



Connector and Cable Specifications

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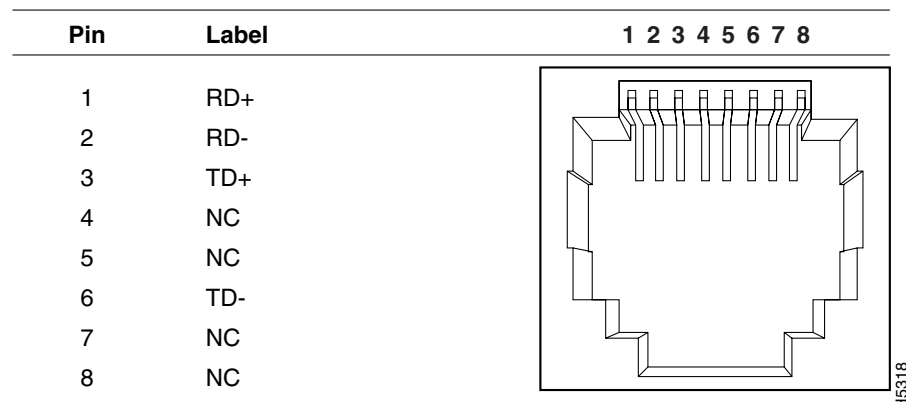
Connector Specifications

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10/100

The 10/100 Ethernet ports use standard RJ-45 connectors and Ethernet pinouts with internal crossovers. These ports have the send (TD) and receive (RD) signals internally crossed so that a twisted-pair straight-through cable and adapter can be attached to the port.

Figure B-1 10/100 Port Pinouts



When connecting 10/100 ports to compatible devices such as servers, workstations, and routers, you can use a two or four twisted-pair straight-through cable wired for 10BASE-T and 100BASE-TX. [Figure B-6](#) shows the two twisted-pair straight-through cable schematics. [Figure B-8](#) shows the four twisted-pair straight-through cable schematics.

When connecting the ports to other devices, such as switches or repeaters, you can use a two or four twisted-pair crossover cable. [Figure B-7](#) shows the two twisted-pair crossover cable schematics. [Figure B-9](#) shows the four twisted-pair crossover cable schematics.

**Note**

You can use the **mdix auto** interface configuration command in the CLI to enable the automatic medium-dependent interface crossover (auto-MDIX) feature. When the auto-MDIX feature is enabled, the switch detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a copper 10/100, 10/100/1000, or 1000BASE-T SFP module port on the switch, regardless of the type of device on the other end of the connection.

You can use Category 3, 4, or 5 cabling when connecting to 10BASE-T-compatible devices. You must use Category 5 (or higher) cabling when connecting to 100BASE-TX-compatible devices.

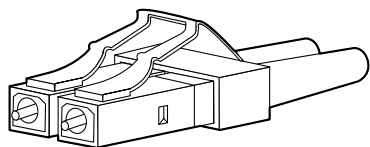
**Note**

Use a straight-through cable to connect two ports only when one port is designated with an X. Use a crossover cable to connect two ports when both ports are designated with an X or when both ports do not have an X.

This applies only to switches on which auto-MDIX is disabled.

SFP Module Connectors

Figure B-2 Fiber-Optic SFP Module LC Connector



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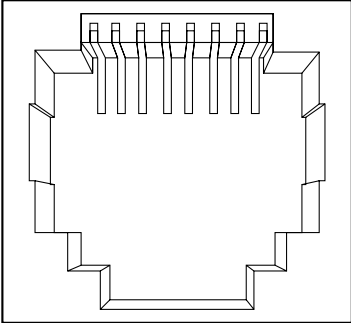
**Warning**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

Dual-Purpose Ports

The 10/100/1000 Ethernet ports on the dual-purpose ports use standard RJ-45 connectors.

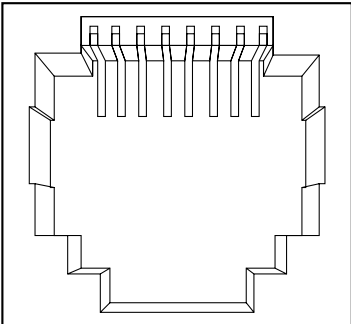
Figure B-3 10/100/1000 Port Pinouts

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-								

10/100 Ethernet Management Port

The 10/100 Ethernet management port uses standard RJ-45 connectors with Ethernet pinouts.

Figure B-4 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								

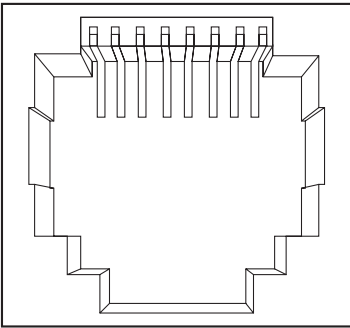
Alarm Input Port

The alarm input port uses a standard RJ-45 connector. See [“Alarm Input Port” section on page 1-4](#) for more information.



Note We recommend using a shielded cable grounded at both ends for NEBS.

Figure B-5 Alarm Input Port Pinouts

Pin	Alarm connection	1	2	3	4	5	6	7	8
1	Alarm 1 input								
2	Alarm 2 input								
3	no connection								
4	Alarm 3 input								
5	Alarm 4 input								
6	no connection								
7	no connection								
8	Alarm common								

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Cables and Adapters

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SFP Module Cables

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

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

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size/Cladding Size (micron)	Modal Bandwidth (MHz/km) ¹	Cable Distance
100BASE-BX (GLC-FE-100BX-D GLC-FE-100BX-U)	1310 TX 1550 RX	SMF	G.652 ²	—	32,810 feet (10 km)
100BASE-EX	1310	SMF	G.652 ²	—	131,240 ft (40 km)
100BASE-FX (GLC-GE-100FX)	1310	MMF	50/125 62.5/125	500 500	6,562 feet (2 km) 6,562 feet (2 km)
100BASE-FX (GLC-FE-100FX)	1310	MMF	50/125 62.5/125	500 500	6,562 feet (2 km) 6,562 feet (2 km)
100BASE-LX (100BASE-LX10)	1310	SMF	G.652 ²	—	32,810 feet (10 km)
100BASE-ZX	1550	SMF	G.652	—	262,480 ft (80 km)

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

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size/Cladding Size (micron)	Modal Bandwidth (MHz/km) ¹	Cable Distance
1000BASE-BX10-D (GLC-BX-D)	1490 TX 1310 RX	SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-BX10-U (GLC-BX-U)	1310 TX 1490 RX	SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-SX (GLC-SX-MM)	850	MMF	62.5/125 62.5/125 50/125 50/125	160 200 400 500	722 feet (220 m) 902 feet (275 m) 1640 feet (500 m) 1804 feet (550 m)
1000BASE-LX/LH (GLC-LH-SM)	1310	MMF ³ SMF	62.5/125 50/125 50/125 G.652 ²	500 400 500 —	1804 feet (550 m) 1804 feet (550 m) 1804 feet (550 m) 32,810 feet (10 km)
1000BASE-ZX (GLC-ZX-SM)	1550	SMF	G.652 ²	—	43.4 to 62 miles (70 to 100 km) ⁴
CWDM	1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610	SMF	G.652 ²	—	62 miles (100 km)
DWDM	1560.61, 1559.79, 1558.98, 1558.17, 1556.55, 1554.55, 1554.94, 1554.13, 1552.13, 1551.72, 1550.92, 1550.12, 1548.51, 1547.72, 1546.92, 1546.12, 1546.12, 1544.53, 1543.73, 1542.94, 1542.14, 1540.56, 1539.77, 1538.98, 1536.61, 1535.82, 1535.04, 1534.25, 1532.68, 1531.90, 1531.12, 1530.33	SMF	G.652 ²	—	62 miles (100 km)

1. Modal bandwidth applies only to multimode fiber.
2. A mode-field diameter/cladding diameter = 9 micrometers/125 micrometers.
3. Requires a mode-conditioning patch cord. An ordinary patch cord with MMF, 1000BASE-LX/LH SFP modules, and a short link distance can cause transceiver saturation, resulting in 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. Link distances greater than 984 feet (300 m) require the mode-conditioning patch cord.
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.

**Note**

When the fiber-optic cable span is less than 15.43 miles (25 km), you should insert a 5-decibel (dB) or 10-dB inline optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASE-ZX SFP module at each end of the link.

Cable Pinouts

Figure B-6 Two Twisted-Pair Straight-Through Cable Schematic

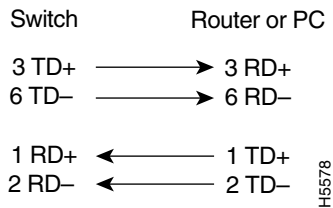


Figure B-7 Two Twisted-Pair Crossover Cable Schematic

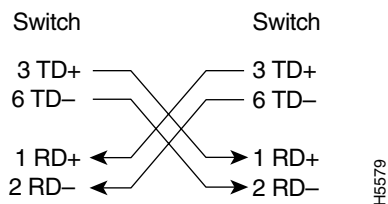


Figure B-8 Four Twisted-Pair Straight-Through Cable Schematic for 1000BASE-T Ports

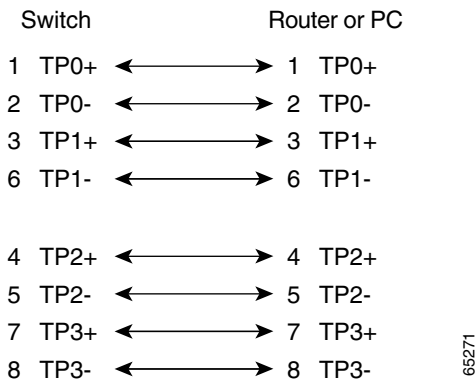
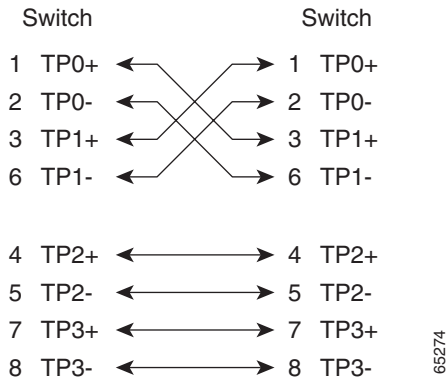
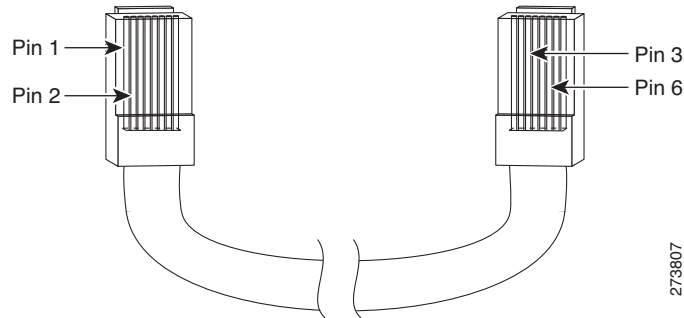


Figure B-9 Four Twisted-Pair Crossover Cable Schematics for 1000BASE-T Ports



To identify a crossover cable, compare the two modular ends of the cable. Hold the cable ends side-by-side, with the tab at the back. The wire connected to pin 1 on the left plug should be the same color as the wire connected to pin 3 on the right plug. The wire connected to pin 2 on the left plug should be the same color as the wire connected to pin 6 on the right plug.

Figure B-10 Identifying a Crossover Cable



Console Port Adapter Pinouts

The console port uses an 8-pin RJ-45 connector, which is described in [Table B-2](#) and [Table B-3](#). If you did not order a console cable with your switch, you need to provide an RJ-45-to-DB-9 adapter cable to connect the console port of the switch to a console PC. You need to provide an RJ-45-to-DB-25 female DTE adapter if you want to connect the switch console port to a terminal. You can order a kit (part number ACS-DSBUASYN=) containing that adapter from Cisco. For console port and adapter pinout information, see [Table B-2](#) and [Table B-3](#).

[Table B-2](#) lists the pinouts for the console port, the RJ-45-to-DB-9 adapter cable, and the console device.

Table B-2 Console Port Signaling Using 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 B-3 lists the pinouts for the console port, RJ-45-to-DB-25 female DTE adapter, and the console device.

**Note**

The RJ-45-to-DB-25 female DTE adapter is not supplied with the switch. You can order a kit (part number ACS-DSBUASYN=) containing this adapter from Cisco.

Table B-3 Console Port Signaling Using 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