D-Link

Model DFE-530TX Ethernet / Fast Ethernet Adapter for PCI Bus User's Guide

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FCC Certifications

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 provide reasonable protection against harmful interference а in residential installation. 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. equipment does cause harmful interference radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Shielded interface cables must be used in order to comply with emission limits.

You are cautioned that changes or modifications not expressly approved by the party responsible for

compliance could void your authority to operate the equipment.

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 including interference t.hat. may undesired cause operation.

Limited Warranty

Hardware:

D-Link warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following periods measured from date of purchase from D-Link or its Authorized Reseller:

Product Type Warranty Period

Complete products One year

Spare parts and spare kits 90 days

The one-year period of warranty on complete products applies on condition that the product's Registration Card is filled out and returned to a D-Link office within ninety (90) days of purchase. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card. Failing such timely registration of purchase, the warranty period shall be limited to 90 days.

If the product proves defective within the applicable warranty period, D-Link will provide repair or replacement of the product. D-Link shall have the sole discretion whether to repair or replace, and replacement product may be new or reconditioned. Replacement product shall be of equivalent or better specifications, relative to the defective product, but need not be identical. Any product or patterner by D-Link pursuant to this warranty shall have a warranty period of not less than 90 days, from date of such repair, irrespective of any earlier expiration of original warranty period. When D-Link provides replacement, then the defective product becomes the property of D-Link.

Warranty service may be obtained by contacting a D-Link office within the applicable warranty period, and requesting a Return Material Authorization (RMA) number. If a Registration Card for the product in question has not been returned to D-Link, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided. If Purchaser's circumstances require special handling of warranty correction, then at the time of requesting RMA number, Purchaser may also propose special procedure as may be suitable to the case.

After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. The package must be mailed or otherwise shipped to D-Link with all costs of mailing/shipping/insurance prepaid; D-Link will ordinarily reimburse Purchaser for mailing/shipping/insurance expenses incurred for return of defective product in accordance with this warranty. D-Link shall never be responsible for any software, firmware, information, or memory data of Purchaser contained in, stored on, or integrated with any product returned to D-Link pursuant to this warranty.

Any package returned to D-Link without an RMA number will be rejected and shipped back to Purchaser at Purchaser's expense, and D-Link reserves the right in such a case to levy a reasonable handling charge in addition mailing or shipping costs.

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Warranty service for software products may be obtained by contacting a D-Link office within the applicable warranty period. A list of D-Link offices is provided at the back of this manual, together with a copy of the Registration Card. If a Registration Card for the product in question has not been returned to a D-Link office, then a proof of purchase (such as a copy of the dated purchase invoice) must be provided when requesting warranty service. The term "purchase" in this software warranty refers to the purchase transaction and resulting licence to use such software.

D-Link warrants that its software products will perform in substantial conformance with the applicable product documentation provided by D-Link with such software product, for a period of ninety (90) days from the date of purchase from D-Link or its Authorized Reseller. D-Link warrants the magnetic media, on which D-Link provides its software product, against failure during the same warranty period. This warranty applies to purchased software, and to replacement software provided by D-Link pursuant to this warranty, but shall not apply to any update or replacement which may be provided for download via the Internet, or to any update which may otherwise be provided free of charge.

D-Link's sole obligation under this software warranty shall be to replace any defective software product with product which substantially conforms to D-Link's applicable product documentation. Purchaser assumes responsibility for the selection of appropriate application and system/platform software and associated reference materials. D-Link makes no warranty that its software products will work in combination with any hardware, or any application or system/platform software product provided by any third party, excepting only such products as are expressly represented, in D-Link's applicable product documentation as being compatible. D-Link's obligation under this warranty shall be a reasonable effort to provide compatibility, but D-Link shall have no obligation to provide compatibility when there is fault in the third-party hardware or software. D-Link makes no warranty that operation of its software products will be uninterrupted or absolutely error-free, and no warranty that all defects in the software product, within or without the scope of D-Link's applicable product documentation, will be corrected.

D-Link Offices for Registration and Warranty Service

The product's Registration Card, provided at the back of this manual, must be sent to a D-Link office. To obtain an RMA number for warranty service as to a hardware product, or to obtain warranty service as to a software product, contact the D-Link office nearest you. An addresses/ telephone/ fax list of D-Link offices is provided in the back of this manual.

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Introduction

Thank you for choosing D-Link DFE-530TX, 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-530TX. 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.

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-530TX Adapter does not support the 100Base-T4 subtype. To provide compatibility in traditional 10Mbps Ethernet environments (where, for example, DFE-530TX adapters are installed *anticipating* upgrade of supporting hub equipment to Fast Ethernet), the DFE-530TX 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 •onnect" 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 •onnect" 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-530TX 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-530TX 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 autonegotiation between the DFE-530TX and its supporting hub proceeds automatically. If the hub has auto-negotiation functionality, then it and the DFE-530TX 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, 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-530TX• auto-negotiation facility, and the DFE-530TX 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-530TX Adapter delivers outstanding performance by fully exploiting the advanced features of your computer • PCI bus. DFE-530TX Adapters utilize the Bus Master Mode of the PCI bus, allowing direct transfers of Ethernet packet content between computer memory and the adapter • controller, thus minimizing network demand on the CPU. The adapter • controller function provides the additional benefit of reduced command processing overhead.

The working relationship between a DFE-530TX 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 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.

Features

Designed for versatility and performance, the DFE-530TX Adapter provides the following features:

- 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.
- 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 autonegotiation.
- Built-in FIFO buffers reduce overhead of memory transfers.
- Three LED indicators: 10Mbps/100Mbps, Link, Activity.
- Drivers[†] for all leading Network Operating Systems.

Installation 5

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

Installation

Installation of a DFE-530TX Ethernet Adapter requires hardware installation first, then software installation.

Unpack and Inspect

CAUTION:

Under ordinary circumstances, a DFE-530TX 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-530TX Ethernet Adapter Card.
- DFE-530TX Software Diskette.

Install the Adapter

 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-530TX 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-530TX card into the connector of any available PCI Bus Master expansion slot. Press the card firmly into the connector and ascertain that the card contacts are fully seated in the connector.
- Install the bracket screw which secures the card to the computer chassis.
- 5. Replace the computer chassis cover.
- 6. Reconnect the computer power cord, and switch computer power on. If the BIOS section of your computer boot program is Plug and Play compliant, then at power-up the BIOS will automatically configure any newly installed DFE-530TX adapter.

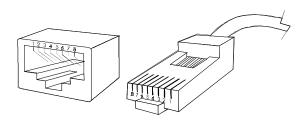
NOTE: Due to a fault in some Plug-n-Play BIOS programs, it happens occasionally that a newly installed adapter is assigned an Interrupt Number which is already assigned to another device. In such a case, the conflict of Interrupt Number will cause faults in the behavior of both devices. Then it is necessary to run the CMOS Setup utility, and manually assign a non-conflicting Interrupt Number.

Connect the Network Cable

Category 5 UTP cable qualifies for both, the Fast Ethernet and Ethernet, cabling rules. The maximum length of any single cable run between any station and its supporting hub is 100 meters. The maximum length of a cable joining two hubs is 10m in general, but is 100m when both hubs qualify as Ethernet Class 2 Repeaters (all D-Link Ethernet hubs do qualify). However, these cable runs may need to be shorter than the given individual maximum lengths, because their lengths are globally restricted by the rule that the maximum aggregated cable run between any two stations is 205m.

Connecting for Fast Ethernet (100Mbps)

Category 5 UTP cable is required for Fast Ethernet operation. The maximum cable run between the DFE-530TX and the supporting hub is 100m. The cable must be *straight* (not a *crossover* cable), with an RJ-45 plug at each end. Make the network connection by plugging one end of the cable into the RJ-45 jack of the DFE-530TX, and the other end into a port of the supporting hub.



Connecting for 10Mbps Ethernet

Category 3, Category 4, and Category 5 UTP cable, as well as EIA/TIA-568 100-ohm STP cable, all qualify under Ethernet cabling rules. The maximum cable run between the DFE-530TX and the supporting hub is 100 meters. The cable must be *straight* (not a *crossover* cable) with RJ-45 connector at each end. Make the network connection by plugging one end of the cable into the RJ-45 jack of the DFE-530TX, and the other end into a port of the supporting hub.

Software Installation

On account of the great variety of network environments for which the DFE-530TX may be used, and revisions of those network systems, the instructions for software installation are given as README files on the DFE-530TX Software Diskette. Review the root directory README for overview information, and for full installation details, see the README and referenced instruction files in the sub-directory appropriate to your network operating system.



Troubleshooting

If you experience any problems with the adapter, first verify that the appropriate driver is loaded, that the proper grade of cable is employed for the network connection, and that the supporting hub is functioning properly.

- Ascertain that the adapter card is fully and firmly seated in the slot connector.
- 2. Check the length and rating of connecting cables.
- Ascertain that the adapter PCI slot is not deactivated at the BIOS level. The CMOS Setup utility in PCI computers ordinarily provides the option to activate or deactivate PCI slots.
- 4. Replace the adapter in question with a verified adapter and run the diagnostic test again.
- 5. Install the questioned adapter in another PCI computer and run the tests again.
- 6. Remove all other PCI adapters from the computer and run the tests again. If the verification/diagnostic run is then normal, then there is probably an interrupt number conflict which will have to be resolved manually by a CMOS Setup utility run after you have reinstalled all of the expansion cards.

The DFE-530TX Adapter features three LED indicators to assist in the resolving of network diagnostics:

• 10Mbps/100Mbps SPEED Indicator

This LED shows steady green (on) when 100Mbps speed is selected. It is dark (off) when 10Mbps is negotiated.

LINK Indicator

Steady green indicates good linkage between the DFE-530TX and its supporting hub.

ACTIVITY Indicator

Flashing green indicates that the adapter is sending or receiving.



Specifications

Network Type:

Fast Ethernet 100Base-TX

IEEE 802.3u standard for 100Mbps baseband CSMA/CD local area network

• Ethernet 10BASE-T

IEEE 802.3 standard for 10Mbps baseband CSMA/CD local area network

Jumperless Hardware

Auto-negotiation functionality

Media interface: RJ-45

LAN Chip Set:

• Interface controller, D-Link DL10030

• Transceiver interface, Davicom DM9101

EMI Compatibility:

FCC Class B

VCCI Class B

CISPR B

SMA Certification

CE Certification, Class B

Host interface: PCI 2.1 Bus (Bus Master)

I/O & IRQ base address: assigned by Plug and Play system

Physical Dimensions: 13.9 cm x 7.3 cm

Environment:

Storage: -20° to 80°C, (-4° to 176° F)

Operating: 0° to 55° C, (32° to 131° F) Humidity: 10% to 90% non-condensing

Power Consumption: 2W (400mA @ 5V) max

PCB Layer: 2 layers
Software drivers[‡] for:

√ Microsoft Windows 95, 98

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 $\sqrt{\text{Banyan VINES v4.00 (2)}}$

√ FTP PC/TCP

√ IBM LAN Server v4.0, v3.0, v2.0

√ Microsoft LAN Manager v2.1

√ Novell Netware 3.x, 4.x ODI driver

√ NDIS 2.x.3.x driver

√ SCO Open Server 5.0.x

√ SUN PC-NFS

√ Microsoft Windows NT3.51, NT4.0

√ DECnet PathWorks v4.0

√ IBM Communication Manager v1.0

√ IBM LAN Support Program v1.3x

√ Microsoft Windows for workgroups 3.11

√ Win/TCP PathWay Access for DOS v1.1

√ Packet Driver

√ SCO UNIX

B-2 Specifications

[‡] Check http://www.dlink.com for drivers not listed and latest release of drivers.

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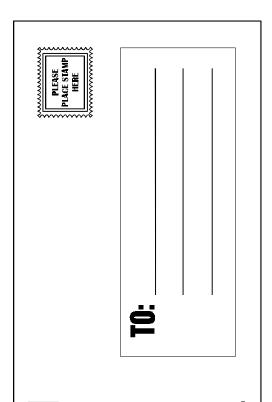
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Registration Card

Print, type or use block letters. Your name: Mr./Ms Organization: Your title at organization: _ Telephone: Organization's full address: Date of purchase (Month/Dav/Year): * Product installed in type of Product Product * Product installed Computer serial Model Serial No. computer (e.g., Compag 486) No. (* Applies to adapters only) Product was purchased from: Reseller's name: Telephone: Fax: Reseller's full address: 1. Where and how will the product primarily be used? □Home □Office □Travel □Company Business □Home Business □Personal 2. How many employees work at installation site? □1 employee □2-9 □10-49 □50-99 □100-499 □500-999 □1000 or more 3. What network protocol(s) does your organization use? □XNS/IPX □TCP/IP □DECnet □Other 4. What network operating system(s) does your organization use? DD-Link LANsmart DNovell NetWare DNetWare Lite DSCO Unix/Xenix □PC NFS □3Com 3+Open □Banvan Vines □DECnet Pathwork □Windows NT □Windows NTAS □Windows '95 5. What network management program does your organization use? □D-View □HP OpenView/Windows □HP OpenView/Unix □SunNet Manager □Novell NMS □NetView 6000 □Other 6. What network medium/media does your organization use ? □Fiber-optics □Thick coax Ethernet □Thin coax Ethernet □10BASE-T UTP/STP □100BASE-TX □100BASE-T4 □100VGAnyLAN □0ther 7. What applications are used on your network? □Desktop publishing □Spreadsheet □Word processing □CAD/CAM □Database management □Accounting □Other_ 8. What category best describes your company? DAerospace DEngineering DEducation DFinance DHospital DLegal DInsurance/Real Estate DManufacturing □Retail/Chainstore/Wholesale □Government □Transportation/Utilities/Communication □VAR □Systemhouse/company□Other_ 9. Would you recommend your D-Link product to a friend? ☐Yes ☐No (why?) _ □I don• know yet





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