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DECconcentrator™ 500



Installation

Order Number: EK-DEFCN-IN-004

CAUTION

People installing the cabling system described in this manual should know local building codes, fire codes, and any other applicable codes or regulations. The manufacturers or their distributors and agents will not be responsible for damage due to improperly installed cabling, neglect, misuse, or improper connection of devices to the cabling system.

CAUTION

This equipment is in the 1st Class category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas. Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused in radios and TV receivers etc. Read the instructions for correct handling.

NOTICE – Class A Computing Device:

This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference; in which case, measures taken to correct the interference are at the user's expense.

NOTICE – Class 1 Laser Device:

The lasers in this equipment are Class 1 devices, compliant with CDRH Rules 21, CFR Subchapter J, Part 1040.10, at date of manufacture. Class 1 laser devices are not considered to be hazardous.

DECconcentrator™ 500

Installation

December 1991

This manual describes how to install and verify the operation of the DECconcentrator 500 unit. Refer to the specific option card installation manual to install your option card.

Supersession/Update Information: This is a revised manual.

digital

Order Number: EK-DEFCN-IN-004

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Safety

Warnings and cautions that appear in this manual are defined as follows:

WARNING	Contains information to prevent personal injury.
CAUTION	Contains information to prevent damage to equipment.
VORSICHT	Enthält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.
ACHTUNG	Enthält Informationen, die beachtet werden müssen, um die Geräte vor Schaden zu bewahren.
DANGER	Signale les informations destinées à prévenir les accidents corporels.
ATTENTION	Signale les informations destinées à prévenir la détérioration du matériel.
AVISO	Contiene información para evitar daños personales.
PRECAUCIÓN	Contiene información para evitar daños al equipo.

The warnings and cautions you must observe for the hardware described in this manual are listed below in English, German, French, and Spanish. The pages on which these safety messages appear are also listed.

CAUTION

Static electricity can damage modules and electronic components. Digital recommends you use a grounded wrist strap and grounded work surface (P/N 29-11762) when you handle any modules or internal parts.
(Pages 2-1, 3-2)

ACHTUNG

Module und elektronische Komponenten können durch elektrostatische Entladungen beschädigt werden. Benutzen Sie immer eine antistatische Gelenkmanschette und eine geerdete Arbeitsunterlage, wenn Sie am offenen Gerät arbeiten. In der BRD ist ein Antistatik-Kit unter der Bestellnummer 29-26246 erhältlich.

ATTENTION

Les charges excessives d'électricité statique peuvent endommager les modules et les composants électroniques. Digital conseille l'utilisation d'un bracelet de masse et d'un plan de travail mis à la terre (Réf. 29-11762) lors de la manipulation des modules et des composants internes.

PRECAUCIÓN

La electricidad estática puede dañar los componentes electrónicos y los módulos. Digital recomienda que se utilicen cintas de pasadores y superficies de trabajo conectadas a tierra (P/N 29-11762) al trabajar con cualquier módulo o parte interna.

WARNING

For continued protection against risk of electric shock, this product must be connected to a three-wire wall receptacle that has its grounding terminal reliably connected to the building's safety earth ground. (Pages 2-3, 3-8)

VORSICHT

Um optimale Sicherheit zu gewährleisten, dürfen Sie es nur an eine ordnungsgemäß geerdete Schuko-Steckdose anschließen.

DANGER

Afin d'assurer une protection efficace contre tout risque d'électrocution, cet équipement doit être raccordé à une prise secteur équipée d'un contact de mise à la terre effectivement relié à la terre secteur du bâtiment.

AVISO

Para evitar el riesgo continuado de descargas eléctricas, este producto debe conectarse en una toma de pared trifásica que tenga un terminal de tierra con una conexión fiable a la toma de tierra del edificio.

CAUTION

Do not reinstall the cover screws into the concentrator's metal chassis without the cover. This could damage the concentrator. (Page 3-2)

ACHTUNG

Der Kabelkonzentrator kann beschädigt werden, wenn Sie die Gehäuseschrauben am Metallgehäuse für den Kabelkonzentrator befestigen.

ATTENTION

Ne remontez pas les vis du capots sur le châssis métallique du concentrateur décâbles. Ceci pourrait endommager le concentrateur.

PRECAUCIÓN

No hay que volver a instalar los tornillos de la cubierta en el chasis de metal del concentrador del cableado, porque al hacerlo se podría dañar éste.

WARNING

The DECconcentrator 500 contains no user-serviceable parts. During installation do not open the unit for any reason. If the concentrator needs repair, only qualified personnel familiar with safety procedures for electrical equipment and the DECconcentrator 500 should access components inside the unit. (Pages 3-1, 5-2)

VORSICHT

Die DECconcentrator 500 enthält keinerlei Teile, die der Benutzer warten könnte. Während der Installation sollte das Gerätauf keinen Fall geöffnet werden. Reparaturen jeglicher Art an der DECconcentrator 500 dürfen nur von elektrotechnisch qualifiziertem Wartungspersonal ausgeführt werden.

DANGER

Le DECconcentrator 500 ne comporte aucun élément remplaçable par l'utilisateur. Cet appareil ne doit en aucun cas être ouvert, y compris lors de l'installation. Les opérations d'entretien et de réparation doivent impérativement être effectuées par des techniciens qualifiés.

AVISO

El DECconcentrator 500 contiene componentes que no pueden ser manejados por el usuario. Durante la instalación, la unidad no debe abrirse bajo ningún concepto. Si el puente necesita una reparación de alguno de los componentes internos de la unidad, sólo podrá llevarla a cabo personal especializado y familiarizado con los procedimientos de seguridad de los equipos eléctricos y del DECconcentrator 500.

WARNING

To avoid bodily injury or damage to the equipment, do not connect the power cord or any other cable until you are instructed to do so in these procedures.

Do not apply power to the unit unless all covers are installed.
(Page 3-1)

VORSICHT

Schließen Sie das Netzkabel oder andere Kabel erst an, wenn Sie dazu aufgefordert werden. Andernfalls besteht LEBENSGEFAHR! Überdies können die Geräte Schaden nehmen.

Schließen Sie das Gerät erst an das Stromnetz an, wenn alle Abdeckungen ordnungsgemäß angebracht worden sind.

DANGER

Afin d'éviter tout risque d'accident corporel ou matériel, NE BRANCHEZ AUCUN cordon d'alimentation ou autre câble sans en avoir reçu l'instruction explicite dans la procédure.

Ne reliez au secteur qu'après l'installation complète de tous les capots.

AVISO

Para evitar daños internos al equipo, NO conectar el cable-dealimentación ni ningún otro hasta que se indique en estos procedimientos.

CAUTION

To prevent damage to electronic components, do not exceed 50° C (122° F) ambient temperature at the air intake of the DECconcentrator 500. (Pages 3-2, A-2)

ACHTUNG

Um Schäden an den elektronischen Bauteilen zu vermeiden, darf die Umgebungstemperatur an den Lüftungsschlitzen des Konzentrators 50 Grad Celsius nicht überschreiten.

ATTENTION

Afin de ne pas endommager les composants électroniques, assurez-vous que la température ambiante n'excède pas 50C à la prise d'air du DECconcentrator 500.

PRECAUCIÓN

Para evitar daños a los componentes electrónicos, no sobrepasar 50 grados centígrados (122 grados Farenheit) de temperatura ambiente en la toma de aire del DEConcentrator 500.

CAUTION

The air inside an enclosed rack can be hotter than the ambient room temperature. Make sure that the air entering the DECconcentrator 500 does not exceed the maximum intake temperature of 50° C (122° F). (Page 3-4)

ACHTUNG

Die Lufttemperatur im Gehäuse kann beträchtlich höher sein als die umgebende Raumtemperatur. Achten Sie darauf, daß die maximale Einlaßtemperatur für den DECconcentrator 500 nicht höher als 50 Grad Celsius ist.

ATTENTION

La température de l'air circulant à l'intérieur d'une baie fermée peut être supérieure à celle de la pièce. Assurez-vous que la température à la prise d'air du DECconcentrator 500 n'excède pas 50C.

PRECAUCIÓN

El aire dentro de un compartimento cerrado puede ser más caliente que la temperatura ambiente. Es importante comprobar que el aire que entra en el DECconcentrator 500 no sobrepasa la temperatura de toma de 50 grados C (122 grados F).

WARNING

To avoid bodily injury, use care when connecting the concentrator power cord. Regulations in some countries may require an authorized person to connect the power.

Make sure you connect the power cord to a grounded wall outlet. (Page 3-8)

VORSICHT

Netzspannung ist lebensgefährlich. Beachten Sie dies, wenn Sie das Netzkabel anschließen. In einigen Ländern dürfen Elektrogerätenur von entsprechend ausgebildetem Personal, beispielsweise Elektrikern, angeschlossen werden. Prüfen Sie, ob das in Ihrem Land zutrifft.

Schließen Sie das Netzkabel nur an eine geerdete Steckdose an.

DANGER

Afin d'éviter tout risque d'accident corporel, agissez avec la plus grande précaution lors du raccordement du cordon d'alimentation du concentrateur. Assurez-vous que la législation vous autorise bien à effectuer ce branchement.

Assurez-vous que la prise sur laquelle vous raccordez le cordon d'alimentation est effectivement reliée à la terre.

AVISO

Para evitar daños generales, es importante tener cuidado a la hora de conectar el cable de alimentación del concentrador. En algunos países existen estipulaciones para que la conexión la tenga que hacer una persona autorizada.

Hay que comprobar que se conecta el cable de alimentación a una toma conectada a tierra.

WARNING

Some fiber optic equipment can emit laser light that can injure your eyes. Never look into an optical fiber or connector port. Always assume the cable is connected to a light source.
(Page 5–7)

VORSICHT

Schauen Sie niemals direkt in ein Glasfaserkabel oder einen Glasfaseranschluß. Die Laserstrahlen in faser-optischen Geräten können Augenverletzungen verursachen.

DANGER

Certains équipements utilisant les fibres optiques peuvent émettre des rayonnements laser dangereux pour les yeux. Ne vous avisez jamais de regarder par l'extrémité d'une fibre optique ou dans l'ouverture d'un connecteur. Considérez toujours que le câble est relié à une source lumineuse.

AVISO

Algunos equipos de fibra óptica pueden emitir luz láser que dañalos ojos. No se debe mirar en una puerta de conector o fibra óptica. Siempre se debe suponer que el cable está conectado a la luz.

WARNING

Always remove the power cord from the concentrator and ac source when performing any removal or installation procedures. (Page 5-2)

VORSICHT

Bevor Sie Teile entfernen oder ersetzen, müssen Sie immer zuerst das Netzkabel aus der Wandsteckdose und anschließend aus der Netzbuchse am Konzentrador ziehen.

DANGER

Assurez-vous toujours que le cordon d'alimentation est débranché du concentrateur et du secteur lors des procédures de dépose et pose de composants.

AVISO

Desconectar siempre el cable de alimentación del concentrador y de la toma de corriente alterna al realizar cualquier procedimiento desustitución.

Preface

This manual explains how to install the DECconcentrator 500 unit and how to check its installation and operation. This manual also includes descriptions of the concentrator controls and indicators.

Intended Audience

This manual is intended for the hardware installer and system/network manager who is familiar with fiber optic network technologies, the Fiber Distributed Data Interface (FDDI) ANSI X3T9 standards, and safety procedures.

Document Structure

This document has five chapters and three appendixes, as follows:

Chapter 1	Describes the DECconcentrator 500 unit and its controls and indicators.
Chapter 2	Describes the contents of the DECconcentrator 500 shipment and contains site-preparation information.
Chapter 3	Describes the installation procedures to install the DECconcentrator 500. It also explains how to verify the operational status of the unit.
Chapter 4	Describes how to access and display the out-of-band management menu options.
Chapter 5	Describes the procedures to solve problems that may occur during installation of the DECconcentrator 500.

Appendix A	Contains the DECconcentrator 500 physical, environmental, operating, electrical, and power supply specifications.
Appendix B	Contains the DECconcentrator 500 Identification List.
Appendix C	Lists related documents.

Conventions Used in This Manual

This manual users the following conventions:

Convention	Meaning
Concentrator, unit	The DECconcentrator 500.
key	Press the specified key. For example, RET means that you should press the RETURN key.
CTRL - Z	Hold down the CONTROL key and press the Z key.
SHIFT - ~	Hold down the SHIFT key and press the tilde key.
<X>	Press the backspace/delete key.

The postage-paid Reader’s Comments form on the last page of this document requests your evaluation of this document to help us prepare future documentation.

Introducing the DECconcentrator 500

This chapter provides an overview and physical description of the DECconcentrator 500.

1.1 Product Overview

The DECconcentrator 500 is an American National Standards Institute (ANSI) X3T9-compliant physical layer device for use in a Fiber Distributed Data Interface (FDDI) network. The concentrator provides flexible application of FDDI to accommodate the diverse building wiring schemes at customer sites. The concentrator is the key component in the Digital dual ring of trees topology. It supports building and campus wiring topologies through the creation of hierarchical trees.

The concentrator is an active device and, in its simplest form, is a multiport physical layer repeater. It decodes, retimes, and, if necessary, modifies the repeated data stream.

1.1.1 Out-of-Band Management

The DECconcentrator 500 has a 25-pin D-subminiature connector on the input/output (I/O) panel. You can connect a terminal directly to the 25-pin D-subminiature connector. You can also connect to a terminal through a Scholar modem (or equivalent).

Out-of-band management (OBM) allows you to manage the concentrator with or without a Network Management Card. OBM does not require any special management station or software other than a terminal.

1.1.2 Optical Bypass

The multimode Network Management Card has an RJ12 connector to provide signals for an optical bypass switch. This switch maintains connectivity of the FDDI dual ring in the absence of power or during fault conditions of a node. Refer to the *Fiber Distributed Data Interface Network Configuration Guidelines* manual for a complete description of the optical bypass switch.

1.2 Location

You can install the DECconcentrator in a standalone configuration or in an extended local area network (LAN). You can place and use the DECconcentrator 500 in a main distribution frame (MDF), intermediate distribution frame (IDF), horizontal distribution frame (HDF), office distribution frame (ODF), satellite distribution frame (SDF), open office environment, and a computer room. You can place a concentrator enclosed in a plastic cover in an office environment. You can install a concentrator without a plastic cover in a standard 48-centimeter (19-inch) rack.

1.3 Configurations

For configuration and cabling information refer to the following:

- Configuration rules and information — refer to the *Fiber Distributed Data Interface Network Configuration Guidelines* manual.
- Cabling information — refer to the *DECconnect System Fiber Optic Planning and Configuration* and *DECconnect System Fiber Optic Installation* manuals.

1.4 Physical Description

A fully configured DECconcentrator 500 unit consists of the cover, chassis, power supply, controller/backplane, card cage, and option cards.

1.4.1 Power Supply

The 154-watt power supply drives two fans and delivers power to the controller/backplane and option cards. The power supply has the following features:

- Thermal protection provides automatic shutdown of the unit if the operating temperature exceeds the specification.
- Automatic voltage select (AVS) that allows the power supply to operate with an input voltage of 110/120 volts or 200/240 volts without setting a voltage switch.

1.4.2 Controller/Backplane

The controller/backplane contains a microprocessor that executes all diagnostic and operational firmware. The controller/backplane also does the following:

- Controls the Network Management Card and Port Cards
- Distributes power from the power supply to the option cards
- Distributes clock and processor-control signals to the option cards
- Provides the data-path interconnect between the option cards

1.4.3 Card Cage

The card cage contains three slots for option cards. Option cards inserted into the card cage connect to the controller/backplane through 120-pin connectors.

1.4.4 Option Cards

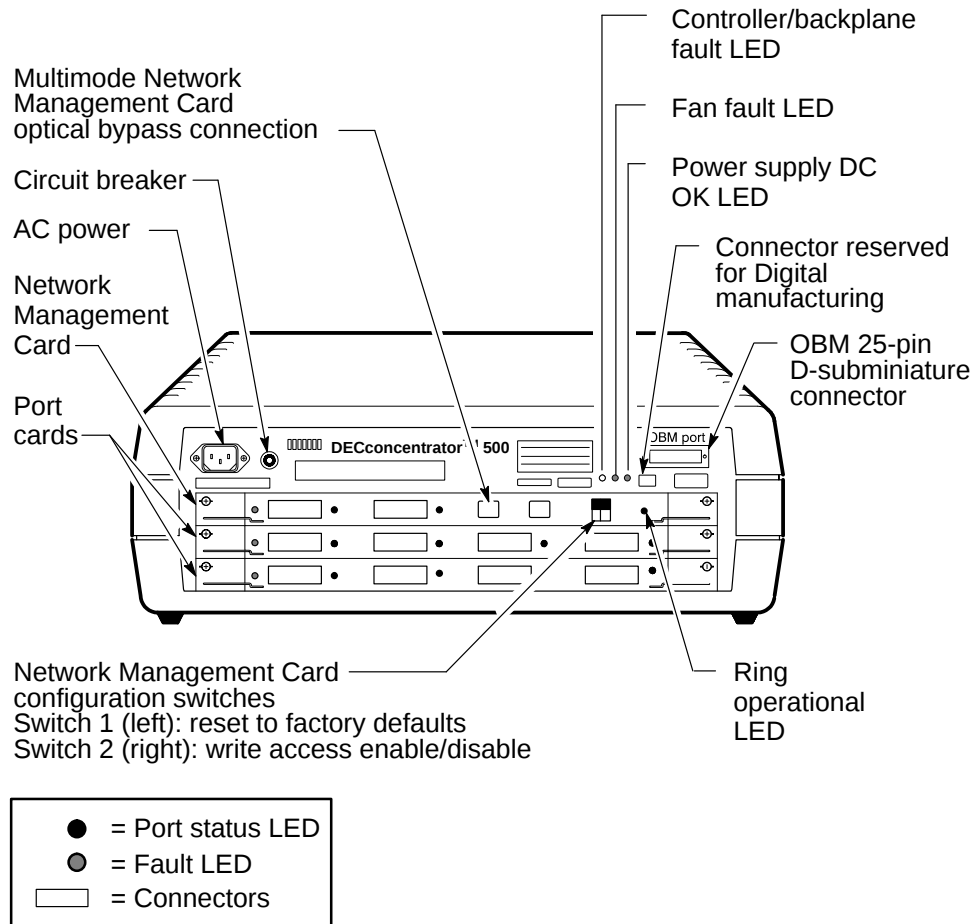
Several option cards are available for the DECconcentrator 500. Contact your Digital representative for more information. Option cards can be Network Management Cards or Port Cards.

- The Network Management Card provides the DECconcentrator 500 with all the hardware to support the connection through the dual ring.
- The Port Card contains all the hardware for the physical connection to an end station. Single attachment stations (SAS) and dual attachment stations (DAS) used as single attachment stations connect to the Port Card.

1.5 Controls and Indicators

The controls and indicators are located on the main frame of the DECconcentrator 500 unit and on the option cards (see Figure 1-1). The light emitting diode (LED) indicators provide operational and fault status.

Figure 1-1: DECconcentrator 500 Controls and Indicators



LKG-5114-911

Table 1–1 describes the DECconcentrator 500 controls. Table 1–2 describes the function of each LED.

Table 1–1: DECconcentrator 500 Controls

Control	Description
AC power socket	Provides connection to ac power source.
Circuit breaker	Provides overcurrent protection for the concentrator. The white center of the circuit breaker pops out if the circuit breaker trips. The ac power is cut off to the concentrator when the circuit breaker trips. Pressing the white center resets the circuit breaker. The circuit breaker trips at 4 amps.
Out-of-band management connector	Provides remote management through connection directly to a terminal or through a modem to a terminal. Refer to Chapter 4.
Optical bypass connector	Provides connectivity of the FDDI ring in the absence of power or during fault conditions of a node. The connector is located on the Multi-mode Network Management Card.

Table 1–2: DECconcentrator 500 Indicators

Icon	LED	I/O Panel	Color	Normal State	Description
	Controller/Backplane fault	Unit	Red	OFF	If ON, there is a fault with the controller/backplane. In this case the concentrator will not go online in the network.
	Power supply DC OK	Unit	Green	ON	If OFF, there is a problem with the power supply.
	Fan fault	Unit	Red	OFF	If ON, there is a problem with the fans.

1.5.1 Option Card Indicators

Each option card has one LED that provides card fault status. The other LEDs provide physical layer (PHY) status.

If system diagnostics detects a broken port, that port is bypassed and the remaining ports continue to operate in the FDDI ring. The PHY LED turns red and the card fault LED turns on.

If the system diagnostics finds all the ports faulty, the entire card is bypassed on the backplane, and the card fault LED turns on.

Refer to Figure 1–1 for the location of the LEDs and Table 1–3 for a description of the LEDs.

Table 1–3: Option Card Indicators

Icon	LED	I/O Panel	Color	Normal State	Description
Ring OK	Ring operation	Network Management Card	Green	ON	If ON, the ring is operating.
	Card fault	Card	Red	OFF	If ON, there is a problem with the card.
PHY	Physical connection status	Card	Green/ Red	Green	Indicates the state of the physical connection.

1.6 Operational Software

The concentrator runs a self-test after power up or a software-initiated reset. The self-test includes software tests and initialization of the hardware. This test includes isolation of faulty hardware by reconfiguration. After successful initialization, the operational software controls the hardware to provide:

- FDDI token ring function
- Support for reception, processing, and transmission of remote management, maintenance operations protocol (MOP) packets, and station management (SMT) packets
- Volatile and nonvolatile error and data logs
- Ring management and ring fault handling (FDDI Station Management (SMT))
- Out-of-band management
- Optical bypass

Refer to Chapter 4 for the out-of-band management functions and capabilities. Refer to the *DECelms Use* manual and the *DECmcc Concentrator Access Module Use* manual for network management functions and capabilities.

Preparing for Installation

This chapter describes the shipment contents and site-preparation information.

2.1 Checking the Shipment Contents

A DECconcentrator 500 shipment consists of one or more boxes, depending on the option equipment ordered. Refer to Figure 2–1 to check the contents of your shipment.

CAUTION

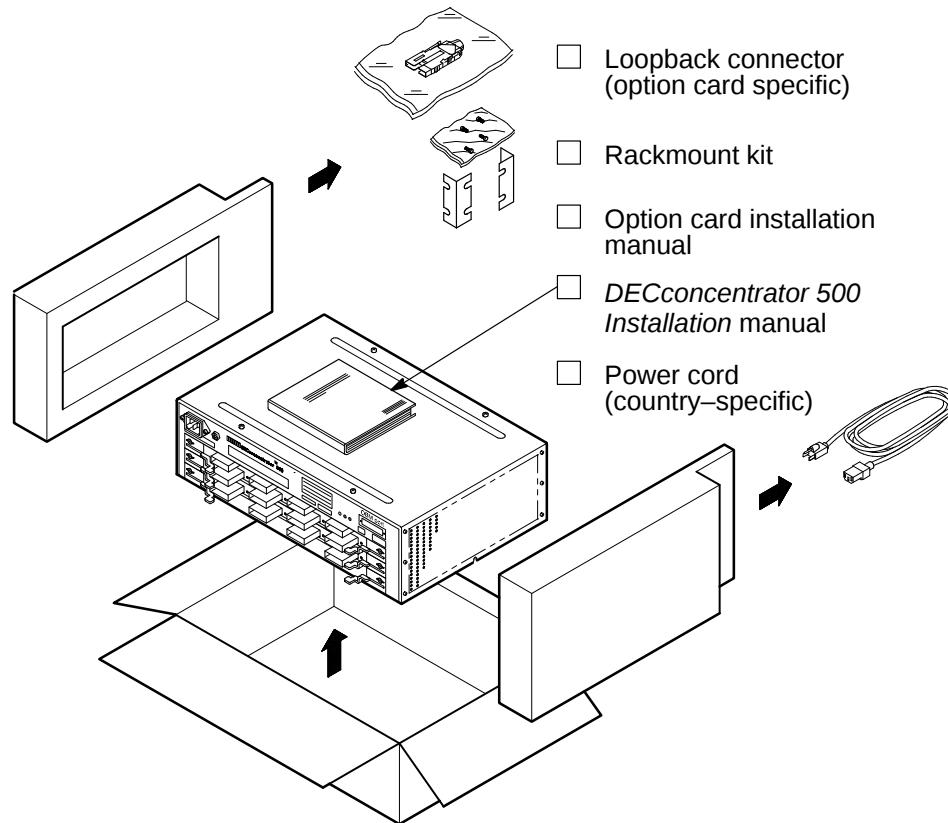
Static electricity can damage modules and electronic components. Digital recommends you use a grounded wrist strap (Digital P/N 29-11762) and grounded work surface when you handle any modules or internal parts.

Do not remove an option card from the antistatic bag until instructed to do so.

1. Unpack and check the shipment for damage and missing parts.
 - In case of damage, contact your shipping agent and your Digital sales representative.
 - In case of missing parts, contact your Digital sales representative.
 - Make sure the power cord matches your wall outlet (see Figure 2–2).

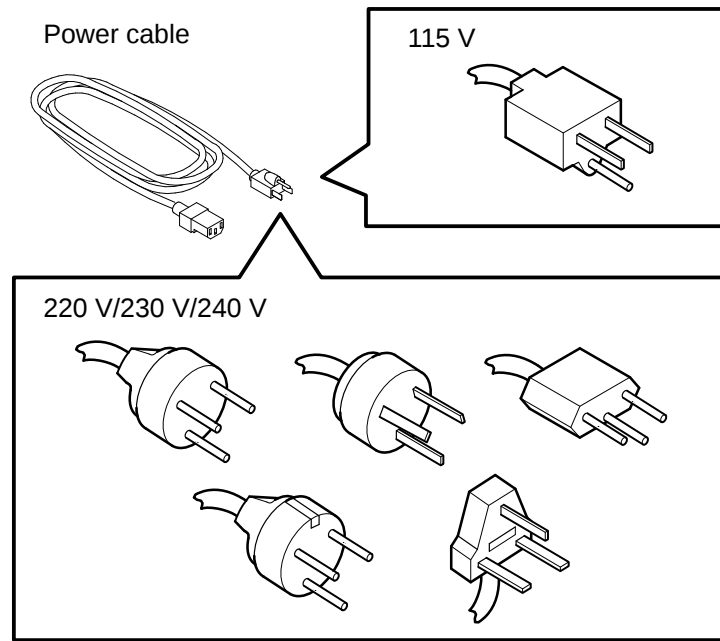
2. Check the model number, serial number, and the hardware address of the concentrator (see Figure 2-3) and record them in the DECconcentrator Identification List in Appendix B.
3. Save all packaging material. To prevent damage, repack the unit or parts in the original packing material when transporting or shipping the unit.

Figure 2-1: Checking the Shipping Contents



LKG-5424-911

Figure 2-2: U.S. and International Power Cords



LKG-4926-91I

WARNING ⚠

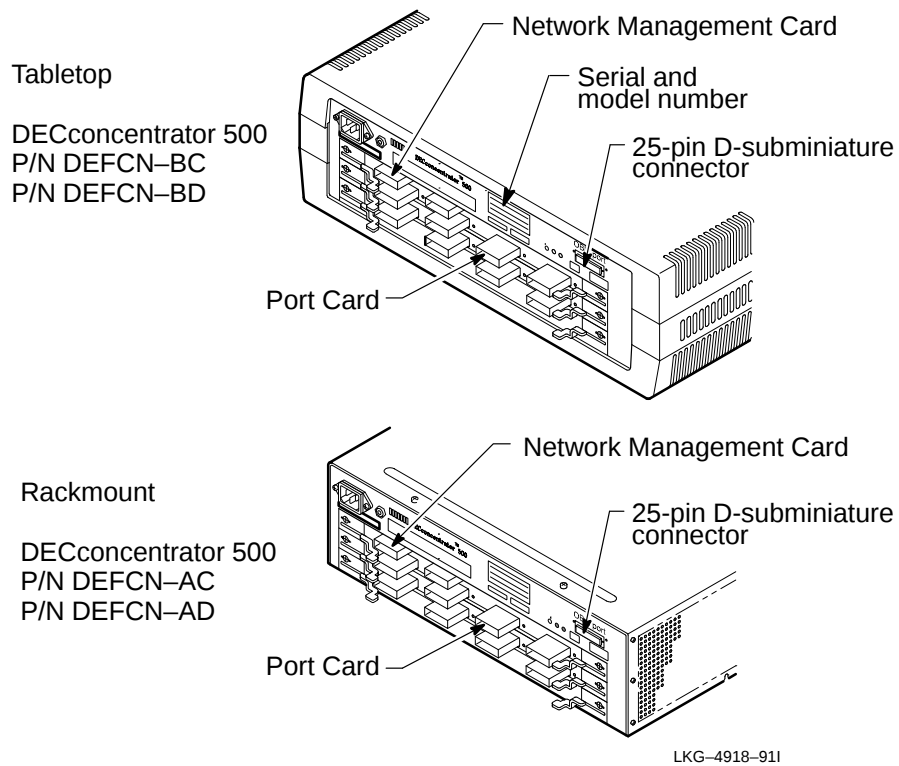
For continued protection against risk of electric shock, this product must be connected to a three-wire wall receptacle that has its grounding terminal reliably connected to the building's safety earth ground.

The DECconcentrator 500 switches automatically to 110/120 Vac or 200/240 Vac. No action is required to set the voltage. Table 2-1 lists the order numbers for the international power cords.

Table 2-1: International Power Cords

Order Number	Country	Order Number	Country
BN20A-2E	United States, Canada	BN20F-2E	Switzerland
BN20B-2E	Japan	BN20H-2E	Denmark
BN20C-2E	Australia, New Zealand	BN20J-2E	Italy
BN20D-2E	Belgium, Finland, France, Germany, Holland, Norway, Spain, Sweden	BN20K-2E	India, South Africa
BN20E-2E	Ireland, United Kingdom	BN20L-2E	Israel

Figure 2-3: DECconcentrator Model and Serial Numbers



The DECconcentrator 500 is available as DEFCN-AC, DEFCN-AD, DEFCN-BC, and DEFCN-BD. You may have option cards already installed in your concentrator. Refer to the *Option Card Installation* manual shipped with the concentrator for option card information.

- DEFCN-AC is for use in a rack and contains a U.S. power cord. It does not have a plastic cover.
- DEFCN-BC is for use on a tabletop and contains a U.S. power cord. It has a plastic cover.
- DEFCN-AD and DEFCN-BD are for applications outside the United States and Canada and have no power cord. You must order the required power cord separately.

2.2 Site Preparation

Verify that the installation site meets the physical, environmental, power, and cabling requirements for the DECconcentrator 500.

Use the checklist in Section 2.3 to verify that the site is ready. Refer to the *Fiber Distributed Data Interface Network Configuration Guidelines* manual or the *Fiber Distributed Data Interface System Level Description* manual for configuration information. Refer to Appendix A for operating, environmental, and power requirements for the unit.

Note that each cable in a cable plant should have a unique identification number recorded on a tag attached to the cable. Testing and certification information about the cable should have been recorded in the cable plant log book. Table 2–2 shows a sample of a fiber cable plant log-book entry.

Table 2–2: Sample Cable Plant Log-Book Entry

Fiber Label	Fiber Size and Color	Fiber Length	Loss 850/1300	Corrected Loss 850/1300	Certification Date	Operator	Test Equipment
B02H02/01	62.5/125	500 M	1.8/1.3	1.7/1.2	8/14/89	J.P.R	Intelco

2.3 Site Preparation Checklist

Use the following checklist to verify the site preparation.

Hardware

- ☐ Make sure the cables are installed, tested, tagged, and certified. Note the cable length and corrected loss (see Table 2–2).
- ☐ If the DECconcentrator 500 is to be connected to a bridge, make sure the appropriate bridge is installed and the required bridge-to-DECconcentrator 500 cabling is in place.
- ☐ If the DECconcentrator 500 is connected to an end station such as a workstation or server, make sure the device is installed and the required device to the DECconcentrator 500 cabling is in place.

Suitable Environment

- ☐ Make sure that the power outlet matches the power requirements of the DECconcentrator 500 and:
 - The outlet is within 1.8 meters (6 feet) of the installation site.
 - The circuit is a 15- or 20-amp, dedicated single-phase (three-wire) circuit (United States and other countries).

For 120-Vac operation, the typical input current for concentrator is 1.6 ARMS at 88 VRMS/line.

For 240-Vac operation, the typical input current for the concentrator is 0.92 ARMS at 176 VRMS/line.

See Appendix A for additional power requirements.

- ☐ Make sure the temperature, altitude, and humidity ranges are within the specifications. See Appendix A.
- ☐ Make sure the space is adequate for ventilation and maintenance access.

Service

- ☐ Make sure the (optional) service agreements are in place. Contact your Digital sales representative for information on available hardware and software services to support the DECconcentrator 500.

Office Installation

- ☐ Make sure the location is at least 45 centimeters (18 inches) above the floor surface.
- ☐ Allow at least 10 centimeters (4 inches) of airspace around the DECconcentrator 500.
- ☐ Place the DECconcentrator 500 away from direct sunlight, heaters, as well as photocopiers and other magnetic devices.

Rackmount Installation

You can install the DECconcentrator 500 into a standard 48-centimeter (19-inch) rack or RETMA rack cabinet. Digital Equipment Corporation and other major manufacturers of electronic equipment use standard-size racks. The rack and cabinet rails, mounting hole patterns, and spacing conform to international standards that allow compatibility with products manufactured by Digital and others in the industry.

Satellite Distribution Frame (SDF) Installation

If you are installing the DECconcentrator 500 in a standalone SDF, or as part of a DECconnect System installation, refer to the *DECconnect System Fiber Optic Installation* manual.

The SDF, a component of the DECconnect System, provides a central location for communication devices that connect fiber optic networks, ThinWire Ethernet, and twisted-pair cable to a standard Ethernet network. The SDF can also be configured as the center of a standalone network.

Installing the DECconcentrator 500

This chapter describes how to install the DECconcentrator 500 and how to verify the operational status.

WARNING

The DECconcentrator 500 contains no user-serviceable parts. During installation, do not open the unit for any reason. If the concentrator needs repair, only qualified personnel familiar with safety procedures for electrical equipment and the DECconcentrator 500 should access components inside the unit.

WARNING

To avoid bodily injury or damage to the equipment, do not connect the power cord or any other cable until you are instructed to do so in the following procedures.

Do not apply power to the unit unless all covers are installed.

The DECconcentrator 500 ships from the factory with the option-card configuration installed. If you ordered additional option cards, refer to the *Option Card Installation* manual.

CAUTION

To prevent damage to electronic components, do not exceed 50° C (122° F) ambient temperature at the air intake of the DECconcentrator 500.

CAUTION

Static electricity can damage modules and electronic components. Digital recommends you use a grounded wrist strap and grounded work surface (P/N 29-11762) when you handle any modules or internal parts.

NOTE

The Network Management Card must be set to the default parameters in order to test all the ports. Make sure you reset switch 1 (*reset to default setting switch*). Refer to your *Option Card Installation* manual for switch settings.

3.1 Installing the Desktop DECconcentrator 500

The desktop concentrator has a plastic cover. The DECconcentrator 500 runs cooler without a plastic cover. If the ambient room temperature is normally above 35° C (95° F) remove the plastic cover.

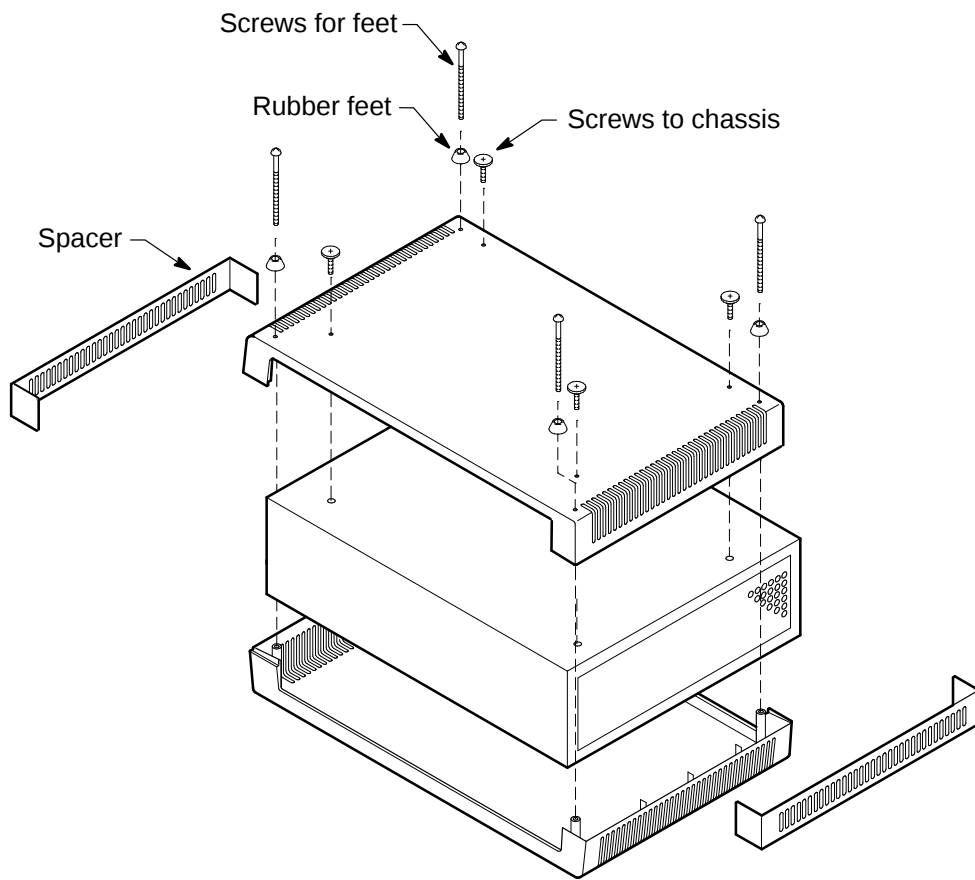
To remove the plastic cover, do the following (see Figure 3–1):

1. Place the concentrator upside down on a sturdy surface.
2. Remove the eight screws from the bottom of the unit. Remove the plastic cover. Store the cover and associated hardware for future use or reconfiguration.

CAUTION

Do not reinstall the cover screws into the concentrator's metal chassis without the cover. This could damage the concentrator.

Figure 3-1: Removing the Plastic Cover



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3.2 Installing the Rackmount DECconcentrator 500

The DECconcentrator 500 can be mounted in a standard 48-centimeter (19-inch) RETMA rack cabinet using the rackmount kit.

Install the concentrator in the rack so that the I/O panel is visible to the network/manager for monitoring the status LEDs.

CAUTION

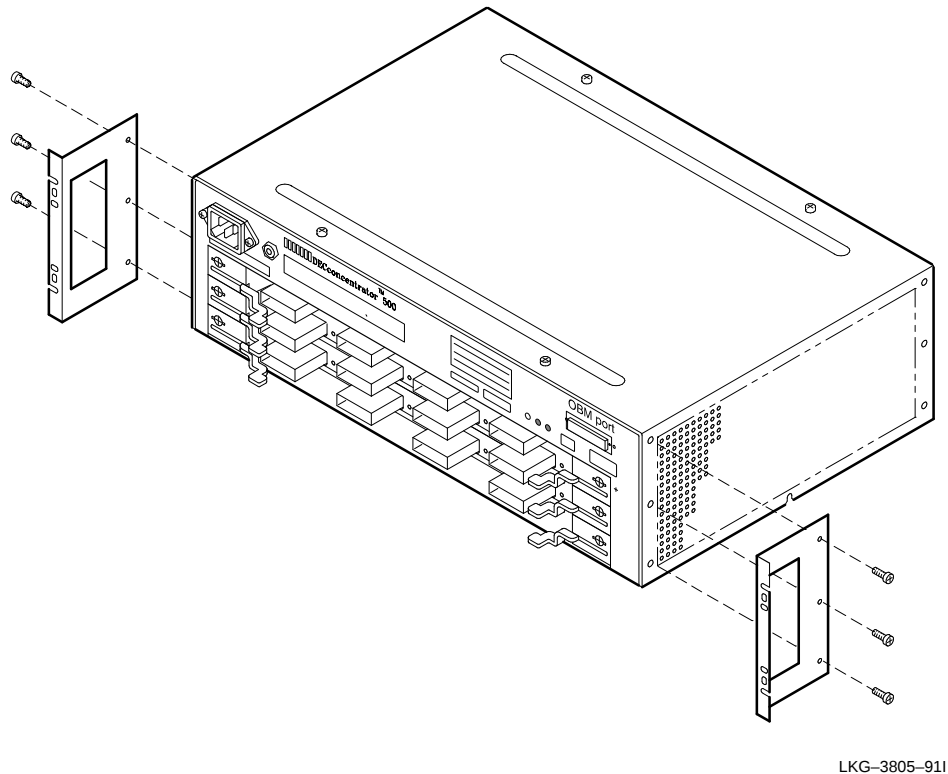
The air inside the enclosed rack can be hotter than the ambient room temperature. Make sure that the air entering the DECconcentrator 500 does not exceed the maximum intake temperature of 50° C (122° F).

3.2.1 Installing the Rackmount Brackets

Install the rackmount brackets as follows (see Figure 3-2):

1. Remove the six screws from the sides of the chassis adjacent to the I/O panel of the concentrator. Save the screws for future use.
2. Install the rackmount brackets. Use the six 8-32 Phillips-head screws with lock washers provided in the rackmount kit.

Figure 3-2: Preparing the Unit for Installation in the Rack

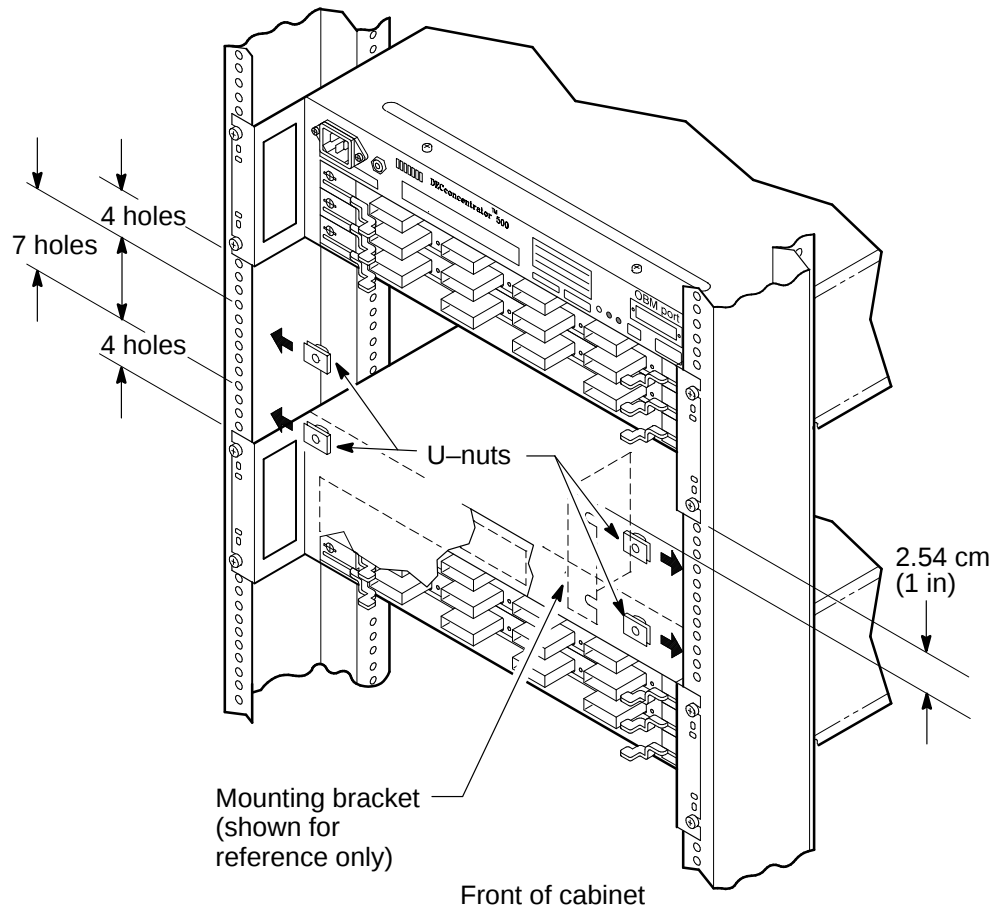


3.2.2 Preparing the Rack

To prepare the rack, do the following:

1. Determine where you want to mount the concentrator in the rack. Allow 2.54 centimeters (1 inch) spacing between mounted devices.
2. Attach the four U-nuts to both rails at the front of the cabinet (Figure 3–3).

Figure 3–3: Preparing the Rack



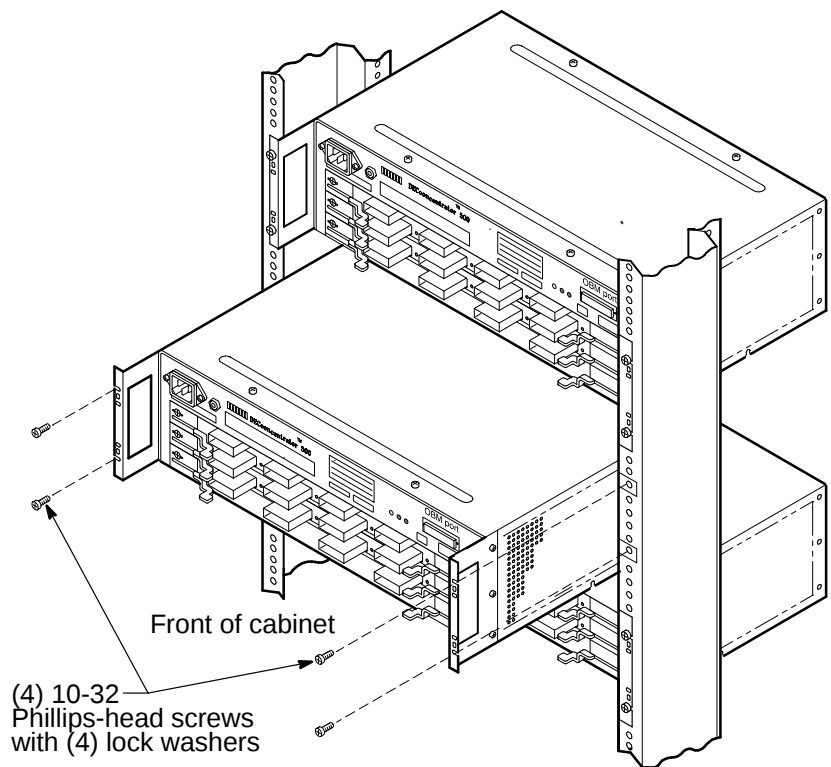
LKG-3806-90I

3.2.3 Installing the Concentrator in a Rack

To install the concentrator in a rack, do the following:

1. With one person supporting the front of the unit, slide the unit into the rack from the front of the cabinet (see Figure 3–4). Make sure that the I/O panel is visible to monitor the LEDs.
2. Fasten the rackmount brackets to the U-nuts on the cabinet rails. Use the four 10–32 Phillips-head screws with lock washers provided in the rackmount kit.
3. Do not connect any cables until instructed to do so.

Figure 3–4: Installing the Unit in the Rack



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3.3 Installing the Option Card

Refer to the option card installation manual to install your option card.

NOTE

If you are installing an option card refer to the manual shipped with your option card. Your option card must be installed before applying power to the concentrator.

The Network Management Card must be installed in the top slot of the DECconcentrator 500. If you are installing only Port Cards, install a Port Card in the top slot.

3.4 Connecting the Power Cord

The DECconcentrator 500 unit does not have a power on/off switch. Plugging in the power cord applies power directly to the concentrator and initiates the self-test. The DECconcentrator 500 switches automatically to 100/120 Vac or 200/240 Vac. No action is required to set the voltage.

Before applying power, your option card must be installed and the Network Management Card switch set to the default settings (refer to the option card installation manual shipped with your option card).

WARNING

To avoid bodily injury, use care when connecting the concentrator power cord. Regulations in some countries may require an authorized person to connect the power.

Make sure you connect the power cord to a grounded wall outlet.

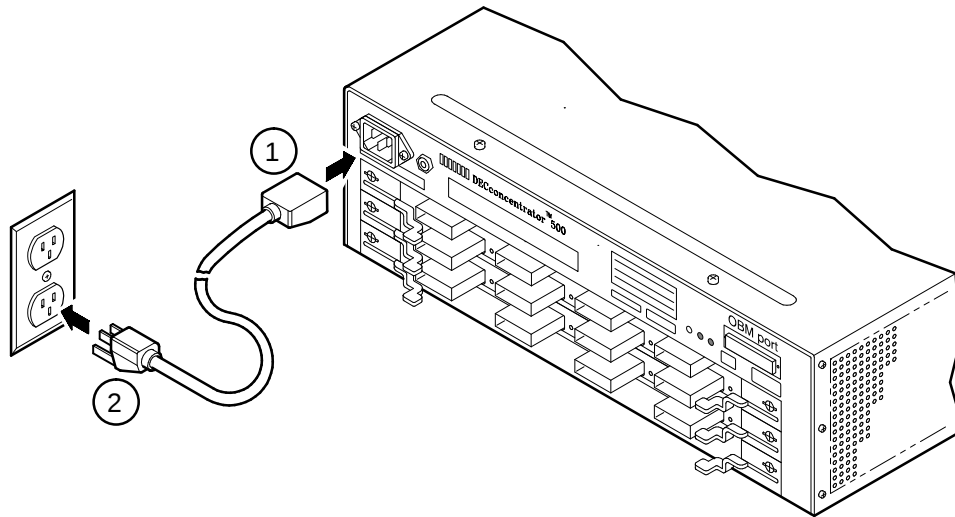
WARNING

For continued protection against risk of electric shock, this product must be connected to a three-wire wall receptacle that has its grounding terminal reliably connected to the building's safety earth ground.

To connect the power cord, do the following:

1. Make sure the power cord plug matches the wall outlet.
2. Refer to Figure 3-5 and plug the power cord into the concentrator (1) and then into the wall outlet (2). This applies power to the concentrator and starts the self-test. Allow 15 seconds for the self-test to complete.

Figure 3-5: Connecting the Power Cord

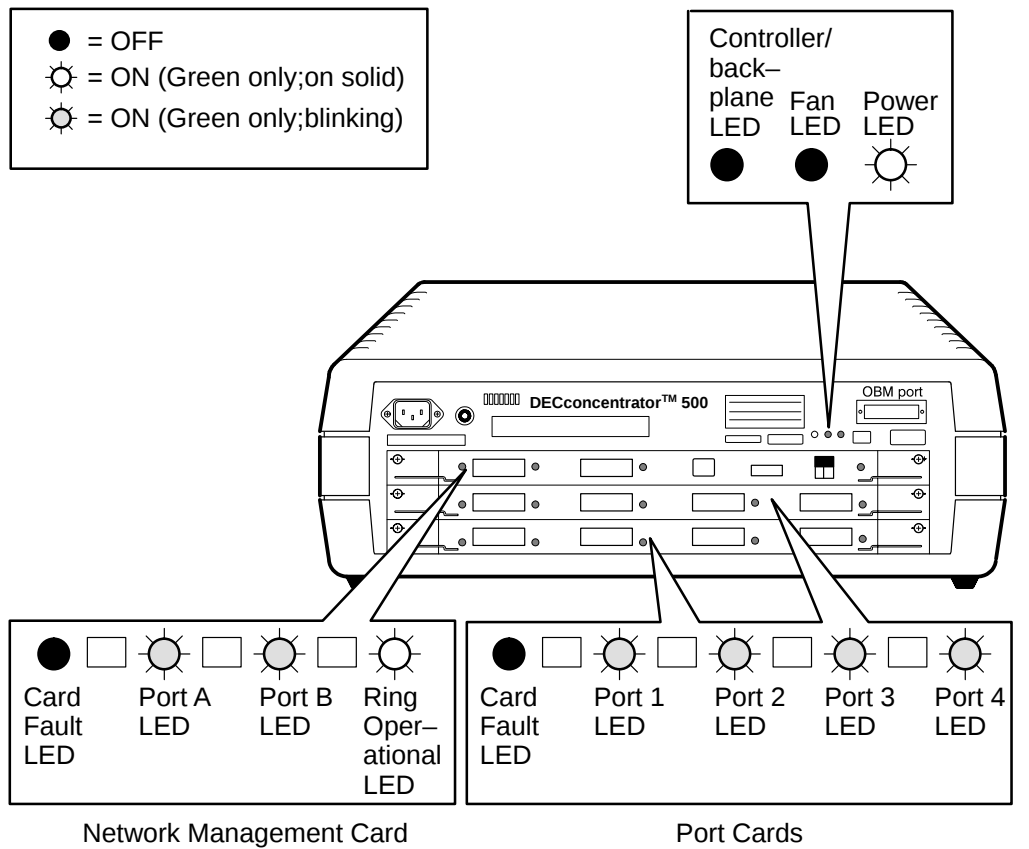


LKG-5052-91I

3. Observe the power, fan, and controller/backplane LEDs to make sure the concentrator operates (see Figure 3-6).

The controller/backplane LED goes ON and remains ON during the self-test. After self-test is complete, the port LEDs blink green. If you experience any problems, go to Chapter 5.

Figure 3-6: Checking the Operational Status



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3.5 Connecting Cables and Connectors

Refer to your *Option Card Installation* manual for the following information:

1. Identifying the connector and port type
2. Connecting the cable to the appropriate connector and port
3. Observing the LEDs when you are connecting the cables
4. Adding the cable identification numbers to the DECconcentrator 500 Identification List in Appendix B

When connecting cables, use the following guidelines:

- Bridges, workstations, and other single attachment stations (SAS) connect to the M ports on the Port Card.
- A concentrator or dual attachment station (DAS) participating in a dual ring connects to the dual ring through Ports A and B on the Network Management Card. Cabling goes from Port B of the upstream concentrator or DAS to Port A.
- In a tree configuration, a concentrator or DAS B port connects to a concentrator M port.

To use the out-of-band management, go to Chapter 4.

Using Out-of-Band Management

This chapter shows you how to access and display the out-of-band management (OBM) menus and menu options. The attributes displayed in the menus are defined in the *DECelms Use* manual and the *DECmcc Concentrator Access Module Use* manual.

4.1 Introduction

Using out-of-band management is optional and is not necessary for the operation of the unit. OBM allows you to manage the DECconcentrator 500 unit with or without a Network Management Card. Using OBM does not require any special management station or software other than a terminal. You can connect a terminal directly to the 25-pin D-subminiature connector on the input/output (I/O) of the concentrator panel. You can also connect the terminal to the concentrator through a modem.

NOTE

The DECconcentrator 500 requires Version 3.1 (or a higher version) microcode for OBM support. OBM microcode does not have full modem support. Therefore, you must use a Scholar modem (or equivalent).

4.2 Connecting OBM Directly to a Terminal

To connect OBM directly to a terminal, do the following:

1. Set your terminal to a 2400 baud rate and 8 bits/no parity/1stop bit.
2. Connect one end of the cable to the 25-pin D-subminiature connector on the DECconcentrator 500 I/O panel and the other end of the cable to your terminal.
 - For VT100 or VT200 series:
 - Digital recommends using P/N BC22R-xx cables with 25-pin connectors at each end. If you use P/N BC16E-xx cables, use a passive adapter (P/N H8575A) at each end of the cable.
 - For VT300 or VT400 series:
 - Digital recommends using the standard six-pin modular jack (MJ) connector cable P/N BC16E-xx.
3. Press **RET** to display the Main Menu (See Example 4–1).

NOTE

The baud rate can be set to 19200 from the Main Menu display. To set the baud rate to 19200 or change back to 2400, press **SHIFT** - **~**. Ensure that your terminal is set to the proper baud rate.

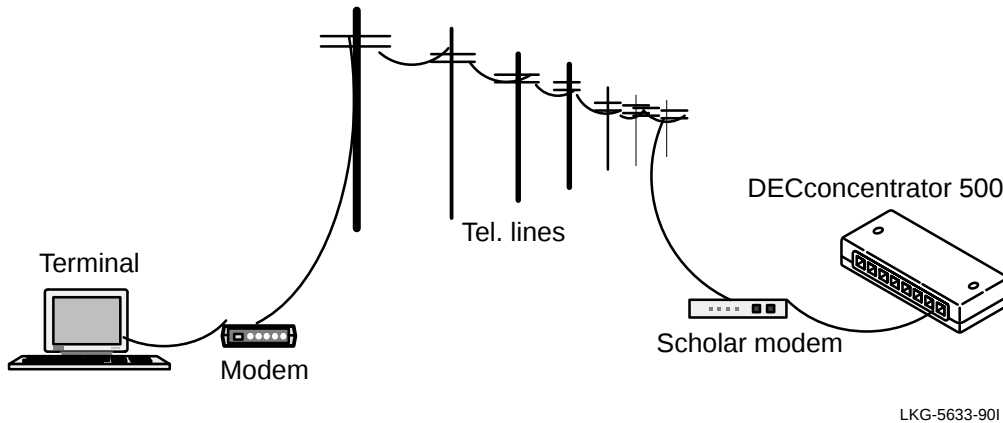
4.3 Connecting OBM through a Modem to a Terminal

To connect OBM through a modem to a terminal, do the following:

1. Set your terminal to a 2400-baud rate and 8 bits/no parity/1stop bit.
2. Connect one end of the cable to the terminal and the other end of the cable to the modem (Figure 4–1).
- For VT100 or VT200 series:
 - Digital recommends using P/N BC22R-xx cables with 25-pin connectors at each end. If you use P/N BC16E-xx cables, use a passive adapter (P/N H8575A) at each end of the cable.

- For VT300 or VT400 series:
 - Digital recommends using the standard six-pin modular jack (MJ) connector cable P/N BC16E-xx.

Figure 4–1: Using a Modem



3. Connect the Scholar modem (or equivalent) to the DECconcentrator 500 OBM port. Ensure that the Data Terminal Ready (DTR) switch is turned on.
 - Digital recommends using P/N BC22R-xx cables with 25-pin connectors at each end. If you use P/N BC16E-xx cables, use a passive adapter (P/N H8575A) at each end of the cable.
4. Press **RET** to display the Main Menu (see Example 4–1).

The main menu and sub-menu options share the following functions:

- Error messages and prompts appear at the bottom of the screen.
- The **[X]** (backspace-delete) key deletes the character to the left of the cursor.
- The **[CTRL]** - **[Z]** keys clear data input and deactivates the menu option or sub-menu. If you are in a sub-menu, **[CTRL]** - **[Z]** returns you to the main menu.
- The “>” character appears to the right of a menu option showing that the option has been activated and requires input. Text appears at the bottom of the screen prompting you to enter data.
- Press any key to return to a sub-menu option from a sub-menu display.
- If your option contains more than one screen of data, press any key to see the rest of the data. When you go to the next screen of data, the first screen is lost. To display the previous screen you must go back and select the option again.
- If there is a power failure or the the out-of-band management cable is disconnected, you can restore the display by pressing **[CTRL]** - **[Z]** and **[RET]**.

NOTE

If you choose an option that requires user input, a prompt appears at the bottom of the screen and the “>” character appears at the option you have selected. Enter the required information at the “>” character.

The Main Menu displays the options available shown in Example 4–1. Select an option number and follow the text prompts at the bottom of the screen.

Example 4–1: Displaying the Main Menu

```
DECconcentrator 500 Local Management

Main Menu

1. Show
2. Set
3. Enable PHY
4. Disable PHY
5. Add trap address
6. Remove trap address
7. Reset

Enter the menu option number
```

4.4 Displaying the Show Menu Option

Example 4–2 shows the display for selection of option 1 (Show) of the Main Menu. The command line (at the bottom of the screen) prompts you to enter an Entity option number.

Example 4–2: Selecting the Entity

```
DECconcentrator 500 Local Management

Show Menu

Entity                               Subgroup
1. Device                           1. Status
2. Line                             2. Characteristics
3. PHY                              3. Counters
                                     e. Exit

Enter the entity option number █
```

To continue, follow steps 1 and 2.

1. Enter an Entity option number. After you enter an Entity option, the Subgroup heading is put in reverse video, as shown in Example 4–3.

2. Enter the Subgroup option number .

Example 4-3: Selecting the Subgroup

```
DECconcentrator 500 Local Management

Show Menu

Entity                               Subgroup
1. Device                           1. Status
2. Line                             2. Characteristics
3. PHY                              3. Counters
                                     e. Exit

Enter the subgroup option number █
```

4.4.1 Displaying the Show Device Status Option

Example 4-4 shows the display for the selection of Entity option 1 (Device), and Subgroup option 1 (Status).

Example 4-4: Displaying Show Device Status

DECconcentrator 500 Local Management			
Show Device Status			
Device_state OPERATE			
Device Broken Reason:			
Nvram Failed Flag: False			
Device Configuration:			
FRU Type	FRU State	FRU ID	FRU Rev.
-----	-----	-----	-----
Controller/Backplane	Working	N/A	0
ANSI Management Card	Working	Slot 1	0
NULL	Empty	Slot 2	0
4 Line Low Power Port Card	Working	Slot 3	0
Fan	Working	N/A	0
Fan	Working	N/A	0
OBM UART Card	Working	N/A	0
Optical Bypass	Not Supported	N/A	0
Press any key to continue █			

4.4.2 Displaying the Show Device Characteristics Option

Example 4–5 shows the display for the selection of Entity option 1 (Device) and Subgroup option 2 (Characteristics).

Example 4–5: Displaying Show Device Characteristics

```
DEConcentrator 500 Local Management

Show Device Characteristics

Node ID:                                08-00-2B-14-13-93
Software Implementation Type: DEFCN
Software Version:                       3.1
ROM Implementation Type:               DEFCN
ROM Version:                           1.0
Reset Default Switch:                  Off
Update Switch:                         Off
IP Address:                            16.21.16.113
Gateway Address:
Trap Address Entries:

Press any key to continue █
```

4.4.3 Displaying the Show Device Counters Option

Example 4–6 shows the display for the selection of Entity option 1 (Device) and Subgroup option 3 (Counters).

Example 4–6: Displaying Show Device Counters

```
DECconcentrator 500 Local Management

Show Device Counters

Seconds Operating: 2476
Power Ups: 16
Management Resets: 0
Unsolicited Resets: 0
Invalid Passwords: 0

Press any key to continue █
```

4.4.4 Displaying the Show Line Status Option

Example 4-7 shows the display for the selection of Entity option 2 (Line) and Sub-menu option 1 (Status).

Example 4-7: Displaying Show Line Status

```
DECconcentrator 500 Local Management

Show Line Status

Link State:                      On Ring Running
Duplicate Address Condition:      Absent
Ring Purger State:               Non-purger
Claim Token Yield:               False
Target TRT:                      7.987200 ms
Upstream Neighbor Address:        08-00-2B-14-13-9D
Old Upstream Neighbor Address:    none
Downstream Neighbor Address:      08-00-2B-13-E0-B3
Old Downstream Neighbor Address:  none
UNA Timed Out:                   False
Ring Error Reason:               Initialization Received

Press any key to continue █
```

4.4.5 Displaying the Show Line Characteristics Option

Example 4–8 and Example 4–9 show the display for the selection of Entity option 2 (Line) and Subgroup option 2 (Characteristics). The data does not appear on one screen. Press any key to view the rest of the data. When you go to the next screen of data, you lose the first screen. To display the previous screen, go back to the Show Menu and select the option again.

Example 4–8: Displaying Show Line Characteristics

```
DECconcentrator 500 Local Management

Show Line Characteristics

Link Address:                08-00-2B-14-14-6B
Port No.:                    1
Datalink Version:            1.0.0
Datalink Type:               FDDI Ring
Station ID:                  00-00-08-00-2B-14-14-6B
Station Type:                Dual Attachment Concentrator
Management Sets Allowed Switch: Enabled
Maximum TRT:                 173.015040 ms
Requested TRT:               7.987200 ms
Valid Transmission Time:     2.621440 ms
SMT Version ID:              1
SMT Resource Index:          7
Frame Strip Mode:            SA Match

Press any key to continue █
```

Example 4–9: Displaying Show Line Characteristics (Cont.)

```
DECconcentrator 500 Local Management

Show Line Characteristics (cont.)

Restricted Token Timeout:      1000.000000 ms
Ring Purge Enable:           False
Optical Bypass Present:      No
IMAX Expiration:             40.000000 ms
Inserted Status:             False
Insert Policy:               True
ECM State:                   In
Stuck Bypass Flag:           False

Press any key to continue █
```

4.4.6 Displaying the Show Line Counters Option

Example 4–10 and Example 4–11 show the display for the selection of Entity option 2 (Line) and Subgroup option 3 (Counters). The data does not appear on one screen. Press any key to view the rest of the data. When you go to the next screen of data, you lose the first screen. To display the previous screen, go back to the Show Menu and select the option again.

Example 4–10: Displaying Show Line Counters

```
DECconcentrator 500 Local Management

Show Line Counters

Seconds Operating:          1519
Total Frames Sent:          484
Total Frames Received:      423
Total Bytes Sent:           36492
Total Bytes Received:       41740
Invalid Device Messages:    0
Bad Frames Received:        0
Transmit Error Frames:      0
Receive Overrun:            0
System Buffer Unavailable:   0
Oversize Frames:            0
Frame Count:                3514757
Error Count:                 0
Lost Count:                  1
Ring Initialization Initiated: 0
Ring Initialization Received: 2
Ring Beaconsing Initiated:  0

Press any key to continue █
```

Example 4–11: Displaying Show Line Counters (Cont.)

```
DECconcentrator 500 Local Management

Show Line Counters (cont.)

Duplicate Address Test Failed: 0
Duplicate Token Detected:      0
Traces Initiated:             0
Traces Received:              0
Frame Status Error:           0
Frame Alignment Error:         0
Ring Purge Error:             0
Transmit Underruns:           0

Press any key to continue █
```

4.4.7 Displaying the Show PHY Option

Example 4–12 shows the display for the selection of Entity option 3 (PHY). The “>” character appears at the PHY option. Enter the PHY and press **RET**. The subgroup heading is put in reverse video. Enter a subgroup option number.

NOTE

If you enter an invalid PHY number, the console beeps and an error message appears at the bottom of the screen.

Example 4–12: Displaying Show PHY

```
DECconcentrator 500 Local Management

Show Menu

Entity                                Subgroup
1. Device                            1. Status
2. Line                              2. Characteristics
3. PHY >                             3. Counters
    e. Exit

Please specify a PHY: 1a, 2a, 1b, 2b, 3b.....etc.
```

4.4.8 Displaying the Show PHY Status Option

Example 4–13 shows the display for the selection Entity option 3 (PHY). Enter a PHY number at the “>” character, press and select Subgroup option 1 (Status).

Example 4–13: Displaying Show PHY Status

```
DECconcentrator 500 Local Management

Show PHY 1A Status

Physical Port State:      Waiting
Neighbor Physical Port Type: Unknown
Reject Reason:           No Reason
Physical Link Error Estimate: 0
Break State Flag:        False

Press any key to continue █
```

4.4.9 Displaying the Show PHY Characteristics Option

Example 4–14 shows the display for selecting Entity option 3 (PHY). Enter a PHY number at the “>” character, press **RET** and select Subgroup option 2 (Characteristics).

Example 4–14: Displaying Show PHY Characteristics

```
DECconcentrator 500 Local Management

Show PHY 1A Characteristics

Physical Port Type:  A
LEM Threshold:      8
PMD Type:           Multimode

Press any key to continue █
```

4.4.10 Displaying the Show PHY Counters Option

Example 4–15 shows the display for the selection of Entity option 3 (PHY). Enter a PHY number at the “>” character, press RET and select Subgroup option 3 (Counters).

Example 4–15: Displaying Show PHY Counters

```
DECconcentrator 500 Local Management

Show PHY 1a Counters

Seconds Operating:      1675
LEM Rejects:           0
LEM Link Errors:       0
LCT Rejects:           0
Connections Completed: 0
Elasticity Buffer Errors: 0
TNE Expired Rejects:   0

Press any key to continue █
```

4.5 Displaying the Set Menu

To access the Set Menu select option 2 of the Main Menu. Example 4–16 displays the Set Menu.

Example 4–16: Displaying the Set Menu

```
DECconcentrator 500 Local Management

Set Menu

1. IP Address
2. Gateway Address
3. Requested TRT
4. LEM Threshold
5. TVX
6. Update Switch      Off
7. Ring Purger Enable True
8. Password
9. Defaults and Reset
0. Restricted Token Timeout
e. Exit

Enter the menu option number █
```

4.5.1 Selecting the IP Address Option

To access the Internet Protocol (IP) address, select option 1 of the Set Menu. Enter the IP address at the prompt and press **RET**. The IP address you entered appears at the bottom of the screen.

4.5.2 Selecting Gateway Address Option

To access the gateway address, select option 2 of the Set Menu. Enter the Gateway address at the prompt and press . The Gateway address you entered is appears at the bottom of the screen.

4.5.3 Selecting the Requested TRT Option

To access the requested Token Rotation Time (TRT), select option 3 of the Set Menu. Enter a value at the prompt and press . The TRT value you entered appears at the bottom of the screen.

4.5.4 Selecting the LEM Threshold Option

To access the Line Error Monitor (LEM) threshold option. select option 4 of the Set Menu. Enter a PHY number at the first prompt and press . Enter a value at the second prompt and press . The value you entered appears at the bottom of the screen.

4.5.5 Selecting the TVX Option

To access the Activity (TVX) option, select option 5 of the Set Menu. Enter a value at the prompt and press . The value you entered appears at the bottom of the screen.

4.5.6 Selecting the Update Switch Option

To access the Update Switch option, select option 6 of the Set Menu. If the Update Switch is ON and you select option 6, the Update Switch toggles to OFF. If you select option 6 and the Update Switch is OFF, the Update Switch toggles to ON.

4.5.7 Selecting the Ring Purger Enable Option

To access the Ring Purger Enable option, select option 7 of the Set Menu. Selecting option 7 toggles to TRUE if the setting was FALSE and toggles to FALSE if the setting was TRUE.

4.5.8 Selecting the Password Option

Select option 8 of the Set Menu to set a password. Type the password at the prompt (1 character minimum, 16 characters maximum). To protect your password, X's will appear on the screen instead of your password. If you select an option that requires a password (that you have previously set) for access, the ">" character appears at option 2 (Set). You must enter the password to access the option.

NOTE

The factory default does not have a password set for the device. If you select an option and you are prompted for a password, press .

After you set a password, you are prompted for that password to access the following options of the Main Menu:

- Option 2 (Set)
- Option 3 (Enable PHY)
- Option 4 (Disable PHY)
- Option 5 (Add trap address)
- Option 6 (Remove trap address)
- Option 7 (Reset)

4.5.9 Selecting the Defaults and Reset Option

Selecting option 9 of the Set Menu resets any system parameters that have been altered through remote management to the default settings.

“Set to defaults and reset, continue?” appears at the bottom of the screen. Press ☐Y for yes or ☐N for no. If you pressed ☐Y, “Resetting; please wait...” appears at the bottom of the screen. Reset is completed when the screen clears and the main menu reappears.

NOTE

If your terminal is set for 19200 baud rate, resetting will default to 2400 baud rate. After reset is complete, you must change the setup on your terminal to 2400. Change the baud rate back to 19200 by following the procedures in Section 4.2.

4.5.10 Selecting the Restricted Token Timeout Option

To access the Restricted Token Timeout option, select option 0 of the Set menu. Enter a value at the prompt and press RET. The value you entered appears at the bottom of the screen.

4.6 Selecting the Enable PHY Option

To access the Enable PHY option, select option 3 of the Main Menu. Enter a PHY number and port at the prompt. The PHY you enabled appears at the bottom of the screen.

4.7 Selecting the Disable PHY Option

To access the Disable PHY option, select option 4 of the Main Menu. Enter a PHY number and port at the prompt. The PHY you disabled appears at the bottom of the screen.

4.8 Selecting the Add Trap Address Option

Select option 5 of the Main Menu to add a trap address. Enter the trap address at the prompt and press . The trap address you entered appears at the bottom of the screen.

4.9 Selecting the Remove Trap Address Option

Select option 6 of the Main Menu to remove a trap address. Enter the trap address at the prompt and press . The trap address you removed appears at the bottom of the screen.

4.10 Selecting the Reset Option

Selecting option 7 of the Main Menu resets the concentrator and zeros all counters. If the reset to defaults switch on the Network Management Card is on, the system parameters will reset to the default settings. If the resets to defaults switch on the Network Management Card is off, the system parameters will remain the same.

NOTE

The Show Device Characteristics option displays the position of the Network Management Card reset to defaults switch.

“RESET box, continue?” appears at the bottom of the screen. Press for yes or for no.

If you pressed , “Resetting; please wait” appears at the bottom of the screen. Reset is complete when the screen clears and the main menu reappears.

NOTE

If your terminal is set for 19200 baud rate, resetting will default to 2400 baud rate. After reset is complete, you must change the setup on your terminal to 2400. Change the baud rate back to 19200 by following the procedures in Section 4.2.

Problem Solving

5.1 Introduction

This chapter helps you identify and correct problems that may occur during installation of the DECconcentrator 500. These procedures are for diagnosing and correcting hardware-related problems only.

As you perform the problem-solving steps, record the symptoms, LED state, and how you corrected the problem.

5.2 Problem-Solving Sequence

Use the following procedures to identify the problem:

1. Check all cable connections to make sure they are properly connected.
2. Run the self-test.
3. Record the condition of the concentrator LEDs.
4. Take the appropriate corrective action (see Table 5-1 through Table 5-5).
5. After diagnosing and correcting the problem, return to Chapter 3 to confirm the correct operation of the concentrator.

WARNING

The DECconcentrator 500 contains no user-serviceable parts. During installation, do not open the unit for any reason. If the concentrator needs repair, only qualified personnel familiar with safety procedures for electrical equipment and the DECconcentrator 500 should access components inside the unit.

WARNING

Always remove the power cord from the unit and ac source when performing any removal and replacement procedures.

Remove any cable that could be in the way when you service the unit.

NOTE

Reinstall all cables back in their original ports and position. An incorrectly installed cable can cause the network to fail.

5.3 Running the Self-Test

To run the self-test:

1. Disconnect the power from the DECconcentrator 500.
2. Reconnect the power to start the self-test.

NOTE

If any ports have been disabled by remote management (DECelms and DECMcc), the LEDs may not light as indicated in these procedures. The Network Management Card switches must be set to the default parameters in order to test all ports. If you are reinstalling the unit, make sure you enable switch 1 (the **reset to default settings** switch). Refer to your Option Card Installation manual.

The DECconcentrator 500 self-test runs for approximately 15 seconds. Observe the power, fan, and controller/backplane LEDs to make sure the concentrator is operational. After self-test is complete, the port LEDs blink green.

If no fault occurs, operational firmware takes control of initializing the DECconcentrator 500. If there is a non-fatal fault, the operational firmware decides whether to continue or to abort the initialization of the DECconcentrator 500.

Section 5.4 describes what to do if the LED display is not normal.

5.4 Diagnosing Problems

Table 5–1 through Table 5–4 are basic problem-solving procedures to follow when you encounter a problem during installation or operation of the concentrator. The symptoms described here are presented in the order they might occur during the power-up self-test.

Table 5–1: Basic Problem Solving by Symptom

Symptom	Probable Cause	Corrective Action
All LEDs off.	Power cord connection.	Make sure the power cord is firmly connected at both ends.
	Incorrect or no power at wall outlet.	Make sure the correct power is available at the wall outlet. If no power is available, check the circuit breaker for the outlet. If necessary, connect the unit to a different outlet.
	Circuit breaker has tripped.	Check the circuit breaker. If the circuit breaker has tripped, reset it by pressing on the white center button. If the problem persists, the power supply or circuit breaker needs to be replaced. Notify your system/network manager or service provider.
	Blown fuse at wall outlet.	In some countries the power connector at the wall outlet has a fuse. Replace the blown fuse. If the problem persists, connect to a different wall outlet. If the problem continues there could be a faulty power cable or incorrect wiring. Notify your system/network manager.
	Faulty power cord.	Use a meter to measure the continuity of the power cord. Replace the cord if defective.
DC OK LED is off, any other LED on.	Problem with the power supply.	The power supply needs to be replaced or repaired. Notify your system/network manager or service provider.
Fan LED is on (red).	Problem with the fan or fan connection.	Notify your system/network manager or service provider.
Controller/backplane LED is on (red) and all option card fault LEDs are on (red).	Problem with the Controller/backplane, LED, or connection to the power supply.	Notify your system/network manager or service provider.

Table 5–2: Network Management Card Problem Solving

Symptom	Probable Cause	Corrective Action
Card Fault LED on (red), other Port Card LEDs off, unit LEDs are normal.	Problem with the Network Management Card.	The card needs to be replaced or repaired. Notify your system/network manager or service provider.
Ring Operational LED off.	No network activity, no token being passed.	Indicates a network configuration problem or problem on the network. See your system/network manager if the problem persists.
Port LED off.	Port disabled by management, LED broken or card at fault.	Set port state on through the management software; otherwise, use the reset to default parameter switch. Always notify your system/network manager that you are resetting the parameters.
Port LED blinking red.	Unsupported configuration or ring topology.	Verify and reconfigure the cable connections or ring topology. Before you reconfigure, see your system/network manager for confirmation.
Port LED blinking green.	Unable to connect; no cable attached.	Check the cable connections. Run the loopback test. described in Section 5.5 to test the port. See Table 5–5 for problem solving during loopback testing.
Port LED red and card fault LED off.	Link Confidence Test (LCT) failure, possible cable or cable connection problem.	Check the cable connections. Run the loopback test.
Port LED red and card fault LED on.	Port broken.	The card needs to be replaced or repaired. Notify your system/network manager or service provider.
Port LED alternates red and green (port A only).	Port is in backup state.	No corrective action is required. The backup link becomes active if the primary link fails.
Controller/backplane Fault LED blinking RED.	Bad UART card.	Replace UART card.

5.4.1 Optical Bypass Problem Solving

Table 5–3 helps you identify and correct problems that may occur using the optical bypass relay.

Table 5–3: Optical Bypass Relay Problem Solving

Symptom	Probable Cause	Corrective Action
DECconcentrator 500 OK, but is bypassed from the dual ring.	Optical bypass relay is stuck in the bypass position. Or the relay is bad.	Verify by removing the relay and observing that communications between station is re-established. If the problem is unresolved, contact your optical bypass relay service provider.
Upstream and downstream stations are wrapped when the concentrator is powered down or the controller/backplane LED is red.	(1) Excessive loss induced by the optical bypass relay. The relay is not supported at this location.	(1) Refer to the <i>FDDI Network Configuration Guidelines</i> manual. If unsupported, remove the optical bypass relay.
	(2) Bad relay.	(2) Remove the optical bypass relay. Contact your optical bypass relay service provider.

Table 5–4: Port Card Problem Solving

Symptom	Probable Cause	Corrective Action
Card Fault LED is on (red), other Port Card LEDs off, unit LEDs normal.	Problem with the Port Card.	The card needs to be replaced or repaired. Notify your system/network manager or service provider.
Port LED off.	Port disabled by management, LED broken or card at fault.	Set port state on through the management software; otherwise, use the reset to default parameter switch. Always notify your system/network manager that you are resetting the parameters.
Port LED blinking red.	Unsupported configuration or ring topology.	Verify and reconfigure the cable connections or ring topology. Before you reconfigure, see your system/network manager for confirmation.
Port LED red and card fault LED on.	Port broken.	The card needs to be replaced or repaired. Notify your system/network manager or service provider.
Port LED red and card fault LED is off.	Link Confidence Test (LCT) failure, possible cable or cable connection problem.	Check cable connections. Run the loopback test described in Section 5.5 to test the port. See Table 5–5 for problem solving during loopback testing.
Port LED alternates red to green.	Port is in backup state.	No corrective action is required. The backup link becomes active if the primary link fails.

5.5 Loopback Testing

Use the loopback test to determine whether the DECconcentrator 500 Port Card or Network Management Card is faulty, or whether there's a problem with the cable or the device at the other end of the cable. This test verifies the ability to transmit and receive. This test does not verify the ability to receive minimum level signals or that the transmitter's output level is within specification.

WARNING

Some fiber optic equipment can emit laser light that can injure your eyes. Never look into an optical fiber or connector port. Always assume the cable is connected to a light source.

Use the following procedure to perform the loopback test:

1. Install the loopback connector.
2. Observe and record the port LED status on that port. The port status LED should blink red.
3. Refer to Table 5–5 for corrective action.

If you have a port or card fault, see your system/network manager or authorized service representative for help.

Table 5–5: Problem Solving During Loopback Testing

Symptom	Probable Cause	Corrective Action
Port LED red on, green on, or blinking green.	Port failure.	The card needs to be replaced or repaired. Contact your system/network manager or service provider.
Port LED blinking red.	Normal during loopback testing. Original problem could be with the cable or device at the other end of the cable. The transmit power may be out of specifications.	Check the operational status of the device at the other end of the link. If the problem persists contact your system/network manager or service provider.

If the problem continues, do the following :

1. Disconnect the power cord before performing any corrective action.
2. Check your warranty or service agreement for information about getting service and the type of service you have.
3. Notify your system/network manager or authorized service representative about the problem.
4. Give a copy of your problem-solving record to your system/network manager or service representative.

Specifications

This appendix contains the DECconcentrator 500 physical, environmental, operating, electrical, and power supply specifications.

A.1 Physical Specifications

Table A–1 (rackmount) and Table A–2 (tabletop) list the DECconcentrator 500 physical specifications.

Table A–1: Rackmount Unit Physical Specifications

Parameter	Dimension	
Height	13.33 cm	(5.25 in)
Depth	29.85 cm	(11.75 in)
Width	43.59 cm	(17.16 in)
Weight	7.95 kg	(17.5 lbs)

Table A–2: Tabletop Unit Physical Specifications (Plastic Enclosure)

Parameter	Dimension	
Height	16.10 cm	(6.34 in)
Depth	31.31 cm	(12.33 in)
Width	49.30 cm	(19.41 in)
Weight	9.97 kg	(22 lbs)

A.2 Environmental Specifications

The DECconcentrator 500 is designed to operate in an open office or in an exposed area of an industrial site. The concentrator is not designed to operate in an air plenum.

CAUTION

To prevent damage to electronic components, do not exceed 50° C (122° F) ambient temperature at the air intake of the DECconcentrator 500.

Table A–3 and Table A–4 list the environmental specifications.

NOTE

Your service agreement may require specific limits for temperature and humidity.

Table A–3: Operating Environment Specifications

Parameter	Value
Temperature	
Operational (without cover)	5° C (41° F) to 50° C (122° F) at sea level*
Operational (with cover)	5° C (41° F) to 35° C (95° F) at sea level*
Non-operational	-40° C (-40° F) to 66° C (151° F)
Relative humidity	10% to 95% (noncondensing)
Wet bulb	32° C (90° F) maximum
Dew point	2° C (36° F) minimum
Altitude	Sea level to 2.4 km (8,000 ft)
Air flow	200 LFM (minimum), for adequate air flow, provide approximately 10 to 15 cm (4 to 6 in) of space at both ends
Inlet/outlet air temperature	Inlet: 50° C (122° F) maximum Outlet: 60° C (140° F) maximum
*Reduce the maximum operating ambient temperature by 1.8° C/1000 m or by 1° F/1000 ft for operation at high-altitude sites.	

Table A-4: Shipping Environment

Parameter	Value
Temperature	-40° C (-40° F) to 66° C (151° F)
Relative humidity	10% to 95% (noncondensing)
Altitude	Sea level to 9.1 km (30,000 ft)

A.3 Electrical Specifications

The DECconcentrator 500 unit has power-cord options for all major Digital markets. Table A-5 lists the DECconcentrator 500 electrical specifications for a fully configured concentrator.

Table A-5: Electrical Specifications

Parameter	120 Vac Operation	240 Vac Operation
Line voltage	110 V	220 V
Voltage tolerance	88 Vac to 132 Vac	176 Vac to 264 Vac
Power source phasing	Single	Single
Frequency	50/60 Hz	50/60 Hz
Line frequency tolerance	47 Hz to 63 Hz	47 Hz to 63 Hz
Input current (maximum)	2.3 ARMS at 88 VRMS line	1.2 ARMS at 176 VRMS line
Input current (typical)	1.6 ARMS at 88 VRMS line	0.92 ARMS at 176 VRMS line
Input power (maximum)	120 W (input VA 200 maximum)	120 W (input VA 200 maximum)
Input power (typical)	105 W (input VA 155)	105 W (input VA 177)
Over voltage condition	150 VRMS for 1 second maximum	300 VRMS for 1 second maximum
Cold start inrush current	Low range: 35 A peak High range: 35 A peak	Low range: 35 A peak High range: 35 A peak
Heat dissipation (maximum)	120 W	120 W
Heat dissipation (typical)	105 W	105 W

A.4 Power Supply Specifications

The 154-W universal power supply has the following specifications:

- + 5.0 Vdc at 18 amps and -5.0 Vdc at 10 amps
- +12.0 Vdc at 2 amps
- Overvoltage protection
- Thermal shutdown
- Automatic-adjust for input voltage to 120-Vac operation and 240-Vac operation

DECconcentrator 500 Identification List

Use the DECconcentrator 500 Identification List to record the following information:

- DECconcentrator 500 model number
- DECconcentrator 500 serial number
- Network Management Card
 - cable ID number
 - hardware address
 - ports used
 - switch 1 setting
 - switch 2 setting
- Port Card
 - cable ID number
 - ports used

Fill in the DECconcentrator 500 Identification List (see Figure B–1) and give a copy to the system/network manager.

Figure B-1: DECconcentrator 500 Identification List

☐	DECconcentrator 500 Model Number	_____
☐	DECconcentrator 500 Serial Number	_____
☐	Network Management Card: Hardware Address	_____
☐	Network Management Card: switch 1 setting	_____
☐	Network Management Card: switch 2 setting	_____
☐	Network Management Card: ports used	_____
	Port A cable ID number	_____
	Port B cable ID number	_____
☐	First Port Card: ports used	_____
	Port 1 cable ID number	_____
	Port 2 cable ID number	_____
	Port 3 cable ID number	_____
	Port 4 cable ID number	_____
	Port 5 cable ID number	_____
	Port 6 cable ID number	_____
☐	Second Port Card: ports used	_____
	Port 1 cable ID number	_____
	Port 2 cable ID number	_____
	Port 3 cable ID number	_____
	Port 4 cable ID number	_____
	Port 5 cable ID number	_____
	Port 6 cable ID number	_____
☐	Third Port Card: ports used	_____
	Port 1 cable ID number	_____
	Port 2 cable ID number	_____
	Port 3 cable ID number	_____
	Port 4 cable ID number	_____
	Port 5 cable ID number	_____
	Port 6 cable ID number	_____

Related Documents

Additional information can be found in the following documents. Refer to the back of this manual for ordering information.

- *DECconcentrator 500 Multimode Option Card Installation*
(Order No. EK-DEFCN-MM)

This manual describes the installation procedures for the multimode option cards.

- *DECconcentrator 500 Single-Mode Option Card Installation*
(Order No. EK-DEFCN-SM)

This manual describes the installation procedures for the single-mode option cards.

- *DECconcentrator 500 ThinWire and Shielded Twisted-Pair Option Card Installation* (Order No. EK-DEFCN-CM)

This manual describes the installation procedures for the ThinWire and shielded twisted-pair option cards.

- *DECconcentrator 500 Problem Solving* (Order No. EK-DEFCN-PS)

This manual describes isolating DECconcentrator 500 faults to the field-replaceable unit (FRU) and removing and replacing each FRU. This is a field problem-solving manual.

- *DECbridge 500/600 Installation and Upgrade* (Order No. EK-DEFEB-IN)
This manual describes the installation and upgrade procedures for the DECbridge 500/600 series.
- *DECbridge 500/600 Problem Solving* (Order No. EK-DEFEB-PS)
This manual describes isolating DECbridge 500/600 faults to the field-replaceable unit (FRU) and removing and replacing each FRU. This is a field problem-solving manual.
- *DECconnect System Fiber Optic Planning and Configuration* (Order No. EK-DECSY-FP)
This manual describes the planning requirements, product information, and guidelines for configuring DECconnect System Fiber Optic Networks that use the DECconnect System fiber optic products.
- *DECconnect System Fiber Optic Installation* (Order No. EK-DECSY-FI)
This manual describes how to install a DECconnect System fiber optic cable plant.
- *DECelms Installation* (Order No. AA-PAK1A-TE)
This manual describes how to install and verify DECelms (DEC Extended LAN Management Software) on a VMS system.
- *DECelms Reference* (Order No. AA-PBWBA-TE)
This is a reference manual to the DECelms (DEC Extended LAN Management Software) commands.
- *DECelms Use* (Order No. AA-PAK2A-TE)
This manual describes how to use DECelms (DEC Extended LAN Management Software) to configure, manage, and monitor the LAN Bridge 100, LAN Bridge 150, LAN Bridge 200, DECbridge 500, and DECconcentrator 500.
- *DECmcc Installation* (Order No. AA-PD58-BTE)
This manual describes how to plan for and install DECmcc.

- *DECmcc Bridge Access Module Use* (Order No. AA-PD1BC-TE)
This manual describes the DECmcc bridge entity model, entity management, and the directives necessary to perform typical management operations.
- *DECmcc Concentrator Access Module Use* (Order No. AA-PH31A-TE)
This manual describes the DECconcentrator 500 entity model, entity management, and the directives necessary to perform typical management operations.
- *Fiber Distributed Data Interface System Level Description* (Order No. EK-DFS LD-SD)
This manual describes the FDDI system, how it works, and the role of the individual components.
- *Fiber Distributed Data Interface Network and Configuration Guidelines* (Order No. EK-DFDDI-CG)
This manual describes the guidelines for connecting devices to an FDDI network. It also includes network configurations and examples.

Additional Networking Documentation

Refer to the Network Management Software documentation specific to your network product. Also refer to the following documents for additional information.

- *Networks and Communications Product Documentation* (Order No. EK-NACPD-RE)
This manual lists the title and order number for each publication associated with Digital's networks and communications products.
- *Network Troubleshooting Guide* (Order No. EK-339AA-GD)
This guide provides an overview of network troubleshooting tools and methodologies, and detailed troubleshooting procedures for specific network products.
- *Networks Buyer's Guide*
This guide describes Digital's networking products. Contact your local sales office to receive a copy.

Glossary

American National Standards Institute (ANSI)

An organization that compiles and publishes computer industry standards.

ANSI

See American National Standards Institute.

attenuation

Magnitude of optical power loss usually expressed in units of decibels (dB).

bypass

The ability of a station to be optically or electronically isolated from the network while maintaining the integrity of the ring.

cable

As used in this manual, the physical medium for transmitting signals; includes copper and optical fiber.

concentrator

An FDDI node that provides additional attachment points for stations that are not part of the dual ring, or for other concentrators in a tree structure. A concentrator has two Physical Layer entities and may have one or more Data Link layer entities. The concentrator is the focal point of Digital's dual ring of trees topology.

configuration switch

The switches located on the Network Management Card handle. Switch 1 is used to enable/disable the reset to default parameters function status (only active during initialization). Switch 2 is used to enable/disable remote write access (always active).

counter-rotating ring

An arrangement where two signal paths, with opposite directions, exist in a ring topology.

DAC

See Dual Attachment Concentrator.

DAS

See Dual Attachment Station.

Dual Attachment Concentrator (DAC)

A concentrator that offers two connections to the FDDI network capable of accommodating the FDDI dual (counter-rotating) ring and additional ports for connection of other concentrators or FDDI stations.

Dual Attachment Station (DAS)

An FDDI device that offers two connections to the FDDI network capable of accommodating the FDDI dual (counter-rotating) ring.

dual ring of trees

A topology of concentrators and nodes that cascade from concentrators on a dual ring.

entity

An active element within an Open Systems Interconnection layer or sublayer.

FDDI

See Fiber Distributed Data Interface.

FDDI connector

A category of connectors that meet the ANSI PMD standard and are used to connect single attachment stations, dual attachment stations, and concentrators to an FDDI network. Type A and B connectors are used to connect a concentrator to the dual ring. Type M and S connectors are used to connect concentrators and single attachment stations.

FDDI network

A network that meets the ANSI X3T9 standard. A counter-rotating timed-token dual ring network operating at a bandwidth of 100 Mb/s.

fiber

Dielectric that guides light; waveguide.

Fiber Distributed Data Interface (FDDI)

A set of ANSI/ISO standards that define a high-bandwidth (100-Mb/s) general-purpose local area network connection between computers and peripheral equipment in a timed-token passing, dual ring of trees configuration.

fiber optic cable

A transmission medium designed to transport signals in the form of pulses of light.

fiber optics

A technology whereby signals are transmitted over an optical waveguide medium through the use of light-generating transmitters and light-detecting receivers.

LASER

Light Amplification by Stimulated Emission of Radiation. Predominantly used for transmission over single-mode cables systems.

MAC

See Media Access Control.

Media Access Control (MAC)

The Data Link sublayer responsible for scheduling, transmitting, and receiving data on a shared medium local area network (for example, FDDI).

Network Management Card

An option card for the concentrator that provides for the connection to the dual ring and the hardware/firmware to allow remote management. A Network Management Card has two ports and two switches.

optical receiver

An optoelectronic circuit that converts an incoming optical signal to an electronic logical signal; typically a photodetector.

optical transmitter

An optoelectronic circuit that converts an outgoing electronic logical signal to an optical signal; typically a light emitting diode or laser diode.

PHY

See Physical Layer Protocol.

physical connection

The full-duplex physical layer association between adjacent PHYs in an FDDI ring; a pair of physical links.

Physical Layer Protocol

FDDI standard that defines symbols, line states, clocking requirements, and encoding of data for transmission.

physical link

The path, through PMD and attached cabling, from the logic of one PHY to the receive logic of an adjacent PHY in an FDDI ring.

Physical Media Dependent

A media-dependent FDDI protocol that provides for the medium, connector, and transmit and receive power levels.

PMD

See Physical Media Dependent.

port

An entrance to or exit from a network; also an access point for data entry or exit.

Port Card

An option card for the concentrator that provides the connection to single attachments. The Port Card conforms to the ANSI X3T9 standard and has type-M connectors.

processor

The functional part of the concentrator controller/backplane that uses instructions to perform computation or manipulate data.

receive

The act of a station accepting a frame, token, or control sequence from the ring.

repeater

A level 1 hardware device that performs the basic actions of restoring signal amplitude, waveform, and timing of signals, before transmission onto another network segment.

ring

Connection of two or more stations in a circular logical topology. Information is passed sequentially between active stations, each one in turn examining or copying the data, and finally returning it to the originating station, which removes it from the network.

SAC

See Single Attachment Concentrator.

SAS

See Single Attachment Station.

Single Attachment Concentrator

A concentrator that offers one S port for attachment to the FDDI network and M ports for the attachment of stations or other concentrators.

Single Attachment Station

An FDDI station that offers one S port for attachment to the FDDI ring.

station

An addressable node on an FDDI ring capable of transmitting, repeating, and receiving data.

token

A bit pattern consisting of a unique symbol sequence that circulates around the ring following a data transmission. The token grants stations the right to transmit.

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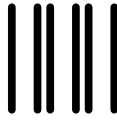
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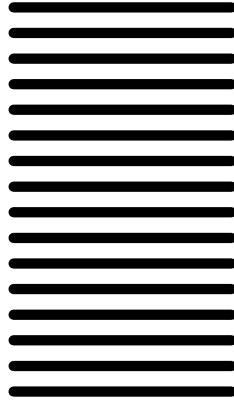
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