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HP ProCurve
Switch 4000M and 8000M

Installation Guide

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Applicable Products

HP ProCurve Switch 4000M (HP J4121A)
HP ProCurve Switch 8000M (HP J4110A)

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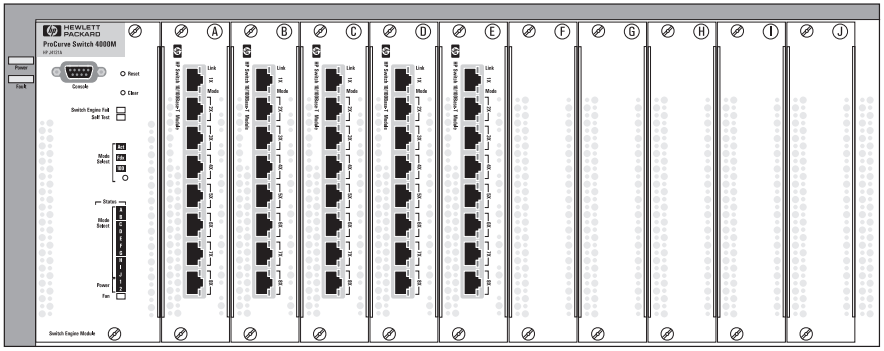
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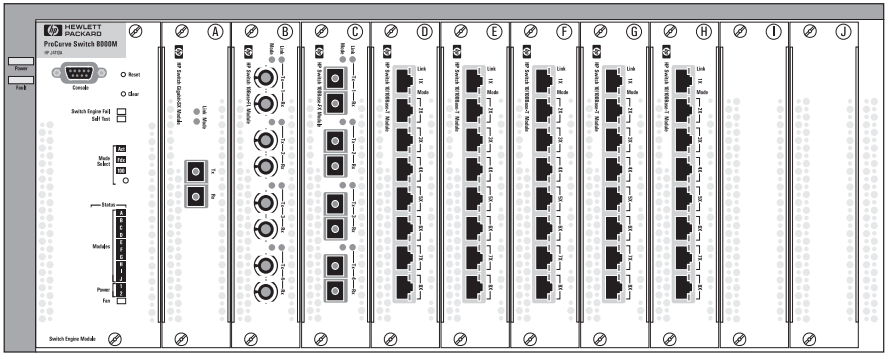
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Introducing the HP ProCurve Switch 4000M and 8000M

The HP ProCurve Switch 4000M and 8000M are multiport switches that can be used to build high-performance switched workgroup networks. These switches are store-and-forward devices that offer low latency for high-speed networking.



HP ProCurve Switch 4000M (HP J4121A) five 10/100Base-T Modules are preinstalled



HP ProCurve Switch 8000M (HP J4110A) showing a sample of switch modules installed

Throughout this manual, these switches will be abbreviated as the Switch 4000M and Switch 8000M, or when common features are being described, as the Switch 4000M and 8000M.

The Switch 4000M has five preinstalled HP ProCurve Switch 10/100Base-T Modules and five universal slots for installing any of the supported switch modules.

The Switch 8000M has 10 universal slots for installing any of the supported switch modules.

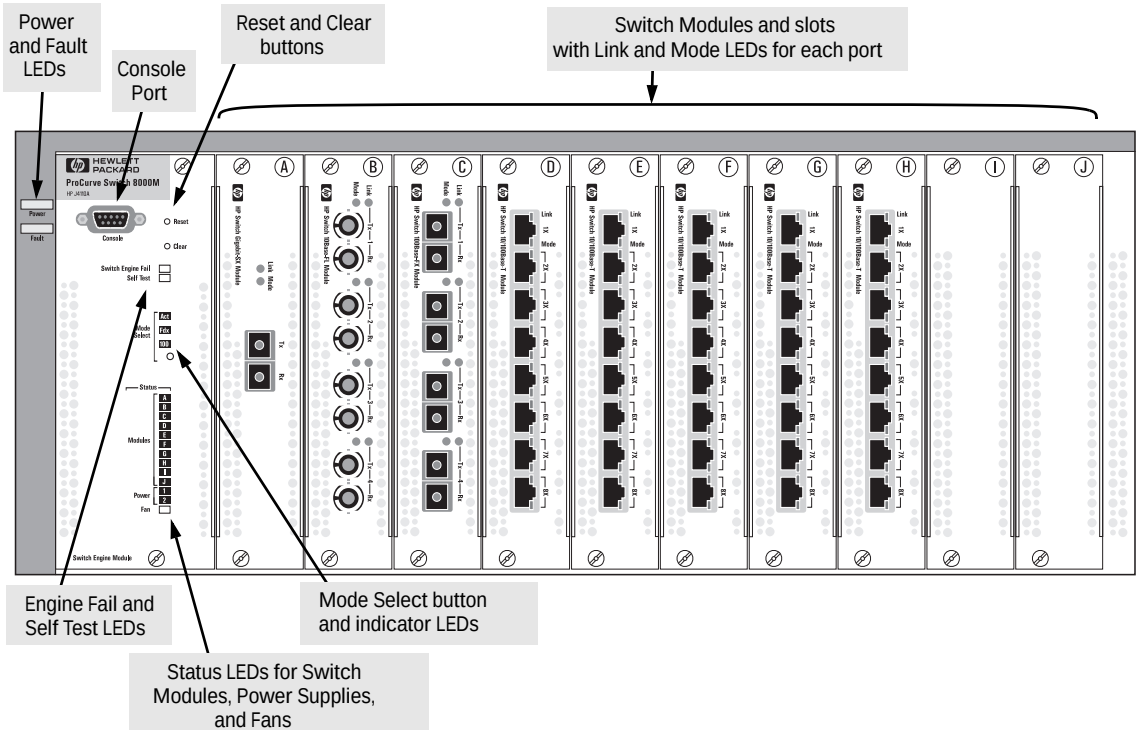
See “Switch Features” on page 1-9 for a list of the switch modules available when this manual was printed.

With these switches you can build a switched network infrastructure by connecting it to hubs, other switches, or routers, or you can connect computers, printers, and servers to this switch to provide dedicated bandwidth to those devices.

This chapter describes your HP Switch 4000M and 8000M including:

- Front and back of the switch
- Features
- Switch operation overview

Front of the Switch



Note

The Switch 8000M is shown in this illustration with a variety of modules installed.

The Switch 4000M has the same physical features, but with five 10/100Base-T switch modules preinstalled in slots A through E.

LEDs

As described in the next three tables, there are LEDs on the switch chassis, on the Switch Engine Module, and on the switch modules that keep you informed of the status of the switch and the network connections.

Table 1-1. Switch LEDs

LEDs	State	Meaning
Power (green)	On	The switch is receiving power.
	Off	The switch is NOT receiving power.
Fault (orange)	Off	The normal state; indicates that there are no fault conditions on the switch.
	Flashing†	A fault has occurred on the Switch Engine, one of the switch modules, a power supply, or a fan. The Status LED for the module or other device with the fault will flash simultaneously.
	On	On briefly at the beginning of switch self test after the switch is powered on or reset. If on for a prolonged time, the switch has encountered a fatal hardware failure, or has failed its self test. See chapter 3, "Troubleshooting" for more information.
† **The flashing behavior is an on/off cycle once every 1.6 seconds, approximately.**		

Table 1-2. Switch Engine LEDs

LED	State	Meaning
Switch Engine Fail (orange)	Off	The normal state; indicates that there are no fault conditions on the Switch Engine.
	On or Flashing†	A fault has occurred on the Switch Engine. The switch Fault LED and the Self Test LED will also be either on or flashing simultaneously, depending on the type of failure.
Self Test (green)	Off	The normal operational state; the switch is not undergoing self test.
	On	The switch self test and initialization are in progress after you have power cycled or reset the switch. The switch is not operational until this LED goes off. The Self Test LED also comes on briefly when you "hot swap" a module into the switch and the module is automatically self tested.
	Flashing†	A component of the switch has failed its self test. The Status LED for that component, for example a switch module, and the switch Fault LED will flash simultaneously.
Mode Select (3 green LEDs)	Act	Indicates that the port Mode LEDs are displaying network activity information.
	Fdx	Indicates that the port Mode LEDs are lit for ports that are in Full Duplex Mode.
	100	Indicates that the port Mode LEDs are lit for ports that are operating at 100 Mbps.

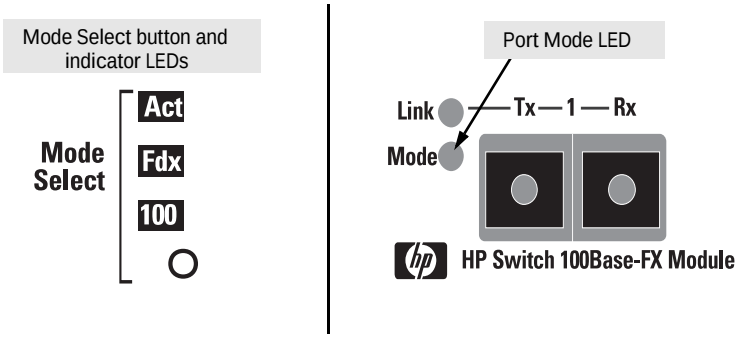
LED	State	Meaning
Status/Modules (green - letters corresponding to the switch module slots)	On	A module is installed in the switch module slot corresponding to the letter and the module is undergoing or has passed self test. This also occurs when you install a module when the switch is powered on ("hot swap").
	Off	A module is not installed in the switch module slot corresponding to the letter.
	Flashing†	The module status LED flashes very briefly when a module is being hot swapped. If the LED flashes for a prolonged time, the module in the slot corresponding to the letter has failed self test or encountered some other error condition. See chapter 3, "Troubleshooting" for a more information.
Status/Power (green - numbers corresponding to the power supply positions)	On	A power supply is installed in the position in the back of the switch corresponding to the number, and the supply is plugged in to an active AC power source. As shipped, the switch has a single power supply in position 1.
	Off	A power supply is not installed in the position corresponding to the number.
	Flashing†	The power supply installed in the position corresponding to the number is not plugged in to an active AC power source, or has experienced a fault. The switch Fault LED will be flashing simultaneously.
Status/Fan (green)	On	The cooling fans are operating normally.
	Flashing†	One or more of the cooling fans have failed. The switch Fault LED will be flashing simultaneously.
† **The flashing behavior is an on/off cycle once every 1.6 seconds, approximately.**		

Table 1-3. Switch Module LEDs

LED	State	Meaning
Link	On	Indicates the port is enabled and receiving a link beat signal (for the twisted-pair ports), or a strong enough light level (for the fiber-optic ports) from the connected device.
	Off	One of these conditions exists: • no active network cable is connected to the port • the port is not receiving link beat or sufficient light • the port has been disabled through the switch console, the web browser interface, or HP TopTools.
Mode	Displays network activity information, or whether the port is configured for Full Duplex operation, or 100 Mbps operation depending on the mode selection. See "Mode Select Button and Indicator LEDs" below for more information.	

Mode Select Button and Indicator LEDs

To optimize the amount of information that can be displayed for each of the switch ports without overwhelming you with LEDs, the Switch 4000M and 8000M use a Mode LED for each port. The operation of this LED is controlled by the Mode Select button on the Switch Engine, and the current setting is indicated by the Mode Indicator LEDs near the button. Press the button to step from one mode to the next.



- If the Activity (Act) indicator LED is lit, each port Mode LED displays activity information for the port—it flickers as network traffic is received and transmitted through the port.
- If the Full Duplex (Fdx) indicator LED is lit, the port Mode LEDs light for those ports that are operating in full duplex.
- If the 100 Mbps (100) indicator LED is lit, the port Mode LEDs light for those ports that are operating at 100 Mbps.

Console Port

This port is used to connect a console to the switch by using the serial cable supplied with the switch. This connection is described under “Connecting a Console to the Switch” in chapter 2, “Installing the Switch 4000M and 8000M”. The console is a full-featured interface that you can use to configure, monitor, and troubleshoot the switch. It can be run on a PC emulating a VT-100 terminal, or on a standard VT-100 terminal.

Reset Button

This button is used to reset the switch while it is powered on. This action clears any temporary error conditions that may have occurred, executes the switch self test, and resets all network activity counters to zero. The counters are displayed in the switch console interface, the switch web browser interface, and through SNMP network management applications, such as HP TopTools for Hubs & Switches.

Clear Button

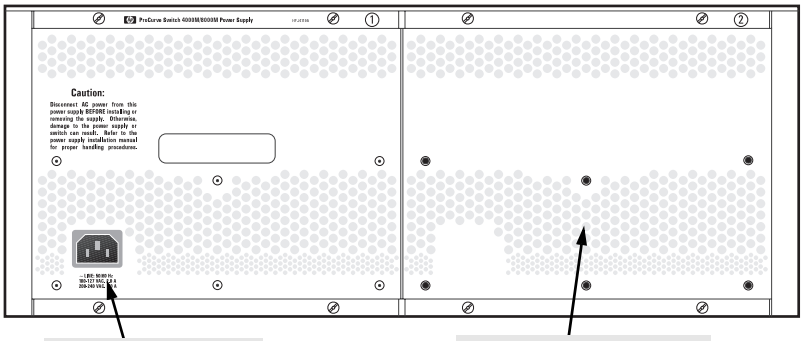
This button is used for these purposes:

- **Deleting Passwords** - When pressed by itself for at least one second, deletes any switch console access passwords that you may have configured. Use this feature if you have misplaced the password and need console access.

  This button is provided for your convenience, but its presence means that if you are concerned with the security of the switch configuration and operation, you should make sure the switch is installed in a secure location, such as a locked wiring closet.

- **Restoring Factory Default Configuration** - When pressed with the Reset button in a specific pattern, clears any configuration changes you may have made through the switch console, the web browser interface, and SNMP management, and restores the factory default configuration to the switch. For the specific method to restore the factory default configuration, see “Restoring the Factory Default Configuration” in chapter 3, “Troubleshooting” of this manual.

Back of the Switch



Power Connector

The Switch 4000M and 8000M does not have a power switch; it is powered on when connected to an active AC power source. The switch automatically adjusts to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz. There are no voltage range settings required.

Slot for Redundant Power Supply

A second, load-sharing redundant power supply (HP ProCurve Switch 4000M/ 8000M Power Supply, HP J4119A) can be installed in the back of the switch. To provide true redundancy, this second power supply should be connected to a different AC power source from the other supply. Then, if one AC power source fails, the switch will continue to run.

Caution

The switch power supplies *are* hot swappable, but, as indicated by the caution statement on the power supply, it ***must*** be disconnected from AC power before being installed or removed.

Caution:

Disconnect AC power from this power supply BEFORE installing or removing the supply. Otherwise, damage to the power supply or switch can result. Refer to the power supply installation manual for proper handling procedures.

Because the switch can run on a single supply, removing a redundant supply will not interrupt switch operation.

Switch Features

The features of the Switch 4000M and 8000M include:

- 10 slots for installing any of the available Switch Modules—as of this printing, this includes:
  - 8-port 10/100Base-TX Module (HP J4111A)
  - 4-port 100Base-FX Module (HP J4112A)
  - 1-port Gigabit-SX Module (HP J4113A)
  - 4-port 10Base-FL Module (HP J4118A)
- the modules can be installed in any order and in any combination and can be “hot swapped”.
- 3.8 Gbps backplane on both the Switch 4000M and Switch 8000M
- plug-and-play networking—all ports are enabled—just connect the network cables to active network devices and your switched network is operational
- automatic learning of the network addresses in the switch’s 8000-address forwarding table, with configurable address aging value
- configurable full-duplex operation of the 10 Mbps, 100 Mbps, and Gigabit ports
- easy management of the switch through several available interfaces:
  - web browser interface—an easy to use built-in graphical interface that can be accessed from common web browsers
  - console interface—a full featured, easy to use, VT-100 terminal interface for out-of-band switch management, or for telnet access to the switch
  - HP TopTools for Hubs & Switches—an SNMP-based graphical interface that is used to manage your entire network, included with your new switch
- support for the Spanning Tree Protocol to eliminate network loops
- support for up to 8 IEEE 802.1Q-compliant VLANs so you can divide the attached end nodes into logical groupings that fit your business needs
- support for many advanced features to enhance network performance—see the Management and Configuration Guide that came with your switch for a description

Switch Operation Overview

Address Table Operation

Address Learning. As devices are connected to the switch ports, either directly or through hubs or other switches that are connected to the switch, the MAC addresses of those devices are learned automatically and stored in the Switch 8000M's 8000-entry address table. The switch also identifies the number of the port on which each address is learned so it knows the network location of each device.

Forwarding, Filtering, Flooding. When the switch receives a packet, it determines the destination address, looks for the address in the address table. Based on the port location of that address, the switch then determines whether to forward, filter-out, or flood the packet.

- **forward** - if the destination address is on a different port than the one on which the packet was received, the packet is forwarded to the destination port and on to the destination device.
- **filter out** - if the destination address is on the same port as the one on which the packet was received, the packet is filtered out. The switch thereby isolates local traffic so the rest of the network connected to the switch does not lose bandwidth dealing with unnecessary traffic. (You can also configure filters on the switch that filter out packets based on specific criteria.)
- **flood** - whenever a new destination address is found in a received packet, the destination address will not yet be in the switch's address table and the Switch 8000M cannot know whether to forward or filter out the packet. In this case, it sends the packet out all the ports other than the one on which it was received. This is referred to as "flooding". When the destination device receives the packet, it replies, and the switch learns the new address from the reply packet. Then, all future packets destined for that address are forwarded or filtered out appropriately.

Network Moves and Changes. When devices are moved in the network, and become connected to a different switch port, the Switch 4000M and 8000M automatically recognizes the change and updates the address table with the new port location of the device. Communication with the device is automatically maintained, without any address table manipulation being required.

Simultaneous Network Communications

In addition to traffic isolation benefits provided by the Switch 4000M and 8000M address table operation, the switch also enhances network performance because it can conduct multiple, simultaneous network connections. Instead of sharing the network bandwidth, as in connections to a hub, each connection has its own 10 Mbps, 100 Mbps, or 1000 Mbps bandwidth to use.

Effect of VLANs

If you configure multiple virtual LANs (VLANs) on the switch, each VLAN behaves as a "logical switch" containing the switch ports that you assign to it. Each logical switch behaves as an isolated broadcast domain, just as if it were a separate physical switch. The forward, filter, and flood behavior described for the physical switch above, operates the same for each of the logical switches defined by the VLANs: packets are forwarded or flooded only to the ports that are within a given VLAN. Just as for separate physical switches, there is no communication between ports that are in separate VLANs unless the VLANs are connected by an external router.

For more information on configuring VLANs and their behavior, see the *HP ProCurve Switch 8000M and 1600M Management and Configuration Guide* that came with your switch.

Installing the Switch 4000M and 8000M

The HP Switch 4000M and 8000M are easy to install units. They each come with an accessory kit that includes the brackets for mounting the switch in a standard 19-inch telco rack or an equipment cabinet, or on a wall, and with rubber feet already attached so they can be securely located on a horizontal surface. The brackets are designed to allow mounting the switches in a variety of orientations.

This chapter shows you how to install your Switch 4000M and 8000M.

Included Parts

The Switch 4000M and 8000M have the following components shipped with them:

- *HP ProCurve Switch 4000M and 8000M Installation Guide* (5967-6916), this manual
- *HP ProCurve Switch Management and Configuration Guide* (5967-6914 for the Switch 4000M; 5967-2142 for the Switch 8000M)
- *HP TopTools for Hubs & Switches* - CD ROM and booklet
- Customer Support/Warranty booklet
- Accessory kit (5064-4213)
  - two mounting brackets
  - four 10 mm M4 screws to attach the mounting brackets to the switch
  - four 5/8-inch number 12-24 screws to attach the switch to a rack
- Console cable
- Power cord, one of the following:

Australia/New Zealand	(8120-6803)
United Kingdom	(8120-6801)
China	(8120-8377)
Continental Europe	(8120-6802)
Denmark	(8120-6806)
Japan	(8120-6804)
Switzerland	(8120-6807)
United States/Canada/Mexico	(8120-6805)

Installation Procedures

Summary

Follow these easy steps to install your switch. The rest of this chapter provides details on these steps.

1. **Prepare the installation site (page 2-4).** Make sure that the physical environment into which you will be installing the switch is properly prepared including having the correct network cabling ready to connect to the switch, and having a good location for the switch. *Please see page 2-3 for some installation precautions.*
2. **Install switch modules (page 2-5).** The Switch 4000M and the Switch 8000M have ten universal slots for installing any of the HP ProCurve switch modules. The Switch 4000M has five 10/100Base-T modules pre-installed. Depending on where you will install the Switch 4000M and 8000M, it may be easier to install the modules first, but the modules are "hot swappable"—they can also be installed and removed after the switch is powered on.
3. **(Optional) Install second power supply (page 2-6).** The Switch 4000M and 8000M have a slot in the back for installing a second, load-sharing power supply. If you have purchased this supply, it may be easier to install it before mounting the switch, although the power supplies are "hot swappable"—they can be installed and removed after the switch powered on.
4. **Verify that the switch passes self test (page 2-8).** This is a simple process of plugging the switch into a power source and observing that the LEDs on the switch's front panel and on the modules show correct operation.
5. **Mount the switch (page 2-10).** The Switch 4000M and 8000M can be mounted in a 19-inch telco rack, in an equipment cabinet, on a wall, or on a horizontal surface.
6. **Connect power to the switch (page 2-14).** Once the switch is mounted, plug it in to the nearby main power source.
7. **Connect the network devices (page 2-14).** Using the appropriate network cables, connect other switches, hubs, routers, computers, servers, printers, and other network devices to the switch ports.

8. **(Optional) Connect a console to the switch (page 2-15).** You may wish to modify the switch's configuration, for example, to configure an IP address so it can be managed using a web browser or from an SNMP network management station. Configuration changes can be made easily by through the switch's console interface.

At this point, the switch is fully installed. See the rest of this chapter if you need more detailed information on any of these installation steps.

Installation Precautions

Follow these precautions when installing your HP Switch 4000M and 8000M

Warning

The rack or cabinet should be adequately secured to prevent it from becoming unstable and/or falling over.

Devices installed in a rack or cabinet should be mounted as low as possible, with the heaviest device at the bottom and progressively lighter devices installed above.

Cautions

- Make sure that the power source circuits are properly grounded, then use the power cord supplied with the switch to connect it to the power source.

  If your installation requires a different power cord than the one supplied with the switch, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch.
- Ensure that the switch does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add together the ampere ratings of all devices installed on the same circuit as the switch and compare the total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the AC power connectors.
- Do not install the switch in an environment where the operating ambient temperature might exceed 55°C (131°F).
- Make sure the air flow around the sides and back of the switch is not restricted.
- Make sure that for any switch slot into which no module is installed, the cover plate is installed to cover the slot. A cover plate is required for safe operation, and to ensure proper switch cooling.

1. Prepare the Installation Site

- **Cabling Infrastructure -** Ensure that the cabling infrastructure meets the necessary network specifications. See the following table for cable types and lengths, and see appendix B, "Cables and Connectors" for more information:

Table 2-1. Summary of Cable Types to Use with the Switch

Port Type	Cable Type	Length Limits
10Base-T	category 3, 4, or 5, 100 ohm unshielded twisted-pair (UTP)	• category 3, 4, or 5 - 100 meters **Note:** Since the 10Base-T operation is through 10/100Base-TX ports, if you ever want to upgrade the ports to 100Base-T, it would be best to cable the ports initially with category 5 cable. For connecting these ports to end nodes or other MDI ports, use "straight-through" cable; for connecting to MDI-X ports on hubs or other switches, use "crossover" cable.
10Base-FL	850 nm multimode fiber-optic cables that are fitted with ST connectors, and conform to ISO/IEC 793-2 type B1 and ITU-T G.652 standards	1 kilometer
100Base-TX	category 5, 100-ohm UTP or shielded twisted-pair (STP)	100 meters (See Note above on use of "straight-through" and "cross-over" cables.)
100Base-FX	1300 nm multimode fiber-optic cables that are fitted with SC connectors, and conform to ISO/IEC 793-2 type B1 and ITU-T G.652 standards	• 412 meters for half-duplex connections • 2 kilometers for full-duplex connections
Gigabit-SX	850 nm multimode fiber-optic cables that are fitted with SC connectors.	• 62.5 µm cable - 220 meters • 50 µm cable - 500 meters

- **Installation Location** - Before installing the switch, plan its location and orientation relative to other devices and equipment. In the front of the switch, allow at least 7.6 cm (3 inches) of space for the twisted-pair and fiber-optic cabling. In the back of the switch, allow at least 3.8 cm (1 1/2 inches) of space for the power cord.

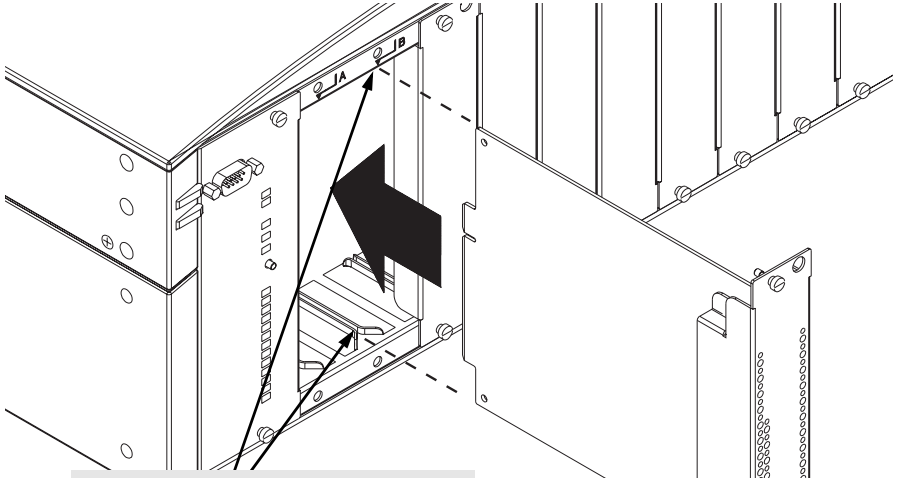
2.Install Switch Modules

Install switch modules into the slots as shown in the illustration below. For installation details, see the instructions in the manual that comes with the module.

The slot cover can be removed, and the module can be installed with either a flat-bladed or Torx T-10 screwdriver. Retain the slot cover for future use.

Notes

- Any of the supported switch modules can be installed in any of the slots.
- The modules can be "hot swapped", installed when the switch is powered on, and normally will be immediately operational. But, if you are replacing a module with a different type than what was previously installed in the slot, the switch must be rebooted after the module is installed. See "Hot Swapping the Switch Module" on page 2-17.
- ***Make sure the module is fully installed and that you screw in the retaining screws to secure the module in place.***
- If you do not use one or more of the slots, make sure that the slot cover plate is still attached over the slot for safe operation and proper switch cooling.



Insert module into the guides and slide it in until it stops. Then press in firmly until the module "snaps" into place and is flush with the face of the switch. ***Then make sure you tighten the retaining screws on the module, but do not overtighten them.***

3. (Optional) Install Second Power Supply

A second, load-sharing redundant power supply (HP ProCurve Switch 4000M/ 8000M Power Supply, HP J4119A) can be installed in the back of the switch. To provide true redundancy, this second power supply should be connected to a different AC power source from the other supply. Then, if one AC power source fails, the switch will continue to run. Each supply provides enough power to operate a fully loaded switch, so even if one fails, the switch will continue to operate normally.

Install the second power supply into power slot number 2 as shown in the illustration on the next page.

The slot cover can be removed with either a flat-bladed or Torx T-10 screwdriver. Retain the slot cover for future use.

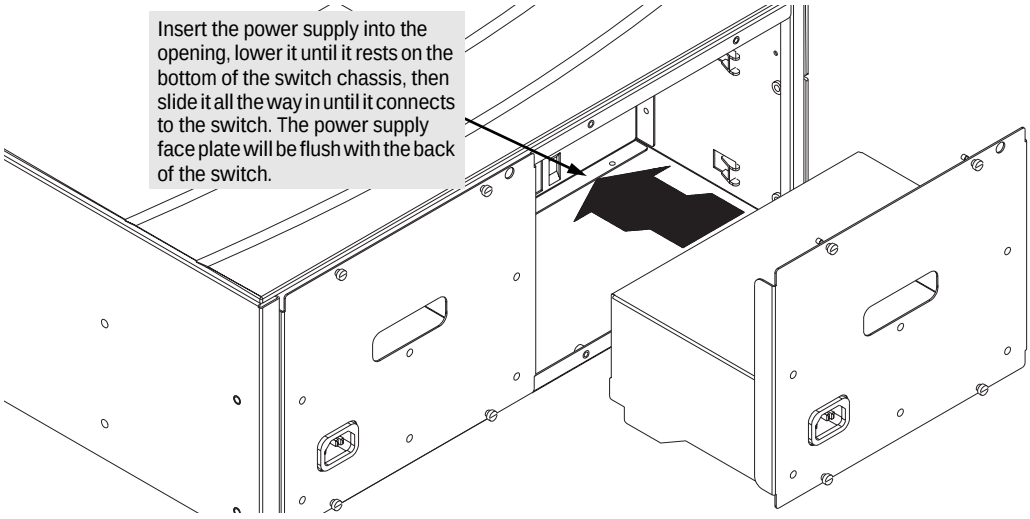
Caution

The switch power supplies *are* hot swappable; they can be installed while the switch is receiving power from the supply in the other slot. But, as indicated by the caution statement on the power supply, the supply ***must not be connected*** to AC power before being installed.

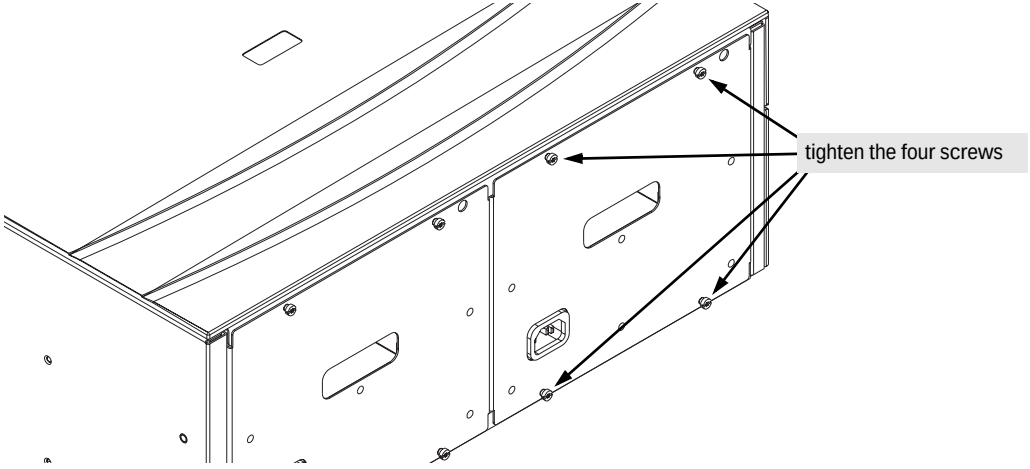
Caution:

Disconnect AC power from this power supply BEFORE installing or removing the supply. Otherwise, damage to the power supply or switch can result. Refer to the power supply installation manual for proper handling procedures.

For installation details, see the instructions in the manual that comes with the power supply.



Once the power supply is installed, make sure you tighten the four retaining screws that hold it in place. The screws can be tightened with either a flat-bladed or Torx T-10 screwdriver. *Be careful not to overtighten the screws.*

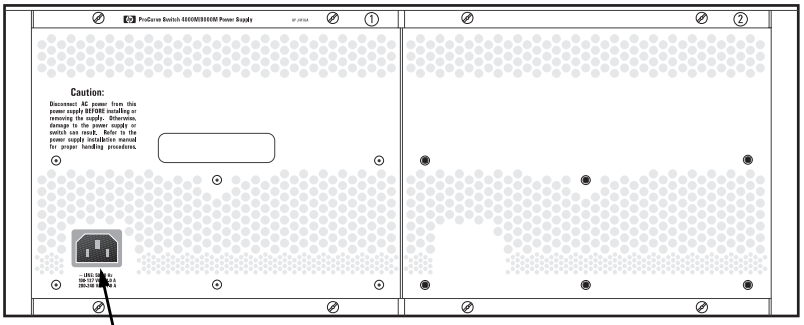


4. Verify the Switch Passes Self Test

After you have installed any modules and the optional second power supply, but before mounting the switch in its network location, you should first verify that it is working properly by plugging it into a power source and verifying that it passes its self test.

If you have installed a second power supply, repeat these procedures with the second power supply to verify that it works correctly too.

1. Connect the power cord supplied with the switch to the power connector on the back of the switch, and then into a properly grounded electrical outlet.



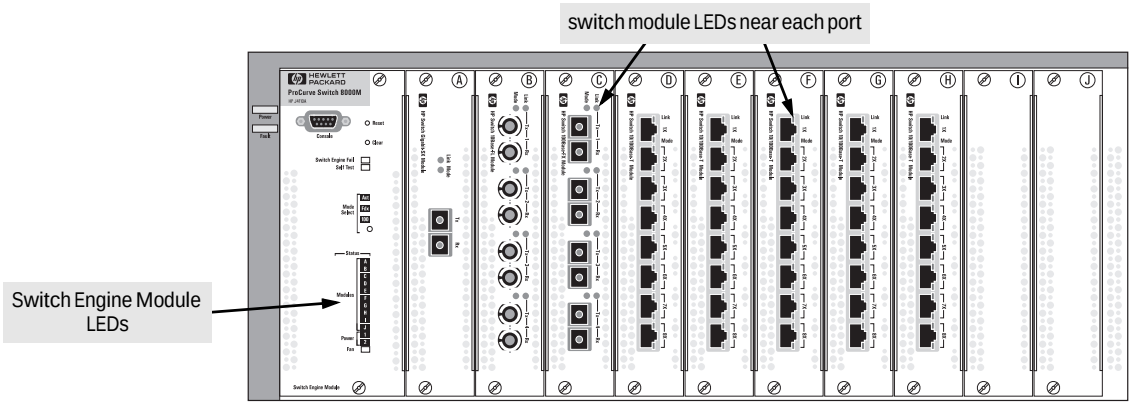
Note

The Switch 4000M and 8000M do not have a power switch. They are powered on when the power cord is connected to the switch and to a power source.

If your installation requires a different power cord than the one supplied with the switch, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch.

2. Check the LEDs on the Switch Engine Module and on each of the switch modules. The LED behavior is described on the next page.

   If the LED display is different than what is described, especially if any Fault LEDs stay on for more than approximately 80 seconds or they start flashing, the self test has not completed correctly. Refer to chapter 3, “Troubleshooting” for diagnostic help.



When the switch is powered on, it performs its diagnostic self test. The self test takes approximately 35 to 70 seconds to complete, depending on the number and type of modules installed in the switch.

LED Behavior:

During the self test:

- Initially, Power and Fault, and all the Switch Engine and switch module LEDs are on.
- After approximately 3 seconds most of the LEDs go off and then may come on again during phases of the self test. For the duration of the self test, the **Self Test** LED stays on.

When the self test completes successfully:

- The large **Power** LED stays on, and the Status LEDs on the Switch Engine Module stay on for the modules installed: one for each switch module installed, one for each power supply installed, and the **Fan** LED.
- The large **Fault** LED goes off, and the **Switch Engine Fail** and **Self Test** LEDs go off.
- The port LEDs on the switch modules go into their normal operational mode:
  - If the ports are connected to active network devices, the **Link** LEDs stay on and the **Mode** LEDs behave according to the mode selected. In the default mode (Activity), the Mode LEDs should flicker showing network activity on the port.
  - If the ports are not connected to active network devices, the LEDs will stay off.

5. Mount the Switch

After the modules and optional power supply are installed and you have verified that the switch passes self test, you are ready to mount the switch in a stable location. The Switch 4000M and 8000M can be mounted in these ways:

- in a rack or cabinet
- on a horizontal surface
- on a wall

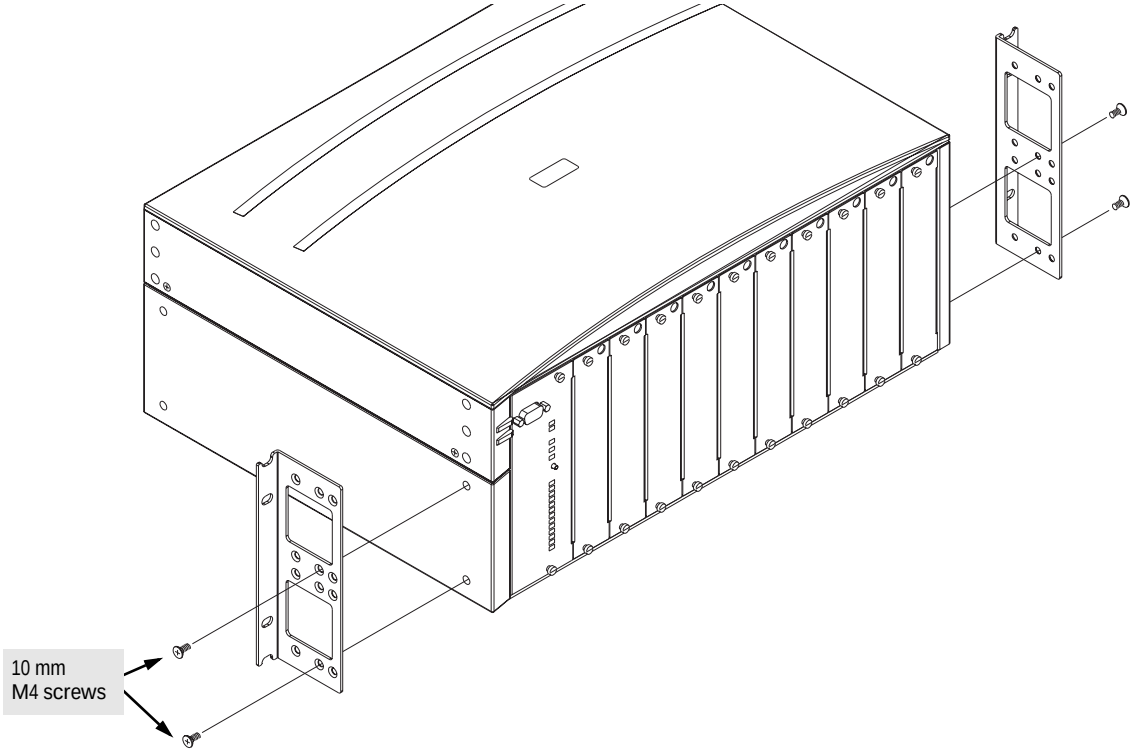
Rack or Cabinet Mounting

The Switch 4000M and 8000M are designed to be mounted in any EIA-standard 19-inch telco rack or in an equipment cabinet such as a server cabinet.

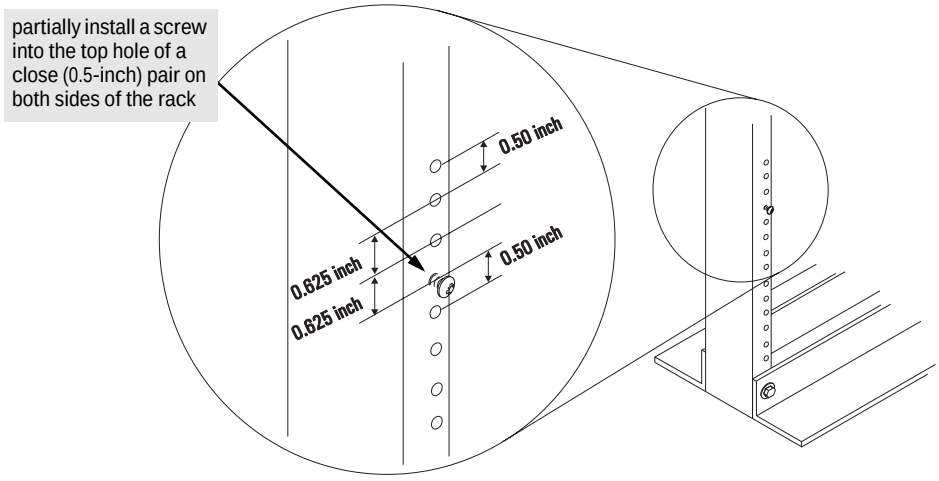
Warning

For safe operation, please read the mounting precautions on page 2-3 before mounting the switch.

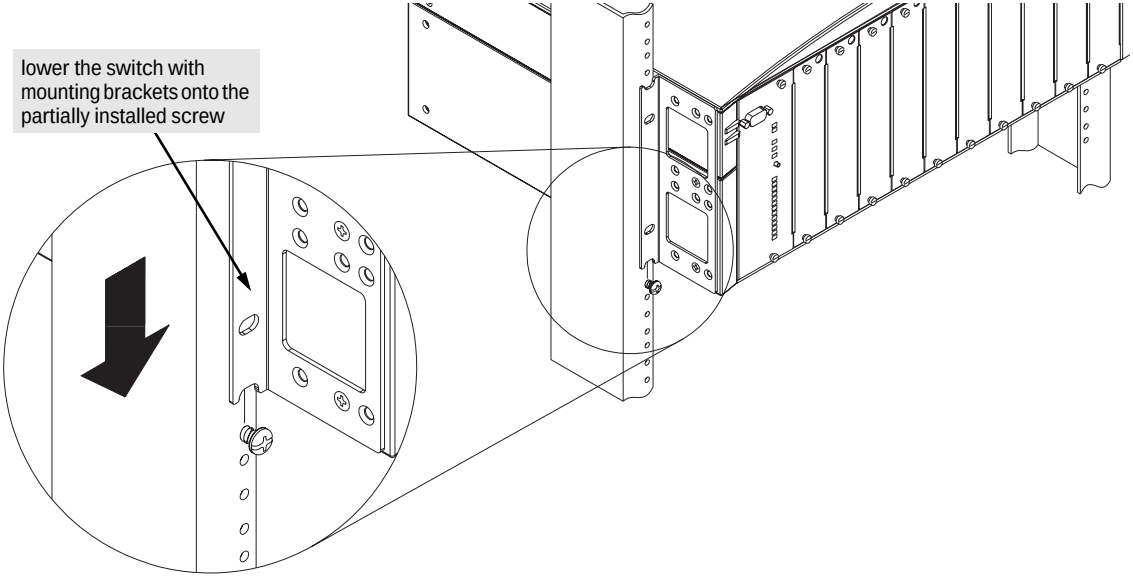
1. Use a #1 Phillips (cross-head) screwdriver and attach the mounting brackets to the switch with the included 10-mm M4 screws.



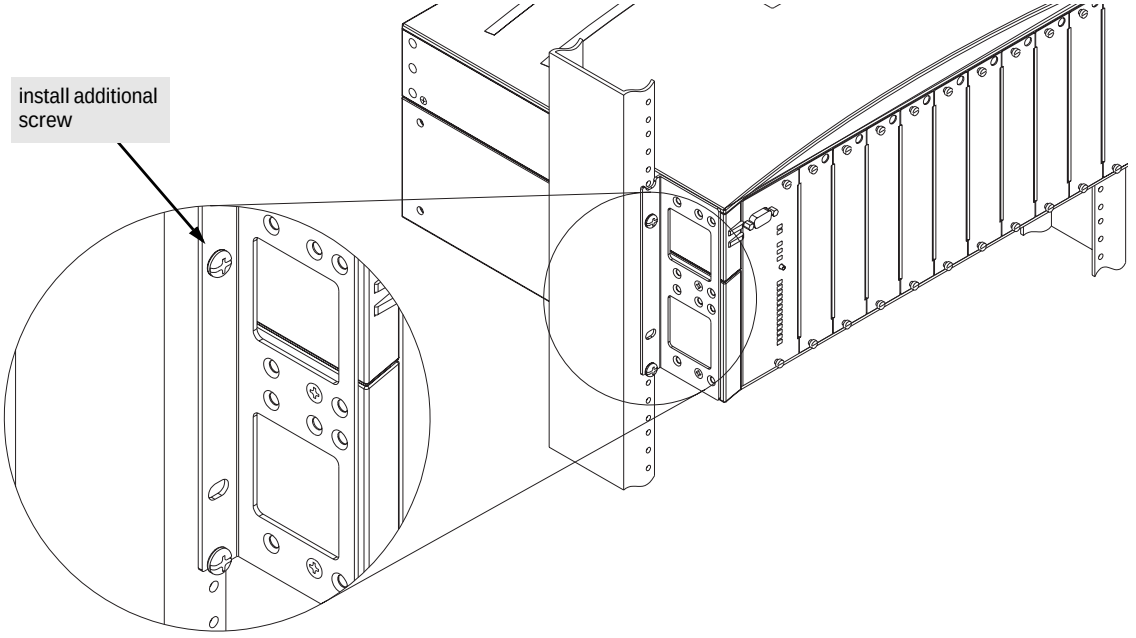
2. Partially install a screw (5/8-inch number 12-24) into the top hole of a pair of holes that are 0.5 inches apart in each rack/cabinet upright as shown in the illustration below. Ensure that the screws are at the same level in each upright.



3. Place the switch in the rack and lower it so the notches in the bottom of the bracket slide onto the screws, then tighten these screws.



4. Install the other number 12-24 screw into the upper hole in each bracket. Tighten these screws.



Horizontal Surface Mounting

Place the switch on a table or other horizontal surface. Use a sturdy surface in an uncluttered area. You may want to secure the networking cables and switch power cord to the table legs or other part of the surface structure to help prevent people from tripping over the cords.

Note

Make sure the air flow is not restricted around the sides and back of the switch.

Wall Mounting

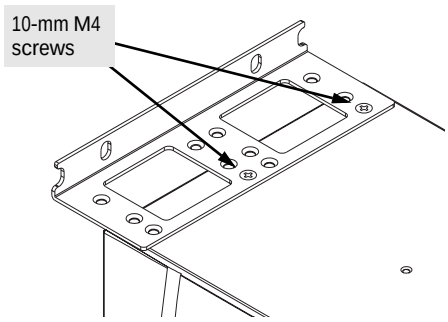
The mounting brackets supplied with the switch allow you to mount it on a wall. You can mount it in any orientation that places the power supplies facing against the wall and the modules facing out. The orientation shown in the illustrations is commonly referred to as a "bookshelf" mount.

Caution

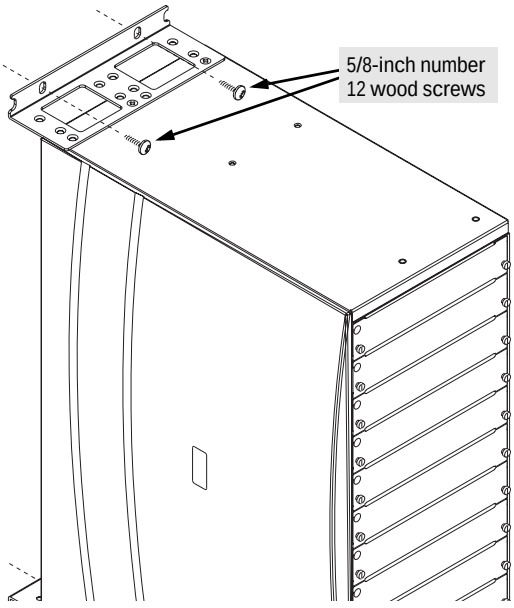
For safety considerations, you should ***not*** mount the switch on a wall such that either the power supplies or the modules are facing downward.

Additionally, the switch should be mounted only to a wall or wood surface that is at least 1/2-inch plywood or its equivalent.

1. Use a #1 Phillips (cross-head) screwdriver and attach the mounting brackets to the switch with the included 10-mm M4 screws.



2. Attach the switch to the wall or wood surface with four 5/8-inch number 12 wood screws or larger (not included).



6. Connect the Switch to a Power Source

1. Plug the included power cord into the switch's power connector and into a nearby properly grounded AC power source.

   If you have installed a redundant power supply module into the switch, it should be connected to a separate AC power source. Then, if there is a power outage from one of the AC sources, the switch will continue to operate by power coming from the other source.

   See the *HP ProCurve Switch 4000M/8000M Power Supply Installation Guide* for additional information.

2. Re-check the LEDs during self test. See "LED Behavior" on page 2-9.

7. Connect the Network Devices

The type of network connections you will need to use depends on the types of switch modules you have installed in your Switch 4000M and 8000M. See the documentation accompanying the modules for cabling configurations and procedures for those modules.

The module documentation will also cover troubleshooting procedures, but, in general for all the modules, when a network cable from an active network device is connected to the switch module port, the Link LED for that port should go on. If the Link LED does *not* go on when the network cable is connected to the port, use the table below to help solve the problem.

Condition	Diagnostic Tip
Port LED is still off when a cable is connected	Try the following procedures: • For the indicated port, verify that both ends of the cabling, at the switch and the connected device, are snug. • Verify the connected device and switch are both powered *on* and operating correctly. • Verify that you have used the correct cable type for the connection. - for twisted-pair connections, in general, for connecting to an end node, use "straight-through" cable; for connecting to hubs or other switches, use "crossover" cable. - for fiber-optic connections, verify that the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device. • Verify that the port has not been disabled through a switch configuration change. You can use the console interface, or, if you have configured an IP address on the switch, use the web browser interface, or HP TopTools for Hubs & Switches network management software to determine the state of the port and re-enable the port if necessary. • If the other procedures don't resolve the problem, try using a different port or a different cable.

8. (Optional) Connect a Console to the Switch

The Switch 4000M and 8000M have a full-featured, easy to use console interface for performing the following tasks:

- Monitor switch and port status and observe network activity counters
- Modify the switch's configuration
- Read the event log and access diagnostic tools to help in troubleshooting
- Download new software to the switch
- Add passwords to control access to the switch from the console, web browser interface, and network management stations

The console can be accessed through these methods:

- **Out-of-band:** The Switch 4000M and 8000M come with a serial cable for connecting a PC or VT-100 terminal to be used as a console directly to the switch. If the PC or terminal has a 25-pin serial connector, you can use a readily available 9-pin to 25-pin serial cable, or attach a 9-to-25 pin "straight-through" adapter to the end of the supplied cable.
- **In-Band:** Access the console using telnet from a PC or UNIX station on the network, and a VT-100 terminal emulator. This method requires that you first configure the switch with an IP address and subnet mask by using either out-of-band console access or through DHCP/Bootp.

The Switch 4000M and 8000M can simultaneously support one out-of-band console session through the Console Port and one in-band telnet console session.

Terminal Configuration

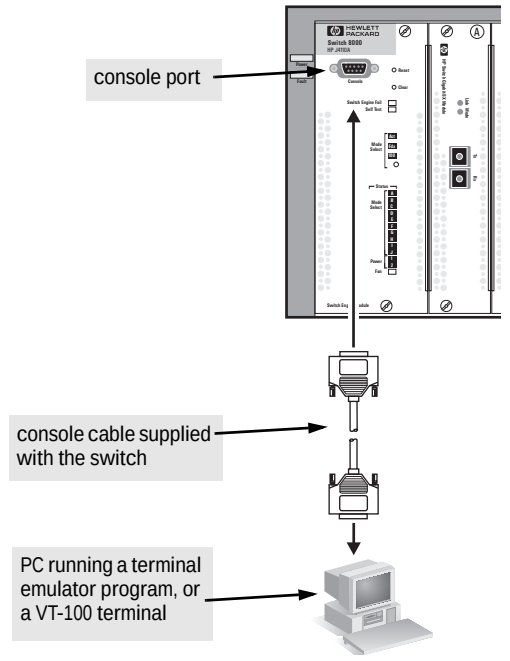
To connect a console to the switch, configure the PC terminal emulator as a VT-100 or DEC VT-100 (ANSI) terminal, or use a VT-100 terminal and configure it to operate with these settings:

- any baud rate from 2400 to 115200 (the switch automatically senses the speed)
- 8 data bits, 1 stop bit, no parity, XON/XOFF flow control
- For Windows Terminal program, also disable (uncheck) the "Use Function, Arrow, and Ctrl Keys for Windows" option.

If you want to operate the console using a different configuration, make sure you change the settings on both the terminal and on the switch. Change the switch settings first, then change the terminal settings, and reestablish the console session.

Direct Console Access

To connect a console to the switch, follow these steps:



1. Connect the PC or terminal to the switch's Console Port using the console cable included with the switch. (If your PC or terminal has a 25-pin serial connector, first attach a 9-pin to 25-pin "straight-through" adapter at one end of the console cable.)
2. Turn on the terminal or PC's power and, if using a PC, start the PC terminal program.
3. Press [Enter] two or three times and you will see the copyright page and the message "Press any key to continue". Press a key, and you will then see the switch console Main Menu.

Telnet Console Access

To access the switch through a telnet session, follow these steps:

1. Make sure the switch is configured with an IP address and that the switch is reachable from the telnet workstation (for example by using a Ping command to the switch's IP address)
2. Start the telnet program and connect to the switch's IP address.
3. You will see the copyright page and the message "Press any key to continue". Press a key, and you will then see the switch console Main Menu.

If you want to continue with console management of the switch at this time through either a direct connection or a telnet session, refer to the *Management and Configuration Guide* that came with your switch.

Hot Swapping Switch Modules

The switch modules can be "hot swapped", that is installed or replaced while the switch is powered on. The procedures differ slightly, though between adding new modules to an empty slot or replacing modules with the same type, and exchanging the module with a different type.

Adding or Replacing Modules

If a module has to be replaced with one of the same type, or you are expanding the switch capability by adding a module in a slot where one was not previously installed, the replaced or new module is immediately operational; there is no interruption to the switch operation.

Changing the Module Type

If you exchange a module with one of a different type though, for example a Gigabit-SX module is installed in place of a 100Base-FX module that was in the slot, the switch must be rebooted after the new module is installed so the switch processor can properly initialize and configure the new module type.

You can reboot the switch by any of these methods:

- select the Reset or Reboot option from the console, web browser interface, or HP TopTools for Hubs & Switches
- press the Reset button on the switch
- unplug and plug in the power cord (power cycle)

Until the switch is rebooted, the module will not operate, the Module Status LED will continue to flash, and all the LEDs on the module will stay on continuously.

Where to Go From Here

Your switch is now correctly installed and is able to send and receive data between end nodes, servers, and printers.

The Switch 4000M and 8000M are plug-and-communicate network devices requiring no configuration. If you wish to manage the switch from an SNMP-based network management station, through the web browser interface, or over a telnet console session, you will need to configure the IP address on the switch. See the *Management and Configuration Guide* that came with your switch for information on how to use the switch console interface to configure the IP address.

3

Troubleshooting

This chapter describes how to troubleshoot your Switch 4000M and 8000M. Note that this document describes troubleshooting mostly from a hardware perspective. You can perform more in-depth troubleshooting using the software tools available with the switch, including the full-featured console interface, the built-in web browser interface, and HP TopTools for Hubs & Switches, the SNMP-based network management tool. See the chapter 8, "Troubleshooting" of the *Management and Configuration Guide* included with your switch for more information.

This chapter describes the following:

- basic troubleshooting tips (page 3-2)
- diagnosing with the LEDs (page 3-4)
- Proactive Networking tools (page 3-7)
- Hardware Diagnostic tests (page 3-8)
- restoring the factory default configuration (page 3-10)
- HP Customer Support Services (page 3-11)

Basic Troubleshooting Tips

Most problems are caused by the following situations. Check for these items first when starting your troubleshooting:

- **Incorrect switch-to-switch or switch-to-hub connections.** If you have connected your switch to another switch or a hub by using twisted-pair cable from an RJ-45 MDI-X connector on your switch to the an MDI-X connector on the other switch or hub, you must use a **crossover cable**. If you have used a straight-through cable, the connection will not work. The LED for the port you are using will not come on when you connect the cable.

  Most switch and hub ports are wired as MDI-X ports, so for these switch-to-switch or switch-to-hub connections use a crossover cable. LAN adapters in end nodes are normally wired as MDI ports as are some ports on hubs and switches. For connections from the switch to these MDI ports, use a **straight-through cable**. See appendix B, "Cables and Connectors" for pinouts and correct cable wiring for crossover and straight-through twisted-pair cables.
- **Faulty or loose cables.** Look for loose or obviously faulty connections. If they appear to be OK, make sure the connections are snug. If that does not correct the problem, try a different cable.
- **Non-standard cables.** Non-standard and miswired cables may cause numerous network collisions and other network problems, and can seriously impair network performance. Use a new correctly-wired cable or compare your cable to the cable in appendix B, "Cables and Connectors" for pinouts and correct cable wiring. A category 5 cable tester is a recommended tool for every 100Base-T network installation.
- **Improper Network Topologies.** It is important to make sure you have a valid network topology. Common topology faults include excessive cable length and excessive repeater delays between end nodes. If you have network problems after recent changes to the network, change back to the previous topology. If you no longer experience the problems, the new topology is probably at fault. Refer to the *Network Design Guide* for topology configuration guidelines. This guide can be found online at the HP World Wide Web site for networking products, *http://www.hp.com/go/network_city* under the Tech Library button.

In addition, you should make sure that your network topology contains no data path loops. Between any two end nodes, there should be only one active cabling path at any time. Data path loops will cause broadcast storms that will severely impact your network performance.

If you wish to build redundant paths between important nodes in your network to provide some fault tolerance, you should enable **Spanning Tree Protocol** support on the switch. This ensures that only one of the redundant paths is active at any time, thus avoiding data path loops. Spanning Tree can be enabled through the switch console, the web browser interface, or HP TopTools for Hubs and Switches.

The Switch 8000M also supports **Switch Meshing** which allows multiple data paths though a switched network to be active simultaneously for enhanced network bandwidth. See the *Management and Configuration Guide* that came with your switch for more information on Spanning Tree and on Switch Meshing.

Diagnosing with the LEDs

Tables 3-1 shows LED patterns on the switch and the switch modules that indicate problem conditions.

1. Check in the table for the LED pattern that you see on your switch
2. Refer to the corresponding diagnostic tip on the next few pages.

Table 3-1. LED Error Indicators

LED Pattern Indicating Problems								Diagnostic Tips
Power	Fault	Switch Engine Fail	Self Test	Module Status (one LED per module)	Power Status (one LED per power supply)	Fan Status	Port Link	
Off with power cord plugged in	*	*	*	*	*	*	*	❶
On	Prolonged On	Prolonged On	Prolonged On	*	*	*	*	❷
On	Flashing†	Flashing†	Flashing†	*	*	*	*	❸
On	Flashing†	Off	Flashing†	Flashing†	*	*	*	❹
On	Off	Off	Off	Flashing†	*	*	*	❺
On	Flashing†	Off	Off	*	Flashing†	*	*	❻
On	Flashing†	Off	Off	*	*	Flashing†	*	❼
On	Off	Off	Off	On	*	*	Off with cable connected	❽

*** This LED is not important for the diagnosis.**
† The flashing behavior is an on/off cycle once every 1.6 seconds, approximately.

Diagnostic Tips:

Tip Number	Problem	Solution
❶	The power supplies installed in the switch are not plugged into active AC power sources, or the power supply may have failed.	1. Verify that the power cord is plugged into an active power source and to the switch. Make sure these connections are snug. 2. Try power cycling the switch by unplugging and plugging the power cord back in. 3. If the Power LED is still not on, verify that the AC power source works by plugging another device into the outlet. Or try plugging the switch into a different outlet or try a different power cord. If the power source and power cord are OK and this condition persists, the switch power supply may have failed. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/ Warranty card for more information.
❷	A switch hardware failure has occurred. All the LEDs will stay on indefinitely.	Try power cycling the switch. If the fault indication reoccurs, the switch may have failed. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty card for more information.
❸	The switch has experienced a software failure during self test.	1. Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch. 2. If the fault indication reoccurs, attach a console to the switch (as indicated in chapter 2) and configure it to operate at 9600 baud. Then, reset the switch. Messages should appear on the console screen and in the console log identifying the error condition. You can view the console log at that point by selecting it from the console Main Menu. If necessary to resolve the problem, contact your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty card for more information.
❹	The module installed in the slot that corresponds to the letter that is flashing is not installed properly, has experienced a self test fault, or has become partly removed during switch operation.	The modules are all tested whenever the switch is powered on, or reset (through the Reset button on the switch, or the Reboot or Reset options in the console or web browser interface), and when they are hot swapped (installed when the switch is powered on). Under this error condition, the following events also occur: • All the LEDs on the module stay on until the error is resolved. • The switch software, including console and web browser access will not be operational for approximately one minute from the time the module gets into this condition. Try reinstalling the module. You can do this without having to power down the switch. When the module is reinstalled, it will be retested automatically. Make sure to screw in the retaining screws so that the module cannot be inadvertently pulled out by pulling on the network cables. If the fault indication reoccurs, the module may have failed. Remove the module from the switch and replace it with another module, or recover the slot with the cover plate. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty card for more information.

Tip Number	Problem	Solution
❺	In the slot corresponding to the letter that is flashing, a module was installed that is a different type than the previously installed module, and the switch has not yet been reset.	When you "hot swap" modules in the switch slots, if you install a different module type than the one that was previously installed in the slot, you must reset the switch so the switch processor can properly initialize and configure the new module type. The flashing LED informs you that this change of module types has occurred. The module will not work properly until the switch is reset as indicated by all the module's LEDs staying on until the switch is reset. You can reset the switch by any of these methods: • pressing the Reset button on the Switch Engine Module • power cycling the switch • selecting the reset or reboot option from the console, web browser interface, or HP TopTools.
❻	A fault condition has been detected on the power supply installed in the slot corresponding to the flashing number.	Try removing and reinstalling the supply. ***Caution:*** *Make sure that the AC power cord is disconnected from the supply before removing and reinstalling the supply.* Reconnect the power supply to the AC power source. If the error indication reoccurs after the supply is reinstalled, the power supply may be faulty. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty card for more information.
❼	One or more of the switch cooling fans may have failed.	Try disconnecting power from the switch and wait a few moments. Then reconnect the power to the switch and check the LEDs again. If the error indication reoccurs, one or more of the fans has failed. The switch has three fans and may continue to operate OK under this condition if the ambient temperature does not exceed normal room temperature, but for best operation, the switch should be replaced. Contact your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty card for more information.
❽	The network connection is not working properly.	Try the following procedures: • For the indicated port, verify that both ends of the cabling, at the switch and the connected device, are snug. • Verify the connected device and switch are both powered *on* and operating correctly. • Verify that you have used the correct cable type for the connection. - for twisted-pair connections, in general, for connecting to an end node, use "straight- through" cable; for connecting to MDI-X ports on hubs or other switches, use "crossover" cable. - for fiber-optic connections, verify that the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device. • Verify that the port has not been disabled through a switch configuration change. You can use the console interface, or, if you have configured an IP address on the switch, use the web browser interface, or HP TopTools for Hubs & Switches network management software to determine the state of the port and re-enable the port if necessary. • If the other procedures don't resolve the problem, try using a different port or a different cable.

Proactive Networking

The Switch 4000M and 8000M have built-in management capabilities that proactively help you manage your network including:

- finding and helping you fix the most common network error conditions (for example, faulty network cabling, and non-standard network topologies)
- informing you of the problem with clear, easy-to-understand messages
- recommending network configuration changes to enhance the performance of your network

The following interfaces provide tests, indicators, and an event log that can be used to monitor the switch and its network connections and to help you take advantage of these proactive networking features:

- HP TopTools for Hubs & Switches - an SNMP-based network management tool that is included with your switch
- A graphical web browser interface that you can use to manage your switch from a PC running a supported web browser, for example Microsoft Internet Explorer, and Netscape Communicator.
- A full-featured easy-to-use console interface that you can access by merely connecting a standard terminal or PC running a terminal emulator to the switch's console port. The cable to make that connection is provided with your switch. The console interface is also accessible through a telnet connection.

See chapter 8, "Troubleshooting", in the *Management and Configuration Guide* that came with your switch for more information on using these software tools to diagnose and manage your switch.

Hardware Diagnostic Tests

Testing the Switch by Resetting It

If you believe that the switch is not operating correctly, you can reset the switch to test its circuitry and operating code. To reset a switch, either:

- Unplug and plug in the power cord (power cycling)
- Press the Reset button on the front of the switch

Power cycling the switch and pressing the Reset button both cause the switch to perform its power-on self-test, which almost always will resolve any temporary operational problems. These reset processes also cause any network traffic counters to be reset to zero, and cause the System Up Time timer to reset to zero. None of the reset procedures cause any changes to the switch configuration.

Checking the Switch LEDs

The self-test passes if the Fault and Self Test LEDs on the front of the switch go off after approximately 30 to 70 seconds depending on the number and type of modules installed in the switch. If these LEDs stay on longer than 80 seconds or begin flashing, the switch may have to be replaced.

See “Diagnosing With the LEDs” on page 3-4 for information on interpreting the LED patterns.

Checking Console Messages

Useful diagnostic messages may be displayed on the console screen when the switch is reset. As described in chapter 2 under step 8, “Connect a Console to the Switch”, connect a PC running a VT-100 terminal emulator program or a standard VT-100 terminal to the switch’s Console Port and configure it to run at 9600 baud, and with the other terminal communication settings shown on page 2-15. Then, when you reset the switch, note the messages that are displayed.

Testing Twisted-Pair Cabling

If you think the cable should work but still isn't working, it may not be compatible with the IEEE 802.3 Type 10Base-T or 100Base-T standards. The twisted-pair cables attached to the Switch 4000M and 8000M must be compatible with these standards.To verify that your cable is compatible with these standards, use a qualified cable test device.

HP also offers a wire testing service. Contact your HP-authorized LAN dealer or your local HP sales office for more information.

Note

Make sure that you are using the correct cabling type for each connection. The switch UTP ports are all wired as MDI-X. For connecting end nodes and other MDI-type devices, use "straight-through" cable. For connecting hubs, other switches, and other MDI-X devices, use "crossover" cable. See appendix B, "Cables and Connectors" for the pinouts for these cables.

Testing Switch-to-Device Network Communications

You can perform the following communication tests to verify that the network is operating correctly between the switch and any connected device that can respond correctly to the communication test.

- Link Test -- a physical layer test that sends IEEE 802.2 test packets to any device identified by its MAC address
- Ping Test -- a network layer test used on IP networks that sends test packets to any device identified by its IP address

These tests can be performed through the switch console interface from a terminal connected to the switch or through a telnet connection, or from the switch's web browser interface. See the *Management and Configuration Guide* that came with your switch for more information.

These tests can also be performed from an SNMP network management station running a program that can manage the switch, for example, HP TopTools for Hubs & Switches.

Testing End-to-End Network Communications

Both the switch and the cabling can be tested by running an end-to-end communications test -- a test that sends known data from one network device to another through the switch. For example, if you have two PCs on the network that have LAN adapters between which you can run a link-level test or Ping test through the switch, you can use this test to verify that the entire communication path between the two PCs is functioning correctly. See your LAN adapter documentation for more information on running the a link test or Ping test.

Restoring the Factory Default Configuration

As part of your troubleshooting process, it may become necessary to return the switch configuration to the factory default settings. This process momentarily interrupts the switch operation, clears any passwords, clears the console event log, resets the network counters to zero, performs a complete self test, and reboots the switch into its factory default configuration including deleting an IP address.

To execute the factory default reset, perform these steps:

1. Using pointed objects, simultaneously press both the Reset and Clear buttons on the front of the switch.
2. Continue to press the Clear button while releasing the Reset button.
3. When the Self Test LED begins to flash, release the Clear button.

   The switch will then complete its self test and begin operating with the configuration restored to the factory default settings.

HP Customer Support Services

If you are still having trouble with your switch, Hewlett-Packard offers support 24 hours a day, seven days a week through the use of a number of automated electronic services. See the Customer Support/Warranty booklet that came with your switch for information on how to use these services to get technical support. The HP networking products World Wide Web site, *http://www.hp.com/go/network_city* also provides up-to-date support information.

Additionally, your HP-authorized network reseller can also provide you with assistance, both with services that they offer and with services offered by HP.

Specifications

Except where noted, the following specifications apply to both the Switch 4000M and the Switch 8000M.

Physical

Width:	44.2 cm (17.4 in)
Depth:	33.5 cm (13.2 in)
Height:	6.6 cm (2.6 in)
Weight:	
• Switch 4000M	10.4 kg (22.9 lbs) – includes five 10/100Base-T Switch Modules
• Switch 8000M	9.4 kg (20.7 lbs)

Electrical

The Switch 4000M and 8000M automatically adjust to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz.

AC voltage:	100–127 volts	200–240 volts
Maximum current:	2.0 A	1.0 A
Frequency range:	50/60 Hz	50/60 Hz

Environmental

	Operating	**Non-Operating**
Temperature:	0°C to 55°C (32°F to 131°F)	-40°C to 70°C (-40°F to 158°F)
Relative humidity: (non-condensing)	15% to 95% at 40°C (104°F)	15% to 90% at 65°C (149°F)
Maximum altitude:	4.6 Km (15,000 ft)	4.6 Km (15,000 ft)

Acoustic

Geraeuschemission LwA=58 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19

Connectors

- The 10/100 Mbps RJ-45 twisted-pair ports are compatible with the IEEE 802.3u 100Base-T standard.
- The 100 Mbps SC fiber-optic are compatible with the IEEE 802.3u 100Base-FX standard.
- The 10 Mbps ST fiber-optic ports are compatible with the IEEE 802.3 Type 10Base-FL standard.
- The 1000 Mbps SC fiber-optic ports are compatible with the IEEE 802.3z Gigabit-SX standard.

Safety

- EN60950 / IEC 950
- CSA 950
- NOM-019-SCFI-1994
- UL 1950

Cables and Connectors

This appendix includes minimum pin-out information and specifications for cables that should be used with the switch modules for the Switch 4000M and 8000M.

Note Incorrectly wired cabling is the most common cause of problems for LAN communications. HP recommends that you work with a qualified LAN cable installer for assistance with your cabling requirements.

Twisted-Pair Cable/Connector Pin-Outs

The RJ-45 ports on the 10/100Base-TX Switch Module are wired as MDI-X ports. The type of twisted-pair cable you connect to these ports (either "straight through" or "crossover") depends on the type of device at the other end of the cable.

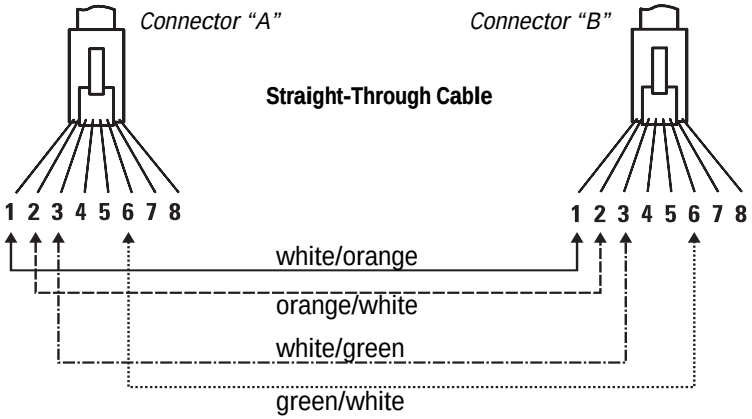
The rule is, *when connecting same-type ports together (for example MDI-X-to-MDI-X), use crossover cable; when connecting opposite-type ports together (for example MDI-X-to-MDI), use straight-through cable.*

These additional rules apply:

- All twisted-pair wires used must be twisted through the entire length of the cable. The wiring sequence must conform to EIA/TIA 568B or AT&T 258A (not USOC). See "Twisted-Pair Cable Pin Assignments" later in this appendix for a listing of the signals used on each pin.
- For connections to the 10 Mbps ports, you can use Category 3, 4, or 5 unshielded twisted-pair cable, as supported by the IEEE 802.3 Type 10Base-T standard.
- For connections to the 100 Mbps ports, use 100-ohm Category 5 UTP or STP cable only, as supported by the IEEE 802.3u Type 100Base-TX standard.

Twisted-Pair Cable for Switch (MDI-X) to Computer (MDI) Network Connection

To connect PCs or other MDI network devices to these ports, use a "straight-through" cable.



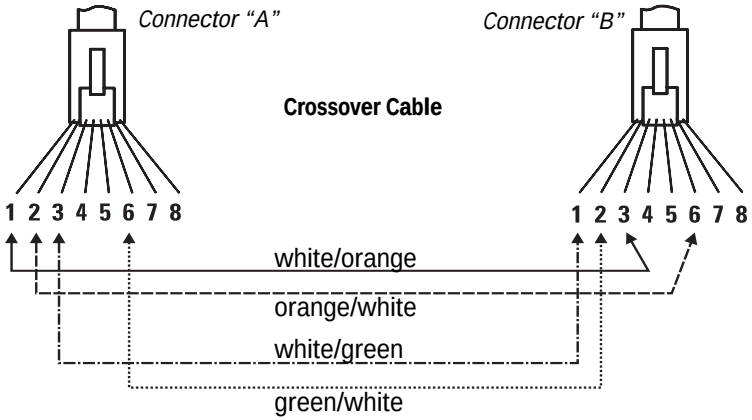
Note

Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".
Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".

Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

Twisted-Pair Cable for Switch (MDI-X) to Hub or Switch (MDI-X) Network Connection

To connect hubs or switches or other MDI-X network devices to these ports, use a "crossover" cable.



Note

Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".
Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".

Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

Twisted-Pair Cable Pin Assignments

Twisted-Pair Straight-Through Cable

Switch End (MDI-X)		**Computer, Transceiver, or Other MDI Port End**	
Signal	**Pins**	**Pins**	**Signal**
receive +	1	1	transmit +
receive -	2	2	transmit -
transmit +	3	3	receive +
transmit -	6	6	receive -

Twisted-Pair Cross-Over Cable

Switch End (MDI-X)		**Hub or Switch Port, or Other MDI-X Port End**	
Signal	**Pins**	**Pins**	**Signal**
receive +	1	6	transmit -
receive -	2	3	transmit +
transmit +	3	2	receive -
transmit -	6	1	receive +

Fiber-Optic Cables

10Base-FL Ports

Fiber-optic cables connected to the 10Base-FL Switch Module ports must be 850 nm wavelength, multimode cable conforming to the ISO/IEC 793-2 type B1, and ITU-T G.652 standards, and the cables must have ST-type connectors.

100Base-FX Ports

Fiber-optic cables connected to the 100Base-FX Switch Module ports must be 1300 nm wavelength, multimode cable conforming to the ISO/IEC 793-2 type B1, and ITU-T G.652 standards, and the cables must have SC-type connectors.

Gigabit-SX Ports

Fiber-optic cables connected to the Gigabit-SX Switch Module ports must be 850 nm wavelength, multimode cable that are fitted with SC-type connectors.

Safety and EMC Regulatory Statements

Safety Information



Documentation reference symbol. If the product is marked with this symbol, refer to the product documentation to get more information about the product.

WARNING — A WARNING in the manual denotes a hazard that can cause injury or death.

CAUTION — A CAUTION in the manual denotes a hazard that can damage equipment.

Do not proceed beyond a WARNING or CAUTION notice until you have understood the hazardous conditions and have taken appropriate steps.

Grounding
These are safety class I products and have protective earthing terminals. There must be an uninterruptible safety earth ground from the main power source to the product's input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

For LAN cable grounding:

- If your LAN covers an area served by more than one power distribution system, be sure their safety grounds are securely interconnected.
- LAN cables may occasionally be subject to hazardous transient voltages (such as lightning or disturbances in the electrical utilities power grid). Handle exposed metal components of the network with caution.

Servicing
There are no user-serviceable parts inside these products. Any servicing, adjustment, maintenance, or repair must be performed only by service-trained personnel.

These products do not have a power switch; they are powered on when the power cord is plugged in.

Informations concernant la sécurité



Symbole de référence à la documentation. Si le produit est marqué de ce symbole, reportez-vous à la documentation du produit afin d'obtenir des informations plus détaillées.

WARNING — Dans la documentation, un WARNING indique un danger susceptible d'entraîner des dommages corporels ou la mort.

CAUTION — Un texte de mise en garde intitulé CAUTION indique un danger susceptible de causer des dommages à l'équipement.

Ne continuez pas au-delà d'une rubrique WARNING ou CAUTION avant d'avoir bien compris les conditions présentant un danger et pris les mesures appropriées.

Cet appareil est un produit de classe I et possède une borne de mise à la terre. La source d'alimentation principale doit être munie d'une prise de terre de sécurité installée aux bornes du câblage d'entrée, sur le cordon d'alimentation ou le cordon de raccordement fourni avec le produit. Lorsque cette protection semble avoir été endommagée, débrancher le cordon d'alimentation jusqu'à ce que la mise à la terre ait été réparée.

Mise à la terre du câble de réseau local:

- si votre réseau local s'étend sur une zone desservie par plus d'un système de distribution de puissance, assurez-vous que les prises de terre de sécurité soient convenablement interconnectées.
- Les câbles de réseaux locaux peuvent occasionnellement être soumis à des surtensions transitoires dangereuses (telles que la foudre ou des perturbations dans le réseau d'alimentation public). Manipulez les composants métalliques du réseau avec précautions.

Aucune pièce contenue à l'intérieur de ce produit ne peut être réparée par l'utilisateur. Tout dépannage, réglage, entretien ou réparation devra être confié exclusivement à un personnel qualifié.

Cet appareil ne comporte pas de commutateur principal ; la mise sous tension est effectuée par branchement du cordon d'alimentation.

Hinweise zur Sicherheit



Symbol für Dokumentationsverweis. Wenn das Produkt mit diesem Symbol markiert ist, schlagen Sie bitte in der Produktdokumentation nach, um mehr Informationen über das Produkt zu erhalten.

WARNING — Symbol für Dokumentationsverweis. Wenn das Produkt mit diesem Symbol markiert ist, schlagen Sie bitte in der Produktdokumentation nach, um mehr Informationen über das Produkt zu erhalten.

CAUTION — Symbol für Dokumentationsverweis. Wenn das Produkt mit diesem Symbol markiert ist, schlagen Sie bitte in der Produktdokumentation nach, um mehr Informationen über das Produkt zu erhalten.

Fahren Sie nach dem Hinweis WARNING oder CAUTION erst fort, nachdem Sie den Gefahrenzustand verstanden und die entsprechenden Maßnahmen ergriffen haben.

Dies ist ein Gerät der Sicherheitsklasse I und verfügt über einen schützenden Erdungsterminal. Der Betrieb des Geräts erfordert eine ununterbrochene Sicherheitserdung von der Hauptstromquelle zu den Geräteingabeterminals, den Netzkabeln oder dem mit Strom belieferten Netzkabelsatz voraus. Sobald Grund zur Annahme besteht, daß der Schutz beeinträchtigt worden ist, das Netzkabel aus der Wandsteckdose herausziehen, bis die Erdung wiederhergestellt ist.

Für LAN-Kabelerdung:

- Wenn Ihr LAN ein Gebiet umfaßt, das von mehr als einem Stromverteilungssystem beliefert wird, müssen Sie sich vergewissern, daß die Sicherheitserdungen fest untereinander verbunden sind.
- LAN-Kabel können gelegentlich gefährlichen Übergangsspannungen ausgesetzt werden (beispielsweise durch Blitz oder Störungen in dem Starkstromnetz des Elektrizitätswerks). Bei der Handhabung exponierter Metallbestandteile des Netzwerkes Vorsicht walten lassen.

Dieses Gerät enthält innen keine durch den Benutzer zu wartenden Teile. Wartungs-, Anpassungs-, Instandhaltungs- oder Reparaturarbeiten dürfen nur von geschultem Bedienungspersonal durchgeführt werden.

Dieses Gerät hat keinen Netzschalter; es wird beim Anschließen des Netzkabels eingeschaltet.

Considerazioni sulla sicurezza



Simbolo di riferimento alla documentazione. Se il prodotto è contrassegnato da questo simbolo, fare riferimento alla documentazione sul prodotto per ulteriori informazioni su di esso.

WARNING — La dicitura WARNINGdenota un pericolo che può causare lesioni o morte.

CAUTION — La diciturаCAUTION denota un pericolo che può danneggiare le attrezzature.

Non procedere oltre un avviso di WARNING o di CAUTIONprima di aver compreso le condizioni di rischio e aver provveduto alle misure del caso.

Questo prodotto è omologato nella classe di sicurezza I ed ha un terminale protettivo di collegamento a terra. Dev'essere installato un collegamento a terra di sicurezza, non interrompibile che vada dalla fonte d'alimentazione principale ai terminali d'entrata, al cavo d'alimentazione oppure al set cavo d'alimentazione fornito con il prodotto. Ogniqualvolta vi sia probabilità di danneggiamento della protezione, disinserite il cavo d'alimentazione fino a quando il collegaento a terra non sia stato ripristinato.

Per la messa a terra dei cavi LAN:

- se la vostra LAN copre un'area servita da più di un sistema di distribuzione elettrica, accertatevi che i collegamenti a terra di sicurezza siano ben collegati fra loro;
- i cavi LAN possono occasionalmente andare soggetti a pericolose tensioni transitorie (ad esempio, provocate da lampi o disturbi nella griglia d'alimentazione della società elettrica); siate cauti nel toccare parti esposte in metallo della rete.

Nessun componente di questo prodotto può essere riparato dall'utente. Qualsiasi lavoro di riparazione, messa a punto, manutenzione o assistenza va effettuato esclusivamente da personale specializzato.

Questo apparato non possiede un commutatore principale; si mette scotto tensione all'inserirsi il cavo d'alimentazione.

Consideraciones sobre seguridad



Símbolo de referencia a la documentación. Si el producto va marcado con este símbolo, consultar la documentación del producto a fin de obtener mayor información sobre el producto.

WARNING — Una WARNING en la documentación señala un riesgo que podría resultar en lesiones o la muerte.

CAUTION — Una CAUTION en la documentación señala un riesgo que podría resultar en averías al equipo.

No proseguir después de un símbolo de WARNING o CAUTION hasta no haber entendido las condiciones peligrosas y haber tomado las medidas apropiadas.

Este aparato se enmarca dentro de la clase I de seguridad y se encuentra protegido por una borna de puesta a tierra. Es preciso que exista una puesta a tierra continua desde la toma de alimentación eléctrica hasta las bornas de los cables de entrada del aparato, el cable de alimentación o el juego de cable de alimentación suministrado. Si existe la probabilidad de que la protección a tierra haya sufrido desperfectos, desenchufar el cable de alimentación hasta haberse subsanado el problema.

Puesta a tierra del cable de la red local (LAN):

- Si la LAN abarca un área cuyo suministro eléctrico proviene de más de una red de distribución de electricidad, cerciorarse de que las puestas a tierra estén conectadas entre sí de modo seguro.
- Es posible que los cables de la LAN se vean sometidos de vez en cuando a voltajes momentáneos que entrañen peligro (rayos o alteraciones en la red de energía eléctrica). Manejar con precaución los componentes de metal de la LAN que estén al descubierto.

Este aparato no contiene pieza alguna susceptible de reparación por parte del usuario. Todas las reparaciones, ajustes o servicio de mantenimiento debe realizarlos solamente el técnico.

Este producto no tiene interruptor de potencia; se activa cuando se enchufa el cable de alimentación.

Safety Information (Japan)

安全性の考慮

安全記号



マニュアル参照記号。製品にこの記号がついている場合はマニュアルを参照し、注意事項等をご確認ください。

WARNING　マニュアル中の「WARNING」は人身事故の原因となる危険を示します。

CAUTION　マニュアル中の「CAUTION」は装置破損の原因となる危険を示します。

「WARNING」や「CAUTION」の項は飛ばさないで必ずお読みください。危険性に関する記載事項をよく読み、正しい手順に従った上で次の事項に進んでください。

これは安全性クラスIの製品で保護用接地端子を備えています。主電源から製品の入力配線端子、電源コード、または添付の電源コード・セットまでの間、切れ目のない安全接地が存在することが必要です。もしこの保護回路が損なわれたことが推測されるときは、接地が修復されるまで電源コードを外しておいてください。

LAN ケーブルの接地に関して:

- もし貴社の LAN が複数の配電システムにより電力を受けている領域をカバーしている場合には、それらのシステムの安全接地が確実に相互に結合されていることを確認してください。
- LAN ケーブルは時として危険な過度電圧（例えば雷や、配電設備の電力網での障害）にさらされることがあります。露出した金属部分の取扱いには十分な注意をはらってください。

本製品の内部にはユーザーが修理できる部品はありません。サービス、調整、保守および修理はサービス訓練を受けた専門家におまかせください。

本製品には電源スイッチがありません。電源コードを接続したとき電源入となります。

Safety Information (China)

HP 网络产品使用安全手册

使用须知

欢迎使用惠普网络产品，为了您及仪器的安全，请注意如下事项
1. 仪器要和地线相接。要使用有正确接地插头的电源线，使用中国国家规定的220V电源。
2. 避免高湿度和灰尘多的地方，否则易引起仪器内部部件的损坏。
3. 避免接近高温，避免接近直接热源，如直射太阳光、暖气等其它发热体。
4. 不得有异物或液体落入机内，以免部件短路。
5. 不要将强磁体放置于仪器附近。

警告

为了防止火灾或触电事故，请不要将该机放置于淋雨或潮湿处。

安装

安装辅助管理模块请参看安装指南。

保修及技术支持

如果您按以上步骤正确使用但遇到了问题，或想了解其它产品性能，请按以下方式与我们联络。

如果是硬件故障:
1.与售出单位或当地维修机构联系。
2.惠普维修中心:
北京市海淀区知春路56号　中航科技大厦
邮政编码: 100086
电话: 010-62623888 转 6101
如果是软件问题:
1.惠普技术支持中心热线电话: 010-65053888 转 5858
2.传真自动回复系统: 010-65055280

EMC Regulatory Statements

U.S.A.

FCC Class A

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 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 the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area may cause interference in which case the user will be required to correct the interference at his own expense.

Canada

This product complies with Class A Canadian EMC requirements.

Australia/New Zealand



This product complies with Australia/New Zealand EMC Class A requirements.

Japan

VCCI Class A

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。

Korea

사용자 안내문 : A 급기기

이기기는 업무용으로 전자파 적합등록을 받은 기기이오니, 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.

Taiwan

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

European Community

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747-5502
U.S.A.

declares that the product:

Product Name: HP ProCurve Switch 8000M
HP ProCurve Switch 4000M

Model Number: HP J4110A
HP J4121A

Accessories: HP J4111A, HP J4112A, HP J4113A,
HP J4118A, HP J4119A

conforms to the following Product Specifications:

Safety: EN60950 (1992)+A1,A2 / IEC 950:1991+A1,A2

EMC: EN 55022 (1994) / CISPR-22 (1993) class A
EN50082-1 (1992)
prEN 55024-2 (1992) / IEC 801-2 (1991) 4 kV CD, 8 kV AD
prEN 55024-3 (1991) / IEC 801-3 (1984), 3 V/m
prEN 55024-4 (1992) / IEC 801-4 (1988): 1 kV-(power line)
0.5 kV-(signal line)

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly. LEDs in this product(s) are Class-1 in accordance with EN60825-1:1994.

Tested with Hewlett-Packard Co. products only.

Roseville, June 16, 1998

Karen Dorchak, Quality Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE, Herrenberger Strasse 130, D-71034 Böblingen (FAX:+49-7031-14-3143).

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