

# Installation and Start-Up

---

This chapter provides installation warnings, guidelines, requirements, and package contents and the following procedures:

- Unpacking the switch
- Powering up the switch and running the power-on self-test (POST)
- Installing the switch on a tabletop or shelf, in a standard or telco rack, and on a wall
- Connecting to the console port
- Assigning IP information to the switch and displaying the web and menu consoles
- Connecting to the 10BaseT, 100BaseT, and AUI ports on the switch
- Avoiding potential problems with shielded twisted-pair cabling

# Warnings

Translated versions of the following safety warnings are provided in the “Translated Safety Warnings” appendix.



**Warning** Only trained and qualified personnel should be allowed to install or replace this equipment.



**Warning** Do not work on the system or connect or disconnect cables during periods of lightning activity.



**Warning Warning** Unplug the power cord before you work on a system that does not have an on/off switch.



**Warning** Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.



**Warning** Read the installation instructions before you connect the system to its power source.



**Warning** This product relies on the building’s installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).



**Warning** To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 113°F (45°C). To prevent airflow restriction, allow at least 3 inches (7.6 cm) of clearance around the ventilation openings.



**Warning** The device is designed to work with TN power systems.



**Warning** This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.



**Warning** When installing the unit, the ground connection must always be made first and disconnected last.



**Warning** Do not stack the chassis on any other equipment. If the chassis falls, it can cause severe bodily injury and equipment damage.



**Warning** Care must be given to connecting units to the supply circuit so that wiring is not overloaded.



**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.*



**Warning** Ultimate disposal of this product should be handled according to all national laws and regulations.

# Installation Guidelines and Requirements

When determining where to place the switch, ensure the following conditions are met:

- Cable distances from the switch to network equipment and workstations are within the limits described in the “Connectors and Cables” appendix.
- Operating environment is within the temperature, humidity, and altitude ranges listed in the “Technical Specifications” appendix.

If the switch is installed in a closed or multirack assembly, the temperature might be greater than normal room temperature.

- Clearance to front and rear panels is such that:
  - Front-panel indicators can be easily read.
  - Access to the front- and rear-panel ports and receptacles is sufficient for connecting cables.
  - Rear-panel power connector is within reach of an AC power receptacle.
- Airflow around the switch and through the vents is unrestricted.
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures.

## Unpacking the Switch

Follow these steps to unpack the switch:

- Step 1** Open the shipping container and carefully remove the contents.
- Step 2** Return all packing materials to the shipping container and save it.
- Step 3** Ensure that all items listed in the “Package Contents” section on page 2-5 are included in the shipment. Check each item for damage.

## Package Contents

Each switch is shipped with the following items:

- Four rubber feet for installing the switch on a table or shelf
- Two mounting brackets
- Four Phillips flat-head screws and four Phillips truss-head screws for attaching the mounting brackets to the switch
- Four Phillips machine screws for attaching the mounting brackets to a rack
- One cable guide and one black Phillips machine screw for attaching the cable guide to one of the mounting brackets
- AC power cord
- RJ-45-to-RJ-45 rollover cable and the following adapters:
  - 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)
- One DOS diskette, containing the switch firmware and device-specific MIBs
- *Catalyst 1900 Series Cabling and Setup Quick Start*
- This *Catalyst 1900 Series Installation and Configuration Guide*
- Cisco Documentation CD-ROM
- Cisco Information Packet, containing warranty, safety, and support information
- Cisco Product Registration Card

---

**Note** If any item is damaged or missing, notify your authorized Cisco sales representative.

---

## Powering Up the Switch and Running the Power-On Self-Test

Attach the AC power cord to the switch. If your configuration has an RPS, see the RPS documentation.

The switch begins the power-on self-test (POST) after power up. POST consists of the 13 individual tests listed in Table 6-1. The port status LEDs show which test the switch is executing. As each test executes, a port status LED turns off. For example, if the LED for port 4x is off, the console port test (test 4) is being executed. On a switch with 24 10BaseT ports, the port status LED for port 16x turns off first, followed by ports 12x, 11x, 10x, and so on. The LEDs for ports 15x, 14x, 13x are not used during POST. On a switch with 12 10BaseT ports, the port status LED for port Ax (or port A) turns off first, followed by ports 12x, 11x, 10x, and so on. The port status LED for port Bx is not used during POST.

When POST completes, the following conditions can exist (if other devices are not connected to the switch):

- All POST tests passed—If the SYSTEM LED is green and all of the port status LEDs are off, no problems were detected. The switch is fully operational.

---

**Note** After POST completes (and if there are devices connected to the switch ports), Spanning-Tree Protocol (if enabled) immediately turns the port status LEDs amber. The forwarding state, even if the Port Fast mode is enabled, is delayed to allow the Spanning-Tree Protocol to discover the network topology and to ensure no temporary loops are formed. Spanning-tree discovery takes approximately 30 seconds to complete, and no packet forwarding takes place during this time. After the initial discovery, ports with Port Fast mode enabled go directly from the blocking state to the forwarding state.

---

- Nonfatal failure(s) detected—If the SYSTEM LED is amber and the switch is functional, POST detected one or more nonfatal failures. The switch is still operational and can forward packets, but it might not operate optimally. Refer to the POST failure message displayed on the Menu Console Logon Screen, identifying the nonfatal failure(s) detected.

- Fatal failure(s) detected—If the SYSTEM LED is amber and one or more of the port status LEDs are amber, POST detected one or more fatal failures. The switch is not operational and the menu console is not available, but the amber port status LED(s) indicate which test(s) failed.

You should inform your system administrator if one or more nonfatal failures are detected. Contact your Cisco sales representative if any fatal failures are detected.

The “Understanding POST Failures” section on page 6-2 provides additional information, including the possible causes of nonfatal and fatal failures.

## Installing the Switch on a Table or Shelf

To install the switch on a table or shelf, follow these steps:

- Step 1** Locate the adhesive strip with the rubber feet that shipped with the switch.
- Step 2** Attach the rubber feet to the round recesses on the bottom corners of the switch.
- Step 3** Place the switch on a table or shelf close to an AC power receptacle.
- Step 4** Attach the AC power cord to the switch. If your configuration has an RPS, see the RPS documentation.

After power is connected, the switch starts the series of self-tests described in the “Powering Up the Switch and Running the Power-On Self-Test” section on page 2-6.

## Installing the Switch in a Rack

This section describes how to install the switch in 19- and 24-inch standard and telco racks.

### Attaching the Brackets to the Switch

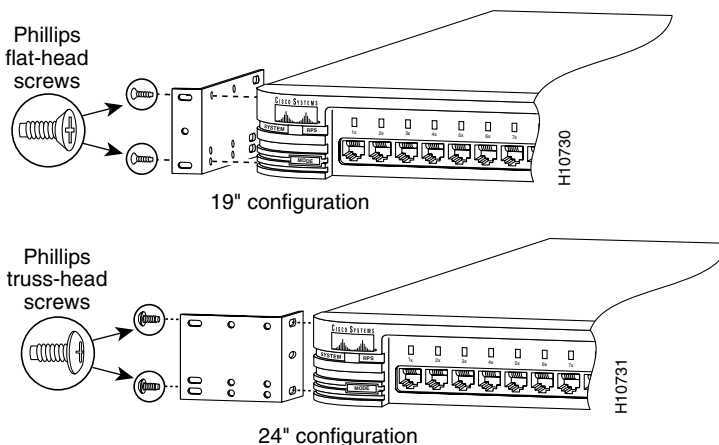
The bracket orientation and the screws you use depend on whether you plan to use a 19-inch or a 24-inch rack:

- For a 19-inch rack-mount, use the Phillips flat-head screws to attach the long side of the bracket to the switch.
- For a 24-inch rack-mount, use the Phillips truss-head screws to attach the short side of the bracket to the switch.

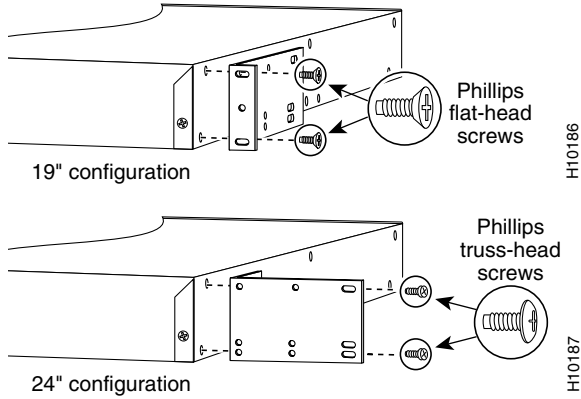
Place the switch on a level surface, and use two of the supplied Phillips flat-head or truss-head screws to attach a mounting bracket to each side of the switch.

Figure 2-1, Figure 2-2, and Figure 2-3 show how to attach one bracket to one side of the switch. Follow the same steps for the opposite side of the switch.

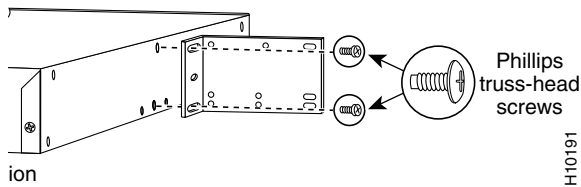
**Figure 2-1 Attaching Brackets for 19- and 24-inch Racks (Front Panel Forward)**



**Figure 2-2 Attaching Brackets for 19- and 24-inch Racks (Rear Panel Forward)**



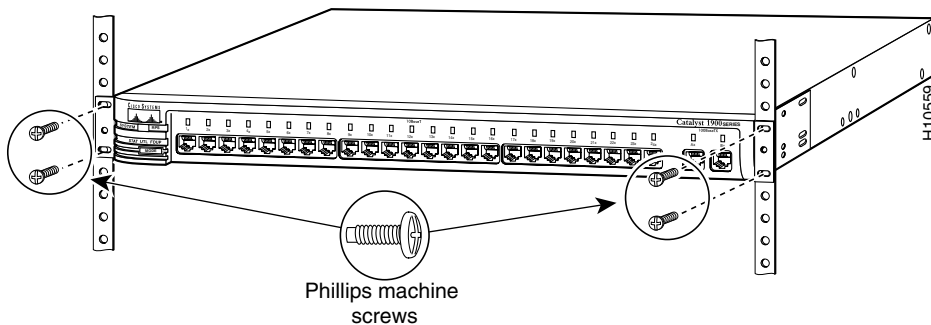
**Figure 2-3 Attaching Brackets for 19- and 24-inch Racks (Mid-Mount)**



## Attaching the Switch to the Rack

After the brackets are attached, use two of the Phillips machine screws to securely attach each bracket to the rack, as shown in Figure 2-4.

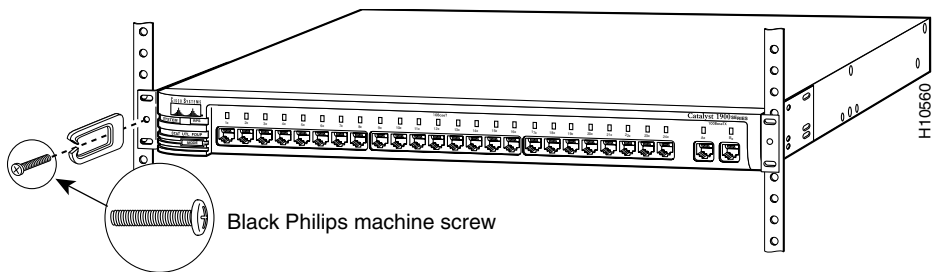
**Figure 2-4 Attaching the Switch to a Rack (Front Panel Forward)**



## Attaching the Cable Guide to the Bracket

Attaching the cable guide and securing the cables in the cable guide prevent the cables from obscuring the switch and other devices in the rack. If the switch is in a 19- or 24-inch rack, you can attach the cable guide to the left or right rack-mount bracket with the black screw, as shown in Figure 2-5.

**Figure 2-5 Attaching a Cable Guide**



After the switch is in the rack, attach the AC power cord to the switch. If your configuration has an RPS, see the RPS documentation.

After power is connected, the switch starts the series of self-tests described in the “Powering Up the Switch and Running the Power-On Self-Test” section on page 2-6.

## Installing the Switch on a Wall

This section describes how to attach the switch in parallel and vertically to a wall.

### Attaching the Brackets to the Switch

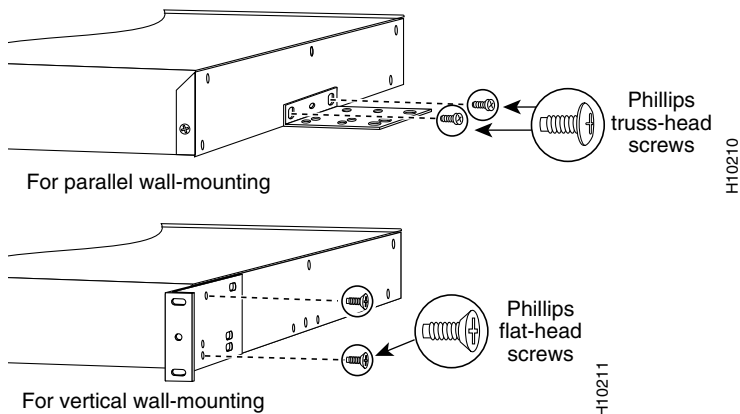
The bracket orientation depends on whether you plan to parallel or vertical wall-mount the switch:

- For a parallel wall-mount, use the Phillips truss-head screws to attach the short side of the bracket to the switch.
- For a vertical wall-mount, use the Phillips flat-head screws to attach the long side of the bracket to the switch.

Place the switch on a level surface, and use two of the Phillips truss-head or flat-head screws to attach a mounting bracket to each side of the switch.

Figure 2-6 shows how to attach one bracket to one side of the switch. Follow the same steps for the opposite side of the switch.

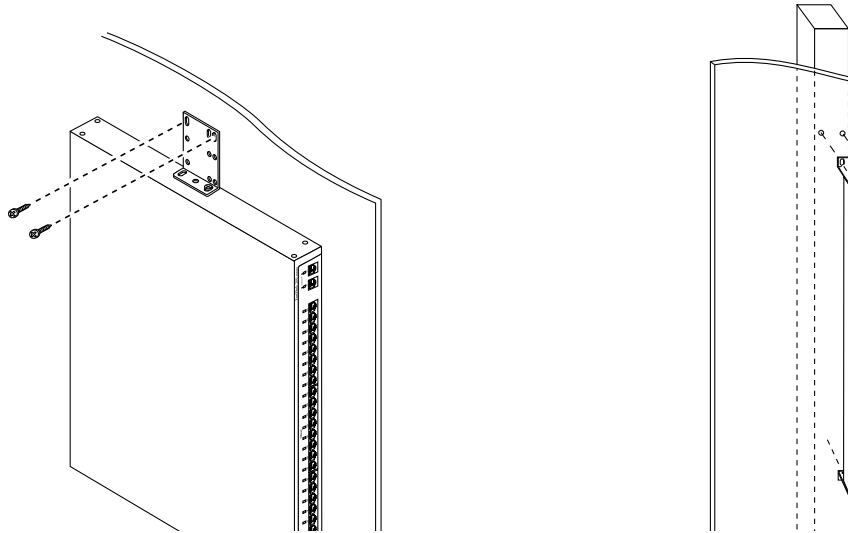
**Figure 2-6 Attaching Brackets for Parallel and Vertical Wall-Mounting**



## Attaching the Switch to a Wall

For the best support of the switch and cables, make sure the switch is securely attached to a wall stud or to a firmly attached plywood mounting backboard, as shown in Figure 2-7. You must supply your own screws to attach the switch to the wall.

**Figure 2-7 Attaching the Switch to the Wall**



After the switch is in the rack, attach the AC power cord to the switch. If your configuration has an RPS, see the RPS documentation.

After power is connected, the switch starts the series of self-tests described in the “Powering Up the Switch and Running the Power-On Self-Test” section on page 2-6.

# Connecting to the Console Port

To configure and monitor the switch through the menu console, use the RJ-45-to-RJ-45 rollover cable and the appropriate adapter (both supplied with the switch) to connect the RJ-45 console port to a management station or modem.

To connect to a management station or modem, follow these steps:

**Step 1** Configure the management station or modem to match the following default physical characteristics of the console port:

- 9600 baud
- Eight data bits
- One stop bit
- No parity
- No flow control

Although the Match Baud Rate option (autobaud) matches the baud rate of an incoming call, the switch uses its configured rate when dialing out. When a call is completed and the line disconnects, the switch always returns to its configured baud rate.

You can change the console port characteristics of the switch with the Console and Upgrade Configuration Page (see the “Console and Upgrade Configuration Page” section on page 4-29) or the RS-232 Port Configuration Menu (see the “RS-232 Interface Configuration Menu” section on page 5-56). If you are using Simple Network Management Protocol (SNMP), use the RS-232 MIB objects.

---

**Note** If you change any of the console port defaults, also change the configuration of the management station or modem.

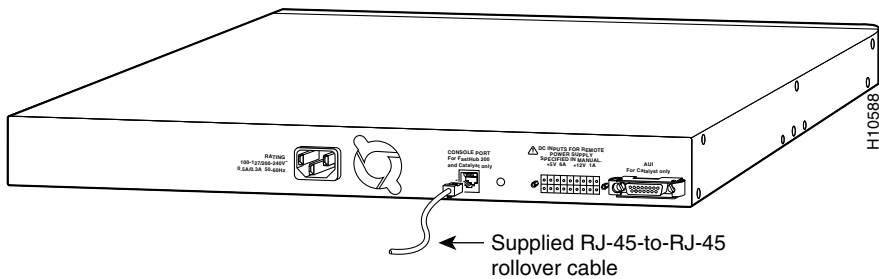
---

**Step 2** Connect one end of the supplied rollover cable to the console port, as shown in Figure 2-8.



**Caution** Do not connect an actual telephone line, a live ISDN line, or an Ethernet cable to this console port. Damage to the switch can result. Make sure you use the supplied RJ-45-to-RJ-45 rollover cable and adapters to connect the console port to the management station or modem.

**Figure 2-8** Connecting to the Console Port



## Connecting to the Console Port

---

**Step 3** Attach one of the following supplied adapters to a management station or modem:

- RJ-45-to-DB-9 female DTE adapter (labeled Terminal) to connect a PC
- RJ-45-to-DB-25 female DTE adapter (labeled Terminal) to connect a UNIX workstation

---

**Note** If you are connecting the switch to a Sun workstation (or to a management station with a female DB-25 serial connector), use a male-to-male gender changer to attach the supplied RJ-45-to-RJ-45 rollover cable and supplied RJ-45-to-DB-25 female DTE adapter to the management station.

---

- RJ-45-to-DB-25 male DCE adapter (labeled Modem) to connect a modem

**Step 4** Connect the other end of the supplied rollover cable to the adapter.

**Step 5** From your management station, start the terminal emulation program.

After POST completes, the Menu Console Logon Screen (shown in the “Assigning IP Information to the Switch” section on page 2-17) is displayed on the management station, and you can then assign IP information to the switch. If the Menu Console Logon Screen does not display, see the “Troubleshooting” chapter.

---

**Note** After POST completes (and if there are devices connected to the switch ports), Spanning-Tree Protocol (if enabled) immediately turns the port status LEDs amber. The forwarding state, even if the Port Fast mode is enabled, is delayed to allow the Spanning-Tree Protocol to discover the network topology and to ensure no temporary loops are formed. Spanning-tree discovery takes approximately 30 seconds to complete, and no packet forwarding takes place during this time. After the initial discovery, ports with Port Fast mode enabled go directly from the blocking state to the forwarding state.

---

Connector and cabling specifications for the console port are in the “Connectors and Cables” appendix.

## Assigning IP Information to the Switch

The Menu Console Logon Screen (Figure 2-9) is displayed on the management station after POST completes. From this logon screen, you display the IP Configuration Menu from which you assign IP information to the switch.

**Figure 2-9**      **Menu Console Logon Screen**

```
Catalyst 1900 Management Console
Copyright (c) Cisco Systems, Inc. 1993-1998
All rights reserved.

Standard Edition Software
Ethernet address:      00-E0-1E-7E-B4-40

PCA Number: 73-2239-01
PCA Serial Number: SAD01200001
Model Number: WS-C1924-A
System Serial Number: FAA01200001
-----

User Interface Menu

[M] Menus
[I] IP Configuration

Enter Selection:
```

## For Using the Web Console

If you want to use the web console, follow these steps to enter IP information:

- Step 1** Enter the **[I]** option on the Menu Console Logon Screen to display the IP Configuration Menu.

**Figure 2-10 IP Configuration Menu**

```
Catalyst 1900 - IP Configuration

Ethernet Address: 00-E0-1E-7E-B4-40

-----Settings-----
[I] IP address                0.0.0.0
[S] Subnet mask              0.0.0.0
[G] Default gateway         0.0.0.0
[M] IP address of DNS server 1 0.0.0.0
[N] IP address of DNS server 2 0.0.0.0
[D] Domain name
[R] Use Routing Information Protocol    Enabled

----- Actions -----
[P] Ping
[X] Exit to previous menu

Enter Selection:
```

- Step 2** At the minimum, select the **[I]** option from the IP Configuration Menu, and enter the IP address of the switch at the prompt. If you want, you can also enter the subnet mask and default gateway from this menu. If the switch is connected to a network that has a DHCP server, the server should assign this information automatically.

---

**Note** If the management station from which the web console is to be executed is not on the same IP subnet as the switch, you must also assign a default gateway.

---

- Step 3** Enter the **[X]** option until you exit from the menu console.
- For information on displaying the web console, see the “Switch Configuration Overview” chapter.

## For Using the Menu Console

If you want to use the menu console, enter the **[M]** option on the Menu Console Logon Screen to display the Management Console Main Menu (Figure 2-11).

**Figure 2-11 Management Console Main Menu**

```
Catalyst 1900 - Main Menu

[C] Console Settings
[S] System
[N] Network Management
[P] Port Configuration
[A] Port Addressing
[D] Port Statistics Detail
[M] Monitoring
[B] Bridge Group
[R] Multicast Registration
[F] Firmware
[I] RS-232 Interface
[U] Usage Summaries
[H] Help

[X] Exit Management Console

Enter Selection:
```

From this menu, you can assign IP information and continue to configure and monitor the switch from the menu console (see the “Menu-Based Management” chapter).

## For Using SNMP

If you are going to manage the switch using SNMP, assign or use the default community strings on the Network Management Menu (Figure 5-6):

- Read community string. The default is Public.
- Write community string. The default is Private.

For information about using SNMP, see the “In-Band Management” section on page 3-14.

# Connecting to the Switched 10BaseT Ports

All 10BaseT ports (ports 1x through 12x or ports 1x through 24x) can be connected to any 10BaseT-compatible device. You must provide the Category 3, 4, or 5 UTP cable(s) to connect any of these ports to the other 10BaseT device. All UTP connections between the switch and the attached device(s) must be within 100 meters.

The 10BaseT ports are internally crossed. When connecting the switch to servers, workstations, and routers, ensure that you use a *straight-through* cable wired for 10BaseT. When connecting to other switches or repeaters, ensure that you use a *crossover* cable.

---

**Note** Always observe these general rules when connecting devices: Use a straight-through cable to connect two ports when one of the ports is marked with an **X**; use a crossover cable to connect two ports when both ports are marked with an **X**.

---

The default setting for these ports is half-duplex mode. You can configure these ports for full-duplex operation by using the web or menu console (see the “Port Management Page” section on page 4-5 or the “Port Configuration Menu” section on page 5-30) or by using SNMP.

---

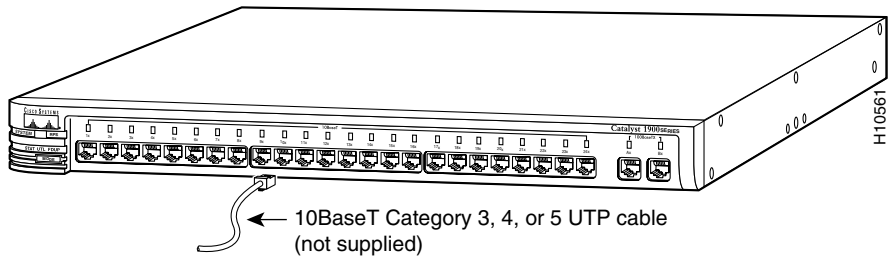
**Note** Full-duplex flow control is not supported on the 10BaseT ports.

---

To connect a 10BaseT port on the switch to another 10BaseT device, follow these steps:

**Step 1** Connect one end of the UTP cable to the 10BaseT port on the switch, as shown in Figure 2-12.

**Figure 2-12** Connecting to a 10BaseT Port



**Step 2** Connect the other end of the UTP cable to the 10BaseT port of the target device.

The port status LED comes on when both the switch and the connected device are powered up. If the LED is not on, the device at the other end might not be turned on, there might be a problem with the adapter in the attached device or with the cable, or you might need to change the type of cable. See the “Troubleshooting” chapter for more information.

**Step 3** Reconfigure and reboot the connected device if necessary.

**Step 4** Repeat steps 1 through 3 for each device to be connected to the switch.

Connector and cabling specifications for the 10BaseT ports are in the “Connectors and Cables” appendix.

# Connecting to the Switched 100BaseTX Ports

The 100BaseTX ports (ports Ax and Bx) can be connected to any 100BaseTX-compatible device. You must provide the Category 5 UTP cable(s) to connect any of these ports to the other 100BaseTX device. All UTP connections between the switch and the attached device(s) must be within 100 meters.

The 100BaseTX ports are internally crossed. When connecting the switch to servers, workstations, and routers, ensure that you use a *straight-through* cable wired for 100BaseT. When connecting to another switch or hub, ensure that you use a *crossover* cable.

---

**Note** Always observe these general rules when connecting devices: Use a straight-through cable to connect two ports when one of the ports is marked with an **X**; use a crossover cable to connect two ports when both ports are marked with an **X**.

---

The default setting for the 100BaseTX ports is autonegotiation-enabled. You can configure these ports for half-duplex, full-duplex, or full-duplex flow control operation or allow autonegotiation to determine the optimum configuration by using the web or menu console (see the “Port Management Page” section on page 4-5 or the “Port Configuration Menu” section on page 5-30) or by using SNMP.

---

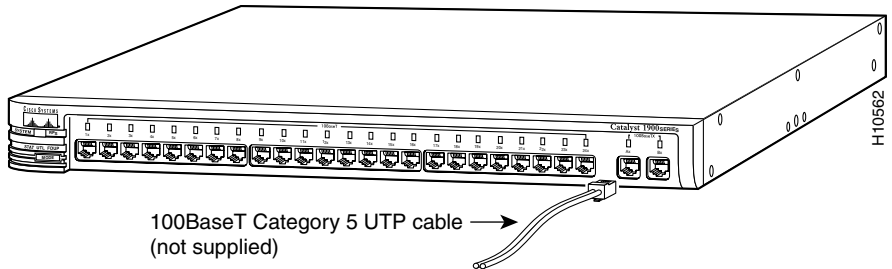
**Note** Autonegotiation is supported on the 100BaseTX ports only, not on the 100BaseFX port. The 100BaseTX ports do not negotiate with 10-Mbps-only ports.

---

To connect a 100BaseTX port on the switch to another 100BaseTX device, follow these steps:

- Step 1** Connect one end of the UTP cable to the 10BaseT port on the switch, as shown in Figure 2-13.

**Figure 2-13** Connecting to a 100BaseTX Port



- Step 2** Connect the other end of the UTP cable to the 100BaseTX port of the target device.

The port status LED comes on when both the switch and the connected device are powered up. If the LED is not on, the device at the other end might not be turned on, there might be a problem with the adapter in the attached device or with the cable, or you might need to change the type of cable. See the “Troubleshooting” chapter for more information.

- Step 3** Reconfigure and reboot the connected device if necessary.

- Step 4** Repeat steps 1 through 3 for each device to be connected to the switch.

Connector and cabling specifications for the 100BaseTX ports are in the “Connectors and Cables” appendix.

## Connecting to the Switched 100BaseFX Port



**Caution** Do not remove the rubber plugs from the fiber-optic port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the fiber-optic port and cable from contamination and ambient light.



**Warning** Class 1 laser product.



**Warning** Avoid exposure to the laser beam.

The 100BaseFX port (port A) can be connected to any 100BaseFX-compatible device. You must provide the 50/125- or 62.5/125-micron multimode fiber-optic cable to connect any of these ports to the other 100BaseFX device.

All fiber-optic connections between the switch and the attached device must be within 2 kilometers. If the 100BaseFX port is configured for full-duplex operation, you can connect it to another 100BaseFX-compatible device over distances of up to 2 kilometers and provide up to 200 Mbps of bandwidth between the two devices. If the port is configured for half-duplex operation, you can connect the port to another device that is within 412 meters of the switch.

The default setting for this port is half-duplex mode. You can also configure this port for full-duplex or full-duplex operation with flow control by using the web or menu console (see the “Port Management Page” section on page 4-5 or the “Port Configuration Menu” section on page 5-30) or by using SNMP.

---

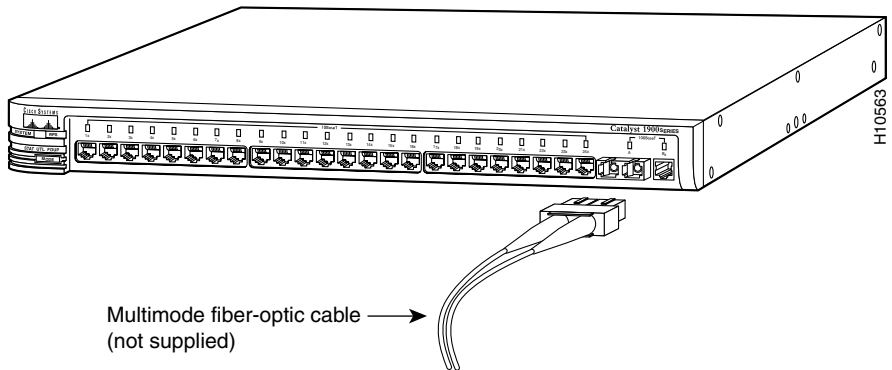
**Note** Autonegotiation is not supported on the 100BaseFX port.

---

To connect a 100BaseFX port on the switch to another 100BaseFX device, follow these steps:

- Step 1** Remove the rubber caps from the cable and connect one end of the fiber-optic cable to the 100BaseFX port on the switch, as shown in Figure 2-14, pushing until it snaps into place.

**Figure 2-14** Connecting to the 100BaseFX Port



- Step 2** Connect the other end of the fiber-optic cable to the 100BaseFX port of the target device.

The port status LED comes on when both the switch and the connected device are powered up. If the LED is not on, the device at the other end might not be turned on, there might be a problem with the adapter in the attached device or with the cable, or you might need to change the type of cable. See the “Troubleshooting” chapter for more information.

- Step 3** Reconfigure and reboot the connected device if necessary.

- Step 4** Repeat steps 1 through 3 for each device to be connected to the switch.

Connector and cabling specifications for the 100BaseFX ports are in the “Connectors and Cables” appendix.

## Connecting to the Switched Ethernet AUI Port

The AUI port on the switch can connect to an Ethernet transceiver, which is then connected to a 10-Mbps Ethernet device through thick coaxial, thin coaxial, fiber-optic, or UTP cable. You must provide the Ethernet transceiver and cable to connect the AUI port to the other network device. Supported network and device distances vary depending on the type of Ethernet AUI transceiver used.

---

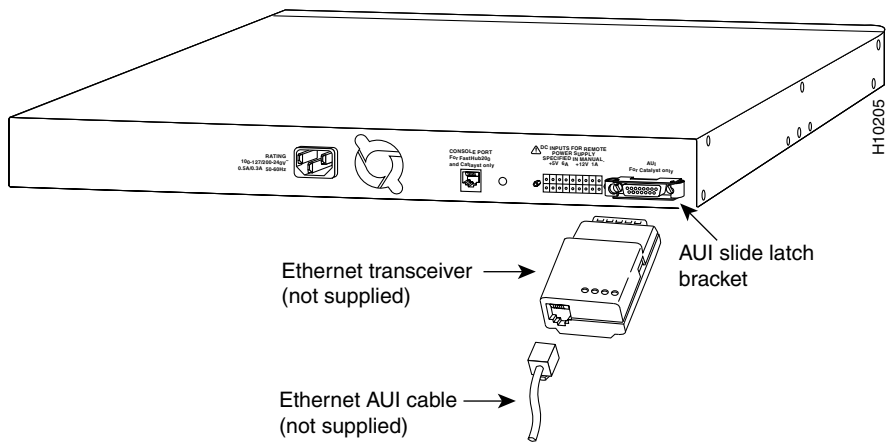
**Note** Use a crossover cable if the transceiver is used to convert to a 10BaseT RJ-45 connector.

---

To connect the AUI port on the switch to an external transceiver, follow these steps:

- Step 1** Slide the AUI slide latch bracket to the right and attach the appropriate external transceiver to the AUI port on the switch. Slide the latch bracket to the left to lock the AUI transceiver to the port.
- Step 2** Connect one end of the appropriate cable to the port on the AUI transceiver, as shown in Figure 2-15. The type of cable (thick coaxial, thin coaxial, fiber-optic, or UTP) you use depends on the AUI transceiver you are using.

**Figure 2-15** Connecting to the AUI Port



**Step 3** Connect the other end of the cable to the port of the target device.

**Step 4** Reconfigure and reboot the connected device if necessary.

Connector and cabling specifications for the AUI port are in the “Connectors and Cables” appendix.

## Avoiding Problems with Token-Ring Environments

Shielded twisted-pair cable is the most commonly used cable in Token-Ring environments. The media interface connectors (MICs) and baluns—used to connect shielded twisted-pair and UTP cabling—create a loopback when they are disconnected; the loopback might cause anomalies with the switch.

To prevent loopback problems when using shielded twisted-pair cabling in a Token-Ring network environment, make sure the MICs and baluns are never left unconnected when they are part of a link connected to the switch (see Figure 2-16).

**Figure 2-16** Shielded Twisted-Pair Cable Connections

