

Cabling Instructions

This chapter describes the procedures to make all external cable connections to the Catalyst 5000 series switch at your site. It includes the procedures for connecting a redundant AC-input power supply and applying power to the Catalyst 5000 series switch.

Connecting Interface Cables

This section describes the basic network connections—Ethernet, FDDI, CDDI, and ATM—that you will make to the switch. Using the Port Configuration Worksheet will help you to make connections and later configure each interface without having to access the rear of the chassis to check port addresses. See the section “Using the Port Configuration Worksheets” in the appendix “Configuration Worksheets.”

External Cabling Guidelines

The following guidelines will assist you in properly connecting the external network cables to your switch.

- Make certain that you connect the correct interface types.
- Avoid crossing high-power cables with interface cables.

Crossing high-power cables with interface cables can cause interference in some interface types. It will not always be possible to avoid this, but try to prevent it whenever possible.

Connecting Interface Cables

- Do not defeat cable strain-relief systems.

Most interfaces provide some type of strain relief to prevent the cables from being accidentally disconnected. Among these types of strain relief are the slide fasteners on Ethernet cables, the cable retention clip on the power supply cord, and the screw-type fasteners on serial cables. Use all strain-relief devices provided to prevent potential problems caused by inadvertent cable disconnection.

- Verify proper interface cabling before starting the system.

Before applying power to the system, prevent unnecessary problems or component damage by double-checking your cabling.

- Verify all cabling limitations before applying power to the system.

When setting up your system, you must consider a number of factors related to the cabling required for your connections. For example, when using EIA/TIA-232 connections, be aware of the distance and EMI limitations. For cabling distances and other requirements, refer to the section “Setting Up the Site” in the chapter “Installation Overview.”

- Check the power cord and power supply for compatibility with your power service.

Check the labels on the equipment and ensure that the power service at your site is suitable for the chassis you are connecting. If you are not sure, refer to the section “Setting Up the Site” in the chapter “Installation Overview.”



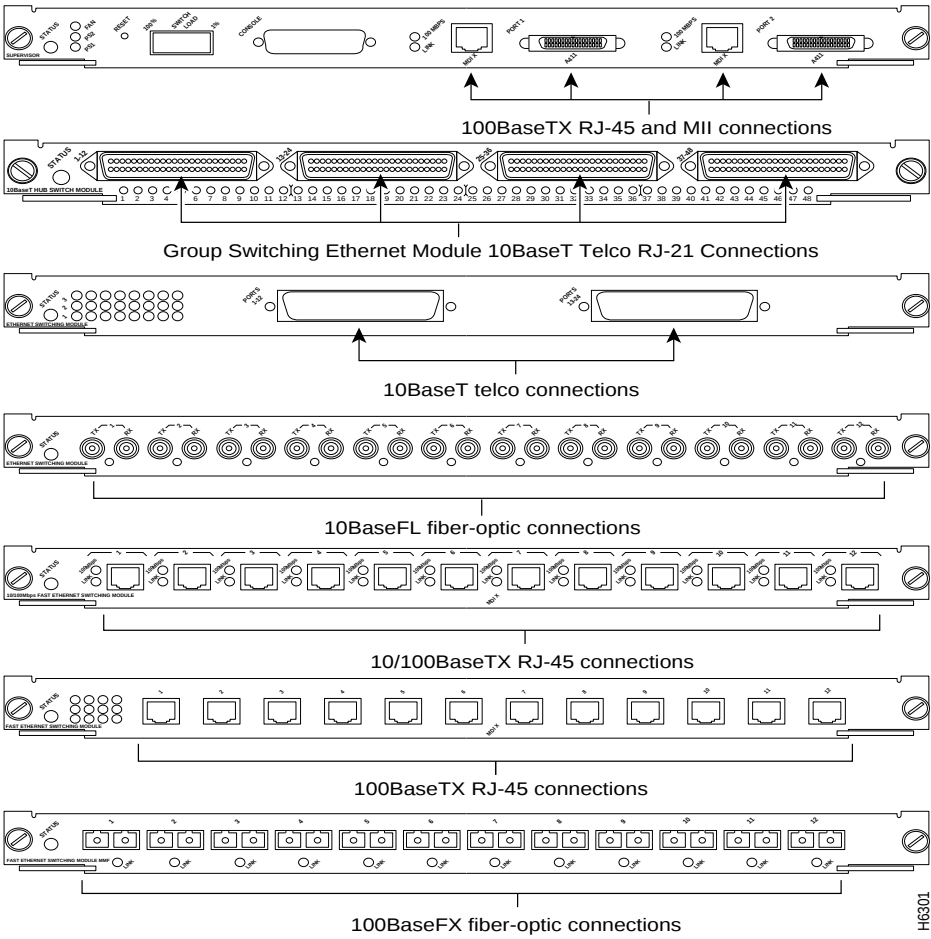
Warning A voltage mismatch can cause equipment damage and may pose a fire hazard. If the voltage indicated on the label is different from the power outlet voltage, *do not connect the chassis to that receptacle*. To see translated versions of this warning, refer to the appendix “Translated Safety Warnings.”

Note After installing all the rear panel cables and powering up the system, refer to the publication *Catalyst 5000 Series Configuration Guide and Command Reference*.

The sections that follow provide illustrations of the connections between the switch interface ports and your network(s). Interface cables and equipment, such as Ethernet transceivers and interface cables, should already be available and in place. If they are not, refer to the following section “Viewing Module Connections” for descriptions of the equipment you need for each interface type to complete the connection to your network.



Figure 4-2 Module Port Connections

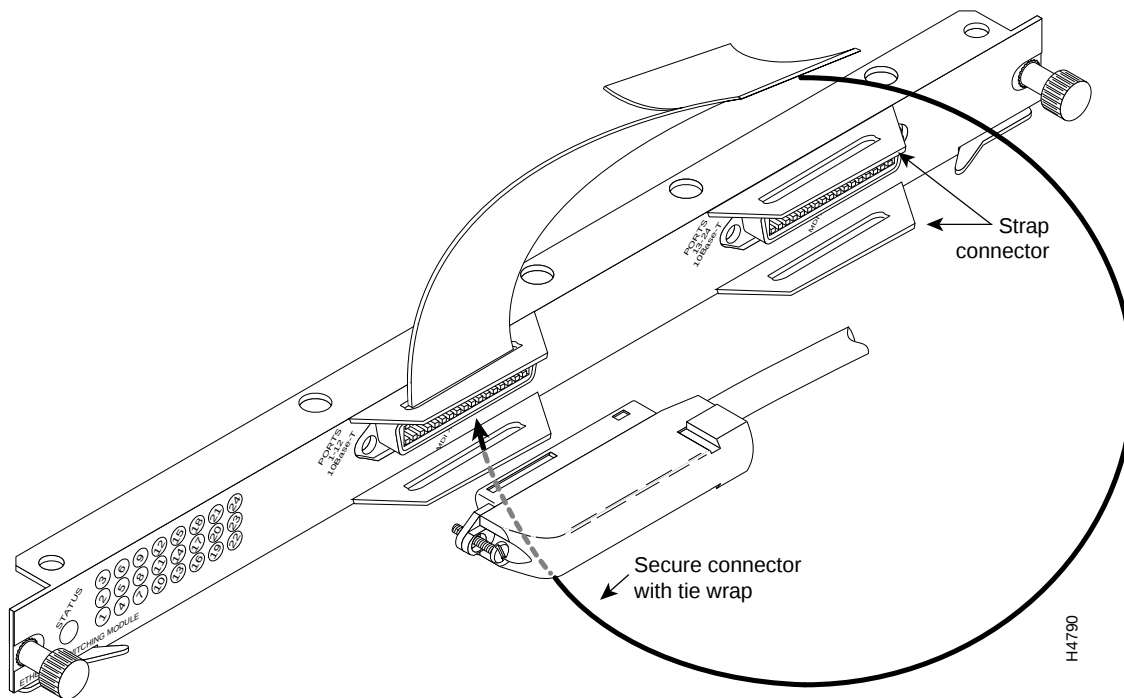


Using Ethernet Connections

On each 10BaseT, 100BaseTX, or 10/100BaseTX switching module port, attach the cable connector and secure the cable in the port, and for the side connector use a tie wrap to provide strain relief. Most Ethernet connections do not require a transceiver on the interface cable. 100BaseTX Fast Ethernet connections to the MII connector on the supervisor engine module require a Fast Ethernet transceiver.

To complete the 10BaseT port connection, tighten the screws and secure the Ethernet RJ-21 Telco interface 90 degree connector with a tie wrap as shown in Figure 4-3 and Figure 4-4. Figure 4-5 and Figure 4-6 show the connector placement for the Group Switching Ethernet module Telco cable.

Figure 4-3 Securing the Ethernet Switching Module (10BaseT 24 Port) Tie Wrap



Connecting Interface Cables

Figure 4-4 Ethernet Switching Module (10BaseT 24 Port) Telco Cable Attachment

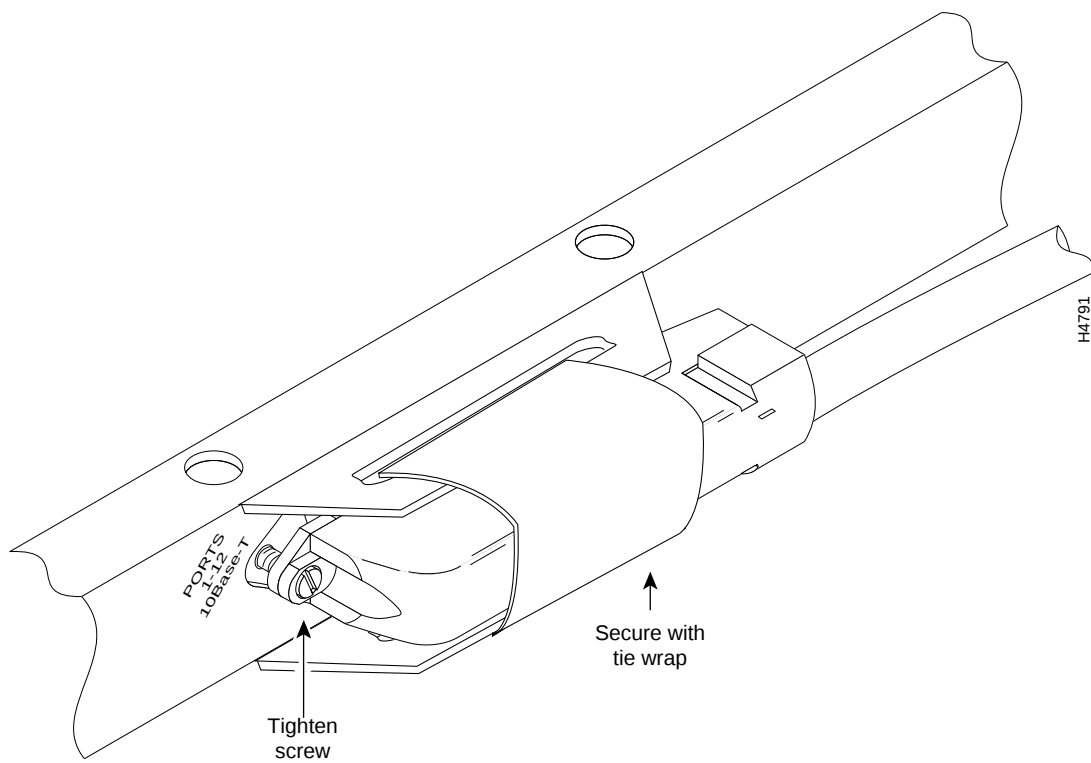


Figure 4-5 Group Switching Ethernet Module (10BaseT 48Port) Connector Placement

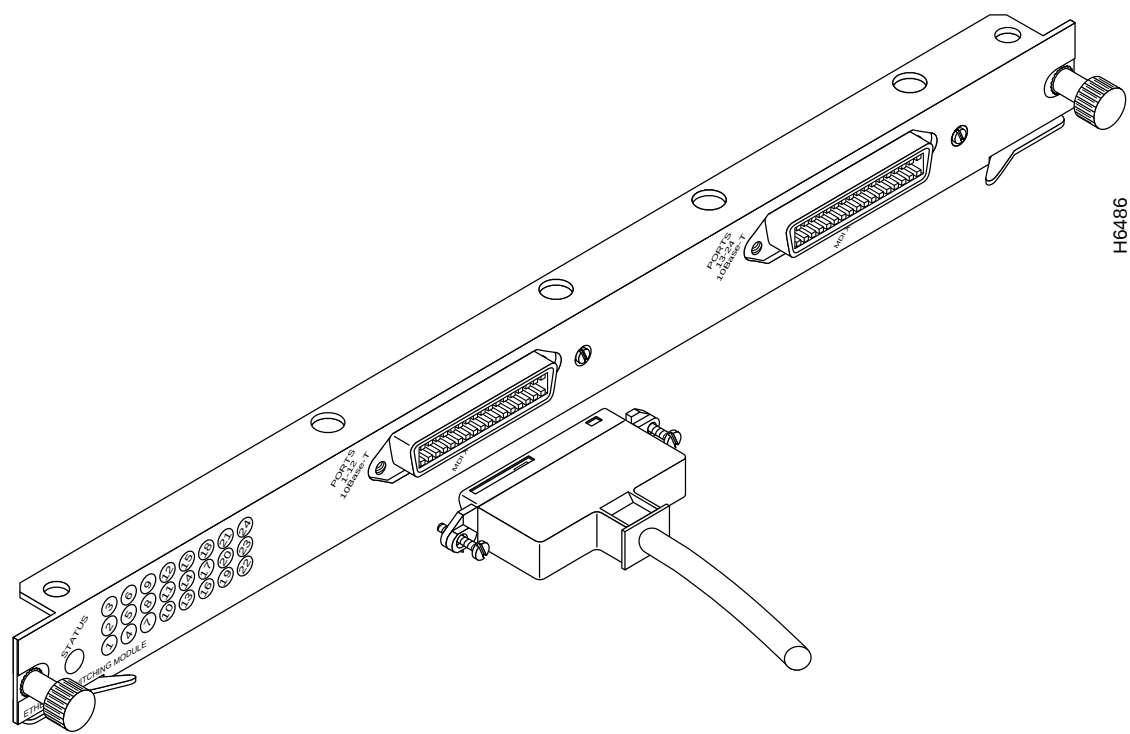
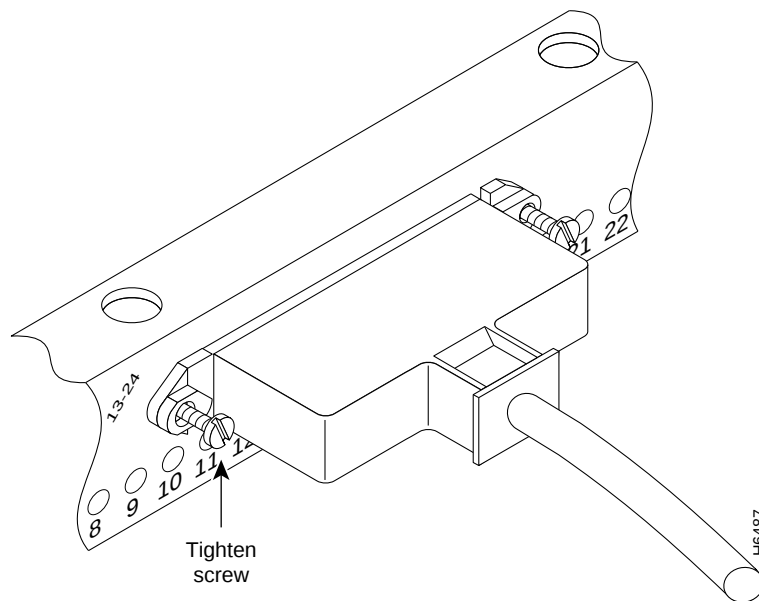


Figure 4-6 **Group Switching Ethernet Module (10BaseT 48 Port) Telco Cable Attachment**



Making ATM Connections

All ATM interfaces are full duplex. You must use the appropriate ATM interface cable to connect the ATM LAN emulation module with an external ATM network.

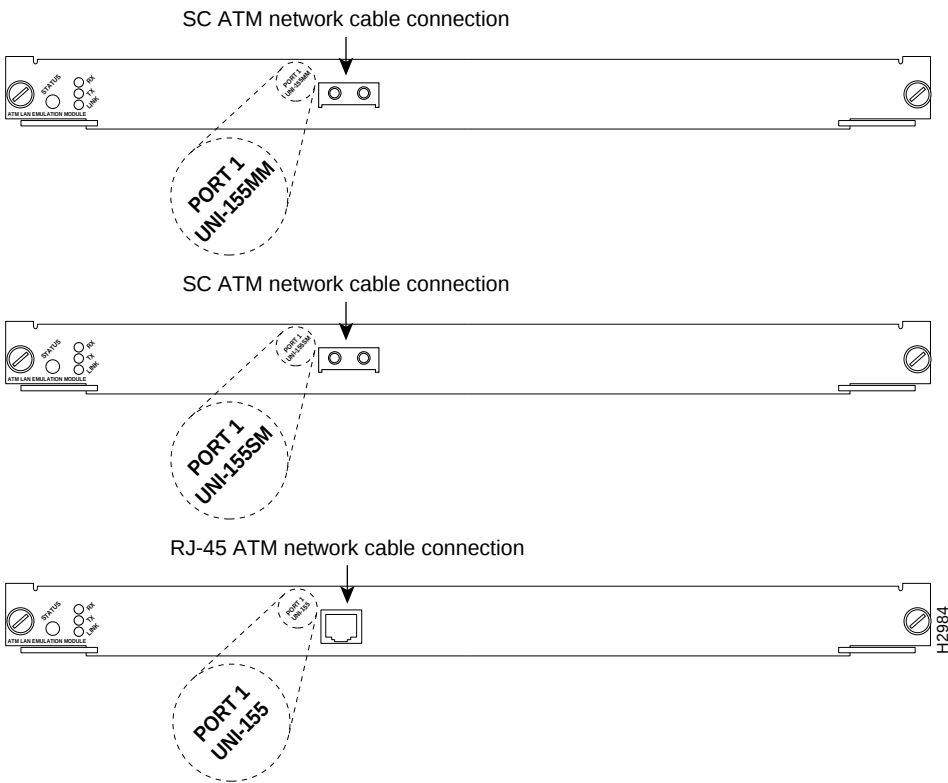
The ATM LAN emulation module provides an interface to ATM switching fabrics for transmitting and receiving data at up to 155 Mbps bidirectionally; the actual data rate is determined by the physical layer interface module (PLIM).

The ATM LAN emulation module can support interfaces that connect to the following physical layers:

- SONET 155-Mbps multimode fiber-optic—STS-3C or STM-1
- SONET 155-Mbps single-mode fiber-optic—STS-3C or STM-1

Connect the ATM interface cables as shown in Figure 4-7. For detailed descriptions of ATM cabling requirements, refer to the section “Limiting Connection Distances” and the section “Making ATM Connections” in the chapter “Installation Overview.”

Figure 4-7 ATM Connections



Using FDDI/CDDI Connections

The FDDI/CDDI UTP and fiber-optic cables connect directly to the CDDI or FDDI module ports. CDDI and FDDI use one integrated transmit/receive cable for each physical interface (one for PHY A and one for PHY B). You will need one CDDI or FDDI cable for a single attachment connection, and two cables for a dual attachment connection. Figure 4-10 and Figure 4-11 show dual attachment connections that use both fiber and copper (UTP) and illustrate the types of connections used for CDDI and FDDI. For cable and connector descriptions, refer to the section “Setting Up CDDI/FDDI Connection Equipment” in the chapter “Installation Overview.”

Note Each station in a ring refers to its neighbor stations as *upstream* or *downstream* neighbors. The *stream* is based on the signal flow on the primary ring. A station receives the primary signal from its upstream neighbor and transmits the primary signal to its downstream neighbor.

This section also provides instructions for connecting an optical bypass switch to a dual attachment FDDI network connection. Because the method of connecting optical bypass switches varies with different manufacturer’s models, refer to the documentation for your particular bypass switch for correct connection instructions. If you are installing an optical bypass switch, proceed to the section “Installing an Optical Bypass Switch” later in this chapter.

Making Single Attachment Connections

The CDDI and FDDI modules that are connected as a single attachment station (SAS) are typically connected to the ring through a concentrator. The CDDI and FDDI modules receive and transmit the signal through the same physical interface, usually PHY A. Depending on whether you are connecting to a CDDI network or single-mode or multimode FDDI fiber network, connect the CDDI or FDDI modules as follows:

- **Single-mode**—Connect one single-mode interface cable to the PHY A transmit port and one to the PHY A receive port. (See Figure 4-8 and Figure 4-9.) Connect the opposite end of each cable to the concentrator transmit and receive ports as specified by the concentrator manufacturer.

- **Multimode**—Connect the multimode interface cable between one of the M ports on the concentrator and the PHY A port on the FDDI module. (See Figure 4-8 and Figure 4-9.) Be sure to observe and match the port labels on the media interface connector (MIC) and the CDDI and FDDI module ports; connect receive on the cable to PHY A receive. Follow the concentrator manufacturer's instructions for connecting the opposite end of the cable.

If you are connecting other CDDI or FDDI modules as dual attachment stations (DASs), proceed to the section “Making Dual Attachment Connections.”

Figure 4-8 Single Attachment Station, Multimode FDDI Network Connections

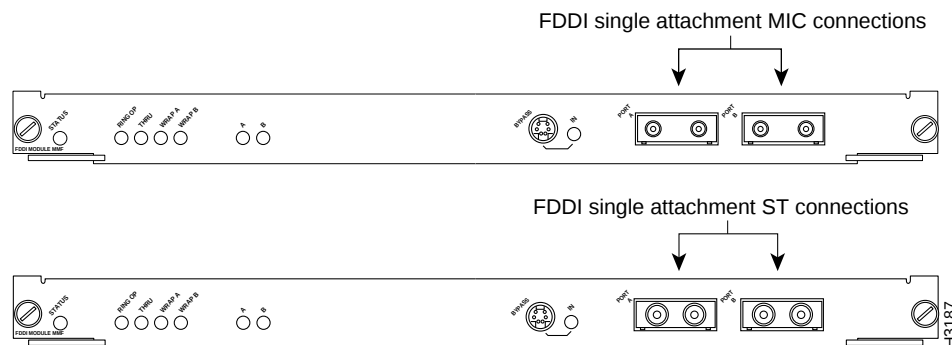


Figure 4-9 Single Attachment Station, CDDI Network Connections



Connecting Interface Cables

Making Dual Attachment Connections

CDDI and FDDI modules that are connected as DAS connect to both the primary and secondary rings. The signal for each ring is received on one physical interface (PHY A or PHY B) and transmitted from the other. The standard connection scheme (see Figure 4-10 and Figure 4-11) for a DAS dictates that the primary ring signal comes into the CDDI or FDDI module on the PHY A receive port and returns to the primary ring from the PHY B transmit port. The secondary ring signal comes into the CDDI or FDDI module on the PHY B receive port and returns to the secondary ring from the PHY A transmit port. Failure to observe this relationship will prevent the CDDI or FDDI interface from initializing. Figure 4-10 and Figure 4-11 show the CDDI and FDDI connections for dual attachment and both multimode and single-mode fiber.

Connect the CDDI or FDDI module as follows. Each of the integrated transmit/receive multimode interface cables attaches to both the primary and secondary ring; each one receives the signal from one ring and transmits to the other ring. (See Figure 4-10 and Figure 4-11.)

Figure 4-10 FDDI Module Dual Attachment Network Connections

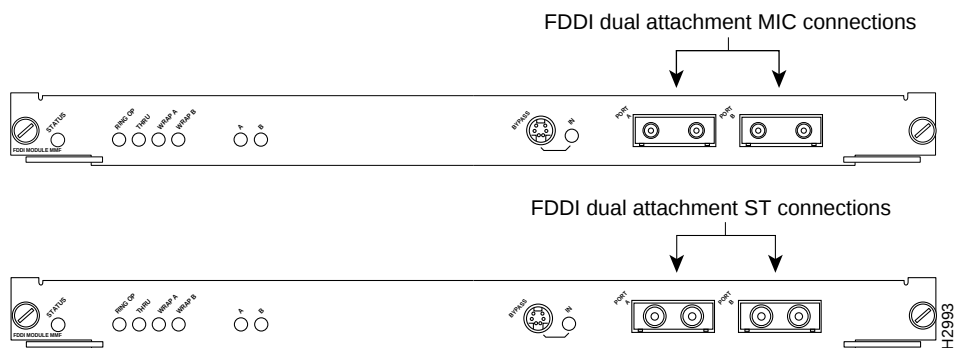
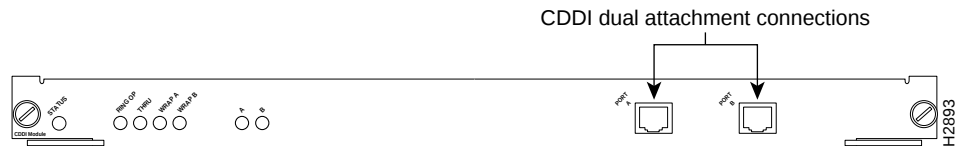


Figure 4-11 CDDI Module Dual Attachment Network Connections



To help avoid confusion, use the receive label on the cable connector as a key and connect the cables to the FDDI module ports as follows:

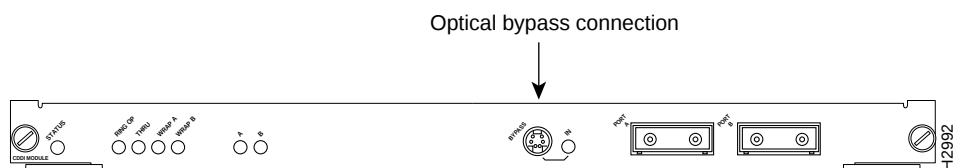
- Connect the cable coming in from the primary ring to the PHY A receive port. This also connects the signal going out to the secondary ring to the PHY A transmit port.
- Connect the cable coming in from the secondary ring to the PHY B receive port. This also connects the signal going out to the primary ring to the PHY B transmit port.

If you are connecting an optical bypass switch, proceed to the next section “Installing an Optical Bypass Switch.”

Installing an Optical Bypass Switch

An optical bypass switch is a device installed between the ring and the station that provides additional fault tolerance to the network. If an FDDI module that is connected to a bypass switch fails or shuts down, the bypass switch activates automatically and allows the light signal to pass directly through it, bypassing the FDDI module completely. A port for connecting an optical bypass switch is provided on the multimode/multimode FDDI module only. (See Figure 4-12.)

Figure 4-12 FDDI Module Connection with Optical Bypass



Connecting Interface Cables

The optical bypass control port on the FDDI module is a six-pin mini-DIN receptacle. Some optical bypass switches use DIN connectors, and some use a mini-DIN.

Following are general instructions for connecting an optical bypass switch to the FDDI module; however, your particular bypass switch may require a different connection scheme. Use these steps as a general guideline, but refer to the instructions provided by the manufacturer of the switch for specific connection requirements.

- Step 1** Connect the bypass switch to the ring. Unless the documentation that accompanies the bypass switch instructs otherwise, observe the same guidelines for connecting the A/B ports on the bypass switch that you would to connect the ring directly to the FDDI module ports.
- Step 2** Use the Receive label on the cable MIC connectors as a key and connect the cables to the network (ring) side of the bypass switch as follows:
- Connect the cable coming in from the primary ring (*from* PHY B at the preceding station) to the PHY A receive port on the network (ring) side of the bypass switch. This also connects the signal going out to the secondary ring to the PHY A transmit port.
 - Connect the cable coming in from the secondary ring (*from* PHY A at the preceding station) to the PHY B receive port on the network (ring) side of the bypass switch. This also connects the signal going out to the primary ring to the PHY B transmit port.
- Step 3** Connect the bypass switch to the FDDI module. Unless the documentation that accompanies the bypass switch instructs otherwise, consider the bypass an extension of the FDDI module ports and connect A to A and B to B. The network cables are already connected to the bypass switch following the standard B-to-A/A-to-B scheme.
- Step 4** Connect an interface cable between the PHY A port on the station (FDDI module) side of the bypass switch and the FDDI module PHY A port.
- Step 5** Connect an interface cable between the PHY B port on the station (FDDI module) side of the bypass switch and the FDDI module PHY B port.
- Step 6** Connect the bypass switch control cable. If the control cable on your optical bypass switch uses a mini-DIN connector, connect the cable directly to the mini-DIN optical bypass port on the FDDI module. Connect the mini-DIN end of the adapter cable to the mini-DIN optical bypass port on the FDDI module.

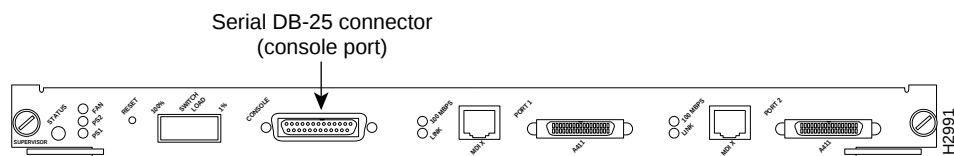
Using Serial Connections and a Console Terminal

The supervisor engine module console port is a DCE DB-25 receptacle, which supports a DCE EIA/TIA-232 interface type and mode. For descriptions and illustrations of each connector type, refer to the section “Configuring EIA/TIA-232 Connections” in the chapter “Installation Overview.” For cable pinouts, refer to the appendix “Cabling Specifications.”

When connecting a serial device, consider the cable as an extension of the switch for an external connection; therefore, use null-modem cable to connect the switch to a remote DCE device such as a modem or data service unit (DSU), and use a straight-through cable to connect the switch to a DTE device such as a terminal or PC.

Use the console port to connect a data terminal, which you will need to configure and communicate with your system. The port is located on the supervisor engine module faceplate and is labelled CONSOLE, as shown in Figure 4-13.

Figure 4-13 Serial Port Adapter Cable (Console Port) Connections



Note The console port is an asynchronous serial port; any devices connected to this port must be capable of asynchronous transmission. (Asynchronous devices are the most common type of serial device; for example, most modems are asynchronous devices.)

Before connecting the console port, check your terminal’s documentation to determine the baud rate. The baud rate of the terminal must match the default baud rate (9600 baud) of the terminal you will be using. Set up the terminal as follows:

- 9600 baud
- 8 data bits

Connecting Power

- No parity
- 1 stop bit

After connecting a data terminal to the console port, follow the steps in the next section, “Connecting Power.”

Connecting Power

This section describes the procedures to apply power to the Catalyst 5000 series switch at your site. It includes instructions for connecting a redundant AC-input power supply.

Connect an AC-input power supply, as follows:

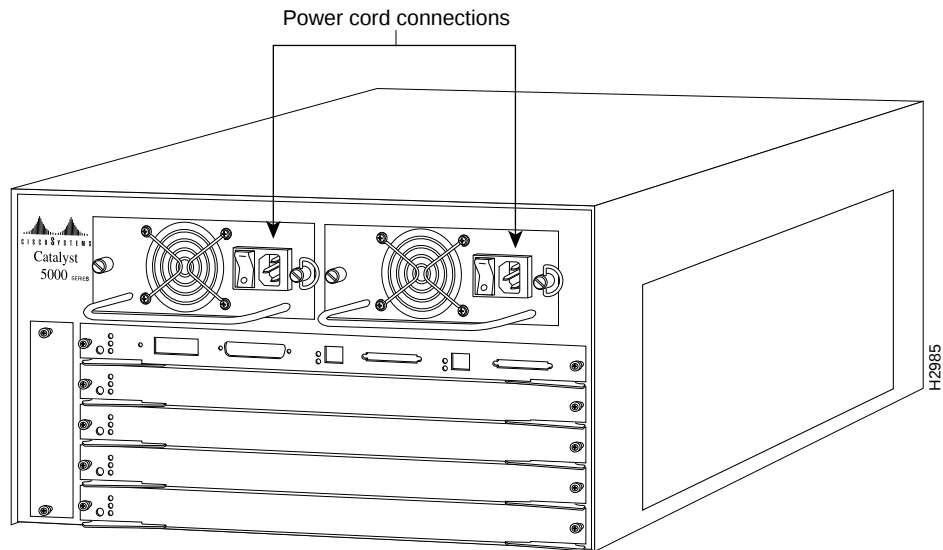
Step 1 Check the following components to make sure they are secure:

- Each switching module is inserted all the way into its slot, and all the captive installation screws are tightened.
- All interface cable connections are secured.
- Each power supply is inserted all the way into its bay, and the captive installation screw is tightened.
- All power-supply cables are securely connected to the power supply.

Step 2 On one power supply, plug in the power cord.

Step 3 Connect the power supply cord to a separate input line (see Figure 4-14).

Figure 4-14 Power Cord Connections



- Step 4** Connect the redundant power supply fully installed in the Catalyst 5000 chassis to a separate input line by plugging in the power cord on the redundant power supply.
- Step 5** Connect the other end of the redundant power supply cord to a separate input line than the initial power supply (see Figure 4-14).

Starting the System

When all interfaces are connected, perform a final check of all connections, then take the following steps to check the components and power up the system:

- Step 1** Check the following components to make sure they are secure:
- Each switching module is inserted all the way into its slot, and all the captive installation screws are tightened.
 - All interface cable connections are secured.

Starting the System

- Each power supply is inserted all the way into its bay, and the captive installation screw is tightened.
 - All power-supply cables are securely connected to the power supply.
- Step 2** Check the external power connections; the power-supply switches should still be OFF:
- At the power source end of the power cable, make sure the connector is securely installed in a grounded outlet and that the source power is within the range labeled on the back of the switch.
 - When two supplies are present, make sure that the second cord is connected to a separate line from the first, if possible.
- Step 3** Check the console terminal and make sure it is ON.
- Step 4** Turn the power supply(ies) ON.
- Step 5** After both power supplies are switched ON, the PS1 and PS2 LEDs on the supervisor engine module faceplate will be green.
- Step 6** Listen for the system fan assembly and check the fan LED on the supervisor engine module. You should immediately hear it start operating.
- Step 7** While the system initializes, the status LED on the supervisor engine module is orange until the boot is complete. Refer to the chapter “Confirming the Installation” for troubleshooting procedures.

During the boot process, the status LED on all interfaces is orange. Some LEDs may go on and remain on or go out and go on again for a short time. Some LEDs, such as the link LED, will stay on during the entire boot process. If an interface is already configured, the LEDs may go on steadily as they detect traffic on the line. Wait until the system boot is complete before attempting to verify the switching module LED indications.

When the system boot is complete (it takes a few seconds), the supervisor engine module begins to initialize the switching modules. During this initialization, the LEDs on each switching module behave differently (most flash on and off). The status LED on each switching module goes on when initialization has been completed, and the console screen displays a script and system banner similar to the following:

```
ATE0
ATS0=1

Catalyst 5000 Power Up Diagnostics

Init NVRAM Log
LED Test
ROM CHKSUM
DUAL PORT RAM r/w
RAM r/w
RAM address test
Byte/Word Enable test
RAM r/w 55aa
RAM r/w aa55
EARL test

BOOTROM Version 1.4, Dated Dec  5 1995 16:49:40
BOOT date: 00/00/00 BOOT time: 03:18:57
SIMM RAM address test
SIMM Ram r/w 55aa
SIMM Ram r/w aa55
Start to Uncompress Image ...
IP address for Catalyst not configured
BOOTP will commence after the ports are online
Ports are coming online ...
Cisco Systems Console
```


Step 9 To add password protection, refer to the section “Default Configuration” in the chapter “Configuring the Software.”

Note If the system does not complete this process, proceed to the chapter “Confirming the Installation” for troubleshooting procedures.

Many of the switching module LEDs will not go on until you have configured the interfaces. In order to verify correct operation of each interface, complete the first-time startup procedures and configuration, then refer to the LED descriptions in the chapter “Confirming the Installation” to check the status of the interfaces.

Your installation is now complete. Refer to the chapter “Configuring the Software” or refer to the publication *Catalyst 5000 Series Configuration Guide and Command Reference* for additional information if needed.

Starting the System
