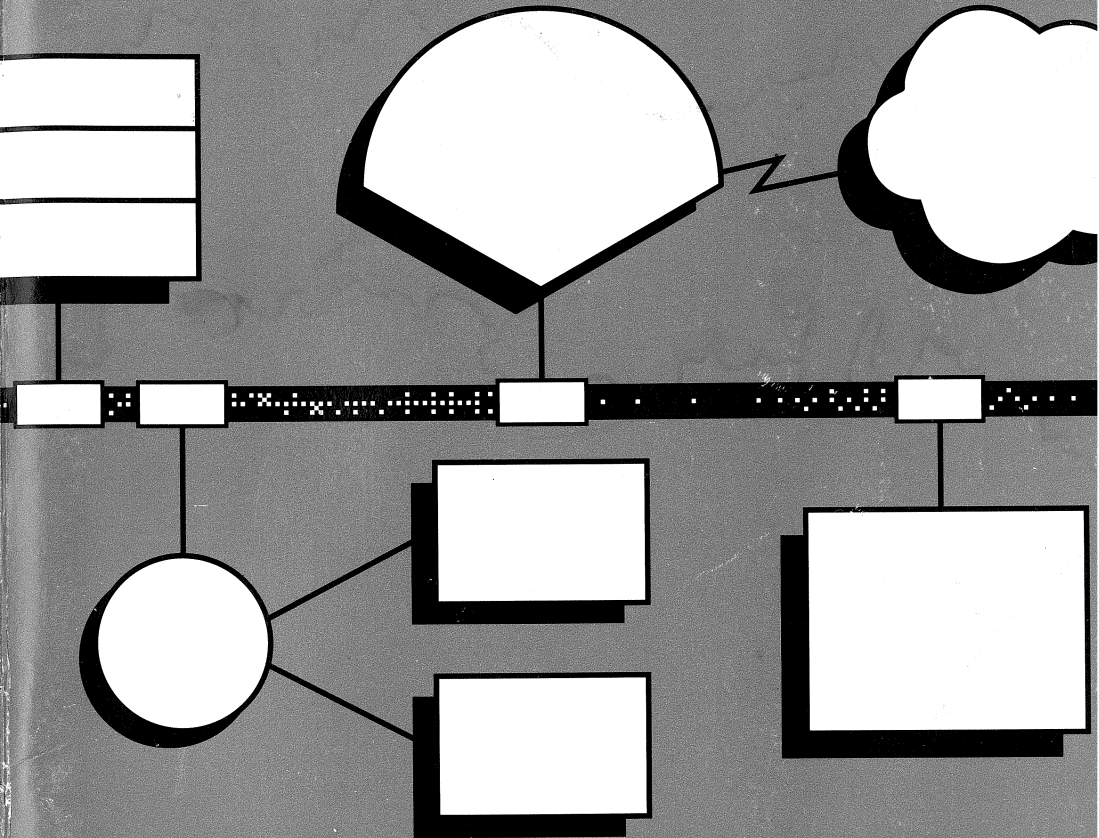


DEC FDDI controller/PCI

digital™

User Information



Part Number: EK-DEFPA-IN. A01

FCC NOTICE: This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

The use of unshielded Ethernet cables on ThinWire and thickwire ports with this equipment is prohibited due to non-compliance with FCC regulations for a Class B computing device pursuant to Part 15 of FCC Rules.

This product is found compliant with the requirements of CISPR-22 Class B and is eligible to bear the CE Mark label.

VCCI NOTICE:

この装置は、第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Technical Support

Digital Adapter Business Group

Littleton, Massachusetts

FAX: 508-486-6311

E-MAIL: digital_nics@chordz.enet.dec.com

Digital Customer Support Center (CSC)

Alpharetta, Georgia

For products under contract or warranty in the U.S., call
1-800-354-9000.

Refer to Appendix C in this manual for a list of international
telephone numbers to call.

DECpc Bulletin Board Service

Using a modem, connect to DECpc Bulletin Board Service by dialing
508-496-8800.

CompuServe

At ! prompt, type: GO DECPCI to access the DECPCI forum.

Ordering Information

For ordering and pre-sales support in the U.S.,
call: 1-800-DIGITAL (1-800-344-4825)
or your authorized Digital distributor.

DEC FDDIcontroller/PCI

User Information

Order Number: EK-DEFPA-IN. A01

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

Revision/Update Information: This is a new manual.

**Digital Equipment Corporation
Maynard, Massachusetts**

NOTICE - Class B Computing Device:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

FCC ID: AO9-DEFPAD (Optical DAS version)

FCC ID: AO9-DEFPAU (UTP version)

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) these devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

This equipment is the second Class category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.

When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

These products comply with DHHS rules 21 CFR Subchapter J Part 1040.10 at the manufacture.

**CLASS 1 LASER PRODUCT
APPAREIL A LASER DE CLASSE
1 LASER KLASSE 1**

November 1994

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About This Manual

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

Related Documents

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

- *DECconcentrator 500 Installation* (Order No. EK-DEFCN-IN)
This manual describes how to configure and install the DECconcentrator 500 unit and how to verify its operation.
- *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)
This manual 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

This manual 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)

This specification 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.

Manual Conventions

This manual uses the following conventions:

Convention	Description
Note	A note contains information of special importance.
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.
<i>variables</i>	In command descriptions, italic type indicates a variable that you supply.
This type	Text in monospace type indicates text that you enter or text that the system displays.

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	Enthält Informationen, die beachtet werden müssen, um den Benutzer vor Schaden zu bewahren.
Achtung	Enthält Informationen, die beachtet werden müssen, um die Geräte vor Schaden zu bewahren.
Danger	Signale les informations destinées à prévenir les accidents corporels.
Attention	Signale les informations destinées à prévenir la détérioration du matériel.
Aviso	Contiene información para evitar daños personales.
Precaución	Contiene información para evitar 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 électroniques. Digital conseille l'utilisation d'un bracelet de masse et d'un plan de travail mis à la terre lors de la manipulation des modules.
PRECAUCIÓN	La electricidad estática puede dañar los componentes electrónicos y los módulos. Digital recomienda que se utilicen cintas de pasadores y superficies de trabajo conectadas a tierra 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 rayonnement laser dangereux pour les yeux. Ne vous avisez jamais de regarder par l'extrémité d'une fibre optique ou dans l'ouverture d'un connecteur. Considérez toujours que le câble est relié à une source lumineuse.

AVISO	Algunos equipos de fibra óptica pueden emitir luz láser que daña los ojos. No se debe mirar en una puerta de conector o fibra óptica. Siempre se debe suponer que el cable está conectado a la luz.
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 système pour obtenir plus d'information.
PRECAUCIÓN	Al añadir cualquier módulo de opciones al ordenador, es preciso comprobar que la potencia combinada (vatios) necesaria para todos los módulos del ordenador no sobrepasa las condiciones normales del suministro de energía. 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 câble de télécommunication 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.

Introduction

The DEC FDDI controller/PCI (hereafter called the controller) provides direct connection of industry standard computers with a peripheral component interconnect (PCI) I/O bus to a 100-megabits/second FDDI network. Drivers for supported operating systems provide the configuration flexibility required in multivendor networks.

Table 1-1 describes the DEC FDDI controller/PCI models available from Digital Equipment Corporation.

Table 1-1 Controller Models

Model	Description
DEFPA-AA	One-card, single attachment station (SAS) controller with multimode optics and SC connectors
DEFPA-UA	One-card, single attachment station (SAS) controller with shielded RJ-45 modular connector. Accepts Category 5 unshielded twisted-pair (UTP) or Category 5 sheath-shielded, 100-ohm twisted-pair (TP) cable with TP-MIC plug
DEFPA-DA	One-card, dual attachment station (DAS) controller with multimode optics and dual SC connectors

Product Features

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

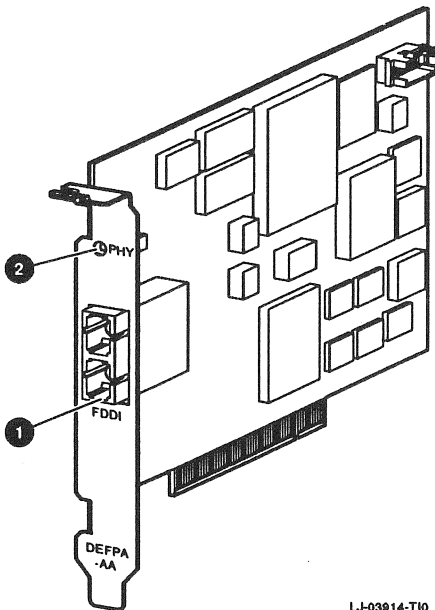
- Industry's first PCI FDDI adapters
- Low price—reduces the cost of entry for FDDI
- Full duplex capability
- DMA engine—supports high throughput and low CPU utilization
- 1 MB buffer RAM
- On-board CPU
- Full suite of drivers to support:
 - NetWare ODI Server (Intel)
 - NetWare ODI Client (DOS)
 - NetWare SFT III MSL (Intel)
 - PATHWORKS
 - Windows NT
 - LAN Manager
 - OpenVMS
 - OSF/1
- Includes a Limited Lifetime Warranty

Fiber-Optic SAS Controller (DEFPA-AA)

The fiber-optic SAS controller (Figure 1-1) 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 controller contains onboard diagnostics that execute when power is applied. A two-color (green or amber) light-emitting diode (LED) ❷ on the controller mounting bracket indicates the operating status of the controller and its PHY port. Refer to the LED Descriptions section of this chapter for information about the controller LEDs.

Figure 1-1 Fiber-Optic SAS Controller (DEFPA-AA)



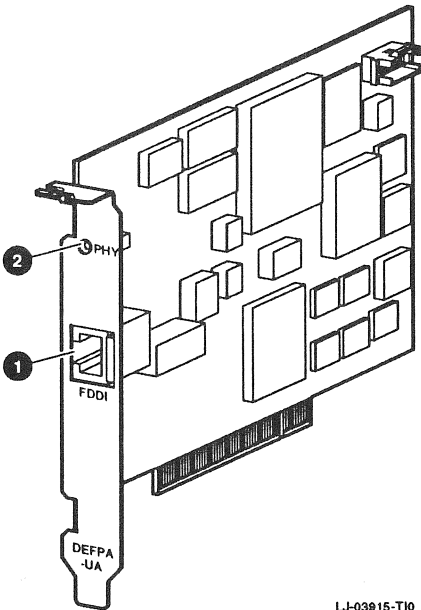
LJ-03914-T10

UTP SAS Controller (DEFPA-UA)

The UTP SAS controller (Figure 1-2) consists of one card that plugs into a single bus master PCI I/O bus slot. An RJ-45 modular connector ❶ interfaces with Category 5 UTP copper cable.

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

Figure 1-2 UTP SAS Controller (DEFPA-UA)



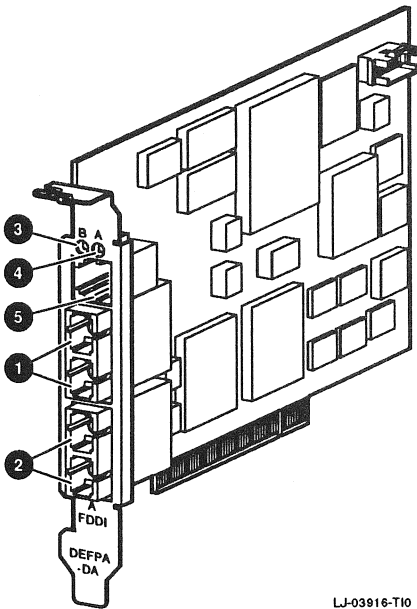
LJ-03915-T10

Fiber-Optic DAS Controller (DEFPA-DA)

The fiber-optic DAS controller (Figure 1-3) 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 controller contains onboard diagnostics that execute when power is applied. The two LEDs, B ❸ and A ❹, on the controller'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 controller LEDs.

Figure 1-3 Fiber-Optic DAS Controller (DEFPA-DA)



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The fiber-optic DAS controller contains an RJ-12 connector ⑤ 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 on the OBR.

LED Descriptions

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

Table 1–2 lists and describes possible LED states for all controller 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 broken 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 concentrator in a dual-homing configuration (DEFPA-DA only) Off—Port disabled by management or LED or controller broken
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 broken 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 management or LED or controller broken

Software Description

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

- **Operating system software**

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

- **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 controller 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 controller and must be installed as part of the installation procedure.

Distribution Diskette

The software distribution diskette is for systems that use 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.
- 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 controller are as follows:

1. **Print and read the README.TXT file 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 controller 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 controller.

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).

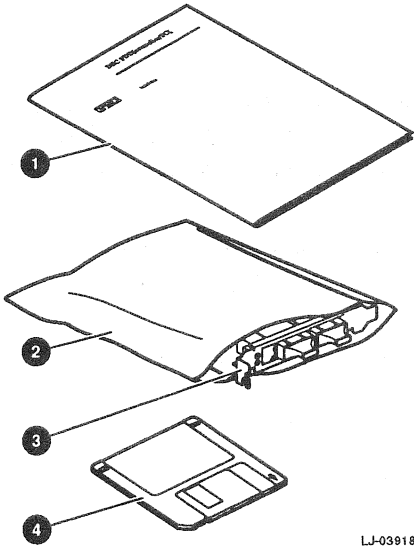
The kit contains the following items (including this manual ❶):

- The controller ❸ (packaged inside an antistatic bag ❷).
- A 3 ½ inch, 1.44-MB DOS-format distribution diskette ❹.

Additional diskettes may be included for product enhancement (such as a firmware upgrade diskette or a SCO UNIX 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



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Preparing to Install the Controller

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

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

Configuring the Controller

The DEC FDDIcontroller/PCI 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 controller, 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 controller.

Installing the Controller

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

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.

To install the controller, complete the following steps:

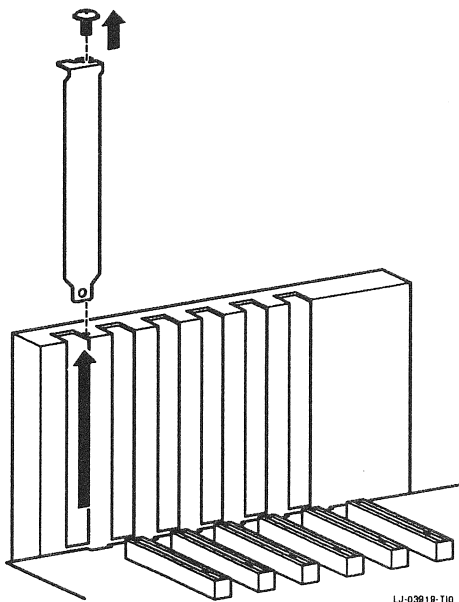
1. Remove any diskette(s) from the computer's disk drive(s).
2. Turn off the power to your computer.

Caution

Make sure you turn off power to the computer when inserting or removing the controller to avoid permanent damage to the module or other computer circuitry.

3. Remove the cover from the computer (refer to your computer documentation).
4. Attach the antistatic ground strap to your wrist and clip the other end of the strap to the computer's chassis ground.
5. Unfasten and remove the option slot cover (Figure 2-2) from the computer's selected PCI slot. Save the removed screw for securing the controller later in this procedure.
6. Remove the controller from the protective bag. Remove the optical dust cap(s) from any fiber optic model SC connectors (see Figure 2-3 and Figure 2-5).
7. Install the controller:
 - a. To install the DEFPA-AA, go to the Fiber-Optic SAS Controller (DEFPA-AA) section.
 - b. To install the DEFPA-UA, go to the UTP SAS Controller (DEFPA-UA) section.
 - c. To install the DEFPA-DA, go to the Fiber-Optic DAS Controller (DEFPA-DA) section.

Figure 2-2 Removing the Option Slot Cover

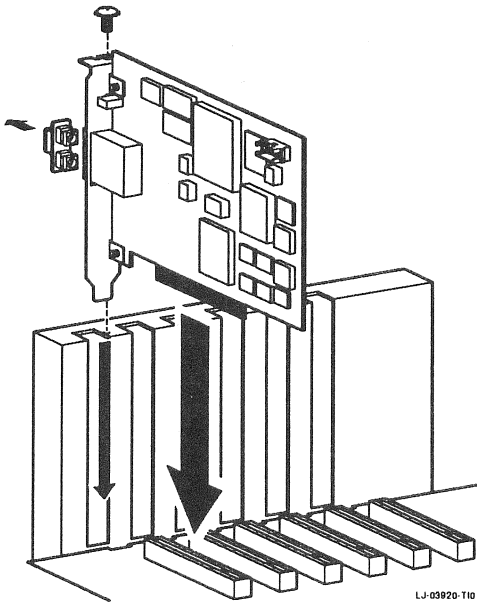


LJ-03916-T10

Fiber-Optic SAS Controller (DEFPA-AA)

1. Install the controller into the appropriate PCI bus master I/O slot and secure it with the slot cover screw (see Figure 2-3).
2. Replace the computer cover.
3. Go to the Verifying the Installation section if you need additional information.

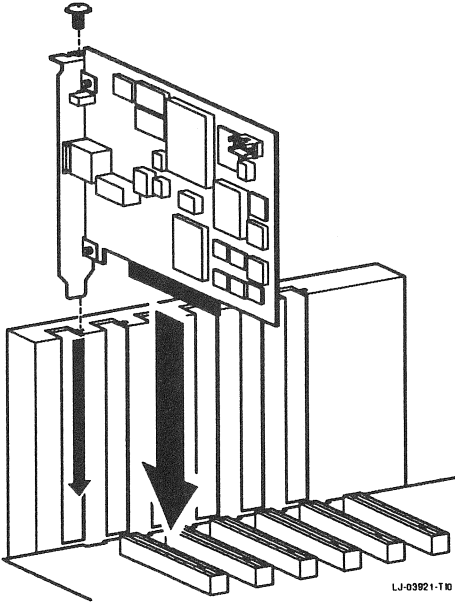
Figure 2-3 Installing the Fiber-Optic SAS Controller (DEFPA-AA)



UTP SAS Controller (DEFPA-UA)

1. Install the controller into the appropriate PCI bus master I/O slot and secure it with the slot cover screw (see Figure 2-4).
2. Replace the computer cover.
3. Go to the Verifying the Installation section if you need additional information.

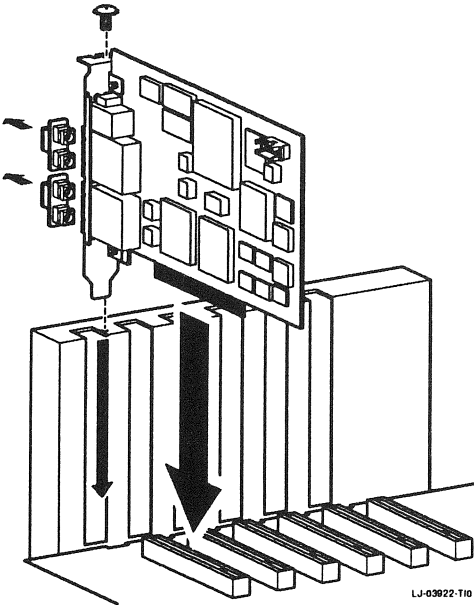
Figure 2-4 Installing the UTP SAS Controller (DEFPA-UA)



Fiber-Optic DAS Controller (DEFPA-DA)

1. Install the controller into the appropriate PCI bus master I/O slot and secure it with the slot cover screw (see Figure 2-5).
2. Replace the computer cover.
3. Go to the Verifying the Installation section if you need additional information.

Figure 2-5 Installing the Fiber-Optic DAS Controller (DEFPA-DA)



Verifying the Installation

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

1. Turn on power to the computer and observe the controller LED(s).
2. Note the following events (within 10 seconds after the computer power is turned on):
 - a. The controller LED on the mounting bracket flashes green (three flashes) for approximately 1 second.
 - b. The LED turns off when the controller passes the powerup self-test.

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

Note

For the DAS model, the A and B LEDs (located on the top-right and top-left of the mounting bracket) indicate the status of the controller 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, reseal the controller, then repeat step 1.

If the self-test fails repeatedly, refer to Chapter 3, 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 NDIS 2.01 driver
- OS/2 NDIS 2.01 driver
- 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 the DOS NDIS 2.01 Driver

The distribution diskette contains the driver and software for using your controller in a DOS system.

To install the DOS NDIS 2.01 driver:

1. Follow the procedures described in your operating system documentation for installing an unlisted network adapter driver.
2. From the DOS prompt, locate and view the \README.TXT file on the distribution diskette to locate the DOS NDIS 2.01 README.TXT file.
3. Refer to the DOS NDIS 2.01 README.TXT file for more specific installation information. Use this information along with your operating system documentation to install the device driver for your controller.

Installing the OS/2 NDIS 2.01 Driver

The distribution diskette contains the driver and software for using your controller in an OS/2 system.

To install the OS/2 NDIS 2.01 driver:

1. Follow the procedures described in your operating system documentation for installing an unlisted network adapter driver.
2. From the DOS prompt, locate and view the \README.TXT file on the distribution diskette to locate the OS/2 NDIS 2.01 README.TXT file.
3. Refer to the OS/2 NDIS 2.01 README.TXT file for more specific installation information. Use this information along with your operating system documentation to install the device driver for your controller.

Installing the Windows NT Driver

The distribution diskette contains the driver and software for using your controller, 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 controllers in your *Windows NT System Guide*.
2. From the DOS prompt, locate and view the \README.TXT file on the distribution diskette to locate the Windows NT README.TXT file.
3. Refer to the Windows NT README.TXT file for more specific installation information. Use this information along with the instructions provided in your *Windows NT System Guide* to install the device driver for your controller.

Installing Novell NetWare Drivers

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

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

The MSL driver can be configured using custom parameters (described 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 controllers.
2. From the DOS prompt, locate and view the \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 controller 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 disk drive C and the controller 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 controllers. The controller 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 controllers 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 controllers. 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 controller to send and receive at the same time. This increases the available aggregate bandwidth of the controller to be greater than 100 Mb/sec, up to a maximum of 160 Mb/sec.

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 disk 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.

Connecting to the Network

This section describes how to connect the FDDI cables (Category 5 UTP and fiber-optic multimode) to the PCI controller 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.

FDDI Duplex SC Connector

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

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 controller to the receive side of the second controller (see Figure 2-7 and Figure 2-9).

The SAS controller can be connected as follows:

- Point-to-point with another FDDI controller 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-AA model), or Category 5 UTP copper cable (for DEFPA-UA model).

The DAS controller can be connected as follows:

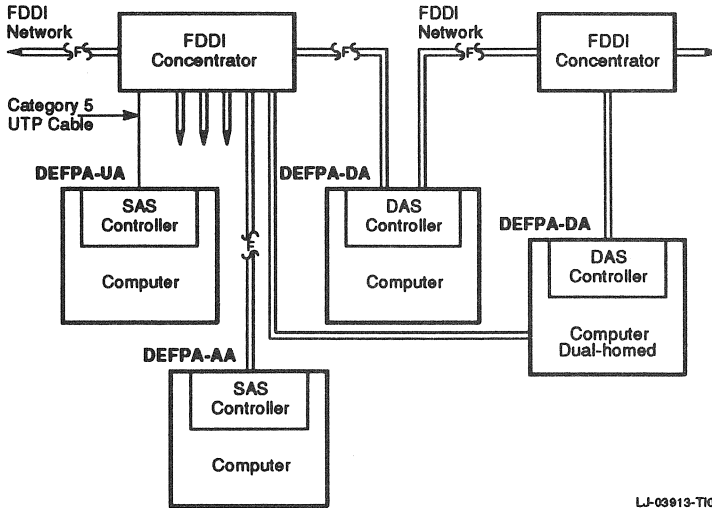
- Directly to the FDDI dual-ring backbone through two pairs of multimode fiber-optic cables.
- Dual-homed, that is, connected to an FDDI dual-ring backbone through FDDI-compliant wiring concentrators, hubs, or switches using two pairs of MMF cables. In this configuration, the ports on the controller 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 controller, or either a single pair or two pairs of MMF cables to a DAS controller.

Figure 2-6 shows an example of how a SAS- or DAS-configured, PCI-compatible computer interfaces to the FDDI network using fiber-optic or Category 5 TP cable.

Figure 2-6 SAS/DAS Controllers Configured in an FDDI Network



LJ-03913-T10

Note

Copper Category 5 UTP and Category 5 sheath-shielded, 100-ohm TP 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.

For further FDDI configuration information, refer to the following publications:

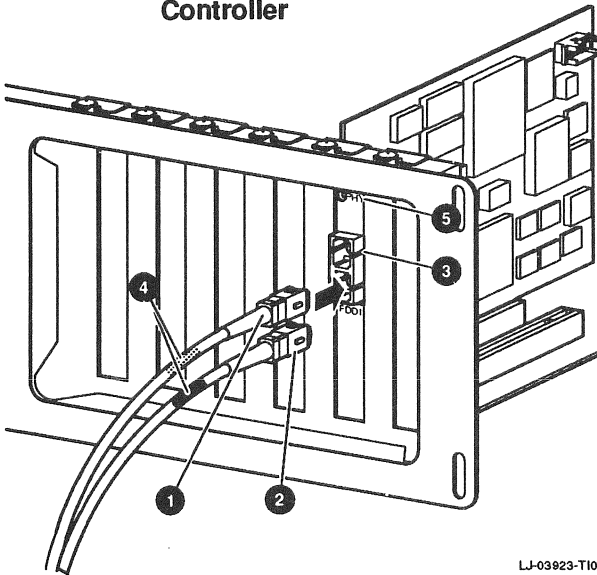
- *Fiber Distributed Data Interface Network Configuration Guidelines*
Order No. EK-DFDDI-CG
- *A Primer on FDDI: Fiber Distributed Data Interface*
Order No. EC-H1580-42/92 07, Version 2.0

Connecting Fiber-Optic SAS Controllers

To connect the fiber-optic SAS controller:

1. Connect both connectors (①, ②) at one end of the cable to the port ③ on your controller (see Figure 2-7). Note the color of the band ④ (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 controller LED ⑤.

Figure 2-7 Connecting the FDDI Cable to a Fiber-Optic SAS Controller



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

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

Connecting UTP SAS Controllers

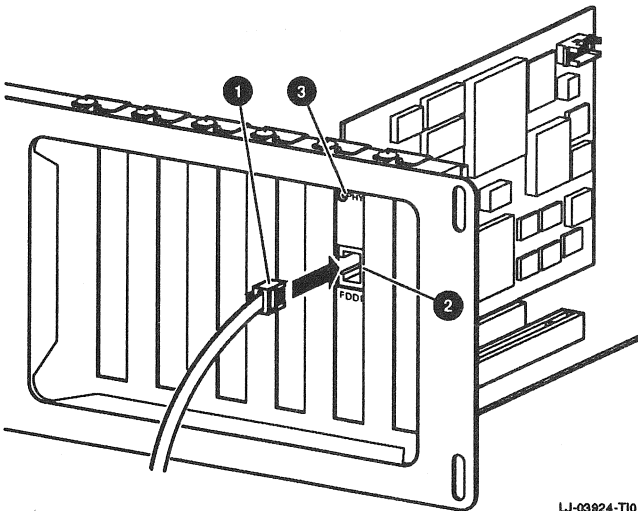
To connect the UTP SAS controller:

1. Connect the FDDI cable ❶ to the RJ-45 connector ❷ on your controller (see Figure 2-8).
2. Observe the controller 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 Chapter 3, *Isolating Network Connection Faults*, to isolate and correct the problem.

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

Figure 2-8 Connecting the FDDI Cable to the UTP SAS Controller



LJ-03924-T10

Connecting Fiber-Optic DAS Controllers

To connect the fiber-optic DAS controller to another controller (or network device) in a dual ring configuration, use two MMF cables as follows:

1. Connect both connectors (①, ②) at one end of cable 1 to the B port ③ of your controller. Note the color of the band ④ (black or white) 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 ⑤ 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 (⑥, ⑦) to the A port ⑧ of your controller. Note the color of the band (black or white) 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 ⑨ 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.

Refer to Figure 2-9.

Note

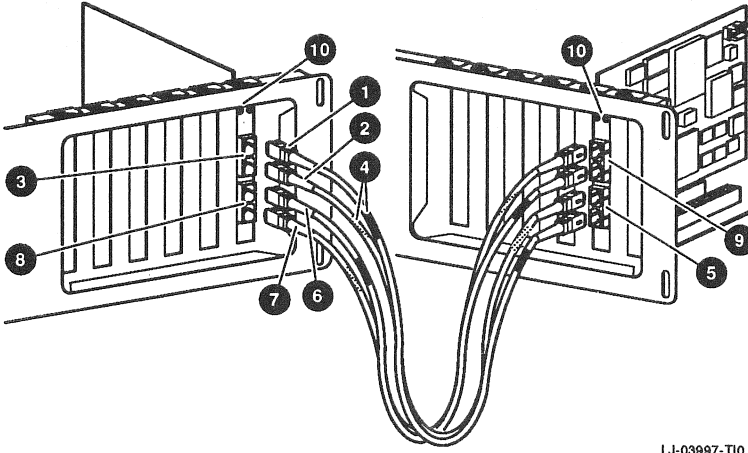
In FDDI dual rings with only two FDDI stations on the dual ring, the other FDDI device mentioned in steps 2 and 4 is the same device (see Figure 2-9).

5. Observe the controller LED(s) ⑩.

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

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

Figure 2-9 Connecting the FDDI Cable to a Fiber-Optic DAS Controller



Warning

While not used or supported by these controllers, 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.

Verifying the Controller Operation on the Network

To verify that your controller is operational in the network, use your network operating system software, such as the executable file NETX.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 Chapter 3, Table 3-3, to isolate and correct the problem. If the problem persists, contact your reseller or authorized Digital distributor.

Installation of the controller is now complete.

Problem Solving

This chapter contains tables describing possible problems with the controller 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:

- **Controller, 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 controller 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 Controller** 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 controller self-test, INSTVER diagnostics, and the Digital local management application (DECLma). The INSTVER and DECLma utilities are useful tools for diagnosing controller installation and network configuration problems.

Diagnosing Problems with a Previously Operational Controller

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 controller, use Table 3-1, Table 3-2, and Table 3-3. These tables list symptoms, 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 controller automatically initiates its self-test and verifies the CPU logic in the unit. The LED(s) on the controller indicate whether the controller 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.

Problem-Solving Tools

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

- A nonattenuated FDDI loopback connector, option number H4085-AA (Part Number 12-44555-01) for testing the FDDI port.
- A UTP loopback connector, for DEFPA-UA models only, option number H4082-AC (Part Number 12-35619-03).

Isolating Controller, Driver Configuration, and Installation Faults

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

Note

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

Table 3–1 Isolating Controller and Driver Configuration and Installation Faults

Symptom	Probable Cause	Corrective Action
System is on; no display.	The controller card is not seated firmly.	Turn off the system and reseal the card firmly.
	The IRQ level of the controller conflicts with another option or video card installed in a PCI bus slot.	Reconfigure the controller 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 card settings conflict with another card in the system.	Reconfigure the controller using different IRQ level settings.
System is on; LED is amber.	With no FDDI cable connected, the controller 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 controller 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 controller installation process and that the controller self-test passes with the FDDI cable attached.

Table 3-2 Isolating Network Connection Faults

Symptom	Probable Cause	Corrective Action
Controller 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 controller and concentrator (Link Error Rate threshold exceeded).	Replace the cable. If the fault persists, a problem with either the concentrator port or the controller is likely.
System is on. Controller 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.

(continued on next page)

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

Symptom	Probable Cause	Corrective Action
System is on. Controller LED is steady amber.	Network problem.	Disconnect the controller cable. If the LED flashes green, the controller is functional. Reconnect the cable, try a new cable, or connect to a different concentrator port.
	Controller problem.	Disconnect the controller cable. If the LED remains amber, the controller might be at fault. Reboot the system and watch the self-test. If the problem persists, contact your reseller or authorized Digital distributor.
Controller 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 controller 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 controller cable or connection.	Verify the integrity of the controller 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.

(continued on next page)

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

Symptom	Probable Cause	Corrective Action
	Faulty controller.	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 controller. If no loopback connector is available, test the cable between the concentrator and the controller. If you verify that the cable is good, test the concentrator. If the concentrator is functional, replace the controller.
Controller LED remains off.	Controller is management disabled.	Enable the port using the DECima utility (refer to the Using the Digital Local Management Application (DECima) section).
	Controller driver is not installed properly.	Reinstall the appropriate driver. If the fault persists, replace the controller.
	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 controller.

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 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 controller token rotation time.

Note

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

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

Running Self-Test

The controller 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 controller logic not covered by the self-test.

Running INSTVER Diagnostics

INSTVER is a DOS-based utility containing the controller's system diagnostic tests. These tests verify the installation beyond the powerup self-test capabilities to include the controller buffer RAM, optical transceiver, connector integrity, and the 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.

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

- **The bus controller chip test** verifies proper operation of this chip. This test verifies controller addressing.
- **The buffer RAM test** verifies the data storage capability of the controller RAM.
- **The internal loopback test** verifies the controller's ability to send/receive an FDDI frame out to (but not including) the controller's optical transceiver.
- **The external loopback test** verifies the controller's ability to send/receive an FDDI frame to/from the network.
- **The display controller address** command displays the physical address of the controller.
- **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 controller interfaces.

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.

General Information

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

Physical Description

The controller is a short IBM AT form-factor card that uses the full PCI-specified, 32-bit bus connector. The controller 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 controller are as follows:

- 1 megabyte 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-AA and DEFPA-DA models)
- ANSI TP-PMD (for DEFPA-UA model)

Specifications

Table A-1 lists the operating environment and power requirements for the controller.

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 maps @ +5.0 V, 1.6 A (maximum) - DAS 1.2 A - SAS MMF, 1.1 A - UTP DC maps @ +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.

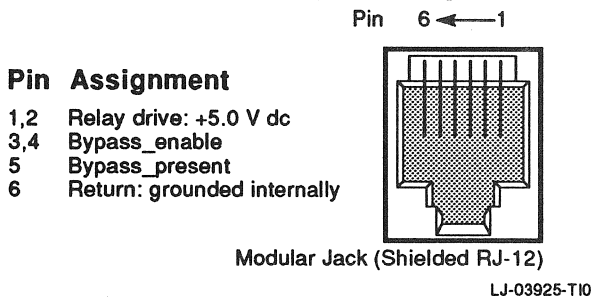
Optical Bypass Relay (OBR) RJ-12 Connector

The OBR connector (see Figure A-1) allows an OBR device to maintain FDDI dual-ring integrity if the controller fails or its power is turned off. An OBR device can be used only with the DAS version of the controller (DEFPA-DA). 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



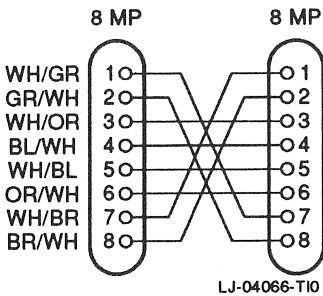
UTP SAS Controller Pin Assignments

The DEC FDDIcontroller/PCI (DEFPA-UA) 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:

- Shielded twisted-pair cable (part number BN26S-03)
- Unshielded twisted-pair 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



When connecting a DEFP-UA controller to another TP-PMD device, an EIA/TIA-568 Category 5 cable must be used. 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

Before creating your own UTP cables for connecting to the DEFP-UA connector, review the cabling constructions shown in the *OPEN DECconnect Applications Guide* (part number EC-G2570-42).

Related Products

The DEC FDDI controller/PCI adapters are part of a complete family of low-cost network interface cards developed by Digital Equipment Corporation. Other products include:

DEC FDDI controller/EISA, a high performance 32-bit adapter for FDDI EISA connections. Three models are available: SAS UTP (DEFEA-UA), SAS MMF (DEFEA-AA), and DAS MMF (DEFEA-DA).

Digital also offers FDDI controllers to support TURBOchannel, FUTUREBUS+, XMI, and Q-bus systems.

EtherWORKS *Turbo PCI* (DE435-AA) and EtherWORKS *Turbo PCI TP* (DE434-AA), high-performance 32-bit direct memory access adapters that enable you to connect PCI-compatible systems into Ethernet networks.

EtherWORKS 3 *Turbo* (DE203-AB), a 16-bit ISA card that supports ThinWire connections.

EtherWORKS 3 *Turbo TP* (DE204-AB), a 16-bit ISA card that supports twisted-pair connections.

EtherWORKS 3 *Turbo PLUS* (DE205-AB), a 16-bit ISA card that supports ThinWire, twisted-pair, and thick wire connections.

Note

All EtherWORKS 3 products feature 128 KB of on-board buffer RAM. These products are available in 5- and 25-multipacks. A Limited Lifetime Warranty is available.

EtherWORKS Pocket Ethernet adapter, an external parallel port adapter available in twisted-pair (DEPEA-AA) and ThinWire (DEPEA-BA) models.

EtherWORKS *Turbo EISA* (DE425-AA), a high-performance 32-bit EISA adapter that supports ThinWire, twisted-pair, and thickwire connections.

To order these products, call 800-DIGITAL in the U.S., or your local authorized Digital distributor.

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 Using Anonymous ftp).

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 type it as shown.

1. Use the Internet application ftp to connect to <ftp.digital.com>. The Internet address is 16.1.0.2.
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:

Note

In the following example, user input is shown in bold text.

```
% 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 Type 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/PCI kit can become outdated as operating system software evolves. To obtain the latest versions of the driver files from the Internet, CompuServe, and the DECpc Bulletin Board Service, use 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 the following:

```
cd /pub/DEC/adapters
```

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. Type `quit` to exit ftp.

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

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

- **CompuServe:**

1. Type `Go decpci` to select the decpci forum and enter the LAN Controllers library.
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.

- **DECpc Bulletin Board Service:**

1. Using a modem (parameters 9600, 8, n, 1), connect to the DECpc Bulletin Board Service in the U.S. by dialing 508-496-8800.
2. Follow the menu-driven instructions on your screen to download the driver files.

C

International Technical Support

Table C-1 lists the telephone numbers to call for technical support for the DEC FDDIcontroller/PCI adapter.

Table C-1 International Technical Support Telephone Numbers

Country	Telephone Number
United States	1-800-354-9000
Australia	31-2-5615252
Austria	0222-86630-555
Belgium	02-7297744
Canada (English)	1-800-267-5251
Canada (French)	1-800-267-2603
Denmark	80301005
Finland	90 9800 2878
France	1-69874123
Germany	01307702
Hong Kong	852-4149779
Israel	052-592-300
Italy	2-1678 20062
Korea	82-2-7991114
Malaysia	60-3-2300111

(continued on next page)

Table C-1 (Cont.) International Technical Support Telephone Numbers

Country	Telephone Number
Mexico	520140810017
Netherlands	030-832888
Northern Ireland	0232 381381
Norway	02-256300
Philippines	623-810-5156
Portugal (Lisbon)	01-3877051
Portugal (Oporto)	02-6068805
Republic of Ireland	01-381216
Singapore	330-6225
Spain (Madrid)	34-(9)1-5834257
Spain (Barcelona)	34-(9)3-4012222
Sweden	08-988835
Thailand	66-254-8191
United Kingdom	025 6-59200

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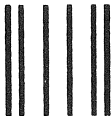
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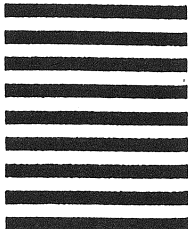


NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 33 MAYNARD MA 01754

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL EQUIPMENT CORPORATION
ADAPTER PRODUCT MKTG LKG1-3/J17
550 KING STREET
LITTLETON MA 01460-9947



digital**digital****Digital Network Adapters
Limited Lifetime Warranty**

Digital is pleased to offer a Limited Lifetime Warranty on its Digital Network Adapters. In addition to the standard three-year warranty, Digital will extend the original warranty for as long as the adapter continues to be used in the computer in which it was originally installed.

Driver software is covered by the standard 90-day limited software warranty, and is not eligible for the Limited Lifetime Warranty.

If you wish to extend your three-year warranty on these adapters to a lifetime warranty, please complete and return the attached product registration card within 90 days of purchase from Digital or a Digital Authorized Reseller. Be sure to include the type and serial number of the computer in which the adapter was originally installed, and the serial number of the Digital Network Adapter (located on the board and on the shipping package).

Failure to complete and return this card does not affect the standard, three-year warranty. Warranty service may be obtained by delivering the defective product to an Authorized Digital Service Center during the applicable warranty period. Returned products must be pre-authorized by Digital with a Return Authorization (RA) number marked on the outside of the package, and sent prepaid, insured and packaged for safe shipment.

Company Name: _____

Date Purchased: _____

Adapter Model Number: _____

Adapter Serial Number: _____

Computer Model Number: _____

Digital Equipment Corporation

Digital Product Registration Card

To activate your lifetime warranty, please provide us with the following information about the end user of this product and return within 90 days of purchase

Name _____ Title _____

Company _____

Dept. _____

Telephone () _____

Address _____

City _____

State _____ Zip _____ Country _____

Adapter Model Number _____

Adapter Serial Number _____

Computer Model Number _____

Computer Serial Number _____

Your company's primary network protocol? (select one)

- OSI DLC SNA NFS IPX/SPX
 TCP/IP DECnet XNS Net BEUI Apple Talk Other _____

Your company's primary network operation system? (select one)

- Novell NetWare LAN Manager Windows for Workgroups
 PATHWORKS Windows NT Banyan VINES
 SCO UNIX OS/1 OS/2
 DOS/Windows Open VMS Other _____

Customers in the areas listed below should send the completed registration card to the appropriate address. Customers in other non-U.S. locations should send the card to the U.S. address on the front of the card.

Pacific Region

Digital Equipment Corporation
410 Concord Road

Europe, Africa, Middle East Areas:

Digital Equipment Corporation Ltd
P.O. Box 110



Software Replication License

Software: Dec FDDI/Controller/PCI Driver

Devices: DEFPA

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