

# Installation Notes for the Cisco TwinGig and OneX Converter Modules

---

## **PID: CVR-X2-SFP and CVR-X2-SFP10G**

This note provides the installation instructions for the Cisco TwinGig and OneX Converter Modules. This document contains these sections:

- [TwinGig Overview, page 1](#)
- [OneX Overview, page 4](#)
- [Converter Module Installation, page 7](#)
- [Obtaining Documentation and Submitting a Service Request, page 16](#)

## TwinGig Overview

The Cisco TwinGig Converter Module (model CVR-X2-SFP), also known as a *converter module*, is a hot-swappable input/output (I/O) device that slides into a 10-Gigabit Ethernet X2 slot on a switch. It converts the 10-Gigabit X2 interface into a dual SFP interface. It was developed for the Catalyst 3560-E switch but is supported on other platforms. The converter module is shown in [Figure 1](#).

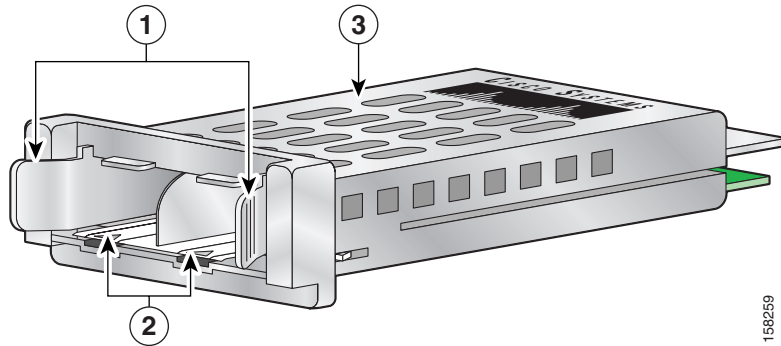


---

**Americas Headquarters:**  
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

© 2007–2010 Cisco Systems, Inc. All rights reserved.

**Figure 1 Cisco TwinGig Converter Module**



<b>1</b>	Latch arms
<b>2</b>	SFP slots
<b>3</b>	Top of the converter module

The converter module supports up to two small-form factor pluggable (SFP) modules. These modules plug into the converter module slots to establish fiber-optic and copper connections to network devices. [Table 1](#) lists the SFP modules that the converter module supports.



**Note**

Use only Cisco SFP modules in the converter module. Each Cisco module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the module meets the requirements for the switch.

**Table 1 Supported SFP Modules**

SFP Module Number	Description
GLC-GE-100FX	100BASE-FX
GLC-LH-SM	1000BASE-LX
GLC-SX-MM	1000BASE-SX
GLC-T	1000BASE-T

**Table 1** Supported SFP Modules (continued)

SFP Module Number	Description
GLC-ZX-SM	1000BASE-ZX
GLC-BX-D	1000BASE-BX, 1490 nm <sup>1</sup>
GLC-BX-U	1000BASE-BX, 1310 nm
CWDM-SFP-xxxx	CWDM SFP
DWDM-SFP-xx.xx	DWDM SFP
CAB-SFP-50CM (3560-E only)	SFP module patch cable <sup>2</sup>

1. nm = nanometer
2. The Catalyst 3560-E switch supports the SFP module patch cable, a 0-5-meter, copper, passive cable with SFP module connectors at each end. The patch cable can connect two Catalyst 3560-E switches in a cascaded configuration.

Table 2 lists the fiber-optic cabling specifications for the SFP modules that you install in the converter module. Each port must match the wavelength specifications on the other end of the cable, and the cable must not exceed the stipulated cable length. The SFP modules using fiber-optic connections need fiber-optic cables with LC/PC or LC/UPC connectors. The SFP modules using copper connections need Category 5E cables with RJ-45 connectors. Copper 1000 BASE-T SFP modules use standard four twisted pair category 5E cable at lengths up to 328 feet (100 meters).

**Table 2** Fiber-Optic Port Cabling Specifications

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance
100BASE-FX	1310	MMF	62.5	500	6562 feet (2 km)
			50	500	6562 feet (2 km)
1000BASE-SX	850	MMF	62.5	160	722 feet (220 m)
			62.5	200	902 feet (275 m)
			50	400	1640 feet (500 m)
			50	500	1804 feet (550 m)

**Table 2** Fiber-Optic Port Cabling Specifications

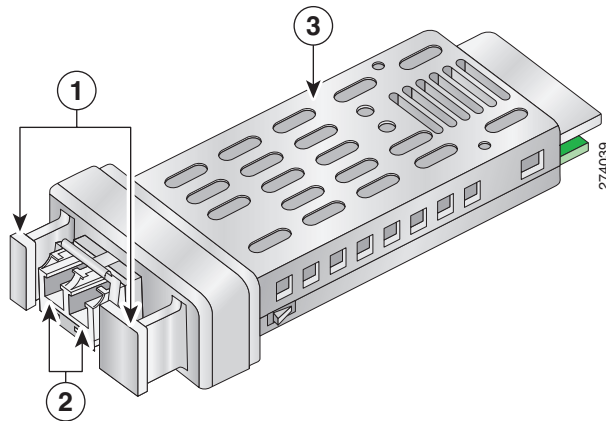
SFP Module	Wavelength (nanometers)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance
1000BASE-LX/LH	1300	MMF <sup>1</sup>	62.5	500	1804 feet (550 m)
			50	400	1804 feet (550 m)
		SMF	50	500	1804 feet (550 m)
			G.652 <sup>2</sup>	—	32,810 feet (10 km)
1000BASE-ZX	1550	SMF	G.652 <sup>2</sup>	—	43.4 to 62 miles (70 to 100 km) <sup>3</sup>
1000BASE-BX	1490/1310	SMF	G.652 <sup>2</sup>	—	32,810 feet (10 km)
Coarse Wave Division Multiplexing (CWDM)	1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610	SMF	G.652 <sup>2</sup>	—	62 miles (100 km)
Dense Wave Division Multiplexing (DWDM)	100GHz ITU channels 20 to 59	SMF	G.652 <sup>2</sup>	—	62 miles (100 km)

1. A mode-conditioning patch cord is required.
2. ITU-T G.652 SMF as specified by the IEEE 802.3z standard.
3. 1000BASE-ZX modules can send data up to 62 miles (100 km) by using dispersion-shifted SMF or low-attenuation SMF; the distance depends on the fiber quality, the number of splices, and the connectors.

## OneX Overview

The Cisco OneX Converter Module (model CVR-X2-SFP10G), also known as a *converter module*, is a hot-swappable input/output (I/O) device that slides into a 10-Gigabit Ethernet X2 slot on a switch. It converts the 10-Gigabit X2 interface into a single 10-Gigabit SFP+ interface. It is supported on many platforms using X2 interfaces. This converter module is shown in [Figure 2](#).

**Figure 2** Cisco OneX Converter Module



<b>1</b>	Latch arms
<b>2</b>	SFP+ slot
<b>3</b>	Top of the converter module

The converter module supports one small-form factor pluggable plus (SFP+) module. The module plugs into the converter module slot to establish fiber-optic and copper connections to network devices. [Table 3](#) lists the SFP+ modules that the converter module supports.



**Note**

Use only Cisco SFP+ modules in the converter module. Each Cisco module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the module meets the requirements for the switch.

**Table 3** Supported SFP+ Modules and Patch Cords

SFP+ Module Number	Description
<b>SFP-10G-SR</b>	Cisco 10GBASE-SR SFP-Plus transceiver module for MMF, 850-nm wavelength
<b>SFP-H10GB-CU1M</b>	Twinax cable assembly, 1m, 30 AWG

**Table 3 Supported SFP+ Modules and Patch Cords (continued)**

SFP+ Module Number	Description
SFP-H10GB-CU3M	Twinax cable assembly, 3m, 30 AWG
SFP-H10GB-CU5M	Twinax cable assembly, 5m, 24 AWG

Table 4 lists the fiber-optic cabling specifications for the SFP+ modules that you install in the converter module. Each port must match the wavelength specifications on the other end of the cable, and the cable must not exceed the stipulated cable length. The SFP modules using fiber-optic connections need fiber-optic cables with LC/PC or LC/UPC connectors.

**Table 4 Fiber-Optic Port Cabling Specifications**

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance
10GBASE-SR	850	MMF	62.5	160	85 feet (26 m)
			62.5	200	108 feet (33 m)
			50	400	216 feet (66 m)
			50	500	269 feet (82 m)
			50	2000	984 feet (300 m)

# Converter Module Installation

This section describes how to install and remove a converter module in a switch and how to install and remove the SFP or SFP+ modules. It contains these sections:

- [Safety Warnings, page 7](#)
- [Installation Guidelines, page 8](#)
- [Installing and Removing the Converter Module, page 9](#)
- [Installing and Removing SFP or SFP+ Modules, page 12](#)

## Safety Warnings

This section includes the basic installation caution and warning statements. Translations of the warning statements appear in the *Regulatory Compliance and Safety Information for the Catalyst 3750-E and Catalyst 3560-E* (available online at [http://www.cisco.com/en/US/docs/switches/lan/catalyst3750e\\_3560e/hardware/regulatory/compliance/1848201.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst3750e_3560e/hardware/regulatory/compliance/1848201.html)) document that ships with the switch. Read this section before you start the installation procedure.



### Caution

---

Proper ESD protection is required whenever you handle Cisco equipment. Installation and maintenance personnel should be properly grounded by means of grounding straps to eliminate the risk of ESD damage to the equipment. Equipment is subject to ESD damage whenever it is removed from the switch.

---



### Warning

---

**This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.** Statement 1071

---



**Warning**

---

**Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 148

---



**Warning**

---

**Do not reach into a vacant slot or chassis while you install or remove a module. Exposed circuitry could constitute an energy hazard.** Statement 206

---



**Warning**

---

**Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

---



**Warning**

---

**Class 1 laser product.** Statement 1008

---

## Installation Guidelines

Follow these guidelines when working with the converter module or an SFP or SFP+ module:

- The converter module and SFP or SFP+ modules are static sensitive. To prevent ESD damage, wear an ESD-preventive wrist strap that is connected to the chassis. Place the module in an antistatic bag when not in use.
- Verify the correct orientation of the modules before inserting them into the slot. Incorrect insertion can damage the module or the switch.
- Do not install or remove a converter module with the SFP or SFP+ modules installed. Always remove any optical cables and SFP or SFP+ modules from a converter module before installing it in the switch.
- Do not install or remove an SFP or SFP+ module with the cables attached because of the potential damage to the cables, the cable connector, or the optical interfaces in the module. Disconnect all cables before removing or installing an SFP or SFP+ module.
- Verify that the converter module is straight and not at an angle when you install it in the slot. Installing the module at an angle can damage it. Any module that is only partially connected to the switch might not operate correctly.



- Do not force the converter module into its slot. This can damage the pins if they are not aligned with the module.
- Do not remove the EMI plug from the converter module, the dust plug from the SFP or SFP+ module, or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the module ports and cables from contamination and ambient light.
- Removing and installing a module can shorten its useful life. Do not remove and insert a module more often than is absolutely necessary.

**Note**

---

Switches support hot swapping of the converter module. You can remove and replace the module without disconnecting the system power. Hot swapping the module does not interrupt normal switch operation.

---

## Installing and Removing the Converter Module

These sections describe how to install and remove a Converter Module in a switch with 10-Gigabit Ethernet module slots.

**Note**

---

When you install or remove the TwinGig converter module, the mode on the switch changes from 10 Gigabit Ethernet to Gigabit Ethernet or the reverse. During this mode change, data traffic on the other switch uplink ports (X2 transceiver or SFP module ports) might temporarily stop. When you install or remove an X2 transceiver or SFP module, traffic delay does not occur.

---

## Installing a Converter Module

To install a converter module in the switch module slot, follow these steps:

- 
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
  - Step 2** Remove the 10-Gigabit Ethernet module slot EMC plugs and save.



**Caution**

Do not remove the EMC plug from the 10-Gigabit Ethernet X2 slot until you are ready to install the converter module. A module or an EMC plug must be installed in the slot at all times.

**Step 3**

Remove the converter module from its protective packaging.



**Caution**

Do not install the converter module with the SFP or SFP+ modules installed. Always remove any cables and SFP or SFP+ modules before installing the converter module in the switch.



**Caution**

Verify the correct orientation of the converter module before inserting it into the slot. Incorrect insertion can damage the module.

**Step 4**

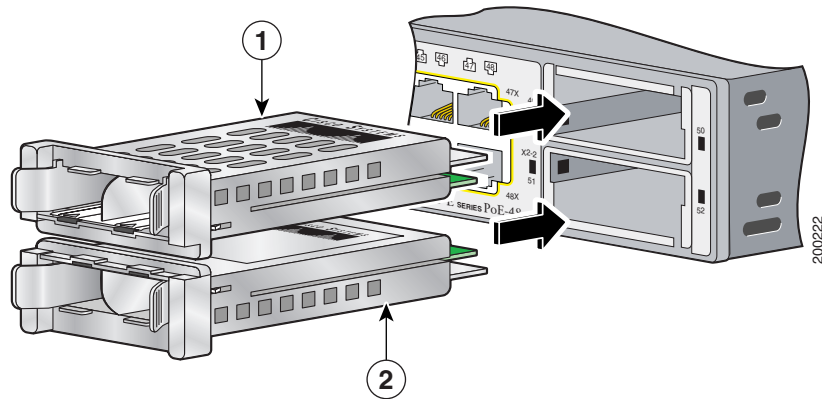
Slide the converter module gently but firmly into the 10-Gigabit switch module slot until the converter module is flush with the switch faceplate and the converter module snaps into place.

When using the Catalyst 3750-E switch upper 10-Gigabit Ethernet module slot (slot1), insert the converter module face up. When using the switch lower module slot (slot 2), insert the converter module face down ([Figure 3](#)). The orientation will vary for other switches, refer to your switch's documentation.

**Step 5**

Install the SFP or SFP+ module into the converter module (See the [“Installing an SFP or SFP+ Module”](#) section on page 13). The switch detects the presence of both the converter module and any inserted Cisco SFP or SFP+ modules.

**Figure 3** *Installing a TwinGig Converter Module (Catalyst 3750-E Specific)*



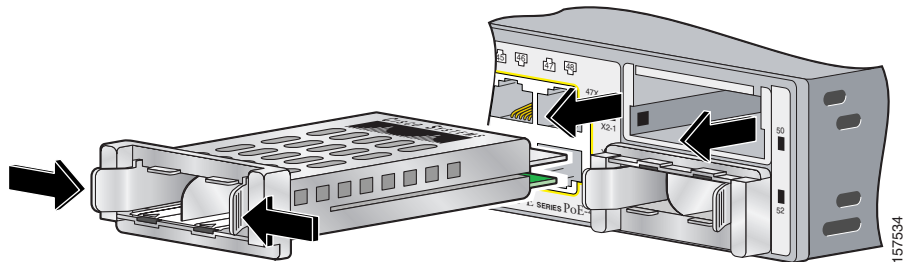
1	Module inserted face up
2	Module inserted face down

## Removing a Converter Module

To remove a converter module from the switch module slot, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.
- Step 2** Disconnect the cables from the SFP or SFP + module and remove the SFP or SFP+ modules from the converter module. (See the [“Installing and Removing SFP or SFP+ Modules”](#) section on page 12).
- Step 3** Pinch the latch arms on each side of the converter module, and carefully slide it out of the slot ([Figure 4](#)).
- Step 4** Place all SFP or SFP+ modules and converter modules in an antistatic bag or other protective environment.
- Step 5** Replace the EMI plug in the switch empty 10-Gigabit Ethernet module slot.

**Figure 4** *Removing a Converter Module from the Switch (TwinGig Shown)*



## Installing and Removing SFP or SFP+ Modules

This section describes how to install and remove SFP or SFP+ modules in the converter module slots. You must have the converter module installed in a 10-Gigabit Ethernet switch slot to use SFP or SFP+ modules with the switch. [Figure 5 on page 14](#) shows the converter module in the switch with the SFP modules installed.

For detailed information about installing, removing, cabling, and troubleshooting SFP and SFP + modules, see the module documentation that shipped with your device.



### Caution

To avoid damage to the converter module, first install the converter module in the switch 10-Gigabit Ethernet X2 slot before installing the SFP or SFP+ modules.



### Note

Do not install or remove an SFP or SFP+ module with cables attached to it because of the potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP or SFP+ module.

## Installing an SFP or SFP+ Module

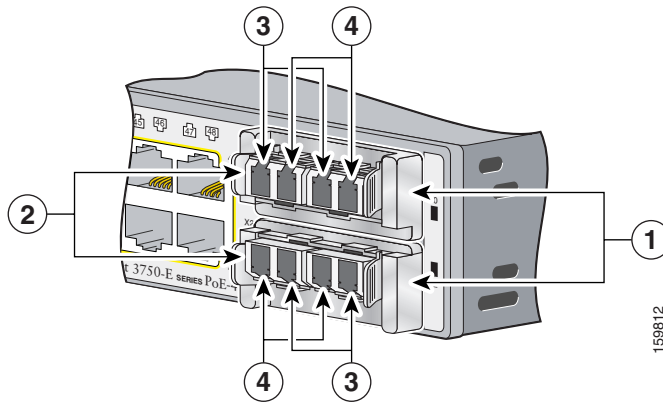
**Caution**

Verify the correct orientation of the SFP or SFP+ module before inserting it into the converter module. Incorrect insertion can damage the converter module, the SFP or SFP+ module, or the switch.

To insert an SFP or SFP+ module into a converter module slot, follow these steps:

- 
- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
- Step 2** Find the send (TX) and receive (RX) markings that identify the top side of the SFP or SFP+ module.
- On some SFP or SFP+ modules, the send and receive (TX and RX) markings might be replaced by arrows that show the direction of the connection, either send (arrow pointing out) or receive (arrow pointing).
- When installing an SFP module in the Catalyst 3750-E switch upper 10-Gigabit Ethernet module slot (slot 1), insert the SFP module face up. When installing an SFP module in the switch lower module slot (slot 2), insert the SFP module face down.
  - If you are using an SFP module patch cable, and the converter module is installed in the switch upper 10-Gigabit Ethernet module slot (slot 1), insert the SFP patch cable into the converter module with the label facing up. If the converter module is installed in the switch lower module slot (slot 2), insert the patch cable into the converter module with the label facing down ([Figure 6](#)).
- Step 3** If the SFP or SFP+ module has a bale-clasp latch, move it to the open, unlocked position.
- Step 4** Slide the SFP or SFP+ module or the patch cable into the opening until you feel the connector on the module snap into place.
- Step 5** If the module has a bale-clasp latch, close it to lock the SFP or SFP+ module in place.
- Step 6** Remove the dust plugs from the SFP or SFP+ module and save. Attach the cables to the SFP or SFP+ module.

**Figure 5** Converter Module with SFP Modules Installed (TwinGig Shown)

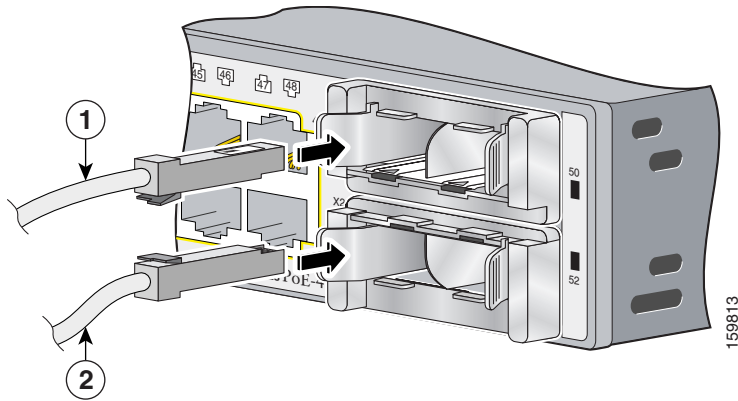


<b>1</b>	Converter module	<b>3</b>	Send (TX) optical bore
<b>2</b>	SFP modules <sup>1</sup>	<b>4</b>	Receive (RX) optical bore

1. Lower SFP modules are inverted.

159812

**Figure 6** SFP Patch Cable Installation (TwinGig Shown)



<b>1</b>	Patch cable inserted face up
<b>2</b>	Patch cable inserted face down

## Removing an SFP or SFP+ Module

To remove an SFP or SFP+ module from the converter module, follow these steps:

- Step 1** Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface.
- Step 2** Disconnect the cable from the SFP or SFP+ module. For reattachment, note which cable connector plug is send (TX) and which is receive (RX).
- Step 3** Insert a dust plug into the optical ports of the SFP or SFP+ module to keep the optical interfaces clean.
- Step 4** If the SFP or SFP+ module has a bale-clasp latch, pull the bale out and down to eject the module. If the bale-clasp latch is obstructed and you cannot use your index finger to open it, use a small, flat-blade screwdriver or other long, narrow instrument to open the bale-clasp latch.
- Step 5** Grasp the SFP or SFP+ module, and carefully remove it from the converter module.

- Step 6** Place the removed SFP or SFP+ module in an antistatic bag or other protective environment.
- 

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at [www.cisco.com/go/trademarks](http://www.cisco.com/go/trademarks). Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1005R)