Installation

This chapter describes how to install your Catalyst 2900 XL switch and interpret the power-on self-test (POST) that ensures proper operation. Read the topics and perform these procedures in the order that they are presented:

- Pre-installation information and guidelines
- Installation procedures
- · Power-on procedures
- · Connection procedures
- · Where to go next



See the Catalyst 2900 Series XL Modules Installation Guide and the Catalyst 2900 Series XL ATM Modules Installation and Configuration Guide for global information about the Catalyst 2900 series XL expansion modules.

Preparing for Installation

Warnings

These warnings are translated into several languages in Appendix C, "Translated Safety Warnings."



Warning

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



Warning

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



Warning

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.



Warning

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



Warning

The plug-socket combination must be accessible at all times because it serves as the main disconnecting device.



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

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



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

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



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

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

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



Warning

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



Warning

Invisible laser radiation may be emitted from the aperture ports of the 100BASE-FX single-mode supervisor engine module. Avoid exposure and do not stare into open apertures.



Warning

Avoid exposure to the laser beam.



Warning

Attach only the Cisco RPS (model PWR600-AC-RPS) to the RPS receptacle.



Warning

Attach only the Cisco RPS (model PWR300-AC-RPS-N1) to the RPS receptacle.

EMC Regulatory Statements

U.S.A.

U.S. regulatory information for this product is in the front matter of this manual.

Taiwan

警告使用者:

這是甲類的資訊產品,在居住的環境中使用時,可能會造成射頻干擾,在這種情況下,使用者會被要求採取某些適當的對策。

Hungary

This equipment is a class A product and should be used and installed properly according to the Hungarian EMC Class A requirements (MSZEN55022). Class A equipment is designed for typical commercial establishments for which special conditions of installation and protection distance are used.

Figyelmeztetés a felhasználói kézikönyv számára:

Ez a berendezés "A" osztályú termék, felhasználására és üzembe helyezésére a magyar EMC "A" osztályú követelményeknek (MSZ EN 55022) megfeleloen kerülhet sor, illetve ezen "A" osztályú berendezések csak megfelelo kereskedelmi forrásból származhatnak, amelyek biztosítják a megfelelo speciális üzembe helyezési körülményeket és biztonságos üzemelési távolságok alkalmazását.

Installation Guidelines

The switch can be installed on a table or shelf, in a rack, or on a wall.

Before installing the switch, first verify that the switch is operational by powering it on and running POST. Follow the procedures in the "Powering On the Switch and Running POST" section on page 2-25.



There are no serviceable parts inside the unit. Removing screws, cover, or otherwise dismantling the unit voids the warranty.



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

When determining where to place the switch, be sure to observe these guidelines:

- For 10/100 ports, cable lengths from the switch to connected devices are up to 328 feet (100 meters).
- For 100BASE-FX ports, cable lengths from the switch to connected devices are up to 1351 feet (412 meters) for half-duplex connections and less than 6561 feet (2 kilometers) for full-duplex connections.
- For LRE ports, cable lengths from the switch to the connected Ethernet device are up to 4921 feet (1500 meters).

- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures.
- For specifications of the expansion modules, refer to the modules documentation in the "Related Publications" section on page xvi.
- Clearance to front and rear panels meet these conditions:
 - Front-panel indicators can be easily read.
 - Access to ports is sufficient for unrestricted cabling.
 - Rear-panel power connector is within reach of an AC power receptacle.
- Operating environment is within the ranges listed in Appendix A, "Technical Specifications."
- Airflow around the switch and through the vents is unrestricted.
- Temperature around the unit does not exceed 113°F (45°C).



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

Verifying Package Contents

When you unpack the switch, be sure that the package contains the items in the following list. If any items are missing, notify your authorized Cisco sales representative:

- The switch
- Catalyst 2900 XL and Catalyst 3500 XL Documentation CD
- Release Notes for the Catalyst 2900 Series XL and Catalyst 3500 Series XL Cisco IOS Release 12.0(5)WC(1)
- The Cisco Documentation CD-ROM package
- AC power cord

- Mounting kit containing these items:
 - Four rubber feet for mounting the switch on a table, shelf, or desk
 - Two mounting brackets
 - Four number-12 Phillips machine screws for attaching the brackets to a
 - Four number-8 Phillips flat-head screws for attaching the brackets to the switch (19-inch rack mount)
 - Four number-8 Phillips truss-head screws for attaching the brackets to the switch (24-inch rack mount)
 - One cable guide and one (two for modular switches) black Phillips machine screw for attaching the cable guide to one of the mounting brackets



The cable guide is not applicable for the Catalyst 2912 LRE XL and 2924 LRE XL switches.

- One RJ-45-to-RJ-45 rollover cable
- One RJ-45-to-DB-9 adapter
- Cisco Information Packet, containing warranty, safety, and support information

Installing the Switch on a Table or Shelf

Follow these steps to install the switch on a table or shelf:

- Locate the adhesive strip with the rubber feet in the mounting-kit envelope. Attach Step 1 the four rubber feet to the recessed areas on the bottom of the unit.
- Place the switch on the table or shelf near an AC power source. Step 2
- Step 3 After the switch is mounted on the table or shelf, power the switch as described in "Powering On the Switch and Running POST" section on page 2-25.

Installing the Switch in a Rack



To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

The supplied rack-mounting brackets can be attached to a 19-, 23-, or 24-inch rack. Figure 2-1 shows which mounting holes to use.



Figure 2-1 shows brackets for two-rack-unit modular switches. Rack-mount points are similar on brackets for one-rack-unit switches.

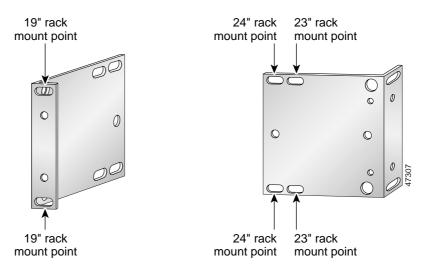
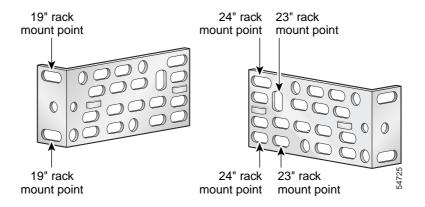


Figure 2-1 Mounting Bracket Points for Catalyst 2912 XL, 2924C XL, 2924 XL, 2912MF XL, or 2924M XL Switches

Figure 2-2 Mounting Brackets Points for Catalyst 2912 LRE XL and 2924 LRE XL Switches



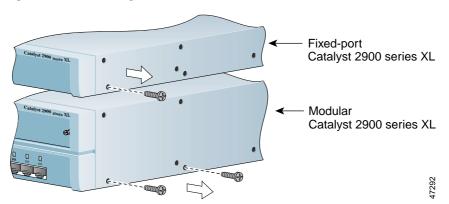
To install the switch in a 19-, 23- or 24-inch standard rack, follow the instructions described in these procedures:

- "Removing Screws from the Switch" section on page 2-10
- "Attaching the Brackets to a Catalyst 2912 XL, 2924C XL, 2924 XL, 2912MF XL, or 2924M XL Switch" section on page 2-11
- "Attaching the Brackets to a Catalyst 2912 LRE XL or 2924 LRE XL Switch" section on page 2-17
- "Mounting the Switch in a Rack" section on page 2-19
- "Attaching the Optional Cable Guide" section on page 2-20

Removing Screws from the Switch

If you plan to install the switch in a rack, you must first remove screws in the switch chassis so that mounting brackets can be attached. Figure 2-3 shows how to remove the chassis screws in a fixed-port and a modular port switch.

Figure 2-3 Removing Screws from the Switch



Attaching the Brackets to a Catalyst 2912 XL, 2924C XL, 2924 XL, 2912MF XL, or 2924M XL Switch

Follow these steps to attach the brackets to a Catalyst 2912 XL, 2924C XL, 2924 XL, 2912MF XL, or 2924M XL switch:

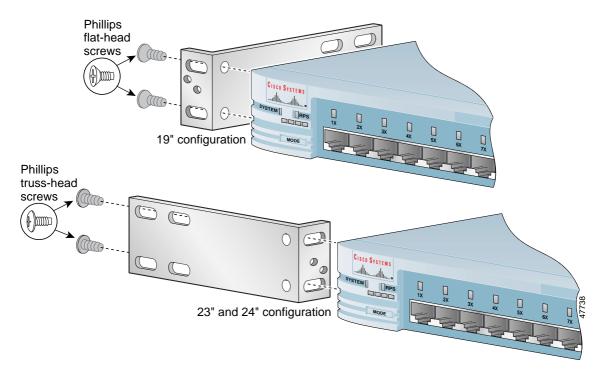
The bracket orientation and screws that you use depend on whether you are attaching the brackets for a 19-, 23-, or 24-inch rack. Use two of the supplied screws to attach each bracket, according to rack size:

- For a 19-inch rack, use the supplied Phillips flat-head screws to attach the long side of the bracket to the switch.
- For a 23- or 24-inch rack, use the supplied Phillips truss-head screws to attach the short side of the bracket to the switch.

Figure 2-3, Figure 2-5, Figure 2-6, Figure 2-7, and Figure 2-8 show how to attach a bracket to one side of the switch. Follow the same steps to attach the second bracket to the opposite side of the switch.

2-11

Figure 2-4 Attaching Brackets on Catalyst 2912 XL, 2924C XL, 2924 XL Fixed-Port Switches (Front-Panel Forward)



Phillips flat-head screws

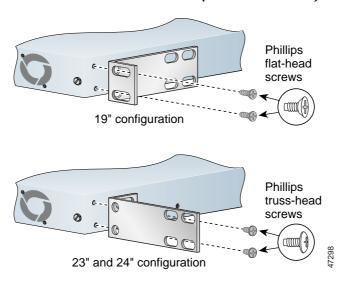
19" configuration

Phillips truss-head screws

23" and 24" configuration

Figure 2-5 Attaching Brackets on Catalyst 2912MF XL and 2924M XL Modular Switches (Front-Panel Forward)

Figure 2-6 Attaching Brackets on Catalyst 2912 XL, 2924C XL, 2924 XL Fixed-Port Switches (Rear-Panel Forward)



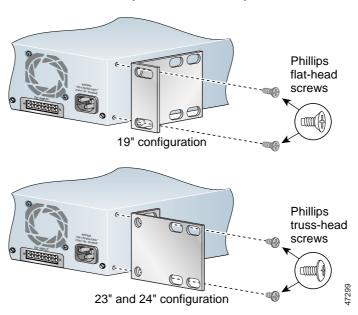


Figure 2-7 Attaching Brackets on Catalyst 2912MF XL and 2924M XL Modular Switches (Rear-Panel Forward)

Phillips flat-head screws

Phillips flat-head screws

Figure 2-8 Attaching Brackets for Telco Racks



Catalyst 2912 LRE XL and 2924 LRE XL switches cannot be mounted in telco racks.

Attaching the Brackets to a Catalyst 2912 LRE XL or 2924 LRE XL Switch

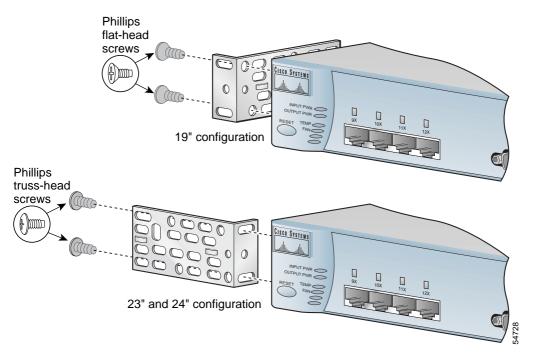
Follow these steps to attach the brackets to a Catalyst 2912 LRE XL or 2924 LRE XL switch:

The bracket orientation and screws that you use depend on whether you are attaching the brackets for a 19-, 23-, or 24-inch rack. Use two of the supplied screws to attach each bracket, according to rack size:

- For a 19-inch rack, use the supplied Phillips flat-head screws to attach the long side of the bracket to the switch.
- For a 23- or 24-inch rack, use the supplied Phillips truss-head screws to attach the short side of the bracket to the switch.

Figure 2-3, Figure 2-5, Figure 2-6, Figure 2-7, and Figure 2-8 show how to attach a bracket to one side of the switch. Follow the same steps to attach the second bracket to the opposite side of the switch.

Figure 2-9 Attaching Brackets on Catalyst 2912 LRE XL and 2924 LRE XL Switches (Front-Panel Forward)



Phillips flat-head screws

19" configuration

Phillips truss-head screws

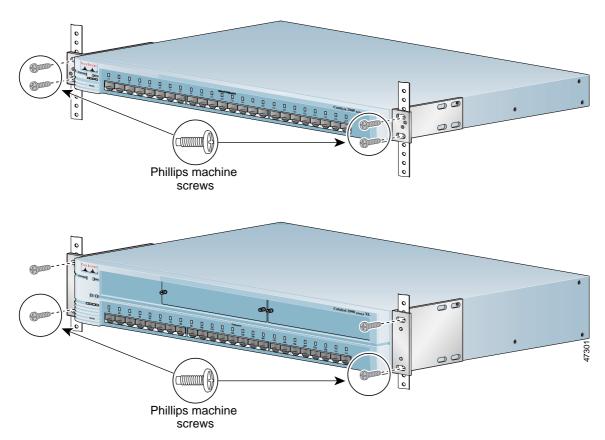
Figure 2-10 Attaching Brackets on Catalyst 2912 LRE XL and 2924 LRE XL Switches (Rear-Panel Forward

Mounting the Switch in a Rack

23" and 24" configuration

After the brackets are attached to the switch, use the four supplied number-12 Phillips machine screws to securely attach the brackets to the rack, as shown in Figure 2-11.

Figure 2-11 Mounting the Switch in a Rack



After the switch is mounted in the rack, power the switch as described in "Powering On the Switch and Running POST" section on page 2-25.

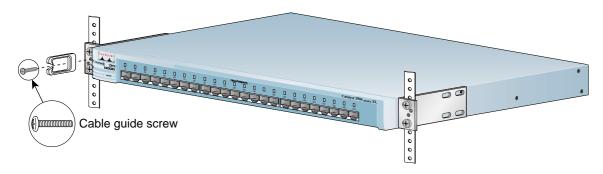
Attaching the Optional Cable Guide

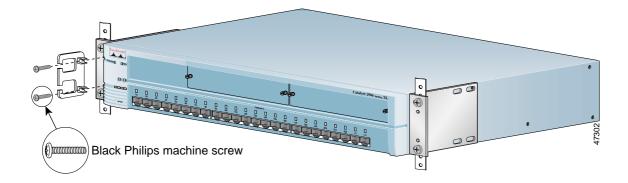
We recommend attaching the cable guide to prevent the cables from obscuring the front panel of the switch and the other devices installed in the rack. If the switch is in a 19-, 23-, or 24-inch rack, use the supplied black screw as shown in Figure 2-12 to attach the cable guide to the left or right bracket. The cable guide for the modular switches requires two screws.



The cable guide is not applicable for the Catalyst 2912 LRE XL and 2924 LRE XL switches.

Figure 2-12 Attaching the Cable Guide





Installing the Switch on a Wall

To attach the switch to a wall, follow the procedures in this section:

- · Attaching the brackets to the switch
- Attaching the switch to a wall



To mount a Catalyst 2912 LRE XL or 2924 LRE XL switch on a wall, you need to obtain two special wall-mount brackets (Cisco part number *wallmount-1ru=*). To order these brackets, contact your Cisco sales representative.

Attaching the Brackets to the Switch

The bracket orientation and the screws you use depend on whether you are attaching the brackets for parallel or vertical wall-mounting. Use two of the supplied screws to attach each bracket, according to the following guidelines:

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



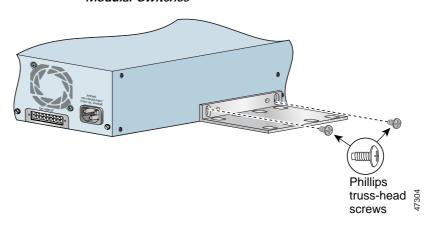
The Catalyst 2912 LRE XL and 2924 LRE XL switches cannot be mounted vertically on a wall.

Figure 2-13 and Figure 2-13 show how to attach the brackets to one side of the switch. Follow the same steps to attach the second bracket to the opposite side of the switch.

Phillips truss-head screws

Figure 2-13 Attaching Brackets for Parallel and Vertical Wall-Mounting for Fixed-Port Switches

Figure 2-14 Attaching Brackets for Parallel and Vertical Wall-Mounting for Modular Switches



Mounting the Switch to a Wall

For best support of the switch and cables, make sure the switch is attached securely to a wall stud or to a firmly attached plywood mounting backboard, as shown in Figure 2-15, Figure 2-16, and Figure 2-17.

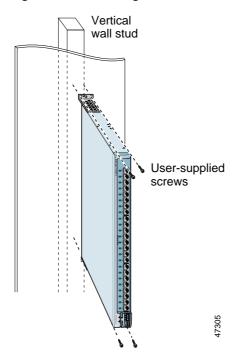


Figure 2-15 Mounting a Fixed-Port Switch to a Wall

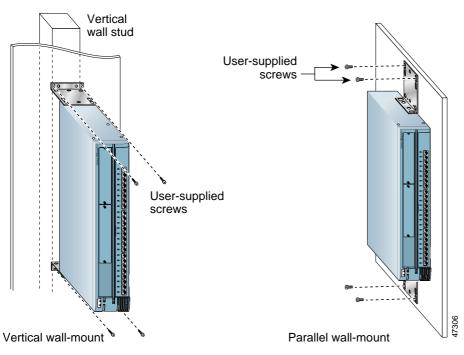


Figure 2-16 Mounting a Modular Switch to a Wall

After the switch is mounted on the wall, power the switch as described in "Powering On the Switch and Running POST" section on page 2-25.

Powering On the Switch and Running POST

To power on the switch after you install it, follow these steps:

Step 1 Connect one end of the AC power cord to the AC power connector on the switch.

Step 2 Connect the other end of the power cord to an AC power outlet.

As the switch powers on, it begins POST, a series of eight tests that run automatically to ensure that the switch functions properly. When the switch begins POST, the port LEDs turn amber for 2 seconds, and then they turn green.

The System LED flashes green, and the RPS LED turns off. As each test runs, the port LEDs, starting with number 1, turn off. The port LEDs for ports 2 to 8 each turn off in turn as the system completes a test.

When POST completes successfully, the port LEDs return to the status mode display, indicating that the switch is operational. If a test fails, the port LED associated with the test turns amber, and the system LED turns amber. If POST fails, refer to Chapter 3, "Troubleshooting," to determine a course of action.

POST failures are usually fatal. Call Cisco Systems immediately if your switch does not pass POST.

Connecting to a 10/100 Port

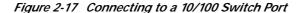
The switch 10/100 ports configure themselves to operate at the speed of attached devices. If the attached ports do not support autonegotiation, you can explicitly set the speed and duplex parameters.

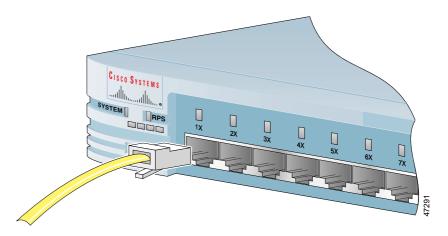
Connecting devices that do not autonegotiate or that have their speed and duplex parameters manually set can reduce performance or result in no linkage. To maximize performance, choose one of these methods for configuring the 10/100 Ethernet ports:

- Let the ports autonegotiate both speed and duplex.
- Set the port speed and duplex parameters on both ends of the connection.

Follow these steps to connect to 10BASE-T and 100BASE-TX devices:

Step 1 When connecting to workstations, servers, routers, and Cisco IP Phones, connect a straight-through Category 5 cable to an RJ-45 connector on the front panel (Figure 2-17). When connecting to switches or repeaters, use a crossover Category 5 cable. Pinouts for the cables are described in the "Cable and Adapter Specifications" section on page B-4.







The switch can connect to a Cisco IP Phone through a straight-through, twisted-pair cable. The rear panel of the Cisco IP Phone might have more than one RJ-45 jack. Use the LAN-to-phone jack to connect the phone to the switch. Refer to the documentation that came with your Cisco IP Phone for information about connecting devices to it.

- Step 2 Connect one end of the cable to the RJ-45 connector of the switch 10/100 port.
- Step 3 Connect the other end of the cable to an RJ-45 connector of the other device.

The switch port LED comes on when both the switch and the connected device have established link.

The port LED is amber while Spanning Tree Protocol (STP) discovers the topology and searches for loops. This takes about 30 seconds, and then the port LED turns green.

If the port LED does not come on, the device at the other end might not be turned on, or there might be a cable problem or a problem with the adapter installed in the attached device. See Chapter 3, "Troubleshooting," for solutions to cabling problems.

Step 4 Reconfigure and reboot the connected device if necessary.

Step 5 Repeat Steps 1 through 3 to connect to each 10/100 port.

Connecting to a 100BASE-FX Port



Warning

Invisible laser radiation may be emitted from the aperture ports of the 100BASE-FX single-mode supervisor engine module. Avoid exposure and do not stare into open apertures.



Warning

Avoid exposure to the laser beam.



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.

You can connect the 100BASE-FX ports to other 100BASE-FX-compatible network devices, such as servers, routers, and other switches. These ports use a duplex SC connector, and you must provide the 50/125- or 62.5/125-micron multimode fiber-optic cable to connect these ports to other 100BASE-FX devices.

The fiber-optic distances between the switch and the attached device follow.

- If the switch port and the port on the attached device are configured for half-duplex operation, the connection can be up to 412 meters.
- If the switch port and the port on the attached device are configured for full-duplex operation, the connection can be up to 2 kilometers.



Speed and duplex-mode autonegotiation is not supported on the 100BASE-FX ports.

To connect a switch 100BASE-FX port to another 100BASE-FX device, follow these steps:

- Step 1 Remove the rubber plugs from the port and the rubber caps from the cable connectors.
- Step 2 Connect one end of the fiber-optic cable to the 100BASE-FX port on the switch, as shown in Figure 2-18.

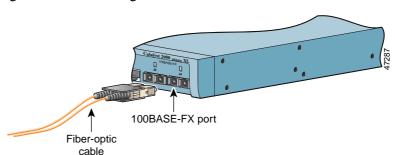


Figure 2-18 Connecting to a 100BASE-FX Switch

- Step 3 Connect the other end of the cable to the 100BASE-FX port of the other device.
- Step 4 The port LED comes on when both the switch and the connected device have established link.

The port LED is amber while the STP discovers the topology and searches for loops. This takes about 30 seconds, and then the port LED turns green.

If the port does not come on, the device at the other end might not be turned on, or there might be a cable problem or a problem with the adapter installed in the attached device. See Chapter 3, "Troubleshooting," for solutions to cabling problems.

- **Step 5** Reconfigure and reboot the connected device if necessary.
- **Step 6** Repeat Steps 1 through 3 to connect each 100BASE-FX port.

Connecting to an LRE Port

Depending on the switch model, you can connect the LRE port to either 12 or 24 Cisco 575 LRE customer premises equipment (CPE) devices through a patch panel. If telephone services, such as voice or integrated services digital network (ISDN), use the same cabling as LRE traffic, you must connect the LRE to a *plain old telephone service* (POTS) splitter.



If no other telephone services travel on the same wiring as LRE traffic, the LRE switch connects directly to a patch panel.

Connecting the LRE port to a patch panel or POTS splitter requires a male-to-male RJ-21 cable, category 3 or above. You can order RJ-21 cables from your cable vendor, or you can order these cables from your Cisco sales representative:

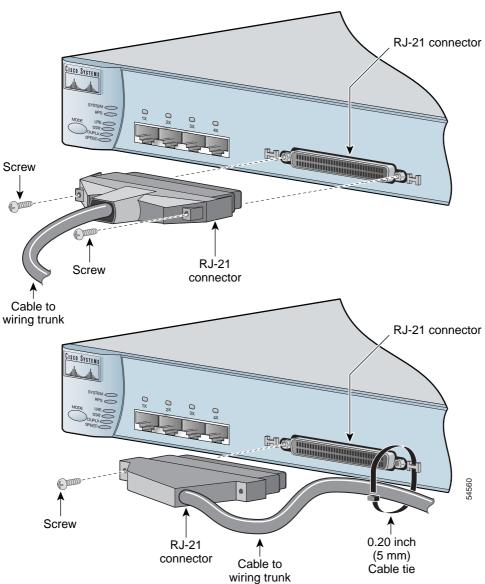
- CAB-5-M120M120-5 (Category 5 cable with 90-degree, male-to-male RJ-21 connectors)
- CAB-5-M180120-5 (Category 5 cable with 120-degree, male-to-male RJ-21 connectors)

The screws you need to secure the cable to the switch are shipped with the cable. Contact your Cisco sales representative for more information.

To connect the LRE port to a patch panel or POTS splitter, follow these steps:

Step 1 Connect one end of a wiring trunk cable to the RJ-21 connector of the LRE port on the switch. (See Figure 2-19.)

Figure 2-19 Connecting to an LRE Port



Step 2 Referring to the following figure, secure the cable to the switch:

- For a 90-degree connector, see the top of Figure 2-19.
- For a 12-degree connector, see the bottom Figure 2-19.



Note

The cable tie is not included with the connector and cable assembly.

Step 3 Connect the other end of the cable to the patch panel or POTS splitter.

Each LRE port status LED turns on when it establishes a link with a Cisco 575 LRE CPE. For more information about the LRE link between the switch LRE port and the CPE, as well as information about the configuration and management of CPE devices, refer to the *Catalyst 2900 Series XL and Catalyst 3500 Series XL Software Configuration Guide*.

For more information about the Cisco 575 LRE CPE device, refer to the Cisco 575 LRE CPE Hardware Installation Guide.

If telephone services, such as voice or ISDN, use the same cabling as LRE traffic, the LRE port must be connected to the patch panel through a basic telephone service, also known as *plain old telephone service* (POTS) splitter. The splitter routes LRE data (high-frequency) and voice (low-frequency) traffic from the telephone line to the switch and private branch exchange (PBX) switch or public-switched telephone network (PSTN).

If the other telephone services are connected through a PBX switch, a Cisco LRE 48 POTS Splitter can be used. The PBX routes voice traffic to private telephone networks and the public system telephone network (PSTN). For more information about the Cisco LRE 48 POTS Splitter (PS-1M-LRE-48), refer to the *Installation Notes for the Cisco LRE 48 POTS Splitter*.

If the installation does not have a PBX, a homologated POTS splitter is required to directly connect to the PSTN. For more information about homologated POTS splitters, contact your Cisco sales representative.



If a connection to a phone network is not required at all, a splitter is not needed, and the switch can connect directly to the patch panel.

Connecting to a Module Port

For information about installing and connecting to modules in the Catalyst 2924M XL and 2912MF XL expansion slots, refer to the *Catalyst 2900 Series XL Modules Installation Guide* and the *Catalyst 2900 Series XL ATM Modules Installation and Configuration Guide*.

Connecting to the Console Port

Use the supplied rollover cable and DB-9 adapter to connect a PC to the switch console port. You need to provide a RJ-45-to-DB-25 female DTE adapter if you want to connect the switch 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 the "Cable and Adapter Specifications" section on page B-4.

The PC or terminal must support VT100 terminal emulation. The terminal-emulation software—frequently a PC application such as Hyperterminal or Procomm Plus—makes communication between the switch and your PC or terminal possible during the setup program.

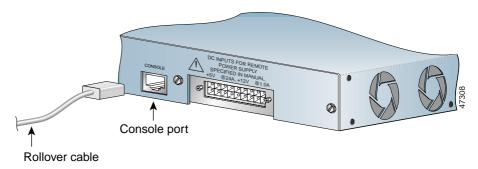
Follow these steps to connect the PC or terminal to the switch:

- Step 1 Configure your PC- or terminal-emulation software to communicate with the switch through hardware flow control.
- Step 2 Configure the baud rate and character format of the PC or terminal to match these switch console port default characteristics:
 - 9600 baud
 - 8 data bits
 - 1 stop bit
 - No parity

After you have accessed the switch, you can change the port baud rate back to its original setting. See the *Catalyst 2900 Series XL and Catalyst 3500 Series XL Software Configuration Guide* for instructions.

Step 3 Using the supplied rollover cable, connect one end of the rollover cable into the console port, as shown in Figure 2-20. See the "Identifying a Rollover Cable" section on page B-6 for a description of the pinout.

Figure 2-20 Connecting to the Console Port



- Step 4 Attach the supplied RJ-45-to-DB-9 female DTE adapter to a PC or attach an appropriate adapter to the terminal.
- Step 5 Connect the other end of the supplied rollover cable to the attached adapter.
- **Step 6** Start up the terminal-emulation program.

Where to Go Next

After the switch passes POST, it can operate on its default settings and passwords after you configure IP information on the switch. For information about using the setup program, refer to the *Release Notes for the Catalyst 2900 Series XL and Catalyst 3500 Series XL Cisco IOS Release 12.0(5)WC(1).*

For information about configuring the switch, refer to the Catalyst 2900 Series XL and Catalyst 3500 Series XL Software Configuration Guide.