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HP ProCurve Switch 2424M
Gigabit Stacking Module
Installation Guide

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HP ProCurve Switch 2424M Gigabit Stacking Module

Installation Guide

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Applicable Products

HP ProCurve Switch 2424M Gigabit Stacking Module
(HP J4130A)

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Contents

HP ProCurve Switch 2424M Gigabit Stacking Module

Description

The HP ProCurve Switch 2424M Gigabit Stacking Module is a component that you can add to an HP ProCurve Switch 2424M to provide stacking between Switch 2424Ms and a variety of other network connectivity options.

handle to assist module
insertion and extraction

Link and Mode LEDs

ProCurve Switch 2424M   1   2   Gigabit Stacking Module
HP J4130A

1 2
Link
Mode
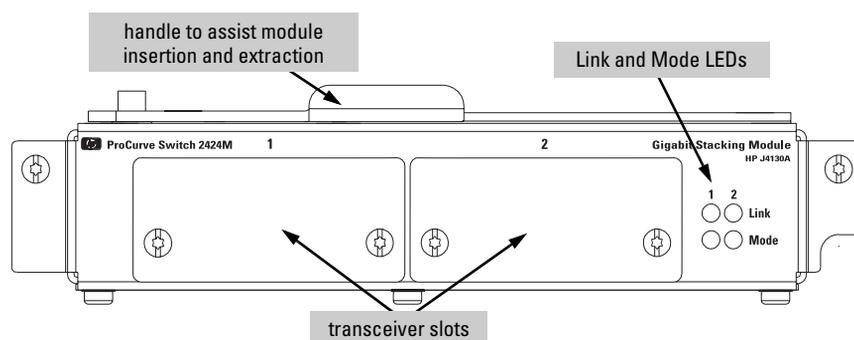
transceiver slots

Features: The HP Gigabit Stacking Module has the following features:

- two transceiver slots for installing any of the HP ProCurve Gigabit transceivers:
  - Gigabit-SX Transceiver (HP J4131A)
  - Gigabit-LX Transceiver (HP J4132A)
  - Gigabit Stacking Transceiver
    (part of the Gigabit Stacking Kit—HP J4116A)
- 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 speed, 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)

Installing the Module

Overview

You can install the Gigabit Stacking Module into only the HP ProCurve Switch 2424M. The installation steps are:

1. Verify that your HP ProCurve Switch 2424M has the correct operating system software (OS) version. Switch 2424M units that were shipped before the Gigabit Stacking Module became available may be running software that does not support the module. The switch must be running OS version C.06.06 or later to support the Gigabit Stacking Module (see page 3).

   Install new software, if needed. The new software 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 are located under the [Support] button on that web page.

2. Install transceivers into the module transceiver slots (see page 5).

3. Install the module in the Switch 2424M slot (see page 6).

4. Verify that the module is installed correctly (see page 7).

5. Connect the network cabling (see page 8).

6. Reset the switch, if you have installed the module into a slot that was previously occupied by a different type module (see page 10).

7. Optionally, customize the configuration for the module's ports (unless the default port configuration is satisfactory for your network environment - see page 11).

N o t e   If necessary, you can "hot-swap" one module for another; that is, replace one module with another of the same type while the switch is still powered on, without interrupting the operation of the rest of the switch ports. You can also install the module into the unused switch slot without interrupting the switch operation. For more information, see page 16.

1. Download Switch Software

Verify Current Switch Software

Your HP ProCurve Switch 2424M must be running OS version C.06.06 or later to support the Gigabit Stacking Module. 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, press ☐ to select Status and Counters... to display the Status and Counters menu.

2. Press ☐ again to select General System Information ... to display the Switch Information screen, as shown in the next figure.

```
                                  ┌──────────────────────────┐
                                  │   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 revision number is C.06.06 or later, the switch can support the Gigabit Stacking Module, and you do not need to download new software to the switch. In this case, go to "Installing Transceivers in the Module" on page 6.

   • If the revision number is earlier than C.06.06, download the new software before installing the Gigabit Stacking Module. In this case, continue with the instructions in this section before you install the module.

Download the New OS Software

This procedure describes how to use a personal computer (PC) to download the software. 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 software file is the disk shipped with the Gigabit Stacking 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 software file is the self-extracting file from the HP ProCurve web page (*http://www.hp.com/go/procurve*), 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.

2. Download the software upgrade to your HP ProCurve Switch 2424M. The download is executed from the switch console, by selecting Download OS from the console Main Menu.
   a. On the Download OS screen, select the file transfer method, TFTP or Xmodem:
      – Use the **TFTP method** to transfer the file over the network. The OS file must be copied to a TFTP server, and the switch must have been configured with an IP address and must have network access to the TFTP server.
      – Use the **Xmodem method** to transfer the file serially (the network does not need to be operating). The OS file must be copied to a PC that can be serially connected to the switch console port (use the console cable supplied with the switch). The PC must have a terminal program that supports the Xmodem transfer protocol.
   b. Then, for the Remote File Name parameter, use the form:
      filename.swi   (for example, C_06_06.swi)

3. When the download is complete, proceed to "2. Install Transceivers Into the Module" on page 5.

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

N o t e   **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*.

2. Install Transceivers Into the Module

Any of the HP Gigabit Transceivers (Gigabit-SX, Gigabit-LX, or Gigabit Stacking) can be installed in either of the transceiver slots in the Gigabit Stacking Module. The order or location does not matter.

Installation Precautions:

■ Static electricity can severely damage the electronic components on the module and on transceivers you install into the module. When handling the module and transceivers and installing them in your switch, follow these procedures to avoid damage from static electricity:

- • Handle the module and transceivers by their bulkheads or edges and avoid touching the components and the circuitry on the boards.

- • When installing the module and transceivers, 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.

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

■ *An incompletely installed module will temporarily disrupt switch operation and prevent the module from operating. Make sure the module is fully installed and that you screw in the retaining screws to secure the module in place.*

■ Before installing the Gigabit Stacking Module into the switch, you should first install all transceivers into the module. *The transceivers can not be "hot swapped".* They must be installed when the module is *not* receiving power, either by first removing the module from the switch, or by powering off the switch.

To install the transceivers, follow these steps:

1. Using a Torx T-10 or flat-bladed screw driver, remove the transceiver slot cover. Keep the cover for future use. *It does not matter which transceiver slot is used first, 1 or 2.*

2. Hold the transceiver by the bulkhead and slide the transceiver all the way into the slot until it "snaps" into place. The transceiver bulkhead should be touching the face of the module.

3. Tighten the retaining screws on the transceiver until they are secure, but *be careful to not overtighten these screws.*

For more detailed information on installing the transceivers, see the *Installation Guide* that came with the transceiver.

3. Install the Module

1. Use a Torx T-10 or flat-bladed screwdriver to unscrew the screws in the module slot cover plate in the back of the Switch 2424M. Then remove the cover plate and store it 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 as shown in the illustration below.

3. Rotate the lever handle fully outward, and then insert the module into the slot guides and slide it into the slot until it stops.

slot guides

rotate the handle fully outward before installing the module
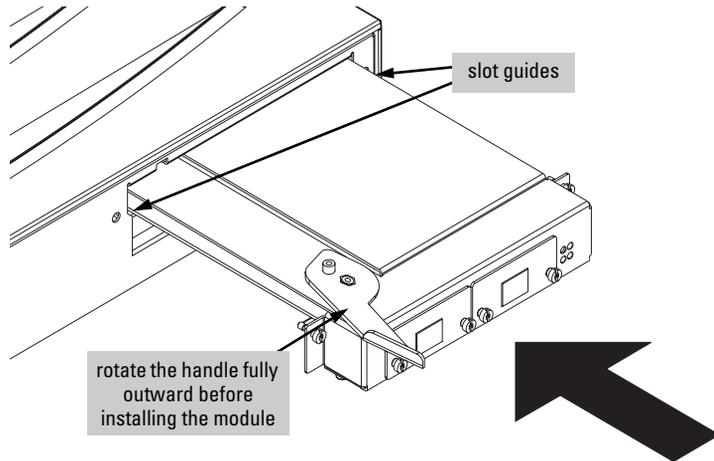
4. Make sure the two retaining screws are aligned with the holes in the switch, then rotate the lever handle inward as far as it will go to pull the module into the switch connectors. The module bulkhead should be in contact with the face of the switch.

rotate the handle fully inward
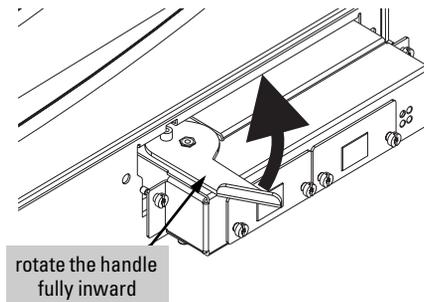
5. Tighten the two retaining screws to hold the module in place. The retaining screws should be secure but *be careful to not overtighten them.*

tighten the two
retaining screws
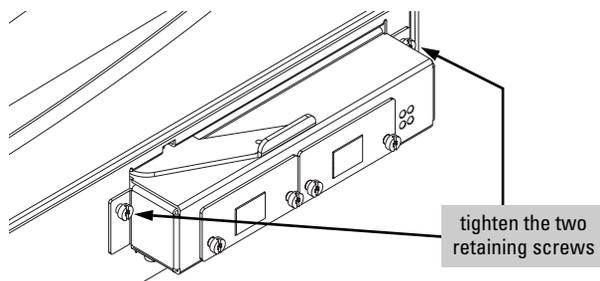
4. Verify the Module is Installed Correctly

Observe the Module Status, Self Test, and Fault LEDs on the front of the switch to verify that the module is installed properly.

Module Status and
Self Test LED

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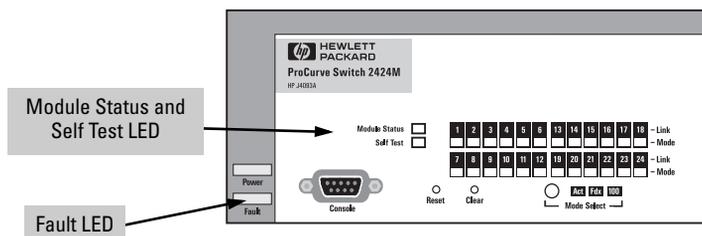
When the module is installed properly and the switch is powered on, or the module is installed when the switch already has power, the module undergoes a self test that takes a few seconds. You can use the LEDs to determine that the module is installed properly and has passed the self test, as described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

LED Behavior

LED	Display for a Properly Installed Module
Module Status	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 13.

5. Connect the Network Cables

1. Connect the appropriate network cables to the module's transceiver ports. The table below shows the supported cable types for each of the transceivers.

Supported Cable Types.

Port Type	Cable Type	Length Limits
Gigabit-SX	62.5/125 μm or 50/125 μm core/cladding diameter, graded-index, **multimode** fiber-optic cables that are fitted with SC 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	**single-mode** cables fitted with SC connectors—the cables must comply with the ITU-T G.652 and ISO,IEC 793-2 Type B1 standards. The multimode fiber-optic cable specified for the Gigabit-SX port may also be used for the Gigabit-LX port, but a **mode conditioning patch cord** may be needed — see "Mode Conditioning Patch Cord for Gigabit-LX" on page 17 for more information.	• single-mode cable - 5 kilometers • multimode cable - 550 meters
Gigabit Stacking	Shielded twisted-pair cable supplied with the Gigabit Stacking Kit (HP J4116A)	A 1/2-meter cable is included in the Gigabit Stacking Kit. A 10-meter cable has also been tested and verified. The cable is AMP part number 627124-1.

2. Check the port LEDs for the newly-installed module to ensure that the port(s) connected in the preceding step are operating correctly. For each of the two transceiver ports on the switch module there are Link and Mode LEDs as shown in the next illustration.

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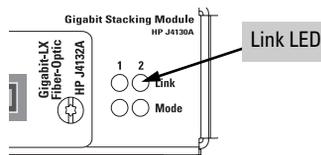
-   The Link LED will be lit for each port that is connected properly to an active network device.

    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 13.

-   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. Since the Gigabit Transceivers operate at 1 Gbps, the [100] Mode LED should not light for these ports.

For examples of connections using the Gigabit Stacking Module, see "Sample Connections" on page 12.

6. Reset the Switch (if necessary)

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 Gigabit Stacking Module in a slot that was previously used for a Gigabit-LX 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 correctly. The Module Status LED on the front of the Switch 2424M 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.)
- For diagnostic purposes. See "Troubleshooting" on page 13 for more information.

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
- changing most of the switch configuration parameters

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

7. Customize the Port Configuration (Optional)

If the module slot in the Switch 2424M 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 configuration for the module is:

■ **Ports Enabled:** Yes
■ **Mode:**
  • Gigabit-SX and Gigabit-LX Transceivers — 1000FDx (1000 Mbps, Full Duplex)
  • Gigabit Stacking Transceiver — Auto (auto negotiates flow control if flow control is enabled for the port)
■ **Trunk (port trunking):** None
■ **Switch Mesh:** Not a member
■ **Broadcast Limit:** 0 (no broadcast limiting)
■ **Flow Control:** Disabled
■ **Spanning Tree:** Disabled
■ **IGMP:** 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.

Sample Connections

The HP Gigabit Stacking Module allows you to easily stack multiple Switch 2424Ms with gigabit speed while at the same time connecting the stack to network backbones, servers and other network devices with gigabit fiber-optic connections. The following illustration shows an example of these connections.

Stacking

Using the Gigabit Stacking Kit (two Gigabit Stacking Transceivers and 1/2-meter Stacking Cable—HP J4116A), you can stack up to seven Switch 2424Ms together.

Gigabit-LX connection to campus backbone

Note:
If the stack is connected to a backbone switch or other switches, the number of switches in the stack must be reduced so that the total number of interconnected switches is at most seven.

Stacking connections between the Switch 2424M units.

One HP Gigabit Stacking Kit (part number HP J4116A) provides the two Gigabit Stacking Transceivers and 1/2-meter cable needed to connect two switches together.

Note that either transceiver slot on the Gigabit Stacking Module can be used for a stacking connection.

Gigabit-SX connection to local server
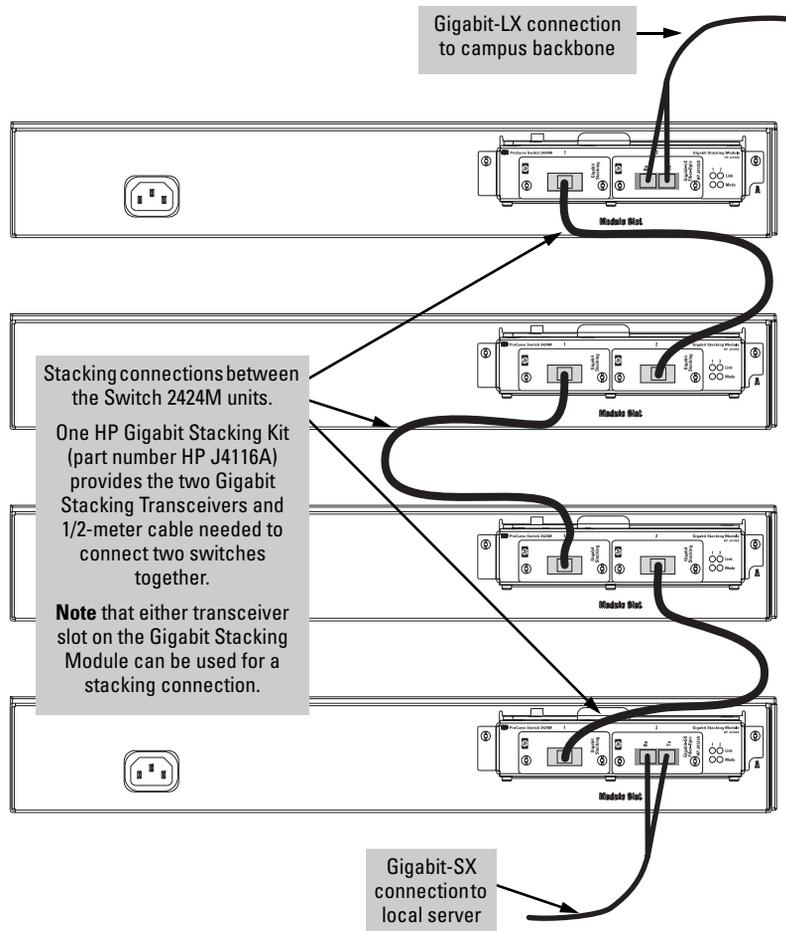
Troubleshooting

The primary tools for troubleshooting the switch modules are the LEDs on the front of the switch and on the module. Refer to "LED Behavior" on page 7. 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	Module Port Link and Mode	Diagnostic Tips
Flashing[†]	Flashing[†]	Flashing[†]	All Link and Mode LEDs On	❶
Off	Off	Flashing[†]	All Link and Mode LEDs On	❷
Flashing[†]	Flashing[†]	On	Link and Mode LEDs On for one or both of the ports after a module hot swap	❸
Flashing[†]	Flashing[†]	On	Link and Mode LEDs On for one or both of the ports after switch power on or reset	❹
Off	Off	On	Off with cable connected	❺

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

Diagnostic Tips:

Tip Number	Problem	Solution
❶	The module is not installed properly in the slot or has become partly removed during switch operation.	Under this error condition, the following events also occur: • All the LEDs on the module stay on until the error is resolved. • The switch software, including console and web browser access will not be operational for approximately one minute from the time the module gets into this condition. Make sure to screw in the retaining screws to firmly position the module and so that the module cannot be inadvertently pulled out by pulling on the network cables. If this does not resolve the condition, try reinstalling the module. You can do this without having to power down the switch.

Tip Number	Problem	Solution
❷	The module was installed in the slot after a different type module was previously installed, and the switch has not yet been reset.	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. See "Reset the Switch" on page 10.
❸	The module has experienced a self test fault.	The module and transceivers are 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). When the module is hot swapped (installed when the switch is powered on), the self test is a partial test that may not detect all possible module failures and does not detect transceiver failures. Try the following procedures to resolve this condition: • Remove and reinstall the module. You can do this without having to power down the switch. When the module is reinstalled, it will be retested automatically. • If this does not resolve the condition, try resetting the switch. See "Reset the Switch" on page 10. A more thorough test is performed when the switch is reset or power cycled. If the same fault indication reoccurs or a new fault indication results from the switch reset, see tip ❹ below.
❹	The module or one of the transceivers has experienced a self test fault.	The self test that is performed after the switch is powered on or reset is a complete test of both the module and the transceivers. **If ONE set of module port LEDs (Link and Mode LEDs for one of the ports) stays on**, the faulty unit is probably the transceiver associated with the LEDs that are on. Try these procedures: 1. Remove the module from the switch. 2. Remove the suspected transceiver from the module. 3. Reinstall the module and reset the switch. See "Reset the Switch" on page 10. • If the self test is successful, the transceiver is faulty and must be replaced. • If the self test still fails, the module is faulty and must be replaced. **If both sets of port LEDs stay on**, the faulty unit is probably the module. Try these procedures: 1. Remove the module from the switch. 2. Remove both of the transceivers. 3. Reinstall the module and reset the switch. • If the self test is successful, both of the transceivers are faulty and must be replaced. • If the self test still fails, the module is faulty and must be replaced.

Tip Number	Problem	Solution
❺	The network connection is not working properly.	Try the following procedures: • For the indicated port, verify that both ends of the cabling, at the switch and the connected device, are snug. • Verify the connected device and switch are both powered *on* and operating correctly. • Verify that you have used the correct cable type for the connection and that the cable does not exceed the length indicated on page 8. • For fiber-optic connections, verify that the transmit port on the switch is connected to the receive port on the connected device, and the switch receive port is connected to the transmit port on the connected device. • Verify that the port has not been disabled through a switch configuration change. You can use the console interface to determine the state of the port and re-enable the port if necessary. If you have configured an IP address on the switch, you can use Telnet to access the console, or use the web browser interface, or HP TopTools for Hubs & Switches network management software. • Try resetting the switch. If the transceivers were installed into the Gigabit Stacking Module and then the module was "hot swapped" into the switch, the resulting module self test is a partial one and does not fully test the operation of the transceivers. Resetting the switch performs a more complete self test of the module and transceivers. You may see a new LED behavior after the reset. • Make sure that the switch port and the device at the other end of the cable are configured the same for speed, duplex, and flow control. The default configuration for the Gigabit-SX and Gigabit-LX ports is 1000 Mbps, full-duplex, with no flow control. The connected device should be configured the same way, or both the switch port and the device should be configured to Auto. • 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 and contact phone numbers. Click on the Support button on that web page.

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

Replacing or Removing the Module

Follow these procedures to replace the Gigabit Stacking Module with another, or to remove the module without replacing it:

1. Remove any network cables from the ports on the module.

2. 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.

3. Rotate the lever handle fully open to disconnect the module from the switch connectors. Then slide the module out from the slot.

4. Do one of the following:
   - If you will be installing another module in the slot, go to "Install Transceivers Into the Module" on page 5.
   - If you will not install another module in the slot (that is, leave it empty), then 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 transceiver or module slot.

5. If you are replacing the module with a module of a different type (for example, replacing a Gigabit-LX Module with a Gigabit Stacking Module), then reset the switch, as described under "Reset the Switch" on page 10.

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

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 Transceiver installed in the Gigabit Stacking Module.

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 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 multi-mode 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.

N o t e   Most of the time, if you are using good quality graded-index multimode fiber cable that adheres to the standards listed on page 8, 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 transceiver.

Installing the Patch Cord

As shown in the illustration below, connect the patch cord to the Gigabit LX Transceiver 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.

Gigabit Stacking Module with Gigabit-LX Transceiver

the multimode cable in the patch cord must match the characteristics of your network cable

to network multimode cabling

Mode Conditioning Patch Cord

single-mode section plugs into Tx port on Gigabit LX Transceiver
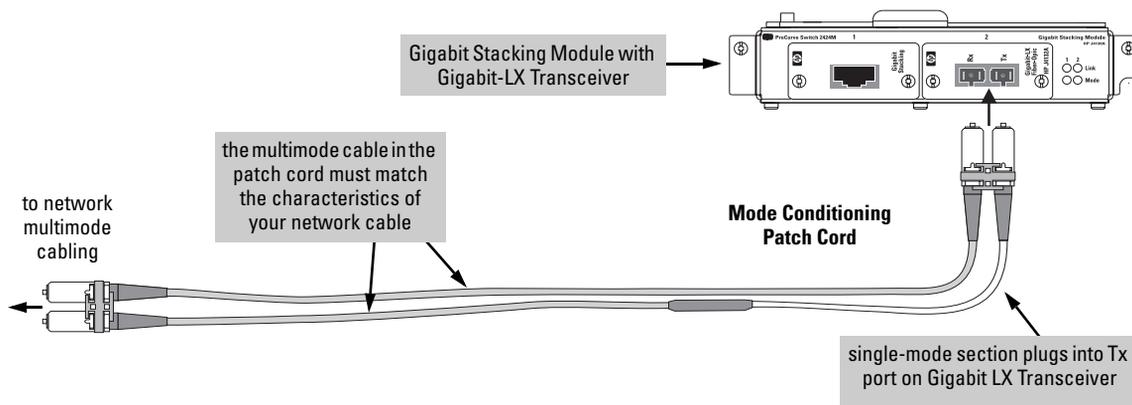
Make sure you purchase a patch cord that has SC connectors on the end that connects to the Gigabit LX Transceiver and has multimode fibers that match the characteristics of the multimode fiber in your network.

Recommended Patch Cords

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

	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.

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)

Connectors

■ The **Gigabit-SX Transceiver** transmits at 850 nm wavelength, and is compatible with the IEEE 802.3z Gigabit-SX standard. It accepts the multi-mode fiber-optic cables for Gigabit-SX described on page 8.

■ The **Gigabit-LX Transceiver** 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 page 8.

■ The **Gigabit Stacking Transceiver** has a proprietary connector. It accepts the 1/2-meter shielded twisted-pair cable that is shipped in the HP Gigabit Stacking Kit (HP J4116A), as described on page 8.

A 10-meter cable has also been tested and verified. The cable is AMP part number 627124-1.

EMC Regulatory Statements

U.S.A.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area may cause interference in which case the user will be required to correct the interference at his own expense.

Canada

This product complies with Class A Canadian EMC requirements.

Australia/New Zealand

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

Japan

VCCI Class A

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

Korea

사용자 안내문 : A 급기기

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

Taiwan

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

European Community Declaration of Conformity

This product is designed for operation with the HP ProCurve Switch 2424M.
Please see the Declaration of Conformity included in the *HP ProCurve Switch 2424M Installation Guide.*

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is subject to change without notice.