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1 Welcome to the IBM International ISDN PC Card!

Welcome to the IBM International ISDN PC Card. Thank you for choosing this product.

The IBM International ISDN PC Card is a passive ISDN adapter in PCMCIA (credit card type) format. It was designed for basic rate ISDN interfaces, allowing use with one B channel at a rate of 64 Kbps or with two B channels simultaneously (multilinked) at 128 Kbps.

The adapter can be installed and operated in Windows 95, Windows 98, Windows NT 4.0 Workstation and Windows 2000 Professional.

For more information on how to install and use the adapter, please see the corresponding sections in this manual.

For further assistance, please refer to the telephone numbers included in the "Product Support Guide" delivered with the product. If you should need additional assistance, please contact your nearest IBM dealer or, if possible, connect to the following Internet site:

`http://www.pc.ibm.com/support`

2 How the “IBM International ISDN PC Card Drivers” CD is Organized

The “IBM International ISDN PC Card Drivers” CD contains the following directories:

\PORT	CAPI Port Drivers for Windows 95, Windows 98, Windows NT, and Windows 2000
\TOOLS	Tools, patches and updates
\WIN2000	CAPI 2.0 compliant device drivers for the IBM International ISDN PC Card for Windows 2000 Professional
\WIN95	CAPI 2.0 compliant device drivers for the IBM International ISDN PC Card for Windows 95
\WIN98	CAPI 2.0 compliant device drivers for the IBM International ISDN PC Card for Windows 98
\WINNT	CAPI 2.0 compliant device drivers for the IBM International ISDN PC Card for Windows NT 4.0 Workstation

3 Before Installing the IBM International ISDN PC Card

Before installing your IBM International ISDN PC Card, check the following web sites if possible:

The Microsoft Windows 95 update site:

<http://www.microsoft.com/windows95/downloads/>

The Microsoft Dial-Up Networking 1.3 update download site for Windows 95:

http://www.microsoft.com/windows95/downloads/contents/wurecommended/s_wunetworking/dun13win95/license.asp

The Microsoft Windows 98 update site:

<http://www.microsoft.com/windows98/downloads/corporate.asp>

The Microsoft Windows 2000 update site:

<http://www.microsoft.com/windows2000/downloads/>

For further assistance regarding the installation of specific patches or updates for any Microsoft Windows operating system, contact either Microsoft or your computer manufacturer's Helpdesk.

Be sure to have the user's manual or installation guide for your computer available for quick reference.

Also keep the original Windows 95, Windows 98, Windows NT 4.0 Workstation, or Windows 2000 CD at hand when you install the device drivers or software.

If you do not have a CD for your operating system, check whether the required .CAB files from Windows 95 or 98 are installed on the hard disk of your computer.

If you are using Windows NT 4.0 Workstation or Windows 2000 Professional, check whether your hard disk includes the I386 directory and its sub-directories from the original CDs.

If this is not the case, or if you require assistance to find the files in question, contact the manufacturer of your computer or your IT department specialist.

4 Installing the Device Drivers in Windows 95

4.1 Determining the Windows 95 Version in Use

Before beginning installation of the IBM International ISDN PC Card in Windows 95, check which version of Windows 95 you are using. For this purpose Microsoft has released the following instructions on their technical support web site:

To determine the version of Windows 95 you are running, proceed as follows:

1. In the Control Panel, double-click the "System" icon.
2. Click the "General" tab.
3. Locate the version number under the "System" heading and then refer to the following table:

Release	Version	File Dates
Windows 95 retail, OEM	400.95	11/07/95
Windows 95 retail SP1	4.00.950A	11/07/95
OEM Service Release 1	4.00.950A	11/07/95
OEM Service Release 2	4.00.1111* (4.00.950B)	24/08/96
OEM Service Release 2.1	4.03.1212-1214* (4.00.950B)	24/08/96-27/08/97
OEM Service Release 2.5	4.03.1214* (4.00.950C)	24/08/96-18/11/97

A comprehensive, up-to-date article on this subject can be reviewed on the web at the following URL:

<http://search.support.microsoft.com>

Search for the article "Q158238".

If you are running the initial release of Windows 95 (Windows 95 retail or OEM) you must first upgrade it to Windows 95 SP1 by downloading the corresponding Service Pack for your Windows 95 version. The Service Pack 1 can be found at

<http://www.microsoft.com/windows/software/localize/localize.htm>

If any of the above URLs are outdated, please contact your local Microsoft support desk for additional assistance.

4.2 Removing any PCMCIA Support Software

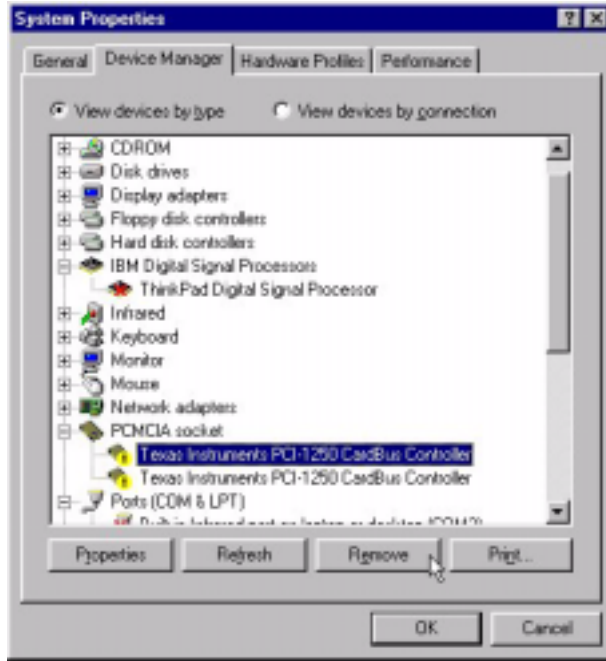
Some laptop manufacturers install PCMCIA support software such as Systemsoft's CardWizard as part of the Windows 95 package. IBM includes this program with its Thinkpad laptop series. This section briefly describes how to remove CardWizard from the system. This software must be removed to ensure correct operation of the IBM International ISDN PC Card.

1. Click "Settings / Control Panel" in the Windows "Start" menu.
2. Double-click the "Add/Remove Programs" icon in the Control Panel.
3. In the "Add/Remove Programs Properties" window, highlight the entry for "SystemSoft CardWorks".
4. Click the "Add/Remove..." button to remove CardWizard.





5. Confirm that this software is to be removed completely.
6. Once uninstallation is complete, click the "OK" button and then confirm that you want to reboot the system.
7. After rebooting, open the Control Panel again via "Start / Settings / Control Panel".
8. Double-click the "System" icon and select the "Device Manager" tab. On this page both PCMCIA sockets are displayed highlighted with a yellow exclamation mark.
9. Select each socket in turn and remove it from the Device Manager.



Ensure that you have both sockets removed!



Some Windows 95 versions may only show one PCMCIA socket instead of two.

Once you have removed the PCMCIA sockets, reboot your system.

While Windows 95 restarts, the operating system will reinstall the drivers for the PCMCIA sockets. After the reboot is complete, return to the Control Panel and check in the Device Manager to make sure that the PCMCIA sockets are now installed properly. If so, close the Device Manager by clicking the "OK" button.

The next step is to install PCMCIA support in Windows 95. Proceed as follows:



1. Double-click the "PC Card (PCMCIA)" icon in the Control Panel. Windows 95 will ask you a few questions and offer you some default values. Please read the next dialog boxes carefully and answer the questions accordingly.
2. Windows 95 will ask you to shut down your laptop. Confirm this by clicking "Yes". When you turn your laptop back on again, your computer is ready to use PCMCIA adapters.

4.3 Upgrading Dial-Up Networking for Windows 95

For proper operation of the IBM International ISDN PC Card your computer must have at least Microsoft Windows 95 with Service Pack 1 (Windows 95 version 4.00.950A) installed.

Check first whether Dial-Up Networking or any ISDN accelerator kit is installed:

1. Click through "Start / Settings / Control Panel" and then double-click "Add/Remove Programs".
2. In the first window, entitled "Install/Uninstall", check whether a newer version of the Microsoft Dial-Up Networking update is installed.



If an entry called "Dial-Up Networking Upgrade 1.2" is listed:

1. Highlight this entry and then click the "Add/Remove..." button to uninstall the older Dial-Up Networking upgrade.
2. Then restart your system and perform the Microsoft Dial-Up Networking 1.3 Upgrade from the \TOOLS\DUN13 directory on the CD, selecting the language version corresponding to your Windows 95 software.
3. Execute the file DUN13xx.EXE and follow the instructions on the screen.



If your country version is not available on the CD, install the English Dial-Up Networking update on your Windows 95 computer instead.

If there are no entries under "Install/Uninstall" referring to a Dial-Up Networking Update:

1. Click the "Windows Setup" tab.
2. In the next dialog, double-click the "Communications" icon and then deactivate the checkbox to the left of "Dial-Up Networking".
3. Click the "OK" button to confirm the operation.



If the Microsoft ISDN 1.1 Accelerator Pack is installed on your computer, a dialog will be displayed reporting that you are about to remove it. Click "Yes" to confirm the operation.

4. Restart your system and perform the Microsoft Dial-Up Networking 1.3 Upgrade from the CD directory \TOOLS\WIN95\DUN13 in the language version corresponding to your Windows 95 software.
5. Execute the file DUN13xx.EXE and follow the instructions on the screen.



If your country version is not available on the CD, install the English Dial-Up Networking update on your Windows 95 computer instead.

4.4 Installing the IBM International ISDN PC Card Using Windows 95 Service Release 1

Once you have prepared Windows 95 by following the instructions above, you are ready to install the IBM International ISDN PC Card.

1. Turn off the PC, select a PCMCIA slot and insert the IBM International ISDN PC Card into the slot without any cable attached.
2. Turn the PC back on. The "New Hardware Found" Wizard appears on screen and reports that it has found an "ISDN PC Card".

3. Now the drivers for the new hardware are requested. Insert the CD labeled "IBM International ISDN PC Card Drivers" into the CD-ROM drive of your computer.
4. Ensure that the option "Driver from disk provided by hardware manufacturer" is selected and then click "OK".
5. Next the "Install From Disk" dialog appears. Click the "Browse..." button and select the letter of the CD-ROM drive containing the "IBM International ISDN PC Card Driver" CD in the "Open" dialog. Select the "Win95" directory and then confirm your selection by clicking "OK".
6. The "Install From Disk" dialog appears again. Click "OK" once more to confirm the installation of the device drivers.
7. Click "OK" in the "Select Device" window. Installation of the device drivers begins.
8. The next dialog allows you to select the installation language. Confirm "English" by clicking "OK" and then "Continue".
9. In the next window, specify the target path for the drivers. By default this path is "IBM_ISDN". Click "Continue" to confirm this path, or type in a different target drive in the "Directory" field.
10. In the next dialog, select the appropriate D-channel protocol. In Europe you must select DSS1, the Euro-ISDN D-channel protocol. 1NI and 5ESS are D-channel protocols used in the USA. 1TR6 is the national D-channel protocol for Germany.



Although 1TR6 may be selected as a D-channel protocol, it is strongly recommended that you use the DSS1 protocol instead. The 1TR6 protocol is no longer very common and may be excluded from future driver releases for this adapter.

11. Once you have selected a D-channel protocol, click the "Continue" button.
12. The last dialog informs you what resources are occupied by the IBM International ISDN PC Card. Now plug in the cable.

You are now ready to use any CAPI 2.0 compliant software with your IBM International ISDN PC Card. If you wish to use non-CAPI 2.0 compliant software as well, please see the section „Installing the CAPI Port Drivers“ auf Seite 31.

4.5 Installing the IBM International ISDN PC Card Using Windows 95 Service Release 2.x

Once you have prepared Windows 95 by following the instructions above, you are ready to install the IBM International ISDN PC Card.

1. Turn off the PC, select a PCMCIA slot and insert the IBM International ISDN PC Card into this slot without any cable attached.
2. Turn the PC back on. The "New Hardware Found" Wizard detects the newly inserted IBM International ISDN PC Card as "ISDN PC Card".
3. Now insert the CD labelled "IBM International ISDN PC Card Drivers" into the CD-ROM drive of your computer.
4. The "Update Device Driver Wizard" informs you that it wants to install the device drivers for it. Click "Next".
5. When it has finished searching for the device drivers, click first "Other Locations..." and then the "Browse" button.
6. Select the letter of the CD-ROM drive containing the "IBM International ISDN PC Card Driver" CD in the "Browse for Folder" dialog. Click the the "Win95" directory entry and then confirm your selection with "OK".
7. Back in the "Select Other Location" dialog, click "OK".
8. Next select the "Finish" button in the "Update Device Driver Wizard" window.
9. Next the following message is returned: "Please insert the disk labeled 'IBM International ISDN PC Card Installation Windows 95', and then click OK."
10. Click the "OK" button to close this dialog. In the "Copying Files..." dialog, click the "Browse..." button and select the "WIN95" directory of the CD in the "Open" dialog. Click "OK" twice.

11. The next window allows you to select the installation language. Confirm "English" by clicking "OK" and then "Continue".
12. In the next dialog window you can specify the target path for the drivers. By default this path is "IBM_ISDN". Click "Continue" to confirm this path or type in a different target drive in the "Directory" field.
13. In the next dialog, the appropriate D-channel protocol may be selected. In Europe you must select DSS1, the Euro-ISDN D-channel protocol. The 1NI and 5ESS entries denote the D-channel protocols used in the USA. 1TR6 is the national D-channel protocol for Germany.



Although you can select 1TR6 as a D-channel protocol, it is strongly recommended that you use the DSS1 protocol instead. The 1TR6 protocol is no longer very common and may be removed from future driver releases for this adapter.

14. Once you have selected the D-channel protocol, click the "Continue" button.

15. The final dialog will inform you which resources are occupied by the IBM International ISDN PC Card. Now plug in the cable.

You are now ready to use any CAPI 2.0 compliant software with your IBM International ISDN PC Card. If you wish to use non-CAPI 2.0 compliant software as well, please see the section „Installing the CAPI Port Drivers“ auf Seite 31.

5 Installing the IBM International ISDN PC Card in Windows 98



The installation for the IBM International ISDN PC Card is the same for both Windows 98 First Edition and Second Edition.

To install the IBM International ISDN PC Card in Windows 98, proceed as follows:

1. Turn off the PC, select a PCMCIA slot and insert the IBM International ISDN PC Card into this slot without any cables attached.
2. Turn the PC back on. The “New Hardware Found” Wizard appears on screen and reports that it has found an “ISDN-CARD”.
3. Now insert the CD labeled “IBM International ISDN PC Card Drivers” into the CD-ROM drive of your computer.
4. Briefly thereafter, the “Add New Hardware Wizard” window informs you that the system is searching for the drivers for the adapter. Click “Next”.
5. Confirm that Windows should “Search for the best driver for your device. (Recommended).” by clicking “Next”.
6. In the next window you are asked where to search for drivers. By default the box to the left of “Floppy disk drives” is checked. Activate the box to the left of “Specify a location” and then click the “Browse” button. Select the letter of the CD-ROM drive containing the “IBM International ISDN PC Card Drivers” CD, click the “WIN98” directory and then click “OK”.
7. Now click the “Next” button to start the driver installation. The following window informs you that it is ready to install the FPCMSET.INF file for the ISDN PC Card. Click “Next”.

8. When the "Add New Hardware Wizard" informs you that it has completed the installation of the software required for the "IBM International ISDN PC Card", click "Finish".
9. The next window informs you that it is ready to install the drivers in English. Click "Continue".
10. The next screen welcomes you to the installation of the IBM International ISDN PC Card. Click "Continue".
11. The following window lets you select the target directory. By default this path is "C:\IBM_ISDN", but you can enter any other directory desired in the dialog. Once your entries are complete, click "Continue".
12. In the next dialog, select the appropriate D-channel protocol. In Europe you must select DSS1, the Euro-ISDN D-channel protocol. 1NI and 5ESS are D-channel protocols used in the USA. 1TR6 is the national D-channel protocol for Germany.





Although you can select 1TR6 as a D-channel protocol, it is strongly recommended that you install the DSS1 protocol instead. The 1TR6 protocol is no longer very common and may be removed from future driver releases for this adapter.

13. Once you have selected the D-channel protocol, click "Continue".
14. The last dialog informs you which resources are occupied by the IBM International ISDN PC Card. Now plug in the cable.

You are now ready to use any CAPI 2.0 compliant software with your IBM International ISDN PC Card. If you wish to use non-CAPI 2.0 compliant software as well, please see the section „Installing the CAPI Port Drivers“ auf Seite 31.

6 Installing the IBM International ISDN PC Card in Windows NT Workstation



The following section assumes that you are logged on to a Windows NT 4.0 Workstation system as an administrator. If you're not logged on as an administrator it might be that you can not perform all the steps outlined in this chapter.

6.1 Before Installing any Drivers

Before you install the IBM International ISDN PC Card in Windows NT Workstation, you must have Service Pack 3 or higher installed. To check which version of Service Pack is installed onto your Windows NT 4.0 Workstation operating system, proceed as follows:

1. Click through the menus "Start / Programs / Command Prompt". In the command prompt window, type **WINVER** and press "Return". A window similar to the one below appears.



2. Click "OK" to close the window, type **EXIT** in the command prompt window and press "Return" to close it.

6.2 Removing any PCMCIA Support Software

Some laptop manufacturers install PCMCIA support software such as Systemsoft's CardWizard as part of the Windows NT 4.0 Workstation package. IBM includes this program with its Thinkpad laptop series. This section briefly describes how to remove CardWizard from the system. This software must be removed to ensure correct operation of the IBM International ISDN PC Card.



1. Click "Start" in the menu bar and select "Settings / Control Panel" to open the Control Panel. Double-click the "Add/Remove Programs" icon.
2. The first panel of the "Add/Remove Programs Properties" window includes the entry for "CardWizard for Windows NT". Highlight it and then click the "Add/Remove..." button.



3. In the "Confirm File Deletion" dialog, confirm the removal of CardWizard for Windows NT by clicking the "Yes" button. In the next dialog, confirm that you want remove all files.
4. Once the removal of CardWizard is complete, you will be presented with a dialog asking you whether you want to restart your system. Click "No", as restarting your system may cause problems. Instead run the Service Pack for your Windows NT 4.0 Workstation computer.

After the Service Pack has been run again, your computer will restart. You may now begin installation of the IBM International ISDN PC Card.

6.3 Installing the IBM International ISDN PC Card in Windows NT 4.0 Workstation

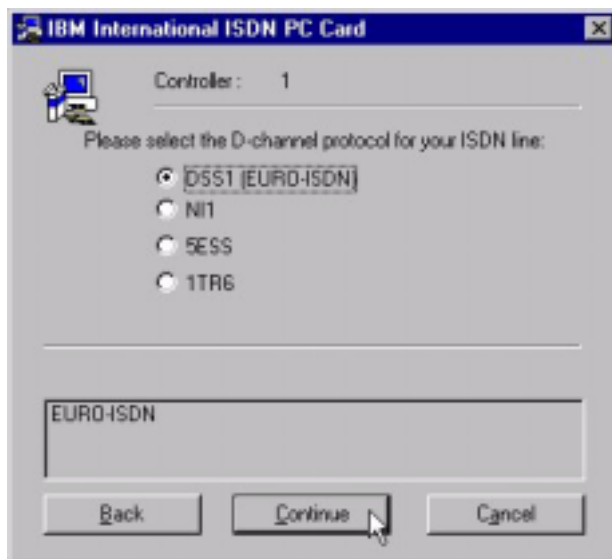
To install the IBM International ISDN PC Card in Windows NT 4.0 Workstation, proceed as follows:

1. Turn off the PC, select a PCMCIA slot and insert the IBM International ISDN PC Card into this slot without any cable attached.
2. Turn your PC back on and insert the CD labeled "IBM International ISDN PC Card Drivers" into the CD-ROM drive of your computer.
3. Double-click the "My Computer" icon on the Windows NT desktop and then double-click the CD-ROM icon. Open the "WINNT" folder with a double-click. This folder contains an icon called "Setup". Double-click to start installation.
4. The first window allows you to select the installation language. If the highlighted language is not the one desired, highlight the correct one and click "Continue".
5. The next window welcomes you to the installation process of the IBM International ISDN PC Card. Click "View Readme now" to read the latest information on the product, or "Continue" to proceed with installation of the CAPI 2.0 drivers for the IBM International ISDN PC Card.
6. The next window lets you specify the target directory for the IBM International ISDN PC Card. By default this is "C:\IBM_ISDN". Click "Continue" to confirm this directory or enter any other drive and directory name as the target for the drivers.
7. The next panel shows you what resources are available on your system and how many adapters you have installed. Since Windows NT 4.0 is not a plug-and-play operating system, assigning free resources is not an easy task.



Once you have set the resources, click "Continue".

8. In the next dialog, select the appropriate D-channel protocol. In Europe you must select DSS1, the Euro-ISDN D-channel protocol. 1NI and 5ESS are D-channel protocols used in the USA. 1TR6 is the national D-channel protocol for Germany.



Although you can select 1TR6 as a D-channel protocol it is strongly recommended that you install the DSS1 protocol instead. The 1TR6 protocol is no longer very common and may be removed from future driver releases.

9. Once you have selected the D-channel protocol, click the "Continue" button.
10. The last dialog displays the adapter settings again. Click "Continue" to complete the installation.
11. Once the installation is complete plug in the cable.

You are now ready to use any CAPI 2.0 compliant software with your IBM International ISDN PC Card. If you wish to use non-CAPI 2.0 compliant software as well, please see the section "Installing the CAPI Port Drivers" on page 31.

7 Installing the Device Drivers in Windows 2000 Professional

To proceed with installation of the device drivers in Windows 2000 Professional, proceed as follows:

1. Turn off the PC, select a PCMCIA slot and insert the IBM International ISDN PC Card into this slot without any cable attached.
2. Turn the PC back on. The “Found New Hardware” dialog appears on screen and reports that it has found an “ISDN CARD_”.
3. Now insert the CD labeled “IBM International ISDN PC Card Drivers” into the CD-ROM drive of your computer.
4. Next the “Found New Hardware” Wizard appears on screen. Click the “Next” button to start the driver installation. The following dialog informs you that “This Wizard will complete the installation for this device: ISDN CARD_”. Make sure that the radio button left of “Search for a suitable driver for my device (Recommended)” is activated. Click the “Next” button.



5. The next window helps you to locate the drivers for the inserted adapter. By default Windows 2000 will search on the disk and CD-ROM drives. This may result in Windows 2000 Professional finding the wrong driver file on the CD. To avoid this, deactivate the boxes to the left of "Disk drives" and "CD-ROM drives" and check the box to the left of "Specify a location".

Click the "Next" button.

6. Windows 2000 Professional displays a smaller dialog for the source of the drivers. Click the "Browse" button and select the "WIN2000" folder on the CD.
7. This returns you to the previous dialog. This time the correct source drive and directory are displayed. Click "OK".
8. The "Found New Hardware Wizard" informs you that drivers have been found. Click the "Next" button. Windows 2000 begins the driver installation.
9. The Wizard warns that the "Digital Signature" for the driver has not been found. Click "Yes" to continue the installation.
10. Click "Yes" in the next window to accept a similar warning regarding the NDIS WAN CAPI Driver.

11. When the "ISDN - IBM International ISDN PC Card" window subtitled "ISDN Switch Type or D-channel Protocol" appears on screen, select the appropriate protocol. In Europe you must select "European ISDN (DSS1)", the Euro-ISDN D-channel protocol. 1NI and 5ESS are D-channel protocols used in the USA. 1TR6 is the national D-channel protocol for Germany.



Although you can select 1TR6 as a D-channel protocol it is strongly recommended that you install the DSS1 protocol instead. The 1TR6 protocol is no longer very common and may be removed from future driver releases for this adapter.

12. Once you have selected your D-channel protocol, click the "Next" button. In Euro-ISDN you can enter "MSNs" (multiple subscriber numbers). These are unique numbers used to identify individual computers in your local ISDN network when more than one ISDN device is connected to your ISDN line.
13. The "Found New Hardware Wizard" will inform you when the installation has been completed. Then click "Finish" to complete installation.
14. Once installation is complete plug in the cable.

You are now ready to use any CAPI 2.0 compliant software with your IBM International ISDN PC Card. If you wish to use non-CAPI 2.0 compliant software as well, please see the section „Installing the CAPI Port Drivers“ auf Seite 31.

8 Installing the CAPI Port Drivers

8.1 Introduction - What are the CAPI Port Drivers?

If you have successfully installed the drivers for the IBM International ISDN PC Card, you have in fact installed CAPI 2.0 compliant drivers. Thus it is possible to use CAPI 2.0 compliant software directly, such as the FRITZ! Software package included with the ISDN PC Card, Symantec's Winfax Pro 9.0, PC Anywhere 8.x, or any other. A list of CAPI 2.0 compliant software can be found in the Internet at

<http://www.capi.org/cgi/sinfo.pl>

However, much software is not CAPI 2.0 compliant, including AOL 5.0, the CompuServe 3.0 dialer and many other applications. The CAPI Port Drivers are included in this package so that such programs can be used via ISDN. These drivers install a set of virtual modems which allows you to use practically any software that relies on communicating with a modem.

In principle, the CAPI Port introduces a layer between the application you use and the CAPI 2.0 interface. It takes the modem AT commands and converts them into CAPI 2.0-compliant API calls to make your ISDN line available even to software which does not support ISDN communication.



The CAPI 2.0 interface is not restricted to Europe -- it works all over the world!

8.2 Prerequisites for the CAPI Port Installation

Before the CAPI Port Drivers may be installed, the device drivers for the IBM International ISDN PC Card must be installed in your system.

If you already have CAPI Port Drivers installed on your system, reinstallation may not be possible without removing the older driver versions. See the relevant sections in the chapter „Removing the IBM International ISDN PC Card“ auf Seite 51.

8.3 Installing the CAPI Port Drivers in Windows Operating Systems

Windows 95 and Windows 98



It is strongly recommended that the Microsoft Dial-Up Networking Update 1.3 be installed in your Windows 95 system before installing the CAPI Port Drivers. See also the chapter „Installing the Device Drivers in Windows 95“ auf Seite 7.

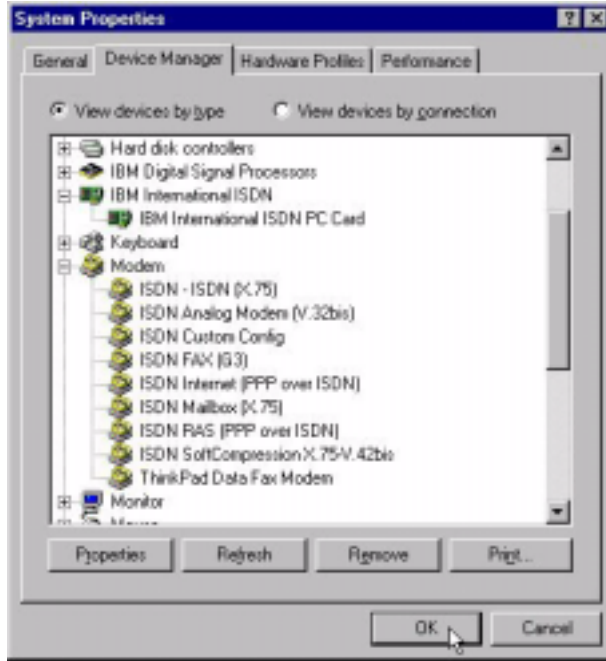
1. Insert the CD labeled “IBM International ISDN PC Card Drivers” into the CD-ROM drive of your computer.
2. Open the “My Computer” icon on the desktop with a double click.
3. Open the folders “Port”, “Win95” and then “English” by double-clicking each.
4. In the “English” folder you will find a “Setup” icon. Double-click this icon to launch the CAPI Port Driver installation.



5. If you do not plan to install other modem emulator software for CAPI 2.0 drivers such as cFos, leave all selections as they are displayed above. Just click “OK” to confirm the installation of the drivers.

Once the installation is complete you will be asked to restart your computer.

6. After rebooting you will find the following list of modems in the “Device Manager” of Windows 95 or Windows 98.



Every modem name that starts with “ISDN” is an emulated modem for the CAPI 2.0 interface provided by the CAPI Port Drivers.

Now you are ready to use non-CAPI 2.0 compliant communication software with the IBM International ISDN PC Card as well.

Windows NT 4.0 Workstation



The following section assumes that you are logged on to a Windows NT 4.0 Workstation system as an administrator. If you do not have administrator rights, you may not be able to perform all of the steps outlined in this chapter.

In order to install the CAPI Port Drivers under Windows NT 4.0 Workstation, “Remote Access Service” must be installed.

Check this by double-clicking first the "My Computer" icon on the desktop, and then the "Dial-Up Networking" icon. Please read the following section to see whether it applies to your Windows NT 4.0 Workstation configuration.

Remote Access Service is not installed

If Remote Access Service is not installed, a dialog appears informing you about the purpose of Dial-Up Networking and reporting that it is currently uninstalled.

1. Click the "Install" button to install the Remote Access Service and Dial-Up Networking now.
2. First the installation process asks you for the location of the Windows NT 4.0 Workstation source file directory, i.e. the I386 directory of the original Windows NT 4.0 Workstation installation CD. Enter the correct path to this I386 directory, e.g. if the directory is on E:\I386, enter **E:\I386** in the "Copy files from" entry field. Click the "OK" button.

The installation process starts by installing services and files such as the Windows Workstation service, the Windows Server service.

3. Once it has finished the first part of the Dial-Up Networking installation, the "Remote Access Setup" dialog appears. This informs you that no RAS capable device is installed and that you now can launch the Modem installer to do so. Click "Yes".
4. The "Install New Modem" dialog appears. During this installation, a modem for temporary use is installed. Prevent Windows NT 4.0 from detecting your modem by checking the box to the left of "Don't detect my modem; I will select it from a list" and then click "Next".
5. Once Windows NT 4.0 Workstation has finished building the modem list, it displays a dialog with two selection windows: "Manufacturers" and "Models". In the "Manufacturers" column, select the "(Standard Modem Types)" and in the "Models" column select "Dial-Up Networking Serial Cable between 2 PCs" by highlighting each of these entries. Now click the "Next" button.

6. The next window lets you choose the serial port (COM port) for the previously selected modem. Make sure that the radio button to the left of "Selected ports" is activated and click any serial port in the window below. Then click the "Next" button.
7. In the next dialog, click "Finish".
8. You are now back in the "Add RAS Device" window, which now reports which modem it will install. Click "OK".
9. Back in the "Remote Access Setup", click the "Continue" button. Now you will be informed that no protocol has been installed. Click the "OK" button.
10. In the next dialog, check only the box to the left of "TCP/IP", then click the "OK" button again and return to the "Remote Access Setup". Click the "Continue" button.
11. Once Windows NT 4.0 Workstation is finished with the installation of the Remote Access Service it will ask you whether or not you would like to restart your computer. To avoid problems with your Windows NT 4.0 Workstation installation, click the "Do Not Restart" button and reapply the current service pack.

Remote Access Service is installed

If you have Remote Access Service installed, after double-clicking the "Dial-Up Networking" icon, a dialog may appear asking you to supply location information.

1. Select your country from the drop-down list and then enter your current local area code in the input field "What area (or city) code are you in now?". Click the "Close" button.
2. Next you may be informed that the phonebook is empty. Click "OK". If the "New Phonebook Entry Wizard" appears, click "Cancel". Dial-Up Networking has been properly installed on your Windows NT 4.0 Workstation computer.

If none of the previously described dialogs appear on-screen, but the “Dial-Up Networking” dialog immediately appears complete with a phonebook entry to dial, simply click “Close”. Dial-Up Networking has been properly installed on your Windows NT 4.0 Workstation computer.

Install the CAPI Port Drivers for Windows NT

1. Insert the CD labelled “IBM International ISDN PC Card Drivers” into the CD-ROM drive of your computer.
2. Open the “My Computer” icon on the desktop by double-clicking it. Open the folders “Port”, “Wnt” and then “English” by double-clicking each. The “English” folder contains a “Setup” icon. Double-click this icon to launch the CAPI Port Driver installation.



3. If you do not plan to install other modem emulator software for CAPI 2.0 drivers such as cFos, leave all selections as they are displayed above. Just click “OK” to confirm the installation of the drivers. Once the installation is complete you will be asked to restart your computer.

After your computer has restarted you must reconfigure Remote Access Service so that you can use the Windows NT 4.0 Workstation Dial-Up Networking to connect over ISDN to any service desired.

1. Click "Start / Settings / Control Panel" to open the Control Panel. Double-click the "Network" icon and then click on the "Services" tab.
2. Click "Remote Access Service" once and then double-click the "Properties..." button.
3. The "Remote Access Setup" dialog appears. Click the "Add..." button. If you see a device starting with "ISDN", click the "OK" button.

Repeat this procedure until you have added all "ISDN" devices desired.

4. Back in the "Remote Access Setup" window, click the "Continue" button. This returns you to the "Network" window.
5. In the "Network" window, click "Close".

Windows NT 4.0 Workstation will complete the Remote Access Service configuration. When prompted to restart the computer click "Yes".

After the system restart, the CAPI Port driver installation and configuration is completed successfully.

Windows 2000 Professional

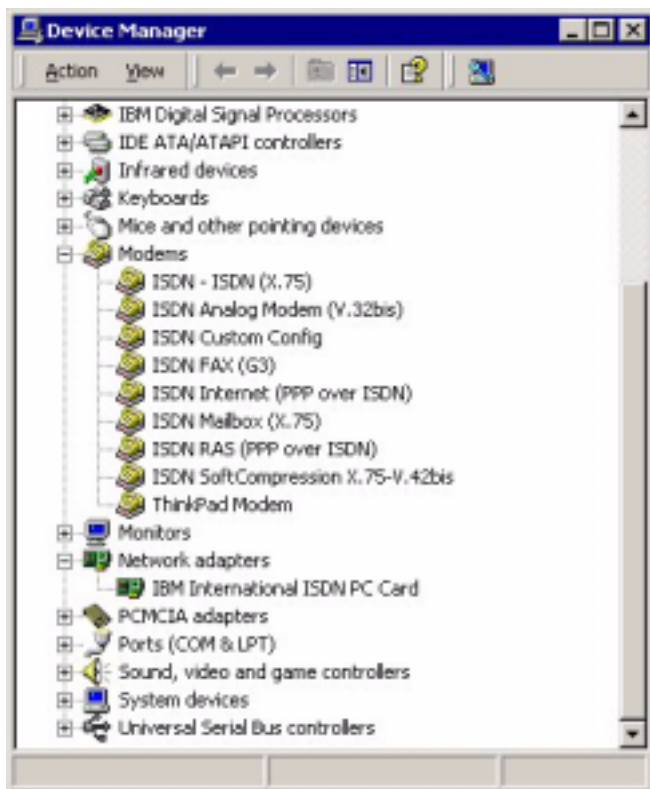
The installation of the CAPI Port Drivers in Windows 2000 Professional is similar to the installation in Windows 95 or Windows 98.

1. Insert the CD labeled "IBM International ISDN PC Card Drivers" into the CD-ROM drive of your computer.
2. Open the "My Computer" icon on the desktop with a double-click. Open the folders "Port", "Wnt" and then "English" by double-clicking each. The "English" folder contains a "Setup" icon. Double-click it to launch the CAPI Port Driver installation.



3. If you do not plan to install other modem emulator software for CAPI 2.0 drivers such as cFos, leave all selections as they are displayed above. Just click "OK" to confirm the installation of the drivers. Once the installation is complete you will be asked to restart your computer.

After the system restart you will find in the Windows 2000 Professional Device Manager the CAPI Port Drivers installed as modems.



9 Installing the NDIS WAN CAPI Driver

The NDIS WAN CAPI Drivers have been included to complete the driver package, but generally it is not necessary to install them. In the majority of cases in which the IBM International ISDN PC Card is used, installation of the CAPI 2.0 compliant device drivers and the CAPI Port Drivers is sufficient. This chapter briefly describes how to install these drivers in Windows 95, Windows 98, and Windows NT 4.0 Workstation. In Windows 2000 Professional the NDIS WAN CAPI Drivers are installed by default.

9.1 Windows 95 and Windows 98



If you have not installed the CAPI 2.0 compliant device drivers and the CAPI Port Drivers, please return to the corresponding chapters and install them first.

The installation of the NDIS WAN CAPI Drivers is identical for Windows 95 and 98. At a certain stage of installation you may be asked again to specify the location of the NDIS WAN CAPI drivers. Simply enter the path to the driver source files again.

1. Insert the CD labeled "IBM International ISDN PC Card Drivers" into the CD-ROM drive of your computer.
2. Click "Start / Settings / Control Panel" to open the Control Panel. Double-click the "Network" icon.
3. In the "Configuration" window, click "Add...".
4. In the "Select Network Component Type" window, click "Adapter" and then "Add...".
5. In the "Select Network Adapters" window, click "Have Disk...".
6. Click the "Browse" button in the "Install From Disk" dialog and then select the CD-ROM drive icon from the "Drives" drop-down list in the "Open" dialog.

Select the path “\WIN95\NDISWAN” and then click “OK”.

7. Click “OK” to close the “Install From Disk”, “Select Network adapters”, and “Network” dialogs.
8. Windows 95 begins the ISDN Configuration. Click the “Next” button.

Leave the selection of the “Switch protocol” on “Automatic” by clicking the “Next” button again.

9. The next window will ask you for two phone numbers and the corresponding SPID. Since this is only required for the USA and Canada, leave these fields blank and just click the “Next” button.
10. In the last dialog click “Finish”.

The NDIS WAN CAPI Drivers were installed successfully.

9.2 Windows NT 4.0 Workstation

1. Insert the CD labeled “IBM International ISDN PC Card Drivers” into the CD-ROM drive of your computer.
2. Click “Start / Settings / Control Panel” to open the Control Panel. Double-click the “Network” icon.
3. Click on the “Adapters” tab and then the “Add...” button.
4. In the “Select Network Adapter” dialog, click “Have Disk...”.
5. In the “Insert Disk” dialog, enter the correct path to the NDIS WAN CAPI drivers, e.g. if your CD-ROM drive has the letter E, enter **E:\winnt\ndiswan**. Click “OK”.
6. In the “Select OEM Option” window, click the “OK” button again.
7. Under the “NDIS WAN CAPI Driver Properties” you can enter two MSN's (Multiple Subscriber Number) if desired. Note that MSNs are only available in the Euro-ISDN environment. Alternatively, leave the fields blank and just click “OK”.

8. The last dialog reports that the installation is complete. Click "OK".
9. Since the NDIS WAN CAPI Drivers are to be used with the Remote Access Service, the Remote Access Setup will be launched. Click the "Add" button and add the "ISDN1 - NDISWAN" by clicking "OK". Click the "Add" button again and add the "ISDN2 - NDISWAN" by clicking "OK".

Click "Continue" and then, back in the Network window, click the "Close" button.
10. Once Windows NT 4.0 Workstation has completed the configuration of the changed network settings, it will ask you to restart the computer. Click "Yes" to restart your system.

This completes the installation of the NDIS WAN CAPI Drivers.

10 Configuration of the IBM International ISDN PC Card

This chapter briefly describes how to change the D-Channel protocol, also referred to as the switch type, and how to diagnose the adapter.



No diagnostics tool is available for Windows 2000 Professional.

When you travel to another country outside Europe, it may be necessary to change D-Channel protocol, also known as the switch type. The IBM International ISDN PC Card supports the following D-Channel protocols:

- Euro-ISDN (DSS1)
- NI1
- 5ESS

Euro-ISDN is used all over Europe, Australia and New Zealand. NI1 and 5ESS are North American switch types.



In the USA, Canada, Australia, or New Zealand it is not possible to use the IBM International ISDN PC Card directly. To use this adapter in these countries, an NT1 adapter is required to convert the U interface used in these countries to the European S/T interface.

Make sure that you purchase an NT1 with the capability to convert the U interface to a S/T interface.

10.1 Changing the Switch Type in Windows 95, Windows 98, Windows NT 4.0 Workstation

1. Click "Start / Programs / IBM ISDN PC Card" and then "IBM ISDN PC Card Setup" to launch the configuration tool.

Windows NT 4.0 Workstation: The first window will allow you to change the adapter's resources (interrupt and I/O address). Change the resources or simply click "Continue". The next window will allow you to select the switch type.

2. Select the desired switch type and then click "Continue". The next window informs you about the adapter configuration.
3. Click "Continue" again. In order to activate the selected switch type you must restart your computer.

10.2 Changing the Switch Type in Windows 2000 Professional

1. Click "Start / Settings / Control Panel" to open the Control Panel. Double-click the "System" icon.
2. Click the "Device Manager" button.
3. Click the plus sign to the left of "Network adapters" and then click "IBM International ISDN PC Card" with the right mouse button.
4. In the pop-up menu, click the "Properties" command.
5. In the "IBM International ISDN PC Card Properties" click the "ISDN" tab and then select the desired switch type.
6. Click "OK" and then restart the computer.

10.3 Running the Diagnostics in Windows 95/98/NT 4.0 Workstation

1. Click "Start / Programs / ISDN PC Card" and then "ISDN PC Card Test". You will be informed that the CAPI will no longer be available after testing, and that you will have to reboot your computer.
2. Click "Yes" to continue. Now the diagnostics will be performed.

3. Upon conclusion of the diagnostics program, the system reports that the tests were completed. Click "OK" again.
4. The next window informs you that the CAPI is no longer available. Click "OK".

Confirm that you want to restart your computer to re-activate CAPI by clicking "Yes".

11 Setting Up Internet Access

This chapter describes briefly how to use one B channel at 64 Kbps or both B channels at 128 Kbps for Internet access. Remember: The IBM International ISDN PC Card is an ISDN base rate adapter. Therefore a maximum of two ISDN B channels can be used with this adapter.

11.1 Windows 95 and Windows 98

Creating a Connection Using One B Channel

1. Double-click the "My Computer" icon in the Windows 95/98 desktop. Double-click the "Dial-Up Networking" icon. In the welcome window, click "Next".
2. In the "Make New Connection" dialog, enter the type and name of the computer to be dialed in the "Name" entry field to define a name for the connection. Select "ISDN Internet (PPP over ISDN)" as the device and then click "Next".
3. In the next window enter the area code and phone number. If necessary, change the country code. Click "Next" again.

Now you can enter a user name and a password and dial into the server.

Creating a Connection Using Both B Channels

This method is also referred to as multilinking. Proceed as follows:

1. Create a new Dial-Up Networking connection as described in section "Creating a Connection Using Both B Channels" on page 47. Instead of dialing, click "Cancel".
2. Back in the "Dial-Up Networking" window, click the new entry with the right mouse button.

3. Click in the pop-up menu on the "Properties" entry.
4. Click the "Multilink" tab. Select "Use additional devices", and then click "Add...".
5. In the "Edit Extra Device" dialog, select the "ISDN RAS (PPP over ISDN)" entry from the drop-down menu and then click "OK".
6. To save your settings, click "OK" again.



In Europe it is not necessary to specify an additional phone number for the second B channel. If you leave this field blank, the number specified for the "ISDN Internet (PPP over ISDN)" will be used to dial with the "ISDN RAS (PPP over ISDN)".

11.2 Windows NT 4.0 Workstation

Creating a Connection Using One B Channel

1. Double-click the "My Computer" icon on the desktop of the Windows NT 4.0 Workstation.
2. Double-click the "Dial-Up Networking" icon. The "New Phonebook Entry Wizard" appears on screen and requests a name for the new phonebook entry. Type in any name you like.
3. In the "Server" window, select "I am calling the Internet".
4. In the "Modem or Adapter" window, select the entry for "ISDN Internet (PPP over ISDN)".
5. In the next window, enter the phone number you wish to dial.
6. Finally click "Finish".

Creating a Connection Using Both B Channels

This method is also referred to as multilinking. Proceed as follows:

1. Create a new Dial-Up Networking connection as described in the section "Creating a Connection Using One B Channel" on page 48.

If you are presented during the setup with the possibility to "Multilink all ISDN lines", do not activate this option as it may result in a malfunctions due to an improper configuration.

2. Once the new connection is complete, click the "More" button and select "Edit entry and modem properties..." from the drop-down menu.
3. In the "Basic" window of the "Edit Phonebook Entry" dialog, click the arrow in the "Dial using" drop-down menu.
4. Select "Multiple Lines" and click "Configure".
5. Click in the box to the left of the entry "ISDN RAS (PPP over ISDN)" and then "OK".
6. Click "OK" again.

Now you are ready to dial into your Internet account with multilinked ISDN lines.

11.3 Windows 2000 Professional

Creating a Connection Using One B Channel

1. Click "Start / Settings / Dial-Up Networking" to launch the "Network Connection Wizard".
2. Click "Dial-up to private network" and then "Next".
3. In the device list deactivate the checkbox "All available ISDN lines multi-linked".
4. Check the box to the left of "Modem - ISDN Internet (PPP over ISDN)" and then click "Next".

5. In the next dialog, enter the phone number to be dialed and click "Next".

Once you've finished the setup you are ready to connect to your Internet Service Provider.



When you select the menu item "Dial-up to the Internet" during the setup process in Windows 2000 Professional, you will be automatically connected to the Microsoft Network (MSN). If you wish to choose Microsoft as your Internet Service Provider (ISP) select the corresponding menu item.

Creating a Connection Using Both B Channels

1. Create an Internet connection as described in section "Creating a Connection Using One B Channel" on page 49. Do not connect to your Internet Service Provider upon completion.

Instead, click the "Settings..." button and then the "Internet Properties" on the "Connections" page.

2. In the box for "Dial-up settings", click the connection to be used for multilinking.

Click the "Settings" button to the right of the connection.

3. In the "Dial-Up settings" section at the bottom of the dialog, click the "Properties" button.

In the "General" window, select the "ISDN RAS (PPP over ISDN)" in the "Connect using" window by checking the box to its left.

4. Underneath the devices list, check the box to the left of "All devices call the same numbers".

Click the "OK" button at the bottom of this window. Click "OK" again to conclude the task.

You are now ready to connect to your Internet Service Provider with two ISDN B channels at the same time.

12 Removing the IBM International ISDN PC Card

The IBM International ISDN PC Card is removed in three steps from your Windows based computer:

- Removing any NDIS WAN CAPI Drivers installed
- Removing any CAPI Port Drivers installed
- Removing the CAPI 2.0-compliant drivers

12.1 Removing the ISDN PC Card from Windows 95 and Windows 98

1. Leave the IBM International ISDN PC Card in the PCMCIA slot. Disconnect the card from the ISDN socket.
2. Click "Start / Settings / Control Panel" to open the Control Panel.
3. Double-click the "Network" icon.

In the configuration window, click the NDIS WAN CAPI Driver in the network components window to select it.

4. Click the "Remove" button and then "OK". Confirm that you want to restart your computer.
5. Once your computer has restarted, open the Control Panel again. Double-click the "Add/Remove Programs" icon.

In the "Install/Uninstall" window, click the "ISDN CAPI Port" and then the "Add/Remove..." button. Once the CAPI Port drivers are uninstalled, confirm that you want to restart the computer.

6. Once your computer has restarted, open the Control Panel again. Double-click the "Add/Remove Programs" icon.
7. In the "Install/Uninstall" window, click the "IBM International ISDN PC Card".

8. In the "Remove IBM International ISDN PC Card" window, click "Continue".
9. Once the card has been removed completely, click "OK". When prompted to restart the computer click "No".
10. Shut down the computer and turn it off if necessary.
11. Remove the IBM International ISDN PC Card from the PCMCIA slot.

The removal of the adapter is complete.

12.2 Removing the ISDN PC Card from Windows NT 4.0 Workstation

1. Leave the IBM International ISDN PC Card in the PCMCIA slot. Disconnect the card from the ISDN socket.
2. Click "Start / Settings / Control Panel" to open the Control Panel.
3. Double-click the "Network" icon.
Click the "Adapters" tab and then "NDIS WAN CAPI Driver".
4. Click the "Remove" button and confirm that you want to remove this device.
5. Click "Close". Once Windows NT 4.0 Workstation has completed updating the network configuration, reboot your system.
6. Once your computer has restarted, open the Control Panel again. Double-click the "Add/Remove Programs" icon.
7. In the "Install/Uninstall" window, click the "ISDN CAPI Port" and then the "Add/Remove..." button.

Once the CAPI Port drivers are uninstalled, confirm that you want to restart the computer.

8. Once your computer has restarted, open the Control Panel again. Double-click the "Add/Remove Programs" icon.
9. In the "Install/Uninstall" window, click the "IBM International ISDN PC Card".
10. In the "Remove IBM International ISDN PC Card" window, click "Continue".

Once the card has been removed completely, click "OK".
11. When prompted to restart the computer, click "No".
12. Shut down the computer and turn it off if necessary.
13. Remove the IBM International ISDN PC Card from the PCMCIA slot.

The removal of the adapter is complete.

12.3 Windows 2000 Professional

1. Leave the IBM International ISDN PC Card in the PCMCIA slot. Disconnect the card from the ISDN socket.
2. Click "Start / Settings / Control Panel" to open the Control Panel.
3. Double-click the "Add/Remove Programs" icon. Make sure that the "Change or Remove Programs" icon is highlighted.
4. In the "Currently installed programs" window, click the "ISDN CAPI Port".

Click the "Change/Remove" button. Once the card has been removed completely, restart your computer.
5. Once the computer is restarted, open the Control Panel again. Double-click the "Add/Remove Hardware" icon.
6. When the "Add/Remove Hardware Wizard" is started, click "Next".
7. In the "Choose a Hardware Task" window, click "Uninstall/Unplug a device" and then "Next".

In the subsequent window click "Uninstall a device" and then "Next".

8. In the device list, click the entry for the "IBM International ISDN PC Card" and then "Next".
9. In the "Uninstall a device" window, confirm that the IBM International ISDN PC Card is to be removed. Click "Next".
10. Click "Finish" and then shut down your computer. Switch it off, if necessary.
11. Remove the IBM International ISDN PC Card from the PCMCIA slot.

The removal of the adapter is complete.

13 The Tools Folder

The “Tools” folder on the “IBM International ISDN PC Card Drivers” CD contains a number of tools and Help programs to assist in operation of the IBM International ISDN PC Card



The tools in this folder are supplied by IBM “as is”. IBM cannot held be responsible for any damages to your system incurred through their implementation and provides no support for these components.

The “ISDNWATCH” Folder

The “ISDNWATCH” folder contains the tool “ISDN Watch”. This tool works only in conjunction with CAPI 2.0 compliant devices. It allows you to see whether one or both B channels are in use, shows you how much money you have spent on your ISDN connection, and much more. Run the SETUP.EXE program in this folder to install this tool.

The “MSDUN13” Folder

The “MSDUN13” folder contains updates for the Microsoft Dial-Up Networking. These Microsoft Dial-Up Networking 1.3 Updates are included in English, French, German, Italian, and Spanish.

The “NDISWAN” Folder

The “NDISWAN” folder contains on-line Help for the NDIS WAN Drivers in the Windows NT and Windows 95 operating systems.

The corresponding on-line Help for the CAPI Port Driver is located in the “PORT” directory of the IBM International ISDN PC Card CD.