



# APPENDIX **B**

## Port, Cable, and Connector Specifications

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**Revised: July 2011**

This appendix lists the port, cable, and connector specifications for the Catalyst 6500 series supervisor engines. The following ports, cables, and connectors along with signal summaries are contained in this appendix:

- [Console Port, page B-1](#)
- [Uplink Ports, page B-5](#)
- [USB Ports, page B-7](#)
- [Copper and Fiber-Optic Connectors, page B-7](#)

Also included in this appendix is information and procedures on how to clean the fiber-optic connectors.

### Console Port

The console port allows you to access the switch either locally (through a console terminal) or remotely (through a modem). The console port is an EIA/TIA-232 asynchronous, serial connection with hardware flow control and an RJ-45 connector. This section covers the following topics:

- [Console Port Cables and Adapters, page B-1](#)
- [CONSOLE PORT MODE Switch \(Supervisor Engine 2 Only\), page B-2](#)

### Console Port Cables and Adapters

The Catalyst 6500 series switch comes with an accessory kit that contains the cable and adapters you need to connect a console (an ASCII terminal or PC running terminal emulation software) or modem to the supervisor engine console port. The accessory kit includes the following items:

- RJ-45-to-RJ-45 rollover cable
- RJ-45-to-DB-9 female DTE adapter (labeled “Terminal”)
- RJ-45-to-DB-25 female DTE adapter (labeled “Terminal”)
- RJ-45-to-DB-25 male DCE adapter (labeled “Modem”)



**Note**

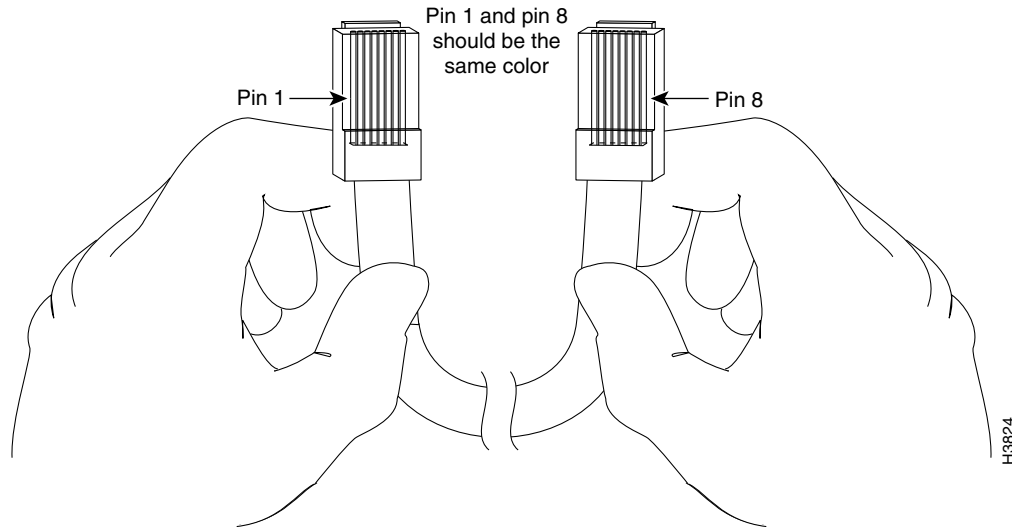
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This is the same rollover cable and connector adapters that ship with many other Cisco products.

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You can identify a rollover cable by comparing the two ends of the cable. Holding the cables side-by-side, with the tab at the back, the wire connected to the pin on the outside of the left plug should be the same color as the wire connected to the pin on the outside of the right plug. (See [Figure B-1](#).) If your cable was purchased from Cisco Systems, pin 1 will be white on one connector, and pin 8 will be white on the other (a rollover cable reverses pins 1 and 8, 2 and 7, 3 and 6, and 4 and 5).

**Figure B-1** Identifying a Rollover Cable



## CONSOLE PORT MODE Switch (Supervisor Engine 2 Only)

The supervisor engine front-panel CONSOLE PORT MODE switch, only on the Supervisor Engine 2, allows you to connect a terminal or modem to the console port as follows:

- Mode 1—Switch in the *in* position. Use this mode to connect a terminal to the console port using the RJ-45-to-RJ-45 rollover cable and DTE adapter (labeled “Terminal”).  
You can also use this mode to connect a modem to the console port using the RJ-45-to-RJ-45 rollover cable and DCE adapter (labeled “Modem”).
- Mode 2—Switch in the *out* position. Use this mode to connect a terminal to the console port using the Catalyst 5000 family Supervisor Engine III console cable and appropriate adapter for the terminal connection (cable and adapter are not provided).



**Note**

Use a ballpoint pen tip or other small, pointed object to access the CONSOLE PORT MODE switch. The switch is shipped in the *in* position.

## Console Port Mode 1 Signaling and Pinouts

This section provides the signaling and pinouts for the console port in mode 1 (CONSOLE PORT MODE switch in the *in* position).

### DB-9 Adapter (for Connecting to a PC)

Use the RJ-45-to-RJ-45 rollover cable and RJ-45-to-DB-9 female DTE adapter (labeled “Terminal”) to connect the console port to a PC running terminal emulation software. [Table B-1](#) lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-9 female DTE adapter.

**Table B-1** Port Mode 1: Console Port Signaling and Pinouts (DB-9 Adapter)

Console Port	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-9 Terminal Adapter	Console Device
	RJ-45 Pin	RJ-45 Pin	DB-9 Pin	Signal
RTS	1 <sup>1</sup>	8	8	CTS
DTR	2	7	6	DSR
TxD	3	6	2	RxD
GND	4	5	5	GND
GND	5	4	5	GND
RxD	6	3	3	TxD
DSR	7	2	4	DTR
CTS	8 <sup>1</sup>	1	7	RTS

1. Pin 1 is connected internally to Pin 8.

## DB-25 Adapter (for Connecting to a Terminal)

Use the RJ-45-to-RJ-45 rollover cable and the RJ-45-to-DB-25 female DTE adapter (labeled “Terminal”) to connect the console port to a terminal. [Table B-2](#) lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-25 female DTE adapter.

**Table B-2** *Port Mode 1: Console Port Signaling and Pinouts (DB-25 Adapter)*

Console Port	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-25 Terminal Adapter	Console Device
	Signal	RJ-45 Pin	RJ-45 Pin	
RTS	1 <sup>1</sup>	8	5	CTS
DTR	2	7	6	DSR
TxD	3	6	3	RxD
GND	4	5	7	GND
GND	5	4	7	GND
RxD	6	3	2	TxD
DSR	7	3	20	DTR
CTS	8 <sup>1</sup>	1	4	RTS

1. Pin 1 is connected internally to Pin 8.

## Modem Adapter

Use the RJ-45-to-RJ-45 rollover cable and the RJ-45-to-DB-25 male DCE adapter (labeled “Modem”) to connect the console port to a modem. [Table B-3](#) lists the pinouts for the asynchronous serial auxiliary port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-25 male DCE adapter.

**Table B-3** *Port Mode 1: Console Port Signaling and Pinouts (Modem Adapter)*

Console Port	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-25 Modem Adapter	Modem
	Signal	RJ-45 Pin	RJ-45 Pin	
RTS	1 <sup>1</sup>	8	4	RTS
DTR	2	7	20	DTR
TxD	3	6	3	TxD
GND	4	5	7	GND
GND	5	4	7	GND
RxD	6	3	2	RxD
DSR	7	3	8	DCD
CTS	8 <sup>1</sup>	1	5	CTS

1. Pin 1 is connected internally to Pin 8.

## Console Port Mode 2 Signaling and Pinouts

This section provides the signaling and pinouts for the console port in mode 2 (CONSOLE PORT MODE switch in the *out* position). See [Table B-4](#) for the pinouts.

**Table B-4** Console Port Pinouts (Port Mode Switch Out)

Console Port	Console Device
Pin (signal)	Input/Output
1 (RTS) <sup>1</sup>	Output
2 (DTR)	Output
3 (RxD)	Input
4 (GND)	GND
5 (GND)	GND
6 (TxD)	Output
7 (DSR)	Input
8 (CTS) <sup>1</sup>	Input

1. Pin 1 is connected internally to Pin 8.

## Uplink Ports

The Supervisor Engine 2, Supervisor Engine 32, Supervisor Engine 32 PISA, the Supervisor Engine 720, Supervisor Engine 720-10GE, and the Supervisor Engine 2T all have Ethernet uplink ports available on the front panel. These Ethernet ports can be used to provide additional port capacity for a fully configured switch or can reduce the need to use a chassis slot for a Gigabit Ethernet module or 10-Gigabit Ethernet module where only a few Gigabit or 10-Gigabit Ethernet ports are required. [Table B-5](#) lists the supervisor engine model and the number and type of uplink ports available.

**Table B-5** Supervisor Engine Uplink Ports

Supervisor Engine	Number of Uplink Ports	Type of Uplink Port
Supervisor Engine 2	2	Two 1000BASE-X ports (The two ports require GBIC transceivers.)
Supervisor Engine 32 (WS-SUP32-GE-3B and WS-SUP32P-GE)	9	<ul style="list-style-type: none"> <li>Eight 1000BASE-X ports (The eight ports require SFP transceivers.)</li> <li>One 10/100/1000 RJ-45 port (The port does not require a pluggable transceiver.)</li> </ul>
Supervisor Engine 32 (WS-SUP32-10GE-3B and WS-SUP32P-10GE)	3	<ul style="list-style-type: none"> <li>Two 10-GBASE-X (The two ports require XENPAK transceivers)</li> <li>One 10/100/1000 RJ-45 port (The port does not require a pluggable transceiver)</li> </ul>

**Table B-5** Supervisor Engine Uplink Ports (continued)

Supervisor Engine	Number of Uplink Ports	Type of Uplink Port
Supervisor Engine 720	3	<ul style="list-style-type: none"> <li>Two 1000BASE-X ports (The two ports require SFP transceivers)</li> <li>One 10/100/1000 RJ-45 port (The port does not require a pluggable transceiver)</li> </ul> <p><b>Note</b> Only two uplink ports can be used at one time.</p>
Supervisor Engine 720-10GE	5	<ul style="list-style-type: none"> <li>Two 10-GBASE-X ports (The ports require X2 transceivers)</li> <li>Two 1000BASE-X ports (The ports require SFP transceivers)</li> <li>One 10/100/1000 RJ-45 port (The port does not require a pluggable transceiver)</li> </ul>
Supervisor Engine 2T	5	<ul style="list-style-type: none"> <li>Three 1000BASE-X ports (The ports require SFP transceivers)</li> <li>Two 10-GBASE-X ports (The ports require X2 transceivers)</li> </ul>

Three types of XENPAK and X2 transceivers have cabling guidelines. The transceivers types and their guidelines are listed in [Table B-6](#).

**Table B-6** Cabling Guidelines for Transceivers

Transceiver Type	Cabling Guideline
LX4 (XENPAK-10GB-LX4 and X2-10GB-LX4)	<p>The Cisco LX4 transceiver supports link lengths of 300 meters on standard FDDI grade MMF. To ensure that specifications are met, the transmitter output should be coupled through a mode conditioning patch cord. Cisco offers two mode conditioning patch cords:</p> <ul style="list-style-type: none"> <li>CAB-GELX-625=—Mode-conditioning patch cable supporting 62.5 micron fiber with dual SC connectors.</li> <li>CAB-MCP50-SC=—Mode-conditioning patch cable supporting 50 micron fiber with dual SC connectors.</li> </ul>

**Table B-6** Cabling Guidelines for Transceivers (continued)

Transceiver Type	Cabling Guideline
CX4 (XENPAK10GB-CX4 and X2-10GB-CX4)	The Cisco CX4 transceiver supports link lengths of up to 49.2 feet (15 m) on CX4 cable. Cisco offers four CX4 cables: <ul style="list-style-type: none"> <li>• CAB-INF-28G-1= (1 meter cable)</li> <li>• CAB-INF-28G-5= (5 meter cable)</li> <li>• CAB-INF-28G-10= (10 meter cable)</li> <li>• CAB-INF-28G-15= (15 meter cable)</li> </ul>
LRM (XENPAK-10GB-LRM and X2-10GB-LRM)	The Cisco LRM transceiver supports link lengths of 220 meters on standard Fiber Distributed Data Interface (FDDI) grade multimode fiber (MMF). To ensure that specifications are met over FDDI-grade, OM1 and OM2 fibers, the transmitter should be coupled through a mode-conditioning patch cord. Cisco offers two mode-conditioning patch cords: <ul style="list-style-type: none"> <li>• CAB-GELX-625= —Mode-conditioning patch cable (62.5 microns) with dual SC connectors.</li> <li>• CAB-MCP50-SC= —Mode-conditioning patch cable (50 microns) with dual SC connectors. No mode-conditioning patch cord is required for applications over OM3 fiber cable.</li> </ul>

## USB Ports

Supervisor Engine 32, Supervisor Engine 32 PISA, Supervisor Engine 720-10GE, and Supervisor Engine 2T have two USB ports located on front panel. One port is designated for host use and the other as a device port. A host USB port can be used to plug in devices such as a PC, while device ports can be used for attaching Flash Memory Key devices.



### Note

Currently the two USB ports are not enabled on the Supervisor Engine 32, Supervisor Engine 32 PISA, and Supervisor Engine 720-10GE. The 5-pin USB port on the Supervisor Engine 2T is enabled. The second USB connector is not currently enabled.

## Copper and Fiber-Optic Connectors

This section describes the types of copper and fiber-optic connectors that are used with the supervisor engines.

### RJ-45 Connector

The RJ-45 connector (see [Figure B-2](#)) is used to connect a Category 3, Category 5, Category 5e, Category 6, or Category 6a FTP or UTP cable from the modem or terminal to the supervisor engine console port, or the network to a copper uplink port if the uplink port has a 1000BASE-T copper transceiver installed in it.

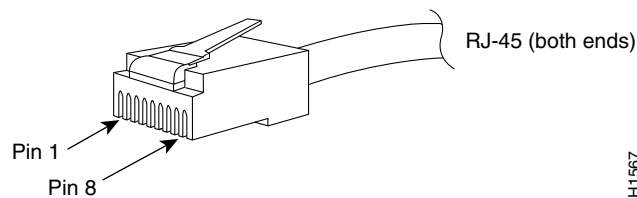
**Caution**

Category 5e, Category 6, and Category 6a cables can store high levels of static electricity because of the dielectric properties of the materials used in their construction. Always ground the cables (especially in new cable runs) to a suitable and safe earth ground before connecting them to the module.

**Caution**

To comply with GR-1089 intrabuilding, lightning-immunity requirements, you must use foil-twisted pair (FTP) cable that is properly grounded at both ends.

**Figure B-2 RJ-45 Interface Cable Connector**



## Fiber-Optic Connectors

This section describes the SC and LC fiber-optic connectors used by the optical transceivers.

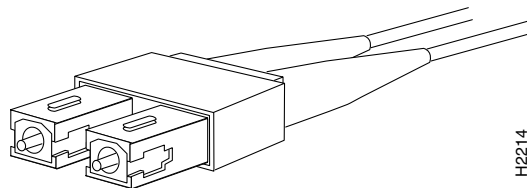
### SC Connectors

**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

The SC connector is used to connect fiber-optic module ports with the external network. (See [Figure B-3](#).)

**Figure B-3 SC Optical Connector**



Always make sure that you insert the connector completely into the socket. This action is especially important when you are making a connection between a module and a long distance (1.24 miles [2 kilometers]) or a suspected highly attenuated network. If the link LED does not light, try removing the network cable plug and reinserting it firmly into the module socket. It is possible that enough dirt or skin oils have accumulated on the plug faceplate (around the optical-fiber openings) to generate significant attenuation, reducing the optical power levels below threshold levels so that a link cannot be made.



**Caution**

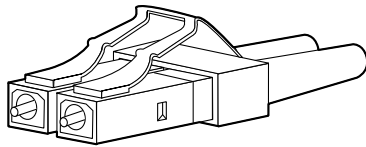
Use extreme care when removing or installing connectors so that you do not damage the connector housing or scratch the end-face surface of the fiber. Always install protective covers on unused or disconnected components to prevent contamination. Always clean fiber connectors before installing them.

When you disconnect the fiber-optic cable from the module, grip the body of the connector. Do not grip the connector jacket-sleeve. Gripping the sleeve can, over time, compromise the integrity of the fiber-optic cable termination in the SC connector.

**LC Connectors**

Small form-factor pluggable (SFP) transceiver modules used on the Supervisor Engine 720 and Supervisor Engine 2T uplink ports use LC connectors shown in [Figure B-4](#).

**Figure B-4 LC Fiber-Optic Connector**

**Caution**

Use extreme care when removing or installing connectors so that you do not damage the connector housing or scratch the end-face surface of the fiber. Always install protective covers on unused or disconnected components to prevent contamination. Always clean fiber connectors before installing them.

When you disconnect the fiber-optic cable from the module, grip the body of the connector. Do not grip the connector jacket-sleeve. Gripping the sleeve can, over time, compromise the integrity of the fiber-optic cable termination in the LC connector.

**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, follow these steps:

