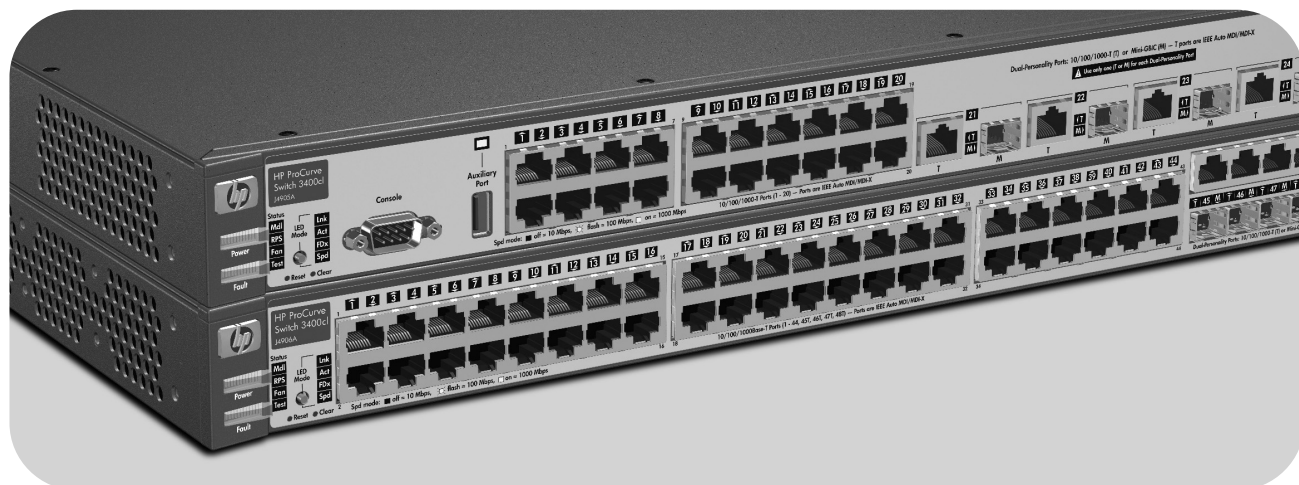


HP ProCurve Switch 3400cl Series

Installation and Getting Started Guide



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Installation and Getting Started Guide

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Applicable Products

HP ProCurve Switch 3400cl-24G (J4905A)

HP ProCurve Switch 3400cl-48G (J4906A)

HP ProCurve 600 Redundant and External

Power Supply (J8168A)

HP ProCurve 10GbE X2-SC LR Optic (J8437A)

HP ProCurve 10GbE X2-CX4 Transceiver (J8440A)

HP ProCurve 10-Gig Copper Module (J8434A)

HP ProCurve 10-Gig Media Flex Module (J8435A)

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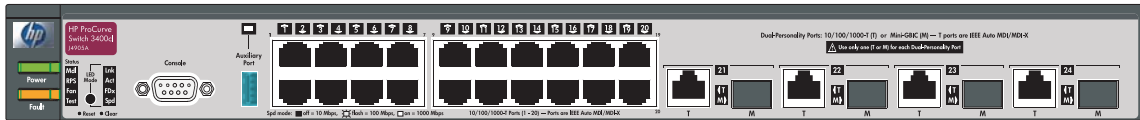
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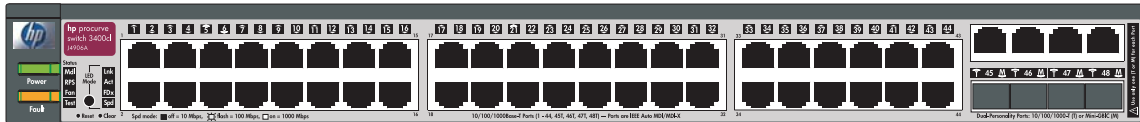
Introducing the Switch

The HP ProCurve Switches 3400cl are multiport switches that can be used to build high-performance switched workgroup networks. These switches are store-and-forward devices offering low latency for high-speed networking.

HP ProCurve Switch 3400cl-24G (HPJ4905A)



HP ProCurve Switch 3400cl-48G (HPJ4906A)



Throughout this manual, this switch will be abbreviated as the Switch 3400cl-24G or Switch 3400cl-48G and collectively as the Switch 3400cl Series devices.

The Switch 3400cl-24G and Switch 3400cl-48G have respectively, 24 or 48, auto-sensing 10/100/1000Base-TX RJ-45 ports, four dual-personality ports—either auto-sensing 10/100/1000Base-T RJ-45 or mini-GBIC, and one slot is provided in the back of the device to support a two port 10 Gigabit per second Ethernet (10-GbE) module to provide box connectivity to other switch boxes, to a 10 Gigabit per second concentrator or to any Ethernet compatible uplink.

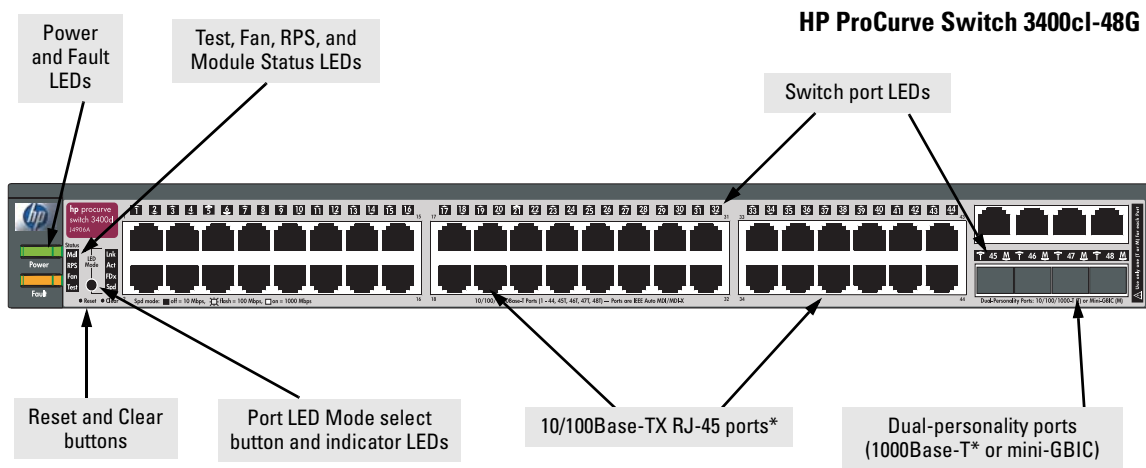
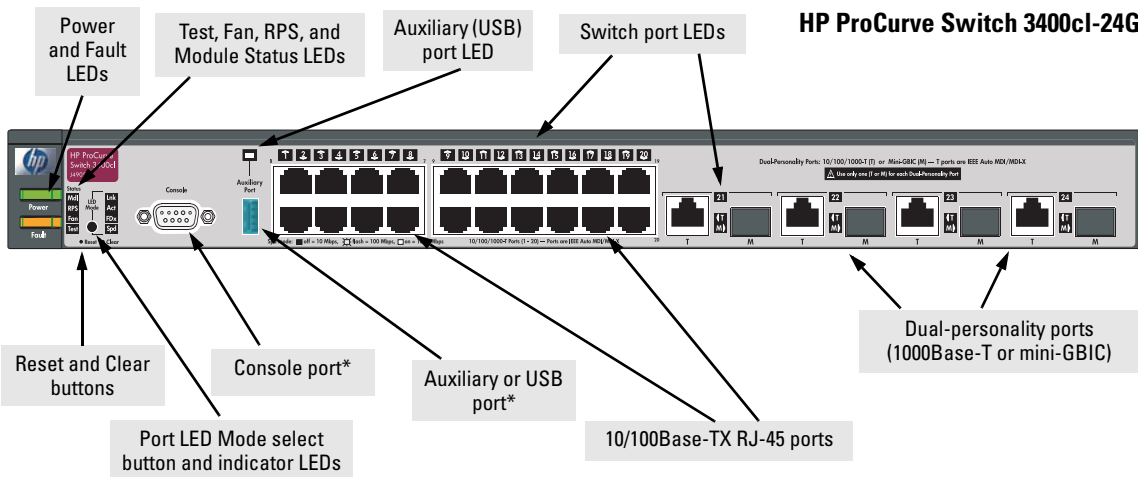
The Switch 3400cl Series devices can be connected to an HP ProCurve RPS/EPS (J8168A) and receive full redundant power from that unit. If the internal power supply in the switch fails, the RPS/EPS unit will immediately provide all the power necessary to keep the switch running.

These switches are designed to be used primarily as a high-density wiring closet or desktop switch. These switches can directly connect computers, printers, and servers to provide dedicated bandwidth to those devices, and can build a switched network infrastructure by connecting the switch to hubs, other switches, or routers. In addition, the Switch 3400cl Series devices offer full network management capabilities.

This chapter describes the Switch 3400cl Series devices, including:

- Front and back of the switches
- Switch features

Front of the Switch



Network Ports

- 24 or 48 auto-sensing 10/100/1000Base-T ports.
All these ports have the “HP Auto MDIX” feature, which means you can use either straight-through or crossover twisted-pair cables to connect any network devices to the switch.
- Four dual-personality ports. Use either the 10/100/1000Base-T RJ-45 connector, or install a supported HP ProCurve mini-GBIC for fiber-optic connections.
The RJ-45 connectors support the IEEE Auto MDI/MDI-X feature, which means you can use either straight-through or crossover twisted-pair cables to connect any network device to the switch.

Dual-Personality Port Operation. By default, the RJ-45 connectors are enabled. If a mini-GBIC is installed in a slot, it is enabled and the associated RJ-45 connector is disabled and cannot be used. If the mini-GBIC is removed, the associated RJ-45 port is automatically re-enabled.

- One, 10 gigabit expansion slot. These switches provide a single slot in the back of the device that can accept a 2 x 10 gigabit transceiver module. The module provides two 10 gigabit ports. The module may provide either copper or fiber optic media that conforms to the gigabit Ethernet standard as well as dual 10 gigabit copper or uplink ports.

LEDs

Table 1-1. Switch LEDs

Switch LEDs	State	Meaning
Power (green)	On Off	The switch is receiving power. The switch is NOT receiving power.
Fault (orange)	Off Blinking* On	The normal state; indicates there are no fault conditions on the switch. A fault has occurred on the switch, one of the switch ports, module in the rear of the switch, or the fan. The Status LED for the component with the fault will blink simultaneously. On briefly after the switch is powered on or reset, at the beginning of switch self test. If this LED is on for a prolonged time, the switch has encountered a fatal hardware failure, or has failed its self test. See chapter 4, "Troubleshooting" for more information.
Test (green)	Off On Blinking*	The normal operational state; the switch is not undergoing self test. The switch self test and initialization are in progress after the switch has been power cycled or reset. The switch is not operational until this LED goes off. The Self Test LED also comes on briefly when you "hot swap" a mini-GBIC into the switch; the mini-GBIC is self tested when it is hot swapped. A component of the switch has failed its self test. The status LED for that component, for example an RJ-45 port, and the switch Fault LED will blink simultaneously.
Port LEDs (green – overlaid with the port number)	Displays port link information, network activity information, whether the port is configured for full-duplex operation, or the speed of the connection depending on the Port LED View selected. See "Port LED View Select Button and Indicator LEDs" on the next page for more information. If a fault has occurred on the port, the port LED will blink with the Fault LED.	
LED Mode View (4 green LEDs)	Link Act FDx Spd	Indicates the port LEDs are displaying link information: - if the port LED is on, the port is enabled and receiving a link indication from the connected device. - if the port LED is off, the port has no active network cable connected, or is not receiving link beat or sufficient light. Otherwise, the port may have been disabled through the switch console, the web browser interface, or HP ProCurve Manager. - if the port LED is blinking* simultaneously with the Fault LED, the corresponding port has failed its self test. Indicates the port LEDs are displaying network activity information. Indicates port LEDs are lit for ports in Full Duplex Mode. Off indicates ½duplex. Indicates the port LEDs are displaying the connection speed at which each port is operating: - if the port LED is off, the port is operating at 10 Mbps. - if the port LED is flashing**, the port is operating at 100 Mbps. - if the port LED is on continuously, the port is operating at 1000 Mbps. ** The flashing behavior is an on/off cycle once every 0.5 seconds, approximately.

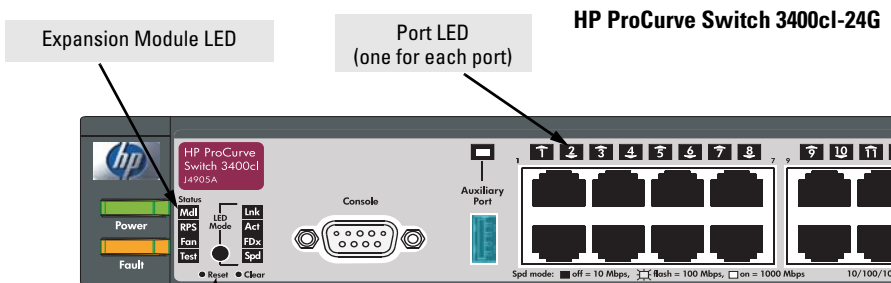
Switch LEDs	State	Meaning
Mdl (Module Status, green)	On	Expansion module is plugged into expansion slot and operating correctly
	Blinking	Expansion module is plugged into expansion slot but has experienced a fault
	Off	Expansion module is not plugged into expansion slot
RPS Status (green)	On	Normal operation. RPS is connected and operating correctly. RPS could be powering the unit - see table below.
	Blinking	RPS is connected but has experienced a fault.
	Off	RPS is not connected or is not powered.
Fan Status (green)	On	Normal operation, all fans are ok.
	Blinking*	One of the unit's fans has failed. The switch Fault LED will be blinking simultaneously.
T/M (green – ports 21 - 24 or 45-48)	On	For the dual-personality ports, indicates the enabled port: • if the “T” is on, the 10/100/1000Base-T RJ-45 port is enabled. • if the “M” is on, the mini-GBIC port is enabled.
Auxiliary (green)	On	Port is in use
	Off	Port is not in use
* The blinking behavior is an on/off cycle once every 1.6 seconds, approximately.		

Table 1-2. RPS LED Behavior

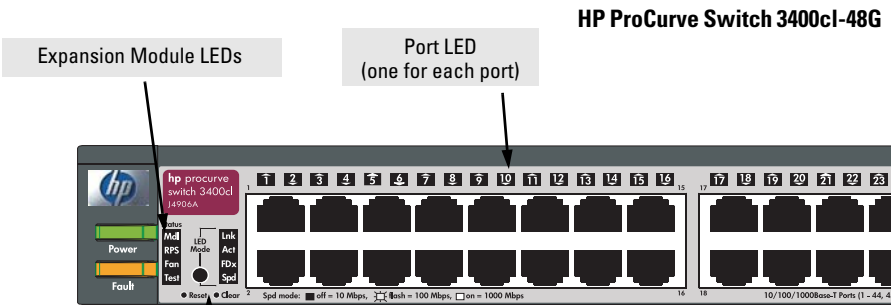
RPS modes	This table describes the behavior of the RPS LED associated with HP 600 RPS/EPS operation. (Power, RPS/EPS, Fault)		
Power LED	RPS LED	Fault LED	Description
On	Off	Off	Normal operation. HP 600 RPS/EPS is not connected or not powered.
On	On	Off	Normal operation. HP 600 RPS/EPS is available.
On	On/Off	Blinking	Unit has experienced a fault and another LED will be blinking to determine fault.
On	On	Blinking	HP 600 RPS/EPS is running the switch in failover mode. No AC power to the unit, or the internal power supply has failed.
Off	Off	Off	Unit is un-powered by AC input line and the external HP 600 RPS/EPS
On	Blinking	Blinking	The HP 600 RPS/EPS unit has experienced a fault.
On	Blinking	Off	The HP 600 RPS/EPS unit is unavailable to power the Switch in event of an internal power supply failure. The HP 600 RPS/EPS is designed to provide power to one of its connected switch devices at a time. The Power Status LED on the HP 600 RPS/EPS unit will also be blinking for this device.

LED Mode Select Button and Indicator LEDs

To optimize the amount of information displayed for each of the switch ports without overwhelming you with LEDs, the Switch 3400cl Series devices use a single LED for each port. The operation of this LED is controlled by the LED Mode select button, and the current setting is indicated by the LED Mode indicator LEDs near the button. Press the button to step from one view mode to the next.



LED Mode select button and indicator LEDs



LED Mode select button and indicator LEDs

- If the Link (Lnk) indicator LED is lit, each port LED displays link information for the associated port.
If the port LED is in Link mode and it is blinking, the port has failed its self test. The Fault and Self Test LEDs will be blinking simultaneously.
- If the Activity (Act) indicator LED is lit, each port LED displays activity information for the associated port—it flickers as network traffic is received and transmitted through the port.
- If the Full Duplex (FDx) indicator LED is lit, the port LEDs light for those ports that are operating in full duplex.
- If the Speed (Spd) indicator LED is lit, the port LEDs behave as follows to indicate the connection speed for the port:
 - Off = 10 Mbps
 - Flashing = 100 Mbps (the flashing behavior is a repeated on/off cycle once every 0.5 sec.)
 - On = 1000 Mbps

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 and executes the switch self test.

Clear Button

This button is used for these purposes:

- **Deleting Passwords** - When pressed by itself for at least one second, the 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, any configuration changes you may have made through the switch console, the web browser interface, and SNMP management are removed, and the factory default configuration is restored to the switch. For the specific method to restore the factory default configuration, see [“Restoring the Factory Default Configuration” on page 11](#), in chapter 4, “Troubleshooting” of this manual.

Expansion Module LEDs

“Expansion Module” LEDs refer to the LEDs specific to the expansion module. These LEDs are located on the physical expansion module bulkhead. These LEDs are only viewable in the rear of the Switch 3400cl-48G product on the Expansion Slot Module itself. These LEDs are duplicated on the front panel of the Switch 3400cl-24G.

Table 1-3. Expansion Module LEDs

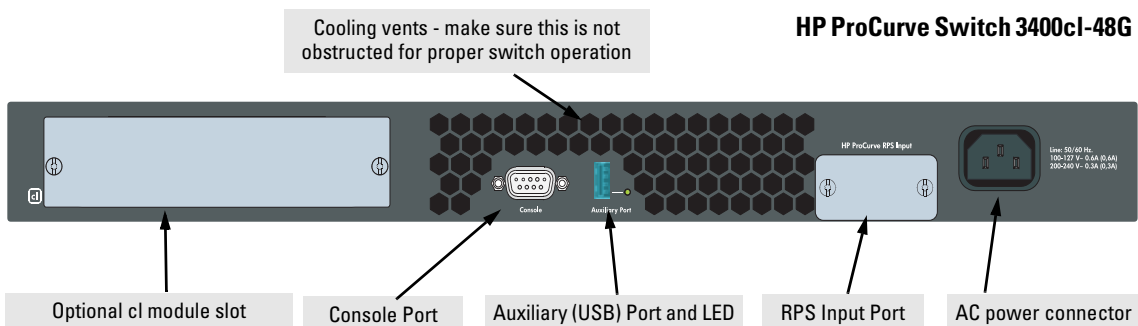
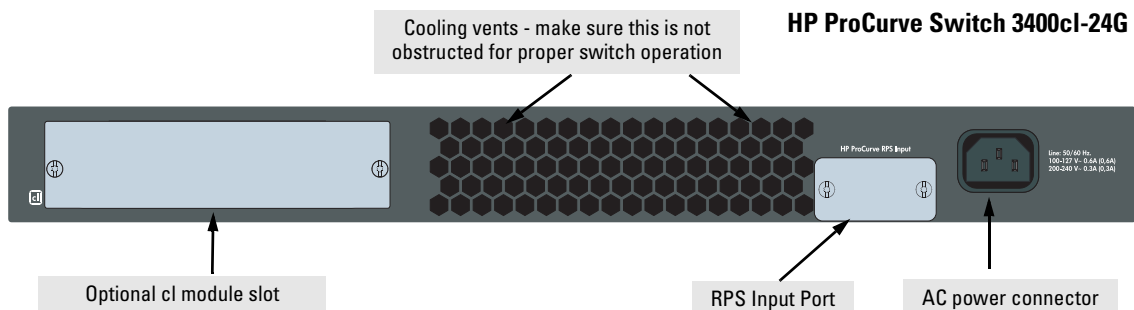
Name	Color	Mode	Description
Expansion Module LEDs per module			
Module (Mdl) Power (ports A & B)	Green	On	Expansion module is plugged into expansion slot and operating correctly
		Off	Expansion module's power has been turned OFF, and the card can be removed from the box if necessary.
Module (Mdl) Fault (ports A & B)	Orange	On	Expansion module is plugged into expansion slot but has experienced a fault
Expansion Module LEDs per port			
Link	Green	On	Indicates that the port LEDs are displaying link information: - if the port LED is on, the port is enabled and receiving a link indication from the connected device. - if the port LED is off, the port has no active network cable connected, or is not receiving link beat or sufficient light. Otherwise, the port may have been disabled through the switch console, the web browser interface, or HP ProCurve Manager. - if the port LED is blinking* simultaneously with the Fault LED, the corresponding port has failed its self test.
		Off	
		Blinking	
Act	Green	On	Indicates the port LEDs are displaying network activity information.

Expansion module LEDs for port A and B operate in modes for Link and Activity. FDX and Spd modes have no meaning for the 10-GbE ports on the expansion module.

Caution

It is recommended the power to the switch be removed before inserting or extracting the Expansion Module.

Back of the Switch



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 “Connect a Console to the Switch” in chapter 2, “Installing the Switch.” The console can be a PC or workstation running a VT-100 terminal emulator, or a VT-100 terminal. The console port is located on the front of the 3400cl-24G and on the back of the 3400cl-48G.

Power Connector

The Switch 3400cl Series devices do not have a power switch; they are powered on when connected to an active AC power source. These switches automatically adjust to any voltage between 100–240 volts and either 50 or 60 Hz. There are no voltage range settings required.

Switch Features

The features of the Switch 3400cl Series devices include:

- 24 or 48 auto-sensing 10/100/1000Base-T RJ-45 ports with HP Auto-MDIX.
- four dual-personality ports—either the auto sensing 10/100/1000Base-T RJ-45 or the mini-GBIC can be used for each port.
- one slot (optional cl module slot) is provided in the back of the device to support a series of transceivers to provide box connectivity to other switch boxes, to a 10 Gig concentrator or to any Ethernet compatible uplink.
- one auxiliary (USB) port is provided.
- The Switch 3400cl Series devices can be connected to an HP ProCurve RPS/EPS (J8168A) and receive full redundant power from that unit. If the internal power supply in the switch fails, the RPS/EPS unit will immediately provide all the power necessary to keep the switch running.
- plug-and-play networking—all ports are enabled—just connect the network cables to active network devices and your switched network is operational.
- IEEE 802.3ab Auto MDI/MDI-X on all 10/100/1000 twisted-pair ports, meaning that **all connections can be made using straight-through twisted-pair cables**. Cross-over cables are not required, although they will also work. The pin operation of each port is automatically adjusted for the attached device: if the switch detects that another switch or hub is connected to the port, it configures the port as MDI; if the switch detects that an end-node device is connected to the port, it configures the port as MDI-X.
- automatic learning of the network addresses in each switch's 8000-address forwarding table, (with configurable address aging value).
- automatically negotiated full-duplex operation for the 10/100/1000 RJ-45 ports when connected to other auto-negotiating devices—the mini-GBIC ports always operate at full duplex.
- easy management of the switch through several available interfaces:
 - **console interface**—a full featured, easy to use, VT-100 terminal interface that is especially good for out-of-band switch management or for Telnet access to the switch.
 - **web browser interface**—an easy to use built-in graphical interface that can be accessed from common web browsers.
 - **HP ProCurve Manager for Hubs & Switches**—an SNMP-based, graphical network management tool that you can use to manage your entire network. This product is 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*, which is on the Documentation CD-ROM that is included with your switch.
- download of new switch software for product enhancements or bug fixes.

Installing the Switch

The HP ProCurve Switch 3400cl Series devices come with an accessory kit that includes the brackets for mounting the switch in a standard 19-inch telco rack, in an equipment cabinet, and with rubber feet that can be attached so the switch can be securely located on a horizontal surface. The brackets are designed to allow mounting the switch in a variety of locations and orientations. This chapter shows how to install the switch.

Included Parts

The Switch 3400cl Series devices have the following components shipped with them:

- *HP ProCurve Switch 3400cl Series Installation and Getting Started Guide*, this manual
- *HP ProCurve Product Documentation CD ROM*
(contains PDF file copies of the documentation for the Switch 3400cl Series devices, including the *Management and Configuration Guide*, and for most other HP ProCurve switches)
- *HP ProCurve Manager* - CD ROM and booklet
- *Read Me First*
- Customer Support/Warranty booklet
- Console cable
- Accessory kits

(5064-2085) for Switch 3400cl-24G	(5069-5705) for Switch 3400cl-48G
two mounting brackets	two mounting brackets*
four 8-mm M4 screws to attach the mounting brackets to the switch	eight 8-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	four 5/8-inch number 12-24 screws to attach the switch to a rack
four rubber feet	four rubber feet
* These mounting brackets differ from the 5064-5085 mounting brackets by being longer to support the increased depth of the 3400cl-48G product (compared to the 3400cl-24G).	

■ Power cord, one of the following:

Australia/New Zealand	8120-6803
China	8120-8377
Continental Europe	8120-6802
Denmark	8120-6806
Japan	8120-6804
Switzerland	8120-6807
United Kingdom/Hong Kong/Singapore	8120-8709
United States/Canada/Mexico	8120-6805

Installation Procedures

Summary

1. **Prepare the installation site (page 2-5).** Ensure the physical environment is properly prepared, including having the correct network cabling ready to connect to the switch and having an appropriate location for the switch. *Please see page 2-4 for some installation precautions.*
2. **Install a cl module (optional—page 2-7).**
3. **Install a transceiver (optional—page 2-8).** If you have installed a media flex cl module, you can now install one or two transceivers.
4. **Install mini-GBICs (optional—page 2-9).** The switch has four slots for installing mini-GBICs. Depending on where you will mount the switch, it may be easier to install the mini-GBICs first. Mini-GBICs can be installed or removed while the switch is powered on.
5. **Verify the switch passes self test (page 2-11).** Plug the switch into a power source and observe that the LEDs on the switch's front panel indicate correct switch operation. When self test is complete, unplug the switch.
6. **Mount the switch (page 2-13).** The Switch can be mounted in a 19-inch telco rack, in an equipment cabinet, or on a horizontal surface.
7. **Connect power to the switch (page 2-19).** Once the switch is mounted, plug it into the nearby main power source.
8. **Connect the network cables (page 2-20).** Using the appropriate network cables, connect the network devices to the switch ports.
9. **Connect a Redundant Power Supply (RPS), (optional—page 2-21).** You may wish to use the RPS option with your Switch. Connect the RPS using the cables supplied with the RPS, to the back of the switch.
10. **Connect a console to the switch (optional—page 2-24).** 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, from an SNMP network management station, or through a Telnet session. Configuration changes can be made easily by using the included console cable to connect a PC to the switch's console port.

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

Installation Precautions:

Follow these precautions when installing the Switch 3400cl Series devices.

WARNING

- **The rack or cabinet should be adequately secured to prevent it from becoming unstable and/or falling over.**
Devices installed in a rack or cabinet should be mounted as low as possible, with the heaviest devices at the bottom and progressively lighter devices installed above.
- **For safe operation, do not install the switch with the back face of the switch (with the fan vents) facing either downward or upward.**
- **Left side vents cannot be placed downward. (That is, the left side of the unit while facing the front.)**

Cautions

- Ensure the power source circuits are properly grounded, then use the power cord supplied with the switch to connect it to the power source.
 - If your installation requires a different power cord than the one supplied with the switch, be sure to use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the switch.
 - When installing the switch, the AC outlet should be near the switch and should be easily accessible in case the switch must be powered off.
 - Ensure 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).
 - Ensure the air flow around the sides and back of the switch is not restricted.
-

1. Prepare the Installation Site

- **Cabling Infrastructure** - Ensure the cabling infrastructure meets the necessary network specifications. See the following table for cable types and lengths, and see Appendix B “Switch Ports and Network Cables” for more information:

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

Port Type	Cable Type	Length Limits
Twisted-Pair Cables		
10/100/1000Base-T	For either 10, 100 Mbps, or 1000 Mbps operation: Category 5 or better, 100-ohm UTP or shielded twisted-pair (STP) balanced cable. For 1000 Mbps (gigabit) operation, Category 5e cabling or better is recommended.	100 meters Note: The Switch 3400cl Series devices are compatible with the IEEE 802.3ab standard including the “Auto MDI/MDI-X” feature, which allows use of 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. Note: For 1000 Mbps operation, all four wire pairs are used for data transmission.

Port Type	Cable Type	Length Limits
Fiber Optic Cables		
Gigabit-SX (on Gigabit-SX-LC mini-GBIC)	Multimode fiber-optic cables designed for Gigabit Ethernet: 62.5/125 μm or 50/125 μm (core/cladding) diameter, 850 nm, low metal content, graded-index cables, fitted with LC connectors. The cables must comply with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a standards.	• 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 Gigabit-LX-LC mini-GBIC)	Single-mode fiber-optic cables designed for Gigabit Ethernet: 9/125 μm (core/cladding) diameter, 1310 nm, low metal content cables, fitted with LC connectors. The cables must comply with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards. The multimode cables specified for the Gigabit-SX mini-GBIC may also be used, but a mode-conditioning patch cord may be needed— see “Mode Conditioning Patch Cord for Gigabit-LX” on page B-3 for more information.	• single-mode cable = 5 kilometers • multimode cable = 550 meters
Gigabit-LH (on Gigabit-LH-LC mini-GBIC)	Single-mode fiber-optic cables designed for Gigabit Ethernet and fitted with LC connectors.	• single-mode cable = 70 kilometers

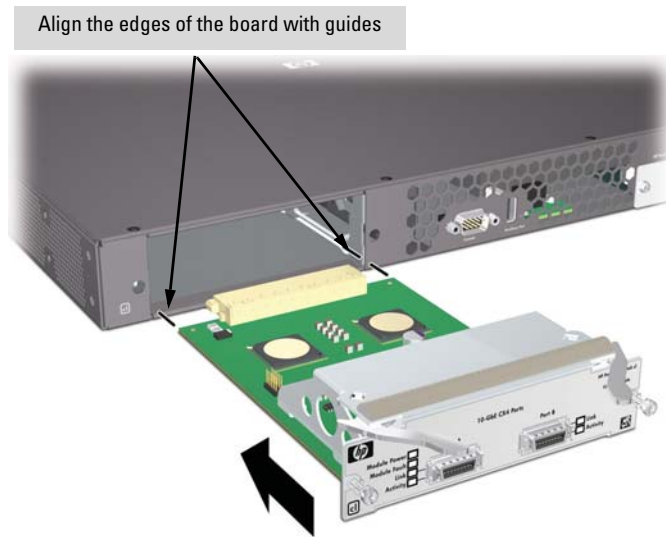
- **Installation Location** - Before installing the switch, plan its location and orientation relative to other devices and equipment:
 - In the front of the switch, leave at least 7.6 cm (3 inches) of space for the twisted-pair and fiber-optic cabling.
 - In the back of the switch, leave at least 3.8 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, except if the switch is installed in an open EIA/TIA rack.

2. (Optional) Install or Remove a cl Module

Note

Hot swapping modules is not supported. If a module is installed or removed with the switch powered on, a reset will occur. Only insert or remove a module during scheduled downtime with the switch powered off.

1. Remove the cover plate



2. Insert the module aligning with the guides in the slot.
3. Once the contacts have engaged, use the extractor handles to seat the module completely.
4. Tighten the captive screws.

Refer to the *cl Module Installation Guide* for more details.

If you have installed a media flex module, you can now install a transceiver. See the following step.

3. (Optional) Install or Remove a Transceiver

Note

Hot swapping transceivers is supported. You can install or remove a transceiver with the switch powered on, a reset will not occur.

- a. Slide the transceiver in until it stops.



- b. Push firmly until the gasket seats against the bulkhead.



Note

When switch power is on, the Link and Activity LEDs will come on for approximately two seconds and then go off. This is confirmation the transceiver is completely seated.

- c. If your transceiver has a bail, move the bail up, if not your transceiver is now completely installed.

Refer to the *HP ProCurve Switch cl Modules Installation Guide* for more details.

To remove the transceiver:

If your transceiver has a bail, lower the bail until it is approximately horizontal, and then using the bail, pull the transceiver from the slot. If your transceiver does not have a bail, pull the transceiver straight out.

4. (Optional) Install or Remove mini-GBICs

You can install or remove a mini-GBIC from a mini-GBIC slot without having to power off the switch. Use only **HP ProCurve mini-GBICs**.

Notes

- The mini-GBIC slots are shared with the four 10/100/1000Base-T RJ-45 ports. If a mini-GBIC is installed in a slot, the associated RJ-45 port is disabled and cannot be used.
- The mini-GBIC ports operate only at full duplex. Half duplex operation is not supported.
- Ensure the network cable is NOT connected when you install or remove a mini-GBIC.

When this manual was printed, the supported mini-GBICs include the following:

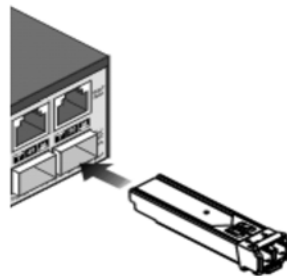
- HP ProCurve Gigabit-SX-LC mini-GBIC (J4858A)
- HP ProCurve Gigabit-LX-LC mini-GBIC (J4859A)
- HP ProCurve Gigabit-LH-LC mini-GBIC (J4860A)

Caution

The HP ProCurve mini-GBICs are Class 1 laser devices. Avoid direct eye exposure to the beam coming from the transmit port.

Installing the mini-GBICs:

Hold the mini-GBIC by its sides and gently insert it into either of the slots on the switch until the mini-GBIC clicks into place.



Removing the mini-GBICs:

Note

You should disconnect the network cable from the mini-GBIC before removing it from the switch.

Depending on when you purchased your HP ProCurve mini-GBIC, it may have either of three different release mechanisms: a plastic tab on the bottom of the mini-GBIC, a plastic collar around the mini-GBIC, or a wire bail.

To remove the mini-GBICs that have the plastic tab or plastic collar, push the tab or collar toward the switch until you see the mini-GBIC release from the switch (you can see it move outward slightly), and then pull it from the slot.

To remove the mini-GBICs that have the wire bail, lower the bail until it is approximately horizontal, and then using the bail, pull the mini-GBIC from the slot.

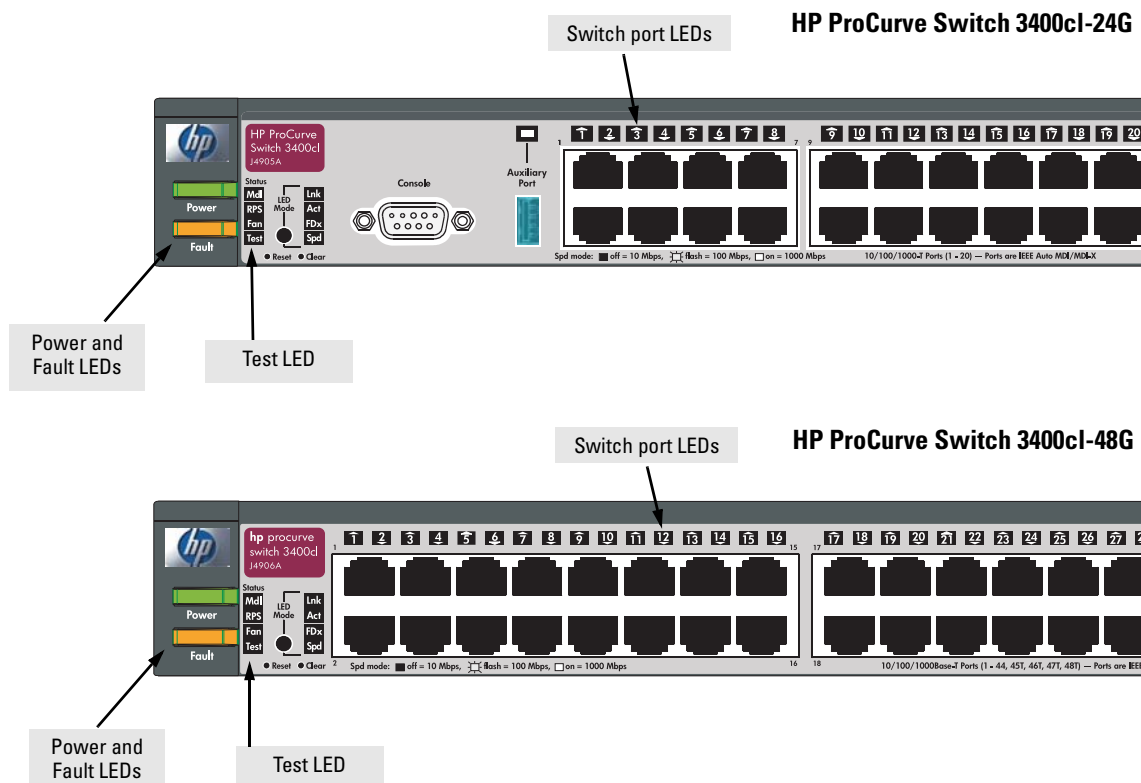
Before mounting the switch in its network location, you should first verify it is working properly by plugging it into a power source and verifying it passes self test.

-

The Switch 3400cl Series devices do not have a power switch. They are powered on when the power cord is connected to the switch and to a power source. For safety, the power outlet should be located near the switch installation.

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

2. Check the LEDs on the switch as described below.



When the switch is powered on, it performs its diagnostic self test. Self test takes approximately 50 seconds to complete.

LED Behavior:

During the self test:

- Initially, all the status, LED Mode and port LEDs are on for most of the duration of the test.
- Most of the LEDs go off and then may come on again during phases of the self test. For the duration of the self test, the Test LED stays on.

When the self test completes successfully:

- The **Power** and **Fan Status** LEDs remain on.
- The **Fault** and **Test LEDs** go off.
- The port LEDs on the front of the switch go into their normal operational mode:
 - If the ports are connected to active network devices, the LEDs behave according to the LED Mode selected. In the default view mode (Link), the LEDs should be on.
 - If the ports are not connected to active network devices, the LEDs will stay off.

If the LED display is different than what is described above, especially if the **Fault** and **Test LEDs** stay on for more than 60 seconds or they start blinking, the self test has not completed correctly. Refer to chapter 4, “Troubleshooting” for diagnostic help.

6. Mount the Switch

After the switch passes self test, you are ready to mount the switch in a stable location. The Switch 3400cl Series devices can be mounted in these ways:

- in a rack or cabinet
- on a horizontal surface

Rack or Cabinet Mounting

The Switch 3400cl Series devices are designed to be mounted in any EIA-standard 19-inch telco rack or communication equipment cabinet.

WARNING

For safe operation, please read the mounting precautions on [page 2-4](#), before mounting a switch.

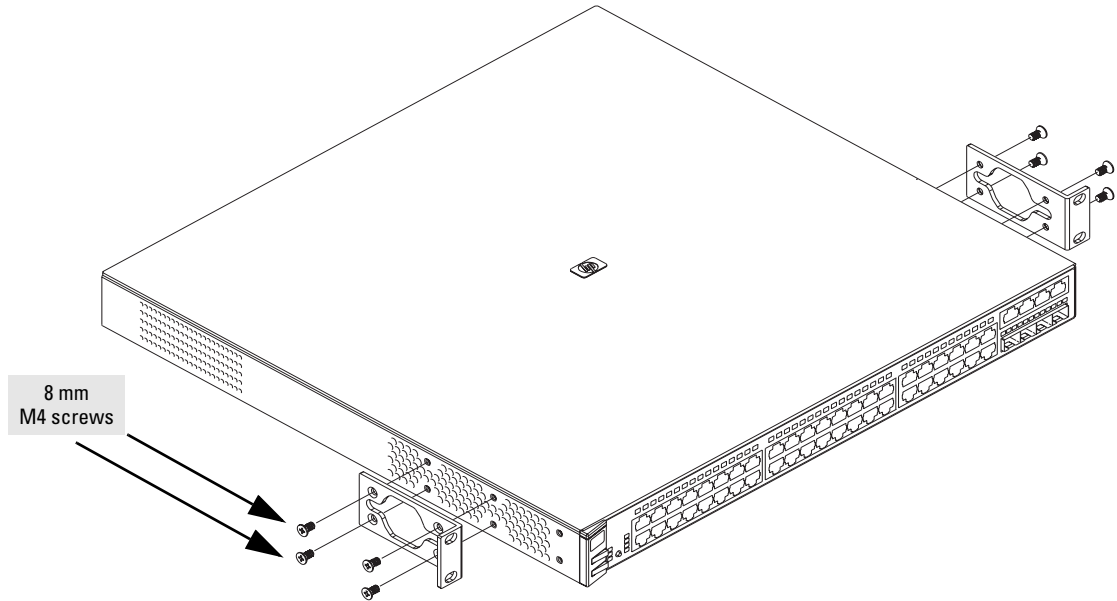
**Equipment
Cabinet
Note**

The 12-24 screws supplied with the switch are the correct threading for standard EIA/TIA open 19-inch racks. If you are installing the switch in an equipment cabinet such as a server cabinet, use the clips and screws that came with the cabinet in place of the 12-24 screws that are supplied with the switch.

Complete step 1, and plan which four holes you will be using in the cabinet and install all four clips. Then proceed to step 2.

Rack Mounting the Switch 3400cl-48G

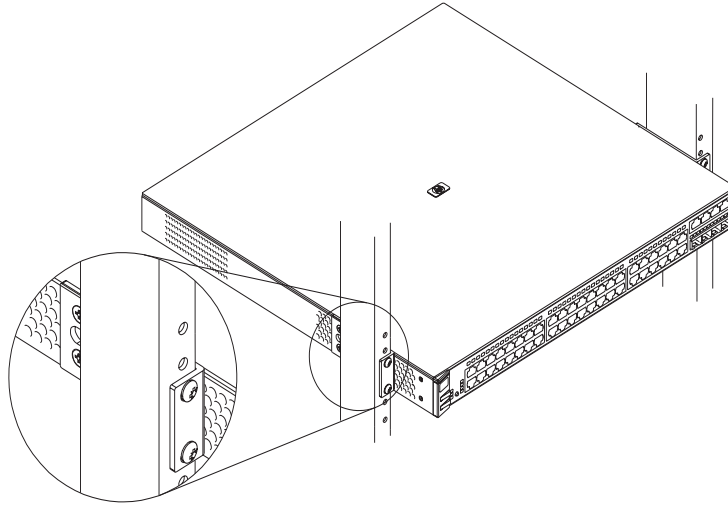
1. Use a #1 Phillips (cross-head) screwdriver and attach the mounting brackets to the switch with the included 8-mm M4 screws.



Note

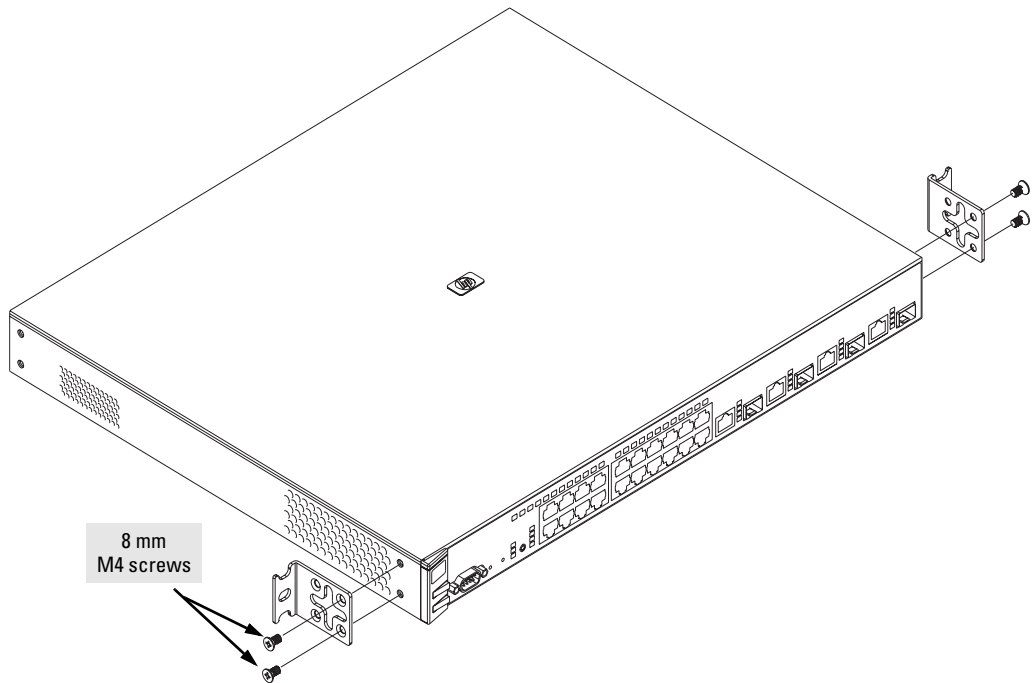
The mounting brackets have multiple mounting holes and can be rotated allowing for a wide variety of mounting options. These include mounting the switch so its front face is flush with the face of the rack, or mounting it in a more balanced position as shown in the illustration.

2. Hold the switch with attached brackets up to the rack and move it vertically until rack holes line up with the bracket holes, then insert and tighten the four number 12-24 screws holding the brackets to the rack.



Rack Mounting the Switch 3400cl-24G

1. Use a #1 Phillips (cross-head) screwdriver and attach the mounting brackets to the switch with the included 8-mm M4 screws.

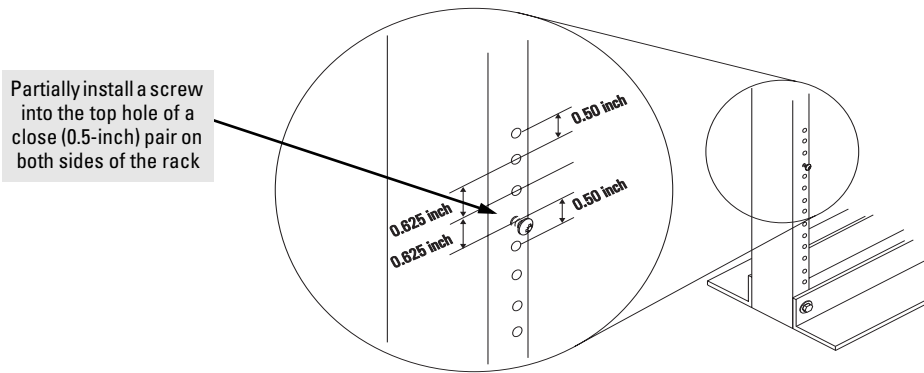


Note

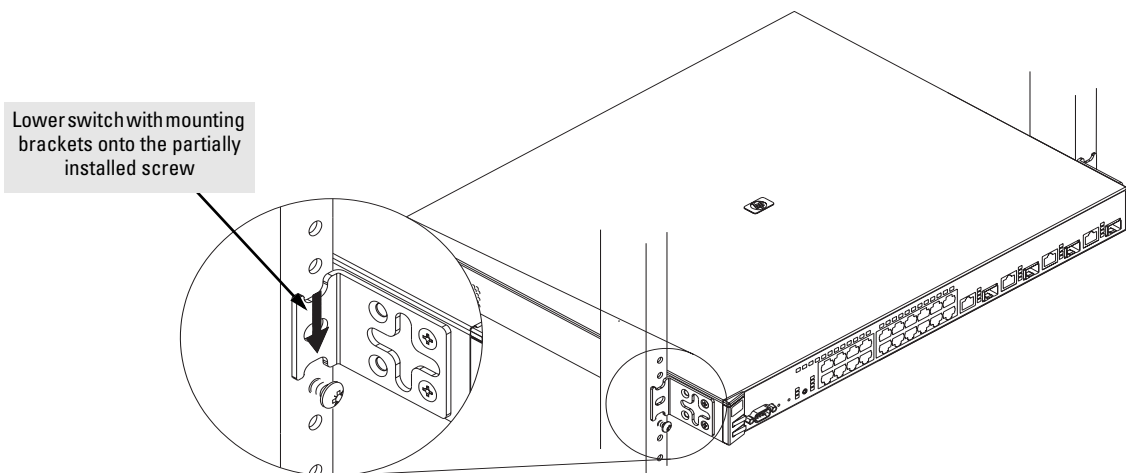
The mounting brackets have multiple mounting holes and can be rotated allowing for a wide variety of mounting options. These include mounting the switch so its front face is flush with the face of the rack, or mounting it in a more balanced position as shown in the illustration.

Steps 2, 3, and 4 on the following pages describe a convenient method of mounting the switch in a rack by placing it on two screws that you first install in the rack. You may, instead, just hold the switch with attached brackets up to the rack and move it vertically until rack holes line up with the bracket holes and notches, then insert and tighten the four screws holding the brackets to the rack.

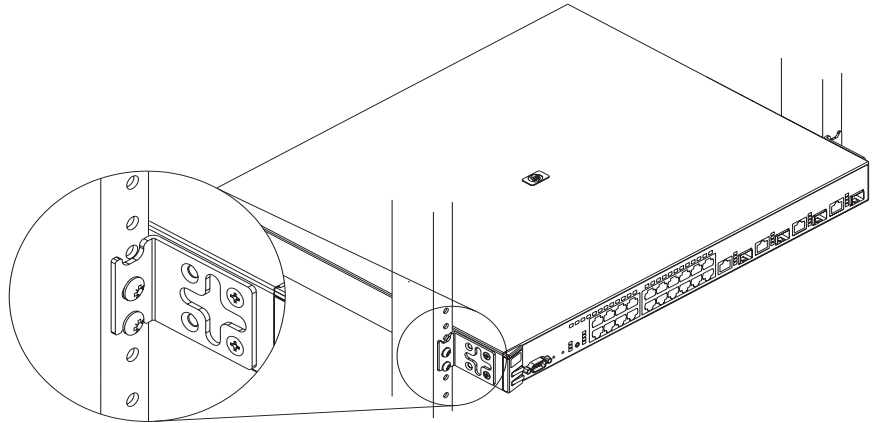
2. Partially install a screw (5/8-inch number 12-24) into the top hole of a pair of holes that are 0.5 inches apart in each rack/cabinet upright as shown in the illustration below. Ensure that the screws are at the same level in each upright.



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



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



Horizontal Surface Mounting

Place the switch on a table or other horizontal surface. The switch comes with rubber feet in the accessory kit that can be used to help keep the switch from sliding on the surface.

Attach the rubber feet to the four corners on the bottom of the switch within the embossed angled lines. Use a sturdy surface in an uncluttered area. You may want to secure the networking cables and switch power cord to the table leg or other part of the surface structure to help prevent tripping over the cords.

Caution

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

7. Connect the Switch to a Power Source

1. Plug the included power cord into the switch's power connector and into a nearby AC power source.
2. Re-check the LEDs during self test. See "LED Behavior" on [page 2-12](#)

8. Connect the Network Cables

Connect the network cables, described under “Cabling Infrastructure” ([page 2-5](#)), from the network devices or your patch panels to the fixed RJ-45 ports on the switch or to any mini-GBICs you have installed in the switch.

Using the RJ-45 Connectors

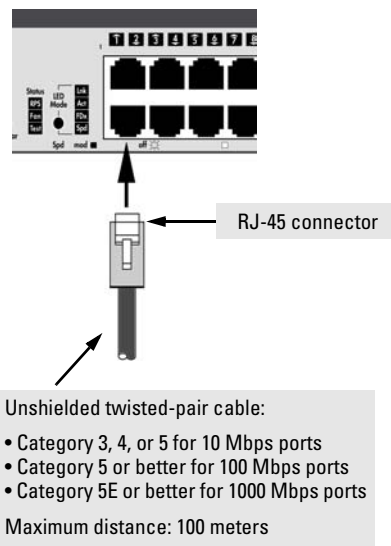
To connect:

Push the RJ-45 plug into the RJ-45 jack until the tab on the plug clicks into place. When power is on for the switch and for the connected device, the Link LED for the port should light to confirm a powered-on device (for example, an end node) is at the other end of the cable.

If the Link LED does *not* go on when the network cable is connected to the port, see [“Diagnosing with the LEDs” on page 4-4](#), in chapter 4, “Troubleshooting”.

To disconnect:

Press the small tab on the plug and pull the plug out of the jack.



Connecting Cables to mini-GBICs

Note

Each of the four mini-GBIC slots is shared with the associated 10/100/1000Base-T RJ-45 port. If a mini-GBIC is installed in a slot, the associated RJ-45 port is disabled.

If you have any mini-GBICs installed in the switch, the type of network connections you will need to use depends on the type of mini-GBICs you have installed. See the table on [page 2-6](#), and appendix B, [“Switch Ports”](#), for the mini-GBIC cabling information.

For mini-GBICs ports, and in general for all the switch ports, when a network cable from an active network device is connected to the port, the port LED for that port should go on. If the port LED does *not* go on when the network cable is connected to the port, see [“Diagnosing with the LEDs” on page 4-4](#) in chapter 4, “Troubleshooting”.

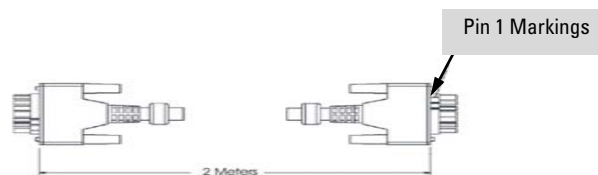
9. (Optional) Connect a Redundant Power Supply to the Switch

The “HP ProCurve 600 Redundant and External Power Supply (hereafter referred to as the RPS/EPS)” (J8168A) is an accessory product for the Switch 3400cl Series devices and specific other HP ProCurve switches. The RPS/EPS provides redundant power to any one of up to six switch products, to back up the power supply in the switch in case of loss of AC power, or a fault condition. The RPS/EPS is an unmanaged power supply that only provides information by way of LEDs or through the port interfaces to attached devices.

Operating Characteristics

The RPS/EPS has six connectors, each of which can provide redundant +12V power to a connected switch, but only one connector can provide this power at a given time. If a switch with no AC power is connected to an operating RPS/EPS, it will NOT immediately power up this new switch. Power can only be provided to a switch if it is first powered on and operating correctly. Then when the power to the switch fails, power will be provided from the RPS/EPS, if it is available, that is, if the RPS/EPS is not already providing power to a higher priority switch. If two or more devices fail, priority goes to the device plugged into the lower numbered port on the RPS/EPS unit. Consequently the most important switch must be plugged into port one on the RPS/EPS. In this state, the “Connected” LED should be ON, and the “Power Status” LED should be BLINKING. (Refer to the documentation that came with your RPS/EPS.)

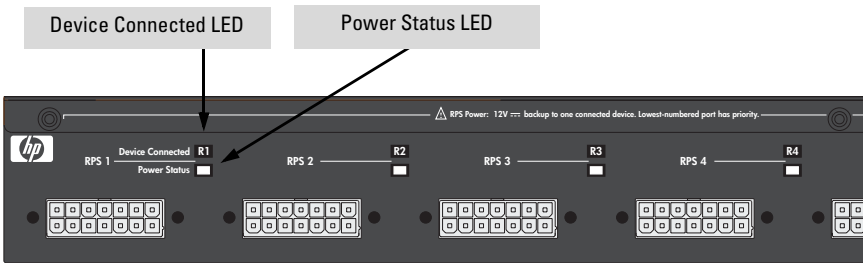
Connect the RPS/EPS to the switch using one of the 6 supplied RPS cables.



LEDs

The RPS LEDs are located on the back of the RPS/EPS. These LEDs are duplicated on the front of the device. The following graphic shows an example of the back of the RPS/EPS. There are two green LEDs for each RPS port:

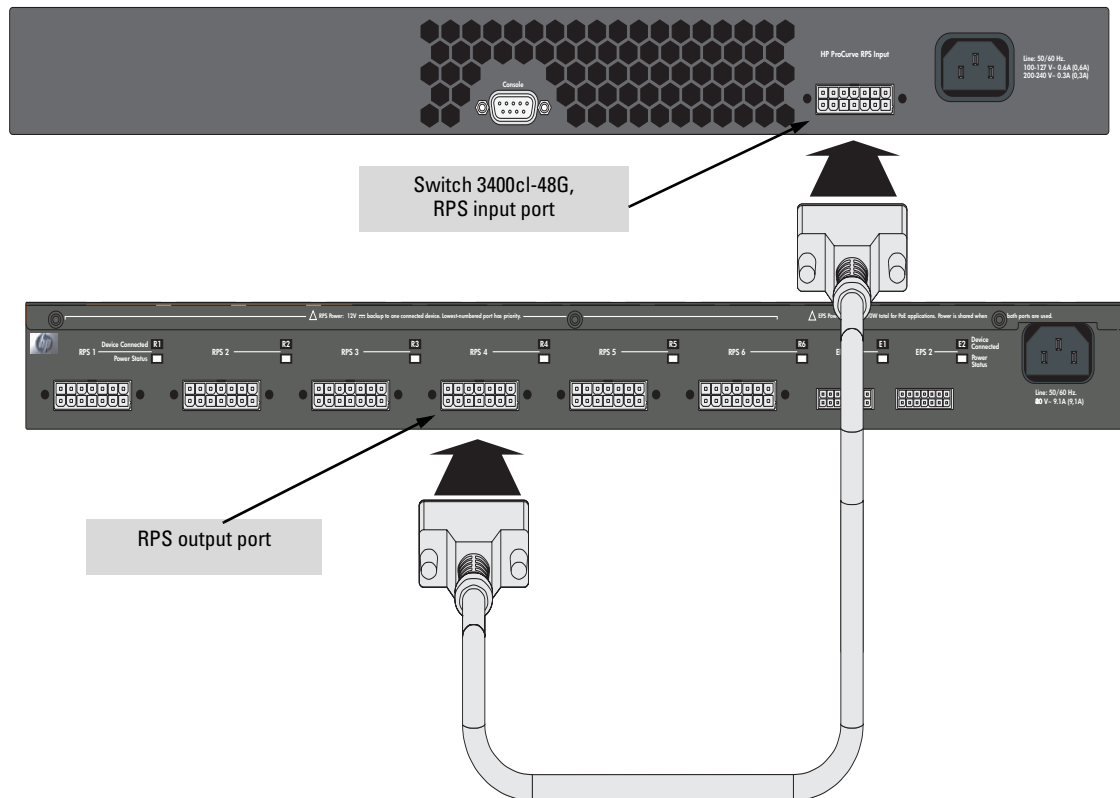
- Device Connected
- Power Status



The following states provide status of an RPS/EPS port.

Fault	Device Connected	Power Status	Message
Off	Off	Off	Nothing Connected
On or Off	Off	On	Not a valid state - should never happen
Off	On	Off	Switch is connected, RPS is available but not required
Off	On	On	RPS is powering the connected device
Blinking	Off	Blinking	RPS port is in fault mode
Off	On	Blinking	Switch is requesting power, RPS can not provide it
Blinking	On	Off	Switch is unplugged, but RPS is powering switch

The following picture demonstrates an example of connectivity between an RPS/EPS device and a Switch device.



RPS/EPS Operation

The RPS/EPS monitors the power signal from the switch by detecting that the RPS/EPS is connected to a switch with an RPS/EPS cable. When the power from the switch is no longer detected, the RPS/EPS will turn on and provide power to the switch within 1ms.

The RPS/EPS supports hot plugging of the RPS/EPS cable without causing a reboot of the switch or causing the power supply in either the RPS/EPS or switch to shut down temporarily or permanently. For more information refer to the documentation that came with the RPS/EPS.

10. (Optional) Connect a Console to the Switch

The switch has a full-featured, easy to use console interface for performing switch management tasks including the following:

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

The console can be accessed through these methods:

- **Out-of-band:** The switch comes with a serial cable for connecting a PC or VT-100 terminal, to be used as a console, directly to the switch.
- **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. For more information on IP addressing and on starting a Telnet session, see chapter 3, *"Getting Started With Switch Configuration"*, and the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

The Switch 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 DEC VT-100 (ANSI) terminal or use a VT-100 terminal, and configure either one to operate with these settings:

- any baud rate from 1200 to 115200 (the switch senses the speed)
- 8 data bits, 1 stop bit, no parity, and flow control set to Xon/Xoff
- For the Windows Terminal program, also disable (uncheck) the "Use Function, Arrow, and Ctrl Keys for Windows" option
- For the Hilgraeve 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 so they are compatible. Change the switch settings first, save your changes, then change the terminal settings, then reboot the switch and reestablish the console session.

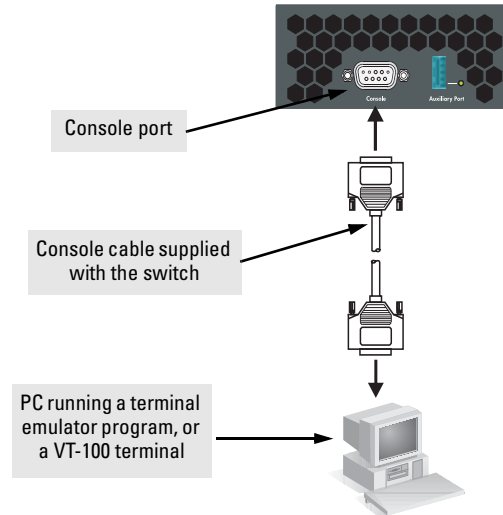
Direct Console Access

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

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

HP ProCurve Switch 3400cl-48G#

If you want to continue with console management of the switch at this time, see chapter 3, *"Getting Started With Switch Configuration"* for some basic configuration steps. For more detailed information, refer to the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with the switch.

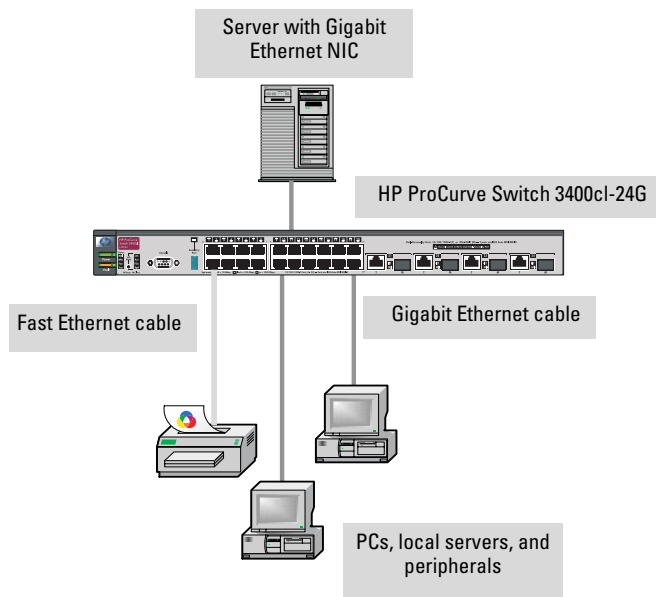


This picture demonstrates the Switch 3400cl-48G. Remember the console port on the Switch 3400cl-24G is in front.

Sample Network Topologies

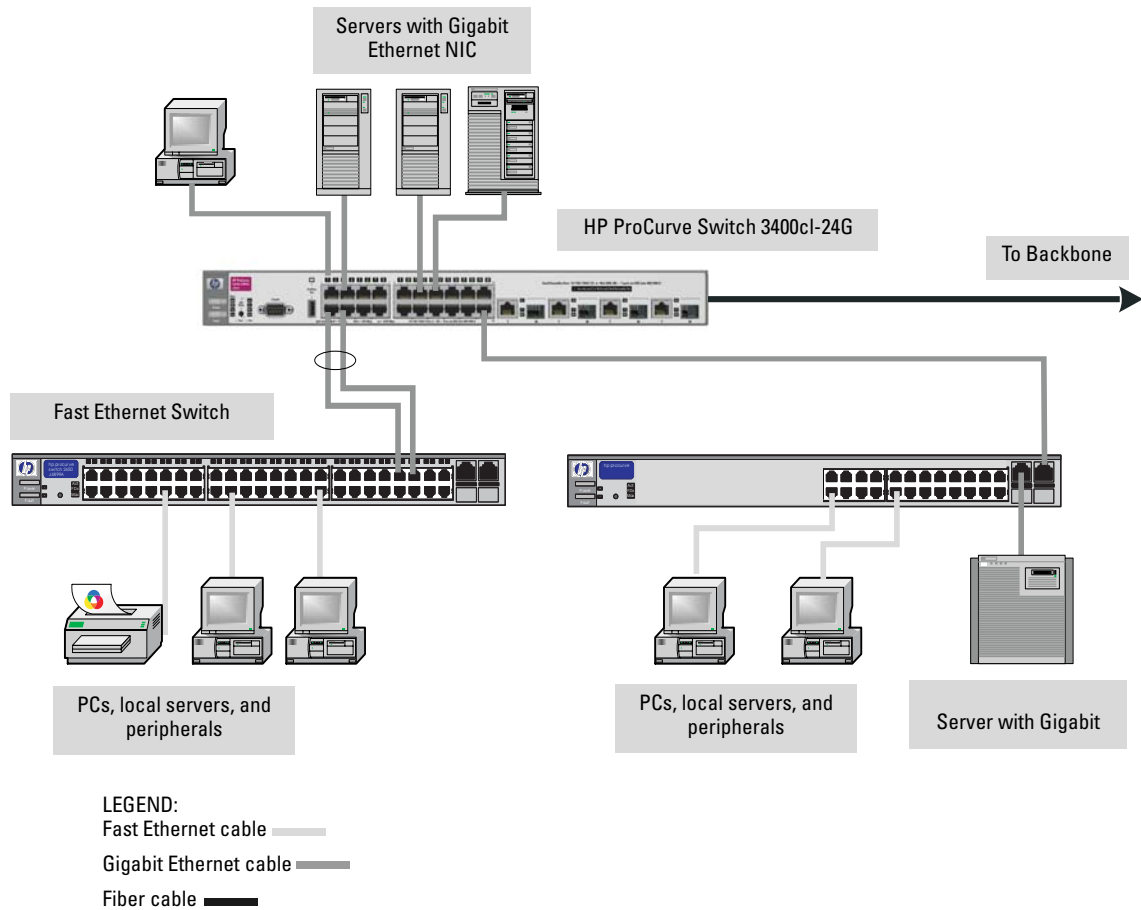
This section shows a few sample network topologies in which the Switch is implemented. For more topology information, see the HP network products World Wide Web site, <http://www.hp.com/go/hpprocurve>.

As a Desktop Switch



The Switch is designed to be used primarily as a desktop switch to which end nodes, printers and other peripherals, and servers are directly connected, as shown in the above illustration. Notice that the end node devices are connected to the switch by straight-through or crossover twisted-pair cables. Either cable type can be used because of the “IEEE Auto MDI/MDI-X” features on the Switch.

As a Segment Switch



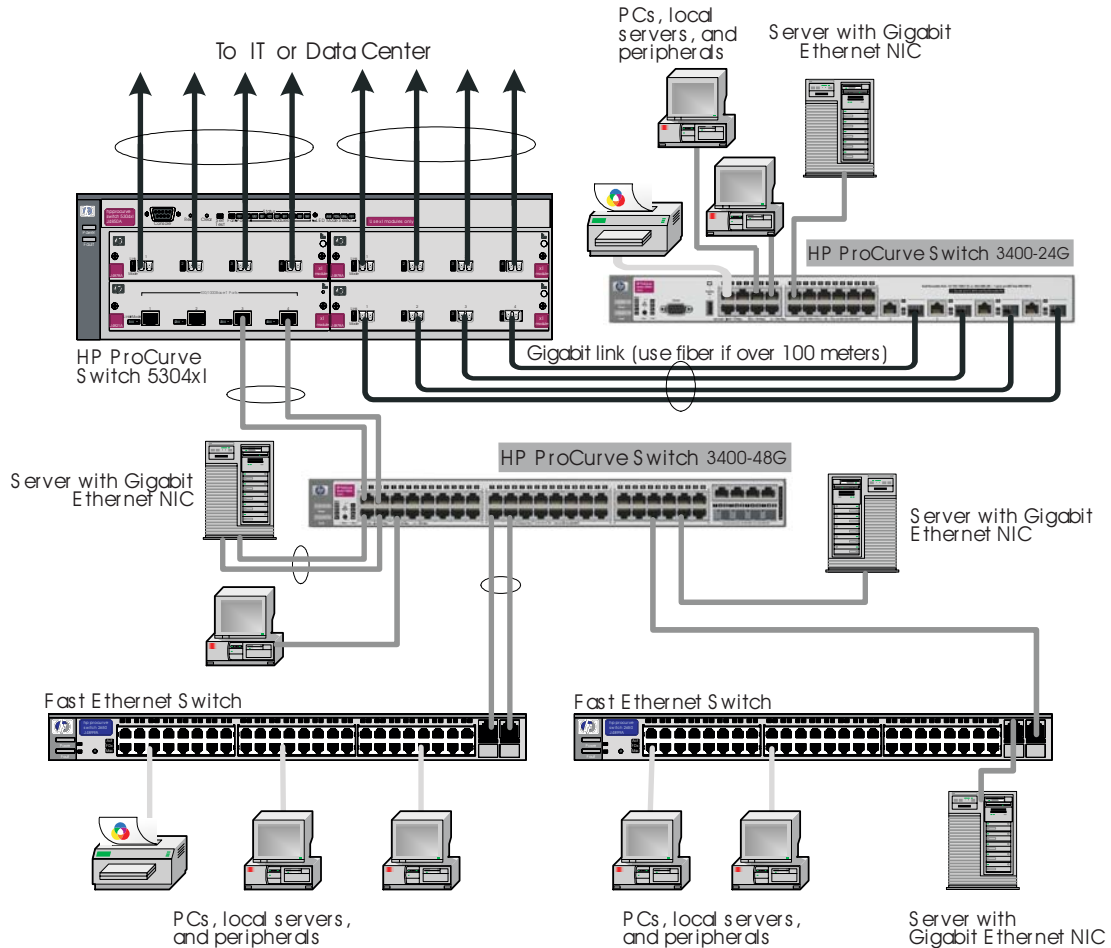
The Switch also works well as a segment switch. That is, with its high performance, it can be used for interconnecting network segments—simply connect the network hubs that form those segments to the switch, or you can also connect other switches.

In the illustration above, two “Fast” Ethernet hubs with PCs, printers, and local servers attached, are both connected to a Switch. The devices attached to the two hubs can now communicate with each other through the switch. They can also all communicate with the server that is connected to a 1000Base-T port on the switch.

Because the Switch has the “IEEE Auto MDI/MDI-X” features, the connections between the switch and the hubs, and between the switch and end nodes or servers can be through category 5 straight-through or crossover twisted-pair cable. Category 3 or 4 cable can also be used if the connection is 10 Mbps only. In all cases, the device ports must be configured to auto negotiate the link characteristics for this feature to work.

The switch, in turn, can be connected to a network backbone through fiber-optic cabling connected to a Gigabit-SX, -LX, or -LH mini-GBIC installed in the switch. Now, all the devices on these network segments can access other network resources that are connected elsewhere on the network backbone.

Connecting to a Backbone Switch



The simpler desktop and segment networks shown in the previous two examples can easily be combined and expanded. For example, you could use an HP ProCurve Switch 5304xl to interconnect each of your smaller switched workgroups to form a larger switched network. All the devices in this network can communicate with each other. With a Gigabit-SX Module, for example, in the Switch 5304xl, the entire switched topology could be connected to a campus backbone, as shown in the illustration above.

Note

In the Backbone Switch illustration, the 1000 Mbps fiber-optic connection between the Switch 3400cl-24G and the Switch 5304xl is by way of a Gigabit-SX mini-GBIC installed in the Switch 3400cl-24G and connected to a Gigabit-SX Module in the Switch 5304xl.

Stacking the Switch

The Switch 3400cl Series devices 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 the switch 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 Switches, please see the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with the switch.

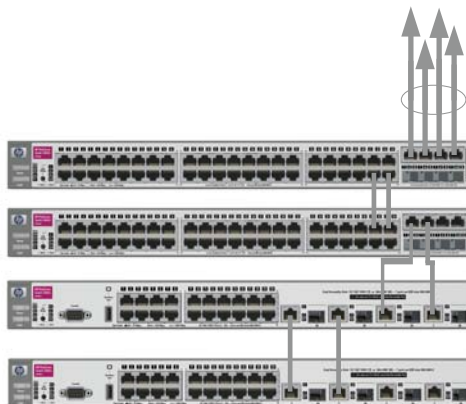
LEGEND:

Gigabit Ethernet cable —

To Gigabit-Ethernet Backbone
(Use fiber if over 100 meters)

HP ProCurve Switch 3400cl-48G

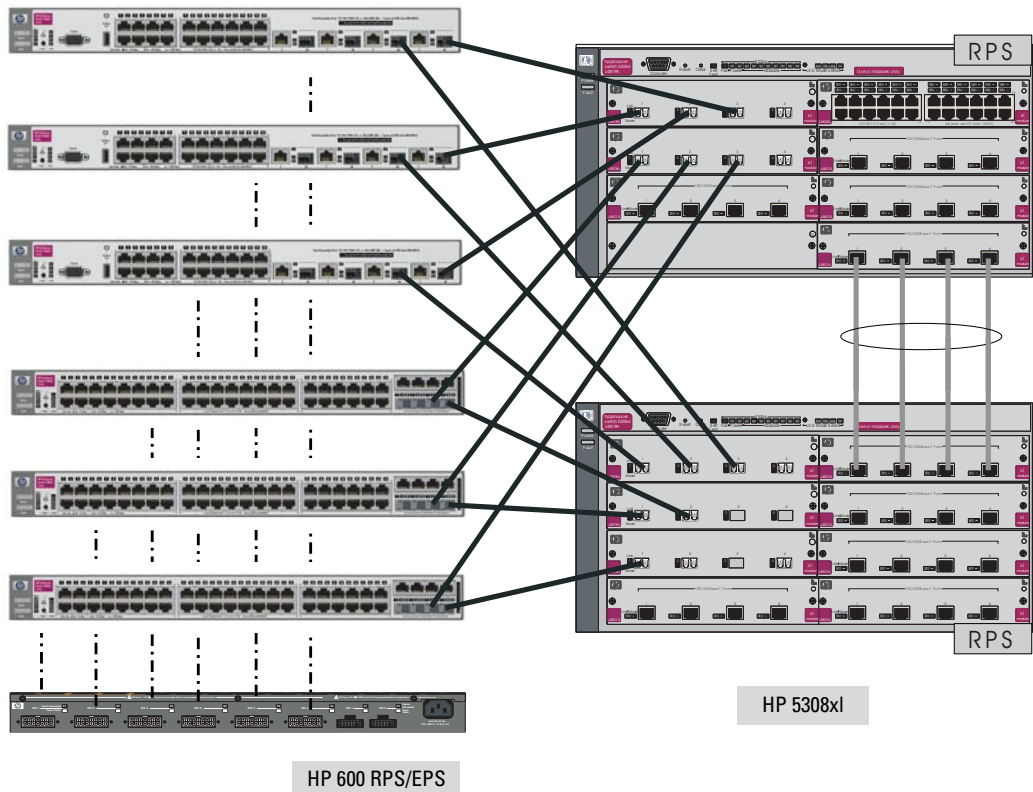
HP ProCurve Switch 3400cl-24G



The Switch in a Redundant Topology

The redundant topology increases the availability of a single switch by protecting against single points of failure with the use of redundant switches and power supplies (RPS).

All hardware and paths are redundant. If any hardware failure occurs, I/O communication can still be completed through another path.



LEGEND:

Fast Ethernet cable —

Gigabit Ethernet cable —

RPS Power - - -

— *This page is intentionally unused.* —

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 ProCurve Manager for Hubs & Switches, please see the *Management and Configuration Guide*, which is 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 ProCurve Manager 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*, which 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*.

Note

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*, which is on the Documentation CD-ROM that came with your switch.

Using the Console 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 3400cl-24G#

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 3400-24G                               1-Jan- 2004   2:59:24
=====-- CONSOLE - MANAGER MODE -----
                        Switch Setup

System Name : HP Procurve Switch 3400-24G
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.

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*, which 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	Optional; Enter the IP address of the next-hop gateway node if network traffic needs to be able to reach off-subnet destinations.
Time Sync Method	None	Optional; The protocol the switch uses to acquire a time signal. The options are SNTP and TimeP.
TimeP Mode	Disabled	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 <i>Management and Configuration Guide</i>, which 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.

Where to Go From Here

The above procedure configures your switch with a Manager password, IP address, and subnet mask. As a result, with the proper network connections, you can now manage the switch from a PC equipped with Telnet, a web browser interface, or from an SNMP-based network management station using a tool such as HP ProCurve Manager for Hubs & Switches.

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 3400, please see the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

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.

Using the IP Address for Remote Switch Management

With your Switch 3400, 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 3400-24G#

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. Entering any command followed by **?** displays a list of options that are available at that point in the command entry.

Starting a Web Browser Session

Your Switch 3400 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.

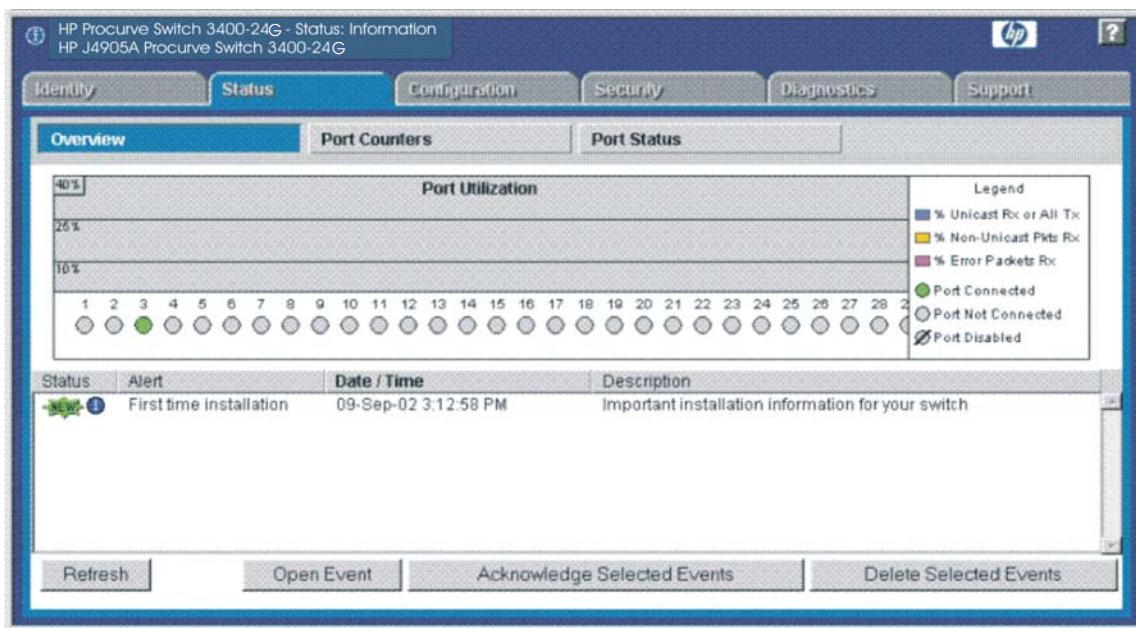
Getting Started With Switch Configuration

Using the IP Address for Remote Switch Management

The operating systems, web browsers, and Java support required to manage the switch through the browser interface are listed in the following table:

Operating System	Internet Explorer	Java Version
Windows 2000 SP4	5.5 SP2, 6.0 SP1	1.3.1_12 and 1.4.2_05
Windows XP SP1a	6.0 SP1	1.3.1_12 and 1.4.2_05
Windows Server 2003	6.0 SP1	1.3.1_12 and 1.4.2_05

The following illustration shows a typical web browser interface screen.



For more information on using the web browser interface, please see the *Management and Configuration Guide*, which 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 ProCurve Manager for Hubs & Switches needs to be installed on a network management station that is on the subnet.

Troubleshooting

This chapter describes how to troubleshoot your switch. This document describes troubleshooting mostly from a hardware perspective. You can perform more in-depth troubleshooting on the switch using the software tools available with the switch, including the full-featured console interface, the built-in web browser interface, and HP ProCurve Manager for Hubs & Switches, the SNMP-based network management tool. For more information, see the chapter “Troubleshooting” in the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came 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 software to the Switch 3400 ([page 4-12](#))
 - HP Customer Support Services ([page 4-13](#))
-

Basic Troubleshooting Tips

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

- **Connecting to devices that have a fixed full-duplex configuration.** The RJ-45 ports are 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 mode of *half* duplex.

Because the switch 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 are configured to auto negotiate, or are configured to connect at half duplex (all hubs are configured this way, for example).

- **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 at the HP ProCurve web site, <http://www.hp.com/go/hpprocurve>.

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.

For your switch, 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 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 ProCurve Manager for Hubs & Switches.

The Switch 3400cl Series devices also support **Trunking**, which allows multiple network cables to be used for a single network connection without causing a data path loop. For more information on Spanning Tree and Trunking, see the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

- **Check the port configuration.** A port on your switch 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. For more information, see the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

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.

Diagnosing with the LEDs

Table 4-1 shows LED patterns on the switch and the switch modules that indicate problem conditions.

1. Check in the table for the LED pattern 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	Module (Mdl) Status/Fault**	RPS Status	Test	Fan Status	Port LED (in Link view mode)	
Off with power cord plugged in	*	*	*	*	*	*	1
On	Prolonged On	*	*	Prolonged On	*	*	2
On	Blinking†	*	*	Blinking†	*	*	3
On	Blinking†	*	*	Off	Blinking†	*	4
On	Blinking†	See tip 5	*	Blinking†	*	Blinking†	5
On	Off	*	*	Off	*	Off with cable connected	6
On	Off	*	*	Off	*	On, but the port is not communicating	7
On	Blinking†	*	On	*	*	*	8
On	Blinking†	F ¹ Blinking† B ² Blinking†	*	Blinking†	*	*	9
* This LED is not important for the diagnosis. † The blinking behavior is an on/off cycle once every 1.6 seconds, approximately. ** The Module Fault LED is located on the module in the rear of the switch. ¹ F - Front ² B - Back							

Diagnostic Tips:

Tip	Problem	Solution
❶	The switch is not plugged into an active AC power source, or the switch's power supply may have failed.	1. Verify 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 booklet 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 booklet for more information.
❸	The switch has experienced a software failure during self test.	1. Try resetting the switch by pressing the Reset button on the front of the switch, or by power cycling the switch. 2. If the fault indication reoccurs, attach a console to the switch (as indicated in chapter 2) and configure it to operate at 9600 baud. Then, reset the switch. Messages should appear on the console screen and in the console log identifying the error condition. You can view the console log at that point by selecting it from the console Main Menu. If necessary to resolve the problem, contact your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty booklet for more information.
❹	One or both 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 both of the fans has failed. The switch has two fans and may continue to operate 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 booklet for more information.
❺	The network port for which the LED is blinking has experienced a self test or initialization failure. If the Mdl Status LED is blinking, the affected port is on the cl Module.	Try power cycling the switch. If the fault indication reoccurs, the switch port 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 booklet for more information. If the port is a pluggable, verify it is one of the pluggables supported by the switch. Unsupported pluggables will be identified with this fault condition. The supported mini-GBICs are listed in Chapter 2, "Installing the Switch" on page 2-1, supported transceivers are listed in the <i>HP ProCurve Switch cl Modules Installation Guide</i>. The mini-GBICs are also tested when they are "hot-swapped"—installed or changed while the switch is powered on. To verify the port has failed, try removing and reinstalling the mini-GBIC without having to power off the switch. If the port fault indication reoccurs, you will have to replace the mini-GBIC.

continued on the next page

Tip	Problem	Solution
⑥	The network connection is not working properly.	Try the following procedures: • For the indicated port, verify both ends of the cabling, at the switch and the connected device, are connected properly. • Verify the connected device and switch are both powered <i>on</i> and operating correctly. • Verify you have used the correct cable type for the connection: – For twisted-pair connections to the fixed 10/100 or 10/100/1000 ports, if the port is configured to “Auto” (auto negotiate), either straight-through or crossover cables can be used because of the switch’s “HP Auto-MDIX” feature and the Auto MDI/MDI-X feature of the 10/100/1000-T port. Note: If the switch port configuration is changed to one of the fixed configuration options (for example, 100 Mbps/Full Duplex), then the port operates as MDI-X only and you must use the correct type of cable for the connection. In general, for connecting an end node (MDI port) to the switch, use straight-through cable; for connecting to MDI-X ports on hubs, other switches, and routers, use crossover cable. – For fiber-optic connections, verify 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 the dual-personality 10/100/1000-T ports, be sure a mini-GBIC is not installed in the associated slot. • For 1000Base-T connections, 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 process must include all patch cables from any end devices, including the switch, to any patch panels in the cabling path. • Verify 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 ProCurve Manager for Hubs & Switches network management software to determine the state of the port and re-enable the port if necessary. • Verify the switch port configuration matches the configuration of the attached device. For example, if the switch port is configured as “Auto”, the port on the attached device also MUST be configured as “Auto”. Depending on the port type, twisted-pair or fiber-optic, if the configurations don’t match, the results could be a very unreliable connection, or no link at all. • If the other procedures don’t resolve the problem, try using a different port or a different cable.

Tip	Problem	Solution
7	The port may be improperly configured, or the port may be in a "blocking" state by the normal operation of the Spanning Tree, LACP, or IGMP features.	Use the switch console to see if the port is part of a dynamic trunk (through the LACP feature) or to see if Spanning Tree is enabled on the switch, and to see if the port may have been put into a "blocking" state by those features. The show lacp command displays the port status for the LACP feature; the show spanning-tree command displays the port status for Spanning Tree. Also check the Port Status screen using the show interfaces command to see if the port has been configured as "disabled". Other switch features that may affect the port operation include VLANs and IGMP. Use the switch console to see how the port is configured for these features. For software troubleshooting tips, see the chapter "Troubleshooting" in the <i>Management and Configuration Guide</i>, which is on the Documentation CD-ROM that came with your switch. Make sure also, the device at the other end of the connection is indicating a good link to the switch. If it is not, the problem may be with the cabling between the devices or the connectors on the cable.
8	An RPS is connected but the switch has experienced a fault.	Refer to the HP 600/610 External Power Supplies documentation.
9	Expansion module is plugged in but has experienced a fault.	Check the rear of the switch. Check the module LEDs for indications. This will only occur during an initialization self test.

Proactive Networking

The HP ProCurve Switch 3400cl Series devices have built-in management capabilities that proactively help you manage your network including:

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

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

- HP ProCurve Manager for Hubs & Switches - an SNMP-based network management tool that is included with your switch.
- A graphical web browser interface that you can use to manage your switch from a PC running a supported web browser, for example Microsoft Internet Explorer, and Netscape Communicator.
- A full-featured easy-to-use console interface that you can access by 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.

For more information on using these software tools to diagnose and manage your switch, see the “Troubleshooting” chapter in the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

Hardware Diagnostic Tests

Testing the Switch by Resetting It

If you believe 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.

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 50 seconds. If these LEDs stay on longer than 60 seconds or begin blinking, there may be a problem with the switch.

See “Diagnosing With the LEDs” on [page 4-4](#) for information on interpreting the LED patterns and LED behaviors in chapter one.

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 7, “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 2-24](#). Then, when you reset the switch, note the messages that are displayed. Additionally, you can check the switch event log, which can be accessed from the console using the **show log** command, or from the console Main Menu.

Testing Twisted-Pair Cabling

Network cables that fail to provide a link or provide an unreliable link between the switch and the connected network device may not be compatible with the IEEE 802.3 Type 10Base-T, 100Base-TX, or 1000Base-T standards. The twisted-pair cables attached to the Switch 3400 must be compatible with the appropriate standards. To verify your cable is compatible with these standards, use a qualified cable test device.

Testing Switch-to-Device Network Communications

You can perform the following communication tests to verify 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. For more information, see the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

These tests can also be performed from an SNMP network management station running a program that can manage the switch, for example, HP ProCurve Manager 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 a link test or Ping test.

Restoring the Factory Default Configuration

As part of your troubleshooting process on the switch, 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 the IP address, if one is configured.

Note

This process removes all switch configuration changes 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. For more information on this command, see the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

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. When 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 **erase startup-config** command from the console command prompt.

Downloading New Switch Software

When product enhancements occur for the switch, new software can be downloaded to the switch through several methods, for product enhancements and new features. For more information, see the *Management and Configuration Guide*, which is on the Documentation CD-ROM that came with your switch.

The new switch software 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 mini-GBICs	the front of the switch, Switch 3400 (HP J4905A or J4906A, respectively), and on labels on the mini-GBICs
details about the switch's status including the software (OS) version, a copy of the switch configuration, a copy of the switch Event Log, and a copy of the switch status and counters information	switch console: show tech command
copy of your network topology map, including network addresses assigned to the relevant devices	your network records

— *This page is intentionally unused.* —

Specifications

Physical

	3400cl-24G (J4905A)	3400cl-48G (J4906A)
Width:	44.3 cm (17.42 in)	44.3 cm (17.42 in)
Depth:	36.7 cm (14.4 in)	43.0 cm (16.9 in)
Height:	4.4 cm (1.7 in)	4.4 cm (1.7 in)
Weight:	4.62 kg (10.20 lbs)	4.88 kg (10.75 lbs)

Electrical

The switch automatically adjusts to any voltage between 100-127 and 200-240 volts and either 50 or 60 Hz.

	3400cl-24F (J4905A)	3400cl-48G (J4906A)
AC voltage:	100-127/200-240 volts	100-127/200-240 volts
Maximum current:	2.0A/1.0A	3.0A/1.5A
Frequency range:	50/60 Hz	50/60 Hz

Environmental

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

Acoustic

Geraeuschemission LwA=48 dB am fiktiven Arbeitsplatz nach DIN 45635 T.19

Noise Emission LwA=48 dB at virtual workspace according to DIN 45635 T.19

Connectors

- The 10/100/1000 Mbps RJ-45 twisted-pair ports are compatible with the following standards:
 - IEEE 802.3ab 1000Base-T
 - IEEE 802.3u 100Base-TX
 - IEEE 802.3 10Base-T
- The 1000 Mbps LC fiber-optic ports on the Gigabit-SX and Gigabit-LX mini-GBIC transceivers are compatible with the IEEE 802.3z Gigabit-SX and Gigabit-LX standards.

Safety

Complies with:

- EN60950 / IEC 950
- CSA 22.2 No. 950
- UL 1950

Lasers

The Gigabit-SX LC mini-GBIC, and the Gigabit-LX LC mini-GBIC, both of which can be installed in the Switch 3400, are Class 1 Laser Products.

Laser Klasse 1

These mini-GBICs comply with IEC 825-2: 1993.

Switch Ports and Network Cables

This appendix includes switch connector information and network cable information for cables that should be used with the Switch 3400, 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

The fixed RJ-45 10/100Base-TX and 10/100/1000Base-T ports on the switch accept 100-ohm unshielded and shielded twisted-pair cable with RJ-45 connectors as described on the next page.

Twisted-Pair Cables

10 Mbps Operation	Category 3, 4, or 5 100-ohm 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 UTP or STP cable, complying with IEEE 802.3u 100Base-TX specifications, fitted with RJ-45 connectors
1000 Mbps Operation	Category 5 100-ohm 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 (<i>please see “Note on 1000Base-T Cable Requirements”, below</i>)

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) 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

1000Base-SX	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 LC connectors.
1000Base-LX	single mode fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards, fitted with LC connectors OR 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 LC connectors Note: Multimode fiber-optic cabling may be used for a 1000Base-LX application, but a mode conditioning patch cord may be needed. See “ Mode Conditioning Patch Cord for Gigabit-LX ” on page B-3 for more information.
1000Base-LH	single mode fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards, fitted with LC connectors

Mode Conditioning Patch Cord for Gigabit-LX

The following information applies to installations in which multimode fiber-optic cables are connected to a Gigabit-LX port.

Note

Mode Conditioning Patch Cord cables only apply to one Gigabit operation. Mode Conditioning Patch Cord cables are not supported for 10 Gigabit operation.

Unlike Gigabit-SX, which connects to only multimode fiber-optic cabling, Gigabit-LX can use either single-mode or multimode cable. Multimode cable has a design characteristic called “Differential Mode Delay”, which requires that the transmission signals be “conditioned” to compensate for the cable design and thus prevent resulting transmission errors. Since Gigabit-SX is designed to operate only with multimode cable, Gigabit-SX mini-GBICs can provide that transmission conditioning internally.

Gigabit-LX mini-GBICs, since they are designed to operate with both single-mode and multimode cable, do not provide the transmission conditioning internally. Thus, under certain circumstances, depending on the cable used and the lengths of the cable runs, an external **Mode Conditioning Patch Cord** may need to be installed between the Gigabit-LX transmitting device and the multimode network cable to provide the transmission conditioning.

If you experience a high number of transmission errors on the Gigabit-LX ports, usually CRC or FCS errors, you may need to install one of these patch cords between the Gigabit-LX port in your switch and your multimode fiber-optic network cabling, *and between the Gigabit-LX transmission device and the network cabling at the other end of the multimode fiber-optic cable run. A patch cord must be installed at both ends.*

The patch cord consists of a short length of single-mode fiber cable coupled to graded-index multimode fiber cable on the transmit side, and only multimode cable on the receive side. The section of single-mode fiber is connected in such a way that it minimizes the effects of the differential mode delay in the multimode cable.

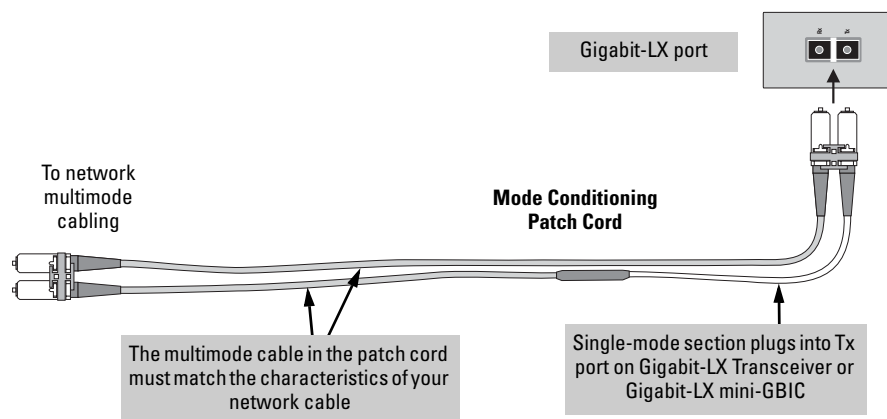
Note

If you are using good quality graded-index multimode fiber cable that adheres to the standards listed on [page 2-5](#), there should not be a need to use mode conditioning patch cords. This is especially true if the fiber runs in your network are relatively short. If you are using *single-mode* fiber-optic cabling, there is no need to use mode conditioning patch cords. Connect the single-mode network cable directly to the Gigabit-LX mini-GBIC.

Installing the Patch Cord

As shown in the illustration below, connect the patch cord to the Gigabit-LX mini-GBIC with the section of single-mode fiber plugged in to the Tx (transmit) port. Then, connect the other end of the patch cord to your network cabling patch panel, or directly to the network multimode fiber.

If you connect the patch cord directly to the network cabling, you may need to install a **female-to-female adapter** to allow the cables to be connected together.



Make sure you purchase a patch cord that has LC connectors on the end that connects to the Gigabit-LX mini-GBIC, and has multimode fibers that match the characteristics of the multimode fiber in your network.

Recommended Patch Cords

Hewlett-Packard maintains a list of recommended Mode Conditioning Patch Cords that have been tested and verified to operate correctly with the HP ProCurve Gigabit-LX Transceiver and HP ProCurve Gigabit-LX LC mini-GBIC.

The list is on the HP ProCurve web site, <http://www.hp.com/go/hpprocurve>, in the Technical Support section.

Twisted-Pair Cable/Connector Pin-Outs

Auto-MDIX Feature: The 10/100/1000-T ports support the IEEE 802.3ab standard, which includes the “Auto MDI/MDI-X” feature. In the default configuration, “Auto”, the ports on the Switch 3400 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.

If you connect a Switch 3400 twisted-pair port to another switch or hub, which typically have MDI-X ports, the Switch 3400 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 3400 port operates as an MDI-X port. In all cases, you can use standard straight-through cables or crossover 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.

Note

Using Fixed Configurations. 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 “Twisted-Pair Cable Pin Assignments” 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-1](#) for more information on 1000Base-T cabling.*
- For 10 Mbps connections to the ports, you can use Category 3, 4, or 5 unshielded twisted-pair cable, as supported by the IEEE 802.3 Type 10Base-T standard.

Switch Ports and Network Cables

Twisted-Pair Cable/Connector Pin-Outs

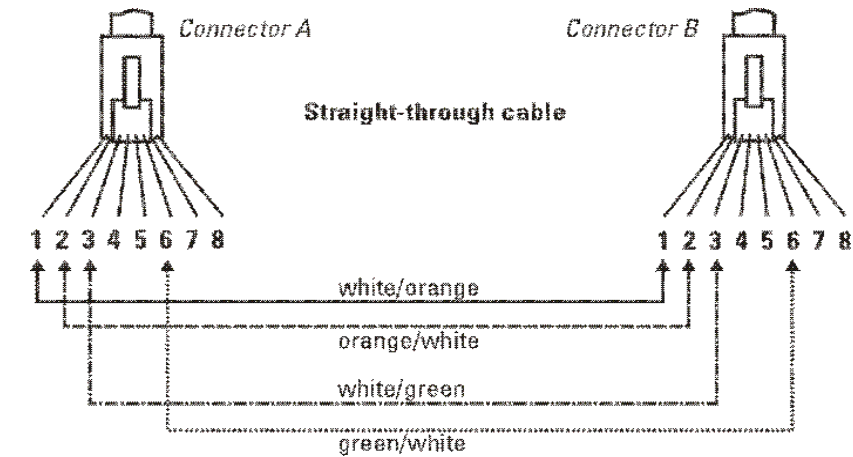
- For 100 Mbps connections to the ports, use 100-ohm Category 5 UTP or STP cable only, as supported by the IEEE 802.3u Type 100Base-TX standard.
- For 1000 Mbps connections, 100-ohm Category 5e or better cabling is recommended.

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 switch, 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



Switch Ports and Network
Cables

Note

Pins 1 and 2 on connector “A” *must* be wired as a twisted pair to pins 1 and 2 on connector “B”.

Pins 3 and 6 on connector “A” *must* be wired as a twisted pair to pins 3 and 6 on connector “B”.

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

Pin Assignments

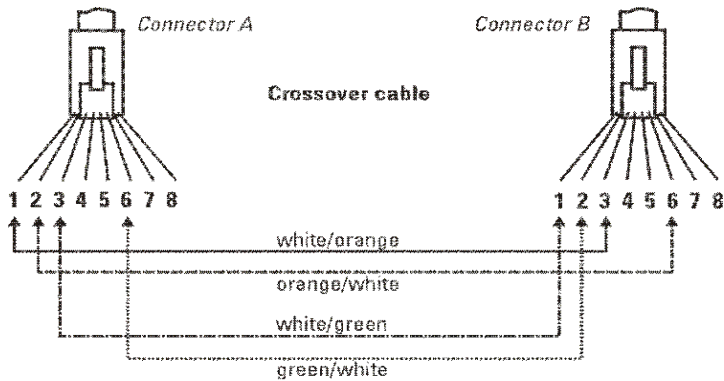
Switch End (MDI-X)		Computer, Transceiver, or Other End	
Signal	Pins	Pins	Signal
receive +	1	1	transmit +
receive -	2	2	transmit -
transmit +	3	3	receive +
transmit -	6	6	receive -

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

The HP Auto-MDIX operation of the 10/100 ports on the switch 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.

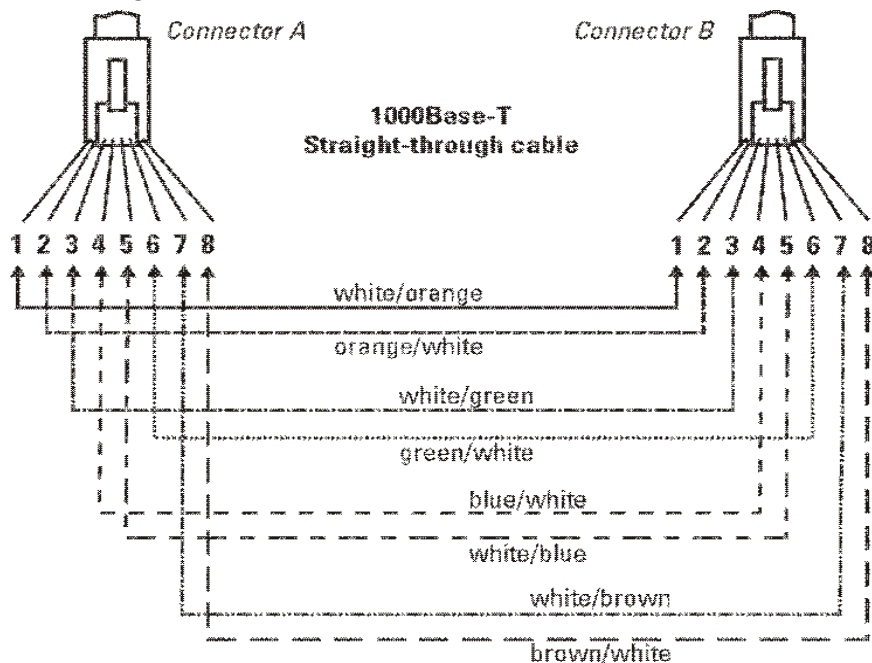
Pin Assignments

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 +

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

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

Cable Diagram



Note

Pins 1 and 2 on connector "A" *must* be wired as a twisted pair to pins 1 and 2 on connector "B".
Pins 3 and 6 on connector "A" *must* be wired as a twisted pair to pins 3 and 6 on connector "B".
Pins 4 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.

— *This page is intentionally unused.* —

Safety and EMC Regulatory Statements

Safety Information



WARNING

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

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

Caution

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

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

Grounding

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

For LAN cable grounding:

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

Servicing

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

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

Informations concernant la sécurité



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

WARNING

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

Caution

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

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

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

Mise à la terre du câble de réseau local:

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

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

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

Hinweise zur Sicherheit



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

WARNING

Eine **WARNING** in der Dokumentation symbolisiert eine Gefahr, die Verletzungen oder sogar Todesfälle verursachen kann.

Caution

Caution in der Dokumentation symbolisiert eine Gefahr, die das Gerät beschädigen kann.

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

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

Für LAN-Kabelerdung:

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

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

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

Considerazioni sulla sicurezza



WARNING

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

Caution

La dicitura **WARNING** denota un pericolo che può causare lesioni o morte.

La dicitura **Caution** denota un pericolo che può danneggiare le attrezzature.

Non procedere oltre un avviso di **WARNING** o di **Caution** prima 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 collegamento a terra non sia stato ripristinato.

Per la messa a terra dei cavi LAN:

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

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

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

Consideraciones sobre seguridad



WARNING

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.

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

Caution

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

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

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

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

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

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

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

Safety Information (Japan)

安全性の考慮

安全記号



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

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

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

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

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

LAN ケーブルの接地に関して:

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

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

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

Safety Information (China)

HP 网络产品使用安全手册

使用须知

欢迎使用惠普网络产品，为了您及仪器的安全，请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。

Korea

사용자 안내문 : A 급기기

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

Taiwan

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

European Community

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN45014

Manufacturer's Name: Hewlett-Packard Company

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

declares that the product:

Product Name: HP ProCurve Switch 3400cl-24G,
HP ProCurve Switch 3400cl-48G

Model Number: J4905A, J4906A

Accessories: J4858A, J4859A, J4860A, J8434A, J8435A, J8437A, J8440A

Regulatory Model Number: RSVLC-0404, RSVLC-0405

conforms to the following Product Specifications:

Safety: EN60950 (2000) / IEC 950 (2001)
EN60825-1 (1994) +A11 (1996) / IEC 825-1 (1993), Class 1

EMC: EN 55022 (1998) / CISPR-22 (1997) Class A
EN55024 (1998) / CISPR-24 (1997)
EN 61000-3-2 (2000) / IEC 61000-3-2 (2000) Harmonics
EN 61000-3-3 (1995) / IEC 61000-3-3 (1994) Flicker

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, 18 August, 2004



Mike Avery,
Regulatory Engineering Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department TRE,
Herrnberger Strasse 140, D-71034 Böblingen (FAX: +49-7031-14-3143).

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