MicroLink™ ISDN 4U

While the information in this manual has been compiled with great care, it may not be deemed an assurance of product characteristics. ELSA shall be liable only to the degree specified in the terms of sale and delivery.

The reproduction and distribution of the documentation and software supplied with this product and the use of its contents is subject to written authorization from ELSA. We reserve the right to make any alterations that arise as the result of technical development.

ELSA is DIN EN ISO 9001 certified. The accredited TÜV CERT certification authority has confirmed ELSA conformity to the worldwide ISO 9001 standard in certificate number 09 100 5069, issued on June 15, 1998.

Trademarks

Windows®, Windows NT® and Microsoft® are registered trademarks of Microsoft, Corp.

The ELSA logo is a registered trademark of ELSA AG. All other names mentioned may be trademarks or registered trademarks of their respective owners.

Subject to change without notice. No liability for technical errors or omissions.

ELSA AG

Sonnenweg 11

52070 Aachen

Germany

www.elsa.com

Aachen, February 2000

20960/0200

Preface

Thank you for placing your trust in this ELSA product.

With the *ELSA MicroLink ISDN 4U*, you have chosen a product that will let you set up local networks and establish connections to the Internet.

Documentation

The accompanying documentation comprises:

- Manual

  Hardware installation, description of the functions, operating modes and sample configurations

- CD containing electronic documentation

This documentation was compiled by several members of our staff from a variety of departments in order to ensure you the best possible support when using your ELSA product.

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.

The KnowledgeBase can also be found on the CD. Just open the file \Misc\Support\MISC\ELSASIDE\index.htm.

Contents

English

English

Introduction

This chapter will introduce your new hardware and will give you a brief overview over the performance and features of the *ELSA MicroLink ISDN 4U*.

The *ELSA MicroLink ISDN 4U* lets you concentrate on two things: the development of a network using the integrated hub and the two network cards, as well as access to the Internet via ISDN. Software wizards simplify the configuration of the unit to help you set up your *ELSA MicroLink ISDN 4U* quickly and easily. Thanks to the use of the TCP/IP protocol, you are not restricted with regard to operating systems. You can use the *ELSA MicroLink ISDN 4U* under Windows, on Macintosh computers, under Linux, and with a BeOS platform.

Networks offer a broad range of options:

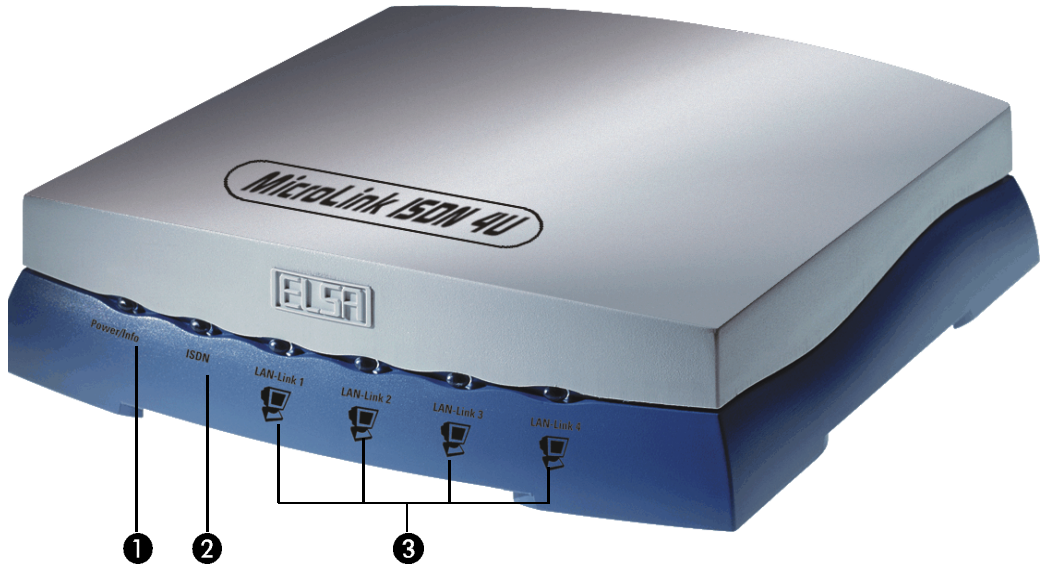
- You can double your available hardware resources, as every computer in the network can access the hardware of the others—hard drives, CD-ROM drives, or printers.
- You can set up your own intranet.
- You can play your favorite games in multiplayer mode.
- And finally, it's exciting to experience the cooperation of multiple computers.

The ELSA MicroLink ISDN 4U has been tested and fulfills the regulations pertaining to electromagnetic compatibility ("Declaration of conformity" see Appendix).

Introducing the *ELSA MicroLink ISDN 4U*

This section introduces the unit's hardware. It covers the unit's display elements and connection options.

English



1 Power/Info

After switching the *ELSA MicroLink ISDN 4U* on, the LED briefly lights up. After about 5 seconds, it remains lit in red to indicate the operational status of the unit. If the LED flashes in red, this indicates a boot error.

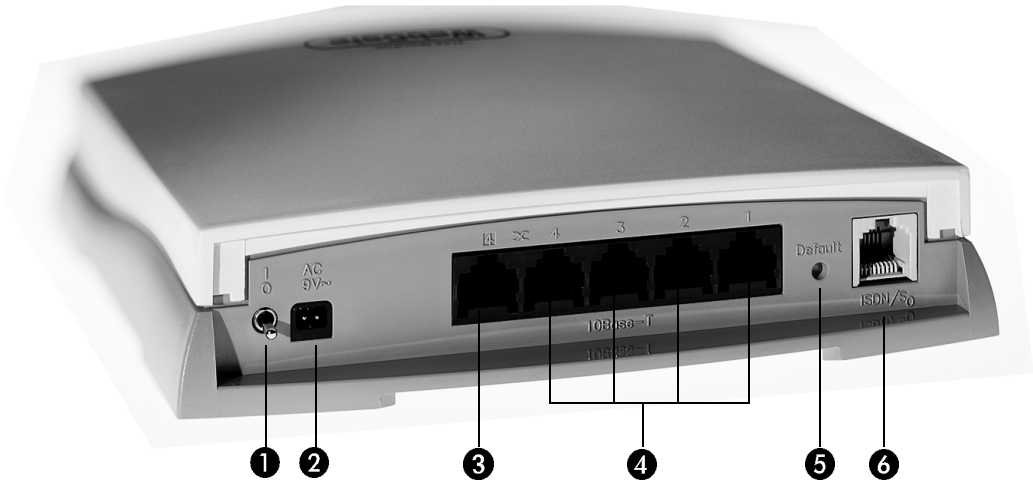
2 ISDN

The ISDN LED shows activity of the ISDN line. The following signals can be distinguished:

- Red flashing: Incoming call pending
- Red steady: Line connection is established
- Green flashing: Outgoing call being placed
- Green: Protocol negotiation complete
- Alternating green/red: Display of sent or received data packets

3 LAN link (1-4)

Signal LEDs for the status of the hub ports. The LED is lit in green when an Ethernet 10Base-T cable is connected. The LED flickers to indicate activity such as the transfer of data between computers.



1. On/Off switch
2. Connection for power supply unit
3. Ethernet 10Base-T connection for uplinking to further hub units (cascading). Do not connect a network computer to this socket!
4. Ethernet 10Base-T network connection (hub)
5. Reset switch After 3 seconds, the unit will be reset to its factory defaults.
6. ISDN line port

What does the *ELSA MicroLink ISDN 4U* offer?

The following is an outline of the principal features of the device giving you a quick overview of its capabilities.

Easy installation

- Connect the *MicroLink ISDN 4U* to the power supply.
- Establish a link to the LAN.
- Plug in the ISDN cable.
- Switch it on.
- Go!

LAN connection

The *MicroLink ISDN 4U* by ELSA functions in Ethernet environments. Use the 10Base-T connections to connect the *MicroLink ISDN 4U* to a 10-Mbit LAN.

Channel bundling and compression

The device supports static channel bundling via MLPPP and BACP on the ISDN line.

Status displays

A display and LED indicators on the front of your *ELSA MicroLink ISDN 4U* allow you to monitor the ISDN and Ethernet connections and the current line connections, thus simplifying the process of diagnosing any systems failures.

ELSA LANmonitor

When using Windows operating systems, this tool will ensure that status information pertaining to your router is always visible on your monitor. For each device on the local network, the most important information is displayed, e.g.:

- Name of the remote station
- Connection duration and transmission rates
- Excerpts of the device statistics (e.g. PPP negotiation data)

Additionally, the software allows you to log and save the messages on the PC for further processing.

Charge monitoring

Subscribing to "Advice of charge during connection" on the ISDN network (AOCD) allows you to set the charge units available for a specified period. This puts you in constant control of your phone bill.

If charge information is not available from your ISDN connection, you can also limit the active ISDN connect time for a specified period. The router will not permit the establishment of connections once this time has elapsed.

Compatibility through PPP

The router uses PPP, a widely used protocol, and other protocols to exchange network data through point-to-point connections with devices made by other manufacturers.

Software update

Your device has a flash ROM memory to ensure that its software remains state of the art. This allows new firmware to be loaded onto the device without the need to open it up.

ELSA LANCAPI

The main advantages of using *LANCAPI* are economic. The *LANCAPI* is a special type of CAPI 2.0 interface through which various communications programs (e.g. *ELSA-RVS-COM*) via the network can access the router.

Any workstation which has been integrated into the LAN (Local Area Network) can use *LANCAPI* to give unlimited access to office communication functions such as fax and EuroFileTransfer. All functions are made available throughout the network without the need to add hardware to the workstations. This does away with the cost of equipping workstations with ISDN adapters or modems. The office communications software simply needs to be loaded onto the individual workstations.

An ISDN fax device is simulated at the workstation so that faxes can be sent. With the *LANCAPI*, the PC forwards the fax via the network to the router which establishes the connection to the recipient.

DHCP

Thus you can define a certain range of IP addresses which the DHCP server then independently assigns to the individual devices on the local network.

When in automatic mode, the router can also define all addresses on the network and assign them to the devices connected to the network.

DNS server

The DNS server functionality lets you create associations between IP addresses and the names of computers or networks. Requests for known computer names can thus automatically be assigned to the correct route.

The DNS server can also serve as an effective filter for the users in your local network. Access to specified domains can be denied to individual computers or complete networks.

Installation

This chapter will help you install the network adapters and connect the *ELSA MicroLink ISDN 4U* to the individual network computers.

Package contents

Please ensure that the delivery is complete before beginning with the installation. The package should include the following components:

- *ELSA MicroLink ISDN 4U*
- External power adapter
- Two network adapters
- Two twisted-pair network cables, 5m
- ISDN connector cable
- Documentation
- CD containing *ELSA LANconfig*, *ELSA LANmonitor*, *ELSA LANCAPI* (4-user license), the *ELSA-RVS-COM* communications suite and further software

If anything should be missing, please contact your dealer.

Setting up and configuring the network

We will be progressing one step at a time in this section. Please maintain the following order:

- Installation of the network adapters
- Connection of the *ELSA MicroLink ISDN 4U* and cabling of the network
- Configuration under Windows

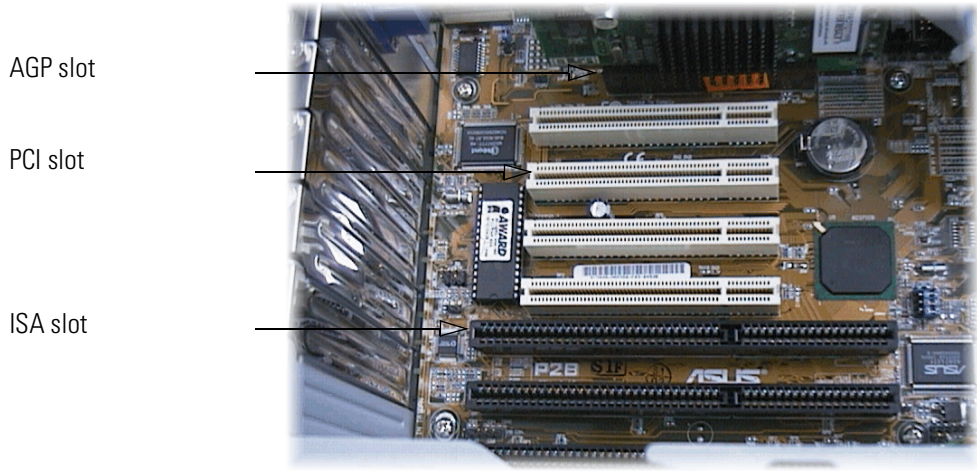
Installation of the network adapters

An installed network adapter that has been recognized by the operating system is a precondition for operating a computer in a network.

① Briefly touch the computer housing to discharge any static electric charge built up in your body. Next, disconnect the AC power supply cable from the rear of the PC housing.

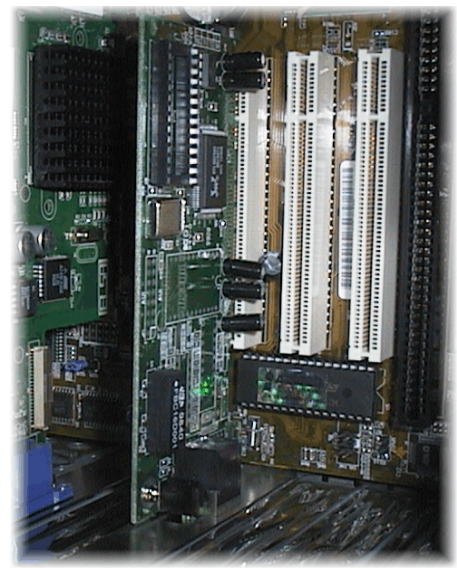
② Remove all retaining screws or release the catches for the PC housing and remove the cover.

③ A free PCI slot is required for the installation of the network adapter. Before installing the card, remove the blind bracket for the slot you intend to use.



④ Carefully insert the card into the free slot. Ensure that the card is correctly seated in its slot and tighten the screw of the mounting plate.

If your computer is equipped with an AGP graphics board, avoid installing the network adapter in the PCI slot immediately next to the graphics board if possible. This may lead to an interrupt conflict between the network adapter and the AGP graphics board.



⑤ Replace the computer case and screw it tight.

⑥ Insert the included network cable into the socket on the bracket of the network adapter.

Connect the *ELSA MicroLink ISDN 4U*

The ELSA MicroLink ISDN 4U is set up for an ISDN Basic Rate Interface. The connection is made using the supplied RJ45 cable.

Connecting the 9V AC adapter

Connect the network computers to the hub ports of the *MicroLink ISDN 4U*

Onto the Internet via the ISDN connection

① First connect the sockets of the network adapters to the hub ports on the back of the *MicroLink ISDN 4U*. Use the supplied twisted-pair cables. Please note that only the sockets numbered 1 to 4 may be used.

② Insert the flat plug of the AC adapter into the 9V socket of the *MicroLink ISDN 4U* and plug the AC adapter into a normal 220V wall socket.

③ Finally, make the connection to the ISDN. Plug the ISDN connector cable into the ISDN/S_0 socket on the back of the *MicroLink ISDN 4U*, and plug the other end into the socket of your point-to-multipoint connection (NTBA).

④ Switch the *ELSA MicroLink ISDN 4U* on.

The unit will initialize and after about 5 seconds, the red LED on the front panel of the *MicroLink ISDN 4U* should be lit. The signal lights for the LAN links in use should be lit green. Your *ELSA MicroLink ISDN 4U* is now ready for network operation.

Configuration under Windows

When starting Windows for the first time after installing the network adapter, the system will recognize the new hardware and prompt you to install the drivers for the network adapter. Insert the included diskette and edit the path to point to the drivers for your Windows system (e.g. `\WIN98 or \WIN9598`).

Next, Windows will prompt you for the Windows installation CD. Please ensure that you have the Windows CD ready. Insert the CD and enter the correct letter for your CD-ROM drive and the path.

- Windows 95: `\WIN95`
- Windows 98: `\WIN98`

The installation will be complete after a few additional program components have been copied. Your local network is now ready!

Configuring the *ELSA MicroLink ISDN 4U*

A variety of methods of accessing the *MicroLink ISDN 4U* are available when configuring the unit. We'll use the simplest and most convenient: *ELSA LANconfig*.

Software installation

The setup program will start automatically as soon as the CD is inserted. If autostart is disabled on your computer, you can also start the program manually. The program SETUP.EXE is located in the root folder of the product CD.

Follow the step-by-step installation instructions. Mark the program components

- *ELSA LANconfig* and
- *ELSA LANmonitor*

if you would like to initially set up the *MicroLink ISDN 4U* for Internet access only. The

- *ELSA LANCAPI* and
- *ELSA LANCAPI* Dial-Up Networking Support

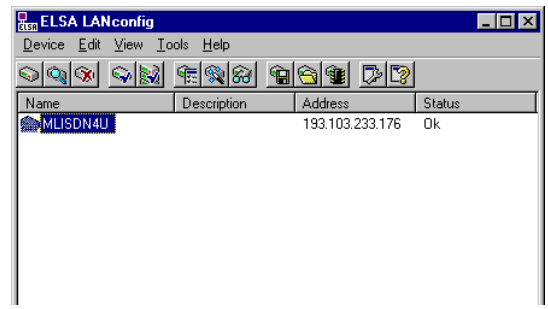
simulate an ISDN adapter card that can be used for office communications applications such as fax and answering machines. Dial-up Networking Support supports the use of Windows Dial-Up Networking. This may be necessary, for example, if you would like to dial into a game server on the Internet; see 'Dial-up networking' on page 19.

The setup program will install the software in the `\Program Files\ELSAlan` folder. Entries for *ELSA LANconfig* and *ELSA LANmonitor* will be put on the Start Menu.

ELSA LANconfig

Start the new software with **Start** ▶ **Programs** ▶ **ELSAlan** ▶ ***ELSA LANconfig***. *LANconfig* will search the local network for the *MicroLink ISDN 4U*. An entry will appear in the list window as soon as it has been found.

ELSA LANconfig searches the local network and finds the connected *MicroLink ISDN 4U*.



A number of queries will be made for the configuration of the *MicroLink ISDN 4U* for its first use. When you are asked for the IP address and network mask, enter the following values:

- IP address assigned **192.168.0.1**
- Network mask **255.255.255.0**

Confirm the entries and accept the default settings for the enabled DHCP server. Next, click on the **Finish** button to send the values to the *MicroLink ISDN 4U*.

A setup wizard will now appear to configure your Internet access. This installation is also dialog-based. If your Internet provider is not listed, select 'Standard access via PPP'. Be sure to have the following information ready:

- The number of your Internet service provider (ISP)
- Your user name and
- Password for Internet access

Once you have entered this information, the setup wizard will take care of the rest and your *MicroLink ISDN 4U* will be ready for Internet access.

Restart your system once you are finished.

The *MicroLink ISDN 4U* is ready

You've got to admit it: it was surprisingly easy. Now here's the reward for your efforts. We will now perform a few tests to check the functionality of the unit in the network and will establish the connection to your Internet provider.

Network test

Windows contains tools with which simple tests can be performed. If you would like to check the connection of the *ELSA MicroLink ISDN 4U* to the sample address, proceed as follows:

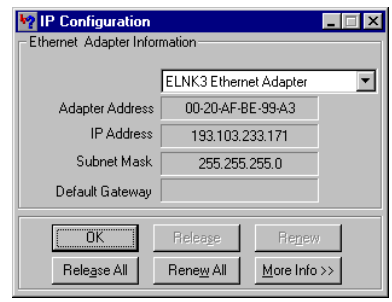
① Open a window with an MS-DOS prompt.

② Enter the following string of commands:

```
C:\>ping -a 192.168.0.1
```

The program will send four packets to the stated address. You will now be able to see how the *MicroLink ISDN 4U* returns an answer line for each packet received.

One way to query the system status is with the program winipcfg.exe. This tool can also be started in a DOS window, or directly using **Start ▶ Run ▶ winipcfg**.



It shows the IP address valid for the current network adapter, the network mask (subnet mask) and the address of the *MicroLink ISDN 4U* (192.168.0.1).

An excursion onto the Internet

To create a connection to the Internet, simply start your Web browser. As soon as you enter a valid Internet address, the *MicroLink ISDN 4U* will respond—as you can see from the LEDs—by dialing your ISP. The status bar of your browser will show the files being loaded from the Internet, and after a short while, the contents of the page will be displayed. *LANmonitor* will inform you of the current status of the connection, see 'Operating modes and functions' on page 29.

Dial-Up Networking

The ELSA setup program will automatically install all of the required network components via the 'ELSA LANCAPI Dial-Up Networking Support' option. Dial-Up Networking connections are required to contact corporate networks or for some game servers on the Internet that transfer special address information in their protocol.

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

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 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 Open the network configuration dialog with **Start** ▶ **Settings** ▶ **Control Panel** ▶ **Network**.

② Click on the **Add...** button to open the network component selection dialog.

③ Highlight the 'Adapter' entry and click **Add...**.

④ Select 'Microsoft' under Manufacturers and 'Dial-Up Networking' under Network Adapters.

⑤ Close all dialogs by clicking on **OK**.

⑥ After the required files have been copied, it will 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 is then installed and the corresponding item will appear in 'My Computer'.

Create 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 'ELSA LANCAPI - Line1'. 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.

The *ELSA MicroLink ISDN 4U* as a hub

This section will show you the options which the *ELSA MicroLink ISDN 4U* has to offer as a hub in a Windows network environment.

Our example will assume that a simple network is being set up, i.e. without a server and its specific services.

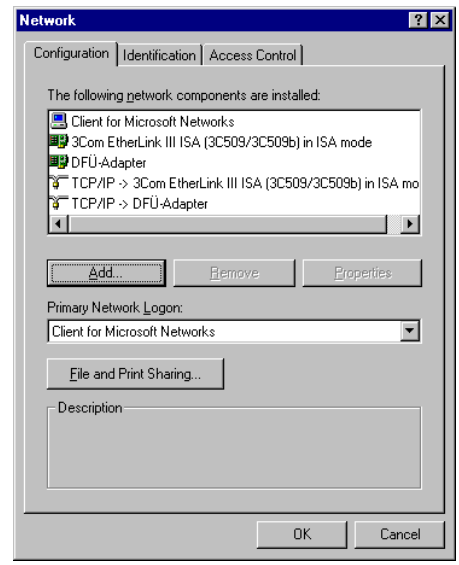
Shared resources

The sharing of resources is a significant advantage of networks. The available possibilities and their implementation will be covered in this section. This includes the sharing of

- printers,
- hard drives and CD drives

All of the options for the configuration of network operations under Windows can be found under the Network dialog. This can be accessed via

Start ▶ Settings ▶ Control Panel ▶ Network



The Network dialog under Windows:
the central location for all network settings

Perform the following steps:

- Add a shared service
- Identify the computer
- Specify the access control

Set up the shared service

The sharing service must be set up under Windows in order to transparently display the hardware of other computers in the network:

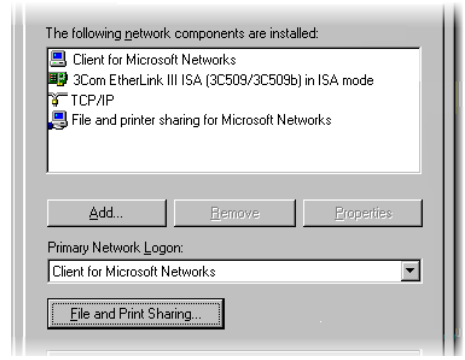
① In the 'Configuration' dialog box, click on **Add.**

② Select the network component 'Service', and once again click on **Add**.

③ Select the network service 'File and printer sharing for Microsoft networks'.

The new service will be entered in the list of network components.

At the same time, the **File and Printer Sharing** button will be enabled.



④ Confirm the settings by clicking **OK**.

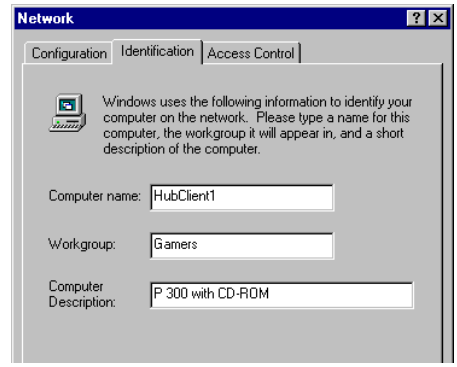
⑤ Click on the **File and Printer Sharing...** button and in the following window, mark the two options that control file and printer access.

The sharing service is now ready.

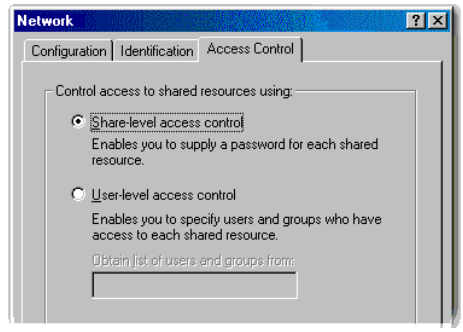
Give your computer a name

The Network dialog contains the 'Identification' tab. Here you can give your computer a name and specify the workgroup to which it should belong.

The name you enter here will then appear in the Network Neighborhood of the other computers.



Granting access rights



The granting of access rights can be taken care of quickly. Two options to control the type of access can be found on the 'Access Control' tab. At this point we are assuming that your network does not use a server and that you are setting up a pure Windows 9x network. In this case mark the 'Share-level access control' option. This will permit all computers in the network to access all drives and folders.

This concludes all of the entries and configuration required for TCP/IP network operation. Repeat these four steps for each computer that you would like to integrate in the network.

Resource sharing

Sharing drives

The simplest way to share drives and printers is via the Windows Explorer. All available drives are listed in the left window of the Explorer. Right-click on the drive that you would like to share.

① In the pop-up menu, select **Sharing...**.

② Select 'Shared As:' and enter a name for the drive.

③ Finally, determine how access will take place: whether only reading or also writing rights will be available, and whether these should be secured with a password.

④ Confirm the settings by clicking **OK**. A hand will appear under the drive icon in the Explorer to indicate the shared status of the drive.

The sharing of drives is now complete.

If you would like to restrict access, you can also apply this process to individual folders. Please note that all subfolders of the shared folder are automatically also shared.

Sharing printers

① To share a printer, select

Start ▶ Settings ▶ Printers

② The window that now appears contains all of the printers installed on the system. Highlight the printer you would like to share and select **File ▶ Sharing...**

③ The dialog box that you already know from drive sharing will now reappear. Make the necessary entries and confirm with **OK**.

The sharing of printers is now complete.

Fun and games in the network

Once you've found your opponents for multiplayer sessions in the LAN, the *MicroLink ISDN 4U* will be extremely cooperative.

All you need to do is to ensure that the network adapters of the computers are connected to the hub ports, and start your game. The settings for network operation are normally handled by the game itself. The multiplayer mode should contain a menu with the option of starting a server and clients. Once a server has been started, a client query will search the network and recognize the server via TCP/IP. The client will then be able to log into the game.

Configuration modes

The *ELSA MicroLink ISDN 4U* is always dispatched with up-to-date software in which several of the settings have already been made.

It will nevertheless be necessary for you to add some information and configure them to your specific needs. These settings are made as part of the configuration process.

This section will show you the programs and routes you can use to access the device and set it up.

And, if the team at ELSA has produced new firmware with new features for your use, we will show you how to load the new software.

Preconditions

TCP/IP or TFTP are used to make configurations using Telnet or *ELSA LANconfig*. This means that the TCP/IP protocol must be installed on the computer being used and the router must be given an IP address which you will then use when addressing it.

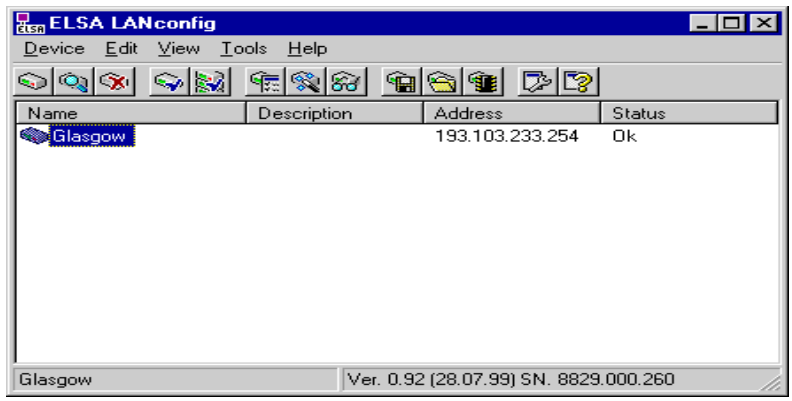
A device that has not been configured yet will respond to the IP address XXX.XXX.XXX.254, in which the Xs are placeholders for the network address in your LAN. If the computers on your network have addresses such as 192.168.130.1, then you will be able to address the device using 192.168.130.254.

Configuration using *ELSA LANconfig*

Call up the configuration tool *ELSA LANconfig* from the Windows Start Menu, for example, with **Start** ▶ **Programs** ▶ **ELSAlan** ▶ ***ELSA LANconfig***. *ELSA LANconfig* searches the local area network for devices.

Just click on the **Browse** button or call up the command with **Device** ▶ **Find** to initiate a search for a new device manually. *ELSA LANconfig* will then prompt for a location to search. You will only need to specify the local area network if using the inband solution, and then you're off.

Once *ELSA LANconfig* has finished its search, it displays a list of all the devices it has found, together with their names and, perhaps a description, the IP address and its status.



Two display options are available for the configuration of the devices using *ELSA LANconfig*:

- The 'simple display' mode only shows the settings required under normal circumstances.
- The 'complete display' mode shows all available configuration options. Some of these settings should only be modified by experienced users.

Select the display mode with the **View** ▶ **Options** menu.

Double-clicking the entry for the highlighted device and then clicking the **Configure** button or the **Edit** ▶ **Edit Configuration File** option reads the device's current settings and displays the 'General' configuration selection.

The remainder of the program's operation is pretty much self-explanatory or you can use the online help. You can click on the question mark top right in any window or right-click on an unclear term at any time to call up context-sensitive help.

Configuration using Telnet

Start inband configuration using telnet with the command from a DOS box:

```
Telnet 10.1.80.125
```

Telnet will then establish a connection with the device using the IP address.

After the entry of the password (if you specified one to protect the settings) all commands from the 'Configuration Commands' section are available.

Configuration commands

Commands and path specifications are entered using the normal DOS or UNIX conventions if you are using telnet or a terminal program to configure the device.

Enter a forward slash or backslash to separate the path specifications. You do not need to write out commands and table entries in full; an unambiguous abbreviation will do.

The entries for the categories MENU, VALUE, TABLE, TABINFO, ACTION and INFO will be displayed during the configuration and may be modified. You can use the following commands to do this:

This command...	... means this...	... for instance:
? or help	calls up help text.	-
dir, list, ll, ls <MENU>, <VALUE> or <TABLE>	displays the contents of MENU, VALUE or TABLE.	dir/status/wan-statistics displays the current WAN statistics.
cd <MENU> or <TABLE>	switches to the MENU or TABLE specified.	cd setup/internet-module (or cd se/in for short) switches to the internet module.
set <VALUE>	this resets the value.	set IP-address 192.110.120.140 sets a new IP address.
	insert a space between all entries in table rows. An * leaves the entry unchanged.	set /setup/name AACHEN assigns the name 'AACHEN' to the device.
set <VALUE> ?	shows you which values can be specified here.	
del <VALUE>	deletes a a table row.	del /se/in/lan/AACHEN deletes the entry for the remote station AACHEN.
do <ACTION> (parameters)	executes the ACTION according to any parameters specified.	do /firmware/firmware-upload starts the upload of new firmware.
passwd	allows a new password to be specified. The old password, if there is one, must be entered first. The new password must then be entered twice in a row and confirmed each time with ↵.	
repeat <sec> <ACTION>	repeats the action at an interval of the number of seconds specified. Any key can be used to terminate the repetition.	repeat 3 dir/status/wan-statistics displays the current WAN statistics every 3 seconds.
time	sets the system time and date.	time 24.12.1998 18:00:00
language <Language>	sets the language for the current configuration session.	Languages currently supported: English (language English) German (language Deutsch)
exit, quit, x	configuration is terminated.	

Text entries (individual and table values) can be deleted as follows:

```
set /se/snmp/admin ""
```

Operating modes and functions

In this chapter we will be covering the configuration options provided by *ELSA LANconfig* and the monitoring functions available using *ELSA LANmonitor*.

ELSA LANconfig

ELSA LANconfig is a convenient administration tool. With it, all of the settings of the *ELSA MicroLink ISDN 4U* can easily be checked and changed as required.

The sections are organized according to the 4 configuration modules and their menu structure. The headers marked with an asterisk (*) mark dialogs that are only available when the complete configuration is displayed.

The ELSA LANconfig online help contains a context-sensitive explanation for each menu item and dialog field.

Management

General

Here is where you assign a name to your *MicroLink ISDN 4U* and can obtain detailed information regarding the type of unit and its firmware.

Security

The simplest option for the protection of the configuration is the establishment of a password. As long as a password hasn't been set, anyone can change the configuration of the device.

Charge

The capability of the router to automatically establish connections to all required remote stations and close them again when no longer required provides users with extremely convenient access (e.g. to the Internet). However, incorrect configuration of the router (such as badly configured filters) for data transfer via or excessive use of the features provided (continual Internet surfing, for example) via lines subject to connect charges can result in high charges.

The software offers a variety of options to limit costs:

- Charge-based ISDN connection limits

  If charge information is available from your ISDN connection, connection charges can be limited quite easily. For example, in its default state, a maximum of 830 charge units may be used per six days. The router will not permit the establishment of any further connections once this limit has been reached.

*The best way to use the router's call charge monitoring function is if you have "call charge information enabled **during** the connection" to the ISDN network (i.e. AOCD). If necessary, subscribe to this facility from your telecommunications carrier. Charge monitoring with the "Charge information **after** connection" feature is also possible in principle, but in this case continuous connections may not be detected!*

- Time-dependent ISDN Connection control

  The maximum duration of connections can also be limited if your ISDN connection does not provide connect-charge information. This requires setting up a time budget for a specified period. In the router's default state, for example, connections may only be established for a maximum of 210 minutes per six days.

When the limit of a budget is reached, all open connections that were initiated by the router itself will be shut down automatically. The budgets will not be reset to permit the establishment of connections until the current period has elapsed. Needless to say, the administrator can reset the budgets at any time if required!

The charge and time monitoring of the router functions can be disabled by entering a budget of 0 units or 0 minutes.

Only the router functions are protected by the charge and time monitoring functions! Connections via LANCAPI are not affected.

Internet

General

Enter the number of your Internet service provider (ISP) here. Determine the period of inactivity after which the call should be ended automatically. The default value is 60 seconds.

The user name and password must be entered to log in with your provider.

Options*

- Channel bundling

  Activating channel bundling opens both B channels anytime a connection is established, permitting data transfer—provided the remote station supports it—at theoretically double the usual speed. Both ISDN channels are thus in use, also resulting in twice the usual connect charges.

- Protocol settings

  Most Internet service providers (ISP) can be reached using the default PPP connection. In some cases it may be necessary to select a different protocol, however. In the event that you cannot establish a connection using the default settings, please contact your ISP.

Security

A number of the access controls relevant to security in the local network and Internet can be placed in this dialog window.

- Blocked Internet addresses

  If you would like to block access to certain Internet addresses, enter their names or IP addresses here.

- Filter packets*

  Packet filtering requires detailed knowledge of protocol negotiations and port addresses. If you would like to filter data packets being transferred over specific port addresses, define the appropriate source and target ports in the tables. This option is available for external network dialogs and the local network.

Advanced*

The manual configuration of the IP address is only necessary if your ISP does not assign this address automatically. This is very rare, however, and your ISP can provide all of the necessary information in such a case.

The masking of the local network is set by default. It is only necessary to change this setting if you have been assigned more than one IP address by your ISP. In that case, assign the addresses to the computers in your network as permanent IP addresses. The computers "behind" the *MicroLink ISDN 4U* are then no longer hidden, however, and will be visible to other Internet users.

The lower group field offers the option of changing the hold times for a variety of common protocols (TCP, UDP and ICMP). You should keep these default settings under normal circumstances. You may want to increase these values, however, if you are experiencing difficulties in establishing a connection or in the event of frequently dropped connections. Please note that the hold time for the ISDN connection must always exceed the hold times for the protocols!

Local network

General

Use this tab to set the intranet address, network mask and domain name. These settings only apply to your local network.

The TCP/IP protocol used for the actual communication between the *MicroLink ISDN 4U* and the remote stations is standardized for the exchange of data in networks. That also applies to the transfer of data on the Internet. After all, IP stands for Internet Protocol.

Each computer needs an IP address to participate in the network dialog; this permits it to be identified clearly for the precisely targeted transfer of data. The IP address consists

of four numbers separated by dots (e.g. 192.168.100.1). Each of these numbers can be between 0 and 255.

A number of address ranges exist, known as classes. These classes can be used for a variety of purposes. Three address classes have been defined for private networks which are never assigned in public networks.

Class A-address	10.x.x.x
Class B-address	172.16.x.x
Class C-address	192.168.x.x

Computers that have been assigned addresses from these ranges are not visible on the Internet.

The address 127.0.0.1 is an exception. It is used to check the local computer and may not be assigned.

DHCP

Activating the DHCP server is recommended in most cases for private local networks. This eliminates the need to set up the workstations – assigning IP addresses and suitable network masks. The DHCP server should thus be activated under normal circumstances.

The address ranges to be assigned may be restricted. Enter the starting and end addresses of the desired range, e.g. 192.168.0.10 and 192.168.0.100 in the appropriate fields.

Advanced*

Changes in the validity addresses for DNS queries and DHCP addresses are normally not required. The default values should only be changed if you have more computers than IP addresses in your network, for example. In such a case, lower the maximum validity. This releases unused IP addresses.

LANCAPI

General

ELSA LANCAPI is a port that simulates an ISDN card and controls the dialog with communications programs such as *ELSA-RVS-COM*. This item must be enabled in the ELSA Setup during the software installation to ensure that you will have access to the CAPI.

First, establish how the *LANCAPI* server should respond. Next, specify the MSNs to which the *LANCAPI* should respond. Individual numbers can be dedicated for telephone and fax services in *ELSA-RVS-COM*, for example. If you enter exactly these numbers, the *LANCAPI* will only respond to calls and faxes, provided that these have been correctly addressed by the sender.

ELSA LANmonitor

The monitoring tool *ELSA LANmonitor* can be used to display the most important information about the status of your router on your monitor at all times. Many of the internal messages generated by the device are converted to plain text, thereby helping you to troubleshoot.

The ELSA LANmonitor online help contains a context-sensitive explanation for each menu item and dialog field.

Installing *ELSA LANmonitor*

Usually, *ELSA LANmonitor* is automatically installed together with the *ELSA LANconfig* configuration software on the computer from which you wish to configure your router.

If *ELSA LANmonitor* is not yet installed on your computer, place the *ELSA MicroLink ISDN 4U* CD in your CD drive. If the setup program does not start up automatically after insertion of the CD, start Windows Explorer, click on 'autorun.exe' on the CD and follow the instructions in the install program.

During the installation you should activate the LANmonitor option.

Checking your internet connection with *ELSA LANmonitor*

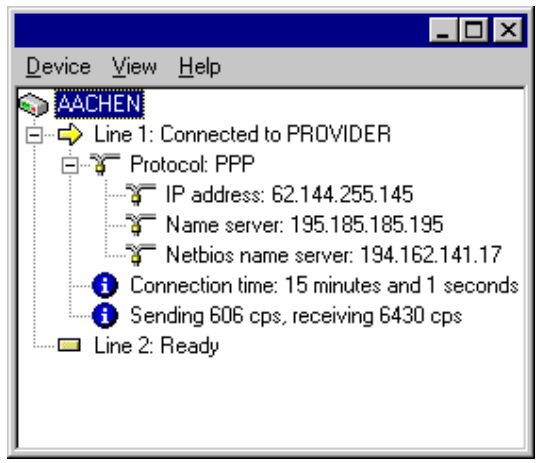
To demonstrate the functions of *ELSA LANmonitor* we will first show you the types of information *ELSA LANmonitor* provides about connections being established to your Internet provider.

① So you should setup *ELSA MicroLink ISDN 4U* to connect to your provider, e.g. with the *ELSA LANconfig* setup wizard. We selected call-by-call access to Arcor for this example.

② Start up *ELSA LANmonitor* by clicking **Start** ▶ **Programs** ▶ **ELSAlan** ▶ **LANmonitor**. Generate a new device by selecting **Device** ▶ **New** and, in the following window, enter the IP address of the router you wish to monitor. If the configuration of the device is protected by password, enter the password too.

Alternatively, you can select the device in the *ELSA LANconfig* and monitor it using **Options** ▶ **Monitor Device**.

③ *ELSA LANmonitor* automatically creates a new entry in the device list and initially displays the status of the B channels. Start your Internet browser and enter any web page you like. You can now see in *ELSA LANmonitor* a connection being established on one channel and the name of the remote site being called. As soon as the connection is established, a plus sign against the B channel entry indicates that further information on this channel is available. Click on the plus sign to open a tree structure in which you can view various information.



In this example, you can determine from the PPP protocol information the IP address assigned to your router by the provider for the duration of the connection and the addresses transmitted for the DNS and NBNS server.

Under the general information you can watch the transmission rates at which data is currently being exchanged with the Internet.

④ To break the connection manually, click on the active channel with the right mouse button.

⑤ If you would like a log of the *ELSA LANmonitor* output in file form, select 'Options' from the 'View' menu and go to the 'Log' tab. Enable logging and specify whether *ELSA LANmonitor* should create a log file daily, monthly, or on an ongoing basis.

Office communications

ELSA-RVS-COM

What does *ELSA-RVS-COM* 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.

ELSA-RVS-COM offers the following options in combination with your ISDN modem:

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 ports 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 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 Windows 98 only)
CPU	fully compatible with Pentium or higher
RAM	min. 16 MB; min. 32 MB for fax mode
Disk space	min. 25 MB free memory space before installation min. 12 MB during operation for virtual main memory (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 and 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 CD in the CD-ROM drive (e.g. D:\) The CD setup will start automatically. If the setup program does not start automatically, double-click 'autorun.exe' on the 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 **Next**. The welcome screen appears.

⑤ Read the displayed notes and press **Next**. The target folder 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 'Installation Folder' dialog box will appear.

⑥ Accept the proposed target folder or enter the path and the name of the folder 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 **Finish** 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 the 'Standard 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 'Customized 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 'Customized 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 'Customized 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. If necessary, find out about your ISDN port's special features.

Start *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.

Appendix

Technical data

Functions	ISDN IP router and 4-port hub
LAN connection	Ethernet IEEE 802.3; 10Base-T (Twisted PairRJ45, Uplink/Hub)
Network protocols	IP, TCP, ICMP, ARP, RIP-1, RIP-2, PROXY ARP, DHCP, DNS, NetBIOS/IP 1 target network, up to 4 local stations Filter concept (UPD/IDP port include/exclude, IP address include/exclude) Firewall and filter concept (filtering of packets on the WAN side) ARP protocol: up to 4 local stations IP address assignment from the remote station IP assignment to terminal devices in the network (DHCP server, static and dynamic), up to 4 local assignments NetBIOS filtering for the suppression of connections in internal Windows network operations
ISDN interface	Connect: ISDN S_0 bus, point-to-point-multipoint configuration, I.430 D-channel: Euro ISDN (DSS1) B-channel: PPP (RFC 1661), asynch. PPP, X.75, HDLC, CAPI 2.0 over *ELSA LANCAPI*
Line control	Short hold mode, Line-on-Demand
Charge monitoring	Restrictions via connect-charge and time budgets
Security and firewall functions	Address filter for IP, protection of the configuration via access lists and passwords, logging of recent connection information
IP masquerading (NAT/PAT)	Internet access using a single IP address via IP address and port implementation; static/dynamic IP address assignment via PPP, masking of TCP, UDP, ICMP and FTP; DNS forwarding; Internet access via standard Internet service providers or CompuServe
Management	Via the LAN with TCP/IP, password protection, TFTP configuration, *ELSA LANconfig*, *ELSA LANmonitor*
Operating security	Hardware watchdogs, regular self-testing
Statistics	LAN and WAN packet counters; error, connection and charge counters, timer
Power supply	9V AC with AC adapter for 230V, 18VA
Ambient conditions	Temperature: 5 - 40° C, humidity: 0 - 80%, non-condensing
Type	Designer housing; connections on rear; LEDs for LAN, WAN and Hub status

Declaration of conformity

English

CE

KONFORMITÄTSERKLÄRUNG

DECLARATION OF CONFORMITY

Diese Erklärung gilt für folgendes Erzeugnis:
This declaration is valid for the following product:

Geräteart: **ISDN Router**
Type of Device:
Typenbezeichnung: ***ELSA MicroLink ISDN 4U***
Product Name:
EG-Baumusterprüfbescheinigungs Nr.: D810576L
Registration No.:
Benannte Stelle: **CETECOM ICT Services GmbH**
Notified Body: CE 0682 X

Hiermit wird bestätigt, daß das Erzeugnis den folgenden Schutzanforderungen entspricht:
This is to confirm that this product meets all essential protection requirements relating to the

Niederspannungs Richtlinie (73/23/EWG)
Low Voltage Directive (73/23/EEC)
EMV Richtlinie (89/336/EWG)
EMC Directive (89/336/EEC)
ISDN Vorschrift (98/515/EG)
Council Decision (98/515/EC)

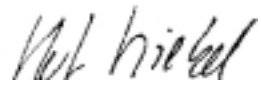
Zur Beurteilung der Konformität wurden folgende **Normen** herangezogen:
The assessment of this product has been based on the following **standards**

EN 50082-1: 1992 Teile / parts **: EN 61000-4-2, 3, 4, 5, 6**
EN 50081-1: 1992 Teil / part **: EN 55022B: 1994**
EN 60950: 1992 +A1: 1993 +A2: 1993 +A3: 1995 +A4: 1997
TBR 3

Diese Erklärung wird verantwortlich für den Hersteller / Importeur:
On behalf of the manufacturer / importer:

ELSA AG
Sonnenweg 11
D-52070 Aachen

abgegeben durch: / this declaration is submitted by:



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 back-ups 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.