DEC EtherWORKS 3 Turbo

Installation

Order Number: EK-LEMAC-IN. D01

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Digital Equipment Corporation
Maynard, Massachusetts

FCC ID: AO9-DE204
FCC ID: AO9-DE205

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.

These products are found compliant with the requirements of CISPR-22 Class B, VCCI, and are eligible to bear the CE Mark label.

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About This Manual

The DEC EtherWORKS 3 Turbo adapter is a personal computer (PC) adapter that enables you to integrate IBM compatible PCs into local area network (LAN) environments that use IEEE 802.3 and Ethernet protocols.

This manual explains how to install and configure the DEC EtherWORKS 3 Turbo adapter (also referred to as Turbo adapter or adapter in this manual).

To install the adapter, you need to understand the basic concepts and uses of Ethernet networks, and be familiar with personal computers.

Manual Conventions

This document uses the following conventions:

Convention	Meaning
Note	A note contains information of special importance.
Caution	A caution contains information to prevent damage to the equipment.
PN	The abbreviation for part number.
❶	A number in a black circle in text refers to the corresponding number in an accompanying illustration.
Enter	A word in a box indicates a particular keyboard key. For example, Enter indicates the Enter key.
`This type`	Text in monospace type indicates text you enter or text that the system displays.

Product Kit Contents

The product kit includes the items shown in Figure 1 or Figure 2, depending on whether you have a DE204 or DE205 model adapter. Verify that you have the following components before proceeding:

- DEC EtherWORKS 3 Turbo adapter ❶
- Owner's manual ❷
- Antistatic packaging ❸
- 3½-inch distribution diskette ❹
- T-connector ❺ (supplied with the DE205 adapter only)
- AUI jumper ❻ (installed on the DE205 adapter)

Figure 1 DE204 Product Kit

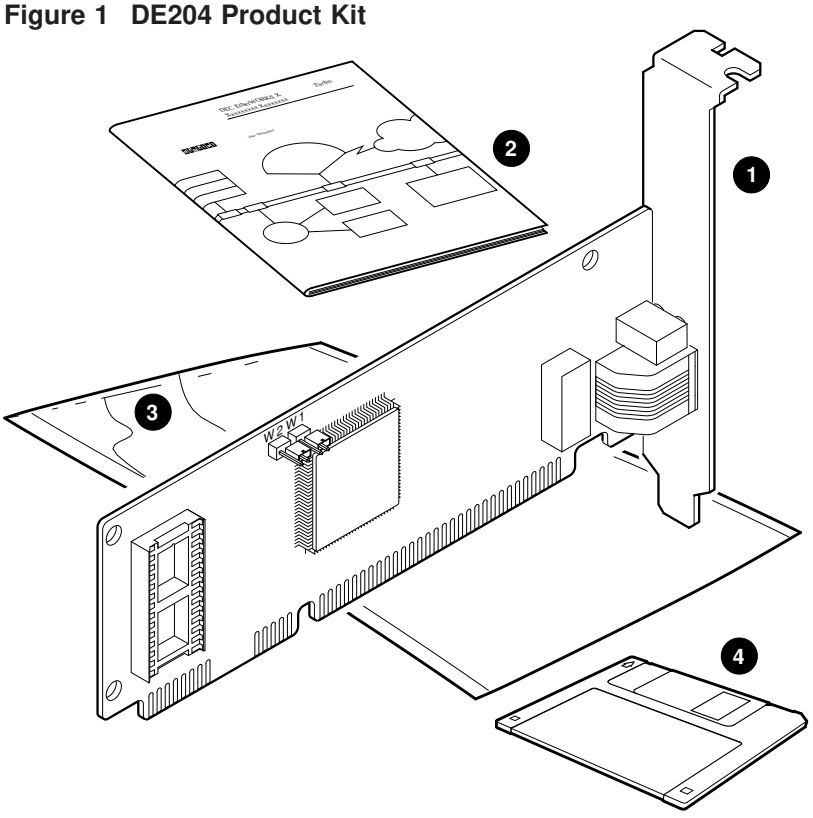

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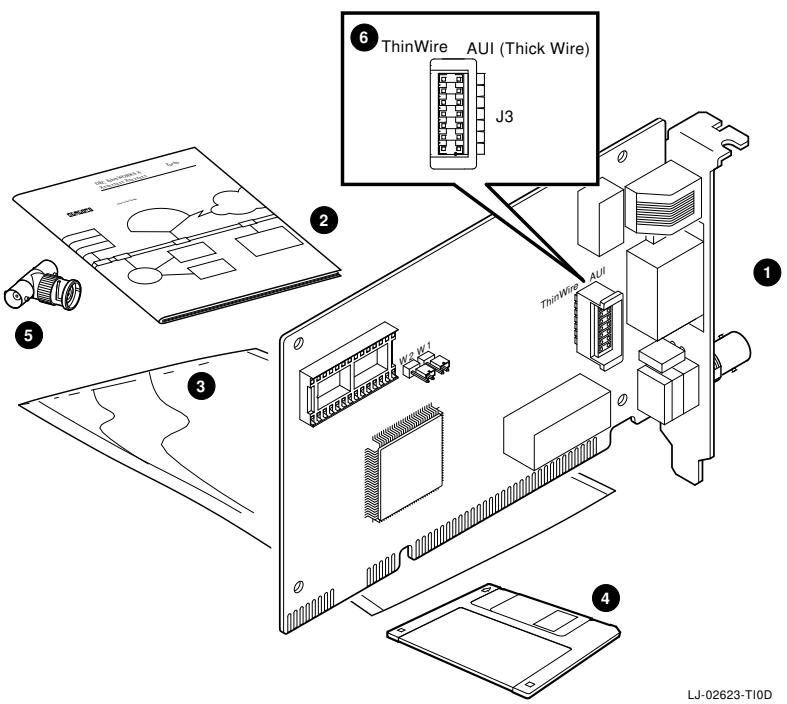
Figure 2 DE205 Product Kit



1
Introduction

This chapter describes the DEC EtherWORKS 3 Turbo adapter and briefly summarizes the adapter's features.

The Turbo adapter is a high-performance adapter that enables computers to reach file, disk, application, print, and network services from Ethernet networks. The Turbo adapter supports Digital's PATHWORKS network operating system as well as multivendor computer network operating systems through NDIS, ODI, and IPX-compliant device driver software.

The two models of the Turbo adapter and their connectors are as follows:

- DE204 TP–10Base-T twisted-pair connector
- DE205 Turbo PLUS–10Base-T twisted-pair, 10Base2 ThinWire, and AUI connectors

Product Features

The main features of the Turbo adapter are as follows:

- High-performance 16-bit network interface card (NIC)
- 128 KB on-board buffer RAM
- Easy installation on DOS-based systems using the EZWORKS Installation utility
- Automatic and complete installation of NetWare DOS VLM client using the EZWORKS Installation utility
- Optional boot ROM support (MOP and RPL) up to 128 KB
- Dynamic buffer management that ensures maximum performance in heavy network traffic
- Interfaces to either ISA or EISA system bus
- Supports Ethernet and IEEE 802.3 industry standards
- FCC Class B, CISPR-22 Class B, VCCI, and CE Mark compliance
- Limited lifetime warranty with the return of the warranty registration card to Digital
- Full suite of software support including the following:
  - NetWare ODI server
  - NetWare ODI client (DOS and OS/2)
  - NetWare IPX (IPX.COM) client
  - PATHWORKS
  - Windows NT
  - Windows 95
  - Windows for Workgroups

- LAN Manager (DOS and OS/2)
- LAN Server (OS/2)
- Banyan VINES client
- Packet Driver
- SCO UNIX
- UnixWare UNIX
- OpenVMS
- OSF/1
- FreeBSD UNIX
- Linux UNIX
- MOP/RPL remote boot

2
Hardware Installation

This chapter describes how to install a DEC EtherWORKS 3 Turbo adapter into your computer and how to connect it to the network.

Note

Before you begin, make a backup copy of the diskette included in the product kit.

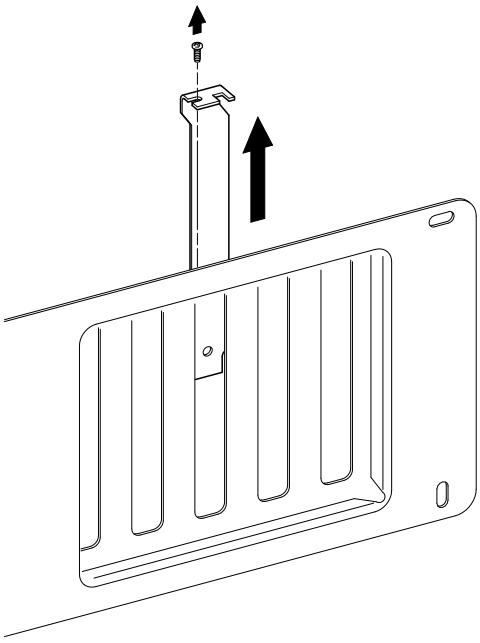
Installing the Adapter

To install a Turbo adapter in your computer, use the following procedure:

1. Unplug the computer, then disconnect all cables that are connected to the main system unit.
2. Remove any diskettes from the computer disk drives.
3. Remove the computer's cover.

4. Unscrew and remove the option slot cover from the slot you plan to use (Figure 2–1).

Figure 2–1 Removing the Slot Cover



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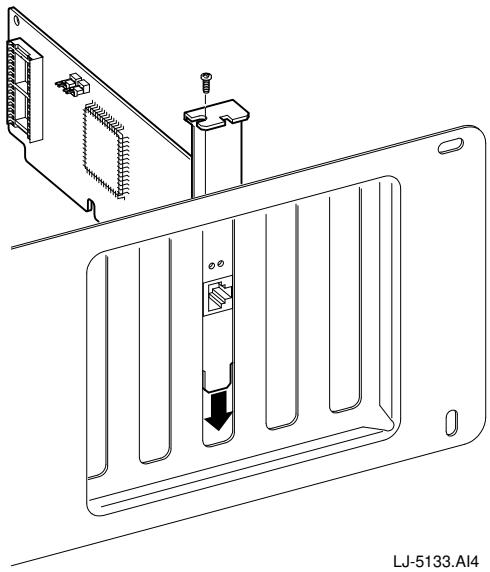
5. Install the boot ROM chip (optional) on the adapter.

6. Insert the adapter into the slot (Figure 2–2), then replace the screw to secure the adapter.
7. Replace the computer's cover, reconnect the cables, then power up your system.

Figure 2–2 Installing a DEC EtherWORKS 3 Turbo Adapter



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Caution

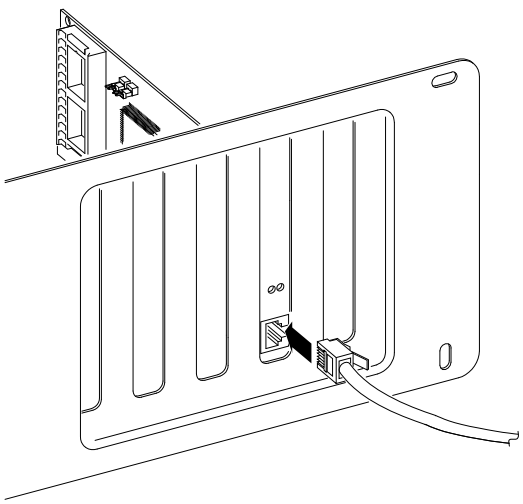
Ensure that there are no missing slot covers when you complete the installation.

Connecting to an Ethernet Network

Figure 2–3 and Figure 2–4 show how to connect the following types of Ethernet cables to the connectors on their respective Turbo adapter:

- The DE204 Turbo TP adapter connects to twisted-pair cable (Figure 2–3).

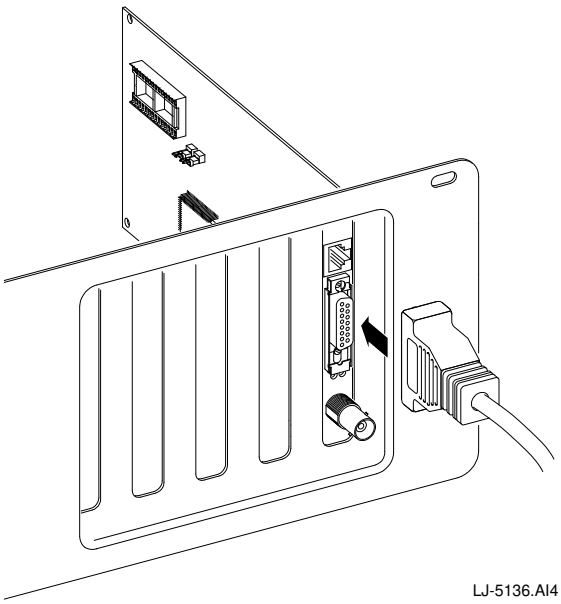
Figure 2–3 Connecting the DE204 to Twisted-Pair Ethernet Cable



- The DE205 Turbo PLUS adapter connects to AUI thick wire (Figure 2–4). Use cable PN BNE4C-*xx*, where *xx* is the cable length in meters.

  When using an AUI cable connector, be sure to slide the latch assembly downward to lock the connector in place.

Figure 2–4 Connecting the DE205 to AUI Thick Wire Ethernet Cable



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The DE205 Turbo PLUS adapter also supports ThinWire and twisted-pair connections.

Selecting the Network Interface

The DE205 adapter has an AUI jumper (J3) that you set to select the network interface. The AUI jumper has a three-row jumper arrangement. The connector's default setting automatically selects either the ThinWire or twisted-pair interface. If you need AUI thick wire connectivity, you must change the AUI jumper settings.

Table 2–1 summarizes the AUI jumper settings. Figure 2, ❻ (in the About This Manual section) shows the AUI jumper set to the default, and the AUI thick wire and ThinWire settings that are printed on the adapter.

Table 2–1 AUI Jumper Settings

If you want to . . .	Then . . .
Connect to a ThinWire or twisted-pair Ethernet network	Leave the right row of pins on the AUI jumper open (the default setting).
Connect to a thick wire (AUI) Ethernet network	Leave the left row of pins on the AUI jumper open.

Caution

Static electricity can damage printed circuit boards and chips. It is strongly recommended that a grounded wriststrap and grounded work-surface-to-earth ground be used when handling these components.

Resolving Bus Conflicts on ISA and EISA Systems

Once you have installed the Turbo adapter, you are ready to turn on your computer and begin the setup and software device driver installation.

The Turbo adapter is shipped with the following preprogrammed factory-default settings:

- Memory address: D0000h to D07FFh (2-KB mode)
- I/O base address: 300h
- Interrupt value: 5

If a setting conflicts with a resource in the system, the system may be unable to access the adapter. If this occurs, use jumpers to cover either the W1 or W2 posts, or both, to override the factory default settings. (This is called a hardstrap override.)

Table 2–2 lists the available jumper selections. Figure 2–5 shows the factory-default (out position) default jumper settings ❶ for W1 and W2 on the DE204 and DE205 adapters.

Note

If a hardstrap override does not resolve the system conflict, contact your Digital Service Representative.

Figure 2–5 Hardstrap Jumpers

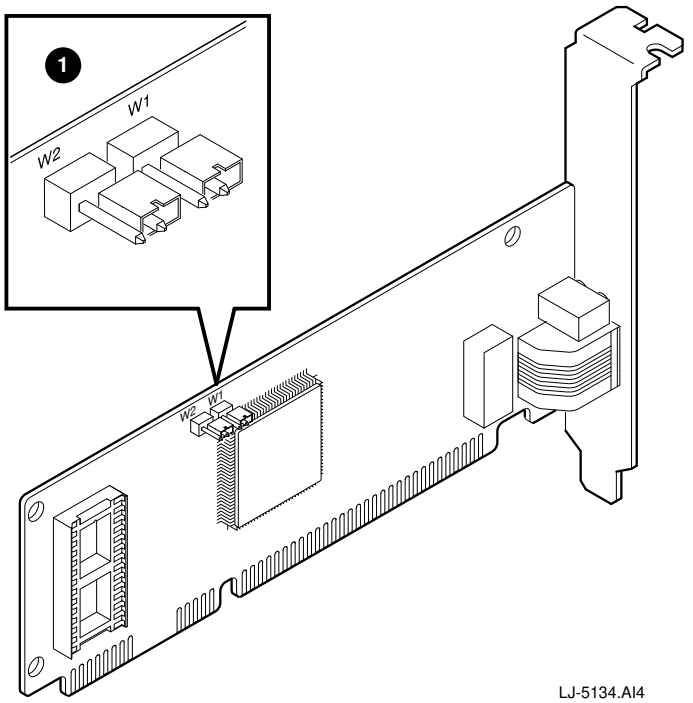


Table 2–2 Hardstrap Override for the Turbo Adapters

Jumper			
W2	**W1**	**I/O Base Address**	**Mode**
In	In	200h	I/O only, no memory address and no IRQ assigned
Out	In	280h	I/O only, no memory address and no IRQ assigned
In	Out	EISA	I/O only, no memory address and no IRQ assigned
Out	Out	EEPROM	User defined from the EZWORKS Installation utility or factory defaults

Once a hardstrap override resolves the system conflict, you can continue setting up the adapter, as described in Chapter 3.

To resolve bus conflicts:

1. Turn off the computer's power.
2. Hardstrap the adapter by inserting one or both W1 and W2 jumpers on the adapter.
3. Turn on the computer's power, then run the EZWORKS Installation utility (see Chapter 3). Select the Change/View Permanent Settings menu item from the EZWORKS Tools option, then change the adapter setup to resolve the conflict.
4. Save your changes by selecting the Exit and save settings option.
5. Turn off the computer's power, remove the jumpers (Figure 2–5), then turn the power back on. If the conflict is not resolved, repeat the procedure.

3

Using EZWORKS for Installation, Diagnostics, and Configuration

This chapter provides information about how to use the EZWORKS Installation utility for software installation and diagnostics, and to customize the adapter's configuration.

EZWORKS Installation Utility

The DEC EtherWORKS 3 Turbo distribution diskette contains the EZWORKS Installation utility to help you configure the adapter. The utility can configure and display setup options for up to four adapters in a system.

Note

The EZWORKS Installation utility is based on the DOS operating system. If you are using another operating system, you need to boot your system from a DOS-based diskette and complete the Setup described later in this chapter). Then, reboot the system to the operating system of your choice.

The EZWORKS Installation utility provides the following:

- Information about the DEC EtherWORKS 3 Turbo adapter (for example, the adapter's current settings)
- Capability to change the adapter's permanent configuration settings
- Capability to configure the settings on an installed remote boot ROM
- Capability to configure and install your system's NetWare ODI client
- Command line switches to configure the adapter and to display adapter information
- Device driver installation instructions
- Capability to run diagnostics
- Capability to detect MS–DOS startup menu items

This information is accessed from menu bar options and pop-up menus.

Note

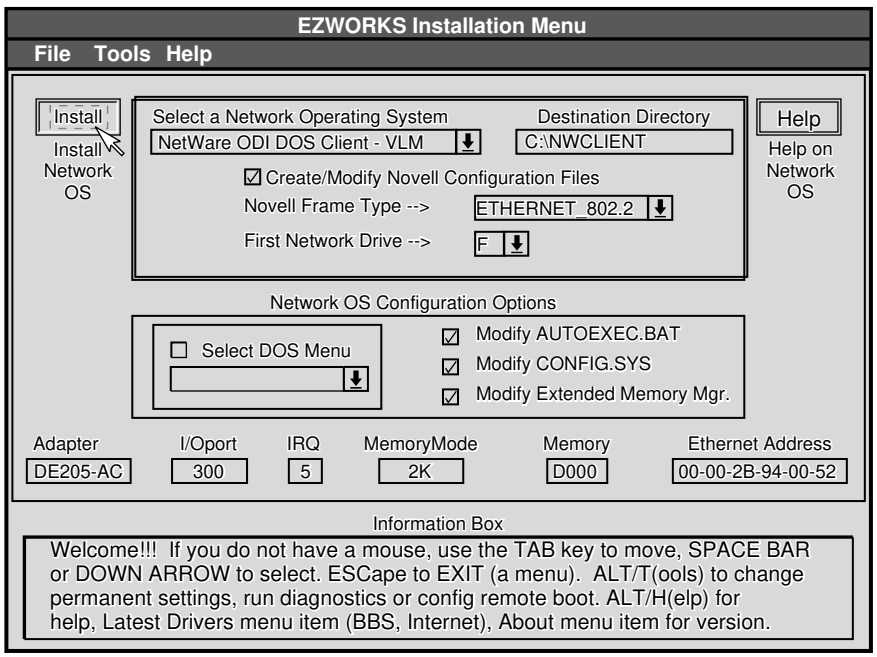
When you click on any box on the EZWORKS Installation utility menu, the information box, located at the bottom of the menu, displays information about that selection.

Running the EZWORKS Installation Utility

To run the EZWORKS Installation utility:

1. Insert the distribution diskette into drive A, then set your default to A:.
2. Enter `Setup` at the DOS prompt to start the EZWORKS Installation utility and display the main menu (Figure 3–1).

Figure 3–1 EZWORKS Installation Menu



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If your system has a DOS startup menu on startup, you can select a specific menu item in which to place the startup command for the currently selected network operating system (NOS). Otherwise, the selected NOS startup command is placed at the bottom of your AUTOEXEC.BAT file.

If you do not wish the utility to add any commands to your AUTOEXEC.BAT file, click on the Modify AUTOEXEC.BAT option to turn it off.

3. Click on the Install button to install and configure the selected network operating system, including drivers.

Note

The EZWORKS Installation utility is automatically ready to install and configure your system as a NetWare ODI client. Once the information box indicates that the NetWare ODI client installation is complete, reboot your system to connect to your NetWare server.

4. Click on the Help box to display device driver installation instructions for the selected NOS.
5. Click on the information boxes, located at the bottom of the menu, for explanations of the adapter's settings.

Note

If multiple adapters are installed in your system, a Multiple cards detected button will be displayed. Click on the button for information about additional DEC EtherWORKS 3 Turbo adapters installed in your system.

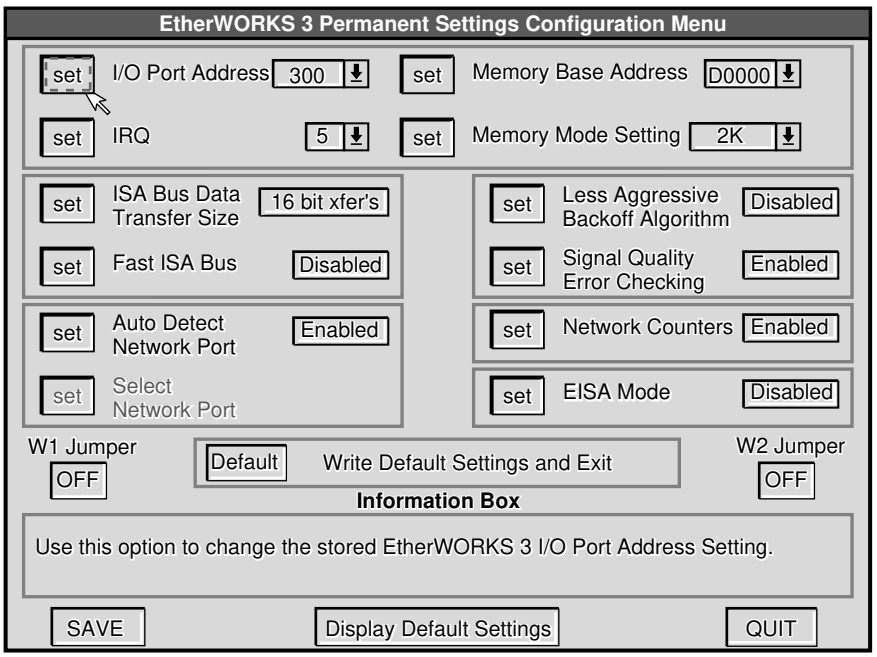
6. Click on the Tools option menu items to change or view permanent adapter settings, run diagnostics, or configure an installed remote boot ROM.
7. Click on the Help option menu items to display an explanation of the EZWORKS Installation utility, to obtain the latest device drivers (from the Latest Drivers menu item), and to show the version number of the utility (from the About menu item).

Configuring and Viewing Adapter Permanent Settings

To change or view the permanent settings on the Turbo adapter, use the following procedure:

1. Click on the Change/view permanent settings menu item from the Tools option to display the EtherWORKS 3 Permanent Settings Configuration menu (see Figure 3–2).

Figure 3–2 EtherWORKS 3 Permanent Settings Configuration Menu



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2. Change settings as needed according to your computer's configuration.
3. Click on the Save button to save any changes you make.
4. Power off your computer for changes to take effect.

Changing Settings

The Change/view permanent settings menu item selected from the Tools option enables you to change the settings for the following parameters:

- I/O Port Address–This address is where the network interface adapter is located. It is important that the I/O Port Address does not conflict with other devices on the system.

  The default address range is 300h to 3C0h. If this does not work, you have to hardstrap the Turbo adapter. If you need to select a different I/O address range, refer to the Resolving Bus Conflicts on ISA and EISA Systems section in Chapter 2 before running the EZWORKS Installation utility.

- Memory Mode Setting–This is the amount of actual memory utilized and owned by the Turbo adapter. There are four selections: I/O only, 2 KB, 32 KB, and 64 KB.

  In most cases, it is recommended that 2-KB mode be used to leave a maximum amount of high memory for other application programs. Refer to the README.TXT file of the particular device driver to determine which memory modes are supported.

- Memory Base Address–This is the starting memory address where the Turbo adapter's network buffer is located.

  Only one device can use a given memory address range. Check the documentation supplied with your computer and other installed products to determine memory address requirements and availability. If other products use a memory range that conflicts with the Turbo adapter, select a range that is not used. Depending upon the memory mode selected, the Turbo adapter can be in any unused high memory area.

On DOS-based systems, running the MSD utility can help determine conflicts with the Turbo adapter's configured memory range.

Selecting a memory mode address in the A0000 to C7FFF range may cause a conflict with some system video adapters. Likewise, selecting a memory mode address in the F0000 to FFFFF range may cause a conflict with the system area of some PCs. In both cases, it is highly recommended that you select an address in the C8000 to EFFF range. (See Appendix B for further information.)

- IRQ–This menu item value is the specific line that the network interface adapter uses to interrupt the CPU.

  It is important that this line not be used by any other device in the system; each device requires its own interrupt line. The default interrupt line is set to IRQ5. Other possible settings are IRQ10, IRQ11, and IRQ15.

- ISA Bus Data Transfer Size–This menu item can be used to select 16-bit or 8-bit memory transfers. The 16-bit transfer is the default mode and provides the best performance.

- Fast ISA Bus–Enable this menu item if the bus clock speed is greater than the standard 8.33 MHz. This item does not yield any performance improvements, but allows the Turbo adapter to interoperate with a system that has a fast bus. A typical fast bus speed is 10 MHz. This setting may be needed for earlier (286) systems; otherwise, it should be disabled.

- Auto Detect Network Port–This menu item enables the Turbo adapter to automatically detect the network port to use (DE205 adapter only).

- Less Aggressive Backoff Algorithm–This menu item enables the Turbo adapter to be less aggressive when transmitting packets on the network. This may be necessary on very busy networks, but could degrade adapter performance.

- Signal Quality Error Checking–This menu item configures the Turbo adapter to expect the SQE (heartbeat) signal when using the thick wire Ethernet interface.
- Network Counters–This menu item enables custom or optional network statistical counter support if this is supported by the Turbo adapter's driver.
- EISA Mode–This menu item enables the Turbo adapter to be configured in an EISA system by the EZWORKS Installation utility. Configuring the Turbo adapter to run in EISA mode does not affect the adapter's performance.
- Default–This menu item configures the Turbo adapter for factory default settings. Select the Display default settings button for a list of the factory default settings.
- W1/W2 Jumpers–These jumpers should only be used when trying to correct a conflict with a computer resource (such as the I/O port setting).

Diagnostics

As previously mentioned, the diagnostics for the DEC EtherWORKS 3 Turbo adapter are run from the EZWORKS Installation utility. It is recommended that you run diagnostics after initial installation to ensure that the adapter is set up to meet your system requirements and to verify the adapter's functionality.

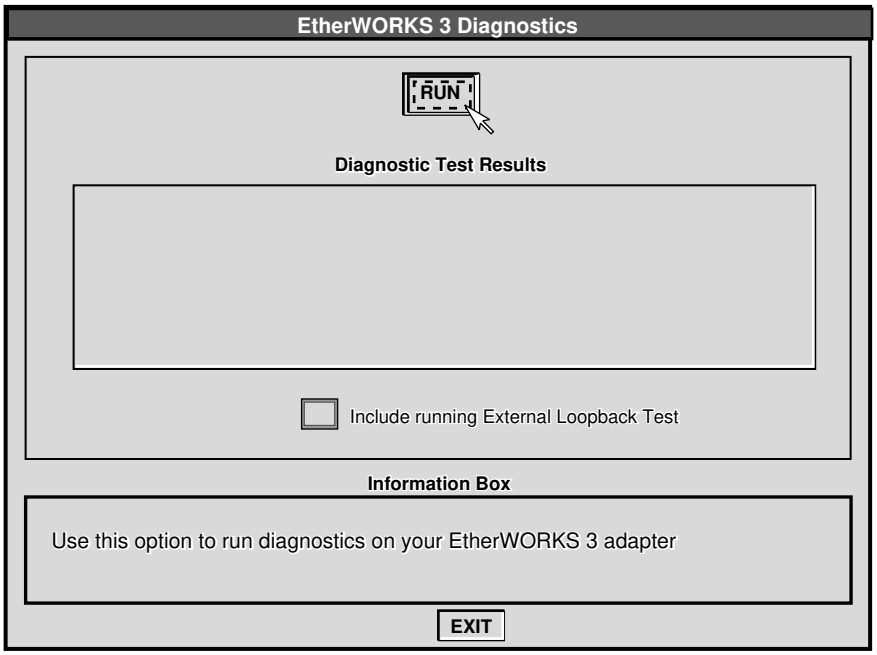
If the adapter is active (when a network device driver is loaded), diagnostics will not run. If necessary, comment out the command that loads the device driver in the CONFIG.SYS or other files, then cold boot the computer to deactivate the adapter. For Windows 95 users with NDIS3 installed, perform a system shutdown, then select the Restart the computer in MS–DOS mode option.

Running Diagnostics

To run EZWORKS diagnostics:

1. Click on the Diagnostics menu item from the Tools option (shown in Figure 3–1) to display the menu shown in Figure 3–3.

Figure 3–3 EtherWORKS 3 Diagnostics Menu



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2. Click on the Run button to perform diagnostics.

   The test results are displayed on the screen.

3. Click on the appropriate button if you wish to include the external loopback test.

   If you enable the external loopback test when running EZWORKS diagnostics, you will receive a Loopback Error message unless you terminate the BNC T-connector (on the DE205) with two 50-ohm terminators, or terminate the other network port (TP or AUI) with a loopback connector. Performing the external loopback test on a live network is not recommended.

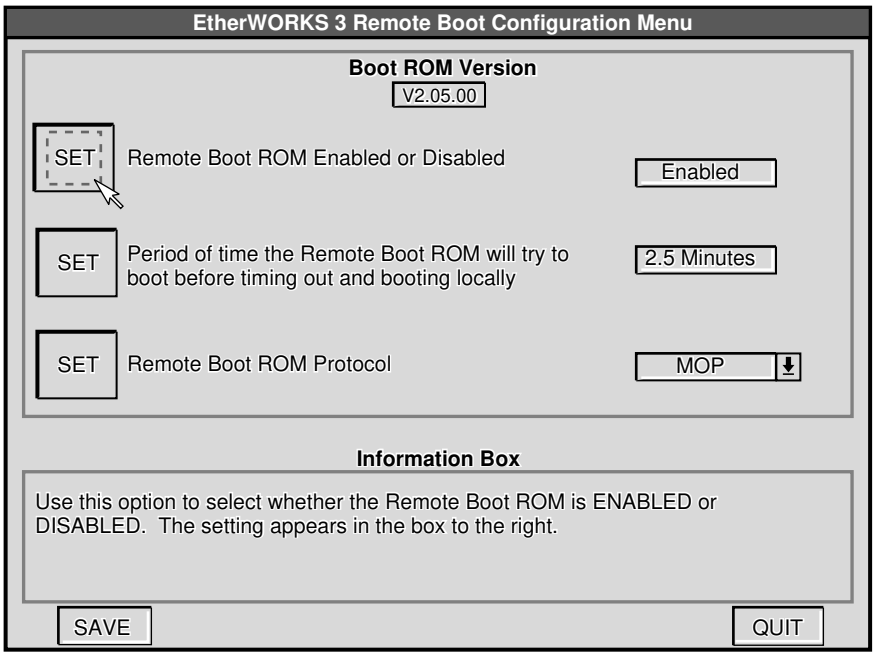
4. Click on the Exit button to end diagnostics.

Configuring the Remote Boot ROM

Once you have installed a remote boot ROM on your adapter and installed the adapter in your system, use the following procedure to configure the ROM:

1. Click on the Remote Boot Settings menu item from the EZWORKS Tools option to display the EtherWORKS 3 Remote Boot Configuration menu (Figure 3–4). If a remote boot ROM is not installed in your system, or is installed incorrectly, an error message will appear.

Figure 3–4 EtherWORKS 3 Remote Boot Configuration Menu



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2. Select the desired options:
   - Enable the remote boot ROM to establish a remote boot session when the computer is powered up.
   - Select the period of time to attempt a remote boot before a local boot occurs (MOP only).
   - Select the appropriate remote boot protocol to be used to establish a remote boot session.
     a. Use the MOP protocol in PATHWORKS V4.1*x* environments.
     b. Use the RPL protocol (the default) in PATHWORKS V5.*x*, Microsoft LAN Manager V2.2, Microsoft Windows NT Advanced Server V3.5*x*, and IBM LAN Server V3.*x*, V4.0 environments.
3. Click on the SAVE button to save your changes.
4. Power down your computer for the changes to take effect.

EZWORKS Command Line Switches

The EZWORKS Installation utility supports command line switches. These switches perform EZWORKS functions when a single DEC EtherWORKS 3 Turbo adapter is installed in your computer. The format for command line switches is not case sensitive; however, all switch fields must be entered without spaces before and after the equal sign (=), and without truncating switch names. (Refer to the following section for the correct command line format.)

Command Line Switch Format

Table 3–1 lists and describe the available EZWORKS command line switches. For further information, see the EZWORKS.TXT file located in the /INSTALL directory on the distribution diskette.

Table 3–1 General Adapter Command Line Switches

Switch	Description
/default	Sets the EtherWORKS 3 parameters to the manufacturing default values.
/fastbus=(enable,disable)	Turns the fastbus setting ON or OFF.
/help or /?	When these switches are included in the command line, EZWORKS displays help information on the command line switches.
/iobase=*www*	The *www* is a hexadecimal value between 100 to 3C0 or EISA, in the increment of 20 hexadecimal.
/irq=*zz*	The *zz* is a decimal value of 5, 10, 11, or 15.
/isabus=(8bit, 16bit)	Changes the adapter's ISA bus transfer rate to 8 or 16 bits.
/loopback	Includes the loopback test for RAMDIAG.
/membase=*xxxx*	The *xxxx* is a hexidecimal value between A000 to FF80 that complies with the memory mode setting.
/memmode=*yy*	The *yy* is a decimal value where 0, 2, 32, and 64 are valid choices. The 0 value sets the EtherWORKS 3 adapter to I/O mode.
/nodisplay	Turns off screen display except for /?, /help, and any error messages.
/novell	Performs a full Novell DOS Client installation. Use the /frametype command to override the IEEE 802.2 default frametype.
/override	Ignores the EtherWORKS 3 busy status; updates both EEPROM and registers.

(continued on next page)

Table 3–1 (Cont.) General Adapter Command Line Switches

Switch	Description
/protocol=(mop,rpl...)	Modifies the remote boot protocol to the value you specify. The adapter default is RPL.
/remote=(enable, disable)	Allows you to change your adapter's remote boot setting to Enable or Disable according to the value you specify. The adapter default is Disable.
/run_diag	Executes RAMDIAG and display the results.
/status or /cmd	Displays current Digital EtherWORKS 3 adapter configuration.
/temporary	Updates registers only; EEPROM will not be modified.
/timeout=(30secs, 2_ 5mins)	Selects the period of time the adapter will attempt a remote boot before a local boot occurs (MOP only). The adapter default is 2.5 minutes.

Exiting the EZWORKS Installation Utility

To exit the EZWORKS Installation utility and return to the DOS prompt, use either the File option from the menu bar, or press the Esc key.

EISA Configuration

When the Turbo adapter is used as an EISA device in an EISA system, the adapter's EISA configuration files are used in conjunction with your system's EISA Configuration Utility (ECU) to configure the adapter.

The following EISA configuration files are located in the \EISA directory on the Turbo adapter's distribution diskette:

- !DEC2040.CFG for use with the DE204 adapter
- !DEC2050.CFG for use with the DE205 adapter

EISA Mode Setup

This section describes how to set up your Turbo adapter configuration prior to running your system ECU software.

To set up the Turbo adapter for EISA mode, perform the following procedure:

1. Install the Turbo adapter in an EISA system.
2. Insert the Turbo distribution diskette into the PC diskette drive and set the default directory to the drive being used (for example, drive A).
3. Enter `Setup` at the DOS system prompt.
4. Select the Change/View Permanent Settings menu item from the EZWORKS Tools option, then set EISA mode to enabled.

Note

The EISA mode button will only be active if you are using is an EISA computer.

5. Change any other settings (for example, Memory Mode, Memory Base address, IRQ, and so on) that are required by your computer's operating environment.
6. Select the Save button to save your changes, then press the Enter key.
7. Press the Esc key to exit the EZWORKS Installation utility and return to the DOS prompt.
8. Turn the system power off and then on again for the changes to take effect.

You can now run the system ECU to add your Turbo adapter to the EISA system configuration. Refer to your PC documentation for information on how to install an adapter using your system ECU.

If the adapter fails diagnostics with an FF error, it is because the correct !DEC20x0.CFG file was not used to configure the Turbo adapter.

Note

It is not necessary to hardstrap the Turbo adapter for EISA mode operation. Hardstrapping the adapter for that setting will prevent the ECU from finding the adapter and cause a slot error message.

Hardstrapping the adapter to EISA mode is needed only when a configured adapter causes a conflict and the PC is inoperable. The hardstrapping will allow the adapter to be reconfigured to correct the conflict.

4

Software Device Driver Installation

This chapter explains how to install the DEC EtherWORKS 3 Turbo software device driver files required for PATHWORKS, LAN Manager-based, and NetWare network operating systems. These files (NDIS and ODI) are contained on the DEC EtherWORKS 3 Turbo distribution diskette.

It is recommended that the EZWORKS diagnostic utility be used to verify that the adapter is installed correctly and is operating correctly. Refer to Appendix A if any problems occur during the installation. Refer to the ERROR.TXT file in the top-level directory of the distribution diskette for a description of the error messages and the suggested corrective action. If the error cannot be corrected, contact your local Digital Service Representative for further assistance.

NDIS-DOS Device Driver Installation

Use the following procedures to install the NDIS driver in either a PATHWORKS or non-PATHWORKS environment. To change or view the adapter settings (such as, Memory range, I/O range, or IRQ line) required by your computer's operating environment, run the EZWORKS Installation utility prior to installing the adapter.

- **PATHWORKS V5.*x* and later environment:**

  1. Install the PATHWORKS diskette in a diskette drive (for example, drive A), or insert the PATHWORKS CD. Run NETSETUP from the diskette or CD to automate the network installation procedure.
  2. When prompted for the network adapter type, select DEC EtherWORKS 3 Turbo adapter.

- **PATHWORKS V4.1 and earlier environment:**

  1. Insert the PATHWORKS distribution diskette into the diskette drive (for example, drive A), then run NETSETUP to automate the network installation procedure.
  2. When prompted for the network adapter type, select the Other NDIS option.
  3. When prompted for the full path name of the NDIS driver, enter the following:

     ```
     A:\NDIS2\DOS\EWRK3.DOS
     ```

  4. When prompted for the full path name of the PROTOCOL.INI stub file, enter the following:

     ```
     A:\NDIS2\DOS\PROTOCOL.INI
     ```

  5. The DEC EtherWORKS 3 Turbo NDIS driver installation is complete. Reboot the system.

NETSETUP will update your CONFIG.SYS, AUTOEXEC.BAT, PROTOCOL.INI, and network-specific files automatically.

- **Non-PATHWORKS environments:**

  1. Select the Other NDIS option when prompted for the network adapter type.
  2. Enter the following when prompted for the full path name of the NDIS driver:

     ```
     A:\NDIS2\DOS\EWRK3.DOS
     ```

  3. Enter the following when prompted for the full path name of the PROTOCOL.INI stub file:

     ```
     A:\NDIS2\DOS\PROTOCOL.INI
     ```

  4. If the CONFIG.SYS file is not updated automatically, edit the file to install the PROTMAN.SYS and EWRK3.DOS device drivers as follows, using the appropriate path names:

     ```
     DEVICE=C:\PROTMAN.SYS
     DEVICE=C:\EWRK3.DOS
     ```

  5. The EtherWORKS 3 NDIS driver installation is complete. Reboot the system.

- **To install the Windows 95 driver:**

  1. Follow the procedures described in your operating system documentation for installing an unlisted network adapter driver.
  2. Refer to the \WIN95\README.TXT file on the distribution diskette for more specific installation information. Use this information in addition to your operating system documentation to install the device driver for the Turbo adapter.

Using Extended Memory Manager

If you use a memory manager such as EMM386 or QEMM in either a PATHWORKS or non-PATHWORKS environment, you must exclude the memory space that the Turbo adapter is using to prevent it from being mapped as high memory.

The following is an example of the text to add to your CONFIG.SYS file if you use a memory manager:

```
DEVICE=C:\DOS\EMM386.EXE x=D000-D07F frame=E000
```

This line is used to exclude the default memory space of the Turbo adapter at D0000 to D07FF in 2K mode. If the adapter is configured for 32K mode at the same memory base address, add the following text to your CONFIG.SYS file:

```
DEVICE=C:\DOS\EMM386.EXE x=D000-D77F frame=E000
```

Consult your memory manager documentation for further information.

Note

If you receive an error message during diagnostics, such as Memory Queue Test Failed, ensure that your extended memory manager has excluded the DEC EtherWORKS 3 Turbo adapter memory region in the CONFIG.SYS file.

ODI Client Device Driver Installation

Use the EZWORKS Installation utility to configure and install a DOS ODI VLM client. To start the utility, enter `Setup` at the DOS prompt. If all settings are correct, click on the Install button.

Alternatively, you can enter the following command line switch to install a DOS ODI VLM client:

```
A>Setup/novell
```

Refer to the `A:\NOVELL\DOSODI\README.TXT` file for ODI client device driver installation information.

ODI Server Device Driver Installation

Refer to the `A:\NOVELL\SRVODI\README.TXT` file for ODI server device driver installation information.

PATHWORKS Native Datalink Installation

To install the DLLEWRK3.EXE file, use the following procedure:

1. Change the Turbo adapter configuration from 2K mode (the default) to 32K or 64K mode using the Change/view permanent settings menu item from the EZWORKS Tools option.
2. If you are using an extended memory manager, ensure that the adapter memory range is excluded (for example, x=D000–D7FF).
3. Run NETSETUP to automate the Native Datalink driver installation. Select the EtherWORKS Native Datalink as the Ethernet adapter type.

To install the DLLEWRK3.EXE file for PATHWORKS V4.1 or earlier, use the following procedure:

1. Select the EtherWORKS Native Datalink as the Ethernet adapter type.
2. After NETSETUP completes, change the `%BOOT%\dlldepca.exe` line in STARTNET.BAT to `%BOOT%\decnet\dllewrk3.exe`.
3. Once this change is complete, copy the DLLEWRK3.EXE driver from the distribution diskette \PATHWRKS directory to the \DECNET directory on your hard drive.

Note

Unlike the Native Datalink driver for earlier EtherWORKS products, DLLEWRK3 does not require changing the command line. If you need to alter the Turbo adapter configuration parameters, use the Change/View Permanent Settings menu item. When the DLLEWRK3 driver is invoked, it will automatically read the adapter's internal settings.

Obtaining the Latest EtherWORKS 3 Turbo Driver Files

The device driver software diskette included in your EtherWORKS 3 Turbo kit can become outdated as operating system software evolves. The latest versions of the driver files can be found on the Internet, CompuServe, World Wide Web, Network Product Business World Wide Web, and the Network Product Business Bulletin Board Service (NPB BBS) by using the following procedures:

- **Internet:**

  1. Perform an anonymous ftp connection to **ftp.digital.com**. Your login name is `anonymous`.
  2. Enter your password. (Use your Internet electronic mail address as your password.)
  3. Using uppercase and lowercase letters (as shown), change your directory to the following:

     ```
     cd /pub/DEC/adapters/ethernet/ewrk3/release
     cd /pub/DEC/adapters/ethernet/ewrk3/interim
     ```

     The release directory contains the driver file included in the current manufacturing released (shipping) kit. The interim directory contains bug fixes and functional enhancements added since the last manufacturing release.
  4. Select image mode before extracting binary (non-ASCII) files:

     ```
     ftp> i
     ```

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

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

  6. Enter `quit` to exit ftp.
  7. Use the *-d* option to extract subdirectories and files:

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

- **CompuServe:**

  1. Enter `Go decpci` to select the DECPCI forum and enter the LAN Controllers library.
  2. Select the *Browse* option to scroll through the library titles.
  3. Click on the EWRK3 title, then press Return to display the description of the EWRK3 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.

- **World Wide Web:**

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

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

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

  1. Using a modem (parameters 9600, i, n, 1), connect to the NPB Bulletin Board Service in the U.S. by dialing 508-486-5777.
  2. Using a modem, connect to the PC Business Unit Bulletin Board Service (PCBU BBS) in Europe by dialing (33) 92 96 03 12, then select networks product/area 23.
  3. Follow the menu-driven instructions on your screen to download the driver files.

- **Network Product Business (NPB) World Wide Web:**

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

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

A

Problem Solving

This appendix describes problems you could encounter with the DEC EtherWORKS 3 Turbo adapter and suggests possible causes and solutions.

Isolating Faults

Table A–1 describes how to isolate faults by the symptoms that are occurring.

Table A–1 Fault Isolation by Symptom

Symptom	Possible Cause	Recommended Action
The system is on, but there is no display.	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 adapter is not seated firmly.	Turn off power to the computer. Remove and reinsert the adapter firmly into the option slot (Figure 2–2).
	The adapter is conflicting with another device.	See the Resolving Bus Conflicts on ISA and EISA Systems section in Chapter 2.

(continued on next page)

Table A–1 (Cont.) Fault Isolation by Symptom

Symptom	Possible Cause	Recommended Action
The adapter is not found by the EZWORKS Installation utility.	Ensure that the I/O port is not conflicting with another adapter.	See the Resolving Bus Conflicts on ISA and EISA Systems section in Chapter 2.
The system is on, but nothing happens. The amber LED is on for longer than 30 seconds. The keyboard does not respond.	The adapter is preventing the CPU from operating correctly.	Turn the computer power off and reseat the adapter. Disconnect the ThinWire cable from the adapter, then turn the computer power back on.
	The memory address, I/O address, or IRQ setting is incorrect or is causing a conflict with another adapter.	Check the setup values and reset if necessary. A conflict could exist between the adapter and another installed adapter. See the Resolving Bus Conflicts on ISA and EISA Systems section in Chapter 2. If the problem persists, contact your system administrator or uthorized Digital Service Representative.
	The software driver is not being installed properly.	Check that the adapter setup agrees with the software installation settings. Check that the software installation syntax is correct in CONFIG.SYS, AUTOEXEC.BAT, or another system file.

(continued on next page)

Table A–1 (Cont.) Fault Isolation by Symptom

Symptom	Possible Cause	Recommended Action
The system does not remote boot.	The Turbo adapter is not configured for remote boot.	Run the EZWORKS Installation utility and ensure that the remote boot feature is enabled in the Remote Boot Configuration Menu.
	The default remote boot timeout could be insufficient for a busy network.	Run the EZWORKS Installation utility and change the remote boot timeout period to 2.5 minutes.
	The Ethernet address is not registered with the remote boot server.	Register the Turbo adapter with the server. If the problem persists, contact your system administrator.
	The remote boot ROM chip is not present or is incorrectly installed.	Check the ROM chip installation to ensure the chip is seated firmly and there are no bent pins.
	The ThinWire link is not connected correctly.	Check to see if the coaxial cable is connected and terminated correctly at each end.
	The twisted-pair (TP) link is down, signaled by the green LED being off on the DE204/DE205 adapter.	Verify that the twisted-pair cable is connected and correctly attached to the HUB. A straight-through or cross-over type of cable may be required.

(continued on next page)

Table A–1 (Cont.) Fault Isolation by Symptom

Symptom	Possible Cause	Recommended Action
The system is on, but the network does not start. The LED is off.	The network cables are loose or terminated incorrectly.	Secure all cables and terminations.
	A conflict exists with another adapter in the system:	
	• The IRQ settings are incorrect.	Check the setup values and reset if necessary.
	• The I/O address or the memory address range is incorrect.	Check the setup values and reset if necessary.
	The Ethernet address is not registered for this address node.	Register the adapter with the remote boot server. If the problem persists, contact your system administrator.
Errors found during diagnostics run under EZWORKS.	A possible problem exists with the Turbo adapter, or the software is not installed correctly.	Refer to the adapter distribution diskette file A:\ERROR.TXT for more information and troubleshooting tips regarding the diagnostic error message.
		Replace or reinsert the adapter and try starting the system again.

Error Messages

Table A–2 describes possible DEC EtherWORKS 3 Turbo adapter error messages and the recommended corrective actions for each group of messages.

Table A–2 Error Messages

Message	Recommended Action
Unable to determine I/O address Ethernet Address ROM CRC failed Wrong Card ID Register R/W test failed EEPROM Checksum test failed	Ensure network configuration file settings (PROTOCOL.INI for NDIS users, NET.CFG for ODI users) match the settings of the adapter. Ensure there is no I/O conflict (occurs when two adapters live in the same I/O space). Try to hardstrap the adapter and use the EZWORKS Installation utility to program the adapter to live in another I/O space. Refer to the Resolving Bus Conflicts on ISA and EISA Systems section in Chapter 2 of this manual for details about how to hardstrap the adapter. Refer to the adapter distribution diskette file A:\ERROR.TXT for more information and troubleshooting tips regarding the diagnostic error message. If the corrective action does not work, you may have a defective adapter. Contact your Reseller or Authorized Digital Distributor.

(continued on next page)

Table A–2 (Cont.) Error Messages

Message	Recommended Action
IRQ test failed ICR, Interrupt Enable test failed ICR (TNE, RNE, TXD, or RXD) Mask test failed	Ensure network configuration file settings match settings of adapter. Use the Change/view permanent settings menu item from the EZWORKS Tool option to view the adapter settings. Refer to the adapter distribution diskette file A:\ERROR.TXT for more information and troubleshooting tips regarding the diagnostic error message. Ensure there is no IRQ conflict (occurs when two devices want to use the same interrupt line). Try to hardstrap the adapter and use the Change/View Permanent Settings menu item from the EZWORKS Tool option to program the adapter to use another IRQ line.

(continued on next page)

Table A–2 (Cont.) Error Messages

Message	Recommended Action
Memory Address test failed Memory Knaizuk test failed Memory Bitwalk test failed Queue, Free Memory Queue test failed Queue, Receive Queue test failed Queue, Transmit Queue test failed Queue, Transmit Done Queue test failed Queue, Page Index Register test failed Queue, I/O Page Register test failed Queue, Memory Page Register test failed	Ensure network configuration file settings match the settings of the Turbo adapter. Use the Change/View Permanent Settings menu item from the EZWORKS Tool option to view the adapter settings. Refer to the adapter distribution diskette file A:\ERROR.TXT for more information and troubleshooting tips regarding the diagnostic error message. Ensure there is no memory conflict (occurs when two adapters or software want to live in the same memory space). Try to hardstrap the adapter and use the Change /View Permanent Settings menu item from the EZWORKS Tools option to program the adapter to live in another memory space.

(continued on next page)

Table A–2 (Cont.) Error Messages

Message	Recommended Action
Xmit Status, Xmit Valid bit not set Xmit Status, SQE check failed Xmit Status, ECL failed Xmit Status, LCL failed Xmit Status, ID failed Xmit Status, NCL failed Recv Status, IAM failed Recv Status, MCM failed Recv Status, PLL failed Recv Status, CRC failed Xmit Control, STOP test failed Xmit Control, Q-Mode test failed Xmit Control, PAD test failed Xmit Control, IFC test failed Xmit Control, ISA test failed CSR, Runt Accept test failed CSR, Promiscuous Mode Enable test failed CSR, Multicast Enable test failed CSR, Transmit Not Empty bit failed CSR, Receive Not Empty bit failed CSR, Transmit Disable test failed CSR, Receive Disable test failed Transmit Packet Size over 1514 Receive Packet Size over 1514 Transmit Packet Size is zero Receive Packet Size is zero Transmit Failure Receive Failure Transmit Timeout Receive Timeout	Refer to the adapter distribution diskette file A:\ERROR.TXT for more information and troubleshooting tips regarding the diagnostic error message. These errors are network-related test failures. If the error messages persist, the adapter may be defective. Contact your Reseller or Authorized Digital Distributor.

(continued on next page)

Table A–2 (Cont.) Error Messages

Message	Recommended Action
CR, Loopback test failed CR, Full Duplex test failed	Refer to the adapter distribution diskette file A:\ERROR.TXT for more information and troubleshooting tips regarding the error message. These errors are supplemental network tests that require loopback connectors for ThinWire or a TP repeater link for TP testing. To test the ThinWire coaxial port (when present), the adapter must be removed from the live network and the ThinWire connector properly terminated with a T-connector and two 50-ohm terminators. Without proper termination, the Loopback or Full Duplex test will fail. To test the TP port (when present), the adapter must have a valid link to a TP repeater. The adapter that supports TP has a green LED that lights when the link to the TP repeater is good. If the green LED does not light, check TP cabling and TP repeater port. To test the AUI thick wire port, select AUI port using adapter AUI jumper and connect to AUI repeater, or test using a test connector. If the error message persists, the adapter may be defective. Contact your Reseller or Authorized Digital Distributor.

B

General Information

This appendix provides some general system specifications, information on how to obtain the latest DEC EtherWORKS 3 Turbo driver files, and information about other Digital network adapter products.

Physical Description

The Turbo adapter is a form-factor printed circuit board that uses the full 32-bit bus data path interface. The adapter is constructed using two-layer circuit board technology. The dimensions for the two models of the Turbo adapter are as follows:

DE204—6.700 inches (167.50 mm) x 2.700 inches (67.50 mm)
DE205—6.196 inches (154.90 mm) x 4.200 inches (105.00 mm)

Functional Components

The major functional components on the Turbo adapter include the following:

- DEC EtherWORKS 3 Turbo bus interface and support registers
- Ethernet network protocol controller (MAC)
- Ethernet media transceiver
- 128 KB network buffer RAM
- 32 KB network remote boot ROM firmware (optional)
- Unique Ethernet address ROM
- Nonvolatile electrically erasable memory

LEDs

Table B–1 describes the LED activity for the DEC EtherWORKS 3 Turbo adapter.

Table B–1 LED Activity

Adapter	Number of LEDs	LED Color	Function
DE204/DE205	2	Amber	Self-test or traffic. Network activity to and from the adapter.
		Green	Twisted-pair link. Blinking LED represents all network activity from the twisted-pair repeater.

System Specifications

This section lists the system specifications for the DEC EtherWORKS 3 Turbo adapter.

- Memory modes
- Memory mode addresses
- I/O base addresses
- IRQ lines
- Power requirements
- PC operating environment

Memory Mode Addresses

The memory mode addresses for the DEC EtherWORKS 3 Turbo adapter are listed in Table B–2.

Table B–2 Memory Mode Addresses

Memory Buffer Size	Memory Address Range
64 KB	A0000–AFFFF, B0000–BFFFF, C0000–CFFFF, D0000–DFFFF, E0000–EFFFF, F0000–FFFFF
32 KB	A0000–A7FFF, A8000–AFFFF, B0000–B7FFF, B8000–BFFFF, C0000–C7FFF, C8000–CFFFF, D0000–D7FFF, D8000–DFFFF, E0000–E7FFF, E8000–EFFFF, F0000–F7FFF, F8000–FFFFF
2 KB[1]	A0000–A07FF, A0800–A0FFF, A1000–A17FF, A1800–A1FFF, A2000–A27FF, A2800–A2FFF, A3000–A37FF, A3800–A3FFF,... B0000–B07FF, B0800–B0FFF, B1000–B17FF, B1800–B1FFF, B2000–B27FF, B2800–B2FFF, B3000–B37FF, B3800–B3FFF,... C0000–C07FF, C0800–C0FFF, C1000–C17FF, C1800–C1FFF, C2000–C27FF, C2800–C2FFF, C3000–C37FF, C3800–C3FFF,... D0000–D07FF, D0800–D0FFF, D1000–D17FF, D1800–D1FFF, D2000–D27FF, D2800–D2FFF, D3000–D37FF, D3800–D3FFF,... E0000–E07FF, E0800–E0FFF, E1000–E17FF, E1800–E1FFF, E2000–E27FF, E2800–E2FFF, E3000–E37FF, E3800–E3FFF,... F0000–F07FF, F0800–F0FFF, F1000–F17FF, F1800–F1FFF, F2000–F27FF, F2800–F2FFF, F3000–F37FF, F3800–FFFFF,...

[1]Each address range increases by 800 Hex. Any 2-KB boundary in the listed segments can be used. Not all address ranges are listed.

I/O Base Addresses for the Turbo Adapter

The I/O base addresses for the DEC EtherWORKS 3 Turbo adapter are shown in Table B–3. Each I/O address range takes up 1Fh location. The default address is signified by an asterisk (*).

Table B–3 I/O Base Addresses

100h	200h	300h*
120h	220h	320h
140h	240h	340h
160h	260h	360h
180h	280h	380h
1A0h	2A0h	3A0h
1C0h	2C0h	3C0h
1E0h	2E0h	EISA[1]

[1]EISA mode is a slot-dependent I/O address range.

IRQ Values

The IRQ values for the DEC EtherWORKS 3 Turbo adapter include the following. The default value is signified by an asterisk (*).

- 5*
- 10
- 11
- 15

Default Settings

The Turbo adapter is preconfigured to work in most installations. If the default settings are appropriate for your installation, you do not need to change them. The default settings are summarized in Table B–4.

Table B–4 DEC EtherWORKS 3 Turbo Default Settings

Menu Item	Turbo Adapter
I/O base	300h
Memory mode	2 KB
Memory base	D0000h
Memory address range	D0000 to D07FFh
IRQ selection	IRQ5
Fast bus	Disabled
16-bit bus	Enabled

Note

If a Turbo adapter is set to use a setting that another installed adapter or resource uses, your computer or other adapters may not operate correctly when you boot the system. Check with your system administrator for a list of the other adapter settings.

Power Requirements

Table B–5 lists the electrical parameters for the DEC EtherWORKS 3 Turbo adapter.

Table B–5 Electrical Parameters

Adapter	Power (Maximum)	DC Amps (+5.0 V) (Maximum)	DC Amps (+12.0 V) (Maximum)	Bus Loads
DE204	3.5 W	0.7 A	0.00 A	1 CMOS
DE205	–	–	–	–
ThinWire or TP	7.1 W	0.7 A	0.30 A	1 CMOS
Thick Wire	9.5 W	0.7 A	0.5 A	1 CMOS

PC Operating Environment

The operating environment for the DEC EtherWORKS 3 Turbo adapter is as follows.

- Temperature (at sea level): 10°C to 40°C (50°F to 104°F)
- Relative humidity: 10% to 90% (noncondensing)
- Radiated emissions: FCC Class B, VCCI, CISPR-22, CE Mark

Caution

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

Other Digital Network Adapter Products

The DEC EtherWORKS 3 Turbo adapter is part of a complete family of low-cost network adapters, repeaters, and remote boot ROMs developed by Digital Equipment Corporation. Other products include the following:

DE45X-AR Remote Boot ROM

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

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

- DE45D-AR, 28-pin remote boot ROM
- DE45F-AR, 32-pin upgradable FLASH remote boot ROM

DE20M-AR Remote Boot ROM

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

EtherWORKS Hub 8TX (DELXR) Repeater

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

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

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

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

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

EtherWORKS Turbo EISA (DE425-AA) Adapter

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

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

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

DEC FDDIcontroller/PCI (DEFPA-UA, DEFPA-MA, DEFPA-AA, DEFPA-DA) Adapter

As the first PCI FDDI adapter in the industry, this custom high-performance, low-cost 32-bit adapter features on-board CPU for SMT processing, DMA chip, and 1 MB buffer. Full-duplex capability extends bandwidth to 200 Mb/s. The device drivers for the DEC FDDIcontroller/PCI adapter include NetWare, Windows for Workgroups, Windows NT, Windows 95, PATHWORKS, LAN Manager, LAN Server, Banyan VINES client, SCO UNIX, UnixWare, Digital UNIX, and OpenVMS. This adapter can be used with PCI-based Alpha, Intel, MIPS, and PowerPC systems. Four models are offered: UTP SAS and DAS, and MMF SAS and DAS. A Lifetime Warranty is included.

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

This custom high-performance, low-cost 32-bit adapter features on-board CPU for SMT processing, DMA chip, and 1 MB buffer. Full-duplex capability extends bandwidth to 200 Mb/s. The device drivers for the DEC FDDIcontroller/EISA include NetWare, Windows for Workgroups, Windows NT, Windows 95, PATHWORKS, LAN Manager, LAN Server, Banyan VINES client, SCO UNIX, UnixWare, Digital UNIX, and OpenVMS. This adapter can be used with Alpha, Intel, MIPS, and PowerPC systems. Four models are offered: UTP SAS and DAS, and MMF SAS and DAS. A Lifetime Warranty is included.

Ordering Information

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