DIGITAL EtherWORKS 1000 PCI Adapter

Installation and Configuration

Part Number: EK-DEGPA-IN. A01

August 1998

Revision/Update Information: This is a new manual.

Digital Equipment Corporation
Maynard, Massachusetts

August 1998

FCC Class B Certification

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 instruction manual, 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:

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

VCCI Class B Compliance

この装置は、第二種情報処理装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅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会（ＶＣＣＩ）基準に適合しております。
しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。
取扱説明書に従って正しい取り扱いをして下さい。

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

Contents

Preface

1 Introduction

2 Installation

3 Connecting to the Network

A General Information

B Online Services

Preface

Overview

This guide explains how to install and configure the DIGITAL EtherWORKS 1000 PCI adapter (also referred to as the DEGPA or adapter) in Alpha and Intel systems.

Intended Audience

This guide is intended for use by system or network administrators experienced in installing similar hardware.

Guide Conventions

This guide uses the following conventions:

Convention	Description
❶	A number in a black circle in text refers to the corresponding number in an accompanying illustration.
Boldface	Boldface type in examples indicates user input.
Italics	Italics in examples indicates a variable. Italics in text emphasizes a term or indicates a book title.
Note	A note contains information of special importance.
`Special Type`	This special type in examples indicates system output.

Package Contents

The DIGITAL EtherWORKS 1000 PCI package contains the following items:

- The DIGITAL EtherWORKS 1000 PCI adapter
- A CD-ROM containing operating system drivers
- This installation and configuration guide
- Antistatic wrist strap
- Antistatic packaging

1
Introduction

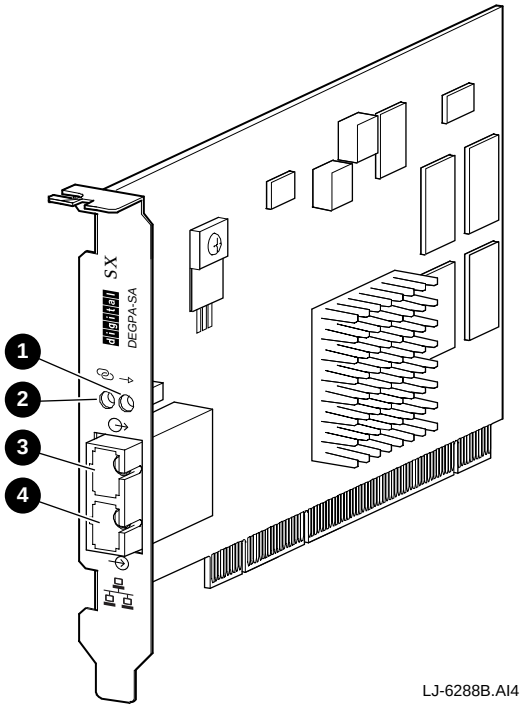
Overview

This chapter describes the DIGITAL EtherWORKS 1000 PCI adapter, and lists the adapter's features and key protocols.

Adapter Description

The DEGPA incorporates a new technology that transfers data at a rate of one gigabit per second—ten times the rate of a Fast Ethernet adapter. This adapter targets the increased congestion experienced at the backbone and server levels by today's networks.

The DEGPA (shown in the following figure) provides an upgrade path for high-end servers and workstations that require more local area network (LAN) bandwidth than either Fast Ethernet or FDDI can provide.



Adapter Components

The following table describes the DEGPA components (shown in the previous figure). The adapter LEDs are used to indicate the status of the adapter and its port.

Reference	Component	Description
❶	Data LED	This amber LED lights (blinking) when data is transmitted or received over the network. It does not light when no data is detected
❷	Link LED	This green LED lights to indicate connection to an active network. The LED does not light when the link is in a failed state, the adapter is not connected to an active network, or there is a configuration mismatch. The LED lights (blinking) if the port is disabled by the software.
❸, ❹	Network Connector	This duplex SC fiber-optic multimode connector is used to connect the DEGPA to the network

Features

The main features of the DEGPA are as follows:

- Full-duplex gigabit Ethernet interface (IEEE 802.3z standard).
- Autonegotiation set as the default. Refer to the Autonegotiation (Link) section in Chapter 2 for more information.
- Standard Ethernet frame size (1518 bytes).
- Capable of supporting jumbo frame sizes (up to 9000 bytes).
- Dual intelligent DMA channels.

- Adaptive interrupt frequency (minimizes system overhead and latency; adapts to traffic load).
- ASIC with on-chip MAC and dual RISC processors.
- PCI Local Bus Revision 2.1 compliant.
- 33/66 MHz, 32- or 64-bit PCI bus master with adaptive DMA.
- Universal dual voltage bus signaling (3.3 V and 5.0 V).
- Duplex SC fiber-optic multimode connector.

Key Protocols and Interfaces

The DEGPA is interoperable with gigabit Ethernet equipment assuming standard Ethernet minimum and maximum frame size (64 to 1518 bytes), frame format, and compliance with the following standards and protocols:

- Gigabit Ethernet (IEEE 802.3z standard)
- Flow Control (IEEE 802.3*x*)
- Logical Link Control (IEEE 802.2)
- SNMP

2
Installation

Overview

This chapter describes how to install the DIGITAL EtherWORKS 1000 PCI adapter into a PCI bus master-compatible system, and how to obtain device driver installation information.

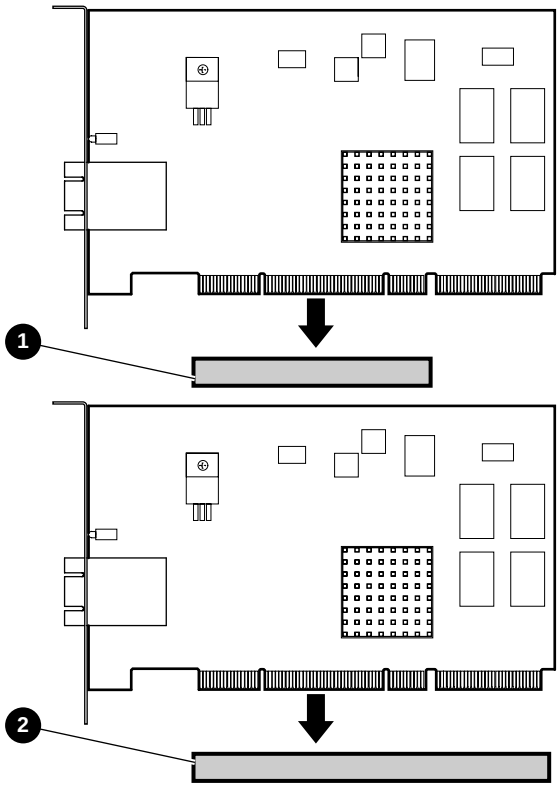
Hardware Installation

To install the DEGPA in your system, complete the following steps:

1. Power down the computer and disconnect the power cable.
2. Remove the system cover.
3. Attach the antistatic ground strap to your wrist and clip the other end of the strap to the computer's chassis ground.
4. Unscrew and remove the option slot cover from the selected PCI slot, insert the adapter into the slot, then secure it with the slot cover screw.
5. Replace the computer's cover, reconnect the power cable, then power up your system.

Note

The DEGPA will work in either a 32-bit ❶ or 64-bit ❷ PCI slot (see the following figure). It is highly recommended that you use a 64-bit slot, if available.



LJ-6297A.AI4

Software Installation

This section provides information on installing the DEGPA software driver in Windows NT, DIGITAL UNIX, and OpenVMS operating systems. For further information, refer to the README.TXT files located on the CD-ROM in the DEGPA kit, and your operating system documentation. Refer to appendix B for information on obtaining the latest driver files.

Windows NT

To install the DEGPA driver in a Windows NT Version 4.0 operating system, use the following procedure:

1. Select Control Panel from the Windows NT Main Menu.
2. Select Network from the Control Panel menu. If installing a network for the first time, select "Yes" when asked if you want to install NT Networking.
3. Follow the screen prompts until you are prompted for a Network Adapter Type, then select "Other."
4. When prompted, insert the driver CD, then click on OK.
5. Modify the default distribution path in the Windows NT Setup box to point to the appropriate path for the DIGITAL Alpha-based system: <CD Drive> \winnt\alpha.
6. Select Continue.
7. Upon completion, the selected adapter is added to the Installed Adapter Cards list in the Network setting box (the number prefixing the adapter is the adapter number).
8. Refer to your *Windows NT Operating System Guide* for network configuration information.
9. Click on Close to complete the network setting initialization.
10. Shut down, then reboot the system

DIGITAL UNIX

To install and configure the DEGPA driver in a DIGITAL UNIX Version 4.0D (or greater) operating system, enter the following commands from your root account:

1. Mount the DEGPA driver CD onto the operating system.
2. **setld -1 /mnt/digitalunix/**
3. When prompted, select option 2, All mandatory and all optional savesets.
4. **halt**
5. In console mode, enter the following:

   >>> **boot -file genvmunix**

6. Log in as root, then enter the following:

   sysconfig -c alt

   doconfig

7. Follow your normal procedure to build a new kernel. After the kernel is built, move it to your root directory by entering the following:

   cp /sys/NAME/vmunix /vmunix

8. Reboot your system by entering the following:

   halt
   init
   b

The DEGPA is now installed and configured for use in your install kernel. Proceed by using setup or netsetup to configure the IP addresses to your DEGPA interfaces. The interface names for the DEGPA driver are alt0, alt1, alt2, and so forth.

OpenVMS

To install and configure the DEGPA driver in an OpenVMS operating system, use the following procedure:

1. Verify that your system is running OpenVMS Alpha Version 7.1-1H1 (or greater).
2. Verify that the ALPBASE02_071 (or greater) remedial kit is installed.
3. **Mount /over=id dka500** (where dka500 is the device name for your CD device).
4. **@sys$update:vmsinstal ALPDEGPA *xx*_071 dka500:[000000.openvms]** (where *xx* indicates the version number).
5. Shut down the system.
6. Install the DEGPA in an available PCI slot (preferably a 64-bit slot).
7. Boot the system.

   If you installed the DEGPA before you installed this kit, then enter the following commands to configure the device without rebooting the system:

   ```
   $ RUN SYS$SYSTEM:SYSMAN
   SYSMAN> IO REBUILD
   SYSMAN> IO AUTO/LOG
   SYSMAN> EXIT
   ```

8. To determine which EtherWORKS device is the DEGPA, enter the following command:

   ```
   $ RUN SYS$SYSTEM:LANCP
   LANCP> SHOW DEV EW/CHAR
   LANCP> EXIT
   ```

   The device that has a line speed of 1000 megabits per second is the DEGPA.

9. Verify that the device is cabled correctly to the switch or point-to-point with another device. If the device is cabled correctly, a link up console message is displayed and the link LED lights solid green.

Diagnostic Support

The adapter's RISC processors run onboard diagnostics when power is applied.

Autonegotiation (Link)

The DEGPA supports autonegotiation. If you are connecting the adapter to gigabit Ethernet equipment that does not support autonegotiation, or if there is a problem establishing a link between two devices, you can turn off autonegotiation by setting the Link Negotiation Enabled parameter to "off." See your README.TXT file on the driver CD for further driver information.

Note

The DEGPA is compliant with the approved IEEE 802.3z autonegotiation specifications (which can be viewed at http://www.gigabit-ethernet.org**)**. Make sure that the two devices you are connecting use the same version of autonegotiation, or turn autonegotiation off on both devices.

3
Connecting to the Network

Overview

This chapter describes how to connect duplex SC fiber-optic multimode cable to the DIGITAL EtherWORKS 1000 PCI adapter and how to connect the adapter to the network.

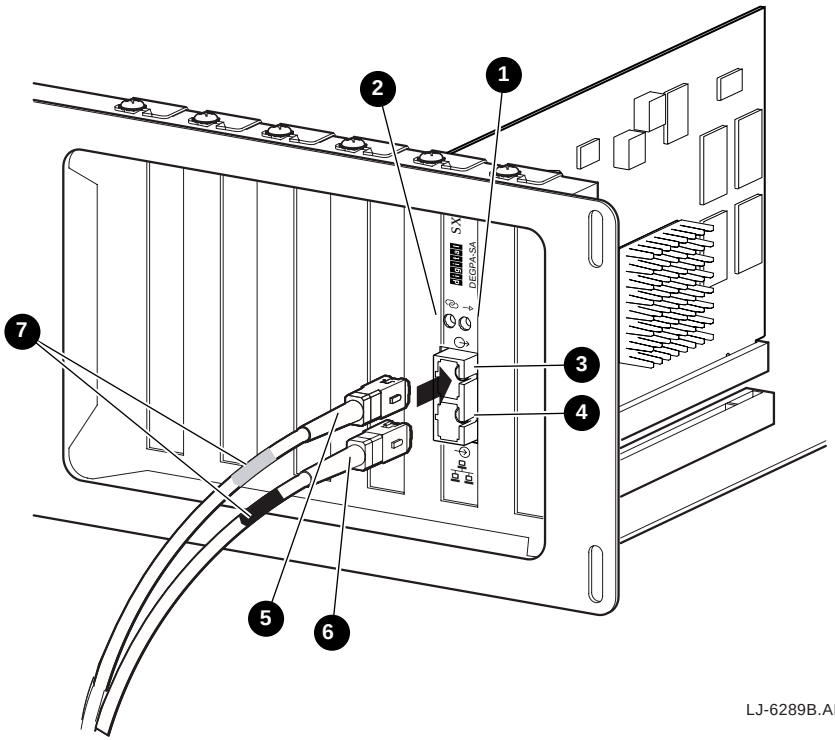
Note

Use DIGITAL duplex SC fiber-optic multimode cable (PN BN34B-*xx*, where *xx* indicates the cable length), or its equivalent, to connect the DEGPA to the network. Refer to the *DIGITAL OPEN DECconnect Applications Guide* (PN EC-G6587-42) for more information about network cabling.

Connecting Fiber-Optic Cable to the Adapter

To connect fiber-optic cable to the adapter:

1. Connect both connectors (❺, ❻) at one end of the cable to the port (❸, ❹) on your adapter (see the following figure). Note the color of the band (❼) on the connector that attaches to the transmit side (❸) of the port.
2. Connect both connectors at the other end of the cable to the other device. Make sure that the connector noted in step 1 is attached to the receive side of the port on the other device.
3. Observe the adapter's Link LED (❷). This LED should light solid green to indicate a proper connection is made.
4. The Data LED (❶) should light when a connection is made and data is either being sent or received.



LJ-6289B.AI4

Link Distance Characteristics

The following table shows the 1000BASE-SX link distance characteristics (IEEE 802.3z standard) for the DEGPA:

Fiber	Bandwidth	Maximum Length
62.5/125	160 MHz	220 meters
	200 MHz	275 meters
50/125	400 MHz	500 meters
	500 MHz	550 meters

A
General Information

Overview

This appendix provides the following general information about the DIGITAL EtherWORKS 1000 PCI adapter:

- Hardware performance specifications
- Physical characteristics
- Power requirements
- Operating environment

Hardware Performance Specifications

The following table shows the hardware performance specifications for the DEGPA:

Feature	Specification
PCI clock	33/66 MHz
PCI data burst transfer rate	132 MB/s
PCI data/address	32/64-bit
PCI modes	Master/slave
1000BASE-SX	2 Gb/s (full-duplex mode)

Physical Description

The following table describes the physical measurements of the DEGPA:

Dimension	Measurement
Length	175 mm (6.87 in)
Width	108 mm (4.25 in)

Power Requirements

The following table describes the power requirements of the DEGPA:

Specification	Measurement
Typical power usage	5.0 V @ 2.0 A, 10 W
Maximum power usage	5.0 V @ 2.8 A, 14 W

Operating Environment Specifications

The following table lists the operating environment requirements of the DEGPA:

Condition	Operating Specification	Storage Specification
Temperature	0°C to 55°C (+32°F to +131°F)	-40°C to +85°C
Relative humidity	5% to 85% noncondensing (40°C, 16 hour dwells at extremes)	5% to 95% noncondensing 10°C/hour
Altitude	Up to 10,000 ft	Up to 35,000 ft
Shock	10g, ½ sine wave, 11 m/s	60g, ½ sine wave, 11 m/s
Vibrations, peak to peak displacement	0.005 in max (5 Hz to 32 Hz)	0.1 in max (5 Hz to 17 Hz)
Vibration, peak acceleration	0.25g (5 Hz to 500 Hz) Sweep rate = 1 octave/min	0.25g (5 Hz to 500 Hz) Sweep rate = 1 octave/min

B
Online Services

Overview

The device driver software included in your DIGITAL EtherWORKS 1000 PCI adapter kit can become outdated as operating system software evolves, or additional drivers become available for the product. Use the following procedures to obtain the latest versions of the driver files.

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/ethernet/degpa/interim

   cd /pub/DEC/adapters/ethernet/degpa/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

World Wide Web

Enter the following universal resource locator (URL) to access the DIGITAL adapter Home Page on the World Wide Web:

http://ftp.digital.com/pub/DEC/adapters/home.html

For the latest drivers, go to:

http://www.networks.digital.com/dr/nics/drivers

Network Product Business (NPB) World Wide Web

For more information on other DIGITAL networking products, go to:

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