

ELSA MicroLink™ ISDN PCI

User Manual

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Preface

Thank you for placing your trust in this ELSA product.

With the *ELSA MicroLink ISDN PCI*, you have selected an ISDN PC board which supports all major operating systems. The highest quality standards in manufacturing and stringent quality control are the basis for high product standards and consistent product quality.

Scope of delivery

Please ensure that the delivery is complete before beginning with the installation of your ISDN PC board.

- ISDN plug&play board *ELSA MicroLink ISDN PCI*
- ISDN line connection cable
- *ELSA MicroLink ISDN PCI* CD
- Proof of license (yellow serial number sticker)
- This printed documentation
- Electronic documentation (on CD-ROM)

Online services



Our online services (Internet server www.elsa.com) are available to you around the clock should you have any queries regarding the topics discussed in this manual or require any further support. In the Support file section under 'Know-how', you can find answers to frequently asked questions (FAQs). The KnowledgeBase also contains a large pool of information. Current drivers, firmware, tools and manuals can be downloaded at any time.

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Introduction

This plug&play ISDN PC board *ELSA MicroLink ISDN PCI* is the comprehensive ISDN solution for the PCI bus systems. The board may be used under Windows NT 4.0, Windows 98, Windows 95 Linux and OS/2. *ELSA MicroLink ISDN PCI* upgrades your PC to a complete ISDN communications center with Group 3 fax, answering machine, EuroFileTransfer and Internet access components.

The board is ready for immediate use thanks to the included software with its preconfigured components for all major communications applications.

What does *ELSA MicroLink ISDN PCI* offer?

The following is an outline of the principal features of the *ELSA MicroLink ISDN PCI* to give you a quick overview of its capabilities.

Simple installation

ELSA MicroLink ISDN PCI ISDN PC boards are particularly easy to install:

- Insert the board.
- Start your computer.
- Install the software.
- Go!

Connecting the board to the S_0 interface

ELSA MicroLink ISDN PCI permits the connection of a PC to the S_0 interface of an ISDN basic rate connection or a PBX (private branch exchange) system.

ISDN operation

The ISDN PC board works via the ISDN interface according to various transmission protocols at speeds of up to 128,000 bps. The highest data rates are reached with the use of channel bundling (multilink PPP), e.g. when using NDIS-WAN miniports.

Status displays

Two color-coded LEDs on the mounting bracket of your *ELSA MicroLink ISDN PCI* board permit the monitoring of the ISDN connection and the line to facilitate troubleshooting of possible system faults.

Applications

The accompanying software enables *ELSA MicroLink ISDN PCI* applications such as:

- Access to the Internet and online services (e.g. via Dial-Up Network)
- Remote access with a full version of LapLink Professional
- Use of your computer as a convenient fax machine (with *ELSA-RVS-COM*)
- Answering machine function (with sound card and *ELSA-RVS-COM*)

What software can I use?

Simply installing the *ELSA MicroLink ISDN PCI* with its associated drivers is not enough to connect your computer with the world. The utilities described below are in part installed automatically and simultaneously with the drivers, while others have to be manually installed subsequently.

ELSA-RVS-COM



ELSA-RVS-COM

ELSA-RVS-COM is a communications suite with a wide range of functions. In addition to fax and EuroFileTransfer, *ELSA-RVS-COM* also offers an answering machine. It also provides you with a virtual COM port.

LapLink



Laplink

LapLink is a comprehensive program package for data transmission and control of remote computers. Once a connection has been successfully established, you can exchange data between two computers, both with LapLink installed.

CAPI interface

A CAPI interface is automatically installed together with the drivers of *ELSA MicroLink ISDN PCI*. CAPI stands for **C**ommon **A**pplication **P**rogramming **I**nterface and connects the ISDN adapter to other drivers or application programs that provide, e.g. network cards for access to the Internet, a modem or a fax machine in your computer.

NDIS WAN



The 'NDIS WAN miniport' driver for Windows is automatically installed with the drivers for *ELSA ISDN PCI*. Under Windows this software provides a network adapter, with which you can for instance establish a connection to the Internet via the Dial-Up Network. NDIS WAN also permits the use of both B channels for one connection (channel bundling).

Installation

This chapter is designed to help you go online in the shortest possible time. You get a short description of the driver installation for various operating systems.

After installing the driver, the setup program on the CD leads you step-by-step through the installation and the software tools.



This ISDN card is intended for use on an ISDN basic rate interface. The connection is made using the supplied RJ45/RJ45 ISDN connector cable.

First steps

This short overview will guide you through the steps for installing the *ELSA MicroLink ISDN PCI*. Please refer to the following chapters for detailed information regarding installation under the various supported operating systems and if necessary connecting the unit to the telephone network.

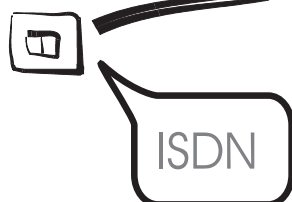
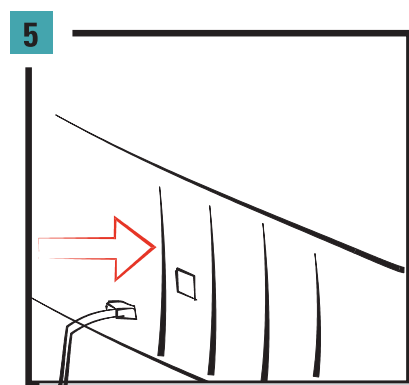
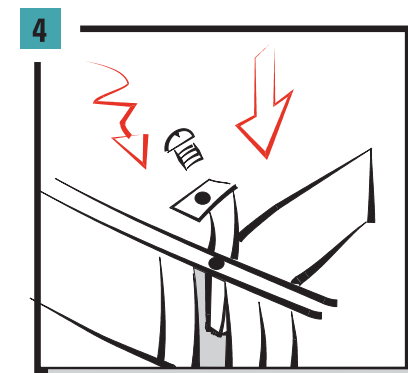
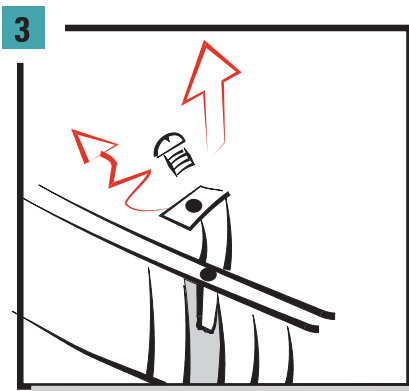
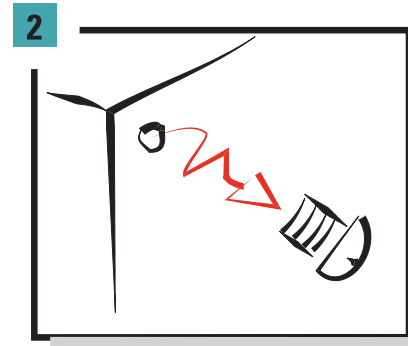
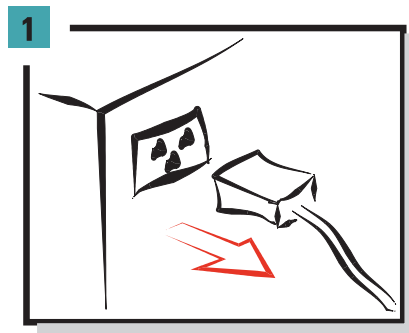


During the installation process files may be required from the data media used to install your operating system. Have the appropriate diskettes or CDs ready.

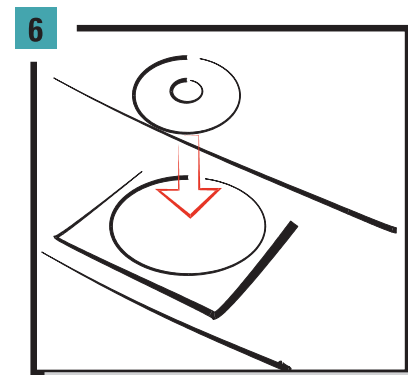


To take advantage of all the functions of the *ELSA MicroLink ISDN PCI* under Windows, the Dial-Up Networking adapter and the TCP/IP protocol are automatically installed under Windows 95 and 98. Please install TCP/IP separately under Windows NT.

A CAPI interface will also be set up on your computer during the installation of the drivers. In the event that you are already using a different version of the CAPI interface, delete the existing CAPI version before installing the drivers for the *ELSA MicroLink ISDN PCI*. Please refer to the manufacturer's documentation for further information.



ISDN



1 Make the first move

Safety First! Disconnect your PC from the main power supply before you open the housing!

2 Loosen the screws

Remove all retaining screws for the PC housing and pull the cover off.

3 Remove the blind bracket

Remove the slot bracket of a free slot.

4 Insert the *ELSA MicroLink ISDN PCI* board

Insert your *ELSA MicroLink ISDN PCI* board in this slot and securely fasten the mounting bracket. Replace the PC housing and screw it tight.

5 Connect cable to the ISDN

Connect your *ELSA MicroLink ISDN PCI* board to the ISDN network by first plugging the cable provided into the jack at the board mounting bracket and then plugging it into your ISDN connector.

Reconnect the power cord to your computer with the power supply and switch the computer on.

6 Insert *ELSA MicroLink ISDN PCI* CD

Insert your *ELSA MicroLink ISDN PCI* CD into your CD-ROM drive.

Installation under Windows 95 and Windows 98

Windows 95 or Windows 98 installation takes place in the following stages:

- Hardware detection and installation of the drivers
- Microsoft Accelerator Pack (Windows 95, unless you have this already installed)
- ISDN configuration
- ISDN tools



*Almost all the windows appearing on your screen during installation can be confirmed by clicking on the **OK**, **Finish** or **Next** buttons. The following information shows you exactly where you will need to take any special steps.*



If during installation the required files on the Windows CD are not found, try, for example, the subdirectory D:\win95, D:\win98 or D:\windows.

Hello Windows, I am your new hardware!

Depending on your Windows version, the hardware detection takes place as follows:

| | Windows 95, Version 4.00.950 | Windows 95, Version 4.00.950 B | Windows 98 |
|---|---|---|---|
| ① | Windows 95 reports 'New hardware found'. Select 'Driver from disk provided by hardware manufacturer'. | Windows 95 starts 'Update Device Driver Wizard' and selects the driver for you. | Windows 98 starts 'Update Device Driver Wizard' and selects the driver for you. Select the option 'Find best driver for the device'. |
| ② | The ISDN PCI board driver is on your <i>ELSA MicroLink ISDN PCI</i> CD. So change to the root directory of your CD-ROM drive in the next window (e.g. D:\). | | In the following window activate the option 'CD drive', lay the <i>ELSA MicroLink ISDN PCI</i> CD in the drive and confirm with Next . |

- ③ Once the driver has been found, confirm with **Next** to start the installation.

Windows 95 only: installing the Microsoft Accelerator Pack

- ④ If Microsoft Accelerator Pack 1.1 is already installed on your computer, this point will be skipped automatically. If not, you will be asked to install it now. Confirm the request with **Yes** so that you can use all the *ELSA MicroLink ISDN PCI* board service features.

ISDN Configuration: moving on swiftly!

- ⑤ If you would like to use your computer as a server, enter one or two of your ISDN subscriber numbers here (SPIDs are only needed for American D-channel protocols). If you do not enter any numbers, the *ELSA MicroLink ISDN PCI* will respond to **all** incoming calls when in server mode.

Tools for the ISDN network



- ⑥ After restarting, insert the *ELSA MicroLink ISDN PCI* CD again. If the setup program does not appear automatically, please start 'autorun.exe' from the root directory on the CD. Select the point **Install ISDN Software** in the initial window of the setup program.
- ⑦ Follow the instructions of the setup program. Click the **Finish** button to copy the ELSA- ISDN tools to your computer.

That's it!

The following components are installed on your computer following the ISDN installation:

- Drivers for your *ELSA MicroLink ISDN PCI* board and for the Euro-ISDN connection
- CAPI interface and NDIS-WAN miniport
- ISDN tools

Test

CONNtest can be used to ensure that the drivers were properly installed and the connection to ISDN network is functioning correctly. Start the test using **Start ► Programs ► ELSAisdn ► CONNtest**.

Enter the MSN for the S_0 connection of the *ELSA MicroLink ISDN PCI* board and start the test with **Next**. *CONNtest* makes a call to itself and attempts to perform a file transfer. In the event of problems, the messages returned aid the process of locating the cause of the error.

Deinstallation



No application may access the CAPI while deinstalling the drivers. First close the corresponding applications, such as the ISDNmonitor.

To remove the drivers from your computer, click **Start ► Settings ► Control Panel ► Network**. Select the 'NDIS WAN Miniport Driver' and 'ELSA MicroLink ISDN PCI' entries and click the **Add/Remove** button.

To remove the ISDN tools from your computer, click **Start ► Settings ► Control Panel ► Add/Remove Programs**. Select the 'ISDN Accessories Programs' entry and click on the **Remove** button.

Installation under Windows NT 4.0



Before installing the drivers please ensure that you have administrator privileges. An installation under Windows NT 4.0 is not possible otherwise. The subsequent operation of the ELSA MicroLink ISDN PCI is also possible with user rights, of course.

Windows NT 4.0 installation takes place in the following stages:

- Installation of the drivers, the NDIS-WAN miniport and the ISDN tools
- ISDN configuration
- Setup of the RAS service



*Almost all the windows appearing on your screen during installation can be confirmed by clicking on the **OK** or **Finish** buttons. The following information shows you exactly where you will need to take any special steps.*

Hello Windows, I am your new hardware!

- ① If the setup program does not appear automatically after you have started Windows NT, please start 'autorun.exe' in the root directory of the CD. In the initial window of the setup program, select the point **Install ISDN software**.
- ② Follow the instructions of the setup program. Click the **Finish** button to copy the drivers and the ISDN tools to your computer.
- ③ After the driver installation, the setup program will suggest installing the NDIS-WAN miniport. This works together with the Dial-up Network and offers the very easy-to-operate access to online providers while providing the full advantage of channel bundling. When starting, a help dialog appears which guides you step by step through the installation.

ISDN Configuration: moving on swiftly!

- ④ If you would like to use your computer as a server, enter one or two of your ISDN subscriber numbers here (SPIDs are only needed for American D-channel protocols). If you do not enter any numbers, the *ELSA MicroLink ISDN PCI* will respond to **all** incoming calls when in server mode.

Networks with RAS services

- ⑤ The RAS services will automatically be installed on your computer if they are not present already. Please have your original operating system CD/disks ready for this.
- ⑥ The RAS setup will start automatically and will suggest integrating 'ISDN1 - NDIS WAN Miniport' in the RAS services. Confirm the selection with **OK**. Use the **Add** button to integrate the second ISDN channel as well and end the RAS installation with **OK**, **Next** and **Finish**.



Update Service Pack 3 if it was already on your computer before installing the drivers for ELSA MicroLink ISDN PCI (is indicated during booting).

That's it!

The following components have now been installed on your computer:

- Drivers for your *ELSA MicroLink ISDN PCI* board and for the Euro-ISDN connection
- CAPI interface and NDIS-WAN miniport
- ISDN tools

Test

CONNtest can be used to ensure that the drivers were properly installed and the connection to ISDN network is functioning correctly.

Enter the MSN for the S_0 connection of the *ELSA MicroLink ISDN PCI* board and start the test with **Starting Test**. *CONNtest* makes a call to itself and attempts to perform a file transfer. In the event of problems, the messages returned aid the process of locating the cause of the error.

Deinstallation



No application may access the CAPI while deinstalling the drivers. First close the corresponding applications, such as the ISDNmonitor.

To remove the drivers from your computer, click **Start ► Settings ► Control Panel ► Network**, and switch to the 'Adapters' tab. Select the 'NDIS WAN Miniport' entry and click on the **Remove** button.

To remove the ISDN tools from your computer, click **Start ► Settings ► Control Panel ► Add/Remove Programs**. Select the 'ISDN Card Software Components' entry and click on the **Add/Remove** button.

Installation under Linux

ELSA is currently the only manufacturer of ISDN cards that provides a certified Linux driver.

We cannot describe the full installation at this point due to differences in the individual distributions, however. In this section, we would like to point out a few important details for you to observe.



Before installing the driver, ensure that you are logged on as "root". Otherwise it will not be possible to install the drivers under Linux. The subsequent operation of the ELSA MicroLink ISDN PCI is also possible with user rights, of course.

The installation under Linux takes place in the following stages:

- Patch the driver into the kernel
- Recompile the kernel
- ISDN configuration

Hello Linux, I am your new hardware!

- ① To introduce the new card to the operating system, first create a new configuration file. Include the following drivers:
 - HiSAX
 - DSS1 Euro-ISDN

- ELSA Cards

If your kernel supports loading drivers as modules, mark this option for the new entries.

- ② Once the kernel has been patched with the new drivers, compile the new kernel.
- ③ Ensure that the new kernel loads the next time you boot the system.

ISDN configuration

- ④ Once you have loaded the new kernel, you can set the ISDN parameters in the network configuration. Select the card type 'ELSA QuickStep 1000 PCI'.

Further help

- ⑤ If you're not feeling very confident yet with the installation of the drivers, please refer to the help in your distribution. The files 'ISDNQUICK.html' and 'DE-ISDN-HOWTO.html' on the included CD contain detailed information on this topic. Current versions can generally be found on the Web sites of the distributors.

Installation under OS/2

- ① Before you start OS/2, insert the *ELSA MicroLink ISDN PCI* CD into the CD-ROM drive. Use the file manager to run the installation file for your product (e.g. from **DRIVER/1000/OS2/ INSTALL.EXE**).
- ② After selecting the language for the installation, the window 'ELSA ISDN driver' will appear. The following settings can be made in this window:
 - Confirm the target directory, or change it if you wish to use another.
 - Select *ISDNmonitor* (recommended). This placed the *ISDNmonitor* program in the Startup program group.
- ③ Finally click on **Install**. The required files will now be copied. Confirm the subsequent message with **OK** and restart your computer. The *ELSA MicroLink ISDN PCI* board is now installed under OS/2.



*ISDNmonitor can be used to ensure that the drivers were properly installed after you have restarted your computer. In the 'ISDNmonitor' window, click on the upper left-hand corner and the menu item **Information**. If the program ISDNmonitor does not start, it is most likely that the CAPI driver was not installed properly.*

Communications software

In addition to the Windows drivers, the *ELSA MicroLink ISDN PCI* includes a number of additional drivers and programs necessary to take full advantage of the features of the ISDN PC board.

This chapter provides a brief introduction to these programs and gives some guidelines for installation. For further information, access the online help of the specific application.

Chapter 'Workshop' provides information on the use of the individual applications in your daily work.

ISDN tools

The ISDN tools contain a number of small applications to perform the following functions:

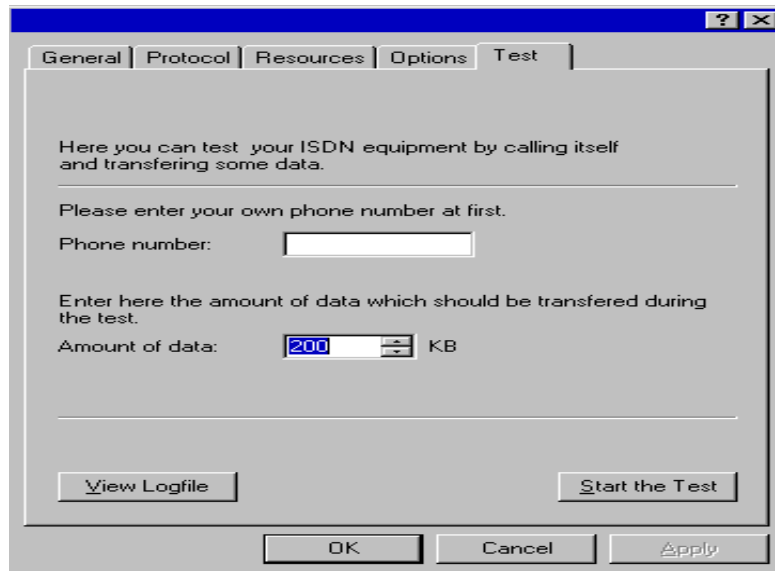
- Testing the hardware and CAPI interface installation
- Monitoring of the status of the S_0 interface and data transfers

Are the hardware and drivers correctly installed?

CONNtest is a monitoring program designed to check the hardware and driver installation of your ISDN adapter. *CONNtest* attempts to establish a connection and transfer data to itself via the ISDN adapter.

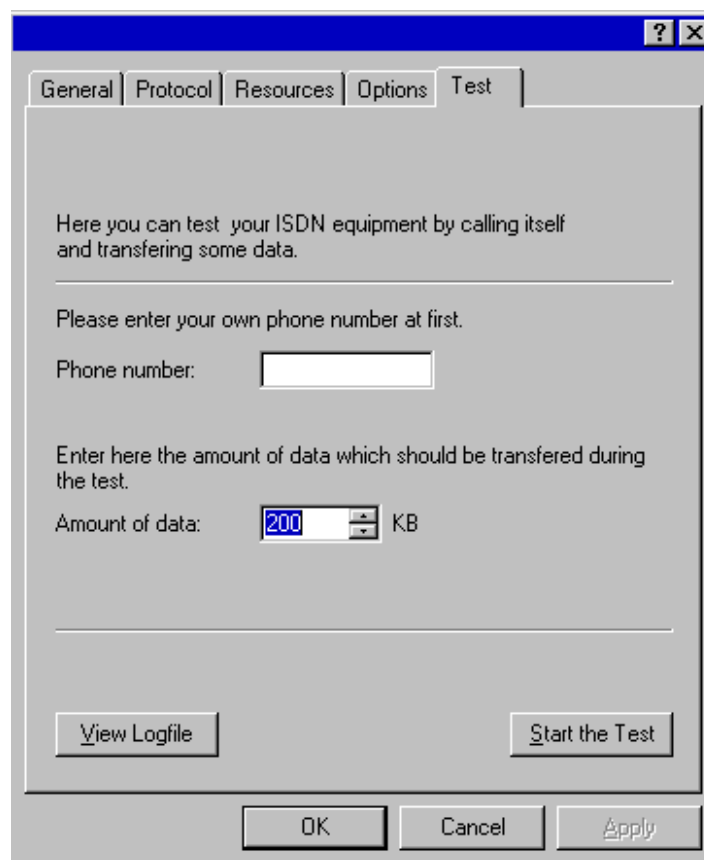
Windows 95 or Windows 98

Start *CONNtest* with **Start ► Programs ► ELSAisdn ► CONNtest**.



Windows NT

- ① Under Windows NT, click **Start ► Programs ► ELSAisdn ► ISDNconfig** and go to the 'Test' tab.



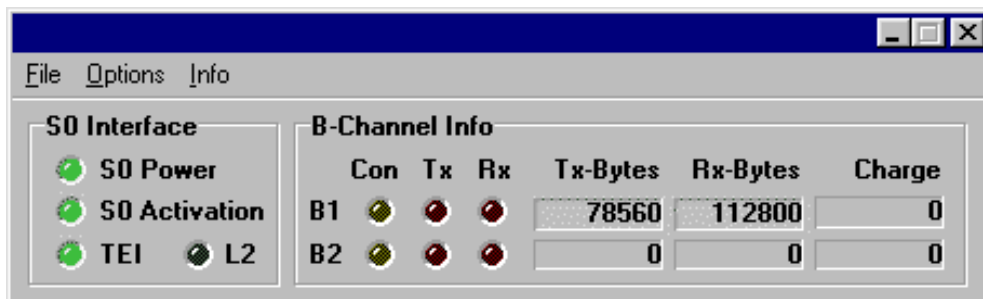
- ② Enter the number of your ISDN connection and start the data transfer.

CONNtest will verify the correct installation of the CAPI, the D channel and both B channels of your ISDN connection.

What's happening on the ISDN line?

The *ISDNmonitor* is an important utility for tracking the movement of data over the various channels of your ISDN connection. Start the *ISDNmonitor* with **Start ► Programs ► ELSAisdn ► ISDNmonitor** or always automatically with Windows to have the latest information on your ISDN line status available at all times.

The status of the S_0 bus, the allocation of the B channels, as well as data transfers and charges are displayed when a connection is established. The contents of the display can be modified under 'Detail' in the Options menu. Additional information can be displayed using the System menu, such as the version of the CAPI driver.



The displays provide the following information:

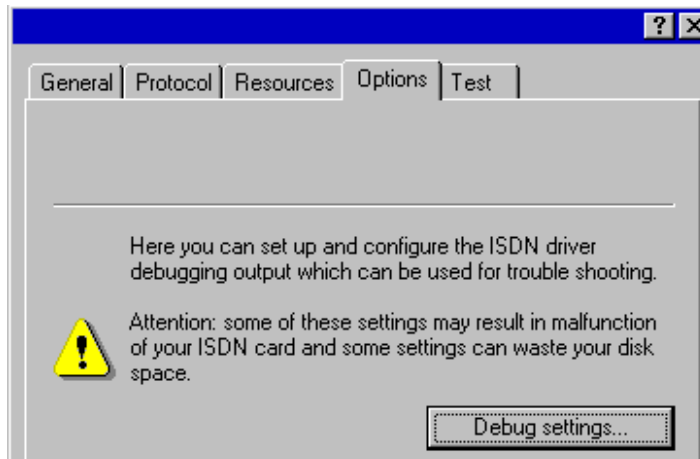
| S_0 Interface | | |
|-----------------------------------|-----|-------------------------------------|
| S ₀ Activation | Off | S ₀ bus is not active |
| | On | S ₀ bus is active |
| TEI | Off | No TEI assigned |
| | On | TEI assigned |
| L2 | Off | D channel (Layer 2) not established |
| | On | D channel (Layer 2) established |

| B-channel info (B channels B1/B2) | | |
|--|---------|------------------------------------|
| Con | Off | B channel not active |
| | Half on | B channel requested |
| | On | B channel transparent (chargeable) |
| Tx | Off | No data sent |
| | On | Data sent |
| Rx | Off | No data received |
| | On | Data received |

Testing the CAPI interface (Windows NT only)

ISDNconfig offers an additional function under Windows NT which can be used to record CAPI interface events.

- ① Start *ISDNconfig* with **Start ► Programs ► ELSAisdn ► ISDNconfig** and go to the 'Options' tab.



- ② The **Debug Settings** button opens a window with the debug output settings.

These logs (also known as traces), are primarily designed to assist the ELSA Support team in the event of driver and installation problems.



Please note: *Incorrect debug output parameters can impair or completely disable the CAPI interface. Do not change the settings on the 'Options' tab without consulting the ELSA Support team.*

ELSA-RVS-COM

What does *ELSA-RVS-COM* have to offer?

ELSA-RVS-COM is a powerful, universal communications program which provides you with the most important data communications applications in a convenient, easy-to-use package.

When used with your *ELSA MicroLink ISDN PCI*, *ELSA-RVS-COM* provides the following functions:

Fax

- Fax group 3 and 4 via software
- Fax operation at up to 64,000 bps
- Fax transmission from Windows applications via a Windows printer driver
- Delayed fax transmission
- Fax polling

File transfer

- Softmodem functionality
- Convenient PC-to-PC file transfer
- EuroFileTransfer with Explorer-compatible user interface

Telephone and answering machine

- Full ISDN telephony features (in conjunction with a full-duplex sound card)
- Digital answering machine (requires sound card)

Virtual COM ports

- Virtual COM port enable employment of traditional data communications software.

CommCenter

- Universal receive status with CommCenter.

Setup for *ELSA-RVS-COM*

The setup program for *ELSA-RVS-COM* copies the required files to the selected drive and creates a program group on your Windows desktop.

System requirements

The following minimum system requirements must be fulfilled for the use of *ELSA-RVS-COM*:

| | |
|------------------|--|
| Operating system | Microsoft Windows 95, Windows 98 or Windows NT 4.0 (USB devices only Windows 98) |
| Operating system | Windows 98 |
| CPU | fully compatible with Pentium or higher |
| RAM | a minimum of 16 MB, 32 MB min. for fax operation |
| Disk space | a minimum of 25 MB free before installation a minimum of 12 MB in operation for virtual RAM (swap file) |
| Graphics board | a minimum of VGA (640 x 480 pixels, 16 colors/shades of gray) 256 colors min. for Btx/Videotext |
| Other | sound card & microphone for answering machine and telephony |

Follow the steps below to install *ELSA-RVS-COM*:

- ① Start Windows. When installing under Windows NT, ensure beforehand that you have administrative privileges.
- ② Insert the *ELSA MicroLink ISDN PCI* CD in your CD drive (e.g. D:). The welcome screen will open automatically. If the setup program doesn't start automatically, double-click 'autorun.exe' on the *ELSA MicroLink ISDN PCI* CD.
- ③ Start the installation by clicking on **ELSA-RVS-COM** in the welcome screen selection. The serial number entry window will appear.
- ④ In the **KEY** field, enter the *ELSA-RVS-COM* serial number on the enclosed serial number sticker (please note that the number is case-sensitive) and click **Continue**. The welcome screen appears.
- ⑤ Read the displayed notes and press **Next**. The target directory selection window will be displayed after the license agreement. Please read the following notes and click the **Next** button. Please read the license agreement and confirm your agreement by clicking the **Yes** button. When installing under Windows NT 4.0, acknowledge the Windows NT information with the **Next** button. The 'Destination Directory' dialog box will appear.
- ⑥ Accept the proposed target directory or enter the path and the name of the directory in which you want to install the program. Then click **Next**. Now the program files will be copied.
- ⑦ Now Setup is terminated. Click on **End** to start the installation wizard.

The installation wizard for *ELSA-RVS-COM*

The installation wizard will support you in configuring the services you require such as fax and answering machine functions and in entering the subscriber number of your ISDN line. Afterwards you are able to start communicating immediately.

- With 'Express Configuration', you can set up a fully functional ISDN system while supplying very little required information. For example, you only need to enter a calling number, without having to assign the numbers to services such as fax, answering machine, etc.
- The 'Custom Configuration' is only required if you have specific configuration requirements (e.g. different numbers for fax, EFT, etc.). You can then enter various numbers and assign individual functions.

You may also call the wizard later at any time to modify or enhance the configuration.



ELSA-RVS-COM has its own 'Inbox' for managing fax and voice messages. No Microsoft Exchange or Outlook components are required if you do not expressly activate this option when setting up ELSA-RVS-COM using the 'Custom Installation'.

The following paragraphs will describe some important configuration items for the various operating systems.



If you experience difficulties when configuring ELSA-RVS-COM, support and further information is available at all times using the comprehensive ELSA-RVS-COM help function.

Entering the subscriber numbers

During the 'Custom Installation', you will be prompted for your ISDN line's subscriber number(s). There are different dialog windows for the various ISDN systems, for example Euro ISDN and 1TR6, the German national ISDN.

■ Euro ISDN connection

For a Euro ISDN line you will normally enter the subscriber numbers of your line as MSN1, MSN2 and MSN3 (Multiple Subscriber Numbers).

The central number and extensions are entered separately for private branch exchanges. Please contact your provider for further information on your ISDN connection if required.

■ **National ISDN connection**

For a German national ISDN line you will need to assign MSN1 – MSN3 to EAZ numbers (terminal device selection numbers). If the EAZ fields are left blank, the last MSN digit will automatically be used as the EAZ number.

Please note that the *MicroLink ISDN PCI* does not support this ISDN system!

Starting *ELSA-RVS-COM*

After the installation is complete, the new **ELSA-RVS-COM** program folder is automatically displayed and the **RVS-CommCenter** starts up. Click on the status indicator to open the program folder.

In the Start Menu, select **Start ► Programs ► ELSA-RVS-COM**, and click on the component that you would like to start.

LapLink

The 'take two' license

Before you can use the LapLink services, LapLink must be installed on all the computers that are to be linked. But don't panic: the LapLink license that you received with your *ELSA MicroLink ISDN PCI* allows you to install the software on two computers.

What can LapLink do?

LapLink provides you with everything you need to connect two remote computers. Under the categories data transfer and remote control, LapLink offers you the following services:

- Data transfer allows you to copy and move files from one computer to another.
- With data transfer, it is also possible to synchronize folders. The Xchange service is a convenient means of reorganizing individual files, folders, or even entire directory structures. In order to keep from interrupting your work for file synchronization, Xchange accomplishes its tasks automatically as desired, even under the cover of night...
- In the case of remote control, one computer user guarantees another free access to the first user's own files, programs, services, etc. The guest at the controlling computer can work on the host (the controlled computer) just as though it were his or her own.
- The dialog function allows users to exchange short messages on the two linked computers.
- You use the security settings to specify exactly who may have access to your computer. On installation the security settings are initially set so no one can have access to your data.

Installing and uninstalling

To install LapLink please proceed as follows:

- ① Start Windows.
- ② Insert the *ELSA MicroLink ISDN PCI* CD into your CD drive (e.g. D:). If the setup program doesn't start automatically, double-click in the CD setup 'autorun.exe' on the *ELSA MicroLink ISDN PCI* CD.
- ③ Start the installation by clicking on **LapLink** in the menu on the welcome screen.
- ④ Then follow the instructions for the installation program and within a few minutes, you will have access to LapLink's full range of functions. After the installation is

complete, a status indicator for the new **LapLink** program folder appears on the taskbar.

Starting LapLink

In the taskbar, select **Start ► Programs ► LapLink**. Click on **LapLink** to start the program.

Deinstallation

If at any time you decide you no longer wish to use LapLink on your computer, simply click **Start ► Programs ► LapLink ► Uninstall**. LapLink then removes all files and system entries.

Workshop

The examples in this section are intended to show you how quickly and easily you can use the *ELSA MicroLink ISDN PCI* and the accompanying software in practical applications.

Special emphasis is given to remote access with LapLink and Internet access.

The fax functions of your *ELSA MicroLink ISDN PCI* will also be described, however.

The chapter concludes with data transfer via the Windows Dial-Up Networking.

Remote access with LapLink

This workshop assists you over the first hurdles of remote access. 'Remote access' as applied to LapLink refers to accessing a remote computer for file transfers, as well as remote control or remote assistance of the other computer.

As an example, we'll set up a computer in a company which can be accessed by the company's field staff and teleworkers. With LapLink, users who work off the company premises can exchange data with the head office or use special programs on the computers in the company.

What is a host, what is a client?

To improve the understanding of this chapter, let's start by explaining a number of the terms used in conjunction with LapLink.

Experienced users of programs for data transfer and remote control of computers will probably find much familiar material here and can skip immediately to the next section.

LapLink always links two computers for data transfer or remote control of a computer. Both computers are given different names to distinguish them from each other:

- Host

One of the two computers has a passive role. It is called the **host** or even **source computer**. The host (in this case the computer in the company) offers its options and functions to the other computer.

- Client

The other computer has the active role. It is called the **client** and uses the host with its functions when it needs them. The client (in this case the computer of the field-service employee) establishes the connection to the host and also generally terminates it.

- Remote computer

LapLink refers to the computer at the other end of the connection as the **remote computer** (also known as **distant computer**). Other programs sometimes also use this designation for the client.

■ Remote access

Access from one computer to another remote computer is referred to as **remote access**.

Preparing

You have seen that a host offers services that other computers wish to make use of. This requires preparation of both the host and the client(s).

The host

First, of course, you need to configure a computer that will make an offer to the clients. The procedure is as follows:

- ① One computer in the company is required for remote access. It should preferably not be directly used by employees.

If this computer is in the local area network (LAN) of the company, the clients will also have access to all free resources and services in the network. This is convenient for the employees but in principle also involves the risk of unauthorized access to the LAN. Therefore: Don't forget the security settings!

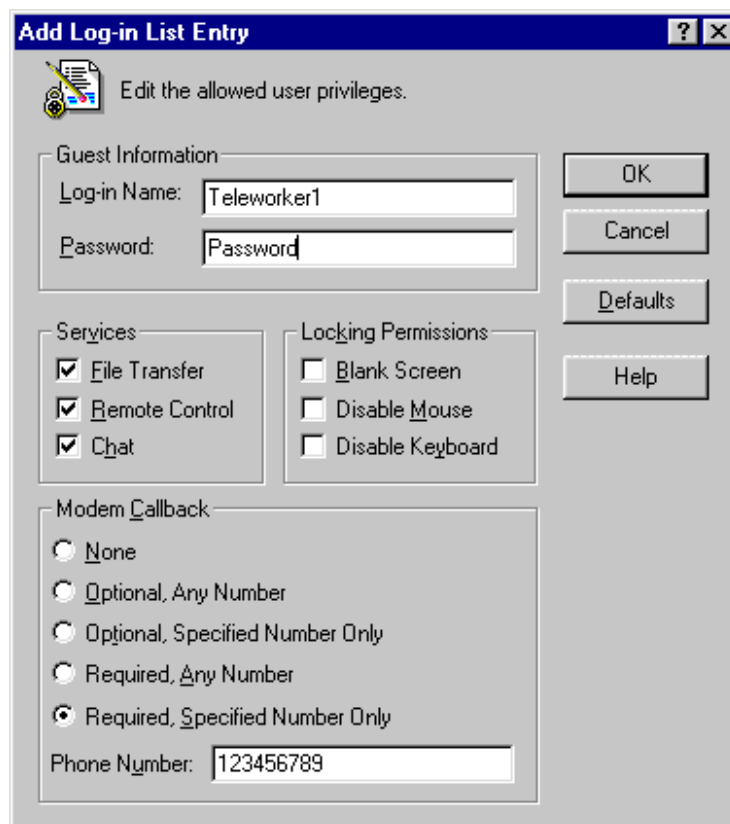
To enable other computers to establish a connection to the host, the host must naturally be "wired" in some way. In this example, you select a modem or an ISDN modem with which to establish telephone connection.

- ② Install LapLink on this computer as described in the chapter 'Communications Software'. The security settings are now set up so that no one can access this computer.
- ③ After the installation you click directly on **Options ► Security...** For the security of your system you can distinguish between
 - private system: No one may access the host (makes no sense for the host but does for the clients)
 - protected system: Only the users agreed in the access list can access the host
 - public system: Anyone can access the host (dangerous, particularly if the host is on a LAN).

Select the option 'Protected System' for the example of "remote access by outside workers".



- ④ Now you click on the tab 'Log-in List'. The **Add** button opens a window in which you can log on a new client.



First enter the user name and the password that the client needs to log on to the host. Then you can specify the services the client may use:

- file transfer,
- remote control, and
- chat.

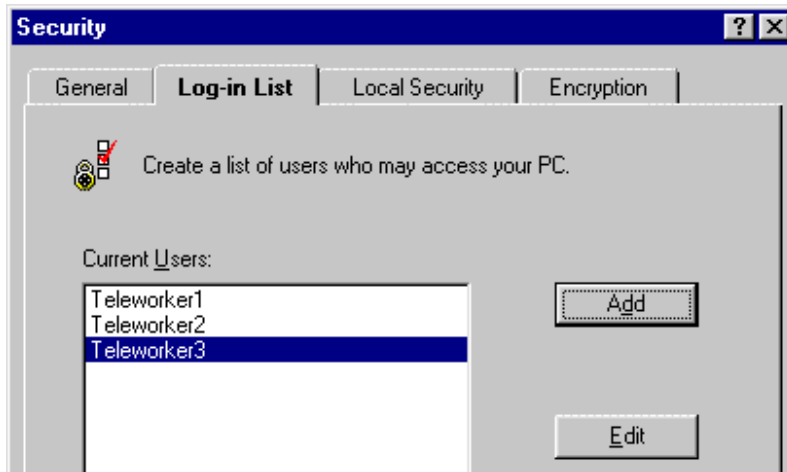
The 'Modem Callback' options first enable you to assign the telephone connection costs either to the host or to the client, secondly the callback enhances security

because only one specific telephone connection is specified for the client. The options are self-explanatory, but please note the following:



Outside workers, for example, who call from hotels or other companies, should be able to set a call number themselves with the callback options ('Any Number' option).

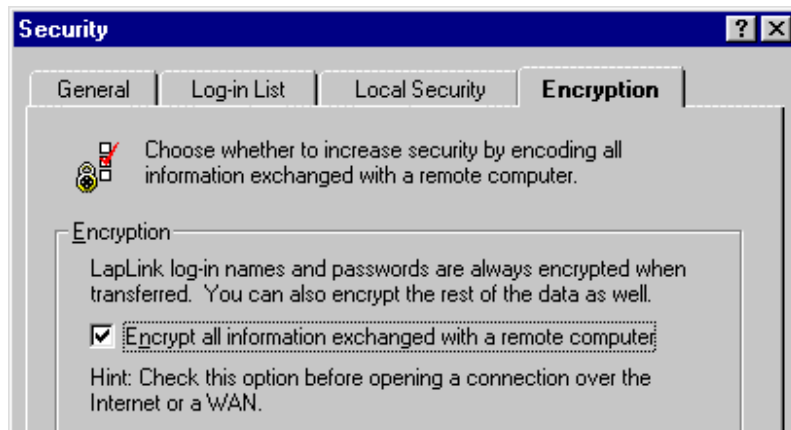
Ultimately, the log-on list may look as follows:



- ⑤ Another click takes you to the 'Local Security'. To prevent every client from changing the security settings on the host, activate the option 'Protect local security with a password'. The **Set Password** button opens the window in which a new password can be agreed or an existing one can be changed.



- ⑥ The final problem is the question of data encryption. If the corresponding option is activated on the 'Encryption' tab, all data exchanged between client and host will also be encrypted. Encryption is recommended for connections made over publicly accessible networks.



- ⑦ Next, prepare the modem and set it for automatic call acceptance.

The visitor

In contrast to the host, the client has a much easier time. After installation of LapLink, the security settings need only to be set to the default 'Nobody (Private System)'. Then the following occurs:

- ① In **Options ► Port Setup** the client selects the modems and activates this port. The **Configure** button opens a window that lists all installed Windows modems. Certain options such as automatic answer can be now set for every one of these modems. The **Properties** button opens the window for configuring the modem. The client then accesses the settings in the Windows control panel and if applicable overwrites them with its changes. The **Add** button can be used to install additional Windows 95 modems.
- ② In **Options ► Address Book** the client can enter the details of the host with which a connection is wanted. First a suitable description for the connection is entered. The name of the host, if known, may be entered in the 'Computer Name' field, otherwise the description is entered here again. In the following list the client selects the 'modem' for the connection and enters the call number, his user name and the password for the connection to the main office. The client will have been assigned a user name and password by the main office beforehand.
- ③ In **Options ► Port Setup** the client selects the modems and activates this port. The client selects **Connect ► Connect over Modem** to start the selection of the hosts. He can now search the list of address book entries for the connection that he wishes to establish. The call number is displayed again in the 'Dial' area, and the client can select from a list the modem that he wishes to use to establish the connection.

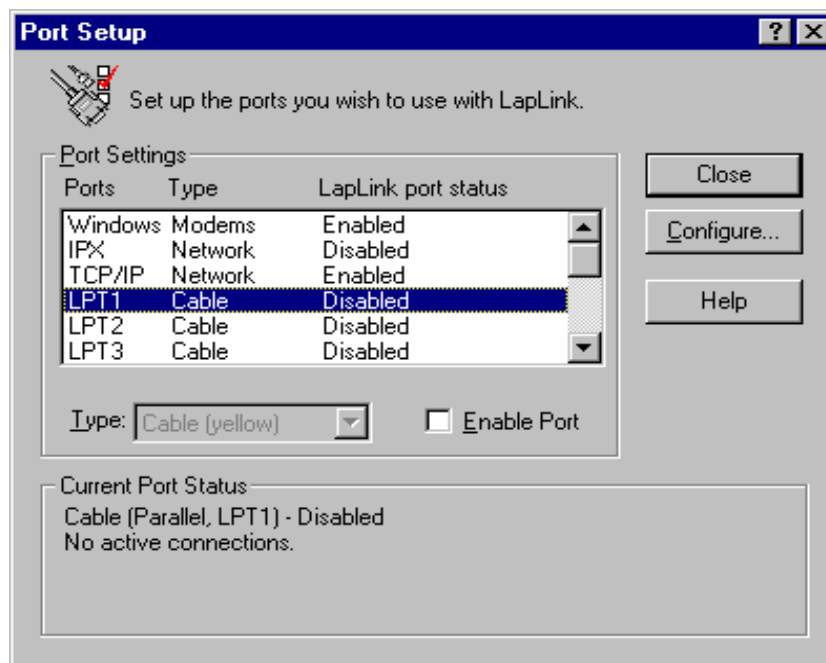
Connection establishment

Using LapLink, you can link your computer to other computers using various means. The following connection options are available:

- cable connection,
- wireless connection,
- modem connection,
- network connection, or
- connection with Dial-Up Networking in Windows

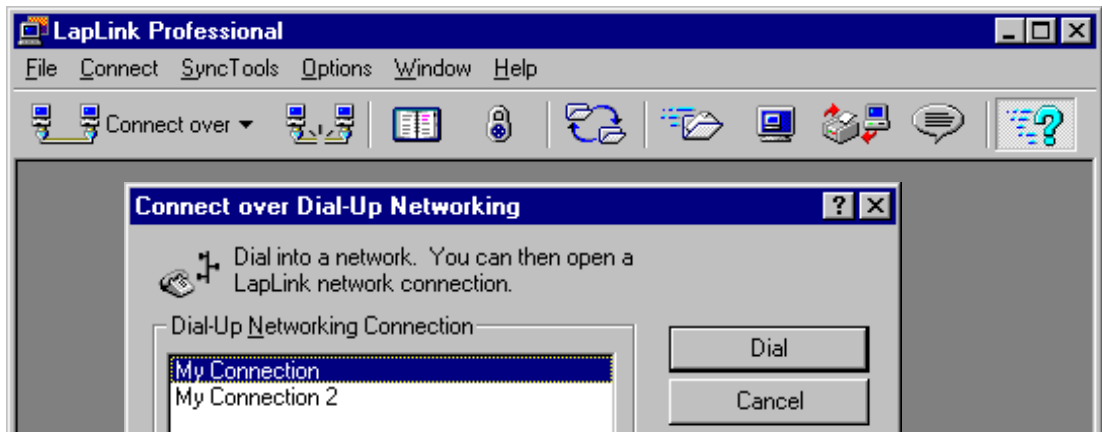
Configuring a port

Each connection accesses a 'Port'. These ports might be called, for example, 'Win95' for the modem connections, 'TCP/IP' for the network connections or 'LPT1' for the cable connections. Some of the ports are available immediately after the default installation, others (such as the ports for the cable connections) need to be set up first. Click on **Options ► Port Setup**. Then select the desired port in the list and activate it. The current status of the port can be checked at any time in the lower area of the window.



Start connection

In order to set up this connection to another computer, simply click on the icon for the relevant connection type at the top of the window:



When connecting by Dial-Up Networking you can select one of the available connections and start the connection to this remote station.

File transfer

LapLink provides numerous options for data transfer. We would like to introduce two procedures here that can often make your day-to-day work easier.

We also have to distinguish between two different applications:

- You wish to connect to another computer and send some specific files to this computer or download them from this computer.
- You wish to compare the data on one computer (e.g. your notebook) with the data on another computer (e.g. the workstation in the office) and update both sets of data.

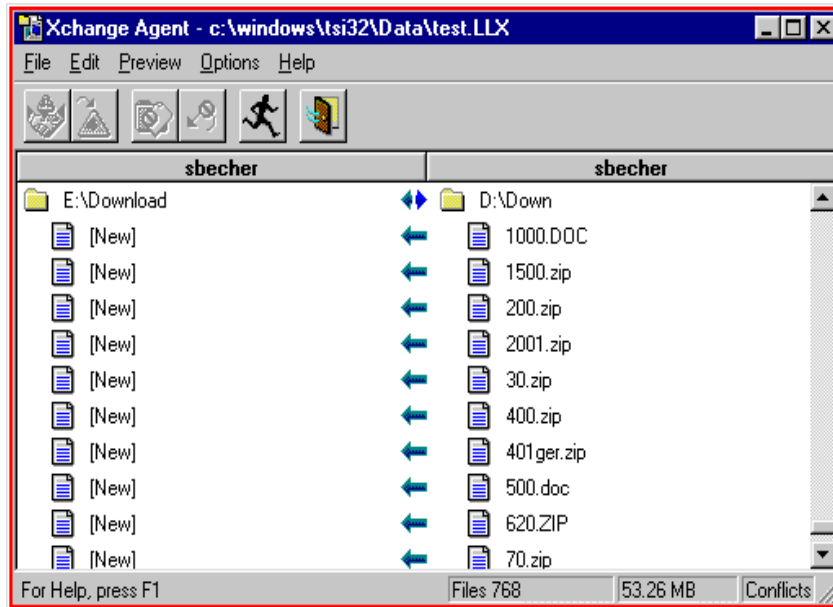
Targeted data exchange

To exchange specified data, establish a connection to the other computer and then open the 'data transfer' window. Your screen will then show two windows that look similar to the explorer in which you can drag and drop files between the two computers in either direction.

Regular data comparison

When you regularly work on your data in the office and on the road, the LapLink Xchange services provide an extremely convenient method of keeping the data up to date and the same on both computers. Set up an Xchange service wizard once and specify which fol-

ders are to be compared. This wizard can be run at any time and will automatically compare the data. LapLink warns of possible conflicts before running the wizard.



Internet via Dial-Up Networking

If you wish to connect to other computers or entire networks (Internet, local area network in a company) under Windows with *ELSA MicroLink ISDN PCI*, you usually connect with Dial-Up Networking.

However, Dial-Up Networking is not installed or not completely installed and set up on many computers. Please check your installation using the following information and if necessary supplement your operating system configuration.

Installation of Dial-Up Networking



Dial-Up Networking

First check whether Dial-Up Networking is installed in your Windows. Open My Computer (generally the icon at the very top left of the Windows 98 desktop).

Look for the Dial-Up Networking icon. If this icon is not present, you will have to install Dial-Up Networking first. You will need your Windows CD for this purpose.

- ① Select **Start ► Settings ► Control Panel ► Add/Remove Programs** to find 'Program Properties'.
- ② Select the 'Windows Setup' tab and mark the entry 'Communications'. Click the **Details** button to open the dialog for selecting communications components.
- ③ Activate the box for 'Dial-Up Networking' and confirm your selection by clicking **OK** twice.

- ④ When prompted, insert your Windows CD into the CD drive and confirm with **OK**. After the required files have been copied, it may be necessary to restart the computer.



*If the required files are not found on the main folder of the CD, try to find them in the D:\win98 or D:\windows subfolders. Alternatively, the key combination **[Alt] + D** will open a search window for searching the CD.*

You may also find the files in a subfolder of the Windows folder on your hard drive, e.g. in 'c:\windows\options\cabs'.



Dial-Up Networking

Dial-Up Networking is then installed and the corresponding item will appear in My Computer.

Installation of the Dial-Up adapter and the protocol TCP/IP

In addition to installing Dial-Up Networking, a dial-up adapter (or dial-up driver, according to the operating system version) with the TCP/IP network protocol in the Windows network environment is required. Proceed as follows if these components have not been set up on your computer:

- ① Open the window for configuring the network properties via **Start ► Settings ► Control Panel ► Network**. Check whether there is an entry for the dial-up adapter in the list of network components.
- ② If there is no entry for the dial-up adapter, click on **Add ► Network card ► Add** and select 'Microsoft' as manufacturer and the 'Dial-up adapter' as the network card. Confirm by clicking **OK** twice.
- ③ When prompted, insert your Windows CD into the CD drive and confirm with **OK**. After the required files have been copied, the computer will need to be restarted for the new settings to become effective.
- ④ Finally open the window for configuring the network properties again with **Start ► Settings ► Control Panel ► Network**. Check whether there is an entry for the TCP/IP protocol in the list of network components.
- ⑤ If there is no entry for TCP/IP, click on **Add ► Protocol ► Add** and select 'Microsoft' as manufacturer and 'TCP/IP' as protocol. Confirm by clicking **OK** twice.
- ⑥ When prompted, insert your Windows CD into the CD drive and confirm with **OK**. After the required files have been copied, the computer will need to be restarted for the new settings to become effective.

Finally, check the correct entry of the installed components. Open the window for configuring the network properties again with **Start ► Settings ► Control Panel ► Network**. Ensure that the list of network components not only contains entries for the

dial-up adapter and the TCP/IP protocol, but also an entry in the form of 'TCP/IP -> Dial-Up Adapter'.

Then Dial-Up Networking is ready to connect to other computers or networks with *ELSA MicroLink ISDN PCI*.

Establishing a new connection



Make New
Connection

- ① Double-click in My Computer, Dial-Up Networking on **Make New Connection**.
- ② Enter a name for the connection in the next window and select your modem. To enter the phone numbers go on to the next window by clicking the **Next** button.
- ③ Enter the area code and the phone number of your Internet provider and if required select a different country code. Selecting **Finish** in the following window establishes the new connection.

Faxing with *ELSA MicroLink ISDN PCI*

Faxing over ISDN with *ELSA-RVS-COM*

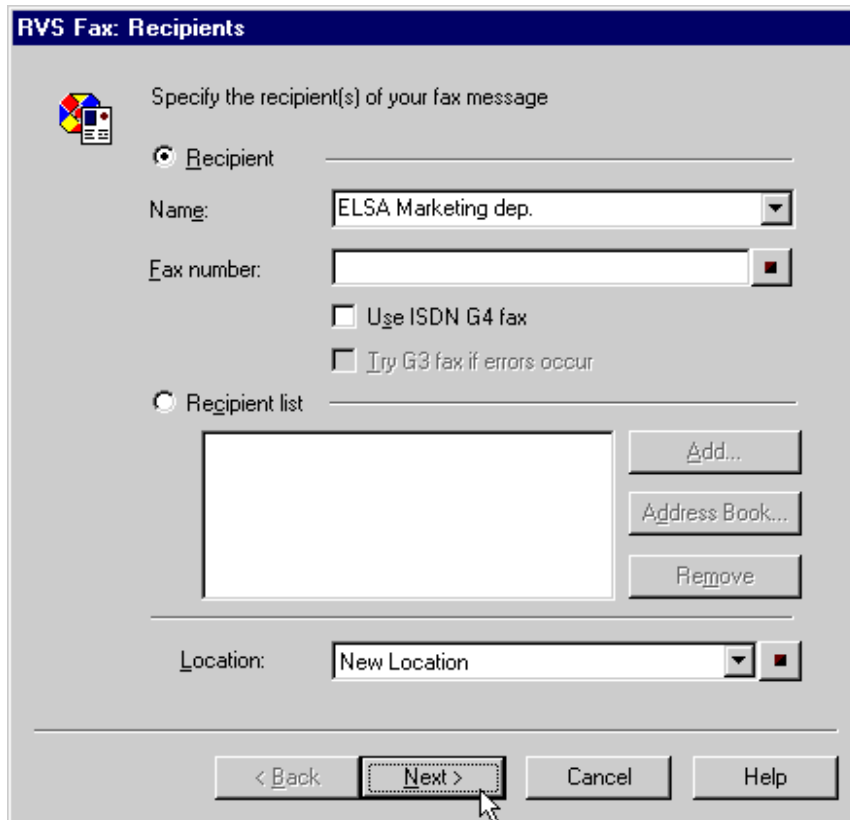
An ELSA ISDN-Adapter also lets you use your computer as a convenient fax machine for ISDN connections.

Sending a fax with *ELSA-RVS-COM*

When it was installed, *ELSA-RVS-COM* configured a special printer driver (RVS Fax) for your standard application programs (e.g. word processing) that will allow you to print your faxes. When you send a document to the 'RVS Fax' printer, the fax wizard takes over the rest of the fax transmission.

Alternatively, you can start sending a fax by clicking **Start ► Programs ► ELSA-RVS-COM ► Create new fax**. In this case as well, the fax wizard takes charge of the further

processing of the fax. It asks you to enter the recipient's name and call number and, further along in the process, offers to enter additional text and use a prepared cover sheet.



Please read the following tips on how to send fax messages effectively using *ELSA-RVS-COM*:

- If you want to send the same fax to several recipients, activate the 'Recipient list' and press the **Add** button to enter the relevant addresses.
- You can display the fax with the RVS FaxViewer before sending it. Then you can either transfer the fax immediately or click the **Fax Settings** button and switch to the 'Schedule' tab to specify a dispatch time. In this way, you can send non-urgent faxes at night and thus save on telephone charges.
- When you click on the **Fax Settings** button, you can create your own coversheets on the 'Cover Sheets' tab.
- If you wish to combine several pages from an application program in a fax transmission, first create the individual fax pages using the particular program and click on **Show fax** on the last page of the Fax wizard. FaxViewer lets you save the relevant pages individually. If you wish to create «blank» fax, you can press the **Add** button to combine the relevant files in one fax transmission.

Receiving a fax

There are basically two possibilities for receiving faxes:

- Another person would like to send you a fax.
- You wish to retrieve a specific preset fax retrieval (fax polling).

In the first case, you simply need to switch on your fax machine (i.e. *ELSA-RVS-COM*) and wait for the incoming fax. Your computer is ready to receive faxes if you have configured fax reception using the *ELSA-RVS-COM* installation wizard and the CommCenter is started (also see communication software).

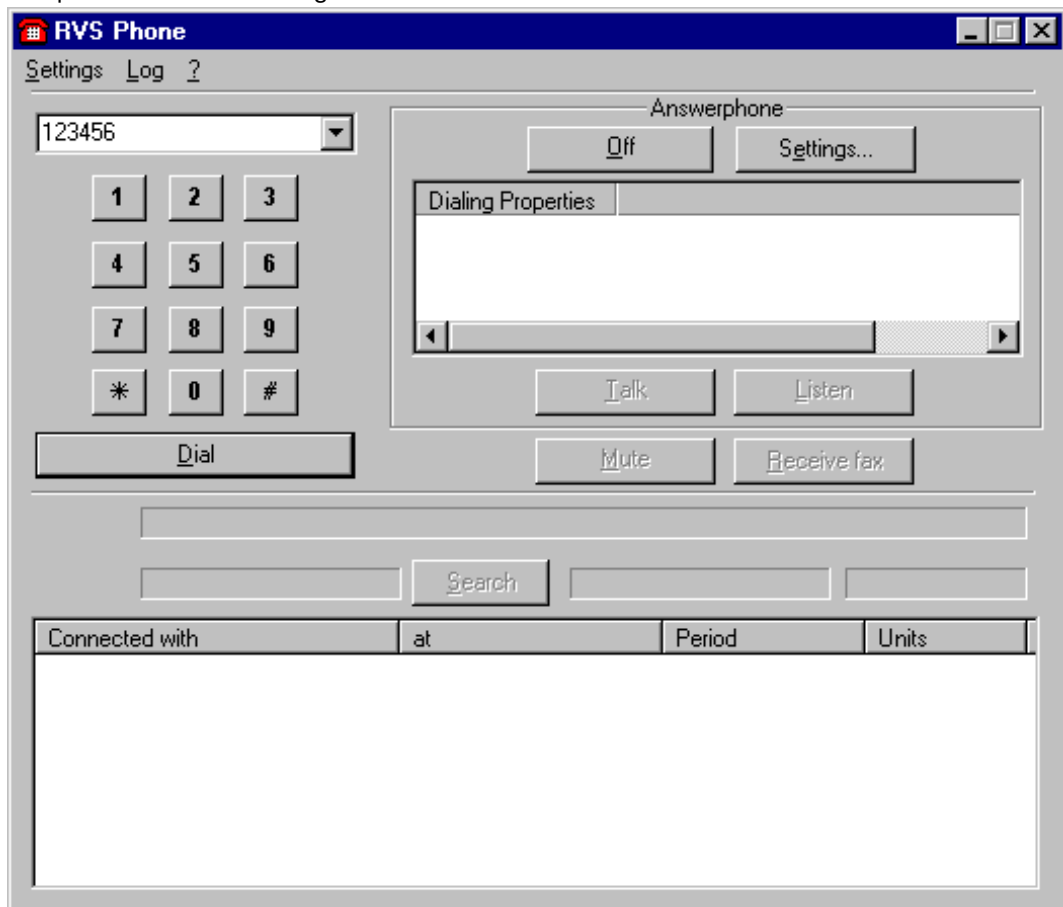
For fax polling, proceed as follows:

- ① Start the 'RVS Phone' in the 'ELSA-RVS-COM' program group.
- ② Dial the call number of the fax machine from which you would like to retrieve the fax.
- ③ As soon as the connection is established, click the **Fax Reception** button.

The remote station's fax machine now transmits the fax to your computer. The call number of the other fax machine and the current connection time are displayed on the status line of the 'RVS Phone'.

Telephone and answering machine

The *ELSA MicroLink ISDN PCI* also lets you use your computer as a convenient ISDN telephone and answering machine.



This requires:

- *ELSA-RVS-COM* as the communications software with answering machine and telephony functions
- A full-duplex sound card with suitable speakers
- A microphone for recording announcement texts

When installing *ELSA-RVS-COM* enter a call number to which the answering machine (and thus the telephone as well) is to respond.

The following are some of the options that *ELSA-RVS-COM*'s answering machine offers you:

- Recording of several announcement and closing texts
- Management of different announcement texts by means of a schedule
- Definition of a maximum recording time per call



Your computer is not ready to receive telephone calls until you have started the ELSA-RVS-COM CommCenter.



Telefon

Using **ELSA-RVS-COM** as a telephone

- Click on this icon. The 'RVS Phone' dialog box will appear.
- Enter the desired number using the keyboard or mouse and start the dialing process with **Dial**. **Hangup** ends the call.



Telefon

Recording calls with **ELSA-RVS-COM**

- Click on this icon. The 'RVS Phone' dialog box will appear.
- Switch on the answering machine (answerphone on). The standard RVS outgoing message will be used automatically whenever the answering machine responds to a call. Calls can be accepted via **Talk** and listened to via **Listen**.
- Select **Settings** to record your own outgoing message.
- Click on **Properties**. In the 'Description' field, enter the title for the message, and if required, specify the times (e.g. lunch break) during which it is to be used and how long the message may be.
- Click **Edit** in the required field (**Greeting Message** or **End Message**) to open the recorder and record the message.

The voice messages received can be played using the Inbox. In addition, all incoming and outgoing connections and connection attempts are listed in a log.



Inbox



*The answering machine can also be started and configured via the **CommCenter**.*

Data Transfer

ELSA MicroLink ISDN PCI and the software included provides you with several possibilities to transfer data from one PC to another. Always take into account the capabilities of the remote terminal when selecting the method of data transfer.

Dial-Up Networking under Windows 98

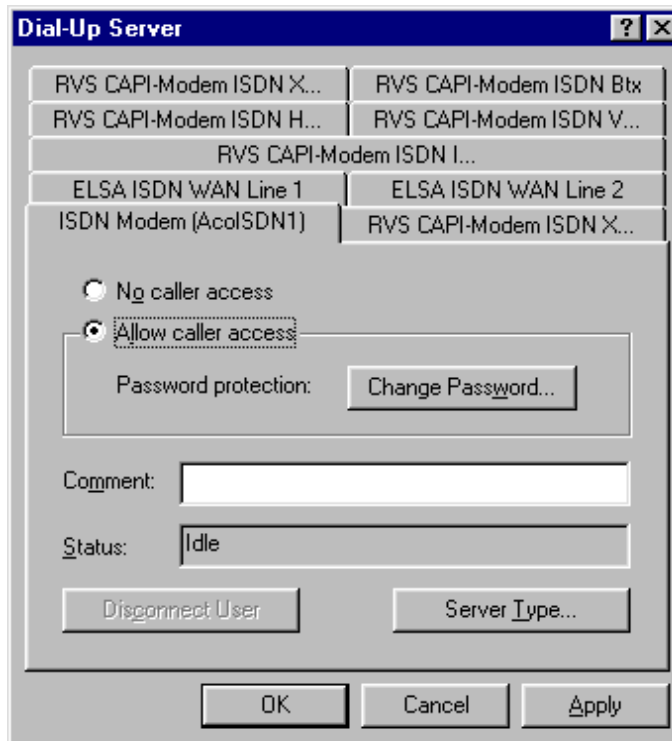
You can set up your computer as a server within the Dial-Up Networking of Windows 98. This allows you to grant other users (clients) access to your files.

Setting up a Server

Following software and hardware components must be installed for your computer to operate as a server:

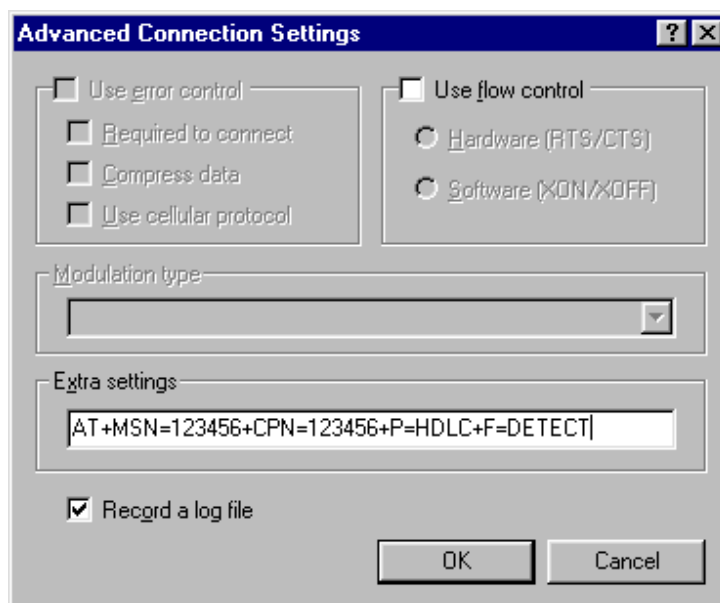
- Microsoft Network (Control Panel, Software, Windows Setup)
- Microsoft Dial Up Server and Dial Up Network (Control Panel, Software, Windows Setup, Connections)
- Client for Microsoft networks (Control Panel, Network)
- One of the protocols TCP/IP, IPX or NetBEUI (Control Panel, Network)
- File and printer sharing for Microsoft Networks (Control Panel, Network)

- ① First, open My Computer and double-click the Dial-Up Networking icon. Under **Connections** ► **Server**, enable access to the server via one of the ISDN lines or a modem for analog connctions. Disable access to the server for all other modems!



- ② Open the Dial-Up Network server settings with the **Server Type** button. Select, for instance, 'PPP' as the server type and activate all options.
- ③ If you would like to restrict the access to your server with a password, open the appropriate window with the **Change password...** button.
- ④ Change the advanced properties of the 'ISDN modem AcoISDN1' under **Control Panel** ► **Modems** ► **Properties**. The entry in the field 'Advanced Properties' should read as follows:

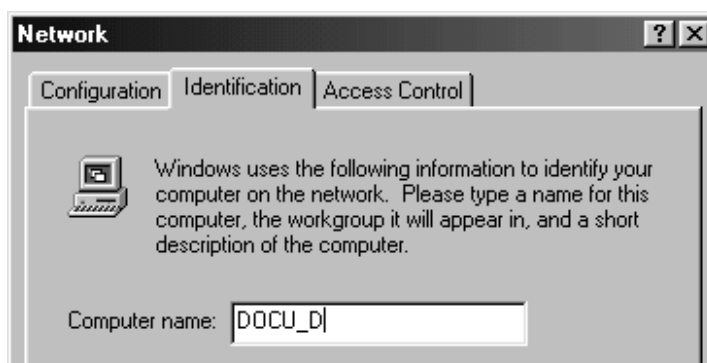
AT + MSN = (Phone number for incoming calls to the Server) + CPN = (Phone number for outgoing calls of the modem) + P = HDLC + F = SYNC



Setting up the Client

Following software and hardware components must be installed for your computer to operate as a client:

- Microsoft Dial Up Network (Control Panel, Software, Windows Setup, Connections)
- client for Microsoft networks (Control Panel, Network)
- the same network protocol as the server (Control Panel, Network)
- You will need the computer name of the server to make the connection from the client to the server. To find out this name, click **Start ► Settings ► Control Panel ► Network ► Identification** on the server.

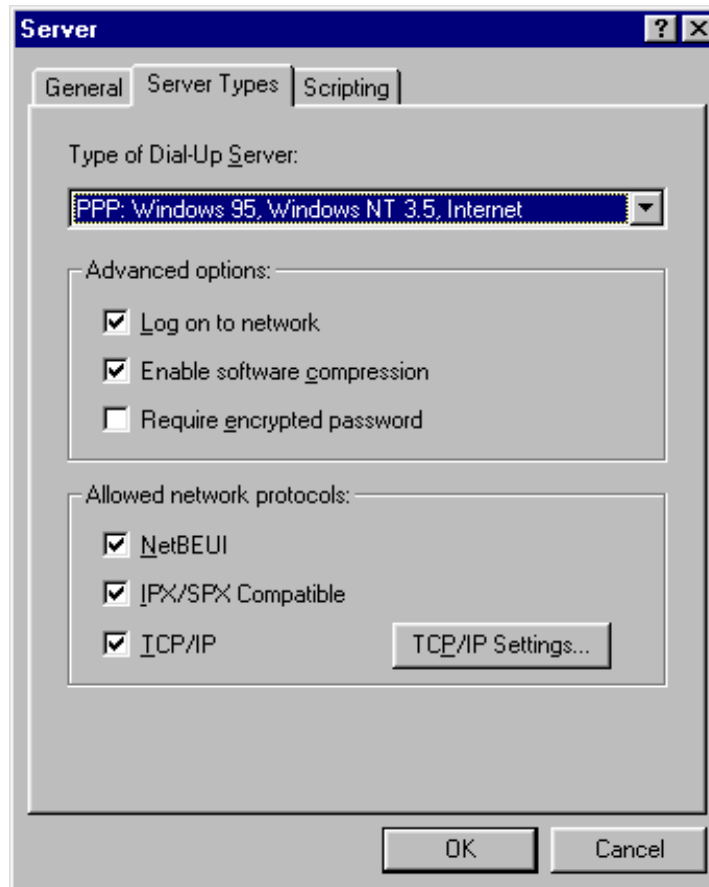


To access the server from another computer, you first have to establish a connection to the server within the Dial-Up Networking.

- ① Double-click on **Make New Connection** in Dial-Up Networking. Enter a name for the connection and select the first ISDN line for the connection. In the following

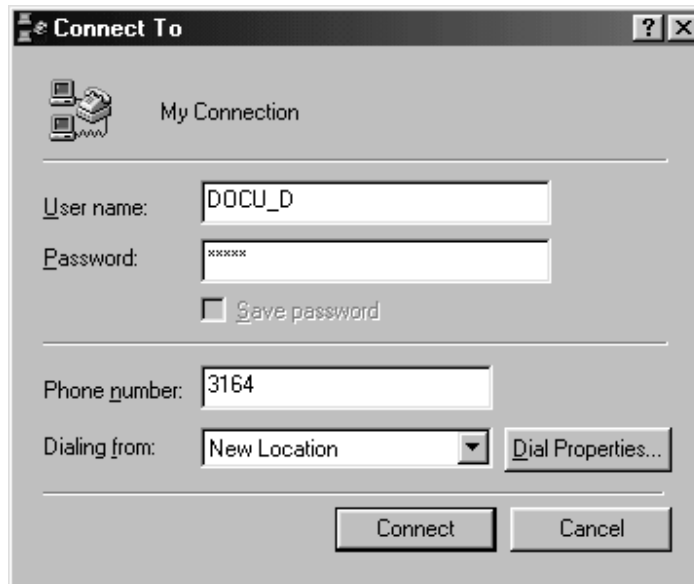
window enter the number of the server and complete the process by clicking the **Finish** button.

- ② Right-click on the new connection in the Dial-Up Networking to set the properties of the connection. Select the server type which you have set for your server and the advanced options as on the server. Enable the network protocol which is also installed on the server and close the window with **OK**.



- ③ Establish the connection to the server by double clicking on the corresponding icon in the Dial-Up Networking.

- ④ Enter the computer name of the server (see above) as the user name for the connection.



- ⑤ Enter the password specified in Dial-Up Networking under **Connections ► Server** (see item ③ in the section 'Setting up a Server').
- ⑥ Click **Connect** to establish the connection to the server.

You then have access to the shared drives and folders on the server which you can address using functions such as **Find ► Computer** in the Windows Start Menu or the Network Neighborhood. For information on sharing folders and files refer to the Windows help.

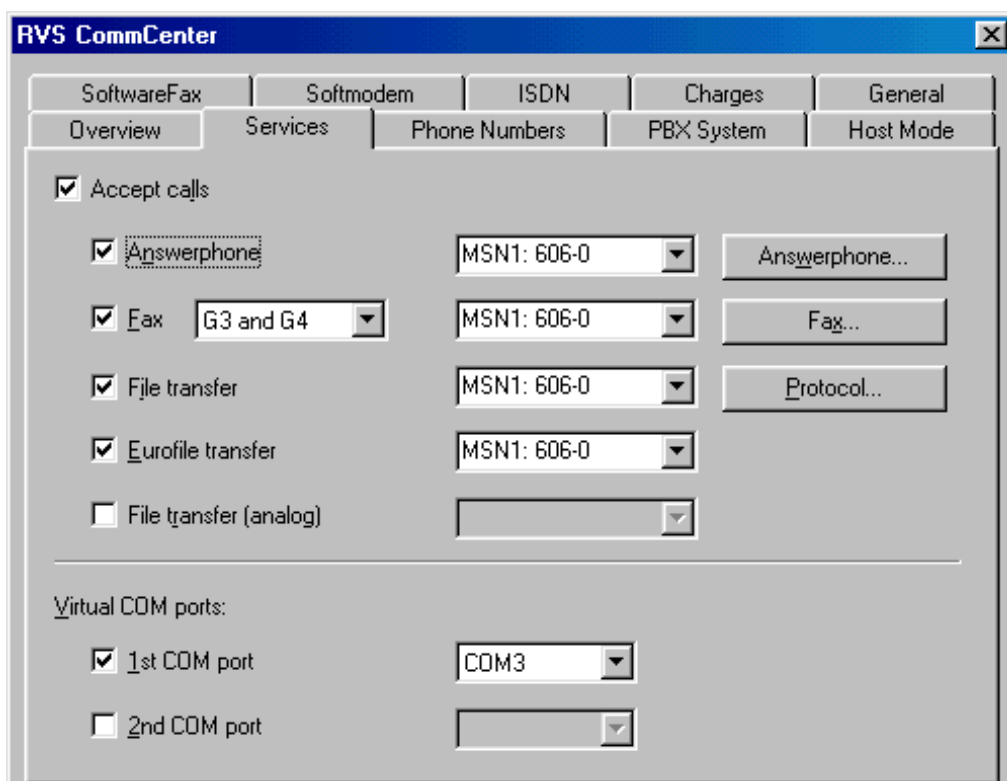
EuroFileTransfer with *ELSA-RVS-COM*

The TransferMaster in *ELSA-RVS-COM* provides a convenient method of transferring files from one computer to another. It simply requires that the ready-to-receive state for EuroFileTransfer be activated on the other PC (e.g. with CommCenter from *ELSA-RVS-COM*).

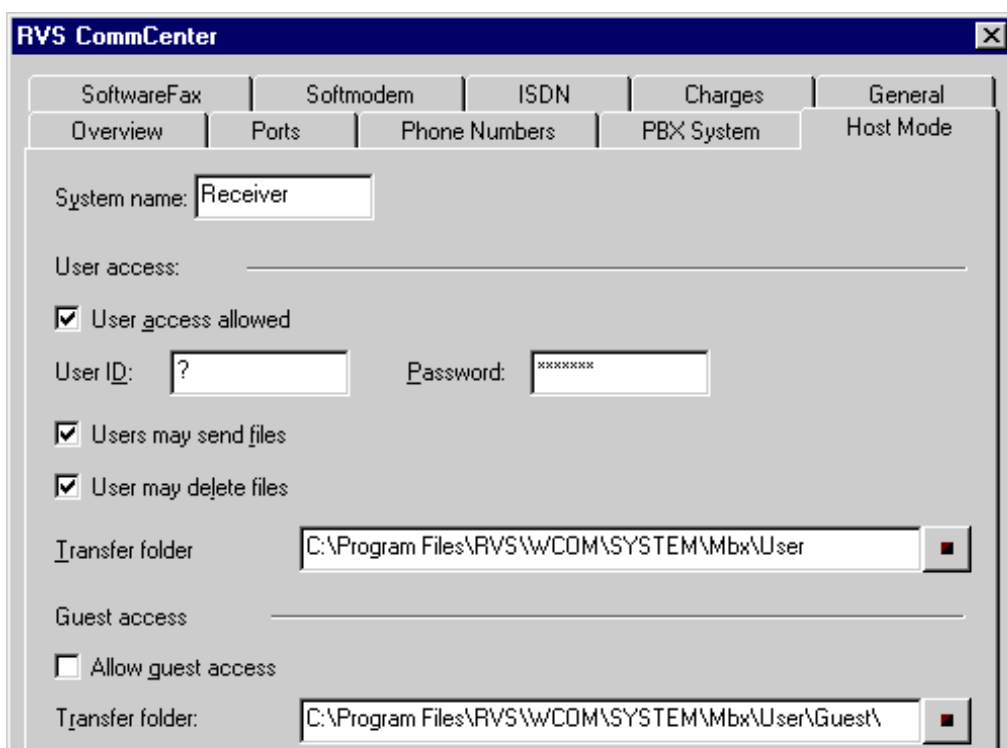
Preparing for EuroFileTransfer

In order to allow other users to access your computer via EuroFileTransfer, set up the access in the *ELSA-RVS-COM* CommCenter by making a few entries.

- ① Activate 'Accept calls' in the properties for the ISDN connection (services tab in the CommCenter) and select the subscriber number to which the connection for the EuroFileTransfer should react.



- ② Use the 'Host Mode' tab to define a user name and password and select the directory to be opened to this user. The user can read and write files in this directory and all its subdirectories (if the corresponding option is enabled).



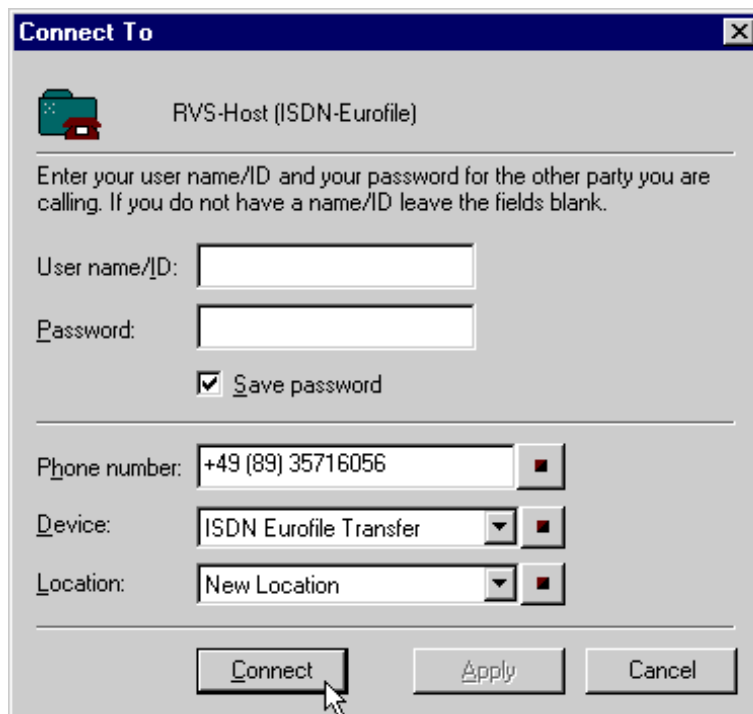
- ③ Deactivate the host mode.

Your computer is ready for EuroFileTransfer as long as the CommCenter is activated.

Transferring Data with EuroFileTransfer

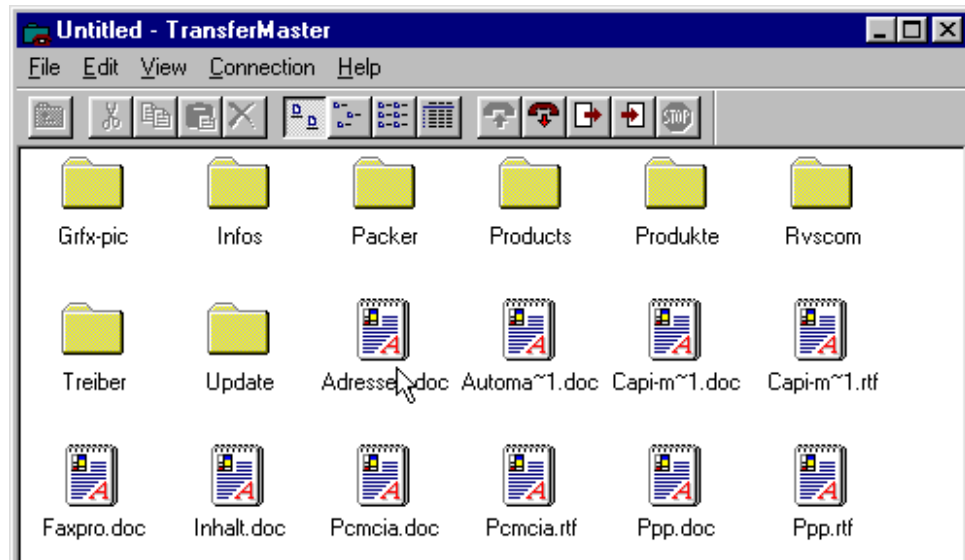
To transfer files yourself from your computer to another (or vice versa), proceed as follows:

- ① Start TransferMaster by double clicking on the corresponding icon.
- ② Open a template (e.g. RVS-Host (ISDN Eurofile)), a saved connection, or a window for a new remote station with **Connection ► Connect**.
- ③ Enter a user name if required (none) and password (none) as well as the subscriber number of the remote station (preset) and confirm with **Connect**.



- ④ After the successful call establishment, the files of the remote computer will appear as an additional folder on your own computer. You can transfer these files between the two computers by using drag&drop. In addition, you will be able to open files

on the other computer by double-clicking on them, provided the appropriate application is installed on your own computer.



For additional help on data transfer with ELSA-RVS-COM please see the program online help.

ISDN Connections

In choosing a modern ISDN connection, you have opened the door to a broad new selection of communications options.

You can use a wider range of services than with analog telephone connections, at higher speeds, and in some cases even simultaneously!

What's more, the assignment of several ISDN subscriber numbers lets you precisely tailor the scope and type of communications services to your requirements.

In this chapter, we would like to provide a few examples for the deployment of various devices (PC, telephone, fax, answering machine, etc.) on your ISDN connection to achieve the most convenient solution for your particular requirements.

Even if you don't find your specific application scenario here, combinations of these examples can provide useful ideas for your applications.

Introduction—What Does ISDN Involve?

This section will introduce the specific characteristics of ISDN as compared to conventional telephone connections in order to illustrate the special capabilities of the ISDN network. While this description is certainly not complete, it covers a number of the questions most frequently asked by new ISDN users.

What Does ISDN Stand for?

ISDN is an abbreviation for **I**ntegrated **S**ervices **D**igital **N**etwork. This name already contains some key information about ISDN:

- It is a digital network.
- A variety of services are integrated in this network.
- Note: This is not a network which provides digital services exclusively. Analog services such as telephony and fax can also be provided via ISDN.

How Many Lines and Subscriber Numbers are Available in the ISDN?

Generally, normal analog telephone connections involve one line with a single number (subscriber number). While several communications devices (e.g. a telephone and a fax) can be connected to a telephone connection, only one device can be used at a time due to the single line.

An ISDN basic rate interface is generally installed for private users and small businesses. The differences to an analog telephone connection: This immediately provides two usable lines, the B channels. An additional line is also available, the D channel, but this channel is used only for control data, such as dialing information, necessary for the establishment and administration of the connection to other devices.

What's more, it is usual for three subscriber numbers to be assigned to your connection. If you need additional subscriber numbers, just apply to your telecommunications provider.

The advantages:

- You can assign specific numbers to the individual devices. For example, separate numbers can be assigned to each telephone and the fax machine, as well as to the PC with the *ELSA MicroLink ISDN PCI* (subject to the availability of free numbers).
- Two tasks can now be performed simultaneously: For example, it's possible to speak to two different parties at the same time, or to use the telephone and fax at the same time. You can also surf the Internet without tying up the telephone.
- A number of things are also considerably faster using ISDN. Your phone calls won't be any shorter, but the call establishment is quicker. You have a clear advantage when it comes to data applications, as the transfer rates of the *ELSA MicroLink ISDN PCI* cannot be reached with an analog modem. If 64,000 bps aren't enough, you can bundle the ISDN channels to double your transfer rate. This will, however, incur double the call costs and you will, for example, no longer be reachable by telephone.

What Is the Difference Between DSS1 and 1TR6 (Germany only)?

The various terminal devices in the ISDN network must agree on a common "language" before they can understand one another. This is standardized for some services, such as telephony, and does not require any further attention. The situation is different for data applications, however: When two devices (e.g. *ELSA MicroLink ISDN PCI*) exchange data using a B channel, the language that they use for their interaction is established in a 'protocol'. PPP (Point-to-Point Protocol), which is generally used in the Internet, and X.75 are examples for such protocols.

However, there is also the control channel (D channel) in addition to the basic channels (B channels). This channel also has a protocol which regulates the transfer of control information between the exchange and the terminal device. The 1TR6 protocol was used in Germany in the early years of ISDN. More recent connections operate almost exclusively with the newer Euro-ISDN (DSS1) protocol. It is not necessary for the two communicating terminal units to use the same D-channel protocol. Data from connections using DSS1 will make their way to 1TR6 connections and vice versa.

DSS1 and 1TR6 connections use different designations for the numbers of the terminal devices.

- DSS1 connections provide at least three different **M**ultiple **S**ubscriber **N**umbers (MSNs) which can be assigned to the individual devices.
- 1TR6 connections offer ten terminal selection digits (EAZs, from the German **E**ndge-**r**äte**a**uswahl**z**iffern) which can be assigned to terminal devices.

The important point is that your terminal devices (e.g. *ELSA MicroLink ISDN PCI* and the communications software) are set up to use the D-channel protocol of your connection. To find out more, please see the 'ELSA-ISDN Tools' chapter or the documentation and online help of the software.

Which Services Does ISDN Provide?

ISDN offers the following services which can be used parallel to one another depending on the configuration of your communications equipment (telephones, fax, PC with *ELSA MicroLink ISDN PCI*):

- Telephony
- Faxing
- Data applications such as remote data access, data transfer, Internet access and online services

What Are the Differences Between the Individual Services?

When one communications device in the ISDN network needs to contact another, it initially sends out a call on the D channel containing the subscriber number of the device, as well as service indicator or bearer capability information. The communications device uses this bearer capability to inform the opposite devices of the service it requires. The currently available bearer capabilities include:

- Telephony, 3.1 kHz
- Telephony, analog
- Fax Group 2
- Fax Group 3
- Fax Group 4
- a/b services
- Datex-J
- One-way videotex
- Video telephony
- Interactive videotex

Once the device with the appropriate subscriber number has been located, the bearer capability of the device is then verified. A connection is not established until both the subscriber number and the correct service are available.

Although this may at first seem to be a major handicap for the communication of the various devices in the ISDN network, this is in fact one of ISDN's greatest strengths: The clever assignment of subscriber numbers and bearer capabilities permits the parallel deployment of a substantially greater number of terminal devices than would otherwise be possible with 3 subscriber numbers, since each terminal device is assigned a precise task.

Here's a couple of examples:

- The same subscriber number can be assigned to a telephone and *ELSA MicroLink ISDN PCI*. The telephone will then automatically respond to calls with the 'telephony' bearer capability, while the *ELSA MicroLink ISDN PCI* accepts calls with a 'data' bearer capability.
- A separate fax machine and a computer with the *ELSA MicroLink ISDN PCI* and fax software (e.g. *ELSA-RVS-COM*) both respond to the same number and the 'fax group 3' bearer capability. If the computer is running, it will be quicker than the fax machine and will accept the call. If the computer is switched off at night, the fax machine will receive the call for lack of other devices capable of doing so.

Can I Continue Using my Old Equipment, such as my Telephone and Fax Machine?

Yes, your "old" equipment can also be used on an ISDN connection. You may not be able to use all of the ISDN-specific functions with them, but any features that were available on your analog telephone line will generally also be usable on the ISDN connection.

Analog terminal equipment must be connected to so-called a/b ports, which convert analog signals to digital form. a/b ports can be found in PBX systems, as separate a/b adapters, or in some external ISDN terminal adapters such as the *ELSA TanGo 2000* or the *ELSA MicroLink ISDN 2 a/b*.

What Exactly Is an NTBA?

NTBA stands for **N**etwork **T**erminator for **B**asic **A**ccess. This box is mounted on your wall by your telecommunications provider, and may have been connected to a telephone socket left over from an analog line. You may either connect your ISDN terminal devices (such as the *ELSA MicroLink ISDN PCI*) to the NTBA, or a PBX system for your telephones, fax, and other communications equipment.

The telephone socket used by the NTBA cannot be used for analog terminal equipment once the line has been converted to ISDN.

And What About the Extras?

These are also available under ISDN, of course. They include a number of functions which increase the simplicity and convenience of telephone conversations in particular, such as:

- call waiting
- brokering
- three-party service
- holding
- call forwarding



Some of these features may require a separate application to your telecommunications provider and may be subject to additional charges.

These features will not be described in detail here, as they are not relevant to data applications with the *ELSA MicroLink ISDN PCI*.

Just Skimming...? What's Important?

Here's a summary of the above which you should keep in mind when configuring your communications equipment:

- ISDN provides a variety of communications **services** such as telephony, fax, data applications, video telephony, and videoconferencing.
- You can assign **different subscriber numbers** to the individual devices (three multiple subscriber numbers are available for an ISDN Basic Rate Interface).
- A normal ISDN Basic Rate Interface has **two lines** which you can use **parallel** to one another.
- The various services report their **bearer capability** to other communications devices (telephone, fax, PC). Depending on its configuration, a device can thus accept or reject calls.
- If you are using **both lines at the same time**, for a data transfer for example, no further functions can be used.
- If two devices have the **same number** and can accept the **same services**, the "faster" device will accept the call as a rule.



All of the following examples are presented as self-contained units. If you go through the sections step by step, some of the material in the following explanations will strike you as familiar.

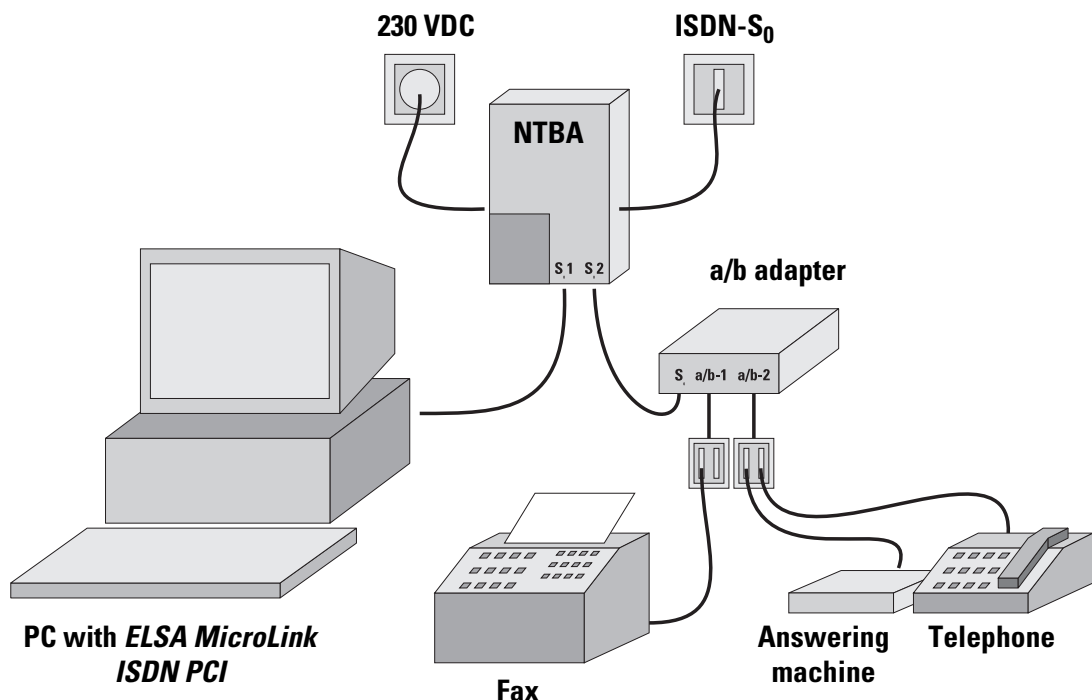
The Basic Package—ISDN with Analog Devices

You've probably already noticed something about the description of ISDN's advantages: Not very much emphasis is placed on the functions of the new digital terminal equipment. A number of the greatest advantages of the digital network can actually be realized using "old" analog equipment, provided that (if a/b adapters exist).

As a result, most private users do not buy a new ISDN telephone or fax machine immediately after their ISDN connection has been installed, but sit back and wait for the prices of this equipment to drop—or perhaps for the equipment itself to drop in under the Christmas tree. In the mean time, they continue to use their old equipment.

But how do you connect these devices when you would like to take advantage of the new communications options after adding the *ELSA MicroLink ISDN PCI*? Our first example shows a possible application for a private user. The initial situation:

- an ISDN Basic Rate Interface (DSS1) with 3 MSNs (e.g. 123456**1**, 123456**2** and 123456**3**)
- a/b adapter with a/b ports and telephone sockets
- analog telephone
- analog answering machine
- analog fax machine
- PC with *ELSA MicroLink ISDN PCI* and *ELSA-RVS-COM*



You would like to achieve the following using this equipment:

- You should always be available under a given telephone number. If you can't answer the phone, the answering machine should take over for you.
- You would also like to receive faxes at all times. If the computer is off, you would like the analog fax machine to receive faxes for you. If the computer is on, the faxes should be received by *ELSA-RVS-COM*. You would also like to send faxes, either straight out of your computer's applications, or on paper using the analog fax machine.
- What's more, you'd like to surf in the Internet and set up your computer in such a manner that you have access to your files at home from your office computer via EuroFileTransfer.



The fact that your ISDN connection provides you with three different telephone numbers does not mean that you have to use all of them! You can use one telephone number for all services which means that you can, if you wish, receive voice calls and faxes on the same number. If, for example, you change from an analog connection with one number to an ISDN connection, your friends will probably continue to send faxes to the old number. No problem. You can receive faxes on the number you use for voice calls.

Here's how to realize your goal:

- ① Connect the a/b adapter to one of the two S_0 connections of the NTBA.
- ② On the first a/b port, connect your telephone and the answering machine using a suitable adapter. Program the a/b adapter so that this port responds to the first MSN (123456**1**).
- ③ Connect the fax machine to the other a/b port.
 - If you want to receive faxes and voice calls on the same number, program the a/b adapter so that this a/b port also responds to the first MSN (123456**1**).
 - If you want to use different telephone numbers for voice calls and faxes, program the a/b adapter so that this a/b port responds to the second MSN (123456**2**).
- ④ Use the other S_0 connection on the NTBA for your PC with the *ELSA MicroLink ISDN PCI*. Install *ELSA-RVS-COM* as the communications software on this computer.

Please note the following when installing:

- If you want to receive voice calls and faxes on the same telephone number select 'Express configuration' setup in the Installation Wizard and enter the same MSN that you entered for the analog fax and voice a/b ports.
 - If you want to use different numbers for voice calls and faxes, select 'User defined configuration' setup in the Installation Wizard. Enter the first MSN (123456**1**) for the answering machine and the second MSN (123456**2**) for the fax. Select any MSN for EuroFileTransfer.
 - Activate 'Enable autoanswer'.
- ⑤ That's it! You're now always available—by telephone, answering machine or fax. When your computer is on, it handles incoming faxes and lets you access your files at home remotely from another workstation.



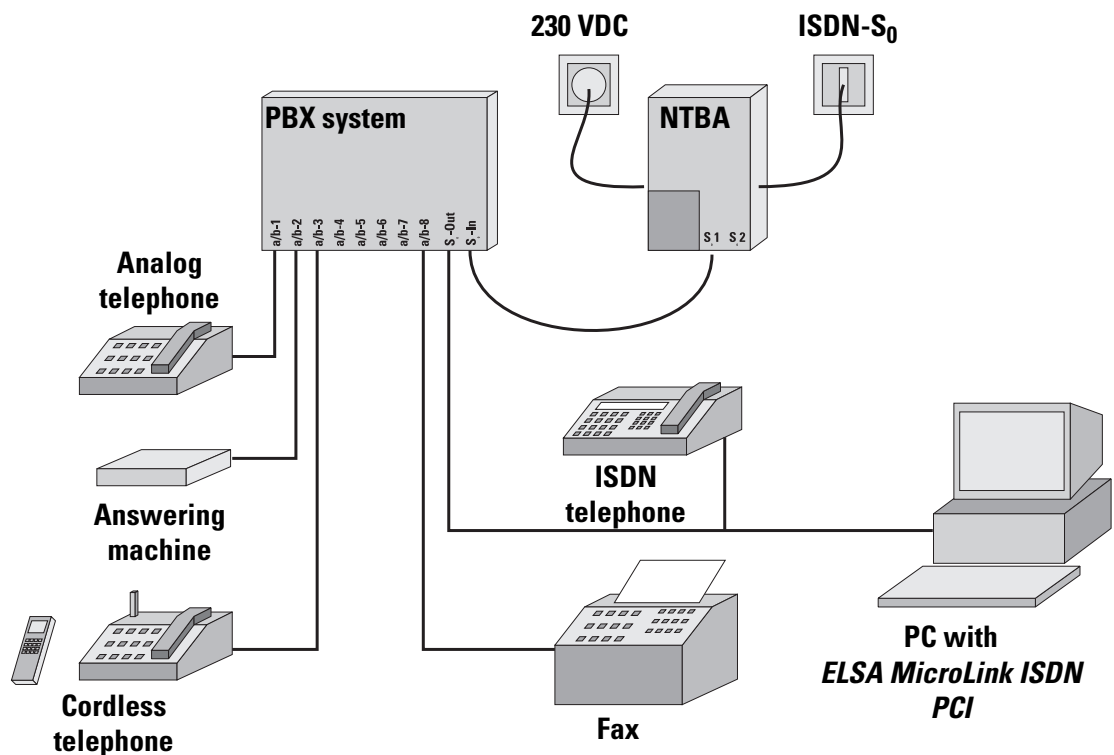
Some a/b adapters do not permit this coordination of the fax machine and computer fax functions. If this is the case, select different MSNs for the fax machine and ELSA-RVS-COM.

The Next Step up—For Freelancers

The prices for telecommunications equipment have continued to fall in the recent past, prompting ever more freelancers to work in home offices. The number of telephone calls is on the increase, but you don't want to inconvenience your three daughters as a result, so you've decided to buy a small PBX system and an ISDN telephone. You've also applied for a few additional MSNs from your telecommunications provider.

How do you connect the new devices to ensure that your private and business matters remain neatly separated? Our first example shows an application for mixed private and business use. The initial situation is as follows:

- an ISDN Basic Rate Interface (DSS1) with 10 MSNs (e.g. 123456**1** to 123456**10**)
- private branch exchange system (PBX) with an internal S_0 bus and eight a/b ports
- an ISDN telephone
- a normal analog telephone
- a cordless analog telephone
- analog answering machine for private calls
- analog fax machine
- PC with *ELSA MicroLink ISDN PCI* and *ELSA-RVS-COM*



You would like to achieve the following using this equipment:

- You need a separate business telephone number. The answering machine in the computer should handle your calls when you are meeting clients.
- The fax machine is exclusively for business use. If the computer is off, you would like the analog fax machine to receive faxes for you. If the computer is on, the faxes should be received by *ELSA-RVS-COM*. You would also like to send faxes, either straight out of your computer's applications, or on paper using the analog fax machine.
- Each of your daughters should have a telephone and subscriber number of her own. The PBX system should also be so kind as to track the calling charges for your business and your children separately.
- You have an additional cordless telephone to which you would like to assign a separate number for your private use. You would also like to be able to take the cordless handset into the office with you when nobody else is at home but you're expecting an important private call nonetheless.
- The PBX should permit internal telephone calls or the transfer of calls without accruing additional connect charges.
- What's more, from time to time you need to access your files at home from on the road using your notebook and EuroFileTransfer.

Here's how to realize your goal:

- ① Connect the PBX system to one of the two S_0 connections of the NTBA.
- ② The analog telephones, answering machine and fax machine are each connected to an a/b port. The ports for the telephones and the fax are each assigned their own MSN (123456**1** to 123456**3**) via the PBX. Set the a/b port of the answering machine to the same MSN as the private family phone.
- ③ Connect the ISDN telephone and the PC with the *ELSA MicroLink ISDN PCI* to the S_0 bus of the PBX system. Set the ISDN telephone to the next MSN (123456**4**).
- ④ Install *ELSA-RVS-COM* as the communications software on the computer.

Please note the following when installing:

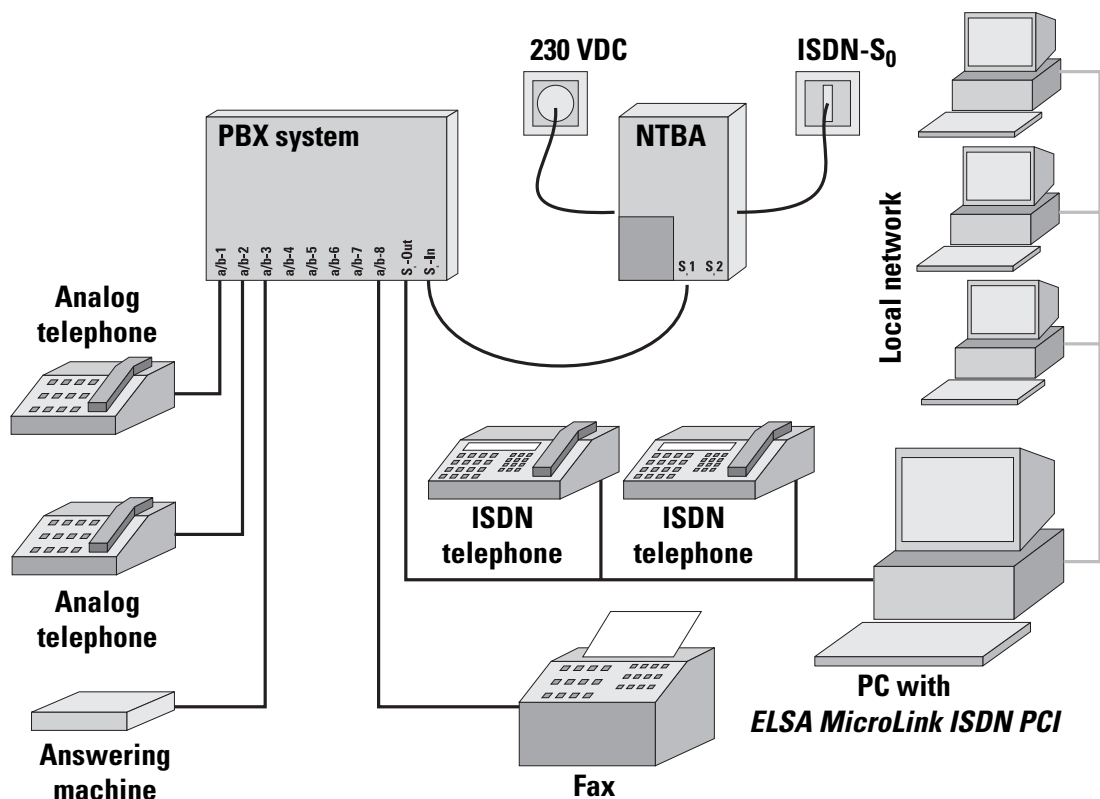
- Select 'Custom' setup in the Installation Wizard.
 - Select the same MSN for the fax as for the analog fax machine on the PBX (123456**3**).
 - Set the answering machine to the same MSN as the ISDN telephone (123456**4**).
 - Select any MSN for EuroFileTransfer (123456**5**).
 - Activate automatic call answering.
- ⑤ That's it! You're now always available—business or private, by telephone, answering machine or fax. When your computer is on, it handles incoming faxes and

lets you access your files at home remotely from another workstation. And if you happen to be enjoying your lunch break in the kitchen, the answering machine will let your clients know when you will be back in the office.

Stage 2—For Small Companies

Business is booming and you now have employees that also need access to telephones and the fax. You've moved to a larger office and are now confronted with a new situation:

- an ISDN Basic Rate Interface (DSS1) with 10 MSNs (e.g. 123456**1** to 123456**10**)
- private branch exchange with an internal S_0 bus and eight a/b ports
- a number of ISDN telephones
- a number of old analog telephones
- analog answering machine
- analog fax machine
- a network with several workstations and Windows NT Server with the *ELSA MicroLink ISDN PCI* and professional version of RVS-COM



You would like to achieve the following using this equipment:

- All of your employees can be reached at their desks under their own extensions.
- The answering machine accepts all calls on your days off and lets your clients know when you and your staff will be available again.
- The fax machine handles all incoming faxes.
- All employees can send faxes from their workstations.

Here's how to realize your goal:

- ① Connect the PBX system to one of the two S_0 connections of the NTBA.
- ② The analog telephones, answering machine and fax machine are each connected to an a/b port. The ports for the telephones and the fax are each assigned their own MSN via the PBX. Assign all MSNs to the a/b port of the answering machine and ensure that it is always switched on after business hours.
- ③ Connect the ISDN telephones and the PC with the *ELSA MicroLink ISDN PCI* to the S_0 bus of the PBX system. Set the ISDN telephones to additional free MSNs.
- ④ Install the professional version of RVS-COM on the server as your communications software. This version is available from the manufacturer (see the online help for sources). Install the regular version of *ELSA-RVS-COM* on the individual workstations. All of the functions of the *ELSA MicroLink ISDN PCI* are thus available to all workstations in the network.
- ⑤ That's it! All employees can now send faxes from their workstations. All incoming faxes are immediately printed out. During your lunch break the answering machine will let your clients know when you will be back in the office.

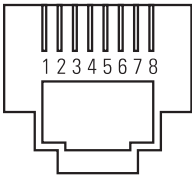
Appendix

This appendix contains the technical data, details to the pin assignment of the ISDN connector socket, the meaning of the color-coded status LEDs and also the warranty conditions.

Technical Data

| | <i>ELSA MicroLink ISDN PCI</i> |
|---|--|
| D-channel protocol | DSS1 (Euro-ISDN) |
| ISDN protocols | V.120, X.75, X.75/T.70NL, X.75-T-Online, T.90NL, EuroFileTransfer (ISO 8208), PPP/HDLC-transp., Multilink PPP |
| Operating Systems | Windows NT 4.0 (I386), Windows 98, Windows 95, Linux, OS/2 |
| Software | <i>ELSA-RVS-COM</i> , LapLink, ELSA-ISDN-Tools |
| Drivers | CAPI 2.0, NDIS WAN Miniport (PPP/MLPPP) |
| Fax G3 | SoftFax: at 486/66 send up to 14,400 bps and receive up to 9,600 bps; at 486/100 send and receive up to 14,400 bps |
| Telephone/ Answering machine | Digital, in conjunction with a full-duplex sound card |
| Permits | Germany, EU, Switzerland |
| Modem speed | Softmodem at 14,000 bps |
| Installation | Automatic hardware and software installation (Plug&Play) |
| Bus system | PCI, 32 bit |
| Dimensions (not including bracket) | 128 x 55 mm |
| Interrupts | 1 Interrupt from 0 to 15 |
| I/O addresses | 128 bytes and 4 bytes in the 0x0000 to 0xffff range Memory requirements: 128 bytes in the 0x00000000 to 0xffffffff range |
| Power supply | 5 V via the PC |
| Power consumption Standby ISDN Operation | 190mA 210mA |

Pin assignments

| Pin assignments | RJ45 pin | line | IAE |
|--|----------|------|-----|
|  ISDN – RJ45 | 1 | – | – |
| | 2 | – | – |
| | 3 | T+ | 2a |
| | 4 | R+ | 1a |
| | 5 | R- | 1b |
| | 6 | T- | 2b |
| | 7 | – | – |
| | 8 | – | – |

Status Display

Two LEDs for the monitoring of the ISDN line and connection status, *ISDNmonitor*. Significance of LEDs: see following table.

| LED | Zustand | Bedeutung | |
|--|--------------------------------|-------------------------------|---|
| The green LED shows the status of the ISDN line and the connection to the exchange (TEI assignment). | Off | S ₀ bus not active | No connection to the exchange (no TEI assigned) |
| | Flashing quickly (3x per sec.) | S ₀ bus active | No connection to the exchange (no TEI assigned) |
| | Constantly lit | S ₀ bus active | Connection to the exchange (TEI assigned) |



This LED remains lit continuously on most ISDN Basic Rate Interfaces.
The green LED may only light up when a connection is established when using certain PBX systems (e.g. Siemens HICOM).

| | | |
|---|--|--|
| The yellow LED shows the connection status of the ISDN board. | Off | No call, no connection |
| | Flashing slowly (1x per sec., 2x or 3x in total) | Incoming call, terminal device is not responsible or establishes connection itself |
| | Flashing quickly (3x per sec.) | Valid call pending, not (yet) answered |
| | Constantly lit | Connection is/being established |

Warranty conditions

The ELSA AG warranty, valid as of June 01, 1998, is given to purchasers of ELSA products in addition to the warranty conditions provided by law and in accordance with the following conditions:

1 Warranty coverage

- a) The warranty covers the equipment delivered and all its parts. Parts will, at our sole discretion, be replaced or repaired free of charge if, despite proven proper handling and adherence to the operating instructions, these parts became defective due to fabrication and/or material defects. Also we reserve the right to replace the defective product by a successor product or repay the original purchase price to the buyer in exchange to the defective product. Operating manuals and possibly supplied software are excluded from the warranty.
- b) Material and service charges shall be covered by us, but not shipping and handling costs involved in transport from the buyer to the service station and/or to us.
- c) Replaced parts become property of ELSA.
- d) ELSA are authorized to carry out technical changes (e.g. firmware updates) beyond repair and replacement of defective parts in order to bring the equipment up to the current technical state. This does not result in any additional charge for the customer. A legal claim to this service does not exist.

2 Warranty period

The warranty period for ELSA products is six years. Excepted from this warranty period are ELSA color monitors and ELSA videoconferencing systems with a warranty period of 3 years. This period begins at the day of delivery from the ELSA dealer. Warranty services do not result in an extension of the warranty period nor do they initiate a new warranty period. The warranty period for installed replacement parts ends with the warranty period of the device as a whole.

3 Warranty procedure

- a) If defects appear during the warranty period, the warranty claims must be made immediately, at the latest within a period of 7 days.
- b) In the case of any externally visible damage arising from transport (e.g. damage to the housing), the transport company representative and ELSA should be informed immediately. On discovery of damage which is not externally visible, the transport company and ELSA are to be immediately informed in writing, at the latest within 7 days of delivery.
- c) Transport to and from the location where the warranty claim is accepted and/or the repaired device is exchanged, is at the purchaser's own risk and cost.
- d) Warranty claims are only valid if the original purchase receipt is returned with the device.

4 Suspension of the warranty

All warranty claims will be deemed invalid

- a) if the device is damaged or destroyed as a result of acts of nature or by environmental influences (moisture, electric shock, dust, etc.),
- b) if the device was stored or operated under conditions not in compliance with the technical specifications,

- c) if the damage occurred due to incorrect handling, especially to non-observance of the system description and the operating instructions,
- d) if the device was opened, repaired or modified by persons not authorized by ELSA,
- e) if the device shows any kind of mechanical damage,
- f) if in the case of an ELSA Monitor, damage to the cathode ray tube (CRT) has been caused especially by mechanical load (e.g. from shock to the pitch mask assembly or damage to the glass tube), by strong magnetic fields near the CRT (colored dots on the screen), or through the permanent display of an unchanging image (phosphor burnt),
- g) if, and in as far as, the luminance of the TFT panel backlighting gradually decreases with time, or
- h) if the warranty claim has not been reported in accordance with 3a) or 3b).

5 Operating mistakes

If it becomes apparent that the reported malfunction of the device has been caused by unsuitable software, hardware, installation or operation, ELSA reserves the right to charge the purchaser for the resulting testing costs.

6 Additional regulations

- a) The above conditions define the complete scope of ELSA's legal liability.
- b) The warranty gives no entitlement to additional claims, such as any refund in full or in part. Compensation claims, regardless of the legal basis, are excluded. This does not apply if e.g. injury to persons or damage to private property are specifically covered by the product liability law, or in cases of intentional act or culpable negligence.
- c) Claims for compensation of lost profits, indirect or consequential detriments, are excluded.
- d) ELSA is not liable for lost data or retrieval of lost data in cases of slight and ordinary negligence.
- e) In the case that the intentional or culpable negligence of ELSA employees has caused a loss of data, ELSA will be liable for those costs typical to the recovery of data where periodic security data backups have been made.
- f) The warranty is valid only for the first purchaser and is not transferable.
- g) The court of jurisdiction is located in Aachen, Germany in the case that the purchaser is a merchant. If the purchaser does not have a court of jurisdiction in the Federal Republic of Germany or if he moves his domicile out of Germany after conclusion of the contract, ELSA's court of jurisdiction applies. This is also applicable if the purchaser's domicile is not known at the time of institution of proceedings.
- h) The law of the Federal Republic of Germany is applicable. The UN commercial law does not apply to dealings between ELSA and the purchaser.

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