, select **Address** and set the value.



Note

As the address of the first MasterSwitch Plus unit, use the number of the units in your configuration. For example, if there are four units in your configuration, set the address to 4.

7. Return to the Main menu by pressing ESC.
8. Connect to the next unit by selecting **Unit Properties** from the Main menu.
9. From the **Unit Properties** menu, select **Address** and set the value to one less than the value of the preceding unit.
10. Return to the Main menu by pressing ESC.
11. Repeat steps 8–10 for the remaining units.
12. Exit the current unit menu system by entering Q from the Main menu, and continue pressing Q until you exit all unit menus.

How to Recover From a Lost Password

You can use a local computer, a computer that connects to the unit or other device through the serial port, to access the control console.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Connect the serial cable (940-0103) to the selected port on the computer and to the configuration port at the unit:
3. Run a terminal program (such as HyperTerminal) on your computer and configure the selected port as follows:
 - 9600 bps
 - 8 data bits
 - no parity
 - 1 stop bit
 - no flow control.
4. Press ENTER, repeatedly if necessary, to display the **User Name** prompt. If you are unable to display the **User Name** prompt, verify the following:
 - The serial port is not in use by another application.
 - The terminal settings are correct as specified in step 3.
 - The correct cable is being used as specified in step 2.
5. Press the **Reset** button. The Status LED will flash alternately orange and green. Press the **Reset** button a second time immediately while the LED is flashing to reset the user name and password to their defaults temporarily.
6. Press ENTER as many times as necessary to redisplay the **User Name** prompt, then use the default, **apc**, for the user name and password. (If you take longer than 30 seconds to log on after the **User Name** prompt is redisplayed, you must repeat step 5 and log on again.)
7. From the **Control Console** menu, select **System**, then **User Manager**.
8. Select **Administrator**, and change the **User Name** and **Password** settings, both of which are now defined as **apc**.
9. Press CTRL-C, log off, reconnect any serial cable you disconnected, and restart any service you disabled.

How to Transfer Firmware Updates



See also

To download a firmware upgrade and transfer it to your MasterSwitch Plus unit, see “File Transfers” in the *User’s Guide* on the *Utility CD* or on the APC Web site (www.apc.com).

To use a local computer that connects to the unit through the serial port on the front of the unit to transfer a downloaded firmware upgrade:

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Use the configuration cable to connect the selected port to the RS-232 serial port on the front panel of the unit.
3. Run a terminal program (such as HyperTerminal) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control. Save the changes.
4. Press ENTER, repeatedly, if necessary, to display the **User Name** prompt.
5. Enter your **User Name** and **Password** (both **apc**, for administrators only) and press the ENTER key.
6. From the **Control Console** menu, select **System**, then **Tools**, then **File Transfer**, then **XMODEM**.
7. The system will prompt you with `Perform transfer with XMODEM -CRC? Type Yes` and press ENTER.
8. The system will then prompt you to choose a transfer rate and to change your terminal settings to match the transfer rate. Press ENTER to set the unit to accept the download.
9. In the terminal program, send the file using the XMODEM protocol. Upon completion of the transfer, the console will prompt you to restore the baud rate to normal.



Caution

Do not interrupt the download.

The unit will reboot when the download is complete.



Note

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

Warranty and Service

Limited warranty

APC warrants the MasterSwitch Plus to be free from defects in materials and workmanship for a period of two years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser.

Warranty limitations

Except as provided herein, APC makes no warranties, expressed or implied, including warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

Except as provided above, in no event will APC be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of this product, even if advised of the possibility of such damage.

Specifically, APC is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise. This warranty gives you specific legal rights and you may also have other rights, which vary according to jurisdiction.

Obtaining service

To obtain support for problems with your MasterSwitch Plus:

1. Note the serial number and date of purchase. The serial number is located on the bottom of the MasterSwitch Plus unit.
2. Contact Customer Support at a phone number on the back cover of this manual. A technician will try to help you solve the problem by phone.
3. If you must return the product, the technician will give you a return material authorization (RMA) number. If the warranty expired, you will be charged for repair or replacement.
4. Pack the unit carefully. The warranty does not cover damage sustained in transit. Enclose a letter with your name, address, RMA number and daytime phone number; a copy of the sales receipt; and a check as payment, if applicable.
5. Mark the RMA number clearly on the outside of the shipping carton.
6. Ship by insured, prepaid carrier to the address provided by the Customer Support technician.

Life-Support Policy

General policy

American Power Conversion (APC) does not recommend the use of any of its products in the following situations:

- In life-support applications where failure or malfunction of the APC product can be reasonably expected to cause failure of the life-support device or to affect significantly its safety or effectiveness.
- In direct patient care.

APC will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to APC that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of American Power Conversion is adequately protected under the circumstances.

Examples of life-support devices

The term *life-support device* includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults and infants), anesthesia ventilators, infusion pumps, and any other devices designated as “critical” by the U.S. FDA.

Hospital-grade wiring devices and leakage current protection may be ordered as options on many APC UPS systems. APC does not claim that units with these modifications are certified or listed as hospital-grade by APC or any other organization. Therefore these units do not meet the requirements for use in direct patient care.

Configuration Worksheet

UNIT PROPERTIES						
Name:				Address:		
OUTLET PROPERTIES						
#	Name (Maximum 23 printable ASCII character)	Outlet Control Mode (Circle one) [†]	Will Device Confirm? (Circle one)	Low Battery Warning Control (Circle never or give delay time (hh mm ss))	UPS Low Battery Multiplier (1-7)	Restart Delay (Circle or give delay time (hh mm ss))
1		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____
2		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____
3		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____
4		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____
5		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____
6		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____
7		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____
8		GS	Y	On Run Time		Remain Off
		A	N	Never Delay: _____		Delay: _____

† GS= Graceful shutdown mode
A= Annunciator mode

Radio Frequency Interference



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

USA—FCC

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

Canada—ICES

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

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

Japan—VCCI

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

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

APC Worldwide Customer Support

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

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

APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702055 (Ireland)
Japan	(0) 3 5434-2021
Australia, New Zealand, South Pacific	(61) (2) 9955 9366 (Australia)

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

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

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