

Quick Start Guide



Installing Cisco uBR-MC3GX60V Cable Interface Line Cards - Quick Start Guide

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Installing Cisco uBR-MC3GX60V Cable Interface Line Cards

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Overview

The Cisco cable interface line card transmits and receives RF signals between the subscriber and the headend over the hybrid fiber-coaxial (HFC) system. This DOCSIS 3.0 compliant line card is designed specifically for the Cisco uBR10012 universal broadband router and conforms to the Modular CMTS (M-CMTS) architecture.

The Cisco cable interface line card has the capacity to support 72 downstream (DS) and 60 upstream (US) channels, depending on the license purchased. The line card supports 15 cable MAC domains (cable interfaces), and the DS and US channels can be associated with any of these 15 MAC domains. Each MAC domain supports a maximum of 32 DS and 8 US channels.

The Cisco cable interface line card has 20 US spigots for RF connectivity, which are organized into 5 groups of 4 connectors each. Each connector group supports up to 12 frequency-stacked US channels, with a default configuration of 3 US channels per RF connector. The line card also provides the flexibility to configure lesser number of US spigots. For example, you can configure 10 US spigots with a frequency-stacking of 6 US channels per spigot.

The Cisco cable interface line card has six Gigabit Ethernet (GE) interface ports organized into three pairs for DS connectivity. Each pair supports 1+1 redundancy and supports 24 DS channels in Annex B mode by default. The GE interfaces connect to an external Edge Quadrature Amplitude Modulation (EQAM) device and provide M-CMTS compliant Downstream External PHY Interface (DEPI) data. This data is directed to only one GE interface, though both the GE interfaces can be active at the same time.

The Cisco cable interface line card uses a front panel display (FPD) to show the licensing status information of the US and DS channels.

Figure 1: Cisco Cable Interface Line Card, on page 2 shows the face plate of the line card. The product ID (PID) of this card is UBR-MC3GX60V.

Figure 1: Cisco Cable Interface Line Card

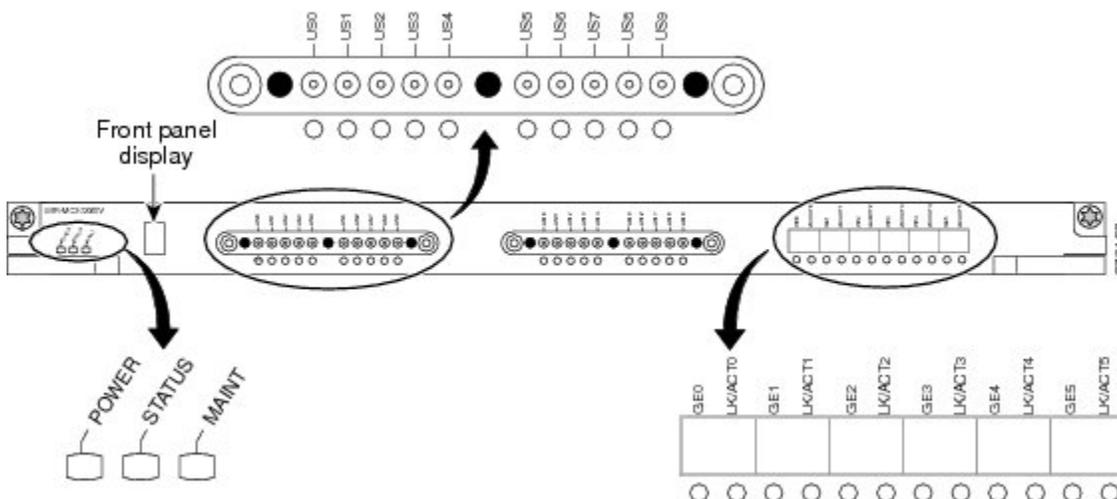


Table 1: Cisco Cable Interface Line Card License Information, on page 3 shows some of the US and DS channel combinations supported on the Cisco line card and their corresponding license type.

Table 1: Cisco Cable Interface Line Card License Information

Front Panel Display	Downstream	Upstream
3G60	72	60
2G40	48	40
1G20	24	20
3314	33	14
2010	20	10

For more information on the Software Licensing feature, refer to the *Cisco uBR-MC3GX60V Cable Interface Line Card Hardware Installation Guide*.



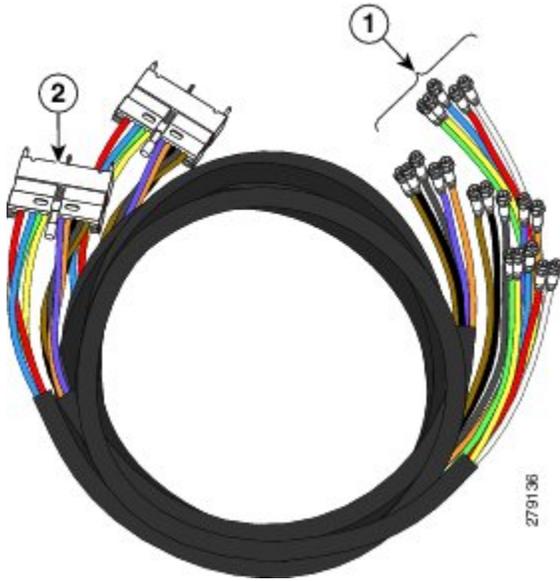
Note You must ensure that two DOCSIS Timing, Communication and Control (DTCC) cards are configured in the DOCSIS Timing Interface (DTI) mode on the Cisco uBR10012 router to make the Cisco cable interface line card work with an EQAM device.

Cable Bundles for the Line Card

The Cisco cable interface line card uses bundled cables. The cables come in bundles of five cables. Quad-shield coaxial cable bundles for the Cisco cable interface line card can be purchased from Cisco, with the Universal Cable Holders (UCH) already connected to the coaxial cable bundles. Alternatively, custom-length quad-shield coaxial cable bundles can be purchased from third-party vendors, with the UCH either connected to the cable bundles or provided as separate components.

Figure 2: Cable Bundle with UCH2 Units and F Connectors, on page 4 shows the cable bundle for Cisco cable interface line card to EQAM or hybrid fiber-coaxial (HFC) plant that has 20 F connectors attached to one end and 2 UCH2 units attached to the other end. This cable is 9.84 feet (3 m) long and its part number is CABRFSW3G60QTIMF2.

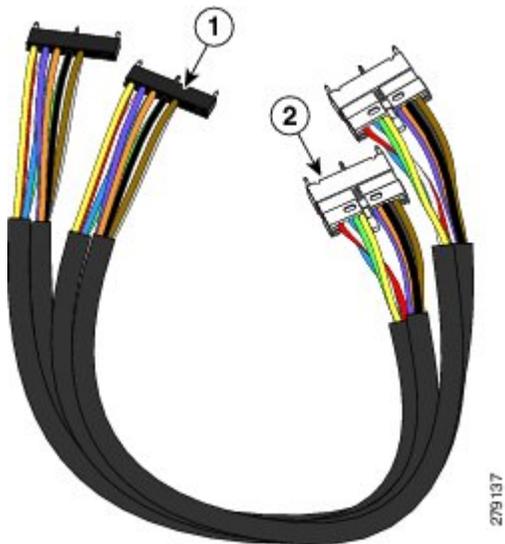
Figure 2: Cable Bundle with UCH2 Units and F Connectors



1	F connector	2	UCH2
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Figure 3: Cable Bundle with UCH2 Units and RF Switch Header Blocks, on page 5 shows the cable bundle for the Cisco cable interface line card to the RF Switch, which has two UCH2 units attached to one end and two RF Switch header blocks attached to the other end. This cable is 3.2 feet (1 m) long and its part number is CABRFSW3G60QTIMM2.

Figure 3: Cable Bundle with UCH2 Units and RF Switch Header Blocks



1	RF Switch header blocks	2	UCH2
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Figure 4: Cable Bundle with RF Switch Header Blocks and F Connectors, on page 5 shows the cable bundle for the RF Switch to HFC plant, which has 2 RF Switch header blocks attached to one end and 20 F connectors attached to the other end. This cable is 9.84 feet (3 m) long and its part number is CABRFSW3G60QTPMF2.

Figure 4: Cable Bundle with RF Switch Header Blocks and F Connectors



1	F connectors	2	RF Switch header blocks
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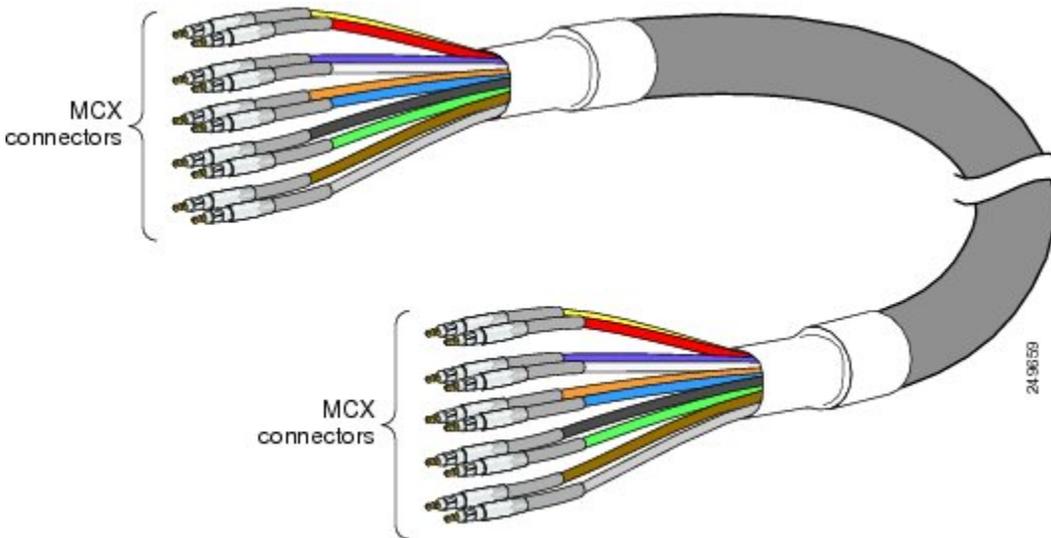


Note Customers purchasing custom-length quad-shield coaxial cable bundles from third-party vendors can purchase spare Universal Cable Holders and spare RF Switch header blocks from Cisco. For the applicable Cisco part numbers, see [Part Numbers, on page 24](#).

[Figure 5: 10-Bundle Dual-Shielded Cable with MCX Connectors, on page 6](#) shows a Cisco dual-shielded cable bundle. This dual-shielded cable configuration can be used when you are cabling the Cisco line card directly to the cable plant.

If you are cabling the line card to the Cisco uBR 3X10 RF Switch, you must have MCX connectors at either end of the cable. See [Figure 5: 10-Bundle Dual-Shielded Cable with MCX Connectors, on page 6](#).

Figure 5: 10-Bundle Dual-Shielded Cable with MCX Connectors



Caution The Cisco cable interface line card must be used with the provided UCH2 for all cable connections to the line card. Failure to use the UCH2 may cause permanent damage to the line card connectors, resulting in low or no RF output in the downstream or upstream.



Note The cable used with the dense connector UCH2 must be 75-ohm precision miniature video cable. For the applicable Cisco part numbers, see [Table 6: Part Numbers, on page 24](#).

SFP Transceiver Modules for the Line Card

The Cisco cable interface line card has three pairs of GE ports that use small form-factor pluggable (SFP) modules for fiber-optic and copper links. The SFP modules are I/O devices that plug into a GE port, linking the port to an EQAM device or network through a network cable.

Figure 6: SFP Transceiver Module (Fiber-Optic LC Connector), on page 7 shows the SFP transceiver module that is used with fiber-optic LC connectors.

Figure 6: SFP Transceiver Module (Fiber-Optic LC Connector)

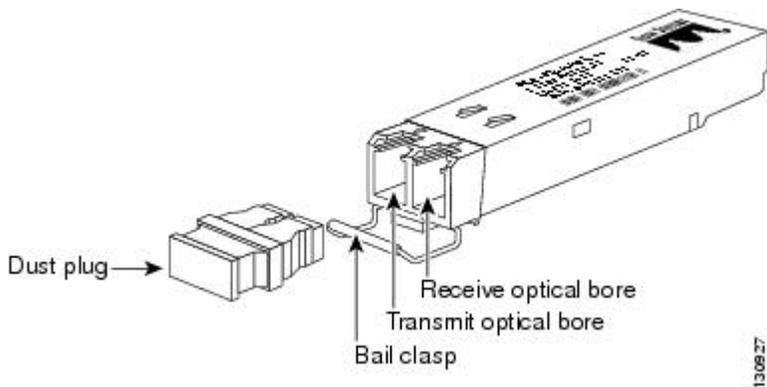
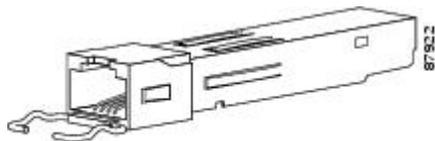


Figure 7: 1000Base-T SFP Transceiver Module (RJ-45 Connector), on page 7 shows the 1000Base-T SFP transceiver module that is used with RJ-45 connectors.

Figure 7: 1000Base-T SFP Transceiver Module (RJ-45 Connector)



You can use any SFP module that the Cisco line card supports. Table 2: SFP Modules for the Cisco Line Card, on page 7 lists the SFP modules that are supported on the Cisco line card. The only restrictions are that each SFP module must match the wavelength specifications on the other end of the cable and that the cable must meet the stipulated cable length range for reliable communications.

Table 2: SFP Modules for the Cisco Line Card

SFP Module Product Number	SFP Module	Description
SFP-GE-T	RJ-45 copper SFP module (1000BASE-T)	Provides full-duplex Gigabit Ethernet connectivity to high-end workstations, and between wiring closets over an existing copper network infrastructure.
GLC-SX-MM	Short wavelength (1000BASE-SX)	Contains a Class 1 laser of 850 nm for 1000BASE-SX (short-wavelength) applications.

SFP Module Product Number	SFP Module	Description
GLC-LH-SM	Long wavelength/long haul (1000BASE-LX/LH)	Contains a Class 1 laser of 1310 nm for 1000BASE-LX/LH (long-wavelength) applications.
GLC-ZX-SM	Extended distance (1000BASE-ZX)	Contains a Class 1 laser of 1550 nm for 1000BASE-ZX (extended-wavelength) applications.



Note Use only Cisco SFP transceiver modules on your Cisco device. Each SFP transceiver module has an internal serial EEPROM that is encoded with security information. This encoding allows Cisco to identify and validate that the SFP transceiver module meets the requirements for the device.

The SFP transceiver modules provide duplex single-mode and multimode connections in supported devices. [Table 3: SFP Transceiver Module Cabling Specifications](#), on page 8 lists the cable specifications for SFP module ports.

Table 3: SFP Transceiver Module Cabling Specifications

SFP Module Model Speed	Wavelength (nanometers)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance
SFP-GE-T (1000BASE-T)	—	Copper	—	—	328 feet (100 m)
GLC-SX-MM (1000BASE-SX)	850	MMF ¹	62.5	160	722 feet (220 m)
			62.5	200	902 feet (275 m)
			50.0	400	1640 feet (500 m)
			50.0	500	1804 feet (550 m)
GLC-LH-SM (1000BASE-LX/LH)	1300	MMF ² SMF ³	62.5	500	1804 feet (550 m)
			50.0	400	1804 feet (550 m)
			50.0	500	1804 feet (550 m)
			G.652	—	32,810 feet (10 km)
GLC-ZX-SM (1000BASE-ZX) ⁴	1550	SMF	G.652	—	43.4 to 62 miles (70 to 100 km)

¹ Multimode fiber (MMF)

² A mode-conditioning patch cord is required at all times as per IEEE specifications.

³ Single-mode fiber (SMF)

⁴ For the GLC-ZX-SM, the minimum attenuation between the transmit bore (TX) and the receive bore (RX) is 8 dB. When using shorter distances of single-mode fiber cable, you might need to insert an inline optical attenuator in the link to avoid overloading the receiver.

Safety Information and Warnings

Follow these safety guidelines when working with any equipment that connects to electrical power.

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which occurs when electronic cards or components are improperly handled, can result in complete or intermittent failures. The AC input power shelf and its AC power modules contain a printed circuit card that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the cards from ESD, use an anti-static wrist strap each time you handle the modules.

Follow these guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact. Before removing a card from the chassis, connect the equipment end of the strap to a bare metal, unpainted surface on the chassis or rack-mount. Ensure that the chassis and/or rack has a grounding cable installed. For more information, see the [Cisco uBR10012 Universal Broadband Router Hardware Installation Guide](#).
- Handle components by the carrier edges only; avoid touching the card components or any connector pins.
- When removing a module, place it on an anti-static surface or in a static-shielding bag. If the module is returned to the factory, immediately place it in a static-shielding bag.
- Avoid contact between the modules and clothing. The wrist strap protects the card from ESD voltages only on the body; ESD voltages on clothing can still cause damage.



Caution

For safety, periodically check the resistance value of the anti-static strap. The measurement should be between 1 and 10 megaohms (Mohm).

Installing the Line Card in the Card Slot

To install a Cisco line card:



Caution Ensure that you are properly grounded with an ESD-preventative ground strap.

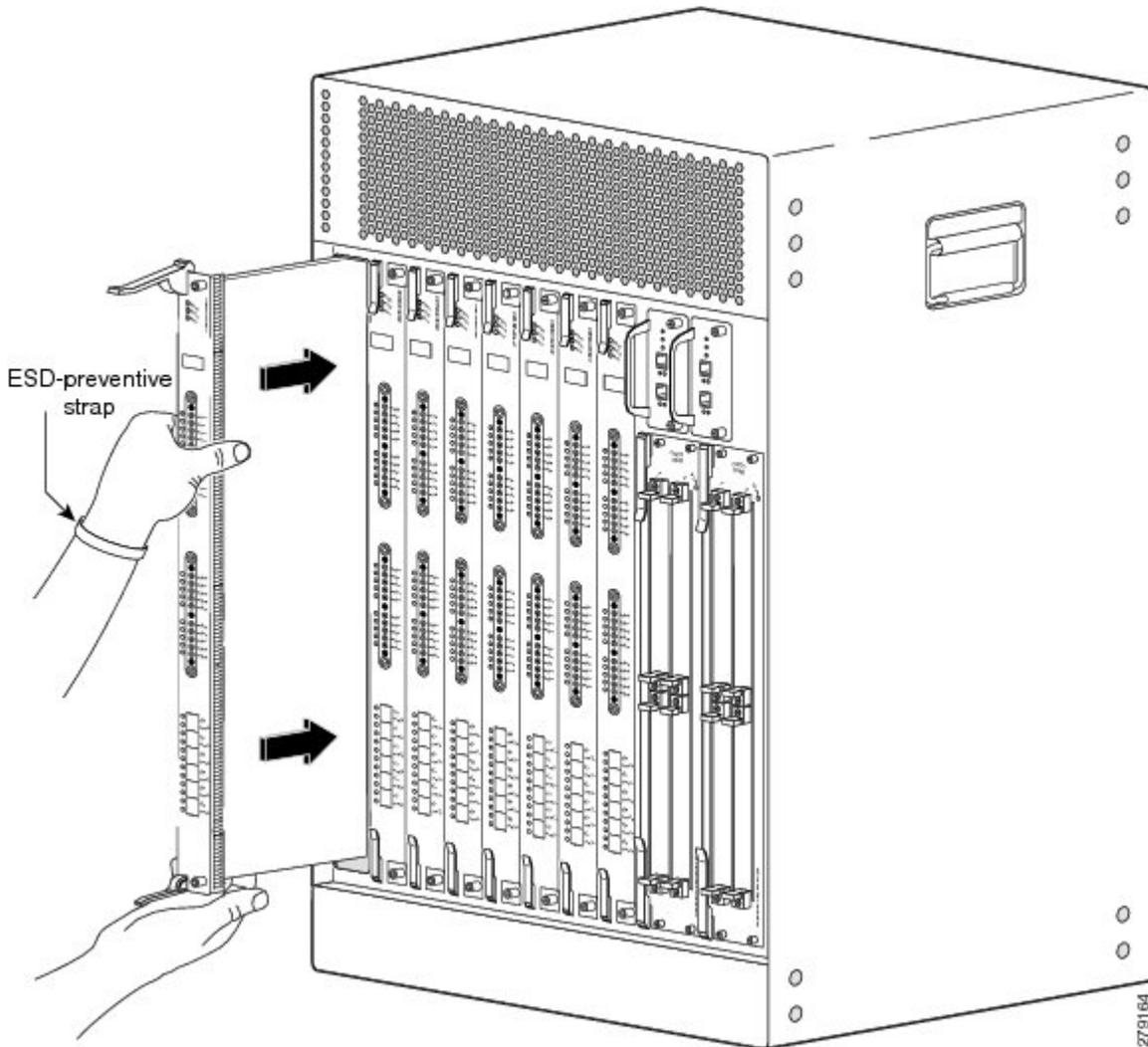
Procedure

Step 1 Carefully align the upper and lower edges of the card with the upper and lower guides in the chassis.

Caution The Cisco cable interface line card weighs 11.6 lbs. Use both hands when handling the card. Do not drop the card or otherwise damage the carrier rails. Bent or damaged rails can damage the card guides and prevent line card installation. When installing cards for the first time, or when all the captive screws of the card are loose, insert cards first in slot 5/1 and work towards slot 8/0 to prevent uneven gasket pressure.

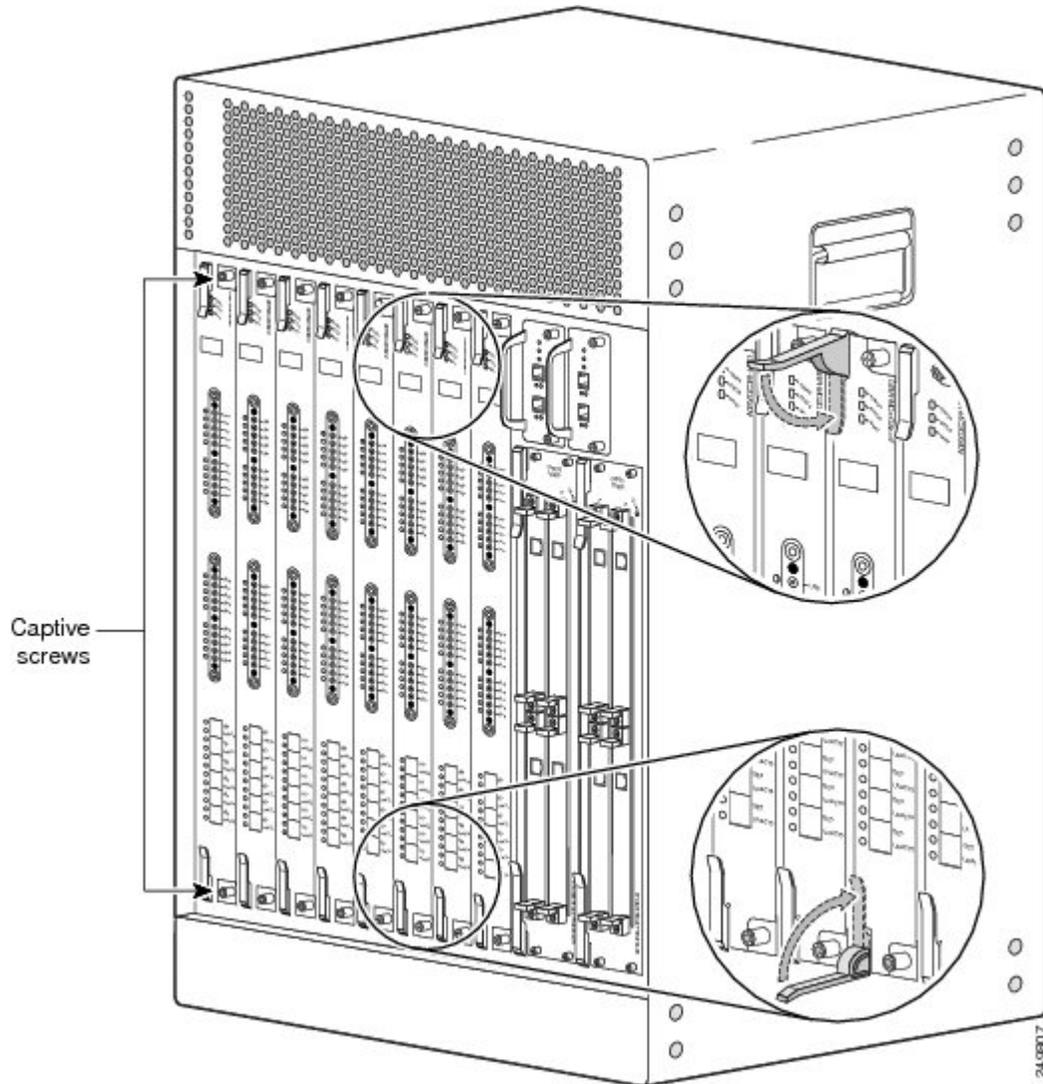
Step 2 Slide the card into the slot until you can feel it seat in the backplane connectors. (See [Figure 8: Cisco uBR10012 Router Chassis with Cisco Cable Interface Line Cards](#).)

Figure 8: Cisco uBR10012 Router Chassis with Cisco Cable Interface Line Cards



Step 3 Close the ejector levers to secure the card in the backplane. (See [Figure 9: Closing the Ejector Levers](#).)

Figure 9: Closing the Ejector Levers



Step 4 Engage and begin tightening the captive screws first by hand. Then, use either a T-10 Torx (included in the line card accessory kit) or a common flathead screwdriver to tighten the captive screws between 5 to 7 in-lbs.

Caution Always tighten the captive screws on each line card, but not more than the maximum of 7 in-lbs. These screws prevent accidental removal and provide proper grounding for electromagnetic interference (EMI) shielding.

Note When fully inserted, the line card cycles through its power-on self-test, and the POWER and STATUS LEDs turn on. (If either of those LEDs is flashing, see *Troubleshooting the Line Card Installation* section).

Cabling the Line Card

The Cisco cable interface line card uses 75-ohm precision video coaxial cables and 75-ohm MCX connectors for the upstream connection to the RF Switch or HFC plant. The SFP modules are used to connect the GE ports for the downstream connection to the EQAM device.

The following procedures are for the customized RF cables and SFP modules, and for the maintenance of the Cisco preconfigured cable bundles.

Installing Cables

Cisco cables are color-coded for easy reference and installation. The cable color corresponds to a specific port on the card. [Table 4: Cisco Dual-shielded and Quad-shielded Cable Ports and Cable Colors](#), on page 12 lists the cable ports and associated cable color applicable when using Cisco dual-shielded cables or quad-shielded cabling.



Note Precision miniature video coaxial cables come in various colors and you can use any cable color combination. However, when you are connecting the Cisco cable interface line card to the Cisco RF Switch, we recommend that you install the cables in the UCH2 as listed in [Table 4: Cisco Dual-shielded and Quad-shielded Cable Ports and Cable Colors](#), on page 12.

Table 4: Cisco Dual-shielded and Quad-shielded Cable Ports and Cable Colors

Universal Cable Holder (1)		RF Switch Header (1)		Universal Cable Holder (2)		RF Switch Header (2)	
Line Card Port	Cable Color	RF Switch Port	Cable Color	Line Card Port	Cable Color	RF Switch Port	Cable Color
US0	Red	A	Red	US10	Red	A	Red
US1	White	B	White	US11	White	B	White
US2	Blue	C	Blue	US12	Blue	C	Blue
US3	Green	D	Green	US13	Green	D	Green
US4	Yellow	H	Yellow	US14	Yellow	H	Yellow
US5	Violet	I	Violet	US15	Violet	I	Violet
US6	Orange	J	Orange	US16	Orange	J	Orange
US7	Black	K	Black	US17	Black	K	Black
US8	Gray	E	Gray	US18	Gray	E	Gray
US9	Brown	L	Brown	US19	Brown	L	Brown



Note The cable kits and cabling color scheme of the Cisco cable interface line card is different from the earlier line cards like the Cisco UBR-MC20X20V and Cisco uBR10-MC5X20S/U/H. However, you can also use legacy cable kits with the Cisco cable interface line card. For applicable color schemes and cabling information for legacy cable kits, refer to [Cabling the Cisco uBR10-MC5X20S/U/H Cable Interface Line Card with UCH2 - Quick Start Guide](#).

To replace cables or install new cables in a UCH2:



Caution The UCH2 must be used for all cable connections to the line card. Failure to use a UCH2 may cause permanent damage to the line card connectors, resulting in low or no RF output in the downstream or upstream.



Note Do not attempt to remove or install cables in the UCH2, when the UCH2 is attached to the faceplate.

Procedure

- Step 1** Use the T-10 TORX driver tool to loosen the lock bar on the side where you want to install a cable. (See [Figure 20: Using the T-10 TORX Driver Tool to Loosen the UCH2 Lock Bar](#), on page 20.)
- Step 2** Use a flathead screwdriver as a lever to slide open the lock bar. (See [Figure 21: Using a Screwdriver to Slide Open the Lock Bar on the UCH2](#), on page 20.)
- Step 3** Remove the ESD cap from a cable (see [Figure 10: Removing an ESD Cap from a MCX connector](#), on page 13 and [Figure 11: Removing an ESD Cap from an F connector](#), on page 14) and insert the cable into the hole in the UCH2. (See [Figure 12: Inserting Cables in the UCH2](#), on page 14.) Use [Table 4: Cisco Dual-shielded and Quad-shielded Cable Ports and Cable Colors](#), on page 12 to determine the correct color and location for each colored cable.

Figure 10: Removing an ESD Cap from a MCX connector

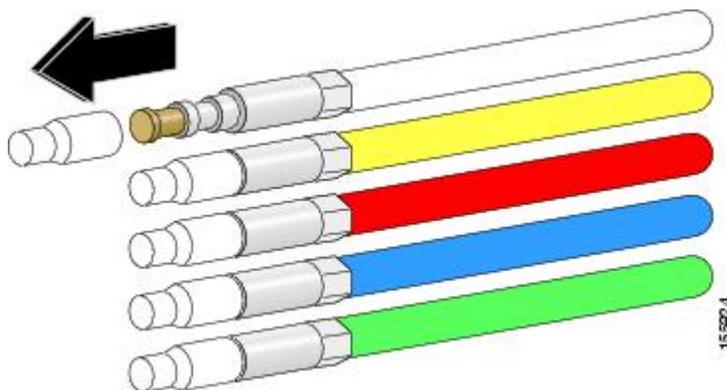


Figure 11: Removing an ESD Cap from an F connector

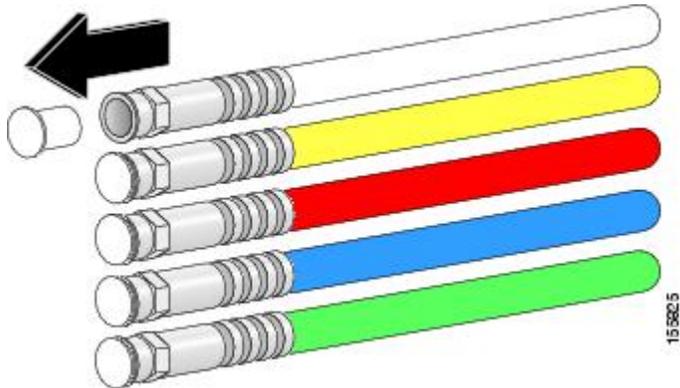
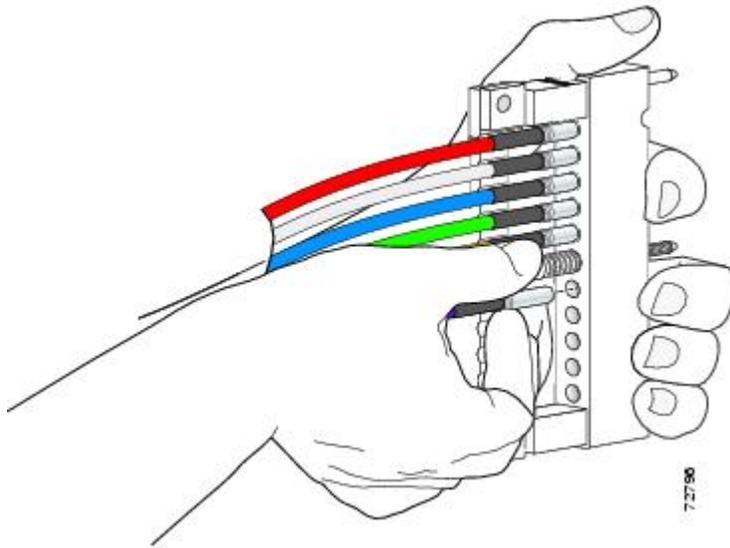


Figure 12: Inserting Cables in the UCH2



Step 4 Insert and wiggle the connector into the hole.

Note The cables fit loosely in the holes, and are not locked into place until the lock bar is closed in [Step 6, on page 14](#)

Step 5 Repeat **Step 3** and **Step 4** for the remaining cables you are installing.

Note Ensure the cables are aligned correctly and inserted completely or the slide bar will not close.

Step 6 Slide the lock bar close completely in the UCH2, and use the T-10 TORX driver tool to tighten the screws clockwise (torque 10 in-lbs, 1.13 Newton meters [Nm]).

Note Clamp bar maximum torque is 15 in-lbs (1.70Nm).

Installing the UCH2

After the cables are installed in the UCH2, perform the following steps to install UCH2 on the line card:



Note Before proceeding, remove the protective sticker covering the line card DS ports.

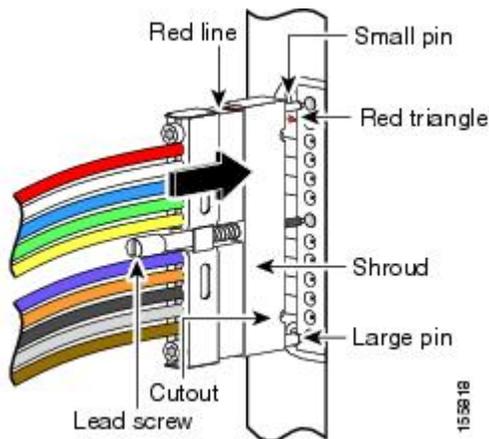


Caution Ensure that you are properly grounded with an ESD-preventative ground strap.

Procedure

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- Step 1** Attach a jumper cable to the ground point on the chassis.
- Step 2** Briefly touch the center of each cable connector with the jumper cable to remove any built-up ESD potential.
- Step 3** Position the UCH2 so that the red line is on the same side as the red triangle on the faceplate. See [Figure 13: Installing the UCH2](#), on page 15.

Figure 13: Installing the UCH2



- Step 4** Align the end pins with the pin holes in the faceplate of the line card, and guide the UCH2 onto the faceplate.
- Step 5** Hold the cables and UCH2 in place while tightening the lead screw with your fingers. Do not bend the cables at right angles.
- Step 6** Use the flathead screwdriver to tighten the lead screw to 10 in-lbs (maximum torque 15 in-lbs).
- Caution** Torquing the lead screw to more than the maximum of 20 in-lbs can cause the lead screw to fail.
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Installing the SFP Module on the Line Card

To insert an SFP transceiver module into the GE interface port of the Cisco cable interface line card:

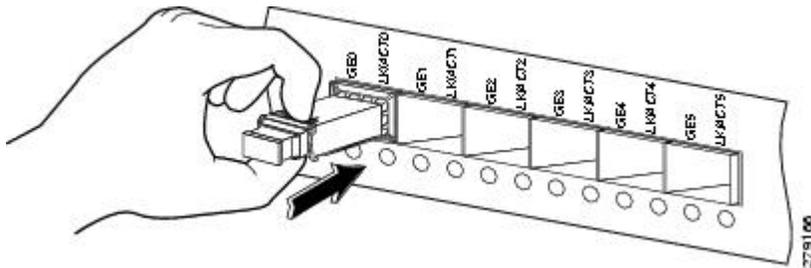


Caution Ensure that you are properly grounded with an ESD-preventative ground strap.

Procedure

- Step 1** Remove the SFP transceiver module from its protective packaging.
- Step 2** Find the transmit (Tx) and receive (Rx) markings that identify the top side of the SFP transceiver module.
- Note** On some SFP transceivers, the Tx and Rx markings might be replaced by arrowheads pointing from the SFP transceiver connector (transmit direction or Tx) and towards the connector (receive direction or Rx).
- Step 3** Position the SFP transceiver module in front of the socket opening.
- Step 4** Insert the SFP transceiver module into the socket until you feel the SFP module connector snap into the socket connector (See [Figure 14: Inserting an SFP Module into a GE Interface Port](#)), and close the SFP latch.

Figure 14: Inserting an SFP Module into a GE Interface Port



- Step 5** Remove the dust cap from the SFP transceiver module and save for future use.
- Step 6** Inspect and clean the LC connector fiber-optic end-faces.
- Step 7** Remove the dust plugs from the SFP transceiver optical bores.
-

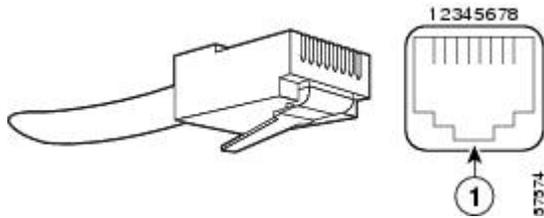
SFP Module Interface Cables

After installing the SFP module in the GE port, you must attach the cables to the SFP module. The connector types used to attach interface cables to the SFP Module are given below:

RJ-45 Connector

The RJ-45 connector, shown in [Figure 15: RJ-45 Connector, on page 17](#), is used to provide full-duplex GE connectivity to high-end workstations and between wiring closets over an existing copper network infrastructure.

Figure 15: RJ-45 Connector



1	RJ-45 connector and port
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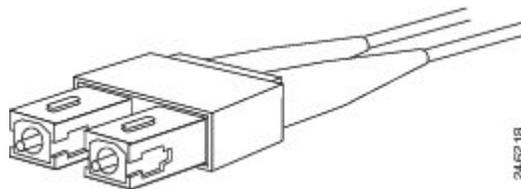
SC Fiber-Optic Connector

The SC Fiber-Optic connector, shown in [Figure 16: SC Fiber-Optic Connector, on page 17](#), is used to connect fiber-optic module ports or transceivers with the external SMF or MMF network.



Note Ensure that the optical connectors are clean before making the connections. Contaminated connectors can damage the fiber and cause data errors.

Figure 16: SC Fiber-Optic Connector



Note Always insert the network connector completely into the socket. A secure connection is especially important when you are establishing a connection between a module and a long distance (1.24 miles or 2 km) network or a module and a highly attenuated network. If the link LED does not light up, try removing the network cable plug and reinserting it firmly into the module socket. It is possible that dirt or skin oils have accumulated on the plug faceplate (around the optical-fiber openings) generating significant attenuation and reducing the optical power levels below threshold levels so that a link cannot be made.

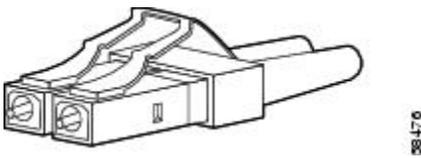
LC Fiber-Optic Connector

The LC fiber-optic connector, shown in [Figure 17: LC Fiber-Optic Connector, on page 18](#), is a small form-factor fiber-optic connector that provides high density fiber connectivity. The line card connector can be used with either MMF or SMF cables. The line card connector uses a latching clip mechanism that is similar to the one used on the RJ-45 copper connector.



Note Ensure that the optical connectors are clean before making the connections. Contaminated connectors can damage the fiber and cause data errors.

Figure 17: LC Fiber-Optic Connector



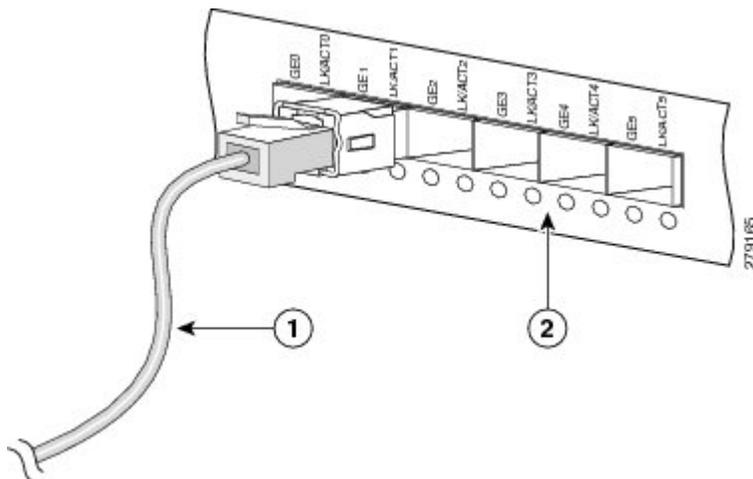
Connecting a Network Cable to an SFP Module

To connect a network cable to an SFP module port:

Procedure

- Step 1** Insert the network cable ([RJ-45 Connector, on page 17](#), [SC Fiber-Optic Connector, on page 17](#), or [LC Fiber-Optic Connector, on page 18](#)) into the SFP module port, and listen for the click sound to ensure proper seating. (See [Figure 18: Gigabit Ethernet Port Cabling, on page 18](#).)
- Step 2** Pull the network cable gently outwards to ensure that the cable connector is firmly in place.

Figure 18: Gigabit Ethernet Port Cabling



1	Cable connector	2	SFP transceiver module
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Step 3 Insert the other end of the network cable into the receptacle of the EQAM device.

Removing the Line Card

Shut down the card interface before removing the card from the chassis. For information about shutting down and restarting the interface, refer to the “Shutting Down and Restarting the Interface” in the *Cisco uBR10012 Software Configuration Guide*.

If the maintenance LED is on, you can remove the card without affecting system operations.

This section describes how to remove the Cisco cable interface line card from the chassis.

Removing the UCH2

To remove the UCH2 from the Cisco cable interface line card:



Caution Ensure that you are properly grounded with an ESD-preventative ground strap.

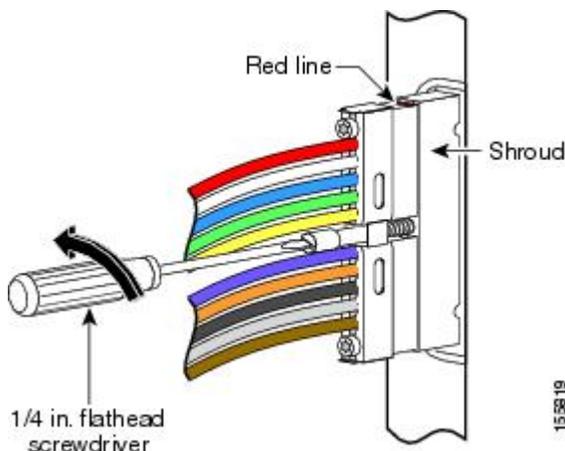
Procedure

Step 1 Loosen the lead screw (counterclockwise) on the UCH2 until it is completely disengaged from the faceplate. See [Figure 19: Removing the UCH2, on page 19](#)

Step 2 Pull the UCH2 straight away from the faceplate using the lead screw.

Caution Do not use the cables to pull the holder from the faceplate. Be careful not to bend the cables at right angles to the holder.

Figure 19: Removing the UCH2



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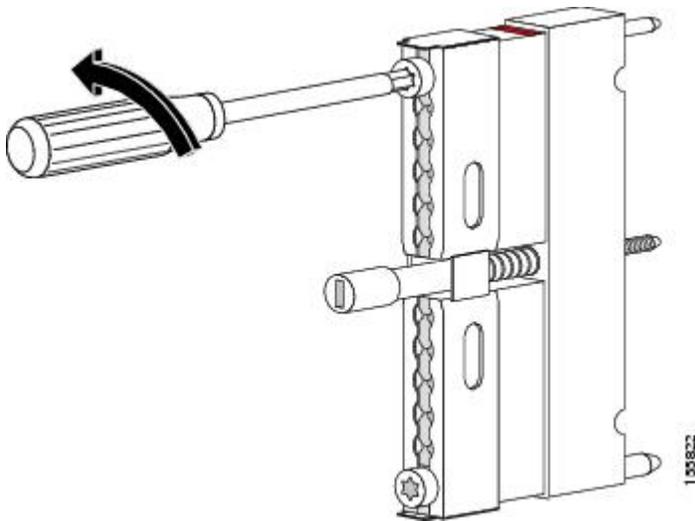
Removing Cables

To remove the old cables:

Procedure

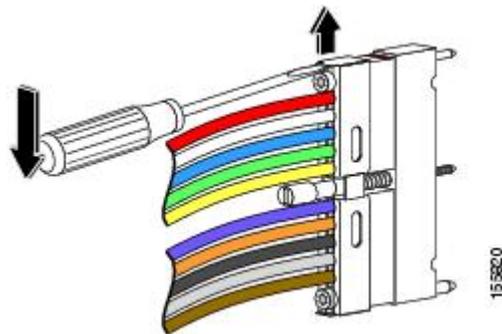
- Step 1** Use the T-10 TORX driver tool to loosen the UCH2 lock bar on the side from where you want to remove the cable. (See [Figure 20: Using the T-10 TORX Driver Tool to Loosen the UCH2 Lock Bar](#), on page 20.)

Figure 20: Using the T-10 TORX Driver Tool to Loosen the UCH2 Lock Bar



- Step 2** Slide open the lock bar by hand, or with a flathead screwdriver if the bar is tight or hard to access. (See [Figure 21: Using a Screwdriver to Slide Open the Lock Bar on the UCH2](#), on page 20.)

Figure 21: Using a Screwdriver to Slide Open the Lock Bar on the UCH2



- Step 3** Carefully pull the cable completely out of the UCH2.

Caution Be careful not to bend the cables at right angles.

Note If the cable does not come loose from the UCH2, make sure the lock bar is completely open.

Step 4 Repeat **Step 1** to **Step 3** for each cable you are removing.

Removing the Line Card

To remove the Cisco line card from the card slot:

Procedure

Step 1 Using a T-10 TORX driver tool or flathead screwdriver, unscrew the top and bottom captive screws on the card.

Step 2 Simultaneously pivot both ejector levers away from each other to disengage the card from the backplane.

Step 3 Slide the card out of the slot and place it on an antistatic surface with the component side facing up.

Tip Always install a blank cover in an empty slot to ensure proper cooling and airflow.

Removing the SFP Module From the Line Card

To remove the SFP module from the SFP transceiver on the Cisco cable interface line card:

Procedure

Step 1 Disconnect the network cable from the SFP module connector. For optical SFP transceivers, immediately reinstall the dust plugs in the SFP transceiver optical bores.

Step 2 Unlock and remove the SFP module from the socket connector.

- a) If the SFP transceiver has a Mylar tab latch, pull the tab gently in a slightly downward direction until the transceiver disengages from the socket connector, and then pull the SFP transceiver straight out of the socket. Do not twist or pull the Mylar tab as you could detach it from the SFP transceiver. (See [Figure 22: Removing an SFP Transceiver Equipped with a Mylar Tab](#), on page 21.)

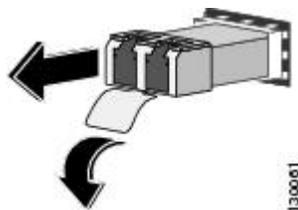


Figure 22: Removing an SFP Transceiver Equipped with a Mylar Tab

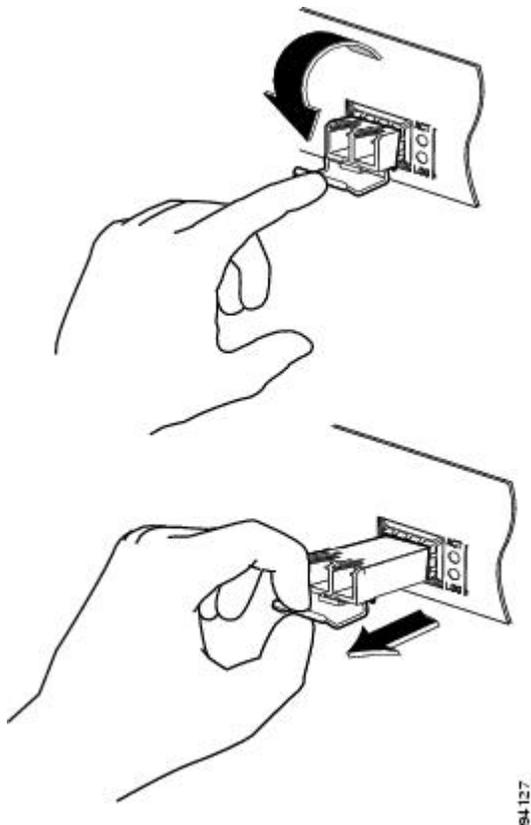
- b) If the SFP transceiver has an actuator button latch, gently press the actuator button on the front of the SFP transceiver until it clicks and the latch mechanism releases the SFP transceiver from the socket connector. Grasp the actuator button between your thumb and index finger, and carefully pull the SFP transceiver straight from the module slot. (See [Figure 23: Removing an SFP Transceiver Equipped with an Actuator/Button Latch](#), on page 22.)

Figure 23: Removing an SFP Transceiver Equipped with an Actuator/Button Latch



- c) If the SFP transceiver has a bale-clasp latch, pull the bale out and down to eject the SFP transceiver from the socket connector. If the bale-clasp latch is obstructed and you cannot use your index finger to open it, use a small, flat-blade screwdriver or a long narrow instrument to open the bale-clasp latch. Grasp the SFP transceiver between your thumb and index finger, and carefully remove it from the socket. (See [Figure 24: Removing an SFP Transceiver Equipped with a Bale-clasp Latch](#), on page 22.)

Figure 24: Removing an SFP Transceiver Equipped with a Bale-clasp Latch



Step 3 Place the removed SFP module in an antistatic bag.

Troubleshooting the Line Card Installation

If the Cisco cable interface line card is not working properly, check the following:

- 1 Verify that the POWER LED is on (green). If the LED is off (not green):
 - Verify that there is power to the system.
 - Verify that the card is configured for the system.
- 2 Verify that the LEDs (see [Table 5: Cisco Line Card LEDs](#), on page 23 for LED description) light up and go through the power on self test (POST) when the card is inserted in the chassis.
- 3 Verify that the captive screws and ejector levers are secure:
 - Check that the captive screws are secure in the faceplate.
 - Check that the ejectors levers are properly closed.
- 4 Verify that the card is properly seated in the chassis:
 - Release the ejector levers and captive screws.
 - Slide the card partially out of the chassis and then slide it back in, making sure that it is properly seated in the backplane.
 - Close the ejector levers and tighten the captive screws.
- 5 Verify that the UCH2 is securely in place on the faceplate. Check that the lead screw is secure.



Note The recommended maximum torque for a lead screw is 15 in-lbs (1.69 Nm).

- 6 Verify that the connectors are properly seated in the ports on the faceplate:
 - Verify that no cables are broken at the connector.
 - Verify that the cables are properly secured in the UCH2.
 - Verify that all the MCX connectors are protruding the same distance out of the UCH2.



Note Use the MCX to F connector adapter to easily adapt the MCX connection for testing the cables.

- 7 Verify that the lock bar on the UCH2 is in place and tightened.
- 8 Verify that the correct level of software licensing is available for the card.

Table 5: Cisco Line Card LEDs

LED	Status	Description
POWER	Green	Card is powered on.
	Off	Card is not powered on.

LED	Status	Description
STATUS	Green	Processor has booted and passed diagnostics, or is on standby.
	Yellow	In bootup mode.
	Off	No power to the line card.
MAINT	Yellow	It is safe to remove the line card.
	Off	No action necessary.
US0 through US19	Green	Upstream-enabled path is configured and able to pass traffic.
	Off	Upstream port is not enabled.
GE0 through GE5	Green	DEPI port is configured and able to pass traffic.
	Off	DEPI port is not enabled.
LK/ACT0-LK/ACT5	Green (steady)	Port is enabled; the link is working, and there is no US or DS traffic activity.
	Green (blinking)	Port is enabled; the link is working, and there is US or DS traffic activity.
	Off	Ethernet link is not working.
Front Panel Display	—	Number of licenses for US and DS channels (See Table 1: Cisco Cable Interface Line Card License Information , on page 3 for license information)

Technical Specifications and Component Part Numbers

The following tables provide technical specifications and part number information for the Cisco cable interface line card.

Part Numbers

[Table 6: Part Numbers](#), on page 24 lists the part numbers for the Cisco cable interface line card, cable kits, cables, connectors, tubing, and tools.

Table 6: Part Numbers

Description	Part Numbers
1 Cisco line card	1 UBR-MC3GX60V=
2 Blank card slot cover	2 UBR10-MC-COVER=
Universal Cable Holder (UCH)	
1 UCH2	1 CAB-520-UCH2, Cisco Systems
2 Universal Cable Holder for MCX connectors, qty 2 pcs	2 CAB-520-MULT-UCH2, Cisco Systems

Description	Part Numbers
<p>Cable Bundles</p> <p>1 Cable bundle for RF card to HFC plant—Two UCH2 units attached to one end and 20 F connectors attached to the other end, 9.84 feet (3 m) long.</p> <p>2 Cable bundle for RF card to RF Switch—2 UCH2 units attached to one end and 2 RF Switch header blocks attached to the other end, 3.2 feet (1 m) long.</p> <p>3 Cable bundle for RF switch to HFC plant—2 RF Switch header blocks attached to one end and 20 F connectors attached to the other end, 9.84 feet (3 m) long.</p>	<p>1 CABRFSW3G60QTIMF2= 2 CABRFSW3G60QTIMM2= 3 CABRFSW3G60QTPMF2=</p>
RF Switch header blocks for MCX connectors, qty 2 pcs	CAB-RFSW-MULT-HB
<p>Small Form-Factor Pluggable (SFP)</p> <p>1 Cisco 1000BASE-T 2 1000BASE-SX 3 1000BASE-LX/LH 4 1000BASE-ZX</p>	<p>1 SFP-GE-T, Cisco Systems 2 GLC-SX-MM 3 GLC-LH-SM 4 GLC-ZX-SM</p>
<p>MCX fixed pin connector</p> <p>1 Dual-shielded 2 Quad-shielded</p>	<p>1 PN-MCXFP, White Sands Engineering 2 PN-MCXFPQ, White Sands Engineering</p>
<p>75-ohm precision miniature video cable</p> <p>1 Dual-shielded single cable 2 Quad-shielded 5-pack</p>	<p>1 YR46940, White Sands Engineering, single cable 2 YR50386, White Sands Engineering, five pack</p>
<p>MCX connector strip tool</p> <p>1 Dual-shielded cables 2 Quad-shielded cables</p>	<p>1 PN-CPT-7538-125, White Sands Engineering 2 PN-CPT-7538-200Q, White Sands Engineering</p>
MCX connector to F connector adapter	PN-53140137, White Sands Engineering
<p>F connector strip tool</p> <p>1 Dual-shielded cables 2 Quad-shielded cables</p>	<p>1 PN-CPT-7538, White Sands Engineering 2 PN-CPT7538Q, White Sands Engineering</p>
MCX and F connector crimper tool	PN-ACT- 483, White Sands Engineering

Description	Part Numbers
F connector 1 Dual-shielded 2 Quad-shielded	1 PN-ASFP, White Sands Engineering 2 PN-ASFPQ, White Sands Engineering
Shrink tubing <ul style="list-style-type: none"> • Size—1/4 inch • Shrink ratio—2:1 • Recovered wall thickness—0.025 inch • Inside diameter after recovery—0.125 inch Note Do not use shrink tubing with Cisco quad-shielded cables.	—

Physical Specifications and Compliance Information

[Table 7: Cisco Cable Interface Line Card Specifications](#) lists the physical specifications for the Cisco uBR-MC3GX60V cable interface line card.

Table 7: Cisco Cable Interface Line Card Specifications

Description	Specification
Card Dimensions	<ul style="list-style-type: none"> • Width: 1.38 in. (3.50 cm) • Height: 21.5 in. (54.61 cm) • Depth: 17 in. (43.18 cm)
Weight	11.6 lb (5.26 kg)
Power Consumption	246W ⁵ (839 BTU/hr ⁶)
Thermal Heat Dissipation	246W (839 BTU/hr)
Mean Time Between Failure (MTBF)	Supports 5 9s availability. 100,748 hours
Temperature Range	<ul style="list-style-type: none"> • Operating: 41 to 104°F (5 to 40°C) • Non-operating: -4 to 149°F (-20 to 65°C)
Relative Humidity	<ul style="list-style-type: none"> • Operating: 10 to 90% non-condensing • Non-operating: 10 to 90%

Description	Specification
Operating Altitude	-196 to 13,123 ft. (-60 to 4000 m)
Standards, Compliance, Protocols	<ul style="list-style-type: none"> • DOCSIS ITU J.112, ITU J.83 Annex A, Annex B • DOCSIS 1.1 • DOCSIS MAC management • DOCSIS spectrum management • CableLabs ECR; RFI-R-98036 • DOCSIS 2.0 • DOCSIS 3.0
Software Requirements	Cisco IOS Release 12.2(33)SCE or a later release

⁵ W = Watts

⁶ BTU/hr = British thermal units per hour

Related Documentation

For more information about the Cisco cable interface line cards, Cisco uBR10012 universal broadband router chassis, and software configuration, see the following documents:

- Configuring the Cisco Cable Interface Line Card
http://www.cisco.com/en/US/docs/interfaces_modules/cable/broadband_processing_engines/ubr_mc3gx60v/configuration/guide/mc3g60_cfg.html
- Cisco uBR10012 Universal Broadband Router Hardware Installation Guide
<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/guide/hig.html>
- Cisco uBR10000 Series Universal Broadband Router Release Notes
http://www.cisco.com/en/US/products/hw/cable/ps2209/prod_release_notes_list.html
- Cisco uBR10012 Router Software Features
http://www.cisco.com/en/US/products/hw/cable/ps2209/products_feature_guides_list.html
- Cisco uBR10012 Universal Broadband Router Software Configuration Guide
<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/configuration/guide/scg.html>
- Cisco IOS CMTS Cable Software Configuration Guide, Release 12.2SC
- Cisco IOS CMTS Cable Command Reference
http://www.cisco.com/en/US/docs/ios/cable/command/reference/cbl_book.html

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Cisco Systems, Inc.
San Jose, CA 95134-1706
USA

Asia Pacific Headquarters
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