Intel® PRO/100

LAN+Modem56 CardBus Adapter

User's Guide

intel.

How to Use This Manual

This **User's Guide** contains installation and configuration information for
Microsoft Windows* 95, Windows 98, and Windows NT*, and general
diagnostics and troubleshooting information.

Additional Information

For information on IBM OS/2*, 32-bit ODI* drivers, and Windows 3.x,
supplementary information on Windows 95, and modem command
reference information, see the text file **README.TXT** on the Intel CD-
ROM.

Visit the Intel support website at **support.intel.com** for software updates
and supplementary technical information.

See **Appendix A** for worldwide access to Intel Customer Support.

Contents

Note: Windows 3.x, IBM OS/2, 32-bit ODI

Installation and troubleshooting information for the Windows 3.x, OS/2, and 32-bit ODI see the README.TXT file on the Intel CD-ROM. Modem command reference information can be found in the Windows Help file HELPDOCS.HLP on the Intel CD-ROM.

CHAPTER 1

Hardware Installation

The PRO/100 LAN+Modem56 adapter supports both 10 Mbps and 100Mbps Ethernet networks and modem speeds up to 56Kbps for high-performance connectivity in any environment. It plugs into your computer's Type II PC Card slot to connect to an Ethernet LAN and to the telephone network.

Installation Overview

Follow the instructions in this chapter to install the PRO/100 LAN+Modem56 adapter hardware and network and modem cabling. Then proceed to the software installation chapter for your operating system environment, as follows:

Chapter 2. Windows 95 and 98 Installation

Chapter 3. Windows NT Installation

Chapter 4. Diagnostics and Troubleshooting

Installation and troubleshooting information for the Windows 3.x, OS/2, and 32-bit ODI see the README.TXT file on the Intel CD-ROM. Modem command reference information can be found in the Windows Help file HELPDOCS.HLP on the Intel CD-ROM.

The PRO/100 LAN+Modem56 adapter provides access to both 10Mbps and 100Mbps networks with a single adapter cable, and auto-negotiates 10Mbps or 100Mbps network speed.

Category 5 (data grade) unshielded twisted pair (UTP) cabling is required for 100Mbps or Category 3 or 5 for 10Mbps.

Power-Saving Modes

The PRO/100 LAN+Modem56 adapter includes battery saving technology for maximum battery life on the road. When the LAN cable is detached, the adapter senses the change and enters low-power mode. Normal power is restored when the cable is reattached.

Before Installing Hardware

Check Package Contents:

- Intel® PRO/100 LAN+Modem56 CardBus adapter
- Ethernet adapter cable with a 16-pin PC Card connector at one end and a female RJ-45 connector at the other
- Modem cable with a 26-pin PC Card connector at one end and a female RJ-11 modular telephone connector at the other
- RJ-11 modular telephone cable
- Software, User's Guide and online documentation on CD-ROM
- Quick Installation booklet

Please fill out the Product Registration Card and mail or fax it immediately to the Intel office indicated on the card.

Verify Other Required Equipment

To install the PRO/100 LAN+Modem56 adapter, you need the following:

1 A mobile PC with a CardBus slot.
2 A local area network supporting 10 or 100Mbps Ethernet and a network operating system supported by the PRO/100 LAN+Modem56 adapter.

Since the PRO/100 LAN+Modem56 adapter automatically detects the speed of the network to which it is connected, it may be safely connected to either a 100Base-TX or 10Base-T network, as specified in items 3 and 4 below.

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3 For connection to a 100Base-TX 100Mbps Ethernet network, a **Category 5** (data grade) unshielded twisted pair (UTP) network cable

terminating in a male RJ-45 connector and connected to a 100Mbps hub or switch.

4 For connection to a 10Base-T twisted pair Ethernet network, a network cable terminating in a male RJ-45 connector and connected to a 10Mbps hub or switch.

5 For **modem** operations: an analog telephone line, RJ-11 modular telephone cable (supplied), and if needed, an RJ-11 adapter for the local telephone system. Communications software is also required for modem and fax operations.

Do not connect to a digital telephone line or digital PABX system. In case of inadvertent connection to a digital line, special circuitry protects your modem.

Determine System Requirements

During installation of the PRO/100 LAN+Modem56 adapter hardware, d your operating system software should be loaded. If configured to do so, your system will detect the PRO/100 LAN+Modem56 adapter. For details on how to install driver software, see the chapter for your operating system environment.

The PRO/100 LAN+Modem56 adapter hardware is compatible with Types II and III PC Card slots that support CardBus technology. Installation and removal procedures may vary on different computers.

Installing the Hardware

Insert the PRO/100 LAN+Modem56 adapter

1 Grasp the CardBus adapter by the edges with the Intel label facing upward and the wide connector next to the CardBus slot.

2 Insert the card into a CardBus slot and push it in until firmly seated.

The CardBus adapter can only be used in CardBus-compliant PC Card slots.
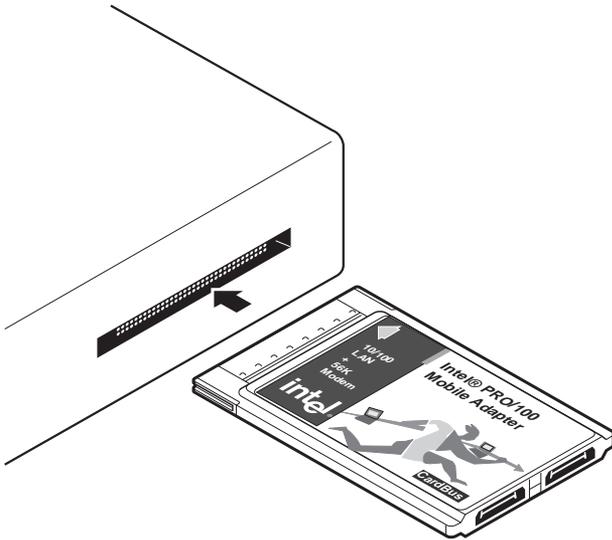
Inserting the CardBus into the Computer

Connecting the LAN Adapter Cable to the Card

- Attach the 16-pin connector at the end of the adapter cable to the matching receptacle on the **left side** of the PRO/100 LAN+Modem56 adapter. Press the connector gently into the receptacle on the card until it's firmly in place. Do not force the connection.
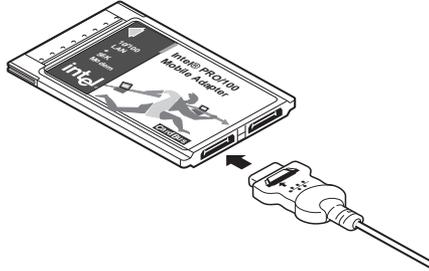
Connecting the LAN Adapter Cable to the CardBus Adapter

Disconnecting Adapter Cable from the Card

- Grasp the small connector with the thumb and forefinger and gently pull it free of the card.

Connecting the Network Cable to the LAN Adapter Cable

- Plug the network cable into the female RJ-45 connector, as shown in the figure.

Connecting to the Network Cable to LAN Adapter Cable

Connecting the Modem Cable to the Adapter

• Attach the 26-pin connector at the end of the Intel modem cable to the matching receptacle on the **right side** of the PRO/100 LAN+Modem56 adapter. Press the connector gently into the receptacle on the card until it's firmly in place. Do not force the connection.
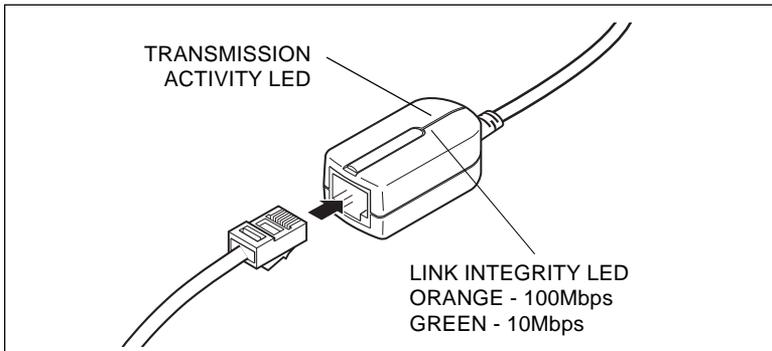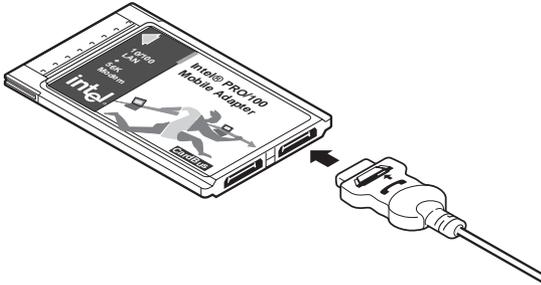

Attaching the Modem Cable to the CardBus Adapter

Disconnecting Modem Cable from the Adapter

• Grasp the small connector with the thumb and forefinger and gently pull it free of the card.

Connecting the Modem Cable to the Telephone Line

• Plug one end of the RJ-11 modular telephone cable into the RJ-11 receptacle on the modem cable, and the other end into an analog (single-line) RJ-11 telephone wall jack.

Connecting the Telephone Cable to the Modem Cable

The PRO/100 LAN+Modem56 adapter will not work with digital telephone lines or digital PBX systems. Special circuitry protects your modem against damage from inadvertent connection to a digital line.

TRANSMIT
RECEIVE

CARRIER
DETECT

TELEPHONE
CABLE

MODEM CABLE
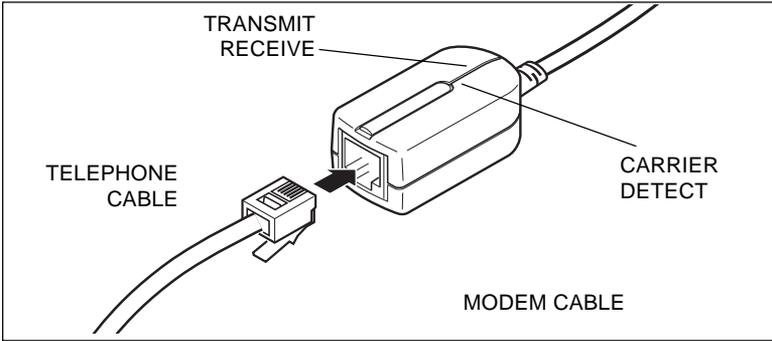
Windows 95 and 98 Installation

Plug and Play Installation

Plug and play installation of the PRO/100 LAN+Modem56 adapter is supported under Windows 95 OSR2 (version 950b or later) and Windows 98. Installation with these versions of Windows is described in this chapter.

> If you are using an earlier version of Windows 95 (versions 950 or 950a), see the README.TXT file on the Intel CD-ROM for installation information.

Drivers Available

The following drivers for Windows 95 OSR2 and Windows 98 are supplied with the PRO/100 LAN+Modem56 adapter:

- NDIS3 driver (M32A.SYS)
- NDIS4 driver (M32A4.SYS)

The NDIS3 driver M32A.SYS is installed by default using the procedures in this chapter. For NDIS4 instructions, see the README.TXT file on the Intel CD-ROM.

Software Installation for Windows 95 OSR2

Note: if your laptop computer does not have a CD-ROM drive, see "Making a Floppy Disk,"in Chapter 4.

1 With Windows running, insert the PRO/100 LAN+Modem56 adapter into the CardBus slot and connect cables as shown above.

2 Windows detects a PCI Ethernet controller and displays the Update Device Driver Wizard. In this procedure, the LAN driver will be installed first and then the modem driver. Insert the Intel CD-ROM

and click Next to start the procedure. (If the New Hardware Found window does NOT appear, proceed to step 8.)

3 Windows confirms the device name. Click Finish. This installs the LAN driver. Windows may prompt you for the location of Windows networking files. Usually these are located in C:\windows\options\cabs or on your Windows 95 installation disk. If prompted for the M32A.SYS file, change the path back to your Intel CD-ROM. If prompted to restart, click No.

4 Windows detects the modem portion of the adapter and repeats the process above for the modem component. If prompted for other files, try changing the path to the Intel CD-ROM.
Note: Windows may display a message indicating some VXD files are out of date. To determine if this affects operation of your computer, restart and check the modem. If it will not function, see the README.TXT file for detailed information.

5 For most networks, you will need to configure properties for your protocols, computer identification, and preferred servers. Contact your network administrator for details if you need assistance.

6 Restart the computer for the configuration to take effect.

7 When the computer restarts, the Country Identifier utility runs. Specify your location and Save or Exit.

8 If the New Hardware Found window does NOT appear, you may need to enable CardBus support in your computer BIOS. See your computer's manual for information or check their website.

Software Installation for Windows 98

Note: if your laptop computer does not have a CD-ROM drive, see "Making a Floppy Disk" in Chapter 4.

1 With Windows running, insert the PRO/100 LAN+Modem56 adapter into the CardBus slot and connect cables as shown above.

2 Windows detects a PCI Ethernet Controller and displays the Add New Hardware Wizard. Click Next to continue. In this procedure, the LAN driver will be installed first and then the modem driver. (If the New Hardware Found window does NOT appear, proceed to step 13.)

3 On the next screen, Windows prompts for a driver search. Choose "Search for the best driver (Recommended)" and click Next.

4 Insert the Intel CD-ROM or floppy disk and click Next to continue. If necessary, specify the path to your CD-ROM or floppy drive and click Next.

5 Windows confirms the device name and location of the LAN driver (NETM32A.INF). Click Next to continue. Windows may prompt you for the location of Windows networking files. Usually these are located in C:\windows\options\cabs or on your Windows 98 installation disk.

6 A message confirming successful LAN driver installation appears. Click Finish.

7 Do not restart your computer yet. When prompted to do so, click No.

8 Windows detects the modem portion of the adapter and repeats the process above for the modem (driver name is MDMM32A.INF). At the end of this process, a small dialog appears reminding you to restart. Click OK to close.

9 The Country Identifier utility also runs at this time. Specify your location and click Exit or Save.

10 If the New Hardware Found wizard is present, click Finish.

11 For most networks, you will need to configure properties for your protocols, computer identification, and preferred servers. Contact your network administrator for details if you need assistance.

12 Restart the computer to complete installation.

13 If the New Hardware Found window does NOT appear, you may need to enable CardBus support in your mobile computer's BIOS. See your computer's manual for information or check their web site.

Windows 95 and 98 Driver Parameters Reference

M32A.SYS (NDIS3) and M32AN4.SYS (NDIS4) Driver Settings

M32A.SYS is an NDIS3 driver. M32A4.SYS is an NDIS4 driver. Both conform to the Microsoft Network Driver Interface Specification (NDIS).

Required files for using M32A.SYS with Windows 95 and 98 include:

NETM32A.INF	Installation file for Windows 95 and 98
M32A.SYS	NDIS3 driver for Windows 95 and 98

There are user-configurable parameters to the M32A.SYS and M32A4.SYS drivers which can be modified using the Network Control Panel built into Windows 95 and 98. This applet queries the user for parameter selections and sets the corresponding parameters in the registry. User-configurable parameters are as follows (for descriptions see Chapter 4):

Parameter	Valid Values	Reg. Value
Adapter LEDs	OFF	0
	ON	1
Address Mode	IO	IO
	MEMORY	MEMORY
Cable Detect	OFF	0
	ON	1
Early Receive	OFF	0
	ON	1
Early Transmit	OFF	0
	ON	1
Line Mode	AutoDetect	0
	Half-Duplex	1
	Full-Duplex	2
Line Speed	AutoDetect	0
	10 Mbps	1
	100 Mbps	2
Link Integrity	OFF	0
	ON	1

Network Address	*See Network Administrators note below.*	
Receive Buffer Size	0-100	same
Transmit Buffer Size	0-100	same

For Network Administrators Only. The network node address can be modified by specifying a value for Network Address such as 00A0C9112233. If the user does NOT specify a Network Address, then the M32A.SYS driver uses the network node address contained in the PRO/100 LAN+Modem56 adapter Card Information Structure.

Troubleshooting Modem Installation

Review this section if any of the following problems occur:

- Modem initialization errors occur when attempting to dial-out using a communications application.

- Connection fails or other problems occur.

It may be necessary to define a modem type within your communications application. If the Intel modem is not listed, choose a "Generic Hayes compatible" device.

If your computer is equipped with an infrared communications port, you may need to disable this port. These ports often use COM port resources required for other communications devices. Disable the infrared port both in the computer's CMOS or BIOS setup program and the Windows 95 Device Manager, as follows:

1 Some computers use a hardware setup utility to configure the infrared port in the BIOS. See your computer documentation.

2 To disable the infrared communications port in Windows 95, go to Device Manager tab under System in the Control Panel.

3 Double-click the Ports (COM & LPT) entry and the IR Serial Port entry. Check the Disable in this Hardware Profile option to disable the device.

4 You may also need to comment out any "device=" lines containing TRANXIT in the SYSTEM.INI file. Use a semicolin at the beginning of the line to comment out the line.

Use the Modem Diagnostics Tool to verify the computer-to-modem interface.

1 In the Modems option in Control Panel, click Diagnostics.

2 In Diagnostics properties, highlight the COM port associated with the Intel modem and click the More Info button. This causes Windows 95 and 98 to send commands to and read responses from the modem and display information about the modem and its COM port. The Port Information box should display the following information:

  • The IRQ and I/O address of the modem's COM port. These should match the physical configuration of the port or modem adapter.
  • Modem responses to various AT commands. The Intel modem may return ERROR for some AT commands that are not supported. This does not indicate a failure.

3 The Record a Log File option in the Modems option can also help identify modem problems by recording modem commands and responses in a MODEMLOG.TXT file. To create the MODEMLOG.TXT file, go to Control Panel, Modems, Properties, Connection, Advanced. In the Advanced Connection Settings window, place a check mark in the Record a log file option box. A MODEMLOG.TXT file will be created in the C:\WINDOWS directory the next time the modem is used.

Windows NT Installation

The PRO/100 LAN+Modem56 adapter supports manual installation under Microsoft Windows NT 4.0. Plug and Play installation and hot swapping of CardBus adapters are not directly supported by Windows NT.

When the CardBus Adapter is installed, the other PC Card slot is available for use by another PC Card.

Drivers Available

The following drivers for Windows NT can be found on the Intel CD-ROM:

- OEMSETNT - Installation file
- M32A.SYS - NDIS3 driver
- M32A4.SYS - NDIS4 driver
- M32MENT4.SYS - modem enabler

For the latest information on CardBus support in Windows NT, review the **README.TXT** file on the Intel **CD-ROM** or visit the Intel support web site at support.intel.com.

Software Installation for Windows NT

1 Before powering-up your mobile computer, insert the PRO/100 LAN+Modem56 adapter into the CardBus slot, as shown on page 1.

2 With the adapter in the CardBus slot, power-up the computer, click Start, click Settings, and select the Control Panel. The Control Panel opens.

3 Double-click the Network icon. The Network Settings window opens.

4 Click the Adapters tab. The Network Adapters window opens.

5 Click Add. The Select Network Adapter window opens.

6   Click Have Disk, insert the Intel CD-ROM, and specify the correct path for the CD.

7   Click OK. The Select OEM Option window opens, showing the PRO/100 LAN+Modem56 adapter.

8   Click OK. The Windows NT Setup window briefly displays.

9   The Intel PRO/100 LAN+Modem56 Settings window opens, displaying the default settings.

Note: In most circumstances, the default settings will properly operate the adapter. However, some computers may require changes to the defaults.

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10   Click OK. The Network Settings window redisplays.

11   Click Close. Complete any relevant dialog boxes that appear such as TCP/IP settings. Contact your Network Administrator for help if necessary.

12   When the Network Settings Change window opens, click Yes to restart the computer.

Modem Setup

13   After the computer has been restarted, select Modems from the Control Panel.

14   At the Install New Modem screen make sure that the *Don't detect my modem; I will select it from a list* checkbox is NOT checked. Click Next. NT will query the COM ports looking for the Intel modem. Once the Intel modem is found, click Next. If a *Standard Modem* is found, click Change. On the next screen, click Have disk. Type in the path to your CD-ROM drive and click OK.

15   The Country Identifier utility automatically starts. Make the appropriate country selection (United States or Canada is the default).

16   At the Install New Modem screen click Finish.

17   At the Modems Properties screen click Dialing Properties to set up dialing properties (not necessary if a modem had been previously installed). Click Close.

Windows NT Driver Parameters

M32A.SYS and M32A4.SYS driver parameters can be modified using the Windows NT Network Control Panel. This applet uses the OEMSETNT.INF file to set the corresponding parameters in the registry.

For definitions of the keywords listed, see Keyword Reference in Chapter 4. Diagnostics and Troubleshooting.

Parameter	Valid Values	Registry Value
Cable Detect	OFF	0
	ON	1
Early Receive	OFF	0
	ON	1
Early Transmit	OFF	0
	ON	1
Interrupt	3 - 15	same
Interrupt Style	AutoDetect	0
	PCI IRQ	1
	ISA IRQ	2
I/O Port	0x1000-0xF800	same
LEDs Enabled	OFF	0
	ON	1
Line Mode	AutoDetect	0
	Half-Duplex	1
	Full-Duplex	2
Line Speed	AutoDetect	0
	10 Mbps	1
	100 Mbps	2
LinkIntegrity	OFF	0
	ON	1
Memory Address	0xC0000-B000C000	same
Memory Mode	OFF	0
	ON	1

PCCard Socket	AutoDetect	0
	1	1
	2	2
	3	3
	4	4
Rx Buffer Size	0-100	same
Tx Buffer Size	0-100	same

For Network Administrators Only. To modify the network node address manually, select Run, type regedit and press Return. Select HKEY_LOCAL_MACHINE, System, CurrentControlSet, Services, M32A. Click the Edit menu, select New, String Value. Rename the new value NetworkAddress (no spaces, case sensitive), press Enter. Double-click NetworkAddress and enter the 12 digit address (no spaces) in the data field and click OK.

Utilities, Diagnostics, and Trouble-shooting

This chapter contains supplementary diagnostics and troubleshooting information for the PRO/100 LAN+Modem56 adapter. For information specific to your operating environment, see the appropriate installation chapter. This supplementary information is intended for users or network administrators who are already familiar with the PRO/100 LAN+Modem56 adapter and its user documentation, and who have run into difficulties **after having completed the appropriate installation and troubleshooting procedures for their operating environment.**

> For additional troubleshooting information, see the Windows Help file **HELPDOCS.HLP** on the Intel CD-ROM.

Additional Sources of Information

Consult your computer and network documentation as needed. For the latest technical notes on the PRO/100 LAN+Modem56 adapter, see the **README.TXT** file on the Intel CD-ROM, or visit the Intel World Wide Web support site at **support.intel.com**.

See **Appendix A** in this User's Guide for Intel support services access information.

Making a Floppy Disk

If your laptop computer does not have a CD-ROM drive, you may create a floppy install disk from the CD-ROM on another computer. Follow these steps:

1   Insert the Intel CD-ROM disk into the CD-ROM drive.
2   Insert a blank, formatted floppy disk into the floppy drive.
3   Click Start and then click Run.

4   In the window that appears, type:

   d:\makedisk d: a: (where d: is your CD drive and a: is your floppy.)

5   Click OK to create the floppy disk. An MS-DOS window opens and
    the program executes, making the floppy.

LAN Diagnostics

If you have trouble installing or setting up the LAN portion of the PRO/
100 adapter, try running the LAN diagnostics utility. To run this utility,
insert the Intel CD-ROM, click Start, then Run, and type:

   M32ADIAG.EXE

and click OK. This starts the diagnostics utility. The utility can perform
several self-tests and provide useful data about the network connection.
For troubleshooting information, click the Support tab and then click the
Troubleshoot button.

Executing the Windows 95, 98, and NT Diagnostic Program

1   Verify that the PRO/100 LAN+Modem56 adapter has been installed
    and configured to work in your version of Windows.

2   Insert the Intel CD-ROM in your CD-ROM drive.

3   Select Start, Run, X:\M32ADIAG.EXW, where X is the drive letter for
    your CD-ROM. If you don't have a CD-ROM drive, see the section
    above on Making a Floppy Disk.

4   Navigate through the diagnostic program by clicking the appropriate
    tab. When finished, click OK to exit.

Troubleshooting Checklist

• Review the README.TXT file on the Intel CD-ROM.

• Be sure you have the current drivers for your adapter. Check the
  Intel support web site at **support.intel.com.**

• When loading drivers or running the test utility, keep the LAN
  adapter cable attached to the CardBus adapter.

- If trying to connect to a Novell server, try chaniging the frame type of the IPX/SPX protocol from "Auto" to the specific frame type used by the server.
- In a twisted pair environment, try plugging directly into the hub or concentrator.
- Plug in to a known working network connection.
- Try using the adapter on a different computer.
- Try another adapter if available.
- If your computer has multiple PC Card sockets, move the adapter to another socket.
- If you have more than one PC Card device in your computer, remove the non-Intel PC Card devices.
- Make sure that the interrupt, memory address, and I/O address for the Intel device do not conflict with other installed hardware (such as sound cards, CD-ROM drives and PEN devices). However, conflicts with the CardBus controllers and/or IRQ handler for PCI steering are normal and do not impact operation of the adapter
- Try using different interrupt locations (i.e., 5, 10, 11).
- Try using different port addresses (i.e., 280, 290, 310, 320).

Keyword Reference (All Drivers)

ADAPTER LEDS see NOLED.

ADDRESS MODE when set to IO disables requests for memory-mapped mode on systems that only support an I/O-driven card. The MEMORY setting provides increased performance on computers that allow simultaneous availability of memory and I/O resources.

CABLE DETECT turns the automatic cable detect feature on or off. When on, cable detect senses when there is no LAN cable attached to the card, and puts the adapter into a low-power mode. Normal power is restored when the cable is reattached.

DIRECT ENABLE (32-bit NDIS Drivers) forces the method used by the driver to determine if an Intel CardBus adapter is present. Valid parameters are AutoDetect, Off, and On. AutoDetect allows the driver to

determine if the CardBus bridge has already been set up by another enabler such as Socket and Card Services. If so, driver will use the current configuration. On forces the driver to enable the CardBus bridge without checking its current state.

EARLY RECEIVE see NOEARLYRX.

EARLY TRANSMIT see NOEARLYTX.

INT, INTERRUPT see IRQ.

INTERRUPT STYLE (For 32-bit NDIS Drivers only) forces the driver to use ISA IRQ routing or PCI IRQ routing. Some CardBus bridges have the capability of supporting both PCI and ISA style IRQ routing. Valid parameters are AutoDetect, PCI-IRQ, and ISA-IRQ.

IOADDRESS, IOBASEADDRESS specifies the base I/O address of the Intel adapter I/O ports, in hexadecimal notation. The Intel CardBus adapter requires 128 contiguous I/O addresses if run in I/O mode. If using memory-mapped I/O mode, no I/O ports are necessary. If not used, driver will detect an I/O port automatically.

I/O PORT see IOADDRESS

IRQ specifies a hardware interrupt for the adapter. If PCI interrupts are used on the CardBus bridge, this parameter is ignored (unless the ISAIRQ keyword is used as an override). If this parameter is not specified the driver will detect an IRQ automatically.

ISAIRQ use this keyword to force ISA IRQ routing. Some CardBus bridges have the capability of supporting both PCI and ISA style IRQ routing. The driver automatically determines the best choice for this option unless this keyword is used as an override.

LEDS ENABLED see NOLED.

LINE MODE (For 32-bit NDIS Drivers) selects either half-duplex or full-duplex mode for the network. Valid parameters are AutoDetect, Half Duplex, and Full-Duplex. Selecting full-duplex enables the PRO/100 LAN+Modem56 adapter to send and receive data simultaneously when connected to a full-duplex hub.

LINE SPEED (For 32-bit NDIS Drivers) forces operation to 10 or 100 Mbps. Valid parameters are AutoDetect, 10 Mbps, and 100 Mbps.

LINK INTEGRITY, LINK DISABLE disables link integrity for non-IEEE 10BASE-T networks such as StarLAN 10. Without this keyword in the driver command line, the driver defaults to link integrity ENABLED.

MEM, **MEMORY, MEMORY ADDRESS** specifies the host PC memory location for the Intel adapter in hexadecimal notation, when MODE MEMORY (memory-mapped I/O) is being used (see MODE). The memory block occupies 4 Kbytes of host memory.

MODE, MEMORY MODE when set to IO (Memory Mode OFF) disables request for memory-mapped mode on systems that only support an I/O –driven card. The MEMORY setting provides increased performance on computers that allow simultaneous availability of memory and I/O resources.

NETWORK ADDRESS allows user to override adapter's unique network node address by specifying a different node address.

NODEADDRESS *see* NETWORKADDRESS.

NOEARLYRX disables Advanced Look-ahead Pipelining features of the adapter. This keyword may be used to troubleshoot systems that have inexplicable network problems. Using this keyword may negatively impact performance.

NOEARLYTX disables early transmit capability of the Adapter. This keyword may be used to troubleshoot systems with inexplicable network problems. Keyword could negatively impact performance.

NOLED turns off LED indicators to conserve power.

PCCARD SOCKET (32-bit NDIS drivers) see SOCKET.

PCIIRQ forces the driver to use PCI IRQ routing. Some CardBus bridges have the capability of supporting both PCI and ISA style IRQ routing. The driver automatically determines the best choice for this option unless this keyword is used as an override.

RECEIVE BUFFER SIZE (RXBUFFERSIZE) sets size of the adapter receive packet buffer. This is a number in decimal in the range 1 - 30 for 16-bit drivers and 1 - 100 for the 32-bit ODI driver. Each packet adds approximately 1520 bytes to the resident size of the driver.

SOCKET (For 32-bit NDIS3 Driver M32A.SYS) identifies the number of the host computer's PC slot or socket into which the Intel CardBus adapter is inserted. Valid parameters are AutoDetect, 1, 2, 3, and 4. If a socket number is specified, only the specified socket is checked for the Intel adapter. Under AutoDetect, the driver will automatically check all slots for the Intel CardBus adapter.

TRANSMIT BUFFERS SIZE (TXBUFFERSIZE) sets the size of the adapter transmit packet buffer. This is the number of transmit packets in decimal in the range 1 - 10 for 16-bit drivers and 1 - 100 for the 32-bit ODI driver. Each packet adds approximately 1520 bytes to the resident size of the driver.

Appendix A

- Intel Automated Customer Support

- Specifications

- Limited Lifetime Hardware Warranty

- Regulatory Notices

- Software License Agreement

Intel Automated Customer Support

You can reach Intel's automated support services 24 hours a day, every day at no charge. The services contain the most up-to-date information about Intel products. You can access installation instructions, troubleshooting information, and general product information.

Readme files on Your Product Disk

Review the topics in the README.TXT file on the CD-ROM.

Web and Internet Sites

Support: http://support.intel.com

Network Products: http://www.intel.com/network

Corporate: http://www.intel.com

FTP Host: download.intel.com

FTP Directory: /support/etherexpress/

Customer Support Technicians

US and Canada: 1-916-377-7000 (7:00 - 17:00 M-F Pacific Time)

Worldwide access: Intel has technical support centers worldwide. Many of the centers are staffed by technicians who speak the local languages. For a list of all Intel support centers, the telephone numbers, and the times they are open, download document 9089 from one of the automated services.

Specifications

General Specifications

Model MBLA3256

Cable: 100Base-TX unshielded twisted pair for use on Category 5 (data grade) cabling; 10Base-T unshielded twisted pair (UTP)

Connector: RJ-45

Operating Distance: 328 ft (100 m)

Ethernet specifications

Ethernet IEEE 802.3 for 10 Mbps, 802.3u for 100 Mbps

Type II CardBus PC Card

10/100 Mbps full-duplex

Size: 3.37 in (86 mm) x 2.13 in (54.0 mm) x 0.20 in (5.0 mm) excluding adapter cable and network connection

Weight: 0.85 oz (24 g)

Power Requirements:

10Base-T	3.3V DC, 110 mA typical
100Base-TX	3.3V DC, 160 mA typical
Modem	3.3V DC, 240 mA typical (connected)
	3.3V DC, 40 mA typical (sleep mode)
100Base-T+Modem	3.3V DC, 280 mA typical
100Base-TX+Modem	3.3V DC, 340 mA typical

Power Management:

Supports ACPI and CardBus Power Management Specification

Temperature Range:

Operating:	32°F to 131°F (0°C to 55°C)
Storage:	-4°F to 149°F (-20°C to 65°C)

Humidity:	95% max. noncondensing
LEDs:	Link integrity, transmission activity
Certification:	FCC Part 15, Class B, CE Mark (EN 55022, Class B, EN50082)

Modem Specifications

Data modulation:	K56flex*/V.90 up to 56000 bps; V.34 from 33,600 down to 2400 bps; V.32terbo at 19200 and 16800 bps; V.32bis at 14400, 12000, 9600, and 7200 bps, uncoded at 4800 bps; V.32 at 9600 bps, uncoded at 4800 bps; V.23 at 1200/75 and 75/1200 bps; V.22bis at 2400 bps; V.22 at 1200 bps; Bell 212A at 1200 bps
Fax modulation:	V.17 at 14400, 12000, 9600, 7200, and 4800 bps; V.29 at 9600, 7200, and 4800 bps; V.27ter at 4800 and 2400 bps
Fax support:	Group 3, EIA/TIA Class 1
Error control:	V.42 Error Control, MNP Levels 2-4 Error Detection
Data compression:	V.42bis (4:1) or MNP Level 5 (2:1)
Diagnostics:	Power-up self tests of program RAM, data RAM, and nonvolatile memory.
Nonvolatile RAM:	1 user definable profile; 2 thirty-six digit telephone numbers; LAN Adapter ID and serial number
Command set:	Hayes and Microcom compatible AT commands
Data interface:	PCMCIA Release 2.1 compliant, 68-pin CardBus connector
Analog interface:	RJ-11C modular telephone connector
DTE speeds:	1200, 2400, 4800, 7200, 9600, 14400, 19200, 37400, 57600, and 115200 bps

Limited Lifetime Hardware Warranty

Intel warrants to the original owner that the adapter product delivered in this package will be free from defects in material and workmanship. This warranty does not cover the adapter product if it is damaged in the process of being installed or improperly used.

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF NONINFRINGEMENT OF INTELLECTUAL PROPERTY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE ARISING OUT OF ANY PROPOSAL, SPECIFICATION, OR SAMPLE.

This warranty does not cover replacement of adapter products damaged by abuse, accident, misuse, neglect, alteration, repair, disaster, improper installation, or improper testing. If the adapter product is found to be defective, Intel, at its option, will replace or repair the hardware product at no charge except as set forth below, or refund your purchase price provided that you deliver the adapter product along with a Return Material Authorization (RMA) number (see below), along with proof of purchase (if not registered), either to the dealer from whom you purchased it or to Intel with an explanation of any deficiency. If you ship the adapter product, you must assume the risk of damage or loss in transit. You must use the original container (or the equivalent) and pay the shipping charge.

Intel may replace or repair the adapter product with either new or reconditioned parts, and any adapter product, or part thereof replaced by Intel becomes Intel's property. Repaired or replaced adapter products will be returned to you at the same revision level as received or higher, at Intel's option. Intel reserves the right to replace discontinued adapter products with an equivalent current generation adapter product.

Returning a defective product

From North America:

Before returning any adapter product, contact Intel Customer Support and obtain a Return Material Authorization (RMA) number by calling +1 916-377-7000.

If the Customer Support Group verifies that the adapter product is defective, they will have the RMA department issue you an RMA number to place on the outer package of the adapter product. Intel cannot accept any product without an RMA number on the package.

All other locations:

Return the adapter product to the place of purchase for a refund or replacement.

Intel Adapter Money-back Guarantee (North America Only)

Intel wants you to be completely satisfied with the Intel adapter product that you have purchased. Any time within ninety (90) days of purchase, you may return your Intel adapter to the original place of purchase for a full refund of the purchase price from your dealer. Resellers and distributors, respectively, accepting returns and refunding money back to their customers may return Intel adapters to their original place of purchase. Intel guarantees that it will accept returns under this policy and refund the original purchase price to customers purchasing directly from Intel.

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Software: Software provided with the adapter product is not covered under the hardware warranty described above. See the applicable software license agreement which shipped with the adapter product for details on any software warranty.

FCC Compliance Statement

FCC Rules and Regulations - Part 15

This product has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Installed correctly, it probably will not interfere with radio or TV reception. However, we do not guarantee the absence of interference.

This product generates and uses energy of about the same frequency as radio and TV broadcasts. Installed incorrectly, it may interfere with reception of radio and TV broadcasts.

If you suspect this product is causing interference, turn your computer on and off while the radio or TV is showing interference. If the interference disappears when you turn the computer off and reappears when you turn the computer on, something in the computer is causing interference.

To reduce interference, try these suggestions:

- Change the direction of the radio or TV antenna.
- Move the computer, radio or TV. For example, if the computer is to the right of the TV, move it to the left of the TV. Or move them farther apart.
- Plug the computer into a different electrical outlet than the radio or TV.
- Ensure that all expansion slots (on the back or side of the computer) are covered. Also ensure that all metal retaining brackets are tightly attached to the computer.

NOTE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

If the device is changed or modified without permission from Intel, the user may void his or her authority to operate the equipment.

FCC Rules and Regulations - Part 68

This equipment complies with Part 68 of the FCC Rules. On the back of the Intel® PRO/100 LAN+Modem56 CardBus adapter is a label that contains, among other information, the FCC Registration Number and Ringer Equivalency Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all those devices ring when your telephone number is called. In most but not all areas, the sum of the RENs of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area.

If your telephone equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, please contact Intel Customer Support, at 916-377-7000 for information on obtaining service or repairs. The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

There are no user serviceable parts contained in this equipment.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Canadian compliance (Industry Canada)

When tested in at least one intended host:

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Canadian Department of Communications.

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Class B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadien des Communications.

NOTICE: The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by a user to this equipment, or equipment malfunctions, may give the telephone communications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection, that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

REN: See back of unit.

Manufacturer declaration

This certifies that Intel PRO/100 Mobile Adapters comply with the EU Directive 89/336/EEC, using the EMC standards EN55022 (Class B) and EN50082-1. This product also meets or exceeds EN60950 safety requirements.

This product has been tested and verified to meet CISPR 22 Class B requirements.

Intel Corporation
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