installation and
getting started guide

hp procurve
switch 4108gl

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HP Procurve
Switch 4108GL

Installation and Getting Started Guide

Applicable Products

HP Procurve Switch 4108GL (HP J4865A)
HP Procurve Switch 4108GL Bundle (HP J4861A)

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Before installing and operating these products, please read the "Installation Precautions" in chapter 2, "Installing the Switch 4108GL", and the safety statements in appendix C, "Safety and Regulatory Statements".

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C Safety and EMC Regulatory Statements

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Introducing the HP Procurve Switch 4108GL and Switch 4108GL Bundle

The HP Procurve Switch 4108GL is a multiport switch that can be used to build high-performance switched workgroup networks. This switch is a store-and-forward device that offers low latency for high-speed networking.

The Switch 4108GL is available as an open 8-slot chassis (J4865A) or as the Switch 4108GL Bundle (J4861A) with one 3-port Gigabit Transceiver GL Module and three 24-port 10/100-TX GL Modules pre-installed.

HP Procurve Switch 4108GL Bundle (HP J4861A)

with one Gigabit Transceiver GL Module and three 10/100-TX GL Modules preinstalled
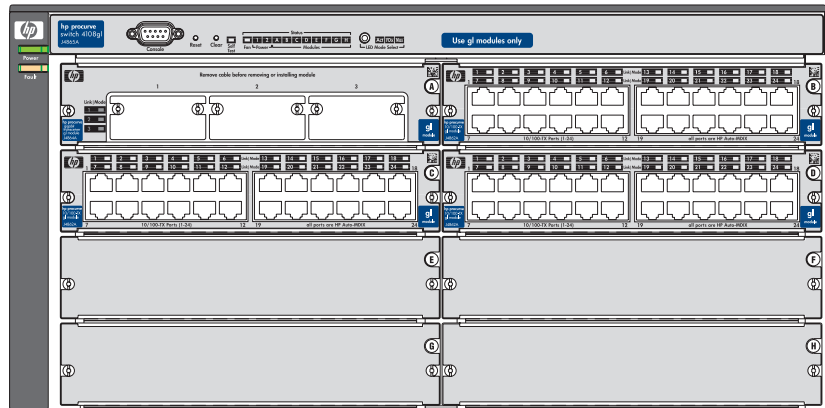
HP Procurve Switch4108GL (HP J4865A)
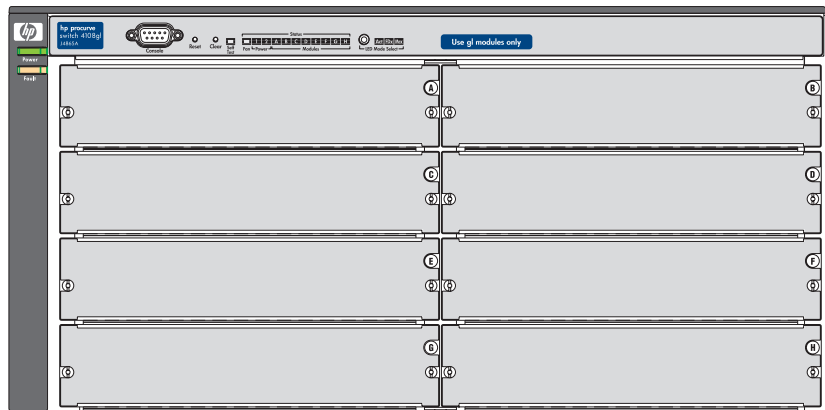
Throughout this manual, these switches will be collectively identified as the Switch 4108GL.

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 4108GL including:

■ Front and back of the switch

■ Features

■ Switch operation overview

Front of the Switch

Power
and Fault
LEDs

Console
Port

Reset and Clear
buttons

Status LEDs for the
Fans, Power Supplies,
and Switch Modules

LED Mode Select button
and indicator LEDs

Self Test LED

Switch Modules and slots
with Link and Mode LEDs for each port located on each module
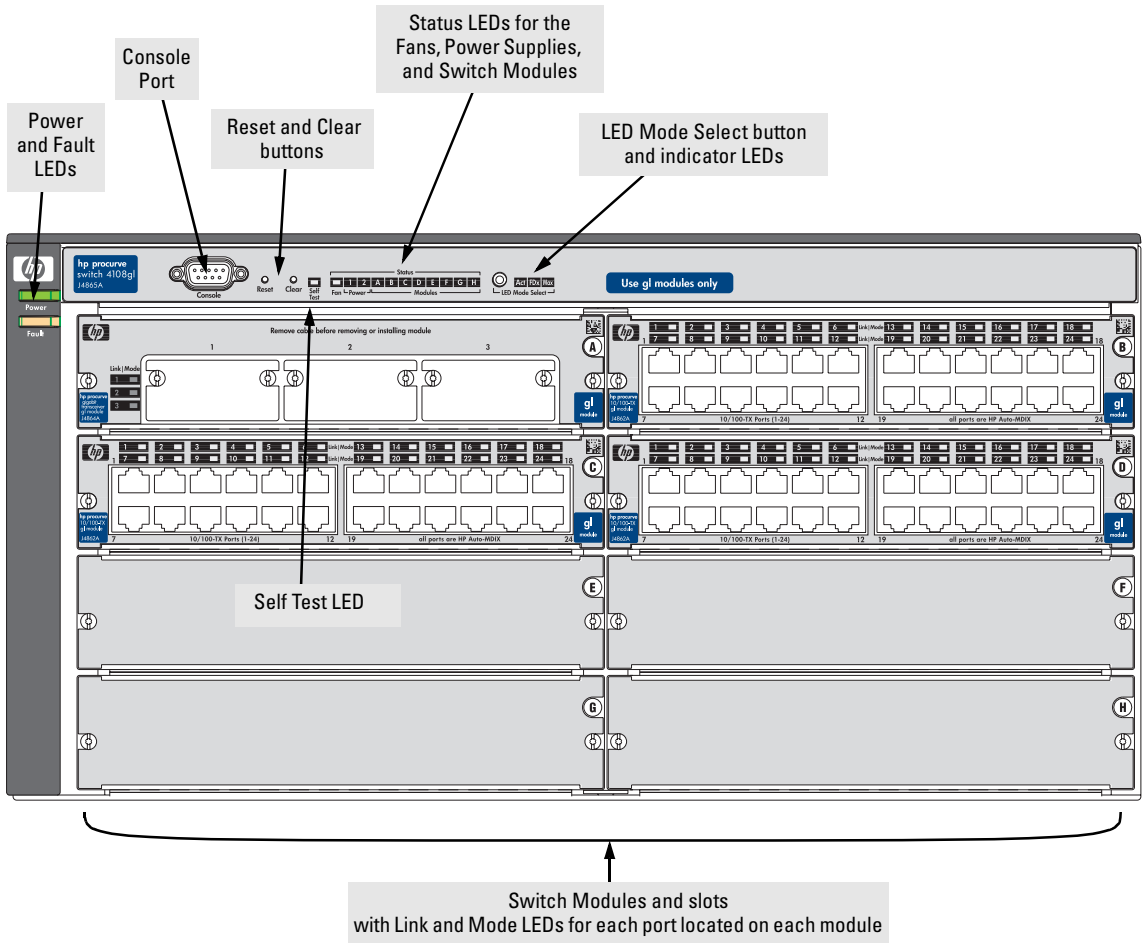
LEDs

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

Table 1-1.   Switch Chassis 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, 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.
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.
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.
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.

LEDs	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.
LED 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.
	Max	Indicates that the port Mode LEDs are lit for ports that are operating at their maximum possible link speed -- for any Gigabit-capable connection, that would be 1000 Mbps; for the 10/100-TX ports and 100-FX ports, that would be 100 Mbps.
[†] The flashing behavior is an on/off cycle once every 1.6 seconds, approximately.		

Table 1-2.   Switch Module LEDs

The following LEDs are located on the modules themselves, one pair for each port.

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 maximum speed operation depending on the mode selected. See "LED Mode Select Button and Indicator LEDs" below for more information.

LED 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 4108GL uses a Mode LED for each port. The operation of this LED is controlled by the LED Mode Select button on the switch chassis, and the current setting is indicated by the mode indicator LEDs near the button. Press the button to change from one mode to the next.
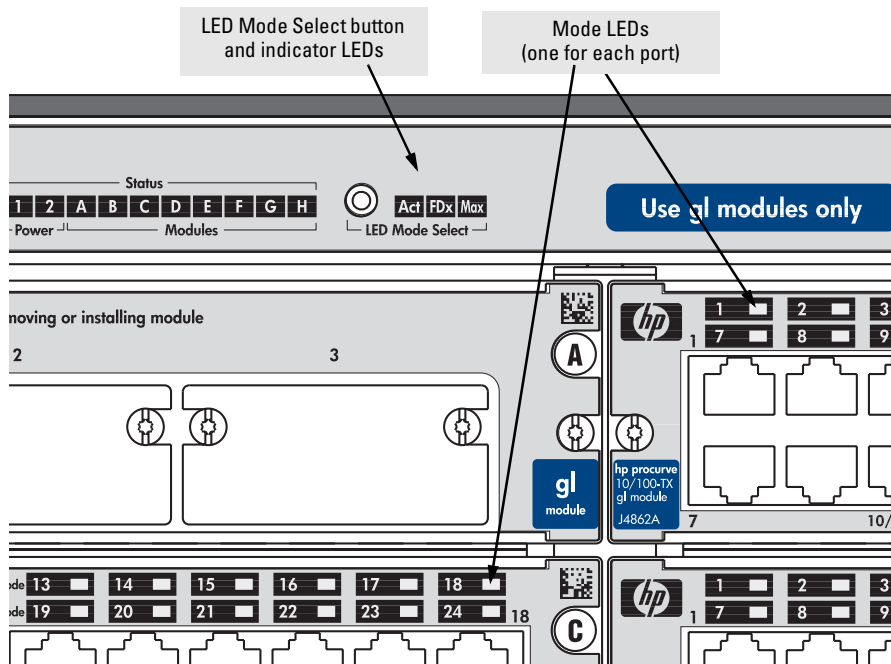
- If the Activity (Act) indicator LED is lit, each port Mode LED displays activity information for the port—it flickers as network traffic is received and transmitted through the port.

- 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 maximum speed (Max) indicator LED is lit, the port Mode LEDs light for those ports that are operating at their maximum possible link speed.

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 4108GL". 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.

Press the Reset button also after changing the module type that is installed in any of the switch module slots while the switch is powered on. In this case, the switch must be reset to initialize the new module type. See "Hot Swapping Switch Modules" on page 2-20.

Clear Button

This button is used for these purposes:

■ **Deleting Passwords** - When pressed by itself for at least one second, the Clear button 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, the Clear button clears any configuration changes you may have made through the switch console, the web browser interface, or 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
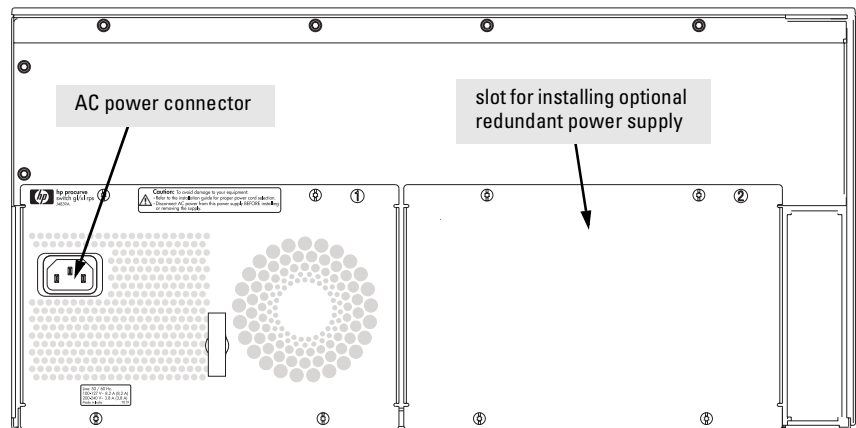
Power Connector

The Switch 4108GL 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 GL/XL RPS, HP J4839A) 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:**
> • Refer to the installation guide for proper power cord selection.
> • Disconnect AC power from this power supply BEFORE installing or removing the supply. Otherwise, damage to the equipment may result.

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 4108GL include:

- 8 slots for installing any of the available Switch GL Modules—as of this printing, this includes:
    - 24-port 10/100-TX GL Module (HP J4864A)
    - 6-port 100/1000-T GL Module (HP J4863A)
    - 3-port Gigabit Transceiver GL Module (HP J4862A) -- into which you can install any of five different transceiver types including Gigabit-SX, Gigabit-LX, 100/1000Base-T, Gigabit Stacking, and 100Base-FX.

    The Switch 4108GL Bundle has one Gigabit Transceiver GL Module and three 10/100-TX GL Modules preinstalled.

- the modules can be installed in any order and in any combination and can be "hot swapped".

- high performance -- 36.6 Gbps switching fabric.

- 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.

- full-duplex operation available on all 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 30 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—for a description, see the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch.

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 4108GL'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 4108GL 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.

Note: Usually, multicast and broadcast packets are flooded, although configuration of software features influence that behavior.

Network Moves and Changes. When devices are moved in the network, and become connected to a different switch port, the Switch 4108GL 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 required address table manipulation.

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 4108GL Management and Configuration Guide* that is included on the documentation CD-ROM that came with your switch.

Installing the Switch 4108GL

The HP Switch 4108GL and Switch 4108GL Bundle are easy to install units. They 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 it can be securely located on a horizontal surface. The brackets are designed to allow mounting the switch in a variety of orientations.

This chapter shows you how to install your Switch 4108GL.

Included Parts

The Switch 4108GL and Switch 4108GL Bundle have the following components shipped with them:

■ *HP Procurve Switch 4108GL Installation Guide* (5969-2376), this manual

■ *HP Procurve Switch 4108GL Documentation CD ROM*
   (contains a PDF file copies of the *HP Procurve Switch 4108GL Management and Configuration Guide*, this *Installation and Getting Started Guide*, and other related documentation)

■ *HP TopTools for Hubs & Switches* - CD ROM and booklet

■ Customer Support/Warranty booklet

■ Accessory kit (5065-6521)
   • 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	Switzerland	8120-6807
China	8120-8377	United Kingdom/	
Continental Europe	8120-6802	Hong Kong/Singapore	8120-8709
Denmark	8120-6806	United States/Canada/Mexico	8121-0605
Japan	8121-0606		

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 2-5).** 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 2-4 for some installation precautions.*

2. **Install switch modules (page 2-7).** The Switch 4108GL has eight universal slots for installing any of the HP Procurve Switch GL modules. The Switch 4108GL Bundle has three 24-port 10/100-TX GL Modules and one 3-port Transceiver GL Module preinstalled. Depending on where you will install the Switch 4108GL, it may be easier to install the modules first. The modules are "hot swappable" though — they can also be installed and removed after the switch is powered on.

    Note: Make sure you use only HP Procurve Switch GL Modules in your Switch 4108GL.

3. **(Optional) Install second power supply (page 2-9).** The Switch 4108GL has 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.

4. **Verify that the switch passes self test (page 2-11).** 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 2-13).** The Switch 4108GL can be mounted in a 19-inch telco rack, in an equipment cabinet, on a wall, or on a horizontal surface. There are some limitations to the wall mounting orientations that are supported, however. Please see the installation details for more information.

6. **Connect power to the switch (page 2-17).** Once the switch is mounted, plug it in to the nearby main power source.

7. **Connect the network devices (page 2-17).** Using the appropriate network cables, connect other switches, hubs, routers, computers, servers, printers, and other network devices to the switch ports. For more information, see "Connect the Network Devices" on page 2-17.

    Note: The 10/100Base-TX ports on the 10/100-TX GL Module have the **HP Auto-MDIX** feature, and the 100/1000Base-T ports on the 100/1000-T GL Module comply with IEEE 802.3x standard which includes the **Auto MDI/MDI-X** feature. These two features operate the same and allow you to use straight-through twisted-pair cable for all of your twisted-pair network connections.

8. **(Optional) Connect a console to the switch (page 2-18).** 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.

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Installation Precautions

Follow these precautions when installing your HP Switch 4108GL:

Warnings

■ **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.**

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

■ **Make sure that for any switch power supply slot into which a power supply is not installed, the cover plate is installed to cover the slot. A cover plate is required for safe operation, and to ensure proper switch cooling.**

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 power supply, be sure the cord is adequately sized for the switch's current requirements. In addition, 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 power supply.

■ When installing the switch, note that the AC outlet should be near the switch and should be easily accessible in case the switch must be powered off.

■ 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).

■ Allow three to four inches of space around the sides of the switch to make sure the air flow for the switch is not restricted.

■ Make sure that for any switch slot into which no module is installed, or any transceiver slot into which no transceiver 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. For safety, you should never have more than one module slot uncovered at a time while the switch is powered on.

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
Twisted-Pair Cables		
10/100Base-TX (on the 10/100-TX GL Module)	• **10 Mbps operation:** Category 3, 4, or 5, 100-ohm differential unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable • **100 Mbps operation:** Category 5, 100-ohm differential UTP or STP cable.	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. The 10/100-Base-TX ports on the Switch 4108GL 10/100-TX Module include the "**HP Auto-MDIX**" feature, which allows you to use either straight-through or crossover twisted-pair cables for connecting to *any* network devices including end nodes, such as computers, or to other switches, hubs, and routers.
100/1000Base-T (on the 100/1000-T GL Module and the 100/1000-T Transceiver)	**For either 100 Mbps or 1000 Mbps operation:** Category 5 or better, 100-ohm differential UTP or STP balanced cable. For 1000 Mbps (gigabit) operation, Category 5E cabling or better is recommended. **Note:** For 1000 Mbps operation, all four wire pairs are used for data transmission.	100 meters **Note:** The HP Procurve 100/1000-T GL Module and 100/1000-T Transceiver are compatible with the IEEE 802.3ab standard including the **"Auto MDI/MDI-X"** feature, which allows you to use either straight-through or crossover twisted-pair cables for connecting to any network devices including end nodes, such as computers, or to other switches, hubs, and routers.

Port Type	Cable Type	Length Limits
Fiber Optic Cables		
100Base-FX (on the 100-FX Transceiver)	62.5/125 μm or 50/125 μm core/cladding diameter, graded-index, multimode fiber-optic cables that are fitted with SC connectors	• 2 kilometers for full-duplex connections

Gigabit-SX (on the Gigabit-SX Transceiver)	62.5/125 μm or 50/125 μm core/cladding diameter, graded-index, multimode fiber-optic cables that are fitted with SC connectors	• 62.5 μm cable:
		  – 160 MHz*km = 220 meters
		  – 200 MHz*km = 275 meters
		• 50 μm cable:
		  – 400 MHz*km = 500 meters
		  – 500 MHz*km = 550 meters

Gigabit-LX (on the Gigabit-LX Transceiver)	Single-mode cables fitted with SC connectors. 62.5/125 μm or 50/125 μm core/cladding diameter, graded-index, multimode fiber-optic cables may also be used, but a mode conditioning patch cord may be needed — see the *Installation Guide* that came with the transceiver for more information.	• single-mode cable - 5 kilometers • multimode cable - 550 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.

■ On the sides of the switch, leave at least 7.6 cm (3 inches) for cooling.

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.

Avoid any electrostatic discharge problems by handling the modules only by their bulkheads.

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.
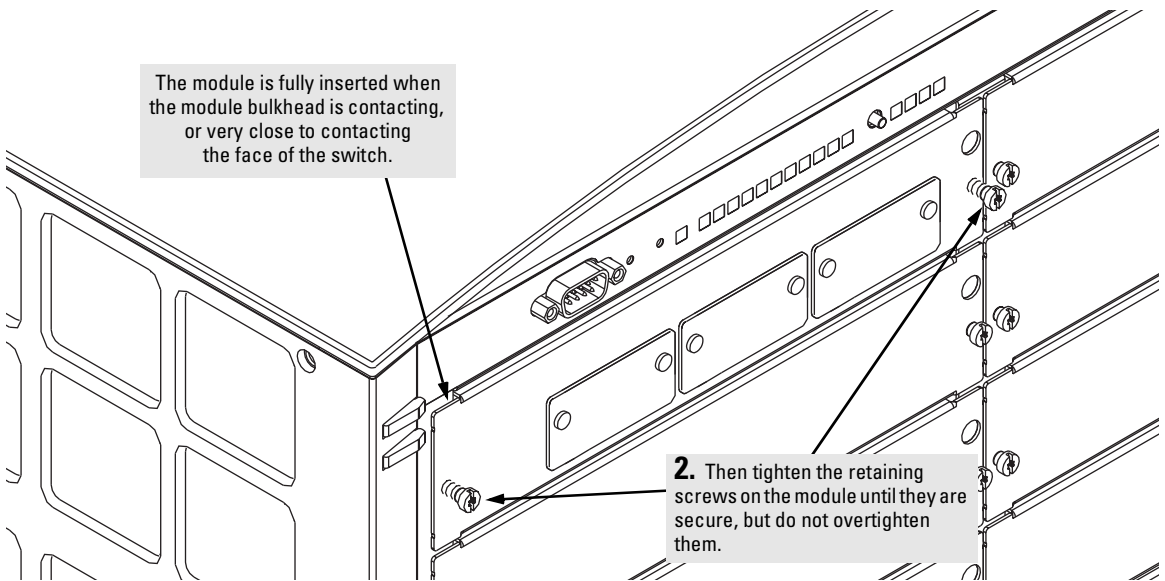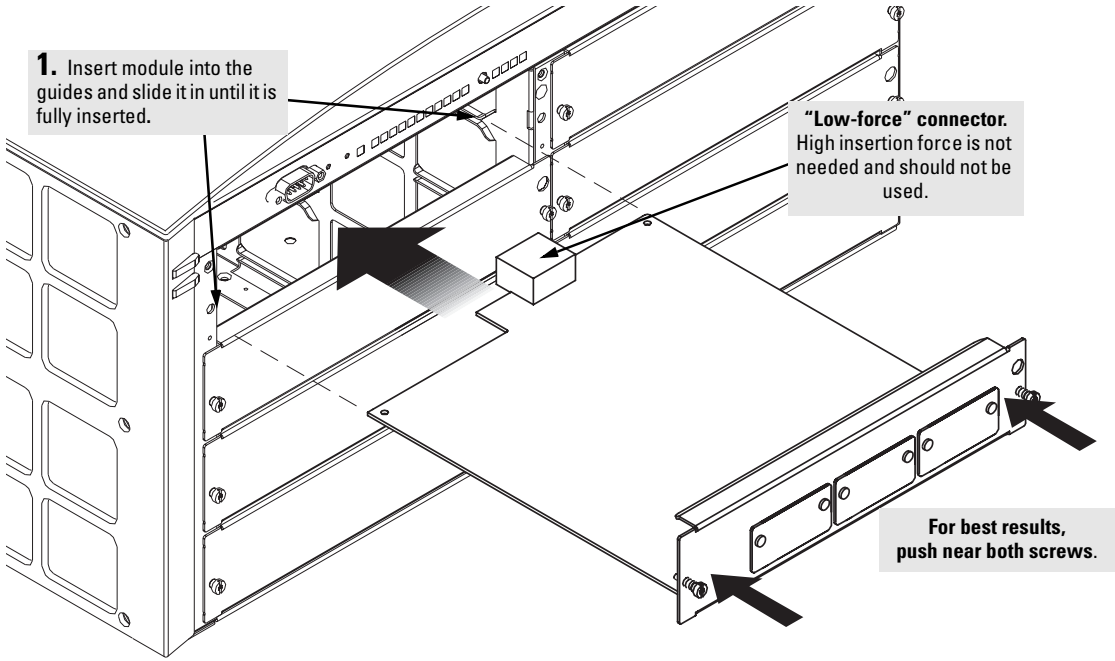
Module Installation Notes

- Any of the supported switch modules can be installed in any of the slots.
- The modules can be "hot swapped", installed while 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 2-20.
- *The modules employ "low-force" connectors. Using high force to insert the modules is not needed and should not be used.*
- *Make sure that you fully insert the modules.* That is, press the module into the slot until the bulkhead on the module is contacting or is very close to contacting the front face of the switch chassis.
- Once the module is fully inserted, make sure that you screw in the two 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. *For safety, you should not have more than one slot uncovered at a time.*

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1. Insert module into the guides and slide it in until it is fully inserted.

"Low-force" connector. High insertion force is not needed and should not be used.

For best results, push near both screws.

The module is fully inserted when the module bulkhead is contacting, or very close to contacting the face of the switch.

2. Then tighten the retaining screws on the module until they are secure, but do not overtighten them.

3. (Optional) Install Second Power Supply

A second, load-sharing redundant power supply (HP Procurve Switch GL/XL RPS, HP J4839A) 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 screw-driver. 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:**
> /!\ • Refer to the installation guide for proper power cord selection.
> • Disconnect AC power from this power supply BEFORE installing or removing the supply. Otherwise, damage to the equipment may result.

For safety and proper switch cooling, if either of the power supply slots are not being used, make sure to attach the cover plate over the slot. Please see the Installation Precautions on page 2-4 for more information.

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

Insert the power supply into the opening, then slide it all the way in until it connects to the switch. The power supply face plate will be flush with the back face of the switch.
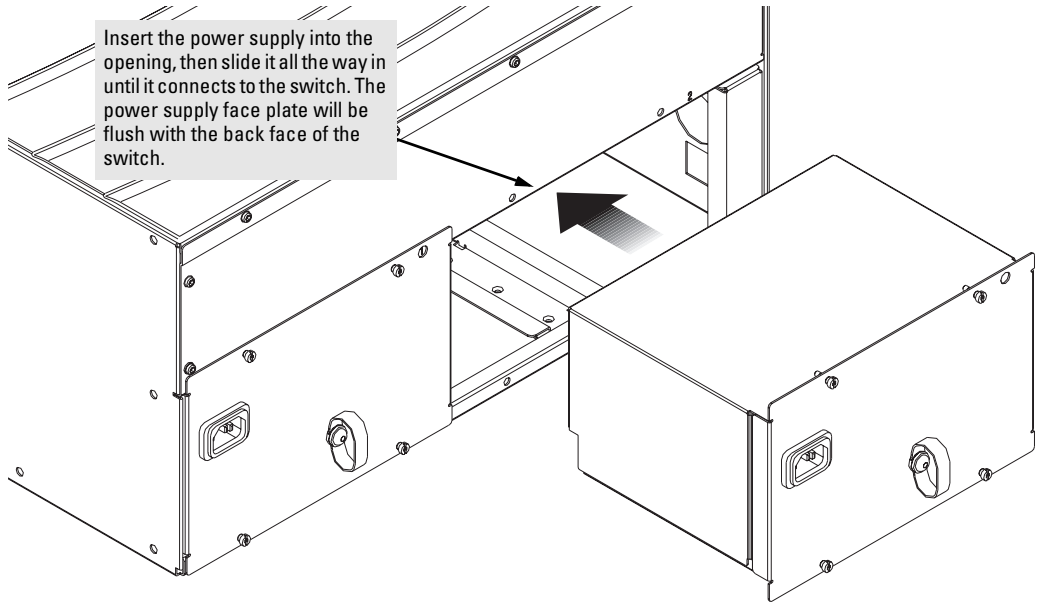
Once the power supply is installed, make sure you tighten the four retaining screws that hold it in place. The screws can be tightened with either a flat-bladed or Torx T-10 screwdriver. *Be careful not to overtighten the screws.*


tighten the four screws
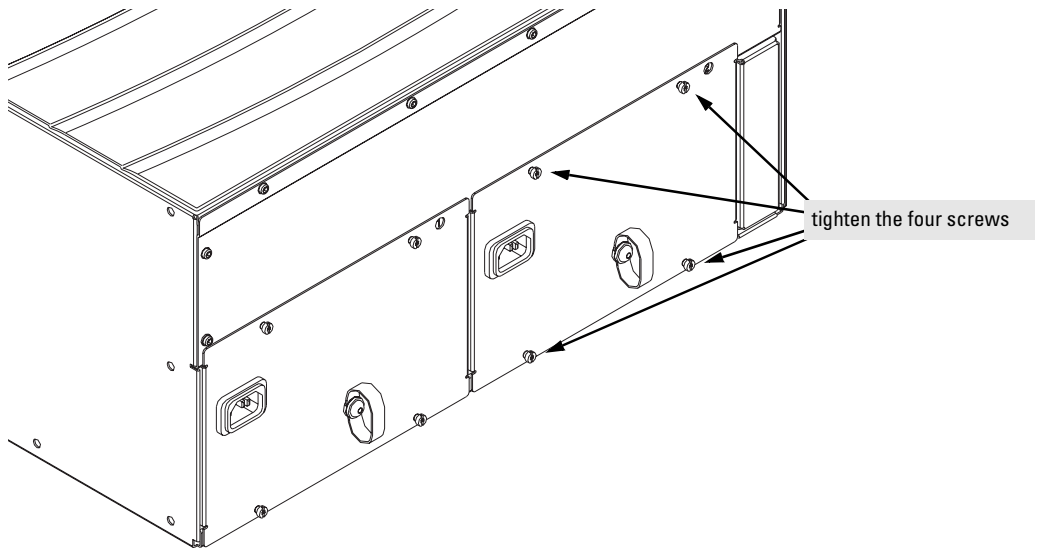
4. Verify the Switch Passes Self Test

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.

Connect power cord to power connector
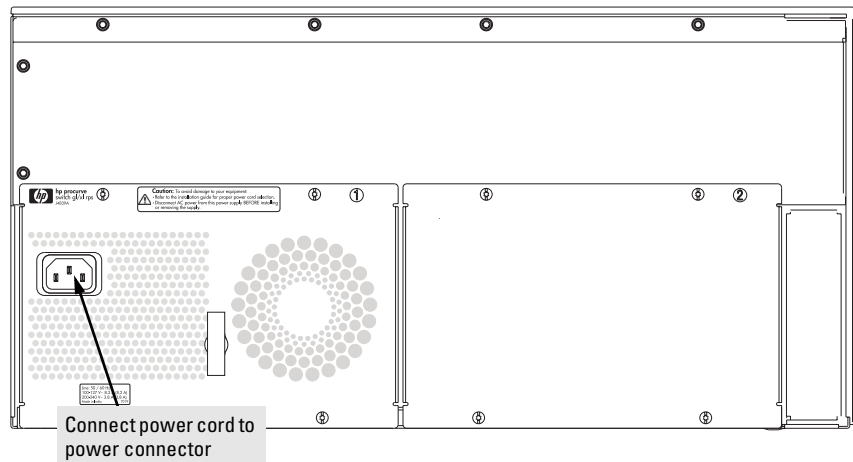
N o t e   The Switch 4108GL does not have a power switch. It is powered on when the power cord is connected to the switch and to a power source.

If your installation requires a different power cord than the one supplied with the switch, please see the Installation Precautions on page 2-4.

2. Check the LEDs on the switch 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 the Fault LED stays on for more than approximately 120 seconds or it starts flashing, the self test has not completed correctly. Refer to chapter 3, "Troubleshooting" for diagnostic help.

Switch Chassis LEDs

switch module LEDs:
Link and Mode LEDs
for each port
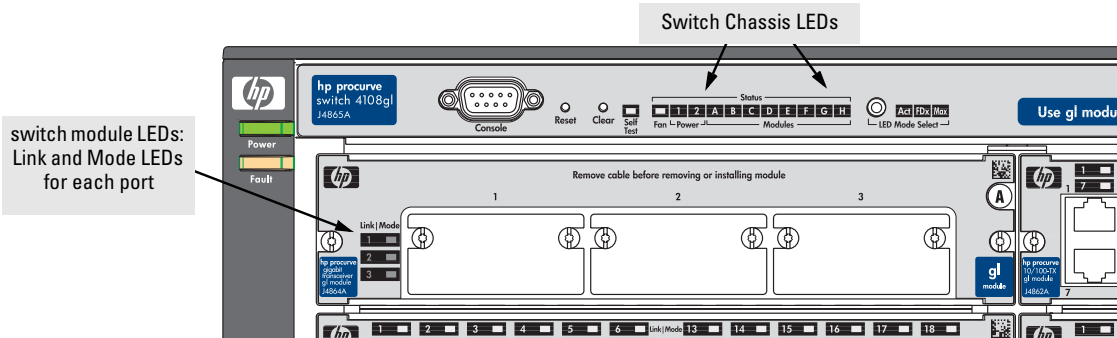
When the switch is powered on, it performs its diagnostic self test. The entire download, initialization, and self test process can take up to 2 minutes for a fully loaded chassis, depending on the number and type of modules installed in the switch.

LED Behavior:

During the self test:

- Initially, **Power** and **Fault**, and all the switch chassis LEDs are on. Then, after approximately 20 seconds, the **Fault** LED goes off.

- After approximately 30 seconds, the chassis LEDs go off except **Power**, **Self Test**, **Fan Status**, and **Power Status**, and all the module LEDs go on as the modules receive power.

- When the download of code to the modules is completed, the module LEDs go off.

- For the duration of the self test, the **Self Test** LED stays on.

When the self test completes successfully:

- The **Power** LED stays on, and the Status LEDs on the switch chassis stay on for the devices installed: one for each switch module installed, one for each power supply installed, and one for all the fans.

- The **Fault** and **Self Test** LEDs are 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 4108GL can be mounted in these ways:

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

Rack or Cabinet Mounting

The Switch 4108GL are designed to be mounted in any EIA-standard 19-inch telco rack or in an equipment cabinet such as a server cabinet.
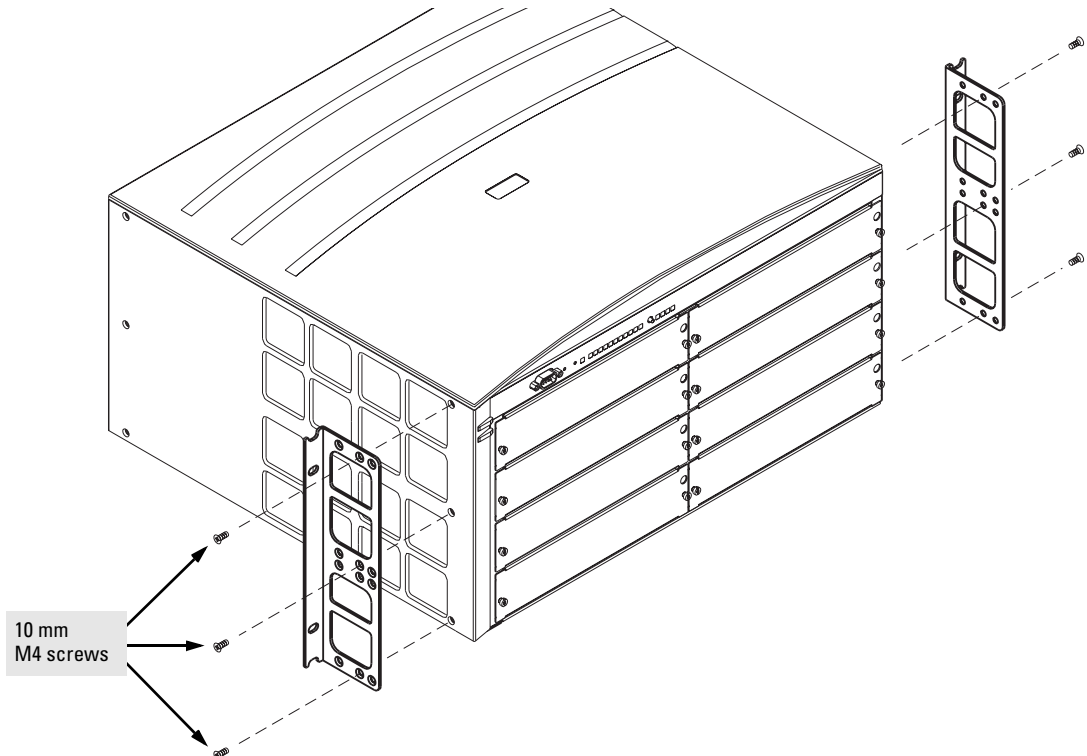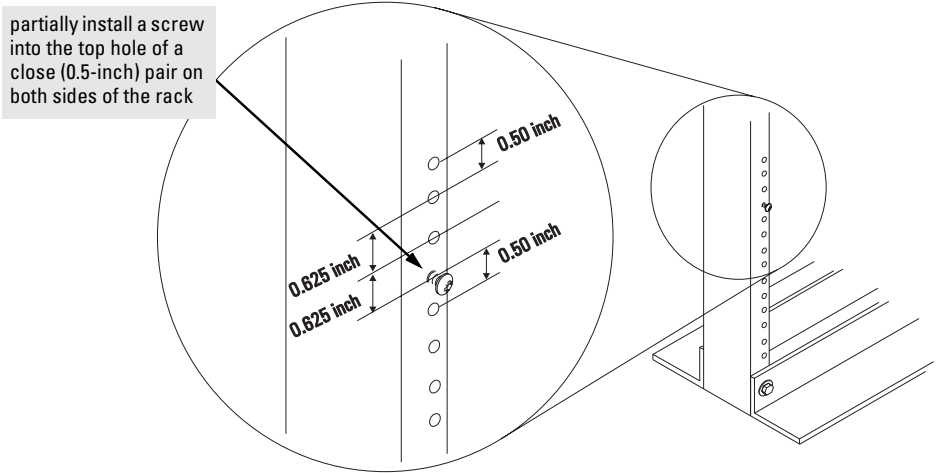
Caution

For safe operation, please read the mounting precautions on page 2-4 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.

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.

partially install a screw into the top hole of a close (0.5-inch) pair on both sides of the rack

0.50 inch

0.50 inch

0.625 inch

0.625 inch

If you are installing the switch in an equipment cabinet, please see the "Equipment Cabinet Note" on the next page.

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.

lower the switch with mounting brackets onto the partially installed screws, then tighten these screws
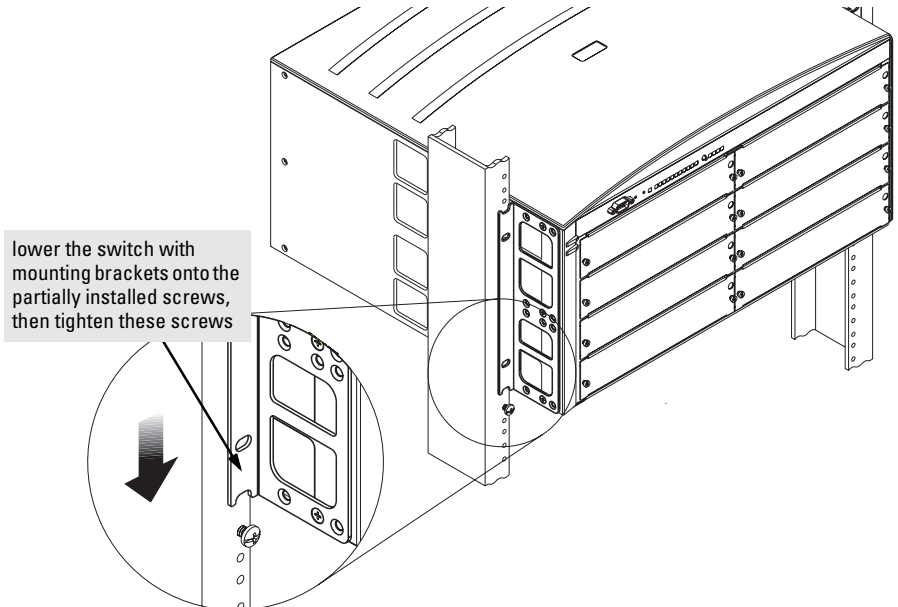
4. Install the other number 12-24 screw into the upper hole in each bracket. Tighten these screws.

install and tighten the other 12-24 screws
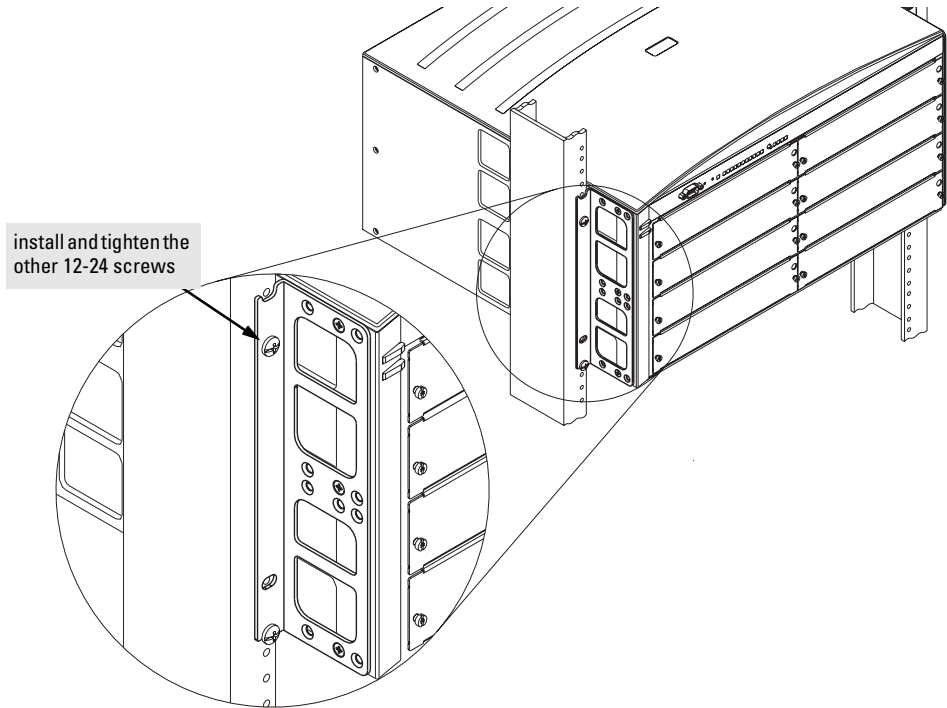
**E q u i p m e n t
C a b i n e t
N o t e**

If you are installing the switch in an **equipment cabinet**, in place of the 12-24 screws supplied with the switch, use the clips and screws that came with the cabinet. Plan which four holes you will be using in the cabinet and install all four clips and partially install the two bottom screws, as described in step 2 on the previous page, before proceeding to step 3.

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.

N o t e

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.

C a u t i o n   The only recommended and supported wall mounting orientation is with the unit upright and the modules facing out, as shown in the illustrations below.

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.

    10 mm M4 screws
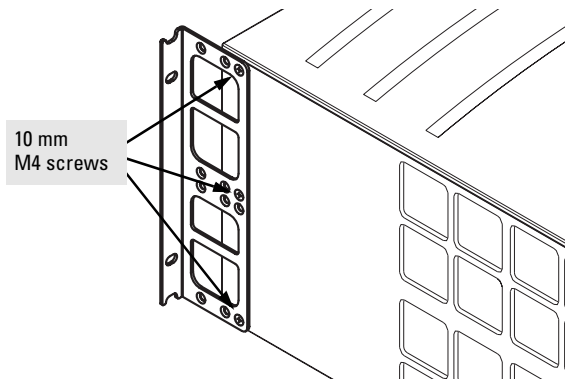
2. Attach the switch to the wall or wood surface with four 5/8-inch number 12 wood screws or larger (not included).

    5/8-inch number 12 wood screws
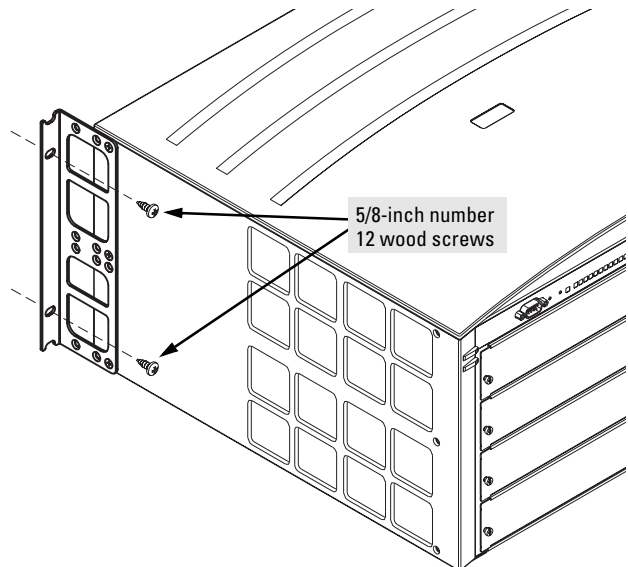
6. Connect the Switch to a Power Source

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 GL/XL RPS Installation Guide* for additional information.

2. Re-check the LEDs during self test. See "LED Behavior" on page 2-12.

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 4108GL. See the documentation accompanying the modules for cabling configurations and procedures for those modules.

In general for all the modules, when a network cable from an active network device is connected to the switch, the Link LED for the switch 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, and see the module documentation for troubleshooting procedures.

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 securely connected.
	• 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 all twisted-pair connections, the RJ-45 connectors on the Switch 4108GL allow you to use either "straight-through" cable or "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 4108GL 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 and other security features 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 4108GL 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 4108GL 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, and flow control set to None

■ For Windows Terminal program, also disable (uncheck) the "Use Function, Arrow, and <u>Ctrl</u> Keys for Windows" option

■ For the Hilgrave HyperTerminal program, select the "Terminal keys" option for the "Function, arrow, and ctrl keys act as" parameter

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

console port

console cable supplied with the switch

PC running a terminal emulator program, or a VT-100 terminal

to continue". Press a key, and you will then see the switch console CLI prompt.
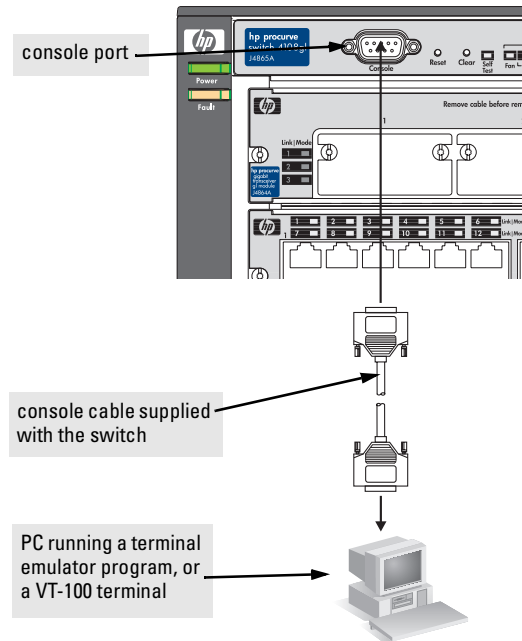
Telnet Console Access

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 CLI prompt.

If you want to continue with console management of the switch at this time through either a direct connection or a telnet session, see chapter 3, "Getting Started With Switch Configuration" for some basic configuration steps. For more detailed information, refer to the *Management and Configuration Guide* that is on the documentation CD-ROM 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 (since the last switch reboot), 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 a different type of module though, for example a 100/1000-T GL Module is installed in place of a 10/100-TX GL 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:

■ pressing the Reset button on the front of the switch

■ unplugging and plugging in the power cord (power cycle)

■ issuing the **reboot system** command from the switch console CLI, or selecting the Reset or Reboot option from the switch console menu, the web browser interface, or HP TopTools for Hubs & Switches

Until the switch is rebooted, the module will not operate and the Module Status LED for the affected slot will continue to flash.

Example Network Topologies

This section shows you a few example network topologies in which the Switch 4108GL can be implemented. For more topology information, see the HP network products World Wide Web site, *http://www.hp.com/go/hpprocurve*.

Basic Connectivity

Server connected by a Gigabit link

Switch 4108GL

twisted-pair "straight-through" or "crossover" cables

PCs and peripherals
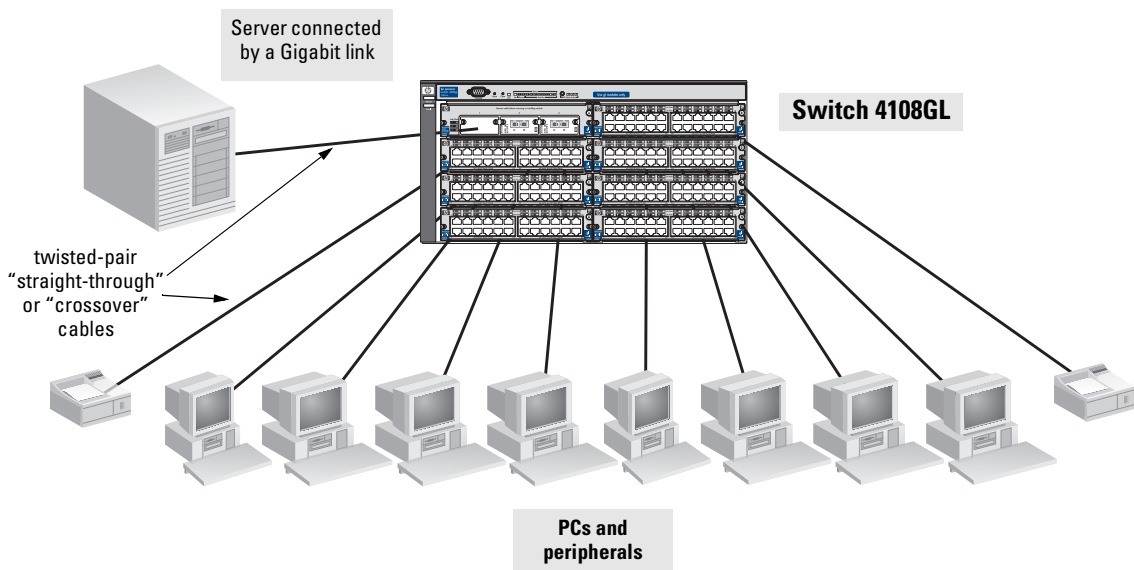
The Switch 4108GL can provide basic network connectivity to a high number of users. End nodes, printers and other peripherals, and servers can be easily connected, as shown in the above illustration.

Notice that the end node devices are connected to the switch by either "straight-through" or "crossover" twisted-pair cables. Either cable type can be used because of the "HP Auto-MDIX" feature on the 10/100-TX GL Modules and the standard "Auto MDI/MDI-X" feature on the 100/1000-T GL Transceiver to which the server is connected. The six twisted-pair ports on the 100/1000-T GL Module also support the "Auto MDI/MDI-X" feature.

Use as an Edge Switch

trunked
redundant Gigabit
fiber-optic cables

Routing Switch 9308

Switch 4108GL
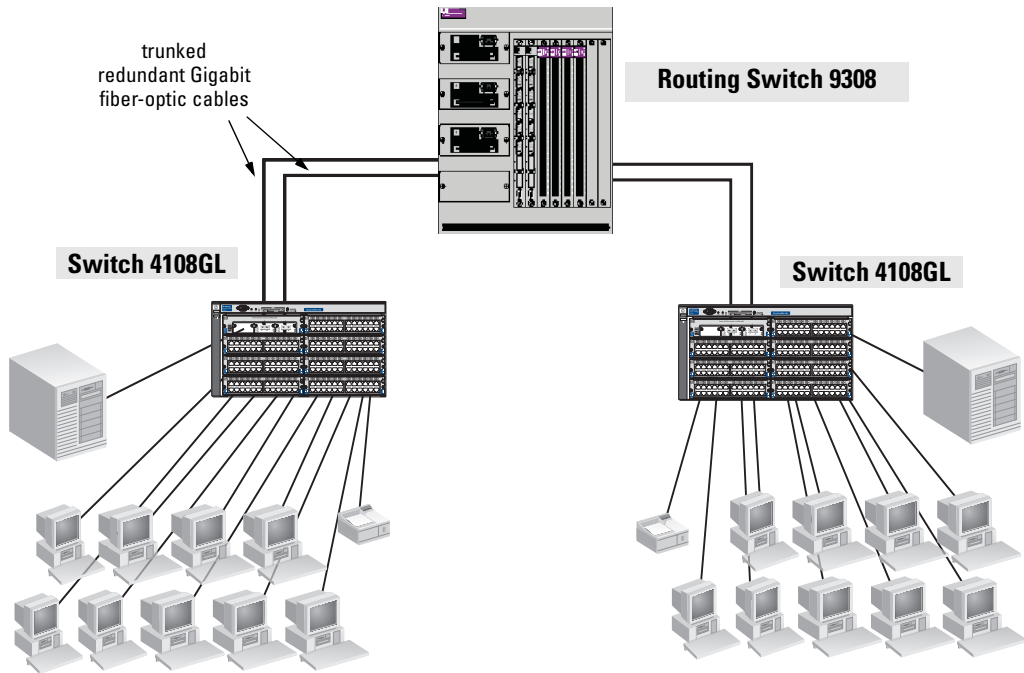
Switch 4108GL

When your network expands and the users need to access resources beyond the edge of the local network, the Switch 4108GL is an excellent platform for that expansion. With the flexibility of 8 slots, the high port count 10/100-TX GL Module for local connections, and the availability of Gigabit speeds through either the Gigabit Transceiver GL Module or the 100/1000-T GL Module, the Switch 4108GL can provide that access beyond the edge for a high number of network users.

In the above illustration, two Switch 4108GLs are connected to an HP Procurve Routing Switch 9308, which can serve as a campus backbone or core switch.

The 1000 Mbps fiber-optic connections between the two Switch 4108GLs and the Routing Switch 9308 is by way of Gigabit-LX Transceivers installed in Gigabit Transceiver GL Modules in the Switch 4108GLs and Gigabit-LX ports on the Routing Switch 9308. With the Gigabit-LX connections, the distance between the Switch 4108GLs and the Routing Switch 9308 can be up to five kilometers.

The connections are trunked, through a configuration change on the Switch 4108GL, to provide redundancy, and load sharing for higher bandwidth.

Stacking the Switches

The Switch 4108GL can be connected together, through standard network connections, and managed through a single IP address. Up to 16 switches can be connected together in such a "virtual stack".

You identify one of the switches as the "Commander" and give that switch an IP address. Up to 15 other switches in the network can then easily be configured as Members of the stack and managed through the Commander's IP address. The management includes Telnet access and web browser interface access to the Commander and to each Member switch through the Commander.

For more information on stacking your Switch 4108GL, please see the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch.

3

Getting Started With Switch Configuration

This chapter is a guide for using the console Switch Setup screen to quickly assign an IP (Internet Protocol) address and subnet mask to the switch, set a Manager password, and, optionally, configure other basic features.

For more information on using the switch console and the other switch management interfaces: the web browser interface and the SNMP management tool, HP TopTools for Hubs & Switches, please see the *Management and Configuration Guide* on the documentation CD-ROM that came with your switch.

Recommended Minimal Configuration

In the factory default configuration, the switch has no IP (Internet Protocol) address and subnet mask, and no passwords. In this state, it can be managed only through a direct console connection. To manage the switch through in-band (networked) access, you should configure the switch with an IP address and subnet mask compatible with your network. Also, you should configure a Manager password to control access privileges from the console and web browser interface. Other parameters in the Switch Setup screen can be left at their default settings or you can configure them with values you enter.

Many other features can be configured through the switch's console interface, to optimize the switch's performance, to enhance your control of the network traffic, and to improve network security. Once an IP address has been configured on the switch, these features can be accessed more conveniently through a remote Telnet session, through the switch's web browser interface, and from an SNMP network management station running a network management program, such as HP TopTools for Hubs & Switches. For a listing of switch features available with and without an IP address, refer to "How IP Addressing Affects Switch Operation" in the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch.

For more information on IP addressing, refer to "IP Configuration" in the *Management and Configuration Guide*.

N o t e   By default, the switch is configured to acquire an IP address configuration from a DHCP or Bootp server. To use DHCP/Bootp instead of the manual method described in this chapter, see "DHCP/Bootp Operation" in the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch.

Using the Switch Setup Screen

The quickest and easiest way to minimally configure the switch for management and password protection in your network is to use a direct console connection to the switch, start a console session, and access the Switch Setup screen.

1.   Using the method described in the preceding section, connect a terminal device to the switch and display the switch console command (CLI) prompt (the default display).

   The CLI prompt appears displaying the switch model number:

   HP Procurve Switch 4108GL#

2.   At the prompt, enter the **setup** command to display the Switch Setup screen. The following illustration shows the Setup screen with the default settings.

```
HP ProCurve Switch 4172GL                              1-Jan-1990    0:02:33
===========================- CONSOLE - MANAGER MODE -============================
                                  Switch Setup

  System Name : HP ProCurve Switch 4172GL
  System Contact :
  Manager Password :                      Confirm Password :
  Logon Default : CLI                     Time Zone [0] : 0
  Community Name : public                 Spanning Tree Enabled [No] : No

  Default Gateway :
  Time Sync Method [None] : TIMEP
  TimeP Mode [Disabled] : Disabled

  IP Config [DHCP/Bootp] : DHCP/Bootp
  IP Address  :
  Subnet Mask :



 Actions->   Cancel     Edit     Save     Help

Enter System Name - up to 25 characters.
Use arrow keys to change field selection, <Space> to toggle field choices,
and <Enter> to go to Actions.
```

3.   Use the ⟨Tab⟩ key to select the **Manager Password** field and enter a manager password of up to 16 characters.

3-2

4. ⌐Tab⌐ to the **IP Config (DHCP/Bootp)** field and use the Space bar to select the **Manual** option.

5. ⌐Tab⌐ to the **IP Address** field and enter the IP address that is compatible with your network.

6. ⌐Tab⌐ to the **Subnet Mask** field and enter the subnet mask used for your network.

7. Press ⌐Enter⌐, then ⌐S⌐ (for **Save**).

Here is some information on the fields in the Setup screen. For more information on these fields, see the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch:

Parameter	Default	
System Name	blank	Optional; up to 25 characters, including spaces
System Contact	blank	Optional; up to 48 characters, including spaces
Manager Password	blank	Recommended; up to 16 characters (no blank spaces)
Logon Default	CLI	The default setting selects the command line interface for console access. The alternative is the menu interface.
Time Zone	0 (none)	Optional; 1440 to -1440. The number of minutes your location is to the West (+) or East (-) of GMT.
Community Name	public	Default setting recommended.
Spanning Tree Enabled	No	Default setting recommended unless STP is already running on your network or the switch will be used in complex network topologies.
Default Gateway	blank	Recommended; Enter the IP address of the next-hop gateway node if network traffic needs to be able to reach off-subnet destinations.
TimeP Config	DHCP	Optional; The method the switch uses to acquire the TimeP server address.
IP Config (DHCP/Bootp)	DHCP/Bootp	Set to Manual unless a DHCP/Bootp server is used on your network to configure IP addressing.
IP Address	xxx.xxx.xxx.xxx	Recommended; If you set IP Config to Manual, then enter an IP address compatible with your network.

Note: The IP address and subnet mask assigned for the switch must be compatible with the IP addressing used in your network. For more information on IP addressing, see the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch.

Subnet Mask	xxx.xxx.xxx.xxx	Recommended; If you entered an IP address, then enter a subnet mask compatible with your network.

Getting Started With Switch Configuration

The switch is now configured with a Manager password, IP address, and subnet mask. As a result, the switch can be accessed through your network using Telnet, the web browser interface, or an SNMP-based network management tool such as HP TopTools for Hubs & Switches.

To Recover from a Lost Manager Password: If you cannot start a console session at the manager level because of a lost Manager password, you can clear all passwords and user names by getting physical access to the switch and pressing and holding the Clear button for a full second.

Where to Go From Here

The above procedure configures your switch with a Manager password, IP address, and subnet mask. With the proper network connections, you can now manage the switch from a PC equipped with Telnet and/or a web browser or from an SNMP network management station.

Some basic information on managing your switch is included in the next section. For more information on the console, web browser, and SNMP management interfaces and all the features that can be configured on the Switch 4108GL, please see the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch.

Using the IP Address for Remote Switch Management

With your Switch 4108GL, you can use the switch's IP address to manage the switch from any PC that is on the same subnet as the switch. You can use either a Telnet session or a standard web browser to manage the switch.

Starting a Telnet Session

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 PC that is running the Telnet session (for example, by using a Ping command to the switch's IP address).

2. Start the Telnet program on a PC that is on the same subnet as the switch 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 command (CLI) prompt, for example:

    HP Procurve Switch 4108GL#

    Enter **help** or **?** to see a list of commands that can be executed at the prompt. Entering any command followed by **help** provides more detailed context help information about the command.

Starting a Web Browser Session

Your Switch 4108GL can be managed through a graphical interface that you can access from any PC or workstation on the network by running your web browser and typing in the switch's IP address as the URL. No additional software installation is required to make this interface available; it is included in the switch's onboard software.

A typical web browser interface screen is shown in the next illustration.

Getting Started With Switch Configuration

For more information on using the web browser interface, please see the
Management and Configuration Guide that is on the documentation CD-
ROM that came with your switch.

An extensive help system is also available for the web browser interface. To
access the help system though, the subnet on which the switch is installed
must have access to the internet, or HP TopTools for Hubs & Switches needs
to be installed on a network management station that is on the subnet.

4

Troubleshooting

This chapter describes how to troubleshoot your Switch 4108GL. 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. For more information, see Chapter 8, "Troubleshooting" in the *Management and Configuration Guide* that is on the documentation CD-ROM included with your switch.

This chapter describes the following:

■ basic troubleshooting tips (page 4-1)

■ diagnosing with the LEDs (page 4-4)

■ Proactive Networking tools (page 4-8)

■ hardware diagnostic tests (page 4-9)

■ restoring the factory default configuration (page 4-11)

■ downloading new code (page 4-12)

■ HP Customer Support Services (page 4-12)

Basic Troubleshooting Tips

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

■ **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 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-TX and 1000Base-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. Sample topologies are shown at the end of chapter 2 in this book, and some topology configuration guidelines can be found online on the HP Procurve web site, *http://www.hp.com/go/hpprocurve* in the Information Library section.

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.

With your Switch 4108GL, 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 4108GL also supports **Trunking**, which allows multiple network cables to be used for a single network connection without causing a data path loop. See the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch for more information on Spanning Tree and on Trunking.

■ **Connecting to devices that have a fixed full-duplex configuration.** The RJ-45 ports on the Switch 4108GL are all configured as "Auto". That is, when connecting to attached devices, the switch will operate in one of two ways to determine the link speed and the communication mode (half duplex or full duplex):

• if the connected device is also configured to Auto, the switch will automatically negotiate both link speed and communication mode

• if the connected device has a fixed configuration, for example 100 Mbps, at half or full duplex, the switch will automatically sense the link speed, but will default to a communication of *half* duplex

Because the Switch 4108GL behaves in this way *(in compliance with the IEEE 802.3 standard)*, if a device connected to the switch has a fixed configuration at *full* duplex, the device will not connect correctly to the switch. The result will be high error rates and very inefficient communications between the switch and the device.

Make sure that all devices connected to the Switch 4108GL are configured to auto negotiate, or are configured to connect at half duplex (all hubs are configured this way, for example).

If necessary though, you can modify the configuration of the Switch 4108GL ports to match the configuration of the connected device. Use the switch console, the web browser interface, or HP TopTools for Hubs & Switches to modify the port configuration.

■ **Check the port configuration.** A port on your Switch 4108GL may not be operating as you expect because it has been put into a "blocking" state by Spanning Tree, GVRP (automatic VLANs), or LACP (automatic trunking). (Note that the normal operation of the Spanning Tree, GVRP, and LACP features may put the port in a blocking state.) Or, the port just may have been configured as disabled through software.

Use the switch console to determine the port's configuration and verify that there is not an improper or undesired configuration of any of the switch features that may be affecting the port. See the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch for more information.

For more information on possible network problems and their solutions, refer to the technical note "Troubleshooting LAN Performance and Intermittent Connectivity Problems", which can be found on the HP Procurve web site, *http://www.hp.com/go/hpprocurve* in the Information Library section.

Troubleshooting

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 4-1.   LED Error Indicators

LED Pattern Indicating Problems							Diagnostic Tips
Power	Fault	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	*	*	*	*	❷
On	Flashing†	Flashing†	*	*	*	*	❸
On	Flashing†	Flashing†	Flashing†	*	*	Prolonged On	❹
On	Flashing†	Off	Flashing†			On briefly, then Off	❺
On	Off	Off	Flashing†	*	*	*	❻
On	Flashing†	Off	*	Flashing†	*	*	❼
On	Flashing†	Off	*	*	Flashing†	*	❽
On	Off	Off	On	*	*	Off with cable connected	❾
* 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 backplane failure during self test.	The failure may be just in the communications with a single module slot, or it might be more significant. Start a console session with the switch, and at the CLI prompt issue the command **show logging**. In the event log that is displayed, there will be messages that describe the extent of the problem. If the problem is with individual slots, the remainder of the switch slots will be fully operational and can be used until you get a chance to replace the switch. 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 has experienced a self test or initialization fault.	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). 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.

Troubleshooting

Tip Number	Problem	Solution
❺	The module installed in the slot that corresponds to the letter that is flashing has experienced a downloading fault.	Operating code is and configuration information is downloaded to each switch module 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). In this fault condition, an error has occurred in the download process.
		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.
		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.
❻	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.
		You can reset the switch by any of these methods:
		• pressing the Reset button.
		• power cycling the switch.
		• selecting the reset or reboot option from the console, web browser interface, or HP TopTools.
❼	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.
❽	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 four 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.

Troubleshooting

Tip Number	Problem	Solution

❾	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 securely connected.
		• 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 (MDI port), use "straight- through" cable; for connecting to MDI-X ports on hubs or other switches, use "crossover" cable.
		
		  Note: For the 10/100-TX GL Module and the 100/1000-T GL Module in the default configuration (Auto), the modules automatically negotiate whether each port operates as MDI or MDI-X, depending on the cable type and the connected device's operation, and either a straight-through or crossover cable can be used. If the module configuration is changed to one of the fixed configuration options though (for example, 100-Full Duplex), then the port operates as MDI-X only and the above statement about straight-through and crossover cables applies.
		
		  – 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.
		• For a 1000 Mbps connection, verify that the network cabling complies with the IEEE 802.3ab standard. The cable should be installed according to the ANSI/TIA/EIA-568-A-5 specifications. Cable testing should comply with the stated limitations for Attenuation, Near-End Crosstalk, Far-End Crosstalk, Equal-Level Far-End Crosstalk (ELFEXT), Multiple Disturber ELFEXT, and Return Loss.
		The cable verification must include all patch cables from any end devices, including the switch, to any patch panels in the cabling path.
		• 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 4108GL has 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 that is running a supported web browser, for example Microsoft Internet Explorer or 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 the "Troubleshooting" chapter in the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch, for more information on using these software tools to diagnose and manage your switch.

Troubleshooting

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. Neither of these reset procedures causes 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 70 to 120 seconds depending on the number and type of modules installed in the switch. If these LEDs stay on longer than 130 seconds or begin flashing, the switch may have to be replaced.

See "Diagnosing With the LEDs" on page 4-4 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 2-18. Then, when you reset the switch, note the messages that are displayed.

Troubleshooting

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, 100Base-TX, or 1000Base-T standards, as appropriate for the switch port type that the cable is connected to. The twisted-pair cables attached to the Switch 4108GL 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.

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 is on the documentation CD-ROM 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, if one is configured.

N o t e   This process removes all switch configuration changes that you have made from the factory default settings. This includes, for example, configuration of VLANs, spanning tree, trunks, and stacking. Returning the configuration of these features to their factory default settings (usually disabling them) may result in network connectivity issues.

If the switch has a valid configuration, and you are restoring the factory default settings for a reason other than configuration problems, you should save the switch configuration prior to performing the factory default reset. Then, after the reset and resolution of the original problem, you can restore the saved configuration to the switch. For both the save and restore processes, you can use the console **copy** command. See the switch *Management and Configuration Guide* that is on the documentation CD-ROM for more information on this command.

You can restore the factory default configuration either on the switch itself or through the switch console.

To execute the factory default reset on the switch, 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. As soon as the Self Test LED begins to blink, release the Clear button.

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

To restore the factory default configuration using the console, execute the **delete startup config** command from the console command prompt.

Troubleshooting

Downloading New Code

When product enhancements occur for the Switch 4108GL, new code can be downloaded to the switch through several methods, for product enhancements and new features. Please see the *Management and Configuration Guide* that is on the documentation CD-ROM that came with your switch for more information.

The new code would be available on the HP Procurve web site, *http://www.hp.com/go/hpprocurve*.

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 Procurve web site, *http://www.hp.com/go/hpprocurve* also provides up-to-date support information.

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

Before Calling Support

Before calling your networking dealer or HP Support, to make the support process most efficient, you first should have retrieved the following information:

Information Item	Information Location
• product identification, including the chassis, modules and transceivers	the front of the switch, and on the modules and transceivers
• switch's OS (software) version	switch console: **show version** command (Firmware revision field)
• copy of the switch configuration	switch console: **show configuration** command

Information Item	Information Location
• copy of the switch Event Log	switch console: **show logging** command
• copy of the switch status and counters information, including the detailed counters for the problem port(s)	switch console: **show statistics** command, and **show statistics <*port list*>** command
• copy of your network to-pology map, including net-work addresses assigned to the relevant devices	your network records

Troubleshooting

A

Specifications

Physical

Width:	44.2 cm (17.2 in)
Depth:	39.0 cm (15.2 in)
Height:	22.5 cm (8.7 in)

Weight:
- Switch 4108GL   11.6 kg (25.5 lbs)
- Switch 4108GL Bundle   13.3 kg (29.3 lbs) – includes one Gigabit Transceiver GL Module and three 10/100-T GL Modules

Electrical

The Switch 4108GL automatically adjusts 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:	8.2 A	3.8 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

Geräuschemission LwA=53.2 dB am fiktiven Arbeitsplatz nach
DIN 45635 T.19

Noise Emission LwA=53.2 dB in a virtual workspace according to
DIN 45635 T.19

Network Connectors

- The 10/100 Mbps RJ-45 twisted-pair ports on the 10/100-TX GL Module are compatible with the IEEE 802.3 10Base-T and IEEE 802.3u 100Base-TX standards.
- The 100/1000 Mbps RJ-45 twisted-pair ports on the 100/1000-T GL Module and the 100/1000-T Transceiver are compatible with the IEEE 802.3u 100Base-TX and IEEE 802.3ab 1000Base-T standards.
- The 100 Mbps SC fiber-optic port on the 100-FX Transceiver is compatible with the IEEE 802.3u 100Base-FX standard.
- The 1000 Mbps SC fiber-optic ports on the Gigabit-SX and Gigabit-LX Transceivers are compatible with the IEEE 802.3z Gigabit-SX and Gigabit-LX standards respectively.

Safety

- EN60950 / IEC 950
- CSA 22.2 No. 950
- NOM-019-SCFI-1994
- UL 1950

B

Switch Ports and Network Cables

This appendix includes switch connector information and network cable information for cables that should be used with the Switch 4108GL, including minimum pin-out information and specifications for twisted-pair cables.

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.

Switch Ports

Twisted Pair

■ The RJ-45 ports on the **10/100-TX GL Module**, the **100/1000-T GL Module**, and the on the **100/1000-T Transceiver** accept 100-ohm differential unshielded and shielded twisted-pair cable with RJ-45 connectors as described on the next page.

Fiber-Optic

■ The SC-type connector port on the **100Base-FX Transceiver** transmits at 1300 nm wavelength, and accepts the multimode fiber-optic cables for 100Base-FX described on page B-3.

■ The SC-type connector port on the **Gigabit-SX Transceiver** transmits at 850 nm wavelength, and accepts the low metal content, multimode fiber-optic cables for Gigabit-SX described on page B-3.

■ The SC-type connector port on the **Gigabit-LX Transceiver** transmits at 1300 nm wavelength, and accepts the low metal content, single mode or multimode fiber-optic cables for Gigabit-LX described on page B-3.

Cables

Twisted-Pair

10 Mbps Operation	Category 3, 4, or 5 100-ohm differential unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable, complying with IEEE 802.3 Type 10Base-T specifications, fitted with RJ-45 connectors.
100 Mbps Operation	Category 5 100-ohm differential UTP or STP cable, complying with IEEE 802.3u 100Base-TX specifications, fitted with RJ-45 connectors.
1000 Mbps Operation	Category 5 100-ohm differential 4-pair UTP or STP cable, complying with IEEE 802.3ab 1000Base-T specifications, fitted with RJ-45 connectors—Category 5E or better is recommended. *(please see "Note on 1000Base-T Cable Requirements", below)*

Note on 1000Base-T Cable Requirements. The Category 5 networking cables that work for 100Base-TX connections should also work for 1000Base-T, as long as all four-pairs are connected. But, for the most robust connections you should use cabling that complies with the Category 5E specifications, as described in Addendum 5 to the TIA-568-A standard (ANSI/TIA/EIA-568-A-5).

Because of the increased speed provided by 1000Base-T (Gigabit-T), network cable quality is more important than for either 10Base-T or 100Base-TX. Cabling plants being used to carry 1000Base-T networking must comply with the IEEE 802.3ab standards. In particular, the cabling must pass tests for Attenuation, Near-End Crosstalk (NEXT), and Far-End Crosstalk (FEXT). Additionally, unlike the cables for 100Base-TX, the 1000Base-T cables must pass tests for Equal-Level Far-End Crosstalk (ELFEXT), Multiple Disturber ELFEXT, and Return Loss.

When testing your cabling, be sure to include the patch cables that connect the switch and other end devices to the patch panels on your site. The patch cables are frequently overlooked when testing cable and they must also comply with the cabling standards.

Fiber-Optic

100Base-FX	62.5/125 µm or 50/125 µm (core/cladding) diameter, graded-index, multimode fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a respectively, fitted with MT-RJ connectors
Gigabit-SX	62.5/125 µm or 50/125 µm (core/cladding) diameter, graded-index, low metal content, multimode fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a respectively, fitted with SC or MT-RJ connectors, depending on the transceiver used
Gigabit-LX	low metal content, single mode fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards, fitted with SC or MT-RJ connectors
	OR
	62.5/125 µm or 50/125 µm (core/cladding) diameter, graded-index, low metal content, multimode fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a respectively, fitted with SC or MT-RJ connectors
	Note: Multimode fiber-optic cabling may be used for a Gigabit-LX application, but a **mode conditioning patch cord** may be needed. See the *Installation Guide* that came with your transceiver for more information.

Twisted-Pair Cable/Connector Pin-Outs

The HP Auto-MDIX Feature: In the **default configuration**, "Auto", the 10/100Base-TX ports on the 10/100-TX GL Module that is used in the Switch 4108GL all automatically detect the type of port on the connected device and operate as either an MDI or MDI-X port, whichever is appropriate. So for any connection, a "straight-through" twisted-pair cable can be used -- *you no longer have to use "crossover" cables*, although "crossover" cables can also be used for any of the connections. The 100/1000-T GL Module, and the 100/1000-T Transceiver supports the IEEE 802.3ab standard, which includes the "Auto MDI/MDI-X" feature, which operates the same way.

N o t e   HP Auto-MDIX was developed and shared with the IEEE for the development of the IEEE 802.3ab standard. HP Auto-MDIX and the IEEE 802.3ab Auto MDI/MDI-X are completely compatible.

If you connect a Switch 4108GL twisted-pair port to another switch or hub, which typically have MDI-X ports, the Switch 4108GL port automatically operates as an MDI port. If you connect it to an end node, such as a server or PC, which typically have MDI ports, the Switch 4108GL port operates as an MDI-X port. In all cases, you can use standard "straight through" cables.

If you happen to use a correctly wired crossover cable, though, the switch will still be able to automatically detect the MDI/MDI-X operation and link correctly to the connected device.

If the port configuration is changed to any of the **fixed configurations** though, for example 100 Mbps/full duplex, the port operates as MDI-X only and the correct cable type must be used: for connections to MDI ports, such as end nodes, use a "straight-through" cable; for connections to MDI-X ports, such as on hubs and other switches, use a "crossover" cable.

Other Wiring Rules:

■   All twisted-pair wires used for 10 Mbps, and 100 Mbps operation must be twisted through the entire length of the cable. The wiring sequence must conform to EIA/TIA 568-B (not USOC). See the Pin Assignment tables below the cable illustrations later in this appendix for a listing of the signals used on each pin.

■   For 1000Base-T connections, all four pairs of wires in the cable must be available for data transmission. *Please see "Note on 1000Base-T Cable Requirements" on page B-2 for more information on 1000Base-T cabling.*

■   For 10 Mbps connections to the ports, you can use Category 3, 4, or 5 100-ohm differential unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable, as supported by the IEEE 802.3 10Base-T standard.

■   For 100 Mbps connections to the ports, use Category 5 100-ohm differential UTP or STP cable only, as supported by the IEEE 802.3u 100Base-TX standard.

■   For 1000 Mbps connections, Category 5 or better 100-ohm differential UTP or STP cable only, as supported by the IEEE 802.3ab 1000Base-T standard; Category 5E or better is recommended.

Straight-Through Twisted-Pair Cable for 10 Mbps or 100 Mbps Network Connections

Because of the HP Auto-MDIX operation of the 10/100 ports on the switches, for all network connections, to PCs, servers or other end nodes, or to hubs or other switches, you can use "straight-through" cables.

If any of these ports are given a fixed configuration, for example 100 Mbps/Full Duplex, the ports operate as MDI-X ports, and straight-through cables *must* be then used for connections to PC NICs and other MDI ports.

Cable Diagram
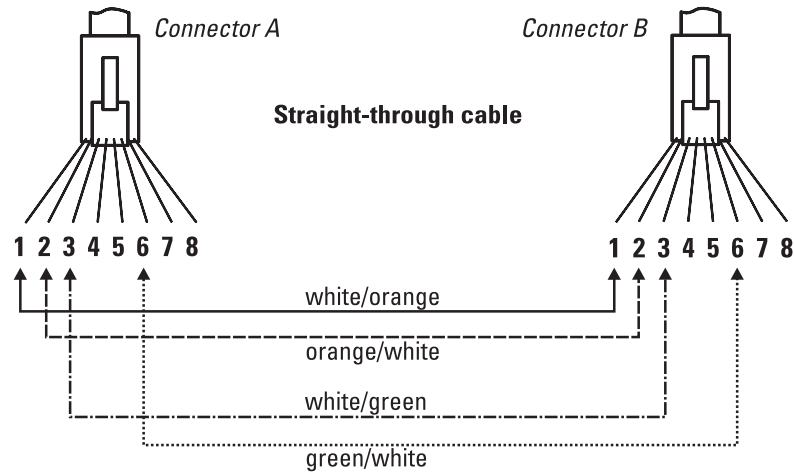
N o t e

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.

Pin Assignments

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

Crossover Twisted-Pair Cable for 10 Mbps or 100 Mbps Network Connection

The HP Auto-MDIX operation of the 10/100 ports on the switches also allows you to use "crossover" cables for all network connections, to PCs, servers or other end nodes, or to hubs or other switches.

If any of these ports are given a fixed configuration, for example 100 Mbps/ Full Duplex, the ports operate as MDI-X ports, and crossover cables *must* be then used for connections to hubs or switches or other MDI-X network devices.

Cable Diagram
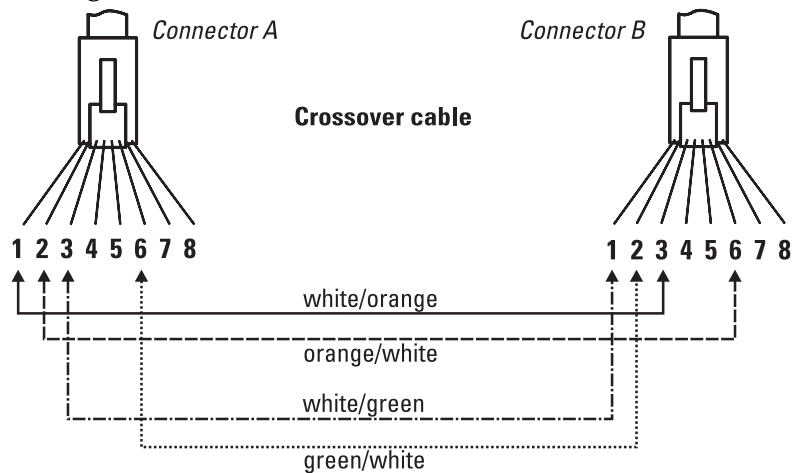
Note Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".
Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".
Pins 4, 5, 7, and 8 are not used in this application, although they may be wired in the cable.

Pin Assignments

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 +

Switch Ports and Network Cables

Straight-Through Twisted-Pair Cable for 1000 Mbps Network Connections

1000Base-T connections require that all four pairs or wires be connected.

Cable Diagram
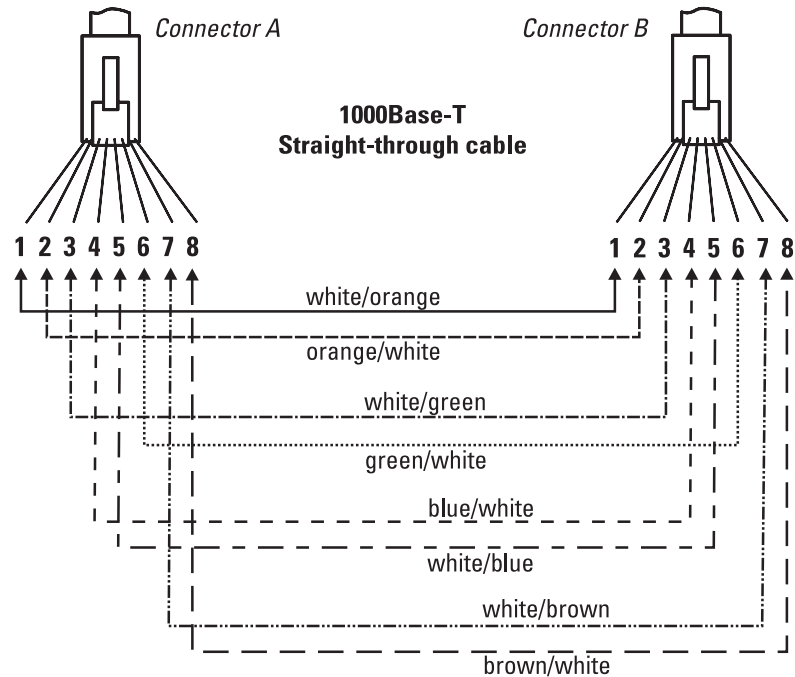
Connector A   *Connector B*

**1000Base-T
Straight-through cable**

1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8

white/orange

orange/white

white/green

green/white

blue/white

white/blue

white/brown

brown/white

N o t e	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 and 5 on connector "A" *must* be wired as a twisted pair to pins 4 and 5 on connector "B". Pins 7 and 8 on connector "A" *must* be wired as a twisted pair to pins 7 and 8 on connector "B".

Pin Assignments

For 1000Base-T operation, all four pairs of wires are used for both transmit and receive.

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

<div style="float:left; margin-right:1em;">⚠</div>

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 suscep-tible 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 perturba-tions 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 Geräteeingabeterminals, 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.

Safety and EMC Regulatory Statements

Considerazioni sulla sicurezza

 Simbolo di riferimento alla documentazione. Se il prodotto è contras-segnato 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 dicituraCAUTION 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'alimen-tazione 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 esclusi-vamente 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.

<div style="writing-mode: vertical">**Safety and EMC Regulatory Statements**</div>

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，请您务必注意如下事项:

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. 避免高温和尘土多的地方，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. 不要有异物或液体落入机内，以免部件短路。
5. 不要将磁体放置于仪器附近。

警告

为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

如果您按照以上步骤操作时遇到了困难，或想了解其它产品性能，请按以下方式与我们联络。

如是硬件故障:

1. 与售出单位或当地维修机构联系。
2. 中国惠普有限公司维修中心地址:
   北京市海淀区知春路49号希格玛大厦
   联系电话: 010-62623888 转 6101
   邮政编码: 100080

如是软件问题:

1. 惠普用户响应中心热线电话: 010-65645959
2. 传真自动回复系统: 010-65645735

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。

Safety and EMC Regulatory Statements

Korea

사용자 안내문 : A 급기기

이기기는 업무용으로 전자파 적합등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 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

<div style="border:1px solid">

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 4108GL Bundle
HP ProCurve Switch 4108GL

Model Number: HP J4861A
HP J4865A

Accessories: HP J4862A, HP J4863A, HP J4864A, HP J4839A,
HP J4131A, HP J4132A, HP J4834A, HP J4853A,
HP J4116A

Conforms to the following Product Specifications:

Safety: EN60950 (1992) +A1,A2,A3,A4,A11 / IEC 950 (1991) +A1,A2,A3,A4
EN60825-1 (1994) / IEC 825-1 (1993), Class 1
GB4943(1995)
EMC: EN 55022 (1998) / CISPR-22 (1997) Class A
EN55024 (1998)
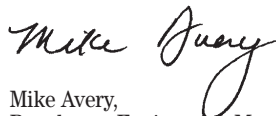
IEC61000-3-2:1995 / EN61000-3-2:1995 +A1:1998 +A2:1998   - Harmonics
IEC61000-3-3:1994 / EN61000-3-3:1995 - Flicker
GB9254(1998)

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.

Tested with Hewlett-Packard Co. products only.

Roseville, March 21, 2001

Mike Avery,
Regulatory Engineering 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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Product of Singapore
April 2001

Manual Part Number
5969-2376