



## Connector and Cable Specifications

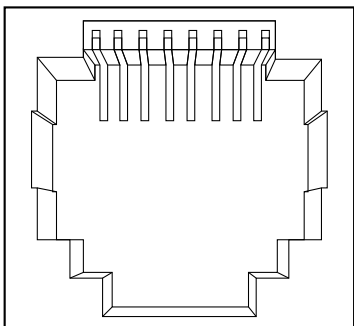
### Connector Specifications

- [10/100 Ports \(Including PoE\), page 1-1](#)
- [10/100/1000 Ports \(Including PoE\), page 1-2](#)
- [SFP Module Connectors, page 1-2](#)

### 10/100 Ports (Including PoE)

All the 10/100 ports use standard RJ-45 connectors and Ethernet pinouts.

**Figure 1-1** 10/100 Port Pinouts

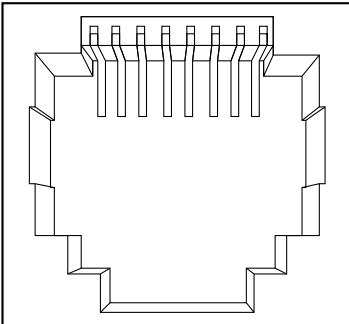
| Pin | Label | 1 2 3 4 5 6 7 8                                                                      |
|-----|-------|--------------------------------------------------------------------------------------|
| 1   | RD+   |  |
| 2   | RD-   |                                                                                      |
| 3   | TD+   |                                                                                      |
| 4   | NC    |                                                                                      |
| 5   | NC    |                                                                                      |
| 6   | TD-   |                                                                                      |
| 7   | NC    |                                                                                      |
| 8   | NC    |                                                                                      |

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## 10/100/1000 Ports (Including PoE)

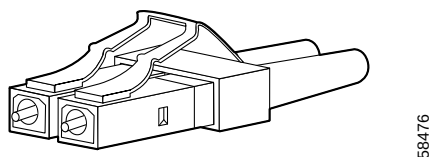
All the 10/100/1000 ports use standard RJ-45 connectors and Ethernet pinouts.

**Figure 1-2** 10/100/1000 Port Pinouts

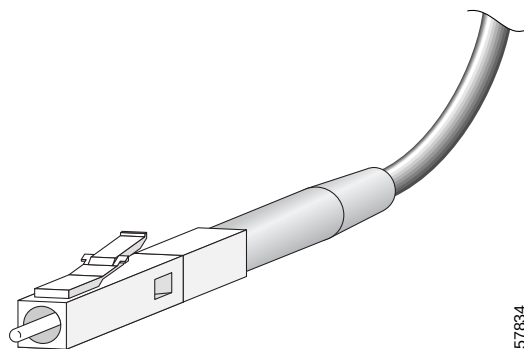
| Pin | Label | 1 2 3 4 5 6 7 8                                                                    |
|-----|-------|------------------------------------------------------------------------------------|
| 1   | TP0+  |  |
| 2   | TP0-  |                                                                                    |
| 3   | TP1+  |                                                                                    |
| 4   | TP2+  |                                                                                    |
| 5   | TP2-  |                                                                                    |
| 6   | TP1-  |                                                                                    |
| 7   | TP3+  |                                                                                    |
| 8   | TP3-  |                                                                                    |

## SFP Module Connectors

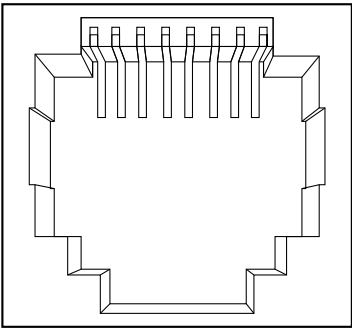
**Figure 1-3** Duplex LC Cable Connector



**Figure 1-4** Simplex LC Cable Connector



**Figure 1-5** Copper SFP Module RJ-45 Connector

| Pin | Label | 1 2 3 4 5 6 7 8                                                                    |
|-----|-------|------------------------------------------------------------------------------------|
| 1   | TP0+  |  |
| 2   | TP0-  |                                                                                    |
| 3   | TP1+  |                                                                                    |
| 4   | TP2+  |                                                                                    |
| 5   | TP2-  |                                                                                    |
| 6   | TP1-  |                                                                                    |
| 7   | TP3+  |                                                                                    |
| 8   | TP3-  |                                                                                    |

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## Cables and Adapters

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- [Cable Pinouts, page 1-5](#)
- [Console Port Adapter Pinouts, page 1-6](#)

## SFP Module Cables

Each port must match the wave-length specifications on the other end of the cable, and the cable must not exceed the stipulated cable length. Copper 1000BASE-T SFP module transceivers use standard four twisted-pair, Category 5 cable at lengths up to 328 feet (100 meters).

**Table 1-1** Fiber-Optic SFP Module Port Cabling Specifications

| SFP Module                                       | Wavelength (nanometers) | Cable Type | Core Size/Cladding Size (micron) | Modal Bandwidth (MHz/km) <sup>1</sup> | Cable Distance                         |
|--------------------------------------------------|-------------------------|------------|----------------------------------|---------------------------------------|----------------------------------------|
| 100BASE-BX<br>(GLC-FE-100BX-D<br>GLC-FE-100BX-U) | 1310 TX<br>1550 RX      | SMF        | G.652 <sup>2</sup>               | —                                     | 32,810 feet (10 km)                    |
| 100BASE-FX<br>(GLC-GE-100FX)                     | 1310                    | MMF        | 50/125<br>62.5/125               | 500<br>500                            | 6,562 feet (2 km)<br>6,562 feet (2 km) |
| 100BASE-FX<br>(GLC-FE-100FX)                     | 1310                    | MMF        | 50/125<br>62.5/125               | 500<br>500                            | 6,562 feet (2 km)<br>6,562 feet (2 km) |
| 100BASE-LX<br>(GLC-FE-100LX)                     | 1310                    | SMF        | G.652 <sup>2</sup>               | —                                     | 32,810 feet (10 km)                    |
| 1000BASE-BX10-D<br>(GLC-BX-D)                    | 1490 TX<br>1310 RX      | SMF        | G.652 <sup>2</sup>               | —                                     | 32,810 feet (10 km)                    |
| 1000BASE-BX10-U<br>(GLC-BX-U)                    | 1310 TX<br>1490 RX      | SMF        | G.652 <sup>2</sup>               | —                                     | 32,810 feet (10 km)                    |

Table 1-1 Fiber-Optic SFP Module Port Cabling Specifications (continued)

| SFP Module                   | Wavelength (nanometers)                        | Cable Type                          | Core Size/Cladding Size (micron)                   | Modal Bandwidth (MHz/km) <sup>1</sup> | Cable Distance                                                                                   |
|------------------------------|------------------------------------------------|-------------------------------------|----------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------|
| 1000BASE-SX (GLC-SX-MM)      | 850                                            | MMF                                 | 62.5/125<br>62.5/125<br>50/125<br>50/125           | 160<br>200<br>400<br>500              | 722 feet (220 m)<br>902 feet (275 m)<br>1,640 feet (500 m)<br>1,804 feet (550 m)                 |
| 1000BASE-T (GLC-T)           | Standard 4 twisted-pair Category 5 cable       | —                                   | —                                                  | —                                     | 328 feet (100 m)                                                                                 |
| 1000BASE-LX/LH (GLC-LH-SM)   | 1310                                           | MMF <sup>3</sup><br><br>SMF         | 62.5/125<br>50/125<br>50/125<br>G.652 <sup>2</sup> | 500<br>400<br>500<br>—                | 1,804 feet (550 m)<br>1,804 feet (550 m)<br>1,804 feet (550 m)<br>32,810 feet (10 km)            |
| 1000BASE-ZX (GLC-ZX-SM)      | 1550                                           | SMF                                 | G.652 <sup>2</sup>                                 | —                                     | 43.4 to 62 miles (70 to 100 km) <sup>4</sup>                                                     |
| CWDM                         | 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 | SMF                                 | G.652 <sup>2</sup>                                 | —                                     | 62 miles (100 km)                                                                                |
| 10GBASE-LR (SFP-10G-LR)      | 1310                                           | SMF                                 | G.652 <sup>2</sup>                                 |                                       | 6.21 miles (10 km)                                                                               |
| 10GBASE-SR (SFP-10G-SR)      | 850                                            | MMF                                 | 62.5/125<br>62.5/125<br>50/125<br>50/125<br>50/125 | 160<br>200<br>400<br>500<br>2000      | 85 feet (26 m)<br>108 feet (33 m)<br>216 feet (66 m)<br>269 feet (82 m)<br>6,561 feet (2000 m)   |
| 10GBASE-LRM (SFP-10G-LRM)    | 850                                            | MMF                                 | 62.5/125<br>62.5/125<br>50/125<br>50/125<br>50/125 | 160<br>200<br>400<br>500<br>2000      | 722 feet (220 m)<br>722 feet (220 m)<br>328 feet (100 m)<br>722 feet (220 m)<br>722 feet (220 m) |
| 10GBASE-CX1 (SFP-H10GB-CU1M) | —                                              | Twinax cable, 30-AWG cable assembly | —                                                  | —                                     | 3 feet (1 m)                                                                                     |
| (SFP-H10GB-CU3M)             |                                                | Twinax cable, 30-AWG cable assembly |                                                    |                                       | 9 feet (3 m)                                                                                     |
| (SFP-H10GB-CU5M)             |                                                | Twinax cable, 24-AWG cable assembly |                                                    |                                       | 16 feet (5 m)                                                                                    |

1. Modal bandwidth applies only to multimode fiber.

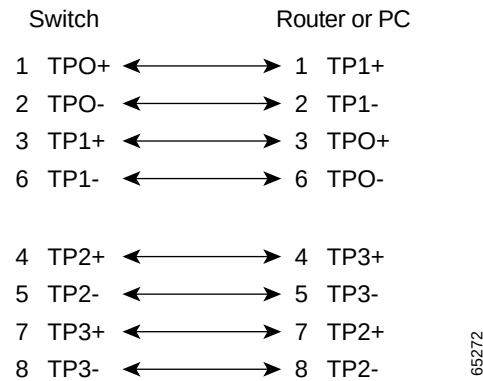
2. A mode-field diameter/cladding diameter = 9 micrometers/125 micrometers.

3. A mode-conditioning patch cord is required. Using an ordinary patch cord with MMF, or 1000BASE-LX/LH SFP modules and a short link distance can cause transceiver saturation, and an elevated bit error rate (BER). When using the LX/LH SFP module with 62.5-micron diameter MMF, you must also install a mode-conditioning patch cord between the SFP module and the MMF cable on both the sending and receiving ends of the link. The mode-conditioning patch cord is required for link distances greater than 984 feet (300 m).

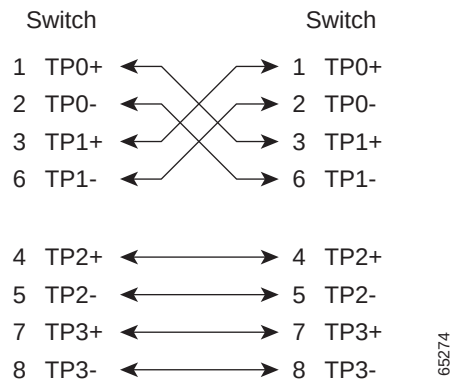
4. 1000BASE-ZX SFP modules can send data up to 62 miles (100 km) by using dispersion-shifted SMF or low-attenuation SMF; the distance depends on the fiber quality, the number of splices, and the connectors.

## Cable Pinouts

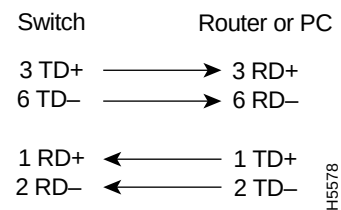
**Figure 1-6 Four Twisted-Pair Straight-Through Cable Schematic**



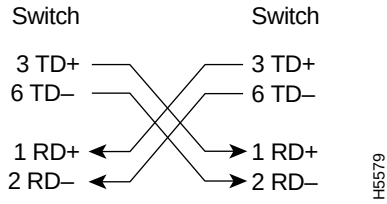
**Figure 1-7 Four Twisted-Pair Crossover Cable Schematic**



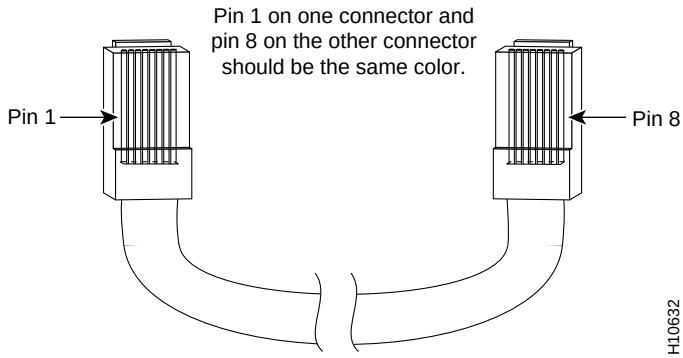
**Figure 1-8 Two Twisted-Pair Straight-Through Cable Schematic**



**Figure 1-9 Two Twisted-Pair Crossover Cable Schematic**



**Figure 1-10 Identifying a Crossover Cable**



# Console Port Adapter Pinouts

The RS-232 console port uses an 8-pin RJ-45 connector. Use an RJ-45-to-DB-9 adapter cable to connect the switch console port to a console PC. You need to provide a RJ-45-to-DB-25 female DTE adapter to connect the switch console port to a terminal. You can order the kit (part number ACS-DSBUASYN=) from Cisco.

**Table 1-2 Console Port Signaling with a DB-9 Adapter**

| Switch Console Port (DTE) | RJ-45-to-DB-9 Terminal Adapter | Console Device |
|---------------------------|--------------------------------|----------------|
| Signal                    | DB-9 Pin                       | Signal         |
| RTS                       | 8                              | CTS            |
| DTR                       | 6                              | DSR            |
| TxD                       | 2                              | RxD            |
| GND                       | 5                              | GND            |
| GND                       | 5                              | GND            |
| RxD                       | 3                              | TxD            |
| DSR                       | 4                              | DTR            |
| CTS                       | 7                              | RTS            |

**Table 1-3** Console Port Signaling with a DB-25 Adapter

| Switch Console Port (DTE) | RJ-45-to-DB-25 Terminal Adapter | Console Device |
|---------------------------|---------------------------------|----------------|
| Signal                    | DB-25 Pin                       | Signal         |
| RTS                       | 5                               | CTS            |
| DTR                       | 6                               | DSR            |
| TxD                       | 3                               | RxD            |
| GND                       | 7                               | GND            |
| GND                       | 7                               | GND            |
| RxD                       | 2                               | TxD            |
| DSR                       | 20                              | DTR            |
| CTS                       | 4                               | RTS            |

