

**AVM ISDN-CONTROLLER**

**B1**  
v3.0

*M a n u a l*

*High-Performance ISDN by ...*



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## AVM ISDN-Controller B1 v3.0

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AVM Audiovisuelles Marketing  
und Computersysteme GmbH  
Alt-Moabit 95  
10559 Berlin

AVM Computersysteme Vertriebs  
GmbH & Co.KG  
Alt-Moabit 95  
10559 Berlin

AVM in the Internet: <http://www.avm.de>

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# Contents

<b>1</b>	<b>Introduction</b>	<b>8</b>
1.1	The AVM ISDN-Controller B1 v3.0 . . . . .	9
1.2	The Driver Software of the Controller B1 v3.0 . . . . .	10
1.3	System Requirements . . . . .	12
1.4	Package Contents . . . . .	12
<b>2</b>	<b>Installing the Hardware</b>	<b>14</b>
2.1	Instructions for the Different Operating Systems . . . . .	14
2.2	Setting the I/O Address . . . . .	14
2.3	Installing the ISDN-Controller B1 v3.0 in the Computer . . .	15
<b>3</b>	<b>Installation in Windows 2000</b>	<b>17</b>
3.1	Installing the Driver Software . . . . .	17
3.2	Changing the Settings. . . . .	19
3.3	Installing Additional Controllers. . . . .	20
3.4	Removing the ISDN-Controller B1 v3.0. . . . .	20
<b>4</b>	<b>Installation in Windows NT</b>	<b>22</b>
4.1	Installing the Driver Software . . . . .	22
4.2	Starting Operation of the ISDN-Controller B1 v3.0 . . . . .	24
4.3	Changing the Settings. . . . .	25
4.4	Installing Additional Controllers. . . . .	25
4.5	Removing the ISDN-Controller B1 v3.0. . . . .	25
<b>5</b>	<b>Installation in Windows Millennium</b>	<b>27</b>
5.1	Installing the New Hardware Device. . . . .	27
5.2	Configuring the ISDN-Controller B1 v3.0 . . . . .	29
5.3	Physically Installing the ISDN-Controller B1 v3.0 . . . . .	29
5.4	Installing the Driver Software . . . . .	30
5.5	Starting Operation of the ISDN-Controller B1 v3.0 . . . . .	31
5.6	Changing the Settings. . . . .	32
5.7	Installing Additional Controllers. . . . .	33
5.8	Removing the ISDN-Controller B1 v3.0. . . . .	33

---

<b>6</b>	<b>Installation in Windows 98</b>	<b>35</b>
6.1	Installing the New Hardware Device . . . . .	35
6.2	Configuring the ISDN-Controller B1 v3.0 . . . . .	37
6.3	Physically Installing the ISDN-Controller B1 v3.0 . . . . .	37
6.4	Installing the Driver Software . . . . .	37
6.5	Starting Operation of the ISDN-Controller B1 v3.0 . . . . .	39
6.6	Changing the Settings . . . . .	40
6.7	Installing Additional Controllers . . . . .	40
6.8	Removing the ISDN-Controller B1 v3.0 . . . . .	41
<b>7</b>	<b>Installation in Windows 95</b>	<b>42</b>
7.1	Installing the New Hardware Device . . . . .	42
7.2	Configuring the ISDN-Controller B1 v3.0 . . . . .	44
7.3	Physically Installing the ISDN-Controller B1 v3.0 . . . . .	44
7.4	Installing the Driver Software . . . . .	44
7.5	Starting Operation of the ISDN-Controller B1 v3.0 . . . . .	45
7.6	Changing the Settings . . . . .	46
7.7	Installing Additional Controllers . . . . .	47
7.8	Removing the ISDN-Controller B1 v3.0 . . . . .	47
<b>8</b>	<b>Installation in Windows 3.x</b>	<b>49</b>
8.1	Installing the Driver Software . . . . .	49
8.2	Configuring the ISDN-Controller B1 v3.0 . . . . .	51
8.3	Starting Operation of the ISDN-Controller B1 v3.0 . . . . .	52
8.4	Changing the Settings . . . . .	53
8.5	Installing Additional Controllers . . . . .	53
8.6	Removing the ISDN-Controller B1 v3.0 . . . . .	55
<b>9</b>	<b>Installation in MS-DOS</b>	<b>56</b>
9.1	Installing the Driver Software . . . . .	56
9.2	Configuring the ISDN-Controller B1 v3.0 . . . . .	58
9.3	Starting Operation of the ISDN-Controller B1 v3.0 . . . . .	59
9.4	Changing the Settings . . . . .	60
9.5	Installing Additional Controllers . . . . .	60
9.6	Removing the ISDN-Controller B1 v3.0 . . . . .	62

<b>10</b>	<b>Installation in Novell NetWare</b>	<b>63</b>
10.1	Installing the Driver Software . . . . .	63
10.2	ISDN-Controller B1 v3.0 Configuration with Stand-Alone CAPI . . . . .	65
10.3	Starting ISDN-Controller B1 v3.0 Operation with Stand-Alone CAPI . . . . .	66
10.4	Installing Additional Controllers with Stand-Alone CAPI . .	66
10.5	ISDN-Controller B1 v3.0 with CAPI for the CAPI Manager . .	67
10.6	Installing Additional ISDN-Controllers with the CAPI Manager . . . . .	68
10.7	Removing the ISDN-Controller B1 v3.0 . . . . .	68
<b>11</b>	<b>Installation in OS/2</b>	<b>70</b>
11.1	Installing the Driver Software . . . . .	70
11.2	Starting Operation of the Controller B1 v3.0 . . . . .	72
11.3	Changing the Settings. . . . .	73
11.4	Installing Additional Controllers. . . . .	73
11.5	Removing the Controller B1 v3.0 . . . . .	75
<b>12</b>	<b>The AVM ISDN-Controller B1 v3.0 on Point-to-Point ISDN Lines</b>	<b>76</b>
<b>13</b>	<b>AVM System Architecture</b>	<b>78</b>
13.1	The Applications Interface CAPI 2.0 . . . . .	78
13.2	IDM Architecture . . . . .	80
13.3	The AVM System Drivers . . . . .	81
13.4	CAPI SoftCompression X75/V42bis . . . . .	83
13.5	CAPI SoftFax. . . . .	84
<b>14</b>	<b>Technical Summary</b>	<b>85</b>
14.1	Connector Pin Assignments . . . . .	85
14.2	Features at a Glance . . . . .	86
14.3	Technical Specifications at a Glance . . . . .	87
<b>15</b>	<b>Technical Assistance from AVM Support</b>	<b>88</b>
15.1	Information and Updates . . . . .	88
15.2	AVM Support . . . . .	89

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<b>16</b>	<b>Troubleshooting</b>	<b>92</b>
16.1	General Malfunctions .....	92
16.2	Error Messages .....	95
<b>17</b>	<b>Support for Multiple Subscriber Numbers (MSNs)</b>	<b>105</b>
17.1	Introduction .....	105
17.2	Using MSN.EXE .....	105

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# Typographical Conventions

The following typographical conventions and symbols are used in this manual to make it more readable and to emphasize important information:

## Highlighting

The following table presents a short overview of the highlighting conventions used in this manual.

Highlighting	Function	Example
quotation marks	keys, buttons, program icons, settings pages, menus, commands	“Start / Programs” or “Enter”
capital letters	paths and files within floating text	SOFTWARE\INFO.PDF or README.DOC
pointed brackets	variables	<CD-ROM drive>
typewriter characters	entries made using the keyboard	<b>a:\setup</b>
gray and italics	information, tips and warnings; always appear with the corresponding symbols	<i>... for more information, see...</i>

## Symbols

The following symbols used in the manual always appear with gray, italicized text:



*This symbol indicates useful tips and supplementary information.*



*The exclamation point designates sections which contain important information.*



*Indicates especially important instructions that absolutely must be observed to ensure correct functioning.*

# 1 Introduction

Modern telecommunications have long since become much more than just making phone calls. Using the computer to surf the Internet, utilizing the resources of the company network through remote access, sending faxes, communicating with sales representatives by e-mail: electronic communications are opening up ever more interesting possibilities all over the world. To take advantage of these opportunities, a powerful telecommunications network is a must.

With the AVM ISDN-Controller B1 v3.0 you can connect your computer to ISDN. ISDN stands for **I**ntegrated **S**ervices **D**igital **N**etwork and is a digital telecommunications network available internationally. Three essential features make ISDN so convincing:

## **High Speed**

Data are transmitted on each of the two available B channels at a speed of 64Kbit/s. In practice, this provides for quick connections and short transmission times. The AVM ISDN-Controller B1 v3.0 also allows the two B channels to be bundled to double transmission speeds.

## **Integration of Services**

All telecommunications services, including telephony, fax, data transfer and video transmission, run over a single data network with ISDN. This means that all available services can be used with one ISDN access, making it possible, for example, to make a telephone call on one B channel while simultaneously receiving a fax on the other.

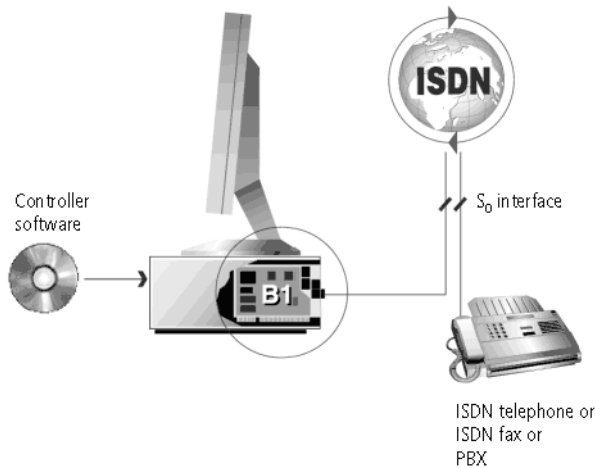
## **Outstanding Transmission Quality**

The third important feature of ISDN is the end-to-end digital transmission of data, the basis for high transmission quality. ISDN makes poor connections and faulty data transmissions a thing of the past.



## 1.1 The AVM ISDN-Controller B1 v3.0

The AVM ISDN-Controller B1 v3.0 constitutes the connection between the ISDN network and your computer.



### *Computer with AVM ISDN-Controller B1 v3.0*

The ISDN-Controller is simply plugged into a free slot on the ISA/EISA bus. The controller is connected to the ISDN basic access over the S<sub>0</sub> interface on the controller. This interface is connected to the ISDN access using the cable included in the controller package.

### **The Active Operating Principle of the Controller**

The AVM ISDN-Controller B1 v3.0 is an active controller and simultaneously processes both B channels of an ISDN basic access (2 x 64,000 bit/s). It owes its extraordinary capacity to the high-power processor (Transputer IMS T400) located on the controller. This processor makes the AVM ISDN-Controller B1 v3.0 the ideal platform for software applications with high demands on data throughput. The 1 MB RAM memory expansion makes it possible to load the protocols and other programs directly on the ISDN-Controller, such that the main memory and CPU of your computer are spared the computation burden of ISDN communications.

## 1.2 The Driver Software of the Controller B1 v3.0

The driver software takes control of the communications processes and data transmission.

The driver software is loaded to the ISDN-Controller from the hard disk. This process ensures that updates to the driver software can be carried out easily at any time.

The driver software can compress data according to the V.42bis standard. For more information about automatic data compression, see the section “CAPI SoftCompression X75/V42bis” on page 83.

The driver software also supports the analog Fax G3 service. For details, see the section “CAPI SoftFax” on page 84.

### CAPI (COMMON-ISDN-API)

The driver software for the Controller B1 v3.0 provides the industry standard CAPI applications interface on your computer. This interface specified by the international standardization organization ETSI guarantees the universal exchangeability of applications used for the ISDN services data transfer, fax and speech transmission. This interface allows the Controller B1 v3.0 to be used with a wide range of CAPI 2.0-based ISDN applications.

For more information about CAPI 2.0, see the section “The Applications Interface CAPI 2.0” on page 78.

### Protocols supported

The driver software supports the international D-channel protocol DSS1 (Euro ISDN), used in Europe and other parts of the world, and the international protocols NI1 and 5ESS (USA) are included in the standard package. Current drivers may be downloaded from the AVM Data Call Center or from the Internet. See the section “Information and Updates” on page 88 for information about how to reach the ADC or AVM’s Internet site.

## **Operating systems supported**

The CAPI driver software for the AVM ISDN-Controller B1 v3.0 is available for all operating systems for which a CAPI 2.0 standard is defined at the time of this printing: Windows 2000, Windows NT, Windows Millennium (Me), Windows 98, Windows 95, Windows 3.x, DOS, NetWare 5.x, 4.x and 3.x, OS/2 and Linux.

## **Applications without CAPI support**

The controller package includes three AVM system drivers: the AVM ISDN CAPI Port Driver, the AVM NDIS WAN Driver and the TAPI Services for CAPI. These system drivers allow you to use applications without CAPI support in parallel operation with ISDN applications based on CAPI. For example, you can use Microsoft Dial-Up Networking to connect your computer to the Internet or to access remote servers.

For detailed information about the AVM system drivers, see the section “The AVM System Drivers” on page 81.

## **Combining multiple ISDN-Controllers**

Combining multiple active AVM ISDN-Controllers in one computer is no problem. Up to four **active** AVM ISDN-Controllers can be operated at the same time. It is also possible to equip the computer with a combination of B1 Controllers for the PCI bus, the ISA bus and the USB, or to combine the B1 with the AVM ISDN-Controller C4. Such configurations make it simple to meet growing ISDN communication needs.

## **Compatibility with the AVM B1 Family**

The Multitask RISC transputer makes the AVM ISDN-Controller B1 v3.0 fully compatible with all earlier controller versions from the AVM B1 family. New features such as ECM (**E**rror **C**orrection **M**ode), support for new ISDN protocols and new operating systems thus are generally available for older controllers as well, depending on the capabilities of the hardware used.

## 1.3 System Requirements

The following hardware and software requirements must be met in order to use the Controller B1 v3.0:

- computer with a free ISA slot
- operating system: Windows 2000, Windows NT, Windows Millennium, Windows 98, Windows 95, Windows 3.x, DOS, Novell NetWare 5.x, 4.x or 3.x, OS/2 or Linux
- CD-ROM drive for installation of the driver software

## 1.4 Package Contents

The package contains:

- AVM ISDN-Controller B1 v3.0 (plug-in card for the ISA/EISA bus)
- cable for connecting the controller to the ISDN network (6 m)
- 1 “AVM ISDN-Controller B1 v3.0” manual
- 1 compact disk (CD-ROM) with all installation programs and the AVM ISDN-Tools

The CD-ROM includes:

- driver software for Windows 2000, Windows NT, Windows Me, Windows 98, Windows 95, Windows 3.x, MS-DOS, OS/2 and Novell NetWare 5.x, 4.x, 3.x
- AVM system drivers
  - AVM ISDN CAPI Port Driver
  - AVM NDIS WAN CAPI Driver
  - AVM ISDN TAPI Services for CAPI

- AVM ISDN Tools

The AVM ISDN-Tools are a collection of CAPI-based ISDN applications. They include such programs as “Connect32” for convenient data transfer in ISDN. For instructions on installing and operating this software, see the “AVM ISDN Tools” manual on the CD.

- 1 “AVM ISDN-Tools” manual in PDF format

Additional CAPI applications, such as FRITZ! or programs from other manufacturers, can be acquired separately from your vendor.



***To install the driver software from diskette, copy the installation programs from the CD or request the installation diskettes from AVM (for the address, see the inside cover). Be sure to specify the operating system used. The diskettes will be delivered to you free of charge.***

## 2 Installing the Hardware

The AVM ISDN-Controller B1 v3.0 can be operated on a number of platforms. The exact procedure for installing the ISDN-Controller differs for the various operating systems.

### 2.1 Instructions for the Different Operating Systems

#### **Windows 2000/NT/3.x/MS-DOS/OS/2/Novell NetWare**

If you work in Windows 2000, Windows NT, Windows 3.x, MS-DOS, OS/2 or Novell NetWare, first check which I/O address is available in your computer. Change the jumper position on the ISDN-Controller if necessary, then install the ISDN-Controller and its driver software. Follow the instructions in the section “Setting the I/O Address” on page 14.

#### **Windows Me/98/95**

Installation in Windows Millennium (Me), Windows 98 or Windows 95 follows a different installation sequence. Please follow the instructions for the relevant installation in the chapters for the individual operating systems.

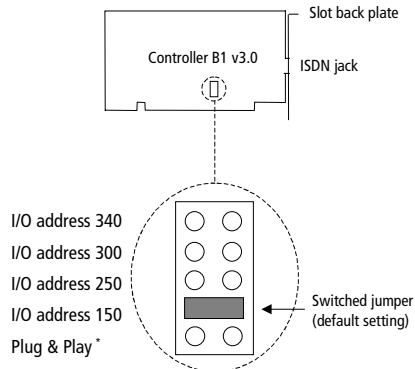
### 2.2 Setting the I/O Address

To manage and to use the ISDN-Controller, the operating system addresses it by means of an “I/O address”.

Upon delivery, the ISDN-Controller is set to the I/O address 150 and the IRQ (interrupt) 5. The I/O address is determined by a jumper on the ISDN-Controller; the interrupt by a software setting.

If the preset I/O address 150 is already used by another plug-in card, the jumper setting must be changed on the ISDN-Controller. If necessary, change the interrupt in the Device Manager (“Start / Settings / Control Panel / System”) or with the “B1 Setup” program.

The figure below illustrates how the jumpers are arranged on the ISDN-Controller B1 v3.0, showing the various jumper positions and their corresponding I/O addresses. These data are also listed as a label on the circuit board of the AVM ISDN-Controller B1 v3.0.



### *Jumper positions and corresponding I/O addresses*

\* The jumper position “Plug & Play” is not yet supported by the AVM ISDN-Controller B1 v3.0’s driver software. Check the AVM Data Call Center from time to time to see if new drivers have become available.



*If there is no jumper switched on the ISDN-Controller, the ISDN-Controller is set to the default I/O address of 150.*

## 2.3 Installing the ISDN-Controller B1 v3.0 in the Computer

The next step is to physically install the ISDN-Controller in your computer. The ISDN-Controller can be inserted into either an 8-bit or a 16-bit slot of the computer. If both slots are available, we recommend using the 16-bit slot.

Proceed as follows to install the AVM ISDN-Controller B1 v3.0 in the computer:

1. Make sure that the PC and all peripherals are switched off. Unplug their power cords.

2. Open the cover of the PC. Touch the metal of the PC housing to discharge any static electricity.
3. Select a suitable slot, remove the housing and insert the ISDN-Controller in the slot.
4. Screw the back plate of the ISDN-Controller to the back panel of the computer.
5. Close the computer and plug in the power cords.
6. Now you need to connect the ISDN-Controller to your ISDN line. The connecting cable supplied has an RJ45 plug on each end. Insert one end in your ISDN jack and the other end in the socket on the back plate of your ISDN-Controller.

Route the six-meter cable as desired.

This completes the hardware installation.



## 3 Installation in Windows 2000

In Microsoft Windows 2000, the AVM ISDN-Controller B1 v3.0 can be installed with the drivers included in the operating system software. In this case, the drivers must be updated using the latest drivers available either on the CD included in the controller package or from the AVM Data Call Center (ADC). This manual describes the other installation option: installing the ISDN-Controller B1 v3.0 using the updated CAPI 2.0 drivers supplied on the controller CD.

The CAPI 2.0 included in the package supports both 16-bit and 32-bit applications. Applications in DOS windows are not supported. For more information about CAPI, see the section “The Applications Interface CAPI 2.0” on page 78.

Before beginning with the software installation, check that the ISDN-Controller has been installed in the computer properly. Make sure that an I/O address available in the computer is set on the ISDN-Controller (see the section “Setting the I/O Address” on page 14).



*The procedures described in this chapter are valid for both Windows 2000 Server and Windows 2000 Professional.*

### 3.1 Installing the Driver Software



*Note that administrator rights are required to perform the installation in Windows 2000.*

Proceed as follows:

1. Start Windows 2000.
2. Insert the “AVM ISDN-Controller B1 v3.0” CD in your CD-ROM drive.
3. Open the Windows 2000 Start menu and select the “Run” command. In the command line, enter the path to the installation program:

<CD-ROM drive>:\cardware\b1\_v30\  
windows.2k\english\setup.exe

4. Confirm by clicking “OK”.
5. The welcome screen of the installation program appears. To view additional information about the ISDN-Controller and the installation routine, click the “Read AVM Readme” button.



*Click the “F1” key at any time to view help about the current step of installation.*

6. Click “Next”.
7. In the next window, activate the “Installation” option.



*If the ISDN-Controller B1 v3.0 is already installed with the drivers included on the Windows 2000 CD, select the “Update” option here to install the latest version of the driver software.*

Click “Next”.

8. Confirm the subsequent information window by clicking “Next”.
9. In the next step, you may be prompted to install software without a digital signature by Microsoft. Confirm such a request by clicking “Yes”.
10. Similarly, also answer the question which may be asked about the AVM NDIS WAN CAPI Driver with “Yes”.
11. Specify which D-channel protocol is used on your ISDN line (DSS1, NI1, 5ESS or 1TR6). Activate the desired option and then click “Next”.
12. Enter the desired multiple subscriber numbers in the “ISDN multiple subscriber number (MSN)” window.



*The settings performed here are valid only for the NDIS WAN CAPI Driver (Internet, RAS over Dial-Up Networking). If you work only with CAPI 2.0 applications, ignore this setting, as the MSNs are configured in the individual CAPI applications.*

he MSNs entered here are valid for both incoming and outgoing calls. The first MSN entry is valid for the first B channel; the second for the second B channel. A maximum of two B channels are supported by the NDIS WAN CAPI Driver. When a B channel is busy, the first MSN (default MSN) will be signalled as the outgoing MSN. Tip: simply enter the same MSN for both B channels to follow all costs accrued on this number.

13. Then click “Next”.
14. In conclusion, a window appears in which the settings for the ISDN-Controller B1 v3.0 are displayed. Click “Finish”.

This concludes the installation of the driver software in Windows 2000. You may start operation of the ISDN-Controller immediately after installation, CAPI 2.0 and the AVM NDIS WAN CAPI Driver are available. For detailed information about the AVM NDIS WAN CAPI Driver and the two other AVM system drivers, see the section “The AVM System Drivers” on page 81.

## 3.2 Changing the Settings

After installation is concluded, you have the opportunity to change the following settings:

- the D-channel protocol
- the multiple subscriber numbers (MSNs)
- and the resources (I/O address and interrupt)

To make changes, proceed as follows:

1. Open the Windows 2000 Control Panel by clicking through “Start / Settings”, and then double-click “System”.
2. Open the Device Manager on the “Hardware” settings page.
3. Click the “+” before the entry “Network adapters”.

4. Click with the right mouse button on the entry “AVM ISDN-Controller B1”.
5. Select “Properties” and activate the “ISDN” settings page.

On this page, select the D-channel protocol.

Click the “Configure” button to specify the multiple subscriber numbers for the NDIS WAN CAPI Driver.

6. Go to the “Resources” settings page. Click the “Change settings...” button.

Here values for the I/O address and the interrupt can be changed.

### 3.3 Installing Additional Controllers

Up to four active AVM ISDN-Controller can be installed in your computer at any given time. It is also possible to combine active AVM ISDN-Controllers for the ISA, PCI and USB buses in one computer.

To install an additional ISDN-Controller for the PCI bus, simply install it in an appropriate slot according to the instructions in the chapter “Installing the Hardware” on page 14. Make the entries described in the section “Installing the Driver Software” on page 17. That’s all!

To add a PCI or USB controller, perform the installation of the ISDN-Controller as described in the corresponding manual.

The driver software of all controllers installed is loaded automatically when Windows 2000 is started.

### 3.4 Removing the ISDN-Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 in Windows 2000, proceed as follows:

1. Open the Windows 2000 Control Panel using “Start / Settings” and double-click the “Add/Remove Hardware” icon.

2. The Add/Remove New Hardware Wizard is started. Click “Next”.
3. In the subsequent dialog, select the option “Uninstall/Unplug a device” and click “Next”.
4. Then select the first option, “Uninstall a device”. Confirm by clicking “Next”.
5. In the next dialog, the device to be installed must be selected. Activate the option “Show hidden devices” and click “Next”.

Select the entry “AVM ISDN-Controller B1”. Click “Next”.

6. Confirm the uninstallation by activating the option “Yes, remove this device” and then clicking “Next”.
7. As a final step, click “Finish”.

The ISDN-Controller is removed from the system.



***Only one ISDN-Controller can be removed at a time. If your system has multiple ISDN-Controller installed and all are to be removed, perform the described procedure several times (without restarting Windows between the individual uninstallation tasks).***

## 4 Installation in Windows NT

For use in Microsoft Windows NT, specially developed drivers are included with delivery. The CAPI 2.0 supplied with the controller supports both 16-bit and 32-bit applications. Applications in DOS windows are not supported. For more information about CAPI, see the section “The Applications Interface CAPI 2.0” on page 78.

Before beginning with the software installation, check that the ISDN-Controller has been installed in the computer properly. Make sure that an I/O address available in the computer is set on the ISDN-Controller (see the section “Setting the I/O Address” on page 14).

### 4.1 Installing the Driver Software



*Note that administrator rights are required to perform the installation in Windows NT.*

Proceed as follows to install the driver software in Windows NT:

1. Start Windows NT.
2. Insert the “AVM ISDN-Controller B1 v3.0” CD in your CD-ROM drive.
3. Open the Windows NT Start menu and select the “Run” command. Enter the path to the installation program in the command line:

```
<CD-ROM DRIVE> : \CARDWARE\B1_v30\  
WINDOWS.NT\ENGLISH\SETUP.EXE
```

Confirm by clicking “OK”.

4. The welcome screen of the installation program appears. For more information about the ISDN-Controller and the installation process, click “Read AVM Readme” in this window.



*Use the “F1” key at any time to view a help text about the current installation step.*

5. Click “Next”.
6. The next window contains a list of the installed controllers. If no AVM ISDN-Controller is installed, the “New” entry (add an ISDN-Controller) is already active.

Select the type of Controller to be installed and click “Next”.

7. In the next window, enter the folder in which the driver software is to be installed.
8. Enter the interrupt for the ISDN-Controller.

In the next dialog, select the I/O address for communication with the ISDN-Controller in the system. Click the address that corresponds to the position of the jumper on the ISDN-Controller card (see the section “Setting the I/O Address” on page 14).

Confirm with “Next”.

9. Enter in the next window which D-channel protocol is used on your ISDN line.

Activate the desired option and then click “Next”. The installation program now copies all files to the specified folder.

10. As a final step, a window appears with the settings of the ISDN-Controller B1 v3.0. Confirm by clicking “Next”.

This concludes the driver software installation in Windows NT. Now the ISDN-Controller can be put into operation.

A new program group called “AVM” is created in the Program Manager/Start menu. This program group contains the files “AVM Internet Home Page”, “B1 Unload”, “B1 Load”, “B1 Readme”, “B1 Setup” and “B1 Test”.



***If the I/O address and interrupt of the ISDN-Controller must be changed after installation, for instance, because new hardware devices were installed, change the position of the jumper on the ISDN-Controller first. Then open the program “B1 Setup” and enter the new values there.***

## 4.2 Starting Operation of the ISDN-Controller B1 v3.0

By default the ISDN-Controller is loaded automatically every time Windows NT is started. Because the Controller is loaded before the items in the “Startup” program group, it is no problem to include communications programs based on CAPI in the “Startup” group.

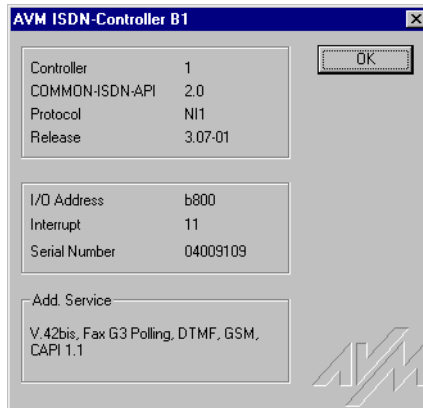
If the ISDN-Controller B1 v3.0 is not to be loaded at all times, use the options for manual loading and unloading.

### Unloading the ISDN-Controller

To unload the ISDN-Controller B1 v3.0, click “B1 Unload”. After unloading, a message appears reporting that CAPI is no longer available.

### Loading the ISDN-Controller

The ISDN-Controller can be loaded manually by clicking the “B1 Load” icon in the “AVM” program group. After loading the following message appears:



*Message after loading in Windows NT*



## 4.3 Changing the Settings

After installation has been concluded, you have the option of changing the following settings of the ISDN-Controller B1 v3.0:

- Interrupt and I/O address
- D-channel protocol
- activate automatic data compression (CAPI SoftCompression X75/V42bis)

Open the “B1 Setup” program from the “AVM” program group and follow the instructions there.



*Information about CAPI SoftCompression is available in the section “CAPI SoftCompression X75/V42bis” on page 83.*

## 4.4 Installing Additional Controllers

Up to four active AVM ISDN-Controllers may be installed in your computer at the same time. It is also possible to combine active AVM ISDN-Controllers for ISA and PCI buses in one computer.

To install an additional ISDN-Controller for the ISA bus, simply repeat the instructions in the chapter “Installing the Hardware” on page 14. Make your settings as for the dialogs described in the section “Installing the Driver Software” on page 22. That’s all!

To add a PCI controller, follow the installation instructions in the corresponding manual.

The drivers of all ISDN-Controllers installed are loaded automatically when Windows is started.

## 4.5 Removing the ISDN-Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 in Windows NT, proceed as follows:

1. Open the Windows NT Control Panel with “Start / Settings”.

2. Double-click the “Add/Remove Software” icon.
3. The list of software installed includes an entry for the “AVM ISDN-Controller B1 Family” (or the last AVM ISDN-Controller installed).
4. Select this entry and click the “Add/Remove” button. The uninstallation program is started.
5. The next window displays the folder which contains the corresponding driver software to be deleted. Confirm by clicking “Next”.
6. At the conclusion of uninstallation you will be prompted to restart Windows NT so that the changes can be implemented.



***Only one ISDN-Controller may be removed at a time. If multiple ISDN-Controllers are installed and all are to be removed, perform the above procedure several times (without restarting Windows between the individual uninstallation procedures).***

## 5 Installation in Windows Millennium

For use in Microsoft Windows Millennium (Me), specially developed drivers are included with delivery. The driver architecture corresponds to the architecture of the Microsoft Win 32 Driver Model (WDM). This true 32-bit device driver offers full support for all features of Microsoft Windows Me.

The CAPI 2.0 supplied with the controller supports both 16-bit and 32-bit applications and, at the same time, applications in DOS windows. For more information about CAPI, see the section “The Applications Interface CAPI 2.0” on page 78.

The AVM ISDN-Controller B1 v3.0 is installed in Windows Me in four main steps:

1. Installing a new hardware device using the Windows Me Hardware Wizard
2. Configuring the controller
3. Physically installing the controller
4. Installing the driver software

The individual steps are described in detail below.

### 5.1 Installing the New Hardware Device



*Do not physically install the ISDN-Controller hardware in your computer first.*

Proceed as follows for installation:

1. Open the “Add New Hardware” folder in the Control Panel (“Start / Settings / Control Panel”).

The Windows Me Add New Hardware Wizard appears. This wizard assists in the installation of new hardware devices. Click “Next” to begin installation.

2. The Add New Hardware Wizard announces that it recognizes new Plug and Play devices. Click “Next”.
3. Answer the question about whether the device is included in the list with “No” and click “Next”.
4. In the next window, answer “No” to the questions, “Do you want Windows to search for your new hardware?” and click “Next” again.
5. In the next window, select the hardware type to be installed. Select the entry “Other devices”. Then click “Next”.
6. The Windows device driver database is generated. Windows Me then shows a list of hardware models and manufacturers. Click the “Have Disk...” button here.
7. Insert the CD included in the controller package into your CD-ROM drive. Enter the path to the installation files:

```
<CD-ROM drive>:\CARDWARE\b1_v30\  
WINDOWS.ME\ENGLISH\B1SETUP.INF
```

Start installation by clicking “OK” twice.

8. In the next window the “AVM ISDN-Controller B1 Family” is displayed as the hardware device. Click “Next”.
9. The Add New Hardware Wizard shows in the next window a free I/O address and a free interrupt. Make a note of the I/O address displayed; the values cannot be changed here. Click “Next”.



*It is advisable to accept the I/O address value displayed here and, if necessary, to change the jumper position on the ISDN-Controller accordingly. If you would prefer to use another I/O address, open the Device Manager (“Settings / Control Panel / System”) before restarting Windows and enter the desired values there.*

Now the driver software is copied to your computer. A message appears announcing that the software for the new hardware device has been installed. Click “Finish”.

10. A message in the next window announces that the computer must be shut down. Remove the CD from the CD-ROM drive and click “Yes”. The computer must be shut down before the ISDN-Controller hardware is physically installed so that all settings made can be activated.
11. Turn off the computer and any other connected devices and pull the power plug.

## **5.2 Configuring the ISDN-Controller B1 v3.0**

In the second step of installation, change the jumper position on the AVM ISDN-Controller B1 v3.0 if necessary. Use the value suggested by the Add New Hardware Wizard. Upon delivery, the jumper is set to the I/O address 150 (see the section “Setting the I/O Address” on page 14).

Once the ISDN-Controller has been installed in Windows Me and the jumper has been set, the ISDN-Controller B1 v3.0 can be physically installed in the computer.

## **5.3 Physically Installing the ISDN-Controller B1 v3.0**

For the physical installation of the AVM ISDN-Controller B1 v3.0 and the connection of the cables, follow the steps described in the section “Installing the Hardware” on page 14.

## 5.4 Installing the Driver Software

After physically installing the Controller B1 v3.0, the next step is to install the driver software. Proceed as follows:

1. Turn your computer back on. The welcome screen of the installation program appears. To obtain more information about the ISDN-Controller and the installation process, click the “Read AVM Readme” button.



*Use the “F1” key at any time to view a help text for the current installation step.*

Click “Next”.

2. Select the ISDN-Controller to be installed. For information about the controllers listed, click the “Info” button. Click “Next”.

In the next window, enter the folder in which the driver software of the AVM ISDN-Controller B1 v3.0 is to be installed. When your entries are complete, click “Next”.

3. The next step is to specify the protocol of your ISDN line.
4. Activate the desired option and then click “Next”. The installation program then copies all files to the specified folder.
5. Once copying has been completed, a window displaying the settings of the ISDN-Controller B1 v3.0 appears. Confirm these settings by clicking “OK”.

This concludes the installation of the driver software for the AVM ISDN-Controller B1 v3.0 in Windows Me. The controller is ready for immediate operation.

A new folder called “AVM” is created in the “Programs” group of the Start menu. This folder contains the programs “AVM Internet Home Page”, “B1 Unload”, “B1 Load”, “B1 Readme”, “B1 Setup” and “B1 Test”.



*If the I/O address of the ISDN-Controller must be changed after installation, because of a new hardware device, for instance, open the Windows Me Device Manager by clicking through “Settings / Control Panel / System”. Enter the new value there.*



*After changing this setting, remove the ISDN-Controller hardware from the computer and switch the jumper accordingly. Windows Me administers the interrupt values automatically.*

## **5.5 Starting Operation of the ISDN-Controller B1 v3.0**

By default the controller is loaded automatically every time Windows Me is started. Because the controller is loaded before the items in the “Startup” program group, it is no problem to include communications programs based on CAPI in the “Startup” group.

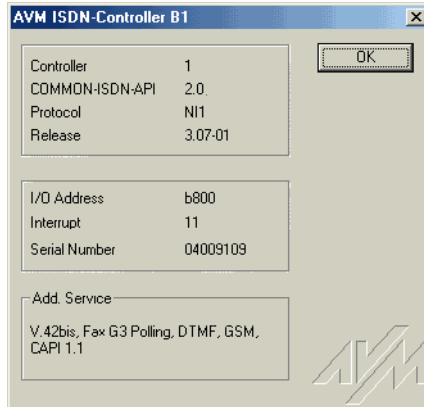
If the ISDN-Controller B1 v3.0 is not to be loaded at all times, use the options for manual loading and unloading.

### **Unloading the ISDN-Controller**

To unload the ISDN-Controller B1 v3.0, click “B1 Unload”. After unloading, a message appears reporting that the AVM ISDN-Service is no longer available. Confirm this message by clicking “OK”.

### Loading the ISDN-Controller

The ISDN-Controller can be loaded manually by clicking the “B1 Load” icon in the “AVM” program group. After loading the following message appears:



*Message after loading in Windows Me*

## 5.6 Changing the Settings

After installation has been concluded, you have the option of changing the following settings of the ISDN-Controller B1 v3.0:

- D-channel protocol
- activate automatic data compression (CAPI SoftCompression X75/V42bis)

Open the “B1 Setup” program from the “AVM” program group and follow the instructions there.



*Information about CAPI SoftCompression is available in the section “CAPI SoftCompression X75/V42bis” on page 83.*



## 5.7 Installing Additional Controllers

Up to four active AVM ISDN-Controllers may be installed in your computer at the same time. It is also possible to combine active AVM ISDN-Controllers for ISA, PCI and USB buses in one computer.

To install an additional AVM ISDN-Controller B1 v3.0, simply repeat the entire installation procedure as described. Start by installing a new hardware device. The installation program automatically recognizes additional ISDN-Controllers and, assisted by the Device manager, integrates them into the system.

To add a PCI or USB controller, perform the installation as described in the corresponding manual.

The drivers of all installed ISDN-Controllers are loaded automatically when Windows is started.

## 5.8 Removing the ISDN-Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 in Windows Me, proceed as follows:

1. Open the Windows Me Control Panel with “Start / Settings”.
2. Double-click the “Add/Remove Software” icon.
3. The list of software installed includes an entry for the “AVM ISDN-Controller B1 Family” (or the last AVM ISDN-Controller installed). Select this entry and click the “Add/Remove” button.

The uninstallation program is started.

4. The next window displays the folder which contains the corresponding driver software to be deleted.

Confirm by clicking “Next”.

5. At the conclusion of uninstallation you will be prompted to restart Windows so that the changes can be implemented.



*Only one ISDN-Controller may be removed at a time. If multiple ISDN-Controllers are installed and all are to be removed, perform the above procedure several times (without restarting Windows between the individual uninstallation procedures).*

## 6 Installation in Windows 98

For use in Microsoft Windows 98, specially developed drivers are included with delivery. The driver architecture corresponds to the architecture of the Microsoft Win 32 Driver Model (WDM). This true 32-bit device driver offers full support for all features of Microsoft Windows 98.

The CAPI 2.0 supplied with the controller supports both 16-bit and 32-bit applications and, at the same time, applications in DOS windows. For more information about CAPI, see the section “The Applications Interface CAPI 2.0” on page 78.

The AVM ISDN-Controller B1 v3.0 is installed in Windows 98 in four main steps:

1. Installing a new hardware device using the Windows Me Hardware Wizard
2. Configuring the controller
3. Physically installing the controller
4. Installing the driver software

The individual steps are described in detail below.

### 6.1 Installing the New Hardware Device



*Do not physically install the ISDN-Controller hardware in your computer first.*

Proceed as follows for installation:

1. Open the “Add New Hardware” folder in the Control Panel (“Start / Settings / Control Panel”).

The Windows 98 Add New Hardware Wizard appears. This wizard assists in the installation of new hardware devices. Click “Next” to begin installation.

2. The Add New Hardware Wizard announces that it recognizes new Plug and Play devices. Click “Next”.

3. Answer the question about whether the device is included in the list with “No” and click “Next”.
4. In the next window, answer “No” to the questions, “Do you want Windows to search for your new hardware?” and click “Next” again.
5. In the next window, select the hardware type to be installed. Select the entry “Other devices”. Then click “Next”.
6. The Windows device driver database is generated. Windows Me then shows a list of hardware models and manufacturers. Click the “Have Disk...” button here.
7. Insert the CD included in the controller package into your CD-ROM drive. Enter the path to the installation files:

```
<CD-ROM drive>:\CARDWARE\b1_v30\  
WINDOWS.98\ENGLISH\B1SETUP.INF
```

Start installation by clicking “OK” twice.

8. In the next window the “AVM ISDN-Controller B1 Family” is displayed as the hardware device. Click “Next”.
9. The Add New Hardware Wizard shows in the next window a free I/O address and a free interrupt. Make a note of the I/O address displayed; the values cannot be changed here. Click “Next”.



***It is advisable to accept the I/O address value displayed here and, if necessary, to change the jumper position on the ISDN-Controller accordingly. If you would prefer to use another I/O address, open the Device Manager (“Settings / Control Panel / System”) before restarting Windows and enter the desired values there.***

Now the driver software is copied to your computer. A message appears announcing that the software for the new hardware device has been installed. Click “Finish”.

10. A message in the next window announces that the computer must be shut down. Remove the CD from the CD-ROM drive and click “Yes”. The computer must be shut down before the ISDN-Controller hardware is physically installed so that all settings made can be activated.
11. Turn off the computer and any other connected devices and pull the power plug.

## **6.2 Configuring the ISDN-Controller B1 v3.0**

In the second step of installation, change the jumper position on the AVM ISDN-Controller B1 v3.0 if necessary. Use the value suggested by the Add New Hardware Wizard. Upon delivery, the jumper is set to the I/O address 150 (see the section “Setting the I/O Address” on page 14).

Once the ISDN-Controller has been installed in Windows Me and the jumper has been set, the ISDN-Controller B1 v3.0 can be physically installed in the computer.

## **6.3 Physically Installing the ISDN-Controller B1 v3.0**

For the physical installation of the AVM ISDN-Controller B1 v3.0 and the connection of the cables, follow the steps described in the section “Installing the Hardware” on page 14.

## **6.4 Installing the Driver Software**

After physically installing the ISDN-Controller B1 v3.0, the next step is to install the driver software. Proceed as follows:

1. Turn your computer back on. The welcome screen of the installation program appears. To obtain more information about the ISDN-Controller and the installation process, click the “Read AVM Readme” button.



***Use the “F1” key at any time to view a help text for the current installation step.***

Click “Next”.

2. Select the ISDN-Controller to be installed. For information about the controllers listed, click the “Info” button. Click “Next”.
3. In the next window, enter the folder in which the driver software of the AVM ISDN-Controller B1 v3.0 is to be installed. When your entries are complete, click “Next”.
4. The next step is to specify the D-channel protocol of your ISDN line.

Activate the desired option and then click “Next”. The installation program then copies all files to the specified folder.

5. Once copying has been completed, a window displaying the settings of the ISDN-Controller B1 v3.0 appears. Confirm these settings by clicking “OK”.

A new folder called “AVM” is created in the “Programs” group of the Start menu. This folder contains the programs “AVM Internet Home Page”, “B1 Unload”, “B1 Load”, “B1 Readme”, “B1 Setup” and “B1 Test”.

This concludes the installation of the driver software for the AVM ISDN-Controller B1 v3.0 in Windows 98.



***If the I/O address of the ISDN-Controller must be changed after installation, because of a new hardware device, for instance, open the Windows 98 Device Manager by clicking through “Settings / Control Panel / System”. Enter the new value there.***

***After changing this setting, remove the ISDN-Controller hardware from the computer and switch the jumper accordingly. Windows 98 administers the interrupt values automatically.***

## 6.5 Starting Operation of the ISDN-Controller B1 v3.0

By default the controller is loaded automatically every time Windows 98 is started. Because the controller is loaded before the items in the “Startup” program group, it is no problem to include communications programs based on CAPI in the “Startup” group.

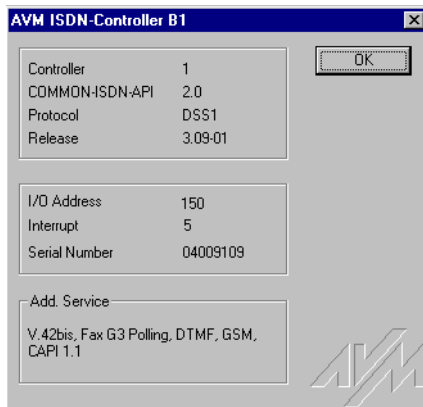
If the ISDN-Controller B1 v3.0 is not to be loaded at all times, use the options for manual loading and unloading.

### Unloading the ISDN-Controller

To unload the ISDN-Controller B1 v3.0, click “B1 Unload”. After unloading, a message appears reporting that the AVM ISDN-Service is no longer available. Confirm this message by clicking “OK”.

### Loading the ISDN-Controller

The ISDN-Controller can be loaded manually by clicking the “B1 Load” icon in the “AVM” program group. After loading the following message appears:



*Message after loading in Windows 98*

## 6.6 Changing the Settings

After installation has been concluded, you have the option of changing the following settings of the ISDN-Controller B1 v3.0:

- D-channel protocol
- activate automatic data compression (CAPI SoftCompression X75/V42bis)

Open the “B1 Setup” program from the “AVM” program group and follow the instructions there.



*Information about CAPI SoftCompression is available in the section “CAPI SoftCompression X75/V42bis” on page 83.*

## 6.7 Installing Additional Controllers

Up to four active AVM ISDN-Controllers may be installed in your computer at the same time. It is also possible to combine active AVM ISDN-Controllers for ISA, PCI and USB buses in one computer.

To install an additional AVM ISDN-Controller B1 v3.0, simply repeat the entire installation procedure as described. Start by installing a new hardware device. The installation program automatically recognizes additional ISDN-Controllers and, assisted by the Device manager, integrates them into the system.

To add a PCI or USB controller, perform the installation as described in the corresponding manual.

The drivers of all installed ISDN-Controllers are loaded automatically when Windows is started.



## 6.8 Removing the ISDN-Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 from Windows 98, proceed as follows:

1. Open the Windows 98 Control Panel with “Start / Settings”.
2. Double-click the “Add/Remove Software” icon.
3. The list of software installed includes an entry for the “AVM ISDN-Controller B1 Family” (or the last AVM ISDN-Controller installed). Select this entry and click the “Add/Remove” button.

The uninstallation program is started.

4. The next window displays the folder which contains the corresponding driver software to be deleted.

Confirm by clicking “Next”.

5. At the conclusion of uninstallation you will be prompted to restart Windows so that the changes can be implemented.



*Only one ISDN-Controller may be removed at a time. If multiple ISDN-Controllers are installed and all are to be removed, perform the above procedure several times (without restarting Windows between the individual uninstallation procedures).*

## 7 Installation in Windows 95

For use in Microsoft Windows 95, specially developed drivers are included with delivery. This 32-bit device driver (VxD) offers full support for all features of Microsoft Windows 95.

The CAPI 2.0 supplied with the controller supports Windows applications and applications in DOS windows at the same time. For more information about CAPI, see the section “The Applications Interface CAPI 2.0” on page 78.

The AVM ISDN-Controller B1 v3.0 is installed in Windows 95 in four main steps:

1. Installing a new hardware device using the Hardware Wizard
2. Configuring the controller
3. Physically installing the controller
4. Installing the driver software

The individual steps are described in detail below.

### 7.1 Installing the New Hardware Device



*Do not physically install the ISDN-Controller hardware in your computer first.*

Proceed as follows for installation:

1. Open the “Add New Hardware” folder in the Windows 95 Control Panel (“Start / Settings / Control Panel”).
2. The Windows 95 Add New Hardware Wizard appears. This wizard assists in the installation of new hardware devices. Click “Next” to begin installation.
3. In the next window, answer “No” to the questions, “Do you want Windows to search for your new hardware?” and click “Next” again.

4. In the next window, select the hardware type to be installed. Select the entry “Other devices”. Then click “Next”.
5. The Windows device driver database is generated. Windows 95 then shows a list of hardware models and manufacturers. Click the “Have Disk...” button here.
6. Insert the CD included in the controller package into your CD-ROM drive. Enter the path to the installation files:

```
<CD-ROM drive>:\CARDWARE\b1_v30\  
WINDOWS.95\ENGLISH\B1SETUP.INF
```

Start installation by clicking “OK” twice.

7. In the next window the “AVM ISDN-Controller B1 Family” is displayed as the hardware device. Click “Next”.
8. The Add New Hardware Wizard shows in the next window a free I/O address and a free interrupt. Make a note of the I/O address displayed; the values cannot be changed here. Click “Next”.



***It is advisable to accept the I/O address value displayed here and, if necessary, to change the jumper position on the ISDN-Controller accordingly. If you would prefer to use another I/O address, open the Device Manager (“Settings / Control Panel / System”) before restarting Windows and enter the desired values there.***

Now the driver software is copied to your computer. A message appears announcing that the software for the new hardware device has been installed. Click “Finish”.

9. A message in the next window announces that the computer must be shut down. Remove the CD from the CD-ROM drive and click “Yes”. The computer must be shut down before the ISDN-Controller hardware is physically installed so that all settings made can be activated.
10. Turn off the computer and any other connected devices and pull the power plug.

## 7.2 Configuring the ISDN-Controller B1 v3.0

In the second step of installation, change the jumper position on the AVM ISDN-Controller B1 v3.0 if necessary. Use the value suggested by the Add New Hardware Wizard. Upon delivery, the jumper is set to the I/O address 150 (see the section “Setting the I/O Address” on page 14).

Once the ISDN-Controller has been installed in Windows 95 and the jumper has been set, the ISDN-Controller B1 v3.0 can be physically installed in the computer.

## 7.3 Physically Installing the ISDN-Controller B1 v3.0

For the physical installation of the AVM ISDN-Controller B1 v3.0 and the connection of the cables, follow the steps described in the section “Installing the ISDN-Controller B1 v3.0 in the Computer” on page 15.

## 7.4 Installing the Driver Software

After physically installing the ISDN-Controller B1 v3.0, the next step is to install the driver software. Proceed as follows:

1. Turn your computer back on. The welcome screen of the installation program appears. To obtain more information about the ISDN-Controller and the installation process, click the “Read AVM Readme” button.



*Use the “F1” key at any time to view a help text for the current installation step.*

Click “Next”.

2. Select the ISDN-Controller to be installed. For information about the controllers listed, click the “Info” button. Click “Next”.
3. In the next window, enter the folder in which the driver software of the AVM ISDN-Controller B1 v3.0 is to be installed. When your entries are complete, click “Next”.

4. The next step is to specify the protocol of your ISDN line.

Activate the desired option and then click “Next”.

5. The installation program then copies all files to the specified folder.
6. Once copying has been completed, a window displaying the settings of the ISDN-Controller B1 v3.0 appears. Confirm these settings by clicking “OK”.

A new folder called “AVM” is created in the “Programs” group of the Start menu. This folder contains the programs “AVM Internet Home Page”, “B1 Unload”, “B1 Load”, “B1 Readme”, “B1 Setup” and “B1 Test”.

This concludes the installation of the driver software for the AVM ISDN-Controller B1 v3.0 in Windows 95.



*If the I/O address of the ISDN-Controller must be changed after installation, because of a new hardware device, for instance, open the Windows Me Device Manager by clicking through “Settings / Control Panel / System”. Enter the new value there.*

*After changing this setting, remove the ISDN-Controller hardware from the computer and switch the jumper accordingly. Windows 95 administers the interrupt values automatically.*

## 7.5 Starting Operation of the ISDN-Controller B1 v3.0

By default the controller is loaded automatically every time Windows 95 is started. Because the controller is loaded before the items in the “Startup” program group, it is no problem to include communications programs based on CAPI in the “Startup” group.

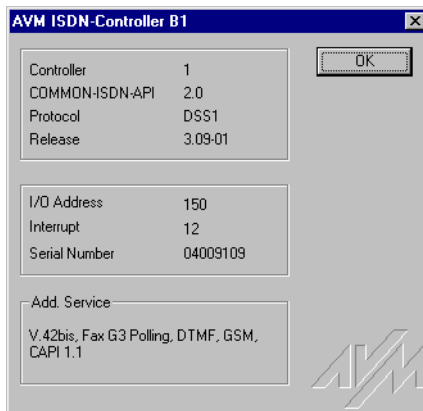
If the ISDN-Controller B1 v3.0 is not to be loaded at all times, use the options for manual loading and unloading.

### Unloading the ISDN-Controller

To unload the ISDN-Controller B1 v3.0, click “B1 Unload”. After unloading, a message appears reporting that the AVM ISDN-Service is no longer available. Confirm this message by clicking “OK”.

### Loading the ISDN-Controller

The ISDN-Controller can be loaded manually by clicking the “B1 Load” icon in the “AVM” program group. After loading the following message appears:



*Message after loading in Windows 95*

## 7.6 Changing the Settings

After installation has been concluded, you have the option of changing the following settings of the ISDN-Controller B1 v3.0:

- D-channel protocol
- activate automatic data compression (CAPI SoftCompression X75/V42bis)

Open the “B1 Setup” program from the “AVM” program group and follow the instructions there.



*Information about CAPI SoftCompression is available in the section “CAPI SoftCompression X75/V42bis” on page 83.*

## 7.7 Installing Additional Controllers

Up to four active AVM ISDN-Controllers may be installed in your computer at the same time. It is also possible to combine active AVM ISDN-Controllers for ISA and PCI buses in one computer.

To install an additional AVM ISDN-Controller B1 v3.0, simply repeat the entire installation procedure as described. Start by installing a new hardware device. The installation program automatically recognizes additional ISDN-Controller and, assisted by the Device manager, integrates them into the system.

To add a PCI or USB controller, perform the installation as described in the corresponding manual.

The drivers of all installed ISDN-Controllers are loaded automatically when Windows is started.

## 7.8 Removing the ISDN-Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 from Windows 95, proceed as follows:

1. Open the Windows 95 Control Panel with “Start / Settings”.
2. Double-click the “Add/Remove Software” icon.
3. The list of software installed includes an entry for the “AVM ISDN-Controller B1 Family” (or the last AVM ISDN-Controller installed). Select this entry and click the “Add/Remove” button.

The uninstallation program is started.

4. The next window displays the folder which contains the corresponding driver software to be deleted.

Confirm by clicking “Next”.

5. At the conclusion of uninstallation you will be prompted to restart Windows so that the changes can be implemented.



*Only one ISDN-Controller may be removed at a time. If multiple ISDN-Controllers are installed and all are to be removed, perform the above procedure several times (without restarting Windows between the individual uninstallation procedures).*



## 8 Installation in Windows 3.x

For use in Microsoft Windows 3.x, specially developed drivers are included with delivery. This 32-bit device driver (VxD) exploits the possibilities of Windows' "protected mode".

The CAPI 2.0 supplied with the controller supports Windows applications and applications in DOS windows at the same time. For more information about CAPI, see the section "The Applications Interface CAPI 2.0" on page 78.

It is not possible to load a DOS-based CAPI before Windows is started. Use the DOS window or install the ISDN-Controller in MS-DOS if you wish to use the controller with DOS applications.

### 8.1 Installing the Driver Software

Before beginning with the software installation, check that the ISDN-Controller has been installed in the computer properly. Make sure that an I/O address available in the computer is set on the ISDN-Controller (see the section "Setting the I/O Address" on page 14).

Proceed as follows to install the driver software in Windows 3.x:

1. Start Windows.
2. Insert the "AVM ISDN-Controller B1 v3.0" CD in your CD-ROM drive.
3. From the "File" menu of the Program Manager, select the "Run" command and enter the path to the installation program in the command line:

```
<CD-ROM DRIVE>:\CARDWARE\B1_v30\  
WINDOWS.3XX\ENGLISH\SETUP.EXE
```

4. Start the installation by clicking "OK".
5. The message "Initializing Setup..." appears. Once initialization is completed, the welcome screen of the installation program appears. Click "Next".



*Installation can be aborted at any time by clicking the “Cancel” button.*

6. Enter the directory in which the driver software is to be installed. Once your entries are complete, click “Next”.
7. Indicate which D-channel protocol is used on your ISDN line by clicking the desired option.

In the same dialog, specify whether automatic data compression should be activated for X.75 connections.



*For more information about data compression in accordance with the V.42bis standard, see the section “CAPI SoftCompression X75/V42bis” on page 83.*

8. Confirm by clicking “Next”.

Now the installation program copies all files to the specified directory. A new program group called “AVM” is created in the Program Manager. This group contains the programs “B1 Unload”, “B1 Load”, “B1 Readme”, “B1 Setup” and “B1 Test”.

The “B1 Load” program is copied into the “Startup” group in the Program Manager so that the driver software is loaded each time Windows is started. If you do not wish the driver software to be loaded automatically, delete the entry in the “Startup” group.

The driver software installation is concluded after the computer is rebooted.

## Entering a Changed I/O Address

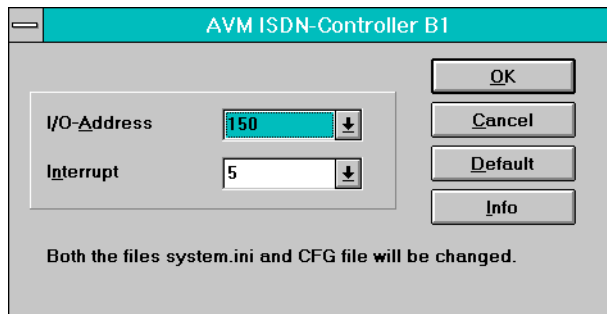
If a different I/O address was set by jumper before the hardware installation, or if another interrupt is to be used, the ISDN-Controller must be configured accordingly before starting operation. If the default settings of the ISDN-Controller were used (I/O address 150, interrupt 5), skip the section “Configuring the ISDN-Controller B1 v3.0” on page 51.

## 8.2 Configuring the ISDN-Controller B1 v3.0

To configure the controller with a new I/O address, proceed as follows:

1. Start the “B1 Setup” program by double-clicking on the corresponding icon in the “AVM” program group.

The following window is opened:



*Dialog of the “B1 Setup” program*

2. Enter new values for the I/O address and the interrupt here.



***The interrupts 10, 11, 12 and 15 can be used only if the ISDN-Controller was inserted in a 16-bit slot.***

3. Save your entries by clicking “OK”. The values specified for the ISDN-Controller are registered in the SYSTEM.INI (Windows directory) and ISDNLOAD.CFG (directory of the driver software) files.
4. Restart Windows to implement the changes.

Note that when multiple AVM ISDN-Controllers are used, the “B1 Setup” program changes only the configuration of the first ISDN-Controller. Changes to the I/O address and interrupts of all other ISDN-Controllers must be made manually in the SYSTEM.INI and the ISDNLOAD.CFG files.



*If the I/O address and interrupt of the ISDN-Controller must be changed after installation, for instance, because new hardware devices were installed, change the position of the jumper on the ISDN-Controller first. Then open the program “B1 Setup” and enter the new values there.*

## 8.3 Starting Operation of the ISDN-Controller B1 v3.0

By default the ISDN-Controller is loaded automatically every time Windows is started.

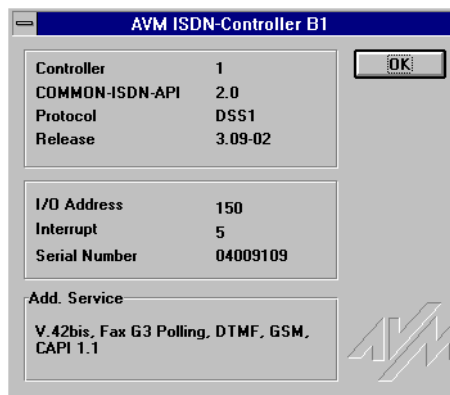
If the ISDN-Controller B1 v3.0 is not to be loaded at all times, use the options for manual loading and unloading.

### Unloading the ISDN-Controller

To unload the ISDN-Controller B1 v3.0, click “B1 Unload”. After unloading, a message appears reporting that CAPI is no longer available.

### Loading the ISDN-Controller

The ISDN-Controller can be loaded manually by clicking the “B1 Load” icon in the “AVM” program group. After loading the following message appears:



*Message after loading in Windows 3.x*

## 8.4 Changing the Settings

After installation has been concluded, you have the option of changing the following settings of the ISDN-Controller B1 v3.0:

- D-channel protocol
- activate automatic data compression (CAPI SoftCompression X75/V42bis)



*Information about CAPI SoftCompression is available in the section “CAPI SoftCompression X75/V42bis” on page 83.*

To change settings, proceed as follows:

1. Open the SETUP.EXE program as described in the section “Installing the Driver Software” on page 49.
2. Select the “Installation” option and follow the instructions on the screen.

## 8.5 Installing Additional Controllers

Up to four active AVM ISDN-Controllers may be installed in your computer at the same time. It is also possible to combine active AVM ISDN-Controllers for ISA and PCI buses in one computer.

To install additional ISDN-Controllers, the ISDNLOAD.CFG (directory of the driver software) and SYSTEM.INI (Windows directory) files must be changed.

### ISDNLOAD.CFG

1. Open the ISDNLOAD.CFG file from the installation directory in a text editor.
2. Copy the entire section beginning with the line [ISDN-Controller-oo]. Enter the copied section again below the original section.
3. Then add one to each of the controller numbers in the new section and enter the desired values for the second controller:

- I/O address and interrupt
- Base module (specifies the T<sub>4</sub> file): “b1.t4” stands for the D-channel protocol DSS1, “b1tr6.t4” for 1TR6, and “b1usa.t4” for NI1 and 5ESS
- :PROTOCOL (specifies the D-channel protocol):  
“\x00” stands for DSS1, “\x06” for 1TR6, “\x03” for NI1, and “\x05” for 5ESS

Example:

```
[ISDN-Controller-00]
```

```
IO Address = 150
```

```
Interrupt = 5
```

```
Base Module = b1.t4
```

```
:PROTOCOL = \x00
```

```
[ISDN-Controller-01]
```

```
IO Address = 250
```

```
Interrupt = 10
```

```
Base Module = b1tr6.t4
```

```
:PROTOCOL = \x06
```

Also note the following:

- When an AVM ISDN-Controller for a different type of bus is added, the paragraphs above must also include the line **Type=XX** to specify the bus type.
- If a PC controller is already installed and an ISA controller is to be added, in addition to the I/O address and the interrupt, the following value must be specified: **Type=Blat**.
- If a PCI controller is to be added, and an ISA controller is already installed, the corresponding entry is: **Type=Blpci**.

- For a PCI controller, it is not necessary to enter the I/O address and interrupt. Also note the information in the manual for the PCI controller.

## SYSTEM.INI

The same changes must be made in the SYSTEM.INI file as well. The entry in SYSTEM.INI may look something like this:

```
[AVM ISDN-Controller B1]
```

```
Interrupt=5
```

```
IO Address=150
```

```
Type=B1at
```

The values for the new controller are simply added below (with the specification of the controller number after the parameter):

```
Interrupt2=10
```

```
IO Address2=250
```

```
Type2=B1at
```

Use the “B1 Load” command to load all ISDN-Controllers installed.

## 8.6 Removing the ISDN-Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 in Windows 3.x, proceed as follows:

1. Start the installation program from the “AVM ISDN-Controller B1 v3.0” driver CD.
2. The program reports that an installed controller was found. Click “Next”.
3. In next dialog, click “Uninstall” and once again “Next”. Follow the instructions on the screen.

This concludes the removal of the AVM ISDN-Controller B1 v3.0.

## 9 Installation in MS-DOS

For the use of the AVM ISDN-Controller B1 v3.0 in MS-DOS, special drivers are included with delivery. Once installed, the driver software makes the programming interface CAPI 2.0 available to the entire system. For more information about CAPI, see the section “The Applications Interface CAPI 2.0” on page 78.

### 9.1 Installing the Driver Software

Before beginning with the software installation, check that the ISDN-Controller has been installed in the computer properly. Make sure that an I/O address available in the computer is set on the ISDN-Controller (see the section “Setting the I/O Address” on page 14).

Proceed as follows to install the driver software for the ISDN-Controller B1 v3.0:

1. Insert the “AVM ISDN-Controller B1 v3.0” CD in your CD-ROM drive.
2. Change to the letter of the CD-ROM drive. Then use the customary DOS commands to switch to the following directory:

```
CARDWARE\B1_V30\DOS\ENGLISH
```

3. Start the installation by entering the following command at the DOS prompt:

```
install
```

If the installation files are located in another directory, enter the appropriate path.

4. The welcome screen of the installation program appears. Installation can be aborted at any time by pressing “Ctrl+x”. To begin installation, press “Return”.
5. An overview of the available drives appears. Select the drive to which the driver software of the ISDN-Controller is to be installed.



Use the arrow keys to browse through the list. Confirm your selection with “Return”.

6. Now specify the installation directory. Confirm your selection with “Return”.
7. Specify which D-channel protocol is used on your ISDN-line.

Press the “Tab” key to jump to the next option. Confirm with “Return”.

8. In the next window, indicate whether you would like to activate automatic data compression V.42bis for X.75 connections.

Use the Tab key to jump to the next option. Confirm with “Return”.

Now the installation program copies all files to the specified directory. If there is not enough free space on the drive for the driver software installation, you will receive an error message to this effect.

This concludes the installation of the driver software.

## **Entering a Changed I/O Address**

If a different I/O address was set by jumper before the hardware installation, or if another interrupt is to be used, the ISDN-Controller must be configured accordingly using the “B1 Setup” program before starting operation. Similarly, if a different interrupt is to be used, this must be specified. If the default settings of the ISDN-Controller were used (I/O address 150, interrupt 5), skip the section “Configuring the ISDN-Controller B1 v3.0” on page 58.

## 9.2 Configuring the ISDN-Controller B1 v3.0

The I/O address set using the jumper must match the entry in the controller software. Proceed as follows to enter the I/O address:

1. Open the “B1 Setup” program. The following dialog appears on the screen:

```
BISETUP Version 1.1
Hardware configuration for AUM ISDN-Controller B1

Controller I/O base address: 150
<values permitted are 150, 300, 250, 340. Default is 150>

Controller IRQ level: 5
<values permitted are 3,4,5,6,7,10,11,12,15. Default is 5>

(c) Copyright AUM GmbH, Berlin 1995          Press Ctrl+Home to save
                                              Press Esc or Ctrl+A to cancel
Space=change value      Tab=List
```

*Dialog of the “B1 Setup” program*

2. In the first input field, enter the I/O address set on the controller.

Either change the specified value with the space bar, or view an overview of the available values by pressing the “Tab” key.

Select the desired I/O address and activate it by pressing “Return” from the input field.

3. In the second input field, enter a new value for the interrupt.

Press the space bar or the “Tab” key to select another value.



*The interrupts 10, 11, 12 and 15 can be used only if the ISDN-Controller was inserted in a 16-bit slot.*

4. Save your entries by pressing “Ctrl+Home” or “Return”.



*If the I/O address and interrupt of the ISDN-Controller must be changed after installation, for instance, because new hardware devices were installed, change the position of the jumper on the ISDN-Controller first. Then open the program “B1 Setup” and enter the new values there.*

## 9.3 Starting Operation of the ISDN-Controller B1 v3.0

### Loading the ISDN-Controller

Now operation of the ISDN-Controller may begin. Switch to the directory of the driver software of the ISDN-Controller, e.g. IDRIVER, and enter the following command at the DOS prompt:

```
ibase
```

This command initializes the ISDN-Controller and loads the driver software. Once the controller has been loaded successfully, the following message appears on the screen:

*Message after loading in MS-DOS*

AVM Berlin	ISDN-Controller B1
COMMON-ISDN-API Version 2.0	Serial No. xxxxxxx
E-DSS1 / Release xxxxxx	Address xxx / IRQ x
Add. Service: Telefax G3, Fax Polling, DTMF, V.110, V.120, GSM, CAPI 1.1	

Now you may begin working with CAPI applications. The AVM ISDN-Controller B1 v3.0 driver for the support of the D-channel protocols and CAPI occupies about 18 KB in your PC's memory.

### Unloading the ISDN-Controller

Enter the following command to unload the driver software:

```
ibase -
```

The program returns a message acknowledging that the driver has been removed.



*To load the driver for the AVM ISDN-Controller B1 v3.0 automatically each time the computer is started, add the call for the IBASE.BAT batch procedure to the AUTOEXEC.BAT file. (Remember to include the path!).*

## 9.4 Changing the Settings

The following settings can be changed:

- D-channel protocol
- activate automatic data compression (CAPI SoftCompression X75/V42bis)

Start the installation program again by entering the **install** command as described in the section “Installing the Driver Software” on page 56 and follow the instructions there.



*Information about CAPI SoftCompression is available in the section “CAPI SoftCompression X75/V42bis” on page 83.*

## 9.5 Installing Additional Controllers

Up to four active AVM ISDN-Controllers may be installed in your computer at the same time. It is also possible to combine active AVM ISDN-Controllers for ISA and PCI buses in on computer.

To install additional ISDN-Controllers, proceed as follows:

1. Open the ISDNLOAD.CFG file from the installation directory in a text editor.
2. Copy the entire section beginning with the line [ISDN-Controller-oo]. Enter the copied section again below the original section.
3. Then add one to each of the controller numbers in the new section and enter the desired values for the second controller:
  - I/O address and interrupt

- Base module (specifies the T4 file): “b1.t4” stands for the D-channel protocol DSS1, “b1tr6.t4” for 1TR6, and “b1usa.t4” for NI1 and 5ESS
- :PROTOCOL (specifies the D-channel protocol): “\x00” stands for DSS1, “\x06” for 1TR6, “\x03” for NI1, and “\x05” for 5ESS

Example:

```
[ISDN-Controller-00]
```

```
IO Address = 150
```

```
Interrupt = 5
```

```
Base Module = b1.t4
```

```
:PROTOCOL = \x00
```

```
[ISDN-Controller-01]
```

```
IO Address = 250
```

```
Interrupt = 10
```

```
Base Module = b1tr6.t4
```

```
:PROTOCOL = \x06
```

Also note the following:

- When an AVM ISDN-Controller for a different type of bus is added, the paragraphs of the ISDNLOAD.CFG file listed above also must include the line **Type=XX** to specify the bus type.
- If a PC controller is already installed and an ISA controller is to be added, in addition to the I/O address and the interrupt, the following value must be specified: **Type=B1at**.
- If a PCI controller is to be added, and an ISA controller is already installed, the corresponding entry is: **Type=B1pci**. For a PCI controller, it is not necessary to enter the I/O address and interrupt. Also note the information in the manual for the PCI controller.

The **ibase** command loads all ISDN-Controllers installed.

## 9.6 Removing the ISDN-Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 in MS-DOS, proceed as follows:

1. First unload the driver with the command **ibase -**
2. Then use the relevant DOS commands to delete the directory in which the drive software is located.
3. If the command **ibase** has been entered in the file AUTOEXEC.BAT, this file must be changed as well.

This concludes the removal of the AVM ISDN-Controller B1 v3.0 from MS-DOS.

# 10 Installation in Novell NetWare

The driver software for the AVM ISDN-Controller B1 v3.0 in Novell NetWare can be installed in the Novell NetWare versions 5.x, 4.x and 3.x.



*Two installation variants are supplied for Novell NetWare 4.x and 5.x: Stand-Alone CAPI and CAPI Manager. If you would like to use the Novell CAPI Manager, make sure that it is installed before installing the ISDN-Controller B1 v3.0.*



*For Novell NetWare 3.x, only the Stand-Alone CAPI driver is available.*

The Novell CAPI Manager is a part of the Novell NetWare 4.x and 5.x operating systems, and is supplied by Novell.

The installation and deinstallation procedures are almost identical for both driver types and for all three Novell NetWare versions. Configuration and operation of the ISDN-Controller B1 v3.0 is different depending on whether the Stand-Alone CAPI or the CAPI Manager version is used.

## 10.1 Installing the Driver Software

Before beginning with the software installation, check that the ISDN-Controller has been installed in the computer properly. Make sure that an I/O address available in the computer is set on the ISDN-Controller (see the section “Setting the I/O Address” on page 14).

Perform the following steps to install the driver software:



*The following instructions describe installation in Novell NetWare 5.x. Minor deviations may arise for Novell NetWare 3.12 and 4.x.*

1. Start your computer.
2. Insert the “AVM ISDN-Controller B1 v3.0” CD in your CD drive.
3. Enter the following command:

```
load nwconfig
```

to load the installation menu of the Novell NetWare server. The “Configuration Options” menu of the installation program appears.

4. Select “Product options” from this menu and press “Return”.

On a NetWare 3.x server, now a list of the programs already installed is displayed.

NetWare servers of version 5.x or 4.x show a menu labeled “Other Installation Items/Products”. Select the item “Install a product not listed” from this menu and press “Return”.

5. The disk drive A:\ is suggested by default. To specify another path, press “F3”.
6. To install the driver software for the **Stand-Alone Version** of the ISDN-Controller B1 v3.0, enter the following command:

```
<CD-ROM DRIVE> : \CARDWARE\B1_C30\  
NETWORK\CAP120\ENGLISH
```

To install the driver software for the **CAPI Manager**, enter the following command:

```
<CD-ROM DRIVE> : \CARDWARE\B1_V30\  
NETWORK\4CAPIMGR\ENGLISH
```

7. Confirm by pressing “Return”.
8. In the next step, select “Install on this server” and press “Return”.

The files for the AVM ISDN-Controller B1 v3.0 are now copied to the SYS:SYSTEM directory.



At the conclusion of installation, the README file for the AVM ISDN-Controller B1 v3.0 is displayed on the screen.

9. Press “Esc” to end the display.
10. Press “Esc” as often as necessary to close all sub-menus and return to the “Configuration Options” menu.
11. Select “Exit” to leave the installation program.



*For operation and configuration with the Stand-Alone CAPI, continue with the next two sections. To perform the installation with CAPI for the CAPI Manager, proceed as described in the section “ISDN-Controller B1 v3.0 with CAPI for the CAPI Manager” on page 67.*

## 10.2 ISDN-Controller B1 v3.0 Configuration with Stand-Alone CAPI

To configure the AVM ISDN-Controller B1 v3.0 with Stand-Alone CAPI, proceed as follows:

1. Enter the following command at the system console:

```
load b1setup
```

A list of available ISDN-Controllers with their I/O addresses, interrupts and D-channel protocols appears.

2. Use the cursor keys to select the controller to be configured from this list and then press “Return”.
3. The configuration window for the AVM ISDN-Controller B1 v3.0 appears. Here you can perform the settings for the I/O address, interrupt, D-channel protocol, the Point-to-Point protocol (Direct Dial-In) and automatic data compression.



*For more information about CAPI SoftCompression, see the section “CAPI SoftCompression X75/V42bis” on page 83.*

4. Move the selection bar to each entry and press “Return”. Select the desired setting from the list displayed or enter the new value in the active input field.

5. Leave the configuration by pressing “Esc”. Select “Yes” to confirm that you want to save the new settings.

The ISDN-Controller B1 v3.0 settings can be changed at any time using this method.

## 10.3 Starting ISDN-Controller B1 v3.0 Operation with Stand-Alone CAPI

The ISDN-Controller must be loaded manually each time the system is started.

### Loading the ISDN-Controller

Enter the following command at the system console to load the controller:

```
load capi20
```

A message appears reporting that the ISDN-Controller has been loaded and the CAPI interface is available.

### Unloading the ISDN-Controller

To unload the ISDN-Controller B1 v3.0, enter:

```
load capi20 -d
```

at the system console. The system displays a message confirming the action.

## 10.4 Installing Additional Controllers with Stand-Alone CAPI

To install additional ISDN-Controllers, enter:

```
load blsetup
```

at the system console. In the list of available ISDN-Controllers, press “Ins”. Each time this operation is performed, another ISDN-Controller is displayed, complete with an available I/O address and interrupt.

Next, follow the instructions in the section “ISDN-Controller B1 v3.0 Configuration with Stand-Alone CAPI” on page 65.

## 10.5 ISDN-Controller B1 v3.0 with CAPI for the CAPI Manager

Proceed as follows to configure and start operation of the AVM ISDN-Controller B1 v3.0 with CAPI for the CAPI Manager:

1. Enter the following command at the system console:  

```
load inetcfg
```
2. The “Internetworking Configuration” window appears. Select the “Boards” entry and press “Return”.  
A list displays all available ISDN-Controllers.
3. To bind the ISDN-Controller into the operating system press the “Ins” key.
4. In the “Select a Driver” dialog, select the “WHSMCAPI” entry and press “Return”.
5. In the next window, assign a name for the ISDN-Controller B1 v3.0, such as B1ISA, and press “Return”.
6. Configure the ISDN-Controller in the “WHSMCAPI Board Configuration” window.  
Move the highlight to “Select to View” and press “Return”.
7. When prompted to choose whether the ISDN-Controller should be loaded automatically, select “Yes”.
8. In the next dialog, select the ISDN-Controller “AVMB1” and press “Return”.
9. Then enter your parameters:
  - Interrupt
  - I/O address
  - Maxports (fixed at 2)
  - Switch Type (D-channel protocol)
  - Line Config (MTP= multipoint or PPT= point-to-point)
  - Automatic Data Compression



*For more information about CAPI SoftCompression, see the section “CAPI SoftCompression X75/V42bis” on page 83.*

10. Exit the configuration dialog by pressing “Esc” twice and select “Yes” to confirm that you want to save the new settings.
11. The final step in the configuration process is to update the system and load the ISDN-Controller.

In the “Internetworking Configuration” window, select the “Reinitialize System” command and confirm it by selecting “Yes”.

12. Select “Exit” to terminate the configuration. Answer “Yes” to have your settings saved.

This concludes the configuration and loading processes for the ISDN-Controller B1 v3.0 with the CAPI Manager.

The ISDN-Controller B1 v3.0 settings can be changed at any time using this method.

## 10.6 Installing Additional ISDN-Controllers with the CAPI Manager

To install additional ISDN-Controllers, enter:

```
load inetcfg
```

at the system console. Follow the instructions described in the section “ISDN-Controller B1 v3.0 with CAPI for the CAPI Manager” on page 67.

## 10.7 Removing the ISDN-Controller B1 v3.0

To remove the ISDN-Controller B1 v3.0 from Novell NetWare, proceed as follows:

1. Enter the following command at the system console:

```
load nwconfig
```

2. The “Configuration Options” menu of the installation program appears. Press “Return”.
3. Select the “Product options” item from the menu and press “Return”.

If you are removing the ISDN-Controller from a NetWare 3.x server, a list of the programs already installed appears.

4. If you are removing the ISDN-Controller from a NetWare 4.x or 5.x server, a menu entitled “Other Installation Items/Products” appears.

Select here the commands “View/Configure/Remove installed products” and press “Return”. A list of the programs already installed is displayed.

5. Move the highlight to the AVM ISDN-Controller B1 v3.0 and press “Del”. Confirm with “Yes”.
6. Press “Esc” as often as necessary to close all sub-menus and return to the “Configuration Options” menu.

This concludes the uninstallation of AVM ISDN-Controller B1 v3.0 in Novell NetWare.

# 11 Installation in OS/2

For use in OS/2, specially developed drivers are included with delivery. This CAPI driver also supports existing OS/2 applications based on CAPI 1.1. For more information about CAPI, see the section “The Applications Interface CAPI 2.0” on page 78.

## 11.1 Installing the Driver Software

Before beginning with the software installation, check that the ISDN-Controller has been installed in the computer properly. Make sure that an I/O address available in the computer is set on the ISDN-Controller (see the section “Setting the I/O Address” on page 14).

Proceed as follows to install the driver software in OS/2:

1. Insert the “AVM ISDN-Controller B1 v3.0” CD in your CD-ROM drive.
2. Open the “System” folder and double-click “Drives”. Then click the icon for your CD-ROM drive. Switch to the following directory:

**CARDWARE\B1\_v30\OS2\ENGLISH**

3. Start the program INSTALL.EXE.
4. An OS/2 command-line window opens and the installation program’s sign-on message appears. Press “Return”.

Installation can be aborted at any time by pressing “Ctrl+x”.

5. The next dialog asks whether the AVM ISDN-Controller B1 v3.0 is to be loaded automatically each time OS/2 is started. Activate the desired option and confirm it with “Return”.

6. Next, enter the I/O address corresponding to the jumper setting on the controller hardware. Press the “Tab” key to move to selection bar to the desired value and confirm your selection by pressing “Return”.
7. The next step is to specify the interrupt to be used by the ISDN-Controller. Confirm with “Return”.
8. Specify the D-channel protocol used on your ISDN line.
9. Then specify the directory in which the driver software for the ISDN-Controller is to be installed.

The driver software is copied to the specified directory.

10. A message indicates that the CONFIG.SYS file has been changed. The drivers for the AVM ISDN-Controller B1 and commands to load the ISDN-Controller software have been entered in the file. Typically, these entries appear as follows:

```

REM - AVM ISDN-Controller B1 Begin-
SET CAPI=C:\OS2\IDRIVER
DEVICE=C:\OS2\IDRIVER\AVMB1.SYS /LD
CALL=C:\OS2\IDRIVER\ISDNLOAD.EXE
REM - AVM ISDN-Controller B1 End --

```

The old CONFIG.SYS file is renamed to CONFIG.B1 to serve as a reference copy to the previous version.

11. Finally, you are prompted to restart the operating system. This is necessary in order to activate the driver software just installed. Confirm by selecting “OK”.

Restarting the computer concludes the installation of the driver software for OS/2.

A new program group called “AVM” is created in the Program Manager/Start menu. This program group contains the programs “B1 Unload”, “B1 Load” and “B1 Readme”.



*If the I/O address and interrupt of the ISDN-Controller must be changed after installation, for instance, because new hardware devices were installed, change the position of the jumper on the ISDN-Controller first. Then enter this I/O address and any new interrupt setting in the ISDNLOAD.CFG file. Another option is to re-install the driver software and enter the changed values during installation.*

## 11.2 Starting Operation of the Controller B1 v3.0

If you specified during installation that the ISDN-Controller is to be activated each time the computer is started, when the system is restarted, the following message appears: “Device driver for AVM ISDN-Controller B1 v3.0 installed”.

### Loading the ISDN-Controller

The ISDN-Controller is installed manually by double-clicking the “B1 Load” icon in the “AVM” folder. An OS/2 window is opened. Once the controller has been loaded successfully, the following message appears on the screen:

*Message after loading in OS/2*

AVM Berlin	ISDN-Controller B1
COMMON-ISDN-API Version 2.0	Serial No. xxxxxxxx
E-DSS1 / Release xxxxxx	Address xxx / IRQ x
Add. Service:Telefax G3, Fax Polling, DTMF, V.110, V.120, GSM, CAPI 1.1.	

### Unloading the ISDN-Controller

To unload the Controller B1 v3.0, double-click “B1Unload”. A message acknowledges that the driver has been unloaded.



## 11.3 Changing the Settings

After installation, the setting for the D-channel protocol may be changed. Proceed as follows:

Start the INSTALL.EXE program as described in the section “Installing the Driver Software” on page 70 and follow the instructions.

## 11.4 Installing Additional Controllers

Up to four active AVM ISDN-Controllers and ISDN-Controllers for the ISA and PCI bus may be combined in one computer.

To install an additional AVM ISDN-Controller B1 v3.0, proceed as follows:

1. Open the ISDNLOAD.CFG file from the directory of the driver software, e.g. IDRIVER, in a text editor.
2. Copy the entire section beginning with the line [ISDN-Controller-oo]. Enter the copied section again below the original section.
3. Then add one to each of the controller numbers in the new section and enter the desired values for the second controller:
  - I/O address and interrupt
  - Base module (specifies the T<sub>4</sub> file): “b1.t4” stands for the D-channel protocol DSS1, “b1tr6.t4” for 1TR6, and “b1usa.t4” for NI1 and 5ESS.
  - :PROTOCOL (specifies the D-channel protocol): “\x00” stands for DSS1, “\x06” for 1TR6, “\x03” for NI1, and “\x05” for 5ESS

Example:

```
[ISDN-Controller-00]
IO Address = 150
Interrupt = 5
Base Module = b1.t4
```

```
:PROTOCOL = \x00

[ISDN-Controller-01]
IO Address = 250
Interrupt = 10
Base Module = bltr6.t4
:PROTOCOL = \x06
```

Then switch off the computer and physically install the second ISDN-Controller into the system. Make sure that the jumper setting on the ISDN-Controller corresponds to the I/O address entered in the file.

Also note the following:

- When an AVM ISDN-Controller for a different type of bus is added, the paragraphs of the ISDNLOAD.CFG file listed above also must include the line **Type=XX** to specify the bus type.
- If a PC controller is already installed and an ISA controller is to be added, in addition to the I/O address and the interrupt, the following value must be specified: **Type=Blat**.
- If a PCI controller is to be added, and an ISA controller is already installed, the corresponding entry is: **Type=Blpci**. For a PCI controller, it is not necessary to enter the I/O address and interrupt. Also note the information in the manual for the PCI controller.

The “B1 Load” program loads all installed controllers.

## 11.5 Removing the Controller B1 v3.0

To remove the AVM ISDN-Controller B1 v3.0 from OS/2, proceed as follows:

1. Start the installation program from the CD.  
The program reports that an installed ISDN-Controller was found.
2. Select the “Uninstallation” option and follow the instructions on the screen.  
The entries added to the CONFIG.SYS during installation of the ISDN-Controller are deleted.
3. Restart the system to deactivate the driver.

This concludes the removal of the AVM ISDN-Controller B1 v3.0 from OS/2.

## 12 The AVM ISDN-Controller B1 v3.0 on Point-to-Point ISDN Lines

By default, the AVM ISDN-Controller B1 v3.0 is installed with settings for BRI lines in point-to-multipoint configuration.

To operate the controller with point-to-point lines (also called direct-dial-in or DDI lines), a number of special settings must be made depending on the operating system used.



*Please note that only one terminal device can be connected to a point-to-point BRI.*

### **Windows 2000**

In Windows 2000 a configuration must be performed in the Device Manager to operate the AVM ISDN-Controller B1 v3.0 at a point-to-point line. Proceed as follows:

1. Open the Device Manager by clicking it on the “Hardware” settings page (“Start / Settings / Control Panel / System”).
2. Click the “+” preceding the entry “Network adapters”.
3. Then click with the right mouse button on the entry “AVM ISDN-Controller B1”.
4. Click the “Properties” option and then go to the “Advanced” settings page.
5. On this settings page, activate the option “Support for Point-to-Point ISDN lines (with DDI capability)”.
6. Save your entries with “OK”.
7. The computer must be restarted for this setting to take effect.

### **Windows NT 4.0 Server/Workstation**

The “B1 Server Edition” developed especially for the AVM products Network Distributed ISDN for Windows NT, AVM ISDN Access Server and the ISDN MultiProtocol Router for Windows NT provides for easy configuration over a selection menu. This setup can be obtained free of charge from the AVM Data Call Center (ADC) or from the Internet (see the inside cover for the addresses) in the folder \CARDWARE\SERVER.B1\.

The “B1 Server Edition” can, of course, be used for all other CAPI applications.

### **Windows Me/98/95, Windows 3.x, DOS and OS/2**

Perform the standard installation for your operating system and exchange one single component of the driver. All necessary components and information are contained in the folder \CARDWARE\B1\_V30\X\_MISC on the “AVM ISDN-Controller B1 v3.0” CD.



*Please note that CAPI applications such as fax servers must also be configured to interpret the DDI (direct dial-in) ISDN numbers correctly. Consult the documentation accompanying your application software.*

### **Novell NetWare 3.x, 4.x and 5.x**

Activate the “P2P” option in the menu for setting the D-channel protocol and restart NetWare.

# 13 AVM System Architecture

This chapter presents information about the ISDN interface CAPI 2.0, the IDM architecture and the AVM system drivers included in the package, along with special CAPI features of the AVM ISDN-Controller B1 v3.0.

## 13.1 The Applications Interface CAPI 2.0

After the ISDN-Controller B1 v3.0 has been installed, the ISDN interface CAPI 2.0 is available in the computer. This interface allows you to use all features of ISDN.

### What is CAPI?

CAPI (COMMON-ISDN-CAPI) is a standardized software interface that provides applications with access to ISDN adapters on basic-rate and primary-rate lines. Applications that build on this standard interface use uniform mechanisms for communication over ISDN connections, and thus do not need to adapt to the peculiarities of particular manufacturers' hardware. This means that such applications are also unaffected by future extensions or hardware modifications: CAPI makes such changes transparent to the application. ISDN hardware manufacturers benefit from this standard too, since it makes all kinds of applications compatible with their products.

CAPI contains an abstract definition of ISDN services which is not dependent on the specifics of underlying telecommunications networks or the adapter cards used to connect computers to ISDN. The specification provides an interface that is easy for application programmers to use, and thus offers uniform access to the various ISDN services, such as data, voice and fax transmission, video conferencing and telephony.

## Benefits of CAPI

CAPI has evolved into an internationally recognized standard. The key factor in this development has been the numerous advantages offered by this uniform interface: independence from specific manufacturers and resulting high investment security, a wide variety of compatible applications for all kinds of operating systems and ISDN protocols, etc. ISDN (the **I**ntegrated **S**ervices **D**igital **N**etwork) is becoming attractive for more and more companies since it affords fast and reliable transfer of information in many different forms.

Over eleven years of experience in the growing ISDN market have gone into CAPI 2.0. This version has all the advantages of an open interface, and covers most ISDN features. Since the CAPI interface handles most ISDN subscriber interface control functions, these no longer have to be programmed. This simplifies the development of ISDN applications. Furthermore, applications no longer have to be tailored to national or manufacturer-specific systems, so that a greater variety of applications is available.

For more information about the CAPI applications interface, see the following Internet site:

<http://www.capi.org>

## Features of CAPI

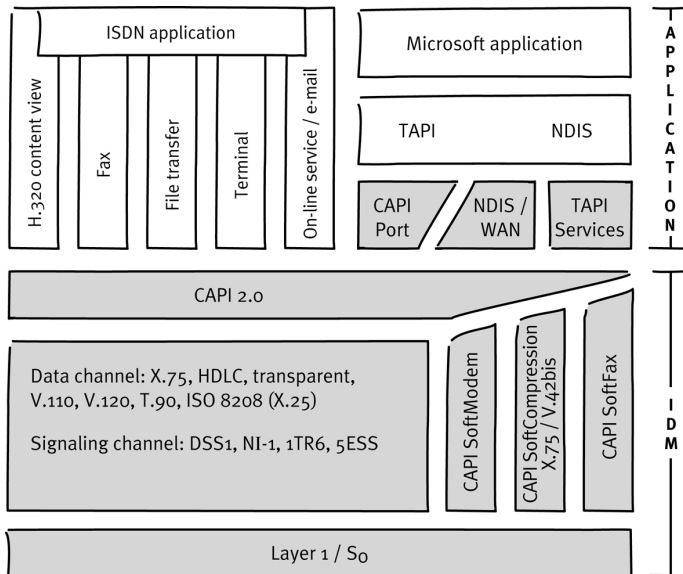
CAPI offers a number of important features:

- Support for basic call features such as call set-up and clear-down
- Support for multiple B channels for data and/or voice connections
- Support for multiple logical data connections within a single physical channel
- Selection of specific services and protocols on dialing and in answering incoming calls
- Transparent interface for protocols above OSI Layer 3

- Support for one or several BRIs and PRIs through one or several ISDN adapters
- Support for multiple concurrent applications
- Message definitions independent of operating systems
- A message-passing mechanism tailored to specific operating systems for optimum system integration
- An asynchronous, event-driven mechanism for high throughput

### 13.2 IDM Architecture

The ISDN Driver Model (IDM) illustrated below shows how ISDN is integrated in Microsoft operating systems.



*IDM Architecture*



The ISDN Driver Model is the framework for all driver components of AVM ISDN products. The IDM describes how ISDN services are integrated and how they are accessed by applications. It also defines the transparent integration of ISDN hardware resources in the operating system.

One of the most important functions the IDM makes possible is the coupling of existing communication components (such as RAS) with CAPI-based hardware. This connection is realized by the AVM system drivers such as the AVM CAPI Port Driver or the NDIS WAN CAPI Driver.

This architecture permits the simultaneous use of CAPI, modem and networking applications over ISDN. Most importantly, it also permits the definition and implementation of new, extended capabilities. Examples to date include the incorporation of V.42bis data compression and Group 3 Fax.

### 13.3 The AVM System Drivers

AVM provides two system drivers for Windows with similar capabilities: the AVM ISDN CAPI Port Driver and the AVM NDIS WAN CAPI Driver. Both of these drivers are controlled through Dial-Up Networking, although they use different interfaces and protocols in the operating system. These drivers achieve the same transfer speeds in data communications.



***The ISDN CAPI Port Driver and the NDIS WAN CAPI Driver can be installed on one computer at the same time if desired.***

The AVM system drivers make it possible to use communication programs that do not incorporate CAPI support, such as Windows' Dial-Up Networking, concurrently with CAPI-based ISDN software.

The third AVM system driver, AVM ISDN TAPI Services, permits the use of telephony applications with the AVM ISDN-Controller B1 v3.0 in the Windows 2000, Windows NT, Windows Me and Windows 98 operating systems.

The AVM system drivers are located on the “AVM ISDN-Controller B1 v3.0” CD in the folder PROGRAMS\<DRIVER>\<DRIVER.OPERATING SYSTEM>. The latest versions are also available for downloading from the AVM Data Call Center or from AVM’s FTP server on the Internet.

For a detailed description of each driver’s functions, please see the Help file in the corresponding folder. The Help file also contains complete installation instructions.

### **AVM ISDN CAPI Port Driver**

The AVM ISDN CAPI Port Driver allows your application to use an ISDN-Controller as if it were an analog modem.

The AVM ISDN CAPI Port Driver makes it possible for even programs designed for analog modems to communicate over the ISDN interface. This means that the various communication functions of Windows can be used with all AVM ISDN-Controllers. For instance, you can use Dial-Up Networking with the TCP/IP protocol to dial into your Internet provider.

A number of different “virtual modems” preset for a variety of purposes can be selected in Windows applications like Dial-Up Networking, Microsoft Exchange/Outlook and Microsoft Money 9x. Just pick a pre-configured destination to begin ISDN communication.

### **AVM NDIS WAN CAPI Driver**

The AVM NDIS WAN CAPI Driver for Windows permits the use of RAS and dial-in Internet access over ISDN.

NDIS (**N**etwork **D**evice **I**nterface **S**pecification) is a standard interface between network adapters (hardware) and network protocols (software). NDIS WAN is a Microsoft extension of this standard for Wide Area Networking (WAN). The AVM NDIS WAN CAPI Driver makes it possible to use the ISDN-Controller as a network adapter, with the ISDN-Controller addressed over the CAPI 2.0 application interface.

Unlike the AVM ISDN CAPI Port Driver, the AVM NDIS WAN CAPI driver cannot be controlled by AT commands. It uses the standard protocols for network connections over ISDN (“HDLC” and “PPP over ISDN”).

## **AVM ISDN TAPI Services for CAPI**

The AVM ISDN TAPI Services for CAPI are universal drivers for the use of TAPI applications with AVM ISDN-Controllers in Windows.

TAPI (**T**elephony **A**pplication **P**rogramming **I**nterface) is a software interface defined by Microsoft to permit the control of telephony equipment by Windows applications. The AVM ISDN TAPI Services for CAPI can be used to initiate telephone calls or to control voice mail systems. For example, Windows’ “Phone Dialer” component can be used to call analog or ISDN telephones. The telephone call is placed using the PC’s sound adapter and a headset or speakers and a microphone. Suitable TAPI applications can make use of numerous other features, such as direct telephone dialing to communication partners listed in programs such as Microsoft Outlook 98/2000.

AVM ISDN-Controllers and the AVM ISDN TAPI Services for CAPI can be used in connection with TAPI applications that conform to version 2.1 (or later) of the Microsoft TAPI standard.

## **13.4 CAPI SoftCompression X.75/V.42bis**

CAPI SoftCompression X.75/V.42bis is a feature of the ISDN-Controller B1 PCI’s driver software. For data connections using the X.75 protocol, the controller can perform data compression in accordance with the V.42bis standard. This reduces transfer times and connection costs.

When the driver software is installed, CAPI SoftCompression X.75/V.42bis is activated by default. Upon request by CAPI applications that support the V.42bis standard, data compression is negotiated with the remote system for the duration of a connection.

If you use older ISDN applications that do not support this method of data compression, you have the option of activating data compression directly in the driver software of the ISDN-Controller B1 v3.0. This switches on data compression for **all** ISDN connections such that the controller will attempt to negotiate V.24bis data compression with the remote site for all X.75 connections, independent of the CAPI application. If the remote site does not perform data compression, the data will be transmitted without compression. This process takes place in the background and is not apparent to the user.



*The “Change Settings” sections for each operating system describes how to activate or deactivate V.42 data compression after installation. In Novell NetWare this information is contained in the sections “Starting ISDN-Controller B1 v3.0 Operation with Stand-Alone CAPI” on page 66 and “ISDN-Controller B1 v3.0 with CAPI for the CAPI Manager” on page 67.*

If your computer does not meet the hardware requirements or if unexpected problems arise during data exchange with remote sites without V.42 capability, it is advisable to deactivate data compression in both the driver and the application.



*If you have problems establishing a connection, try deactivating data compression.*

## 13.5 CAPI SoftFax

The CAPI SoftFax feature allows the controller to send faxes on two B channels simultaneously at up to 14.4 Kbit/s, or to receive a fax one one channel at up to 9.6 Kbit/s. The ISDN-Controller B1 v3.0 acts as a standard Group 3 fax device.

The following fax protocols are supported:

- V.17 (14.4 Kbit/s)
- V.29 (9.6 Kbit/s)
- ECM (Error Correction Mode)

# 14 Technical Summary

## 14.1 Connector Pin Assignments

The ISDN-Controller is connected to the ISDN BRI by a standard RJ45 connector. The pin assignments of this connector are shown in the following tables.

*Connector pin assignments, S<sub>o</sub> interface (RJ45) to ISDN (IAE)*

RJ 45	IAE plug	Function
1-		
2-		
- 5 (b1)	- 5 (b1)	transmit
- 4 (a1)	- 4 (a1)	transmit
- 3 (a2)	- 3 (a2)	receive
- 6 (b2)	- 6 (b2)	receive
7-		
8-		

*Connector pin assignments, S<sub>o</sub> interface (RJ45) to ISDN (TAE 8)*

RJ 45	TAE plug	Function
1-		
2-		
- 5 (b1)	- 4 (b1)	transmit
- 4 (a1)	- 3 (a1)	transmit
- 3 (a2)	- 6 (a2)	receive
- 6 (b2)	- 5 (b2)	receive
7-		
8-		

## 14.2 Features at a Glance

- ISDN card with an S<sub>0</sub> interface for the ISA/EISA bus for operation on a BRI or on PBX extensions (point-to-multi-point and point-to-point)
- Supports file transfer, internetworking, fax, voice and video communication
- DTMF recognition and fax polling
- High-power processor (Multitasking-RISC transputer) with 20 MIPS, 1 MB RAM on board
- Designed for high-load operation with 2 B channels
- CAPI 2.0 interface fully downward compatible to the AVM ISDN-Controller B1 2.0
- Driver software loadable for national and international protocols (DSS1, 1TR6, 5ESS and NI1)
- Software loaded on the ISDN-Controller, for instance V.42bis data compression
- Implementation in different operating systems, up to 4 controllers in one computer; combinations with the B1 PCI v4.0 possible
- Switching requires only an I/O address and an interrupt, occupies no RAM and no DMA channel in the PC
- Hardware configuration performed by software
- Contains driver software, configuration program and diagnosis program
- AVM ISDN Tools included with delivery: Connect2 (MS-DOS) and Connect32 (Windows 2000/NT/Me/98/95) compatible with FRITZ!data and IDtrans, AVM NDIS WAN CAPI Driver and AVM ISDN CAPI Port Driver for Windows 2000/NT/98/95 and AVM TAPI Services for CAPI (Windows 2000/NT/Me/98)
- Extensive CAPI 2.0 applications available

## 14.3 Technical Specifications at a Glance

- ISDN plug-in card for ISA/EISA-Bus (SMT), dimensions ca. 160 x 105 mm.
- S<sub>0</sub> interface for basic access/BRI
- High-performance processor (multitasking RISC transputer with 20 MIPS)
- 1 MB RAM on board, 2 KB high-speed cache memory
- Installation of the I/O address (150, 250, 300, 340) and interrupt (2-15) by software
- Data transmission rate of 2 x 64,000 bit/s + 1 x 16,000 bit/s
- D-channel protocols supported: DSS1, 1TR6, 5ESS, NI1
- Level 2 B-channel protocols supported: X.75, HDLC transparent, V.110, V.120 and V.17/V.29
- Level 3 B-channel protocols supported: transparent, X.25, ISO 8208, T.70, T.90 and T.30
- Implementation in the operating systems Windows 2000, Windows NT, Windows Me, Windows 98, Windows 95, Windows 3.x, MS-DOS, OS/2, Novell NetWare and Linux
- Standardized COMMON-ISDN-API version 2.0 as the programming interface, including support for CAPI 1.1 applications (in Windows NT, Windows 98, Windows 95, Windows 3.x, MS-DOS and OS/2)
- Power consumption approx. 1 Watt.
- EMV tested in accordance with EN41003, VDE 0878
- Security tested in accordance with IEC 950, EN 41003, EN 60950, VDE 0804, VDE 0805
- CE certification 0170 X

# 15 Technical Assistance from AVM Support

AVM provides numerous sources of information to assist you in your day-to-day work with the AVM ISDN-Controller B1 v3.0. New drivers and software updates for your ISDN-Controller B1 v3.0 are available for downloading free of charge from AVM's Internet site or the AVM Data Call Center (ADC). If you are not able to resolve a problem using these resources, AVM Support is available to assist you.

## 15.1 Information and Updates

Information about the AVM ISDN-Controller B1 v3.0 can be obtained from the following sources:

### **The ISDN-Controller B1 v3.0 manual**

The manual is contained in the ISDN-Controller package in printed form, and is also included in PDF format on the CD in the INFO\MANUAL\ENGLISH folder. If you do not have the Adobe Acrobat Reader to display PDF documents, you can install this program from the CD as well. See the \PROGRAMS\ACROBAT folder.

### **The "AVM ISDN-Tools" manual**

This manual documents the AVM ISDN-Tools and is available in PDF format in the INFO\MANUAL\ENGLISH folder. If you do not have the Adobe Acrobat Reader to display PDF documents, you can install this program from the CD as well. See the folder \PROGRAMS\ACROBAT.

### **The "B1 Readme" file**

The "B1 Readme" file in the "AVM" program group contains current information that was not yet available at the time the manual was printed.



### The AVM Internet Site

AVM publishes detailed information and free software updates in the Internet. Direct your browser to [www.avm.de](http://www.avm.de) and:

- Click “Products” for detailed information on all current AVM products, as well as announcements of new products and product versions.
- Click “Service” to consult the FAQs: the answers to Frequently Asked Questions about AVM products. Here you will find solutions for specific situations.
- Under “Service” you will also find the latest driver software to download for the AVM ISDN-Controller B1 v3.0.

The AVM Data Call Center (ADC) is a direct ISDN file transfer server that also provides all the programs and drivers found on AVM's Internet site. Dial the AVM Data Call Center using FRITZ!data (IDtrans protocol) or the Connect2 or Connect32 program at:

+49 (0)30 / 39 98 43 00.

## 15.2 AVM Support



*Please take advantage of the information sources listed above before contacting AVM Support!*

If the tips and information sources listed above have not assisted you in solving your problem, please contact AVM Support for further information.

AVM Support can be reached by E-mail or by fax.

### Support by E-mail

You may send support requests to AVM by e-mail. Please do so using our e-mail request form, which you can find at

<http://www.avm.de/support/english>

Fill out the form and click “Send” to send it to AVM Support.

## Support by Fax

If you have no connection to the Internet, AVM Support can be reached at the fax number:

**+49 (0) 30 / 39 00 44 05**

Please supply the following information in your support request:

- Which AVM ISDN-Controller model are you having trouble with?
- What is the version number of the driver you are using? You can find this information in the README file in the “AVM” program group.
- Is your ISDN-Controller connected directly to the ISDN NT, or to a PBX extension line?
- What operating system is running on the computer in which you have installed the AVM ISDN-Controller B1 v3.0?
- Please specify the exact text of all error messages you encountered.
- Describe the problem in as much detail as possible: in what context does the error occur; what application software are you using; etc.

Please answer the following questions in your support request as well, as these points can be very helpful in solving your problem:

- Is the error reproducible?
- Does the “B1 Test” program in the “AVM” group detect problems with your ISDN-Controller?
- Are you able to dial up a data connection to the AVM Data Call Center (ADC) with your AVM ISDN-Controller B1 v3.0?

Attempt to make a test connection to the ADC with the ISDN Tool Connect32, included with your ISDN-Controller, or with FRITZ!data. Use the IDtrans protocol and dial the number +49 (0)30 / 39 98 43 00.

If the connection to the ADC fails, what error messages are displayed?

- Describe your PC configuration in as much detail as possible, including the system type, sound card type, any other components installed, and the allocated resources (interrupts and I/O addresses).

# 16 Troubleshooting

This chapter describes general malfunctions and specific error messages, and suggests remedies. The error messages are grouped according to the operating platforms in which the AVM ISDN-Controller B1 v3.0 can be operated.

## 16.1 General Malfunctions

### **The AVM ISDN-Controller is not detected or not initialized.**

- Have you installed other new hardware components or changed the configuration of existing hardware?

If so, check whether conflicts have arisen in the assignment of system resources (I/O addresses and IRQ levels). Use the Device Manager in Windows 2000/NT/Me/98/95, accessible from “Settings / Control Panel / System”. In Windows 3.x and MS-DOS, use the MSD.EXE program included in the package.

- If you are using a computer with a PCI/ISA bus, make sure that the interrupt selected on the AVM ISDN-Controller is also available on the relevant bus (computer setup or ICU utility).
- Have any changes been made to the computer’s BIOS setup?
- Has the configuration of your computer been changed (for instance, boot menus, memory manager, etc.)?

### **You are unable to establish an ISDN connection.**

If the ISDN-Controller is correctly installed but you are unable to establish a connection, check for the following conditions:

- Is the ISDN-Controller firmly inserted in the computer slot? Is its slot plate screwed down?
- Is the ISDN cable firmly inserted in the AVM ISDN-Controller and connected to your ISDN socket?

- Is your ISDN line active? Use another terminal device, such as an ISDN telephone, to check it.
- Is your network terminator (NT) installed correctly? Some NTs must be connected to an electrical outlet as well as to the incoming ISDN line.
- If your ISDN-Controller is connected to a point-to-point line, have you included the outside dialing prefix (usually ‘o’) in the numbers dialed?
- Are all the pertinent services (for data connections) available and enabled in your PBX?
- Did you indicate the correct D-channel protocol for your ISDN line in installing the ISDN-Controller software?

**Problems arise during ISDN-Controller operation:**

If problems occur regularly during operation, run the program “B1 Test”, located in the “AVM” program group or in the installation folder of the driver software. This program performs functional tests of the ISDN-Controller’s components and displays the results.

If “B1 Test” reports no malfunctions in the ISDN-Controller hardware, attempt a test connection to the AVM Data Call Center. Use the program “Connect2” or “Connect32”, both of which are included among the AVM ISDN-Tools supplied with your ISDN-Controller. The number of the AVM Data Call Center is +49-(0)30 39 98 43 00.

**After you have run the diagnostic program “B1 Test,” the CAPI interface is no longer available (error message: COMMON-ISDN-API Version 2.0 is not installed).**

Load the AVM ISDN-Controller B1 v3.0 once again by running the appropriate program for your operating system, such as IBASE.BAT in DOS or “B1 Load” in Windows.

**Applications like Connect32 and FRITZ!com are unable to connect to analog dial-in ports.**

To connect to analog systems, appropriate communications software is needed in addition to the ISDN-Controller. With programs like FRITZ!fax, for example, you can connect to Group 3 (analog) fax machines.

**DOS and Windows drivers loaded at the same time**

Load either the DOS driver or the Windows driver for your AVM ISDN-Controller, not both at once. The Windows driver also supports CAPI-based DOS applications in DOS windows.

**No connection charge information is displayed.**

The drivers for the AVM ISDN-Controller B1 v3.0 allow CAPI-based applications to display charge information. This information is only available if the corresponding ISDN service has been enabled by your ISDN service provider. Contact your ISDN service provider to request charge information.

## 16.2 Error Messages

### Error Messages in Windows 2000

Please refer to the Windows 2000 documentation from Microsoft.

### Error Messages in Windows NT

**Error message:** “Controller-xx with I/O address <xxx> could not be found”

**Possible cause:** The position of the jumper that sets the I/O address on the ISDN-Controller does not correspond to the entry in the “B1 Setup” program; the I/O address is used by another hardware device (a network adapter, for instance) or the hardware is not installed.

**Remedy:** Check which I/O address is available in your computer and set the jumper on the ISDN-Controller accordingly (see the section “Setting the I/O Address” on page 14). Then enter the new I/O address in the driver software by starting the “B1 Setup” program from the “AVM” program group. Windows NT must be restarted for this setting to take effect.

**Error message:** “Installation Error. Interrupt <xx> not available.”

**Possible cause:** The AVM ISDN-Controller B1 v3.0 and another hardware device (such as a sound card) are configured to the same interrupt.

**Remedy:** Check which interrupt is available in your computer, e.g. using the “Windows NT Diagnostics” program (IRQ/Port Status). Then start the “B1 Setup” program from the “AVM” program group and change the interrupt setting. Windows NT must be restarted for this setting to take effect.

## Error Messages in Windows Me/98/95

**Error message:** “Controller-xx with I/O address <xxx> could not be found”

**Possible cause:** The position of the jumper that sets the I/O address on the ISDN-Controller does not correspond to the entry in the Control Panel (Device Manager), or the hardware is not installed.

**Remedy:** The I/O address set with the jumper must correspond to the entry in the Device Manager. Open the Device Manager by clicking through “Settings / Control Panel / System” and select the AVM ISDN-Controller B1 v3.0. Click “Properties” there and then the “Resources” settings page. Use the “Change setting” button to adapt the I/O address to the jumper position on the ISDN-Controller. If Windows indicates a device conflict for the desired I/O address, another address must be set, first with the jumper on the ISDN-Controller, and then again in the Device Manager.

The computer must be restarted for these settings to take effect.

**Error message:** “Interrupt <xx> not available” or “Interrupt <xx> cannot be used”

**Possible cause:** The AVM ISDN-Controller B1 v3.0 and another hardware device (such as a sound card) are set to the same interrupt.

**Remedy:** Open the Device Manager by clicking through “Settings / Control Panel / System” and select the AVM ISDN-Controller B1 v3.0. Click “Properties” there and then the “Resources” settings page. Select the resource type “Interrupt”. Use the “Change setting” button to set a different interrupt which is not used by any device. Windows automatically indicates any conflicts with other devices. The computer must be restarted for these settings to take effect.



**Error message:** “Controller <xx> with I/O address <xxx> does not answer”

**Possible cause:** Hardware defect, or installation files are damaged.

**Remedy:** Repeat the entire installation and then run the hardware test program “B1 Test”. If the hardware is defective, please contact your vendor or AVM.

**Error message:**“..... at least one application/user task is registered.”

**Possible cause:** You tried to unload or uninstall the AVM ISDN-Controller B1 PCI v4.0 while an application (such as a terminal or fax program) was still using it.

**Remedy:** First close all applications that use the AVM ISDN-Controller. Then you can unload or uninstall it.

**Error message:** “CAPI not loaded”

**Possible cause:** You tried to start an ISDN application without loading the AVM ISDN-Controller B1 v3.0 first.

**Remedy:** Load the Controller B1 v3.0 using the “B1 Load” program and then start your ISDN application.

**Error message:** “CAPI.DLL, CAPI20.DLL or CAPI2032.DLL not found.”

**Possible cause:** The DLL files have been renamed or removed from the \WINDOWS\SYSTEM folder.

**Remedy:** Repeat the complete AVM ISDN-Controller B1 v3.0 installation to replace the missing files.

**Error message:** “Incorrect CAPI driver loaded.”

**Possible cause:** You tried to use another manufacturer’s CAPI with the AVM ISDN-Controller B1 v3.0.

**Remedy:** Repeat the complete installation of the driver software and use the CAPI driver supplied by AVM to operate the ISDN-Controller.

**Error message: “Passive and active controllers cannot be installed simultaneously.”**

**Possible cause:** You tried to install a passive ISDN-Controller (such as the A1) in a system which already has an active AVM ISDN-Controller B1 v3.0 installed.

**Remedy:** You may install up to four active AVM-ISDN Controllers in one PC. Active and passive ISDN-Controllers cannot be used together in the same system, however.

**Error message: “Hardware recognition is complete. No new hardware components were found.”**

**Possible cause:** During the installation of the AVM ISDN-Controller B1 v3.0, the “Automatic Recognition” of new hardware was activated in the Add New Hardware Wizard.

**Remedy:** Start the Add New Hardware Wizard again and answer the question “Search for the new hardware?” with “No”. Confirm by clicking “Next”. See the installation chapter for the corresponding operating system.

## **Error messages in Windows 3.x**

**Error message: “Controller-xx with I/O address <xxx> could not be found”**

**Possible cause:** The position of the jumper that sets the I/O address on the ISDN-Controller does not correspond to the entry in the “B1 Setup” program, the I/O address is used by another hardware device (such as a network adapter), or the hardware is not installed.

**Remedy:** Check which I/O address is available in your computer and set the jumper on the ISDN-Controller accordingly (see the section “Setting the I/O Address” on page 14). Then enter the new I/O address in the driver software by starting the “B1 Setup” program from the “AVM” program group. Windows must be restarted for these settings to take effect.

**Error message: “Error in the configuration file. Incorrect B1 controller type.”**

**Possible cause:** Different types of controllers (ISDN-Controllers for the ISA and PCI buses) are combined in your system. During the installation of the additional controller, the ISDNLOAD.CFG and SYSTEM.INI files were not changed correctly.

**Remedy:** Note the instructions for installing additional controllers in the section for the relevant operating system. When adding an AVM ISDN-Controller for a different bus type, the line **Type=XX** must be added in the ISDNLOAD.CFG file (“B1at” for ISA controller, “B1pci” for PCI controller). This change must also be made in the SYSTEM.INI file.

**Error message: Interrupt <xx> not available”**

**Possible cause:** The AVM ISDN-Controller B1 v3.0 and another hardware device (like a sound card) are set to the same interrupt.

**Remedy:** Check which interrupts (IRQs) are available in your system by using the MSD.EXE program in the Windows directory. Then start the “B1 Setup” program from the “AVM” program group and define another interrupt for the ISDN-Controller. Windows must be restarted for these settings to take effect.

**Error message: “Installation error. Internal error: ISDN driver not loaded.”**

**Possible cause:** The driver file B1CBASE.386 has been moved or deleted, or the SYSTEM.INI file no longer contains the corresponding entry.

**Remedy:** Run the installation program SETUP.EXE from the original installation disk.

**Error message: The diagnostics program “B1 Test” does not run in Windows.**

**Possible cause:** The test program was started while the driver software (CAPI) was loaded.

**Remedy:** Run the “B1 Unload” program from the “AVM” program group to unload the ISDN-Controller and then start the test program again.

## Error messages in MS-DOS

**Error message:** “Controller-xx with I/O address <xxx> could not be found”

**Possible cause:** The position of the jumper that sets the I/O address on the ISDN-Controller does not correspond to the entry in the “B1 Setup” program, the I/O address is used by another hardware device (such as a network adapter), or the hardware is not installed.

**Remedy:** Check which I/O address is available in your computer and set the jumper on the ISDN-Controller accordingly (see the section “Setting the I/O Address” on page 14). Then enter the new I/O address in the driver software by starting the “B1 Setup” program from the “AVM” program group. Then reload the ISDN-Controller with “**ibase.bat**”.

**Error message:** “Installation Error. Interrupt <xx> not available.”

**Possible cause:** The AVM ISDN-Controller B1 v3.0 and another hardware device (like a sound card) are set to the same interrupt.

**Remedy:** Check which interrupts (IRQs) are available in your system by using the MSD.EXE program in the Windows directory. Then start the “B1 Setup” program from the “AVM” program group and define another interrupt for the ISDN-Controller. Then reload the ISDN-Controller with “ibase.bat”.

**Error message:** “Error in the configuration file. Incorrect B1 controller type.”

**Possible cause:** Different types of controllers (ISDN-Controllers for the ISA and PCI buses) are combined in your system. During the installation of the additional controller, the file ISDNLOAD.CFG was not changed correctly.

**Remedy:** Note the instructions for installing additional controllers in the section “Installing Additional Controllers” on page 60. When adding an AVM ISDN-Controller for a different bus type, the line **Type=XX** must be added in the ISDNLOAD.CFG file (“B1at” for ISA controller, “B1pci” for PCI controller).

## **Error messages in OS/2**

**Error message: “Controller-xx with I/O address <xxx> could not be found”**

**Possible cause:** The position of the jumper that sets the I/O address on the ISDN-Controller does not correspond to the entry in the ISDNLOAD.CFG file, the I/O address is used by another hardware device (such as a network adapter), or the hardware is not installed.

**Remedy:** Check which I/O address is available in your computer and set the jumper on the ISDN-Controller accordingly (see the section “Setting the I/O Address” on page 14). Then enter the new I/O address in the ISDNLOAD.CFG file using a text editor. The computer must be restarted for these settings to take effect. Another option is to simply repeat the installation of the driver software.

**Error message: Interrupt <xx> not available.”**

**Possible cause:** The AVM ISDN-Controller B1 v3.0 and another hardware device (like a sound card) are set to the same interrupt.

**Remedy:** Check which interrupts (IRQs) are available in your system. Then use a text editor to enter a new interrupt for the ISDN-Controller in the ISDNLOAD.CFG file. The computer must be restarted for these settings to take effect. Another option is to simply repeat the installation of the driver software.

## Error messages in Novell NetWare

### Error message: "CAPI not loaded."

**Possible cause:** You tried to start an ISDN application without loading the AVM ISDN-Controller B1 v3.0 first.

**Remedy:** Load the Controller B1 v3.0 by entering `load capi20` at the system console and then start your ISDN application.

### Error message: "Error in configuration file, no ISDN-Controller defined."

**Possible cause:** During the AVM ISDN-Controller B1 v3.0 installation, the configuration file CAPI20.CFG is created. If you later edit this file manually and corrupt the ISDN-Controller definition(s) it contains, the error occurs.

**Remedy:** Repeat the complete AVM ISDN-Controller B1 v3.0 installation.

### Error messages:

"Deinstallation error, wrong CAPI driver loaded."

"Installation error, wrong CAPI driver loaded."

"Installation error, ISDN-Controller-xx unknown keyword <xx>."

"Installation error, ISDN-Controller-xx <xxxx> value too long."

"Installation error, ISDN-Controller-xx <xxxx> illegal value."

**Possible cause:** You have replaced some files in the ISDN-Controller driver installation directory (on obtaining updated drivers from the AVM Data Call Center, for example). Older files in the same directory cause version conflicts.

**Remedy:** Always perform the full AVM ISDN-Controller B1 v3.0 installation procedure; never replace individual files.

**Error message: “Installation error, Controller-xx with I/O address <xxx> does not answer.”**

**Possible cause:** The ISDN-Controller was not completely loaded, or the hardware has been damaged.

**Remedy:** Repeat the complete ISDN-Controller installation procedure. To test the hardware, you may install the ISDN-Controller in DOS and then run the program “B1 Test”. In case of a hardware defect, please contact your dealer or AVM.

**Error message: “Installation error, Controller-xx with I/O address <xxx> not found.”**

**Possible cause:** The position of the jumper that sets the I/O address on the ISDN-Controller does not correspond to the entry in the “B1 Setup” program, the I/O address is used by another hardware device (such as a network adapter), or the hardware is not installed.

**Remedy:** Check which I/O address is available in your computer and set the jumper on the ISDN-Controller accordingly (see the section “Setting the I/O Address” on page 14). Then enter the new I/O address in the driver software by entering `load b1setup` at the system console. Then reload the ISDN-Controller.

**Error message: “Installation error, Interrupt <xx> cannot be used.”**

**Possible cause:** The AVM ISDN-Controller B1 v3.0 and another hardware device (like a sound card) are set to the same interrupt.

**Remedy:** Check which interrupts (IRQs) are available in your system by using the MSD.EXE program in the Windows directory. Enter `load B1 Setup` at the server console and set a different interrupt. Then reload the ISDN-Controller.

**Error message: “... at least one application is registered.”**

**Possible cause:** You attempted to unload or uninstall the AVM ISDN-Controller B1 v3.0 while an application (such as a file transfer or fax program) was still using it.

**Remedy:** First end all applications that use the ISDN-Controller. Then you can unload or uninstall it.

**Error message: “Installation error, I/O address <xxx> not available.”**

**Possible cause:** The I/O address selected during installation of the ISDN-Controller is used by another hardware device and is not available.

**Remedy:** Establish which I/O addresses are available in your system. Then adjust the position of the jumper on the ISDN-Controller to match the selected I/O address and enter the new I/O address in the “b1setup” program. This program is started by entering `load b1setup` at the server console.

**Error message: “Installation error, Interrupt <xx> not available.”)**

**Possible cause:** The interrupt set for the AVM ISDN-Controller B1 v3.0 during installation is not available.

**Remedy:** Check which interrupts (IRQs) are available in your system. Enter `load b1setup` at the server console and set another interrupt. Then reload the ISDN-Controller.



# 17 Support for Multiple Subscriber Numbers (MSNs)

## 17.1 Introduction

### What are MSNs?

Deutsche Telekom provides new ISDN subscribers with Euro-ISDN lines.

Several terminal devices may be operated at a single ISDN access. A given terminal device on the Euro-ISDN connection is selected by dialing the MSN (Multiple Subscriber Number) assigned to it. Deutsche Telekom provides each Euro-ISDN subscriber with three MSNs as a standard feature. More numbers may be requested.

### Applications on CAPI 1.1 and MSNs

The assignment of MSNs to terminal equipment is performed on the terminal equipment itself. The method of addressing terminal equipment under Germany's older national ISDN protocol 1TR6, using a terminal selector digit called the "EAZ", is still in use, but no longer supported in Euro-ISDN.

Many DOS, Windows 3.x or Windows 95 applications based on CAPI version 1.1 support EAZ sub addressing, but not MSNs.

Euro-ISDN subscribers can still use such applications, however, simply by configuring them for the EAZ o (zero), to respond to all incoming calls regardless of the number dialed.

## 17.2 Using MSN.EXE

If it becomes necessary to assign a certain MSN to a given application, however, this can be accomplished by the utility MSN.EXE. Start MSN.EXE with no command line arguments to read a summary of all functions.

## Mapping an MSN to an EAZ

To map an MSN to an EAZ, proceed as follows:

1. Configure your application for a certain EAZ (from 1 to 9). Refer to the application's manual for instructions. If the application is configured for the EAZ 0 (zero), it will respond to all MSNs configured in the system by MSN.EXE.

2. Load the controller by typing the command

```
ibase <Return>
```

at the DOS prompt.

3. Run MSN.EXE to assign an MSN to the EAZ configured in Step 1. Use the following syntax:

```
msn -sx=yyyyyyy
```

where x is the EAZ and yyyyyyy is the desired MSN

**Example:** To assign the subscriber number 01234567 to EAZ 5, type at the DOS prompt: **msn -s5=1234567**.

When this is done you may begin working with the application.

The assignment of a given EAZ to an MSN can be canceled either by using MSN.EXE or by removing the CAPI driver from memory.

## Displaying EAZ–MSN Mapping

The following command line arguments can be used to display the current EAZ assignments:

- Display all EAZ assignments.

```
msn -d
```

- Displays the MSN mapped to the given EAZ.

```
msn -d<EAZ>
```

## Canceling/Resetting MSN–EAZ Mapping

The following commands can be used to cancel an MSN assignment or to reset the MSN mapping:

- Cancels the MSN assignment to the given EAZ so that a new MSN may be mapped to it.

```
msn -f<EAZ>
```

- Resets the MSN mapping for the given EAZ so that the ISDN-Controller is in its original state.

```
msn -r<EAZ>
```

## Other Command Line Arguments

Two other command line arguments are also available:

- Specifies a certain controller if there are several installed in the PC. For example, to assign the MSN 01234567 to the EAZ 4 for controller number 1, enter **msn -c1 -s4=01234567**.

```
msn -c<No.>
```

- Suppresses all screen output:

```
msn -w
```



*When the controller is unloaded, all MSN mapping is lost. If you want to set the same MSN mapping each time you start your computer or load the controller, add the command **MSN.EXE** with the appropriate command line arguments to the batch file **ibase.bat**.*



*In Windows, **MSN.EXE** can be added to the “Startup” group. Note that **MSN.EXE** can only work after the controller has been loaded.*

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# Index

## A

- active controller 9
- additional controllers, installing
  - Windows 2000 20
- additional ISDN-Controllers with the CAPI-Manager installation
  - Novell NetWare 68
- AVM Data Call Center (ADC) 89
- AVM ISDN CAPI Port Driver 82
- AVM ISDN TAPI Services for CAPI 83
- AVM ISDN-Tools 86
- AVM NDIS WAN CAPI Driver 82
- AVM Support 88
- AVM system drivers 78

## C

- CAPI
  - applications interface 78
- CAPI features 79
- CAPI SoftCompression X75/V42bis 83
- CAPI SoftFax 84
- changing the settings
  - MS-DOS 60
  - Novell NetWare with CAPI for the CAPI Manager 67
  - Novell NetWare with Stand-Alone CAPI 65
  - OS/2 73
  - Windows 2000 19
  - Windows 3.x 53
  - Windows 95 46
  - Windows 98 40
  - Windows Me 32
  - Windows NT 25
- combining controllers 11
- connecting cable 16
- controller configuration
  - MS-DOS 58
  - Novell NetWare with CAPI for the CAPI Manager 67

- Novell NetWare with Stand-Alone CAPI 65
- OS/2 73
- Windows 2000 19
- Windows 3.x 51
- Windows 95 44
- Windows 98 37
- Windows Me 29
- Windows NT 25
- controller configuration with Stand-Alone CAPI 65
- controller hardware installation
  - Windows 95 44
  - Windows 98 37
  - Windows Me 29
- controller with CAPI for the CAPI Manager
  - Novell NetWare 67
- current drivers 10

## D

- D-channel protocol 10
- Dial-Up Networking 11
- direct-dial-in 76
- driver software 10
- driver software installation
  - MS-DOS 56
  - Novell NetWare 63
  - OS/2 70
  - Windows 2000 17
  - Windows 3.x 49
  - Windows 95 44
  - Windows 98 37
  - Windows Me 30
  - Windows NT 22

## E

- error messages
  - MS-DOS 100
  - Novell NetWare 102
  - OS/2 101

---

- Windows 2000 95
- Windows 3.x 98
- Windows Me/98/95 96
- Windows NT 95

- errors
  - general 92

## F

- FAQs 89
- fax protocols 84
- features of the ISDN-Controller B1 v3.0 86

## G

- general malfunctions 92

## I

- I/O address 14
- IDM (ISDN Driver Model) 81
- IDM architecture 80
- information in the Internet 89
- installation
  - MS-DOS 56
  - Novell NetWare 63
  - OS/2 70
  - Windows 2000 17
  - Windows 3.x 49
  - Windows 95 42
  - Windows 98 35
  - Windows Millennium 27
  - Windows NT 22
- installing a new hardware device
  - Windows 95 42
  - Windows 98 35
  - Windows Me 27
- installing additional controllers
  - MS-DOS 60
  - OS/2 73
  - Windows 2000 20
  - Windows 3.x 53
  - Windows 95 47
  - Windows 98 40
  - Windows Me 33

- Windows NT 25
- installing additional controllers with Stand-Alone CAPI
  - Novell NetWare 66
- installing the driver software
  - MS-DOS 56
  - Novell NetWare 63
  - OS/2 70
  - Windows 2000 17
  - Windows 3.x 49
  - Windows 95 44
  - Windows 98 37
  - Windows NT 22
- international protocols 10
- interrupt (IRQ) 14
- ISDN 8
- ISDN Driver Model 81

## J

- jumper positions 15

## L

- latest driver software 89

## M

- MS-DOS
  - changing the settings 60
  - controller configuration 58
  - driver software installation 56
  - error messages 100
  - installing additional controllers 60
  - removing the controller 62
  - starting operation 59

## N

- Novell NetWare
  - configuring the controller with Stand-Alone CAPI 65
  - controller with CAPI for the CAPI Manager 67
  - error messages 102
  - installing additional controllers with Stand-Alone CAPI 66

---

installing additional ISDN-Controllers  
with the CAPI Manager 68  
installing the driver software 63  
removing the controller 68  
starting ISDN-Controller B1 PCI opera-  
tion with Stand-Alone CAPI 66  
Novell NetWare  
configuring the controller with CAPI  
for the CAPI Manager 67

## O

operation on point-to-point lines 76  
OS/2  
changing the settings 73  
configuring the controller 73  
error messages 101  
installing additional controllers 73  
installing the driver software 70  
removing the controller 75  
starting operation 72

## P

package contents 12  
point-to-point line 76

## R

removing the controller  
MS-DOS 62  
Novell NetWare 68  
OS/2 75  
Windows 2000 20  
Windows 3.x 55  
Windows 95 47  
Windows 98 41  
Windows Me 33  
Windows NT 25

## S

So interface 9  
starting operation  
MS-DOS 59  
Novell NetWare with Stand-Alone  
CAPI 66

Novell NetWare with Stand-Alone  
CAPI 66  
OS/2 72  
Windows 3.x 52  
Windows 95 45  
Windows 98 39  
Windows Me 31  
Windows NT 24  
support by E-mail 89  
support by fax 90

## T

technical specifications of the AVM ISDN-  
Controller B1 v3.0 87  
telecommunications services 8  
transmission quality 8  
transmission speed 8  
troubleshooting 92

## U

updates 88

## W

Windows 2000  
changing the settings 19  
configuring the controller 19  
error messages 95  
installing additional controllers 20  
installing the driver software 17  
physically installing the  
controller 17  
removing the controller 20  
starting operation 19  
Windows 3.x  
changing the settings 53  
controller configuration 51  
driver software installation 49  
error messages 98  
installing additional controllers 53  
physically installing the  
controller 49  
removing the controller 55  
starting operation 52

- 
- Windows 95
    - changing the settings 46
    - configuring the controller 44
    - error messages 96
    - installing a new hardware device 42
    - installing additional controllers 47
    - installing the driver software 44
    - physically installing the controller 44
    - removing the controller 47
    - starting operation 45
  - Windows 98
    - changing the settings 40
    - configuring the controller 37
    - error messages 96
    - installing a new hardware device 35
    - installing additional controllers 40
    - installing the driver software 37
    - physically installing the controller 37
    - removing the controller 41
    - starting operation 39
  - Windows Me
    - changing the settings 32
    - configuring the controller 29
    - error messages 96
    - installing a new hardware device 27
    - installing additional controllers 33
    - installing the driver software 30
    - physically installing the controller 29
    - removing the controller 33
    - starting operation 31
  - Windows NT
    - changing the settings 25
    - configuring the controller 25
    - error messages 95
    - installing additional controllers 25
    - installing the driver software 22
    - physically installing the controller 22
    - removing the controller 25
    - starting operation 24