DEC FDDIcontroller/EISA

Installation

Order Number: EK-DEFEA-IN. D01

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

Revision/Update Information: This is a revised manual.

Digital Equipment Corporation
Maynard, Massachusetts

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About This Manual

This manual describes how to install the DEC FDDIcontroller/EISA network interface card (NIC) into a 32-bit EISA 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 use of FDDI networks.

Manual Conventions

This manual uses the following conventions:

Convention	Description
bold	In interactive examples, bold type indicates text that you must enter exactly as shown.
1	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.

Kit Contents

The DEC FDDIcontroller/EISA kit includes the items shown in
Figure 1. Verify that you have the following components before
proceeding:

- This user's manual **1**

- The adapter **3** (packaged inside an antistatic bag **2**)

- Two 3½-inch distribution diskettes **4**

  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 1 Contents of Shipping Package
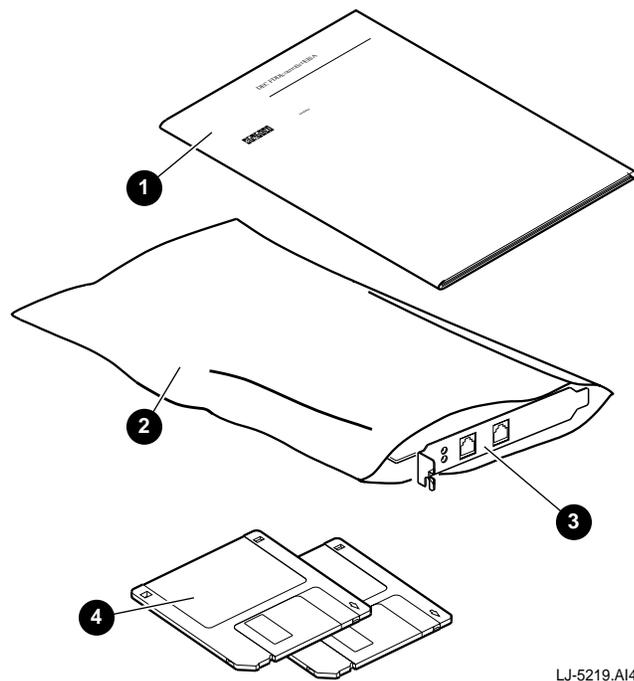
LJ-5219.AI4

Related Documents

Additional information relative to the DEC FDDIcontroller/EISA 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 roles 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)

  Provides the specifications for the optical transmitter and receiver used by FDDI, the power levels, allowable bit error rates, fiber-optic transmission, 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 daños personales.
Precaución	Contiene informacion para evitar daños 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 móndulo 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/EISA adapter (also referred to as the FDDI/EISA adapter or adapter) provides direct connection of industry standard computers with an EISA I/O bus to a 100 Mb/s FDDI network. Drivers for supported operating systems provide the configuration flexibility required in multivendor networks.

Product Features

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

- 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
  - LAN Manager
  - OpenVMS
  - Digital UNIX
  - SCO OpenServer
- Includes a Limited Lifetime Warranty

Adapter Models

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

Table 1–1 DEC FDDIcontroller/EISA Adapter Models

Model	Description
DEFEA-AB	One-card, single attachment station (SAS) adapter with multimode optics and duplex SC connectors.
DEFEA-U*	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.
DEFEA-DB	One-card, dual attachment station (DAS) adapter with multimode optics and dual duplex SC connectors.
DEFEA-M*	One-card, dual attachment station (DAS) adapter with two 8-pin MJ connectors. This model accepts Category 5 UTP or ScTP cable.

The fiber-optic SAS adapter (DEFEA-AB) connects to the FDDI network through an FDDI-compliant concentrator (DECconcentrator 900MX), using multimode fiber-optic cable. The fiber-optic DAS adapter (DEFEA-DB) connects directly to the FDDI ring through multimode fiber-optic cables.

The UTP SAS and DAS adapters (DEFEA-U* and DEFEA-M*) connect to the FDDI network using Category 5 UTP copper cable.

_____ **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.

_____

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

Figure 1–1 SAS and DAS Adapters Configured in an FDDI Network
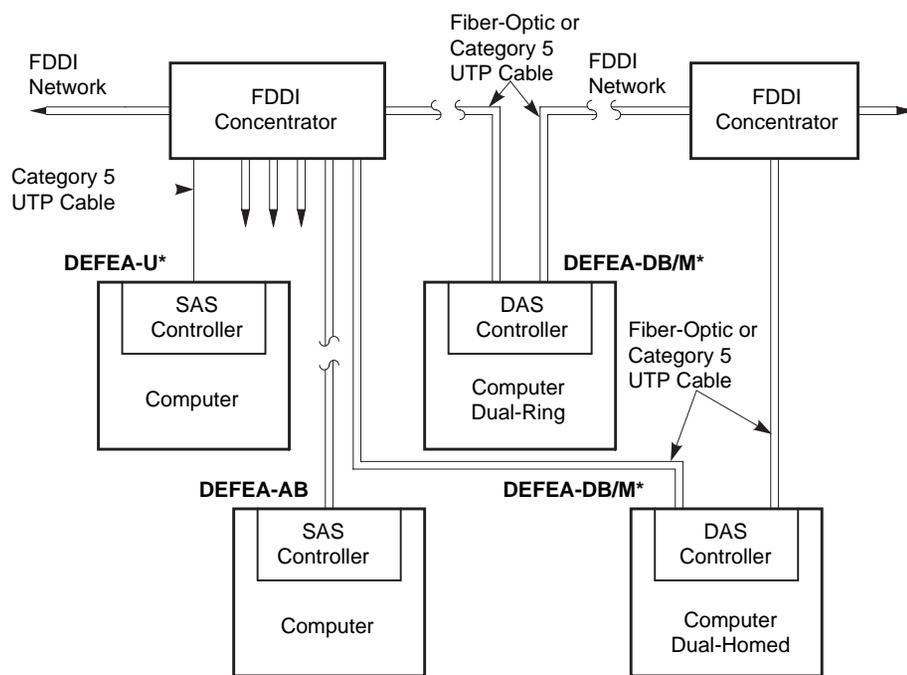
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Fiber-Optic SAS Adapter (DEFEA-AB)

The fiber-optic SAS adapter (Figure 1–2) plugs into a single EISA I/O
bus slot. A duplex SC connector **2** is the interface to FDDI fiber-optic
cable (from a concentrator such as the DECconcentrator 900MX).

The adapter contains onboard diagnostics that execute when power
is applied. The two-color (green or amber) LED **1** on the adapter's
mounting bracket indicates the operating status of the adapter and its
PHY port. (See the LED Descriptions section in this chapter.)

Figure 1–2   Fiber-Optic SAS Adapter (DEFEA-AB)

LJ-5214.AI4
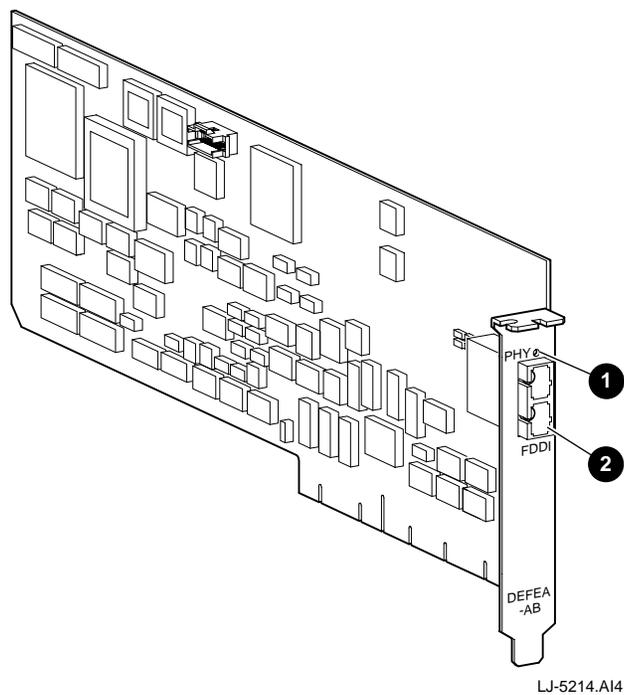
UTP SAS Adapter (DEFEA-U*)

The UTP SAS adapter (Figure 1–3) plugs into a single EISA I/O bus slot. An 8-pin MJ connector **1** interfaces with Category 5 UTP copper cable.

The adapter contains onboard diagnostics that execute when power is applied. The two-color (green or amber) LED **2** on the adapter's mounting bracket indicates the operating status of the adapter and its PHY port. (See the LED Descriptions section in this chapter.)

Figure 1–3 UTP SAS Adapter (DEFEA-U*)

LJ-04605-TI0
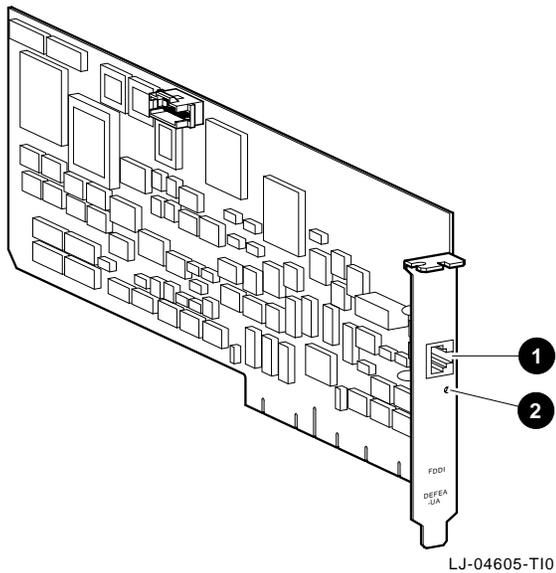
Fiber-Optic DAS Adapter (DEFEA-DB)

The fiber-optic DAS adapter (Figure 1–4) plugs into a single EISA I/O bus slot. Two duplex SC connectors, port B **3** and port A **4** , interface with the FDDI fiber-optic cable.

The adapter contains onboard diagnostics that execute when power is applied. The two-color (green or amber) LEDs on the mounting bracket indicate the operating status of the adapter and its PHY ports, port A **1** and port B **2** . (See the LED Descriptions section in this chapter.)

Figure 1–4 Fiber-Optic DAS Adapter (DEFEA-DB)
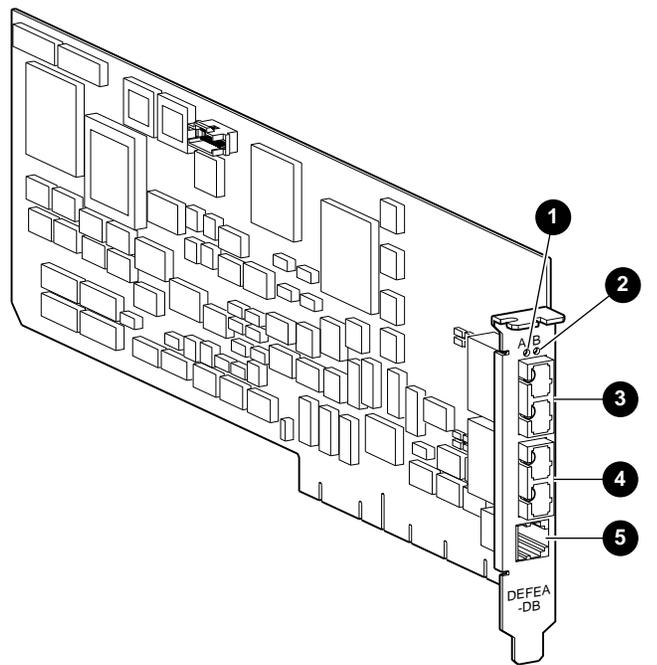
LJ-5217.AI4

The fiber-optic DAS adapter also contains an RJ-12 connector **5** for inserting an optional optical bypass relay (OBR). This relay maintains connectivity of the FDDI ring in the absence of power or during fault conditions in the node.

—————————————— **Warning** ——————————————

To prevent personal injury or equipment damage, do not insert telecommunications cabling into the OBR connector. Refer to the Optical Bypass Relay (OBR) RJ-12 Connector section in Appendix A for more information about the OBR.

_____

UTP DAS Adapter (DEFEA-M*)

The UTP DAS adapter (Figure 1–5) plugs into a single EISA I/O bus slot. Two 8-pin MJ connectors, port B **1** and port A **2**, interface with Category 5 copper cable.

The adapter contains onboard diagnostics that execute when power is applied. The two-color (green or amber) LEDs on the adapter's mounting bracket indicate the operating status of the card and its PHY ports, port A **4** and port B **3**. (See the LED Descriptions section in this chapter.)

Figure 1–5 UTP DAS Adapter (DEFEA-M*)

LJ-04598-TI0
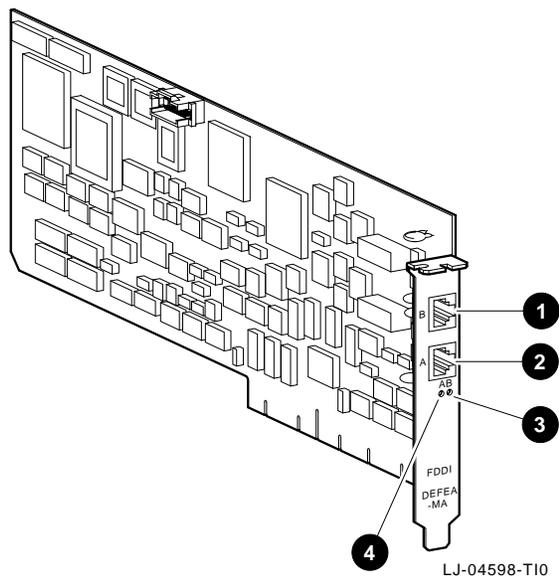
LED Descriptions

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 or Amber	Alternating	Alternating—Standby mode when connected to a concentrator in a dual-homing configuration (DEFEA-DB and DEFEA-M* models)
			Off—Device driver not loaded, port disabled by management or LED, or adapter fails
PHY B (DAS only)	Green	On	On—PHY connection complete
	Green	Flashing	Flashing—PHY connection in progress (or no cable attached)

Table 1–2 (Cont.) LED States

LED	Color	Normal	Description
	Amber		On—If on after system boots, indicates port or LCT failure; retry loop
			If on before system boots, indicates self-test failure
	Amber		Flashing—Illegal topology
			Off—Device driver not loaded, port disabled by management or LED, or adapter fails

Software Description

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

- **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's 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 diskettes are 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:

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

- A `RELEASE.NOT` file 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.

- EISA configuration files:

    ```
    A:\!DEC3001.CFG
    A:\!DEC3002.CFG
    A:\!DEC3003.CFG
    ```

- 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/EISA adapter into an EISA bus master-compatible computer and how to connect the adapter to the network.

The preinstallation and installation steps to install the adapter are as follows. The referenced sections are located in this chapter.

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 (see the Verifying System and Software Requirements section).

3. Perform the EISA configuration procedure (see the Configuring the Adapter section).

4. Install the adapter into an EISA bus master slot (see the Installing the Adapter section).

5. Install the driver software (see the Installing Device Drivers section).

6. Connect to the network (see the Connecting to the Network section).

7. Verify the hardware and software installations (see the Verifying the Adapter Operation on the Network section).

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

To configure the DEC FDDIcontroller/EISA adapter into your computer, perform the following steps:

1. Turn off power to your computer before running the EISA Configuration utility.

2. Determine whether you have any ISA hardware options (such as an ISA video adapter) installed in the EISA slots of the system. Refer to your computer system documentation to determine the slots available for EISA options. If any ISA options are located in EISA slots, record the slot number, interrupt-request (IRQ) level, and memory address settings for each of these ISA options. For the IRQ level and memory address settings information, refer to your computer documentation.

3. Read your computer documentation for information about using the EISA Configuration utility to add a new hardware option to your system.

4. Insert the EISA Configuration utility diskette (write-enabled) into the appropriate diskette drive. This diskette is packaged with your computer.

5. Turn on the power to your computer.

6. Follow your EISA Configuration utility instructions to copy the configuration files (`!DEC3001.CFG`, `!DEC3002.CFG`, and `!DEC3003.CFG`) from the distribution diskette to your EISA Configuration utility diskette.

Note _____

There are three EISA configuration files provided for the
adapters: `!DEC3001.CFG`, `!DEC3002.CFG`, **and** `!DEC3003.CFG`.
The file you use to configure the system depends upon the part
number of the adapter you are installing. The adapter's part
number is marked on a label attached to the adapter.

---

7. Determine which configuration file you need to use (see
    Table 2–1).

Table 2–1   Configuration Files

Adapter Part Number	Use Configuration File...
54-21497-0X	!DEC3001.CFG
54-21503-0X	!DEC3002.CFG
54-24239-0X	!DEC3002.CFG
54-24889-0X	!DEC3003.CFG

8. Configure the system. This process adds the configuration file
    information to the system configuration file.

9. Examine the slot number, memory address, and IRQ settings
    for the adapter. You may need to adjust these settings to avoid
    conflicts with the settings of other hardware options in your
    system. See the `\CONFIG\README.TXT` file for the recommended
    settings based on the device driver you plan to use.

10. Record the slot number, memory address, and IRQ settings for
    future reference.

    Appendix A contains more information regarding memory-address
    and interrupt-request selections.

11. Save the new configuration data, then exit the utility.

    For some Configuration utilities, you must examine system and new hardware option switch settings before you save the configuration data and exit the utility. The FDDI/EISA adapter has no switches or jumpers. Follow your EISA Configuration utility instructions before you exit the utility.

12. When the Configuration utility indicates it is safe to do so, turn off the power to your computer and install the adapter.

Installing the Adapter

This section explains how to install the DEC FDDIcontroller/EISA adapter into an EISA-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. Remove the option slot cover (Figure 2–1) from the computer's selected EISA slot. Save the removed screw to secure the adapter later in this procedure.

Figure 2–1   Removing the Option Slot Cover

LJ-04599-TI0
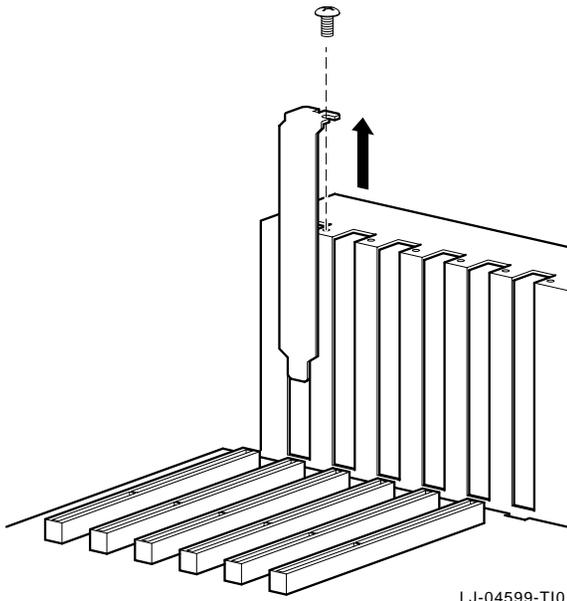
5. Remove the adapter from the protective bag. Remove the optical dust cap from any fiber-optic model SC connectors (see Figure 2–2).

6. Insert the adapter into the appropriate EISA bus master I/O slot, then secure it with the slot cover screw.

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

8. Go to the Verifying the Installation section if you need additional information.

Figure 2–2   Installing the DEFEA Adapter (DEFEA-AB Model Shown)
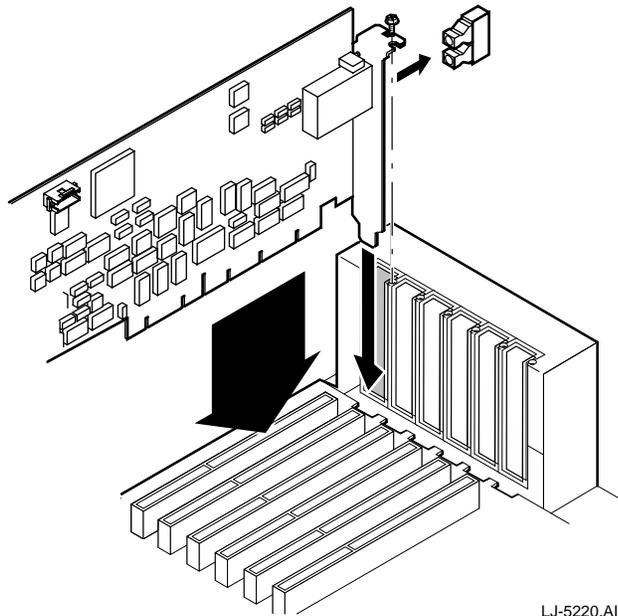
LJ-5220.AI4

Verifying the Installation

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

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

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

   a. The adapter's 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 DEFEA-DB and DEFEA-M* models, the A and B LEDs (located on the top left and top right 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 located on the distribution diskette:

- DOS and OS/2 NDIS 2.01 drivers
- Windows 95 and Windows NT 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 along with your operating system documentation to install the device driver for your adapter.

Installing 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 along with your operating system documentation to install the device driver for your adapter.

Installing Windows NT Driver

A device driver for the DEC FDDIcontroller/EISA 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 `\WINNT\README.TXT` file for more specific installation information. Use this information and 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 driver `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's 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 3.1*x* 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 be 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 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
distribution diskette, or 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.

Connecting to the Network

This section describes how to connect the FDDI cables (fiber-optic multimode and Category 5 UTP) to the EISA 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 or DAS Adapters

To connect the FDDI cables to fiber-optic SAS or DAS adapters:

1. Remove the dust cap **3** from the connector (see Figure 2–3).

2. Connect the connectors at one end of the cable **4** , **5**) to the ports (**1** , **2**) on your adapter. Note the color coding of the band **6** that attaches to the top (transmit) side of the port.

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

4. Observe the adapter LEDs **7** . The LEDs should be a steady
   green, indicating a proper connection to the FDDI network device.

5. Use the RJ-12 connector **8** for inserting an optional OBR.

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

Figure 2–3 shows an example of how a SAS- or DAS-configured, EISA-
compatible computer interfaces to the FDDI network using fiber-optic
cable.

**Figure 2–3 Connecting FDDI Cable to Fiber-Optic Adapters
(DEFEA-DB Model Shown)**

LJ-5222.AI4
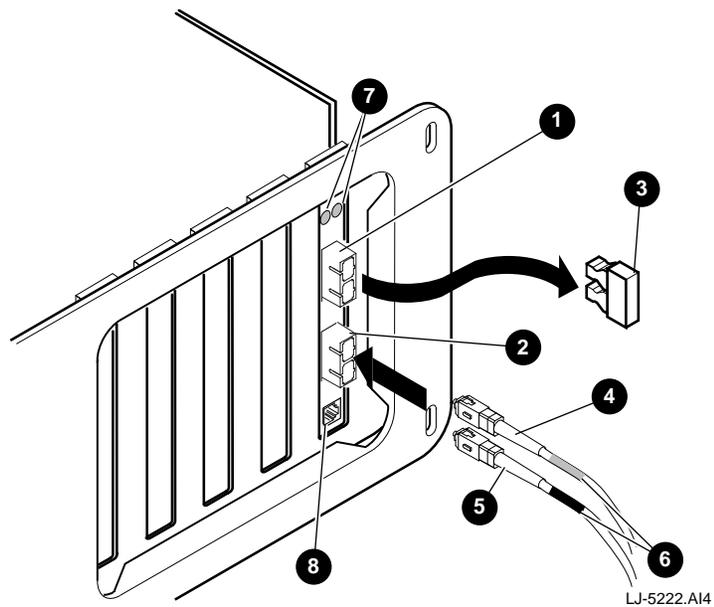
Connecting UTP SAS Adapters

To connect the UTP SAS adapter:

1. Connect the FDDI cable **1** to your adapter (see Figure 2–4).

2. Observe the adapter's LED **2** .

   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 2–4   Connecting the FDDI Cable to the UTP SAS Adapter
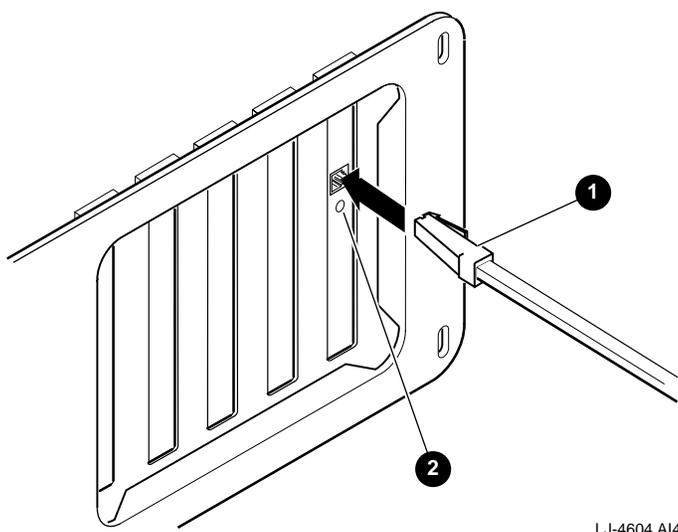
LJ-4604.AI4

Connecting UTP DAS Adapters

To connect the UTP DAS adapter:

1. Connect the FDDI cables **1** , **3** to your adapter (see Figure 2–5).

2. Observe the adapter's LEDs **2** , **4** .

   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.

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

Figure 2–5 Connecting FDDI Cables to a UTP DAS Adapter

LJ-4608.AI4
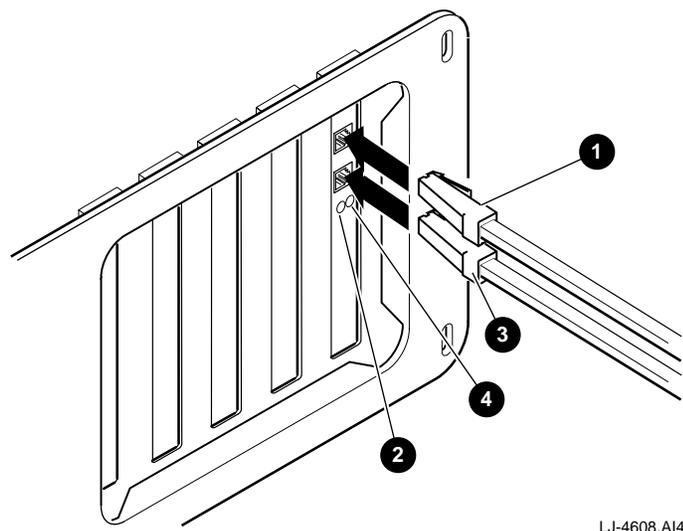
Verifying the Adapter Operation on the Network

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, 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, describe probable causes, and suggest corrective actions to remedy problems related to possible 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 LEDs 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 strap when handling the cards.

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

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 and Driver Configuration and Installation Faults

Symptom	Probable Cause	Corrective Action
System is on; no display.	The adapter is not seated firmly.	Turn off the system and reseat the adapter.
	The IRQ level of the adapter conflicts with another option or video card installed in an EISA 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 card 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.

Table 3–1 (Cont.)   Isolating Adapter and Driver Configuration and Installation Faults

Symptom	Probable Cause	Corrective Action
The computer display indicates a slot configuration error.	The adapter was inserted into a slot other than the one designated by the Configuration utility.	Turn off the system, then insert the adapter into the correct slot. If the problem persists, refer to the Configuring the Adapter section in Chapter 2, then repeat the configuration process.
The computer display indicates a configuration error, with no adapter present.	The system was configured for an EISA adapter, but did not find one.	Install the adapter.
The computer display indicates that the system found an unrecognized card.	The adapter was installed before the system was configured.	Turn off the system, then remove the adapter. Repeat the configuration process (refer to the Configuring the Adapter section in Chapter 2).

Isolating Network Connection Faults

Table 3–2 lists problems that you may encounter when you connect your 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. Adapter 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. Adapter 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 may 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).
	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.

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

Symptom	Probable Cause	Corrective Action
		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.
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.
	Novell NetWare server and client have incompatible frame types (for example, an FDDI_SNAP server cannot connect to an FDDI_802.2 client).	Using DEClma, enter the **Select** command to display a unique identifier, the slot number, the adapter type, and the frame type for each DEC FDDIcontroller/EISA driver currently running. Make sure the client and server frame types are compatible.

Table 3–3 (Cont.)   Isolating Network Interconnect Faults

Symptom	Probable Cause	Corrective Action
	A physical path does not exist between the host and target node.	Verify that the target node is running and 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 but not all considerations include the network address (duplicate address) and adapter token rotation time.

The host in which the adapter is installed may 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 these 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** ――――――――――――――

Make sure that the ANSI.SYS file is loaded in your system's CONFIG.SYS file before running INSTVER; otherwise, INSTVER screens will not display properly. Refer to the \DIAG\README.TXT file for installation instructions.

―――――――――――――――――――――――――――――――

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 out to (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 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/EISA physical characteristics, and operating environment and power requirements.

Physical Description

The adapter is a full-length IBM AT form-factor card that uses the full EISA-specified, 32-bit bus connector. The adapter measures 13.42 inches (341.0 mm) by 5.0 inches (127.0 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 megabyte of packet memory

- 68000 onboard processor

- DMA control

- EISA bus interface control logic

- FDDI interface chipset

- FDDI optical or TP-PMD interface

- IEEE address ROM

- Onboard, nonvolatile memory for firmware storage

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

- ANSI TP-PMD (for DEFEA-U* and DEFEA-M* 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, 3.5 A (maximum) DC amps @ +12.0 V, 0.1 A (maximum) Bus loading per EISA standard

_____ **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. The OBR device is available only on the fiber-optic DAS model (DEFEA-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 V @ 200 mA (max.)
3,4,6	Return; grounded internally
5	Bypass present; must be externally grounded to pin 3,4, or 6
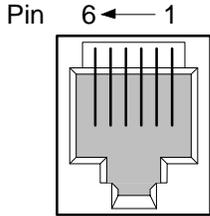
Modular Jack (Shielded RJ-12)

LJ-4596.AI4

UTP SAS and DAS Adapter Pin Assignments

The DEC FDDIcontroller/EISA (DEFEA-U* and DEFEA-M*) adapter requires 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 (ScTP) cable (part number BN26S-03)

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

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

Figure A–2 Crossover Pin Assignments for BN25H Office Cable

```
        8 MP              8 MP

WH/GR  1○          ○1
GR/WH  2○          ○2
WH/OR  3○          ○3
BL/WH  4○          ○4
WH/BL  5○          ○5
OR/WH  6○          ○6
WH/BR  7○          ○7
BR/WH  8○          ○8

            LJ-04066-TI0
```
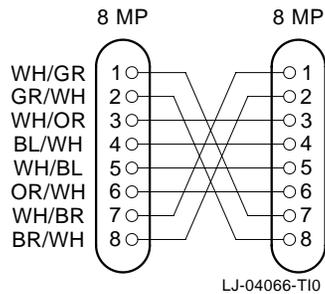
When connecting a UTP SAS or DAS adapter to another TP-PMD device, use EIA/TIA-568 Category 5 cables. The link may be made up of patch cordage (maximum length 10 meters) and behind-the-wall cable (maximum length 90 meters).

_____ **Note** _____

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

Other Digital Network Adapter Products

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

EtherWORKS Switch 6T/2TX (DEL6X)

This switch provides five 10 Mb/s 8-pin MJ station ports and one 10 Mb/s TP/AUI/BNC combination port to connect to either a subnetwork, or directly to a PC, server, or key workstation, and two 8-pin 100 MB/s Fast Ethernet ports for connection to a backbone or server. In addition to partitioning an overloaded network, the DEL6X provides connection between legacy 10Base-T networks and the newer generation 100Base-TX. It can be configured to operate in either full-duplex or half-duplex data transfer mode to support the interconnection requirements of other high-speed devices. As a device functioning on the media access control (MAC) layer, the DEL6X is protocol independent, and therefore compatible with IEEE 802.3, IEEE 802.3u, TCP/IP, NetWare, DECnet, and XNS protocols. The DEL6X can be configured as a standalone device to form a work group consisting of two to eight subnetworks or workstations; it can function as a simple twisted-pair LAN; or it can serve as a multiport bridge.

EtherWORKS Switch 2TTX (DEL2X)

This switch provides two 10/100 Mb/s 8-pin MJ ports (set at full- or half-duplex mode) to connect to either a subnetwork, or directly to a PC, server, or workstation. In addition to partitioning an overloaded network, the DEL2X provides connection between legacy 10Base-T networks and the newer generation 100Base-TX. The DEL2X is protocol independent, and therefore compatible with IEEE 802.3, IEEE 802.3u, TCP/IP, NetWare, DECnet, and XNS protocols. Where traditional 100Base-TX networks restrict the maximum distance between end nodes to 205 meters, the DEL2X divides your network into smaller and more manageable segments, each linked to the larger network with a switch. This enables unlimited maximum distance for communications between end nodes.

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 is ready to run with all network operating systems and protocols. A Lifetime Warranty is included.

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 EtherWORKS 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.

Fast EtherWORKS PCI 10/100 Adapter

This 32-bit dual-speed adapter uses a single connector for either a 10 Mb/s or a 100 Mb/s IEEE 802.3 Ethernet network connection. The adapter automatically senses and adjusts to either speed. The Fast EtherWORKS PCI 10/100 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 0/100 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 Adapter

This 32-bit 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 MOP, RPL, 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 and the DE450-CA adapter supports twisted-pair, ThinWire, and AUI connections. A Lifetime Warranty is included.

EtherWORKS 3 Turbo Adapter

This low-cost, high-performance, 16-bit ISA adapter is designed to meet client/server needs. The adapter features 128 KB of onboard buffer RAM that is dynamically allocated for optimal transmit /receive performance. The device drivers for the EtherWORKS 3 Turbo adapter include NetWare, Windows for Workgroups, Windows NT, Windows 95, PATHWORKS, LAN Manager, LAN Server, Banyan VINES client, Packet Driver, SCO OpenServer, UnixWare, Digital UNIX, and OpenVMS. The DE204-AB supports twisted-pair connection and the DE204-AC supports ThinWire, twisted-pair, and AUI connections. A Lifetime Warranty is included.

EtherWORKS Turbo EISA Adapter

This 32-bit Ethernet adapter 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). The EtherWORKS Turbo EISA adapter supports full-duplex operation of 20 Mb/s. The device drivers for this adapter include NetWare, Windows for Workgroups, Windows NT, Windows 95, 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 Adapter

This credit card sized adapter is designed to link laptop and notebook PCs 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 Turbo adapter include NetWare, Windows for Workgroups, LAN Manager, LAN Server, PATHWORKS, Banyan VINES client, Packet Driver, SCO OpenServer, UnixWare, Digital UNIX, and OpenVMS. A five-year warranty is included.

DEC FDDIcontroller/PCI Adapter

As the first PCI FDDI adapter in the industry, this custom high-performance, low-cost 32-bit adapter features onboard CPU for SMT processing, DMA chip, and 1 MB buffer. Full-duplex capability extends bandwidth to 200 Mb/s. The device drivers for the DEC FDDIcontroller/PCI 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. This adapter can be used with PCI-based Alpha, Intel, MIPS, and PowerPC systems. Four models are offered: UTP SAS and DAS (DEFPA-UB, DEFPA-MB), and MMF SAS and DAS (DEFPA-AB, DEFPA-DB). A Lifetime Warranty is included.

To order these 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 the `get` command 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).

   _____

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/EISA 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 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/defea/interim
     cd /pub/DEC/adapters/fddi/defea/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.

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