DEC FDDIcontroller/PCI
Installation

Order Number: EK-DEFPA-IN. C01

This manual describes how to install and verify the operation of the DEC FDDIcontroller/PCI.

Revision/Update Information: This is a revised manual.

Contents

3 Problem Solving

A General Information

B Accessing MIBs and RFCs

Index

Figures

Tables

About This Manual

This manual describes how to install the DEC FDDIcontroller/PCI network interface card (NIC) into a 32-bit PCI local bus-compatible computer, and how to connect the adapter to a Fiber Distributed Data Interface (FDDI) network.

Intended Audience

This manual assumes that you are familiar with computers and understand the concepts and uses of FDDI networks.

Product Features

The main features of the DEC FDDIcontroller/PCI are as follows:

*   Industry's first PCI FDDI adapters
*   PCI V2.1 compliant
*   Low price reduces the cost of entry for FDDI
*   Full-duplex capability
*   DMA engine supports high throughput and low CPU utilization
*   1 MB buffer RAM
*   Onboard CPU

- Full suite of drivers to support:
    - NetWare ODI Server (V3.1*x* and V4.*x*)
    - NetWare ODI Client (DOS and OS/2)
    - NetWare SFT III MSL (V3.11 and V4.*x*)
    - PATHWORKS
    - Windows NT
    - Windows 95
    - Mac OS Open Transport
    - LAN Manager
    - OpenVMS
    - Digital UNIX
    - SCO OpenServer
- Includes a Limited Lifetime Warranty

Manual Conventions

This manual uses the following conventions:

Convention	Description
Note	A note contains information of special importance.
❶	A number in a black circle in text refers to the corresponding number in an accompanying illustration.
Enter	A word in a box indicates a particular keyboard key. For example, Enter indicates the Enter key.
variables	In command descriptions, italic type indicates a variable that you supply. In text, it emphasizes a term or indicates a book title.
This type	Text in monospace type indicates text that you enter or text that the system displays.

Related Documents

Additional information relative to the DEC FDDIcontroller/PCI and FDDI networks can be found in the following documents:

- *DECconcentrator 900MX Installation* (Order No. EK-DEF6X-IN)

  Describes how to install and configure the DECconcentrator 900MX.

- *Fiber Distributed Data Interface System Level Description* (Order No. EK-DFSLD-SD)

  Describes the FDDI system, how it works, and the role of the individual components.

- *Fiber Distributed Data Interface Network Configuration Guidelines* (Order No. EK-DFDDI-CG)

  Describes the guidelines for connecting devices to an FDDI network. It also includes network configuration examples.

- *A Primer on FDDI: Fiber Distributed Data Interface* (Order No. EC-H1580-42/92 07, Version 2.0)

  Describes the features, topologies, and components of the FDDI local area network (LAN) standard.

- *X3.166-1990 Physical Media Dependent for Multimode Fiber*, American National Standards Institute (ANSI)

  Defines the Physical Layer Medium Dependent (PMD) sublayer. This sublayer corresponds to the lower portion of the physical layer of the OSI seven-layer model. This standard provides the specifications for the optical transmitter and receiver used by FDDI, the power levels, allowable bit error rates, fiber-optic transmission wavelength, fiber-optic cable, and connectors.

- *OPEN DECconnect Applications Guide* (Order No. EC-G2570-42)

  Provides information to help plan and install networking systems based on Digital Equipment Corporation's OPEN DECconnect System and networking products.

- *Network Product Guide* (Order No. EC-G4343-42)

  Provides comprehensive information about Digital Equipment Corporation's hardware and software networking solutions.

Safety Statements

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	Enthaält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.
Achtung	Enthält Informationen, die beachtet werden müssen, um die Gerä te vor Schaden zu bewahren.
Danger	Signale les informations destinées à prévenir les accidents corporels.
Attention	Signale les informations destinées à prévenir la deterioration du matériel.
Aviso	Contiene informacion para evitar dañños personales.
Precaución	Contiene informacion para evitar danos al equipo.

The cautions you must observe for the hardware described in this manual are listed in English, German, French, and Spanish as follows:

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 electron- iques. Digital conseille l'utilisation d'un bracelet de masse et d'un plan de travail mis à la terre lors de lamanipulation des modules.
PRECAUCIÓN	La electricidad estática puede dañar los componentes electronicos y los módulos. Digital recomienda que se utilicen cintas de pasadores y superficies de trabajo conectadas a tierra al trabajar con cualquier módulo.
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.
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 rayonne-ment laser dangereux pour les yeux. Ne vous avisez jamais de regarder par l'extremite d'une fibre optique ou dans l'ouverture d'un connecteur. Considerez toujours que le cable est relié a une source lumineuse.
AVISO	Algunos equipos de fibra óptica pueden emitir luz láser que daña los ojos. No sedebe mirar en una puerta de conector o fibra optica. Siempre se debe suponer que el cable está conectado a la luz.

CAUTION	When adding any option module to your computer, verify that the combined power (wattage) required for all modules in your computer does not exceed the power supply rating. Check your computer documentation for this information.
ACHTUNG	Wenn Sie Zusatzmodule in Ihren Computer einbauen, darf die gemeinsame Leistung (in Watt) aller eingebauten Module die Nennleistung nicht überschreiten. Weitere Informationen finden Sie in der Dokumentation zu Ihrem Computer.
ATTENTION	Si vous ajoutez des options à votre système, assurez-vous que le nombre de watts total n'excede pas la puissance nominale du bloc d'alimentation. Reportez-vous à la documentation de votre systeme pour obtenir plus d'information.
PRECAUCIÓN	Al añadir cualquier modulo de opciones al ordenador, es preciso comprobar que la potencia combinada (vatios) necesaria para todos los modulos del ordenador no sobrepasa las condiciones normales del suministro de energia. Consúltense estos datos en la documentación del ordenador.
WARNING	To prevent personal injury or equipment damage, do not insert telecommunications cabling into the optical bypass relay connector.
VORSICHT	Um Personen oder Geräteschaden zu vermeiden, dürfen Sie das Telefonkabel AUF KEINEN FALL am Anschluß des optischen Bypass-Relais anschließen.
DANGER	Pour éviter tout risque d'accident corporel ou de dommage matériel, NE BRANCHEZ PAS de cable de télecommunication sur le connecteur de relais selectif optique (optical bypass relay connector).
AVISO	Para evitar daños personales o al equipo, NO se debe introducir cableado de telecomunicaciones en el conector óptico de reles de derivación.

1
Introduction

The DEC FDDIcontroller/PCI adapter (also referred to as the FDDI
PCI adapter or adapter) provides direct connection of industry
standard computers with a peripheral component interconnect (PCI)
I/O bus to a 100-Mb/s FDDI network. Drivers for supported operating
systems provide the configuration flexibility required in multivendor
networks.

Table 1–1 describes the DEC FDDIcontroller/PCI models available
from Digital Equipment Corporation.

Table 1–1 Adapter Models

Model	Description
DEFPA-AB	One-card, single attachment station (SAS) adapter with multimode optics and SC connectors.
DEFPA-UB	One-card, single attachment station (SAS) adapter with a single 8-pin MJ connector. This model accepts Category 5 unshielded twisted-pair (UTP) or 100-ohm screened twisted-pair (ScTP) cable.
DEFPA-DB	One-card, dual attachment station (DAS) adapter with multimode optics and dual SC connectors.
DEFPA-MB	One-card, dual attachment station (DAS) adapter with two 8-pin MJ connectors. This model accepts Category 5 UTP or ScTP cable.

The FDDI multimode fiber-optic cable connectors are used with SAS and DAS PCI adapters.

When the duplex SC connector is attached to a wiring concentrator, hub, or FDDI switch, make sure that the fiber-optic cable is connected from the transmit side of one adapter to the receive side of the second adapter (see Figure 2–4, Figure 2–5, and Figure 2–6).

The SAS adapters can be connected as follows:

- Point-to-point with another FDDI adapter in a two-station network using a single pair of MMF cables.

- To an FDDI dual-ring backbone through an FDDI-compliant wiring concentrator (such as the DECconcentrator 900MX), a hub, or switch using multimode fiber-optic cable (for DEFPA-AB model) or Category 5 UTP copper cable (for DEFPA-UB model).

The DAS adapter can be connected as follows:

- Directly to the FDDI dual-ring backbone through two pairs of multimode fiber-optic cables.

- Dual-homed, that is, connected to an FDDI dual-ring backbone through FDDI-compliant wiring concentrators, hubs, or switches using two pairs of MMF cables. In this configuration, the ports on the adapter are connected to different concentrators, hubs, or switch port modules.

  These configurations provide all of the automatic failover benefits of a DAS connection with the added benefits of end-user isolation from the backbone ring, and the simplicity of SAS end-station management.

- Point-to-point, using a single pair of MMF cables to a SAS adapter, or either a single pair or two pairs of MMF cables to a DAS adapter.

Figure 1–1 shows an example of how a SAS- or DAS-configured, PCI-compatible computer interfaces to an FDDI network using fiber-optic or Category 5 twisted-pair cable.

Figure 1–1 SAS/DAS Adapters Configured in an FDDI Network
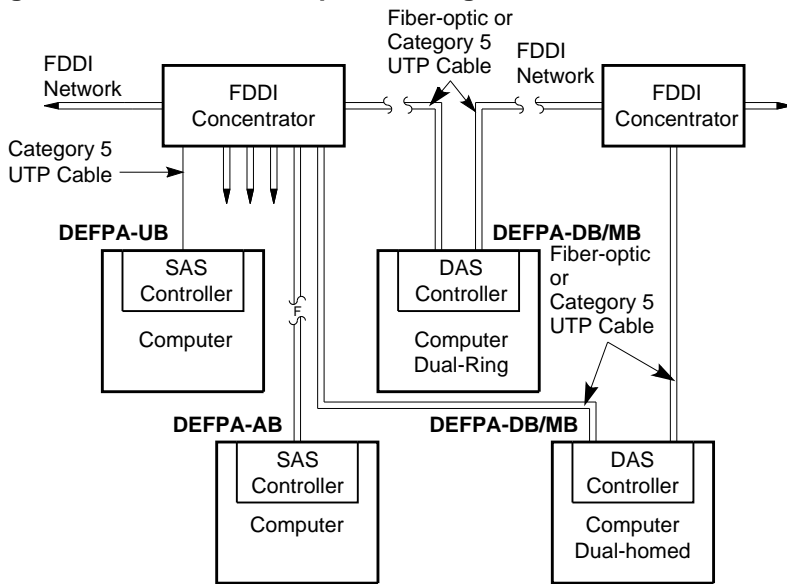
LJ-4841B.AI4

_____ **Note** _____

Copper Category 5 UTP and 100-ohm ScTP cable comply with FDDI standards and interoperate with products that implement the American National Standards Institute (ANSI) Twisted Pair-Physical Medium Dependent (TP-PMD) standard.

Fiber-Optic SAS Adapter (DEFPA-AB)

The fiber-optic SAS adapter (Figure 1–2) consists of one card that plugs into a single bus master PCI I/O bus slot. A duplex SC connector ❶ interfaces with the FDDI fiber-optic cable.

The adapter contains onboard diagnostics that execute when power is applied. A two-color (green or amber) light-emitting diode (LED) ❷ on the adapter mounting bracket indicates the operating status of the adapter and its PHY port. Refer to the LED Descriptions section of this chapter for information about the adapter's LED.

Figure 1–2   Fiber-Optic SAS Adapter (DEFPA-AB)
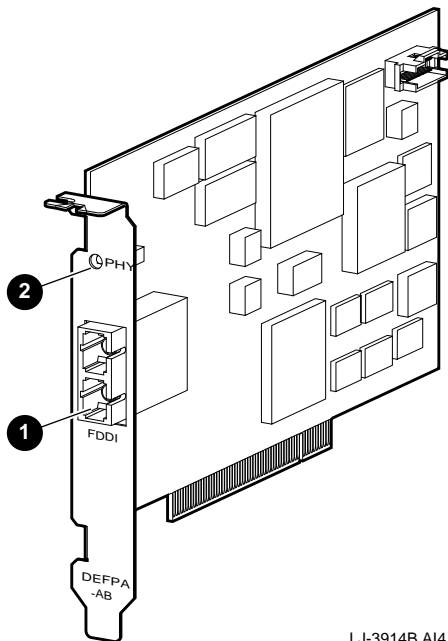
UTP SAS Adapter (DEFPA-UB)

The UTP SAS adapter (Figure 1–3) consists of one card that plugs into a single bus master PCI I/O bus slot. An 8-pin MJ connector ❶ interfaces with Category 5 UTP copper cable.

The adapter contains onboard diagnostics that execute when power is applied. A two-color (green or amber) LED ❷ on the adapter mounting bracket indicates the operating status of the adapter and its PHY port. Refer to the LED Descriptions section in this chapter for information about the adapter's LED.

Figure 1–3   UTP SAS Adapter (DEFPA-UB)

LJ-3915B.AI4
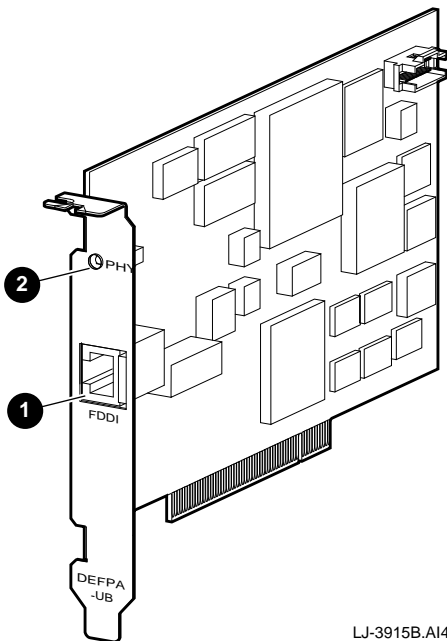
Fiber-Optic DAS Adapter (DEFPA-DB)

The fiber-optic DAS adapter (Figure 1–4) consists of one card that plugs into a single bus master PCI I/O bus slot. Two duplex SC connectors, port B ❶ and port A ❷, interface with the FDDI fiber-optic cable.

The adapter contains onboard diagnostics that execute when power is applied. The two LEDs, B ❸ and A ❹, on the adapter's mounting bracket, indicate the operating status of the adapter and its PHY ports. Refer to the LED Descriptions section in this chapter for information about the adapter's LEDs.

Figure 1–4 Fiber-Optic DAS Adapter (DEFPA-DB)
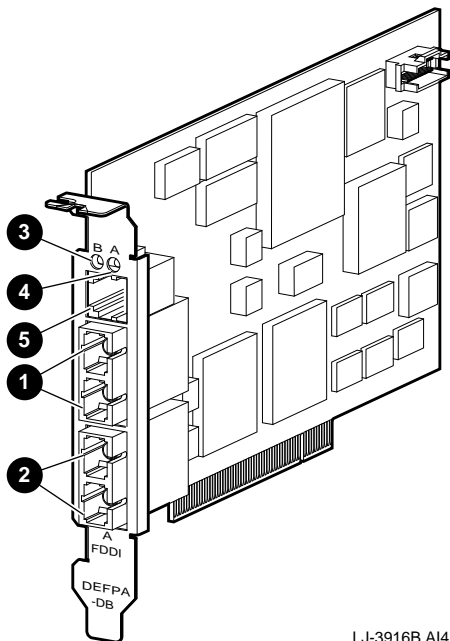
LJ-3916B.AI4

The fiber-optic DAS adapter contains an RJ-12 connector ❺ for inserting an optional third-party optical bypass relay (OBR). This relay maintains connectivity of the FDDI ring in the absence of power or during fault conditions in the node. (OBR devices are not available from Digital.)

_____ **Warning** _____

To prevent personal injury or equipment damage, do not insert telecommunications cabling into the optical bypass relay connector.

_____

Refer to the Optical Bypass Relay (OBR) RJ-12 Connector section in Appendix A for more information about the OBR.

UTP DAS Adapter (DEFPA-MB)

The UTP DAS adapter (Figure 1–5) consists of one card that plugs into a single bus master PCI I/O bus slot. Two 8-pin MJ connectors, port A ❶ and port B ❹, interface with the Category 5 copper cable.

The adapter contains onboard diagnostics that execute when power is applied. The two LEDs, A ❸ and B ❷, on the adapter's mounting bracket, indicate the operating status of the card and its PHY ports. Refer to the LED Descriptions section in this chapter for information about the adapter's LEDs.

Figure 1–5   UTP DAS Adapter (DEFPA-MB)
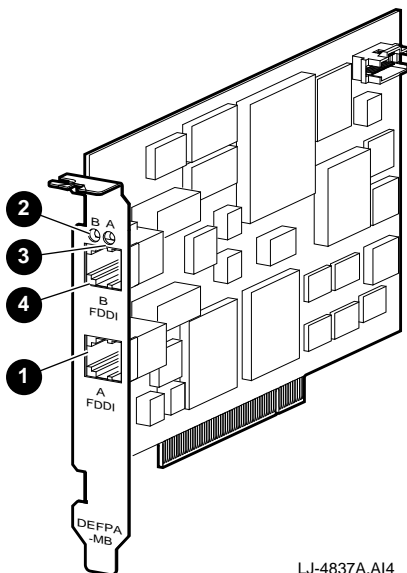
LJ-4837A.AI4

LED Descriptions

The adapter LEDs are used to indicate the status of the adapter and the FDDI ports. The LEDs are visible on the adapter's front panel (at the back of your computer).

Table 1–2 lists and describes possible LED states for all adapter models.

Table 1–2 LED States

LED	Color	Normal	Description
PHY/PHY A	Green	On	On—PHY connection complete
	Green	Flashing	Flashing—PHY connection in progress (or no cable attached)
	Amber		On—If on after system boots, indicates port or Link Confidence Test (LCT) failure; retry loop
			If on before system boots, indicates self-test failure
	Amber		Flashing—Illegal topology
	Green /Amber	Alternating	Alternating—Standby mode when connected to a con-centrator in a dual-homing configuration (DEFPA-DB and DEFPA-MB)
			Off—Port disabled by man-agement, or LED or adapter failed
PHY B (DAS only)	Green	On	On—PHY connection complete
	Green	Flashing	Flashing—PHY connection in progress (or no cable attached)
	Amber		On—If on after system boots, indicates port or Link Confidence Test (LCT) failure; retry loop
			If on before system boots, indicates self-test failure
	Amber		Flashing—Illegal topology
			Off—Port disabled by man-agement, or LED or adapter failed

Software Description

The software packages required to operate the adapter on the network are as follows:

- **Operating system software**

  This is your system software, such as DOS, SCO OpenServer, OS/2, Windows NT, or Windows 95.

- **Network operating system software**

  This includes software such as Novell NetWare, Digital PATHWORKS, or Microsoft LAN Manager. This layered software provides the network services such as DECnet or Transmission Control Protocol/Internet Protocol (TCP/IP).

- **Device driver software**

  For most operating environments, this software is part of the adapter product package contained on the distribution diskette (refer to the Distribution Diskette section in this chapter). The device driver allows the network operating system software to communicate with the adapter and must be installed as part of the installation procedure.

Distribution Diskette

The driver distribution diskette is for systems that can read DOS-format diskettes. Additional diskettes containing product enhancements may be included in your shipment.

The distribution diskette contains the following information:

- A `README.TXT` file in the root directory that explains how to access files and provides an overview of the diskette.

- A `RELEASE.NOT` in the root directory that includes important software Release Notes.

- Subdirectories for each supported operating system. The subdirectories contain driver and installation procedures for that particular operating system.

- System diagnostic INSTVER:

        A:\DIAG\INSTVER.EXE

- A Digital Local Management Application (DEClma) executable file for some supported operating systems.

Note

Software components will be added to this diskette throughout the product's life as new operating systems are supported. Refer to the `README.TXT` file in the root directory for the latest description of the diskette contents.

2
Installation

This chapter describes how to install the DEC FDDIcontroller/PCI
into a PCI bus master-compatible computer and how to connect it to
the network.

The steps to install the adapter are as follows:

1. Print and read the `README.TXT` file located in the root directory
   of your distribution diskette and the `README.TXT` file for your
   operating environment. The README.TXT file for your operating
   environment is located in the subdirectory specific to your
   operating system.

2. Verify the system and software requirements.

3. Install the adapter into a PCI bus master slot.

4. Install the driver software.

5. Connect to the network.

6. Verify the hardware and software installations.

Checking Package Contents

Check the contents of your shipment as follows:

1. Remove the contents from the box and place them nearby until you are ready to install the adapter.

   _____ **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. Check the shipment for damage and missing parts (see Figure 2–1).

The kit contains the following items:

- This user's manual ❶.

- The adapter ❸ (packaged inside an antistatic bag ❷).

- A 3½-inch, 1.44-MB DOS-format distribution diskette ❹.

  Additional diskettes may be included for product enhancement (such as a firmware upgrade diskette).

Notify your carrier immediately if there is any shipping damage. If the kit is incomplete, contact your reseller or Authorized Digital Distributor.

Figure 2–1   Contents of Shipping Package
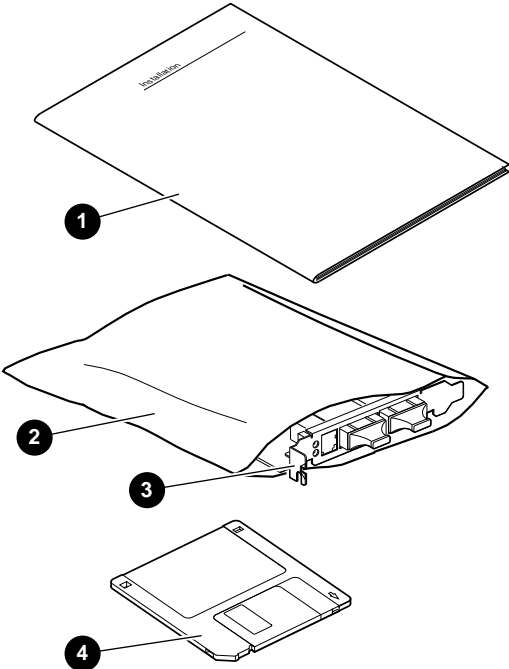
LJ-3918.AI4

Preparing to Install the Adapter

You need the following network equipment and tools before you install and use the adapter:

- Your computer system documentation.

- FDDI cables (Category 5 UTP or multimode fiber-optic cables) to connect the computer to the network. See the *OPEN DECconnect Building Wiring Components and Applications Catalog* if you need additional information about cabling.

- An antistatic grounded wrist strap. A wrist strap, ground wire, and table pad (not supplied) are available in Digital's field service kit (part number 29-11762-00).

- A Phillips-head screwdriver and a flat-head screwdriver.

Verifying System and Software Requirements

The DOS and SCO OpenServer requirements are listed separately in the following sections. Configure the adapter after you verify the requirements for your operating environment (refer to the Configuring the Adapter section in this chapter).

DOS Requirements

The following are system and software requirements for DOS computers:

- Computer operating system and network operating system compatibility. Refer to your system documentation for instructions on displaying your software version number.

- Adequate disk and DRAM memory space. Refer to your system documentation for instructions on verifying your system memory requirements.

- FDDI frame type identification. Contact your network manager to identify the FDDI frame type selected for this network.

SCO OpenServer Requirements

The following are system and software requirements for SCO OpenServer computers:

- An account with superuser privileges.

- Computer operating system and network operating system compatibility. Refer to the `\SCO\README.TXT` file on the distribution diskette to determine driver and operating system compatibility.

Configuring the Adapter

The DEC FDDIcontroller/PCI adapter will be configured automatically in most PCI systems. Use your system's BIOS Setup utility only if you wish to modify the configuration after you install the adapter, or if you need to change the computer settings.

Note

Refer to your computer documentation for instructions on how to use your system's BIOS Setup utility. Refer to the `A:\CONFIG\README.TXT` file for additional PCI configuration information for your adapter.

Installing the Adapter

This section explains how to install a SAS or DAS adapter into a PCI-based computer.

To install the adapter, complete the following steps:

1. Unplug the computer, then disconnect all cables that are connected to the main system unit.

   Remove any diskettes from the computer diskette drives.

2. Remove the cover from the computer (refer to your computer documentation).

3. Attach the antistatic ground strap to your wrist and clip the other end of the strap to the computer's chassis ground.

4. Unfasten and remove the option slot cover (Figure 2–2) from the computer's selected PCI slot.

Figure 2–2 Removing the Option Slot Cover

LJ-3919.AI4
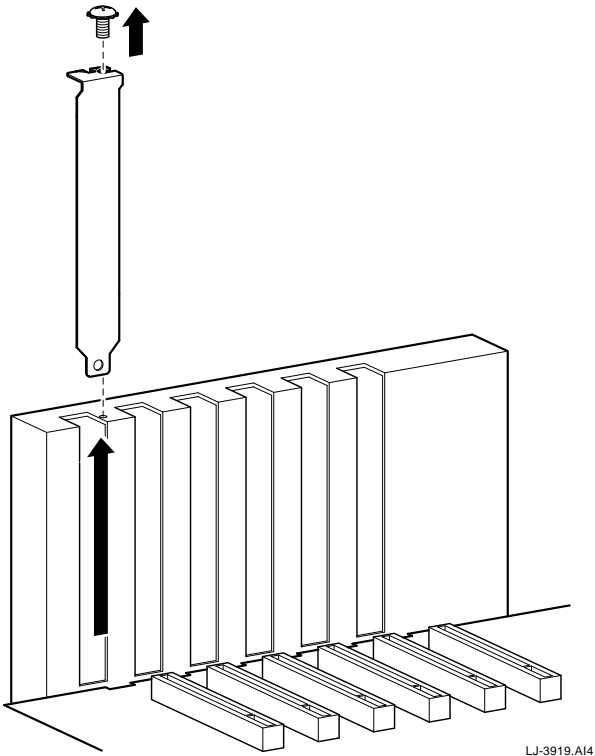
5. Remove the adapter from the protective bag. Remove the optical dust cap(s) from any fiber-optic model SC connectors (see Figure 2–3).

6. Insert the adapter into the appropriate PCI bus master I/O slot, then secure it with the slot cover screw (Figure 2–3).

7. Replace the computer's cover, reconnect the cables, then power up your system.

Figure 2–3 Installing the DEFPA Adapter (DEFPA-AB Model)

LJ-03920-TI0
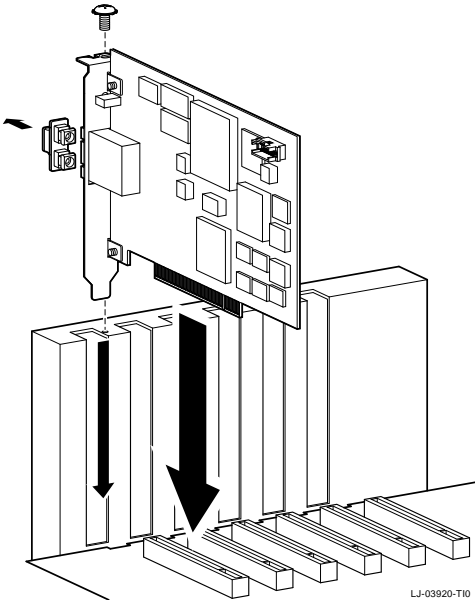
Verifying the Installation

Complete the following steps to verify that the adapter is installed and operating properly in your computer:

1. Turn on power to the computer and observe the adapter LEDs.

2. Note the following events (within 10 seconds after the computer power is turned on):

   a. The adapter LED on the mounting bracket flashes green (three flashes) for approximately 1 second.

   b. The LED turns off when the adapter passes the powerup self-test.

      A steady amber LED indicates a powerup self-test failure.

   _____ **Note** _____

   For the DEFPA-DB and DEFPA-MB models, the A and B LEDs (located on the top-right and top-left of the mounting bracket) indicate the status of the adapter's A and B ports respectively. A steady amber LED indicates a possible failure with that specific port.

   _____

If you observe any indication other than a successful self-test, turn off power to the computer, reseat the adapter, then repeat step 1.

If the self-test fails repeatedly, refer to Table 3–1 for problem-solving information.

You are now ready to install your device driver.

Installing Device Drivers

This section explains how to install the following device drivers from the distribution diskette:

- DOS and OS/2 NDIS 2.01 drivers

- Windows NT and Windows 95 drivers

- Novell NetWare drivers and software

Note

Refer to the Loading and Viewing the Distribution Diskette section for additional information.

After you install the driver, proceed to the Connecting to the Network section for information on connecting your system to the network.

Installing DOS or OS/2 NDIS 2.01 Drivers

The distribution diskette contains the driver and software for using your adapter in a DOS or OS/2 system.

To install the DOS or OS/2 NDIS 2.01 driver:

1. Follow the procedures described in your operating system documentation for installing an unlisted network adapter driver.

2. Refer to the `\NDIS2\README.TXT` file for more specific installation information. Use this information in addition to your operating system documentation to install the device driver for your adapter.

Installing the Windows 95 Driver

The distribution diskette contains the driver for using your adapter in a Windows 95 environment.

To install the Windows 95 driver:

1. Follow the procedures described in your operating system documentation for installing an unlisted network adapter driver.

2. Refer to the `\WIN95\README.TXT` file for more specific installation information. Use this information in addition to your operating system documentation to install the device driver for your adapter.

Installing the Windows NT Driver

A device driver for the DEC FDDIcontroller/PCI adapter is located on the Windows NT Version 3.51 CD-ROM. A more recent device driver may be included on the driver distribution diskette. The device driver will allow your adapter to operate under Windows NT on a variety of hardware platforms.

To install the Windows NT driver:

1. Follow the procedure that describes the installation of network adapters in your *Windows NT System Guide*.

2. Refer to the Windows NT `\WINNT\README.TXT` file for more specific installation information. Use this information in addition to the instructions provided in your *Windows NT System Guide* to install the device driver for your adapter.

Installing Novell NetWare Drivers

The distribution diskette contains the drivers and software for using your adapter in NetWare systems.

The software includes ODI drivers for server and DOS and OS/2 client environments, mirrored-server link (MSL) drivers for operation under NetWare SFT III, and SNMP network management software for remote management of your adapter.

The MSL driver can be configured using custom parameters (see the Using Custom Parameters for NetWare SFT III section in this chapter).

Installing Netware Drivers

To install a NetWare driver:

1. Follow the standard NetWare procedures described in your operating system documentation for installing LAN adapters.

2. From the DOS prompt, locate and view the `\NOVELL\README.TXT` file on the distribution diskette to locate the various NetWare `README.TXT` files.

3. Refer to the appropriate NetWare `README.TXT` file for more specific installation information.

Using Custom Parameters for NetWare SFT III

The Novell NetWare SFT III mirrored-server link (MSL) drivers contain additional custom driver parameters that are not available to standard MSL drivers.

The following parameters are implemented in the adapter MSL drivers. Refer to the corresponding driver README.TXT file for the latest list of optional parameters.

Note

In all of the following examples, the NetWare SFT III 3.1x MSL driver is loaded from the current default path on diskette drive C and the adapter is installed in slot 5 of the system. Replace the driver name, path, and slot number as appropriate.

- **Network Coexistence Mode**

  In a normal mode of operation, the MSL is a point-to-point connection between two MSL adapters. The adapter also allows the link to coexist on an FDDI network as long as there are no routers in the path between the two linked servers.

  Note

  In this mode of operation, you must specify the IOENGINE name for the linked server. Failure to do so will result in improper operation.

To complete the link, connect both MSL adapters to the network. Load the MSL driver on both IOENGINEs as follows:

```
LOAD C:DECMSL3X.MSL SLOT=5 PARTNER=IO_RIGHT
```

IO_RIGHT is the name of the other server's IOENGINE.

Repeat this procedure on the other server, specifying this server's IOENGINE name. The IOENGINEs find each other, then report that the link is available. The IOENGINEs synchronize once the server is activated.

- **Increasing Message Retry Count**

  Running the driver on a busy network increases the possibility for a packet to become lost between the two MSL adapters. As your network traffic increases, it may become necessary to increase the retry count.

  To adjust the retry count, add the *RETRY* option to the command line when loading the MSL driver:

```
LOAD C:DECMSL3X.MSL SLOT=5 PARTNER=IO_RIGHT RETRY=2
```

- **Full-Duplex Operation**

  The driver can be configured to run in Digital's FDDI full-duplex technology (FFDT) mode of operation known as full duplex (FDX). When in this mode, the MSL adapters must be connected in a point-to-point two-station configuration or by way of a Digital GIGAswitch/FDDI.

  In this mode, the normal FDDI token rotation is eliminated, allowing the adapter to send and receive at the same time. This increases the available aggregate bandwidth of the adapter to be greater than 100 Mb/s, up to a maximum of 160 Mb/s.

  To activate this mode of operation, add the *FULLDUPLEX=ON* option to the command line when loading the MSL driver:

```
LOAD C:DECMSL3X.MSL SLOT=5 FULLDUPLEX=ON
```

Loading and Viewing the Distribution Diskette

To load and view the distribution diskette:

1. Insert the distribution diskette into diskette drive A.

2. From the DOS prompt, locate and view the appropriate
    README.TXT file as follows:

    a. Enter the following command at the DOS prompt:

        ```
        more < readme.txt  Return
        ```

        The file is displayed, one screen at a time.

    b. To view the next screen, press the space bar.

    c. To quit viewing the file, press Ctrl/C .

Installing the SCO OpenServer Driver

The distribution diskette contains the driver and software for using
your adapter in a SCO OpenServer system.

To install the SCO OpenServer driver, follow the instructions in the
\SCO\README.TXT file on diskette 1 to create a SCO OpenServer driver
distribution diskette, or to install the driver directly from diskette 1.

Network Management Information

The network management diskette contains the NICWORKS local management application. NICWORKS is a graphical tool that allows the user to view adapter performance statistics in real time.

The \README.TXT file, located in the network management diskette's root directory, contains a list of additional supported network management software and the directory structure for the supported operating environments.

The network management diskette contains additional README.TXT files within the directory structures for each supported operating environment. The information in these files pertain to the specific network management software or operating environment corresponding to the subdirectory where they are found.

Mac OS Information

The Mac OS distribution diskette is a 1.44 MB Macintosh-formatted diskette containing the software that supports the Apple Mac OS operating system. The \README.TXT file, located in the diskette's root directory, contains a list of the supported device drivers, installation instructions, and a list of the included utilities.

Connecting to the Network

This section describes how to connect the FDDI cables (fiber-optic multimode and Category 5 UTP) to the PCI adapter and how to verify a good connection to a network device.

If the other end of the FDDI cable is not already connected to the appropriate FDDI network or network device (typically a concentrator), contact the network manager to connect the cable.

—————————————— **Note** ——————————————

Be sure you install the appropriate software driver as described in the Installing Device Drivers section before you install FDDI cables.

Connecting Fiber-Optic SAS Adapters

To connect the fiber-optic SAS adapter:

1. Connect both connectors (❶, ❷) at one end of the cable to the port ❸ on your adapter (see Figure 2–4). Note the color of the band ❹ (black or white) on the connector that attaches to the top (transmit) side of the port.

2. Connect both connectors at the other end of the cable to the other FDDI device. Make sure that the connector noted in step 1 is attached to the bottom (receive) side of the port on the other FDDI device.

3. Observe the adapter LED ❺.

   The LED should be a steady green, indicating a proper connection to the FDDI network device. If you observe any other indication, refer to Table 3–2 to isolate and correct the problem.

4. Go to the Verifying the Adapter Operation on the Network section to verify proper network operation.

Figure 2–4 Connecting the FDDI Cable to a Fiber-Optic SAS Adapter
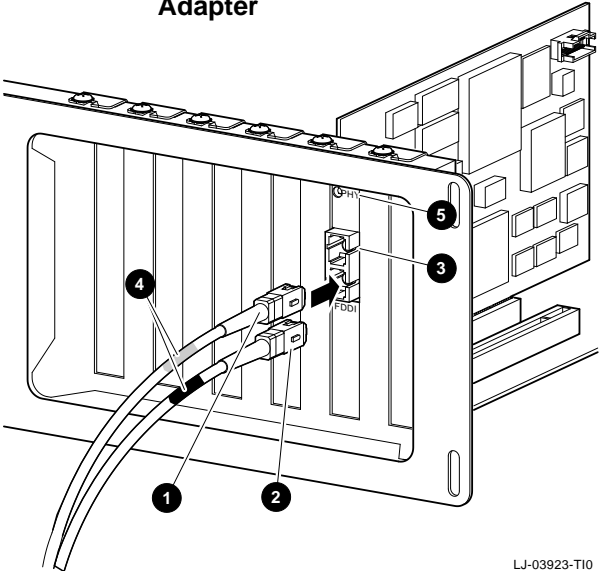
LJ-03923-TI0

Connecting Fiber-Optic DAS Adapters

To connect the fiber-optic DAS adapter to another adapter (or network device) in a dual ring configuration, use two MMF cables as follows (see Figure 2–5 and Figure 2–6):

1. Connect both connectors (❶, ❷) at one end of cable 1 to the B port ❸ of your adapter. Note the color coding of the band ❹ on the connector that attaches to the top (transmit) side of the B port.

2. Connect both connectors at the other end of cable 1 to the A port ❺ of the other FDDI device. Make sure that the connector noted in step 1 is attached to the bottom (receive) side of the A port.

3. Connect both connectors at one end of cable 2 (❻, ❼) to the A port ❽ of your adapter. Note the color coding of the band on the connector that attaches to the top (transmit) side of the A port.

4. Connect both connectors at the other end of cable 2 to the B port ❾ of the other FDDI device. Make sure that the connector noted in step 3 is attached to the bottom (receive) side of the B port.

---------------------------- **Note** ----------------------------

In FDDI dual rings with only two FDDI stations on the dual ring, the other FDDI device mentioned in steps 2 and 4 is the same device (see Figure 2–5 and Figure 2–6).

---

5. Observe the adapter LEDs ❿.

   The LEDs should be a steady green, indicating a proper connection to the FDDI network device. If you observe any other indication, refer to Table 3–2 to isolate and correct the problem.

6. Go to the Verifying the Adapter Operation on the Network section to verify proper network operation.

Figure 2–5 Connecting the FDDI Cable to a Fiber-Optic DAS Adapter
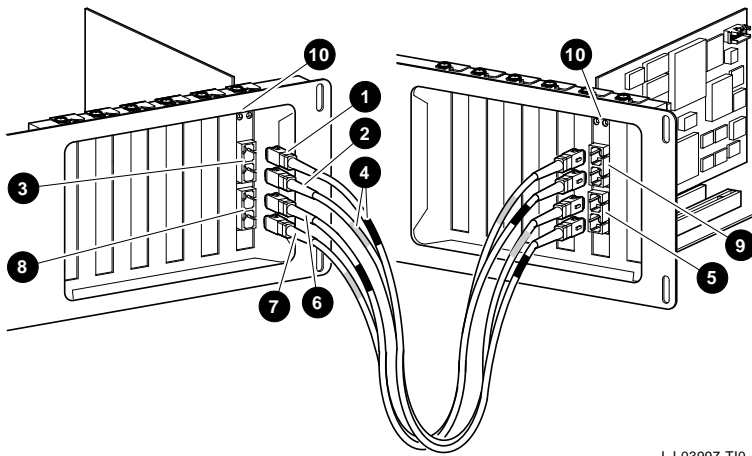
LJ-03997-TI0

Figure 2–6 Simplified Version of the Connection Diagram

LJ-04396-TI0

Connecting UTP SAS Adapters

To connect the UTP SAS adapter:

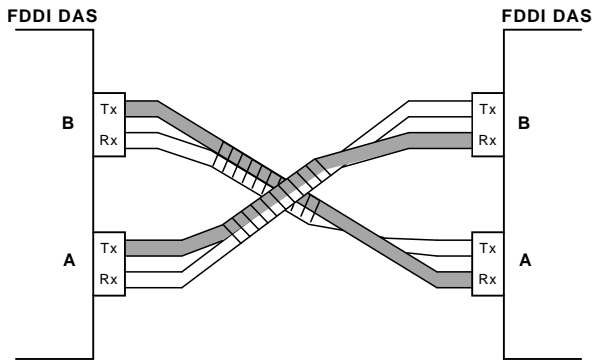1. Connect the FDDI cable ❶ to the 8-pin MJ connector ❷ on your adapter (see Figure 2–7).

2. Observe the adapter LED ❸.

    The LED should be a steady green, indicating a proper connection to the FDDI network device. If you observe any other indication, refer to Table 3–2 to isolate and correct the problem.

3. Go to the Verifying the Adapter Operation on the Network section to verify proper network operation.

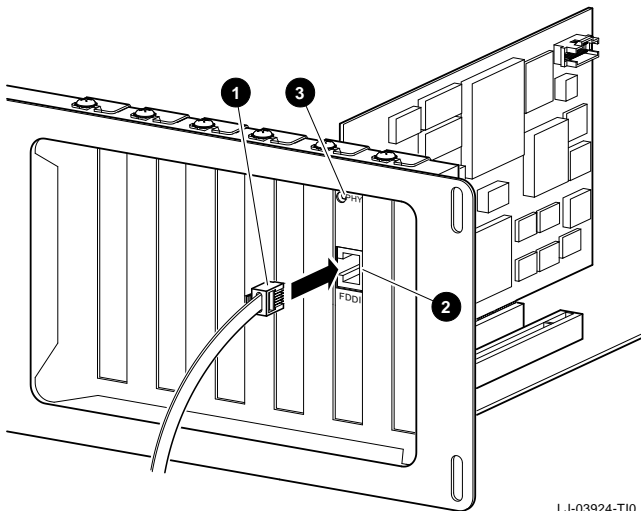**Figure 2–7 Connecting the FDDI Cable to the UTP SAS Adapter**

LJ-03924-TI0

Connecting UTP DAS Adapters

To connect the UTP DAS adapter:

1. Connect the FDDI cables ❶, ❹ to the 8-pin MJ connectors (port A ❷, port B ❺) on your adapter (see Figure 2–8).

2. Observe the adapter LEDs ❸, ❻.

   The LED should be a steady green, indicating a proper connection to the FDDI network device. If you observe any other indication, refer to Table 3–2 to isolate and correct the problem.

3. Go to the Verifying the Adapter Operation on the Network section to verify proper network operation.

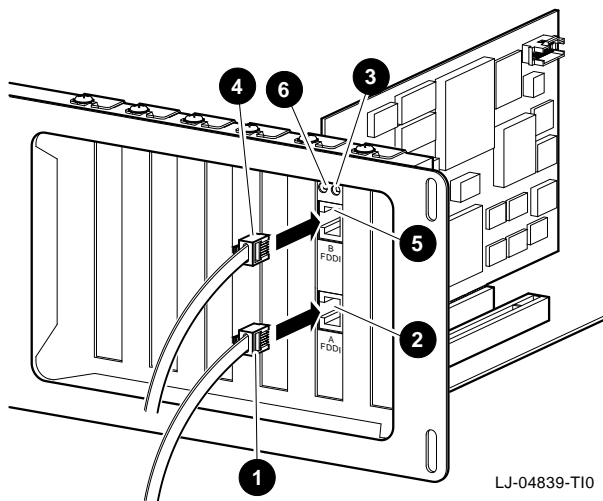**Figure 2–8   Connecting the FDDI Cable to the UTP DAS Adapter**

LJ-04839-TI0

Verifying the Adapter Operation on the Network

To verify that your adapter is operational in the network, use your network operating system software, such as the executable file VLM.EXE for Novell NetWare clients, to make a connection to another node on the network.

If you cannot establish and maintain communications with another node, refer to Table 3–3 to isolate and correct the problem. If the problem persists, contact your reseller or Authorized Digital Distributor.

Installation of the adapter is now complete.

3
Problem Solving

This chapter contains tables describing possible problems with the
adapter hardware/software installation, connection to the network
access device, and network interconnection (communication with
a target node). The tables suggest causes and solutions for each
symptom.

The diagnostic tables are grouped in the following categories:

* Adapter, Driver Configuration, and Installation Faults

  Refer to Table 3–1 if you experience problems during installation
  and no FDDI connection has been made.

* Network Connection Faults

  Refer to Table 3–2 if you experience problems when the adapter is
  first connected to a network access device.

* Network Interconnect Faults

  Refer to Table 3–3 if you cannot communicate with a target node.

Refer to the Diagnosing Problems with a Previously Operational
Adapter section if you suspect this node/link is causing a
communication failure in a network that was previously functional.

This chapter also contains brief descriptions of the adapter self-test,
the INSTVER diagnostics, and the Digital local management
application (DEClma). The INSTVER and DEClma utilities are useful
tools for diagnosing adapter installation and network configuration
problems.

Diagnosing Problems with a Previously Operational Adapter

This section provides information to aid in isolating faults to the optimum field replaceable unit (FRU) or to an associated device that can be the source of the problem.

When diagnosing problems during the initial installation of the adapter, use Table 3–1, Table 3–2, and Table 3–3. These tables list symptoms, probable causes, and corrective actions to remedy problems related to installation faults.

Normal Powerup

During system powerup, or during a node reset, the adapter automatically initiates its self-test and verifies the CPU logic in the unit. The LED(s) on the adapter indicate whether the adapter passed or failed the self-test.

Problem-Solving Tips

Consider the following tips before you begin the problem-solving procedures:

*   To prevent damage to the circuit cards, use the antistatic ground wrist strap when handling the cards.

*   Power fluctuations, high ambient temperatures, and interference from other equipment could be responsible for environmental problems.

Problem-Solving Tools

The following tools are not supplied but can be ordered from Digital Equipment Corporation:

*   A nonattenuated FDDI loopback connector for testing the FDDI port, option number H4085-AA (part number 12-44555-01).

*   A UTP loopback connector for DEFPA-UB and DEFPA-MB models, option number H4082-AC (part number 12-35619-03).

Isolating Adapter, Driver Configuration, and Installation Faults

Table 3–1 lists problems that you may encounter when performing the adapter configuration, installing the adapter, and installing the driver software.

---------------------------------- **Note** ----------------------------------

The fault analysis in Table 3–1 assumes that the computer was operating properly before you began the adapter installation process and that no FDDI cable is connected to the adapter.

Table 3–1 Isolating Adapter, Driver Configuration, and Installation Faults

Symptom	Probable Cause	Corrective Action
System is on, but there is no display.	The adapter is not seated firmly.	Turn off the system and reseat the adapter firmly.
	The IRQ level of the adapter conflicts with another option or video card installed in a PCI bus slot.	Reconfigure the adapter using different IRQ level settings. If the problem persists, contact your system administrator or your Authorized Digital Distributor.
System is on, but there is no response from the keyboard.	The adapter settings conflict with another adapter in the system.	Reconfigure the adapter using different IRQ level settings.
System is on. LED is amber.	With no FDDI cable connected, the adapter is suspect.	Reboot the system and watch the self-test. If the problem persists, contact your reseller or Authorized Digital Distributor.

Isolating Network Connection Faults

Table 3–2 lists problems that you may encounter when you connect the adapter to a network device, such as a concentrator, through an FDDI cable.

Note ───────────

The fault analysis in Table 3–2 assumes that the computer was operating properly before you began the adapter installation process and that the adapter self-test passes with the FDDI cable attached.

Table 3–2 Isolating Network Connection Faults

Symptom	Probable Cause	Corrective Action
Adapter LED sequentially cycles to solid amber (for 50 seconds), then to solid green for a period of time, and then to solid amber again (repeatedly).	Faulty cable between the adapter and concentrator (Link Error Rate threshold exceeded).	Replace the cable. If the fault persists, a problem with either the concentrator port or the adapter is likely.
System is on. LED is flashing amber.	Invalid topology.	Use a valid topology configuration. Use the DEClma Show SMT command to view the current connection capabilities. Refer to the DEClma documentation for details.

Table 3–2 (Cont.)   Isolating Network Connection Faults

Symptom	Probable Cause	Corrective Action
System is on. LED is steady amber.	Network problem.	Disconnect the adapter cable. If the LED flashes green, the adapter is functional.
		Reconnect the cable, try a new cable, or connect to a different concentrator port.
	Adapter problem.	Disconnect the adapter cable. If the LED remains amber, the adapter might be at fault. Reboot the system and watch the self-test.
		If the problem persists, contact your reseller or Authorized Digital Distributor.
Adapter LED continues to flash green and does not change to solid green when the cable is connected.	Driver not installed correctly.	If the software driver is installed correctly and the adapter is configured properly, then refer to the README.TXT file in subdirectory A:\DIAG of your distribution diskette for information on running the INSTVER network diagnostics (also refer to the Running INSTVER Diagnostics section in this chapter).

Table 3–2 (Cont.)   Isolating Network Connection Faults

Symptom	Probable Cause	Corrective Action
	Faulty adapter cable or connection.	Verify the integrity of the adapter cable. Replace if defective. Verify that the FDDI connection is between transmit to receive and receive to transmit.
	Faulty FDDI concentrator.	Verify the integrity of the concentrator. Replace if defective.
	Faulty adapter.	Connect a loopback connector (use PN 12-44555-01 for the SC connector or PN 12-35619-03 for the UTP connector).
		If the port LED for the connector changes to solid green, a problem exists with the cable or the concentrator.
		If the port LED continues flashing green, replace the adapter.
		If no loopback connector is available, test the cable between the concentrator and the adapter.
		If you verify that the cable is good, test the concentrator. If the concentrator is functional, replace the adapter.

Table 3–2 (Cont.)   Isolating Network Connection Faults

Symptom	Probable Cause	Corrective Action
Adapter LED remains off.	Adapter is management disabled.	Enable the port using the DEClma utility (refer to the Using the Digital Local Management Application (DEClma) section).
	Adapter driver is not installed properly.	Reinstall the appropriate driver. If the fault persists, replace the adapter.
	Network operating system software is not enabled.	Refer to your network operating system documentation.

Isolating Network Interconnect Faults

Table 3–3 lists problems that you may encounter when you establish communication with a target node. Fault isolation at this level is beyond the scope of installing the adapter.

Note

The fault analysis in Table 3–3 assumes that the computer was operating properly before you began the installation process, and that the adapter self-test passes with the FDDI cable attached.

Table 3–3   Isolating Network Interconnect Faults

Symptom	Probable Cause	Corrective Action
Cannot establish a connection to another node.	Target node is not in network operating system database.	Add the node to the database.
	Duplicate address on network.	Use the DEClma utility to determine if a duplicate address exists on the FDDI network.
	A physical path does not exist between the host and target node.	Verify that the target node is running and is on the network.

This information is supplied as a transition to network node configuration considerations because the functional operation of an FDDI-connected node involves the performance and integrity of the network. Some considerations include the network address (duplicate address) and adapter token rotation time.

The host in which the adapter is installed might not be configured properly in the network. An inappropriate network configuration can result in symptoms that make it appear that the adapter is malfunctioning when the problem is elsewhere.

Running Self-Test

The adapter powerup self-test checks much of the onboard CPU-associated hardware up to (but not including) the network interface power optics and connector circuits.

The INSTVER diagnostics (described in the next section) test other adapter logic not covered by the self-test.

Running INSTVER Diagnostics

INSTVER is a DOS-based utility containing the adapter's system diagnostic tests. These tests verify the installation beyond the powerup self-test capabilities to include the adapter buffer RAM, optical transceiver connector integrity, and FDDI cable to/from a network device port such as a concentrator.

Run INSTVER diagnostics when you suspect a hardware or network connection problem not indicated by the self-test. You can use the diagnostics as a fault isolation tool when problem solving as described in the previous tables.

_____ **Note** _____

The current version of the INSTVER.EXE file requires that the ANSI.SYS file be loaded in the CONFIG.SYS file prior to running INSTVER diagnostics.

_____

INSTVER checks and reports the status of the following adapter logic functions:

- The bus adapter chip test verifies proper operation of this chip. This test verifies adapter addressing.

- The buffer RAM test verifies the data storage capability of the adapter RAM.

- The internal loopback test verifies the adapter's ability to send/receive an FDDI frame to/from (but not including) the adapter's optical transceiver.

- The external loopback test verifies the adapter's ability to send/receive an FDDI frame to/from the network.

- The **display adapter address** command displays the physical address of the adapter.

- The **display revisions** command displays the hardware and firmware revisions.

- This utility is located on the distribution diskette in the subdirectory `A:\DIAG\INSTVER.EXE`. Refer to the `README.TXT` file in this same subdirectory for the diagnostic requirements and instructions for running INSTVER.

Using the Digital Local Management Application (DEClma)

DEClma is a standalone utility for network personnel responsible for configuring, assessing the status of, and diagnosing problems with adapter interfaces.

Note _____

See the `README.TXT` file in your operating system subdirectory
to determine if DEClma can be used on your system.

Using simple command lines, you can access the FDDI (SMT, MAC,
PATH, and PORT) and INTERFACE group objects, as described in the
IETF SNMP FDDI MIB (RFC 1512), MIB-II (RFC 1213), and DEC
Vendor Management Information Base (MIB) extensions.

You can manage objects contained in these MIBs as follows:

- Display objects in the following groups:

    - INTERFACE (MIB-II and DEC MIB extensions)

    - SMT (SNMP FDDI MIB and DEC MIB extensions)

    - MAC (SNMP FDDI MIB and DEC MIB extensions)

    - PATH (SNMP FDDI MIB and DEC MIB extensions)

    - PORT (SNMP FDDI MIB and DEC MIB extensions)

- Display counter objects from all of the groups just listed.

- Set configurable parameters where valid for an FDDI object.

- Display network events.

- Display and/or dump the contents of the error logger to a file.

The `DECLMA.DOC` file that contains the *Digital Local Management
Application User's Guide* is located in `A:\DECLMA`. The DEClma
application executable files are located (along with the device driver)
in the supported platform-specific subdirectories of the distribution
diskette. Each platform subdirectory also contains instructions in its
`README.TXT` file for installing the DEClma utility.

A
General Information

This appendix provides general DEC FDDIcontroller/PCI physical characteristics, and operating environment and power requirements.

Physical Description

The adapter is a short IBM AT form-factor card that uses the full PCI-specified, 32-bit bus connector. The adapter measures 6.95 inches (174 mm) x 4.20 inches (105 mm), and is constructed using six-layer circuit board technology with four signal layers and two power/ground layers.

Functional Components

The major components on the adapter are as follows:

- 1 MB of packet memory
- 68000 onboard processor
- DMA control
- 32-bit, 33 MHz PCI bus interface
- FDDI interface chipset
- IEEE address ROM

- Onboard, nonvolatile memory for firmware storage

- Multimode Physical Layer Medium Dependent (for DEFPA-AB and DEFPA-DB models)

- ANSI TP-PMD (for DEFPA-UB and DEFPA-MB models)

Specifications

Table A–1 lists the operating environment and power requirements for the adapter.

Table A–1   Operating Environment and Power Requirements

Specification	Rating
Operating temperature (at sea level)	10°C to 40°C (50°F to 104°F)
Nonoperating temperature	-40°C to 85°C (-40°F to 185°F)
Relative humidity	8% to 80% (noncondensing)
Radiated emissions	FCC Class B VDE Class B CE Class B
Power requirements	DC amps @ +5.0 V, 1.6 A (maximum) - DAS MMF 1.2 A - SAS MMF, 1.1 A - SAS, DAS UTP DC amps @ +12.0 V, 0.1 A (maximum) Bus loading - per PCI standard, Revision 2.0

_____ **CAUTION** _____

When adding any option module to your computer, verify that the combined power (wattage) required for all modules in your computer does not exceed the power supply rating. Check your computer documentation for this information.

_____

Optical Bypass Relay (OBR) RJ-12 Connector

The OBR connector (see Figure A–1) allows an OBR device to maintain FDDI dual ring integrity if the adapter fails or its power is turned off. An OBR device can be used only with the DAS MMF version of the adapter (DEFPA-DB). Refer to this information when selecting optical bypass devices.

Warning

To prevent personal injury or equipment damage, do not insert telecommunications cabling into the optical bypass relay connector.

Figure A–1   RJ-12 (OBR) Pin Assignments

Pin   6 ◀——1

Pin   Assignment

1,2   Relay drive: +5.0 V dc
3,4   Bypass_enable
5   Bypass_present
6   Return: grounded internally

Modular Jack (Shielded RJ-12)

LJ-03925-TI0
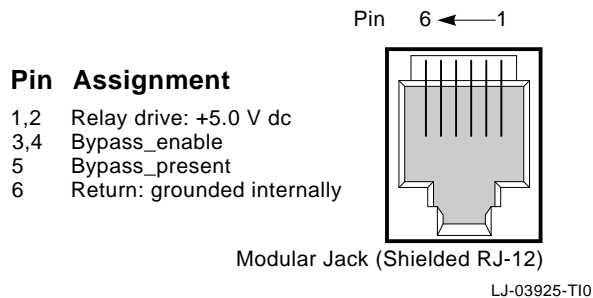
UTP SAS and DAS Adapter Pin Assignments

The DEC FDDIcontroller/PCI DEFPA-UB and DEFPA-MB adapters require 100-ohm Category 5 twisted-pair media with a single crossover in the cable. For the office environment, 3-meter crossover office cables are available from Digital in the following constructions:

* Screened twisted-pair cable (part number BN26S-03)

* Unshielded twisted-pair cable (part number BN25H-03)

Refer to Figure A–2 for the screened twisted-pair cable pin assignments.

Figure A–2 Crossover Pin Assignments for BN25H Office Cable

LJ-04066-TI0
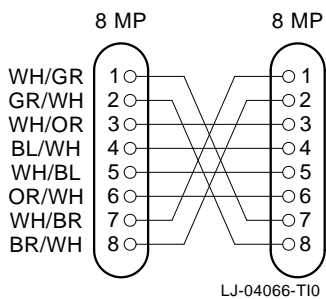
When connecting a UTP SAS or DAS adapter to another TP-PMD device, use EIA/TIA-568 Category 5 cable. The link may be made up of patch cordage and behind-the-wall cable with the following restrictions:

- Maximum patch cordage length—10 meters

- Maximum behind-the-wall cable length—90 meters

Note

For UTP cable information, see the *OPEN DECconnect Applications Guide* (part number EC-G2570-42).

Other Digital Network Adapter Products

The DEC FDDIcontroller/PCI adapter is part of a complete family of low-cost network adapters, repeaters, and remote boot ROMs developed by Digital Equipment Corporation. Other products include the following:

DE45X-AR Remote Boot ROM

This option ROM is installed on an EtherWORKS Turbo PCI 10 adapter (either DE450-CA or DE450-TA) in a DOS-based system. The installed ROM can be configured and tested using the EZWORKS Installation utility. The DE45X-AR remote boot ROM enables your computer to perform a remote boot using the MOP or RPL protocols.

Digital offers the following remote boot ROMs to be used with the EZWORKS Turbo PCI 10 adapter:

- DE45D-AR, 28-pin remote boot ROM

- DE45F-AR, 32-pin upgradable FLASH remote boot ROM

DE20M-AR Remote Boot ROM

This option ROM is installed on an EtherWORKS 3 Turbo adapter (either DE204 or DE205) in a DOS-based system. The installed ROM can be configured and tested using the EZWORKS Installation utility. This remote boot ROM enables your computer to perform a remote boot using the MOP or RPL protocols.

EtherWORKS Hub 8TX (DELXR) Repeater

This 8-port Class II 100BASE-TX repeater complies with the IEEE 802.3u standard. The Hub 8TX is used for 100 Mb/s Ethernet networks. It can link two to eight PCs or workstations using Category 5 unshielded or screened twisted-pair (UTP or ScTP) cables to form a simple, fast Ethernet LAN. The Hub 8TX also contains a daisy-chain port to connect to another compatible repeater using twisted-pair cable. The EtherWORKS Hub 8TX is ready to run with all network operating systems and protocols. A Lifetime Warranty is included.

DEC FDDIcontroller/EISA (DEFEA-AA, DEFEA-DA, DEFEA-UA, DEFEA-MA) Adapter

This custom high-performance, low-cost 32-bit adapter features on-board CPU for SMT processing, DMA chip, and 1 MB buffer. Full-duplex capability extends bandwidth to 160 Mb/s. The device drivers for the DEC FDDIcontroller/EISA include NetWare, Windows for Workgroups, Windows NT, Windows 95, PATHWORKS, LAN Manager, LAN Server, Banyan VINES client, SCO OpenServer, UnixWare, Digital UNIX, and OpenVMS. This adapter can be used with Alpha, Intel, MIPS, and PowerPC systems. Four models are offered: UTP SAS and DAS, and MMF SAS and DAS. A Lifetime Warranty is included.

Fast EtherWORKS PCI 10/100 (DE500-AA, DE500-XA) Adapter

This 32-bit adapter is a dual-speed adapter that uses a single
connector for either a 10 Mb/s or a 100 Mb/s IEEE 802.3 Ethernet
network connection. The adapter is software configurable to operate
in full-duplex mode, increasing aggregate bandwidth up to 20 Mb/s
and 200 Mb/s. Easy installation of this adapter is ensured by using
the EZWORKS Installation utility. The adapter supports IEEE 802.3u
autonegotiation (DE500-AA) and IEEE 802.3 autosensing (DE500-XA)
functions. In addition, the DE500-AA model provides optional boot
ROM support (FLASH or OTP) up to 128 KB. The device drivers
for the Fast EtherWORKS PCI 10/100 adapter include NetWare,
Windows for Workgroups, Windows NT, Windows 95, PATHWORKS,
LAN Manager, LAN Server, Banyan VINES client, SCO OpenServer,
UnixWare, Digital UNIX, and OpenVMS. The adapter supports
twisted-pair connections. A Lifetime Warranty is included.

EtherWORKS Turbo PCI 10 (DE450-TA, DE450-CA) Adapter

This 32-bit, low-cost 10 Mb/s PCI Ethernet adapter features DMA
bus master design with a fast cut-through FIFO buffer (2 x 256B
FIFOs). Easy installation of this adapter is ensured by using the
EZWORKS Installation utility. The adapter provides optional remote
boot ROM interface for RPL, MOP, and other future protocols. The
device drivers for the EtherWORKS Turbo PCI 10 adapter include
NetWare, Windows for Workgroups, Windows NT, PATHWORKS,
LAN Manager, LAN Server, Banyan VINES client, SCO OpenServer,
UnixWare, Digital UNIX, and OpenVMS. The DE450-TA adapter
supports twisted-pair connections; the DE450-CA adapter supports
twisted-pair, ThinWire, and AUI connections. A Lifetime Warranty is
included.

EtherWORKS Turbo EISA (DE425-AA) Adapter

This adapter is a 32-bit Ethernet adapter that maximizes throughput without compromising CPU time or network performance. Ideal for intensive server-based applications, this adapter features a fast cut-through FIFO buffer (2 x 256B FIFOs). This adapter supports full duplex, for operation of 20 Mb/s. The device drivers for the EtherWORKS Turbo EISA adapter include NetWare, Windows for Workgroups, PATHWORKS, LAN Manager, LAN Server, Banyan VINES client, Packet Driver, SCO OpenServer, UnixWare, Digital UNIX, and OpenVMS. The adapter supports ThinWire, twisted-pair, and AUI connections. A Lifetime Warranty is included.

EtherWORKS PCMCIA Turbo (DEPCM-AA, DEPCM-BA) Adapter

This credit card sized adapter is designed to link laptop and notebook systems to 10 Mb/s Ethernet networks quickly and affordably. This adapter for PCMCIA-compliant (Type II) PCs features a highly integrated single-chip design, easy installation, hot-swapping capabilities, and card and socket services. The device drivers for the EtherWORKS PCMCIA adapter include NetWare, Windows for Workgroups, LAN Manager, LAN Server, PATHWORKS, Banyan VINES client, and Packet Driver. Two models are offered: the DEPCM-AA adapter supports twisted-pair; the DEPCM-BA adapter supports both twisted-pair and ThinWire. A five-year warranty is included.

Ordering Information

To order the Digital adapter, repeater, and remote boot ROM products, contact an Authorized Digital Distributor or Digital sales representative. For more information, call 800-457-8211 in the U.S. and Canada, 508-692-2562 in other locations, or your local sales office.

B

Accessing MIBs and RFCs

This appendix describes how to access Digital's private Management Information Base (MIB) and Request For Comments (RFCs).

Public MIBs can be accessed over the Internet network using any of the following methods:

- Electronic mail

- ftpmail

- Anonymous ftp

- Diskette (for some Digital products)

You can use these methods to access up-to-date FDDI MIBs, as described in the following sections.

Using Electronic Mail

The DDN Network Information Center (NIC) of SRI International provides automated access to NIC documents and information through electronic mail. This is especially useful for people who do not have access to the NIC from a direct Internet link, such as BITNET, CSNET, or UUCP sites.

To use the mail service, follow these instructions:

1. Send a mail message to `service@nic.ddn.mil`.

2. In the SUBJECT field, request the type of service that you want, followed by any needed arguments.

Normally the message body is ignored, but if the SUBJECT field is empty, the first line of the message body is taken as the request. The example at the end of the Using ftpmail section lists some of the services available.

Requests are processed automatically once a day. Large files are broken down into separate messages. However, a few files are too large to be mailed.

Using ftpmail

Digital offers Internet ftpmail access to private MIB information, in ASCII text form, at `ftp.digital.com`, with up-to-date documents stored in the `/pub/DEC/mib` directory. Check the INDEX file and the README file for the current contents. To use ftpmail, follow these instructions:

1. Send a mail message to:

        ftpmail@ftp.digital.com

2. Ignore the subject line.

3. Include the word "connect" in the first line of the body.

4. Include `get` commands for each document required; for example:

        get /pub/DEC/mib/README

    Requests are acknowledged, then queued and processed every 30 minutes. Because of the number of requests, it may take a day or two before you receive a reply.

    _____ **Note** _____

    For more timely access, consider using anonymous ftp (refer to the Using Anonymous ftp section in this chapter).

    _____

The following are example SUBJECT lines to obtain DDN NIC documents:

HELP
RFC 822
RFC INDEX
RFC 1119.PS
FYI 1
IETF 1IETF-DESCRIPTION.TXT
INTERNET-DRAFTS 1ID-ABSTRACTS.TXT
NETINFO DOMAIN-TEMPLATE.TXT
SEND RFC: RFC-BY-AUTHOR.TXT
SEND IETF/1WG-SUMMARY.TXT
SEND INTERNET-DRAFTS/DRAFT-IETF-NETDATA-NETDATA-
00.TXT
HOST DIIS

Using Anonymous ftp

You can obtain RFCs and up-to-date FDDI MIBs from Digital using anonymous ftp.

Digital offers Internet anonymous ftp access to private MIB information, in ASCII text form, at `ftp.digital.com`, with up-to-date documents stored in the `/pub/DEC/mib` directory. Check the INDEX file and the README file for the current contents.

To use anonymous ftp to copy files, follow these instructions:

—————————————— **Note** ——————————————

User input is case sensitive; you must enter it as shown.

————————————————————————————————————

1. Use the Internet application ftp to connect to `ftp.digital.com`.

2. Log in as user `anonymous`.

3. Use your electronic mail address as the password.

4. Use the `cd` command to get to the `/pub/DEC/mib` directory.

5. Use the `ascii` command to specify that you are retrieving ASCII text files.

6. Use the `get` command to get the file, or files, that you require.

7. Use the `quit` command to log out when you are finished.

The following example shows how to copy the README file from the repository:

```
% ftp ftp.digital.com
Connected to gatekeeper.dec.com
220 GATEKEEPER.DEC.COM FTP Service Process
Name: anonymous
331 ANONYMOUS user ok, send real ident as password.
Password: milano@netman.stateu.edu
230 User ANONYMOUS logged in at Tue 10-Aug-1993 10:24-EST,
job 54.
ftp> cd /pub/DEC/mib
331 Default name accepted.  Send password to connect to it.
ftp> ascii
220 Enter A ok.
ftp> get README
200 Port 19.54 at host nnn.nn.nn.nn accepted.
150 ASCII retrieve of /pub/DEC/mib/README started.
226 Transfer completed.  40239 (8) bytes transferred.
40239 bytes received in 23.65 seconds (5.8 Kbytes/s)
ftp> quit
%
```

Obtaining a Diskette

You can obtain a free diskette containing the latest FDDI RFCs and Digital's private MIBs. To obtain a diskette, call 800-DIGITAL, press 2, and ask for presales technical support. Request the FDDI RFC and Digital's private MIB diskette.

Obtaining the Latest DEC FDDIcontroller/PCI Driver Files

The device driver software diskette included in your DEC FDDIcontroller/EISA kit can become outdated as operating system software evolves. The latest versions of the driver files can be found on the Internet, CompuServe, World Wide Web, and the Network Product Business (NPB) Bulletin Board Service by using the following procedures:

- **Internet:**

    1. Perform an anonymous ftp connection to `ftp.digital.com`. Your login name is `anonymous`.

    2. Enter your password. (Use your Internet electronic mail address as your password.)

    3. Using uppercase/lowercase letters (as shown), change your directory to one of the following:

        ```
        cd /pub/DEC/adapters/fddi/defpa/interim
        cd /pub/DEC/adapters/fddi/defpa/release
        ```

    4. Select image mode before extracting binary (non-ASCII) files:

        ```
        ftp> i
        ```

5. Retrieve a driver file, as in the following example:

```
ftp> get driver.ZIP
```

6. Enter `quit` to exit ftp.

7. Use the *-d* option to extract subdirectories and files:

```
C:\> pkunzip -d driver.ZIP
```

- **CompuServe:**

  1. Enter `!Go decpci` to select the DECPCI forum and enter Library **8** (LAN Controllers).

  2. Select the *Browse* option to scroll through the library titles.

  3. Select the *Retrieve* option to copy a file to your system.

  For information on how to obtain a CompuServe account in the U.S., call 1-800-848-8990.

- **World Wide Web:**

  Enter the following universal resource locator (URL) to access Digital's Network Product Business Home Page on the World Wide Web:

  ```
  http://www.networks.digital.com/
  ```

- **Network Product Business (NPB) Bulletin Board Service:**

  1. Using a modem (parameters 9600, 8, n, 1), connect to the NPB Bulletin Board Service in the U.S. by dialing 508-486-5777.

  2. Using a modem, connect to the PC Business Unit Bulletin Board Service (PCBU BBS) in Europe by dialing (33) 92 96 03 12, then select networks product/area 23.

  3. Follow the menu-driven instructions on your screen to download the driver files.

Index

U

UTP connectors
   DEFPA-MB, 1–2
   DEFPA-UB, 1–2

V

Verifying
   system and software
      requirements, 2–4
Verifying installation, 2–9
Verifying operation on network,
   2–24