DFE-528TX

Fast Ethernet Adapter

for PCI Bus

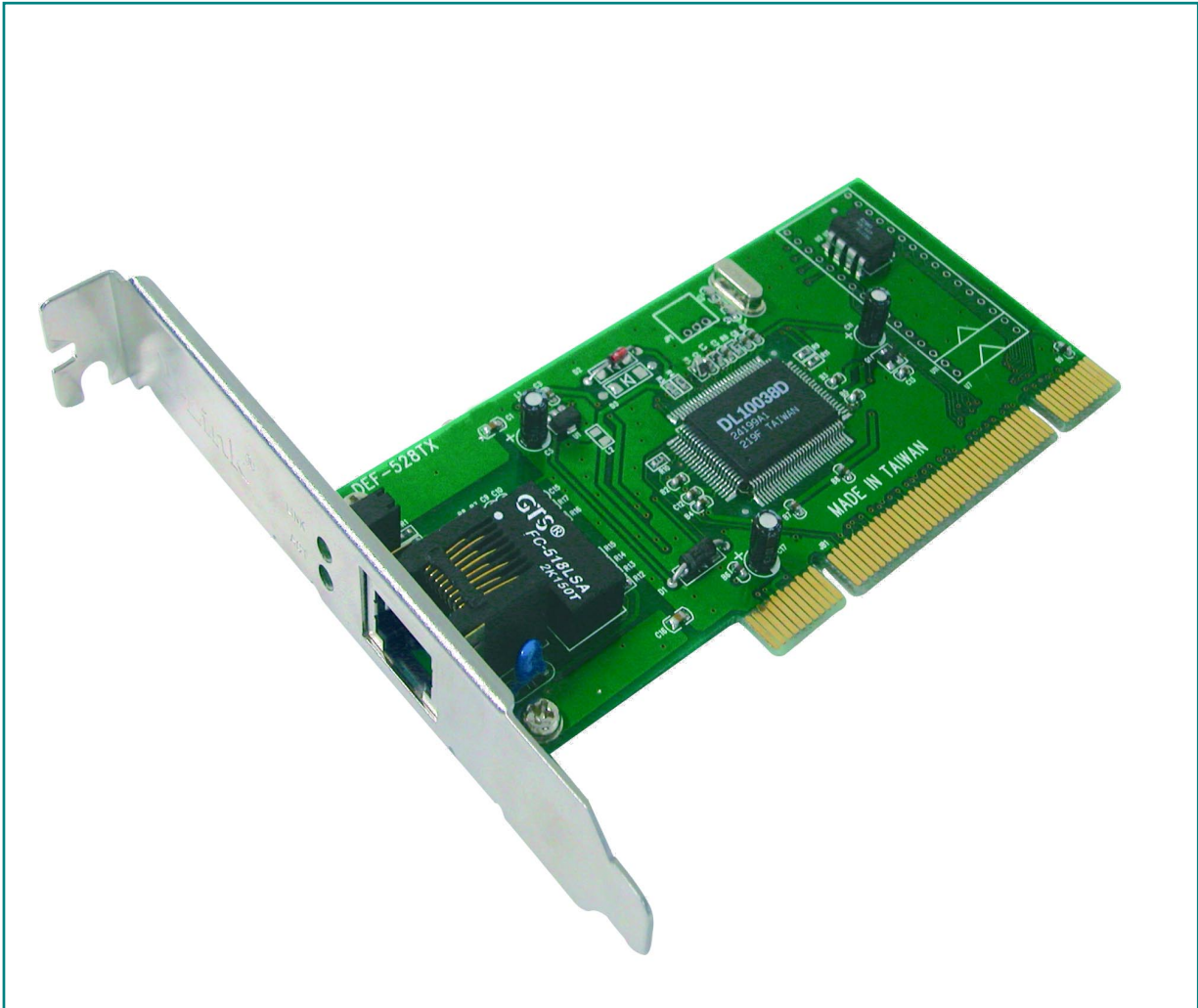## User's Guide

Rev.3.00

Table of Contents

Introduction

The D-Link DFE-528TX is ideal for the small office or home office environment. After completing the steps in this manual, you will have the ability to share information and resources - such as files and printers - and take full advantage of a "connected" environment for work and play!

The DFE-528TX comes with drivers for the most popular operating systems and can be integrated into a larger network.   However, this Guide is designed to help you network two computers running Windows 95/98, Windows Me, 2000, XP, 2003, Vista, 2008 and Win 7 in a peer-to-peer configuration. The standards compliant DFE-528TX gives you the flexibility to expand and customize your Ethernet / Fast Ethernet network at will.

The Ethernet standard allows you to connect computers and devices at speeds up to 10 Mbps. Fast Ethernet allows speeds up to 100 Mbps. A Dual-Speed 10/100 Mbps Ethernet / Fast Ethernet network combines both standards allowing computers and devices of different speeds to communicate with each other. The DFE-528TX is a Dual-Speed 10/100 Mbps Ethernet / Fast Ethernet network card.

Contents of Package

DFE-528TX Fast Ethernet Adapter Package Contents	
1	DFE-528TX Fast Ethernet Adapter
2	Driver CD
3	User's Manual
4	Quick Install Guide

Technology Basics

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/CD 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, Fast Ethernet is the clear choice in terms of cost-effectiveness, as well as convenience and smoothness in transition.

Category 5 cabling is required for 100Base-TX Fast Ethernet in order to provide full duplex operation. Full duplex 100Base-TX operation allows simultaneous transmission and reception, both at 100Mbps, thus providing service potentially equal to 200Mbps connection.

To provide compatibility in traditional 10Mbps Ethernet environments (where, for example, DFE-528TX adapters are installed anticipating upgrade of supporting hub equipment to Fast Ethernet,) the DFE-528TX 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 exchanges between your modem and the modem at the other end of the telephone line. 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.

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-528TX Adapter serving your station (installed in your computer), and the hub through which it is connected to the LAN. The options to be negotiated between the DFE-528TX and its supporting hub includes Ethernet type (100BASE-TX Fast Ethernet of 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 powered up. Once the cable connection and the Network Operating System software is satisfied, the preparatory process of auto-negotiation between the DFE-528TX and its supporting hub proceeds automatically. If the hub has auto-negotiation functionality, it and the DFE-528TX exchange a series of messages, 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.

If the hub does not support auto-negotiation, the (single capability) message will be

recognized by the DFE-528TX auto-negotiation facility, which will switch to those settings of its own capabilities, which match that of the hub.

Auto-negotiation reoccurs any time the linkage is restored, making the line ready again for optimal data communications.

About PCI Bus

Your DFE-528TX Adapter delivers outstanding performance by fully exploiting the advance features of your computer's PCI bus. DFE-528TX 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 demands on the CPU. The adapter's controller function provides the additional benefit of reduced command processing overhead.

The working relationship between a DFE-528TX 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.

Feature

Flow Control

The DFE-528TX implements IEEE 802.3x compliant flow control for full duplex, which provides traffic management functions for full-duplex operation. Flow control allows for enhanced full duplex operation with switches. When operating at full duplex (requiring a direct connection to a switch) and the switch's data buffer is about to overflow, a Pause frame will be transmitted to the DFE-528TX. The ensuing idle time keeps the buffer from overflowing and prevents data from being lost. This enhancement can improve network throughput, avoid collisions and prevent lost data, helping the network achieve optimal performance.
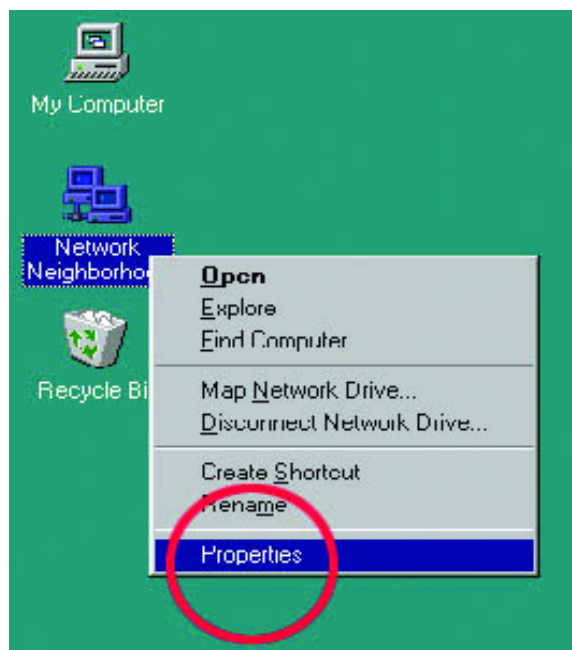
Networking Basics

You may have had some ideas about how to use your new network prior to installing this kit – sharing files, printing from any computer on the network, or accessing the Internet on multiple computers with one connection. This section will help you get started on those ideas or even give you some new ones. However, this section is not intended to be a comprehensive guide to networking, it is just an outline of a few networking basics.

If you installed your DFE-528TX on computers running Windows 95, you got an opportunity to give each computer a name during the installation of the network system software. If you had previously given your Windows 95 computers names or if you are using Windows 98, you may need to verify that each computer has a unique name and common workgroup name.

Computer Identification

1. On your Desktop, **right-click** the icon "Network Neighborhood" and select "Properties" from the context menu.

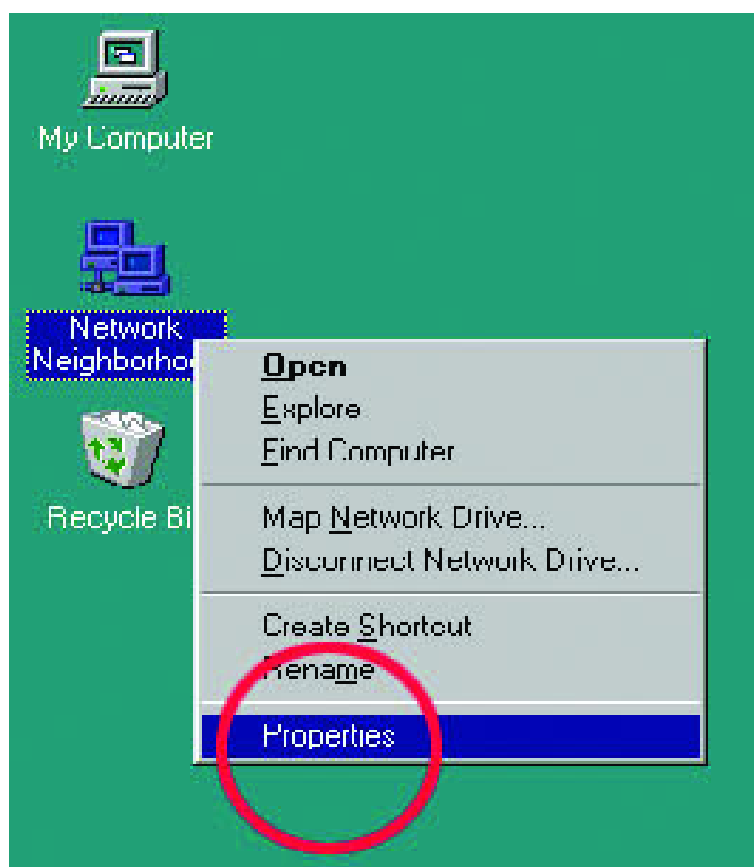Click the "Identification" tab on the top of the dialog box.

2. Type a unique, identifying name for this particular computer in the "Computer name:" box. This will be the name that other computers on your network will use to communicate with this computer. Each computer's name must be unique on a particular network or confusion will result. (The computer's name should be 15 or fewer characters with no spaces.)

3. Type the workgroup name this computer will be a part of in the "Workgroup:" box. All of the computers on your network should have an identical Workgroup name.

4. The "Computer Description:" box is optional. You may enter a description that will help you identify this computer on your network. Then **click OK**.

5. Repeat this process for each computer on your network to ensure that they all have a unique "Computer Name" and identical "Workgroup."

Sharing Files

With your computers connected together on a network, you may now open and save files on another computer. You will be able to specify particular folders or disk drives to "share" and even password protect them. The steps below will enable you to share specific files and folders with other computers on your network.

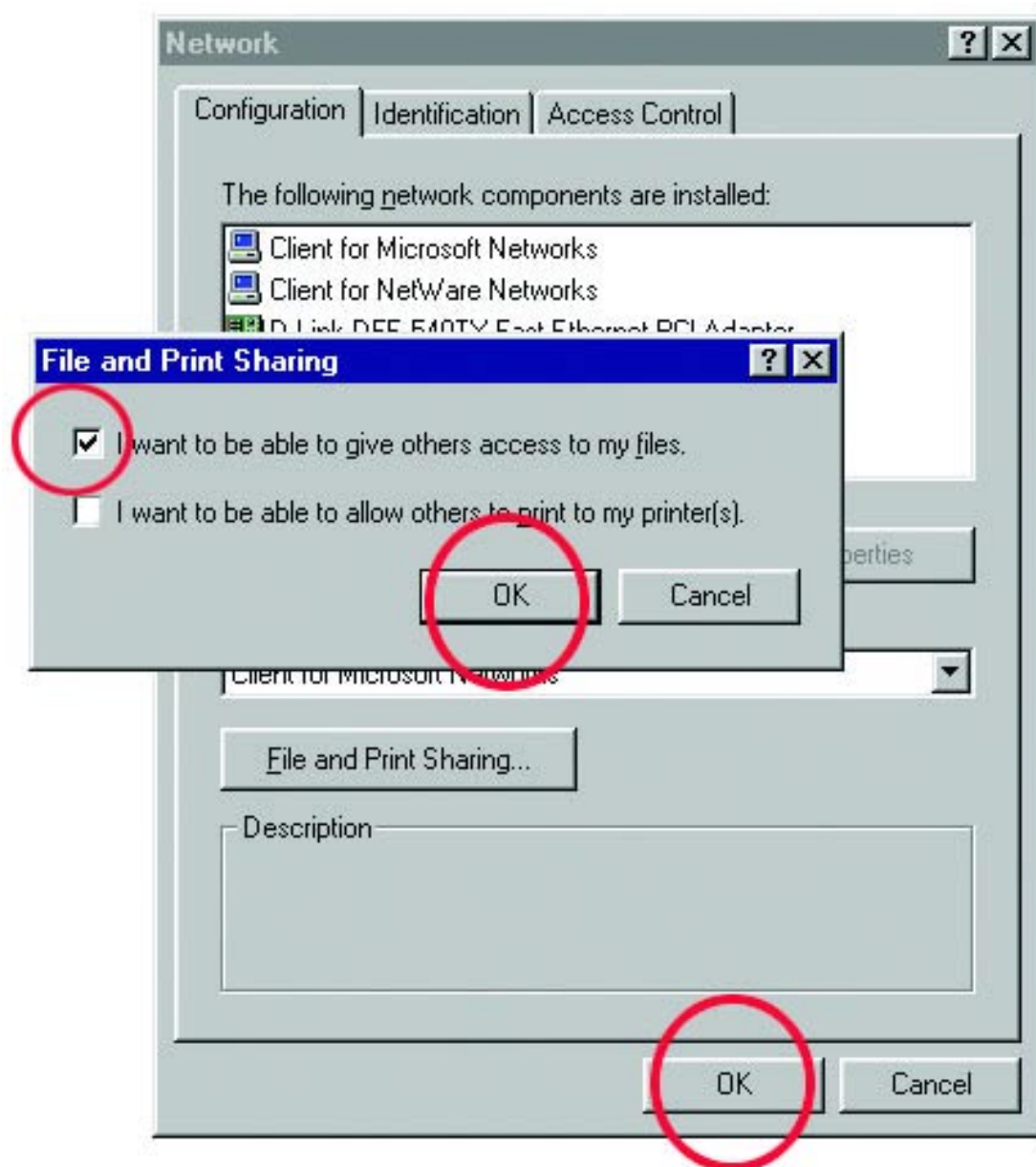1.   On your Desktop, **right-click** the icon "Network Neighborhood" and select "Properties" from the context menu.

This dialog box is where you will configure most of your computers network settings. It is also available through the "Network" icon in the Control Panel.

2.   **Click** the "File and Print Sharing…" button.

3. Select "I want to be able to give others access to my files."

4. **Click OK** on the "File and Print Sharing" dialog box.

5. **Click OK** on the "Network" dialog box.

6. Provide the Windows 95/98 installation CD or diskette(s) if prompted or direct Windows to the proper location of the installation files. Reboot if prompted.

7. You will now be able to identify a particular folder or disk drive to share. You may want to share a folder that both you and a colleague/family member need to access occasionally. Or, maybe you want to share a CD-ROM drive so your other computer that does not have one can read CD's. Both of these processes are the same. Only the disk drives and folders that you specifically identify as shared will be accessible to other computers on your network.

8. Find the disk drive or folder you want to share with Windows Explorer or the "My Computer" icon on your desktop.

9. **Right-click** on the disk drive or folder icon and select "Sharing…"

10.   Select "Share As:" to set the parameters for sharing this particular disk drive or folder.

The "Share Name:" box is used to identify the disk drive or folder you are sharing to other computers on the network. You can give it any name you wish. However, a specific identification may help as more resources on your network are shared. The "Comment:" box is optional. You can use this box to further describe the disk drive or folder for others on the network.

"Access Type:" allows you to designate how much someone else on the network can do with this disk drive or folder. "Read-Only" allows others to only look at or open the files on the disk drive or in the folder. "Full" allows others to read, write, open, save, copy, move, and delete files on the disk or in the folder. "Depends on Password" gives other computers access conditional upon the password they provide.

"Passwords:" allow you to apply a level of security to your shared disk drives and folders. Another computer (user) will be required to enter the password you designate here before accessing the disk drive or folder. Two passwords are used to give two levels of security (or access) to others on the network using the "Depends on Password" setting. Leaving the "Password" boxes empty gives everyone on the network access to the disk drive or folder.

11.   Navigate to the computer with the shared disk drive or folder (recognized by the "Computer Name" you provided), **double-click**. You should now see the disk drive or folder, **double-click**. If you specified a password when sharing this disk drive or folder, you will be prompted for the password.
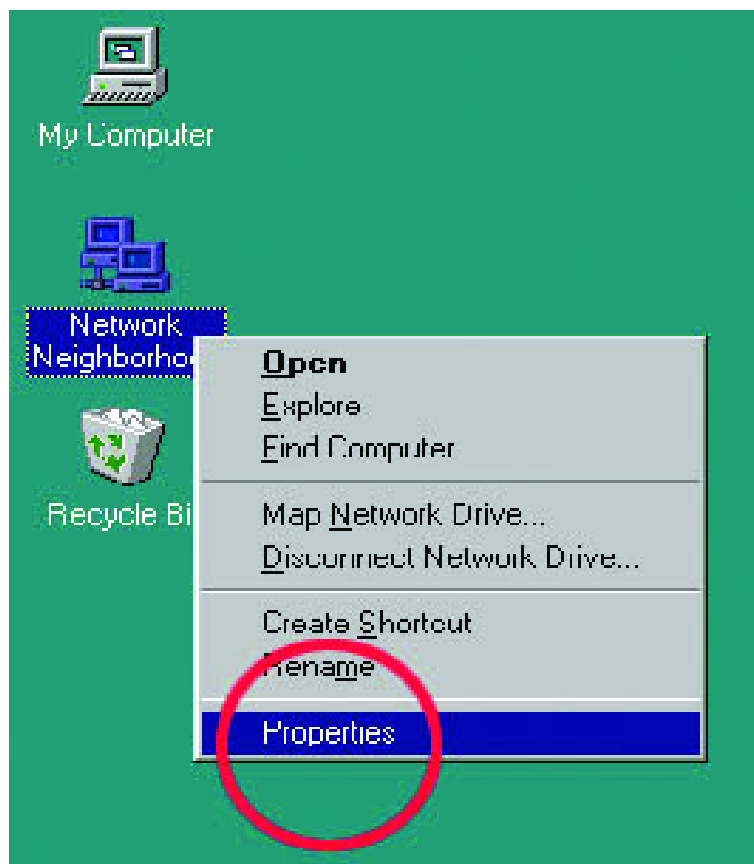
12. You can access a disk drive or folder shared over the network from most Windows 95/98 applications. To make this process easier, Windows allows you to map these disk drives and folders to a drive letter on another computer. For example, on a computer where you are accessing a shared folder from another computer, inside Windows Explorer right-click and select "Map Network Drive…" You will then be able to assign an available drive letter. Checking "Reconnect at logon" allows Windows to map this network drive each time you start your computer.

Sharing Printers

"Sharing" a printer connected to one computer with other computers on your network can be very convenient - allowing you to print from any computer on the network. The steps below will enable you to print with other computers on your network.

1. On your Desktop, **right-click** the icon "Network Neighborhood" and select "Properties" from the context menu.

1. **Click "File and Print Sharing…"**

2. Select "I want to be able to allow others to print to my printer(s)."

3. **Click OK** on the "File and Print Sharing" dialog box.

4. **Click OK** on the "Network" dialog box.

5. Provide the Windows 95/98 installation CD or diskette(s) if prompted or direct Windows to the proper location of the installation files. Reboot if prompted.

6. You may now share any installed printers connected to this computer with other computers on your network.

Go to START>SETTINGS>PRINTERS

7. **Right-click** on the printer you want to share with others on the network and select "Sharing…"

8. **Click** "Share As:" and provide a "Share Name:" to identify the printer to other computers on the network. "Comment:" and "Password:" are optional. **Click OK.**

9. Shared printers become Network Printers for other computers on the network. For a computer to access a Network Printer, the device driver or software for that printer must be installed and pointed to the proper location of the printer.

This is done much the same way you installed the printer on the computer it is connected to.

10. Go to a computer that does not have the printer connected to it. Go to **START>SETTINGS>PRINTERS**

11. **Double click** the "Add Printer" icon.

12. The "Add Printer Wizard" will appear.

13. Choose "Network printer." **Click Next.**

14. Now you will identify the location of the Network Printer. If you know the name of the computer and the share name of the printer, you can type it into the "Network path or queue name:" box. However, it is easier to **click "Browse…"** and navigate to the location of the printer.

Click OK after you have selected the desired printer. Finish the installation by continuing the "Add Printer Wizard" normally.

15. You may now use the Network Printer as if it was connected directly.
Note: the computer that the printer is connected to must be "ON" to use the printer. If you find this inconvenient, devices known as Network Print Servers are available from multiple vendors, including D-Link. A Network Print Server would allow you to directly connect your printer to your network.

Networking with Windows 2000

Configuring Your Network Settings

When computers are placed on a network they need a way to communicate with each other in order to share files, printers and other network resources. Computers communicate using protocols. This section assumes that you have installed the protocols listed in the "Installing Software" section of the Quick Install Guide. If you have not installed the protocols, return to "Installing Software," select the Windows 2000 icon and follow the instructions for installing and configuring protocols. You cannot network your computers until the protocols are installed and properly configured.

Your network Identification is the unique name given to each computer on your network. The names shown in the screen shots are only examples. The names you choose must be unique to each computer. The names assigned in this step are the names that will appear in your "Network Places" after the network is up and running. For example, you could name the computer after the person it belongs to. Jane's computer is named Jane and John's computer is named John. As long as no other computer on the network has the same name it will be fine.

Configuring your Network Identification

Follow these steps to configure your DFE-528TX card for networking:

1. Go to **Start> Settings> Control Panel**

2. **Double click** on the System icon.

3. Select the "Network Identification" tab and then **click** "Properties."

4. Specify the Computer name you want for the computer, and the membership of the Workgroup you are configuring. The Computer name can be any name you wish to call your PC. Each PC will need to have a unique computer name. The Workgroup name will need to be the same for all PCs on the same network. **Click OK.**

   Click OK in the "System Properties" window.

Configuring the IP Address for TCP/IP

Follow these steps to configure your DFE-528TX card for networking:

1. Go to **Start> Settings> Network and Dial-up Connections**

2. **Right-click** on Local Area Connection then click on Properties.

3. Highlight Internet Protocol (TCP/IP) and then **click Properties**.

4. The "Internet Protocol (TCP/IP) Properties" window appears. Make sure that **"Obtain an IP address automatically"** is selected.

Click OK.

Note: Repeat this step for each computer that will be added to this network.

If you are unable to obtain an IP address automatically, you will need to assign an IP address manually. Please follow these steps to assign an IP address manually:

1. When the "Internet Protocol (TCP/IP) Properties" window appears. Make sure that **"Use the following IP address"** is selected.

2. Specify your **IP address** (e.g., 192.168.0.1) and your **Subnet mask** as 255.255.255.0 and **click OK**. The IP address shown is an example. You can substitute another IP address as long as it is unique, follows the same format as the one shown in the example, and the IP address is in the same subnet as your local network.

*Note: Repeat this step for each computer that will be added to this network. Make sure that the IP address is unique for each computer. The first computer is computer A and uses the IP address of 192.168.0.1 with Subnet mask of 255.255.255.0. The **last number** in Computer B's address will be different. No two devices on the network can have the same IP address.*

3. Assign a different IP Address to computer B: 192.168.0.2 (the last number changed from number 1 to number 2.) The Subnet mask for computer B will have to be the same as computer A with 255.255.255.0.

4. After entering the IP address and Subnet mask, **click OK** and close the "TCP/IP Properties" Box.

Note: Windows 2000 does not have to reboot to activate the changes in IP addresses. However, it is always a good idea to reboot after making changes to Network Settings.

Sharing Drives

Follow these steps to share a hard drive:

1. Log in as a member of the Administrators, Server Operators, or Power Users groups. You cannot make the necessary changes and configurations unless you are logged in as a member of one of those groups.
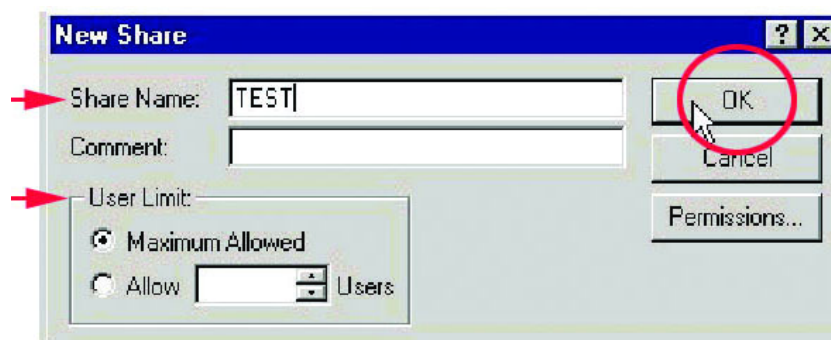
2. **Double click** on "My Computer."

3. **Right click** on the drive you want to share and select "Sharing."

4. Select the "Sharing" tab on the "Local Disk Properties" Window. Select "Share this folder," and **click** "New Share."
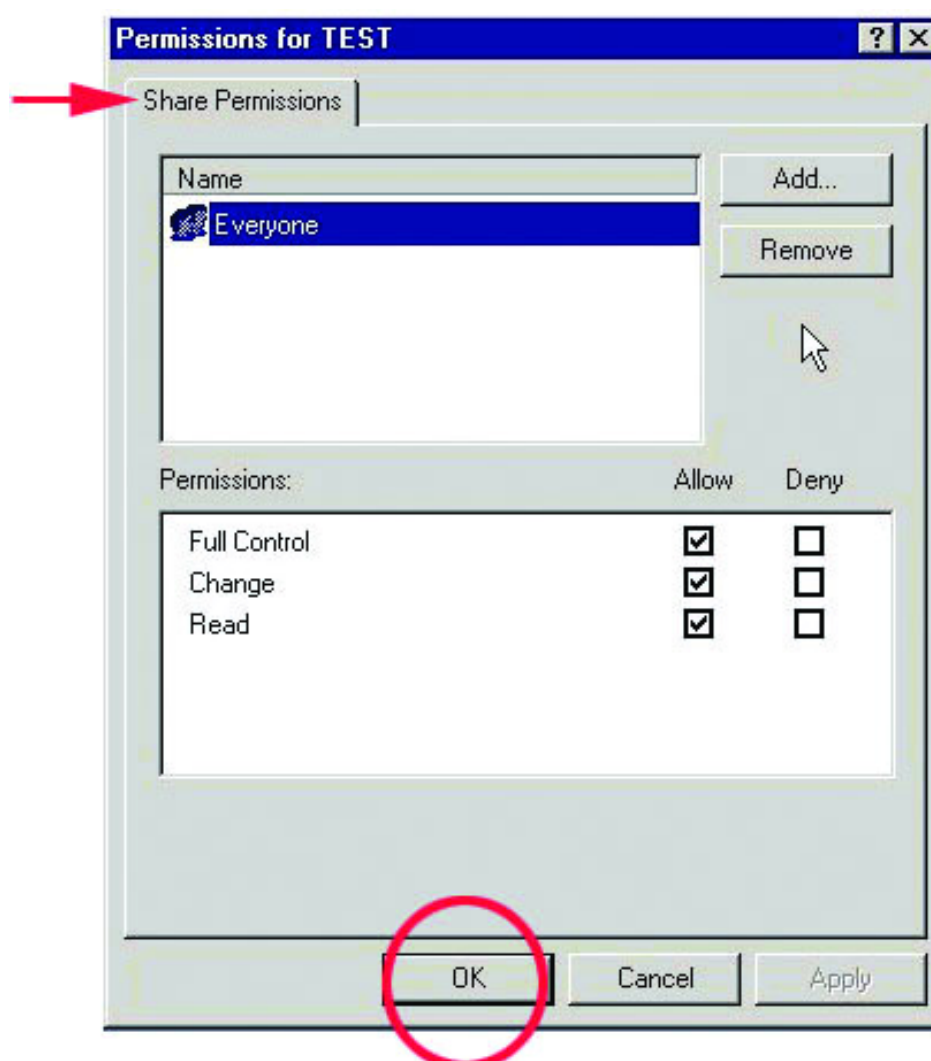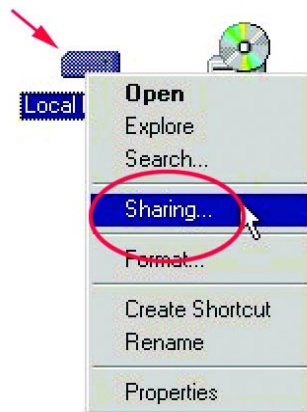
5. In the "New Share" box, name the share as you would like it to appear in "My Computer" and "Network Neighborhood," set the maximum number of users and make a comment, then **click OK**.

6. Choose the "Share Permissions" tab and set limits on the share as needed. The default settings allow all users to read and write to the hard drive.

   Click OK.

7. The shared drive should now have a hand underneath it, indicating that it is a shared drive.

Local Disk (C:)

Sharing Folders

Follow these steps to share a folder:

1. You must be logged in as a member of the Administrators, Server Operators, or Power Users groups to perform these operations.

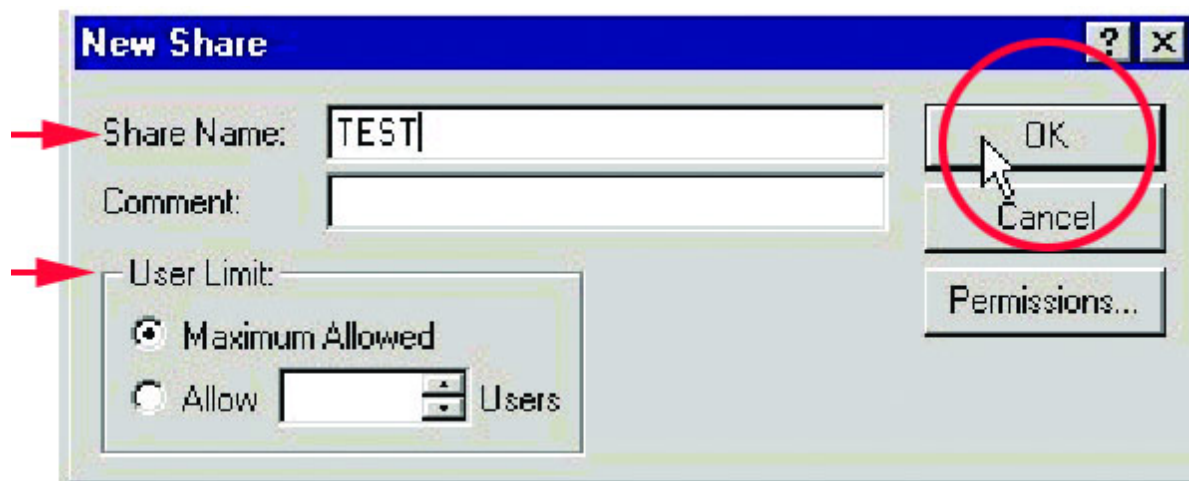2. **Double click** the "My Computer" icon to open it.

3. **Double click** on the **Local Drive** that contains the files to be shared.
   Click "Sharing."

4. Navigate to the folder you want to share and **right click** on it. Choose "Sharing." Change the settings under the "Sharing" tab to "Share this folder." Set the "Permissions" on the folder and the number of users who can access the file.
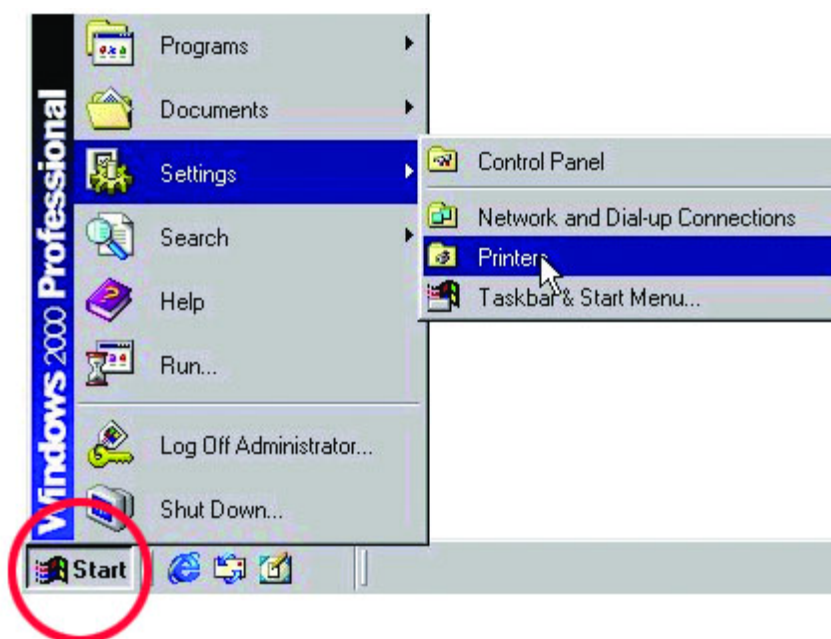
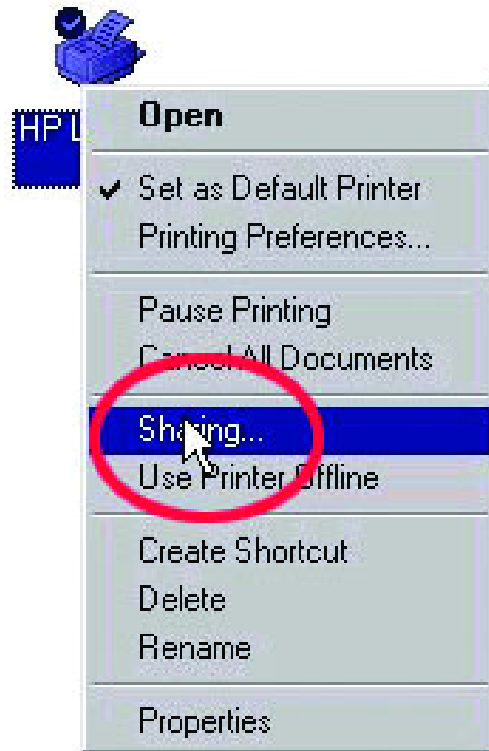5. You must enter the "Share Name" in order for it to be seen on the network. **Click OK** when you have finished entering the information.

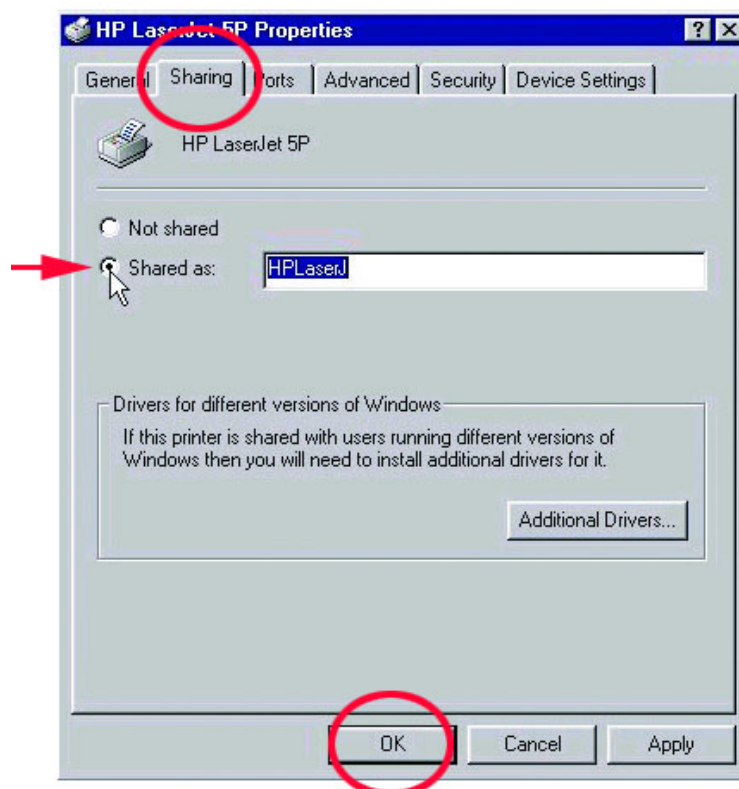# Sharing a Printer

Follow these steps to share a printer:

1. All printer-sharing instructions assume that you have a printer on one machine that is connected to the Local Area Network. Go through this procedure on the computer the printer is connected to.

2. Go to **Start> Settings> Printers**

3. **Right click** on the printer you want to share and select "Sharing."

4. Under the "Sharing" tab change the value from "Not Shared" to "Shared As" and **click OK**.
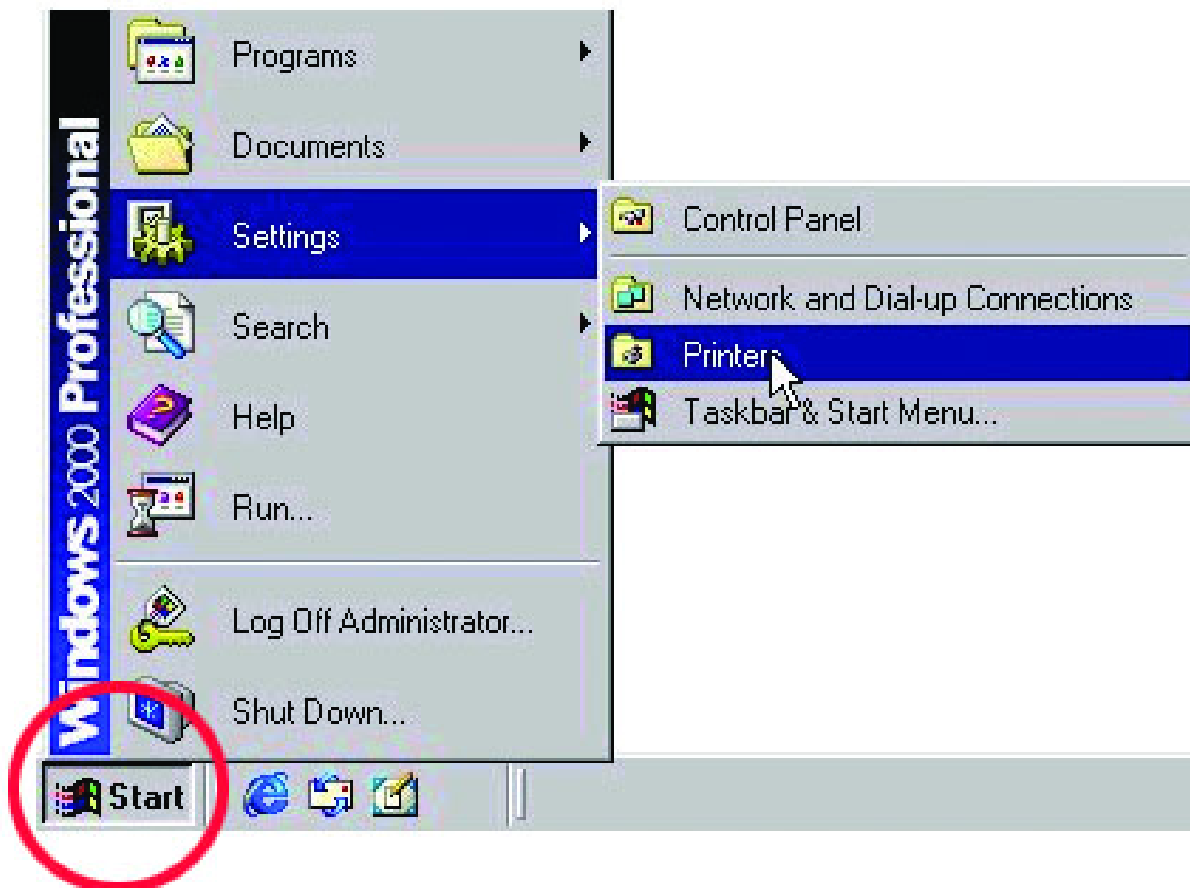
HP LaserJet 5P

The printer should now have a hand underneath it, indicating that it is now shared.

Follow these steps to access the printer from all other computers on the network, repeat as needed for each computer:
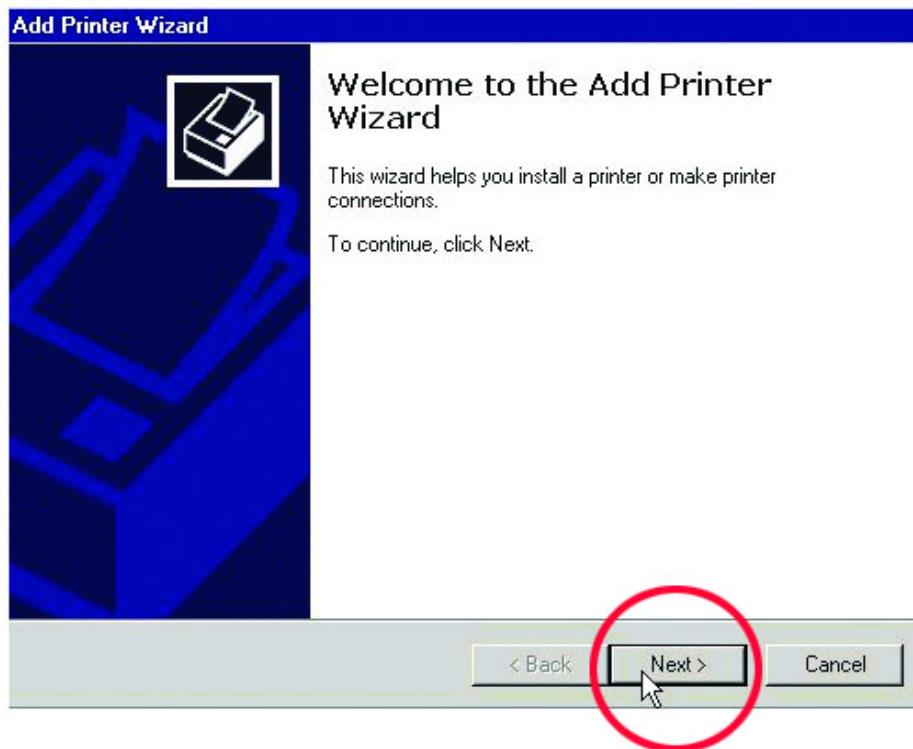
5. Go to **Start > Settings > Printers**
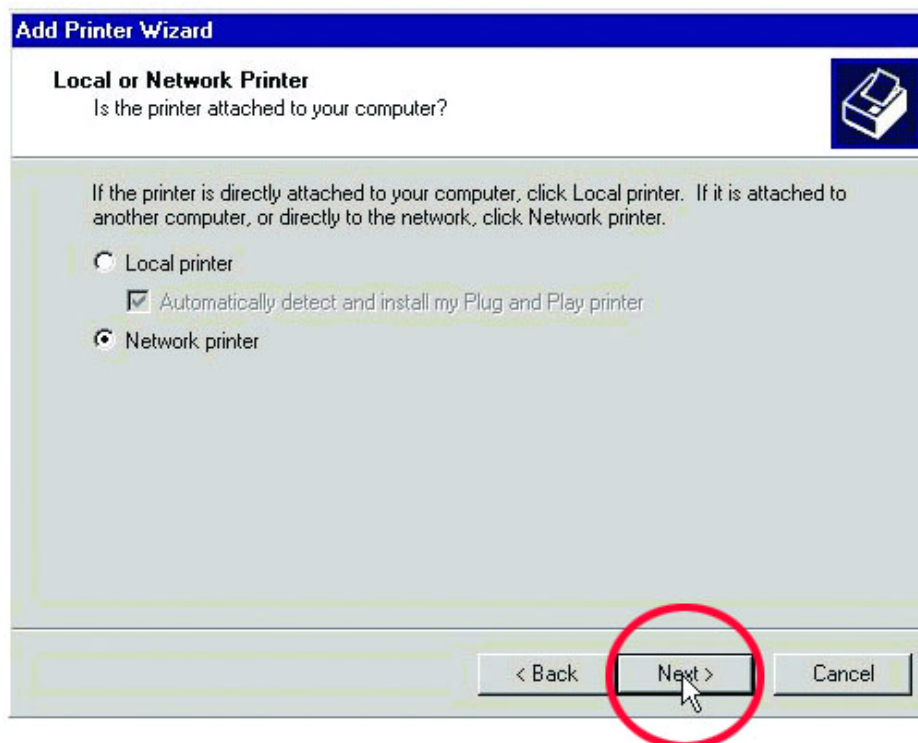

6. **Double click** on the "Add Printer" icon.
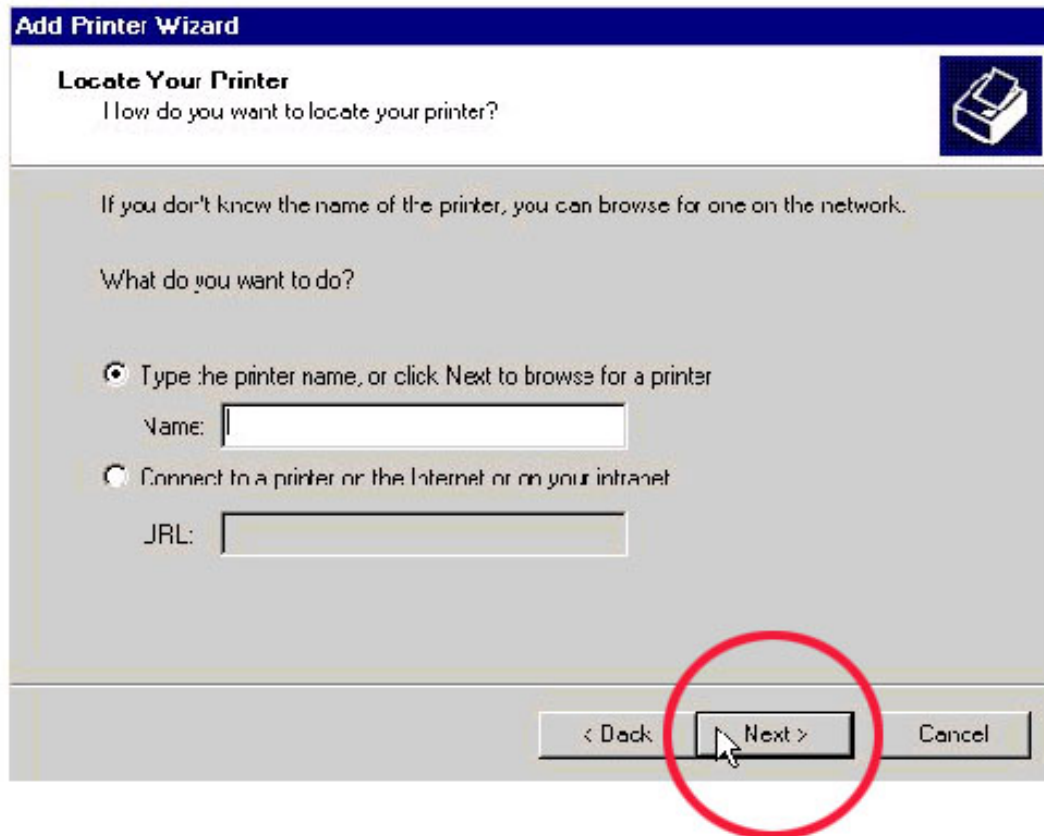

Add Printer

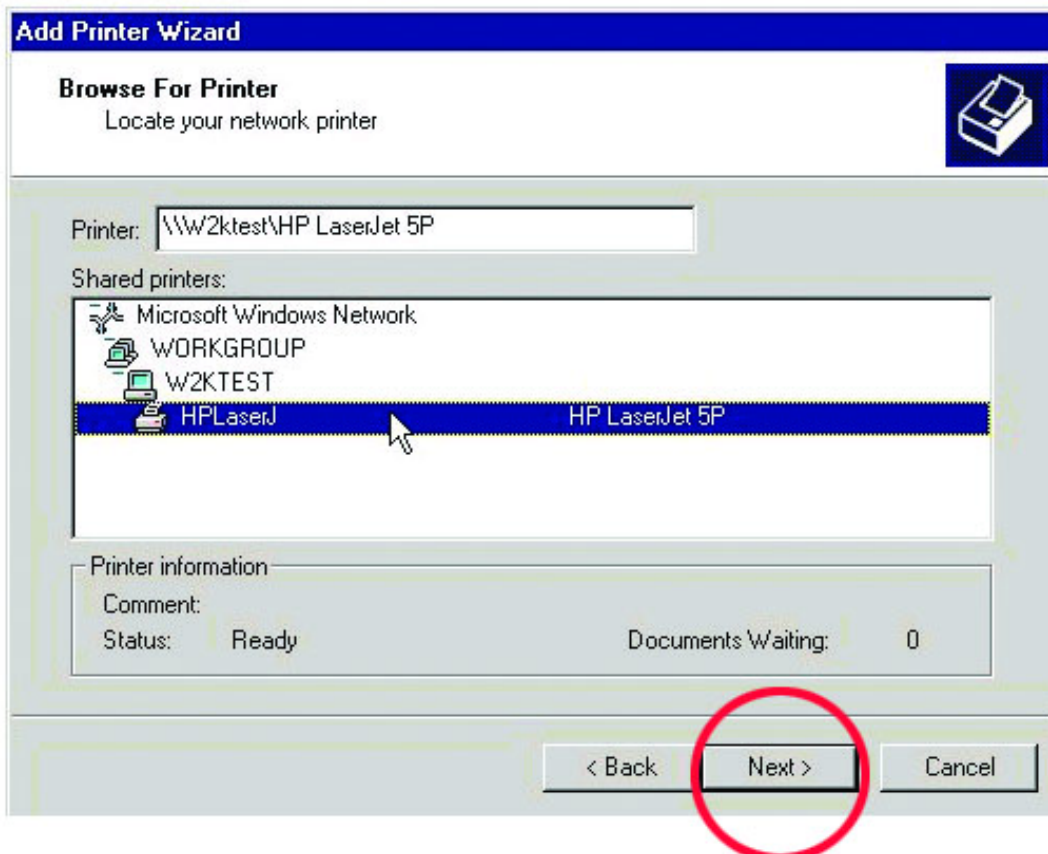7. **Click Next** at the "Add Printer Wizard" screen.

8. Select "Network printer" to make the printer available as a resource on the network.
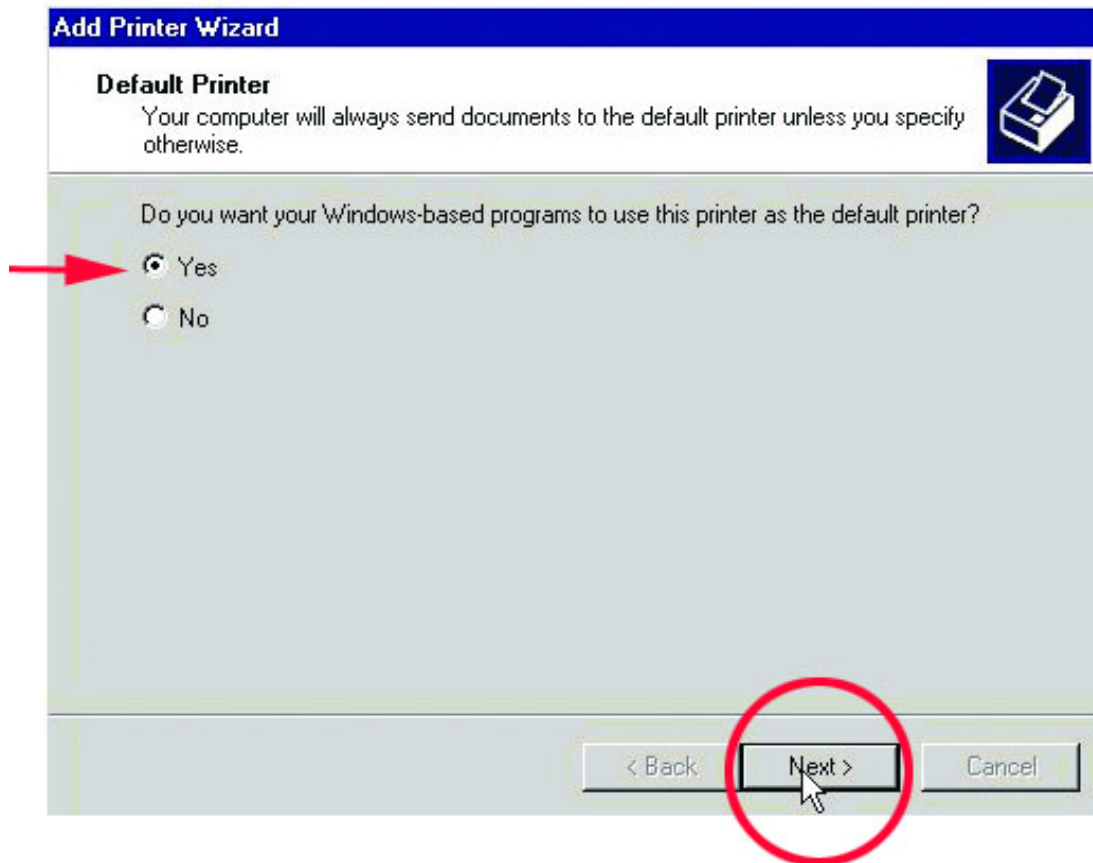
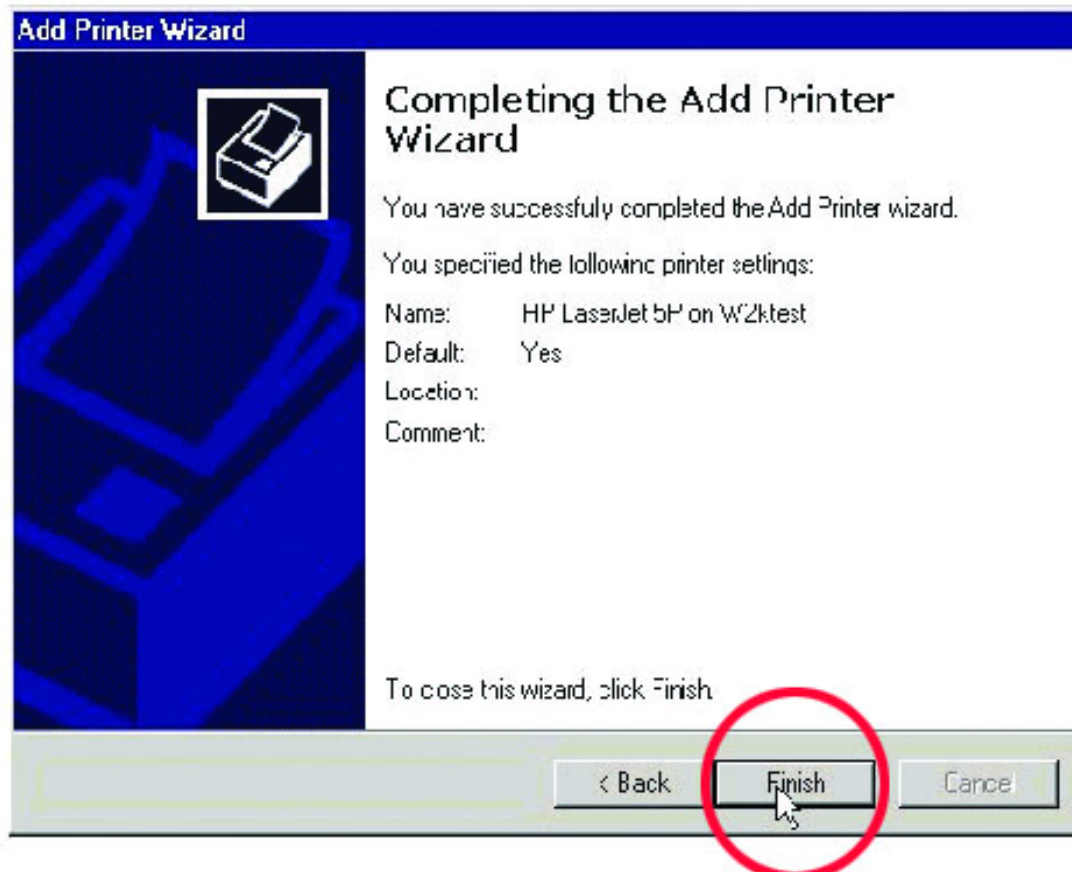9. At this screen, **click Next** to "Browse" for a printer.

10. Select the printer and **click Next** to continue.

11. **Click Yes** and then **click Next**.

12. **Click Finish** to complete the printer installation.

Troubleshooting

A network can be simple to install and maintain. However, occasionally something might go wrong. The best approach to troubleshooting network problems is to start at the very simplest level and work your way up.
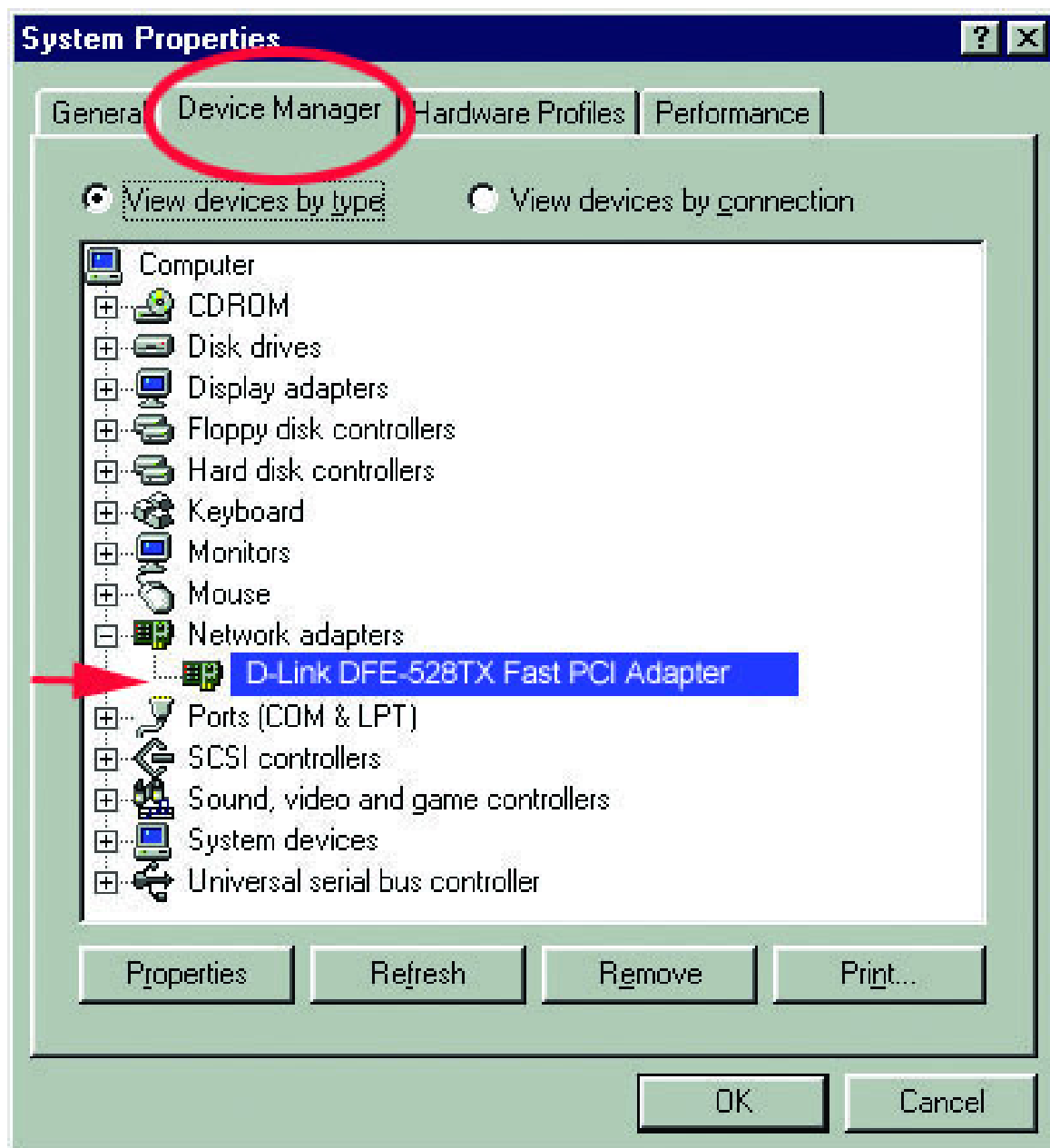
Verify Each Computers Identification

If more than one computer on your network has the same "Computer Name," communications may be negatively affected. Also, each computer must have the same "Workgroup" name to communicate properly. Use the steps in Networking Basics to ensure that each computer on your network has a unique "Computer Name" and identical "Workgroup."

Verify Network Adapter Installation

If your Network Adapters were not properly installed, including the Network System Software or device drivers, your network will not function properly. Use these steps to verify that your Network Adapters are properly installed:

1. **Double-click** the "System" icon in the Control Panel.
2. Select the "Device manager" tab on top of the "System Properties" dialog box.
3. **Double-click** "Network adapters." You should see "D-Link DFE-528TX Fast Ethernet PCI Adapter" or "Realtek RTL8139D(A)" branching out after double-clicking "Network adapters."

If you do not see any items branching out after double-clicking "Network adapters," your Network Adapter has not been properly installed. Start at the beginning of the guide and follow all the steps for this computer.

If you see symbols such as a yellow exclamation point or red "X" over the icon adjacent to "D-Link DFE-528TX Fast Ethernet PCI Adapter," your adapter is not installed properly or may have a problem. Double-click the "D-Link DFE-528TX Fast PCI Adapter" to read the explanation of the problem. This information will be helpful if you require technical support from D-Link.

Verify Cable Connections

Check to see that the computer(s) you are troubleshooting are properly connected. Each computer must be connected from its DFE-528TX with Category 5 UTP cables. Examine the Network cables and ensure that they have not been damaged by walking-on, rolling over with chairs, or closed in doors. Additionally, make note of and alleviate any possible electromagnetic interference that may be affecting your network.

Your network cables can be plugged into any port on your hub except the "Uplink" port. The "Uplink" port is only used when connecting your hub to another hub or switch.

Understanding Indicators

Your DFE-528TX has indicators or lights that can give you information about your network traffic and help you determine problems when troubleshooting.

Your DFE-528TX's have two indicators labeled "ACT" and "LINK" on their back panels. A steady green "LINK" light indicates a good connection with the Hub. A flashing green "ACT" light indicates that the Network Adapter is sending or receiving data.

Diagnostics and Checking Communications

Included on the CD labeled "DFE-528TX PCI Ethernet Adapter Driver Program" is a diagnostic program that will help you determine if any faults exist in your DFE-528TX Network Adapters or connections.
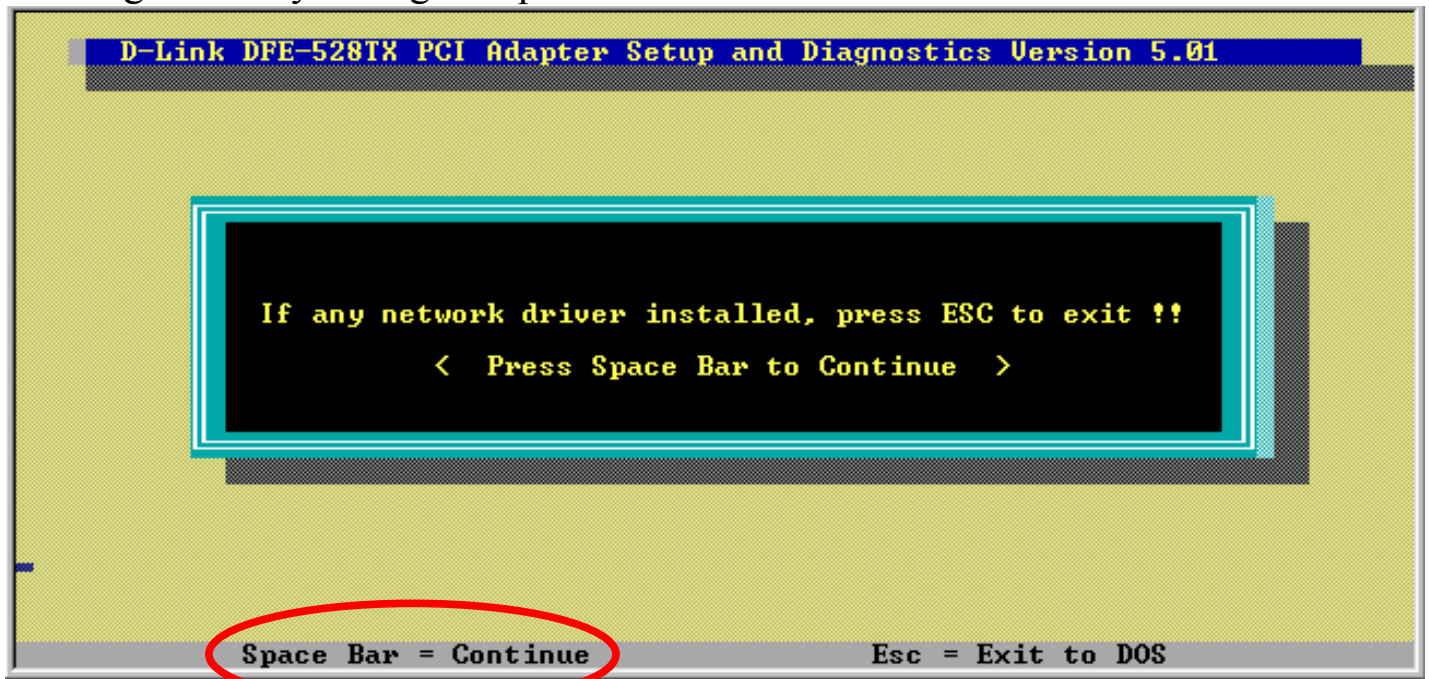
1. Restart your computer in MS-DOS mode. (Click "Start", then "Shut Down... " and finally select "Restart the computer in MS-DOS mode?")

2. Insert the CD labeled "DFE-528TX PCI Ethernet Adapter Driver Program" into your CD-ROM drive (D:).

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3. Type **D:\DIAG** at the MS-DOS prompt, (where "D" is your CD-ROM drive) and press "ENTER" to start the "D-Link PCI Fast Ethernet Adapter Diagnostic Program."

4. Read and follow the instructions on the screen. (Press the F1 key anytime for additional help.)

5. "Adapter Basic Diagnostic" will determine if any problems exist with a DFE-528TX.

6. "Network Diagnostic" will determine if any problems exist with your network or connections. To use "Network Diagnostic" please run the diagnostic program on both computers in MS-DOS mode. One computer must be designated the "Master" and the other designated the "Slave".

Running Diagnostics on the Network Adapter

Follow these steps to run Diagnostics:

1. Restart your computer in MS-DOS mode. (Click "Start", then "Shut Down... " and finally select "Restart the computer in MS-DOS mode?")

2. Insert the CD-ROM labeled "DFE-528TX PCI Ethernet Adapter Driver Program" into the "D" drive. The "D" drive represents the CD-ROM drive.

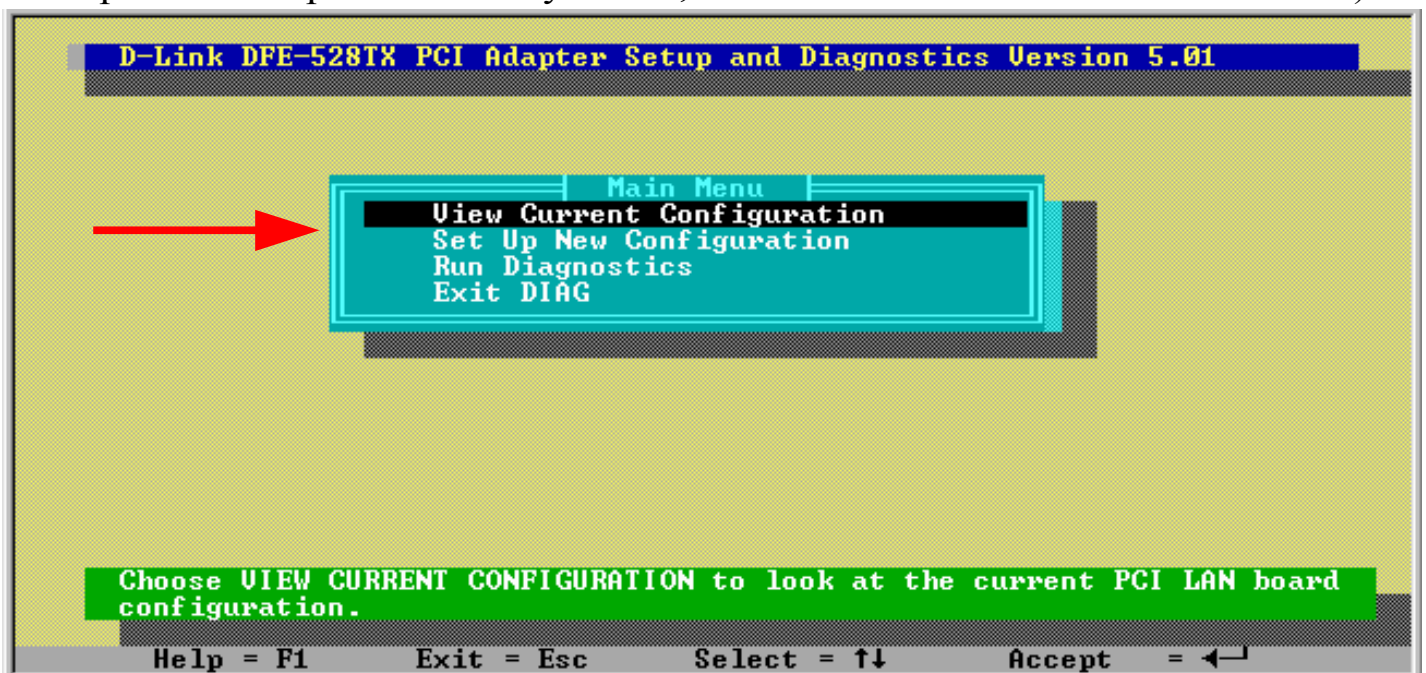3. Type in "**D:**" to specify the CD-ROM drive.   Then type **"diag"** and hit enter.

```
D:\>diag_
```
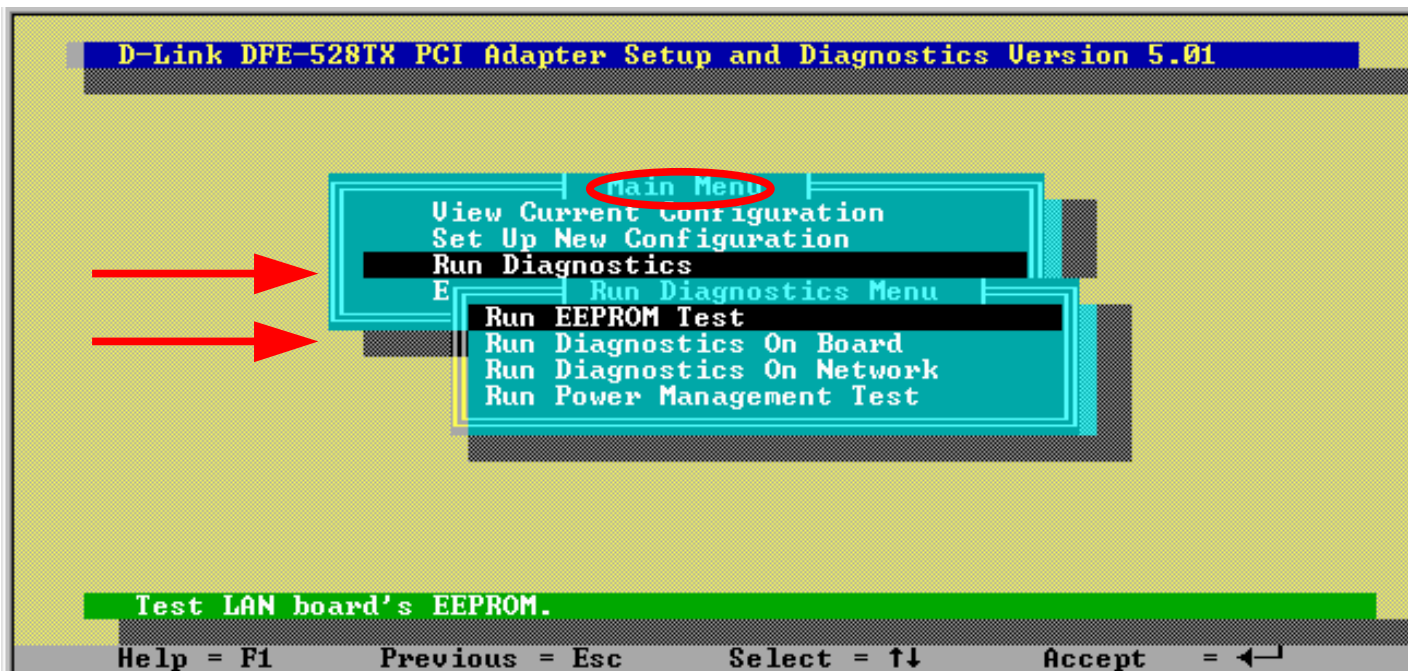
The screen on the following page will appear.

4. Go down to the bottom of the screen and follow the instruction to enter the diagnostics by hitting the space bar.
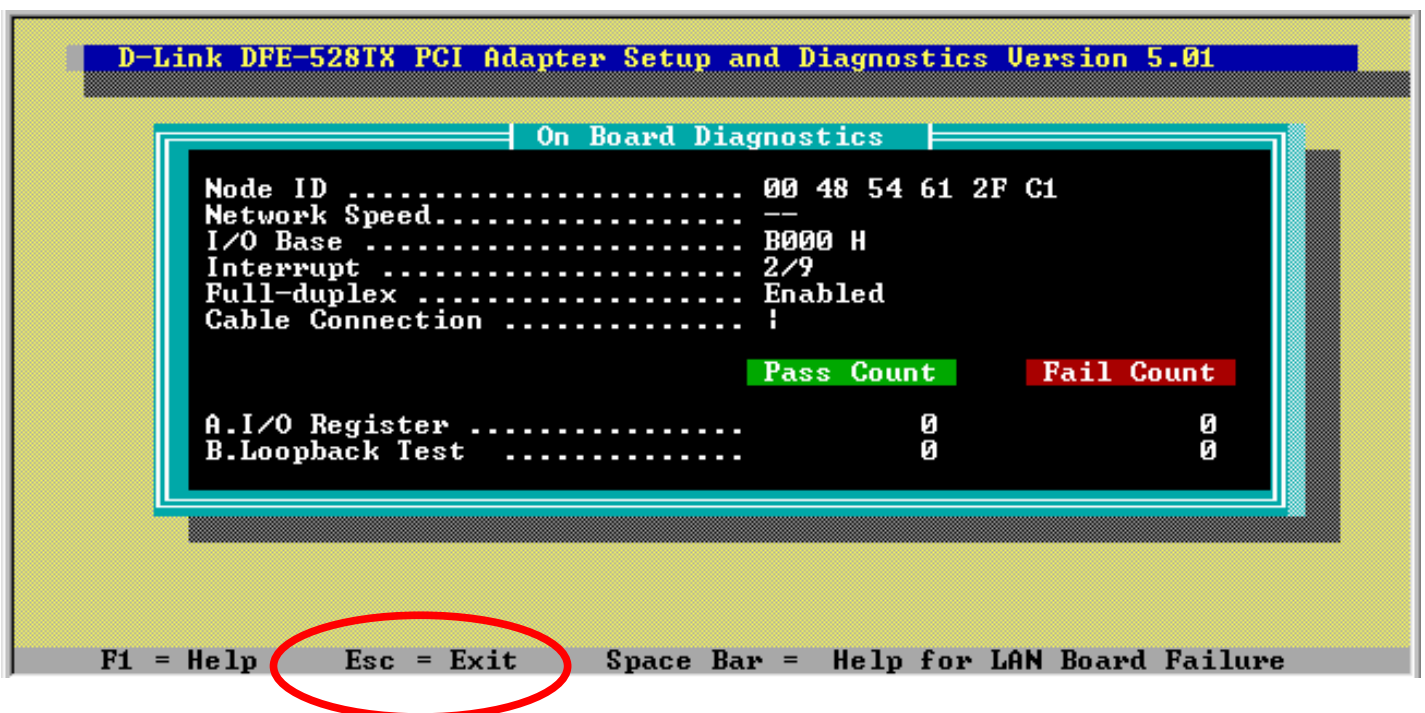

5. Go to View Current Configuration, hit enter and check the Ethernet Address for the card. (If the address is A5-A5-A5-A5-A5, FF-FF-FF-FF-FF, or any single alphanumeric pair all the way across, that is an indication of a defective card.)

6. Go back to the main menu to run on-board diagnostics on the card.

7. Once the diagnostics has run for a while, hit the Esc key to back out of the diagnostic program (Note: The Diagnostic Program will run continuously until you ESC out). Remove the CD-ROM and reboot the computer.
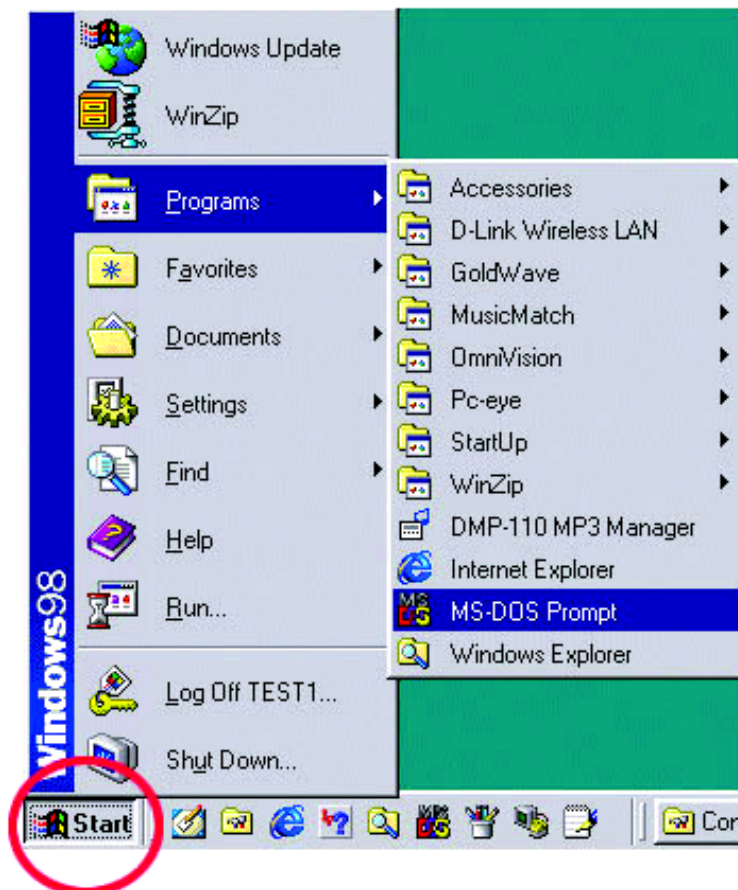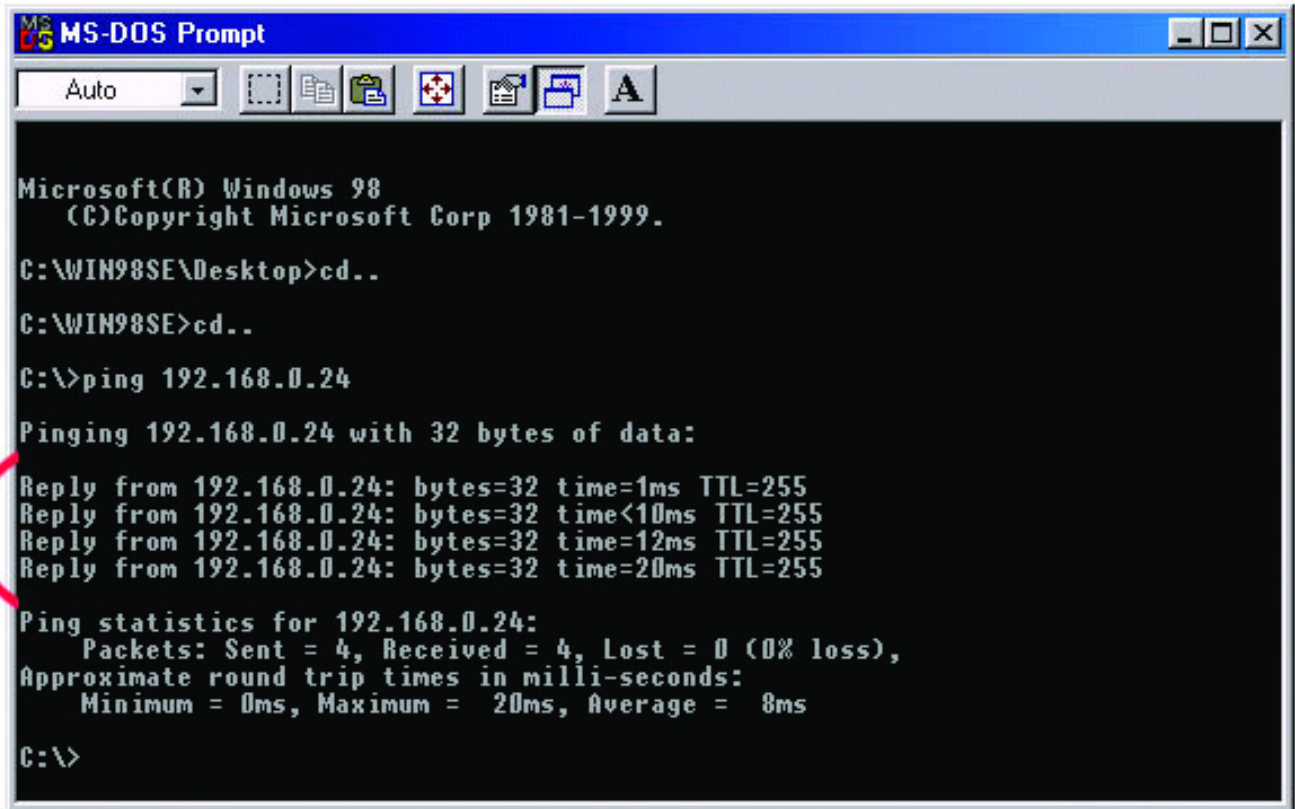
Pinging your DFE-528TX Card

Follow these steps to Ping a device:

Ping is the acronym for Packet Internet Groper (PING), a utility to determine if a specific IP address is accessible. It works by sending a packet to the specified address and waiting for a reply. Ping is primarily used to troubleshoot Internet connections. By sending out a ping, you are verifying that a specific computer is available. Since all computers on the network must have a unique IP address, getting a reply means that a computer is on the network and that they can communicate. If they can communicate, then the hardware and cabling is fine. If you cannot ping another computer, then there is a problem with the hardware. Check the cabling and adapter installation. If you are unable to network, even when you receive a reply to your ping, it is probably a software configuration issue. Verify that all the settings are correct.

Go to **Start> Programs> MS-Dos Prompt**.

Type in the following: **ping xxx.xxx.xxx.xxx**, where xxx.xxx.xxx.xxx is the IP address to be pinged (i.e. 192.168.0.24). In this case, computer B with the IP address=192.168.0.24 is being pinged from computer A. Press Enter to begin pinging.

If the connection is good, you will receive four "Reply from" messages. Type **exit** at the prompt to return to Windows.

Specifications

Standards:

- IEEE 802.3 10BASE-T
- IEEE 802.3u 100BASE-TX
- IEEE 802.3x Flow Control
- NWay Auto-Negotiation
- PC99 Standard

Data Bus: 32-bit, 33-Mhz Bus Mastering

Host Interface: PCI 2.2 compliant

Ports: One RJ-45

Diagnostic LEDs: Link

Activity

Temperature: Operating: 0°C to 55°C
Storage: -25°C to 55°C

Humidity: 10% to 90%, non-condensing

Compliances: CE – Class B, FCC Class B, VCCI Class B, C-Tick

Power Consumption: 0.32W (96mA@3.3V) max.

Available Drivers:

Microsoft Windows 95 / 98 / Me	Macintosh 8.0 or higher
Microsoft Windows 2K / XP / 2003 / Vista / 2008 / Win 7	Linux
Microsoft Windows NT 4.0	Packet Driver
Novell Netware 3.12 / 4.1x / 5.x	NDIS 2 Driver
Microsoft LAN Manager	SCO Open 5.x

For additional drivers see website