FCC ID: KA2APC500E1

EUT: FAST ETHERENET CARD

D-LINK CORPORATION

USER'S MANUAL

FEDERAL COMMUNICATIONS COMMISSION

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two 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. This equipment generates, uses and can radiated 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:

-Reorient o 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

I

Fast Ethernet comprises two subtypes: 100Base-T4 and 100Base-TX. 100Base-T4 Fast Ethernet can utilize existing Category 3 or Category 4 UTP network cabling, but does not provide for full duplex operation. 100Base-TX requires Category 5 cabling, but does provide full duplex operation. Full duplex 100Base-TX operation allows simultaneous transmission and reception, both at 100Mbps, thus providing service potentially equal to 200Mbps half-duplex service.

The DFE-500TX Adapter does not support the 100Base-T4 subtype. To provide compatibility in traditional 10Mbps Ethernet environments (where, for example, DFE-500TX adapters are installed *anticipating* upgrade of supporting hub equipment to Fast Ethernet), the DFE-500TX also supports traditional 10Mbps Ethernet operation, in full-duplex as well as half-duplex modes. Selection of the best operation mode in any given installation is automatically governed by auto-negotiation.

About Auto-negotiation

You have probably had the experience of making a dialup connection through a modem, and have heard the gravelly-sounding exchanges between your modem and the modem at the other end of the telephone line (these exchanges are ordinarily played out through a speaker in your local modem). As irritating as those few seconds of noise may be, they do let you know that your modem and the remote modem are on the job, preparing for your intended communication with the remote computer.

The preparatory work of the two modems during those few seconds before you see the "connect" message is to *negotiate*

the best data communication scheme which is supported by both modems, and which is suitable for the quality of the telephone line linkage between them. The parameters to be settled between the two modems include best baud rate, compression method, and error correction method. When the two modems have tested the phone-line quality and settled on the combination of shared options and parameters which will provide the best data communication over the connecting phone line, then you are given the "connect" message which signals the end of the intermodem negotiation and the beginning of your intended communication with the remote computer.

Auto-negotiation between devices within an Ethernet LAN is similar in concept, but much briefer. The two devices involved in the auto-negotiation will be the DFE-500TX Adapter serving your station (*installed in your computer*), and the hub through which it is connected into the LAN. The options to be negotiated between the DFE-500TX and its supporting hub include Ethernet type (100BASE-TX Fast Ethernet or 10BASE-T Ethernet) and duplex mode (half-duplex, being one-way-at-a-time, or full duplex, being simultaneous transmit-and-receive).

Startup communication between the two devices occurs when both devices are power-on, the cable connection between them is good, and the Network Operating System software is running. As soon as those conditions are satisfied, the preparatory process of auto-negotiation between the DFE-500TX and its supporting hub proceeds automatically. If the hub has auto-negotiation functionality, then it and the DFE-500TX exchange a series of messages in which each device signals its capabilities and listens for corresponding information about the other. The auto-negotiation process requires only a few milliseconds,

in overall computing (multitasking) performance. At the same time, it produces superior network throughput by reducing latency (waiting for CPU service) during transmissions and receptions.

About WOL

WOL (Wake-On-LAN) is an ACPI function allowing a powered OFF computer to be powered ON from a remote station. ACPI (Advanced Configuration Power Interface) is a new technology and an open industry specification to provide power management support systems through hardware and operating system cooperation. To use the WOL feature, the NIC must be WOL capable and the motherboard of the PC (for which the card is installed) must be of ACPI architecture.

While the powered OFF computer sleeps, the WOL NIC monitors LAN traffic for valid Wake-up frames. The NIC will determine whether a received Wake-up frame is addressed to the PC. If so, the NIC will send a signal to the motherboard to power ON the computer.

What is the utility in the WOL card?

- "I forgot a document and I'm out of town?" Send a Wake-up signal to your computer and transfer the needed file to your location.

- Initiate long routines and reports _before_ you get to work.

- Transfer files when the network traffic is low (during late hours).

- Three LED indicators: 10Mbps/100Mbps, Link, Activity.

- Drivers† for all leading Network Operating Systems.

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† Check *http://www.dlink.com* for newest release of drivers.

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Installation

Installation of a DFE-500TX Ethernet Adapter requires hardware installation first, then software installation.

Unpack and Inspect

CAUTION: *Under ordinary circumstances, a DFE-500TX card will not be affected by static charge as may be received through your body during handling of the unit. In special circumstances where you may carry an extraordinarily high static charge, it is good practice to reduce the charge by touching a ground before handling the adapter card.*

Open the shipping carton and carefully remove all items. In addition to this User's Guide, ascertain that you have:

- One DFE-500TX Ethernet Adapter Card.

- DFE-500TX Software Diskette.

- WOL Cable[‡].

[‡] The WOL Cable is an optional component of your DFE-500TX kit. If a cable is not included in your kit, purchase the cable through your local computer retailer.

Install the Adapter

1. Shut down the computer, unplug its power cord, and remove the chassis cover.

2. If your order does not include the Boot ROM option, go ahead to Step 3. If your order includes the Boot ROM option, then install the Boot ROM Chip by plugging the chip into the Boot ROM Socket on the DFE-500TX card. The notched end of the Boot ROM Chip must be aligned with the notched end of the Boot ROM Socket (opposite alignment will cause destruction of the Boot ROM Chip).

3. Insert the contact edge of the DFE-500TX card into the connector of any available PCI Bus Master expansion slot. Press the card firmly into the connector and ascertain that the card's contacts are fully seated in the connector.

4. Install the bracket screw which secures the card to the computer chassis.

5. Replace the computer's chassis cover.

6. Reconnect the computer's power cord, and switch computer power on. If the BIOS section of your computer's boot program is Plug and Play compliant, then at power-up the BIOS will automatically configure any newly installed DFE-500TX adapter.

7. Refer to section *Connect the WOL Cable* to install the WOL Cable between the NIC and the PC's motherboard.

This page is intended to be left blank.

- Power ON your PC before you arrive to work.

WOL has great utility in power management of PCs, workstations, and kiosks. For more information about WOL, check the Intel site, *http://www.intel.com.*

Features

Designed for versatility and performance, the DFE-500TX Adapter provides the following features:

- <u>W</u>ake-<u>O</u>n-<u>L</u>AN (WOL) provides great utility for power management of PC.

- Operates in a PCI Bus Master slot of a Pentium/486 computer, independent of CPU speed.

- PCI Bus Master memory access, for high throughput and low CPU demand.

- DEC 21143 32-bit Intelligent Ethernet controller.

- Complies with IEEE 802.3 100Base-TX and 10Base-T Ethernet standards.

- Plug and Play installation.

- RJ-45 connector for network cable connection.

- 100Mbps Fast Ethernet or 10Mbps Ethernet data transfer, selected via auto-negotiation.

- Full duplex or half-duplex operation, selected by auto-negotiation.

- Built-in FIFO buffers reduce overhead of memory transfers.

and the two devices select the best communication parameters supported by both devices.

If the hub does not have auto-negotiation functionality, then its monotone (single capability) message will be recognized by the DFE-500TX's auto-negotiation facility, and the DFE-500TX will simply switch to the one of its own capabilities which matches that of the hub.

When the preparatory procedure of auto-negotiation is completed, then the line is ready and will provide a data channel which is optimal for the two devices. The line will remain ready without further auto-negotiation action until the linkage is broken. Auto-negotiation then reoccurs at any time that the linkage is restored, again making the line ready for optimal data communications.

About PCI Bus

Your DFE-500TX Adapter delivers outstanding performance by fully exploiting the advanced features of your computer's PCI bus. DFE-500TX Adapters utilize the Bus Master Mode of the PCI bus, allowing direct transfers of Ethernet packet content between computer memory and the adapter's controller, thus minimizing network demand on the CPU. The adapter's controller function provides the additional benefit of reduced command processing overhead.

The working relationship between a DFE-500TX adapter and main memory working in Bus Master mode is powered by the Bridge/Memory Controller of the PCI bus. This reduces the CPU role in network operations, thus freeing the CPU to service other tasks, with resulting improvement

Introduction

Thank you for choosing D-Link DFE-500TX, the value leader among Fast Ethernet adapters for PCI–Bus personal computers. This Introduction chapter will be useful if you are new to Fast Ethernet and other new technology featured by the DFE-500TX. Otherwise, skip ahead to the Installation chapter.

About Fast Ethernet

Fast Ethernet is a network technology specified by IEEE Standard 802.3u. It extends the traditional 10Mbps Ethernet technology to achieve 100Mbps transmission and reception, while retaining the same CSMA/CA Ethernet protocol. Thus while Fast Ethernet provides a tenfold increase in network capacity, it is wholly compatible with traditional 10Mbps Ethernet network facilities. This compatibility is the key to easy and efficient upgrades to 100Mbps in your network areas needing greater bandwidth. Upgrading selected areas to Fast Ethernet does not require hardware or software changes in network areas where traditional 10Mbps Ethernet is providing good service. For upgrading existing Ethernet installations to 100Mbps, and especially for selectively upgrading areas needing upgrade, Fast Ethernet is the clear choice in terms of cost-effectiveness, as well as convenience and smoothness in transition.