C H A P T E R 2

Preparing for Installation

Before installing the Catalyst 1200 series switch, read this chapter carefully.

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.

- Keep tools away from walk areas where you and others could trip over them.

- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.

- Wear safety glasses when working under any conditions that might be hazardous to your eyes.

- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

Safety with Electricity

Follow these guidelines when working on equipment powered by electricity.

Warning Read the installation instructions before you connect the system to its power source. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

Warning   Do not work on the system or connect or disconnect cables during periods of lightning activity. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

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. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

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). To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

Warning   The device is designed to work with TN power systems. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

Warning   Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

- Locate the emergency power-off switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn OFF the power.

- Before working on the system, unplug the power cord.

- Disconnect all power before doing the following:

    — Installing or removing a chassis

    — Working near power supplies

    — Performing a hardware upgrade

- Do not work alone if potentially hazardous conditions exist.

- Never assume that power is disconnected from a circuit. Always check.

- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.

- If an electrical accident occurs, proceed as follows:

  — Use caution; do not become a victim yourself.

  — Unplug the power cord.

  — If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.

  — Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic components are improperly handled and can result in complete or intermittent failures. Always follow ESD-prevention procedures when removing and replacing components. Ensure that the chassis is electrically connected to earth ground using an ESD mat or a ground wire. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. To safely channel unwanted ESD voltages to ground, connect the clip to an unpainted surface of the chassis frame. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Caution   For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohm (Mohm).

Warning   There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

> **Warning** Ultimate disposal of this product should be handled according to all national laws and regulations. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

Site Requirements

Following are the site requirements for installation.

Environment

Choose a clean, dust-free, (preferably) air-conditioned location. Avoid direct sunlight, heat sources, or areas with high levels of electromagnetic interference (EMI).

Chassis Accessibility

Make the front panel of the switch accessible so that you can monitor the LED indicators and access the reset switch. Leave at least 24 inches (60.9 centimeters) clearance at the rear of the switch for easier cabling and service.

Cooling and Airflow

Two fans, located at the front of the switch, cool the interior by drawing air through vents in the front and forcing heated air through holes in the rear. If the internal temperature exceeds 122 F (50 C), a temperature alarm is generated.

> **Warning** To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 104 F (40 C). To prevent airflow restriction, allow at least 3 inches (7.6 cm) of clearance around the ventilation openings. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

Power

The source electrical outlet should be installed near the switch, be easily accessible, and be properly grounded. Power should come from a building branch circuit. Use a maximum breaker current rating of 20A for 110V, or 8A for 230V. Note the power consumption ratings of the unit before you connect to a power source.

Warning   Care must be given to connecting units to the supply circuit so that wiring is not overloaded. To see translated versions of this warning, refer to the appendix "Translated Safety Warnings."

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."

Cabling Requirements

Following are cabling requirements for installation. For cable pinouts, refer to the appendix "Wiring Specifications."

FDDI

The multimode FDDI connectors on the switch accept 62.5/125-micron multimode fiber, or 50/125-micron multimode fiber, with standard FDDI media interface connectors (MICs). The single-mode connectors accept 8.7 to 10/125-micron single-mode fiber, with standard FDDI ST-type connectors. Table 2-1 lists FDDI maximum transmission distance specifications, and Figure 2-1 and Figure 2-2 illustrate single-mode and multimode connectors, respectively.
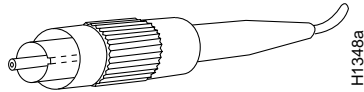
Table 2-1   **FDDI Maximum Transmission Distances**

| Transceiver Type	Maximum Distance between Stations
Single-mode	18.6 miles (30 km)
Multimode	1.2 miles (2 km)

Figure 2-1   **Single-Mode FDDI Interface Connector—ST Type**

Warning   Invisible laser radiation may be emitted from the aperture ports of the single-mode FDDI card when no cable is connected. *Avoid exposure and do not stare into open apertures.* To see translated versions of this warning, refer to the appendix "Translated Safety Warnings." Following is an example of the warning label that appears on the product:

WARNING

AVOID EXPOSURE–Invisible Laser radiation is emitted from transmit ports.

1300NM
CLASS 1 LASER PRODUCT
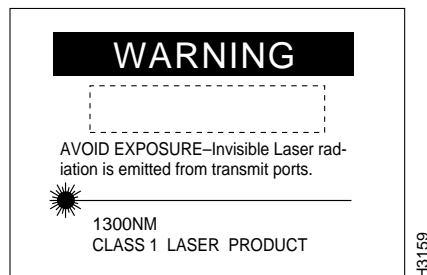
Figure 2-2   Multimode FDDI Interface Connector—MIC Type
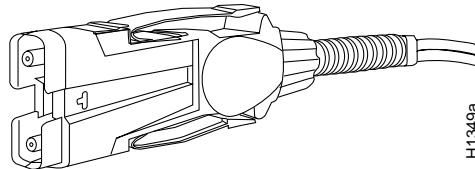
CDDI

Check all existing cables for conformance with CDDI/MLT-3 distance requirements and to ensure that you have the proper connectors (modular RJ-45). Following are cable and distance specifications:

- Data-grade unshielded twisted pair (UTP) wiring—EIA/TIA-568-B, category 5, data-grade cable is required for Copper Distributed Data Interface (CDDI) installations. The total length of data-grade UTP cable from the switch to another switch, station, or CDDI concentrator must not exceed 330 feet (100.6 m), including patch cords and cross-connect jumpers.

- Shielded twisted-pair (STP) wiring—Use IBM Type 1 STP wiring for your CDDI installation. The total length of STP cable measured from the adapter or media access unit (MAU) to the switch must not exceed 330 feet (100 m). To connect CDDI to STP, you must use an impedance-matching balun (balance/unbalanced) device (model number WS-C737). Use high-performance, category 5, data-grade, modular cables for external connections.

When you plan your CDDI installation, remember the following:

- Use cross-connect (patch) panels that comply with the EIA/TIA-568-B, category 5 wiring standard.

- Do *not* use bridge taps.

- Do *not* use protection coils.

- Do *not* share services (such as voice and data) on the same cable. CDDI uses two of the four pairs in the twisted-pair cable. The remaining two pairs cannot be used for other applications.

- Do *not* exceed the maximum cable length for CDDI UTP and STP of 330 feet (100 m).

Ethernet 10BaseF

The IEEE 802.3 Ethernet 10BaseF ports accept ST-type connections using 62.5/125-micron multimode optical fiber. The distance limitation for 10BaseF is 1.2 miles (2 km). 10BaseF supports both the 10BaseFL (fiber link) and fiber-optic interrepeater link (FOIRL) standards.

In general, distance limitations depend on the combined effects of fiber, connectors, and the power levels of other devices on the fiber link. Table 2-2 lists the maximum power levels for 10BaseF and FOIRL.

Table 2-2   10BaseF and FOIRL Power Levels

Maximum Power	10BaseF	FOIRL
Transmit power at transmitter	–12 dB[1]	–9 dB
Receive power at receiver	–32.5 dB	–27 dB

1. dB = decibel.

Ethernet 10BaseT

The Ethernet 10BaseT ports accept modular RJ-45 connectors. For pinouts of the Ethernet 10BaseT ports, refer to the appendix "Wiring Specifications." 10BaseT requires a minimum of category 3 UTP cable as specified by the EIA/TIA-568-B wiring standard. The distance limitation for 10BaseT is a maximum of 328 feet (100 m) between segments.

EIA/TIA-232

As with all signaling systems, EIA/TIA-232 signals can travel a limited distance at any given bit rate. Generally, the slower the data rate, the greater the distance. Table 2-3 shows the relationship between baud rate and maximum distance. The EIA/TIA-232 admin. port requires a modular RJ-45 connector for the switch end, and an RJ-45-to-DB-25 adapter for the console terminal where it is attached.

Table 2-3   EIA/TIA-232 Speed and Distance Limitations

| Data Rate (baud)	Distance (feet)	Distance (meters)
2,400	200	60
4,800	100	30
9,600	50	15
19,200	25	7.6
38,400	12	3.7

Network Topology Overview

When the switch is installed in your network, the resulting topology might resemble the high-speed transparent and translational bridging overview shown in Figure 2-3. This consists of workstations connected to the 10BaseT Ethernet ports of two switches. The 10BaseF ports might be connected in a similar manner. The switches are connected to a CDDI or FDDI dual ring, which is part of a larger CDDI or FDDI backbone.

Figure 2-3 **High-Speed Translational and Transparent Bridging Topology**
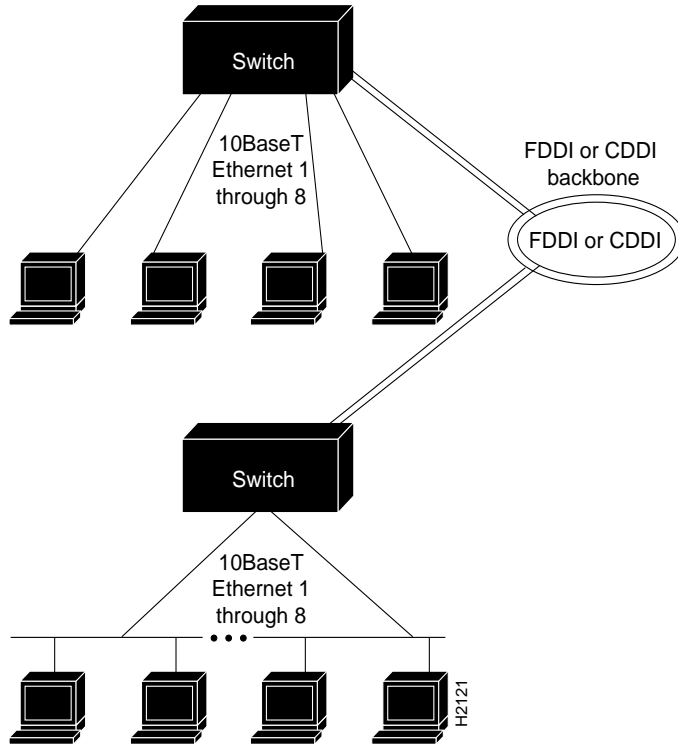
Modem Requirements

Operating the switch with a modem is optional. To connect the switch to a modem, you should consult the modem documentation. At a minimum, you need to connect the modem to the EIA/TIA-232 admin. port on the switch. You need to configure the modem to operate with the switch because no configuration is possible at the switch. As an example modem configuration, Table 2-4 lists the dual inline package (DIP) switch settings for the U.S. Robotics Sportster 14,400-baud fax modem.

Table 2-4   Modem DIP Switch Settings

Switch	Setting	Function	Explanation
1	Down	DTR override	Modem ignores Data Terminal Ready (DTR).
2	Up	Audible results	Modem returns audible result messages instead of a number.
3	Up	Suppress results	Modem does not return any result messages. Required because this function is not configurable on the switch.
4	Down	No echo of offline commands	Modem does not echo when it is offline and it receives a command. Required because this function is not configurable on the switch.
5	Up	Auto answer on ring	Modem answers automatically after one ring. Required because this function is not configurable on the switch; therefore, the modem must answer automatically.
6	Down	CD override	Modem always asserts Carrier Detect (CD).
7	Down	Load factory defaults	This is modem-dependent.
8	Up	Dumb mode	Modem does not recognize modem attention (AT) command.

Note   The DIP switch information is only for the modem connected to the switch, *not* for the modem connected to your terminal, PC, computer, or whatever else you are using for your modem-based communication.

Tools and Materials Required

Table 2-5 provides a list of tools and supplies you need to install the switch. The switch can be mounted in a standard 19-inch rack, on a wall in a wiring closet or office, or placed on a desktop in a work area.

Table 2-5   Tools and Materials Required for Installation

	Type of Installation		
Tools and Hardware	**Rack**	**Wall**	**Desk**
Rack-mount kit (standard):	Yes	No	No
Two brackets Eight screws (attach brackets to switch) Four screws (switch to rack—you supply these)			
Wall-mount kit[1](optional):	No	Yes	No
Two brackets Four screws (attach brackets to switch) Four screws (attach to wall—you supply these) Wall-mounting template			
No. 2 Phillips screwdriver	Yes	Yes	No
Flat-blade screwdriver (to remove A/B port cards or blank plates)	Yes	Yes	Yes
3/8" (0.952 cm) drill with 1/4" (0.635 cm) bit	No	Yes	No

1. Model number WS-C1670.