D-Link®

Fast Ethernet PC Card
DFE-650 Series

User's Guide

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FCC Warning

DFE-650TX   FCC Class B ID KA2FEPC65001

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. 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:

- 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 received,

including interference that cause undesired 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 lengths of time from the date of purchase from D-Link or its authorized reseller:

Product Type	Warranty Period
Network adapters	Lifetime
Unmanaged and managed hubs *	Lifetime
Repeaters, MAUs, transceivers, media converters	One year
Concentrators	One year
Internetworking products	One year
Other hardware products	One year
Spare parts and spare kits	90 days
* Power supply and fans in these devices	One year

If a product does not operate as warranted during the applicable warranty period, D-Link shall, at its option and expense, (1) repair the defective product or part, (2) deliver to Customer an equivalent product or part to replace the defective item. All products that are replaced will become the property of D-Link. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

D-Link shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to D-Link pursuant to any warranty.

All products with lifetime warranty have a standard five-year warranty. To qualify for lifetime warranty, the enclosed Product Registration Card must be completed and returned to D-Link within ninety (90) days of purchase.

Warranty service may be obtained by contacting a D-Link office for a Return Material Authorization (RMA) number. See list of office locations at the end of this manual. If a Product Registration Card has not been

previously sent, proof of purchase, such as a copy of the dated purchase invoice, must be provided. Once an RMA number is issued, the defective product must be shipped back to D-Link prepaid, insured and wrapped in the original or similar shipping package to ensure that it will not be damaged during shipment. When returning the defective product to D-Link for service, the RMA number must be marked on the outside of the shipping package. Any product returned without an RMA number shall be rejected and sent back to the Customer, and D-Link reserves the right to have Customer bear the cost of sending back such products. A service charge may or may not be levied to Customer by D-Link. To find out if a service charge is levied or not, and the charged amount, read the RMA that is returned to Customer, or ask the D-Link office when an RMA is requested.

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D-Link warrants that the software programs licensed from it will perform in substantial conformance to the applicable published program specifications 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 containing software against failure during the warranty period. No updates are provided. D-Link's sole obligation hereunder shall be to replace any defective software products with products which substantially conform to D-Link's applicable published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. D-Link makes no warranty that its software products will work in combination with any hardware of applications software products provided by third party, that the operation of the software products will be uninterrupted or error free, or that all defects in the software product will be corrected. For any third party products listed in the D-Link software product documentation or specifications as being compatible. D-Link will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by "bug" or defect in the third party's product.

Warranty service for software products may be obtained by contacting a D-Link office within the warranty period. See list of office locations at the end of this manual. Where no Product Registration Card has been sent by Customer, proof of purchase, such as a copy of the dated purchased invoice, must be provided.

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Table of Contents

Introduction

Thank you for choosing D-Link DFE-650, the value leader among PC-Card Fast Ethernet adapters. This chapter provides a general description of DFE-650 Series features, with a summary of features at the end of the chapter. Installation instructions are given in Chapter 2.

General Description

The D-Link DFE-650 Series Fast Ethernet PC Card is a credit-card sized Fast-Ethernet adapter for connecting a notebook PC to an IEEE 802.3 or 802.3u Ethernet network. The notebook PC must be equipped with a Type II or Type III PC Card slot.

NOTE: *The terms "PC Card" and "PC Card slot" are used throughout this manual to refer to those objects as defined in the Personal Computer Memory Card Industry Association (PCMCIA) standards.*

The DFE-650 automatically detects the parameters of its Ethernet environment, and automatically negotiates and determines its own speed and duplex settings as required for maximum performance in its environment.

Inside its compact PC-Card package, the D-Link DFE-650 holds an Ethernet controller, network processing interface, 64 Kb RAM data buffer, a 68-pin PC Card Standard front-end plug which connects to the notebook PC, and a 15-pin back-end receptacle for connecting

the media coupler. The DFE-650 requires no pre-installation setup −− simply insert its front end into the notebook PC's PC-Card slot.

The DFE-650 is supplied with a media coupler which plugs into the back end (15-pin receptacle) of the DFE-650. The other end of the media coupler has an RJ-45 receptacle which receives the network cable. The media coupler features LED indications for linkage and activity states, and for the speed and duplex settings.

About Fast Ethernet

Fast Ethernet is a network technology specified by IEEE Standard 802.3u. It extends the traditional 10Mbps (10 megabit/sec) Ethernet technology to achieve 100Mbps (100 megabit/sec) transmission and reception. Because Fast Ethernet retains the traditional Ethernet CSMA/CD (Carrier Sense, Multiple Access, Collision Detect) protocol, it remains wholly compatible with 10Mbps Ethernet while providing a tenfold increase in network capacity.

The Fast Ethernet standard specifies three subtypes, corresponding to three media types:

100Base-TX (using two twisted pairs in EIA 568 Category 5 UTP or STP cable)

100Base-T4 (using four twisted pairs in a Category 3, Category 4, or Category 5 UTP cable)

100Base-FX (using two fiber-optic strands).

D-Link DFE-650 Series Fast Ethernet PC Cards offer half-duplex 100Base-TX operation (in Category 5 twisted-pair cable environments). These products do not support 100Base-T4 or 100Base-FX operation. To provide for traditional 10Mbps Ethernet operation in twisted-pair cable environments, the DFE-650 series

also offers 10Mbps Ethernet operation, in full-duplex and half-duplex modes. Selection of the best operation mode in any given installation is automatically governed by autonegotiation.

About Autonegotiation

The basic idea of autonegotiation can be understood by reflecting for a moment on the familiar process of making a dialup connection between two modems. You have probably heard some gravelly–sounding exchanges between your local modem and a modem at the other end of a 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 connection 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 have switched to the combination of parameters which will provide the best data communication, then you are given the "connect" message which signals the end of the inter-modem negotiation and the beginning of your intended communication with the remote computer.

Autonegotiation between devices within an Ethernet LAN is similar in concept, but much briefer. The two devices involved in the autonegotiation will be your DFE-650 Series PC Card and the hub or switch through which it is connected into the LAN. (Switches ordinarily provide autonegotiation functionality; hubs usually do

not.) The parameters to be negotiated between the DFE-650 and its supporting hub or switch include speed (100Mbps = Fast Ethernet, or 10Mbps = traditional Ethernet) and duplex mode (half-duplex or full-duplex).

Startup communication between the two devices occurs when both devices are operating, the cable connection between them is good, and the connected notebook PC's network software is loaded. As soon as those conditions are satisfied, the preparatory process of autonegotiation between the DFE-650 and its supporting device begins and proceeds automatically.

If the supporting hub or switch has autonegotiation functionality, then it and the DFE-650 exchange a series of messages in which each device signals its capabilities and listens for corresponding information about the other. The autonegotiation process requires only a few milliseconds, and the two devices select the best communication parameters supported by both devices.

If the supporting device does not have autonegotiation functionality, then its monotone (single capability) message will be recognized by the DFE-650's autonegotiation facility, and the DFE-650 will simply switch to the one of its own capabilities which matches that of the supporting device.

Once the autonegotiation is completed, then the line is ready, and it will provide an optimal data channel between the DFE-650 and the supporting device. The line will remain ready without further autonegotiation action until the linkage is broken. Autonegotiation then reoccurs at any time that the linkage is restored, again making the line ready for optimal data communications.

LED Indicators

The media coupler features three LED indicators:

1. 10/100 Indicator

   Steady green indicates Fast Ethernet selected.

   Dark indicates 10Mbps Ethernet selected.

2. Half /Full Indicator

   Steady green indicates Full-Duplex selected.

   Dark indicates Half-Duplex selected.

3. Ln/Act Indicator

   Steady green indicates that there is good linkage to the network ("Linkage" state, quiescent).

   Flashing green indicates that the DFE-650 is transmitting or receiving ("Activity" state). In 10Mbps mode, flashing will be regular and periodic. In 100Mbps mode, flashing may be irregular, with longer dark periods during heavy traffic activity.

Summary of Features

Features of Model DFE-650TX Fast Ethernet PC Card:

- 100Mbps and 10Mbps data rates in compliance with IEEE 802.3 Ethernet standards 100Base-TX and 10Base-T

- Complies with PCMCIA V2.x, JEIDA V4.x, and 16-Bit PC Card Standards

- PC Card Standard 68-pin front-end connector

- 15-pin back-end connector for media coupler

- Built-in 64KB RAM data buffer

- Full-Duplex capable in 10Mbps mode

- Autonegotiation per IEEE 802.3u specification

- No manual setup switches −− fully automatic configuration

- Low power consumption (2 watts max.)

- Electronics miniaturization by VLSI and surface-mount fabrication technologies

- Laser-welded stainless steel case

- RJ-45 connector with auto-detection of network speed

- Software support:

```
Install Program
Diagnostic Program
NDIS 2.0 for Banyan
NDIS 2.0 for IBM Lan Support/Services
NDIS 2.0 for IBM Wrap Server, Lan Server,
and                 Communication Manager 1.x
NDIS 2.0 for MicroSoft Lan Manager for DOS
NDIS 2.0 for MicroSoft Network Client 3.0
for DOS
NDIS 2.0 for WIN/TCP PathWay Access
SUN PC-NFS V5.0
NetWare Client32 for Windows 95
NetWare Client32 for DOS/Windows 3.1
NetWare Server 3.12
NetWare Server 4.x
```

```
NetWare DOS ODI
NetWare Lite
Personal NetWare
Windows 95
Windows 95 OSR2
Windows NT 3.51
Windows NT 4.0
Packet Driver for NCSA
Packet Driver for FTP PC/TCP
Packet Driver for IPX
Packet Driver for Winsock
```
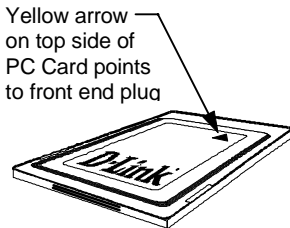
Hardware Installation
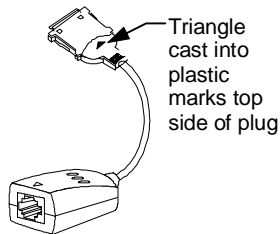
Unpack and Inspect

NOTE: *Under ordinary circumstances, the DFE-650 Series Fast Ethernet PC Card will not be affected by static charge as may be received through your body during handling of the unit. In special circum-stances where you may carry an extraordinarily high static charge, it is good practice to reduce the charge by touching a ground before handling the DFE-650.*

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

- One DFE-650 Series Fast Ethernet PC Card
- One plastic storage bag for the PC Card
- One media coupler
- One D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette

Yellow arrow on top side of PC Card points to front end plug

DFE-650 Series Fast Ethernet PC Card

Triangle cast into plastic marks top side of plug

Media Coupler

In the event that any item is missing, or if you find any mismatch or damage, promptly contact your dealer for correction.

Hardware Installation

Follow these four steps to install the DFE-650 :

Step 1 Insert the DFE-650

Under the PCMCIA standard and the corresponding Japanese JEIDA standard, PC Cards may safely be "hot swapped" –– it is not necessary to switch the computer's power off before installing or removing the DFE-650, or any other PC Card.

Find/select an open Type II or Type III PC Card slot on your notebook computer's side or rear panel. Hold the DFE-650 with the colorful D-Link splash label upward. Notice that the splash label features a yellow triangle or "arrow," which points to the front end of the PC Card. Insert the front end of the PC Card into the PC Card slot, and slide the PC Card all the way into the slot until it reaches a firm stop.


Type II or Type III
PC Card slot(s)

D-Link color-splash
label facing up
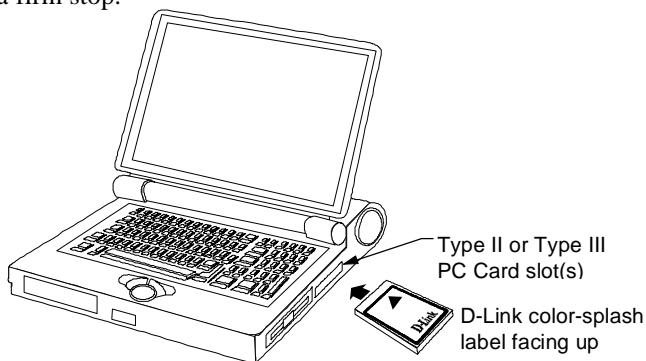
NOTE: *Many notebook PCs feature a stacked pair of PC card slots, logically (but not physically) designated as Slot 1 and Slot 2.*

It is most usual for the lower one of the two slots in the stack to be designated Slot 1, but there are exceptions. In the subsequent procedure for DFE-650 software installation, it may be necessary for you to know whether your DFE-650 is installed in Slot 1 or Slot 2. Under Windows 95, you can check by opening the Control Panel / PC Card display. Under DOS it is also possible to make a software check, but it is more difficult. If you are unable to determine the DFE-650's slot number in advance, then you can make a trial-and-error determination later, according to instructions given in the Software Installation section of this chapter.

Step 2 Attach the Media Coupler

The back-end receptacle of the DFE-650 remains accessible (approximately flush with the case of the computer) when the DFE-650 is properly seated in its PC Card slot. Taking care to keep the top side of the media coupler plug up, insert the plug into the DFE-650's receptacle until it is firmly seated and latched. (The top side of the plug is labeled with a triangle molded into the plastic.)


Keep the triangle mark on top when you plug the media coupler into the DFE-650
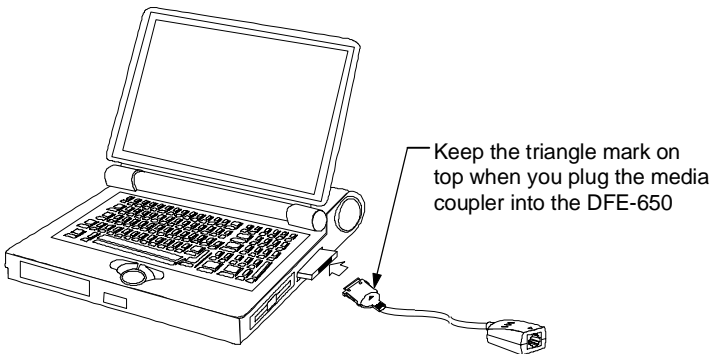
NOTE: *When the media coupler plug is firmly seated, it is held in place by small latching hooks at either side of the plug. To*

avoid damage when detaching the plug from the DFE-650, it is necessary to depress the latch wings of the plug. See the following section, "Remove Ethernet PC Card."

Step 3 Connect to the Network Medium

Make the network connection by running a UTP cable from the supporting hub to your media coupler. Simply plug one end (RJ-45 connector) of the cable into an available hub port, and plug the other end (RJ-45 connector) into the RJ-45 socket of the media coupler.

Ethernet / Fast
Ethernet Hub

Media Coupler

RJ-45 Connectors
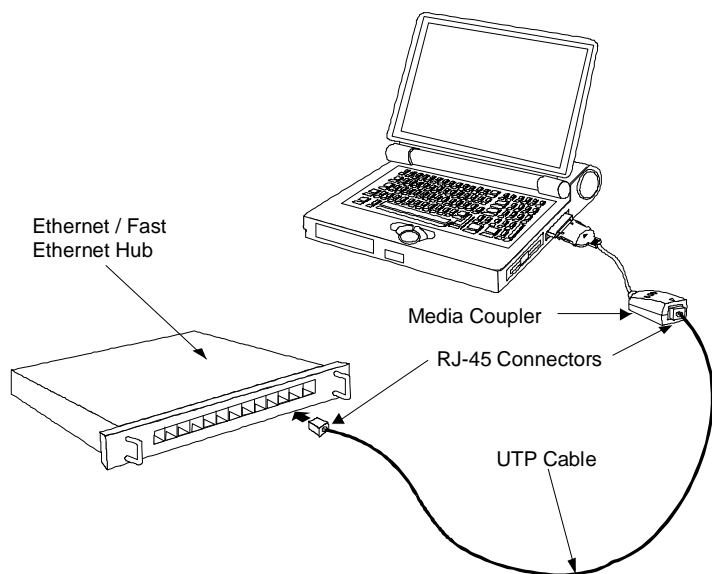
UTP Cable

UTP cable connecting media coupler to the supporting hub

Step 4 Confirm Connection (Ln/Act Indicator)

When the notebook computer's power is ON, the DFE-650 is firmly seated in the slot connector, the media adapter plug is firmly engaged (and latched) in the back-end receptacle of the DFE-650, the media adapter has a good cable connection to the supporting hub, and the supporting hub is power on and functioning properly, then the media coupler's Ln/Act LED glows steady green ("linkage" state).

If the Ln/Act LED remains dark without apparent cause, then the most likely fault is poor engagement of the 68-pin front-end plug. Review the following section titled "Remove the DFE-650," then remove the DFE-650 from its slot. Repeat the procedures of the above Step 1, "Insert the DFE-650," taking care to ensure that the DFE-650 is right side up and front-end first, and that it seats firmly in a suitable PC Card slot of your notebook. Repeat procedures of Steps 2 and 3 as necessary get the Ln/Act LED confirmation.

NOTE: *You might need to wait a few seconds following notebook powerup, or following insertion of a PC Card, for the software processing to be completed. The Ln/Act indicator will remain dark until the software processing is completed.*

Remove the PC Card

Follow these two steps to remove the DFE-650 its slot:

Step 1 Disconnect the Media Coupler Plug from the DFE-650

Unplug the media coupler from the DFE-650 before ejecting the DFE-650 from the PC Card slot. The media coupler plug is held in place by small latching hooks at either side of the plug. To remove the media coupler plug from the DFE-650, it is necessary to unlatch the hooks by depressing the two small latch wings of the plug. Use

thumb and forefinger to squeeze the latch wings into the plug body
and gently pull the plug out of its receptacle.
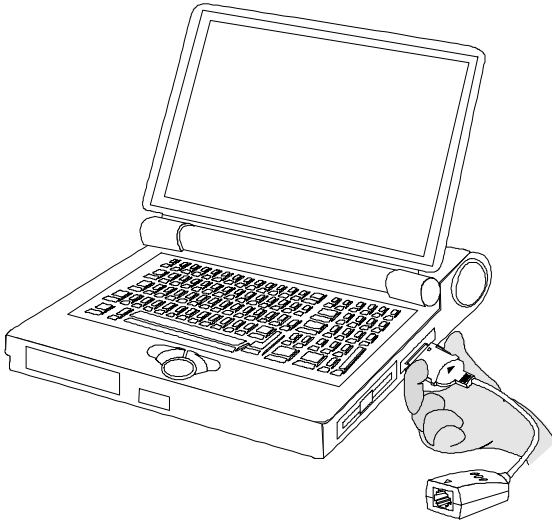
Depress clip wings while unplugging the connector
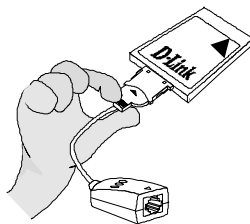
Don't pull the connector without depressing the clip wings

WARNING: *Pulling the coupler plug out of its receptacle without
depressing the clip wings will cause damage to the plug.*

Step 2 Eject the DFE-650 from the Computer

Firmly press the computer's PC Card Eject button to disengage the DFE-650 from the slot connector. The DFE-650 will then protrude from the PC Card slot. Grip its protruding end between your fingers and withdraw it from the PC Card slot.

Connect the Network Cable

Category 5 UTP cable is good enough to qualify under both the Fast Ethernet cabling rules and the traditional Ethernet cabling rules. The maximum individual cable run between any station and its supporting hub or switch is 100m. The maximum individual cable run 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). But these cable runs may need to be shorter than the given individual maximum lengths, because their lengths are also restricted by the rule that the maximum *aggregated* cable run between any two stations is 205m.

Connecting for Fast Ethernet

Category 5 UTP cable is required for Fast Ethernet operation. The maximum cable run between the DFE-650 and the supporting hub is 300 ft. 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 receptacle of the media coupler, 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 traditional Ethernet cabling rules. The maximum cable run between the DFE-

650 and the supporting hub is 300 ft. The cable must be "straight" (not a "crossover" cable) with RJ-45 plug at each end. Make the network connection by plugging one end of the cable into the RJ-45 receptacle of the DFE-650, and the other end into a port of the supporting hub.

Software Installation

Hardware installation as described in Chapter 2 must be completed before you proceed with software installation.

Instructions for software installation are given as README files on the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette. The diskette also holds the Installation Director program, which helps you access the installation instructions appropriate to your station OS and the network environment.

Run Installation Director

For proper function of Installation Director, it is necessary that the DFE-650 to be plugged into a PC Card slot of the notebook PC. Ascertain that the DFE-650 is in place, according to Step 1 of Hardware Installation, Chapter 1, then insert the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette into the diskette drive of the notebook PC. Then select that drive as the active drive. In the Run dialog box, or at the command prompt, type the letter designator for that drive (here assumed to be A), and complete the line as follows:

```
A:\install.exe
```

Then key <Enter> to run Installation Director. It will guide you to, and display, the appropriate installation instructions. Installation Director provides installation instructions for every combination of platform OS and network environment in which the DFE-650 can be used.

During your Installation Director run, if you choose DOS as your station OS, then in some cases Installation Director will provide additional services. In such cases, you will be prompted to select a target directory for storage of software modules that Installation Director will copy over from the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette. The README text will provide full information on the additional services provided..

Installation Director also provides access to the Diagnostic Program, which may be used to check the hardware components of the DFE-650, as well as its proper interoperation with your network.

For the case that you have a Novell NetWare network environment and your notebook PC workstation is running MS-DOS (or equivalent) or Windows 3.1, then Installation Director will lead you to the appropriate installation README, and you will also find expanded installation instructions in the following subsections of this chapter. Refer to whichever instructions you find most comfortable.

Expanded Installation Instructions: DOS Platform in NetWare Network

If your notebook PC is running MS-DOS or an equivalent OS, then you have a choice between two flavors of NetWare client software. You can choose to install the traditional 16-bit NetWare Client for DOS, or you can install the 32-bit NetWare Client32 for DOS. Both types of client software will provide excellent service. It is not certain whether there is a performance benefit in using the 32-bit client software under DOS. But the procedure for installation of the 32-bit client software is by far more complicated. Thus you might choose to make an overview comparison of the following installation instructions for the two kinds of client software before you decide which to install.

Installing 16-bit NetWare Client for DOS

Installation Director includes a Quick Install option for the DFE-650 support software required for interoperation with the 16-bit NetWare Client for DOS. The screen text, status line guide text, and helptext of Installation Director will assist you through the Quick Install procedure.

Installing NetWare Client32 for DOS

Installation of the 32-bit support software for the DFE-650 can only be accomplished as part of a new installation, or a re-installation of the Client32 software on your notebook PC workstation.   The NetWare Client32 software includes a DOS-based installer program, INSTALL.EXE, which is used for the original installation, and for any necessary re-installation, of the Client32 software on your station.   Thus INSTALL.EXE is also the installation program for the DFE-650 support software required for interoperation with NetWare Client32 for DOS.

Before you can proceed with any of the steps which follow, it will be necessary for you to find a source for the NetWare Client32 software. Depending on decisions which have been made by the NetWare administrator for your LAN, the Client32 software may be available from a NetWare server on the LAN or, alternatively, it may be necessary for you to install from the Client32 CD-ROM or diskettes. If you are in doubt as to the proper source for the Client32 software, please consult your NetWare administrator.

Irrespective which form your source takes, you will need to identify the directory which holds the Client32 for DOS software. If your source for the Client32 software is the Novell NetWare 4.11 CD-ROM, then the appropriate directory will be (assuming that the CD-ROM drive is E:),

```
E:\PRODUCTS\DOSWIN32\IBM_6
```

Navigate to the appropriate directory in your Client32 source, so that it is your active directory, and find INSTALL.EXE in that directory. Then at the DOS prompt (shown here as >), type:

> `> INSTALL.EXE`

and `<Return>`. Following the copyright notice screen, the next screen in the INSTALL.EXE run will be the "Select the products" screen.

"Select the products" Screen

This screen offers simultaneous installation of several network software packages. NetWare Client 32 for DOS appears at the top of the list. Follow the on-screen instructions, and select the checkbox at the left of NetWare Client 32 for DOS:

> `[X] NetWare Client 32 for DOS`

For the purpose of basic LAN operations, it is not necessary to select any of the other products. If you are in doubt whether any of the other packages offered by this screen should be included in your installation, then consult your LAN administrator. After the proper selections are made (marked with an X), key `<F10>` to continue.

"Select a LAN Driver Type" Screen

In this screen, use the up or down arrow keys to highlight

> `32-bit LAN drivers`

Then key `<F10>` to continue.

"32-Bit Network Board Drivers" Screen

Use the down arrow key, or the Page Down key to scroll to the bottom of the long list of driver modules (drivers which are included with the NetWare software). At the bottom of the list,

following the last of the included drivers, there are some additional options. Highlight

> USER SPECIFIED 32 BIT DRIVER

Then key <F10> to continue.

"Insert The Driver Disk" Dialog Box

Insert the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette into a diskette drive of the notebook PC. Type this path-name into the textbox (here assuming the diskette drive to be Drive A):

> A:\NETWARE\32BITLAN\

Then key <Enter> to continue. The dialog box closes, and the DFE-650 driver name appears highlighted in the "32-Bit Network Board Drivers" screen. Key <F10> to continue.

"Settings for D-Link DFE-650 Fast Ethernet PC Card Driver"

This screen provides control of four settings. The Connection Type setting is an aggregate setting which includes Line Speed (10Mbps or 100Mbps) and Duplex (Half Duplex or Full Duplex). It is recommended that you deselect all line speed and duplex settings, by celecting "none" as Connection Type.

WARNING: *Whenever any value is shown for either Line Speed or Duplex (i.e., the Connection Type setting is different from "none"), then the entire autonegotiation function of the DFE-650 will be disabled (turned off).*

It is ordinarily best not to change either of the next two settings, Driver Retries or Frame Type, from their default values. The first of these two parameters affects the error-correction processing of defective data packets. The default value

is 5, and that is ordinarily a suitable value. The second parameter is a list of the data frame formats that the DFE-650 and the client software will be enabled to handle. The default setting enables four different frame types. That is the maximum range of frame types, and that is the most appropriate choice in most environments.

The last parameter, Node Address, should ordinarily be left blank, as well. It provides for entry of an alias hardware address, which is rarely needed.

When your entries are settled, key <Esc> to continue.

"Installation Configuration Summary" Screen

This is the last screen before the automatic portion of the installation. It offers a default target path/directory name, and allows for your option/permission to automatically alter the AUTOEXEC.BAT and CONFIG.SYS files.

If the offered default path/directory name for the installation is not acceptable, then key in the path/directory name of your choice. In all events, make a note of the path/directory name, which will be needed in the "Edit STARTNET.BAT" section, below.

The permission choice is captioned

    Modify AUTOEXEC.BAT and CONFIG.SYS:

If you elect Yes, then a STARTNET.BAT command will be added into your AUTOEXEC.BAT file. In that case, the network software will automatically be loaded each time you power up the notebook PC.

If you elect No, then it will be necessary for you to enter the STARTNET.BAT command manually at the DOS prompt any time that you want to enable the notebook PC for network operation. If you want to maximize your notebook PC's resources which will be available during off-line operations, just choose No

(key an n, followed by <Enter>). And you must then remember to enter the STARTNET.BAT command each time you connect and prepare for network operations.

Key <F10> to approve the installation and initiate the automatic portion of the installation process. (Or key <Alt + F10> to abort.)

Final Screen of INSTALL.EXE

At completion of the INSTALL.EXE run, there will be an a screen of advisory information which also instructs you to reboot the notebook PC. In order to avoid some troublesome diagnostics which would follow a restart at this time, it is necessary to edit the file STARTNET.BAT before the restart. Key <ENTER> to exit INSTALL.EXE.

Edit STARTNET.BAT

At the DOS prompt, change active directory to the target directory (named in the Installation Configuration Summary screen). Then use the DOS Edit utility to edit STARTNET.BAT. For example:

```
C:\NOVELL\CLIENT32\> EDIT STARTNET.BAT
```

For each enabled frame type (four types at maximum), STARTNET.BAT will include a line similar to this shortened example:

```
LOAD C:\...\DFE650.LAN FRAME=...
```

Edit each such statement (there will be a maximum of four) as follows: just ahead of the FRAME keyword, insert "SLOT=1" separated by at least one space before and after (but if you know that the DFE-650 is in PC Card Slot No. 2 of the notebook PC, then you should insert "SLOT=2). The shortened example above would then read,

---

```
LOAD C:\...\DFE650.LAN SLOT=1 FRAME=...
```

When you have completed the edit for each such line in STARTNET.BAT, then save STARTNET.BAT and exit from Edit. If you are uncertain whether the DFE-650 occupies Slot 1 or Slot 2, and you have entered the wrong slot number, then when you restart the notebook PC, there will be a diagnostic which advises that "the PC Card is not present" and there will be no network connection. If you do not get a network connection upon your restart, then rework your editing of STARTNET.BAT, entering the alternate PC Card Slot Number (substitute SLOT=2 in each place where you have added SLOT=1).

Restart the notebook PC. Excepting the possibility that the wrong PC Card Slot Number is indicated in STARTNET.BAT, you should get a NetWare login upon this restart.

Expanded Installation Instructions: Windows 3.1 Platform in NetWare Network

If your notebook PC station is running Windows 3.1, then you need to install Client32 for DOS. (Fundamentally, the DFE-650 support software modules to be installed are the same under Windows 3.1 and DOS. But the Windows 3.1-based installer program SETUP.EXE does produce a different result from the installation made by the DOS-based installer, INSTALL.EXE.)

Installing NetWare Client32 for DOS (under Windows 3.1)

Installation of the support software for the DFE-650 can only be accomplished as part of a new installation, or a re-installation of the Client32 software on your notebook PC. The NetWare Client32 software includes a Windows-based installer program, SETUP.EXE which is used for the original installation, and for any necessary re-installation, of NetWare Client32 for DOS on your station.. Thus

the NetWare SETUP.EXE program is also the installation program
for the DFE-650 software.

Before you can proceed with any of the steps which follow, it will
be necessary for you to have a source for the NetWare client
software. Depending on decisions which have been made by the
NetWare administrator for your LAN, the NetWare client software
may be available from a NetWare server on the LAN, or it may be
necessary for you to install from the Novell NetWare CD-ROM or
diskettes. If you are in doubt as to the proper source for your
NetWare client software, then please consult your NetWare
administrator.

Irrespective which form your source takes, you will need to identify
the directory which holds the NetWare Client32 for DOS software.
If your source for NetWare Client32 for DOS is the NetWare 4.11
CD-ROM, then the appropriate directory will be (assuming that the
CD-ROM drive is E:),

> `E:\PRODUCTS\DOSWIN32\IBM_6`

In Program Manager, choose RUN under the FILE menu, then, in
the RUN dialog box, choose the `Browse` button. Select the drive
which holds the software source, then navigate to the appropriate
directory. Double-click SETUP.EXE to initiate the installation run.

The initial screen in the SETUP.EXE run is only for the purpose of
selecting the language in which the screen instructions which will
appear during the rest of the SETUP.EXE run. Choose the `OK`
button for English, or select another one of the languages offered,
and then choose the `OK` button. The NetWare Client 32 Welcome
screen then appears.

NetWare Client 32 Welcome Screen

The Welcome screen provides some orientation information, and
offers you the choice of reading additional technical information in
the README file before going ahead with installation. It might be

your best choice to go ahead with the installation run by choosing the Continue button. If the installation run is not successful, then the information given in the README file might be more useful at this stage in a second attempt.

When you choose the Continue button, the Software License Agreement screen appears. Accept the provisions of the Software License Agreement, and continue the installation run, by choosing the Yes button. The Directory Locations screen appears.

Directory Locations Dialog

It is ordinarily suitable to approve the default entries which appear in this dialog's two text boxes, by simply choosing the Next> button.

The first textbox provides for selection of a target directory to receive your computer's copies of the necessary Client 32 files. The textbox shows a default directory name which is ordinarily a suitable choice. There is a "browse" button at the right of the textbox. In all events, it is a good idea to write down the name of this target directory, because you will need to know the directory name at a later stage of the installation procedure.

The second textbox in this screen shows the name of the directory which holds the currently active WIN.COM file. The textbox provides for entry of a Windows filename different from the currently active Windows directory. Do not change this textbox unless you are doing a special procedure involving multiple copies of the Windows 3.1 system software on your computer.

When you choose Next>, then the ODI Driver Selection screen appears.

ODI Driver Selection Screen

Disregard the "Board" textbox at the top of this dialog box. In the "Driver" section below the textbox, select the `32 bit` option button, then choose the `Other Boards` button. This brings up the ODI Driver Path dialog box.

The ODI Driver Path dialog box features a textbox for specification of the full path filename to the ODI driver (Open Data Interface driver module) needed for operation of the DFE-650 under DOS or Windows 3.1 OS. That module is supplied on the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette.

Insert the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette into a diskette drive of your notebook PC (here assumed to be drive A), and type in the textbox to complete the following entry:

> `A:\NETWARE\32BITLAN\DFE650.LAN`

Then choose the `OK` button to close the ODI Driver Path dialog box. In the Select a Board dialog box which then appears, there will be just one entry: `D-Link DFE-650 Fast Ethernet PC Card Driver`. Click that entry to confirm that you are installing the DFE-650, then choose the `OK` button to close the Select a Board dialog box.

This returns control to the ODI Driver Selection dialog box. Now choose the `Driver Settings` button. The Driver Settings dialog box appears.

Driver Settings Screen

This screen provides control of four settings. The `Connection Type` setting is an aggregate setting which includes Line Speed (10Mbps or 100Mbps) and Duplex (Half Duplex or Full Duplex). It is recommended that you deselect all line speed and duplex settings, by celecting "none" as `Connection Type`.

WARNING: *Whenever any value is shown for either Line Speed or Duplex (i.e., the Connection Type setting is different from "none"), then the entire autonegotiation function of the DFE-650 will be disabled (turned off).*

It is ordinarily best not to change either of the next two settings, `Driver Retries` or `Frame Type`, from their default values. The first of these two parameters affects the error-correction processing of defective data packets. The default value is 5, and that is ordinarily a suitable value. The second parameter is a list of the data frame formats that the DFE-650 and the client software will be enabled to handle. The default setting enables four different frame types. That is the maximum range of frame types, and that is the most appropriate choice in most environments.

The last parameter, `Node Address`, should ordinarily be left blank, as well. It provides for entry of an alias hardware address, which is rarely needed.

When your entries are choose the OK button to continue. This returns control once more to the ODI Driver Selection dialog box. Choose the `Next>` button to continue. The Additional Options dialog box appears.

Additional Options Screen

The Additional Options screen is the last preparatory step before starting the automatic portion of the installation procedure. This screen features a checkbox for authorizing modification of your notebook PC's AUTOEXEC.BAT file, and it also offers the option to simultaneously install several additional network software packages.

If you select the `Update AUTOEXEC.BAT to load NetWare Client 32` checkbox, then a `STARTNET.BAT` command will be added into your AUTOEXEC.BAT file. In that case, the network software will automatically be loaded each time you power up the notebook PC.

If you de-select the checkbox, then it will be necessary for you to run STARTNET.BAT manually any time that you want to enable the notebook PC for network operation. If you want to maximize your notebook PC's resources which will be available during off-line operations, then de-select the checkbox (so that it is "blank"). Then remember to run STARTNET.BAT each time you connect and prepare for network operations.

For the purpose of basic LAN operations, it is not necessary to select any of the Additional Software items. If you are in doubt whether any of the additional software items offered by this screen should be included in your installation, then consult your LAN administrator. It might also be useful review the help text which you can access by choosing the Help button

When you have made your selections in the Additional Options screen, then choose the Next> button to initiate the automatic portion of the installation procedure.

When the automatic procedure is completed, SETUP will offer to restart the computer. In order to avoid some troublesome diagnostics which would follow a restart at this time, it is necessary to edit the file STARTNET.BAT before the restart. Exit SETUP.

Edit STARTNET.BAT

In Program Manager, open a DOS window. At the DOS prompt, change active directory to the target directory (named in the Installation Configuration Summary screen). Then use the DOS Edit utility to edit STARTNET.BAT. For example:

```
C:\NOVELL\CLIENT32\> EDIT STARTNET.BAT
```

For each enabled frame type (four types at maximum), STARTNET.BAT will include a line similar to this shortened example:

```
        LOAD C:\...\DFE650.LAN FRAME=...
```

Edit every such statement (there will be a maximum of four such statements), as follows: just ahead of the FRAME keyword, insert "SLOT=1" separated by at least one space before and after(but if you know that the DFE-650 is in PC Card Slot No. 2 of the notebook PC, then you should insert "SLOT=2). The shortened example above would then read,

> LOAD C:\...\DFE650.LAN SLOT=1 FRAME=...

When you have completed the edit for each such line in STARTNET.BAT, then save STARTNET.BAT and exit from Edit. If you are uncertain whether the DFE-650 occupies Slot 1 or Slot 2, and you have entered the wrong slot number, then when you restart the notebook PC, there will be a diagnostic which advises that "the PC Card is not present" and there will be no network connection. If you do not get a network connection upon your restart, then rework your editing of STARTNET.BAT, entering the alternate PC Card Slot Number (substitute SLOT=2 in each place where you have added SLOT=1).

Restart the notebook PC. Excepting the possibility that the wrong PC Card Slot Number is indicated in STARTNET.BAT, you should get a NetWare login upon this restart.

A

Troubleshooting

Troubleshooting the Hardware Installation

If you experience any problems with the hardware installation, first ascertain that all network cable connections are firm, that the proper grade of cable is used for the network connection, and that the cable makeup is correct (straight −− without un-needed crossovers in the connector wiring). Check that the supporting hub is power-on and operating normally, and that the hub is properly qualified (under 10Base-T and/or 100Base-TX standards).

Troubleshooting the Software Installation

You Get the "DFE-650 PC Card Not Detected" Error

You are running Installation Director, and in the Main Menu you have selected

```
Quick Install 16-bit Driver for Dos Netware Client
```

The Quick Install run is then interrupted by an error message which says that the DFE-650 PC Card is not detected by the system.

You have followed the instruction given by the error message, to repeat Step 1 of the Hardware Installation procedure given at the beginning of Chapter 2 of the User's Guide. And you have then re-run Installation Director. And the same error message has come up.

Proceed as follows:

1. Exit Installation Director. Examine the CONFIG.SYS file in the root directory of your notebook PC's startup drive (hard drive). Ascertain that CONFIG.SYS contains a DEVICE statement for Extended Memory Manager (EMM). Such a statement should resemble the following example,

   ```
   DEVICE = C:\DOS\EMM386.EXE X=D000-D7FF
   ```

2. If there is no similar DEVICE statement in your notebook PC's CONFIG.SYS file, then edit the CONFIG.SYS file, adding a statement copied exactly from the above example.

3. If there such a statement in CONFIG.SYS but the "DFE-650 PC Card not detected" error appears on each attempted Quick Install run anyway, then edit that statement to read exactly the same as the above example.

4. If, after you have completed the above instructions, the "DFE-650 PC Card not detected" error still appears on each subsequent restart of the notebook PC, then please contact your dealer or your nearest D-Link office, as listed at the end of this User's Guide.

You need to "unload the conflicting network driver"

You are running Installation Director, and in the Main Menu you have selected

```
Quick Install 16-bit Driver for Dos Netware
                  Client.
```

Then you have seen the warning message which advises that the presence in memory of another network card driver could cause a system halt. (That warning messages appears in every Quick Install run −− it does not indicate that there is another network card driver already loaded into memory.) Then you have elected to continue

the Quick Install run. And the Quick Install run has indeed produced a halt (system hangup).

If you have not been through all of those steps, then you should not be reading this. You should be in the Software Installation section of Chapter 2. And you should be staying on track with your Quick Install run. Continue reading here *only if* your Quick Install run is actually obstructed by a system halt (so that you can only restore your control of the notebook PC by a restart). And *only if* after your restart (which provides assurance of a "clean" DOS environment) you have tried Quick Install once more (and experienced the system halt once more). Only then should you conclude that you must "unload the conflicting network driver."

Stay Cool

The first thing you need to know is that "unload the conflicting network driver" is easier said than done. . . . This Troubleshooting section will provide some guidance, and if you don't have a great deal of experience in such matters, this guidance will be helpful. But if you have easy access to a network administrator (or other resident expert), now might be a good time to go for help. If it is your choice to have a go at it alone, then don't be hurried or worried. Just pour yourself a cup of coffee, relax, and read on. If this Troubleshooting section is not sufficient guidance, and you do not have ready access to an expert, then help may be available from the dealer who has supplied your DFE-650, and you can also get help by calling D-Link Technical Support at the D-Link office nearest to you (see the list of office locations at the end of this User's Guide).

"Unload" Really Means "Avoid Loading at Startup"

It is true that driver programs and related software modules, such as those supplied on your D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette, are often written so that the addition of a "/u" switch or "-u" option to the command line for loading the driver

---

will cause unloading of the same driver (if it is in fact already loaded). But such unloading is only possible under special circumstances. So, as a practical matter, what we really must do is *avoid loading of the conflicting driver* upon startup of the notebook PC.

A software installation procedure (such as "Quick Install 16-bit Driver for DOS NetWare Client") copies the necessary drivers and related modules from the supplied DFE-650 Series Fast Ethernet PC Card Driver diskette, into the target directory of the notebook PC's hard drive or other storage. The installation program also adds commands to the computer's AUTOEXEC.BAT file, so that each time the computer is subsequently booted up (and you then make certain choices in the startup menus, if any), the drivers and related modules are automatically loaded into memory.

The "conflicting driver" problem now at hand arises because certain commands already present in your notebook PC's AUTOEXEC.BAT file are being executed during bootup, and are causing some kind of previously installed network driver module to be loaded into memory. The presence of that network driver in memory is now making it impossible to load the DFE-650 network driver software (16-bit driver for DOS NetWare client).

So the fix is to delete from AUTOEXEC.BAT the line which is causing the conflicting driver to be loaded. Thus we will *avoid loading of the conflicting driver* when we next restart the notebook PC. And the trick is to delete that line from AUTOEXEC.BAT without deleting or changing anything which needs to remain unchanged in AUTOEXEC.BAT (so that your notebook PC will behave as you expect it to after each startup).

So which line of AUTOEXEC.BAT do we need to delete?

Now there is a really good question! It gets right to the heart of the problem. If you are savvy enough about such matters, then you may be able to go directly into DOS Edit,

```
C:\> edit autoexec.bat
```

and find the troublesome line by inspection, and simply delete it.
But if you are that clever, then it is very unlikely that you will be
reading this. So here is a procedure which will help you to identify
the troublesome line of AUTOEXEC.BAT.

Use the MEM Command to Help Identify the Conflicting Network Driver

At the DOS prompt (here represented by C:\>), type

```
C:\> mem /d | find "Program"
```

exactly as shown here, including the vertical bar (DOS "pipe"
symbol, **|**), then <Enter>. The resulting display of memory
allocation information will be a few rows of tabular data. Here is
an example:

```
  0122E      80   (0K)   MSDOS     System
  Program
  01236   2,656   (3K)   COMMAND   Program
  012F8   5,376   (5K)   LSL       Program
  0144F  32,994  (32K)   DFE650    Program
  01718  16,640  (16K)   IPXODI    Program
  01B28  48,688  (48K)   NETX      Program
  0270B  29,024  (28K)   SMARTDRV  Program
  02E2D  27,952  (27K)   MSCDEX    Program
  03500   4,144   (4K)   DOSKEY    Program
  03610  88,992  (87K)   MEM       Program
```

The next-last column lists the names of certain program modules
present in memory. We will disregard all the other columns.

Now we can cull that list of program names, by disregarding any item which is obviously not the name of a network driver. You might notice that some of the items (as in the example above) are names of DOS commands. (A convenient way to determine whether any item is the name of a DOS command is to search for that name in the alphabetical index of DOS commands which appears when you type "help" at the DOS prompt.) Thus, in our example, we have a list of ten names, and we can

disregard MSDOS, because it is the "System Program," and thus is not a network driver

disregard COMMAND, because it appears in the alphabetical list of DOS commands

disregard SMARTDRV, because it appears in the alphabetical list of DOS commands

disregard MSCDEX, because it appears in the alphabetical list of DOS commands

disregard DOSKEY, because it appears in the alphabetical list of DOS commands

disregard MEM, because it appears in the alphabetical list of DOS commands

This leaves us to deal with just four possibilities as to the name of the network driver which is conflicting with our Quick Install:

LSL, DFE650, IPXODI, and NETX

Let's call this list the "short list." One of the items in the short list is certain to be the conflicting driver.

Now It's Trial-and-Error Time

It is good news that the short list is short. The bad news is that there is only one method guaranteed to determine which of the

items on the short list is the culprit (conflicting driver). And that method is trial and error. So we begin testing each of the items on the short list in turn. We take the items in the same order as they appear in the short list (because taking them in that order will ordinarily lead us to the earliest success). LSL is the first item on our example short list, so we begin our trial-and-error round by starting with LSL and following this procedure:

1. Find the AUTOEXEC.BAT line which invokes the first item in your short list (LSL in our example):

    At the DOS prompt (here represented by C:\>), type

    ```
    C:\> find /n/i "LSL" autoexec.bat
    ```

    then <RETURN>. This will display the line from AUTOEXEC.BAT which causes the LSL program to be loaded.

    ```
           ---------- AUTOEXEC.BAT
        [2]C:\ODI.DOS\LSL.COM
    ```

    Ignore the header line of the display, which only identifies the subject file. To help locate the LSL line of the AUTOEXEC.BAT file, the line's line number in AUTOEXEC.BAT is shown in brackets to the left of the actual text of the line. If LSL appears in more than one line of AUTOEXEC.BAT, then you will need to decide which of the several lines is the one that causes loading –– but it is most likely that any additional lines will simply be remark lines, which you can ignore.

    Note that in this step, you must name the first item of *your* short list, rather than LSL, which is used here only for purposes of example.

2. Edit AUTOEXEC.BAT to cancel out that line.

    At the DOS prompt (here represented by C:\>), type

```
C:\> edit autoexec.bat
```

then `<RETURN>`. The content of AUTOEXEC.BAT is shown in the Edit window. Notice that the line number of the cursor position is shown at the right end of the status bar (at the foot of the Edit window; the line position of the cursor is shown ahead of a colon, and the column position of the cursor within the line is shown after the colon). *Take care* not to introduce any inadvertent changes while you have AUTOEXEC.BAT in the Edit window. Use the down arrow key to move the cursor down until you reach the line number as found in Step 1. Check that the line marked by the cursor is the same as that displayed in Step 1. Then type in the word REMARK at the beginning of the line. Immediately save, then exit from Edit.

3. Remove the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette from its drive, and key `<CTRL + ALT + DELETE>` to restart the notebook PC.

4. At the DOS prompt, insert the D-Link DFE-650 Series Fast Ethernet PC Card Driver diskette and run Installation Director, again choosing

```
Quick Install 16-bit Driver for
     DOS NetWare Client
```

and proceed with the installation run. If the installation run completes normally, then you are all through with the problem! ***Give yourself a big pat on the back***, and return "Installing 16-bit NetWare Client for DOS" in Chapter 3.

5. If the installation run again ends with a crash (halt), then the short list item we have just tested (LSL in our example case) is ***not*** the culprit. Repeat Step 1 above, but substitute the next program named in your short list (in our example we substitute DFE650 in place of LSL):

```
C:\> find /n/i "DFE650" autoexec.bat
```

Note that in this step, you must name the next item of *your* short list, rather than DFE650, which is used here only for purposes of example.

6. Repeat Step 2 above, but before you REMARK the line which invokes DFE650 (in the example case) you must *undo the editing previously done in Step 2*. That is (in our example case), delete the six letters REMARK from the beginning of the line which invokes LSL (first item in *your* short list). Then go ahead and REMARK the line which invokes the next program named in your short list (DFE650 in our example case). Immediately save, then exit from Edit.

7. Repeat Step 3

8. Repeat Step 4

9. If necessary, repeat Step 5.

10. Repeat Step 6

If You're Still Reading . . .

It's hard to guess why you might still be reading this Troubleshooting section, but maybe it's because you are still having trouble. So here is a little bit of clarification to the above procedure description. The example references (to LSL and DFE650) will only be useful in getting started on the cyclic pattern of the above instructions. After you are well into the rhythm of it, the example references are best ignored because they are specifically appropriate to the initial passes. By the time you get to testing the third item in your short list, the example references in the above description will be excess baggage –– refer only to *your* short list.

You Are Now an Uncertified Expert!

If you are not still having trouble, but you are still reading, then maybe it is because you are simply excited about your success in

the above "trial by fire."   You are excited about being an Uncertified Expert. Congratulations! But, you ask: How is a Certified Expert any different?

The difference is only this: certain items in your short list would be old friends to the Certified Expert.   He or she would have recognized them by name just as surely as you know your friend's face when you meet in a crowd. In the example case, the short list included four items,

LSL, DFE650, IPXODI, and NETX.

The Certified Expert would have recognized NETX as a NetWare shell module, therefore not the culprit conflicting network driver. And the Certified Expert would have recognized LSL as most likely being a link support layer module, which functions in a higher layer of the communications system, while a hardware-specific network adapter driver functions in a lower (physical) layer.   And the Certified Expert would have recognized or guessed that the IPXODI module is a protocol-layer element concerned with the transmission/reception of NetWare IPX packets by an ODI (Open Data Interface) network adapter. Thus the Certified Expert would have known, by a simple process of elimination, that the DFE650 element is the conflicting driver. So the Certified Expert would have been able to skip the trial and error process, which we needed to grunt through, in order to know which line of AUTOEXEC.BAT to cancel.

And here is one more bit of insight. Since the conflicting driver must be a hardware-specific driver, then it is likely to bear a name which suggests the model name of the PC Card it serves.   The Certified Expert will be acquainted with a large range of PC Card products. So he or she will be able to know which element in the short list has a name which suggests a PC Card model name. Now you know what lies between you and being a Certified Expert.

DFE-650TX
Specifications

Network Type:

- Ethernet 100Base-TX

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

- Ethernet 10BASE-T

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

Jumperless Hardware

Autonegotiation functionality

Media interface: RJ-45

LAN Chip Set:

- Interface controller,   DLI-0019C
- Transceiver interface,   LTX970QC

EMI Certifications:

FCC Class B
VCCI Class 2
CISPR B
Canada ICES-003, Class B

CE Certification

Host interface: PCI Bus (Bus Master)

I/O base address assigned by Plug and Play system

Interrupt Number Assigned by Plug and Play system

Physical Dimensions: $85.6 \times 54.0 \times 5.0$ mm

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: 2.0W

PCB Construction: 2 layers

Device Drivers*

- NDIS 2.0 for Banyan
- NDIS 2.0 for IBM Lan Support/Services
- NDIS 2.0 for IBM Wrap Server, Lan Server, and Communication Manager 1.x
- NDIS 2.0 for MicroSoft Lan Manager for DOS
- NDIS 2.0 for MicroSoft Network Client 3.0 for DOS
- NDIS 2.0 for WIN/TCP PathWay Access
- SUN PC-NFS V5.0
- NetWare Client32 for Windows 95
- NetWare Client32 for DOS/Windows 3.1
- NetWare Server 3.12
- NetWare Server 4.x
- NetWare DOS ODI
- NetWare Lite
- Personal NetWare
- Windows 95
- Windows 95 OSR2
- Windows NT 3.51
- Windows NT 4.0
- Packet Driver for NCSA
- Packet Driver for FTP PC/TCP
- Packet Driver for IPX
- Packet Driver for Winsock

*Check *http://www.dlink.com* for newest

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releases of drivers.

[this page is a placeholder only -- l/c standard]

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D-Link Offices

U.S.A.	**D-LINK SYSTEMS, INC.** 5 Musick Irvine, CA 92618 USA TEL: 1-714-455-1688 FAX: 1-714-455-2521
CANADA	**D-LINK CANADA, INC.** 2180 Dunwin Drive, Unit # 6, Mississauga Ontario, L5L 5M8, Canada TEL: 1-905-828-0260 FAX: 1-905-828-5669
U.K.	**D-LINK (EUROPE) LTD.** D-Link House, 6 Garland Road, Stanmore, London HA7 1DP U.K. TEL: 44-181-235-5555 FAX: 44-181-235-5500
GERMANY	**D-LINK (DEUTSCHLAND) GMBH I.G.** Bachstrae 22, 65830 Kriftel Germany TEL: 49-6192-97110 FAX: 49-6192-971111
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