

**ASUS<sup>®</sup> PCI-L101**  
**10/100 Fast Ethernet PCI Card**

**USER'S MANUAL**

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# ASUS CONTACT INFORMATION

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## ASUSTeK COMPUTER INC.

### *Marketing Info*

Address: 150 Li-Te Road, Peitou, Taipei, Taiwan 112, ROC  
Telephone: +886-2-2894-3447  
Fax: +886-2-2894-3449  
Email: info@asus.com.tw

### *Technical Support*

Fax: +886-2-2895-9254  
BBS: +886-2-2896-4667  
Email: tsd@asus.com.tw  
WWW: www.asus.com.tw  
Gopher: gopher.asus.com.tw  
FTP: ftp.asus.com.tw/pub/ASUS

## ASUS COMPUTER INTERNATIONAL

### *Marketing Info*

Address: 721 Charcot Avenue, San Jose, CA 95131, USA  
Telephone: +1-408-474-0567  
Fax: +1-408-474-0568  
Email: info-usa@asus.com.tw

### *Technical Support*

BBS: +1-408-474-0569  
Email: tsd-usa@asus.com.tw  
WWW: www.asus.com

## ASUS COMPUTER GmbH

### *Marketing Info*

Address: Harkort Str. 25, 40880 Ratingen, BRD, Germany  
Telephone: 49-2102-445011  
Fax: 49-2102-442066  
Email: info-ger@asus.com.tw

### *Technical Support*

BBS: 49-2102-448690  
Email: tsd-ger@asus.com.tw  
Hotline: 49-2102-499712

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# FCC & DOC COMPLIANCE

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## ***Federal Communications Commission Statement***

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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 manufacturer's 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 to 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.

**WARNING!** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## ***Canadian Department of Communications Statement***

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

# I. INTRODUCTION

## Item Checklist

- ☒ ASUS PCI-L101
- ☒ 3-pin wake on LAN cable
- ☒ This User's Manual
- ☒ ASUS Driver & Utility Diskette

The ASUS PCI-L101 is a 32-bit 10/100Mbps Ethernet network interface card for PCI local bus-compliant computers. It supports the bus mastering architecture, and auto-negotiation feature which make it possible to use the common twisted-pair cabling with RJ45 connectors for both 10Mbps and 100Mbps connections. Extensive driver support for commonly used network operating systems is also provided.

## Features

- Intel 82558 Ethernet LAN Controller (Fully integrated 10BASE-T/100BASE-TX)
- Wake-On-LAN Remote Control Function Supported
- PCI Bus Master Complies to PCI Local Bus Rev. 2.1 specifications
- Consists of MAC & PHY (10/100Mbps) interfaces
- Complies to IEEE 802.3 10BASE-T and IEEE 802.3u 100BASE-TX interfaces
- Fully supports 10BASE-T & 100BASE-TX operations through a single RJ45 port
- Supports 32-bit Bus Master Technology / PCI Rev. 2.1
- Enhancements on ACPI & APM
- Adheres to PCI Bus Power Management Interface Rev. 1.0, ACPI Rev. 1.0, and Device Class Power Management Rev. 1.0
- IEEE 802.3u auto-negotiation for 10Mbps/100Mbps Network Data Transfer Rates.
- Provides LED indicators for monitoring network conditions
- Plug and Play

## Software Driver Support

**NetWare ODI Drivers** - Novell Netware 3.x, 4.x; NetWare LAN WorkPlace TCP/IP; Novell LAN Analyzer for Netware

**Packet Drivers** - FTP PC/TCP, NCSA TCP/IP, Accton LANSoft

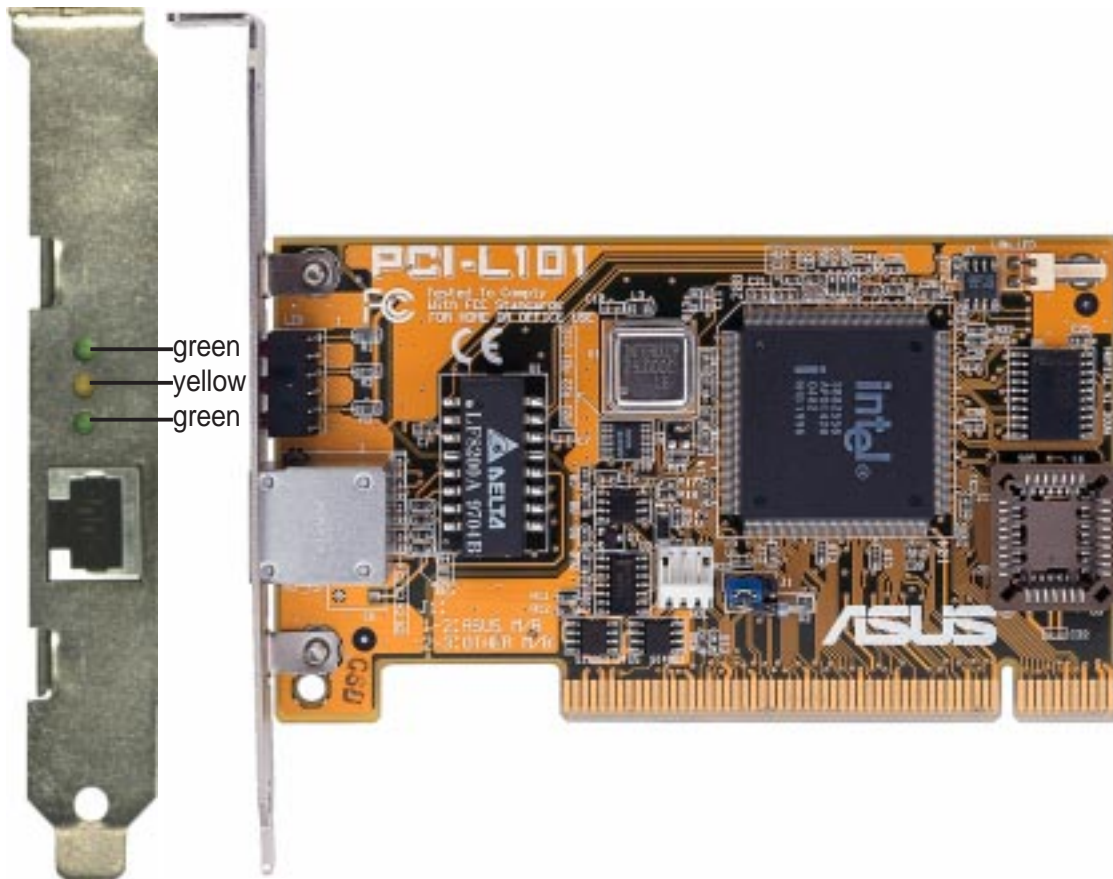
**NDIS Drivers** - LAN Manager V2.x; Windows 3.x, 95, NT (Server/Workstation) V3.x, V4.0; IBM LAN Server 2.x, 3.0; IBM LAN Support V1.x; IBM OS/2 EE V2.0; DEC Pathworks V4.x & V5.0; Sun PC-NFS; Banyan VINES; IBM TCP/IP for DOS & OS/2; Wollongong Pathway Access

**Unix Driver** - SCO Unix



# I. INTRODUCTION

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## LED Indicators

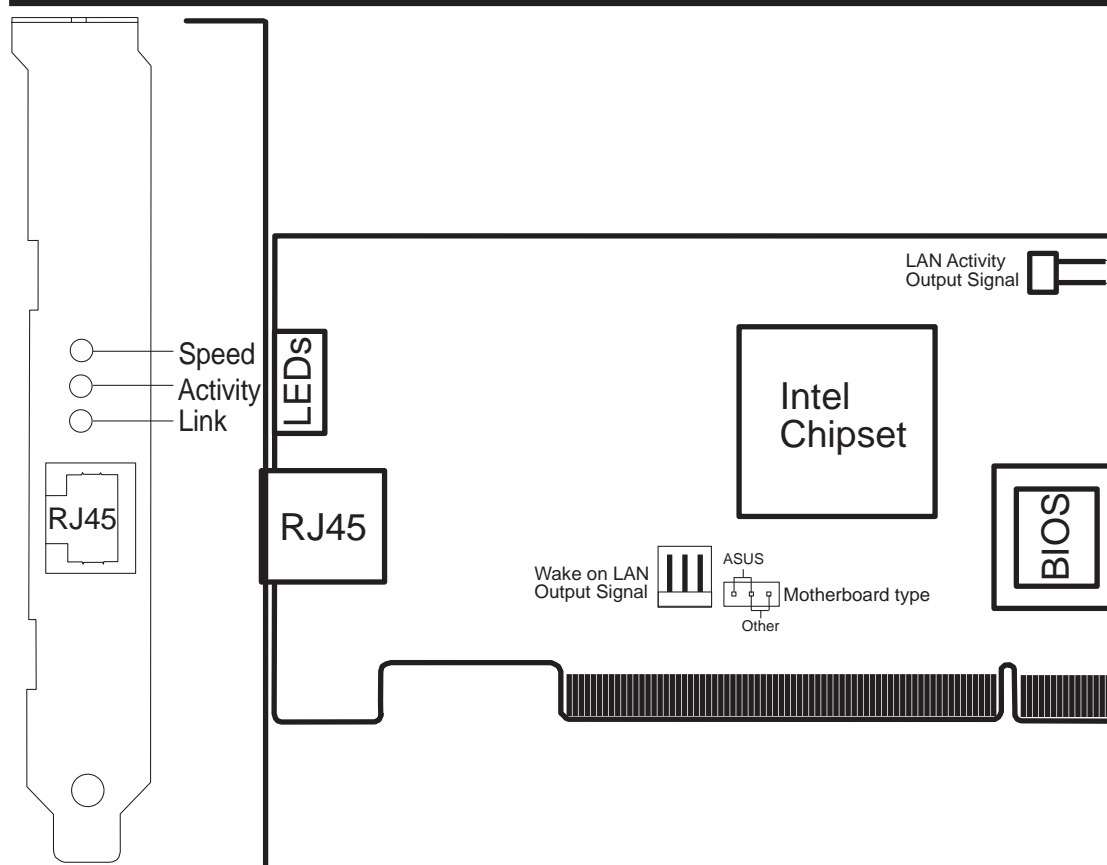
**Green Speed LED** - This LED lights when connection is made to a 100Base-TX host.

**Yellow Activity LED** - This LED lights when there is network packets sent or received through the RJ45 port. The rate of flashing is proportional to the amount of network traffic.

**Green Link** - This LED monitors 10Base-T and 100Base-TX connections. This LED lights to indicate a successful network connection, and remains steady if the connection is stable.



## II. INSTALLATION



### II. Installation Jumpers

**WARNING!** Computer boards and components contain very delicate Integrated Circuit (IC) chips. To protect the computer board and other components against damage from static electricity, you must follow some precautions.

1. Make sure that you unplug your power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.
2. Keep all components such as the host adapter in its antistatic bag until you are ready to install it.
3. Use a grounded wrist strap before handling computer components. If you do not have one, touch both of your hands to a safely grounded object or to a metal object, such as the power supply case. Hold components by the edges and try not to touch the IC chips, leads, or circuitry.
4. Place components on a grounded antistatic pad or on the bag that came with the component whenever the components are separated from the system.

### Jumper Setting

If you are using the ASUS PCI-L101 on an ASUS motherboard, leave the jumper on its default setting of "ASUS." If you are using another brand of motherboard, set the jumper to "Other." Connect the Wake On LAN (WOL) output signal to the WOL\_CON in order to utilize the Wake On LAN feature of the motherboard. Connect the LAN activity output signal (LAN\_LED) to the motherboard's LAN\_LED (if available) in order to display the LAN data activity on the system's front panel LED.

# II. INSTALLATION

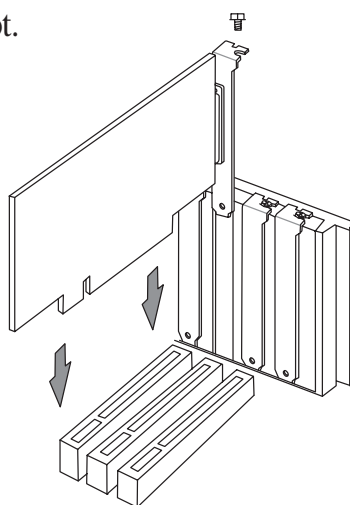
## Installation Procedures

These procedures describes basic installation procedures for typical computer systems. Your computer may require slightly different procedures.

1. Turn off the computer and unplug the power cord. Then remove its cover.

**WARNING!** Turn off and unplug power to the computer before removing its cover. Failure to do so could shock you and may damage the adapter or computer.

2. Remove the cover bracket from a PCI busmaster adapter slot. In most computers, all slots are busmaster-enabled. If you have configuration problems, see your computer's documentation to determine if the PCI slots are busmaster-enabled.
5. Ground yourself to an antistatic mat or other grounded source.
6. Pick up the board (still in its protective bag) by grasping the edge bracket with one hand and then remove the protective bag.
7. Position the card directly over the PCI slot and insert one end of the board in the slot first. Firmly but gently press the bus connector on the bottom of the card down into the slot. Be sure the metal contacts on the bottom of the host adapter are securely seated in the slot.



8. Anchor the board's mounting bracket to the computer chassis using the screw from the slot cover that you set aside previously.
9. Attach the twisted-pair cable using the RJ45 connector
10. Replace the computer's cabinet cover.
11. Power on the computer.
12. Run the diagnostics program to check the card's configurations.
13. Install the driver.

## II. INSTALLATION

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### Connect the Network Cable

**Twisted Pair Ethernet (TPE)** - Connect a single network cable to the ASUS PCI-L101 PCI adapter as shown below. For 100BASE-TX, your network cable must be category 5 (not category 3), twisted-pair wiring with RJ45 connectors. If you plan on running the adapter at 100 Mbps, 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.

**WARNING:** Turn off and unplug power to the computer before installing the WOL cable. The WOL connector on your motherboard is live when the computer is plugged in to a power outlet. Failure to do so could damage the adapter or computer.

### Connect the Wake On LAN Power Cable

In order for the Wake On LAN (WOL) feature to work correctly, the adapter must be connected to a continuous power source. This allows the ASUS PCI-L101 adapter to “listen to” the network even when the computer is turned off. To install the WOL power cable, carefully follow the procedure below. Warning: Turn off and unplug power to the computer before installing the WOL cable. The WOL connector on your motherboard is live when the computer is plugged in to a power outlet. Failure to do so could damage the adapter or computer.

#### Installing the WOL Power Cable

1. Make sure your computer is completely unplugged from the power outlet.
2. Locate the WOL connector on the ASUS PCI-L101 adapter. Attach one end of the WOL cable to the adapter. Note that the connector is keyed.
3. Locate the WOL connector on your motherboard. The location varies, depending on vendor and model of motherboard.
4. Connect the other end of the WOL cable to the connector on the motherboard. Note that the connector is keyed.
5. Some computers may require you to change a setting in your computer's BIOS or Setup program to enable the WOL feature. Check your computer owner's manual or contact your dealer for more information.
6. Replace the computer cover and plug in the power cord. Install only one active WOL adapter per computer. You can install additional, non-WOL adapters.

**IMPORTANT!** The ATX or NLX power supply must deliver at least 720mA on the 5volt standby lead (5VSB) in order for the Wake On LAN to work properly.

# III. DRIVERS

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## DOS and Windows 3.1 Setup for Novell

### **Automatic configuration**

PCI computers automatically detect and configure PCI-compliant adapters while booting. The ASUS PCI-L101 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.

### **Run 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. If your computer already has network drivers installed, restart the computer without loading them. If the drivers are loaded from the AUTOEXEC.BAT or CONFIG.SYS file, type REM in front of each line that loads a network driver. Or, with DOS 6.x or later press “F5” as DOS starts, to bypass the drivers.
2. Insert the ASUS Configuration and Drivers disk in a floppy drive, switch to that drive, and at the DOS prompt, type “SETUP”.
3. If you have more than one ASUS PCI-L101 PCI adapter in your computer, an adapter selection menu appears on the screen. Select the adapter you want by noting the Ethernet address.
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’s configuration, then runs a series of diagnostic tests that makes sure 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’ll see the Install Network Drivers screen.
6. Select the driver you want to install. Setup can install a NetWare client driver for you. If you’re installing other drivers, Setup displays a README file with installation instructions.

# III. DRIVERS

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## Troubleshooting

If you can't connect to a server, first try the suggestions here, then turn to the Troubleshooting section if necessary.

- Make sure you're using the drivers for this adapter. The driver filename contains the letter B (for example, E100BODI.COM).
- If you're replacing an existing adapter, make sure the LINK statement in your NET.CFG is correct for the new adapter. For example, the LINK statement for a NetWare client should be: "LINK DRIVER E100BODI"
- 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.
- Check the README files.

## 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 EtherExpress adapter installed (except EtherExpress 32 or EtherExpress 16 MCA).
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.

## III. DRIVERS

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### Windows NT Server or Workstation

#### **Automatic configuration**

PCI computers automatically detect and configure PCI-compliant adapters while booting. The ASUS PCI-L101 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.

#### **Install network drivers - Windows NT Version 4.0 only**

After putting the adapter in the computer and starting Windows NT, you need to install the device drivers. Have the Windows NT CD-ROM disk available for this procedure.

**NOTE:** If you are installing Windows NT 4.0 at this time, click the Start Search button when the network adapter installation window appears. This allows NT to auto-detect the adapter. You may then skip steps 1 - 4 below.

1. Double-click the Network icon in the Control Panel.
2. Click the Adapters tab in the window that appears.
3. Click Add. A list of adapter appears.
4. Select the "Intel EtherExpress PRO Adapter" and click OK.

# III. DRIVERS

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

After putting the adapter in the computer and starting Windows NT, 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 ASUS Configuration and Drivers disk in the A: drive and click OK.
5. Select the “Intel EtherExpress PRO Adapter” and click OK.
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.

## **Troubleshooting**

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

- Make sure you're using the drivers for this adapter. Drivers are located on the Windows NT CD-ROM or on the ASUS Drivers and Configuration disk.
- 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.
- Check with your LAN administrator — you may need to install supplemental net-working software.



# III. DRIVERS

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## Windows 95

### **Automatic Configuration**

PCI computers automatically detect and configure PCI-compliant adapters while booting. The ASUS PCI-L101 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 95 starts. If your computer displays an error while booting, it may require additional steps to configure.

### **Install 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. After you put the adapter in the computer, start 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.
2. Click "Driver from disk provided by hardware manufacturer," then click OK. The Install From Disk dialog box appears.
3. Insert the ASUS 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.

# III. DRIVERS

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## Manually Adding a LAN Card

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 ASUS Configuration and Drivers Disk and click OK.
8. Select the “Intel 82558-based Integrated Fast Ethernet for WfM” and click OK.
9. Follow any prompts for Windows 95 installation disks and restart when prompted.

## Troubleshooting

If you can't connect to a server or if Windows 95 reports an error after you double-click Network Neighborhood, try the suggestions here first, then the Troubleshooting section if necessary.

- Make sure you're 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).
- 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.

## III. DRIVERS

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### Installing Multiple LAN Cards

**All users:** The adapter's 12-digit, hexadecimal Ethernet address is on a sticker on the back of the adapter. 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.

Install only one active WOL adapter per computer. You can install additional, non-WOL adapters.

**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 ASUS 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 NT and Windows 95 users:** Repeat the configuration procedure for each adapter you want to install (add only one adapter at a time). You need to perform the configuration process on each adapter. In Windows NT, be sure to click the Show all PRO Adapters box in the Configuration window. See the README file for more information.

### 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 ASUS PCI-L101 adapter can operate at full duplex only when connected to a full duplex 10BASE-T, 100BASE-TX switching hub, or another full duplex adapter. To summarize:

- **Auto (requires a full duplex adapter or 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 or adapter).** 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.

## III. DRIVERS

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

### 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 to change to full duplex.

Configuration is specific to the driver you're loading 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.

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.

### DOS ODI, NDIS 2.01 Clients

Edit the NET.CFG or PROTOCOL.INI file. Add keywords 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 window.

## III. DRIVERS

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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.

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 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.
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. “Push” Installation for Windows 95

If you are a LAN Administrator setting up server-based push installation of Windows 95 as defined in Microsoft Windows 95 Resource Kit, additional steps are required for this adapter.

## IV. TROUBLESHOOTING

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### 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).

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

The ASUS PCI-L101 adapter has three diagnostic LEDs above the cable connector. These lights help indicate if there's a problem with the connector, cable, or hub. The table below describes the LEDs.

<b>LED</b>	<b>Indication</b>	<b>Meaning</b>
<b>SPD</b>	<b>On</b>	Network connection operating at 100 Mbps.
	<b>Off</b>	Network connection operating at 10 Mbps.
<b>ACT</b>	<b>On or flashing</b>	The adapter is sending or receiving network data. The frequency of the flashes varies with the amount of network traffic.
	<b>Off</b>	The adapter is not sending or receiving network data.
<b>LNK</b>	<b>On</b>	The adapter and hub have acknowledged a connection; the link between the hub and adapter is good.
	<b>Off</b>	The cable connection between the hub and adapter is faulty; or you have a driver configuration problem.

## IV. TROUBLESHOOTING

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### **Make sure you're using the correct drivers.**

Make sure you're 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 ASUS PCI-L101 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 ASUS Configuration and Drivers 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*

#### **SETUP.EXE reports the adapter is "Not enabled by BIOS".**

- The PCI BIOS isn't configuring the adapter correctly. Try the PCI installation tips.

#### **The computer hangs when the drivers are loaded.**

- Change the PCI BIOS interrupt settings. See the next page for PCI installation tips.
- If you are using EMM386, it must be version 4.49 or newer (this version ships with MS-DOS 6.22 or newer).

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

- At 100 Mbps use category 5 wiring and make sure the network cable is securely attached.
- For NetWare clients, make sure you specify the correct frame type in the 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 LNK LED doesn't light.**

- Make sure you've loaded the network drivers.
- Check all connections at 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 two pairs. Some hubs require a crossover cable while others require a straight-through cable. See the *Cabling* README file for more information on cabling.



## IV. TROUBLESHOOTING

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### **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.
- 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 the ASUS PCI-L101 PCI adapter.
- Make sure your PCI BIOS is current.
- Make sure the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts — OS/2\* doesn't.
- Try reseating the newest adapter.

### **The adapter stopped working without apparent cause.**

- Try reseating the adapter first, then try a different slot if necessary.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- Try a different ASUS PCI-L101 PCI adapter.
- Run the diagnostics.

### **The Wake On LAN feature is not working.**

- Make sure the WOL cable is attached and power is applied to the computer.
- Check the BIOS for its WOL setting. Some computers may need to be configured to WOL.
- Make sure the network cable is fully attached to the adapter.

### **Link LED does not light when power is connected.**

- Make sure WOL cable is attached and power is applied to computer.
- Make sure network cable is attached at both ends.

# IV. TROUBLESHOOTING

## 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 PCI BIOS setup utility. Refer to your computer's documentation. You may need to verify or change some BIOS settings.

**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 'Enable for ISA,' 'Reserve for ISA,' or 'Disable 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 computers 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 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 example 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.

# IV. TROUBLESHOOTING

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## Fast Ethernet Wiring

**100BASE-TX Specification:** The 100BASE-TX specification supports 100 Mbps transmission over two pairs of category 5 twisted-pair Ethernet (TPE) wiring. One pair is for transmit operations and the other for receive operations. 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. ASUS PCI-L101 adapters can be used with either type of hub for 10 Mbps. At 100 Mbps, a TX hub or switch is required.

### *Shared hubs*

In a shared network environment, computers are connected to hubs called repeaters. All ports of the repeater hub share a fixed amount of bandwidth, or data capacity. On a 100 Mbps shared hub, all nodes on the hub must share the 100 Mbps 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 10 Mbps or 100 Mbps. Fast Ethernet repeaters provide 100 Mbps of available bandwidth, ten times more than what's 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 type 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 multi-lane 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 100 Mbps switching hub, the new station receives its own dedicated 100 Mbps link and doesn't impact the 100 Mbps bandwidth of another station. Switching hubs can effectively increase the overall bandwidth available on the network, significantly improving performance. Switching hubs can also support full duplex.

# V. APPENDIX

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## 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.

## Question and Answer

Q: What is Wake-On-LAN ?

A: The Wake-On-LAN feature provides the capability to remotely power on systems supporting Wake-On-LAN by simply sending a wake-up frame. With this feature, remotely uploading/downloading data to/from systems during off-peak hours will be feasible.

Q: What can Wake-On-LAN do for you ?

A: Wake-On-LAN is a remote management tool with advantages that can reduce system management workload, provide flexibility to the system administrator’s job, and then of course save you time-consuming efforts and costs.

Q: What components does Wake-On-LAN require to be enable?

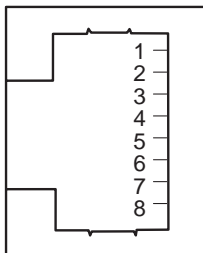
A: To enable Wake-On-LAN function, your system requires Ethernet LAN adapter card that can activate Wake-On-LAN function, a client with Wake-On-LAN capability, and software such as LDCM Rev. 3.10 or up that can trigger wake-up frame.

# V. APPENDIX

## Pin Definitions

### RJ45 Connector

Pin 1	Output Transmit Data +
Pin 2	Output Transmit Data -
Pin 3	Input Receive Data +
Pin 6	Input Receive Data -
Pin 4,5 7 8	(Reserved)



### Twisted-Pair Cable

The cable used to connect the Ethernet card to a host (generally a Hub) is called a straight-through twisted-pair. The end connectors are called RJ45 connectors which are not compatible with the standard RJ11 telephone connectors. The illustration shows the connection diagram between a typical Hub and Ethernet Card.

### Straight-Through Cable

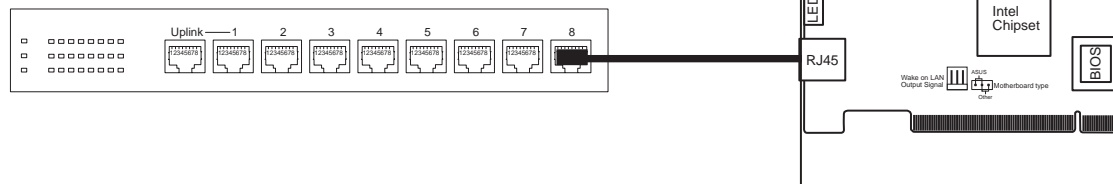
Hub                      Card

1 IRD+ — 1 OTD+

2 IRD- — 2 OTD-

3 OTD+ — 3 IRD+

6 OTD- — 6 IRD-



# V. APPENDIX

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## Glossary

**100Base-TX**

IEEE's specification for running 100Mbps Ethernet using twisted-pair cables.

**10Base-T**

IEEE's specification for running 10Mbps Ethernet using twisted-pair cables.

**10Base2**

IEEE's specification for running Ethernet using thick coaxial cables.

**BNC**

A connector with a half-twick locking shell typically used for thin coaxial cables.

**Boot ROM**

Read-only memory chip that allows a workstation to communicate with LAN cards.

**Driver**

A program that enables the network operating system to communicate with LAN cards.

**IEEE 802.3 standard**

Standard for the physical and electrical connections in local area networks developed by the IEEE (Institute of Electrical and Electronics Engineers).

**IEEE 802.3u standard**

IEEE standard for Local Area Networks (LAN) employing CSMA/CD as the access method. This standard is intended to encompass several media types and techniques for signal rates from 1Mb/s to 100Mb/s.

**Interrupt (IRQ)**

Signal suspending a program temporarily and transfers control to the operating system when input or output is required.

**LED**

Light emitting diode

**Mbps**

Megabits per second