

FDDI Modular Media Interface Cards

Installation

Part Number: EK-FDDIM-IM. A01

May 1997

This manual describes how to install and verify the operation of the FDDI Modular Media Interface (Mod-FDDI) cards.

Revision/Update Information: This is a new document.

Digital Equipment Corporation makes no representations that the use of its products in the manner described in this publication will not infringe on existing or future patent rights, nor do the descriptions contained in this publication imply the granting of licenses to make, use, or sell equipment or software in accordance with the description.

Possession, use, or copying of the software described in this publication is authorized only pursuant to a valid written license from Digital or an authorized sublicensor.

© Digital Equipment Corporation 1997. All rights reserved. Printed in U.S.A

The following are trademarks of Digital Equipment Corporation: clearVISN, the clearVISN logo, DEC, DECconnect, DEChub, DECnet, Digital, the DIGITAL logo and ThinWire.

All other trademarks and registered trademarks are the property of their respective holders.

FCC 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 digital device pursuant to Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference.

Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. Any modifications to this device - unless expressly approved by the manufacturer - can void the user's authority to operate this equipment under part 15 of the FCC rules.

VCCI Notice — Class 1 Computing Device:

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 to radios and TV receivers. Read the instructions for correct handling.

CE Notice — Class A Computing Device:

Warning!

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Achtung!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Avertissement!

Cet appareil est un appareil de Classe A. Dans un environnement résidentiel cet appareil peut provoquer des brouillages radioélectriques. Dans ce cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

Contents

Preface

- Overview vii
 - Purpose of This Manual vii
 - Intended Audience vii
- Organization viii
- Terms ix
 - Terms Used in This Manual ix
- Associated Documents x
- Correspondence xi
 - Documentation Comments xi
 - Online Services xi
- How to Order Additional Documentation xii

Safety

- Overview xiii
- Precautions xiv

1 FDDI Modular Media Interface Cards

- Overview 1-1
 - Introduction 1-1
 - In This Chapter 1-1
- Introduction 1-2
- Hot-Swap Support 1-5

2 Installing the Card

- Overview 2-1
 - Introduction 2-1

| | |
|------------------------------------|-----|
| In This Chapter. | 2-1 |
| Installation Preparation | 2-2 |
| Required Tools | 2-2 |
| Preparing a Host Module. | 2-3 |
| Removing the Slot Cover | 2-4 |
| Installing the Card | 2-5 |
| Removing the Card | 2-7 |

3 Connecting and Removing Cables

| | |
|----------------------------------------------------------------------|-----|
| Overview | 3-1 |
| Introduction | 3-1 |
| In This Chapter. | 3-1 |
| Connecting the Multimode or Single-Mode Fiber-Optic Cables | 3-2 |
| Removing the Multimode or Single-Mode Fiber-Optic Cables | 3-4 |
| Connecting the FDDI UTP Cable | 3-5 |
| Removing the FDDI UTP Cable | 3-6 |

4 Using the Card

| | |
|--------------------------------------------------------------------------------|-----|
| Overview | 4-1 |
| Introduction | 4-1 |
| In This Chapter. | 4-1 |
| Initializing the Card. | 4-2 |
| LED Conditions. | 4-3 |
| Verifying Operability | 4-4 |
| Performing a Loopback Test. | 4-5 |
| Checking the Connections | 4-5 |
| Connecting a FDDI UTP Loopback Connector | 4-6 |
| Connecting a Multimode or Single-Mode Fiber-Optic Loopback Connector | 4-7 |
| If the Loopback Test Passes | 4-8 |

A Cable and Connector Information

| | |
|----------------------------------------------------------------|-----|
| Overview | A-1 |
| In This Appendix | A-1 |
| Multimode Fiber-Optic Cable and Connector Information. | A-2 |
| Multimode and Single-Mode Cable Specifications | A-3 |
| Multimode Fiber-Optic Cable Specifications | A-3 |
| Single-Mode Fiber-Optic Cable Specification | A-3 |
| FDDI UTP Cable and Connector Information | A-4 |

| | |
|-------------------------------------|-----|
| FDDI UTP Cable Specifications | A-5 |
| 8-Pin MJ Connector | A-5 |

Figures

| | |
|--------------------------------------------------------------------------------|-----|
| 1-1 Multimode or Single-Mode Mod-FDDI Card Components | 1-3 |
| 1-2 UTP Mod-FDDI Card Components | 1-4 |
| 2-1 Removing the Slot Cover | 2-5 |
| 2-2 Installing the Card | 2-7 |
| 2-3 Removing the Card | 2-9 |
| 3-1 Connecting the Multimode and Single-Mode Fiber-Optic Cables | 3-3 |
| 3-2 Removing the Multimode or Single-Mode Fiber-Optic Cables | 3-4 |
| 3-3 Connecting the FDDI UTP Cables | 3-5 |
| 3-4 Removing the FDDI UTP Cable | 3-6 |
| 4-1 FDDI UTP Loopback Connector | 4-6 |
| 4-2 Connecting a Multimode or Single-Mode Fiber-Optic Loopback Connector | 4-7 |
| A-1 Multimode Fiber-Optic Cables | A-2 |
| A-2 Multimode Fiber-Optic Loopback Connector | A-2 |
| A-3 FDDI UTP Cable | A-4 |
| A-4 FDDI UTP Loopback Connector | A-4 |
| A-5 8-Pin MJ Connector | A-5 |

Tables

| | |
|------------------------------------|-----|
| 4-1 LED Conditions | 4-3 |
| A-1 8-Pin MJ Pin Assignments | A-5 |

Preface

Overview

Purpose of This Manual

This manual describes how to install the FDDI Modular Media Interface (Mod-FDDI) cards and how to verify their installation and operation.

Intended Audience

This manual is intended for the user who has experience with installing system hardware.

Organization

This manual is organized as follows:

| Section | Description |
|----------------|------------------------------------------------------------------------------|
| Chapter 1 | Provides a description of the FDDI Modular Media Interface (Mod-FDDI) cards. |
| Chapter 2 | Describes how to install the modular media interface card. |
| Chapter 3 | Contains media connection information. |
| Chapter 4 | Contains operation and initialization information. |
| Appendix A | Contains cable specifications for each media type. |

Terms

Terms Used in This Manual

This book uses the following terms:

| Term | Definition |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| FDDI | Fiber Distributed Data Interface, a set of industry standards for high-speed fiber-optic ring local area networks. |
| Mod-FDDI | FDDI Modular Media Interface, front-insertable, hot-swappable, single-slot option interface cards |
| UTP | Unshielded twisted-pair, twisted pair cable with no metal shielding around the conductors |

Associated Documents

The following documents provide information relating to the FDDI Modular Media Interface cards. To order any of the following documents, refer to the direction in the section titled, How to Order Additional Documentation.

| Title and Order Number | Description |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>VNswitch 900EF Installation and Configuration</i> | Provides installation and configuration information for the VNswitch 900EF module. |
| <i>VNswitch 900 Series Technical Overview</i> | Provides a technical overview of the VNswitch 900 family of high-density switching products. |
| <i>VNswitch 900 Series Switch Management</i> | Describes how to configure, monitor, and manage a VNswitch 900 series module. |
| <i>OPEN DECconnect Applications Guide EC-G2570-42</i> | Provides information to help plan and install networking systems based on Digital Equipment Corporation's OPEN DECconnect System and networking products. |
| <i>clearVISN Installation</i> | Provides pre- and post-installation information, as well as actual installation procedures for each application. |
| <i>clearVISN Overview Guide</i> | Provides an overview of clearVISN, and explanation of each application and descriptions of all concepts necessary to understand and use the application efficiently. |
| <i>clearVISN User's Guide</i> | Provides information for starting each application, configuring them and general use information. |
| <i>CCITT Recommendation I.432, B-ISDN UNI-Physical Interface Specification</i> | Provides information on implemented standards. |

Correspondence

Documentation Comments

If you have comments or suggestions about this document, send them to the Network Products Business Organization.

Attn: Documentation Project Manager
FAX: (508) 486-6093
E-MAIL: doc_feedback@lkg.mts.dec.com

Online Services

To locate product-specific information, refer to the following online services:

- BBS** To read the Bulletin Board System, set your modem to 8 bits, no parity, 1 stop bit and dial 508-486-5777 (U.S.).
- WWW** The Digital Equipment Corporation Network Products Business Home Page on the World Wide Web is located at the following addresses:

| | |
|-----------------------|---------------------------------------------------------------------------------------------|
| North America: | http://www.networks.digital.com |
| Europe: | http://www.networks.europe.digital.com |
| Australia: | http://www.digital.com.au/networks |

How to Order Additional Documentation

To order additional documentation, use the following information:

| To Order: | Contact: |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| By Telephone | Continental USA: 1-800-DIGITAL (1-800-344-4825) Canada: 1-800-267-6215 Alaska, New Hampshire, and Hawaii: 1-603-884-6660 |
| Electronically (USA. only) | Dial 1-800-DEC-DEMO (For assistance, call 1-800-DIGITAL) |
| By Mail (USA and Puerto Rico) | DIGITAL EQUIPMENT CORPORATION P.O. Box CS2008 Nashua, New Hampshire 03061 (Place prepaid orders from Puerto Rico with the local Digital subsidiary: 809-754-7575) |
| By Mail (Canada) | DIGITAL EQUIPMENT CORPORATION LTD. 940 Belfast Road Ottawa, Ontario, Canada K1G 4C2 Attn: A&SG Business Manager |
| Internationally | DIGITAL EQUIPMENT CORPORATION A&SG Business Manager c/o local Digital subsidiary or approved distributor |
| Internally | U.S. Software Supply Business (SSB) DIGITAL EQUIPMENT CORPORATION 10 Cotton Road Nashua, New Hampshire 03063 |

Safety

Overview

The cautions that must be observed for the hardware described in this manual are listed in this section in English, German, French, and Spanish. Any warning or caution that appears in this manual is 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. |

Precautions

| | |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WARNING | Some fiber-optic equipment can emit laser or infrared 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. |
| VORSICHT | Bestimmte Lichtleitergeräte können für die Augen gefährliches Laser- oder Infrarotlicht abstrahlen. Vermeiden Sie es daher unter allen Umständen, direkt in ein Lichtleiterkabel oder einen Lichtleiteranschluß zu schauen. Gehen Sie immer davon aus, daß Lichtleiterkabel mit einer Lichtquelle verbunden sind. |
| DANGER | Certains équipements à fibre optique peuvent émettre un rayonnement laser ou infra-rouge pouvant provoquer des troubles oculaires. Ne regardez jamais à l'intérieur d'une fibre optique ou d'un port de connecteur. Considérez que le câble est connecté en permanence à une source lumineuse. |
| AVISO | Ciertos equipos de fibras ópticas pueden emitir luz láserica o infrarroja con riesgos de lesiones en los ojos. No se debe nunca mirar en una fibra óptica o una puerta de conexión. Siempre hay que suponer que el cable está conectado a una fuente luminosa. |

Precautions

| | |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAUTION | Static electricity can damage modules and electronic components. Digital recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules. |
| 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. |
| 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 lors de la manipulation des modules. |
| PRECAUCION | 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 al trabajar con cualquier módulo. |

Chapter 1

FDDI Modular Media Interface Cards

Overview

Introduction

This chapter describes the two types of Fiber Distributed Data Interface (FDDI) Modular Media Interface (Mod-FDDI) cards.

In This Chapter

| Topic | Page |
|------------------|------|
| Introduction | 1-2 |
| Hot-Swap Support | 1-5 |

Introduction

The FDDI Modular Media Interfaces (Mod-FDDI) are part of the Modular Media Interface family of front insertable, hot swappable, single-slot option cards. They are customer installable and field replaceable. The host module provides the power, initialization, and control for the card.

Attachment and removal of these cards depends on the type of physical media interface that they use. For more media connection information, refer to Chapter 3.

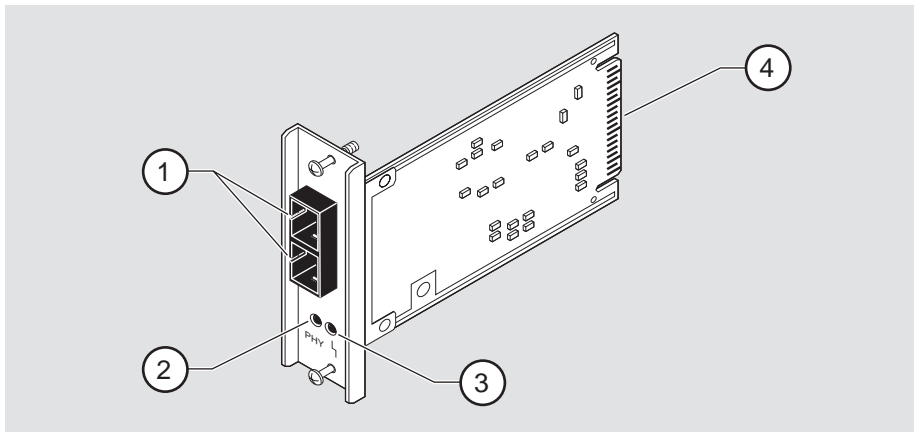
CAUTION

Static electricity can damage modules and electronic components. Digital recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.

Figure 1-1 and Figure 1-2 show examples of the FDDI modular media interface cards discussed in this manual.

Figure 1-1 shows the components of the multimode (DEFYM-AA) or single-mode (DEFYS-AA) Mod-FDDI card.

Figure 1-1: Multimode or Single-Mode Mod-FDDI Card Components



NPB-0705-96F

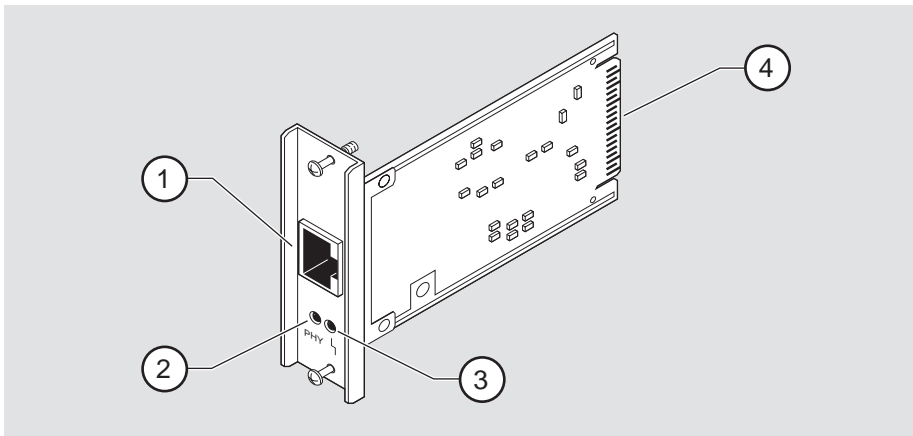
The following legend identifies the card components:

| Item | Description |
|------|-----------------------|
| 1 | FDDI connectors |
| 2 | PHY LED |
| 3 | FRU State LED |
| 4 | 50-pin host connector |

Introduction

Figure 1-2 shows the components of the UTP Mod-FDDI (DEFYU-AA) card.

Figure 1-2: UTP Mod-FDDI Card Components



NPB-0706-96F

The following legend identifies the card components:

| Item | Description |
|------|-----------------------|
| 1 | UTP connectors |
| 2 | PHY LED |
| 3 | FRU State LED |
| 4 | 50-pin host connector |

Hot-Swap Support

The cards support the hot-swap feature. However, make sure that your host module supports the hot-swap feature before attempting to perform this operation.

Refer to the host module documentation for information about the hot-swap feature.

NOTE

Hot swapping a card in a host module that does not support the hot-swap feature can cause the card to behave erratically. If you are unsure of hot-swap support, Digital Equipment Corporation recommends that you install the card into a module that is powered down.

Chapter 2

Installing the Card

Overview

Introduction

Before you begin to install a card into the module, you must understand whether the hot-swap feature is supported and what effects this might have. Refer to the host module's documentation for information about hot-swap support.

The installation instructions in this chapter are applicable to both cards described in this manual.

In This Chapter

| Topic | Page |
|--------------------------|------|
| Installation Preparation | 2-2 |
| Preparing a Host Module | 2-3 |
| Removing the Slot Cover | 2-4 |
| Installing the Card | 2-5 |
| Removing the Card | 2-7 |

Installation Preparation

To prepare to install the card into the host module, complete the following steps:

| Step | Action |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Remove the contents from the box and be sure to keep all original packing materials. The card comes packed in protective antistatic material. You should not remove the card from the material until you are ready to install the card. |
| 2 | Check the shipment for damage and missing parts. In case of damaged or missing parts, contact your delivery agent and your Digital Equipment Corporation sales representative. |
| 3 | Check to find out if the host module supports the hot-swap feature. Refer to the host module's documentation. |

Required Tools

Digital Equipment Corporation recommends the use of, but does not supply, the following tools to install the cards:

- Phillips-head screwdriver
- Antistatic grounding strap and grounded work surface

CAUTION

Static electricity can damage modules and electronic components. Digital recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.

Preparing a Host Module

To prepare your host module for the card installation, complete the following steps:

| Step | Action |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Refer to the host module's documentation to determine what steps you need to take before installing any cards. For example, check to see whether you need to power down the system or remove any modules before attempting this operation. |
| 2 | Check the front of the module and determine which slots to use. |

After you have completed these steps, go to the following sections:

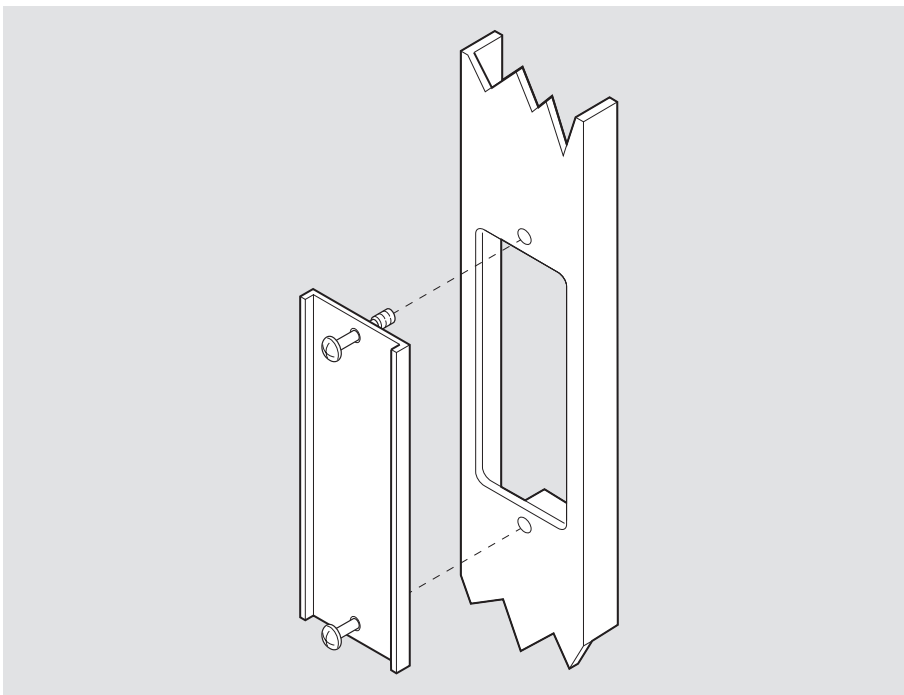
| Topic | Page |
|-------------------------|-------------|
| Removing the Slot Cover | 2-4 |
| Installing the Card | 2-5 |
| Removing the Card | 2-8 |

Removing the Slot Cover

To remove the host module's slot cover (Figure 2-1), complete the following steps:

| Step | Action |
|------|---------------------------------------------------------------------------------------------------------------------------|
| 1 | Use a Phillips-head screwdriver to loosen the two captive screws that hold the slot cover in place, and remove the cover. |
| 2 | Save the slot cover and screws for future use. |

Figure 2-1: Removing the Slot Cover



LKG-09986-96F

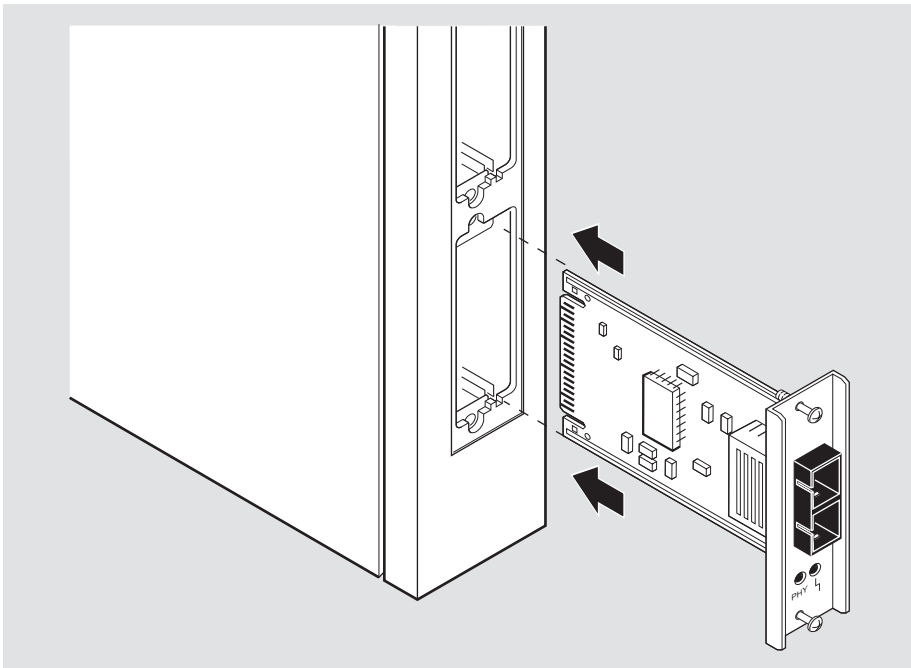
Installing the Card

To install the card into a host module (Figure 2-2), complete the following steps:

| Step | Action |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Attach one end of the antistatic wrist strap to your wrist and the other end to a chassis ground. CAUTION Static electricity can damage modules and electronic components. Digital Equipment Corporation recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules. |
| 2 | Remove the dust caps from the card. |
| 3 | Hold the card by the edges of the bezel and position it so that it is parallel with the slot opening. |
| 4 | Insert the card into the slot opening by aligning the sides of the card with the slot opening. <u>Note:</u> To prevent the screws from interfering with the card insertion, make sure that the captive screws on the bezel are partially threaded into the bezel threads. |
| 5 | Firmly fasten the card to the module with the two captive screws. |

Installing the Card

Figure 2-2: Installing the Card



NPB-0703-96F

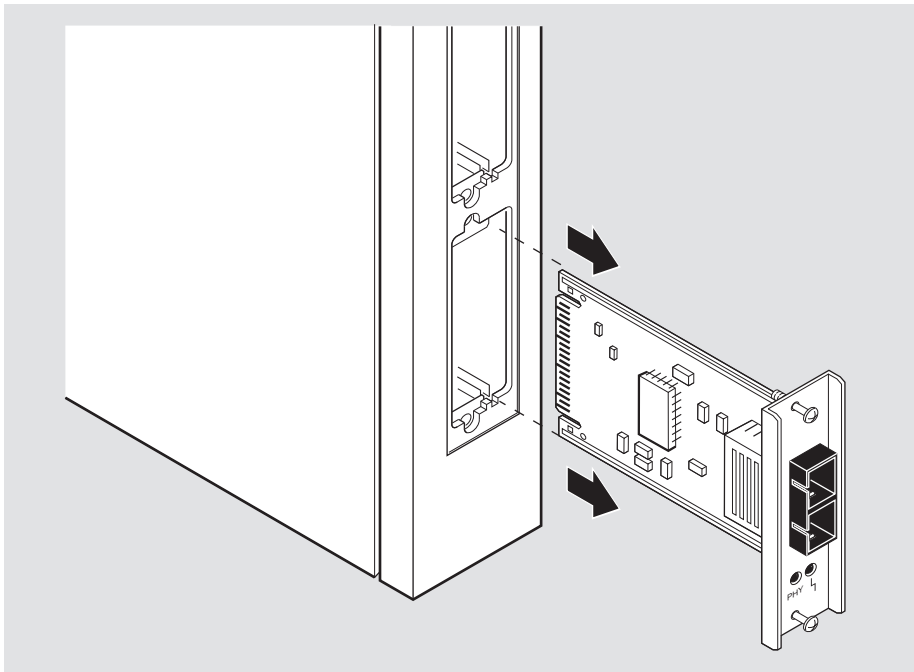
Removing the Card

To remove a card from the host module (Figure 2-3), complete the following steps:

| Step | Action |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Attach one end of the antistatic wrist strap to your wrist and the other end to a chassis ground. CAUTION Static electricity can damage modules and electronic components. Digital Equipment Corporation recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules. |
| 2 | Disconnect all cables from the card. Refer to Chapter 3 for cable removal information. |
| 3 | Use a Phillips-head screwdriver to loosen the two captive screws that hold the card in place. |
| 4 | Grasp the captive screws and disconnect the card from the host module by pulling on the screws. |
| 5 | Gently slide the card out of the slot. |
| 6 | Replace the dust caps on the card, if necessary. |
| 7 | Place the card into a static-proof bag. |
| 8 | If the slot is to be unused, reinstall the slot cover. |

Removing the Card

Figure 2-3: Removing the Card



NPB-0704-96F

Chapter 3

Connecting and Removing Cables

Overview

Introduction

This chapter describes the connecting and removing of cables for each type of physical media interface used in a card. This information applies to both types of cards.

In This Chapter

| Topic | Page |
|------------------------------------------------------------|------|
| Connecting the Multimode or Single-Mode Fiber-Optic Cables | 3-2 |
| Removing the Multimode or Single-Mode Fiber-Optic Cables | 3-4 |
| Connecting the FDDI UTP Cable | 3-5 |
| Removing the FDDI UTP Cable | 3-6 |

Connecting the Multimode or Single-Mode Fiber-Optic Cables

This section describes the media connection information for the multimode or single-mode fiber-optic cables.

WARNING

Some fiber-optic equipment can emit laser or infrared 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.

To connect the cables, (Figure 3-1) complete the following steps:

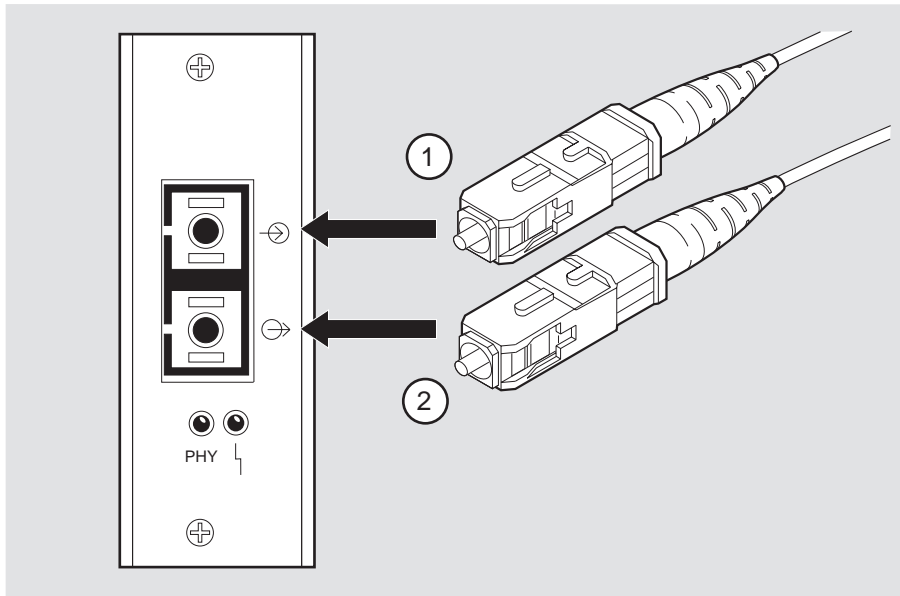
| Step | Action |
|------|----------------------------------------------------------------------------------------------------------------------|
| 1 | Remove the dust caps from the ports. |
| 2 | Align the receive cable connector (1) with the receive port and transmit cable connector (2) with the transmit port. |
| 3 | Insert the cables. |
| 4 | Connect the other end of the cable to your network device. |

NOTE

Make sure that the bend radius of any fiber-optic cable is 2.5 cm (1 in) or greater. To avoid optical power loss, do not touch the fiber ends.

Connecting the Multimode or Single-Mode Fiber-Optic Cables

Figure 3-1: Connecting the Multimode and Single-Mode Fiber-Optic Cables



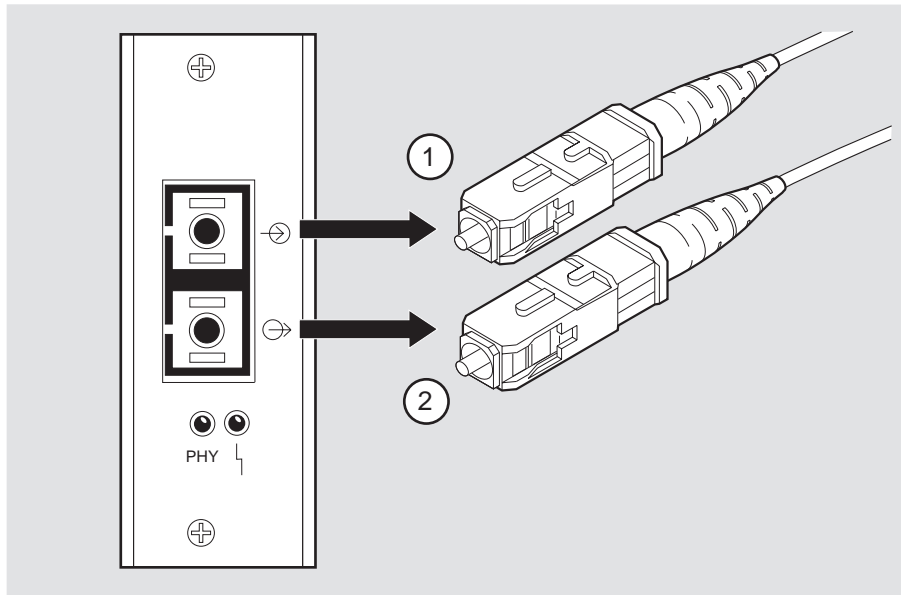
NPB-0707-96F

Removing the Multimode or Single-Mode Fiber-Optic Cables

To remove the cables (Figure 3-2), complete the following steps:

| Step | Action |
|------|-------------------------------------------------------------------------------------------|
| 1 | Pull the receive cable connector (1) and the transmit cable connector (2) from the ports. |
| 2 | Remove the other end of the cables from your network device. |
| 3 | Replace the dust caps. |

Figure 3-2: Removing the Multimode or Single-Mode Fiber-Optic Cables



NPB-0708-96F

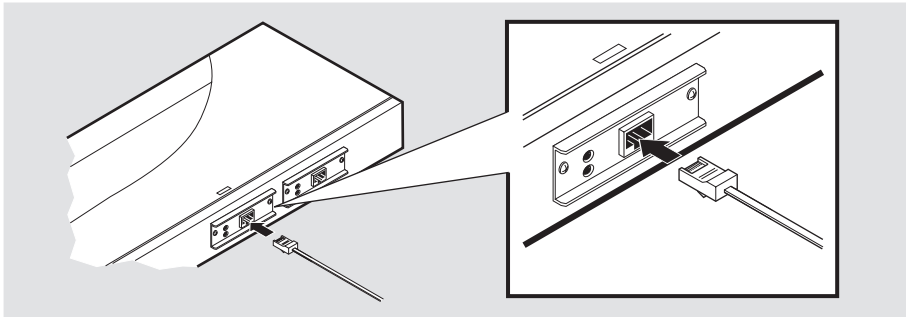
Connecting the FDDI UTP Cable

This section describes the media connection information for the FDDI UTP cables.

To connect the FDDI UTP cable (Figure 3-3), complete the following steps:

| Step | Action |
|------|---------------------------------------------------------------------------------------------------|
| 1 | Align the release tab on the cable plug with the keyway on the card port connector. |
| 2 | Insert the plug into the connector, ensuring that the release tab snaps into the locked position. |
| 3 | Connect the other end of the cable to your network device. |

Figure 3-3: Connecting the FDDI UTP Cables.



NPB-0643-96F

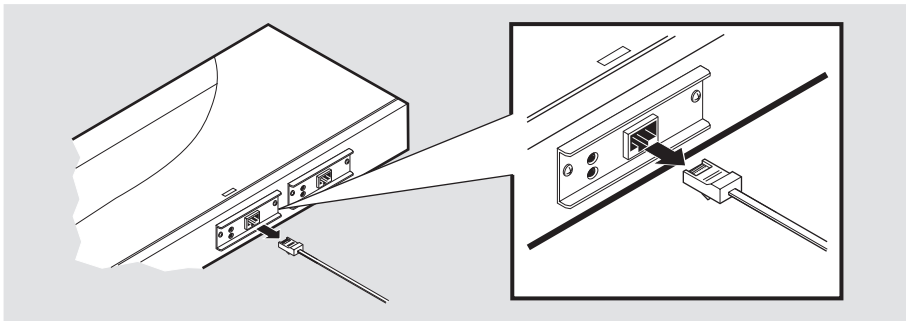
Removing the FDDI UTP Cable

Removing the FDDI UTP Cable

To remove the FDDI UTP cable (Figure 3-4), complete the following steps:

| Step | Action |
|------|--------------------------------------------------------------------|
| 1 | Press the release tab on the cable plug, and disconnect the cable. |
| 2 | Remove the other end of the cable from your network device. |

Figure 3-4: Removing the FDDI UTP Cable



NPB-0644-96F

Chapter 4

Using the Card

Overview

Introduction

This chapter explains the operation of the Mod-FDDI cards. The instructions in this chapter apply to both types of Mod-FDDI cards.

After you install a card and before you can use it, the card must be initialized.

In This Chapter

| Topic | Page |
|----------------------------------------------------------------------|------|
| Initializing the Card | 4-2 |
| LED Conditions | 4-3 |
| Verifying Operability | 4-4 |
| Performing a Loopback Test | 4-5 |
| Performing a Loopback Test | 4-6 |
| Connecting a FDDI UTP Loopback Connector | 4-6 |
| Connecting a Multimode or Single-Mode Fiber-Optic Loopback Connector | 4-7 |
| If the Loopback Test Passes | 4-8 |

Initializing the Card

The card should be initialized after insertion into your host module. Host modules that support the hot-swap feature perform this procedure automatically. Refer to your host module documentation for information about module initialization and the hot-swap feature.

If you are installing the card into a powered-down module, the module needs to be reset. Once there is power to the module, the initialization procedure is performed automatically.

After initialization, the two LEDs on the card provide information about its operation. The Physical Layer (PHY) LED indicates the state of the Physical Layer interface. The field-replaceable unit (FRU) status LED indicates the port's fault or diagnostic status.

If your host module supports the hot-swap feature, the PHY LED blinks three or more times after the card is inserted to indicate that recognition and initialization of the card is being attempted. Table 4-1 describes other LED indications that occur after this point.

The following table describes what you might see after initialization:

| If your module | Then |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supports the hot-swap feature | The PHY LED blinks three or more times after the card is inserted to indicate that recognition and initialization of the card is being accepted. |
| Was powered up before the insertion of the card and it does not support the hot-swap feature | The LEDs remain off, and no initialization takes place. The module needs to be reset. |
| Does not support the hot-swap feature, or the card has a fault on the module's port where the card is installed | None of the LEDs light within 10 seconds after the card is inserted. Take one of the following actions: <ul style="list-style-type: none">• Reinitialize the module. Refer to your host module's documentation for more information.• Replace your card.• Contact your Digital Equipment Corporation Representative. |

LED Conditions

Table 4-1 describes the conditions of the LEDs.

Table 4-1: LED Conditions

| Symptom | Probable Cause | Corrective Action |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FRU LED is off. | Tree topology, M-type port. | No action necessary. |
| FRU LED is green. | Tree topology, S-type port. | No action necessary. |
| FRU LED is yellow. | The diagnostics have detected a fault. | If possible, insert the card into another slot to determine whether the card or the host module contains the fault. If the card contains the fault, replace your card or contact your Digital Equipment Corporation representative. |
| FRU LED is blinking green. | Dual ring, A port or B port. | No action necessary. |
| PHY LED is off. | The port is unable to receive from the neighboring switch or station indicating that there might be a connection problem. | Check your connection (see section titled Checking the Connections on page 4-5). |
| PHY LED is green. | The card is working properly and a link is established. | No action is necessary. |
| PHY LED is yellow. | The link error rate limit has been exceeded. | Perform loopback testing to isolate the problem. |
| PHY LED is blinking green. | The card has been disabled by network management. | Enable the card, if necessary. |
| PHY LED is blinking yellow. | Illegal connection. | Check the connections (see section titled Checking the Connections on page 4-5). |
| PHY LED is blinking green and yellow alternately. | The card is in standby (dual homing) mode. | No action is necessary. |

Verifying Operability

A card might be operational but inactive because it is not connected to a remote system. In this situation, the PHY LED is off.

If the FRU LED is off, this could be an indication of an unknown error, and you should contact your Digital Equipment Corporation representative.

Once the card is connected to another system, verify that the connection is active by checking the LEDs:

| If your host module supports the hot-swap feature, and | Then |
|---------------------------------------------------------------|-------------------------------------------------------------------|
| Neither LED lights yellow | Replace the host module. |
| The LEDs do light | Refer to Table 4-1 to determine whether you must take any action. |

Performing a Loopback Test

Loopback connectors help to isolate your connection problems. Loopback testing verifies the ability of a port to transmit and receive data and isolates a problem to a particular element of a connection, that is, one of the ports or the media connecting them. Tests on the individual ports allow independent verification of each port as operational.

The loopback test configuration involves connecting a particular port's transmitter to its own receiver. (Special connectors or cables might be required). If the loopback connectors are properly connected, the PHY LED lights solid green.

NOTE

Before performing the loopback test, disable the port via network management. Performing the loopback test on an enabled port could cause undesired results.

Checking the Connections

Before performing the loopback test, check the following conditions:

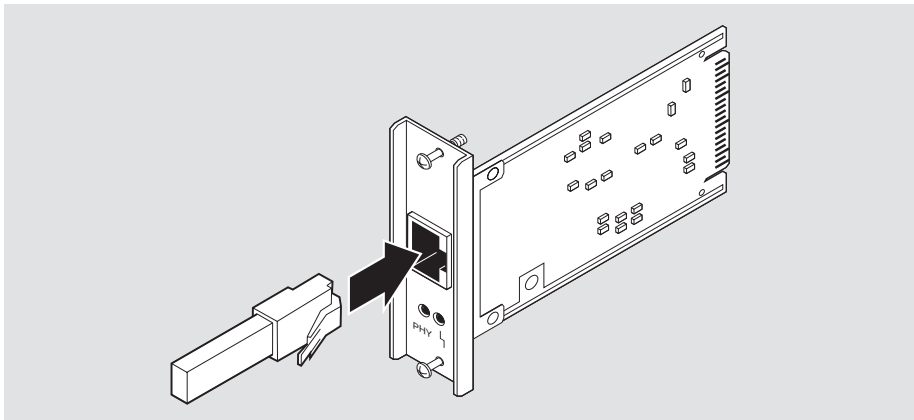
| Step | Action |
|------|-------------------------------------------------------------------------------------------|
| 1 | Ensure that you have the correct cable for your particular type of port. |
| 2 | If the correct cables are being used, test the port connections with loopback connectors. |

Connecting a FDDI UTP Loopback Connector

To connect a FDDI UTP loopback connector, complete the following steps:

| Step | Action |
|------|----------------------------------------------------------------------------------------------------------------|
| 1 | Remove the FDDI UTP cable from the card. |
| 2 | Align the keyway on the loopback plug with the key on the connector. |
| 3 | Insert the plug into the connector, ensuring that the locking clip on the plug snaps into the locked position. |

Figure 4-1: FDDI UTP Loopback Connector



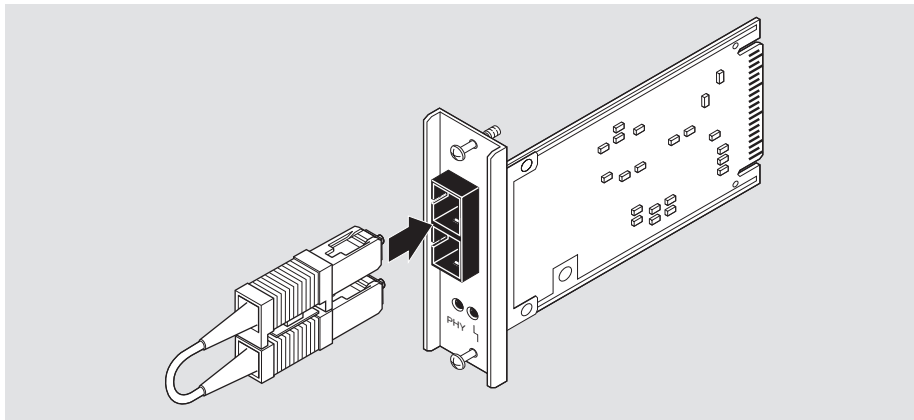
NPB-0709-96F

Connecting a Multimode or Single-Mode Fiber-Optic Loopback Connector

To connect a multimode or single-mode loopback connector, complete the following steps:

| Step | Action |
|------|--------------------------------------------------------------------------------------------------------------------|
| 1 | Remove the cable from the card. |
| 2 | Line up the transmit cable connector with the transmit port and the receive cable connector with the receive port. |
| 3 | Insert the loopback connector. |

Figure 4-2: Connecting a Multimode or Single-Mode Fiber-Optic Loopback Connector



NPB-0710-96F

Refer to Appendix A for more information about the appropriate loopback connectors to use for testing different types of ports.

If the Loopback Test Passes

If the Loopback Test Passes

If the port passes the loopback test, take one of the following actions:

| If | Then |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Neither port is identified as faulty | Replace the cables. |
| Replacement cables are not available | Perform continuity tests or cable loss measurements to identify the cable problems. Repair the cables. |

Appendix A

Cable and Connector Information

Overview

This appendix describes cable and connector information and specifications for each cable type.

In This Appendix

| Topic | Page |
|-------------------------------------------------------|------|
| Multimode Fiber-Optic Cable and Connector Information | A-2 |
| Multimode and Single-Mode Cable Specifications | A-3 |
| FDDI UTP Cable and Connector Information | A-4 |
| FDDI UTP Cable Specifications | A-5 |

Multimode Fiber-Optic Cable and Connector Information

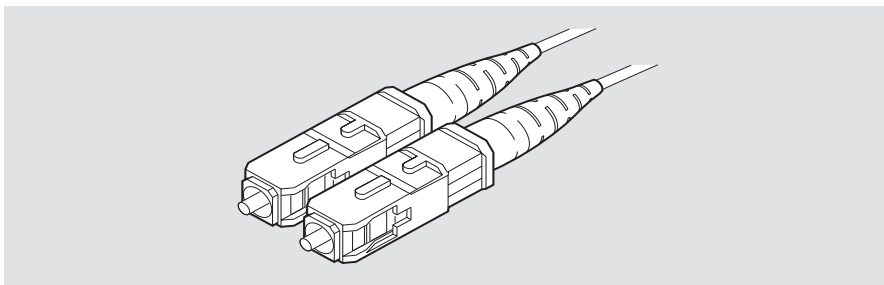
The following multimode fiber-optic cables and loopback connectors are available from Digital Equipment Corporation:

| Cable Description | Order Number |
|------------------------------|-----------------------|
| FDDI SC-type to FDDI SC-type | BN34B-xx ¹ |
| FDDI SC-type to 2.5 ST-type | BN34A-xx ¹ |
| Loopback connector | H4085-AA |

¹ The symbol xx represents the cable length. The available cable lengths are described in the *OPEN DECconnect Applications Guide*

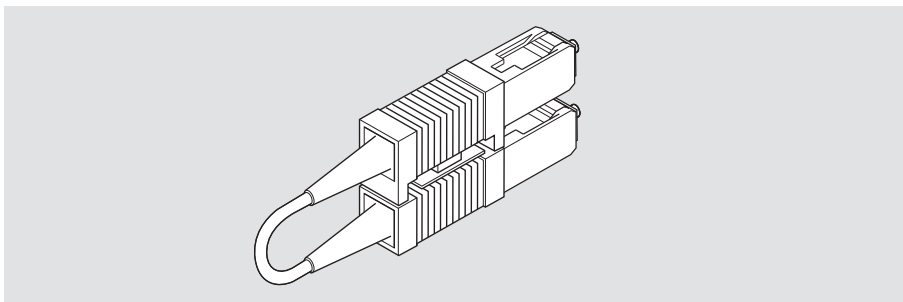
Figure A-1 shows the multimode fiber-optic cable. Figure A-2 shows the multimode fiber-optic loopback connector.

Figure A-1: Multimode Fiber-Optic Cables



NPB-0645-96F

Figure A-2: Multimode Fiber-Optic Loopback Connector



NPB-0697-96F

Multimode and Single-Mode Cable Specifications

Multimode Fiber-Optic Cable Specifications

The multimode fiber-optic cables should adhere to the following specifications:

- EIA/TIA 492-AAAA
- 62.5/125 μm
- SC connector
- 0 through 2 km
- 0 through 9 dB loss at 1300 nm (UNI V3.1, ATM User-Network Interface Specification)
- 0 through 11 dB loss at 1300 nm (ANSI X3.166-1990, FDDI PMD)

Single-Mode Fiber-Optic Cable Specification

The single-mode cables should adhere to the following specifications:

- Cable plant loss of between 12 dB and 22 dB (measured at a wavelength of 1300 nm).
- Cable plant attaches to the FDDI device through FC/PC-type connectors.
- Cables have an optical fiber that conforms to EIA/TIA 492BAAA and for which the cutoff wavelength is 1240 nm or less.
- Use inline loss elements with cables of less than 12 dB of loss. Use one of the following types of inline loss element, as appropriate:

| Cable Loss | Loss Element Rating |
|------------|---------------------|
| 0 to 6 dB | 12 to 16 dB |
| 6 to 12 dB | 6 to 10 dB |

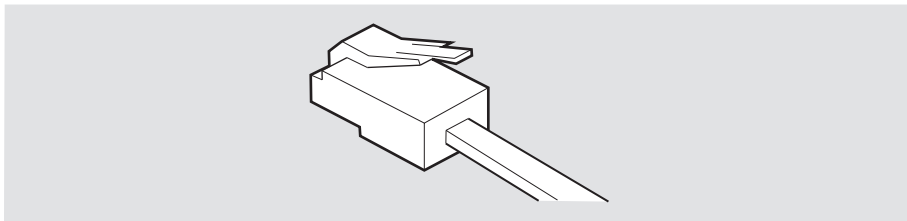
FDDI UTP Cable and Connector Information

The following FDDI UTP cables and loopback connectors are available from Digital Equipment Corporation:

| Cable Description | Order Number |
|----------------------------------------------------|--------------|
| 8-pin MP to 8-pin MP Category 5 (crossover) | BN25H |
| 8-pin MP to 8-pin MP Category 5 (straight-through) | BN25G |
| Loopback connector | H4082-AC |

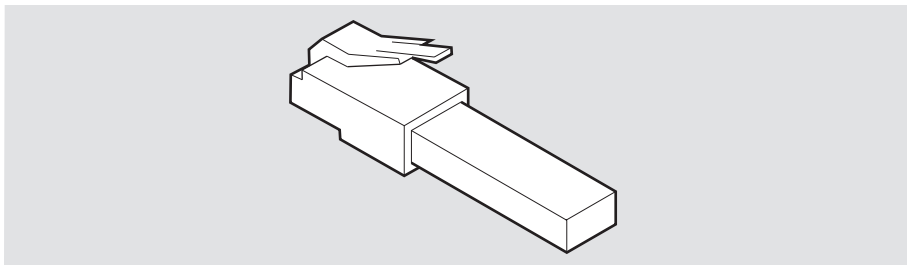
BN25H contains crossover wiring. BN25G contains straight-through wiring. Refer to the *OPEN DEConnect Applications Guide* for information about installed wiring and other configurations. Figure A-3 and Figure A-4 show the UTP FDDI cable and loopback connector.

Figure A-3: FDDI UTP Cable



NPB-0602-96F

Figure A-4: FDDI UTP Loopback Connector



NPB-0647-96F

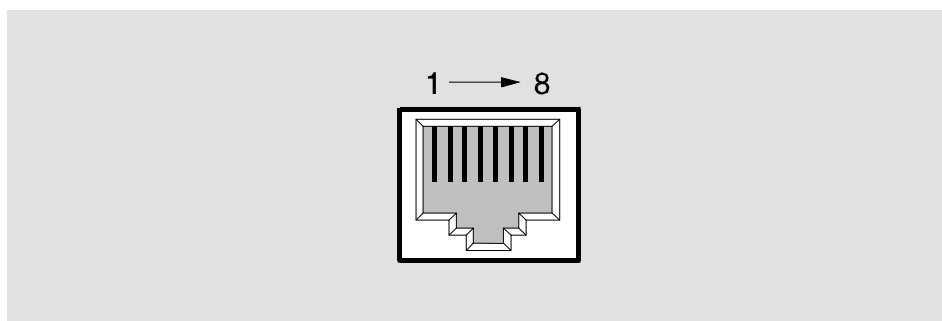
FDDI UTP Cable Specifications

The FDDI UTP cables should meet the requirements of EIA/TIA-568B for Category 5 twisted-pair for FDDI installation.

8-Pin MJ Connector

Figure A-5 shows the 8-pin MJ connector and its pin assignments:

Figure A-5: 8-Pin MJ Connector



NPG-8719-95F

Table A-1 lists the pin assignments for the FDDI UTP 8-pin MJ connector.

Table A-1: 8-Pin MJ Pin Assignments

| Pin | Assignment | Pin | Assignment |
|-----|------------|-----|------------|
| 1 | Transmit + | 5 | Unused |
| 2 | Transmit - | 6 | Unused |
| 3 | Unused | 7 | Receive + |
| 4 | Unused | 8 | Receive - |