

HP ProCurve Switch Modules Installation Guide



for the:
HP 10/100Base-T Module
HP 100Base-FX Module
HP Gigabit-SX Module
HP Gigabit-LX Module
HP 100/1000Base-T Module
HP 10Base-FL Module

Less Work, More Network

<http://www.hp.com/go/procurve>

HP ProCurve Switch Modules

Installation Guide

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Applicable Products

HP ProCurve Switch 10/100Base-T Module (HP J4111A)
HP ProCurve Switch 100Base-FX Module (HP J4112A)
HP ProCurve Switch Gigabit-SX Module (HP J4113A)
HP ProCurve Switch Gigabit-LX Module (HP J4114A)
HP ProCurve Switch 100/1000Base-T Module (HP J4115B)
HP ProCurve Switch 10Base-FL Module (HP J4118A)

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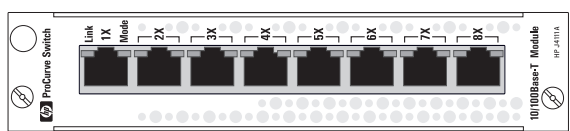
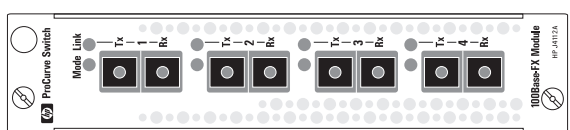
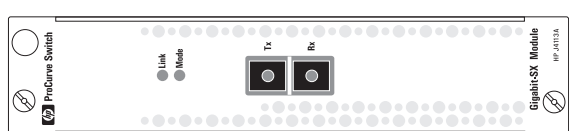
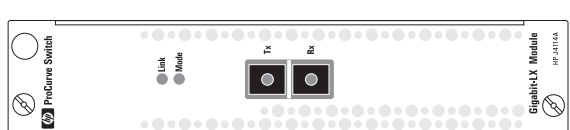
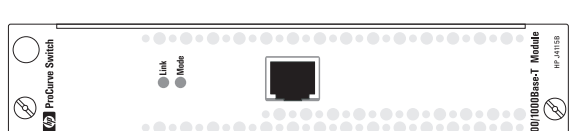
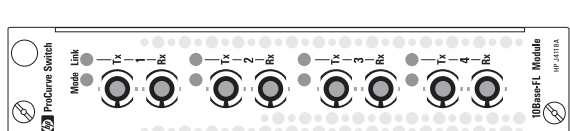
HP ProCurve Switch Modules

For the HP ProCurve Switches 1600M, 2424M, 4000M, and 8000M

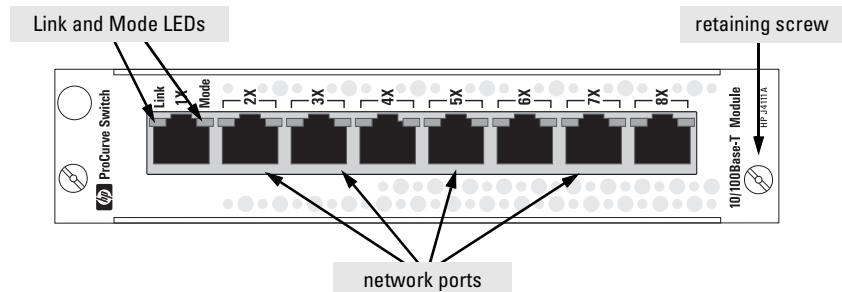
Descriptions

The HP ProCurve Switch Modules are components that you can add to an HP ProCurve switch to provide a variety of network connectivity options.

The following modules are available as of this printing:

Module	Image	Description
HP ProCurve Switch 10/100Base-T Module (HP J4111A)		8 twisted-pair MDI-X ports with RJ-45 connectors for 10 Mbps or 100 Mbps operation over unshielded (UTP) or shielded (STP) twisted-pair cable
HP ProCurve Switch 100Base-FX Module (HP J4112A)		4 fiber-optic ports with SC connectors for 100 Mbps operation over multimode fiber-optic cable
HP ProCurve Switch Gigabit-SX Module (HP J4113A)		one fiber-optic port with SC connector for 1000 Mbps (Gigabit Ethernet) operation over multimode fiber-optic cable
HP ProCurve Switch Gigabit-LX Module (HP J4114A)		one fiber-optic port with SC connector for 1000 Mbps (Gigabit Ethernet) operation over single mode or multimode fiber-optic cable
HP ProCurve Switch 100/1000Base-T Module (HP J4115B)		one twisted-pair port with RJ-45 connector for 1000 Mbps (Gigabit) or 100 Mbps operation over category 5 UTP cable (category 5E recommended for Gigabit)
HP ProCurve Switch 10Base-FL Module (HP J4118A)		4 fiber-optic ports with ST connectors for 10 Mbps operation over multimode fiber-optic cable

Contact your HP-authorized networking products reseller or your HP representative for information on availability of other modules. You can also visit the HP networking products Web site at <http://www.hp.com/go/procurve> to get more information.



Example: The HP ProCurve 4-Port 100Base-FX Module

Features: The HP ProCurve Switch Modules have the following features:

- auto-enabled ports—the ports are all configured to be ready for network operation as soon as a viable network cable is connected
- auto-configuration—a default configuration is applied to the module when the switch is powered on and the module passes self test; this default configuration works well for most network installations
- LEDs that provide information on the link status, network activity, connection bandwidth, and communication mode (half or full duplex)
- “hot swap” operation—you can add a module or replace a module without having to shut down the switch (changing the module type in a given slot *does* require a switch reset)
- standards adherence:
 - the 10/100Base-T Module (HP J4111A) is compatible with the IEEE 802.3 10Base-T and IEEE 802.3u 100Base-TX standards
 - the 100Base-FX Module (HP J4112A) is compatible with the IEEE 802.3u 100Base-FX standard
 - the Gigabit-SX Module (HP J4113A) and Gigabit-LX Module (HP J4114A) are compatible with the IEEE 802.3z Gigabit-SX and Gigabit-LX standards
 - the 100/1000Base-T Module (HP J4115B) is compatible with the IEEE 802.3u 100Base-TX and IEEE 802.3ab 1000Base-T standards
 - the 10Base-FL Module (HP J4118A) is compatible with the IEEE 802.3j 10Base-FL standard

Installing the Module

Overview

You can install any of the modules into any of the HP ProCurve switches that have a compatible module slot. The installation steps are:

1. **For the Gigabit-LX Module or 100/1000Base-T Module**, download the new OS code to your HP ProCurve switch. The switch must be running OS version C.05.06 or later to support the Gigabit-LX Module and version C.07.27 or later to support the “B” model of the 100/1000Base-T Module (HP J4115B) (see page 4). The new code is found on the floppy disk included with the module.

You can also copy the OS file from the HP networking products world wide web site:

<http://www.hp.com/go/procurve>

The software files to download can be accessed by clicking on **Technical Support** on that web page.

2. Install the module in a switch slot (see page 6).
3. Verify that the module is installed correctly (see page 8).
4. Connect the network cabling (see page 9).
5. Optionally, customize the configuration for the module’s ports (unless the default port configuration is satisfactory for your network application - see page 15).
6. Reset the switch, if you have installed the module into a slot that was previously occupied by a different type module (see page 17).

Note

If necessary, you can “hot-swap” one module for another; that is, replace one module with another while the switch is still powered on, without interrupting the operation of the rest of the switch ports. For more information, see page 16.

Downloading Switch Software

Verifying Current Switch Software

Most of the HP ProCurve Switch Modules are supported by all versions of the switch operating system (OS). For two of the modules, your HP ProCurve Switch must be running specific OS versions:

- Gigabit-LX Module (HP J4114A) - OS version C.05.06 or later
- 100/1000Base-T Module (HP J4115B) - OS version C.07.27 or later

To determine which OS version is running in the switch, connect a console to the switch and perform the following (see the switch *Installation Guide* for more information about connecting a console and using the console interface):

1. From the console Main Menu, select Status and Counters... to display the Status and Counters menu.
2. Select General System Information... to display the Switch Information screen, as shown in the next figure.

```

Switch1 OS Version information
----- TELNET - MANAGER MODE -----
                Status and Counters - General System Information

System Contact      : J. Doe
System Location     : Pole 5
Firmware revision   : C.06.01           Base MAC Addr      : 080009-0123456
ROM Version         : C.06.01           Serial Number       : SD300CI00194

Up Time             : 2 days             Memory - Total      : 1,874,316
CPU Util (%)        : 16                 Free                : 859,804

IP Mgmt - Pkts Rx   : 347,954           Packet - Total      : 200
              Pkts Tx : 146,806         Buffers Free        : 198
                                          Lowest              : 162
                                          Missed              : 0

Actions->  Back  Help

Return to previous screen.
Use arrow keys to change action selection and <Enter> to execute action.

```

3. Check the "Firmware Revision" line.
 - If the OS version number is C.05.06 or later, the switch can support the Gigabit-LX Module; if the version is C.07.27 or later, the switch can support the 100/1000Base-T Module ("B" model), and you do not need to download new software to the switch. In this case, go to "Installing the Module in an Unused Slot" on page 6.
 - If the version number is earlier than the required version, download the new OS, as described on the next page, before installing the module.

Downloading the New OS

This procedure describes how to use a personal computer (PC) to download the OS. If you are using a UNIX workstation, refer to the Note at the bottom of this page.

1. Do one of the following:
 - If the source of your OS file is the disk shipped with the Gigabit-LX or 100/1000Base-T Module, copy the file from the disk into the PC directory you will use for downloading to the switch, or you can download it directly from the floppy disk. Go on to step 2.
 - If the source of your OS files is the self-extracting file from an electronic source (for example, the web), do the following:
 - a. Copy the self-extracting file into the directory you will use for downloading to the switch.
 - b. Execute the file to decompress and extract its contents.
 - c. Go on to step 2.
2. Download the software upgrade to your HP ProCurve switch.

The download is executed from the switch console, by selecting Download OS from the console Main Menu.

On the Download OS screen, select the file transfer method, TFTP or Xmodem. Then, for the Remote File Name parameter, use the form:

filename.swi (for example, C_07_27.swi)

For details on the download process, see the *Management and Configuration Guide* you received with your switch.

3. When the download is complete, proceed to “Installing the Module in an Unused Slot” on page 6.

Note

TFTP Download from UNIX: To perform a TFTP download from a UNIX system, store the OS file, *filename.swi*, in the UNIX TFTP directory, then perform the TFTP download as described in the switch *Management and Configuration Guide*.

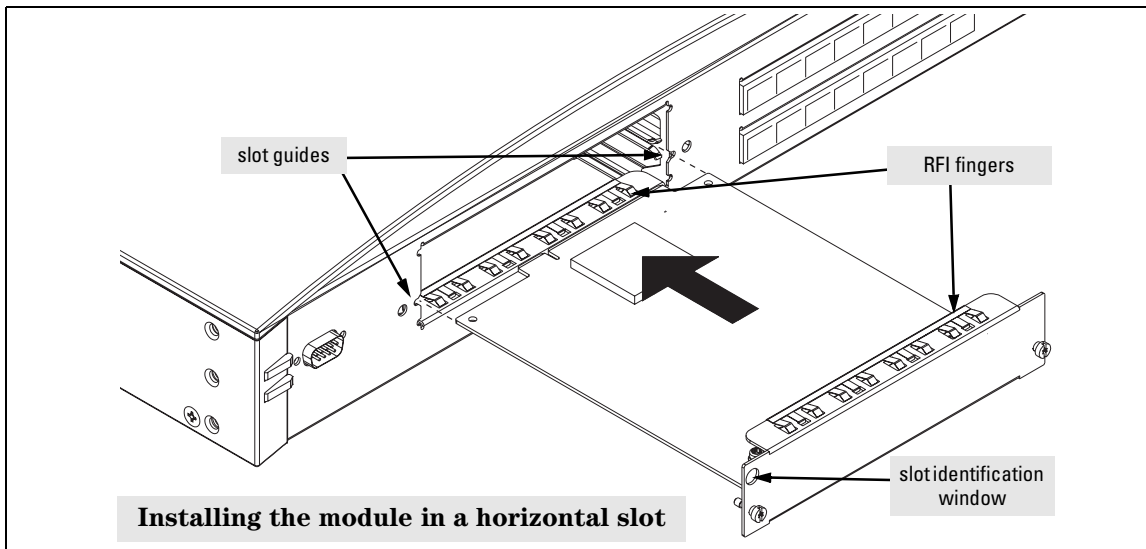
Installing the Module in an Unused Slot

Installation Precautions:

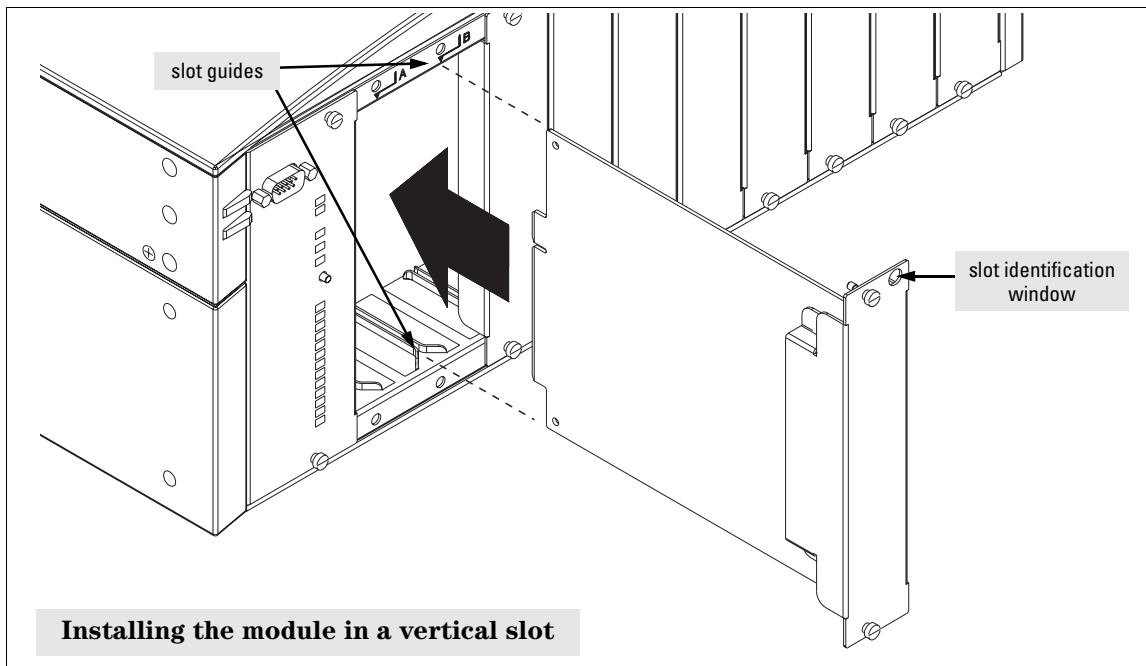
- Static electricity can severely damage the electronic components on the modules. When handling and installing the modules in your switch, follow these procedures to avoid damage from static electricity:
 - Handle the module by its bulkhead or edges and avoid touching the components and the circuitry on the board.
 - When installing the module, equalize any static charge difference between your body and the switch by wearing a grounding wrist strap and attaching it to the switch’s metal body, or by frequently touching the switch’s metal body.
- Make sure that when installing a module that you use some caution to slide the module past the initial contact with the RFI fingers on the switch chassis or on adjacent modules or bulkheads before applying strong installation force. It is possible to dislodge the RFI fingers on an adjacent module or bulkhead if the module you are installing is “biased” toward the fingers and strong installation force is applied before the module you are installing has passed the initial contact with the RFI fingers. The RFI fingers are identified in one of the illustrations on the next page. If the RFI fingers are dislodged, make sure to unplug the switch, remove the RFI fingers from the switch chassis, and reinstall them before powering on the switch.
- For proper switch cooling and reduction of electromagnetic emissions, ensure that a slot cover is installed on any unused module slot.
- ***An incompletely installed module will temporarily disrupt switch operation and prevent the module from operating. Make sure all modules are fully installed and that you screw in the retaining screws to secure the module in place.***

1. Use a Torx T-10 or flat-bladed screwdriver to unscrew the screws in the cover plate over the slot you want to use, and remove the cover. Store the cover plate for possible future use.
2. Hold the module by its bulkhead—taking care not to touch the metal connectors or components on the board. Orient the module so the slot letter on the switch face can be seen through the slot identification window on the module when the module is installed.
3. Insert the module into the slot guides and slide it into the slot until it stops. Then press the module in firmly until it “snaps” into place. The module bulkhead should be in contact with the face of the switch.

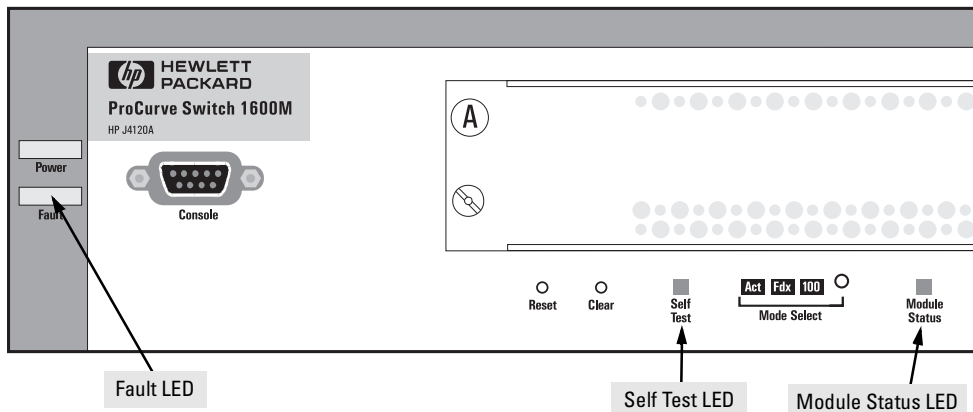
Note: As shown in the illustrations on the next page, the switch may have either vertical or horizontal module slots. In all switches, the modules can be installed in only the orientation that allows the slot identification letter on the switch to be viewed through the slot identification window on the module.



Note: Use some caution when installing modules. Excessive installation force could cause the RFI fingers on the switch or adjacent module or bulkhead to be dislodged. Please see the “Installation Precautions” on the previous page.



- Verify the module is installed correctly. Observe the Module Status LED for the slot in which the module is being installed, and the Self Test and Fault LEDs on the switch to verify that the module is installed properly.



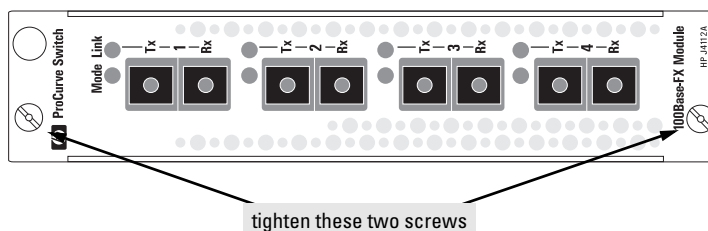
When the module is installed properly and the switch is powered on, or the module is installed when the switch already has power, the module undergoes a self test that takes a few seconds. You can use the LEDs to determine that the module is installed properly and has passed the self test, as described in the “LED Behavior” table below.

LED Behavior

LED	Display for a Properly Installed Module
Module Status (for the slot in which you are installing the module)	Goes ON as soon as the module is installed and the switch is powered on, and stays ON steadily.
Self Test	ON briefly while the module is being tested, then OFF. Note: If the switch was powered off while the module was installed, when the switch is powered on, the Self Test LED will stay ON for the duration of the whole switch self test.
Fault	OFF

If the Module Status, Self Test, and Fault LEDs are flashing, the module may not be completely installed. Make sure the module is installed all the way into the switch slot. If the flashing continues, see the Troubleshooting section on page 18.

5. Tighten the two retaining screws with a flat-blade or Torx T-10 screwdriver to secure the module in the slot. *Be careful not to overtighten the screws.*



6. Connect the appropriate network cables to the module's ports as shown in the table on the next two pages. The table shows the supported cable types for each of the modules. For more information on the cable specifications, see “Cables” on page 22.

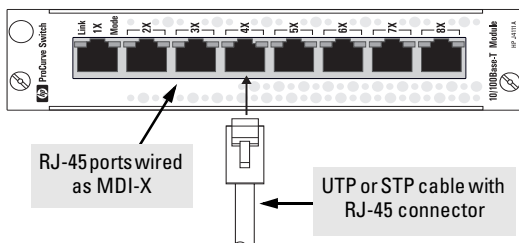
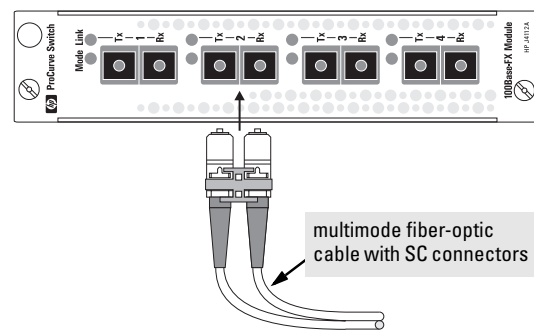
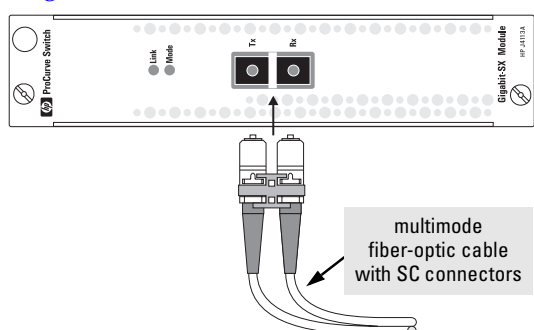
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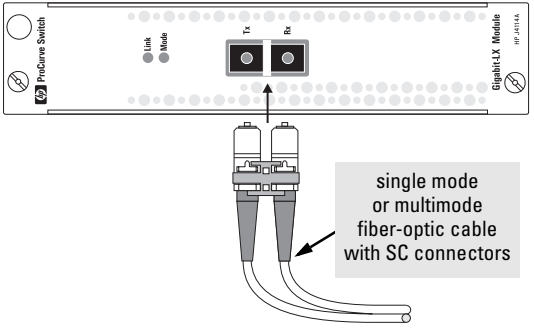
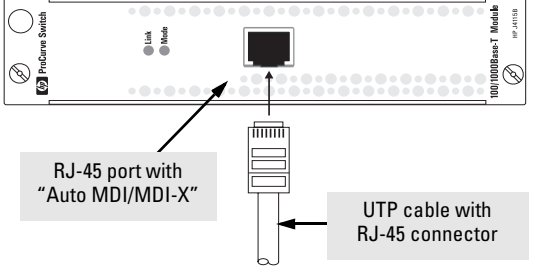
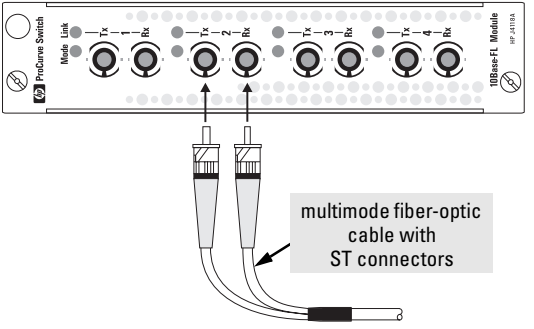
“Auto MDI/MDI-X” with the 100/1000Base-T Module:

When the 100/1000Base-T Module is in the default configuration, Auto, the module automatically negotiates whether the port operates as MDI or MDI-X, depending on the cable type and the connected device’s operation. As a result, **any connection to either another Gigabit device or to a 100Base-T device can be made using a straight-through cable.** You never have to use a crossover cable, but a crossover cable may also be used if you choose. Either a straight-through or crossover cable will work correctly.

If, however, the configuration is changed to one of the 100 Mbps fixed options (100-Half Duplex or 100-Full Duplex), the port operates as an MDI-X port. In that case, to connect the module to another switch or hub, use a crossover cable; to connect to an end node, use a straight-through cable.

Supported Cable Types

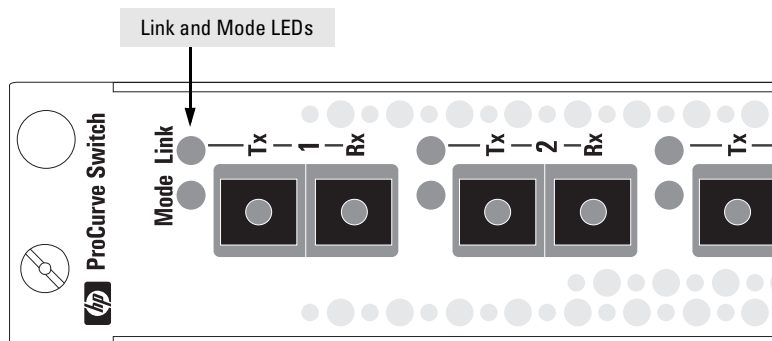
Module	Cable Type	Maximum Length
<p>10/100Base-T Module</p> 	<p>10 Mbps operation: category 3, 4, or 5, 100-ohm unshielded twisted-pair (UTP) cable fitted with RJ-45 connectors</p> <p>100 Mbps operation: category 5, 100-ohm UTP or shielded twisted-pair (STP) cable</p>	<p>100 meters (recommended)</p> <p>100 meters</p>
<p>100Base-FX Module</p> 	<p>62.5/125 μm or 50/125 μm core/cladding diameter, graded-index, multimode fiber-optic cables that are fitted with SC connectors</p>	<ul style="list-style-type: none"> • 412 meters for half-duplex connections • 2 kilometers for full-duplex connections
<p>Gigabit-SX Module</p> 	<p>62.5/125 μm or 50/125 μm core/cladding diameter, graded-index, multimode fiber-optic cables that are fitted with SC connectors</p>	<p>62.5 μm cable:</p> <ul style="list-style-type: none"> - 160 MHz\cdotkm = 220 meters - 200 MHz\cdotkm = 275 meters <p>50 μm cable:</p> <ul style="list-style-type: none"> - 400 MHz\cdotkm = 500 meters - 500 MHz\cdotkm = 550 meters

Module	Cable Type	Maximum Length
<p>Gigabit-LX Module</p> 	<p>single mode fiber-optic cables that are fitted with SC connectors</p> <hr/> <p>62.5/125 μm or 50/125 μm core/cladding diameter graded-index, multimode fiber-optic cables may also be usable, but a mode conditioning patch cord may be needed. See "Mode Conditioning Patch Cord" on page 13.</p>	<p>5 kilometers</p> <hr/> <p>550 meters</p>
<p>100/1000Base-T Module</p> 	<p>100 Mbps operation: category 5, 100-ohm UTP cable</p> <p>1000 Mbps (Gigabit) operation: category 5E, 100-ohm UTP cable is recommended, although category 5 cable may also work.</p>	<p>100 meters</p> <hr/> <p>100 meters</p>
<p>10Base-FL Module</p> 	<p>62.5/125 μm or 50/125 μm core/cladding diameter, graded-index, multimode fiber-optic cables that are fitted with ST connectors</p>	<p>1 kilometer</p>

Note: In the module's default configuration, Auto, **either a straight-through or crossover cable can be used** to connect the module to either another Gigabit device or to a 100Base-T device. See the Note on page 9.

7. Check the port LEDs for the newly-installed module to ensure that the port(s) connected in the preceding step are operating correctly. Each port on the switch modules has Link and Mode LEDs near it as shown in the next illustration.

Example Link and Mode LEDs



- The Link LED will be lit for each port that is connected properly to an active network device.

If the Link LED does not go on when an active network cable is connected to the port, there may be something wrong with the cable, the cable connectors, or the device at the other end of the cable. See the troubleshooting information on page 18.

- If the switch Mode is set to display activity (the **Act** mode indicator LED is lit), then the Mode LED for each port that is transmitting and/or receiving packets will flicker when traffic is detected on the port.
 - If the Mode is set to display full duplex (the **Fdx** mode indicator LED is lit), then the Mode LED will be lit for each port that is operating in full duplex.
 - If the Mode is set to display 100 Mbps operation (the **100** mode indicator LED is lit), then the Mode LED will be lit for each port that is operating at 100 Mbps. *Note that for ports operating at 1000 Mbps (Gigabit), the Mode LED will **not** be lit.*
8. Customize the port configuration, if necessary. (See “Customizing the Port Configuration” on page 15.)
 9. Reset the switch, if you have installed a module in place of a different type of module. (See “Resetting the Switch” on page 17 for more information on when the switch must be reset.)

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 Module installed in the switch.

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 transceivers can provide that transmission conditioning internally.

Gigabit-LX transceivers, 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 Module installed 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

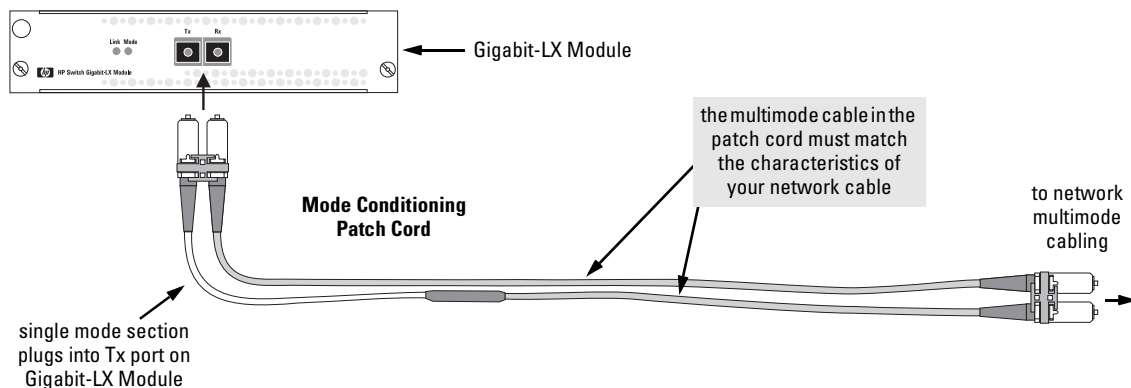
Most of the time, if you are using good quality graded-index multimode fiber cable that adheres to the standards listed on page 22, there should not be a need to use mode conditioning patch cords in your network. This is especially true if the fiber runs in your network are relatively short.

If you are using single mode fiber-optic cabling in your network, there is no need to use mode conditioning patch cords. Connect the single mode network cable directly to the Gigabit-LX Module.

Installing the Patch Cord

As shown in the illustration below, connect the patch cord to the Gigabit-LX Module 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 SC connectors on the end that connects to the Gigabit-LX module and has multimode fibers that match the characteristics of the multimode fiber in your network.

Recommended Patch Cords

The following Mode Conditioning Patch Cords have been tested and verified to operate correctly with the HP ProCurve Switch Gigabit-LX Module:

	Part Number	Connectors	Multimode Section Fiber Type
Computer Crafts	• MCP07071-002	SC-SC	62.5/125 μm
	• MCP07072-002	SC-SC	50/125 μm
	• MCP01071-002	SC-ST	62.5/125 μm
	• MCP01072-002	SC-ST	50/125 μm

These part numbers could change. Contact Computer Crafts through the world wide web at www.computer-crafts.com. A number of other vendors provide mode conditioning patch cords including Siecor, Inc. which can be contacted at www.siecor.com.

Customizing the Port Configuration

If the slot in which you installed the module was empty the last time the switch was either rebooted or reset (or the power to the switch was cycled), then the module will use preconfigured default parameter values that will work for most networks.

The default port configurations for the modules are:

- **Ports Enabled:** Yes
- **Mode:**
 - **10/100Base-T Module:** Auto — If the port is connected to a network device that complies with the 802.3u standard for auto negotiation, the port auto negotiates speed (10 or 100 Mbps), and communication mode (half or full duplex).
 - **100Base-FX Module:** 100HDx — 100 Mbps, Half Duplex
 - **Gigabit-SX Module:** 1000FDx — 1000 Mbps, Full Duplex
 - **Gigabit-LX Module:** 1000FDx — 1000 Mbps, Full Duplex
 - **100/1000Base-T Module:** Auto — If the port is connected to a network device that complies with the 802.3ab standard for auto negotiation, the port auto negotiates speed (1000 or 100 Mbps), communication mode (half or full duplex), and MDI or MDI-X port operation. *Note: if you configure the port to one of the fixed 100 Mbps modes, the port will then operate only as an MDI-X port.*
 - **10Base-FL Module:** 10HDx — 10 Mbps, Half Duplex
- **Trunk (port trunking):** None
- **Switch Mesh:** Not a member
- **Broadcast Limit:** 0 — no broadcast limiting
- **Flow Control:** Disabled
- **Traffic Filters:** None — the switch performs its filtering and forwarding only according to standard address table operation

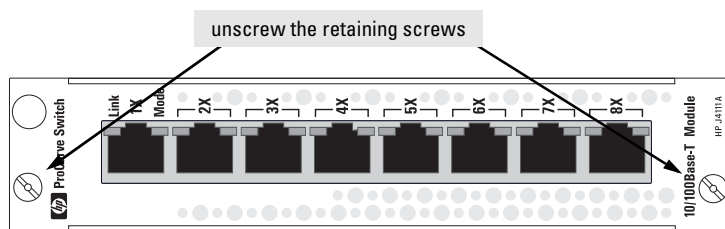
If necessary, configure the port(s) in the module by using the switch console or the web browser interface. For more information, see the *Management and Configuration Guide* shipped with the switch, and the online Help provided in the console and web browser interface.

If the default port configuration listed above is acceptable for your network, then skip this process.

Replacing or Removing a Module

Follow these procedures to replace one module with another, or to remove a module without replacing it:

1. Make sure the switch is running an OS version that supports the module. See page 4 for more information.
2. Remove any network cables from the ports on the module.
3. On the module you want to remove from the switch, unscrew the retaining screws enough to disconnect them from the threaded holes in the switch.



4. Grab the screws and pull the module out from the slot. It may help to brace your hands against the face of the switch and “lever” the module out from the switch slot.
5. Do one of the following:
 - If you will be installing another module in the slot, go to “Installing the Module in an Unused Slot” on page 6 and begin with step 2.
 - If you will not install another module in the slot (that is, leave it empty), then re-install a slot cover plate over the empty slot opening.

Caution

For proper cooling and reduction of electromagnetic emissions, ensure that a slot cover is installed on any unused slot.

6. Reset the switch, as described under “Resetting the Switch” on page 17, if you are exchanging one type of module with a different type of module in the same slot (for example, replacing a 10/100Base-T Module with a 100/1000Base-T Module).

If you are replacing a module with another one of the *same* type in the same slot, it is not necessary to reset the switch. The current configuration for ports in that slot will apply to the new module.

Resetting the Switch

Reasons for Resetting the Switch

Generally, you only need to reset the switch when it needs to recognize a change in its hardware or software (console) configuration. Some circumstances in which you will need to reset the switch are:

- Installing a module in a slot that was previously occupied by a different type of module—for example, installing a 100/1000Base-T Module in a slot that was previously used for a 10/100Base-T Module—the switch must be reset after the new module is installed so the switch processor can properly initialize and configure the new module type.

Note

When a module is exchanged for a different type, until the switch is reset the module will not operate, the Module Status LED for the slot will continue to flash, and all the LEDs on the module will stay on continuously.

- Changing certain switch configuration parameters through the console interface. (In this case, the console provides indications when the switch must be reset for the configuration change to be activated.)

You do not need to reset the switch when:

- Installing a module in a previously unused slot.
- Replacing a module with the *same* type of module.

Methods of Resetting the Switch

You can reset the switch by any of these methods:

- pressing the Reset button on the front of the switch
- power cycling the switch
- selecting the Reset or Reboot option from the switch console, web browser interface, or HP TopTools for Hubs & Switches

Troubleshooting

The primary tools for troubleshooting the switch modules are the LEDs on the front of the switch and on the modules. Refer to “LED Behavior” on page 8. Also, refer to the *Installation Guide* and the *Management and Configuration Guide* shipped with the switch, for more detailed troubleshooting information.

The following tables describe switch and module LED displays that indicate that the module or connections to the ports on the module are not operating correctly.

Switch and Module LED Error Indicators:

Fault	Self Test	Module Status	Port Link	Diagnostic Tips
Flashing [†]	Flashing [†]	Flashing [†]	All Link and Mode LEDs On	❶
Off	Off	Flashing [†]		❷
Off	Off	On	Off with cable connected	❸

[†] The flashing behavior is an on/off cycle once every 1.6 seconds, approximately.

Diagnostic Tips:

Tip Number	Problem	Solution
❶	The module installed in the slot is not installed properly, has experienced a self test fault, or has become partly removed during switch operation.	<p>The module is tested whenever the switch is powered on, or reset (through the Reset button on the switch, or the Reboot or Reset options in the console or web browser interface), and when it is hot swapped (installed when the switch is powered on). Under this error condition, the following events also occur:</p> <ul style="list-style-type: none"> All the LEDs on the module stay on until the error is resolved. The switch software, including console and web browser access will not be operational for approximately one minute from the time the module gets into this condition. <p>Try reinstalling the module. You can do this without having to power down the switch. When the module is reinstalled, it will be retested automatically. Make sure to screw in the retaining screws so that the module cannot be inadvertently pulled out by pulling on the network cables.</p> <p>If the fault indication reoccurs, the module may have failed. Remove the module from the switch and replace it with another module, or recover the slot with the cover plate. Call your HP-authorized LAN dealer, or use the electronic support services from HP to get assistance. See the Customer Support/Warranty booklet for more information.</p>

Tip Number	Problem	Solution
2	A module was installed in the slot that is a different type than the previously installed module, and the switch has not yet been reset.	<p>When you “hot swap” modules in the switch slot, if you install a different module type than the one that was previously installed in the slot, you must reset the switch so the switch processor can properly initialize and configure the new module type. The flashing LED informs you that this change of module types has occurred. The module will not work properly until the switch is reset as indicated by all the module’s LEDs staying on until the switch is reset.</p> <p>See “Resetting the Switch” on page 17.</p>
3	The network connection is not working properly.	<p>Try the following procedures:</p> <ul style="list-style-type: none"> • For the indicated port, verify that both ends of the cabling, at the switch and the connected device, are securely connected. • Verify the connected device and switch are both powered <i>on</i> and operating correctly. • Verify that you have used the correct cable type for the connection. <ul style="list-style-type: none"> – for twisted-pair connections, in general, for connecting to an end node (MDI port), use “straight- through” cable; for connecting to MDI-X ports on hubs or other switches, use “crossover” cable. <hr/> <p>Note: For the 100/1000Base-T Module in the default configuration (Auto), the module automatically negotiates whether the port operates as MDI or MDI-X, depending on the cable type and the connected device’s operation, and either a straight-through or crossover cable can be used. If the module configuration is changed to one of the fixed 100 Mbps options though (100-Half Duplex or 100-Full Duplex), then the port operates as MDI-X only and the above statement about straight-through and crossover cables applies.</p> <hr/> <ul style="list-style-type: none"> – for fiber-optic connections, verify that the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device. <ul style="list-style-type: none"> • For a 1000 Mbps connection, verify that the network cabling complies with the IEEE 802.3ab standard. The cable should be installed according to the ANSI/TIA/EIA-568-A-5 specifications. Cable testing should comply with the stated limitations for Attenuation, Near-End Crosstalk, Far-End Crosstalk, Equal-Level Far-End Crosstalk, and Return Loss. <p>The cable verification must include all patch cables from any end devices, including the switch, to any patch panels in the cabling path.</p> • Verify that the port has not been disabled through a switch configuration change. You can use the console interface, or, if you have configured an IP address on the switch, use the web browser interface, or HP TopTools for Hubs & Switches network management software to determine the state of the port and re-enable the port if necessary. • If the other procedures don’t resolve the problem, try using a different port or a different cable.

Customer Support Services

If you are having any trouble with your module or switch, Hewlett-Packard offers support 24 hours a day, seven days a week through the use of a number of automated electronic services. See the Customer Support/Warranty booklet that came with your switch for information on how to use these services to get technical support. The HP networking products World Wide Web site, <http://www.hp.com/go/procurve> also provides up-to-date support information. Additionally, your HP-authorized network reseller can also provide you with assistance, both with services that they offer and with services offered by HP.

Specifications

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)

Lasers

The Gigabit-SX and Gigabit-LX Modules are Class 1 Laser Products.

Laser Klasse 1

These modules comply with IEC 825-2: 1993.

Connectors

- The ports on the **10/100Base-T Module** are compatible with the IEEE 802.3 10Base-T and 802.3u 100Base-TX standards and accept unshielded and shielded twisted-pair cable with RJ-45 connectors.
- The ports on the **10Base-FL Module** transmit at 820 nm wavelength, and are compatible with the IEEE 802.3j Type 10Base-FL standard. They accept the multimode fiber-optic cables for 10Base-FL described on the next page.
- The ports on the **100Base-FX Module** transmit at 1300 nm wavelength, and are compatible with the IEEE 802.3u 100Base-FX standard. They accept the multimode fiber-optic cables for 100Base-FX described on the next page.
- The port on the **Gigabit-SX Module** transmits at 850 nm wavelength, and is compatible with the IEEE 802.3z Gigabit-SX standard. It accepts the multimode fiber-optic cables for Gigabit-SX described on the next page.
- The port on the **Gigabit-LX Module** transmits at 1300 nm wavelength, and is compatible with the IEEE 802.3z Gigabit-LX standard. It accepts the single mode or multimode fiber-optic cables for Gigabit-LX described on the next page.
- The port on the **100/1000Base-T Module** is compatible with the IEEE 802.3ab standard and accepts Category 5 unshielded twisted-pair cable with an RJ-45 connector. *For 1000 Mbps operation, Category 5E unshielded twisted-pair cable is recommended.*

Cables

Twisted-Pair

10 Mbps Operation	Category 3, 4, or 5 100-ohm unshielded twisted-pair (UTP) cable, complying with IEEE 802.3 Type 10Base-T specifications, fitted with RJ-45 connectors
100 Mbps Operation	Category 5 100-ohm unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable, complying with IEEE 802.3u 100Base-TX specifications, fitted with RJ-45 connectors
1000 Mbps Operation	Category 5E 100-ohm unshielded twisted-pair (UTP) cable, complying with IEEE 802.3ab 1000Base-T specifications, fitted with RJ-45 connectors <i>(please see “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, 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

10Base-FL	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 ST connectors
100Base-FX	62.5/125 μm or 50/125 μm (core/cladding) diameter, graded-index, multimode fiber-optic cables, complying with the ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a respectively, fitted with SC connectors
Gigabit-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 SC connectors
Gigabit-LX	single mode fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards, fitted with SC 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 SC connectors

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

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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

This product is designed for operation with the HP ProCurve switches that have module slots. Please see the Declarations of Conformity included in the Installation Guides for those products.



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