Cabling the Gigabit Ethernet Line Cards

This chapter provides cabling instructions and information for the interfaces on the Gigabit Ethernet Line Card (GLC2), the four-port Quad Gigabit Ethernet Line Card (QGLC), and 10 Gigabit Ethernet Line Card (XGLC).

These cards support 802.3z-compliant Gigabit Ethernet interface(s) which connect the chassis to other elements in the packet data network.
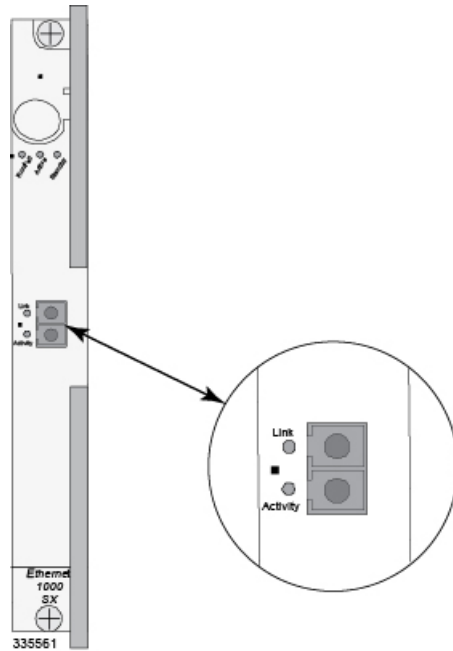
This chapter includes the following sections:

Gigabit Ethernet Line Card (GLC2)

The following figure shows the single-port GLC2. The front panel of this card is labeled "Ethernet 1000". This card supports a single fiber or copper Small Form-factor Plugin (SFP) transceiver module as described below:

Figure 1: GLC2 Fiber Optic Interface

> **Important** The following SFP modules are hot-pluggable.

Table 1: SFP Modules Supported by the GLC2

Module Type	Card Identification	Interface Type	Cable Specifications
1000Base-SX	Ethernet 1000 SX	Fiber, LC duplex female connector	**Fiber Type:** Multi-mode fiber (MMF), 850 nm wavelength **Core Size (microns)/Range:** • 62.5/902.23 feet (275 meters) • 50/1640.42 feet (500 meters) **Minimum Tx Power:** -9.5 dBm **Rx Sensitivity:** -17 dBm

Module Type	Card Identification	Interface Type	Cable Specifications
1000Base-LX	Ethernet 1000 LX	Fiber, LC duplex female connector	**Fiber Type:** Single-mode fiber (SMF), 1310 nm wavelength **Core Size (microns)/Range:** 9/32808.4 feet (10 Kilometers) **Minimum Tx Power:** -9.5 dBm **Rx Sensitivity:** -19 dBm
1000Base-T	Ethernet 1000 Copper	RJ-45	Operates in full-duplex up to 100 meters of CAT-5 shielded twisted pair (STP) cable with BER less than 10e-10. **NOTE:** To comply with GR-1089 intra-building, lightning-immunity requirements and ensure compliance with Radiated Emissions Criteria, you must use shielded-twisted pair cable and ensure that it is properly terminated at both ends.

> ☞ **Important**　The SFP interface is only certified to work with SFP transceiver modules purchased from Cisco for use with the GLC2.

> ☞ **Important**　**Class 1 Laser Compliance Notice**
>
> Because of the optical SFP interface, this product has been tested and found to comply with the limits for Class 1 laser devices for IEC825, EN60825, and 21CFR1040 specifications.
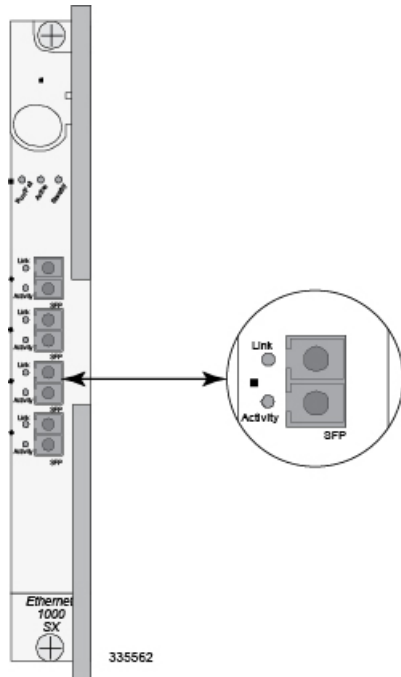
Quad Gigabit Ethernet Line Card (QGLC)

The following figure shows the four-port Quad Gigabit Ethernet Line Card (QGLC). The front panel of this card is labeled "Ethernet 1000".

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> **Important**   If you enter the **show card table** CLI command, the QGLC is listed as a Quad 1000 Ethernet Line Card.

Figure 2: QGLC Fiber Optic Interfaces

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> **Important**   The QGLC supports four fiber or copper SFP transceiver modules as described below. The modules are hot-pluggable. However, they must all be the same type. You cannot mix-and-match SFP modules in one QGLC.

Table 2: SFP Modules Supported by the QGLC

Module Type	Card Identification	Interface Type	Cable Specifications
1000Base-SX	Ethernet 1000 SX	Fiber, LC duplex female connector	**Fiber Type:** Multi-mode fiber (MMF), 850 nm wavelength **Core Size (microns)/Range:** • 62.5/902.23 feet (275 meters) • 50/1640.42 feet (500 meters) **Minimum Tx Power:** -9.5 dBm **Rx Sensitivity:** -17 dBm

Module Type	Card Identification	Interface Type	Cable Specifications
1000Base-LX	Ethernet 1000 LX	Fiber, LC duplex female connector	**Fiber Type:** Single-mode fiber (SMF), 1310 nm wavelength **Core Size (microns)/Range:** 9/32808.4 feet (10 Kilometers) **Minimum Tx Power:** -9.5 dBm **Rx Sensitivity:** -19 dBm
1000Base-T	Ethernet 1000 Copper	RJ-45	Operates in full-duplex up to 100 meters of CAT-5 shielded twisted pair (STP) cable with BER less than 10e-10. **NOTE:** To comply with GR-1089 intra-building, lightning-immunity requirements and ensure compliance with Radiated Emissions Criteria, you must use shielded-twisted pair cable and ensure that it is properly terminated at both ends.

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Important The SFP interface is only certified to work with SFP transceiver modules purchased from Cisco for use with the QGLC.

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Important Because of the optical SFP interface, this product has been tested and found to comply with the limits for Class 1 laser devices for IEC825, EN60825, and 21CFR1040 specifications.

RJ-45 SFP Module Detail

The following describes the RJ-45 (copper) SFP module for the GLC2 and the QGLC with pinouts and definitions.

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Important To comply with GR-1089 intra-building, lightning-immunity requirements and ensure compliance with FCC Radiated Emissions Criteria, you must use shielded-twisted pair (STP) cable and assure that it is properly terminated at both ends.

The 1000Base-TX interface is suitable for connection to intra-building or unexposed wiring or cabling only. These intra-building ports MUST NOT be metallically connected to interfaces that connect to the outside plant (OSP) or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 5) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

Figure 3: RJ-45 Interface Pinout

Table 3: RJ-45 Interface Pinout

Pin	1000Base-Tx 1Gbps Cat5+
1	BI DA+
2	BI DA-
3	BI DB+
4	BI DC+
5	BI DC-
6	BI DB-
7	BI DD+
8	BI DD-
RX = Receive Data TX = Transmit Data BI = BI directional data DA, DB, DC, DD = Data Pair A, B, C, and D	

The following light emitting diode (LED) status indicators are provided on the Gigabit Ethernet line cards:

- **Link:** This green LED shows whether or not the line card is connected to the network. The LED is illuminated when the card is connected.

- **Activity:** This green LED shows when data is transmitted or received. The LED is illuminated when data is passing through the interface.

Cabling the Optical SFP+ Interface

To interconnect the optical SFP+ interface on the XGLC, follow the instructions below.

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Important	Be sure to label the interface cable with its destination prior to connecting it to the XGLC. This will assure proper reconnection should the card need to be serviced.

Only trained and qualified personnel should install, replace, or service this equipment.

Invisible laser radiation may be emitted from the aperture of the port when no cable is connected. Avoid exposure to laser radiation and do not look into open apertures. **Be sure to keep the cover on the interface when it is not in use.**

Laser Klasse 1 - nur speziell ausgebildetes Personal darf dieses Geraet warten.

Nicht in den Laser schauen, um Augenverletzungen zu vermeiden.

Nicht genutzte Buchsen mit der entsprechenden Kappe verschliessen.

Step 1   Remove the cover from the SFP interface.

Step 2   Insert the optical cable from a network device into the interface and ensure that it is securely in place.

10 Gigabit Ethernet Line Card (XGLC)

The 10 Gigabit Ethernet Line Card or XGLC, is a full-height line card. The XGLC uses industry standard SFP+ transceiver modules to support various fiber types as required. The following diagram shows the XGLC's single SFP+ interface.

Figure 4: XGLC Fiber Optic Interface

Table 4: SFP+ Modules Supported by the XGLC

Module Type	Card Identification	Interface Type	Cable Specifications
10G Base-SR	Ethernet 10G SR	Fiber, LC duplex female connector	**Fiber Type:** Multi-mode fiber (MMF), 850 nm wavelength **Core Size (microns)/Range:** • 62.5/902.23 feet (275 meters) • 50/1640.42 feet (500 meters) • 62.5um/33m (OM1) • 50um 500MHz-km/82m (OM2) • 50um 2000MHz-km/300m (OM3) **Minimum Tx Power:** -7.3 dBm **Rx Sensitivity:** -11.1 dBm
10G Base-LR	Ethernet 10G LR	Fiber, LC duplex female connector	**Fiber Type:** Single-mode fiber (SMF), 1310 nm wavelength **Core Size (microns)/Range:** 9/32808.4 feet (10 Kilometers) **Minimum Tx Power:** -11.0 dBm **Rx Sensitivity:** -19 dBm

XGLCs can be installed in chassis slots 17 through 23 and 26 through 32. These cards should always be installed directly behind their respective PSCs, PSC2s, or PPCs, but they are not required behind any redundant packet processing cards (those operating in Standby mode).

The following Light Emitting Diodes (LEDs) are provided on the Gigabit Ethernet line cards:

- **Link:** This green LED shows whether or not the line card is connected to the network. The LED is illuminated when the card is connected.

- **Activity:** This green LED shows when data is transmitted or received. The LED is illuminated when data is passing through the interface.

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Important   Because of the optical SFP interface, this product has been tested and found to comply with the limits for Class 1 laser devices for IEC825, EN60825, and 21CFR1040 specifications.

Cabling the Optical SFP+ Interface

To interconnect the optical SFP+ interface on the XGLC, follow the instructions below.

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Important   Be sure to label the interface cable with its destination prior to connecting it to the XGLC. This will assure proper reconnection should the card need to be serviced.

Only trained and qualified personnel should install, replace, or service this equipment.

Invisible laser radiation may be emitted from the aperture of the port when no cable is connected. Avoid exposure to laser radiation and do not look into open apertures. **Be sure to keep the cover on the interface when it is not in use.**

Laser Klasse 1 - nur speziell ausgebildetes Personal darf dieses Geraet warten.

Nicht in den Laser schauen, um Augenverletzungen zu vermeiden.

Nicht genutzte Buchsen mit der entsprechenden Kappe verschliessen.

Step 1   Remove the cover from the SFP interface.

Step 2   Insert the optical cable from a network device into the interface and ensure that it is securely in place.