

10/100 EtherJet PCI Adapters



Installation Guide

10/100 EtherJet PCI Adapters



Installation Guide

Note

Before using this information and the product it supports, be sure to read "Safety Information" on page viii and "Appendix I. Notices" on page 43.

Sixth Edition (September 1999)

This edition applies to the IBM 10/100 EtherJet PCI Management Adapter and 10/100 EtherJet PCI Adapter with Alert on LAN 2.

You can submit comments concerning this documentation online at <http://www.ibm.com/networking/support/feedback.nsf/docsoverall>

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About This Manual

This manual contains the information you need to install and use your adapter.

Also on this CD-ROM are the installation aids and device drivers for the adapter.

Who Should Read This Manual

This manual is intended for use by network administrators and other end users of the IBM 10/100 EtherJet™ PCI Management Adapter and the IBM 10/100 EtherJet PCI Adapter with Alert on LAN 2. In this manual, unless specified otherwise both adapters are referred to as IBM 10/100 EtherJet PCI Adapters for functions and applications that apply to both.

How This Manual Is Organized

“Chapter 1. Installing the Adapter Hardware” on page 1 describes the procedure for installing the adapter into your computer.

“Chapter 2. Configuring Your Adapter” on page 11 describes the procedure for software installation for a number of network operating environments.

“Appendix A. IBMSet: An Overview” on page 21 describes the IBMSet configuration utility.

“Appendix B. Duplex Mode (Optional)” on page 23 describes the duplexing performance option.

“Appendix C. Virtual LANs” on page 25 describes using a virtual LAN.

“Appendix D. Alert on LAN 2: An Overview” on page 27 describes Alert on LAN 2.

“Appendix E. Troubleshooting and Testing the Adapter” on page 29 describes troubleshooting procedures and how to contact IBM product support.

“Appendix F. Priority Packet: An Overview” on page 33 describes this traffic-prioritization utility.

“Appendix G. PCI Installation Tips” on page 35 lists common situations in which manual installation of PCI is warranted.

“Appendix H. Adapter Specifications” on page 41 lists the specifications of the adapter.

“Appendix I. Notices” on page 43 contains the legal notices that apply to the 10/100 EtherJet PCI Adapters.

Related Information

For additional information such as software updates, troubleshooting tips, and installation notes, refer to the Web at:

<http://www.ibm.com/networking>

Refer the readme files on the CD-ROM for more information. Use one of the following methods:

- Automatic online help from the CD-ROM autorun program
- Go to the \info directory and open the files with any text editor
- From a DOS prompt, enter **setup /readme**

Year 2000

This product is Year 2000 ready. When used in accordance with its associated documentation, it is capable of correctly processing, providing and/or receiving date data within and between the 20th and 21st centuries, provided all other products (for example, software, hardware and firmware) used with the product properly exchange accurate date data with it.

Safety Information



Danger: Before you begin to install this product, read the safety information in *Caution: Safety Information—Read This First*, SD21-0030. This booklet describes safe procedures for cabling and plugging in electrical equipment.



خطر: قبل عملية بدء تركيب هذا المنتج، قم بقراءة معلومات الحماية الموجودة في التحذير: معلومات الحماية - Read This First، SD21-0030 . يقوم هذا الكتيب بوصف اجراءات الأمان لتوصيل الأدوات الكهربائية بالكابلات والمقبس الكهربائي.



Gevaar: Voordat u begint met de installatie van dit produkt, moet u eerst de veiligheidsinstructies lezen in de brochure *PAS OP! Veiligheidsinstructies—Lees dit eerst*, SD21-0030. Hierin wordt beschreven hoe u elektrische apparatuur op een veilige manier moet bekabelen en aansluiten.



Perigo: Antes de começar a instalar este produto, leia as informações de segurança contidas em *Cuidado: Informações Sobre Segurança—Leia Isto Primeiro*, SD21-0030. Esse folheto descreve procedimentos de segurança para a instalação de cabos e conexões em equipamentos elétricos.



危險：安裝本產品之前，請先閱讀
"Caution: Safety Information--Read
This First" SD21-0030 手冊中所提
供的安全注意事項。這本手冊將會說明
使用電器設備的纜線及電源的安全程序。



Opasnost: Prije nego što počnete sa instalacijom produkta, pročitajte naputak o pravilima o sigurnom rukovanju u
Upozorenje: Pravila o sigurnom rukovanju - Prvo pročitaj ovo, SD21-0030. Ovaj privitak opisuje sigurnosne postupke za priključivanje kabela i priključivanje na električno napajanje.



Upozornění: než zahájíte instalaci tohoto produktu, přečtěte si nejprve bezpečnostní informace v pokynech „Bezpečnostní informace“ č. 21-0030. Tato brožurka popisuje bezpečnostní opatření pro kabeláž a zapojení elektrického zařízení.



Fare! Før du installerer dette produkt, skal du læse sikkerhedsforskrifterne i *NB: Sikkerhedsforskrifter—Læs dette først SD21-0030*. Vejledningen beskriver den fremgangsmåde, du skal bruge ved tilslutning af kabler og udstyr.



Gevaar Voordat u begint met het installeren van dit product, dient u eerst de veiligheidsrichtlijnen te lezen die zijn vermeld in de publikatie *Caution: Safety Information - Read This First, SD21-0030*. In dit boekje vindt u veilige procedures voor het aansluiten van elektrische apparatuur.



VAARA: Ennen kuin aloitat tämän tuotteen asennuksen, lue julkaisussa *Varoitus: Turvaohjeet—Lue tämä ensin, SD21-0030*, olevat turvaohjeet. Tässä kirjasessa on ohjeet siitä, miten sähkölaitteet kaapeloidaan ja kytketään turvallisesti.



Danger : Avant d’installer le présent produit, consultez le livret *Attention : Informations pour la sécurité — Lisez-moi d’abord, SD21-0030*, qui décrit les procédures à respecter pour effectuer les opérations de câblage et brancher les équipements électriques en toute sécurité.



Vorsicht: Bevor mit der Installation des Produktes begonnen wird, die Sicherheitshinweise in *Achtung: Sicherheitsinformationen—Bitte zuerst lesen*, IBM Form SD21-0030. Diese Veröffentlichung beschreibt die Sicherheitsvorkehrungen für das Verkabeln und Anschließen elektrischer Geräte.



Κίνδυνος: Πριν ξεκινήσετε την εγκατάσταση αυτού του προϊόντος, διαβάστε τις πληροφορίες ασφάλειας στο φυλλάδιο *Caution: Safety Information-Read this first*, SD21-0030. Στο φυλλάδιο αυτό περιγράφονται οι ασφαλείς διαδικασίες για την καλωδίωση των ηλεκτρικών συσκευών και τη σύνδεσή τους στην πρίζα.



סכנה : לפני שמתחילים בהתקנת מוצר זה, יש לקרוא את הוראות הבטיחות בחוברת
Caution: Safety Information - Read This First, SD21-0030
חוברת זו מתארת את הוראות הבטיחות לחיבור הכבלים ולחיבור לחשמל של ציוד חשמלי.



Vigyázat: Mielőtt megkezdi a berendezés üzembe helyezését, olvassa el a *Caution: Safety Information— Read This First*, SD21-0030 könyvecskében leírt biztonsági információkat. Ez a könyv leírja, milyen biztonsági intézkedéseket kell megtenni az elektromos berendezés huzalozásakor illetve csatlakoztatásakor.



Pericolo: prima di iniziare l'installazione di questo prodotto, leggere le informazioni relative alla sicurezza riportate nell'opuscolo *Attenzione: Informazioni di sicurezza — Prime informazioni da leggere* in cui sono descritte le procedure per il cablaggio ed il collegamento di apparecchiature elettriche.



危険： 導入作業を開始する前に、安全に関する小冊子SD21-0030 の「最初にお読みください」(Read This First)の項をお読みください。
この小冊子は、電気機器の安全な配線と接続の手順について説明しています。



위험: 이 제품을 설치하기 전에 반드시 "주의: 안전 정보-시작하기 전에" (SD21-0030) 에 있는 안전 정보를 읽으십시오.



ОПАСНОСТ

Пред да почнете да го инсталирате овој продукт, прочитајте ја информацијата за безбедност:
"Предупредување: Информација за безбедност: Прочитајте го прво ова", SD21-0030.
Оваа брошура опишува безбедносни процедури за каблирање и вклучување на електрична опрема.



Fare: Før du begynner å installere dette produktet, må du lese sikkerhetsinformasjonen i *Advarsel: Sikkerhetsinformasjon — Les dette først*, SD21-0030 som beskriver sikkerhetsrutinene for kabling og tilkobling av elektrisk utstyr.



Uwaga:

Przed rozpoczęciem instalacji produktu należy zapoznać się z instrukcją: "Caution: Safety Information - Read This First", SD21-0030.

Zawiera ona warunki bezpieczeństwa przy podłączaniu do sieci elektrycznej i eksploatacji.



Perigo: Antes de iniciar a instalação deste produto, leia as informações de segurança *Cuidado: Informações de Segurança — Leia Primeiro*, SD21-0030. Este documento descreve como efectuar, de um modo seguro, as ligações eléctricas dos equipamentos.



ОСТОРОЖНО: Прежде чем устанавливать этот продукт, прочтите Инструкцию по технике безопасности в документе "Внимание: Инструкция по технике безопасности -- Прочсть в первую очередь", SD21-0030. В этой брошюре описаны безопасные способы каблирования и подключения электрического оборудования.



Nebezpečenstvo: Pred inštaláciou výrobku si prečítajte bezpečnostné predpisy v

Výstraha: Bezpečnostné predpisy - Prečítaj ako prvé, SD21-0030. V tejto brožúrke sú opísané bezpečnostné postupy pre pripojenie elektrických zariadení.



Pozor: Preden začnete z inštaláciou tega produktu preberite poglavje: "Opozorilo: Informacije o varnem rokovanju-preberi pred uporabo," SD21-0030. To poglavje opisuje pravilne postopke za kabliranje,



Peligro: Antes de empezar a instalar este producto, lea la información de seguridad en *Atención: Información de Seguridad — Lea Esto Primero*, SD21-0030. Este documento describe los procedimientos de seguridad para cablear y enchufar equipos eléctricos.



Varning — livsfara: Innan du börjar installera den här produkten bör du läsa säkerhetsinformationen i dokumentet *Varning: Säkerhetsföreskrifter— Läs detta först*, SD21-0030. Där beskrivs hur du på ett säkert sätt ansluter elektrisk utrustning.



危險：

開始安裝此產品之前，請先閱讀安全資訊。

注意：

請先閱讀 - 安全資訊 SD21-0030

此冊子說明插接電器設備之電纜線的安全程序。

Chapter 1. Installing the Adapter Hardware

This chapter contains information to assist you in installing the IBM 10/100 EtherJet™ PCI Management Adapter and the IBM 10/100 EtherJet PCI Adapter with Alert on LAN 2. Topics include:

- “Installing the Adapter”
- “Using the Correct Adapter Cable” on page 3
- “Using Wake On LAN” on page 9
- “Using Alert on LAN 2” on page 9

Installing the Adapter

1. In the manual provided with your computer, locate the instructions for installing an adapter. Be sure to follow any safety instructions in that manual.
2. Switch OFF the computer and all connected devices.

Note: In the U.K., by law, the telephone line cable (if connected) must be disconnected before the power cord.

3. Remove the power cord from the outlet.
4. Remove all cables from your computer to the connected devices.

Note: Make sure that you label the cables for correct reconnection later.

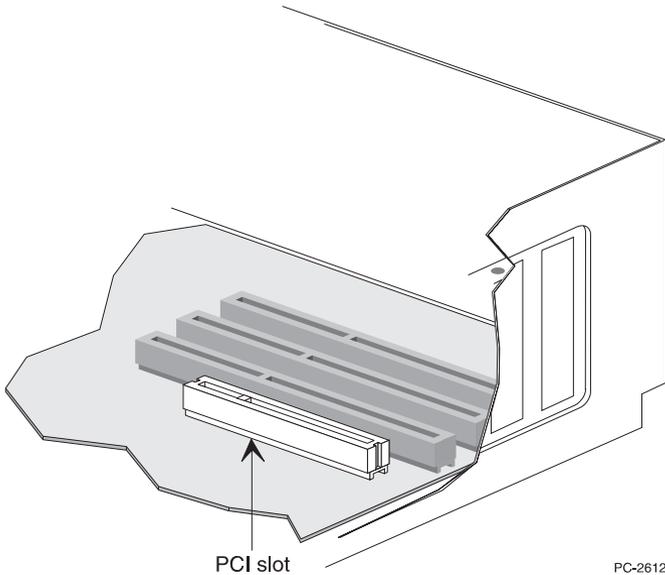
5. Follow the instructions provided in your computer manual for removing the cover or otherwise accessing the adapter slots.
6. Remove the screw and cover for the appropriate PCI Busmaster-capable expansion slot. (Refer to your computer manual.) Keep the cover to use again if you remove the adapter.

If you plan to use the adapter for Wake on LAN®, go to “Wake On LAN Connection” on page 4.

If you do not plan to use Wake on LAN, continue with step 7

7. Place the adapter in the slot.

Note: Most PCI slots in computers are Busmaster-enabled, but some are not. If you have configuration problems, refer to your computer manual.



PC-2612

Figure 1. PCI Slot Illustration

8. Push the adapter into the slot until the adapter is seated firmly. Secure the adapter bracket with a screw.
9. If you are installing more than one adapter, repeat steps 6, 7, and 8 for each adapter you want to install.
Otherwise, continue with step 10.

Note: In the U.K., by law, the power cord must be connected before the telephone line cable.

10. Replace the cover on the computer, connect the cables to the connected devices, connect the signal cables to the receptacles, and then connect the power cord to the outlet.
11. Connect a twisted-pair Ethernet Category 5 cable to the adapter and to your Ethernet outlet. See “Using the Correct Adapter Cable” on page 3 for more information.
12. Switch ON the connected devices and the computer.

If you want to run the adapter diagnostics at this point, see “Testing the Adapter Using the Diagnostics” on page 31 for details.

Using the Correct Adapter Cable

To operate your network reliably at 100 Mbps, you must use Category 5 data-grade cables with this adapter. Although Category 3 or 4 might appear to work, you might experience intermittent loss of data. For more information, refer to the Hardware Specifications and Cabling topic on the IBM Installation and Drivers CD-ROM or diskette. For 10 Mbps, you can use Category 3, 4, or 5 cabling.

Residential Use: If you are using this adapter in a residential environment, you *must* use Category 5 data-grade cables for either 10 Mbps or 100 Mbps (see emission notices in “Appendix I. Notices” on page 43).

Note: The adapter Ethernet address is printed on a sticker on the edge of the adapter as shown in Figure 2.

The Ethernet address is sometimes called the *node address* or the *MAC address*. This unique, 12-digit hexadecimal address was stored in the adapter memory at the factory.

You can use this address to match the adapter to the slot number when configuring multiple adapters.

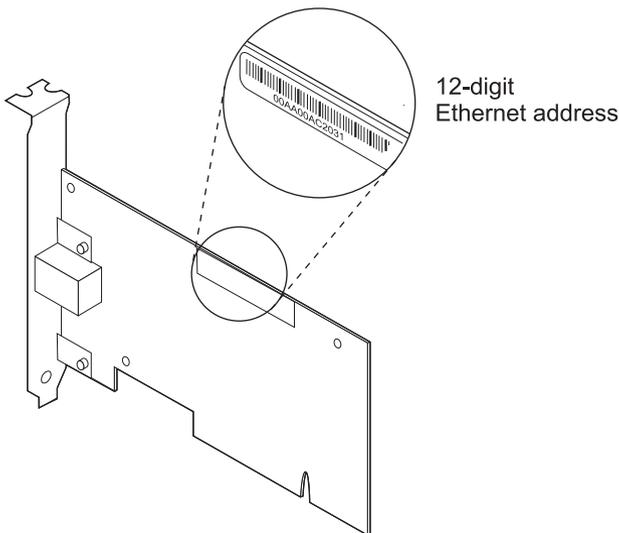


Figure 2. Ethernet Address Location

Wake On LAN Connection

For the Wake On LAN feature to work correctly, the adapter must be connected to a continuous power source. This allows the IBM 10/100 EtherJet PCI Management Adapter or the IBM 10/100 EtherJet PCI Adapter with Alert on LAN 2 to monitor the network even when the computer is switched off.

If you are installing the IBM 10/100 EtherJet PCI Adapter with Alert on LAN 2, you do not need a Wake on LAN cable. This adapter supports Wake on LAN and Alert on LAN 2 mainly on PCI 2.2–compliant systems. With PCI 2.2 systems, all Wake on LAN and Alert on LAN 2 signaling and power connections will be through the PCI Bus Connector between the adapter and the system.

If you are installing the IBM 10/100 EtherJet PCI Management Adapter, the adapter can support Wake on LAN on both PCI 2.1 and PCI 2.2 systems, providing that these systems are Wake on LAN-capable.

Your adapter is shipped with two Wake on LAN cables.

- 08L2558 3-way Wake on LAN Cable
- 08L2559 2-way Wake on LAN Cable

With a PCI 2.2 system, you do not need a Wake on LAN cable. All Wake on LAN connections will be through the PCI Bus. With a PCI 2.1 system, you will need a Wake on LAN cable.

If your computer planar has a combined 3-pin WOL connector (check your computer manual), use the instructions in “Connecting the 2-Way Wake on LAN Cable”.

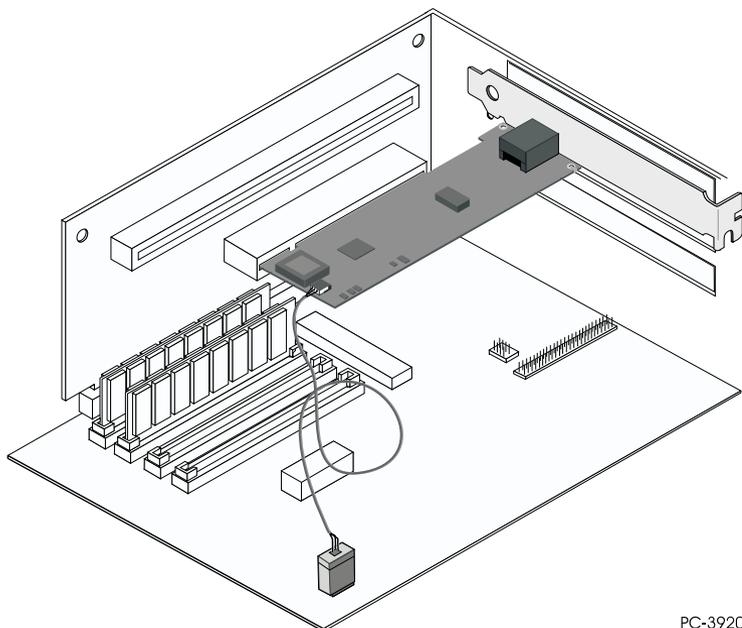
If your computer planar has a separate WOL signal and power connectors (check your computer manual), go to “Connecting the 3-Way Wake on LAN Cable” on page 6.

Connecting the 2-Way Wake on LAN Cable

Attention: Switch off and unplug power to the computer before installing the WOL cable. Failure to do so could damage the adapter or computer. The WOL connector on your motherboard is live when the computer is plugged in to a power outlet. Likewise, always unplug the computer prior to removing an adapter from the computer.

1. Make sure that your computer is unplugged from the power outlet.
2. Locate the Wake On LAN 3-pin connector on the adapter. Attach one end of the cable to the adapter as shown in Figure 3 on page 5. Note that the

connector is notched so as to prevent incorrect attachment. Also note that you can use either end of the cable, because the two ends are identical.



PC-3920

Figure 3. Connecting the 2-Way Wake On LAN Cable

3. Place the adapter in the slot.

Note: Most PCI slots in computers are Busmaster-enabled, but some are not. If you have configuration problems, refer to your computer manual.

4. Push the adapter into the slot until the adapter is seated firmly. Secure the adapter bracket with a screw.
5. Locate the Wake On LAN connector on your system board. The location varies, depending on the vendor and model. The connector is usually located near other power connectors, such as the LED connectors.
6. Connect the other end of the cable to the connector on the system board as shown in Figure 3.
7. Some computers might require you to change a setting in the BIOS or setup program to enable the Wake On LAN feature. Check your computer manual or contact your dealer for more information.
8. If you are installing more than one adapter, repeat steps 6, 7, and 8 on page 2 for each adapter that you want to install.

Otherwise, continue with step 9.

Note: In the U.K., by law, the power cord must be connected before the telephone line cable.

9. Replace the cover on the computer, connect the cables to the connected devices, connect the signal cables to the receptacles, and then connect the power cord to the outlet.
10. Connect a twisted-pair Ethernet Category 5 cable to the adapter and to your Ethernet outlet. See “Using the Correct Adapter Cable” on page 3 for more information.
11. Switch ON the connected devices and the computer.

Connecting the 3-Way Wake on LAN Cable

Attention: Switch off and unplug power to the computer before installing the WOL cable. Failure to do so could damage the adapter or computer. The WOL connector on your motherboard is live when the computer is plugged in to a power outlet. Likewise, always unplug the computer prior to removing an adapter from the computer.

1. Make sure that your computer is unplugged from the power outlet.
2. Connect the single 3-pin female end of the 08L2558 cable to the Wake on LAN 3-pin connector on the adapter, as shown in Figure 4 on page 7.

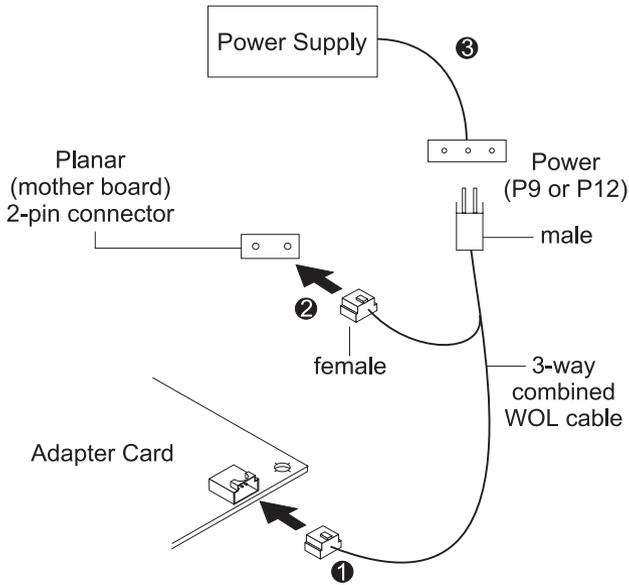
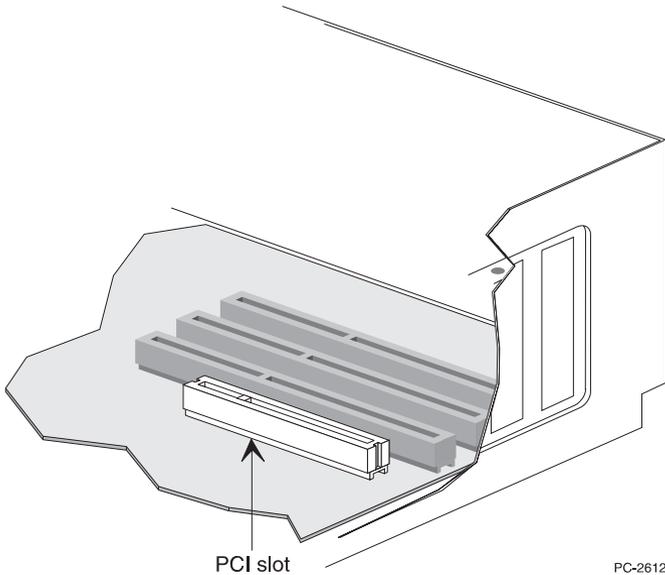


Figure 4. Connecting the 3-Way Wake On LAN Cable

3. Place the adapter in the slot.

Note: Most PCI slots in computers are Busmaster-enabled, but some are not. If you have configuration problems, refer to your computer manual.



PC-2612

Figure 5. PCI Slot Illustration

4. Push the adapter into the slot until the adapter is seated firmly. Secure the adapter bracket with a screw.
5. Locate the 2-pin Wake on LAN signal connector on the computer planar as shown in Figure 4 on page 7. On the split male-female end of the cable, connect the female connector to the 2-pin connector on the planar.
6. Also on the male-female end of the 3-way cable, connect the male connector to the computer Wake on LAN power cable (marked **P9** or **P12**).
7. Some computers might require you to change a setting in the BIOS or setup program to enable the Wake On LAN feature. Check your computer manual or contact your dealer for more information.
8. If you are installing more than one adapter, repeat steps 6, 7, and 8 on page 2 for each adapter that you want to install.
Otherwise, continue with step 9.

Note: In the UK, by law, the power cord must be connected before the telephone line cable.

9. Replace the cover on the computer, connect the cables to the connected devices, connect the signal cables to the receptacles, and then connect the power cord to the outlet.
10. Connect a twisted-pair Ethernet Category 5 cable to the adapter and to your Ethernet outlet. See “Using the Correct Adapter Cable” on page 3 for more information.

11. Switch ON the connected devices and the computer.

Using Wake On LAN

You can disable or enable the Wake on LAN feature using your system configuration utility. Refer to your computer documentation for details.

Power for the 10/100 EtherJet PCI Adapters is always ON when the computer is connected to ac power, regardless of the computer ON/OFF switch setting. When the computer power is OFF, this adapter constantly monitors the LAN for the wake-up frame that requests power to be applied to the computer.

The wake-up frame can be a broadcast or an individually-addressed frame. The following data is required and can be included anywhere in the data portion of the wake-up frame.

- 6 bytes of X'FF', followed by
- 48-bit universally administered address (UAA or MAC address) of the adapter to be woken up, repeated eight or more times. Eight repetitions are required; more than eight are acceptable.

If you are not familiar with Wake on LAN operation, you can refer to the following documents on the Web:

- *Wake on LAN* at <http://www.pc.ibm.com/infobrf/iblan.html>
- *Wake up to Wake on LAN* at <http://www.networking.ibm.com/eji/ejiwake.html>

For more details about Wake on LAN cables and IBM Wake on LAN computer systems, read WOLCABLE.TXT and WOL-INFO.TXT help files in the \INFO\GENERAL directory on the IBM Installation and Drivers CD-ROM or diskette.

See "Appendix E. Troubleshooting and Testing the Adapter" on page 29 for general troubleshooting and a listing of common problems and solutions for Wake On LAN operability.

Using Alert on LAN 2

The IBM 10/100 EtherJet PCI Adapter with Alert on LAN 2 supports Alert on LAN 2 with IBM PC systems that are PCI 2.2-compliant and support Alert on LAN 2. All Alert on LAN 2 hardware connections between the adapter and the PC system are through the PCI Bus Connector. All Alert on LAN 2 software

and software installation procedures are provided with your IBM Alert on LAN 2 PC systems. Refer to your system documentation for setting up and installing Alert on LAN 2 software.–

Chapter 2. Configuring Your Adapter

This chapter describes how to make a setup diskette, if needed, and how to configure the adapter and install the drivers in many different LAN environments.

Making a Setup Diskette

If you need to use a diskette to install the IBM 10/100 EtherJet PCI Adapter drivers, use MAKEMS.BAT (for Microsoft® operating systems) or MAKENW.BAT (for NetWare operating systems), located in the \MAKEDISK directory on this CD-ROM. The format for the command is:

d:\makedisk\makems.bat d: a:

where d: is your CD-ROM drive and a: is your diskette drive.

Configuring the Adapter and Installing the Drivers

Novell NetWare 5.0

Note: For Novell NetWare 4.1x, see “Novell NetWare 4.1x” on page 12. For versions 3.11 and 3.12, refer to the README files on this CD-ROM. For DOS ODI, see “DOS and Windows 3.1 Setup for Novell NetWare DOS ODI Clients” on page 17.

1. From the NetWare console, type **load nwconfig** and press **Enter**.
2. From the Configuration Options screen, select **Driver options** and press **Enter**.
3. Select **Configure network drivers** and press **Enter**. If any drivers are already loaded, a list of them appears.
4. Choose **Select an additional driver** and press **Enter**. A list of drivers appears.
5. Insert the IBM Installation and Drivers CD-ROM or diskette and press **Insert** to install an unlisted driver.
6. Specify the correct path to your media if necessary by pressing **F3**. Press **Enter** to search the diskette or CD-ROM. To install from the CD, type CD volume name :\IBM100S31:\NWSERVER.
7. Highlight the 10/100 EtherJet PCI Adapters and press **Enter** to select it.

8. The next panels ask for frame and protocol types. Use the arrow keys to select specific items or select the defaults. Select **Save parameters and load driver** to continue.
9. To install an additional adapter, press **Esc** to go back to select an adapter to install. Then, repeat steps 7 through 9 for each additional adapter that you want to install.
10. To complete the driver installation process, go back to the Installation Options panel by pressing the **Esc** key until you see it.
11. Select **Exit** to return to the console prompt.

Note: If the adapter cannot transmit or receive following the installation, you might need to modify the frame type in the AUTOEXEC.NCF file.

Novell NetWare 4.1x

For Novell NetWare 3.11 and 3.12, refer to the README files. For DOS ODI, see “DOS and Windows 3.1 Setup for Novell NetWare DOS ODI Clients” on page 17.

Note: Prior to installing, either load DOS or NetWare drivers for your computer’s CD-ROM drive or create a diskette from the CD-ROM on a different computer.

1. From the NetWare console, type **load install** and press **Enter**.
2. From the Installation Options panel, select **Driver options** and press **Enter**.
3. Select **Configure network drivers** and press **Enter**. If any drivers are already loaded, a list of them appears.
4. Choose **Select an additional driver** and press **Enter**. A list of drivers appears.
5. Insert the IBM Installation and Drivers CD-ROM or diskette and press **Insert** to install an unlisted driver.
6. If necessary, specify the correct path to your media by pressing **F3**. Press **Enter** to search the diskette or CD-ROM.
7. The driver name is displayed: IBM 10/100 EtherJet PCI Adapter. Press **Enter** to select it.
8. The next panels enable you to specify frame and protocol types. Use the arrow keys to select specific items or select the defaults. Select **Save parameters and load driver** to continue.
9. To install an additional adapter, press **Esc** to go back to **Select an adapter to install**. Then, repeat steps 7 through 9 for each additional adapter that you want to install.
10. To complete the driver installation process, go back to the Installation Options panel by pressing **Esc** until you see it.

11. Select **Exit** to return to the console prompt.

Note: If the adapter cannot transmit or receive following the installation, you may need to modify the frame type in the AUTOEXEC.NCF file.

Windows 95

Windows 95 Automatic Configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS automatically sets the adapter IRQ level and I/O address each time you start your computer.

Start your computer to automatically configure the adapter. Resource configuration is complete when Windows® 95 starts.

If your computer displays an error while booting, it might require additional configuration steps. See “Appendix G. PCI Installation Tips” on page 35 for more information.

Installing Network Drivers from Diskette

Have your Windows 95 installation CD-ROM or diskettes available, because you will be prompted for them when you install the new adapter.

1. After you put the adapter in the computer and connect the cable, start Windows 95. You will see the New Hardware Found dialog box.

Note: If this box does not appear and Windows 95 starts normally, you might need to manually add the adapter. Refer to the MS.TXT readme file in the \MS directory for more information.

2. Click **Driver from disk provided by hardware manufacturer**, then click **OK**. You will see the Install From Disk dialog box.
3. Insert the IBM Installation and Drivers CD-ROM or diskette.
4. Specify D:\ (or the appropriate drive letter for the CD-ROM drive) or A:\ (for diskette) as the path and then click **OK**.
5. Follow the prompts for any Windows 95 installation diskettes and restart the computer when prompted.

Note: If you installed from the CD-ROM, the installation files are typically located at D:\Win95, where D is your CD-ROM drive.

After restarting Windows 95, connect to your network by double-clicking **Network Neighborhood** on the desktop.

Windows Troubleshooting

If you cannot connect to a server or if Windows 95 or Windows 98 reports an error after you double-click **Network Neighborhood**, try the suggestions here first and then see “Appendix E. Troubleshooting and Testing the Adapter” on page 29 if necessary.

- Make sure that you are using the drivers that are on the CD-ROM that ships with this adapter.
- Make sure that the driver is loaded and that the protocols are bound. Check the Device Properties list for trouble indicators (an X or ! symbol).
- Test the adapter with the IBMSet advanced configuration utility that was installed on your system when you installed the IBM 10/100 EtherJet PCI Adapter. To start IBMSet, double-click **IBMSet** in the Windows control panel. To run diagnostics, select the adapter and click **Diagnostics**, then click **Run Tests**. For additional information, click **Help** in the IBMSet window.
- Check with your LAN administrator. You might need to install additional networking software.

Windows 98

Windows 98 Automatic Configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS automatically sets the adapter IRQ level and I/O address each time you start your computer.

Start your computer to automatically configure the adapter. Resource configuration is complete when Windows 98 starts.

If your computer displays an error while booting, it might require additional steps to configure. See “Appendix G. PCI Installation Tips” on page 35 for more information.

Install Network Drivers from Diskette

1. After you put the adapter in the computer and connect the cable, start Windows 98. You will see the New Hardware Found dialog box.

Note: If this box does not appear and Windows 98 starts normally, you might need to manually add the adapter. See “Manually Installing the Network Drivers” on page 15.

2. When prompted, insert the IBM Installation and Drivers CD-ROM or diskette.
3. Specify D:\ (or the appropriate drive letter for the CD-ROM drive) or A:\ (for diskette drive) as the path, then click **OK**.

4. Restart the system when prompted.

Manually Installing the Network Drivers

1. After you put the adapter in the computer and connect the cable, start Windows 98.
2. Double-click **System** in the Control Panel.
3. Click **Device Manager**.
4. Double-click **Network Adapters** in the list area.
5. Double-click the IBM 10/100 EtherJet PCI Adapter. The Update Device Driver Wizard appears.
6. Select **Search for a better driver than the one your device is using now**. Make sure that the IBM Installation and Drivers CD-ROM or diskette is in the drive, and click **Next**.
7. Select the drive that contains the IBM Configuration and Drivers disk and click **Next**.
8. Select **Choose the updated driver (Recommended)** and continue to click **Next** at each dialog box until the driver files are copied.
9. When Windows has finished copying drivers, click **Close** and restart your computer.

Note: For troubleshooting information, see “Windows Troubleshooting” on page 14.

Windows NT Automatic Configuration

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

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

If your computer displays an error while booting, it might require additional steps to configure. See “Appendix G. PCI Installation Tips” on page 35 for more information.

Adding an Adapter when Installing Windows NT

The IBM driver that ships with Windows NT 4.0 is an older driver which does not support the IBM 10/100 EtherJet PCI Adapter. Therefore, if you want to install the IBM 10/100 EtherJet PCI Adapter software while installing Windows NT, you need to either install the adapter after the Windows NT installation is

complete or install the adapter software from a installation diskette created from the IBM Installation and Drivers CD (using the MAKEMS.BAT file on the root of the CD).

While running the MAKEMS.BAT batch file, you might see an error message indicating that a >CAT file could not be copied. Ignore this message.

Windows NT Version 4.0

After you have put the adapter in the computer, connected the cables, and started Windows NT, install the correct drivers by performing the following steps.

1. Double-click **Network** in the Control Panel.
2. Click **Adapters**.
3. Click **Add**. You will see a list of adapters.
4. Do not select an adapter from this list. Instead, insert the IBM Installation and Drivers CD-ROM or diskette into the appropriate drive and click **Have Disk**.
5. Specify the appropriate drive in the dialog box and click **OK**. Then follow the prompts to complete installation. When the adapter is added you will see a new adapter listed in the Network adapter list.
6. Click **Close** to finish.
7. Restart Windows NT when prompted.

Windows NT Version 3.51

After you have put the adapter in the computer, connected the cables, and started Windows NT, install the correct drivers.

1. Double-click **Network** in the Control Panel.
2. Click **Add Adapter**.
3. When the list of adapters appears, scroll to the end of the list and select **<Other> Requires disk from manufacturer** and then click **Continue**.
4. Insert the IBM Installation and Drivers CD-ROM or diskette in the appropriate drive, specify that drive, and click **OK**.
5. Select **IBM 10/100 EtherJet PCI Adapter** and click **OK**. Drivers and utilities are then installed.
6. The TCP/IP Configuration dialog box appears. Enter the appropriate information and click **OK**. Remove the installation disk.
7. When prompted, restart Windows NT.

Note: For troubleshooting information, see “Windows NT Troubleshooting” on page 17.

Windows NT Troubleshooting

If Windows NT reports an error or you cannot connect to the network, try the suggestions here first, then see “Appendix E. Troubleshooting and Testing the Adapter” on page 29 if necessary.

- Make sure that you use the drivers for this adapter. Drivers are located on the IBM Installation and Drivers CD-ROM or diskette.
- Make sure that the driver is loaded and that the protocols are bound. Check the settings in the Control Panel 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.
- Test the adapter with the IBMSet advanced configuration utility that was installed on your system when you installed the IBM 10/100 EtherJet PCI Adapter. To start IBMSet, double-click **IBMSet** in the Windows control panel. To run diagnostics, select the adapter and click the **Diagnostics** tab, then click **Run Tests**. For additional information, click **Help** in the IBMSet window.
- Check with your LAN administrator - you might need to install supplemental networking software.

DOS and Windows 3.1 Setup for Novell NetWare DOS ODI Clients

Note: If you are using Windows 95 and Windows 98, see the previous sections on Windows 95 and Windows 98. If you are using NetWare Client 32, refer to the NetWare readme files in the \NETWARE directory.

DOS and Windows 3.1 Automatic Configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS sets the adapter IRQ level and I/O memory address automatically each time you start your computer.

Start your computer in order to automatically configure the adapter. Resource configuration is complete when the DOS prompt appears. You can now continue with the following procedure.

If your computer displays an error while booting, it might require additional steps to configure a PCI adapter. See “Appendix G. PCI Installation Tips” on page 35 for more information.

Run Setup to Install Network Drivers

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

1. If your computer already has network drivers installed, restart the computer without loading them. If the drivers are loaded from the AUTOEXEC.BAT or CONFIG.SYS file, type REM in front of each line that loads a network driver. Or, with DOS 6.x or later, press **F5** as DOS starts, to bypass the drivers.
2. Insert the IBM Installation and Drivers CD-ROM or diskette in a drive, switch to that drive, and at the DOS prompt, type **setup** and press **Enter**.
3. Select the adapter from the menu.
4. Select **Automatic Setup** from the Main menu. Then follow the instructions on the panel. If you want to test the adapter with a responder on the network, see “Responder Testing on the Network (Optional)” on page 19. Setup displays the adapter configuration and then runs a series of diagnostic tests that make sure that the adapter and network are functioning correctly. If Setup finds a problem, it displays the results and some possible solutions.
5. When Setup finishes the tests, you will see the Install Network Drivers panel.
6. Select the driver that you want to install. Setup can install a NetWare client driver for you. If you want to install other drivers, Setup displays a README file with installation instructions.

To set duplexing options, see “Appendix B. Duplex Mode (Optional)” on page 23.

Troubleshooting

If you cannot connect to a server, first try the suggestions here and then see “Appendix E. Troubleshooting and Testing the Adapter” on page 29.

- Make sure that you are using the drivers for this adapter (for example, IBMFEODI.COM).
- If you are replacing an existing adapter, make sure that the LINK statement in your NET.CFG is correct for the new adapter. For example, the LINK statement for a NetWare client is LINK DRIVER IBMFEODI.
- Verify that the frame type in your NET.CFG file matches your network.
- Test the adapter by running diagnostics in Setup. Additional testing is available by using a responder. See “Responder Testing on the Network (Optional)” on page 19.
- Check the README files.

Responder Testing on the Network (Optional)

Setup can test the adapter more thoroughly if there is a responder on the network while you run the tests.

1. Go to a computer on the network with a comparable PCI adapter installed.
2. Run the appropriate configuration program for the installed adapter and set it up as a responder.
3. Return to the computer that has the new adapter. Run Setup and test the adapter by running diagnostics.

NetWare 3.11, 3.12, Client 32, UNIX, Banyan VINES, and Other Operating Systems

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

To view the README files, insert the IBM Installation and Drivers CD-ROM or diskette into a drive, switch to that drive, and enter **setup /readme**

Appendix A. IBMSet: An Overview

When you install the IBM 10/100 EtherJet PCI Adapter Windows drivers, an advanced configuration utility called IBMSet is also installed. If you are running Windows NT, Windows 95, or Windows 98, you can easily test hardware and set standard and advanced adapter features with IBMSet.

IBMSet runs when you click on the **Adapter Icon** at the lower right hand corner of the Windows task bar or when you highlight an adapter and click **Properties** in the Network control panel.

From the IBMSet panel as shown in Figure 6, you can view the following information:

- View adapter parameters such as MAC Address and IP Address
- View Network Link status such as speed, duplex mode, and activity
- Check the device driver level used for the adapter
- Obtain IBM Web support information

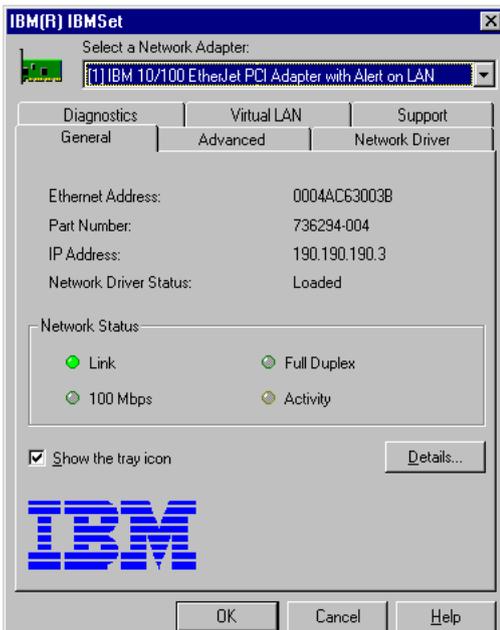


Figure 6. IBMSet Panel

Note about Adapter DOS Diagnostics

Besides the Adapter Hardware Test feature available with IBMSet, you can also run adapter diagnostics from DOS with SETUP.EXE. With the CD-ROM or driver diskette in the drive, from a DOS prompt enter **setup**.

Appendix B. Duplex Mode (Optional)

Duplexing is a performance option that lets you choose how the adapter sends and receives data packets over the network. The adapter can operate at full duplex only when connected to a full-duplex 10BASE-T or 100BASE-TX switch, or to another full-duplex adapter.

The possible settings for duplexing are:

- Auto (requires a full-duplex adapter or switch with auto-negotiation capability). The adapter negotiates with the switch to send and receive packets at the highest rate. This is the default setting. If the switch does not provide auto negotiation, the adapter runs at half duplex.
- Full duplex (requires a full-duplex switch or adapter). The adapter can send and receive packets at the same time. This mode can increase adapter performance capability. If the full-duplex switch provides auto negotiation, the adapter runs at full duplex. If the full-duplex switch does not provide auto-negotiation, you need to set the adapter duplex mode manually (see the following sections), because it defaults to half duplex.
- Half duplex. The adapter performs one operation at a time; it either sends or receives.

Note: If an adapter is running at 100 Mbps and half duplex, your potential bandwidth is higher than if you run it at 10 Mbps and full duplex.

Manually Configuring for Full Duplex

If your switch supports auto-negotiation with the N-way standard, duplex configuration is automatic and no action is required on your part. However, many currently-installed switches do not support auto-negotiation. Check with your network system administrator to verify whether your switch supports this feature. Most installations will require manual configuration to change to full duplex.

Configuration is specific to the driver that you are loading for your network operating system.

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

Attention: Adapter performance may suffer or your adapter may not operate if your switch does not support full duplex and you configure the adapter to full duplex. The switch settings must always agree with the adapter.

Also, make sure that you always set the speed when you configure duplex.

Setting Full Duplex in DOS, ODI, NDIS 2.01 Clients

For each adapter, edit the NET.CFG or PROTOCOL.INI file. If you edit the NET.CFG file, add the following keywords to the Link Driver section. For the PROTOCOL.INI file, add the keywords anywhere:

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

Setting Full Duplex in NetWare Servers

For each adapter in AUTOEXEC.NCF, edit the LOAD command and add the following options (you must include the equal sign for servers):

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

For more information, refer to the readme file for NetWare computers.

Setting Full Duplex in Windows 95 and Windows 98

While running Windows 95 or Windows 98:

1. Double-click **IBMSet** from the Control Panel.
2. Click **Settings**.
3. In the Network Speed list box, click **10** or **100**, according to the speed of your network.
4. In the Duplex Mode list box, click **Full**.
5. Click **OK**.
6. Restart Windows.

Setting Full Duplex in Other Operating Systems

Refer to the OTHER.TXT readme file in the \OTHER directory on the IBM Installation and Drivers CD-ROM or diskette. Open the file with any text editor.

Appendix C. Virtual LANs

The appendix describes how to set up a virtual LAN (VLAN).

Creating a 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. VLANs lets a user see and access only specified network segments. This increases network performance and improves network security.

VLANs offer the ability to group users and devices together into logical workgroups. This can simplify network administration when connecting clients to servers that are geographically dispersed across the building, campus, or enterprise network.

Typically, VLANs consist of co-workers within the same department but in different locations, groups of users running the same protocol, or a cross-functional team working on a joint project.

Normally, VLANs are configured at the switch and any computer can be a member of one VLAN per installed network adapter. The IBM 10/100 EtherJet PCI Adapter supersedes this by communicating directly with the switch, allowing multiple VLANs on a single network adapter (up to 64 VLANs).

To set up VLAN membership, your adapter must be attached to a switch that has VLAN capability. You also need to use Windows NT 4.0 or later, or Novell NetWare 4.1x or later.

For more information about VLANs, refer to the switch documentation or the VLAN readme files on the IBM Installation and Drivers CD.

General Configuration Notes

- Windows NT versions prior to 4.0 do not support VLANs.
- VLANs require NT 4.0 with Service Pack 3.0 and the NDIS driver hotfix from Microsoft.
- In Windows NT, VLANs cannot be implemented on adapters that have been configured for teaming options. NetWare can support teaming options and VLANs on the same adapters.

Joining a VLAN from Windows NT 4.0

1. Create a VLAN on the switch. Use the parameters you assign there to join the VLAN from the server. Refer to your switch documentation for more information.
2. Double-click the Network icon in Control Panel window.
3. On the Adapters tab, select the adapter you want to be on the VLAN and select **Properties**.
4. In IBMSet, select **Join VLAN**. Note that VLANs cannot be assigned to adapters that are already defined to have an adapter teaming option.
5. Enter the VLAN ID and VLAN name. The VLAN ID must match the VLAN ID of the switch. The ID range is from 1 to 1000. The VLAN name is for information only and does not need to match the name on the switch.
6. Select Join VLAN. Repeat steps 3 through 5 for each VLAN you want the server to join. The VLANs you add are listed on the Adapters tab.
7. Select **Close** and restart the computer.

Joining a VLAN from NetWare 4.1x or 5.0

The software currently shipped with this adapter does not support VLAN with NetWare 4.1x or 5.0. For the most current information on software updates that will include the support of NetWare VLAN, visit the IBM Support Web site at: <http://www.ibm.com/networking/support>

Appendix D. Alert on LAN 2: An Overview

The IBM 10/100 EtherJet PCI Adapter with Alert on LAN 2 supports Alert on LAN 2 with IBM Alert on LAN 2 capable PC systems.

Alert on LAN 2 uses a combination of hardware and software to provide immediate notification of system events regardless of the power status of the system. Alert on LAN 2 also allows the system administrator to take corrective actions from a remote location to either repair or secure the machine upon receiving notification events. Together, notification and corrective actions provide smarter manageability and better asset protection for lower total cost of ownership.

The notification events include:

- Notification of configuration and system errors during POST
- Notification of operating systems errors or crashes
- Excessive system environmental changes
- Client disconnect from the network or power outlet
- Chassis intrusion
- Processor removal

The corrective actions included:

- Restart the client
- Require administrator password on the next boot
- Safe Mode BIOS and link to network
- Restart the client and initiate "Dead System Restore"
- Restart the client and initiate remote diagnostics

The key benefits from smarter manageability and better asset protection include:

- Protecting the physical asset from tampering and theft
- System administrator can initiate corrective actions immediately when alerts occur
- Saving time and money in the recreation of data
- Less downtime in repairing or replacing a machine

All Alert on LAN 2 hardware connections between the adapter and the PC system are through the PCI Bus connector.

All Alert on LAN 2 software and software installation guide come from the software package for IBM Alert on LAN 2 capable PC systems. Refer to your system documentation and guide for setting up and installing Alert on LAN 2.

Appendix E. Troubleshooting and Testing the Adapter

The appendix describes corrective actions for a number of common problems. It also describes how to test the adapter using the diagnostics.

Problem Symptoms and Corrective Actions

The adapter cannot connect to the network

1. **Make sure that the cable is installed correctly.**

The network cable must be securely attached at both RJ-45 connections (adapter and hub). The maximum allowable distance from adapter to the hub is 100 m (328 ft). If the cable is attached and the distance is within acceptable limits but the problem persists, try a different cable.

If you are directly connecting two computers without a hub or switch, use a crossover cable.

2. **Check the LED indicators on the adapter.**

The adapter has two diagnostic LEDs, one on each side of the cable connector. These indicators help you to determine whether there is a problem with the connector, cable, switch, or hub.

LED	Indication	Meaning
ACT/LNK	On	<ul style="list-style-type: none">• The adapter and switch are receiving power.• The cable connection between the switch and adapter is good.
	Off	This can be due to one of the following causes: <ul style="list-style-type: none">• The adapter is not sending or receiving network data.• The adapter and switch are not receiving power.• The cable connection between the switch and adapter is faulty.• You have a driver configuration problem.
	Blinking	The adapter is sending or receiving network data. The frequency of the blinks varies with the amount of network traffic.
100	On	The adapter is operating at 100 Mbps.
	Off	The adapter is operating at 10 Mbps.

3. **Make sure that you are using the correct drivers.**

Make sure that you are using the drivers that come with this adapter (for example, IBMFEODI.DOS). Drivers that support previous versions of this adapter do not support this version of the adapter.

4. **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.

SETUP.EXE reports the adapter is “Not enabled by BIOS”

The PCI BIOS is not configuring the adapter correctly. See “Appendix G. PCI Installation Tips” on page 35.

The computer hangs when the drivers are loaded

1. Change the PCI BIOS interrupt settings. See “Appendix G. PCI Installation Tips” on page 35 for more information.
2. If you are using EMM386, make sure that it is Version 4.49 or higher (this version ships with MS-DOS 6.22 or higher).

Diagnostics pass, but the connection fails or errors occur

1. For 100 Mbps:
 - a. Use Category 5 cabling and make sure that the network cable is securely attached.
 - b. Connect to a 100BASE-TX hub/switch (not 100BASE-T4).
2. For NetWare, make sure you specify the correct frame type in your NET.CFG file.
3. Make sure the duplex mode setting on the adapter matches the setting on the switch.

The LNK LED does not light

1. Make sure that you loaded the network drivers.
2. Check all connections at the adapter and the switch.
3. Try another port on the switch.
4. Make sure that the duplex mode setting on the adapter matches the setting on the switch.
5. Make sure that you have the correct type of cable between the adapter and the hub. 100BASE-TX requires two pairs. Some hubs require a crossover cable while others require a straight-through cable.

The ACT LED does not light

1. Make sure that you loaded the correct network drivers.
2. The network may be idle. Try accessing a server.
3. The adapter is not transmitting or receiving data. Try another adapter.
4. Make sure that you are using two-pair cable for TX wiring.

The adapter stops working without apparent cause

1. Run the diagnostics.
2. Try reseating the adapter in its slot, or try a different slot if necessary.
3. The network driver files may be corrupt or missing. Remove the drivers and then reinstall them.

The Wake on LAN feature is not working

1. Make sure that the WOL cable is attached and that power is being applied to the computer.
2. Check the BIOS for its WOL setting. Some computers may need to be configured for WOL. For IBM WOL PC systems, make sure that the WOL option in the BIOS is set to ENABLED.
3. Make sure the network cable is fully attached to the adapter.

The LNK LED does not light when you connect the power

1. Make sure that the WOL cable is attached and power is applied to the computer.
2. Make sure that the network cable is attached at both ends.

Testing the Adapter Using the Diagnostics

Test the adapter by running diagnostics.

- For DOS or Windows 3.1, run Setup on the IBM Installation and Drivers CD-ROM or diskette.
- For Windows NT, Windows 95, or Windows 98, run IBMSet by double-clicking **IBMSet** in the Windows control panel.

To run diagnostics, select the adapter, click **Diagnostics**, and then click **Run Tests**. For additional information, click **Help** in the IBMSet window.

IBM Product Support

The following IBM product support is available:

- Internet Service

You can use the Internet to download software updates, troubleshooting tips, installation notes, and more. Contact the IBM Networking Web site at:

<http://www.ibm.com/networking/support>

- IBM Product Support
 - 1-800-772-2227 for IBM HelpCenter®
 - 1-800-237-5511 for IBM Support Services
 - 1-800-565-3344 for HelpPC (Canada)

Web Sites for Software Updates

You can download the necessary Microsoft and Novell software updates from the following sites:

- **Microsoft Service Pack 4:**

<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/ussp4/>

- **Microsoft Service Pack 3:**

<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/ussp3/>

- **Microsoft NDIS Driver Hotfix:**

<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/hotfixes-postsp3/ndis-fix>

- **Novell Support Pack 6 for NetWare 4.11 or Support Pack 1 for NetWare 5.0:**

<http://support.novell.com/misc/pat1st.htm>

Appendix F. 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.

Priority Packet is available on the IBM Networking Web site at:
<http://www.ibm.com/networking/support>

Prioritizing Network Traffic

Priority Packet lets you set up priority filters to send information from critical nodes or applications with an indicated priority. By prioritizing traffic 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 based on priority filters. These are parameters you assign to outgoing (transmit) packets. Using the Priority Filter Wizard, you can set up predefined or custom priority filters based on a node (MAC) address, Ethernet type, or by various properties of the protocol and port. Priority Packet provides two different methods for prioritizing traffic: IEEE 802.1p tagging and High Priority Queue.

IEEE 802.1p Tagging

IEEE 802.1p is IEEE standard for tagging, or adding additional bytes of information to, packets with different priority levels. Packets are tagged with 4 additional bytes, which increase the packet size and indicate a priority level. When these packets are sent out on the network, the higher priority packets are transferred first. Priority packet tagging (also known as Traffic Class Expediting) allows the adapter to work with other elements of the network (such as switches and routers) to deliver priority packets first. 802.1p tagging enables you to assign specific priority levels from 0 (low) to 7 (high).

Using the IEEE 802.1p standard for packet tagging, you can assign values to packets based on their priority. This method requires a network infrastructure that supports packet tagging. The routing devices receiving and transferring these packets on your network must support 802.1p for tagging to be effective.

After you set up the priority filter in Priority Packet, you must launch IBMSet and select **802.1p/802.1Q Tagging** on the Advanced tab.

Attention: IEEE 802.1p tagging increases the size of the packets it tags. Some hubs and switches will not recognize the larger packets and will drop them. Check your hub or switch documentation to see if they support 802.1p. (You can configure the switch to strip the tags from the packets and send it on to the next destination as normal traffic.) If these devices do not support 802.1p or if you are not sure, use High Priority Queue (HPQ) to prioritize network traffic.

The requirements for effectively using IEEE 802.1p tagging are:

- The other devices receiving and routing 802.1p tagged packets must support 802.1p.
- The adapters on these devices must support 802.1p (adapters using the Intel 82558 or higher Ethernet controller). All IBM 10/100 EtherJet PCI Adapters support 802.1p.
- The adapter cannot be assigned to an adapter team.
- If you are setting up VLANs and packet tagging on the same adapter, 802.1p/802.1Q Tagging must be Enabled on the IBMSet Advanced tab.

High-Priority Queue

If your network infrastructure devices do not support IEEE 802.1p or you are not sure, you can still define filters and send packets as high priority. While High Priority Queue (HPQ) does not provide the precise priority levels of 802.1p tagging, it does assign traffic as either high or low priority and sends high priority packets 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 does not change network routing, nor does it add any information to the packets.

To assign HPQ, you can specify it using Priority Packet when you create or assign a filter.

To effectively use HPQ tagging, the adapter cannot be assigned to an adapter team.

For more information on Priority Packet, refer to the related white papers on IBM's Networking Web site at

<http://www.ibm.com/networking/support>

Appendix G. PCI Installation Tips

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

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

Some common PCI solutions are listed here.

- Busmaster-enabled slots. On some computers, not all slots are busmaster enabled by default. Check your BIOS PCI bus setting. It will be set to either Busmaster or Non-busmastered. Select **Busmaster**.
- Reserve interrupts (IRQs) and/or memory addresses for ISA adapters. This prevents PCI cards from trying to use the same settings that ISA cards are using. Check your PCI BIOS setup program. There might be IRQ options such as Enable for ISA, Reserve for ISA, or Disable for PCI. This option is sometimes in the Plug and Play area of the BIOS setup.
- Enable the PCI slot. In some PCI computers, you must use the PCI BIOS setup program to enable the PCI slot. This is especially common in PCI computers with the PhoenixBIOS.
- Update your PCI BIOS. An updated PCI system BIOS can correct some PCI configuration problems. Contact your computer manufacturer to see if an updated BIOS version is available for your computer.
- Configure the slot for level-triggered interrupts. The slot that the adapter is using must be configured for level-triggered interrupts rather than edge-triggered interrupts. Check your PCI BIOS Setup program.

Here are some examples of PCI BIOS setup program parameters:

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

The exact wording of these parameters varies with different computers.

Removing an Existing Adapter in Windows 95

If you are replacing an existing adapter with a 10/100 EtherJet PCI Adapter, follow these steps before physically removing the adapter:

1. Double-click **My Computer**.
2. Double-click **Control Panel**.
3. Double-click **System**.
4. Click **Device Manager**.
5. Double-click **Network Adapters**.
6. Select the adapter driver listed below the Network Adapters group and click **Remove**.
7. Click **OK**.
8. Follow the instructions in “Chapter 1. Installing the Adapter Hardware” on page 1.

Push Installation for Windows 95

If you are a LAN administrator setting up server-based push installation of Windows 95 as defined in Microsoft Windows 95 Resource Kit, you will need to follow additional steps for this adapter. Refer to the Push Installation for Windows 95 README file on the IBM Support Web site.

Fast Ethernet Wiring

The 100BASE-TX specification supports 100-Mbps transmission over two pairs of Category 5 twisted-pair Ethernet wiring. One pair is for transmit operations and the other for receive operations. Segment lengths are limited to 100 meters with 100BASE-TX for signal timing reasons. This complies with the EIA 568 wiring standard.

Boot Agent

The Boot Agent is a utility program that is stored in a flash memory chip on the adapter, allowing the adapter to remotely boot the system from the network using 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 IBM LAN Client Control Manager or Intel LANDesk Management suite.

- The alternative method is RPL, an established industry standard historically utilized for remote booting of diskless workstations from network operating systems such as NetWare and Windows NT Server.

Computers do not need to be enabled for Wake on LAN to use this feature, and the feature will work with or without the 3-pin auxiliary power connector attached.

Configuration

When the computer is first powered on, the Boot Agent will execute and display the following message:

```
Initializing Boot Agent Version 2.0  
Press Ctrl+S to enter the Setup Program
```

By default, this message will display for 2 seconds, after which the agent will attempt to boot from a local drive. If the attempt to boot from a local drive fails, the agent will attempt to boot remotely.

To change the configuration of the Boot Agent, press **Ctrl+S** during the time that this message is displayed. This will bring up the Boot Agent configuration panel.

There are five configurable parameters. Follow the on-screen instructions to select, change and save the different parameters. The different parameters are explained below, with the default parameter listed first.

Boot Protocol

Selections are PXE and RPL. Select **PXE** for use with Wired for Management-compliant network management programs, such as IBM LAN Client Control Manager or Intel LANdesk Management Suite. Select **RPL** for legacy-style remote booting.

PnP/BEV Boot

Selections are Disable and Enable. Select **Disable** for normal remote boot operation. Select **Enable** if you want to use the computer BIOS boot sequence instead of the Boot Agent.

Default Boot

Selections are Local and Network. If you select **Local**, the Boot Agent will attempt to boot from a local drive first, then attempt to boot from the network if local boot fails. With IBM Personal Computer (PC) systems, selecting Local

also means that the adapter will let the system BIOS take over control of the Boot process. Therefore, based on the BIOS design for IBM PC systems, Local is the recommended setting.

If you select **Network**, the Boot Agent will attempt to boot from the network first. With IBM PC systems, selecting Network also means that the Boot Agent from the adapter would control the boot process instead of the system BIOS. This setting would cause conflict with IBM PC BIOS and this is **not** recommended with IBM PC systems.

Local Boot

Selections are Enable and Disable. If you select **Enable**, the system will be able to boot from a local drive (diskette drive or hard drive). If you select **Disable**, the system will not be able to boot from a local drive. This will be true regardless of the Default Boot setting.

Prompt Time

Selections are 2, 3, 5, and 8 representing the amount of time in seconds during which the following message is displayed every time the system is booted:

Initializing Boot Agent Version 2.0 - Press Setup Program

Troubleshooting Boot Agent

If you do not see the message Initializing Boot Agent Version 2.0, check the following:

In the computer setup, check for the boot device sequence. If **Boot Agent** or **Network** is listed, move it ahead of the hard drive in the boot sequence.

Some computers require manual intervention to execute the Boot Agent. Look for an informational note on the computer monitor after power-on that instructs you about executing a network boot.

Recommended Boot Sequence Setting for IBM Personal Computer Systems

The system BIOS for IBM PC systems is designed to control and handle the Remote Boot process for the adapter after the adapter has initialized a Remote Boot option.

As a result the following recommended Boot Sequence Setting is to be used with the IBM 10/100 EtherJet PCI Adapters for the Remote Boot option when the adapters are used in an IBM PC systems:

Boot Protocol: PXE (or RPL)
PnP/BEV Boot: Disable
Default Boot: Enable
Local Boot: Enable
Prompt Time: 2
Boot Msg: Enable
Power Mgmt: ACPI or APM

The adapters come with onboard boot ROM pre-flashed with latest Boot Agent Code that should already be set to the above boot sequence. If you experience boot problems, check the boot sequence by pressing **Ctrl-S** right after POST during system boot-up to make sure the boot sequence is set to the recommended setting.

Setting the Default Boot at Local does not mean just booting to the local hard drive or diskette drive. It actually means that the adapter will allow the BIOS to control the boot. If Network Boot is enabled in the BIOS then the system will attempt to boot to the network first, and then boot to the local hard drive or diskette drive if the boot to the network fails.

Setting the Default Boot to Network will enable the adapter to take over the Remote Boot process causing conflict with the BIOS and resulting in potential remote boot problems

If the system BIOS does not control the Remote Boot process, then the Network setting can be used with no problems.

Appendix H. Adapter Specifications

Compatibility	PCI V2.2 systems
Media (cable) Connectors and Wiring	<ul style="list-style-type: none">• RJ-45• Use Category 5 cabling at 100 Mbps• Supports 100BASE-TX Fast Ethernet
Data Rate Mode	10 or 100 Mbps
Interrupt Levels	PCI: INTA
SRAM Transmit/Receive Buffer	6 KB
Power Requirements	1.06 Watts at 5.0 V dc
Isolation Voltage	200 V rms
Operating Temperature	0 to 55 degrees C
Humidity	10% to 90% non-condensing
Diagnostic LEDs	Activity/Link, 100 Mbps
Diagnostic Software	<ul style="list-style-type: none">• On-board• IBMSet, Setup• Responder
Compliance and Certification	<ul style="list-style-type: none">• Safety - UL• FCC Class B• CE & Immunity• C-tick (Australian)

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Statement of Compliance with the United Kingdom Telecommunications Act 1984

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connections to the public telecommunications systems in the United Kingdom.

Electronic Emission Notices for Category 5 Data Grade Cables

IBM 10/100 EtherJet PCI Adapter — P/N 34L0801

IBM 10/100 EtherJet PCI Adapter with Wake on LAN — P/N 34L0201

IBM 10/100 EtherJet PCI Adapter with Alert on LAN 2 — P/N 34L1101

IBM 10/100 EtherJet PCI Management Adapter — P/N 34L1201

IBM Netfinity 10/100 Ethernet Adapter — P/N 34L1501 and P/N 34L0901

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- 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.
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Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Telephone - 19195432193

Industry Canada Class B Emission Compliance Statement

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Der Aussteller der Konformitätserklärung ist die

IBM Deutschland Informationssysteme GmbH
70548 Stuttgart

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Avis de conformité aux normes d'Industrie Canada

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Machine 10/100 EtherJet PCI Adapters

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