APPENDIX B

Connector and Cable Specifications

Connector Specifications

10/100 and 10/100/1000 Ports

The 10/100 and 10/100/1000 Ethernet ports on switches use RJ-45 connectors and Ethernet pinouts with internal crossovers. Figure B-1 and Figure B-2 show the pinouts.

Figure B-1 10/100 Port Pinouts

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

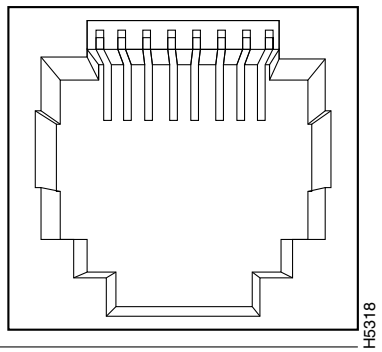
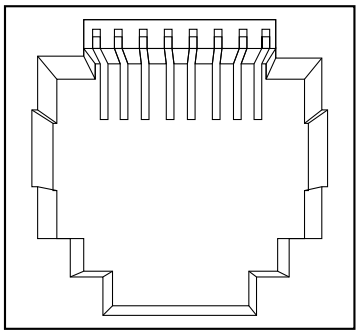


Figure B-2 10/100/1000 Port Pinouts

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-	

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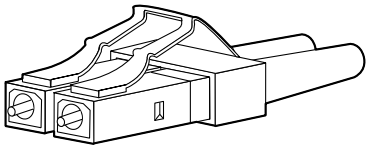
SFP Module Connectors

Figure B-3 Fiber-Optic SFP Module LC Connector



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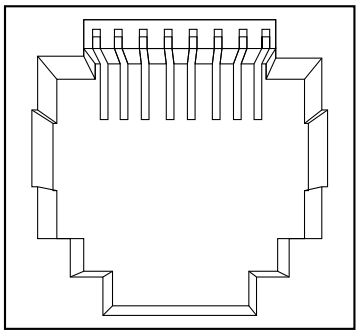
Warning **Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 1051

Dual-Purpose Ports

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

Figure B-4 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-	

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Cables and Adapters

SFP Module Cables

Each port must match the wave-length specifications on each end of the cable, and for reliable communications, the cable must not exceed the allowable 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

Type of SFP Module	Wavelength (nanometers)	Fiber Type	Core Size/Cladding Size (micron)	Modal Bandwidth (MHz/km)[1]	Cable Distance
1000BASE-LX/LH (GLC-LH-SM)	1310	MMF[2] 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-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-ZX (GLC-ZX-SM)	1550	SMF	G.652[2]	—	43.4 to 62 miles (70 to 100 km)[3]
1000BASE-BX10-U (GLC-BX-U)	1310 TX 1490 RX	SMF	G.652[2]	—	32,810 feet (10 km)
1000BASE-BX10-D (GLC-BX-D)	1490 TX 1310 RX	SMF	G.652[4]	—	32,810 feet (10 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 (GLC-FE-100LX)	1310	SMF	G.652[2]	—	32,810 feet (10 km)
100BASE-BX (GLC-FE-100BX-D GLC-FE-100BX-U)	1310 TX 1550 RX	SMF	G.652[2]	—	32,810 feet (10 km)
CWDM	1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610	SMF	G.652[2]	—	62 miles (100 km)

1. Modal bandwidth applies only to multimode fiber.
2. A mode-conditioning patch cord is required. Using 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. The mode-conditioning patch cord is required for link distances greater than 984 feet (300 m).

3. 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.
4. A mode-field diameter/cladding diameter = 9 micrometers/125 micrometers.

Note When the fiber-optic cable span is less than 15.43 miles (25 km), 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.

Cable Pinouts

Figure B-5 Two Twisted-Pair Straight-Through Cable Schematic for 10/100 Ports

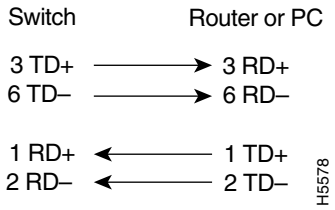


Figure B-6 Two Twisted-Pair Crossover Cable Schematic for 10/100 Ports

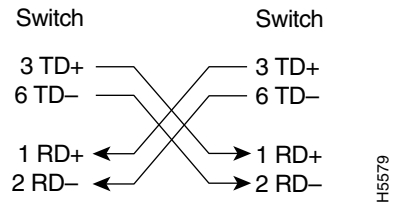


Figure B-7 Four Twisted-Pair Straight-Through Cable Schematic for 1000BASE-T Ports

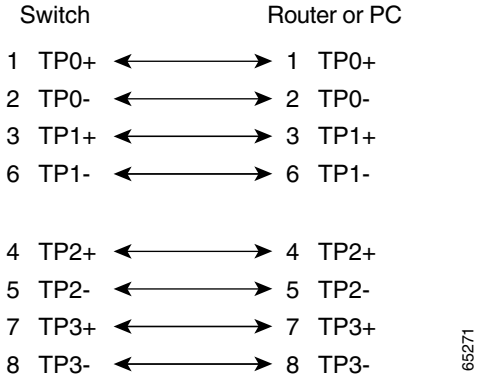
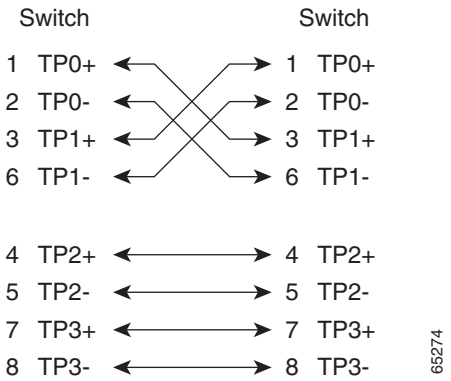
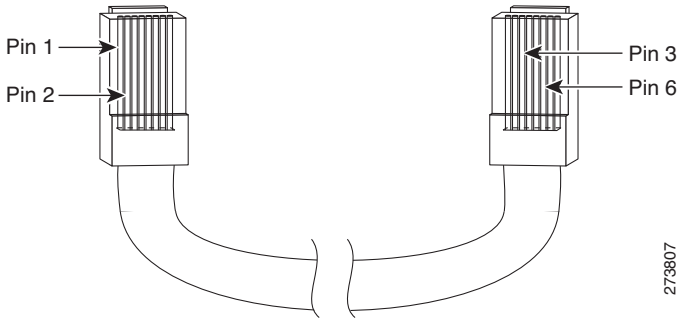


Figure B-8 Four Twisted-Pair Crossover Cable Schematics for 1000BASE-T Ports



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

Figure B-9 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, you need to provide an RJ-45-to-DB-9 adapter cable to connect the switch console port to a PC console port. 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 an adapter (part number ACS-DSBUASYN=). 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

Table B-2 Console Port Signaling Using a DB-9 Adapter (continued)

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

Table B-3 lists the pinouts for the switch 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 this adapter from Cisco (part number ACS-DSBUASYN=).

Table B-3 Console Port Signaling Using a DB-25 Adapter

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