

■ ***ELSA TanGo™ 2000***

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Aachen, March 1998

# Preface

Thank you for placing your trust in this ELSA product.

With *ELSA TanGo 2000*, you have purchased an ISDN terminal adapter which will permit you to take advantage of modern ISDN technology. Exacting manufacturing standards and stringent quality control are the basis for high product standards and consistent quality to ensure your fullest satisfaction with this ISDN adapter.

## About this Manual

This manual will inform you about all aspects of your ELSA ISDN terminal adapter, including the installation and use of the supplied software. It also contains an overview of the AT command set.

## Changes to this Manual

ELSA products are characterized by ongoing further development. It is therefore possible that the information printed in this manual is not current in all points.



*If you have questions to the topics covered in this manual or require additional help, our online services (Internet server, newsgroups, ELSA LocalWeb and the CompuServe forum GO ELSA) are at your disposal around the clock. The complete scope of support and services provided by ELSA can be found in the chapters "Advice and help" and "ELSA-Service."*

## Online Documentation



*The ELSA TanGo CD contains extensive electronic documentation in addition to the printed handbooks (Installation Guide, User Manual). This provides information on topics such as the installation of access software, the online services or other support notes. This information has been stored in HTML or PDF format. A browser (e.g. Netscape Navigator or Microsoft® Internet Explorer) is required for reading and printing HTML files. The ACROBAT Reader program is required to read and print PDF files. It can also be found on the ELSA TanGo CD and may be installed using the CD setup program.*

To read the online documentation, proceed as follows:

- ① Insert the included *ELSA TanGo* CD in your CD drive. The CD setup will start automatically under Windows® 95 and Windows NT® 4.0. If you are using a different operating system, please start the CD setup program (CDSETUP.EXE) on the CD.
- ② In the CD-Setup, go to **Installation of:**, mark the option **Online Documentation (with ACROBAT Reader)**, and click **Display**.

## **The ELSA Homepage on the Internet**

The ELSA Homepage (<http://www.elsa.com>) is a service for our customers and others interested in ELSA products, which include ISDN terminal adapters, modems, routers, graphics boards and monitors. The ELSA Homepage provides continuously updated product information about your *ELSA TanGo 2000* and other ELSA products. You can also find answers to frequently asked questions (FAQs), a wealth of tips and tricks, current drivers and selected links to other WWW pages.



### **Before you continue**

*The installation of the ELSA TanGo 2000 is described in the Installation Guide. Please read the information there before continuing with this manual.*

# Contents

|   |           |
|---|-----------|
| <b>Contents .....</b>   | <b>V</b>  |
| <b>Introduction .....</b>   | <b>1</b>  |
| Highlights of the <i>ELSA TanGo 2000</i> .....                                      | 1         |
| What do I need for <i>ELSA-RVS-COM</i> ? .....                                      | 3         |
| Everything in the Box? .....  | 3         |
| CE Conformity .....   | 4         |
| <b>Software on the <i>ELSA TanGo CD</i> .....</b>                                   | <b>5</b>  |
| Installation and Operation of <i>ELSA-RVS-COM</i> .....                             | 5         |
| Installation under Windows 95 and Windows NT 4.0 .....                              | 5         |
| The Icons and their Meanings .....  | 8         |
| Receiving and Sending Faxes .....   | 9         |
| Telephone and Answering Machine Function .....                                      | 9         |
| Connecting to BBSs .....  | 10        |
| Installation of <i>ELSA Configuration Manager</i> under Windows 95 and NT 4.0 ..... | 11        |
| Installation of <i>ELSA-ZOC</i> under Windows 95 and Windows NT 4.0 .....           | 12        |
| Installation of <i>Telix</i> for DOS .....  | 13        |
| Installation of LapLink for Windows 95.....   | 14        |
| <b>Control Commands .....</b>   | <b>15</b> |
| Entering and Executing AT Commands.....   | 15        |
| Escape Command.....   | 15        |
| Bit-oriented Registers .....  | 16        |
| Modifying Bit-oriented Registers .....  | 16        |
| Advanced Features .....   | 16        |
| <b>Appendix .....</b>   | <b>17</b> |
| Brief overview of the AT command set .....  | 17        |
| Status display and troubleshooting .....  | 20        |
| Status display .....  | 20        |
| Technical data.....   | 22        |
| Characteristics of the terminal adapter.....  | 22        |
| Declaration of Conformity.....  | 24        |
| Questions and Answers .....   | 25        |
| General topics .....  | 25        |
| Advice and Help.....  | 27        |
| Who to contact?.....  | 27        |
| The ELSA LocalWeb.....  | 28        |
| Driver updates.....   | 28        |
| Repair? .....   | 28        |

|                           |           |
|---------------------------|-----------|
| Warranty Conditions ..... | 29        |
| <b>Glossar</b> .....      | <b>31</b> |
| <b>Index</b> .....        | <b>35</b> |

# Introduction

*ELSA TanGo 2000* one of the family of ISDN products from ELSA. It is an external terminal adapter for connecting your PC to an ISDN Basic Rate Interface point-to-point or point-to-multipoint connection, or to private branch exchanges (PBX systems) with an S<sub>0</sub> interface. In addition to the advantages of ISDN technology such as high-speed Internet access, the *ELSA TanGo 2000* analog connectors (a/b ports) provide access to the advanced features of digital exchanges such as call waiting, alternating, three-party conferencing, call forwarding or connections without dialing. In addition, you can keep track of your calling charges with the charge monitor. The hardware installation is fast and user-friendly thanks to Plug&Play support (see Installation Guide).

## Highlights of the *ELSA TanGo 2000*

The following is an outline of the essential technical features of the ISDN terminal adapter to provide a quick overview of its performance:

- **Transmission modes** – *ELSA TanGo 2000* supports the following transmission modes and speeds:
  - HDLC-PPP    Internet providers can be reached using PPP protocol.
  - X.75         *ELSA TanGo 2000* supports X.75/T.70NL connections.
  - V.120        The *ELSA TanGo 2000* also supports the ITU-T V.120 (I.465) recommendation at 56,000 and 64,000 bps.
- **a/b ports** – *ELSA TanGo 2000* provides two connectors (a/b ports) for analog terminal equipment. You can thus continue using your analog equipment such as telephones, answering machine or fax.
- **Flash ROM technology** – Firmware updates can be performed quickly and easily using the command **AT\$UPX**. This provides a convenient way to equip your unit with future functions.
- **Automatic protocol detection** – Depending on its configuration, the terminal adapter supports automatic detection of the X.75, V.120 and HDLC-PPP protocols for incoming and outgoing connections.
- **Automatic detection of 56,000 and 64,000 bps** – If an incoming connection with 56,000 bps is indicated in the D channel (e.g. from the USA), the X.75 and V.120 protocols automatically switch to 56,000 bps.
- **D channel protocols** – The command **AT\$IDP** can be used to switch between the DSS1 protocol (Euro-ISDN) and the 1TR6 protocol (national ISDN). The DSS1 protocol is the default selection.

- **Terminal selection digits and MSN** – The ISDN terminal adapter supports the setting and querying of terminal selection digits via the command **AT\$IEAZ** and multiple subscriber numbers (MSN) via the command **AT\$IMSN**.
- **Delayed call answering** – This function permits the delayed answering of incoming calls. This can be useful if several terminal adapters with the same terminal selection digit or MSN (multiple subscriber number) are connected to one ISDN S<sub>0</sub> interface. Delayed call answering can be set using the S152 register.
- **Dial number lock** – The terminal adapter can be locked for outgoing calls with specific dial numbers using the command **AT\$INCB**. A connection will not be established if the first digits of the number dialed correspond to the locked number (maximum of 5 digits).
- **User groups** – The verification of the caller IDs of incoming calls can be set with the command **AT\$ICLD** and permits the creation of closed user groups to protect the system against unauthorized access.
- **Additional information** – The S153 register can be used to display the caller ID of the remote station before the connection is established. The connection charges can be reviewed during and after the connection. Information pertaining to the establishment of the connection can also be returned (e.g. ALERTING).
- **Status displays** – LED displays with two colors at the front of the ISDN terminal adapter permit the monitoring of the ISDN connection and the line to facilitate troubleshooting of possible system faults.
- **24-hour access** – is available to ELSA Support in the ELSA LocalWeb, the Internet and ELSA's CompuServe forum.
- **Guaranteed** – 6-year warranty on the *ELSA TanGo 2000*.
- **Protected** – The *ELSA TanGo 2000* satisfies the CE requirements.



## What do I need for *ELSA-RVS-COM*?

The following minimum requirements must be fulfilled:

- **Computer:** To run *ELSA-RVS-COM*, your computer should be equipped with a 486 or Pentium CPU.
- **RAM:** a minimum of 16 MB. To ensure reliable operation, 32 MB or more are recommended.
- **Hard disk space:** a minimum of 25 MB prior to installation. A minimum of 12 MB hard disk space should be available on the hard disk during operation as virtual memory (swap file).
- **Operating system:** Microsoft Windows 95 or Windows NT 4.0.
- **Graphics board:** VGA (640x480 pixels, 16 colors or shades of gray) or better.
- **Microsoft Inbox:** The Microsoft Inbox is required for the use of the fax and voice recording functions.

## Everything in the Box?

Please ensure that the delivery is complete before beginning with the installation of your ISDN terminal adapter. If anything should be missing, please contact your dealer:

- *ELSA TanGo 2000*
- AC adapter
- ISDN S<sub>0</sub> connector cable
- Serial connector cable (Mini-DIN8) to 9-pin subminiature socket
- 9 pin/25 pin adapter
- 2 adapters (RJ-14 to TAE-NFN)
- CD-ROM with application software and additional utilities
- Documentation: Installation Guide and User Manual

ELSA reserves the right to change the scope of delivery without prior notice.

## **CE Conformity**

**CE 0188 X**

This unit has been tested and has been found to comply under realistic operating conditions to the protective requirements laid down by the European Community for the alignment and mutual recognition of the member states' laws concerning telecommunications devices.

All ISDN terminal units with the CE seal therefore comply with:

- NET 3 (ISDN Basic Rate Access)
- EMC compatibility standards
- Safety standards

and may therefore be connected to the Euro-ISDN in all EU countries.

## Software on the *ELSA TanGo CD*

Continue with the software installation once you have set up the ISDN terminal adapter according to the Installation Guide. A CD-ROM with software is provided as standard with the *ELSA TanGo 2000* terminal adapter (*ELSA TanGo CD-ROM*).

### Installation and Operation of *ELSA-RVS-COM*

*ELSA-RVS-COM* for Windows 95 and Windows NT 4.0 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* includes the following functions:

#### Fax

- Fax operation (Group 3) at up to 14,400 bps
- Fax transmission from Windows applications via a Windows printer driver
- Fax operation via MS Exchange

#### Telephone Answering Machine

- Telephone answering device functions, with playback via a sound card
- Telephone functions when using a full-duplex sound card, including microphone and speakers

### Installation under Windows 95 and Windows NT 4.0

To install *ELSA-RVS-COM* on your computer under Windows 95 or Windows NT 4.0, please proceed as follows:

- ① Start Windows 95 or Windows NT 4.0. When installing under Windows NT, ensure beforehand that you have administrative privileges.
- ② Insert the *ELSA TanGo CD* in your CD drive (e.g. D:).
- ③ Under **Installation of:** in the **ELSA CD Setup**, select **ELSA-RVS-COM** in the list and click **OK** to start the setup program. The 'RVS-COM' dialog box 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 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 suggested installation directory or click on **Browse**, and enter the name and path of the directory that you would like to use for the installation. Click on the **Next** button. The 'Program Group' dialog box will appear.
- ⑦ Use the **Next** button to confirm the creation of the **ELSA-RVS-COM** program folder. The 'Installation Start' dialog box will appear.
- ⑧ Click on the **Next** button to start the installation. The files will now be copied to your hard disk. The 'Finish Setup' dialog box is displayed after the successful installation.
- ⑨ Click on **Finish** to start the Installation Wizard. The Installation Wizard will guide you through the configuration of the various *ELSA-RVS-COM* components.



*ELSA-RVS-COM* requires a Windows EMail system (such as Microsoft Exchange or Outlook) to send and receive faxes. This can be installed under Windows 95 using **Start ► Settings ► Control Panel ► Add/Remove Programs ► Windows Setup**.

*If the Microsoft Inbox is not installed on your computer, a dialog box will appear requesting you to install it at this time. Please refer to your Microsoft Windows 95 documentation for a detailed description of the installation.*

The Wizard will now guide you up to the end of the installation. You will be asked to enter the numbers for your ISDN connection. The dialog boxes for Euro-ISDN (DSS1) and national ISDN (1TR6) differ. Nearly all new ISDN connections in Europe use the European standard DSS1. Refer to the following illustrations as an orientation aid to correctly enter your numbers:

## Euro-ISDN Connection (DSS1)

The three numbers for your Euro-ISDN connection could be as follows:

**RVS-COM Installation: ISDN Phone Numbers**

Please enter your ISDN phone numbers which will be used to accept calls with RVS-COM.

Do not enter country or area codes.

Enter the corresponding MSN for each phone number if the full number is not to be used automatically.

|                    |                                     |      |                      |
|--------------------|-------------------------------------|------|----------------------|
| Phone number MSN1: | <input type="text" value="123456"/> | MSN: | <input type="text"/> |
| Phone number MSN2: | <input type="text" value="123457"/> | MSN: | <input type="text"/> |
| Phone number MSN3: | <input type="text" value="123458"/> | MSN: | <input type="text"/> |

In most cases the MSN is the full phone number; you can then leave the MSN fields empty. However, for some PBX systems only the extension number and not the full number may be used as MSN.

Please consult the manufacturer's instructions for your ISDN adapter and, if necessary, ask for information about the special features of your ISDN line.

< Back   **Next >**   Cancel   Help

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.



*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.*

## Starting *ELSA-RVS-COM*

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

## The Icons and their Meanings

The following icons can be found in the *ELSA-RVS-COM* program group:



### CommCenter

The **CommCenter** is active in the background when *ELSA-RVS-COM* is in use. It serves as the center for the control of the ISDN settings. These settings may be used to configure the various *ELSA-RVS-COM* services (file transfer server, fax reception, answering machine).

The **CommCenter** automatically starts after the Installation Wizard finishes. The icon for the **CommCenter** will be placed in your taskbar. If this option was deactivated during the installation, **CommCenter** can be started using this icon.



Info

### Info

This contains information on the current version of *ELSA-RVS-COM*.



### Installation Wizard

The Installation Wizard will guide you through the configuration of the various *ELSA-RVS-COM* components. It can also be used for subsequent, user-specific settings.



### Create new fax

You can send and receive faxes with your ISDN terminal adapter in conjunction with a Windows EMail system (e.g. Microsoft Exchange).



### Online documentation

*The online documentation provides detailed instructions for ELSA-RVS-COM. It also contains many hints and tips pertaining to the individual functions. You can obtain context-sensitive help with the **F1** key.*



Setup

### Setup

This icon can be used to start the setup program, which can also be used to update or uninstall *ELSA-RVS-COM*.



Telephone

### Telephone

With this function, you can use your PC as a telephone in conjunction with a microphone, speakers and a full-duplex sound card.



Terminal

### Terminal

This component is used to access BBS's and information systems.



TransferMaster

## TransferMaster

**TransferMaster** can be used to transfer files from one PC to another.

## Receiving and Sending Faxes

*ELSA-RVS-COM* requires a Windows EMail system (such as Microsoft Exchange or Outlook) to send and receive faxes. This can be installed under Windows 95 using **Start ► Settings ► Control Panel ► Add/Remove Programs ► Windows Setup**.

### Receiving Faxes with *ELSA-RVS-COM*

The **CommCenter** starts automatically after installation and is located in the Start Menu.



CommCenter

Click on this icon in the Start Menu, or select **Start ► Programs ► ELSA-RVS-COM ► CommCenter** from the taskbar. Next, click on **Properties**. Select **Autoanswer, Answer calls automatically** and **Autoanswer for Fax:** to activate fax reception. If desired, enter the number under which you would like to receive faxes in the field **Phone number (analog)**.



Inbox

Fax reception is now set up. Faxes and receive logs can be displayed in the Microsoft Exchange Inbox.

### Sending Faxes with *ELSA-RVS-COM*

Click on this icon. The 'RVS Fax: Recipient' dialog box will appear.



Create new fax

- Enter the name of the recipient and the appropriate number. You may also enter several recipients into the recipient list.
- Write the desired text and indicate whether the fax should be sent with a cover sheet or not. If the fax is to be sent with an attachment, mark the required file.
- Before sending the fax with Finish, you can preview the full page with Show Fax.

The transmission logs can be displayed using the Microsoft Exchange Outbox.



Inbox

### Sending Faxes from an Application using *ELSA-RVS-COM*

It is also possible to send faxes directly from your word processor (e.g. Microsoft Word). Write the desired text and select the appropriate printer driver (RVS Fax on RVSFAX32 or Microsoft Fax). Enter the fax recipient data before starting the transmission.

## Telephone and Answering Machine Function

You can use your PC as a telephone and answering machine in conjunction with a full-duplex sound card, microphone and speakers.

### 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.

### 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 **Edit** to record a personal outgoing message and enter the name under which the OGM will be saved in the **Description** field of the 'Schedule Properties' dialog box.
- If required, specify the scheduling (e.g. during the lunch break) of the outgoing message and the maximum length of the incoming messages.
- Click **Edit** in the required field **Greeting Message** or **End Message** to open the recorder and record the message.

The closing OGM is used only if the option **Record Calls** has been activated and the caller exceeds the maximum message recording duration.



The voice messages received can be played using the Microsoft Exchange Inbox. All incoming and outgoing connections and connection attempts are listed in a log. Additional notes can be added to each log entry.



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

### Connecting to BBSs



- Click on this icon. The 'RVS Terminal' dialog box will appear.
- Select the appropriate template, click **OK** and enter the number of the BBS using **Edit**.



## Installation of *ELSA Configuration Manager* under Windows 95 and NT 4.0

*ELSA Configuration Manager* is a utility program which permits the simple, convenient configuration of your *ELSA TanGo 2000*. It can be used to set the D channel protocol for example, to enter the MSN or to install the current firmware for the *ELSA TanGo 2000*. In addition, it can be used to set a variety of services such as call waiting, call forwarding and connections without dialing.

- ① Switch the ISDN terminal adapter on and boot Windows 95 or Windows NT 4.0.
- ② Insert the *ELSA TanGo CD* in your CD drive (e.g. D:).
- ③ Under **Installation of:** in the **ELSA CD Setup**, select **ELSA Configuration Manager** from the list and click **OK**, followed by **Next** to start the installation program. The welcome screen appears.
- ④ Accept the suggested installation directory or click on **Browse**, and enter the name and path of the directory that you would like to use for the installation. When everything has been entered correctly, click **Next**.
- ⑤ Click on the **Finish** button to start the installation. The files will now be copied to your hard disk. Conclude the installation by clicking **Close**.

### Starting *ELSA Configuration Manager*

In the taskbar, select **Start** ► **Programs** ► **ELSA ISDN-Utilities** ► **ELSA CFGmanager** to start the program.



After installation, use **Device** ► **New** in the '*ELSA Configuration Manager*' dialog box to select the COM port to which you have connected your ISDN terminal adapter and click **OK** to confirm.

## Installation of *ELSA-ZOC* under Windows 95 and Windows NT 4.0

*ELSA-ZOC* is a communications program which you can use to address your ISDN terminal adapter from your PC. After starting *ELSA-ZOC*, you will be able to send individual AT commands to the terminal adapter. To install *ELSA-ZOC* on your computer, proceed as follows:

- ① Switch the ISDN terminal adapter on and boot Windows 95 or Windows NT 4.0.
- ② Insert the *ELSA TanGo* CD in your CD drive (e.g. D:).
- ③ Under **Installation of:** in the **ELSA CD Setup**, select ***ELSA-ZOC*** in the list and click **OK** to start the setup program. The 'ELSA-ZOC Install' dialog box will appear.
- ④ In the field **Destination path**, enter the path and the name of the directory that you would like to use for the installation.
- ⑤ Click on **Install** to start the installation. The files will be copied to your hard disk and you will be able to start the program after the successful conclusion of the installation.

### Starting *ELSA-ZOC*

In the taskbar, select **Start ▶ Programs ▶ ELSA-ZOC for Windows ▶ ZOC** to start the program.

## Installation of *Telix* for DOS

The terminal program *Telix Lite* is included with your *ELSA TanGo 2000*. To install *Telix Lite* on your computer, proceed as follows:

- ① Insert the *ELSA TanGo* CD in your CD drive (e.g. D:), switch to the **ELSAWARE\ENGLISH\DOS\TELEX**, directory and run the file **INSTALL.BAT** (`INSTALL.BAT` ). Please read the following notes and press .
- ② Accept the suggested installation directory or enter the name and path of the directory that you would like to use for the installation and continue with **OK**. The files will now be expanded and copied to your hard disk.
- ③ In the field **Name**, enter your User ID (the name must be at least 5 characters long). In the field **Serial Number**, enter the serial number. The serial number may be found on the enclosed serial number sticker (software license). Conclude the installation by clicking **OK**.
- ④ Select **OK** to update your AUTOEXEC.BAT file or enter the modifications manually. Read the README.TXT and continue the installation with .
- ⑤ Enter the name of your ISDN terminal adapter or select it from the list and confirm the selection with . If your adapter is not in the list, select a compatible type (e.g. *MicroLink ISDN TLpro*).
- ⑥ Use the  key or the mouse to mark the COM port to which your ISDN terminal adapter is connected and select the IRQ in the event that it deviates from the default setting. Continue the installation with **OK**.
- ⑦ Select **OK** to save the changes to the settings in the *Telix* configuration file.



*The computer must be restarted to ensure correct operation if the AUTOEXEC.BAT file was automatically updated.*

### Starting *Telix*

Enter `telix`  in the *Telix* directory to start the program. If you are starting *Telix* for the first time, you will be prompted to configure the program before use.

## Installation of LapLink for Windows 95

LapLink for Windows 95 is a program for remote access, file transfers and many other functions. With LapLink for Windows 95, you can use your ISDN terminal adapter to communicate with a remote computer. After the successful establishment of a connection, it is possible to control the remote computer, transfer files and chat with a partner online. To install LapLink for Windows 95, proceed as follows:

- ① Switch the ISDN terminal adapter on and boot Windows 95.
- ② Insert the *ELSA TanGo* CD in your CD drive (e.g. D:). The CD setup will start automatically.
- ③ Under **Installation of:** in the **ELSA CD Setup**, select **LapLink 7.5 for Windows 95** in the list and click **OK** to start the setup program. The welcome screen appears.
- ④ Please read the following notes and click the **Next** button.
- ⑤ In the dialog box 'User Information', enter your name, company and product serial number in the appropriate fields. The serial number can be found on the enclosed serial number sticker (please note that the number is case-sensitive). Next, enter a name for your computer in the **Computer Name** field and click **Next**.
- ⑥ In the dialog box 'Confirm Registration', confirm your entries with **Yes**.
- ⑦ To start the installation, click **Next** in the 'Setup Type' and 'Start copying files' dialog boxes.
- ⑧ Click on **Finish** in the 'Product Registration' dialog box to conclude the installation. After the installation is complete, a status indicator for the new **LapLink for Windows 95** program folder will appear on the taskbar.

### Starting LapLink for Windows 95

In the taskbar, select **Start ► Programs ► LapLink for Windows 95 V7.5** and click on **LapLink for Windows 95 V7.5** to start the program.

# Control Commands

The so-called AT command set established itself as the worldwide standard for modem control command syntax (AT = command prefix Attention). The *ELSA TanGo 2000* also operates with the AT command set, permitting users of data communications equipment to continue using a familiar command set for ISDN communications. A complete description of the AT command set can be found on the *ELSA TanGo* CD. A terminal program is required to enter AT commands via a PC (e.g. *ELSA-ZOC*).

## Entering and Executing AT Commands

After switching on, the ISDN terminal adapter is in the command phase. Commands can only be accepted, interpreted and executed in this phase.

In the event that several commands are to be sent to the ISDN terminal adapter, these may be entered individually, each with an AT command prefix and a concluding . It is also possible, however, to enter these commands consecutively in a single command line after an introductory **AT** and to conclude the line with an .

The individual commands may be separated by spaces to improve the overview. No further characters may be entered once the end of the command line buffer has been reached. The command line can then only be edited with  (backspace) or executed with .

## Escape Command

The characters  and  may be used to abort the execution of a command line or a screen display (e.g. when returning the contents of the registers with **AT%R**).

Commands that must be specified with a parameter may also be entered without a parameter. The absence of a parameter corresponds to the parameter 0 (e.g. **ATI = ATIO**).

After the successful establishment of a connection to the remote station, the ISDN terminal adapter switches from the command phase to the transfer phase.

Transfer phase means that a connection to a remote data station (i.e. to another ISDN terminal adapter) exists: the ISDN terminal adapter is "online". This is the case after successful call establishment (outgoing call), as well as after answering a call (incoming call). The exchange of data between two data stations can take place during this phase.

A renewed transition to the command phase and back, also in the case of an existing connection, is possible with the escape command and the command **ATO**. The escape command consists of a series of three escape characters (default setting: +++) and a valid command line.

After the three escape characters have been entered, the ISDN terminal adapter is already in the command phase. Data transfer is not interrupted until a valid command line has been recognized.

The escape character is not associated with the `Esc` of the ASCII character set. It can be redefined using the S2 register.

All commands sent to the ISDN terminal adapter must begin with the ASCII characters **AT** or **at** (not valid: **At** or **aT**) and must be concluded with `Enter`. A valid command line in an escape sequence is restricted to a maximum of 40 characters.

The command **AT&F** loads the firmware default parameter settings. The ISDN terminal adapter is thus reset to its factory condition. This command does not execute during existing connections.

## Bit-oriented Registers

Bit-oriented registers are primarily used to provide status information. Please note that the modification of a single value in the bit-oriented register may have several functions. Great caution should thus be applied when changing bit-oriented registers! We recommend the use of the AT commands to change the configuration of the ISDN terminal adapter. A complete description of the S registers can be found on the *ELSA TanGo* CD.

### Modifying Bit-oriented Registers

The following example will illustrate the modification of the bit-oriented options of a register. To set the bit 6 of register S14, enter the command **ATS14.6=1**.

If you would like this value to be maintained after the ISDN terminal adapter is switched off, the new entry can be stored with the command **AT\*W**.

## Advanced Features

The a/b ports of the ISDN terminal adapter let you take advantage of a number of advanced features, such as call alternation, offered by digital telephone exchanges. This requires the use of a telephone with tone dialing and a flash button.

If you are not sure whether your telephone uses tone or pulse dialing, check the sounds that it makes during normal dialing: If you hear a rattling sound for each digit you dial, the phone uses pulse dialing, whereas a beeping noise indicates tone dialing.



*Please contact your telephone service provider for further details regarding the implementation of these advanced features.*

# Appendix

## Brief overview of the AT command set

The complete AT command set can be found in the online documentation on the included CD.

| Command  | Description  |
|--|--|
| A  | Answer incoming call   |
| &C0<br>&C1   | DCD is always active<br><b>DCD indicates an existing connection</b>  |
| Dn   | Call establishment   |
| <b>\$D0</b><br>\$D1                                | <b>Disables DTR dialing</b><br>Enables DTR dialing   |
| &D0<br>&D1<br><b>&amp;D2</b><br>&D3                | Ignore transition of DTR status<br>Switch to command phase if DTR → OFF<br><b>Abort connection if DTR → OFF</b><br>Abort connection and reinitialize if DTR → OFF  |
| <b>\D0</b><br>VD1<br>VD2<br>VD3                    | <b>DSR and CTS always active</b><br>DSR tracks transmission channel and CTS always active<br>DSR always active and CTS tracks DCD<br>DSR tracks transmission channel and CTS tracks DCD  |
| E0<br><b>E1</b>                                    | Commands not echoed<br><b>Commands echoed</b>  |
| &F   | Load default configuration   |
| \F   | Dialing of stored telephone numbers  |
| H  | Hang up  |
| H2   | Call rejected  |
| I0<br>I1<br>I2<br>I3<br>I4<br>I5<br>I6<br>I7<br>I9 | Report product code in nnn format<br>Report checksum<br>Report checksum result<br>Report version number and firmware release date<br>Display of current parameters<br>Report serial number and hardware release<br>Display product name<br>Report self-test result<br>Report Plug & Play ID text |
| \$!?   | Display of current ISDN parameters   |
| \$!AD  | Connection without dialing   |
| \$!BP  | Setting the B channel protocol   |
| \$!BR  | Setting the ISDN bit rate  |
| \$!CI?   | Display charge information   |
| \$!CI  | Delete charge information  |

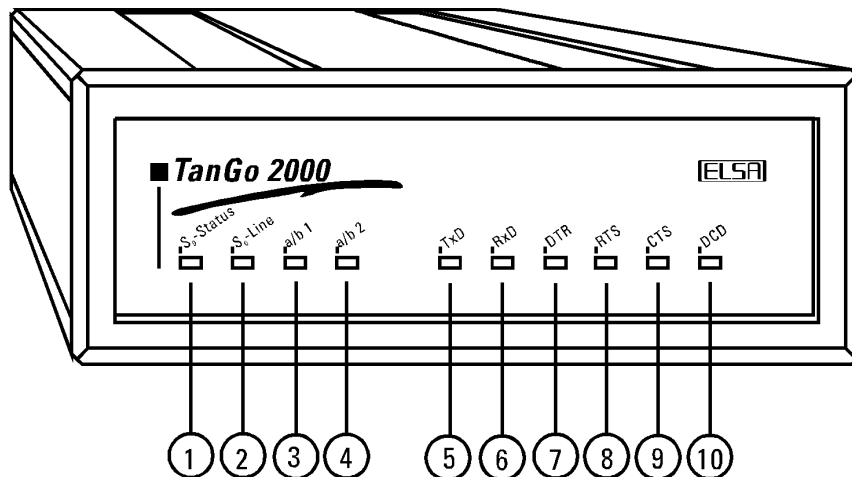
| Command    | Description   |
|------------|---|
| \$ICLD     | Store dial numbers for user groups                      |
| \$ICLI     | Setting the outgoing multiple subscriber number (MSN)   |
| \$ICLI     | Suppression of caller ID display                        |
| \$IDBS     | Setting the data block length                           |
| \$IDP      | Setting the D channel protocol                          |
| \$IEAZ     | Setting the terminal selection digit (EAZ)              |
| \$IMSN     | Call acceptance from multiple subscriber numbers (MSNs) |
| \$INCB     | Block dial numbers                                      |
| \$ISCI     | Service characteristics for incoming analog calls       |
| \$ISCO     | Service characteristics for outgoing analog calls       |
| <b>-M0</b> | <b>Plain text CONNECT messages dependent on ATV</b>     |
| -M1        | Plain text CONNECT messages independent of ATV          |
| 0          | Transition to online status                             |
| \Pmn       | Storing dial numbers (m = 0 to 9)                       |
| <b>Q0</b>  | <b>Return of messages from ISDN terminal adapter on</b> |
| Q1         | Return of messages from ISDN terminal adapter off       |
| Q2         | Messages off in answer mode                             |
| <b>*Q0</b> | <b>CONNECT message after invalid escape sequence</b>    |
| *Q1        | No CONNECT message after invalid escape sequence        |
| \Q0        | No handshake  |
| \Q1        | Bidirectional XON/XOFF handshake                        |
| \Q2        | Unidirectional CTS handshake                            |
| <b>\Q3</b> | <b>Bidirectional RTS/CTS handshake</b>                  |
| \Q4        | Unidirectional XON/XOFF handshake                       |
| Sn=x       | Sets register n to value x                              |
| Sn?        | Reads the value of register n                           |
| Sn         | Sets pointer to register n                              |
| ?          | Reads value of last register used                       |
| =x         | Sets value of last register used to x                   |
| \S         | Display of the current settings                         |
| \Tn        | Inactivity timer  |
| \$UPX      | Firmware upload in flash ROM                            |
| V0         | Messages in short form as a digit                       |
| <b>V1</b>  | <b>Messages in plain text</b>                           |
| %V         | Display of firmware version                             |
| &V         | Display configuration profiles                          |
| \V0        | No modified CONNECT messages                            |
| \V1        | Identification of connections with error correction     |
| \V2        | Additional distinction of correction processes          |
| <b>\V8</b> | <b>Detailed CONNECT messages</b>                        |
| &W         | Save configuration profile                              |
| *W         | Save complete configuration profile                     |



| Command    | Description  |
|------------|--|
| X0         | Busy signal returns NO CARRIER                                 |
| X1         | Busy signal returns NO CARRIER                                 |
| X2         | Busy signal returns NO CARRIER                                 |
| X3         | Busy signal returns BUSY                                       |
| <b>X4</b>  | <b>Busy signal returns BUSY</b>                                |
| <b>\X0</b> | <b>XON/XOFF characters are not sent</b>                        |
| \X1        | XON/XOFF characters are sent                                   |
| &Y         | Set pointer to configuration profile                           |
| Zn         | Load configuration profile                                     |
| &Z         | Store dial number  |
| AT.m=x     | Sets the bit m to the value x (m = 0 to 7; x = 0 to 1)         |
| AT.m?      | Reads the value of bit m                                       |
| ATSn.m=x   | Sets bit m in S register n to value x (m = 0 to 7; x = 0 to 1) |
| =?         | Query of the value range of a command                          |

## Status display and troubleshooting

The LEDs on the front panel show the condition of the interface lines or the condition of the ISDN  $S_0$  connection.



- ①  $S_0$  status
- ②  $S_0$  line
- ③ a/b Port 1
- ④ a/b Port 2
- ⑤ TxD (D1) – Data or command from local PC to ISDN terminal adapter
- ⑥ RxD (D2) – Data or messages from ISDN terminal adapter to local PC
- ⑦ DTR (S1) – Computer operational
- ⑧ RTS (S2) – Switch on transmit
- ⑨ CTS (M2) – ISDN terminal adapter clear to send
- ⑩ DCD (M5) – Connection established

### Status display

Green and yellow LEDs on the front panel of the ISDN terminal adapter serve as the status display of the ISDN connection.

#### Green LED

The green LED shows the status of your ISDN line and the connection to the exchange.

Normal connections (Dial-up and fixed D channel connections):

| State of LED       | Status                                       |
|--------------------|--|
| Off                | S <sub>0</sub> bus not active, normal status |
| Blinking (quickly) | S <sub>0</sub> bus active, no TEI assigned   |
| On                 | S <sub>0</sub> bus active, TEI assigned      |

### Yellow LED

The yellow LED shows the connection status of the ISDN terminal adapter:

| State of LED                                    | Status   |
|---|--|
| Off   | No call, no connection   |
| Blinking slowly (once per sec.) (total 2 to 3x) | Incoming call, terminal device is not responsible or terminal unit establishes connection itself |
| Blinking quickly (3x per sec.)                  | Valid call pending, not (yet) answered   |
| Constantly lit                                  | Connection being/is established  |

### a/b ports

The status display shows the condition of the analog terminal equipment:

| State of LED | Status                                 |
|--------------|--|
| Off          | Analog terminal unit has not picked up |
| On           | Analog terminal unit has picked up     |

### V.24 display

The V.24 display shows the status of the V.24 connection to the computer:

| LED      | Description  |
|----------|--|
| TxD (D1) | Data or command to ISDN terminal adapter   |
| RxD (D2) | Data or signals from ISDN terminal adapter   |
| DTR (S1) | Computer operational (see also command <b>AT&amp;D</b> )   |
| RTS (S2) | Switch on transmit (see also command <b>ATQ</b> )  |
| CTS (M2) | ISDN terminal adapter clear to send (see also commands <b>ATD</b> and <b>ATQ</b> )   |
| DCD (M5) | Connection established (see also command <b>AT&amp;C</b> )<br>Red LED lit during connections without error correction and during fax connections<br>Green LED lit during error-corrected connections |

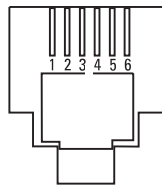
## Technical data

Users with specific technical interests should refer to this chapter for detailed information on *ELSA TanGo 2000*. All connections and their pin assignments are described in detail.

### Characteristics of the terminal adapter

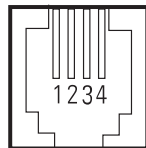
|                       | <i>ELSA TanGo 2000</i>   |
|-----------------------|--|
| Power supply          | 24 VAC , max. 750 mA   |
| Power consumption     | 7.2 W  |
| Dimensions and design | 08 x 38 x 140 mm (W x H x D) metal case  |
| Ambient conditions    | 5 to 40°C, 0 to 80%, non-condensing  |
| ISDN connection       | Basic Rate Interface (S <sub>0</sub> -connection, I.430) and ISDN PBXs with S <sub>0</sub> connections   |
| a/b ports             | Two RJ-14 sockets, tone dialing support  |
| Transmission modes    | Euro-ISDN/DSS1, Basic Rate Interface (point-to-point and point-to-multipoint connections), 1TR6 (incl. semipermanent connections)  |
| Transfer protocols    | X.75 at 56,000 bps, 64,000 bps; V.120 at 56,000 bps, 64,000 bps; X.75/T.70NL at 56,000 bps; 64,000 bps; X.75 T-Online (VT-100, CEPT, KIT) bit-transparent, HDLC-transparent, PPP synchronous/asynchronous implementation |
| Max. data throughput  | 230,400 bps asynchronous at the DTE interface  |
| Protocol detection    | Automatic switching between X.75, V.120 and PPP synchronous  |
| Error correction      | When operating in ITU-T V.120 and X.75   |
| Command set           | Extended AT command set (incl. EAZ and MSN support, as well as polling options for the remote station caller ID and connect charges, status of the connection)   |
| Computer interface    | V.24, RS 232, 9-pin D-subminiature socket  |
| Status display        | LED in various colors for the monitoring of the ISDN line and connection status, V.24 display  |
| CE conformity         | tested in accordance with EN 50082/Part 1, EN 55022, Class B, EN 60950   |
| Permits               | EU   |
|                       | Germany BAPT: D133319J   |

### RJ11 socket contact assignments



| S <sub>0</sub> socket | Line | IAE |
|-----------------------|------|-----|
| 1                     | -    | -   |
| 2                     | T+   | 2a  |
| 3                     | R+   | 1a  |
| 4                     | R-   | 1b  |
| 5                     | T-   | 2b  |
| 6                     | -    | -   |

### a/b port pin assignment (RJ14 socket)



| a/b ports | Line |
|-----------|------|
| 1         | -    |
| 2         | a    |
| 3         | b    |
| 4         | -    |

# Declaration of Conformity



## DECLARATION OF CONFORMITY

This declaration applies to the following product:

**Equipment type:** ISDN terminal adapter  
**Type designation:** TanGo 2000  
**EC type sample test certificate No.:** D133319J  
**Empowered authority:** German Federal Telecommunications Type Approval Office

We confirm herewith that the product complies with the following EC standards:

amended by **89/336/EWG** (EMC regulations)  
**91/263/EWG; 92/31/EWG; 93/68/EWG**

amended by **73/23/EWG** (low-voltage regulations)  
**93/68/EWG**

**94/797/EWG** (I-CTR3)

Standards applied:

**EN 50082: 1992 Part 1**  
**EN 55022: 1992 Class B**  
**ETS 300 047- 3**  
**EN 60950**  
**TBR 3**

This declaration has been made on behalf of the manufacturer / importer

**ELSA AG**  
**Sonnenweg 11**  
**D-52070 Aachen**  
**GERMANY**

by

**Peter Padar**  
**Quality Management Officer**

Aachen, December 18, 1997

by order, Peter Padar  
Quality Management Officer

## Questions and Answers

### General topics



#### How can I send AT commands to the ISDN terminal adapter?

A terminal program such as *ELSA ZOC* is necessary to address the ISDN terminal adapter from your PC. After starting *ELSA-ZOC*, you will be able to send individual AT commands to the terminal adapter. These are sent to the ISDN adapter via the serial interface of your PC.



#### How do I configure the terminal adapter for the D channel protocols for Euro-ISDN (DSS1) or national ISDN (1TR6)?

The *ELSA Configuration Manager* permits the simple, convenient configuration of your *ELSA TanGo 2000*. It can be used to set the D channel protocol for example, or to enter the MSN or the terminal selection digits.



#### What is the optimal initialization string for BBS operations with my ISDN terminal adapter?

All ISDN terminal adapters have ideal default settings for BBS operation. If you have changed the configuration in the mean time, you can restore the ISDN adapter's factory defaults with the command **AT&F** and save this condition with the command **AT\*W**.



#### How can I accelerate data communications programs such as the CompuServe Information Manager under Windows 3.x?

As the owner of a buffered UART 16550 interface chip, you should open the SYSTEM.INI file in your Windows directory and make the following entry in the [386Enh] section:

```
COMx FIFO=1
```

Replace the placeholder **x** with the number of the correct serial port (e.g. `COM2 FIFO=1`; in this case, "2" stands for **COM port 2**). In the event that your computer does not have a UART 16550, we recommend the upgrade of your serial interface.



#### My ISDN terminal adapter no longer accepts AT commands. Is it incorrectly configured or defective?

If AT commands do not appear on your screen and are not executed by your terminal adapter, this can have a number of causes. You should check the following settings:

- Is your ISDN terminal adapter connected to the serial interface (COM port) specified in the settings of your communications software?
- If the configuration of your ISDN adapter is incorrect, try to restore the default settings with the command **AT&F**, even if the command isn't displayed on the screen when entering it. In this condition it should be possible to enter an AT, to which the ISDN adapter will return an OK.



#### Can I reach a Euro-ISDN (DSS1) remote station from a 1TR6 connection or vice versa?

The various connection types or D channel protocols are not relevant in this case, as these are only significant for the communications between your ISDN connection and the local exchange. A connection can be established even if both sides are using different D channel protocols.



**When uploading and downloading from/to BBS systems, a large number of CRC errors result; in some cases the connection is even aborted. What are the possible reasons?**

CRC errors can have a variety of reasons. A possible cause is an incorrectly-set or missing handshake process. In order to take proper advantage of data compression, the speed on the computer side should be set higher than on the telephone side (e.g. 115,200 bps instead of 64,000 bps). This, however, requires either a hardware- (RTS/CTS) or software-based (XON/XOFF) handshake process.

Both the software and the ISDN terminal adapter must use the same settings for these processes. CRC errors may occur during data transfer if this is not the case. If you use RTS/CTS handshaking, the V.24 connection can also be the cause. When using a so-called mouse adapter (V.24 adapter from 25 to 9 pins), it is also possible that the RTS and CTS conductors (Pin 4 and 5) in the adapter are not connected. One should always ensure that V.24 cable adapters are fully wired for this reason.

The serial port of your computer can be a further source of errors. The use of a type 16550 UART chip is advisable for speeds of 19,200 bps and higher under DOS and for general use under Windows and OS/2. This UART has a 16 byte FIFO buffer which permits significantly higher transfer speeds. Type 8250 and 16450 chips only function reliably at speeds of up to 9600 bps; individual characters can be lost in the interface at speeds of 19,200 bps upwards, leading to CRC errors.



**Why do I always get CRC errors with my ISDN terminal adapter during ZModem downloads at 115,200 bps, even though I'm using a UART 16550 with FIFO in my COM port? The throughput for CONNECTs at 64,000 bps is only around 6,000 cps.**

The poor throughput is the result of the large number of CRC errors. Check the BIOS settings of your computer and ensure that IDE HDD BLOCK MODE is set to DISABLED.



## Advice and Help

If you encounter any problems during the installation or operation of your ELSA product, please consult this manual first. On the ELSA CD you will find a file called README.TXT, containing late-breaking changes and additional information not available when this manual was printed.

If you have further questions, you can contact our Support team. Ensure that you can provide the following information.

- Exact model name of your ELSA device.
- Version of the used ELSA driver or file date and time of the driver file.
- Operating system, hardware environment and bus system.
- Name and version of the application program with the error.
- A detailed error description. To be certain, try to reproduce the error at least three times and exactly describe the steps you took to deliberately trigger the error.

## Who to contact?

First you should contact the dealer where you bought your ELSA product. If there are still questions remaining, contact one of the following:

### ■ ELSA on the Internet

|  |   |                |
|--|---|----------------|
| The ELSA Internet WWW site                                   | <a href="http://www.elsa.com">http://www.elsa.com</a> |                |
| ELSA LocalWeb  | +49-241-938800  |                |
| (ELSA's dial-up WWW site:<br>no Internet provider required!) | ISDN  | X75, V120, PPP |
|  | Analog  | K56flex, V.34  |
|  | Protocol  | PPP oder MLPPP |
|  | User name:  | guest          |
|  | no password   |                |

### ■ ELSA and CompuServe

|                              |         |
|------------------------------|---------|
| The ELSA forum in CompuServe | GO ELSA |
|------------------------------|---------|

### ■ ELSA Support Fax Line

|                                    |                  |
|------------------------------------|------------------|
| By fax to the ELSA support faxline | +49-241-606-6499 |
|------------------------------------|------------------|

### ■ ELSA by Mail

|                  |  |
|------------------|--|
| Or write to ELSA | ELSA AG<br>Data Communication Support<br>Sonnenweg 11<br>D-52070 Aachen, Germany |
|------------------|--|

### ■ ELSA Hotline

If very urgent, call

+49-241-606-6142

Mondays to Fridays from: 9.00 am until 5.00 pm (CET)

### ■ ELSA World Wide

You can contact the ELSA subsidiaries:

ELSA Inc.  
2231 Calle De Luna  
Santa Clara, CA 95054  
California, USA

Phone: +1-408-935-0350  
+1-800-272-ELSA  
Fax: +1-408-919-9120

ELSA Asia Inc.  
7F-11, No. 188, Sec. 5  
Nanking East Road  
Taipei 105  
Taiwan, R.O.C.

Phone: +886-2-768-5730  
Fax: +886-2-766-0873

ELSA Japan Inc.  
Mita Suzuki Building 3F  
5-20-14 Shiba, Minato-ku,  
Tokyo, Japan 108-0014

Phone: +81-3-5765-7391  
Fax: +81-3-5765-7235

## The ELSA LocalWeb

The ELSA LocalWeb provides direct access to ELSA's local Internet server, and contains the same information as the Internet web server [www.elsa.com](http://www.elsa.com). Here you will find information about all ELSA products, the latest drivers, software and documentation, and you have the opportunity to put questions to our sales and support departments via the ELSA news server. To access the ELSA LocalWeb, you need a dialer program (e.g. the Dial-up Network in Windows 95) and an Internet browser.

To make a connection, first start the dialer software. Where information for the DNS server is requested, enter the IP address as 172.22.1.2. The user name is guest; no password is necessary. With a successful connection active, the browser software can be started.

## Driver updates

The latest versions of the ELSA drivers are always available for download from our Internet WWW site <http://www.elsa.com> or our LocalWeb, via direct FTP from [ftp.elsa.com](ftp://ftp.elsa.com) and in the ELSA Forum on CompuServe. You will also find lots of information and answers to frequently asked questions (FAQs). You might also consider the newsgroups on our Web pages. Before you contact the ELSA Support team, please make sure that you are using the latest driver versions.

## Repair?

If you are not sure whether your ELSA expansion board is defective or if the problem is just a driver which is incorrectly installed, please call the ELSA Hotline before you send the board for repair. Should you need to send in the ELSA expansion board to be repaired, please use suitable packing material and the original box to prevent damage during transport. In addition, please include a copy of the original purchase receipt as well!

You can help reduce the repair time by including a detailed description of the fault with the device, which will help us track down the error source. Please send your ELSA product directly to our Service department at ELSA AG.

# Warranty Conditions

The ELSA AG warranty, valid as of 01.01.98, 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 CRT color monitors and ELSA video conferencing systems with a warranty period of 36 months. Also excepted are the ELSA TFT Monitors with a warranty period of 12 months. 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 speci-

- 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), or
- g) 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.

# Glossary

- **1TR6** – 1TR6 is a Telekom guideline for S<sub>0</sub>-interface ISDN terminal units which defines the →D channel protocol.
- **a/b port** – The a/b port is used to connect analog terminal devices (e.g. telephone, answering machine, fax) to ISDN adapters.
- **Asynchronous transmission** – In serial data transmission a method is needed to synchronize transmitter and receiver in order to enable the receiver to detect the beginning and end of a transmitted character. In asynchronous transmission this structuring is achieved by marking each byte to be sent with one start bit and one or two stop bits. Especially in the microcomputer sector, this start/stop method is one of the most commonly used transmission methods, since, unlike β synchronous transmission, it is comparatively easy to perform.
- **AT command set** – "Intelligent" modems are able to establish connections and accept calls automatically. This requires a set of modem control commands. The extended AT command set (AT = command prefix ATtention) has become a world-wide standard for the syntax of these commands. All ELSA modems are equipped with an automatic dialing device and can accept calls automatically. They use an extended AT command set, depending on the respective modem type.
- **B channel** – →Basic channel
- **Basic Rate Interface** – ISDN subscriber connection with two →bearer channels (64,000 bps each) and a signal channel (16,000 bps). The →S<sub>0</sub> interface is the subscriber interface used by the Basic Rate Interface.
- **Basic channel** – ISDN transfer channel (also known as B channel) for the delivery of communications data with a capacity of 64,000 bps.
- **Baud** – Baud (abbreviation: Bd) is the unit for the step rate (1 Bd = 1 step per second), i.e. the frequency of status changes on a transmission channel per second. Erroneously, the unit Baud is often confused with the transmission rate measured in bps. In the case of signals having only two states, the step rate is identical with the transmission rate. Rates over 1200 bps are, however, normally performed by transmission of four, eight or more bits per step, so that in these cases the step rate is lower than the transmission rate. Example: V.32 = step rate 2400 Baud, transmission rate 9600 bps.
- **CCITT** – ITU-T
- **Communications software** – Communications software such as a terminal program is required to operate the ISDN terminal adapter from a personal computer, to change the transfer parameters for example, or to initiate file transfers (→Download, →Upload). An 'intelligent terminal', i.e. a simple input/output device with additional functions for storage of received data or the transmission of local data, is emulated on a PC using such a program.
- **D channel** – →Signaling channel
- **Data format** – To allow a data exchange between two stations in an asynchronous transmission, the parties must agree on the length and structure of the bytes to be transferred. This specification is called data format. The most common data formats for asynchronous transmission are: 8N1 (1 start bit, 8 data bits, no parity bit and 1 stop bit = 10 bits per byte) and 7E1 (1 start bit, 7 data bits, 1 parity bit (even parity) and 1 stop bit = 10 bits per byte).

- **DSS1** – A European standard developed by the →ETSI for the →D channel protocol (also known as "Euro-ISDN"). This standard has been in effect in Germany since the end of 1993 and will replace the FTZ standard →1TR6. ISDN connections will be available for a transitional period which support both standards.
- **EAZ** – The Endgeräteauswahlziffer, or terminal selection digit, serves to distinguish various terminal units attached to the same Basis Rate Interface when using the German national 1TR6 protocol. This digit is appended to the dial number by the caller.
- **Endgeräteauswahl- ziffer** – →EAZ
- **Effective transfer rate** – The effective transfer rate must be distinguished from the transmission speed. The transmission speed indicates the number of bits per second sent through a data connection as a theoretical maximum value. The transfer rate, on the other hand, is the average quantity of communications data transferred within a given unit of time. The effective transfer rate can be reduced by signaling data or protocol routines which must also be transferred. The use of data compression processes permits the effective speed to be increased to multiples of the transmission speed.
- **ETSI** – European Telecommunications Standards Institute. This is the standardization authority which developed the European →D channel protocol (→DSS1).
- **Euro-ISDN** – →DSS1
- **Firmware** – Firmware is the designation for the complete body of microprograms belonging to an item of hardware which cannot be modified by the user.
- **I.430** – Subscriber network interfaces for the ISDN Basic Rate Interface - description of layer 1. I.463 →V.110 I.465 →V.120
- **ISDN** – Integrated Services Digital Network
- **ITU-T** – The Telecommunications Standardization Sector of the International Telecommunications Union (ITU) is working on the standardization of data and telephone services. The ITU-T standards of the V. series mainly deal with data transmission across telephone networks, while the I. and Q. series are standards for the ISDN. The ITU-T is the successor organization of the CCITT (Comité Consultatif International Tèlègraphique et Tèlèphonique).
- **Multiple Subscriber Number** – →MSN
- **NT** – Network Terminator. This terminator, which is installed on the subscriber's premises for the ISDN →Basic Rate Interface, converts the signals from the exchange of the telecommunications provider to the →S<sub>0</sub> interface and vice versa.
- **Parity bit** – The parity bit is a signal bit which is transferred in addition to the actual communications data. The bits set to logical '1' are completed to make an even or odd bit sum. The parity check is an error-recognition process. The effectiveness of this test is very questionable, however, as double errors cannot be recognized, for example. The setting 'no parity' is thus generally selected for data communications. This also has a positive effect on the effective transfer rate, as no additional parity bit must be transferred.
- **PPP implementation** – The implementation of the point-to-point protocol permits the use of asynchronous PPP software on the computer in conjunction with synchronous PPP ISDN connections (e.g. routers). The conversion is effected as per RFC 1662.
- **S<sub>0</sub> interface** – Subscriber interface of the →Basic Rate Interface. This interface is a bus permitting the connection of up to eight ISDN

terminal devices. Up to 12 sockets can be installed on this bus.

- **SPC** – Semi-permanent Connection. A semi-permanent connection is currently available for the →1TR6 protocol and can be established between any two ISDN subscribers. The connection is effected separately for each B channel. The billing of communications charges is no longer based on connect time when a semi-permanent connection has been established, but on a flat monthly rate. This permits communications charges to be saved on connections which remain established over very long periods of time.
- **Signaling channel** – ISDN signaling channel (also →D channel), for the transfer of control information (e.g. the signaling of an incoming call, etc.) between the exchange and the ISDN network terminator, with a transfer capacity of 16,000 bps for →Basic Rate Connections or 64,000 bps for Primary Multiplex Connections.
- **Synchronous transfer** – Synchronous transfer is, like →asynchronous transfer, a process to achieve synchronism between the transmitter and receiver. In this data transfer format, synchronism is not achieved with start and stop bits for a whole character as with asynchronous transfer, but clock pulses for each individual bit. As no start or stop bits must be sent, synchronous transfer is faster, but also significantly more complex to realize.
- **T.70NL** – T.70NL is a data packet header which is used in the →X.75 transfer mode. The T.70NL headers must be switched either on or off at both ends of the transfer route.
- **TA** – →Terminal adapter
- **TEI** – TEI (Terminal Endpoint Identifier) is an identification in the →D channel protocol arranged with the exchange and used to distinguish between various terminal units on an  $S_0$  interface.
- **Terminal Endpoint Identifier** – →TEI
- **Terminal adapter** – Terminal adapters (TA) are devices used for the connection of non-ISDN equipment to the ISDN.
- **UART** – The UART chip (Universal Asynchronous Receiver/Transmitter) with FIFO buffer storage (type 16550) is used to ensure error-free communications via the asynchronous serial communications interface.
- **Transfer protocol** – A number of transfer protocols exist which are designed to ensure the smooth transfer of data from one computer to another. Over the course of time, protocols were developed with varying levels of performance and convenience. Basic functional principle: As a rule, data is transferred in blocks which are tested for completeness and lack of errors by the opposite side. If a transfer error is detected, the defective block is requested again. Examples of common transfer protocols are →Xmodem, Xmodem-1k, →Ymodem and Zmodem.
- **V.42, V.42bis** – V.42 and V.42bis are error-correction and data compression processes standardized by the →ITU-T. V.42bis contains a data compression process which permits up to a fourfold increase in data throughput.
- **V.120** – (also I.465). Recommendation by the →ITU-T for the packaging of asynchronous and synchronous data in a (secure) HDLC framework in the ISDN →B channel.
- **X.75** – Similar to V.120. Recommendation by the →ITU-T for the secure transfer of data using the HDLC transfer process in the ISDN →B channel.

Notes:



# Index

- **A**
  - a/b ports ..... 1
  - Answering machine ..... 8
  - AT command set ..... 17
- **B**
  - Bit-oriented registers ..... 16
- **C**
  - CE ..... 4
  - CommCenter ..... 8
  - CompuServe ..... 27
  - Computer ..... 3
  - Connecting to BBSs ..... 10
  - Control commands ..... 15
  - Create new fax ..... 8
- **D**
  - D channel protocol ..... 1
  - Delayed call answering ..... 2
  - Download ..... 28
  - Driver ..... 28
- **E**
  - ELSA World Wide ..... 27
  - ELSA-RVS-COM* ..... 5
  - ELSA-ZOC* ..... 12
  - Escape command ..... 15
  - Euro-ISDN ..... 7
  - Executing AT commands ..... 15
- **F**
  - Fax ..... 5
  - Fax reception ..... 8
  - Flash ROM technology ..... 1
- **G**
  - Graphics board ..... 3
- **H**
  - Hard disk space ..... 3
  - Here's How ..... 11
  - Hotline ..... 27
- **I**
  - Internet ..... 27
- **L**
  - LapLink ..... 14
  - LocalWeb ..... 27, 28
- **M**
  - MSN ..... 2
- **O**
  - Operating system ..... 3
- **P**
  - Plug&Play ..... 1
  - Protocol detection ..... 1
- **R**
  - RAM ..... 3
  - Recording calls ..... 10
  - Repair ..... 28
- **S**
  - Scope of delivery ..... 3
  - Sending faxes ..... 9
  - Status displays ..... 2
  - Support ..... 2, 27
  - System requirements ..... 3
- **T**
  - Telephone ..... 10
  - Telephone answering device ..... 5
  - Telix for DOS* ..... 13
  - Terminal selection digits ..... 2
  - TransferMaster ..... 9
  - Transmission modes ..... 1
- **W**
  - Warranty ..... 2
  - WWW ..... 27