



# **IBM 10/100 EtherJet™ Mini-PCI Adapter with 56K Modem**

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## *User's Guide*

**OPTIONS**  
*by* **IBM**



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# Using the IBM 10/100 EtherJet Mini-PCI Adapter with 56K Modem

This book provides instructions for using the IBM 10/100 EtherJet Mini-PCI adapter with 56K modem (hereafter called Combo card in this manual). The Combo card has features for a LAN and for a modem.

The device drivers are as follows:

**For the LAN:** Intel® PRO/100+ Mini PCI

**For the modem:** Xircom MPCI+ Modem 56 WinGlobal

When you set up a modem or a network, select one of them in the Device Manager, Modem properties, or Network properties window.

To use these features, you need to install each driver in your computer after you install the Combo card. This book has sections on installing drivers and on troubleshooting. It also provides advanced information.

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## Using the LAN

After you install the Combo card in your computer, connect a Twisted Pair Ethernet (TPE) network cable to the Ethernet connector at the rear of the computer.

**Note:** You need to purchase the network cable.

Put the MAC address label on your computer. The other one can be used whatever it is needed—for example, by the system administrator.

**Notes:**

1. For 100BASE-TX, use Category 5 twisted-pair wiring cable. If you plan to run the adapter at 100 Mbps, it must be connected to a 100 BASE-TX hub or switch (not a 100 BASE-T4 hub).
2. For 10BASE-T, use Category 3, 4, or 5 twisted-pair wiring cable. If you want to use this adapter in a residential environment, you must use a Category 5 cable.

**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 transmission, the other for reception. Segment lengths are limited to 100 meters with 100BASE-TX for signal timing reasons. This complies with the EIA 568 wiring standard.

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## Installing the driver

The installation of the driver is specific to your operating system. Go to the appropriate section.

- “For Windows 95”
- “For Windows 98” on page 4
- “For Windows 2000” on page 5
- “For Windows NT” on page 5

### For Windows 95

Have your Windows 95 CD or diskettes available; you will need them during the installation. To install the driver, do as follows:

#### For Windows 95 OSR0 or OSR1

To install the driver, do as follows:

- 1 Start Windows 95.  
The “New Hardware Found” dialog box appears.
- 2 Click **Driver from disk provided by hardware manufacturer**.
- 3 Click **OK**.

- 4 Insert the drivers CD-ROM.
- 5 When you are prompted to specify the path that the device driver is in, type x:\ETHERNET, where x is the drive letter of the CD-ROM drive.
- 6 Click **OK**.
- 7 Follow the instructions on the screen.
- 8 When you are prompted to specify the path that the device driver is in, type x:\ETHERNET, where x is the drive letter of the CD-ROM drive.
- 9 Follow the instructions on the screen.
- 10 When you are prompted, restart your system.

#### Hints

If you can't connect to a server, or if Windows 95 reports an error after you double-click **Network Neighborhood**, do as follows:

- Make sure that you're using the drivers from the driver CD shipped with the Combo card.
- Make sure that the driver is loaded and the protocols are bound. Check the **Device Properties** list for trouble indicators (if there is trouble, an X or ! symbol appears beside the icon).
- Ask your LAN administrator whether you need to install additional networking software.

If the problem persists, go to "Troubleshooting" on page 7.

### For Windows 95 OSR2.1 or OSR2.5

Have your Windows 95 CD or diskettes available; you will need them during the installation. To install the driver, do as follows:

- 1 Start Windows 95.  
The "Update Device Driver Wizard" dialog box appears.
- 2 Insert the drivers CD-ROM.
- 3 Click **Next**.
- 4 Click **Other Location...**
- 5 Specify x:\ETHERNET, where x is the drive letter of the CD-ROM drive.
- 6 When the "Windows found the following update driver for this device: Intel(R) PRO/100+ MiniPCI" message appears, click **Finish**.
- 7 When you are prompted to specify the path that the device driver is in, type x:\ETHERNET, where x is the drive letter of the CD-ROM drive.
- 8 Click **OK**.
- 9 Follow the instructions on the screen.

**10** When you are prompted, restart your system.

**Hints**

If you can't connect to a server, or if Windows 95 reports an error after you double-click **Network Neighborhood**, do as follows:

- Make sure that you're using the drivers from the driver CD shipped with the Combo card.
- Make sure that the driver is loaded and the protocols are bound. Check the **Device Properties** list for trouble indicators (if there is trouble, an X or ! symbol appears beside the icon).
- Ask your LAN administrator whether you need to install additional networking software.

If the problem persists, go to "Troubleshooting" on page 7.

## For Windows 98

To install the driver, do as follows:

**1** Start Windows 98.

The "Add New Hardware Wizard" dialog box for the PCI Ethernet Controller appears.

**2** Click **Next**.

**3** Insert the drivers CD-ROM.

**4** Select **Search for the best driver for your driver**.

**5** Click **Next**.

**6** Select **Specify a location:** and specify x:\ETHERNET, where x is the drive letter of the CD-ROM drive.

**7** Click **Next**.

**8** Follow the instructions on the screen.

**9** When you are prompted to specify the path that the device driver is in, type x:\ETHERNET, where x is the drive letter of the CD-ROM drive.

**10** When you are prompted, restart your system.



**Hints**

If you can't connect to a server, or if Windows 98 reports an error after you double-click **Network Neighborhood**, do as follows:

- Make sure that you're using the drivers from the drivers CD-ROM shipped with the Combo card.
- Make sure that the driver is loaded and the protocols are bound. Check the Device Properties list for trouble indicators (if there is trouble, an X or ! symbol appears beside the icon).
- Ask your LAN administrator whether you need to install additional networking software.

If the problem persists, go to “Troubleshooting” on page 7.

**For Windows 2000**

To install the driver, do as follows:

- 1** Start Windows 2000.  
The “Found New Hardware Wizard” appears.
- 2** Click **Next**.
- 3** Select **Search for a suitable driver for my device (recommended)**, and click **Next**.
- 4** Select **Specify a location**, and click **Next**.
- 5** When prompted, insert the drivers CD-ROM.
- 6** Specify `x:\ETHERNET`, where x is the drive letter of the CD-ROM drive, and click **OK**.
- 7** Follow the instructions on the screen.
- 8** When you are prompted, restart your system.

**For Windows NT**

To install the driver, do as follows:

- 1** Start Windows NT.
- 2** Open **Control Panel**, and then **Network**.
- 3** If this is the first time to configure the Network, the message appears and saying “Windows NT Networking is not installed. Do you want to install it now?.” Click **Yes**. If not, go to step 12 on page 6.
- 4** Select “Wired to the network” and click **Next**.
- 5** Click **Select from list...** and **Have Disk...**
- 6** Insert the drivers CD-ROM.
- 7** Specify `x:\ETHERNET`, where x is the drive letter of the CD-ROM drive.

- 8** Click **OK**.
- 9** Follow the instructions on the screen. When you are prompted to point Windows NT files, specify C:\I386
- 10** When the adapter is listed in the “Network Adapter,” click **Close**.
- 11** When you are prompted, restart your system. You have installed the driver.
- 12** Click the **Adapters** tab.
- 13** Click **Add**.
- 14** Insert the drivers CD-ROM, and click **Have Disk...**
- 15** Specify x:\ETHERNET, where x is the drive letter of the CD-ROM drive, and click **OK**.
- 16** Click **OK**.
- 17** Click **Close** to finish.
- 18** When you are prompted, restart your system.

**Hint**

If Windows NT reports an error, or you can't connect to the network, do as follows:

- Make sure that you're using the drivers that are on the driver CD shipped with the Combo card.
- Make sure that the driver is loaded and the protocols are bound. Check the **Settings** in the **Control Panel**'s “Network/Bindings” dialog box.
- 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 or server software has been installed.
- Ask your LAN administrator whether you need to install supplemental networking software.

If the problem persists, go to “Troubleshooting” on page 7.

To install the Ethernet Power Management driver for Windows NT, do as follows:

- 1** Start Windows NT.
- 2** Open **Control Panel**, and then **Network**.
- 3** Click the **Protocols** tab, and click **Add...**
- 4** Insert the drivers CD-ROM, and click **Have Disk**.
- 5** Specify x:\ETHERNET\NPMINT40, and click **OK**.
- 6** Click **OK**.
- 7** Click **Close**.

8 When you are prompted, restart your system.

## Troubleshooting

Problem	Action
The Combo card can't connect to the Network.	<ul style="list-style-type: none"> <li>• Make sure that the cable is installed properly. The network cable must be securely attached to the Ethernet connector and hub. The maximum allowable distance from adapter to hub is 100 meters. If the problem persists though the cable is attached and the distance is within acceptable limits, try a different cable. If you're directly connecting two computers without a hub or a switch, use a crossover cable.</li> <li>• Make sure that you're using the correct drivers.</li> <li>• Make sure that you're using the drivers that come with the Combo card.</li> <li>• Make sure that the switch port and the adapter have the same duplex setting. If you configured the adapter for full duplex, make sure that the switch port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.</li> </ul>
The connection fails or errors occur.	<ul style="list-style-type: none"> <li>• At 100 Mbps, use Category 5 wiring and make sure that the network cable is securely attached.</li> <li>• At 100 Mbps, connect to a 100BASE-TX hub/switch (not 100BASE-T4).</li> <li>• Make sure that the duplex mode setting on the adapter matches the setting on the switch.</li> </ul>
The adapter stopped working without apparent cause.	<ul style="list-style-type: none"> <li>• The network driver files may be corrupt or missing. Remove the drivers and then reinstall them.</li> </ul>
The Wake on LAN (WOL) feature is not working.	<ul style="list-style-type: none"> <li>• Check the BIOS for its WOL setting.</li> <li>• Make sure that the network cable is fully attached to the adapter.</li> </ul>
Resuming normal operation from hibernation or suspend mode takes a long time.	<ul style="list-style-type: none"> <li>• This is not a problem. If you have not connect the network cable, the computer queries the Ethernet until the timeout timer is reached. Connect the network.</li> </ul>

## Advanced information

This section presents advanced information about tasks to be handled only by the system administrator.

### Push installation for Windows 95

You can set up a server-based push installation of Windows 95 as defined in the Microsoft Windows 95 Resource Kit. You'll need to follow additional steps for the Combo card. See the W9XPUSH.TXT readme file in the x:\ethernet\push directory in the drivers CD.

### Advanced adapter features

To access the advanced features of the adapter, do as follows:

- 1** In the Control Panel, double-click **Network**.
- 2** Select the adapter and click **Properties**.
- 3** Click the **Advanced** tab.

The Combo card has following advanced features:

- **802.1p/802.1Q Tagging**

IEEE 802.1p is a new IEEE standard for tagging packets— that is, assigning packets priorities. Each packet is tagged with four additional bytes, which increase its size and indicate its priority—from 0 (low) to 7 (high). This process is called priority packet tagging or traffic class expediting. It enables the adapter, working with the switches and routers in the network, to send packets with higher priorities first.

To use priority packet tagging, your network infrastructure—specifically, the routing devices that receive and transfer packets, and the adapters for those devices—must support 802.1 p/802.1Q tagging. Using the Priority Packet utility, set up the priority filter. Then set the 802.1p/802.1Q tagging option to **Enabled**.

If the priority filter is set up but the setting is **Disabled**, the tagged packets will still be processed by priority, if the Combo card uses a Intel 82558 or later Ethernet controller.

There are two requirements for using IEEE 802.1p tagging effectively:

- The other devices receiving and routing 802.1p tagged packets must support 802.1p.
- The adapters must support 802.1p.

- **ACPI Wake On LAN**

Enables or disables the Magic Packet service for Wake on LAN when used in Microsoft Windows 98 version 4.10.1998 without the Service Pack. If you are using a later version of Windows 98, or have Service Pack 1 or later installed, this option will be ignored and you will be using the ACPI Wake on LAN services.

**Note:** To determine your version of Windows 98: From the Windows 98 desktop, right-click on **My Computer** and choose **Properties**. The System Properties window appears; your Windows 98 version is listed under “System.”

- **Enable PME**

Use this setting to adjust the power management compatibility of the adapter. The default setting is **Disable**. To explicitly allow wake up with a Magic Packet from shutdown under APM power management mode, change the setting to **Enable**. To explicitly turn the 82559 LAN controller off in shutdown under ACPI power management mode, leave the setting at to **Disable**.

- **Adaptive Inter-Frame Spacing**

This is a performance setting that compensates for excessive Ethernet packet collisions on your network. For most computers and networks, the default setting works best, by dynamically adapting to the network traffic conditions. However, in some rare cases you may obtain better performance by setting the spacing manually. Setting a value forces a static gap between packets. Increasing the value increases the delay between frames being transmitted.

**Default:** 1

**Range:** 1 – 255

- **Adaptive Technology**

Recommended value, On

This parameter either enables or disables the Adaptive Technology performance enhancement feature. To enable the feature, click ON. To disable the feature, click OFF. To minimize CPU use for better system performance, leave this parameter ON.

- **Adaptive Transmit Threshold**

Recommended value: 16.

Specifies the number of bytes before the adapter empties its internal transmit FIFO onto the wire. The value is multiplied by 8 to produce the number of bytes. For example, if Transmit Threshold = 200, the number of bytes is 1600. Because this is greater than the maximum packet size for Ethernet, the adapter won't attempt early transmits. Although this is the safest setting, the best performance is achieved when the threshold parameter is as low as possible without producing underruns. To experiment, set the parameter to 16. Then, if performance drops significantly, increase the value in small increments.

- **Coalesce Buffers**

Recommended value: 8. Range: 1 – 32.

Specifies the number of memory buffers available to the driver in case the driver runs out of available Map Registers. This buffer area is also used when a packet consists of many fragments. If no coalesce buffers or map registers are available, the driver will be forced to queue the packet for later transmission. The most effective method of transmitting data, however, is to use map registers.

- **Link Speed & Duplex**

Recommended setting: Auto Detect (default).

This parameter lets the adapter know what speed to use on the Ethernet wire, and how to send and receive packets, either full or half duplex. The following options are available:

## Advanced information

- Auto Detect  
The adapter detects whether its environment can support a speed of 100Mbps, and uses that speed if possible, also it negotiates with the switch on whether to send and receive packets at full or half duplex.
  - 10Mbps/Half Duplex  
The adapter uses a speed of 10Mbps and performs one operation at a time. It either sends or receives.
  - 10Mbps/Full Duplex  
The adapter uses a speed of 10Mbps and sends and receives packets at the same time. This improves the performance of your adapter. Select this mode only if you have a full duplex switch.
  - 100Mbps/Half Duplex  
The adapter uses a speed of 100Mbps and performs one operation at a time. It either sends or receives.
  - 100Mbps/Full Duplex  
The adapter uses a speed of 100Mbps and sends and receives packets at the same time. This improves the performance of your adapter. Select this mode only if you have a full duplex switch.
- **Locally Administered Address (LAA)**  
You can optionally override the factory default network address of the adapter. To enter a new network address, type a 12-digit hexadecimal number in this box. The address entered should be in the range of 000000000000 ? FFFFFFFF. Exceptions: Do not use a multicast address (LSB of the high byte = 1). For example, in the address 0X123456789AB, X cannot be an odd number. A value of 000000000000 will default to the address set at the factory.
  - **PCI Bus Efficiency**  
When enabled, this option causes all transmit packets to be coalesced into a single buffer before being sent to the network card. Because the entire frame requires only one PCI transaction, the PCI bus is more efficient but transmit time is slightly longer. When the option is disabled, the packets are not coalesced, and each packet requires several PCI transactions. The PCI bus is less efficient, but transmit time is faster.
  - **Receive Buffers**  
Recommended value: 32. Range: 1 – 1024.  
Specifies how many buffers the driver is to use when copying data to the protocol memory. When the network load is high, increasing receive buffers can increase performance. The tradeoff is that this also increases the amount of system memory used by the driver. If too few receive buffers are used, performance will suffer. If too many are used, the driver will unnecessarily consume memory resources.

- **Transmit Control Blocks**

Recommended value: 16. Range: 1 – 80.

Specifies how many transmit control blocks the driver allocates for adapter use. This directly corresponds to how many outstanding packets the driver can have in its "send" queue. If too few transmit control blocks are used, performance will suffer. If too many transmit control blocks are used, the driver will unnecessarily consume memory resources. Transmit Control Blocks range: 1-80

- **Smart Power Down**

Recommended value: Enabled.

Designed for mobile computers, this feature helps extend battery life. When the feature is enabled, the adapter automatically removes power from the adapter when the LAN cable is disconnected from the adapter. Later, when the LAN cable is connected, power to the adapter is restored. If the feature is off, power is applied to the adapter at all times.

## Intel Priority Packet: An Overview

Priority Packet is a traffic-prioritization utility that enables you to set up filters to process high-priority traffic before normal traffic. Using Priority Packet, you can set up filters to give priority to critical applications or users.

### Prioritizing network traffic

To set up priority filters so that information from critical nodes or applications will be sent according to priority, use Intel's Priority Packet. When traffic is prioritized at the host or entry point of the network, network devices can base forwarding decisions on priority information defined in the packet.

Priority Packet prioritizes traffic on the basis of priority filters—parameters you assign to be applied to outgoing (transmit) packets. Using the Priority Filter Wizard, you can set up predefined or custom priority filters on the basis of node (MAC) address, Ethernet type, or various properties of the protocol and port. Priority Packet provides two methods for prioritizing traffic, IEEE\_802.1p tagging and Intel High Priority Queue. To use Priority Packet, you need to enable the IEEE\_802.1p Tagging and then install the Priority Packet.

To enable IEEE\_802.1p tagging on an adapter, do as follows:

- 1** In the Control Panel, double-click **Network**.
- 2** Select the adapter and click **Properties**.
- 3** Select the **Advanced** tab and enable IEEE\_802.1p tagging.

To install Priority Packet, run the setup program on the Drivers CD. It is at `x:\prtpkt\setup.exe`, where x is the drive letter of the CD-ROM drive.



**IEEE\_802.1p tagging increases the size of the packets it tags. Some hubs and switches won't recognize the larger packets and will drop them. Check the documentation for your hubs and switches to see whether they support 802.1p. If they don't or if you're not sure, you have two choices: (1) you can use High Priority Queue (HPQ) instead (see the next section) (2) you can configure the switch to strip the tags from the packets and send them on to the next destination as normal traffic.**

### Intel High Priority Queue

If your network infrastructure devices don't support IEEE\_802.1p, or if you're not sure, you can still define filters and send packets as high priority by assigning them to the High Priority Queue (HPQ). To do this, you use Priority Packet when you create or assign a filter. This method doesn't provide the precise priority levels of 802.1p tagging, but it does assign high or low priority to traffic and send packet with high priority first. Therefore, if there are multiple applications on a system sending packets, the packets from the application with a filter are sent out first. HPQ doesn't change network routing, nor does it add any information to the packets.

### Using Wake on LAN

The Wake on LAN (WOL) feature operates according to a published specification. In simple terms, the specification enables 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 predefined program.

### Virtual LAN

A Virtual LAN (VLAN) is a logical grouping of network devices put together as a LAN regardless of their physical grouping or collision domains.

If you use the VLAN, the following is required:

- Windows NT 4.0 with Service Pack 4.0 (or later) or Service Pack 3.0 and the NDIS driver hotfix from Microsoft.

When a VLAN is used, a user see and access only specified network segments. This improves network performance and improves network security. VLANs offer the ability to group users and stations together into logical work-groups. This can simplify network administration when clients are connecting to servers that are geographically dispersed across a building, a campus, or an enterprise network.

Typically, VLANs consist of co-workers within the same department but in different locations, groups of users running the same network protocol, or a cross-functional team working on a joint project. Joining workers with VLANs forms logical working groups. Normally, VLANs are configured at the switch and any computer can be a member of one VLAN per installed network adapter. The PRO/100 adapter supersedes this by communicating directly with a switch, so that up to 64 VLANs can be on a single adapter. To set up VLAN membership, your adapter must be attached to a switch that has VLAN capability.



## How to join a VLAN from Windows NT 4.0

To join a VLAN, do as follows:

**1** Create a VLAN on the switch. Use the parameters you assign there to join the VLAN from the server. For more information for your switch, see the documentation.

**2** Double-click **Network** in Control Panel.

**3** On the Adapters tab, select the adapter you want to be on a VLAN.

**4** Click **Properties**.

**5** In PROSet, click **Join VLAN**.

**6** Type the **VLAN ID** and the **VLAN Name**.

**Note:** The VLAN ID must match the VLAN ID on the switch. The Valid ID range is from 0–4095. The VLAN Name is for informational purposes only and doesn't have to match the name on the switch.

**7** Click **Join VLAN**.

**8** Repeat steps 3 to 6 for each VLAN you want the server to join. The VLANs you add are listed on the **Adapters** tab.

**9** Click **Close** and restart the computer.

## Boot agent

The Boot Agent is a utility program that is stored in a flash memory chip on the adapter, enabling the adapter to remotely boot the system from the network by either of two methods. The default method is PXE, a remote boot procedure defined by the “Wired for Management” specifications and used by powerful network management programs, such as Intel LANDesk Management suite. The alternative method is RPL, an established industry standard historically used for remote booting of diskless workstations from network operating systems such as NetWare and Windows NT Server.

When you power on the computer in Diagnostic POST Mode (by pressing the Esc key while the IBM ThinkPad logo screen is being displayed), the Boot Agent executes and displays the following message (version number may change);

To initialize the Intel Boot Agent Version 2.6,  
press Ctrl+S to enter into the Setup Program.

By default, this message displays for 2 seconds, and then the adapter attempts to boot the system from a local drive. If the attempt fails, the adapter attempts to boot the system remotely. To change the configuration of the Boot Agent, press Ctrl+S while this message is displayed. This opens the Boot Agent configuration screen.

There are seven configurable parameters. To select and change one of them, and save your changes, follow the on-screen instructions. They are as follows, with their options:

- **Boot Protocol**
  - PXE** (default): For Wired for Management compliant network management programs, such as Intel LANDesk Management Suite.
  - RPL**: For legacy-style remote booting.

## Advanced information

- **PnP/BEV Boot**  
**Enable** (default): For normal remote boot operation.  
**Disable**: To use the Intel Boot Agent boot sequence rather than the computer **BIOS**.
- **Default Boot**  
**Local** (default): The Boot Agent attempts first to boot from a local drive, and then, if that attempt fails, to boot from the network.  
**Network**: The Boot Agent attempts to boot from the network first.
- **Local Boot**  
**Enable** (default): The system boots from a local diskette drive or hard drive.  
**Disable**: The system cannot boot from a local drive, regardless of the setting for Default Boot.
- **Prompt Time**  
The selection are **2** (default), **3**, **5**, and **8**. Choose a number to specify how many seconds the message, “Initialization Intel Boot Agent Version 2.6—Press Ctrl+S to enter the Setup Program,” will be displayed when the system is booted.
- **Setup Message**  
**Enable** (default): The message, “Initializing Intel Boot Agent Version 2.6—Press Ctrl+S to enter the Setup program,” will be displayed when the system is booted in Diagnostic POST mode.  
**Disable**: Only the message, “Initializing Intel Boot Agent Version 2.6” will appear. However, you can still enter the setup program by entering Ctrl+S.
- **Power Management**  
**ACPI** (default):  
**APM**: Changing from the default setting to **APM** increases the power consumption of the computer in standby state.

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## Using the modem

After you install the Combo card in your computer, connect a modem cable to the modem connector at the rear of the computer.

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### Installing the modem driver

To install the modem driver, do as follows:

- 1** Start Windows.  
The “New Hardware Found” dialog or the “Update Device Driver Wizard” dialog appears.
- 2** Click **Cancel**.
- 3** Insert the IBM 10/100 EtherJet Mini-PCI Adapter with 56K Modem drivers CD-ROM.
- 4** Click **Start** and **Run**.
- 5** Type `x:\MODEM\setup.exe`  
where x is the drive letter of the CD-ROM drive.
- 6** Follow the instructions on the screen.
- 7** Restart the system.

As you configure your communication software, you will be prompted to select a modem. Select **Xircom MPCII Modem 56 WinGlobal**.

**Note:** When you reinstall the Mini PCI, reinstall the drivers, too.

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### Using the modem abroad

This section provides the information for using the modem outside of your country. For the list of the regions of support the use of the Combo card, see the online information on your computer.

#### Setting up the dialing properties

When you use the Combo card outside of the country where it was set up, reset the dialing properties, as follows:

- 1** Click **Start** and move the cursor to **Settings**; then click **Control Panel**.
- 2** Double-click **Modem**.
- 3** Double-click **Dialing Properties**.
- 4** In the **Country/Region** section, select the region where you are going to use the modem.

The regions where IBM supports the use of your modem are listed in the on-line manual. If you select a region not on that list, your modem might not work correctly.

## Troubleshooting

Problem	Action
<p>Your modem does not work properly after you install the driver.</p>	<p>Check the following:</p> <ul style="list-style-type: none"> <li>• The cable is connected to the modem card correctly.</li> <li>• You selected <b>Xircom MPCI+ Modem 56 WinGlobal</b> in the application setting.</li> <li>• You are using the driver that is on the drivers CD shipped with the Combo card.</li> <li>• For Windows 95, Windows 98, or Windows 2000, the trouble indicator (an X or ! symbol) appears on the modem icon in the "Device Manager."</li> <li>• For Windows NT 4.0, the Windows NT 4.0 Event Viewer shows an error message.</li> </ul> <p>If these items are OK, do the following:</p> <ol style="list-style-type: none"> <li>1. Click <b>Start</b>.</li> <li>2. Move the cursor to <b>Settings</b>, and click <b>Control Panel</b>.</li> <li>3. Double-click <b>Modem</b>.</li> <li>4. Click <b>Properties</b>.</li> <li>5. Click the <b>Connection</b> tab.</li> <li>6. Clear the <b>Wait for dial tone before dialing</b> check box.</li> <li>7. Click <b>Advanced</b>.</li> <li>8. Clear the <b>Use error control</b> check box.</li> <li>9. Select the <b>Use flow control</b> check box, and make sure that <b>Hardware (RTS/CTS)</b> is selected.</li> <li>10. Click the <b>OK</b> button to return to the <b>Modem Properties</b> window.</li> <li>11. Click <b>Dialing Properties</b>, and click either <b>Tone dialing</b> or <b>Pulse dialing</b>. Most telephones today use tone dialing.</li> <li>12. Close all the windows opened in this process.</li> </ol>

## Advanced information

### Command Set

- V.250
- TIA-602
- Identification: +GMI, +GMM, +GMR
- Port control: +IPR, +ICF, +IFC, +Ilrr
- Modulation: +MS, +MR, +MA
- Error control: +ES, +ER, +EB, +ESR, +ETBM
- Data compression: +DS, +DR
- V.251

### Modem AT Commands

Command	Description
+++	Escape sequence: Exit data mode and enter on-line command mode.
A/	Repeat last command: Repeat the preceding command. Note: Do not precede with AT or follow with Enter.
A	Answer command: Answer an incoming call.
Bn	Communication standard setting: Determines CCITT vs. Bell standard  <b>B0:</b> Selects ITU/CCITT V.22 mode @ 1200 bps. <b>B1:</b> Selects BELL 212A @ 1200 bps (defaults). <b>B2:</b> Unselects V23 reverse channel (same as B3). <b>B3:</b> Unselects V23 reverse channel (same as B2). <b>B15:</b> Selects ITU/CCITT V.21mode @ 300 bps. <b>B16:</b> Selects BELL 103J mode @ 300 bps.
Cn	Carrier control:  <b>C0:</b> Transmit carrier always off. <b>C1:</b> Normal transmit carrier switching.
Dn	Dial command: Dial a telephone number n (n=0-9, A-D, #, *) automatically. You can also assign the following:  <b>s=L:</b> Redials the last number dialed. <b>s=P:</b> Specifies pulse dial. <b>s=T:</b> Specifies tone dial (default). <b>s=W</b> Waits for a second dial tone. <b>s=,</b> Specifies pause. <b>s=@</b> Waits for 5 seconds of silence. <b>s=!</b> Specifies flash. <b>s=;</b> Returns to command mode after dialing. <b>s=\$</b> Detects bong tone.
DS=n	Dial command: Dial one of four telephone numbers (n=0-3) stored in the modem's nonvolatile memory.

## Advanced information

Command	Description
En	Echo command: <b>E0:</b> Disables echo to the computer. <b>E1:</b> Enables echo to the computer (default).
Fn	Online data character echo command: Determines whether the modem will echo data from the DTE. <b>F0:</b> Online data character echo enabled (NOT SUPPORTED). <b>F1:</b> Online data character echo disabled.
Hn	Hook control: Controls on-hook/off-hook. <b>H0:</b> Modem goes on-hook (default). <b>H1:</b> Modem goes off-hook.
I	Request ID information: Displays specific product information about the modem. <b>I0:</b> Specifies the firmware and device ID. <b>I1:</b> Specifies the checksum code. <b>I2:</b> Start the ROM test and verifies the checksum. <b>I3:</b> Specifies the firmware and device ID (same as I0). <b>I4:</b> Specifies the firmware version for data pump. <b>I5:</b> Specifies the code version, board ID, country ID, and subsystem vendor ID in hex. <b>I6-8:</b> Returns OK for compatibility. <b>I9:</b> Specifies country ID in English. <b>I11:</b> Displays connection information.
L	Monitor speaker volume: Sets speaker volume. <b>L0:</b> Selects low volume. <b>L1:</b> Selects low volume. <b>L2:</b> Selects medium volume (default). <b>L3:</b> Selects high volume.
M	Monitor speaker mode: Controls speaker mode. <b>M0:</b> The speaker is off. <b>M1:</b> The speaker is on until the modem detect the carrier signal (default). <b>M2:</b> The speaker is always on when modem is off-hook. <b>M3:</b> The speaker is on until the carrier is detected, except when dialing.
N	Modulation handshake: Controls whether the local modem performs a negotiated handshake. <b>N0:</b> Disables auto mode, with the modem handshake speed specified by S37. <b>N1:</b> Enables auto mode, with the modem handshake speed specified by S37 (default).
O	Return to on-line data mode: <b>O0:</b> Returns to data mode. <b>O1:</b> Starts an equalizer retain and return to data mode. <b>O3:</b> Starts a rate renegotiation and return to data mode.
P	Select pulse dialing.
Q	Result code control: Turns result code on or off. <b>Q0:</b> Enables result codes (default). <b>Q1:</b> Disables result codes.

Command	Description																																				
Sn	Control S register: <b>Sn?</b> : Read the S register n?, where n=0-110. <b>Sn=r</b> : Set the S register n to value r (n=0-110, r=0-255).																																				
T	Select tone dialing.																																				
V	DCE response format: Control the result code format. <b>V0</b> : Displays result code as digits. <b>V1</b> : Displays result code as text (default).																																				
W	Result code option: <b>W0</b> : CONNECT result code reports DTE receive speed. Disable protocol result codes. <b>W1</b> : CONNECT result code reports DTE receive speed. Enable protocol result codes. <b>W2</b> : CONNECT result code reports DCE receive speed. Enable protocol result codes (defaults).																																				
X	Result code selection and call progress monitoring: Control the tone detection option used in the dialing process.  <table border="1"> <thead> <tr> <th></th> <th>Ext. Result Code</th> <th>Dial Tone Detect</th> <th>Busy Tone Detect</th> </tr> </thead> <tbody> <tr> <td>X0</td> <td>Disable</td> <td>Disable</td> <td>Disable</td> </tr> <tr> <td>X1</td> <td>Enable</td> <td>Disable</td> <td>Disable</td> </tr> <tr> <td>X2</td> <td>Enable</td> <td>Enable</td> <td>Disable</td> </tr> <tr> <td>X3</td> <td>Enable</td> <td>Disable</td> <td>Enable</td> </tr> <tr> <td>X4</td> <td>Enable</td> <td>Enable</td> <td>Enable (default)</td> </tr> <tr> <td>X5</td> <td>Enable</td> <td>Enable</td> <td>Enable</td> </tr> <tr> <td>X6</td> <td>Enable</td> <td>Enable</td> <td>Enable</td> </tr> <tr> <td>X7</td> <td>Disable</td> <td>Enable</td> <td>Enable</td> </tr> </tbody> </table>		Ext. Result Code	Dial Tone Detect	Busy Tone Detect	X0	Disable	Disable	Disable	X1	Enable	Disable	Disable	X2	Enable	Enable	Disable	X3	Enable	Disable	Enable	X4	Enable	Enable	Enable (default)	X5	Enable	Enable	Enable	X6	Enable	Enable	Enable	X7	Disable	Enable	Enable
	Ext. Result Code	Dial Tone Detect	Busy Tone Detect																																		
X0	Disable	Disable	Disable																																		
X1	Enable	Disable	Disable																																		
X2	Enable	Enable	Disable																																		
X3	Enable	Disable	Enable																																		
X4	Enable	Enable	Enable (default)																																		
X5	Enable	Enable	Enable																																		
X6	Enable	Enable	Enable																																		
X7	Disable	Enable	Enable																																		
Y	Long-space disconnect: Long space disconnect is always disabled. <b>Y0</b> : Disable long space disconnect (default). <b>Y1</b> : Enable long space disconnect (NOT SUPPORTED).																																				
Z	Reset and recall stored profile.																																				
&B	V.32 auto retrain: This modem always auto retrains. <b>&amp;B0</b> : Disable V.32 auto retrain (NOT SUPPORTED). <b>&amp;B1</b> : Enable V.32 auto retrain (default).																																				
&C	Data carrier detect (DCD) control: <b>&amp;C0</b> : Specifies that carrier detect (CD) is always on. <b>&amp;C1</b> : Turns on CD when the remote carrier is present (default).																																				
&D	Data terminal ready (DTR): <b>&amp;D0</b> : Ignores the DTR signal. <b>&amp;D1</b> : Return the modem to command mode after a DTR toggle. <b>&amp;D2</b> : Hangs up the modem and returns to command mode after a DTR toggle (default). <b>&amp;D3</b> : Resets the modem after a DTR toggle.																																				
&F	Local factory settings: Loads the factory default configuration.																																				
&G	V.22bis guard tone control: Determines which guard tone to transmit while transmitting in the high band. <b>&amp;G0</b> : Disable the guard tone (default). <b>&amp;G1</b> : Enables a 550-Hz guard tone. <b>&amp;G2</b> : Enables a 1800-Hz guard tone.																																				

## Advanced information

Command	Description
&J	Auxiliary relay option: <b>&amp;J0:</b> The auxiliary relay is never closed (default). <b>&amp;J1:</b> NOT SUPPORTED.
&K	Local flow control selection: <b>&amp;K0:</b> Disables flow control. <b>&amp;K1:</b> Reserved. <b>&amp;K2:</b> Reserved. <b>&amp;K3:</b> Enable RTS/CTS (hardware) flow control (default). <b>&amp;K4:</b> Enable XON/XOFF flow control.
&M	Asynchronous communications mode: <b>&amp;M0:</b> Asynchronous mode (default). <b>&amp;M1:</b> Reserved. <b>&amp;M2:</b> Reserved. <b>&amp;M3:</b> Reserved. <b>&amp;M4:</b> Reserved.
&Pn	Pulse dial make-to-break ratio selection: This command is effective only for Japan. <b>&amp;P0:</b> 39/61 make/break ratio, 10PPS. <b>&amp;P1:</b> 33/67 make/break ratio, 10PPS (default). <b>&amp;P2:</b> 33/67 make/break ratio, 20PPS.
&Q	Asynchronous communications mode. <b>&amp;Q0:</b> Asynchronous mode, buffered. Same as \N0. <b>&amp;Q5:</b> Error control mode, buffered (default). Same as \N3. <b>&amp;Q6:</b> Asynchronous mode, buffered. Same as \No. <b>&amp;Q8:</b> MNP error control mode. If an MNP error control protocol is not established, the modem will fall back according to the current user setting in S36. <b>&amp;Q9:</b> V.42 or MNP error control mode. If neither error control protocol is established, the modem will fall back according to the current user setting in S36.
&S	Data set ready (DSR) option: This command selects DSR action. <b>&amp;S0:</b> DSR always ON (default). <b>&amp;S1:</b> DSR comes on when a connection is established, and goes off when the connection ends.
&T	Self-test commands: Perform diagnostic tests on the modem. <b>&amp;T0:</b> Abort. Stops any test in progress. <b>&amp;T1:</b> Local analog loop. <b>&amp;T3:</b> Local digital loopback test. <b>&amp;T6:</b> Remote digital loopback test.
&V	View the active configuration: This command is used to display the active profiles.
&W	Store current configuration: Store certain command options and S-register value except S3, S4, S5.
&Y	Select stored profile for hard reset: For compatibility with applications that issue the &Y0 command. <b>&amp;Y0:</b> Select stored profile 0 on power-up. <b>&amp;Y1:</b> ERROR.
&Z	Store telephone number: Store up to 4 dialing strings.



Command	Description
\A	Select maximum MNP block size: <b>\A0:</b> 64 characters. <b>\A1:</b> 128 characters. <b>\A2:</b> 192 characters. <b>\A3:</b> 256 characters.
\B	Transmit break to remote: <b>\Bn:</b> Break length in 100ms units (n=1-9, default: 3).
\G	Modem port flow control: <b>\G0:</b> Modem process XON/XOFF flow control characters locally (default). <b>\G1:</b> Modem process XON/XOFF flow control characters.
\J	Adjust bits rate control: <b>\J0:</b> Buffer mode. Error control selected by \Nn command (default). <b>\J1:</b> Force the max DCE rate to the DTE rate.
\K	Send break control: <ul style="list-style-type: none"> <li>• When the modem, operating in data transfer mode, receives a break from the DTE.               <ul style="list-style-type: none"> <li><b>\K0:</b> Enter on-line command mode: do not send break to the remote modem.</li> <li><b>\K1:</b> Clear data buffers and send break to remote modem.</li> <li><b>\K2:</b> Same as 0.</li> <li><b>\K3:</b> Send break to remote modem immediately.</li> <li><b>\K4:</b> Same as 0.</li> <li><b>\K5:</b> Send break to remote modem in sequence with transmitted data (default).</li> </ul> </li> <li>• When the modem is in the on-line command state during a data connection, and the \B is received in order to send a break to the remote modem.               <ul style="list-style-type: none"> <li><b>\K0:</b> Clear data buffers and send break to remote modem.</li> <li><b>\K1:</b> Clear data buffers and send break to remote modem (same as 0).</li> <li><b>\K2:</b> Send break to remote modem immediately.</li> <li><b>\K3:</b> Send break to remote modem immediately (same as 2).</li> <li><b>\K4:</b> Send break to remote modem in sequence with data.</li> <li><b>\K5:</b> Send break to remote modem in sequence with data. (same as 4) (default)</li> </ul> </li> <li>• When there a break is received from a remote modem during a connection.               <ul style="list-style-type: none"> <li><b>\K0:</b> Clear data buffers and send break to the DTE.</li> <li><b>\K1:</b> Clear data buffers and send break to the DTE (same as 0).</li> <li><b>\K2:</b> Send break to remote modem immediately.</li> <li><b>\K3:</b> Send break to remote modem immediately (same as 1).</li> <li><b>\K4:</b> Send break in sequence with received data to DTE.</li> <li><b>\K5:</b> Send break in sequence with received data to DTE (same as 4) (default).</li> </ul> </li> </ul>
\N	Error control mode selection: <b>\N0:</b> Buffer mode. No error control (same as &Q6). <b>\N1:</b> Direct mode. <b>\N2:</b> MNP or disconnect mode. <b>\N3:</b> V.42, MNP or buffer (default). <b>\N4:</b> V.42 or disconnect. <b>\N5:</b> V.42, MNP or buffer (same as \N3). <b>\N7:</b> V.42, MNP or buffer (same as \N3).

## Advanced information

Command	Description
\Q	Local flow control selection: \Q0: Disable flow control. Same as &K0. \Q1: XON/XOFF software control. Same as &K4. \Q2: CTS-only flow control. This is not supported and the response is ERROR. \Q3: RTS/CTS to DTE (default). Same as &K3.
\R	Ring indicator off after answer: \R0: Ring indicator signal if off after the telephone call is answered.
\T	Inactivity timer: \T0: Inactivity timer disabled (default). \Tn: Inactivity timer, n minutes (n=1-255).
\V	Protocol result code: \V0: Disable protocol result code appended to DCE speed. \V1: Enable protocol result code appended to DCE speed (default). \V2: Same as \V1.
\X	XON/XOFF pass through: \X0: Modem process XON/XOFF flow control characters locally (default). \X1: Modem passes XON/XOFF flow control characters.
%B	View numbers in blacklist: Displays the numbers for which the last call attempted in the passed two hours failed.
%C	Data compression control: %C0: V.42bis/MNP5 disabled. No data compression. %C1: V.42bis/MNP5 enabled. Data compression enabled (default).
%E	Automatic rate change: %E0: Disable fallback or fall forward. %E1: Enable fallback, disable fall forward. %E2: Enable fallback or fall forward (default).
-C	Data calling tone: -C0: Disabled (default). -C1: Enabled
-V90	Enable/disable V.90 setting: -V90=0: Disables V.90. -V90=1: Enables V.90 auto rate (default). -V90=n: Controls the downstream rate (2-23). -V90=? : Shows the range of n. -V90?: Shows the current value.

## Modem S Registers

Register	Function	Register/Units
S0	Auto Answer Ring Number	0-255 rings
S1	Ring Counter	0-255 rings
S2	AT Escape Character (user-defined)	0-127 ASCII

Register	Function	Register/Units
S3	Command Line Termination Character (user-defined)	0-127 ASCII
S4	Response Formatting Character (user-defined)	0-127 ASCII
S5	Command Line Editing Character (user-defined)	0-127 ASCII
S6	Wait Before Dialing	2-65 seconds
S7	Connection Completion Time-Out	1-255 seconds
S8	Comma Dial Modifier Time	0-65 seconds
S10	Automatic Disconnect Delay	1-254/10ths of a second
S11	DTMF Dialing Speed	50-150 ms
S12	Escape Guard Time	0-255/50ths of a second
S14	General Bit Mapped Options Status	<p>Only bit 2 and bit 6 are used.</p> <p>Bit 3: Result codes (Vn)</p> <ul style="list-style-type: none"> <li>• 0=Numeric(V0)</li> <li>• 1=Verbose(V1)</li> </ul> <p>Bit 6: Pulse dial PPS selection (&amp;Pn)</p> <ul style="list-style-type: none"> <li>• 0=10 PPS (&amp;p0, &amp;p1)</li> <li>• 1=20 PPS (&amp;p2)</li> </ul>
S21	V.24/General Bit Mapped Options Status	<p>Only bits 3, 4, and 5 are used.</p> <p>Bits 3-4: DTR behavior (&amp;Dn)</p> <ul style="list-style-type: none"> <li>• 0=&amp;D0 selected</li> <li>• 1=&amp;D1 selected</li> <li>• 2=&amp;D2 selected</li> <li>• 3=&amp;D3 selected</li> </ul> <p>Bit 5: DCD behavior (&amp;Cn)</p> <ul style="list-style-type: none"> <li>• 0=&amp;C0 selected</li> <li>• 1=&amp;C1 selected</li> </ul>
S22	Results Bit Mapped Options Status	<p>Only bits 4, 5, and 6 are used.</p> <p>Bits 4-5: result codes (Xn)</p> <ul style="list-style-type: none"> <li>• 0=X0 selected</li> <li>• 4=X4 selected</li> <li>• 5=X5 selected</li> <li>• 6=X6 selected</li> <li>• 7=X7 selected</li> </ul>
S24	Timer to Control Sleep Mode	0, 5-65 seconds
S28	V.34 Modulation Enable/Disable	<ul style="list-style-type: none"> <li>• 0=Disabled</li> <li>• 1=Enabled</li> </ul>
S30	Inactivity Timer	0-255 minutes
S32	Synthetic Ring Volume	0-255
S33	Synthetic Ring Frequency	0-5

## Advanced information

Register	Function	Register/Units
S35	Data Calling Tone <ul style="list-style-type: none"> <li>• 0=Disabled</li> <li>• 1=Enabled</li> </ul>	
S36	Negotiation Fallback	See S48
S37	Dial Line Rate	<ul style="list-style-type: none"> <li>• 0=Auto Rate</li> <li>• 1=reserved</li> <li>• 2=1200/75 bit/s (V.23)</li> <li>• 3=300 bit/s</li> <li>• 4=reserved</li> <li>• 5=1200 bit/s</li> <li>• 6=2400 bit/s</li> <li>• 7=4800 bit/s</li> <li>• 8=7200 bit/s</li> <li>• 9=9600 bit/s</li> <li>• 10=12000 bit/s</li> <li>• 11=14400 bit/s</li> <li>• 12=16800 bit/s</li> <li>• 13=19200 bit/s</li> <li>• 14=21600 bit/s</li> <li>• 15=24000 bit/s</li> <li>• 16=26400 bit/s</li> <li>• 17=28800 bit/s</li> <li>• 18=31200 bit/s</li> <li>• 19=33600 bit/s</li> </ul>
S38	K56flex Downstream Rate	<ul style="list-style-type: none"> <li>• 0=Disable K56flex</li> <li>• 1=Automatic rate selection</li> <li>• 2=32 kbit/s</li> <li>• 3=34 kbit/s</li> <li>• 4=36 kbit/s</li> <li>• 5=38 kbit/s</li> <li>• 6=40 kbit/s</li> <li>• 7=42 kbit/s</li> <li>• 8=44 kbit/s</li> <li>• 9=46 kbit/s</li> <li>• 10=48 kbit/s</li> <li>• 11=50 kbit/s</li> <li>• 12=52 kbit/s</li> <li>• 13=54 kbit/s</li> <li>• 14=56 kbit/s</li> </ul>
S42	Auto Rate	<p>This command is used for testing and debugging only.</p> <ul style="list-style-type: none"> <li>• 0=Disabled</li> <li>• 1=Enabled</li> </ul>
S43	Auto Mode	<p>This command is used for testing and debugging only.</p> <ul style="list-style-type: none"> <li>• 0=Disabled</li> <li>• 1=Enabled</li> </ul>

Register	Function	Register/Units
S48	LAPM Error Control and Feature Negotiation	<ul style="list-style-type: none"> <li>• 7=Enabled</li> <li>• 128=Disabled</li> <li>• S48=7</li> <li>• S48=128</li> <li>• S36=0, 2: LAPM or hangup; do not use</li> <li>• S36=1, 3: LAPM or async</li> <li>• S36=4, 6: LAPM, MNP, hangup MNP, or hangup</li> <li>• S36=5, 7: LAPM, MN,P async MNP, or async</li> </ul>
S89	Timer to Control Sleep Mode	0, 5-65 seconds
S90	Read-only Local Phone	<ul style="list-style-type: none"> <li>• 0=on-hook</li> <li>• 1=off-hook</li> </ul>
S91	Line Transmit Level	6-15 dB
S108	Network Codec Type	<ul style="list-style-type: none"> <li>• 22=<math>\mu</math>-Law</li> <li>• 33=A-Law</li> <li>• 7=V.8 information. Or choose on the basis of its country ID.</li> </ul>

## Modem Messages

Result Code	Numeric	Description
OK	0	Command executed
CONNECT	1	Modem connected to line
RING	2	A ring signal has been detected
NO CARRIER	3	Modem lost carrier signal, or does not detect carrier signal, or does not detect answer tone
ERROR	4	Invalid command
CONNECT 1200EC	5	Connection at 1200 bit/s
NO DIALTONE	6	No dial tone detected
BUSY	7	Busy signal detected
NO ANSWER	8	Remote end never answered
CONNECT 2400 EC	10	Connection at 2400 bit/s
CONNECT 4800 EC	11	Connection at 4800 bit/s
CONNECT 9600 EC	12	Connection at 9600 bit/s
CONNECT 14400 EC	13	Connection at 14400 bit/s
CONNECT 19200 EC	14	Connection at 19200 bit/s

## Advanced information

Result Code	Numeric	Description
CONNECT 7200 EC	24	Connection at 7200 bit/s
CONNECT 12000 EC	25	Connection at 12000 bit/s
CONNECT 16800 EC	86	Connection at 16800 bit/s
CONNECT 300 EC	40	Connection at 300 bit/s
CONNECT 21600 EC	55	Connection at 21600 bit/s
CONNECT 24000 EC	56	Connection at 24000 bit/s
CONNECT 26400 EC	57	Connection at 26400 bit/s
CONNECT 28800 EC	58	Connection at 28800 bit/s
CONNECT 31200 EC	59	Connection at 31200 bit/s
CONNECT 33600 EC	60	Connection at 33600 bit/s
CONNECT 38400 EC	28	Connection at 38400 bit/s (DTE rate)
CONNECT 57600 EC	18	Connection at 57600 bit/s (DTE rate)
CONNECT 115200 EC	87	Connection at 115200 bit/s (DTE rate)
DELAYED	88	Delay is in effect for the dialed number
BLACKLISTED	89	Dialed number is blacklisted
BLACKLIST FULL	90	Blacklist is full
CONNECT 32000 EC	70	Connection at 32000 bit/s (K56flex mode or V.90)
CONNECT 34000 EC	71	Connection at 34000 bit/s (K56flex mode)
CONNECT 36000 EC	72	Connection at 36000 bit/s (K56flex mode or V.90)
CONNECT 38000 EC	73	Connection at 38000 bit/s (K56flex mode)
CONNECT 40000 EC	74	Connection at 40000 bit/s (K56flex mode or V.90)
CONNECT 42000 EC	75	Connection at 42000 bit/s (K56flex mode)
CONNECT 44000 EC	76	Connection at 44000 bit/s (K56flex mode or V.90)
CONNECT 46000 EC	77	Connection at 46000 bit/s (K56flex mode)
CONNECT 48000 EC	78	Connection at 48000 bit/s (K56flex mode or V.90)
CONNECT 50000 EC	79	Connection at 50000 bit/s (K56flex mode)
CONNECT 52000 EC	80	Connection at 52000 bit/s (K56flex mode or V.90)
CONNECT 54000 EC	81	Connection at 54000 bit/s (K56flex mode)
CONNECT 56000 EC	82	Connection at 56000 bit/s (K56flex mode or V.90)
CONNECT 28000 EC	100	Connection at 28000 bit/s (V.90 mode)
CONNECT 29333 EC	101	Connection at 29333 bit/s (V.90 mode)
CONNECT 30666 EC	102	Connection at 30666 bit/s (V.90 mode)
CONNECT 33333 EC	103	Connection at 33333 bit/s (V.90 mode)
CONNECT 34666 EC	104	Connection at 34666 bit/s (V.90 mode)

<b>Result Code</b>	<b>Numeric</b>	<b>Description</b>
CONNECT 37333 EC	105	Connection at 37333 bit/s (V.90 mode)
CONNECT 38666 EC	106	Connection at 38666 bit/s (V.90 mode)
CONNECT 41333 EC	107	Connection at 41333 bit/s (V.90 mode)
CONNECT 42666 EC	108	Connection at 42666 bit/s (V.90 mode)
CONNECT 45333 EC	109	Connection at 45333 bit/s (V.90 mode)
CONNECT 46666 EC	110	Connection at 46666 bit/s (V.90 mode)
CONNECT 49333 EC	111	Connection at 49333 bit/s (V.90 mode)
CONNECT 50666 EC	112	Connection at 50666 bit/s (V.90 mode)
CONNECT 53333 EC	113	Connection at 53333 bit/s (V.90 mode)
CONNECT 54666 EC	114	Connection at 54666 bit/s (V.90 mode)

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## Appendix A. Regulatory Agency Notices

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### FCC Regulations - Part 15

#### Declaration of Conformity (DoC)

Xircom, Inc. declares that the equipment described in this document is within the requirements of the Code of Federal Regulations listed below: Title 47 Part 15, Subpart B, Class B for a digital device. This declaration is based upon compliance of the Xircom Mini PCI Global Modem 56 model MPC13A-56G to the above standards. Xircom has determined that model MPC13A-56G has been shown to comply with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. These units are identical to the units tested and found acceptable with the applicable standards. Records maintained by Xircom continue to reflect that units being produced under this Declaration of Conformity, within the variation that can be expected due to quantity production and tested on a statistical basis, continue to comply with the applicable technical standards.

Authorized Signature:

R.W. Bass  
Vice President, Operations  
Xircom, Inc.  
2300 Corporate Center Drive  
Thousand Oaks, California 91320  
U.S.A.

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### FCC Rules and Regulations - Part 15

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. The Xircom Mini PCI Global Modem 56 complies with the FCC Rules for a Class B digital device. As required by FCC Rules and Regulations, the following Class B information is provided for the guidance of the user.



**Warning:** This equipment has been tested and found to comply with the limits for Class B digital devices pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. Changes or modifications to the digital device not expressly approved by Xircom Inc. could void the user's authority to operate the equipment.

It is suggested that only shielded and grounded cables be used with the equipment to ensure compliance with FCC rules.

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## FCC Regulations - Part 68

To comply with the Federal Communications Commission (FCC) Rules and Regulations, Part 68, these instructions must be followed:

1. Your modem must not be connected to a party line or coin-operated telephone.
2. If a problem occurs on the telephone line, your modem must be disconnected from the telephone line until it has been determined that your modem is not the cause of the problem.
3. All repairs to your modem must be made by Xircom, Inc. Unauthorized or unorthodox repair methods can alter the modem's radio frequency emissions and other characteristics sufficiently to void your authority to operate the modem over a public telephone network.
4. If requested, you must be prepared to provide the telephone company with the following information:

**Equipment Manufacturer:** Xircom, Inc.  
2300 Corporate Center Drive  
Thousand Oaks, CA 91320-1420 U.S.A.

**Model:** MPC13A56G-100

**FCC Registration Number:** See the unit labeling.

**Ringer Equivalency Number:**  
1.0 (B)

This equipment complies with Part 68 of the FCC Rules. On the Xircom Mini PCI Global Modem 56 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 Xircom, Inc. at (805) 376-9200 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. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic devices, including fax machines, to send any message unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual. (The telephone number provided may not be a 900 number or any other for which charges exceeds local or long-distance transmission charges.) In order to program this information into your fax software, you should refer to the manual of the Fax software being used.

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## Canadian Department of Communications

### Industry Canada (IC) Notice

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. Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

**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: 0.5 (A)

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## European Community –CE Mark

### Declaration of Conformity

Xircom, Inc. declares that the equipment described in this document is in conformance with the requirements of the European Council Directive listed below:

**73/23/EEC** Low Voltage Directive with Amendment

**93/68/EEC**

**89/336/EEC** EMC Directive with Amendments

**92/31/EEC and 93/68/EEC**

**98/13/EC** Telecommunications Terminal Equipment and Satellite Earth Station Equipment with Council Decision 98/482/EC for pan-European single terminal connection to the public switched network (PSTN).

This declaration is based upon compliance of the product to the following standards:

**EN 60950 (1992 w/ A1, 2, 3, 4, &11)** Product Safety

**EN 55022 (C.I.S.P.R. 22 Class B)** RF Emissions Control

**EN 50082-1 (IEC 801-2, 3, & 4)** Immunity to Electromagnetic Disturbances

**CTR21 (TBR21)** pan-European PSTN

Xircom, Inc. also declares its awareness of the Advisory Notes contained in E.T.S.I. Guides EG 201 120 & EG 201 121, including any amendments thereto.

**Product Description:** Mini PCI Global Modem 56 +10/100 Ethernet

**Model:** MPC13A56G-100

**Authorized Signature:** R.W. Bass,  
Vice President, Operations Xircom, Inc.  
2300 Corporate Center Drive  
Thousand Oaks, California 91320 U.S.A.

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## European Union CTR 21 Compliance

For information about compliance of this product with the European Union Common Technical Regulation (CTR) 21 on connection of telecommunications equipment to the public switched telephone network (PSTN), see the insert supplied with the product.

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## New Zealand Telepermit Compliance Notes

### General

The grant of a Telepermit for any item of terminal equipment indicates only that Telecom has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom, nor does it provide any sort of warranty. Above all, it provides no assurance that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom's network services.

### Important Notice

Some parameters required for compliance with Telecom's Telepermit requirements are dependent on the equipment (PC) associated with this device. The associated equipment shall be set to operate within the following limits for compliance with Telecom's Specification:

- There shall be no more than 10 call attempts to the same number in any 30 minute period for any single manual call initiation, and
- The equipment shall go off-line for a period of not less than 30 seconds between the end of one call attempt and the beginning of the next attempt.
- Where automatic calls are made to different numbers, the equipment shall go off-line for a period of not less than 5 seconds between the end of one call attempt and the beginning of the next attempt.
- When used in the automatic answer mode, the equipment shall be set to answer within 3 and 30 seconds of the receipt of ringing. This can be achieved by setting the AT 0 register between 2 and 10.

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## Appendix B. Safety Notices



- This card is intended for use with UL1950/EN60950/IEC60950 (or other NTRL) listed ITE computers that contain a Mini PCI type 3A connector.
- Care should be taken to avoid damaging the insulation tape on the Xircom Mini PCI Global Modem 56 + 10/100 Ethernet card. Do not cut, tear, pierce, or remove the insulation tape.
- (English) CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

(Francais) ATTENTION: Pour réduire le risque d'incendie, utiliser uniquement des conducteurs de telecommunications 26 AWG ou de section supérieure.

### Germany

The MPC13A56GSP-100PA is designed only for connection to the analogue public switched telephone network (PSTN). Please connect the cable from the MPC13A56GSP-100PA with the wired plug connector code F with the wire down in the wall socket (TAE 6) code F. The MPC13A56GSP-100PA can be used as a single device.