Chapter 1
Product Overview

The CDDI/FDDI Workgroup Concentrator (Model Number WS-X1100) 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 publication, unless otherwise noted, the term CDDI refers specifically to the CDDI/MLT-3 standard and the term concentrator refers specifically to the WS-C1100 Concentrator.

CDDI and FDDI ports can be mixed and added as needed, up to a maximum of 16 ports.

The concentrator can be further expanded by adding an optional A/B port card. This card adds two CDDI or FDDI ports that comply fully with the FDDI American National Standards Institute (ANSI) draft specification for A and B ports. In addition, optional CDDI and FDDI line cards are available, providing from four to eight additional ports per card.

Following are the available concentrator models:

- WS-X1131—Four multimode FDDI ports
- WS-X1134—Four single-mode FDDI ports
- WS-X1140—Eight CDDI/MLT-2 ports
- WS-X1141—Eight multimode FDDI ports
- WS-X1143—Eight CDDI/MLT-3 ports

You can place concentrators on a desktop, mount them on a wall, 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 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

Note Prior to the acceptance of the EIA/TIA-232 standard by the ANSI committee, it was referred to as a recommended standard called RS-232.

- 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

- Port control: enable, disable, start, and stop ports
- Display remote MIB

Workgroup Concentrators fully comply 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 light-emitting diode (LED) indicators for concentrator, ring, and port status, and port traffic. There is also a reset button that is used to reset the system. (See Figure 1-1.)

Note In Figure 1-1, Figure 1-2, and Figure 1-4, the concentrator is shown with the plastic front panel removed and installed. The presence of this panel depends on your installation requirements.

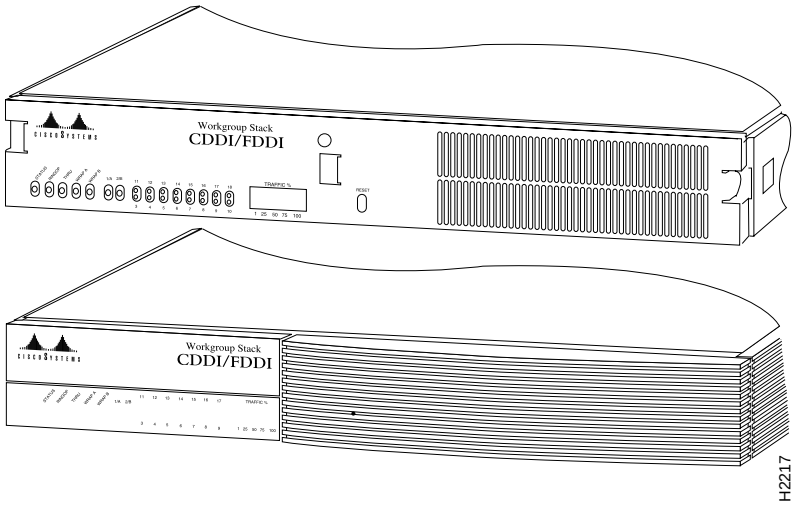

Figure 1-1 CDDI/FDDI Workgroup Concentrator—Front-Panel View

LEDs

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

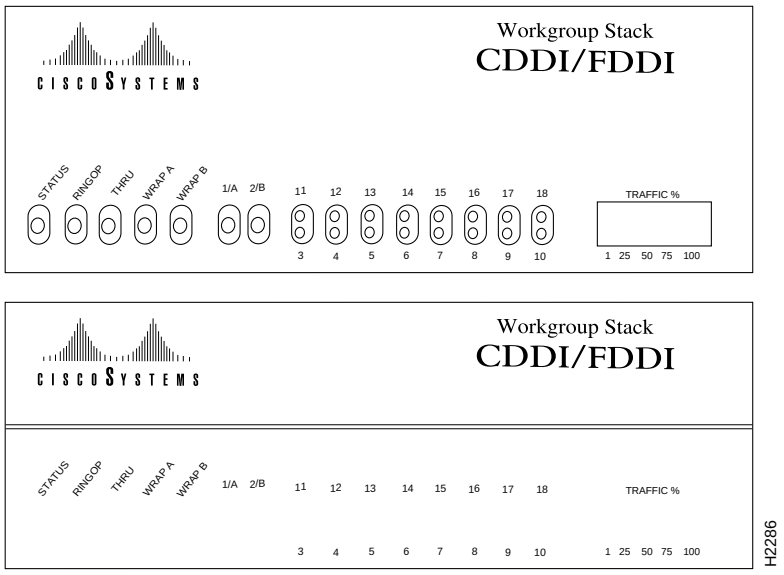

Figure 1-2 LED Indicators—Partial Front-Panel View

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

Status

The concentrator performs a series of self-tests and diagnostics. If all the tests pass, the status LED will be green. If any concentrator test fails, the status LED will be red.

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.

Thru

In thru mode, indicated by the green thru LED, ports 1/A and 2/B are connected to the primary and secondary paths.

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.

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.

Link Status

The link status LEDs (labeled 1/A, 2/B, and 3 through 18) indicate the connection state of each link. Table 1-2 explains what the colors of the LEDs indicate.

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 LED of an M[1] port connected to the 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.)

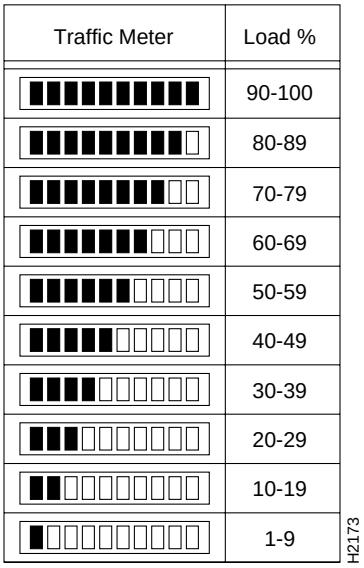

Figure 1-3 Traffic Meter LED

Reset Button

You can access the reset button, which is located behind the front panel, through a small hole approximately one and a half inches to the right of the traffic meter LED. Using a thin tool, such as a paper clip, press the button, then release it to reset the concentrator. (See Figure 1-4.)

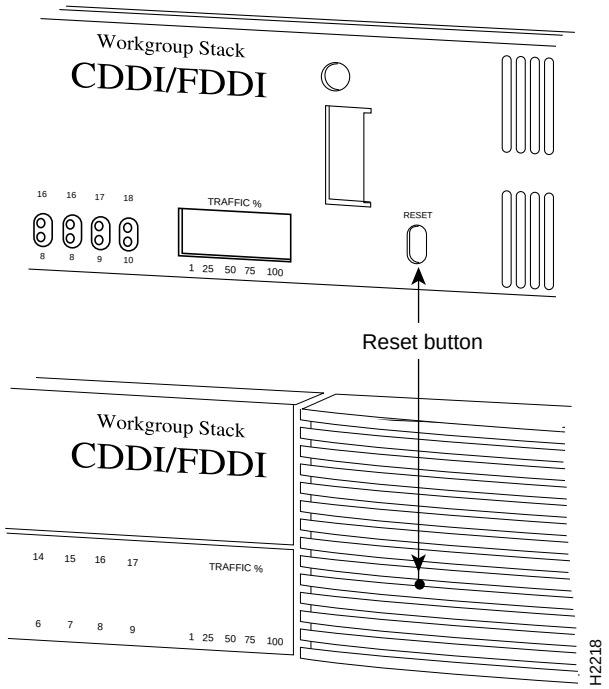

Figure 1-4 Reset Button—Partial Front-Panel View

Rear Panel

The rear panel has three slots: one for A/B port cards, and two for line cards. The A/B port card slot is for an optional CDDI or FDDI A/B port card. The line card slots each accommodate a line card with from four to eight 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 1-5.)

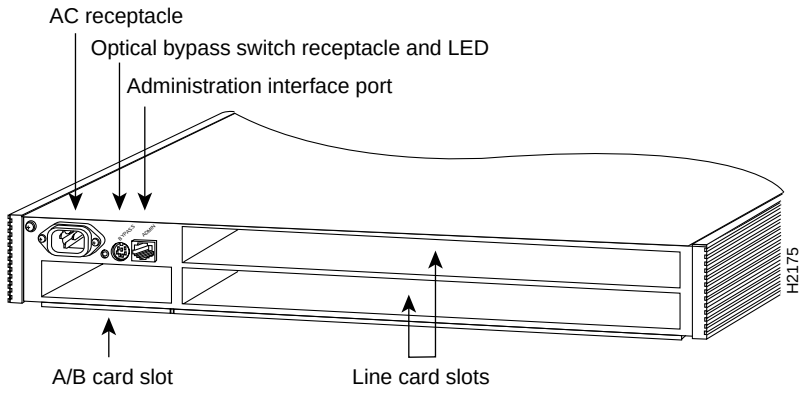

Figure 1-5 CDDI/FDDI Workgroup Concentrator—Rear-Panel View

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. Use a bypass switch only with the A/B port card option. If you install or remove an optical bypass switch, you must reset the concentrator. The optical bypass switch LED indicates the status of the device connected to the concentrator. When the LED is on, the bypass switch is activated and is in thru mode (the concentrator is attached to the dual ring).

Administration Interface Port

To use the administration interface port (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.

A/B Card Slot

The A/B card slot supports a single MAC dual attachment station (DAS) with dual homing configuration for FDDI. (A/B ports can also be configured as single attachment stations [SASs].) The slot also accepts CDDI/MLT-3 cards for unshielded twisted-pair (UTP) and shielded twisted-pair (STP) connections.

Figure 1-6 shows the following three models of A/B port cards:

- WS-X1510—DAS CDDI/MLT-2 which accepts category 5, UTP, modular RJ-45 connectors. (See 1 in Figure 1-6.)
- WS-X1511—DAS multimode FDDI, which accepts FDDI media interface connectors (MICs). (See 2 in Figure 1-6.)
- WS-X1513—DAS CDDI/MLT-3, which accepts category 5, UTP, modular RJ-45 connectors. (See 3 in Figure 1-6.)
- WS-X1514—DAS single-mode FDDI, which accepts standard FDDI ST-type connectors. (See 4 in Figure 1-6.)

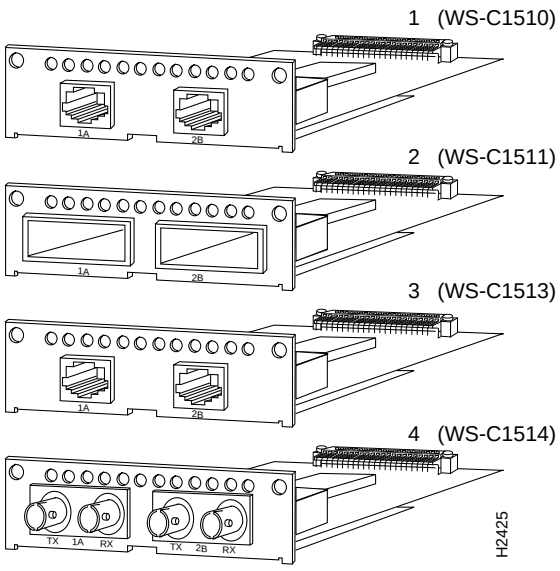

Figure 1-6 FDDI and CDDI A/B Port Cards

The A/B port cards allow the concentrator to connect to a dual ring as a peer connection or to the M port of another concentrator (cascaded tree configuration). To add an A and B port to the concentrator, insert an optional A/B port card. For A/B port card installation, see the appendix "Installing and Removing Port and Line Cards."

Line Card Slots

The line card slots (see Figure 1-5) support the following optional CDDI and FDDI line cards, which are shown in Figure 1-7. The appendix "Installing and Removing Port and Line Cards" contains procedures for installing and removing the line cards.

- WS-X1521—Four-port multimode FDDI (See 1 in Figure 1-7.)
- WS-X1524—Four-port single-mode FDDI (See 2 in Figure 1-7.)
- WS-X1530—Eight-port CDDI/MLT-2 (See 3 in Figure 1-7.)

- WS-X1531—Eight-port multimode FDDI (See 4 in Figure 1-7.)
- WS-X1533—Eight-port CDDI/MLT-3 (See 5 in Figure 1-7.)

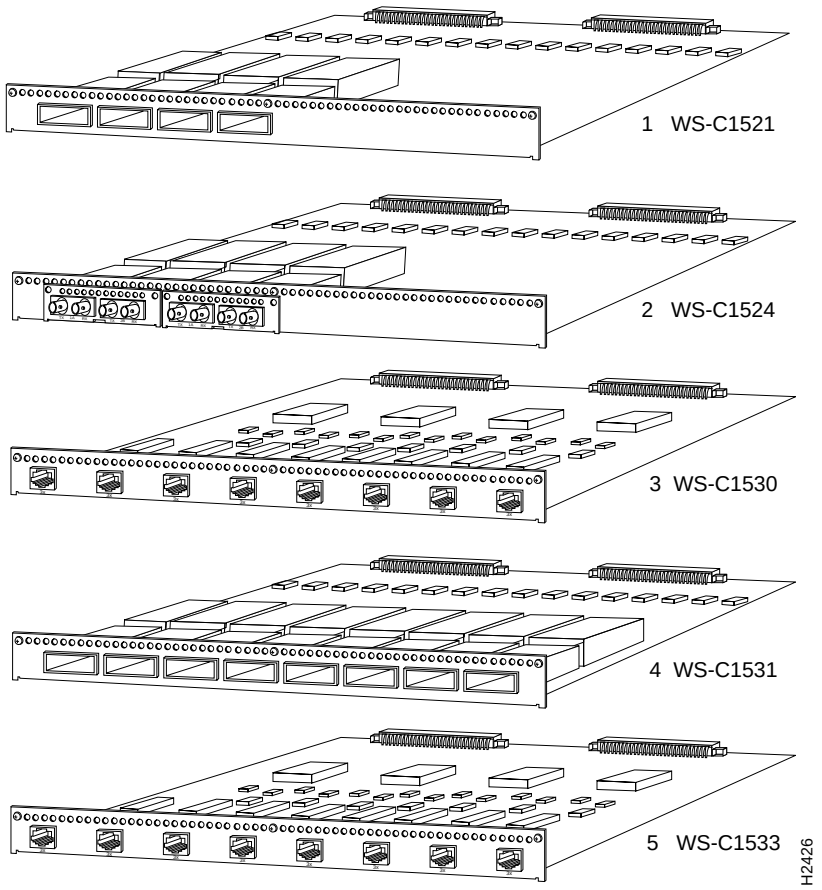

Figure 1-7 CDDI and FDDI Line Cards

Figure 1-8 shows a concentrator with the maximum number of CDDI line card ports installed.

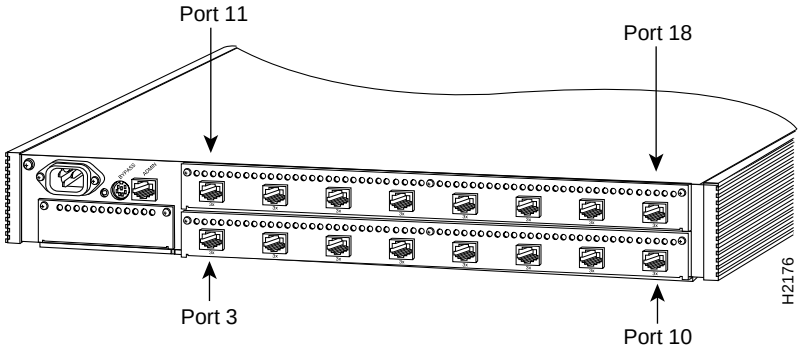

Figure 1-8 Concentrator with CDDI Line Cards Installed—Rear-Panel View

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 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 1-9 shows the translator (Model Number WS-X703).

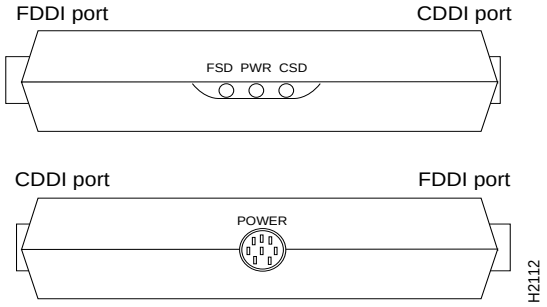

Figure 1-9 CDDI-FDDI Translator

On the side of the translator you will find three status LEDs: FSD (FDDI signal detect), PWR (power), and CSD (CDDI signal detect).

Technical Specifications

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

Table 1-3 Technical Specifications

Specification	Description
Physical (H x W x D)	2.7 x 18 x 16" (6.86 x 45.72 x 40.64 cm)
Weight	16 lb (7.3 kg)
Power requirements	2.5A @ 110 VAC, 60 Hz 1.6A @ 220 VAC, 50 Hz
Thermal dissipation	FDDI: 75W (maximum) CDDI: 65W (maximum)
Operating temperature	32 to 104F (0 to 40C)
Storage temperature	-40 to 167F (-40 to 75C)
Relative humidity	10% to 90% noncondensing
Electromagnetic emissions certifications	CDDI/FDDI: FCC Class A (47 CFR, Part 15) CDDI/FDDI: CISPR 22 Class A FDDI: VDE Class B
Safety	UL: 1950 CSA-C22.2 No. 950-M89 IEC 950
Mounting	Desktop 19-inch rack (hardware included) Wall-mount (hardware included with optional kit)
Connectors	Multimode FDDI: MIC Single-mode FDDI: ST CDDI: RJ-45 Admin. port: RJ-45
Ports	Four-port multimode FDDI line card Four-port single-mode FDDI line card Eight-port CDDI line card Eight-port multimode FDDI line card FDDI single-mode A/B port card FDDI multimode A/B port 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

Specification	Description
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) Optical bypass switch (rear panel)
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: 1.24 miles (2 km) Single-mode fiber: 18.6 miles (30 km) Category 5 UTP: 328' (100 m) IBM Type 1 or Type 2 STP: 328' (100 m)
FDDI transmit power levels: Single-mode fiber Multimode fiber	Average optical power: Maximum: -4.0 dBm Minimum: -7.0 dBm Maximum: -14.0 dBm Minimum: -18.5 dBm
FDDI receive power levels: Single-mode fiber Multimode fiber 	 Average optical sensitivity: -33.0 dBm Average maximum input power: -14.0 dBm Average optical sensitivity: -34.0 dBm Average maximum input power: -14.0 dBm