

EtherWORKS Turbo PCI

User Information

Order Number: EK-DE435-OM. B01

Revision/Update Information: This is a revised manual.

Digital Equipment Corporation
Maynard, Massachusetts

FCC ID: AO9-DE435

FCC ID: AO9-DE434

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 thick wire 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.

BENUTZERHINWEIS: Das EtherWORKS Turbo PCI-Modul in Verbindung mit Turbo Personalcomputersystemem entsprechen den Funkentstöranforderungen der DBP-Verfugung 523/69 und VDE0871 Grenzwertklasse B.

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About This Manual

The EtherWORKS *Turbo PCI* adapter is a processor-independent network interface card (NIC) designed for the peripheral component interconnect (PCI) bus.

This manual explains how to install the EtherWORKS *Turbo PCI* adapter, how to run the BIOS Setup utility, and how to run diagnostics. To install the *Turbo PCI* adapter, you need to understand the basic concepts and uses of Ethernet networks and be familiar with personal computers.

The two models of the EtherWORKS *Turbo PCI* adapter are as follows:

- EtherWORKS *Turbo PCI* (DE435-AA)—with 10Base2 ThinWire, AUI, and 10Base-T twisted-pair connectors
- EtherWORKS *Turbo PCI TP* (DE434-AA)—with a 10Base-T twisted-pair connector

Reference to the EtherWORKS *Turbo PCI* adapter includes both models unless otherwise noted.

Manual Conventions

This manual uses the following conventions:

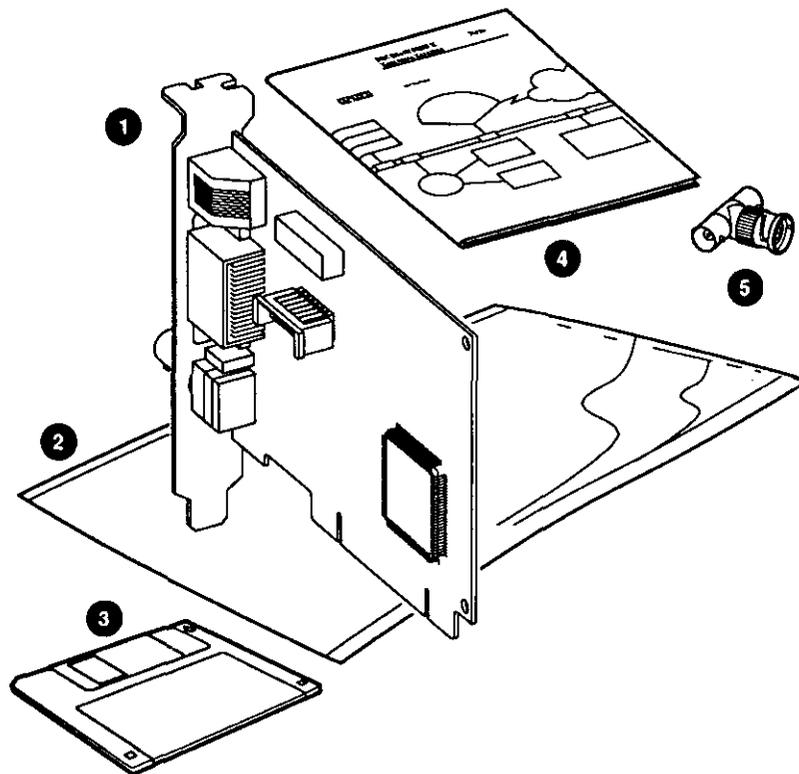
Convention	Description
Note	A note contains information of special importance.
Caution	A caution contains information to prevent damage to the equipment.
PN	Part number.
①	A number in a black circle in text refers to the corresponding number in an accompanying illustration.
Enter	A word in a box indicates 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.

EtherWORKS Turbo PCI Product Kit Contents

The product kit includes the items shown in Figure 1 and Figure 2. Verify that you have the following components before proceeding:

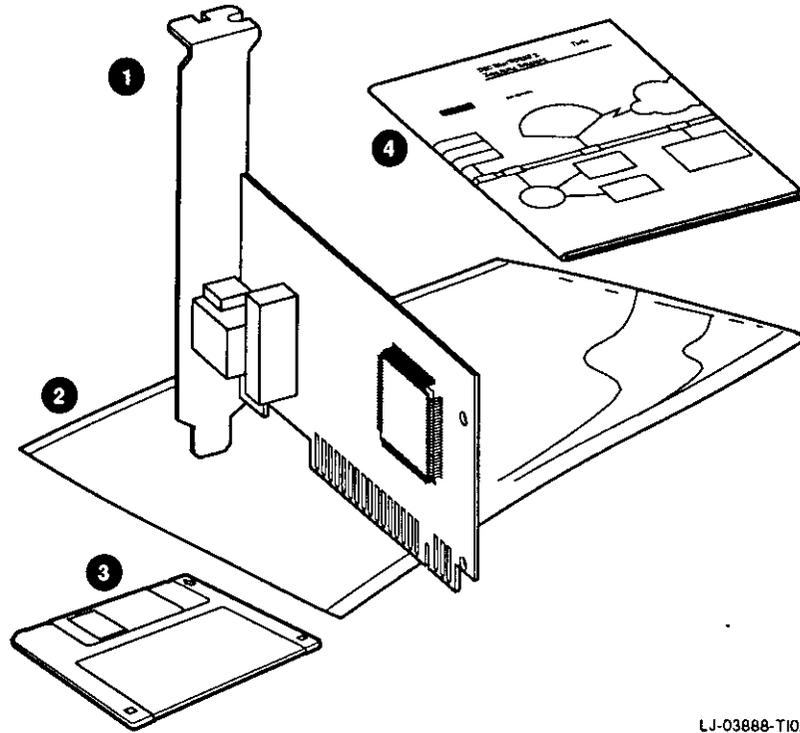
- EtherWORKS Turbo PCI adapter ①
- Antistatic packaging bag ②
- 3½ inch distribution diskette ③
- Owner's manual ④
- T-connector ⑤ (supplied with DE435-AA model only)

Figure 1 EtherWORKS Turbo PCI Kit (DE435-AA)



LJ-03736-T10A

Figure 2 EtherWORKS Turbo PCI TP Kit (DE434-AA)



LJ-03688-T10A

Introduction

This chapter describes the EtherWORKS *Turbo PCI* adapters and briefly summarizes the adapters' features.

The EtherWORKS *Turbo PCI* adapter is a network interface card that enables you to connect PCI-compatible systems (mobile computers, desktop PCs, high-end workstations, and multiprocessor servers) into an Ethernet/IEEE 802.3 network. After you install the adapter in your system, you can use various network software products to integrate your system into a local area network (LAN) environment.

Features

The main features of the EtherWORKS *Turbo PCI* and EtherWORKS *Turbo PCI TP* adapters are as follows:

- Digital-designed VLSI Ethernet chip supports high data transfer rates for optimal network performance
- Low CPU utilization on the host computer
- Optimized system interface and two 256-byte on-chip FIFOs
- High performance 32-bit direct memory access (DMA) architecture
- Full duplex (20 Mb/s) operation in 10Base-T mode
- Auto-configurable
- FCC Class B and VDE Class B certified for worldwide use

- ThinWire, AUI, and twisted-pair Ethernet connections (DE435-AA only)
- Comprehensive set of device drivers for the most popular network operating environments:
 - Novell NetWare
 - Microsoft Windows NT (Intel and AXP)
 - Microsoft Windows
 - Microsoft Windows for Workgroups
 - Digital PATHWORKS
 - LAN Manager
 - SCO Unix
 - DOS
 - OS/2

2

Installation, Configuration, and Diagnostics

The steps to install the EtherWORKS *Turbo PCI* adapter are as follows:

1. Prepare the EtherWORKS *Turbo PCI* adapter (DE435-AA model only) for installation.
2. Install the EtherWORKS *Turbo PCI* adapter into a PCI-compatible computer.
3. Configure your computer (when necessary) using the BIOS Setup utility.
4. Connect your system to the network.
5. Install the device driver software (see Chapter 3).

The only tool you need is a screwdriver.

Caution

Static electricity can damage electronic components. Use an antistatic wrist strap while handling the components.

Preparing the Adapter (DE435-AA Only)

The EtherWORKS *Turbo PCI* adapter provides auto media selection with software media configuration features for 10Base-T twisted-pair networks and 10Base2 ThinWire networks.

If you intend to connect to a 10Base-T twisted-pair network, no adapter preparation is needed—the AUI jumper has no effect. Proceed to the Installing the Adapter section of this chapter.

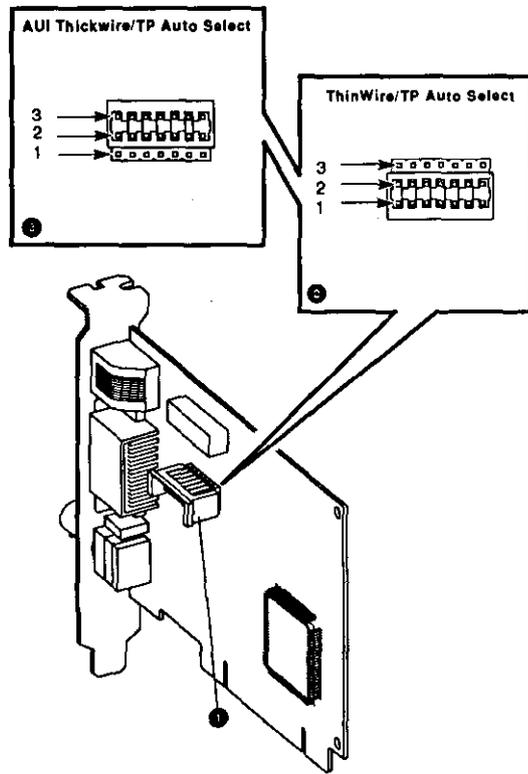
When not using a 10Base-T twisted-pair interface, the AUI jumper (❶, Figure 2-1) automatically determines which media interface—10Base2 ThinWire or AUI—is used. The default AUI jumper setting on the DE435-AA adapter is for a ThinWire network.

If you intend to use an AUI network, change the AUI jumper setting before you install the adapter in your computer. Table 2-1 provides instructions for setting the AUI jumper; Figure 2-1 shows the AUI jumper settings.

Table 2-1 AUI Jumper Settings (DE435-AA Only)

If you want to ...	Then ...
Connect to a 10Base-T twisted-pair Ethernet network	AUI jumper has no effect. No action required. (See Table B-2 in Appendix B for power considerations.)
Connect to a 10Base2 ThinWire Ethernet network ❷	Leave the AUI jumper in the position connecting pin rows 1 and 2 (default setting).
Connect to Ethernet network using AUI cable ❸	Remove the AUI jumper assembly from the adapter. Rotate the assembly 180°, then position it over pin rows 2 and 3. Press the AUI jumper assembly firmly into place.

Figure 2-1 Configuring Media Interface



LJ 02728-10

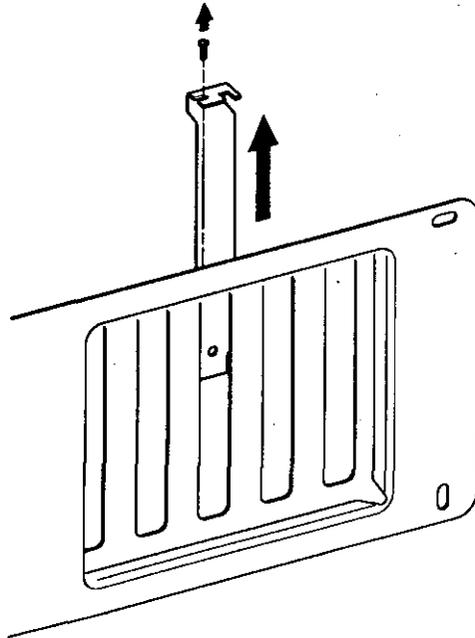
Installing the Adapter

The EtherWORKS *Turbo PCI* adapter has bus mastering support for high performance operation. Refer to your computer documentation to choose a bus-mastering PCI slot on your system.

Use the following procedure to install the EtherWORKS *Turbo PCI* adapter:

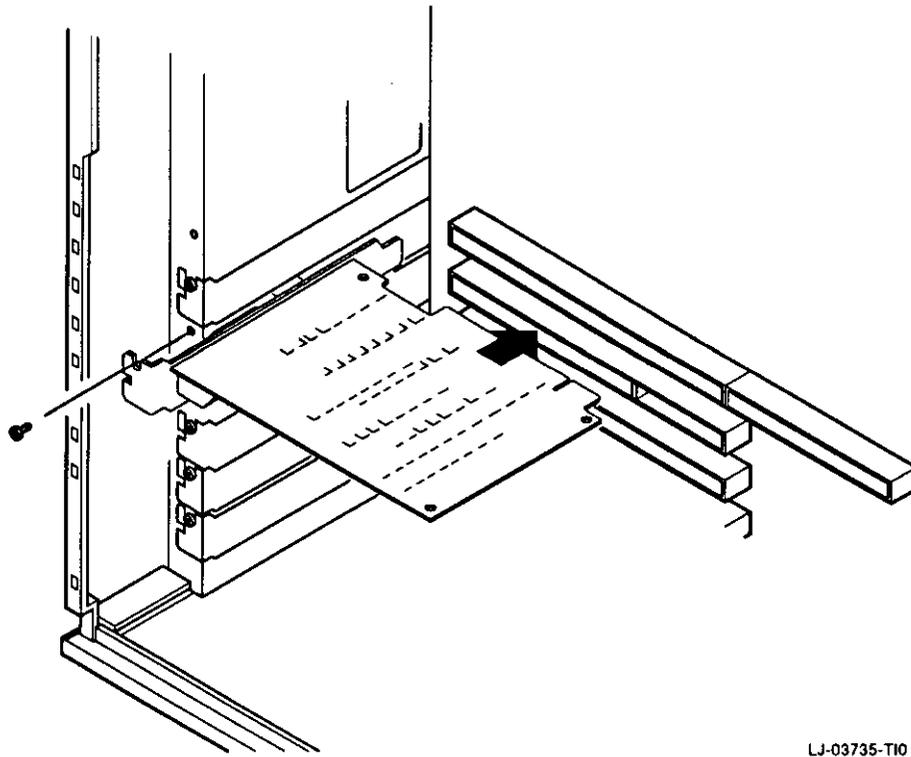
1. Set all power switches (system and peripherals) to the off position.
2. Unplug the power cord from the wall socket, then disconnect the cord from the system unit. Unplug any external devices.
3. Remove the computer cover(s) to access the PCI slots.
4. Unscrew and remove the system's option slot cover from an available PCI slot that supports bus mastering (Figure 2-2).
5. Insert the EtherWORKS *Turbo PCI* adapter into the slot, then push firmly into place (Figure 2-3).
6. Replace the screw to secure the adapter.
7. Replace the computer cover(s).
8. Connect the power cord to the system unit, then plug the power cord into the wall outlet. Reconnect any external devices.
9. Power on the system and peripherals.

Figure 2-2 Removing the PCI Slot Cover



LJ-00462-T10

Figure 2-3 Installing the EtherWORKS Turbo PCI Adapter



LJ-03735-T10

Configuration

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

Note

Refer to your computer documentation for instructions on how to use your system's BIOS Setup utility.

BIOS Setup Utility

The BIOS Setup utility enables you to select and permanently store information about the computer's hardware and software in the battery-backed memory of the CMOS RAM. This information takes effect each time the computer boots and can be changed each time you run Setup.

The PCI device option allows you to configure the PCI slots on your computer's main logic board. Table 2-2 lists the PCI option settings available for the EtherWORKS *Turbo PCI* adapter.

Table 2-2 EtherWORKS Turbo PCI Option Settings

This setting ...	Allows you to ...	EtherWORKS Turbo PCI Requirements
Enable/disable device	Individually enable or disable each PCI slot.	PCI slot must be enabled.
IRQ	Individually set an IRQ default for each PCI slot (none, IRQ 5, 9, 10, 14, or 15).	IRQ 5, 9, 10, 14, or 15.
Enable master	Enable bus mastering on a PCI slot.	PCI slot must be enabled for bus mastering. ¹
Latency timer	Set the PCI latency timer (in PCI clocks) for each PCI device.	All settings supported. The recommended value is 0xF8.

¹Some PCI computers have a slot that does not support bus mastering. Make sure the EtherWORKS Turbo PCI adapter is installed in a PCI slot that has bus mastering capabilities.

Running Setup

To run the BIOS Setup utility, use the following procedure:

1. Power on your computer and allow the power-on self-test (POST) to complete.
2. Make note of any configuration errors listed, then press **F1** to display the setup screens.
3. Follow the instructions on your screen, or from any on-line help pop-up menu, to configure your computer.

Diagnostics

The EtherWORKS *Turbo PCI* distribution diskette contains the NICDIAG Diagnostic utility for DOS-based computers. For other systems, refer to your computer documentation. It is recommended that you run this utility after initial installation to ensure the EtherWORKS *Turbo PCI* adapter is set up to meet your system requirements and to verify the adapter's functionality.

To install multiple adapters in your system, invoke the BIOS Setup utility. Before running the Diagnostic utility, perform the following steps for each PCI slot containing an EtherWORKS *Turbo PCI* adapter:

1. Enable the PCI slot.
2. Assign an IRQ number.
3. Enable bus mastering.

Note

Make sure you perform these steps prior to running the Diagnostic utility.

When you run the NICDIAG diagnostics, make sure both the NICDIAG.EXE and DIAG.EXE files are in the same directory.

The NICDIAG Diagnostic utility prevents diagnostics from running if it detects an active EtherWORKS *Turbo PCI* adapter. The adapter is considered active if a network device driver is loaded. If necessary, remove the statement that loads the device driver in the CONFIG.SYS or other files and cold boot the computer to deactivate the adapter. On some systems, you can press **F5** to bypass all startup files.

Accessing the Diagnostic Utility

To access the Diagnostic utility, use the following procedure:

1. Insert the EtherWORKS *Turbo PCI* distribution diskette into the disk drive.
2. Set the system to the disk drive being used.
3. Type NICDIAG at the DOS prompt.

An introductory window appears. Follow the screen instructions to display the Main Menu.

4. Select the *View Configuration* option, then press to display the current EtherWORKS *Turbo PCI* adapter configuration. Press again to display more detailed configuration information. These parameters are for viewing only, and cannot be changed.
5. Select the *Diagnostic* option, then press to run the diagnostics.

When the diagnostics are complete, the screen displays the diagnostic result code to let you know whether the adapter diagnostics passed or failed.

6. Press to return to the NICDIAG Main Menu.
7. Select the *Exit* option from the Main Menu.

The following warning message appears:

Do you really want to quit? (Y/N)

8. Press Y to exit NICDIAG.
9. Restore the CONFIG.SYS file if modified.
10. Reboot your system.

Connecting to a Network

Use one of the following procedures to connect your system to the network.

Connecting to a Twisted-Pair Ethernet Network

To connect the EtherWORKS *Turbo PCI* adapter to a twisted-pair network:

Plug the twisted-pair Ethernet cable connector into the 8-pin (RJ-45) connector until it clicks and locks in place (see ❶ in Figure 2-4 and Figure 2-5).

To configure a full duplex connection, make sure that you are connecting to another device that supports full duplex mode to avoid serious network problems. Full duplex mode is enabled by the software. See the README.TXT file referenced in Chapter 3 for further information.

Connecting to a ThinWire Ethernet Network (DE435-AA Only)

To connect the EtherWORKS *Turbo PCI* adapter to a ThinWire network:

1. Attach the ThinWire cable(s) to a T-connector.
2. If the system is at the end of an Ethernet segment, attach a terminator to the unused side of the T-connector. If the system is between consecutive networked systems, attach a ThinWire cable to each end of the T-connector. Termination is usually required at each end of a ThinWire cable segment.
3. Push the T-connector onto the BNC connector, then twist the T-connector to lock it in place (see ❷ in Figure 2-4).

Connecting to an AUI Ethernet Network (DE435-AA Only)

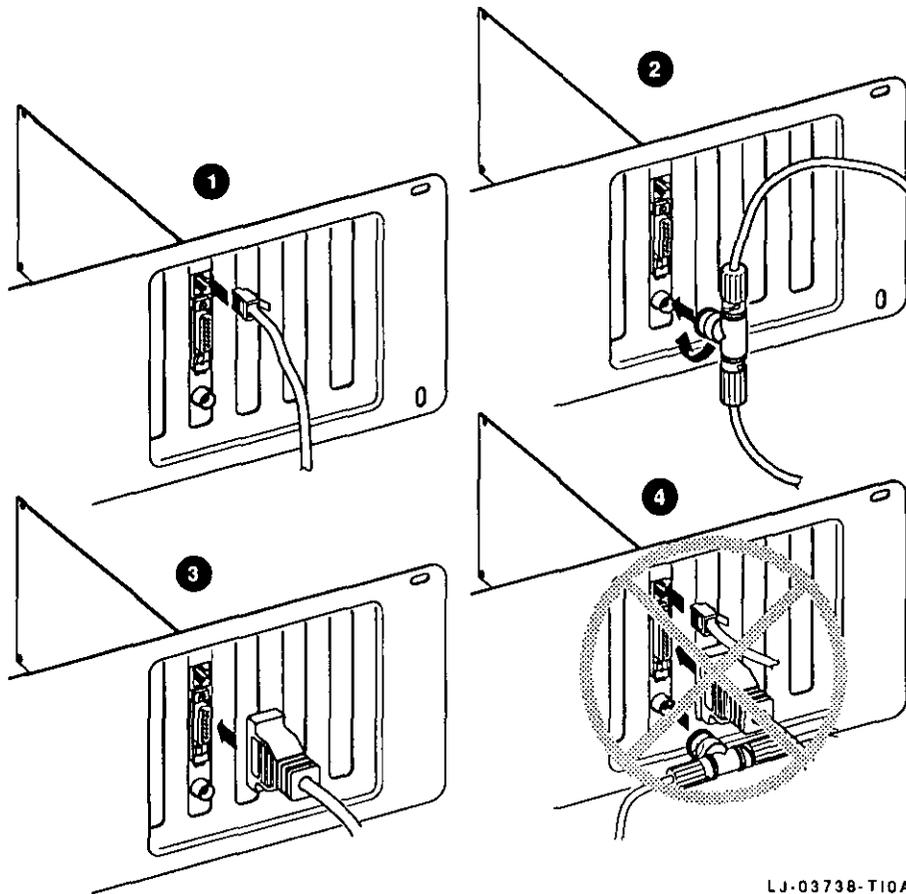
To connect the EtherWORKS *Turbo PCI* adapter to an AUI network:

1. Slide the latch assembly on the adapter's AUI connector upward.
2. Plug the AUI cable connector into the 15-pin AUI connector on the adapter.
3. Slide the latch assembly downward to lock the connector in place (see ④ in Figure 2-4).

Note

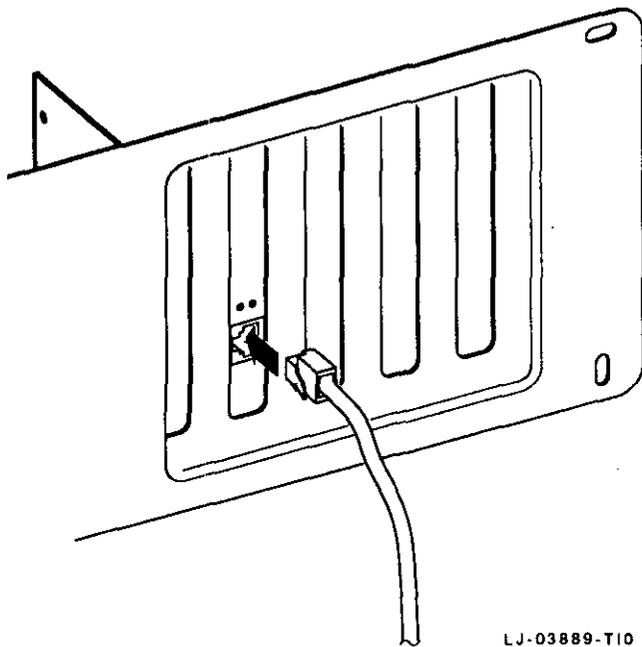
Do not connect more than one Ethernet cable to the EtherWORKS *Turbo PCI* DE435-AA adapter at the same time (see ④ in Figure 2-4).

Figure 2-4 Connecting to the Ethernet Network (DE435-AA)



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Figure 2-5 Connecting to the Ethernet Network (DE434-AA)



LJ-03889-T10

Device Driver Installation Information

The EtherWORKS *Turbo PCI* distribution diskette files, README.TXT and RELEASE.NOT, contain device driver software and installation information. The diskette also contains configuration information for PATHWORKS, LAN Manager-based, Windows NT, and NetWare network operating systems (NOS).

- Refer to the README.TXT file located in the diskette's root directory for a complete list of the supported device drivers and the directory structure for each of the supported operating environments.
- Refer to the RELEASE.NOT file for information about known installation or configuration problems.

The diskette contains additional README.TXT files within the directory structures for each supported operating environment. These files contain information that pertains to the specific device driver or operating environment corresponding to the subdirectory where they are found.

Obtaining the Latest EtherWORKS *Turbo PCI* Driver Files

The device driver software diskette included in your EtherWORKS *Turbo 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 lowercase letters, 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 depci` to select the `depci` forum and enter the LAN Controllers library.
2. Select the *Browse* option to scroll through the library titles.
3. Click on the DE435 title, then press `Return` to display the description of the DE435 file.
4. Select the *Retrieve* option to copy the 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 2400, 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.

A

Problem Solving

This appendix describes problems you could encounter when installing the EtherWORKS *Turbo PCI* adapter and suggests possible causes and solutions. The EtherWORKS *Turbo PCI* adapter is also referred to as adapter in this appendix.

Fault Isolation By Symptom

Table A-1 describes how to isolate faults by the symptoms that occur.

Table A-1 Fault Isolation By Symptom

Symptom	Possible Cause	Recommended Action
The system is on, but there is no display or response from the keyboard.	The monitor is not on or it is not connected to the video board.	Be sure the monitor cable is firmly connected to the video board. Set the monitor power switch to ON.
	The EtherWORKS <i>Turbo PCI</i> adapter is not seated firmly.	Turn the computer off, reseal the adapter, then turn the computer on again (see Chapter 2).

(continued on next page)

Table A-1 (Cont.) Fault Isolation By Symptom

Symptom	Possible Cause	Recommended Action
	The adapter is preventing the computer from operating correctly.	Disconnect the cable from the adapter. Turn the computer off, reseal the adapter, then turn the computer on again. If the problem persists, contact your system administrator or authorized Digital distributor.
	A conflict exists with another adapter in the system:	
	The IRQ settings are incorrect.	Check the BIOS setup.
	The PCI slot containing the adapter is not enabled or not enabled for bus mastering.	Use the BIOS Setup utility to enable the PCI slot.
The system is on, but the network does not start.	The network interface is set incorrectly.	Set the AUI jumper to the correct setting (DE435-AA only).
	The network cable is loose.	Secure the cable. Do not connect more than one Ethernet cable to the adapter at the same time.
	A conflict exists with another adapter in the system:	
	The IRQ settings are incorrect.	Check the BIOS setup.

(continued on next page)

Table A-1 (Cont.) Fault Isolation By Symptom

Symptom	Possible Cause	Recommended Action
	The PCI slot containing the adapter is not enabled or not enabled for bus mastering.	Use the BIOS Setup utility to enable the PCI slot.

Diagnostic Test Errors

Table A-2 describes the EtherWORKS *Turbo PCI* adapter diagnostic test error messages and the recommended corrective actions for each group of messages.

Note

If the adapter detects an error and is not operating, you can still use your computer.

Table A-2 Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 1, Memory allocation error	This message indicates insufficient memory for diagnostics; release some memory. If problem persists, contact your system administrator.

(continued on next page)

Table A-2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 2, Registers W/R error	Ensure adapter is seated firmly in bus slot, or try another available bus slot. If problem persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.
Err 4, Adapter not enabled or found	Ensure the PCI device was configured correctly in the BIOS Setup utility, or try another available bus slot. If problem persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.
Err 5, Undefined error code	This error code is reserved for future use.
Err 7, Bus error: parity error	Adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.
Err 8, Bus error: master abort	
Err 9, Bus error: target abort	

(continued on next page)

Table A-2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 10, EtherWRKS babbler, can't transmit	These messages indicate network-related test failures. If driver was installed before running diagnostics, disable drivers and network software, power down computer, rerun diagnostics. If problem persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.
Err 11, Transmit time-out error	
Err 12, Receive time-out error	
Err 13, Receive data failure	
Err 14, RDES0: receive error detected	
Err 15, RDES0: framing error	
Err 16, RDES0: overflow error	
Err 17, RDES0: CRC error	
Err 18, RDES0: runt frame	
Err 19, RDES0: length error	
Err 20, RDES0: collision seen	
Err 21, EtherWRKS failed to detect CRC error	
Err 22, TDES0: transmit error detected	
Err 23, TDES0: deferred	
Err 24, TDES0: underflow error	
Err 25, TDES0: link fail	
Err 26, TDES0: heartbeat fail	

(continued on next page)

Table A-2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 27, TDES0: excessive collisions Err 28, TDES0: late collision Err 29, TDES0: no carrier Err 30, TDES0: loss of carrier Err 31, TDES0: jabber time-out Err 32, TDES0: chained xmt/rcv test error	These messages indicate network-related test failures. If driver was installed before running diagnostics, disable drivers and network software, power down computer, rerun diagnostics. If problem persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.
Err 33, Internal loopback test error Err 34, 10Base-T internal loopback test error	These messages indicate an IRQ conflict (when two adapters want to use the same interrupt line). Reconfigure the adapter to use another IRQ line. If problem persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.

(continued on next page)

Table A-2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 35, 10Base-T external loopback test error Err 36, AUI external loopback test error	<p>These messages indicate improper termination causing loopback test to fail. Supplemental network tests require loopback connectors for ThinWire or twisted-pair repeater link for twisted-pair testing (available when diagnostics are run from NICDIAG diagnostic menu).</p> <p>To test ThinWire coaxial port, remove adapter from live network, then terminate T-connector. To test the twisted-pair port, adapter must have valid link to a repeater (green LED lights when good link). If LED does not light, check cabling and repeater port.</p> <p>To test AUI port, select AUI port using adapter AUI jumper and connect to AUI Hub or repeater. If error persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.</p>

(continued on next page)

Table A-2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 37, Interrupt mask test error	This message indicates an IRQ conflict (when two adapters want to use the same interrupt line). Reconfigure the adapter to use another IRQ line. If problem persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.
Err 38, Force collision test error	These messages indicate network-related test failures. If driver was installed before running diagnostics, power down computer, then start again. If problem persists, adapter could be defective. Depending on where you purchased the adapter, contact either your authorized Digital distributor or Digital Technical Support.
Err 39, Two buffered xmt/rcv test error	
Err 40, CSR5: transmit process stopped	
Err 41, CSR5: transmit jabber time-out	
Err 42, CSR5: transmit underflow	
Err 43, CSR5: receive buffer unavailable	
Err 44, CSR5: receive process stopped	
Err 45, CSR5: receive watchdog time-out	
Err 46, CSR5: AUI/TP switch	
Err 47, CSR5: full duplex short frame rcv	
Err 48, CSR5: link fail	
Err 49, Multiple xmt/rcv test error	
Err 50, RDESO: dribbling bit error	
Err 51 to 59, Unidentified error code	These error codes are reserved for future use.

B

General Information

This appendix provides general system specifications and cabling requirements for the EtherWORKS *Turbo PCI* adapter.

Physical Description

The EtherWORKS *Turbo PCI* adapter is a PCI form-factor printed circuit board that uses the full 32-bit bus data path interface. The physical descriptions of the two models of the EtherWORKS *Turbo PCI* adapter are as follows:

- The DE435-AA adapter measures 5.086 inches (129 mm) x 3.750 inches (95 mm), and is constructed using four-layer circuit board technology with two signal layers and two power/ground layers.
- The DE434-AA adapter measures 5.06 inches (128.5 mm) x 2.72 inches (69 mm), and is constructed using two-layer circuit board technology.

Functional Components

The major functional components of the EtherWORKS *Turbo PCI* adapter are as follows:

- Ethernet network protocol controller (MAC)
- 10Base-T twisted-pair Ethernet (RJ-45 connector) network interface
- 10Base2 ThinWire Ethernet (coaxial) network interface (DE435-AA only)
- AUI Ethernet network interface (DE435-AA only)

LEDs

During normal system power-up, both the amber and green LEDs turn on and remain on. Once the network software and driver are loaded, or the EtherWORKS *Turbo PCI* adapter's diagnostics are running, the LEDs reflect status as described in Table B-1.

Table B-1 describes the EtherWORKS *Turbo PCI* adapter LEDs.

Table B-1 LEDs

This LED...	Indicates	And the status is...
Amber	Network activity	On or blinking —Network is active. Off —Network is inactive.
Green ¹	Twisted-pair link	On —Link is OK. Off —Link has failed Blinking —Link is failing.

¹This LED is used when twisted-pair or twisted-pair full duplex mode is selected and a twisted-pair cable is attached to the network. Refer to the twisted-pair link LED description for more information.

Network Activity

When the network or diagnostic software is running, the network activity LED turns on whenever transmit or receive data is detected on the network. With low levels of network activity, the LED blinks. As network activity increases, the LED blinks faster, and at times appears to remain on.

Twisted-Pair Link

When the network or diagnostic software is running, the green LED turns on in either Twisted-pair or Twisted-pair Full Duplex mode if receive data or link pulses are detected. If no receive data or link pulses are detected within 150 milliseconds, the green LED turns off, indicating link fail status. When Twisted-pair Link Disabled, AUI, or ThinWire mode is selected, this LED remains on.

Interrupt Request (IRQ) Lines

The IRQ lines can be set to IRQ5, IRQ9, IRQ10, IRQ14, or IRQ15.

Electrical Parameters

Table B-2 shows the electrical parameters for the EtherWORKS Turbo PCI DE435-AA adapter.

Table B-2 Electrical Parameters (DE435-AA)

Cable Type	AUI Jumper	Power Maximum	DC Amps (+5.0 V) Maximum	DC Amps (+12.0 V) Maximum
Twisted-pair ¹	ThinWire	3.4 W	0.2 A	0.2 A
	AUI	1.0 W ²	0.2 A	0.0 A
ThinWire	ThinWire	3.4 W	0.2 A	0.2 A
	AUI ³	7.0 W	0.2 A	0.5 A

¹When using twisted-pair cable, the AUI jumper position affects the amount of power consumed by the EtherWORKS Turbo PCI adapter.

²AUI cable not connected to MAU.

³When using the AUI cable, the amount of +12.0 V dc power used is dependent on the transceiver or medium attachment unit (MAU) to which the adapter is connected.

Note

The maximum power for the EtherWORKS Turbo PCI TP DE434-AA adapter is 1.0 watts; the maximum amount for +5.0 V dc power is 0.2 amps.

Caution

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

Operating Environment

Table B-3 lists the recommended operating environment specifications for the EtherWORKS *Turbo PCI* adapter.

Table B-3 Operating Environment

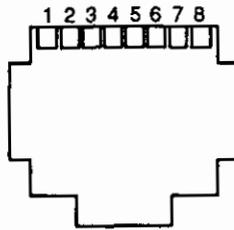
Condition	Value
Temperature (at sea level)	15°C—32°C (59°F—90°F)
Relative humidity	8% to 80% (non-condensing)
Radiated emissions	FCC Class B, VDE Class B

Card Connector Pinning (RJ-45)

The EtherWORKS *Turbo PCI* adapter's 10Base-T twisted-pair networks connector has the following pin signals (see Figure B-1).

Pin Number	Signal Name
1	Transmit +
2	Transmit -
3	Receive +
4	NC (no connection)
5	NC (no connection)
6	Receive -
7	NC (no connection)
8	NC (no connection)

Figure B-1 RJ-45 Connector (Front View)



LJ-00661-T10

Cabling Requirements

Use one of the following cable types, or its equivalent, to connect your EtherWORKS *Turbo PCI* adapter to the network. The xx stands for cable length in meters for each of the following Digital part numbers.

- 10Base-T twisted-pair cable:
 - BN25G-xx or BN26K-xx—Point-to-point unshielded twisted-pair patch cable to connect an EtherWORKS *Turbo PCI* adapter to an office wall plate from a repeater.
 - BN26M-xx—Point-to-point shielded twisted-pair office cable to connect an EtherWORKS *Turbo PCI* adapter to a shielded office wall plate.
 - BN24F-xx—Unshielded twisted-pair office cable with crossover (4-conductor,) 2-twisted pair to connect an EtherWORKS *Turbo PCI* adapter to another EtherWORKS *Turbo PCI* adapter, or an EtherWORKS *Turbo PCI* adapter to an office wall plate from a 900-series DEC repeater.
 - BN26N-xx—Shielded twisted-pair office cable with crossover (4-conductor, 2-twisted pair) to connect an EtherWORKS *Turbo PCI* adapter to another EtherWORKS *Turbo PCI* adapter, or an EtherWORKS *Turbo PCI* adapter to a shielded office wall plate from a 900-series DEC repeater.
- 10Base2 ThinWire cable:
 - BC16M-xx—ThinWire cable used with an H8223-00 T-connector and an H8225-00 ThinWire terminator when connecting to an office wall plate.
- AUI cable:
 - BNE4C-xx—IEEE 802.3 office transceiver cable
 - BNE3H-xx—(PVC) IEEE 802.3/standard transceiver cable
 - BNE3L-xx—(Plenum) IEEE 802.3/standard transceiver cable

For more information about network configuration, planning, and cabling, refer to the *OPEN DECconnect Applications Guide* (PN EC-G2570-42).

Related Products

The EtherWORKS *Turbo PCI* and *EtherWORKS Turbo PCI TP* adapters are part of a complete family of low-cost network interface cards developed by Digital Equipment Corporation. Other products include:

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 for Ethernet networks.

DEC FDDIcontroller/PCI, a high performance 32-bit PCI-to-FDDI adapter, available in three models: SAS UTP (DEFPA-UA), SAS MMF (DEFPA-AA), and DAS MMF (DEFPA-DA).

DEC FDDIcontroller/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.

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

C

International Technical Support

Table C-1 lists the telephone numbers to call for technical support for the EtherWORKS Turbo 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