

100 Mb/s Fast Ethernet Modular Media Interface Cards

Installation

Part Number: EK-MBITM-IM. C01

December 1997

This manual explains how to install and verify the operation of the 100 Mb/s Fast Ethernet Modular Media Interface cards.

Revision/Update Information: This is a revised 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, DEChub, DECnet, DIGITAL, ThinWire, and the DIGITAL logo.

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
Conventions and Terms	ix
Overview	ix
Associated Documents	x
Correspondence	xi
Documentation Comments	xi
Online Services	xi
WWW	xi
How to Order Additional Documentation	xii

Safety

Overview	xiii
Precautions	xiv

1 100 Mb/s Fast Ethernet Modular Media Interface Cards

Overview	1-1
Introduction	1-1
In This Chapter	1-1
Introduction	1-2
100BaseFX	1-3
100BaseTX	1-4
100BufFX	1-5
Hot-Swap Support	1-6

2 Installing the Card

Overview	2-1
Introduction	2-1
In This Chapter.	2-1
Installation Preparation	2-2
Required Tools	2-3
Preparing a Host Module.	2-4
Removing the Slot Cover	2-5
Installing the Card.	2-6
Removing the Card	2-8

3 Connecting and Removing Cables

Overview	3-1
In This Chapter.	3-1
Connecting the Multimode Fiber-Optic Cables	3-2
Removing the Multimode Fiber-Optic Cables	3-4
Connecting the UTP Cable	3-5
Removing the 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	4-5
Performing a Loopback Test.	4-6
Checking the Connections	4-6
Connecting a UTP Loopback Connector	4-7
Connecting a Multitmode Fiber-Optic Loopback Connector.	4-8
If the Loopback Test Passes	4-9

A Cable and Connector Information

Overview	A-1
In This Appendix	A-1
Multimode Fiber-Optic Cable and Connector Information.	A-2
Multimode Fiber-Optic Cable Specifications	A-4

UTP Cable and Connector Information	A-5
UTP Cable Specifications	A-6
Connectors	A-7
8-Pin MJ	A-7

Figures

1-1 100BaseFX Components	1-3
1-2 100BaseTX Components	1-4
1-3 100BufFX Components	1-5
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 Multimode Fiber-Optic Cables to the 100BaseFX Card	3-3
3-2 Connecting Multimode Fiber-Optic Cables to the 100BufFX Card	3-3
3-3 Removing Multimode Fiber-Optic Cables	3-4
3-4 Connecting the UTP Cable	3-5
3-5 Removing the UTP Cable	3-6
4-1 UTP Loopback Connector	4-7
4-2 Connecting a Multimode Fiber-Optic Loopback	4-8
A-1 100BaseFX Multimode Fiber-Optic Cable	A-3
A-2 Multimode Fiber-Optic Loopback Connector	A-3
A-3 100BaseTX Cable	A-5
A-4 100BaseTX Loopback Connector	A-5
A-5 8-pin MJ Connector	A-7

Tables

4-1 LED Conditions	4-3
A-1 8-pin MJ Pin Assignments	A-7

Preface

Overview

Purpose of This Manual

This manual describes how to install the 100 Mb/s Fast Ethernet Modular Media Interface (MM-100) cards and how to verify their installation and operation.

Intended Audience

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

Organization

This manual is organized as follows:

Section	Description
Chapter 1	Provides a description of the Fast Ethernet Modular Media Interface 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.

Conventions and Terms

Overview

This manual uses the following conventions:

Convention	Description
Special Type	Indicates system output in examples.
Boldface	Indicates user input in examples.
<Return>	Indicates that you should press the Return key.

Associated Documents

The following documents provide related information:

Title and Order	Description
<i>VNswitch 900EX Installation and Configuration</i>	Describes the VNswitch 900EX module, including its features, installation, and configuration information.
<i>VNswitch 900XX Installation and Configuration</i>	Describes the VNswitch 900XX module, including its features, installation, and configuration information.
<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</i>	Provides general descriptions to help plan, configure, and install networking systems based on 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</i>	Provides an overview of clearVISN, an 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 and configuring each application, 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: (978) 506-6093
E-MAIL: doc_feedback@lkg.mts.dec.com

Online Services

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

WWW

The Digital Equipment Corporation Network Products Business Home Page on the World Wide Web is located at the following addresses:

Americas:	http://www.networks.digital.com
Europe:	http://www.networks.europe.digital.com
Asia Pacific:	http://www.networks.digital.com.au

How to Order Additional Documentation

To order additional documentation, use the following information:

To Order:	Contact:
By Telephone	Continental U.S.A.: 1-800-DIGITAL (1-800-344-4825) Canada: 1-800-267-6215 Alaska, New Hampshire, and Hawaii: 1-603-884-6660
Electronically (U.S.A. only)	Dial 1-800-DEC-DEMO (For assistance, call 1-800-DIGITAL)
By Mail (U.S.A. 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 8 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

100 Mb/s Fast Ethernet Modular Media Interface Cards

Overview

Introduction

This chapter describes the types of 100 Mb/s Fast Ethernet Modular Media Interface (MM-100) cards.

NOTE

Asynchronous Transfer Mode (ATM) Modular PHY (modPHY) cards, Fiber Distributed Data Interface (FDDI) Modular Media Interface (Mod-FDDI) cards, and MM-100 cards are not interchangeable.

In This Chapter

Topic	Page
Introduction	1-2
100BaseFX	1-3
100Base TX	1-4
100BufFX	1-5
Hot-Swap Support	1-6

Introduction

The 100 Mb/s Fast Ethernet Modular Media Interfaces are part of the MM-100 family of modular media interfaces that support MII Fast Ethernet Modular Media. The cards are front-insertable, hot-swappable, single-slot option cards that are customer installable and field replaceable. (See Note.) The host module provides the power, initialization, and control for the card.

NOTE

Although MM-100 cards are hot-swappable in most modules, some modules require you to install MM-100 cards prior to installing the module in its host. For module specific information, refer to the installation and configuration manual for that module.

Depending on the type of physical media interface used in the card, there are differences in the attachment and removal of connectors. For more media connection information, refer to Chapter 3.

CAUTION

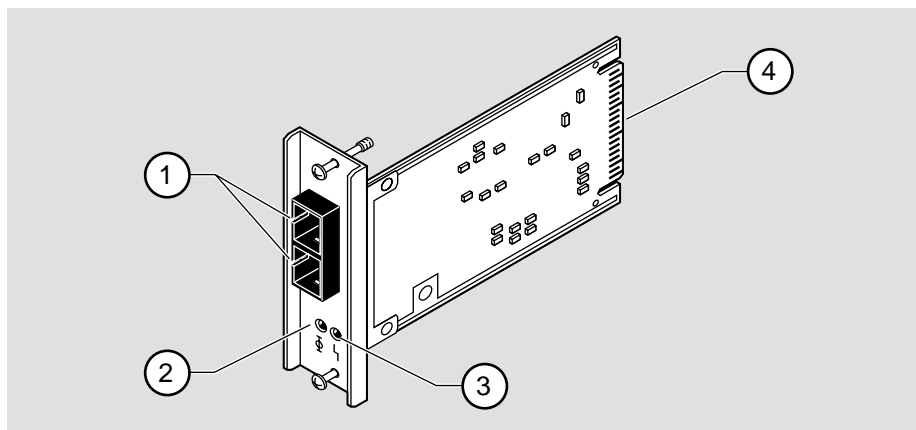
Static electricity can damage modules and electronic components. DIGITAL recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.

The three Modular Media Interfaces are illustrated and their components are described in the following sections:

100BaseFX

Figure 1-1 shows the components of the 100BaseFX card. This illustration is only a representation of the card. It may not show the exact components of your card.

Figure 1-1: 100BaseFX Components



NPB-0543-96F

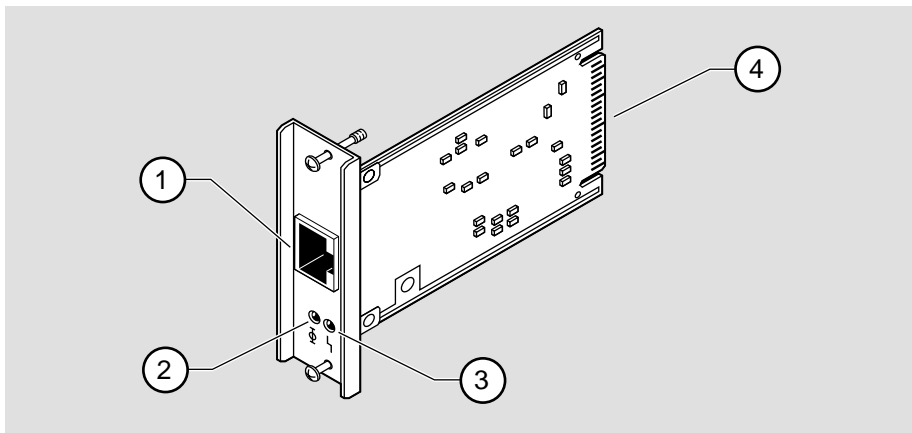
The following legend identifies the 100BaseFX card components:

Item	Symbol	Description
1		SC-transmit and receive connectors
2		PHY Status LED
3		FRU Status LED
4		40-pin host connector

100Base TX

Figure 1-2 shows the components of the 100BaseTX card. This illustration is only a representation of the card. It may not show the exact components of your card.

Figure 1-2: 100BaseTX Components



NPB-0542-96F

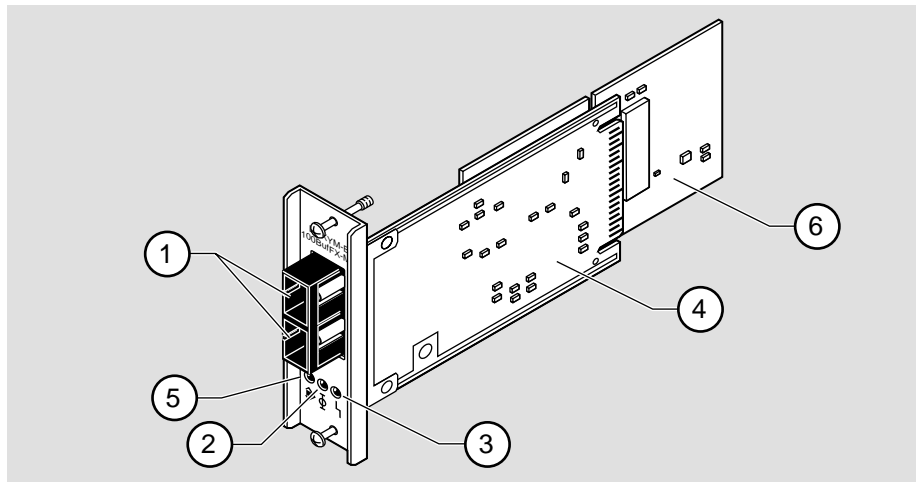
The following legend identifies the 100BaseTX card components:

Item	Symbol	Description
1		8-pin MJ connector
2	⊕	PHY Status LED
3	⌊	FRU Status LED
4		40-pin host connector

100BufFX

Figure 1-3 shows the components of the 100BufFX card. This illustration is only a representation of the card. It may not show the exact components of your card.

Figure 1-3: 100BufFX Components



NPB-0951-97F

The following legend identifies the 100BufFX card components:

Item	Symbol	Description
1		SC-transmit and receive connectors
2		PHY Status LED
3		FRU Status LED
4		40-pin host connector
5		Buffer Status LED
6		Buffer card

Hot-Swap Support

The cards support the hot-swap feature, which allows you to install the card without turning off power to the module. However, make sure that your host module supports the hot-swap feature before attempting to perform this operation.

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

NOTE

Hotswapping a card in a host module that does not support the hot-swap feature does not damage the module, but can cause the card to behave erratically. If you are unsure of hot-swap support, DIGITAL recommends that the card be installed into a module that has been powered down.

Chapter 2

Installing the Card

Overview

Introduction

Before you begin to install the 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 the hot-swap feature.

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

In This Chapter

Topic	Page
Installation Preparation	2-2
Required Tools	2-3
Preparing a Host Module	2-4
Removing the Slot Cover	2-5
Installing the Card	2-6
Removing the Card	2-8

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. Do 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 sales representative.
3	Ensure that you have the proper card for your module. Fast Ethernet, ATM, and FDDI MMI cards are not interchangeable.
4	Find out if the host module supports hotswap. Refer to the host module's documentation.

Required Tools

DIGITAL 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 a 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 host module and determine which slots to use.

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

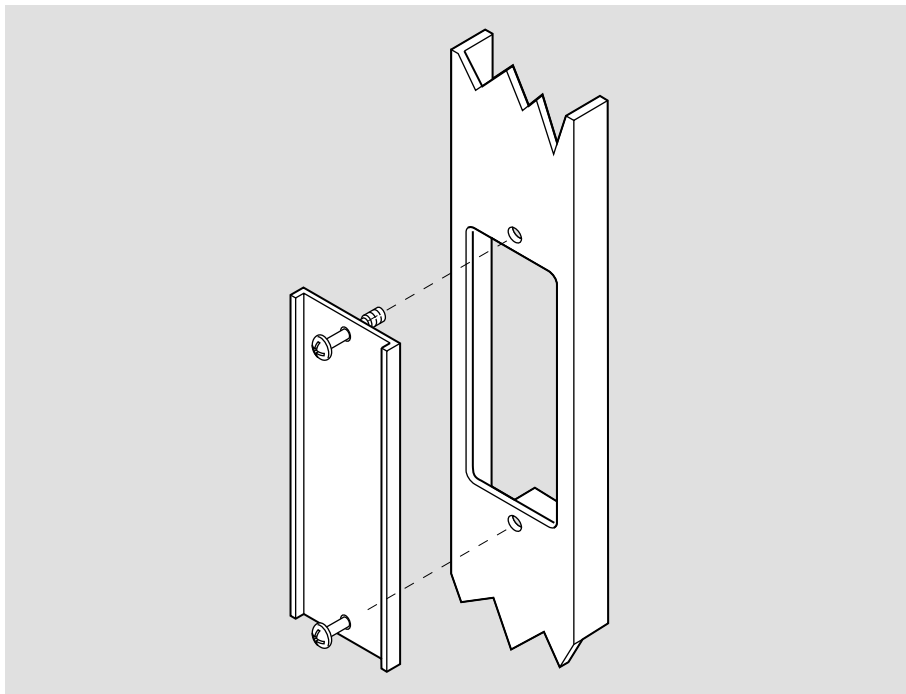
Topic	Page
Removing the Slot Cover	2-5
Installing the Card	2-6
Removing the Card	2-8

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 remove the two 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



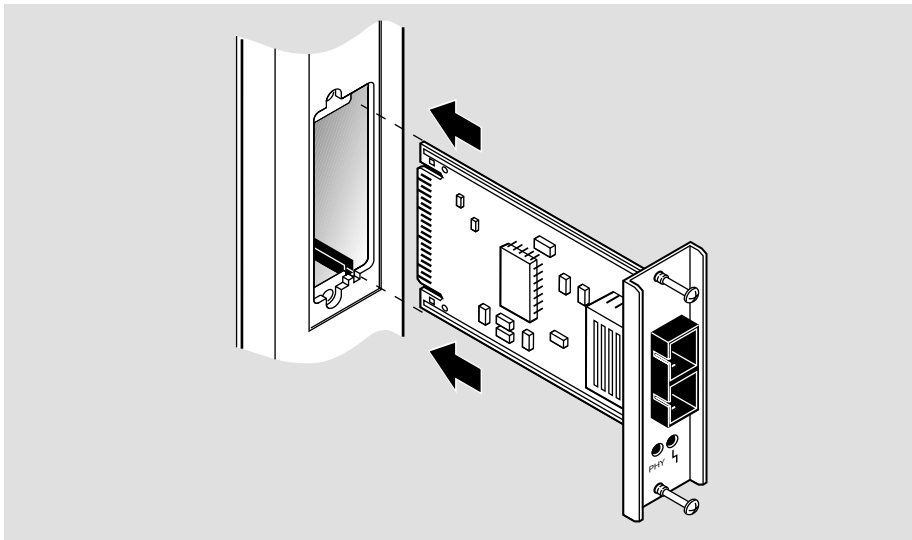
LKG-09986-96F

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 an antistatic wrist strap to your wrist and the other end to a chassis ground. 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.
2	Remove the dust cap from the card, if necessary.
3	Hold the card by the edges on the bezel and position it so that it is parallel with the slot opening.
4	Insert the card into the slot opening and slide the card along the card guides until the bezel is flush with the module. <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.

Figure 2-2: Installing the Card



NPB-0904-97F

Figure 2-2 shows the vertical installation of the 100BaseFX card. The procedure for installing the 100Base TX and the 100BufFX cards is the same depending on the orientation of the module. Some platforms may require horizontal installation.

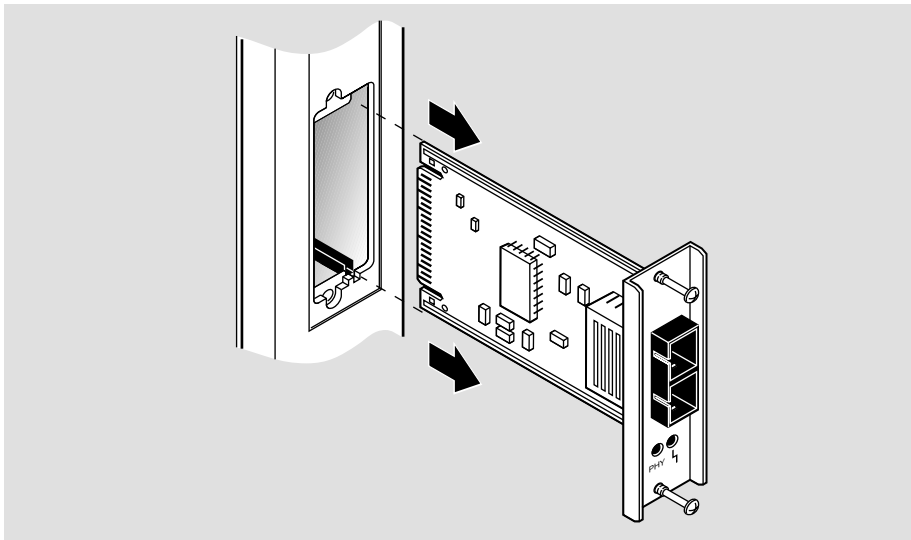
Removing the Card

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

Step	Action
1	Attach one end of an antistatic wrist strap to your wrist and the other end to a chassis ground. 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.
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-0905-97F

Figure 2-3 shows the removal of the 100BaseFX card. The procedure for removing the 100Base TX and the 100BufFX cards is the same.

Chapter 3

Connecting and Removing Cables

Overview

This chapter describes the connecting and removing of cables for each type of physical media interface used in a card.

In This Chapter

Topic	Page
Connecting the Multimode Fiber-Optic Cables	3-2
Removing the Multimode Fiber-Optic Cables	3-4
Connecting the UTP Cable	3-5
Removing the UTP Cable	3-6

Connecting the Multimode Fiber-Optic Cables



This section describes the connection information for 100BaseFX (Figure 3-1) and 100BufFX (Figure 3-2) multimode 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 and Figure 3-2), complete the following steps:

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

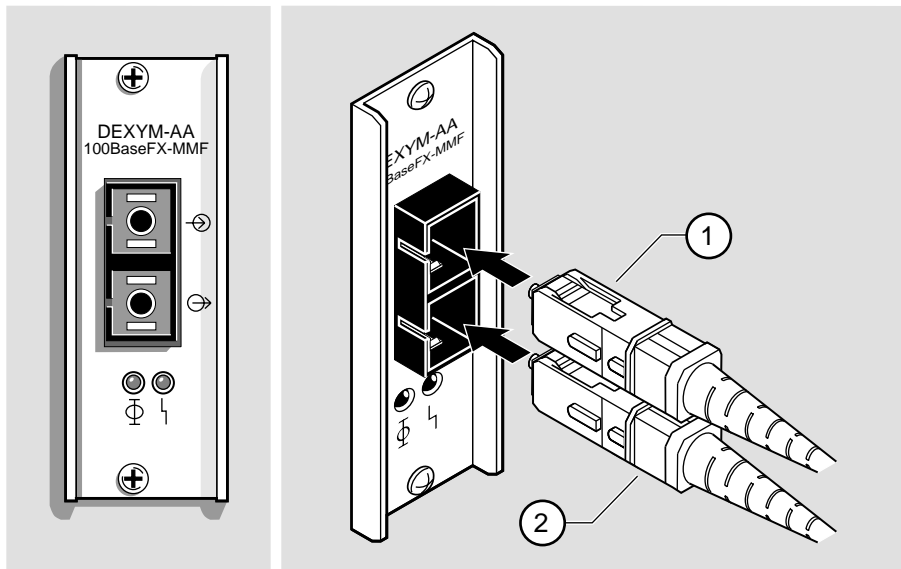
*Symbol	Meaning
	Receive port
	Transmit port

NOTE

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

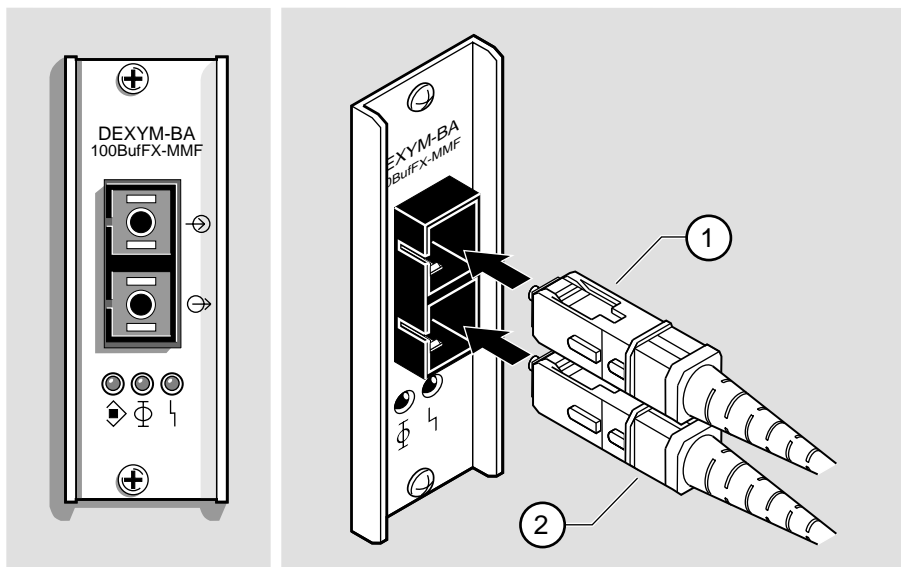
Connecting the Multimode Fiber-Optic Cables

Figure 3-1: Connecting Multimode Fiber-Optic Cables to the 100BaseFX Card



NPB-0648-96F

Figure 3-2: Connecting Multimode Fiber-Optic Cables to the 100BuFX Card



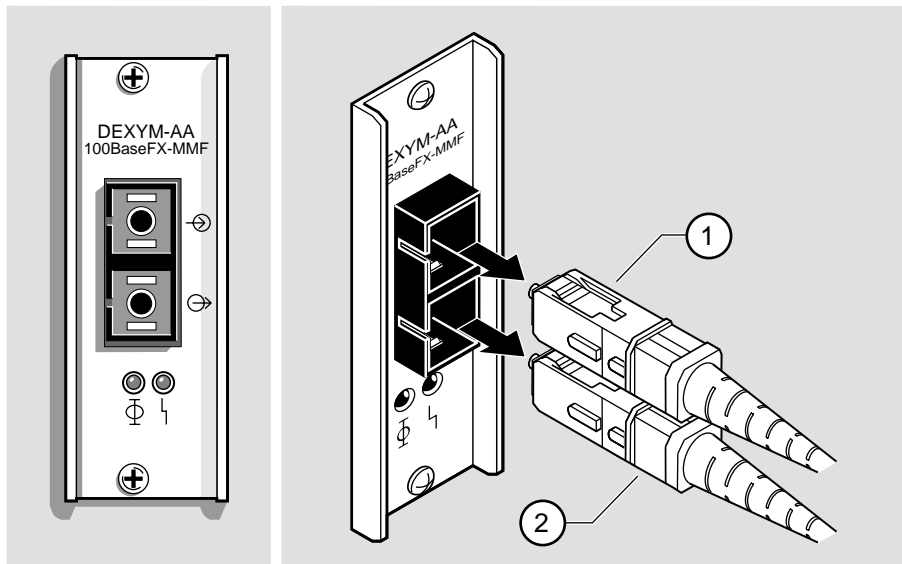
NPB-0953-97F

Removing the Multimode Fiber-Optic Cables

To remove the cables (Figure 3-3), 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 3-3: Removing Multimode Fiber-Optic Cables



NPB-0649-96F

This illustration is an example of removing the cables from the 100BaseFX card. The procedure for removing the cables from the 100BufFX cards is the same.

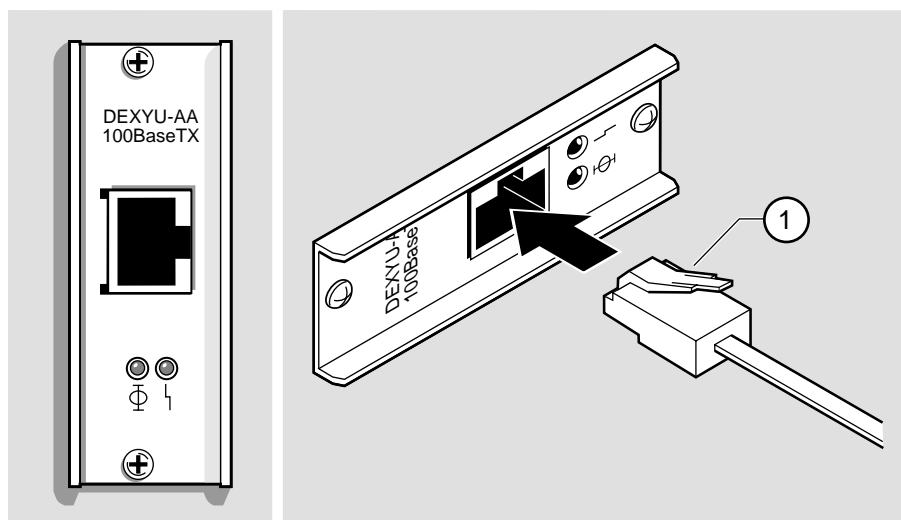
Connecting the UTP Cable

This section describes the connection information for the straight-through, unshielded twisted-pair (UTP) cable for the 100BaseTX card.

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

Step	Action
1	Align the release tab (1) 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 cable to your network device.

Figure 3-4: Connecting the UTP Cable



NPB-0907-97F

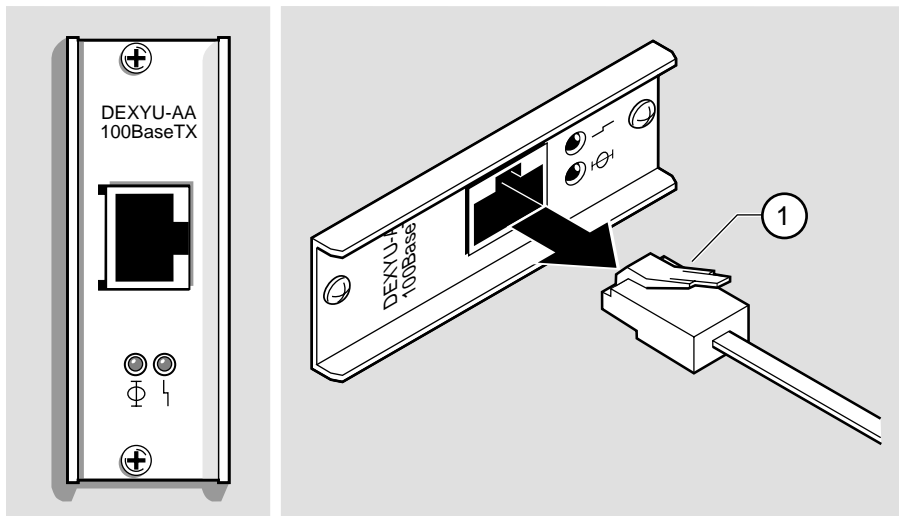
Removing the UTP Cable

Removing the UTP Cable

To remove the UTP cable (Figure 3-5), complete the following steps:

Step	Action
1	Press the release tab (1) on the cable plug, and pull out the cable.
2	Remove the other end of cable from your network device.

Figure 3-5: Removing the UTP Cable



NPB-0906-97F

Chapter 4

Using the Card

Overview

Introduction

This chapter explains the operation of the 100 Mb/s Fast Ethernet 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	4-5
Performing a Loopback Test	4-6
Connecting a UTP Loopback Connector	4-7
Connecting a Multimode Fiber-Optic Loopback Connector	4-8
If the Loopback Test Passes	4-9

Initializing the Card

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

If you are installing the card into a powered down module, once there is power to the module, the initialization procedure is performed automatically.

After initialization, the LEDs on the card provide information about its operation. (Your card may not contain all the LEDs described in this chapter.) The Physical Layer (PHY) LED indicates the state of the Physical Layer interface. The Field-Replaceable Unit status (FRU) LED indicates the port's fault or diagnostic status. The Buffer status (BUF) LED indicates the occupancy status of the buffer.

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 will take place. The module needs to be reset.
Does or does not support the hot-swap feature, if the module or power to the module is faulty	None of the LEDs light within 10 seconds after the card is inserted. <ul style="list-style-type: none">• Refer to your host module's documentation for troubleshooting information.• Contact your DIGITAL Representative.

Other LED indications that occur after this point are described in Table 4-1.


LED Conditions

Table 4-1 describes the conditions of the LEDs.

Table 4-1: LED Conditions

LED Condition	Meaning	Action
BUF LED is green 	Buffer is less than half full.	No action is necessary.
BUF LED is yellow. 	Buffer is more than half full.	No action is necessary.
BUF LED is alternately yellow and no light. 	Buffer has overflowed and lost packets during the last second.	Reduce the network load.
BUF LED is alternating yellow and green. 	Buffer is crossing over midpoint.	No action is necessary.
FRU LED is off. 	The card's diagnostic status is unknown. The card could not be tested because of some other port failure.	The port could have a hard failure. Power cycle the module to run diagnostics on the entire system. If the card continues to fault, contact your DIGITAL representative.
FRU LED is green. 	The card has passed diagnostics.	No action is 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 representative.

LED Conditions

LED Condition	Meaning	Action
PHY LED is green. 	The card is working properly and a link is established.	No action is necessary.
PHY LED is blinking yellow.	Unsupported connection on the port.	Perform loopback testing to isolate the problem. Check the configuration at the other end of link.
PHY LED is off.	No link connection is established due to a cable fault or no cable attached.	Check your connection (see section titled Checking the Connections on page 4-6).

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 representative.

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

If...	Then...
The system is working	The FRU LED, the PHY LED, and the BUF LED are green.
The FRU LED is yellow or off	Troubleshoot the MMI module.
The PHY LED is blinking yellow or off	Troubleshoot the cables.

Refer to Table 4-1 in this section to determine what action you should take.

Performing a Loopback Test

NOTE

Do not perform a loopback test on a repeater that contains a 100BaseFX or 100BuffFX card. A loopback test will cause segmentation.

Loopback connectors help to isolate your connection problems. Loopback testing verifies the ability of a port to transmit and receive 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. Refer to Appendix A for more information about the appropriate loopback connectors to use for testing different types of ports.

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 attached, the PHY LED lights solid green.

NOTE

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

Checking the Connections

Before performing a loopback test, check the following conditions:

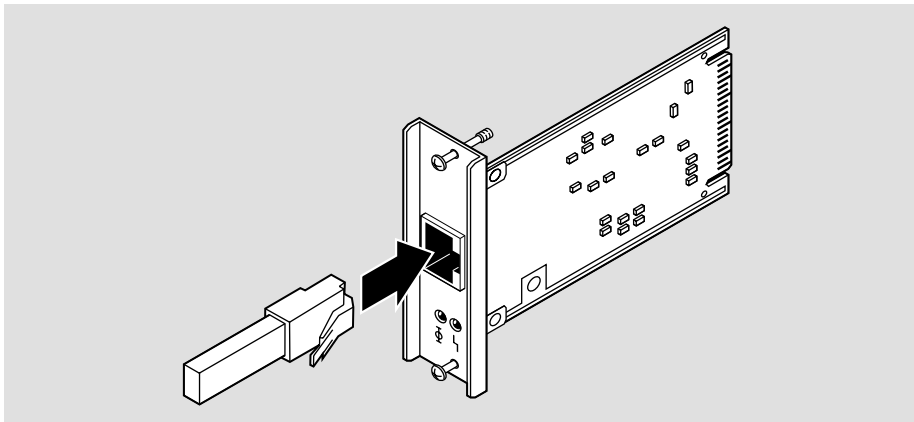
Step	Action
1	Ensure that you have the correct cable for your particular type of port.
2	If the correct cables are being used, test the port connections with loopback connectors.

Connecting a UTP Loopback Connector

To connect a UTP loopback connector (Figure 4-1), complete the following steps:

Step	Action
1	Remove the 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 side of the connector snaps into the locked position.

Figure 4-1: UTP Loopback Connector



NPB-0646-96F

Connecting a Multimode Fiber-Optic Loopback Connector

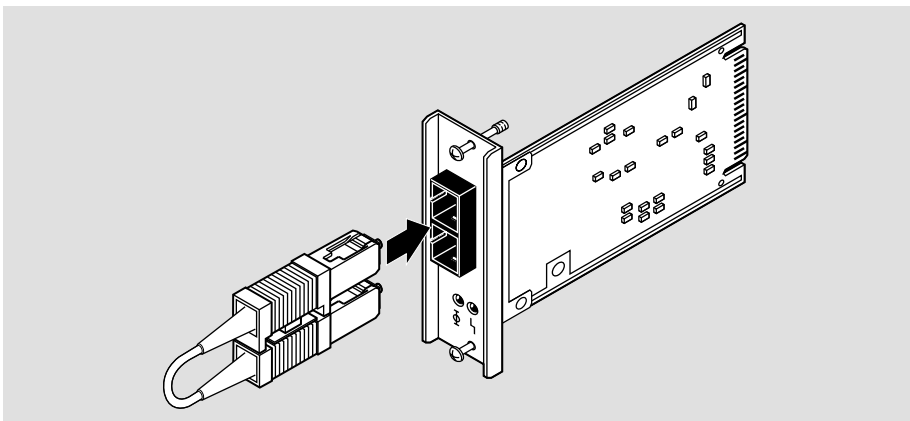
NOTE

Do not perform a loopback test on a repeater that contains a 100BaseFX or 100BaseFX card. A loopback test will cause segmentation.

To connect a multimode fiber-optic loopback connector (Figure 4-2), complete the following steps:

Step	Action
1	Remove the multimode fiber-optic 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 Fiber-Optic Loopback



NPB-0698-96F

If the Loopback Test Passes

If the Loopback Test Passes

If the port passes the loopback test, complete 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 Fiber-Optic Cable Specifications	A-4
UTP Cable and Connector Information	A-5
UTP Cable Specifications	A-6
Connectors	A-7

Multimode Fiber-Optic Cable and Connector Information

The following multimode fiber-optic cables and loopback connector are available from DIGITAL.

NOTE

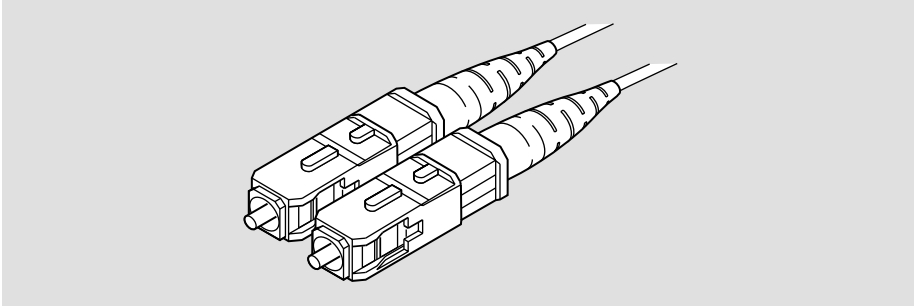
Do not perform a loopback test on a repeater that contains a 100BaseFX or 100BaseFX card. A loopback test will cause segmentation. See the section, Connecting a Multimode Fiber-Optic Loopback Connector in Chapter 4.

Cable Description	Order Number
ST-SC, MM, dual fiber-optic cables	BN34A-xx ¹
SC-SC, MM, dual fiber-optic cables	BN34B-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*.

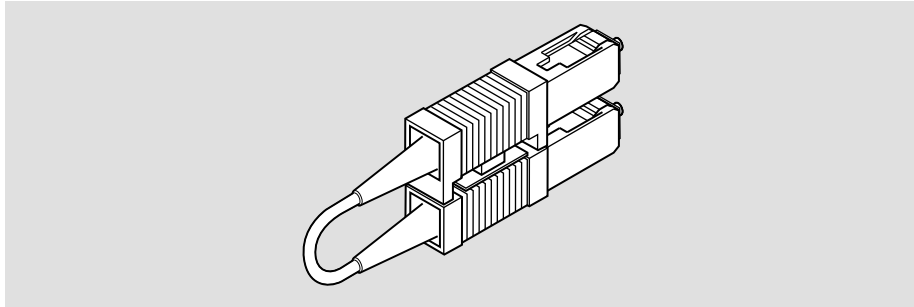
Multimode Fiber-Optic Cable and Connector Information

Figure A-1: 100BaseFX Multimode Fiber-Optic Cable



NPB-0645-96F

Figure A-2: Multimode Fiber-Optic Loopback Connector



NPB-0697-96F

Multimode Fiber-Optic Cable Specifications

The multimode fiber-optic cables should adhere to these specifications:

- EIA/TIA 492-AAAA
- 62.5/125 μm
- SC connector
- 0 through 2 km
- 0 through 9 dB loss at 1300 nm

UTP Cable and Connector Information

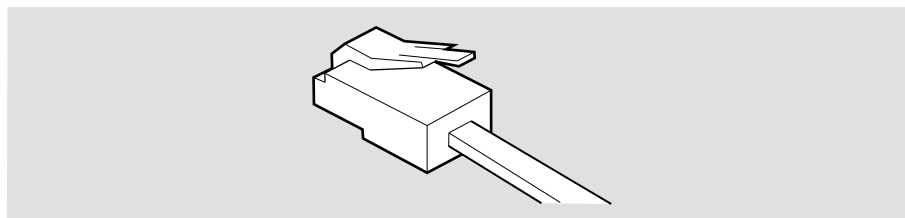
The following UTP cables and loopback connector are available from DIGITAL:

Cable/Connector Description	Order Number
UTP Category 5 patch cord (straight)	BN25G-xx ¹
UTP Category 5 patch cord (crossover)	BN24Q-xx
Loopback connector	H4082-AA

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

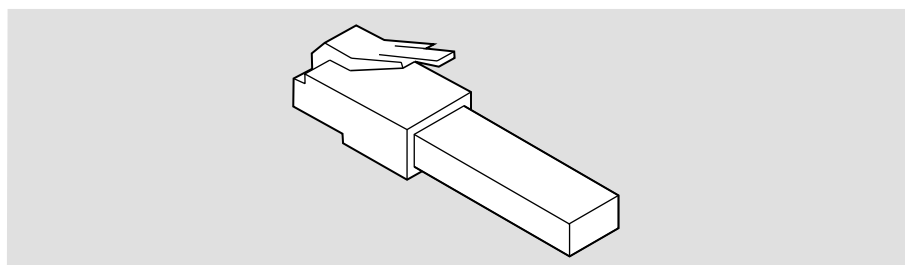
BN24Q contains a crossover and can be used to directly connect two devices in close proximity. Refer to the *OPEN DECconnect Applications Guide* for information about installed wiring and other configurations.

Figure A-3: 100BaseTX Cable



NPB-0602-96F

Figure A-4: 100BaseTX Loopback Connector



NPB-0647-96F

UTP Cable Specifications

The UTP cable must meet the requirements of EIA/TIA-568B for a Category 5 twisted-pair installation. See the *OPEN DECconnect Applications Guide* for more information.

EIA/TIA 568B requirements are typically met with:

- 90 m (295 ft) of Category 5 building cable
- 10 m (33 ft) Category 5 patch cords
- 1 punchdown block (Category 5)

Connectors

8-Pin MJ

Figure A-5 shows the 8-pin MJ connector on the 100BaseTX card.

Figure A-5: 8-pin MJ Connector

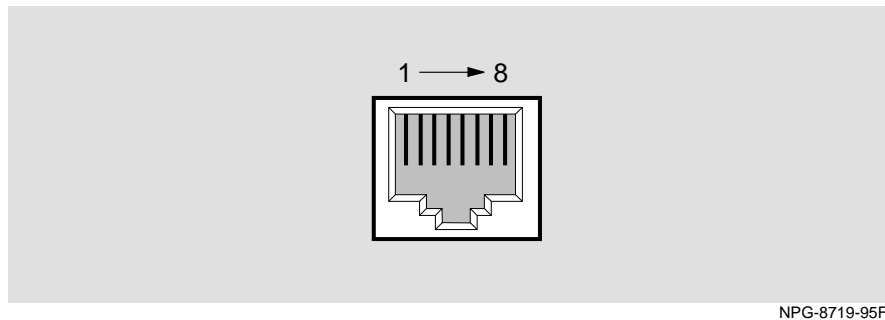


Table A-1 lists the pin assignments for the 8-pin MJ connector.

Table A-1: 8-pin MJ Pin Assignments

Pin	Assignment	Pin	Assignment
1	Transmit +	5	AC coupled to chassis
2	Transmit -	6	Receive -
3	Receive +	7	AC coupled to chassis
4	AC coupled to chassis	8	AC coupled to chassis

