

HP ProCurve
Switch c1 Modules
Installation Guide



www.hp.com/go/hpprocurve

ProCurve Switch cl Modules

Installation Guide

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Applicable Products

ProCurve 10-GbE Copper Module (J8434A)
ProCurve 10-GbE Media Flex Module (J8435A)
ProCurve 10-GbE X2 SR-SC Xcvr (J8436A)
ProCurve 10-GbE X2 LR-SC Xcvr (J8437A)
ProCurve 10-GbE CX4 Media Converter (J8439A)
ProCurve 10-GbE X2 CX4 Xcvr (J8440A)
ProCurve Switch 3400cl-24G (J4905A)
ProCurve Switch 3400cl-48G (J4906A)
ProCurve Switch 10-GbE CX4 6400cl-6XG (J8433A)
ProCurve Switch 10-GbE X2 6410cl-6XG (J8474A)

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See the Customer Support/Warranty booklet included with the product.

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Safety

Before installing and operating these products, please read the "Installation Precautions" on Page 6, "Installing a Module", and the regulatory statements beginning on Page 24.

Contents

Descriptions	1-1
Features	1-2
Installing the Modules	1-5
Installing a Module	1-6
Installation Precautions:	1-6
Installation Procedures:	1-6
Installing or Removing the transceivers	1-8
Verifying the Module is Installed Correctly	1-9
Connecting the Network Cables	1-10
Supported Cable Types	1-10
Connecting Cables	1-11
Verifying the Network Connections Are Working	1-12
Removing a Module	1-13
Troubleshooting	1-14
Diagnostic Tips:	1-14
Customer Support Services	1-16
Specifications	1-17
Physical	1-17
Environmental	1-18
Lasers	1-18
Optical Power Specifications	1-19
ProCurve 10-GbE X2 SR-SC Xcvr (J8436A)	1-19
ProCurve 10-GbE X2 LR-SC Xcvr (J8437A)	1-20
ProCurve 10-GbE CX4 Xcvr (J8440A)	1-21

EMC Regulatory Statements	1-22
U.S.A.	1-22
Canada	1-22
Australia/New Zealand	1-22
Japan	1-22
Korea	1-23
Taiwan	1-23
European Community Declaration of Conformity	1-23

ProCurve Switch cl Modules

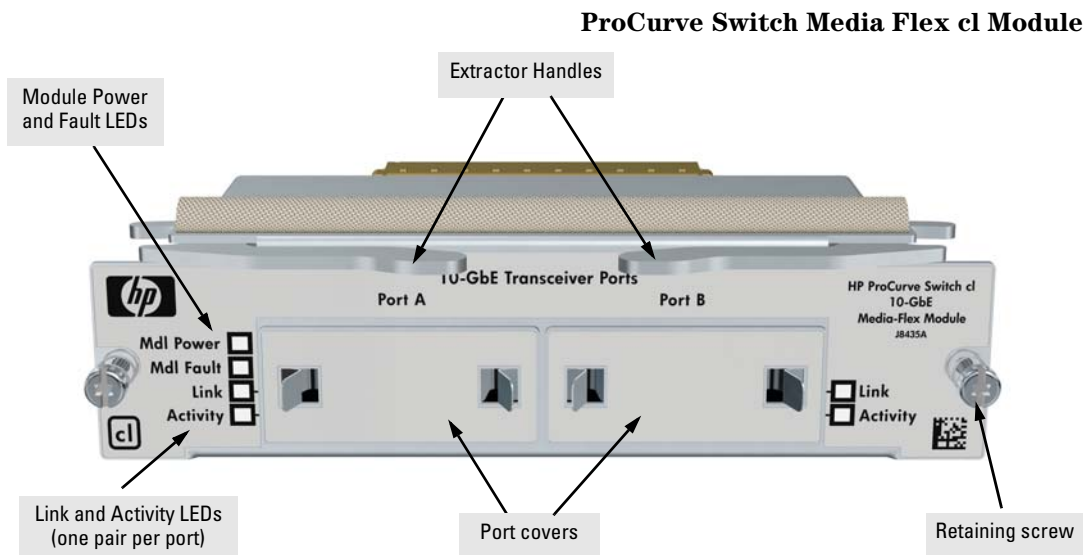
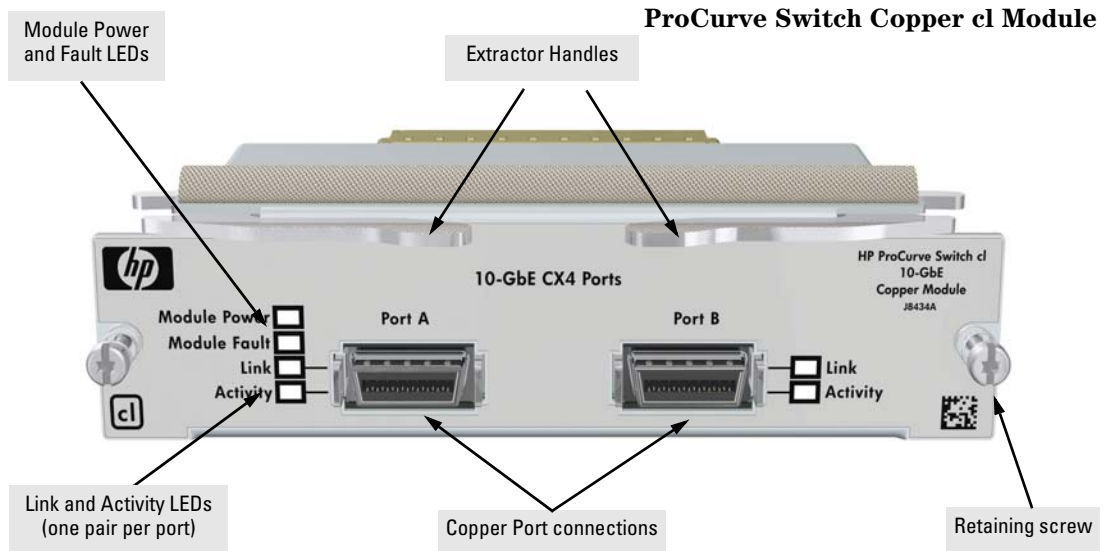
Descriptions

The ProCurve Switch cl Modules are components you can add to a ProCurve cl switch to provide a variety of network connectivity options. The following modules are available as of this printing:

Module		Description
ProCurve Switch CX4 cl Module (J8434A)		2-port 10 Gigabits CX4 transceiver switch expansion module.
ProCurve Switch Media Flex cl Module (J8435A)*		2-port 10 Gigabits Media Flex switch expansion module. This module can support both the Optic Transceivers (J8436A and J8437A), and the CX4 Transceiver (J8440A).
* Supported transceivers: The following ProCurve transceivers are supported by the Media Flex cl Module (as of this printing): • ProCurve 10-GbE X2 SR-SC Xcvr (J8436A) • ProCurve 10-GbE X2 LR-SC Xcvr (J8437A) • ProCurve 10-GbE CX4 Xcvr (J8440A) • ProCurve 10-GbE CX4 Optical Media Converter (J8439A)		
These modules require switch software version M.08.60 or later to be installed in the switch.		

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

Features



The ProCurve Switch cl Modules have the following features:

- Connectivity to both copper and fiber when using a Media Flex cl module.
- LEDs that provide information for each port on the link status and network activity.
- LEDs that provide information on Module power and Module fault conditions.
- “hot swap transceivers” operation—you can add, replace, or change the type of any of the transceivers that you use in the Media Flex cl Module, without having to first remove the module, and without having to shut down the switch.
- standards adherence:
 - IEEE 802.3ak CX4
 - IEEE 802.3ae XAUI
 - Compliant with X2 and XENPAK MSA's

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Installing the Modules

You can install any of the modules into any of the ProCurve cl Switches that have a compatible module slot. As of this printing, those are the ProCurve Switch 3400cl Series:

- 3400cl-24G (J4905A)
- 3400cl-48G (J4906A)

ProCurve Switch 6400cl Series:

- 6400cl-6XG CX4 (J8433A)
- 6410cl-6XG X2 (J8474A)

“Hot Swap”

Notes

The transceivers can be “hot swapped”. That is, they can be installed or removed after the Media Flex cl Module is installed in the switch and the module is receiving power.

The expansion cl module itself is not “hot-swappable” or “hot pluggable.” You cannot insert or remove a module while the switch is powered on without interrupting the operation of the rest of the switch ports. If you install or remove an expansion cl module with the switch powered on, a reboot will occur.

You can install the modules into the switch either with the switch powered on or off. The following procedures assume the switch is powered off.

1. Install a module (see [page 7](#)).
2. If you are using the Media Flex cl Module, install the transceivers in the module. You can install the transceivers before or after installing that module into the switch (see [page 8](#)).
3. Verify the modules are installed correctly (see [page 9](#)).
4. Connect the network cabling (see [page 10](#)).
5. Verify the network connections are working properly (see [page 12](#)).

Installing a Module

Installation Precautions:

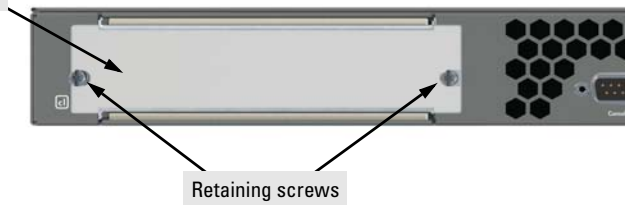
- Static electricity can severely damage the electronic components on the modules. When handling and installing the modules in your switch, follow these procedures to avoid damage from static electricity:
 - Handle the module by its bulkhead or edges and avoid touching the components and the circuitry 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.
- ***The ProCurve Switch cl Modules have “low-force”, high-performance connectors. High insertion forces are not necessary to install the modules, and should not be used.***
- ***Ensure you fully insert the modules.*** That is, press the module into the slot until the bulkhead on the module is contacting or is very close to contacting the front face of the switch chassis. Use the extractor handles to seat the module completely.
- Once the module is fully inserted, make sure to screw in the two retaining screws to secure the module in place.
- For safe operation, proper switch cooling, and reduction of electromagnetic emissions, ensure that a slot cover is installed on any unused module slot.
- Do not install the switch in an environment where the operating ambient temperature might exceed 55°C (131°F)¹.

¹ If you are installing either of the Switch 6400cl Series switches using one of the fiber transceivers, the switch operating ambient temperature should not exceed 40°C (104°F). See transceiver specifications on [page 18](#).

Installation Procedures:

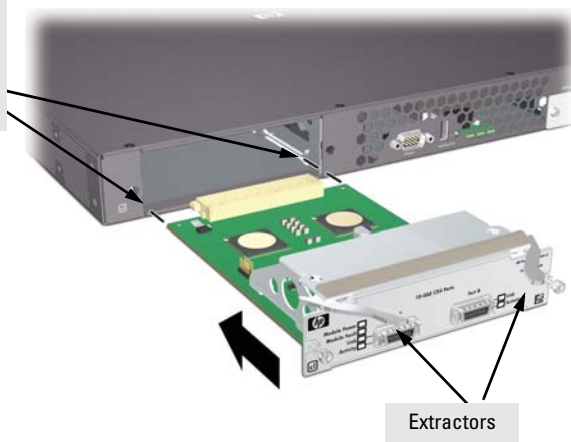
1. Use a Torx T-10 or flat-bladed screwdriver to unscrew the screws in the cover plate over the slot, and remove the cover. Store the cover plate for possible future use.
2. Hold the module by its bulkhead—taking care not to touch the metal connectors or components on the board.
3. Insert the module into the slot guides and slide it into the slot until the extractors come in contact with the chassis.
4. Use an equal amount of pressure and push both extractor handles closed to completely seat the module.
5. Tighten the retaining screws.

1. Remove the cover plate.

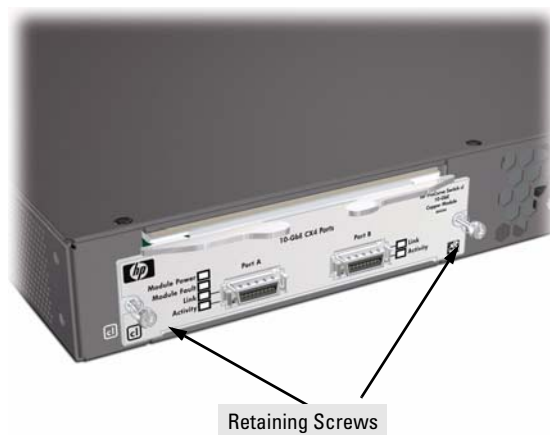


2. Insert module into the guides and slide it in until the extractors come in contact with the chassis.

For best results, push simultaneously near both screws.



3. Push the extractor handles closed and tighten the retaining screws.



Installing or Removing the transceivers

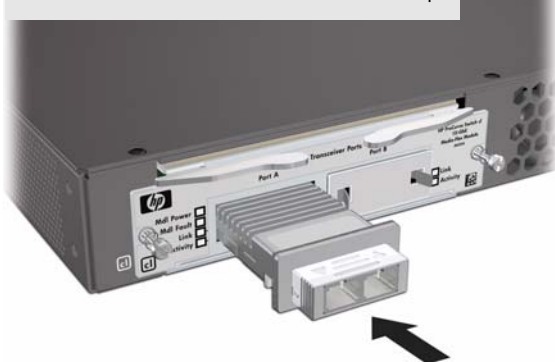
If you installed a copper module you can now connect the cables. If you installed a media flex module, you can now install the transceivers.

You can install or remove a transceiver from the Media Flex c1 Module without having to power off the switch. Use only ProCurve transceivers.

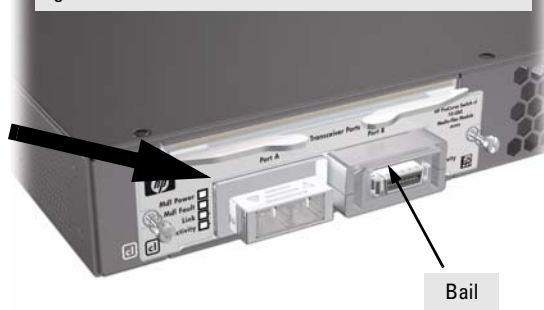
Installing the transceivers:

1. Remove a port cover by squeezing the metal tabs together.

2. Slide the transceiver into either slot until it stops.



3. Push firmly until you hear a click and 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 installed and seated correctly.

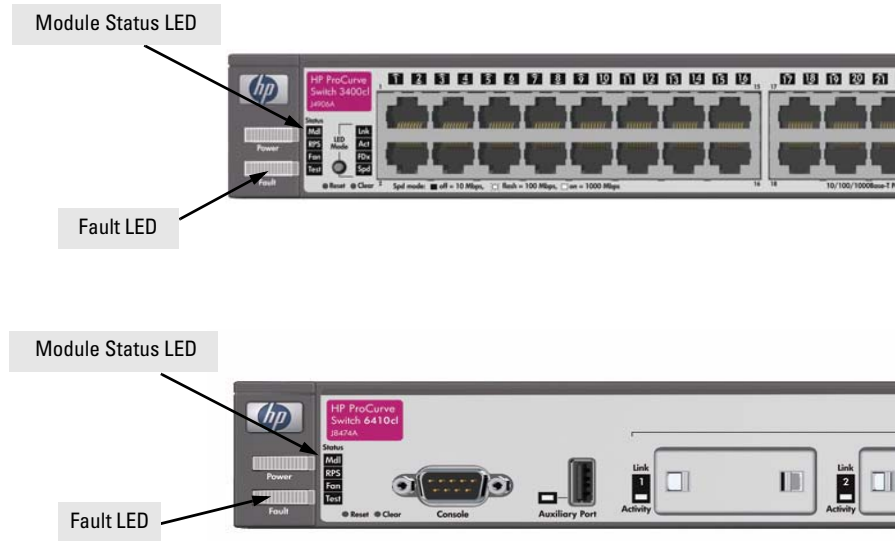
4. If your transceiver has a bail, move the bail up to lock the transceiver in place, if not your transceiver is now completely installed. Network cables can now be connected, see [page 10](#).

Removing the transceivers:

1. You should disconnect the network cable from the transceiver before removing it from the module.
2. If your transceiver has a wire bail, lower the bail until it is approximately horizontal, and then using the bail, pull the transceiver from the slot.
3. If your transceiver does not have a bail, pull the transceiver straight out.

Verifying the Module is Installed Correctly

Observe the Module Status and Fault LEDs on the front of the switch to verify 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
Mdi Status (module status) on the front of the switch	The LED goes ON as soon as the module is installed and the switch is powered on, and stays ON steadily.
Mdi Power (module power) on the front of the module	The LED goes ON as soon as the module is installed and the switch is powered on, and stays ON steadily.
Fault	OFF normal state, no fault condition exist.
Link (on the module)	The LED goes ON to indicate the port is enabled, connected and detects a signal from the attached device.
Activity (on the module)	This LED blinks to show relative activity.

Connecting the Network Cables

Supported Cable Types

Table 1. Fiber-Optic Cables

Port Type	Cable Specifications	Connector Type	Supported Length
10-GbE SR	Multimode fiber-optic cable designed for Gigabit Ethernet: 62.5/125 μm (core/cladding) diameter or 50/125 μm , 850 nm, low metal content, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards.	SC	■ 62.5 μm cable: • 160 Mhz*km = 2-26 meters • 200 Mhz*km = 2-33 meters ■ 50 μm cable: • 400 Mhz*km = 2-66 meters • 500 Mhz*km = 2-82 meters • 2000 Mhz*km = 2-300 meters
10-GbE LR	9/125 μm (core/cladding) diameter, 1480 nm, low metal content, single mode fiber-optic cables, complying with the ITU-T G.652 and ISO/IEC 793-2 Type B1 standards.	SC	single-mode cable: 2-10 kilometers
Note: Conditioning patch cord cables are not supported.			

Table 2. Copper Cables

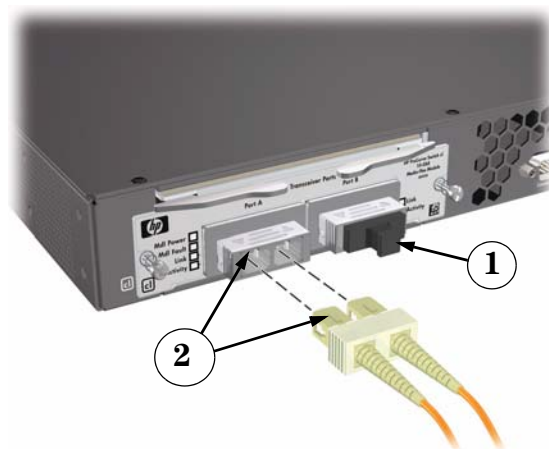
Port Type	Cable Specifications	Connector Type	Supported Length
CX4	Speed 3.125Gbx4 (Cables compliant with the 802.3ak standard)	CX4	0.5-15 meters
OMC CX4 Fiber	12 fiber 50/125 μm (core/cladding) diameter, multimode Fiber ribbon cable. 12 fiber 62.5/125 μm (core/cladding) diameter, multimode Fiber ribbon cable is also supported.	Optical Media Converter	1-300 meters

Connecting Cables

Connecting the Fiber cable

1. Remove the dust covers from the cable connectors on the transceiver port.

2. Aligning the notches on the cable connectors with the slots of the transceiver ports, press the cable connector into the transceiver port until it snaps into place.



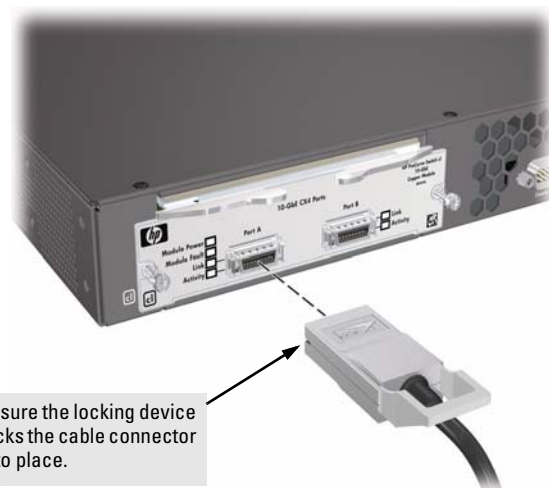
Note

To ensure proper transmit/receive connections, make sure the transmit from one device is connected to the receive of the other device.

Connecting the Copper cable

1. Push the copper cable connector into the copper transceiver port.

Ensure the locking device locks the cable connector into place.

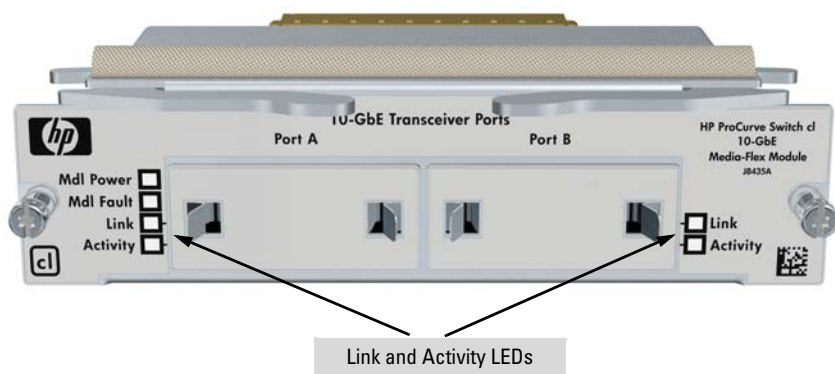


Verifying the Network Connections Are Working

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

- On the 48 port 3400cl switch, Port A is port 49 and Port B is port 50.
- On the 24 port 3400cl switch, Port A is port 25 and Port B is port 26
- On the 6 port 6400cl switches, Port A is port 7 and Port B is port 8.

Example Link and Activity 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 LED Behavior on [page 9](#) and troubleshooting information on [page 14](#).
- The Activity LED will flicker when traffic is detected on the port and the port is transmitting and/or receiving packets.

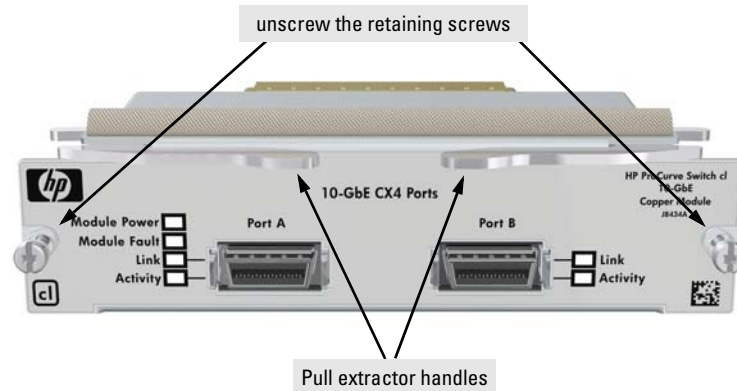
Removing a Module

Note

Installing or removing a module with the switch powered on causes a switch reset to occur.

Follow these procedures to remove a module:

1. Remove any network cables from the ports on the module.
2. On the module unscrew the retaining screws enough to disconnect them from the threaded holes in the switch.



3. Using the extractor handles, pull the module out from the slot.
4. Do one of the following:
 - If you will be installing another module in the slot, go to “Installing a Module” 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 a slot cover is installed on any unused slot.

Troubleshooting

One of 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 9](#) for a description of the normal LED behavior. Also, refer to the switch *Installation and Getting Started Guide* for more detailed troubleshooting information for the switch.

LED Error Indicators:

Switch LEDs			Module LEDs				Diagnostic Tips
Fault	Test	Module Status	Module (Mdl) Power	Module (Mdl) Fault	Link	Activity	
Blinking [†]	Blinking [†]	Blinking [†]			Blinking [†]		❶
Blinking	Blinking	Blinking	On	Off	Blinking	Off	❷
Off	Off	On			Off with cable connected		❸
Blinking	On	Blinking	Off	Blinking	*	*	❹
Blinking		Blinking			Blinking		❺

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

^{††} The fast blinking behavior is an on/off cycle once every 0.8 seconds, approximately.

* This LED is not important for the diagnosis.

Diagnostic Tips:

See the table on the next page to diagnose the LED error indicators in the previous table.

Tip Number	Problem	Solution
❶	The network port for which the Link LED is blinking has experienced a self test or initialization failure.	During the module self test (described in item 1 above), each network port is also tested. If the port self test fails, the individual port is not usable, but the rest of the ports on the module, which have passed their self test, will continue to operate normally.
❷	A port on the expansion c1 module has a failure	If it is a media flex module try reseating the transceiver. If it is a fixed copper module, you may have to replace the module.
❸	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 securely connected. • 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. See “Connecting the Network Cables” on page 10 for the correct cable specifications. – 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. • 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 ProCurve Manager 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 connected device. For example, if the switch port is configured as “Auto”, the port on the connected device also MUST be configured as “Auto”. 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.
❹	The expansion c1 module has a power failure	Try re-seating the module and rebooting the switch. If this does not clear the error 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.
❺	There is something wrong with the link.	The transceiver or cable may have failed. Check all connections for proper seating. The system error log may contain additional information helpful in diagnosing the problem.

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 they offer and with services offered by HP.

Specifications

Physical

MODULES

Width:	114.3 mm (4.5 in)
Depth:	173 mm (6.8125 in)
Height:	40.8 mm (1.6 in)
Weight:	CX4 J8434A 308.5g (0.68 lbs)
	Media Flex J8435A 297.6g (0.65 lbs)

TRANSCIVERS

	SR Optic J8436A LR Optic J8437A	Copper J8440A
Width:	36 mm (1.42 in)	36 mm (1.42 in)
Depth:	88.6 mm (3.48 in)	89.8 mm (3.54 in)
Height:	11 mm (.43 in)	18.96 mm (.75 in)

Environmental

MODULES

	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)

* If you are installing any of the fiber transceivers, the switch operating ambient temperature should not exceed 40°C (104°F).

TRANSCEIVERS

Temperature: SR Optic J8436A LR Optic J8437A Copper J8440A	0°C to 40°C (32°F to 104°F) 0°C to 40°C (32°F to 104°F) 0°C to 55°C (32°F to 131°F)
Relative humidity: (non-condensing)	15% to 95% at 40°C (104°F)
Maximum altitude:	4.6 Km (15,000 ft)

Lasers

The following products are Class 1 Laser Products.
Laser Klasse 1:

- The ProCurve 10-GbE X2 SR-SC Xcvr
- The ProCurve 10-GbE X2 LR-SC Xcvr

The transceivers complies with IEC 825-2: 1993.

Optical Power Specifications

ProCurve 10-GbE X2 SR-SC Xcvr (J8436A)

Transmitter Optical Characteristics:

Parameter	Minimum	Typical	Maximum	Notes
Average Launch Power	-7.3dBm	N/A	-1.0dBm	
Extinction Ratio	3dB	N/A	N/A	
Nominal Wavelength	840nm	850nm	860nm	

Receiver Optical Characteristics:

Parameter	Minimum	Typical	Maximum	Notes
Receiver Sensitivity	-X.XdBm			
Center Wavelength	840nm	850nm	860nm	
Average Receiver Power	N/A		-1.0dBm	

ProCurve 10-GbE X2 LR-SC Xcvr (J8437A)**Transmitter Optical Characteristics:**

Parameter	Minimum	Typical	Maximum	Notes
Average Launch Power	-8.2dBm	N/A	0.5dBm	
Extinction Ratio	3.5dB	8dB	N/A	
Nominal Wavelength	1260nm	1310nm	1355nm	
Spectral Width	N/A	N/A	0.2Nm	

Receiver Optical Characteristics:

Parameter	Minimum	Typical	Maximum	Notes
Receiver Sensitivity	-12.6dBm	N/A	N/A	
Center Wavelength	1260nm	1310nm	1355nm	
LOS Detect Asserted	N/A	N/A	-30dBm	
Average Receiver Power	- 14.4	N/A	+0.5dBm	

ProCurve 10-GbE CX4 Xcvr (J8440A)

Copper Transceiver Characteristics:

Parameter	Minimum	Typical	Maximum	Notes
Supply Voltage 3.3V	3.13VDC	3.3VDC	4.37VDC	
Supply Current 3.3V	N/A	196mA	216mA	
Impedance	N/A	100ohms	N/A	Differential
Transmit Voltage	800mVpp	1472mVpp	1600mVpp	
Receive Voltage	100mVpp	N/A	1600mVpp	
Rise Time	60ps	N/A	130ps	20%-80%

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

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Korea

사용자 안내문 : A 급기기

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Taiwan

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European Community Declaration of Conformity

These products are designed for operation with the ProCurve switches that have c1 module slots. Please see the Declarations of Conformity included in the Installation Guides for those products.

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