

# Contents

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Connecting the Network Cable -----	1
Using Wake On LAN* -----	3
DOS and Windows*3.1 Setup for Novell NetWare Clients-----	4
Windows NT* Server or Workstation-----	6
Windows 95-----	8
NetWare Server, Client 32, UNIX, OS/2, Banyan, and Other Operating Systems -----	10
Installing Multiple Adapters-----	11
Select Duplex Mode-----	11
Using Adapter Teaming-----	13
Set Up Adapter Fault Tolerance-----	15
u3h" Installation for Windows 95 -----	17
Troubleshooting-----	17
If the Adapter Can Connect to the Network-----	17
Testing the Adapter -----	18
Common Problems & Solutions-----	18
Technical Information-----	19

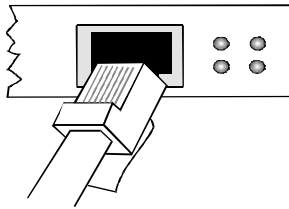
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## Connecting the Network Cable

1. Connect a single network cable to the on-board Intel PRO/100+ TX PCI adapter as shown below. For 100BASE-TX, your network cable must be category 5, twisted-pair wiring. If you plan on running the adapter at 100Mbps, it must be connected to a 100BASE-TX hub (not a 100BASE-T4 hub.) For 10BASE-T, use category 3, 4 or 5 twisted-pair wiring. In a residential environment, you must use a category 5 cable.

### 100BASE-TX Wiring



Twisted pair Ethernet(TPE).  
Use category 5 cable and RJ-45 connector for this adapter. Do not use category 3 wiring at 100 Mbps. At 100 Mbps, connect to a TX hub, not a T4 hub. For full duplex, see instructions on page 11.



**Note:**

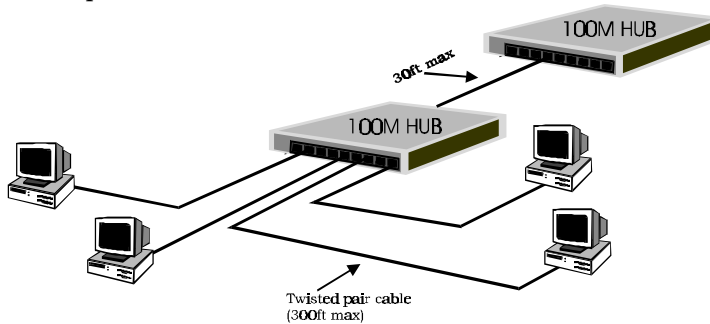
For more information on 100BASE-TX wiring requirements and limitations, see page 20 in this guide and refer to the README files on the

2. To configure the adapter, continue with the procedures specific to your operating system on pages 4 through 10:
  - **DOS and Windows 3.1 users with NetWare, go to page 4**
  - **Windows NT 4.0 and 3.5X users, go to page 6**
  - **Windows 95 users, go to page 8**
  - **Others, go to page 10**

## Connection for Fast Ethernet

Category 5 UTP cable is required for Fast Ethernet operation. The maximum cable running between the LAN adapter and the supporting hub is 300ft. The cable must be "straight" (not a "crossover" cable, see Pin Assignments on page 18), 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 DFE-500TX, and the other end into a port of the supporting hub.

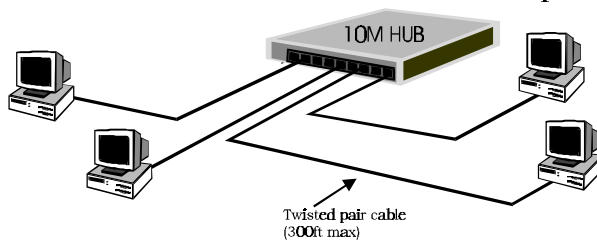
### 100Mbps hub connection



## Connection for 10Mbps Ethernet

Category 3, Category 4, and Category 5 UTP cable, all qualify under Ethernet cabling rules. The maximum cable running between the on-board Intel PRO/100+ TX PCI and the supporting hub is 300ft. The cable must be "straight" (not a "crossover" cable) with RJ-45 receptacle of the on-board Intel PRO/100+ TX/PCI, and the other end into a port of the supporting hub.

### 10Mbps hub connection



## Using Wake On LAN

The Wake On LAN feature operates according to a published specification. In simple terms, the specification allows designers to build network adapters that are capable of "listening to" network activity even when the computer is turned off. WOL adapters have a special low power standby mode that is active when the rest of the computer is without power. The adapter will respond to a special "wake-up" packet sent by another computer or network device. Typically this wake-up packet causes the adapter to signal the computer to power up and run a pre-defined program.

The wake up packet structure and behavior is defined in the WOL specification, available on the web at:

<http://www.us.pc.ibm.com/infobrf/iblan.html>

## Troubleshooting

The Wake On LAN feature is not working.

- Make sure power is applied to the computer and the power supply installed meets the requirements of the motherboard. Refer to the manual of the motherboard.
- Check the BIOS for its WOL setting.
- Make sure the network cable is fully attached to the adapter.

The LINK LED does not light when power is connected.

- Make sure power is applied to the computer and the power supply installed meets the requirements of the motherboard. Refer to the manual of the motherboard.
- Make sure network cable is attached at both ends.

# DOS and Windows 3.1 Setup for Novell NetWare Clients

## **Important Note:**

*Windows 95 users and Windows NT users should skip the procedure on this page and go directly to page 6 for Windows NT or page 8 for Windows 95, NetWare Client 32 users, go to page 10.*



**ONE**

## **Automatic configuration**

PCI computers automatically detect and configure PCI-compliant adapters while booting. The Intel PRO/100+ TX PCI adapter IRQ level and I/O memory address are automatically set by the BIOS each time you start your computer.

Start your computer to automatically configure the adapter. Configuration is complete when the DOS prompt appears. You can now continue with the procedure below.

If your computer displays an error while booting, it may require additional steps to configure a PCI adapter, see the BIOS section of the manual.



**TWO**

## **Running the Setup to install network drivers**

Setup can automatically install NetWare DOS ODI client drivers for you or display a README file with installation instructions for other NOS drivers.

1. Correctly install DOS.
2. Insert the Intel Configuration and Drivers disk in a floppy drive, switch to that drive, and at the DOS prompt, type

SETUP 

3. If you have other Intel PRO series PCI adapter in your computer, an adapter selection menu appears on the screen. See page 11 for more information on multiple adapters.
4. select Automatic Setup from the Main menu. Then follow the instructions on the screen. (If you want to test the adapter with a responder on the network, see the next procedure.)

Setup displays the adapter configuration, then runs a series of diagnostic tests that verifies the adapter configuration, then runs a series of diagnostic test that verifies the adapter and network are functioning properly. If Setup finds a problem, it displays the results and some possible solutions.

5. When Setup finishes the tests, you will see the Install Network Drivers screen.
6. Select the driver you want to install. Setup can install a NetWare client driver on your behalf. If you are installing other drivers, Setup displays a README file with installation instructions.



## **Troubleshooting**

If you cannot connect to a server, first try the suggestions here, otherwise turn to page 17.

- Make sure you are using the drivers for this adapter. The driver filename contains the letter B (for example, E100BODI.COM).
- Verify that the frame type in your NET.CFG file matches your network.
- If setting up a server, check your LOAD and BIND statements.
- Test the adapter by running diagnostics in Setup. Additional testing is available by using a responder (see below).
- Check the README files, see page 10 for instruction.

## **Responder testing on the network (optional)**

Setup can test the adapter more thoroughly if you have a responder on the network while running the tests.

1. Go to a computer on the network with any Intel PRO/100+ adapter installed.
2. Run the appropriate configuration program for the installed adapter and set it up as a responder.
3. Return to the computer with the new adapter. Run Setup and make the new adapter a sender. Test the adapter.

# Windows NT Server or Workstation



## Automatic configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The Intel PRO/100+ TX PCI adapter IRQ level and I/O address are automatically set by the BIOS each time you start your computer.

Start your computer to automatically configure the adapter. Configuration is complete when Windows NT starts or the DOS prompt appears.

If your computer displays an error while booting, it may require additional steps to configure. See the BIOS section of the manual.

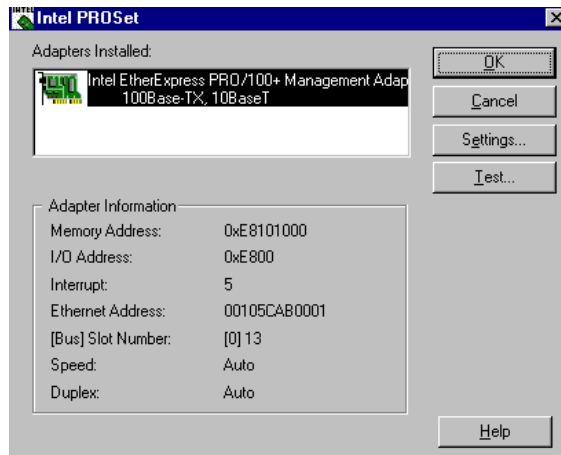


## Install network drivers - Windows NT Version 4.0 only

If using a disk in which Windows NT 4.0 installed, you need to install the Intel drivers.

Have the Windows NT CD-ROM disk available for this procedure.

1. Double-click the Network icon in the Control Panel.
2. Click the Adapters tab in the windows that appears.
3. Click Add. A list of adapter appears.
4. **Don't select an adapter from this list. Instead,** insert the Intel Configuration and Drivers disk into your floppy drive and click Have Disk.



PROSet is an enhanced utility that you can use to easily configure and test your adapter in Windows NT. PROSet also displays the computer resources that were assigned to each PRO adapter installed.

5. Type A:\ in the dialog box and click OK. Then follow the instructions to install the drivers. When the adapter is added, you'll see its name listed in the Network



adapters list. If you've installed multiple like adapters, all are configured at this time.

6. Select the adapter and click Properties to run PROSet to view the adapter configuration or test diagnostics. Adapter diagnostics are available only when the drivers are loaded (before you restart your computer). Driver diagnostics are available when the drivers are loaded.
7. Click OK in the main PROSet window to return to Windows NT.
8. Click Close to finish. If you have TCP/IP installed, its configuration window appears.
9. Restart Windows NT when prompted.



To run the PROSet software at any time, double-click the Intel PROSet icon in the Control Panel or click the Adapter Properties button

### **Install network drivers - Windows NT Version 3.5x only.**

When your computer starts Windows NT for the first time, you need to install the Intel drivers and test the adapter.

1. Double - Click the Network icon in the Control Panel.
2. Click Add Adapter.
3. When the list of adapters appears, Scroll to the end of the list and select **<Other> Requires disk from manufacturer.**
4. Insert the Intel Configuration and Drivers disk in the A: drive and click OK. Drivers and the Intel PROSet utility are installed and PROSet starts .PROSet is an enhanced utility that you can use to easily configure and test your adapter in Windows NT. PROSet also displays the computer resources that were assigned to each PRO adapter installed. The PROSet main window is shown on the preceding page.
5. Click OK in the PROSet main window to return to Windows NT.
6. Click OK in the Network Settings dialog box and remove the installation disk. When prompted, restart Windows NT.

To install multiple adapters, repeat this procedure for each new adapter. See page 11 for specific information.



To run the PROSet software at any time, double-click the Intel PROSet icon in the Control Panel.



## Troubleshooting

If Windows NT reports an error or you can't connect to the network, try the suggestions here first, then turn to page 17 if necessary.

- Make sure you're using the drivers for this adapter. Drivers are located on the Intel Drivers and Configuration disk version 3.0 or later.
- Make sure the driver is loaded and the protocols are bound. Check the Network Bindings dialog box in Windows NT.
- Check the Windows NT Event Viewer for error messages.
- If you are attaching to a NetWare network, check your frame type and verify that NetWare client software has been installed.
- Test the adapter with PROSet. After installing the adapter you can run PROSet from your hard disk. To do this, double-click the Intel PROSet icon in the control Panel. Click Test to run diagnostics. For additional information, click Help in the PROSet window.
- Check with your LAN administrator - you may need to install supplemental networking software.

## Windows 95



**ONE**

### Automatic configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The Intel PRO/100+ TX PCI adapter IRQ level and I/O address are automatically set by BIOS each time you start your computer. Start your computer to automatically configure the adapter. Configuration is complete when Windows 95 starts.

If your computer displays an error while booting, it may require additional steps for configuration. See BIOS section in the manual of motherboard.



**TWO**

### Installing Network drivers from diskette

Have your Windows 95 installation CD-ROM or disks available, as Windows 95 prompts for them when you install the new adapter.

1. When the computer starts Windows 95, the New Hardware Found dialog box appears. If this box does not appear and Windows 95 starts normally, you may need to manually add the adapter. See page 10.
2. Click **Driver from disk provided by hardware manufacturer,** then click OK. The Install From Disk dialog box appears.
3. Insert the Intel Configuration and Drivers disk.
4. Specify A:\ (or B:\) as the path, then click OK.

5. Follow prompts for any Windows 95 installation disks and restart when prompted (If you installed from CD-ROM, the installation files are typically located at D: \Win95, where D is your CD-ROM drive.)

After restarting Windows 95, you should be able to connect to your network by double-clicking the Network Neighborhood.



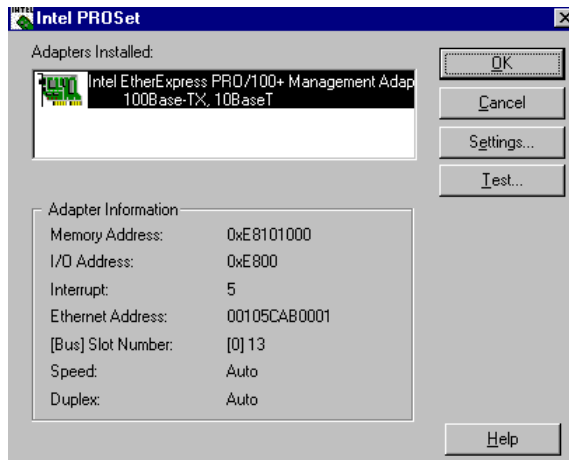
## Install PROSet software

PROSet is an enhanced Intel utility used to easily configure and test your adapter in Windows 95. PROSet also displays the computer resources that were assigned to each PRO adapter installed. To install PROSet :

1. Insert the Intel Configuration and Drivers disk.
2. From My Computer or the Windows Explorer, double-click the 3½ Floppy disk icon.
3. Click the "PROSet" icon or filename and click the right mouse button. From the menu that appears, click Install.
4. The PROSet files are copied to your hard disk.
1. Start PROSet by double-clicking on the Intel icon in the Control Panel:



1. The PROSet software examines your computer and displays the window shown here.



2. Click OK to exit PROSet and return to Windows 95.

## Manually adding an adapter

If the New Hardware Found dialog box does not appear at startup and you cannot connect to the network, check the device Manager list to see if the new adapter is present. If it is not, use the following procedure.

1. From the Control Panel, double click the system icon.
2. Click the Device Manager tab in the window that appears.
3. Double-click Other Devices (question mark icon) in the list area.
4. Double-click PCI Ethernet Controller.
5. Click the Driver tab, then click Change Driver.
6. Select Network Adapters and click OK.
7. Click Have Disk from the window that appears. Insert the Intel configuration and Drivers Disk and click OK.
8. Follow any prompts for Windows 95 installation disks and restart when prompted.



## Troubleshooting

If you cannot connect to a server or if Windows 95 reports an error after you double-clicked Network Neighborhood. Try the suggestions here first, then turn to page 17 if necessary.

- Make sure you are using the drivers that are on the drivers diskette that ships with this adapter.
- Make sure the driver is loaded and the protocols are bound. Check Device Properties list for trouble indicators (an X or ! Symbol).
- Test the adapter. Start PROSet (see page 9) and click Test to run diagnostics.
- Check with your LAN administrator- you may need to install supplemental networking software.

## NetWare Server, Client 32, UNIX, OS/2, Banyan, and Other Operating Systems

For these, refer to our online documents. On a DOS computer, view the appropriate README file for information on installing your network driver.

To view the README file, insert the Intel Configuration and drivers disk into a drive, switch to that drive, and type :



SETUP / README



Look through the selection called "Installing Onboard Intel PRO/100+ TX PCI Adapter Drivers" for the operating system you need.

## Installing Multiple Adapters

**All users:** The adapter 12-digit, hexadecimal Ethernet address is on a sticker near the edge of the motherboard. The Ethernet address is sometimes called the node address or the MAC address. Note that the PCI slot number may not correspond with the physical connector in your computer.

**NetWare users:** The server drivers use the PCI slot number to identify each installed adapter. You can correlate the PCI slot number to the adapter by using the Ethernet address that is printed on a label on the adapter. Run setup from the Intel disk to view the Ethernet address and slot number for each installed adapter. For more information, see the README files. NetWare 4.11 server installations use unique slot numbers that are assigned during sever setup.

**Windows 95 users:** Repeat the configuration procedure for other adapter you want to install.

## Select Duplex Mode(Optional)

Duplexing is a performance option that lets you choose how the adapter sends and receives data packets over the network. The on-board Intel PRO/100+ TX PCI adapter can operate at full duplex only when connected to a full duplex 10BASE-T or 100 BASE-TX switching hub. To summarize:

- **Auto(requires a full duplex switching hub with auto-negotiation capability).** The adapter negotiates with the hub to send and receive packets at the highest rate. This is the default setting. If the hub does not provide auto-negotiation, the adapter runs at half duplex.
- **Full duplex(requires a full duplex switching hub).** The adapter can send and receive packets at the same time. This mode can increase adapter performance capability. If the full duplex hub provides auto-negotiation, the adapter runs at full duplex. If the full duplex hub does not provide auto-negotiation, you need to set the adapter duplex mode manually (see following paragraphs)
- **Half duplex.** The adapter performs one operation at a time; it either sends or receives. Adapter performance may suffer or your adapter may not operate if your hub does not support full duplex and you configure the adapter to full duplex. Leave the adapter on half duplex if you are not sure what type of hub you are connected to.



## Manually Configuring for Full Duplex

If your switch supports auto-negotiation with the N-way standard, duplex configuration is automatic and no action is required on your part. However, few switches in the current installed base support auto-negotiation. Check with your network system administrator to verify. Most installations will require manual configuration for changing to full duplex.

Configuration is specific to the driver you are reloading for your network operating system (NOS), as shown in the following paragraphs.

To set up the duplex mode, refer to the section below that corresponds to your operating system.

If your hub is running at 100Mbps and half duplex, your potential bandwidth is higher than if you run at 10Mbps and full duplex.



## Dos ODI, NDIS 2.01 Clients

Edit the NET.CFG or PROTOCOL.INI file. Add to Link Driver section:

```
FORCEDUPLEX 2  
SPEED 100 (or 10 if 10BASE-T)
```

## NetWare server

In AUTOEXEC.NCF, load E100B.LAN and add the following statement(you must include the equal sign for servers):

```
FORCEDUPLEX=2  
SPEED=100 (or 10 if 10BASE-T)
```

For more information, see the README file for NetWare servers.

## Windows NT

While running windows NT:

1. From the Control Panel, double-click the Intel PROSet icon
2. PROSet examines your system and displays the Adapter Setup windows. If you have multiple adapters, click the "Show All Adapters" box and then select the adapter you are configuring (you can identify it by its Ethernet address). Each adapter must be configured separately. See page 10, *installing multiple Adapters*, for more information.
3. From the window that appears, click Change.
4. From the adapter Setup window, click the menu for Network Speed.
5. Click 100 or 10Mbps, depending on hub speed.

6. Click the menu for Duplex Mode.
7. Click Full.
8. Click OK When finished .
9. Click Restart Windows NT.

## **Windows 95**

While running Windows 95:

1. From the Control Panel, double-click the Intel PROSet icon.
2. PROSet examines your system and displays the adapter setup window. If you have multiple adapters, click the adapter you are configuring (you can identify it by its Ethernet address). Each adapter must be configured separately. See page 11, *installing Multiple adapters*, for more information.
3. From the window that appears, click Change.
4. From the Adapter Setup window, click the menu for Network Speed.
5. Click 100 or 10 Mbps, depending on hub speed.
6. Click the menu for Duplex Mode.
7. Click Full.
8. Click OK when finished.
9. Click OK to restart Windows 95.

## **Other operating systems**

See the Adapter Installation and Special Configurations README file. See page 9 for instructions on viewing README files.

# **Using Adapter Teaming(Optional)**

The Intel PRO/100+ adapter provides several options for increasing throughput and fault tolerance when running Windows NT 4.0 or NetWare 4.1x and newer:

Adapter Fault Tolerance (AFT) - provides automatic redundancy for your adapter. If the primary adapter fails, the secondary takes over.

Adaptive Load Balancing (ALB) - creates a team of 2 - 4 adapters to increase transmission throughput. Also includes AFT. Works with any 100BASE-TX switch.

Fast EtherChannel\* (FEC) - creates a team of 2 or 4 adapters to increase transmission and reception throughput. Also includes AFT. Requires a Cisco switch with FEC capability.

To set up an option, go to the instructions in the Windows NT 4.0 or NetWare 4.1x readme files.

## ***General configuration notes***

- Windows NT versions prior to 4.0 don't support Adapter Teaming options.
- Adapter Teaming options require NT 4.0 with Service Pack 3.0 and Hotfix.

## ***Adapter Fault Tolerance***

Please see " Set Up Adapter Fault Tolerance ".

## ***Adaptive Load Balancing***

Adaptive Load Balancing (ALB) is a simple and efficient way to increase your workstation or server's transmission throughput. With ALB, as you add adapters to your workstation or server, you can group them in teams to provide up to a 400 Mbps transmit rate and a 100 Mbps receive rate, with a maximum of four adapters.

The ALB software continuously analyzes transmit loading on each adapter and balances the transmission across the adapters as needed. Adapter teams configured for ALB also provide the benefits of AFT. Receive rates remain at 100 Mbps.

To use ALB, you must have two, three, or four Intel PRO/100+ adapters installed in your server or workstation and linked to the same network switch.

## ***Cisco Fast EtherChannel***

Fast EtherChannel (FEC) is a performance technology developed by Cisco to increase your server's throughput. Unlike ALB, FEC can be configured to increase both transmission and reception channels between your server and switch. FEC works only with FEC-enabled Cisco switches such as the Catalyst 5000 series. With FEC, as you add adapters to your server, you can group them in teams to provide up to 800 Mbps at full duplex, with a maximum of four Intel PRO/100+ adapters. The FEC software continuously analyzes loading on each adapter and balances network traffic across the adapters as needed. Adapter teams configured for FEC also provide the benefits of AFT.

To use FEC, you must have two or four Intel PRO/100+ adapters installed in your server or workstation and linked to the same FEC-enabled Cisco switch.

For more information on Adapter Teaming options, see the Installation Guide, Adapter Teaming readme file, or the white papers posted on Intel Networking web site ([www.intel.com/network](http://www.intel.com/network)).



### *Moving and removing adapter teams in Windows NT 4.0*

When you move adapters out of a team or remove a team, check the adapter bindings to make sure they are set properly. Bindings are displayed on the Network control panel bindings' tab.

### *Using AFT with a NetWare server and switch*

The NetWare AFT driver, when used with some switches, may fail to create the AFT group when the server is initially started. This is because the switch updates its MAC tables slowly when a new link is established. Clients won't be able to access the server until the MAC tables are updated and the switch begins receiving packets.

If you experience this problem, add the command:

**AFT LINK TIMEOUT 40**

to the server AUTOEXEC.NCF file immediately after the LOAD AFT command. 40 is the number of seconds.

\* Brand, name, or trademark owned by another company.

## **Set Up Adapter Fault Tolerance (Optional)**

Adapter Fault Tolerance provides the safety of an additional backup link between the server and hub or switch. In the case of hub or switch port, cable, or adapter failure, you can maintain uninterrupted network performance.

Adapter Fault Tolerance is implemented with a primary adapter and a backup, or secondary. For more information about Adapter Fault Tolerance, see the disabled. If the Adapter Fault Tolerance README files on the Intel Configuration and Drivers disk. These are located in the Microsoft and NetWare sections of the README files.

To use Adapter Fault Tolerance, you must have two Intel PRO/100+ adapters (Management or standard model) installed in your Windows NT4.0 OR NetWare 4.x server and they must be linked to the same network.



### ***To set up Adapter Fault Tolerance in Windows NT4.0:***

1. Double - click the Network icon in the Control Panel.
2. On the Adapters tab, select and Intel PRO/100+ adapter that will be in the team and click Properties.
3. Click Fault Tolerance.  
**Windows NT versions prior to 4.0 don't support Adapter Fault Tolerance.**
4. To add an adapter team, click OK.
5. Close the Network control panel.
6. In the AFT Configuration Manager dialog box, follow the instructions for assigning adapters to a team. Adapter Fault Tolerance supports up to four adapter teams, two adapters per team.
7. Click OK and then Close. When prompted, restart your computer.



**Adapter Fault Tolerance must be loaded before the Intel  
Note: PRO/100+ adapter driver. E100B.LAN**

### ***To set up Adapter Fault Tolerance in NetWare:***

1. Copy the following lines from the EXAMPLES.TXT file (on the Intel Configuration and Drivers disk) and paste them into the appropriate file.



**Note:**

#### **Copy these lines into the AUTOEXEC.NCF file**

```
;- Load Adapter Fault Tolerance
load aft

;- Load LAN Driver on 1st Adapter
load e100b slot=7 frame=ethernet_802.2 name=pri_802.2

;- Load LAN Driver on 2nd Adapter
load e100b slot=8 frame=ethernet_802.2 name=sec_802.2

;- Bind ipx to 1st adapter
bind ipx pri_802.2 net=2

;- Set the 2nd Adapter to be a Fault Tolerance Partner to
;- the first adapter
aft bind 7 8
```

**Where:** slot= the slot in which your Intel PRO/100+ adapter is installed, such as 7. If you don't know the number, load the driver without it. NetWare will prompt you with supported PCI slot

numbers.

frame = the frame type of the network segment the computer is on.

7 is the primary adapter slot number.

8 is the secondary adapter slot number.

2 Modify the lines to match your server requirements.

3 Save the AUTOEXEC.NCF file and restart your server.

## Push Installation for Windows 95

If you are a LAN Administrator setting up server-based push installation for Windows 95 as defined in Microsoft Windows 95 Resource Kit, additional setups are required for this adapter. Refer to *Windows 95 README* file under the Microsoft section of *Installing Onboard Intel PRO/100+ adapter drivers*.

## Troubleshooting

### If the adapter can't connect to the network

#### Make sure the cable is installed properly.

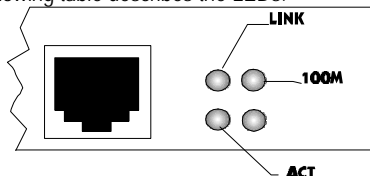
The network cable must be securely attached at both RJ-45 connections (adapter and hub). If the cable is attached but the problem persists. Try a different cable. The maximum allowable distance from adapter to hub is 100 meters.

If you're directly connecting two computers (no hub), use a crossover cable. Most hubs require a straight-through cable, while most switches require a crossover cable (see your hub or switch documentation to verify).

See the *Cabling Information README* file for more information on crossover cables.

#### Check the LED lights on the adapter.

The Onboard Intel PRO/100+ TX PCI adapter has three diagnostic LEDs on the right of cable connector. These lights help indicate if there's a problem with the connector, cable, or hub. The following table describes the LEDs.



LED	Indication	Meaning
-----	------------	---------

<b>LINK</b>	on	The adapter and hub are receiving power; the cable connection between the hub and adapter is good.
	Off	The adapter and hub are not receiving power; the cable connection between the hub and adapter is faulty; or you have a driver configuration problem.
<b>ACT</b>	On or flashing	The adapter is sending or receiving network data. The frequency of the flashes varies with the amount of network traffic.
	Off	The adapter is not sending or receiving network data.
<b>100M</b>	On	Operating at 100 Mbps.
	Off	Operating at 10 Mbps.

### **Make sure you are using the correct drivers**

Make sure you are using the drivers that come with this adapter. The driver filename contains the letter B (for example, E100BODI.DOS). Drivers that support previous versions of the Onboard Intel PRO/100+ TX PCI adapter do not support this version of the adapter.

### **Make sure the hub port and the adapter have the same duplex setting.**

If you configured the adapter for full duplex, make sure the hub port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.

## **Testing the adapter**

Test the adapter by running Intel diagnostics. For DOS or Windows 3.1 computers, run Setup on the Intel Drivers and Configuration disk. For Windows NT and Windows 95 run Intel PROSet by double-clicking the Intel PROSet icon in the Control Panel. Click Help from the main PROSet window to get complete diagnostics information and instructions.

## **Common problems and solutions**

*Diagnostics pass, but the connection fails or errors occur.*

- Make sure you are using category 5 wiring and the network cable is securely attached.
- For NetWare clients, make sure you specify the correct frame type in your NET.CFG file.
- Make sure the duplex mode setting on the adapter matches the setting on the hub.
- At 100 Mbps, connect to a 100BASE-TX hub only (not T4).

*The LINK LED doesn't light.*

- Make sure you've loaded the network drivers
- Check all connections relating to the adapter and the hub.
- Try another port on the hub.
- Make sure the duplex mode setting on the adapter matches the setting on the hub.
- Make sure you have the correct type of cable between the adapter and the hub. 100 BASE-TX requires four pairs. Some hubs require a crossover cable while others require a straight-through cable. See the *Cabling* README file for more information on cabling.

*The ACT LED doesn't light*

- Make sure you've loaded the correct network drivers.
- The network may be idle. Try accessing a server.
- The adapter isn't transmitting or receiving data. Try another adapter.
- It may not be using four-pair cable for TX wiring.

*The adapter stopped working when another adapter was added to the computer:*

- Make sure the cable is connected to on-board Intel PRO/100+ TX PCI adapter.
- Make sure your PCI BIOS is current. See page 19 for PCI installation tips.
- Make sure the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts. —OS/2\* doesn't.
- Try resetting the newest adapter.

*The adapter stopped working without apparent cause.*

- Run the diagnostics.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.

## Technical Information

### PCI installation tips

PCI computers are designed to automatically configure add-in cards each time the computer starts. Your PCI computer sets the I/O address and IRQ level for your Intel network adapter when the computer starts. These values cannot be changed by Intel adapter software. If you experience a problem when the computer starts, additional configuration steps may be required.

On these computers, manual configuration is possible through the computer's BIOS setup utility. Refer to your computer's documentation. You may need to verify or change some BIOS setting.

Some common PCI solutions are listed here:

- **Busmaster enabled slots.** On some computers, all slots are not busmaster enabled by default. Check your BIOS PCI bus setting. It will set to either Busmaster or Non-busmastered. Choose Busmaster.
- **Reserve interrupts (IRQs) and/or memory addresses for ISA adapters.** This prevents PCI cards from trying to use the same settings ISA cards are using. Check your PCI BIOS setup program. There may be IRQ options such as "Legacy ISA", "enable for ISA", "disable for ISA", or "enable for PCI". This option is sometimes in the Plug and Play area of the BIOS setup.
- **Enable the PCI slot.** In some PCI computers, you must use the PCI BIOS setup program to enable the PCI slot. This is especially common in PCI computer with the Phoenix BIOS.

- **Update your PCI BIOS.** An updated PCI system BIOS can correct some PCI configuration problems. Call your computer manufacturer to see if an updated BIOS version is available for your computer. Phone numbers for the top PCI computer manufacturers are listed in the *PCI Installation* README file on the Intel Configuration and Drivers disk.
- **Configure the slot for level-triggered interrupts.** The slot in which the adapter is using must be configured for level-triggered interrupts rather than edge-triggered interrupts. Check your PCI BIOS Setup program.

Here are some examples of PCI BIOS setup program parameters:

PCI slot #:	Slot where the adapter is installed
Master:	ENABLED
Slave:	ENABLED
Latency timer:	40
Interrupt:	Choose an IRQ from the list
Edge-level:	level

The exact wording of these parameters varies with different computers.

## FAST Ethernet wiring

**100BASE-TX Specification:** The 100BASE-TX specification supports 100Mbps transmission over four pairs of category 5 twisted-pair Ethernet (TPE) wiring. Three pairs of wire are used to send and receive, while the fourth is used for collision detection. Segment lengths are limited to 100 meters with 100BASE-TX for signal timing reasons. This complies with the EIA 568 wiring standard.

## Fast Ethernet hubs and switches

The two basic types of hubs are shared hubs and switching hubs. Onboard Intel PRO/100+ TX PCI adapters can be used with either type of hub for 10Mbps. At 100Mbps, a TX hub or switch is required.

### Shared hubs

In shared network environments, computers are connected to hubs called repeaters. All ports of the repeater hub share a fixed amount of bandwidth, or data capacity. On a 100Mbps shared hub, all nodes on the hub must share the 100Mbps of bandwidth. As stations are added to the hub, the effective bandwidth available to any individual station gets smaller. Shared hubs do not support full duplex.

Think of a shared repeater hub as a single-lane highway that everyone shares. As the number of vehicles on the highway increases, the traffic becomes congested and transit time increases for individual cars.

On a shared hub all nodes must operate at the same speed, either 10Mbps or 100 Mbps. Fast Ethernet repeaters provide 100Mbps of available bandwidth, ten times more than what is available with a 10BASE-T repeater.

Repeaters use a well-established, uncomplicated design, making them highly cost effective for connecting PCs within a workgroup. These are the most common types of Ethernet hubs in the installed base.

### **Switching hubs**

In a switched network environment, each port gets a fixed, dedicated amount of bandwidth. In the highway scenario, each car has its own lane on a multilane highway and there is no sharing.

In a switched environment, data is sent only to the port that leads to the proper destination station. Network bandwidth is not shared among all stations and each new station added to the hub gets access to the full bandwidth of the network.

If a new user is added to a 100Mbps switching hub, the new station receives its own dedicated 100Mbps link and doesn't impact the 100Mbps bandwidth available on the network, significantly improving performance. Switching hubs can also support full duplex.

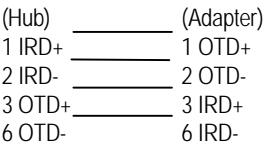
# Pin Assignments

## RJ-45 Connector

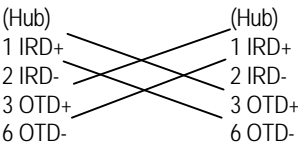
Pin Number		Assignment
Pin 1		Output Transmit Data +
Pin 2		Output Transmit Data -
Pin 3		Input Receive Data +
Pin 6		Input Receive Data -
Pin4, 5, 7, 8		Reserved for other use

Schematics for both straight and crossover twisted-pair cable are shown below. (Note that crossover cable is only required if you cascade hubs via the RJ-45 station ports; i.e., the Daisy-Chain port is not used.)

### Straight - Through



### Crossover





P/N: 430-09000-201  
Manual On-board Intel® PRO/100+ TX PCI

## LAN Adapter Ver 1.0