



# APPENDIX **B**

## Connector and Cable Specifications

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This appendix describes the cables and adapters that you use to connect that you use to connect the switch module to other devices. This appendix includes these sections:

- [Connector Specifications, page B-1](#)
- [Cable and Adapter Specifications, page B-4](#)

### Connector Specifications

These sections describe the connectors used with the switch:

- [10/100/1000 Ports, page B-1](#)
- [10-Gigabit Ethernet Module Interfaces, page B-3](#)
- [Cisco TwinGig Converter Module Ports, page B-3](#)
- [Console Port, page B-4](#)

### 10/100/1000 Ports

The 10/100/1000 Ethernet ports on the switch module use standard RJ-45 connectors. [Figure B-1](#) shows the pinout.



#### 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 module 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 10/100/1000 or 1000BASE-T SFP module port on the switch module, regardless of the type of device on the other end of the connection.

For configuration information for this feature, refer to the switch module software configuration guide or the switch module command reference.

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## Connecting to 10BASE-T- and 100BASE-TX-Compatible Devices

When connecting the ports to 10BASE-T- and 100BASE-TX-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 10BASE-T- and 100BASE-TX-compatible 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.

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

## Connecting to 1000BASE-T Devices

When connecting the ports to 1000BASE-T devices, such as servers, workstations, and routers, you must use a four twisted-pair, Category 5, straight-through cable wired for 10BASE-T, 100BASE-TX, and 1000BASE-T. [Figure B-8](#) shows the straight-through cable schematics.

When connecting the ports to other devices, such as switches or repeaters, you must use a four twisted-pair, Category 5, crossover cable. [Figure B-9](#) shows the crossover cable schematics.

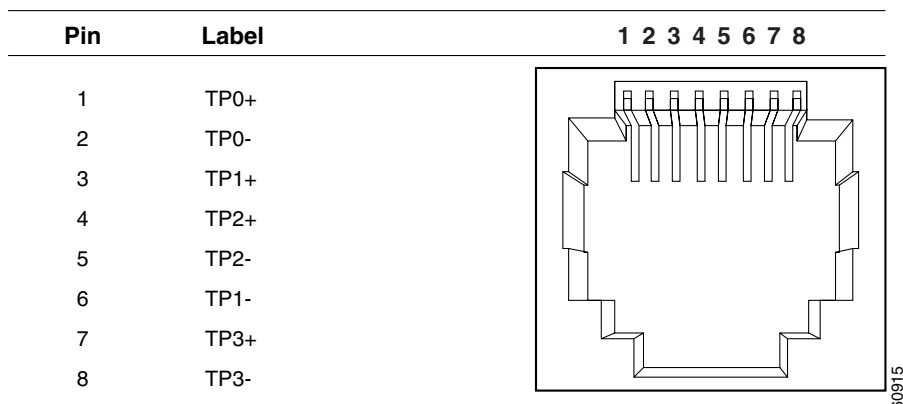


**Note** Be sure to use a four twisted-pair, Category 5 cable when connecting to a 1000BASE-T-compatible device.



**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.

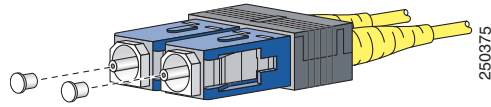
**Figure B-1** 10/100/1000 Port Pinouts



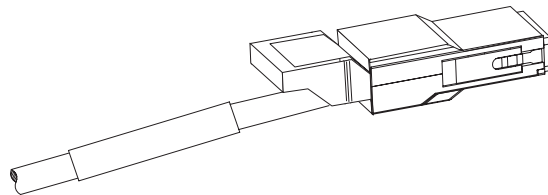
# 10-Gigabit Ethernet Module Interfaces

The 10-Gigabit Ethernet modules use SC connectors or Infiniband 4x connectors, as shown in [Figure B-2](#) and [Figure B-3](#).

**Figure B-2** 10-Gigabit Ethernet Optical Module SC Connector



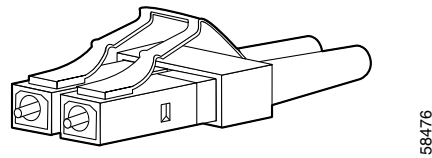
**Figure B-3** 10-Gigabit Ethernet Infiniband 4x Connector



# Cisco TwinGig Converter Module Ports

The Cisco TwinGig Converter Module uses SFP modules for fiber-optic and copper uplink ports. [Figure B-4](#) and [Figure B-5](#) show the SFP module connectors.

**Figure B-4** Duplex LC Cable Connector



**Figure B-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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## Console Port

The console port uses an 8-pin RJ-45 connector, which is described in [Table B-4](#) and [Table B-5](#). The supplied RJ-45-to-DB-9 adapter cable is used to connect the console port of the switch module to a console PC. You need to provide a RJ-45-to-DB-25 female DTE adapter if you want to connect the switch module 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-4](#) and [Table B-5](#).

## Cable and Adapter Specifications

These sections describe the cables and adapters used with the switch module.

- [10-Gigabit Ethernet X2 Transceiver Module Cable Specifications, page B-4](#)
- [SFP Module Cable Specifications, page B-6](#)
- [Two Twisted-Pair Cable Pinouts, page B-6](#)
- [Four Twisted-Pair Cable Pinouts for 1000BASE-T Ports, page B-7](#)
- [Identifying a Crossover Cable, page B-8](#)
- [Console Port Adapter Pinouts, page B-8](#)

## 10-Gigabit Ethernet X2 Transceiver Module Cable Specifications

[Table B-1](#) lists the port cabling specifications for the 10-Gigabit Ethernet X2 transceiver modules. 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 stipulated cable length. [Table B-2](#) lists the transceiver optical send and receive specifications.

**Table B-1** X2 Transceiver Port Cabling Specifications

X2 Product Number	Wavelength (nm)	Cable Type	Core Size (microns)	Modal Bandwidth (MHz/km)	Maximum Cabling Distance
X2-10GB-SR	850	MMF	62.5	160	85 feet (26 m)
			62.5	200	108 feet (33 m)
			50.0	400	217 feet (66 m)
			50.0	500	269 feet (82 m)
			50.0	2000	984 feet (300 m)
X2-10GB-LX4	1310	MMF <sup>1</sup>	62.5	500	984 feet (300 m)
			50.0	400	787 feet (240 m)
			50.0	500	984 feet (300 m)

**Table B-1 X2 Transceiver Port Cabling Specifications (continued)**

<b>X2 Product Number</b>	<b>Wavelength (nm)</b>	<b>Cable Type</b>	<b>Core Size (microns)</b>	<b>Modal Bandwidth (MHz/km)</b>	<b>Maximum Cabling Distance</b>
X2-10GB-CX4	—	InfiniBand (copper)	—	—	49 feet (15 m)
X2-10GB-LRM	1310	MMF	62.5	160	220 m (722 feet)
			62.5	200	220 m (722 feet)
			50.0	400	220 m (722 feet)
			50.0	500	220 m (722 feet)
			50.0	1500	220 m (722 feet)

1. Mode conditioning patch cord is recommended for MMF applications.

**Table B-2 X2 Transceiver Optical Send and Receive Specifications**

<b>X2 Product Number</b>	<b>Transceiver Type</b>	<b>Transmit Power (dBm)</b>	<b>Receive Power (dBm)</b>	<b>Transmit and Receive Wavelength (nm)</b>
X2-10GB-SR	10GBASE-SR, 850-nm MMF	-1 <sup>1</sup> (max) -7.3 (min)	-1.0 (max) -9.9 (min)	840 to 860
X2-10GB-LX4	10GBASE-LX4 WWDM 1300-nm MMF	-0.5 per lane (max) —	-0.5 (max) -14.4 per lane	Four lanes; overall range: 1269 to 1356
X2-10GB-LRM	10GBASE-LR, 1310-nm MMF	0.5 (max) -6.5 (min)	0.5 (max) -8.4 (min average) and -6.4 (min in OMA)	1260 to 1355

1. The launch power shall be the lesser of the Class 1 safety limit or the maximum receive power. Class 1 laser requirements are defined by IEC 60825-1: 2001.

## SFP Module Cable Specifications

Table B-3 lists the cable specifications for the fiber-optic SFP module connections. 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-3** Fiber-Optic SFP Module Port Cabling Specifications

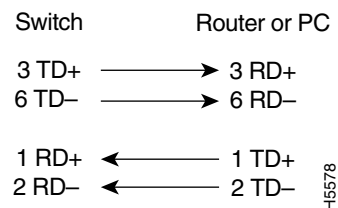
SFP Module	Wavelength (nanometers)	Fiber Type	Core Size/Cladding Size (micron)	Modal Bandwidth (MHz/km) <sup>1</sup>	Cable Distance
1000BASE-SX (GLC-SX-MM)	850	MMF	62.5/125	160	722 feet (220 m)
			62.5/125	200	902 feet (275 m)
			50/125	400	1640 feet (500 m)
			50/125	500	1804 feet (550 m)
1000BASE-T (GLC-T)	N/A				

1. Modal bandwidth applies only to multimode fiber.

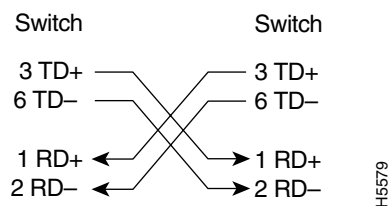
## Two Twisted-Pair Cable Pinouts

Figure B-6 and Figure B-7 show the schematics of two twisted-pair cables for connecting to 10BASE-T- and 100BASE-TX-compatible devices.

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



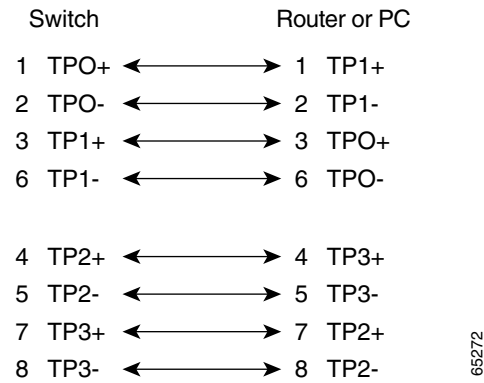
**Figure B-7** Two Twisted-Pair Crossover Cable Schematic



## Four Twisted-Pair Cable Pinouts for 1000BASE-T Ports

Figure B-8 and Figure B-9 show the schematics of four twisted-pair cables for 10/100/1000 ports on the switch module.

**Figure B-8** Four Twisted-Pair Straight-Through Cable Schematic for 10/100/1000 Ports

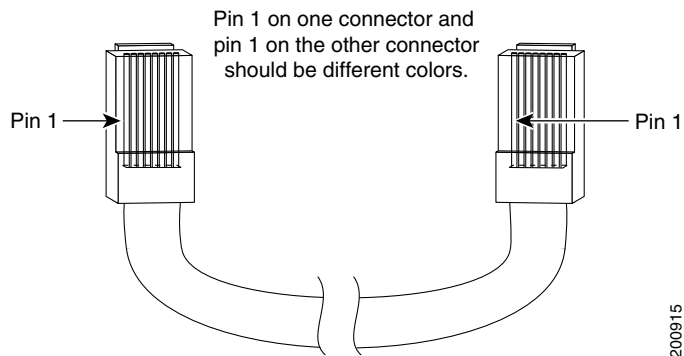


**Figure B-9** Four Twisted-Pair Crossover Cable Schematics for 10/100/1000 Ports

## Identifying a Crossover Cable

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 the pin on the outside of the left plug should be a different color from the wire connected to the pin on the inside of the right plug. (See [Figure B-10](#).)

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



## Console Port Adapter Pinouts

[Table B-4](#) lists the pinouts for the console port, the RJ-45-to-DB-9 adapter cable, and the console device.

**Table B-4** 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-5](#) 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 module. You can order a kit (part number ACS-DSBUASYN=) containing this adapter from Cisco.



**Table B-5 Console Port Signaling Using a DB-25 Adapter**

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

