CHAPTER 1

Product Overview

The CDDI/FDDI C1400 Concentrator is a member of a family of concentrators that provide Copper Distributed Data Interface/multilevel transmission (CDDI/MLT-3) and single and multimode Fiber Distributed Data Interface (FDDI) connectivity. This concentrator combines the best features of compact, workgroup-style concentrators with the flexibility of chassis-style concentrators.

Note Throughout this document, the CDDI/FDDI C1400 concentrator is also referred to as the Workgroup WS-C1400 concentrator or C1400. The term CDDI refers specifically to the CDDI/MLT-3 encoding scheme.

CDDI and FDDI line cards can be mixed and added as needed, up to a maximum of 32 ports. Optional line cards are available that provide from 8 to 16 additional ports per card. Ports 1 and 2 of the line card installed in slot 1 can be configured as A/B ports that comply fully with the FDDI American National Standards Institute (ANSI) draft specification for A and B ports.

Following are the available concentrator models:

- WS-C1441—8 multimode, MIC connector, FDDI ports
- WS-C1444—8 single-mode, ST connector, FDDI ports
- WS-C1450—2 multimode, MIC connector, FDDI ports and 12 RJ-45 connector, CDDI/MLT-3 ports
- WS-C1455—10 multimode, SC connector, FDDI ports
- WS-C1483—16 RJ-45 connector, CDDI/MLT-3 ports

You can place concentrators on a desktop or mount them in an Electronic Industries Association (EIA)–compliant, 19-inch open or closed rack.

Summary of Features

Following are the features of the Workgroup WS-C1400 Concentrator:

- Easy installation, configuration, and management
- Single attachment, dual attachment, or null attachment operation
- Dual Media Access Control (MAC) and three-path architecture
- Ring and port LED status indicators
- A visual traffic-meter LED
- Power-up diagnostics
- Concentrator administration through a local Electronics Industries Association/Telecommunications Industry Association (EIA/TIA)-232 port called the admin. interface port

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Note EIA/TIA-232 was known as recommended standard RS-232 before its acceptance as a standard by the Electronic Industries Associations (EIA) and Telecommunications Industry Association (TIA).

- Telnet support for remote login to the admin. interface
- Password protection for the admin. interface
- Ability to download new software through the admin. port using Kermit or over the network from the concentrator through a download server via the Trivial File Transfer Protocol (TFTP)
- Nonvolatile memory for software configuration data
- Support for an external optical bypass switch

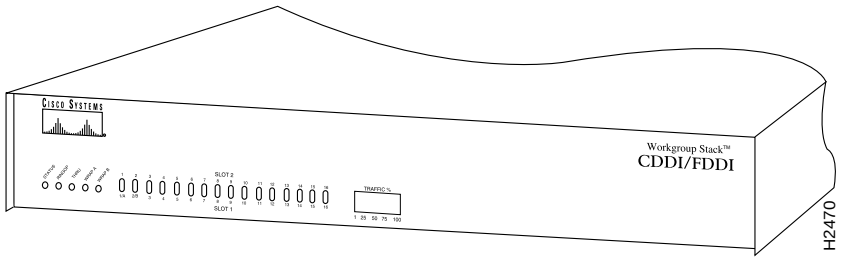
- Simple Network Management Protocol (SNMP) agent that supports Management Information Base (MIB) II, FDDI MIB, and a Cisco MIB
- Bootstrap Protocol (BOOTP) support so the concentrator can get its Internet Protocol (IP) address from a BOOTP server on the network
- Company and IP aliases
- Ringmap display
- Ability to generate traffic on FDDI networks
- Port control: enable, disable, start, and stop ports
- Display remote MIB

Workgroup WS-C1400 Concentrators comply fully with the FDDI Station Management (SMT) Specification, Revision 7.3 and include an SNMP agent for network management. A network administrator can monitor and control Workgroup Concentrators from anywhere on the network using any SNMP management application (for example, Workgroup Director network management software).

Front Panel

The front panel of the concentrator has LED indicators for concentrator, ring, and port status, and port traffic. (See Figure 1-1.)

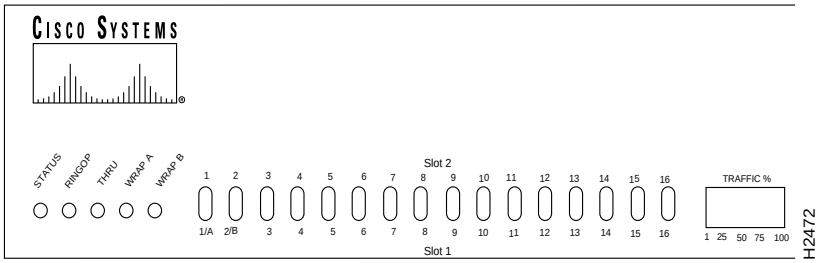
Figure 1-1 CDDI/FDDI Workgroup WS-C1400 Concentrator—Front-Panel View



Front Panel LEDs

The LEDs on the front panel of the concentrator (see Figure 1-2) indicate the status of the concentrator (faulty or not faulty), the status of the ring, the configuration state of the dual ring, and the status of each port.

Figure 1-2 LED Indicators—Partial Front-Panel View



Following are descriptions of the status, ringop, thru, wrap A, wrap B, link status, and traffic-meter LEDs.

Note All LED indicators except the traffic meter are duplicated on the back panel next to cable connections for easy diagnosis and monitoring. (See the section “Rear Panel” for a detailed description of the LEDs.)

Status

The concentrator performs a series of self-tests and diagnostics. The status LED indicators are as follows:

- Green—The concentrator has passed all tests.
- Orange—A minor alarm; for example, one line card has failed and has to be replaced.
- Red—A major alarm; for example, a motherboard has failed and you need to call a customer service representative.

Ringop

The ringop LED indicates which ring is operational. (See Table 1-1.)

Table 1-1 Ringop LED Descriptions

Color	Meaning
Green	Primary ring is operational (secondary ring may also be operational).
Orange	Secondary ring is operational, primary ring is nonoperational.
Off	Both rings are nonoperational.

This LED is labeled “RO” on the rear panel of the concentrator.

Thru

In thru mode, indicated by the green thru LED, ports 1/A and 2/B are connected to the primary and secondary paths. This LED is labeled “TH” on the rear panel of the concentrator.

Wrap A

In wrap A mode, indicated by the green wrap A LED, port 2/B is isolated and port 1/A is connected to the ring. This LED is labeled “WA” on the rear panel of the concentrator.

Wrap B

In wrap B mode, indicated by the green wrap B LED, port 1/A is isolated and port 2/B is connected to the ring. This LED is labeled “WB” on the rear panel of the concentrator.

Link Status

The link status LEDs, slot 1 (labeled 1/A, 2/B, and 3 through 16) and slot 2 (labeled 1 through 16) indicate the connection state of each link. Table 1-2 describes what the LEDs indicate.

Note Slot 1 LEDs labeled 1/A and 2/B can be configured by software as A and B ports.

Table 1-2 Link Status LED Descriptions

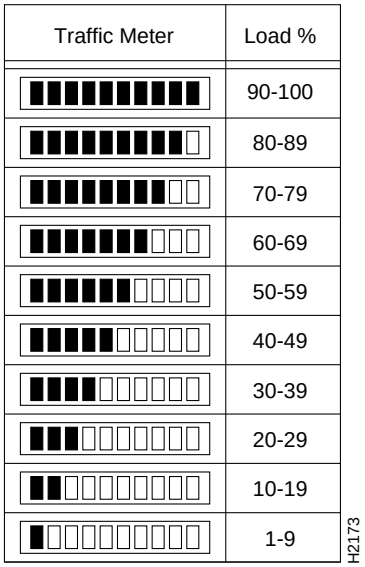
Color	Meaning
Green	The link has connected properly with the remote device.
Orange	Signal detected, but the link has failed to connect or is in the process of connecting. A dual homed station causes the link status LEDs of both the homing station M[1] port and the dual homed station A port to be orange.
Off	No signal detected.

1. M = master port.

Traffic Meter

The traffic-meter LED provides a visual indication (as an approximate percentage) of the current traffic load on the primary ring. (See Figure 1-3.)

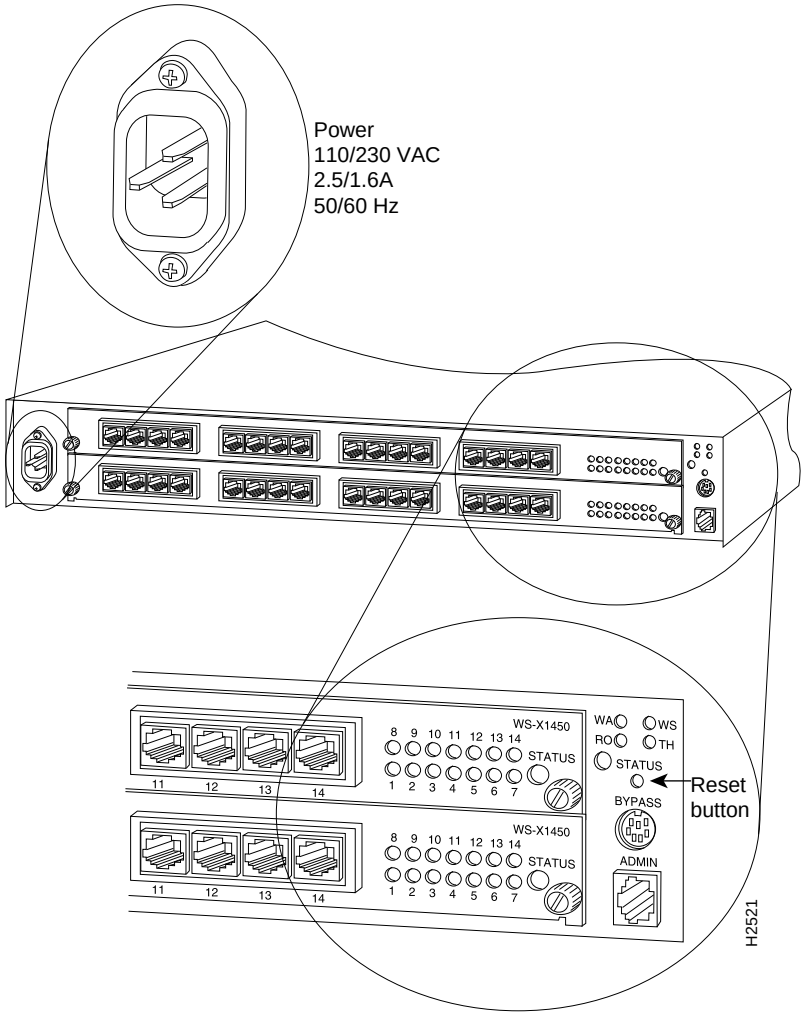
Figure 1-3 Traffic Meter LED



Rear Panel

The rear panel has two slots for line cards. The slots each accommodate a line card with from 8 to 16 M ports for connecting to CDDI or FDDI A, B, or slave (S) ports. There is an AC power receptacle, an optical bypass switch connector and LED, and an EIA/TIA-232 port for the admin. interface. (See Figure 1-4.)

Figure 1-4 CDDI/FDDI Workgroup WS-C1400 Concentrator—Rear-Panel View



AC Receptacle

The AC power receptacle uses the AC power cord supplied with the concentrator. The power supply automatically accepts either 110 VAC or 230 VAC. To apply power, attach the power cord. To disconnect power, remove the power cord.

Optical Bypass Switch Connector

The six-pin mini-DIN connector is used to connect an external optical bypass switch to the concentrator. An activated bypass switch inserts the concentrator into the ring. An optical bypass switch can only be used with a line card in slot 1 and ports 1 and 2 configured as A/B ports. If you install or remove an optical bypass switch, you must reset the concentrator.

Rear Panel LEDs

The LEDs on the rear panel of the concentrator (see Figure 1-4) duplicate the LEDs on the front panel and indicate the status of the concentrator (faulty or not faulty), the status of the ring, the configuration state of the dual ring, and the status of each port. (See the section "Front Panel LEDs" earlier in this chapter.)

Administration Interface Port

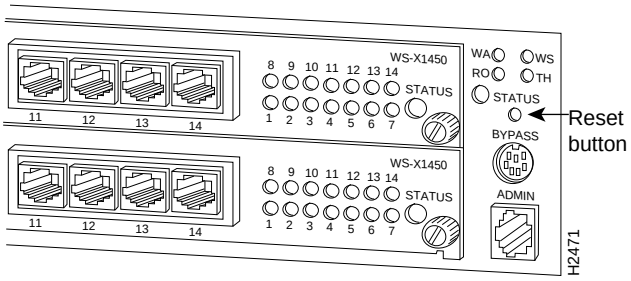
To use the administration interface port (called the admin. interface), you can connect an EIA/TIA-232 terminal, modem, or workstation to the admin. port. You can also access the admin. interface from a remote host using Telnet. An RJ-45 cable and RJ-45-to-DB-25 data terminal equipment (DTE) adapter are provided for the admin. port. Refer to the appendix "Cabling Specifications" for the admin. port pinout.

Note You have access to one Telnet or admin. interface connection per concentrator.

Reset Button

You can access the reset button through a small hole above the optical bypass switch connector. Using a thin tool, such as a paper clip, press the button, then release it to reset the concentrator. (See Figure 1-5.)

Figure 1-5 Reset Button—Partial Rear-Panel View



Line Card Slots

The line card slots (see Figure 1-6) support five optional CDDI and FDDI line cards, which are shown in Figure 1-6. The appendix “Installing and Removing Line Cards” contains procedures for installing and removing the line cards.

The optional line cards are as follows:

- WS-X1441—8-multimode, MIC connector, FDDI ports (See 1 in Figure 1-6.)
- WS-X1444—8-multimode, ST connector, FDDI ports (See 2 in Figure 1-6.)
- WS-X1450—2 multimode, MIC connector, FDDI ports, and 12-RJ-45 connector, CDDI/MLT-3 ports (See 3 in Figure 1-6.)
- WS-X1455—10-single-mode, SC connector, FDDI ports (See 4 in Figure 1-6.)
- WS-X1483—16-RJ-45 connector, CDDI/MLT-3 ports (See 5 in Figure 1-6.)

Figure 1-6 CDDI and FDDI Line Cards

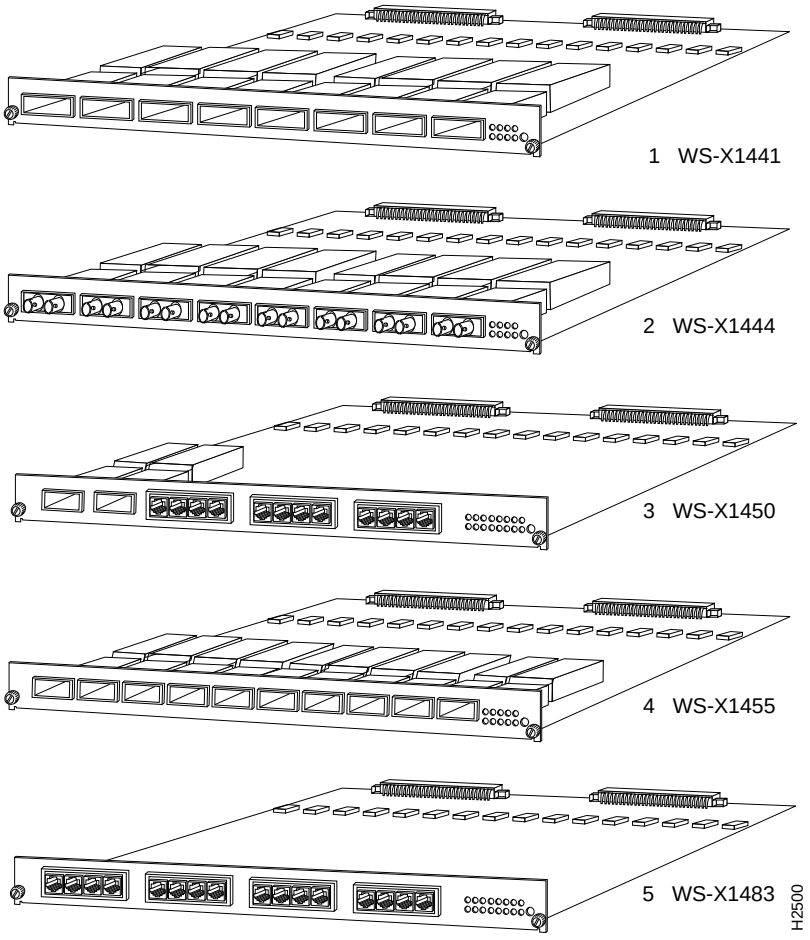
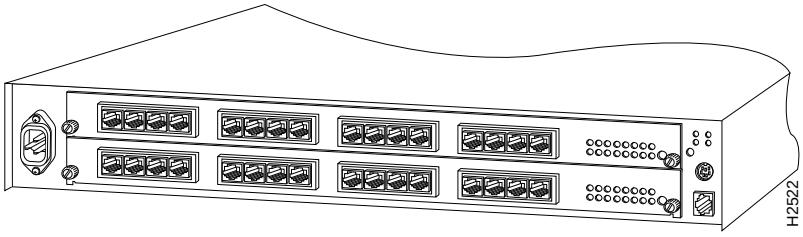


Figure 1-7 shows a concentrator with both CDDI line cards installed.

Figure 1-7 Concentrator with CDDI Line Cards Installed—Rear-Panel View

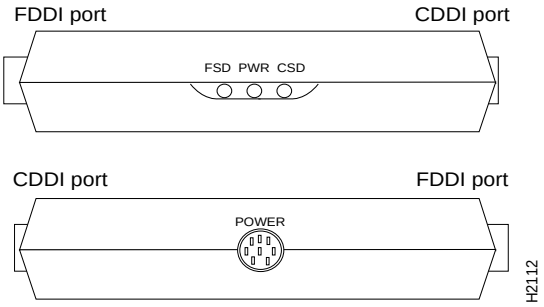


CDDI-FDDI Translator

The CDDI-FDDI translator allows you to connect a device with an FDDI interface to a CDDI twisted-pair network. The translator has an FDDI media interface connector (MIC) M port to connect to the FDDI station and a CDDI port to connect to the concentrator or wall plate with a modular cable.

The CDDI-FDDI translator includes an AC power adapter. Figure 1-8 shows the translator (Model Number WS-C703).

Figure 1-8 CDDI-FDDI Translator



There are three status LEDs on the side of the concentrator: FSD (FDDI signal detect), PWR (power), and CSD (CDDI signal detect).

Technical Specifications

Table 1-3 lists specifications for the CDDI/FDDI Workgroup WS-C1400 Concentrator.

Table 1-3 CDDI/FDDI Workgroup WS-C1400 Concentrator Specifications

Specification	Description
Physical	Width: 18" (45.72 cm) Depth: 16" (40.64 cm) Height: 2.7" (6.86 cm) Weight: 16 lb (7.3 kg)
Power requirements	3.0A @ 110 VAC, 60 Hz 1.6A @ 220 VAC, 50 Hz
Thermal dissipation	FDDI: 90W (maximum) CDDI: 110W (maximum)
Operating temperature	32 to 104 F (0 to 40 C)
Storage temperature	–40 to 167 F (–40 to 75 C)
Relative humidity	10% to 90% noncondensing
Electromagnetic emissions certifications	CDDI/FDDI: FCC Class A (47 CFR, Part 15) CDDI/FDDI: CISPR 22 Class A CDDI/FDDI: VCCI Class I FDDI: VDE Class B
Safety	UL: 1950 CSA-C22.2 No. 950-M89 IEC 950
Mounting	Desktop 19-inch rack (hardware included)
Connectors	Multimode FDDI: MIC Multimode FDDI: SC Single-mode FDDI: ST CDDI: RJ-45 Admin. port: RJ-45

Specification	Description
Ports	8-port multimode FDDI line card 8-port single-mode FDDI line card 2-port multimode FDDI and 12-port CDDI/MLT-3 line card 10-port multimode FDDI line card 16-port CDDI/MLT-3 line card Admin. interface port (EIA/TIA-232)
Fiber interface	62.5/125-micron multimode fiber 50/125-micron multimode fiber 8/125-micron single-mode fiber
Network management	SMT 7.3 SNMP agent (RFC 1157) FDDI MIB (RFC 1285) MIB II (RFC 1213) Workgroup-specific MIB
LED indicators	Concentrator status Ringop Thru Wrap A Wrap B Traffic meter Link status (each link)
Maximum station-to-station cabling distance	62.5/125 micron multimode fiber: 1.24 miles (2 km) 50/125 micron multimode fiber: 1.24 miles (2 km) 8/125-micron single-mode fiber: 18.6 miles (30 km) Category 5 UTP[1]: 328' (100 m) IBM Type 1 or Type 2 STP[2]: 328' (100 m)
FDDI transmit power levels: Single-mode fiber Multimode fiber	Average optical power: Maximum: –4.0 dBm[3] Minimum: –7.0 dBm Maximum: –14.0 dBm Minimum: –18.5 dBm

Specification	Description
FDDI receive power levels:	
Single-mode fiber	Average optical sensitivity: –33 dBm Average maximum input power: –14 dBm
Multimode fiber	Average optical sensitivity: –34 dBm Average maximum input power: –14 dBm

1. UTP = unshielded twisted-pair.
2. STP = shielded twisted-pair.
3. dBm = decibels per milliwatt.