Cisco CWDM GBIC and CWDM SFP Installation Note

Product Numbers:

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CWDM-GBIC-1470=	CWDM-GBIC-1550=	CWDM-SFP-1470=	CWDM-SFP-1550=
CWDM-GBIC-1490=	CWDM-GBIC-1570=	CWDM-SFP-1490=	CWDM-SFP-1570=
CWDM-GBIC-1510=	CWDM-GBIC-1590=	CWDM-SFP-1510=	CWDM-SFP-1590=
CWDM-GBIC-1530=	CWDM-GBIC-1610=	CWDM-SFP-1530=	CWDM-SFP-1610=

This installation note contains instructions for installing Coarse Wave Division Multiplexer (CWDM) Gigabit Interface Converter (GBIC) laser optical transceiver modules and CWDM Small Form-Factor Pluggable (SFP) laser optical transceiver modules enabling your system to connect to a Cisco CWDM network.

Contents

This installation note contains the following sections:

CISCO SYSTEMS

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

Overview

The CWDM GBICs are hot-swappable, transceiver components that you can plug into IEEE 802.3z standard receptacles in Cisco routers and switches and convert Gigabit Ethernet electrical signals into a single-mode fiber-optic (SMF) interface. You can connect the CWDM GBICs to CWDM passive optical system optical add/drop multiplexer (OADM) or multiplexer/demultiplexer plug-in modules using single-mode fiber-optic cables with standard SC connectors. Figure 1 shows a CWDM GBIC with one optical port dust plug removed.

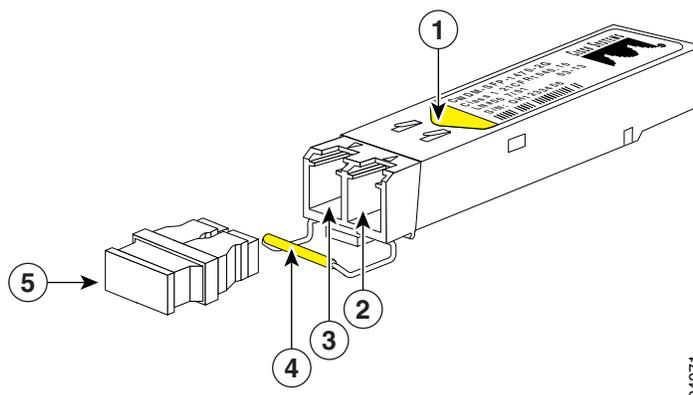*Figure 1   CWDM GBIC (Yellow-Coded CWDM-GBIC-1550= Shown)*

1	Color band on label	5	Optical bore dust plug
2	Alignment groove	6	Receive optical bore
3	Spring clip	7	Color dot
4	Transmit optical bore	—	—

The CWDM SFPs are hot-swappable, transceiver components that you can plug into standard receptacles in Cisco routers and switches and convert Gigabit Ethernet electrical signals into a single-mode fiber-optic (SMF) interface. You can connect the CWDM SFPs to CWDM passive optical system optical add/drop multiplexer (OADM) or multiplexer/demultiplexer plug-in modules using single-mode fiber-optic cables with standard SC connectors. Figure 2 shows a CWDM SFP with the optical port dust plug removed.

Figure 2   CWDM SFP Module (Yellow-Coded CWDM-SFP-1550= Shown)

1	Color arrow on label	4	Color coded bale clasp
2	Receive optical bore	5	Optical bore dust plug
3	Transmit optical bore	—	—

Both the CWDM GBICs and CWDM SFPs come in eight wavelengths that range from 1470 nm to 1610 nm. Color markings on the devices identify the wavelength to which the Gigabit Ethernet channel is mapped. Table 1 lists the CWDM GBICs and SFPs with their wavelengths and color codes.

Table 1   GBIC and SFP Wavelengths and Color Coding

GBIC Product Number	SFP Product Number	Wavelength	Color Identifier
CWDM-GBIC-1470=	CWDM-SFP-1470=	Longwave 1470 nm laser, single mode	Gray
CWDM-GBIC-1490=	CWDM-SFP-1490=	Longwave 1490 nm laser, single mode	Violet
CWDM-GBIC-1510=	CWDM-SFP-1510=	Longwave 1510 nm laser, single mode	Blue
CWDM-GBIC-1530=	CWDM-SFP-1530=	Longwave 1530 nm laser, single mode	Green
CWDM-GBIC-1550=	CWDM-SFP-1550=	Longwave 1550 nm laser, single mode	Yellow
CWDM-GBIC-1570=	CWDM-SFP-1570=	Longwave 1570 nm laser, single mode	Orange
CWDM-GBIC-1590=	CWDM-SFP-1590=	Longwave 1590 nm laser, single mode	Red
CWDM-GBIC-1610=	CWDM-SFP-1610=	Longwave 1610 nm laser, single mode	Brown

Installing and Removing CWDM GBICs and CWDM SFPs

This section describes how to install and remove CWDM GBICs and CWDM SFPs. This section also contains guidelines for handling the CWDM GBICs and CWDM SFPs. This section contains the following topics:

Laser Safety

CWDM GBICs and CWDM SFPs are equipped with a Class 1 laser, which emits invisible radiation. Do not stare into open optical ports. The following laser warnings apply to CWDM GBICs and CWDM SFPs.

⚠ **Warning** **Class 1 laser product.**

⚠ **Warning** **Because invisible laser radiation may be emitted from the aperture of the port when no fiber is connected, avoid exposure to laser radiation and do not stare into open apertures.**

⚠ **Warning** **Only trained and qualified personnel should be allowed to install or replace this equipment.**

Guidelines for Handling GBICs and SFPs

Follow these guidelines when working with GBICs and SFPs:

- CWDM GBICs and CWDM SFP modules are static sensitive. To prevent ESD damage, wear an ESD-preventive wrist strap that is connected to the chassis.
- CWDM GBICs and CWDM SFP modules are dust sensitive. Always store the devices with plugs installed in the optical bores.
- Do not remove and insert a CWDM GBIC or CWDM SFP module more often than is necessary. Repeated romovals and insertions of a CWDM GBIC or a CWDM SFP module can shorten its useful life.

Installing a CWDM GBIC

To install a CWDM GBIC, use Figure 3 as a reference and follow these steps:

Step 1 Remove the CWDM GBIC from its protective packaging, and verify that the CWDM GBIC is the correct model for your network configuration.

✎
Note You can identify CWDM GBICs by the color dot on the GBIC body and by the color band on the GBIC label, which also lists the CWDM GBIC model number and wavelength. (See Figure 1 and Table 1.)

Step 2 Holding the sides of the CWDM GBIC between your thumb and forefinger, align the alignment grooves on the sides of the CWDM GBIC with the corresponding guides in the GBIC slot on your module.
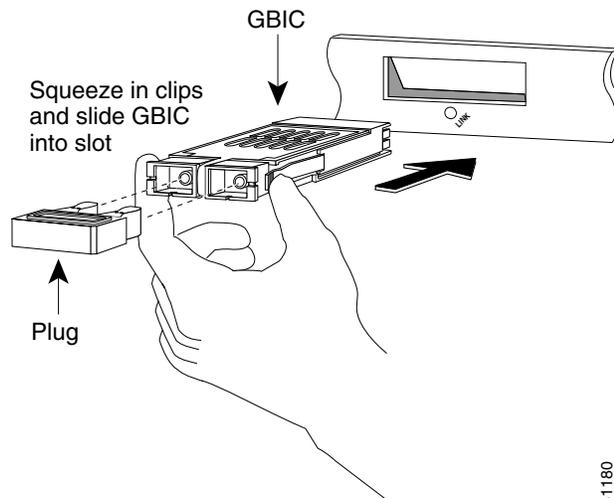
Step 3 Slide the CWDM GBIC gently but firmly into the GBIC slot. You should hear a click when the clips on either side of the GBIC snap into place, locking the GBIC in the port receptacle.

⚠
Caution Do not remove the dust plugs from the optical bores of the GBIC or the dust caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the GBIC optical ports and the cable connectors from contamination.

Figure 3   Installing a CWDM GBIC

GBIC

Squeeze in clips and slide GBIC into slot

LINK

Plug

51180

Removing a CWDM GBIC

Warning   **Because invisible radiation may be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to radiation and do not stare into open apertures.**

To remove a CWDM GBIC, use Figure 4 as a reference and follow these steps:

Step 1   Disconnect any fiber-optic cable from the CWDM GBIC, and install dust plugs in the optical bores of the CWDM GBIC and dust caps on the fiber-optic cable connectors.
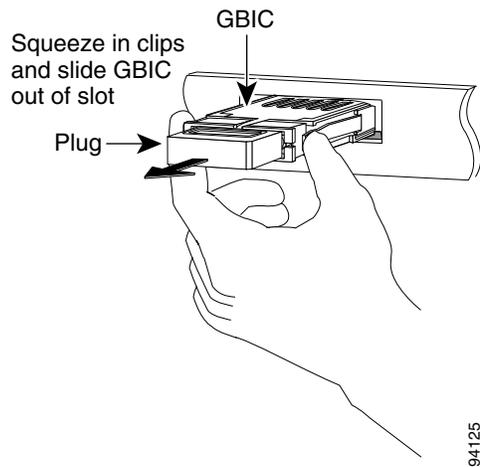
Tip   For reattachment, note which cable connector is transmit (Tx) and which is receive (Rx).

Step 2   Release the CWDM GBIC from the slot by simultaneously squeezing the plastic spring clips (one on each side of the CWDM GBIC).

Step 3   Slide the CWDM GBIC out of the slot, and place the CWDM GBIC in protective packaging.

Figure 4   *Removing a CWDM GBIC*

Installing a CWDM SFP Module

To install a CWDM SFP module, use Figure 5 as a reference and follow these steps:

Step 1   Remove the CWDM SFP module from its protective packaging, and verify that the CWDM SFP module is the correct model for your network configuration.

✎

Note   You can identify CWDM SFP modules by the color arrow on the CWDM SFP module label, which also lists the SFP model number and wavelength, and by the color bar on the bale clasp. (See Figure 2 and Table 1.)

Step 2   Verify that the bale clasp on the front of the SFP module is closed before inserting the SFP module.
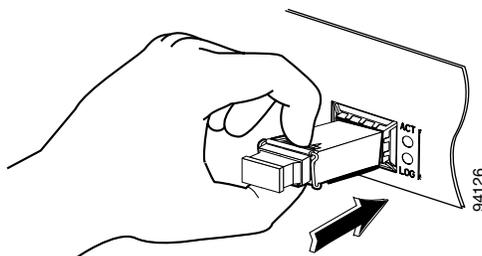
Step 3   Align the CWDM SFP module in front of the slot opening, and slide the SFP module into the slot until you feel the connector on the module snap into place in the rear of the slot.

⚠

Caution   Do not remove the dust plugs from the optical bore of the CWDM SFP module or the dust caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the CWDM SFP module optical ports and the cable connectors from contamination.

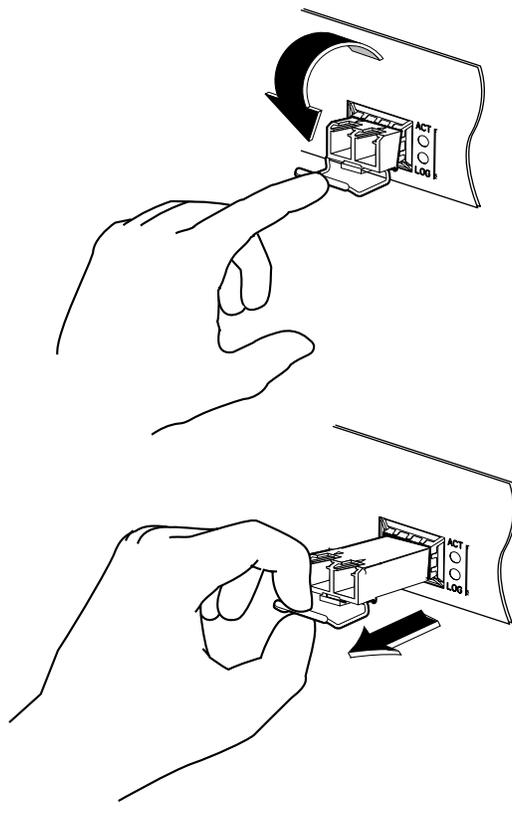*Figure 5*   *Installing a CWDM SFP Module*

Removing a CWDM SFP Module

To remove a CWDM SFP module, use Figure 6 as a reference and follow these steps:

Step 1   Disconnect the fiber-optic connector cable from the CWDM SFP module.

Step 2   Pivot the bale out and down to eject the CWDM SFP 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 3   Grasp the CWDM SFP between your thumb and index finger and, carefully slide the module out of the receptacle.

Step 4   Close the CWDM SFP bale-clasp and then insert the dust plug into the optical bores. Place the CWDM SFP in an antistatic bag or other protective environment.

Figure 6   Removing a CWDM SFP Module

Connecting to the CWDM Passive Optical System

For information on connecting your CWDM GBICs and CWDM SFP modules to a CWDM network, refer to the *Installation Note for the Cisco CWDM Passive Optical System*.

Related Documentation

For more information about CWDM GBIC solution deployment, refer to the following related documentation:

- *Cisco GBIC Solution, Data Sheet*
- *Cisco GBIC Solution, Q & A*
- *Installation Note for the CWDM Passive Optical System*
- *Regulatory Compliance and Safety Information for the Catalyst 6500 Series Switch*

For more information about Cisco GBICs, refer to the information at the following URL:

http://www.cisco.com/en/US/products/hw/modules/ps872/prod_module_series_home.html

For hardware installation and maintenance information on specific Cisco routers and switches, refer to the installation and configuration guide for your router or switch.

For software configuration information and support, refer to the Cisco IOS software configuration and command reference publications for the installed Cisco IOS software release. Also refer to the Cisco IOS software release notes for the version of Cisco IOS software that you are using on your router or switch.

Translated Safety Warnings

Before you install CWDM GBICs in your system, or attempt to operate or service a router or switch equipped with CWDM GBICs, you should read and observe the important safety information in this publication. For the complete list of translated safety warnings and agency approvals that apply to your router or switch, refer to the *Regulatory Compliance and Safety Information* publication that supports your Cisco router or switch.

Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

International Cisco websites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which may have shipped with your product. The Documentation CD-ROM is updated regularly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual or quarterly subscription.

Registered Cisco.com users can order a single Documentation CD-ROM (product number DOC-CONDOCCD=) through the Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/ordering_place_order_ordering_tool_launch.html

All users can order monthly or quarterly subscriptions through the online Subscription Store:

http://www.cisco.com/go/subscription

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/en/US/partner/ordering/index.shtml

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit comments electronically on Cisco.com. On the Cisco Documentation home page, click **Feedback** at the top of the page.

You can e-mail your comments to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com, which includes the Cisco Technical Assistance Center (TAC) website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco TAC website. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC website, including TAC tools and utilities.

Cisco.com

Cisco.com offers a suite of interactive, networked services that let you access Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com provides a broad range of features and services to help you with these tasks:

*   Streamline business processes and improve productivity
*   Resolve technical issues with online support
*   Download and test software packages
*   Order Cisco learning materials and merchandise
*   Register for online skill assessment, training, and certification programs

To obtain customized information and service, you can self-register on Cisco.com at this URL:

http://tools.cisco.com/RPF/register/register.do

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available: the Cisco TAC website and the Cisco TAC Escalation Center. The type of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco TAC inquiries according to urgency:

*   Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration. There is little or no impact to your business operations.
*   Priority level 3 (P3)—Operational performance of the network is impaired, but most business operations remain functional. You and Cisco are willing to commit resources during normal business hours to restore service to satisfactory levels.
*   Priority level 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively impacted by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.
*   Priority level 1 (P1)—An existing network is "down," or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Cisco TAC Website

The Cisco TAC website provides online documents and tools to help troubleshoot and resolve technical issues with Cisco products and technologies. To access the Cisco TAC website, go to this URL:

http://www.cisco.com/tac

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC website. Some services on the Cisco TAC website require a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

http://tools.cisco.com/RPF/register/register.do

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC website, you can open a case online at this URL:

http://www.cisco.com/tac/caseopen

If you have Internet access, we recommend that you open P3 and P4 cases online so that you can fully describe the situation and attach any necessary files.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

Before calling, please check with your network operations center to determine the Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:

  http://www.cisco.com/en/US/products/products_catalog_links_launch.html

- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary, Internetworking Technology Handbook, Internetworking Troubleshooting Guide,* and the *Internetworking Design Guide.* For current Cisco Press titles and other information, go to Cisco Press online at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access *Packet* magazine at this URL:

  http://www.cisco.com/go/packet

- iQ Magazine is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

- Internet Protocol Journal is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html

- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

  http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html

This document is to be used in conjunction with the publications described in the "Related Documentation" section, as well as other documents that support your specific router or switch.