

ELSA AirLancer™ MC-II

ELSA AirLancer™ USB-II

ELSA AirLancer™ PCI-II

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Preface

Thank you for placing your trust in this ELSA product.

Wireless networks from ELSA are economical alternatives or additions to local wired networks (LANs). Notebooks and PCs can use mobile network cards to communicate with one another or access wired networks via access points and can even be integrated into the ISDN network.

This documentation is intended for the user of the *ELSA AirLancer MC-11*, *ELSA AirLancer USB-11* and *ELSA AirLancer PCI-11* mobile network cards. First we describe the devices and their options, then provide instructions for installing the devices and the drivers and as an initial application example we describe how to connect two computers with each other and to an access point.

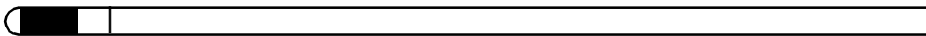
Documentation

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 (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 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\ELSA\SIDE\index.htm`.

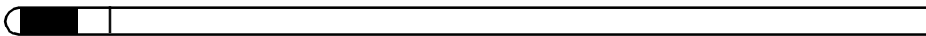


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1 Introduction

The advantages of wireless networks (wireless LANs) are obvious: Notebooks and PCs can be set up where they are wanted. Problems with missing ports or construction alterations are a thing of the past with wireless networking.

Network links in conferences or presentations, access to resources in adjacent buildings and exchanging data with mobile units are only a few of the options available with a wireless LAN.

1.1 What is a wireless LAN?

Wireless LANs connect separate units (PCs and notebooks) to a local network (also LAN – **L**ocal **A**rea **N**etwork). Unlike conventional LANs, the connection is established through radio transmission, not via a network cable. For this reason, wireless LANs are also called **W**ireless **L**ocal **A**rea **N**etworks (WLAN).

All of the standard functions of a wired network are also available in a wireless LAN: Access to files, servers, printers etc. is possible as is the integration of the single stations into an internal company e-mail system or access to the Internet.

1.2 What is required for a wireless LAN?

The question of the required hardware arises in conjunction with the advantages of a wireless LAN.

1.2.1 Radio interfaces with the network

Every unit in the wireless LAN needs access to the wireless LAN in the form of a radio interface. Devices that do not come with a standard radio interface, can be upgraded using an advanced card or an adapter. You use an *ELSA AirLancer* to upgrade your unit to access the wireless LAN.

A wireless LAN consists of at least two units with radio interfaces. Both units then communicate directly via radio.

1.2.2

The center—the access point

The convenience and performance of a wireless LAN can be enhanced with an additional access point. This access point permits the central administration of the wireless LAN. In addition, the access point can be used to link the wireless LAN to a cable-based LAN or to the Internet.

Depending on whether or not an access point is used, there are two possible ways to operate the wireless LAN: Either as an ad hoc network (peer-to-peer), or an infrastructure network (access point).

1.3

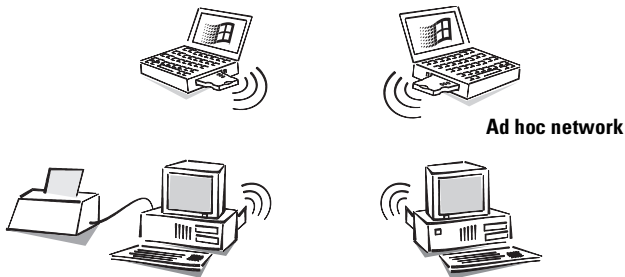
Operating modes

Let's have a look at both operating modes.

1.3.1

The ad hoc network

In the case of the ad hoc network, two or more computers that each have their own interfaces to the wireless LAN are connected to one another. All computers in a WLAN can then communicate with one another without additional hardware.



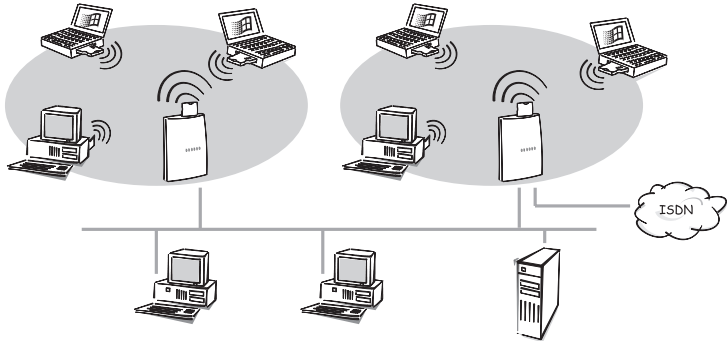
Ad hoc network

This mode is also generally referred to as a peer-to-peer network (spontaneous network). PCs can connect to each other immediately and exchange data.

1.3.2

The infrastructure network

An access point is required to connect to an existing network. The access point acts as the switching center for data exchange within the WLAN. It also offers access to a cable-based LAN or to the ISDN and Internet.



Infrastructure
network

A wireless LAN with one or more access points is generally referred to as a peer-to-LAN network; however, in the LAN terminology this type of networking is referred to as an infrastructure network. ELSA access points also have an integrated router for ISDN or DSL connections. This allows all connected stations to access the Internet.

This network type is ideally suited as an addition to existing LANs. The infrastructure network is the ideal solution for expansion of a LAN in areas where wiring is not possible or not economical.

1.4

IEEE 802.11b radio transmission

IEEE 802.11b

All *ELSA AirLancer* operate under IEEE Standard 802.11b. This standard is a supplement to the current IEEE standards for LANs, with IEEE 802.3 for Ethernet being the most well-known. IEEE 802.11b covers the operation of local wireless LANs on private and public property in the ISM frequency range (**I**ndustrial, **S**cientific, **M**edical: 2.4 and 2.483 GHz).

Please note that not all frequencies are permitted in every country! A table with the frequencies and the approval regulations is included in the appendix.



11 Mbps

The maximum bandwidth for data transfer is 11 Mbps. However, the actual throughput depends on both the distance and the quality of the connection. Increasing distance and decreasing connection quality reduces the transfer speed to 5.5 Mbps, then to 2 and finally 1 Mbps. The transfer range in the open is up to 400 meters, in buildings it is typically around 30 – 40 meters.

The actual range achieved strongly depends on the spatial environment. Interference and obstacles in particular have a strong influence on the range. Optimum positioning of the wireless stations is often decisive.

DSSS

The wireless LAN cards from ELSA use the DSSS process (**D**irect **S**equen**S**pread **S**pectrum) to shield against interference from other transmitters that may be using the same frequency range. A transmitter normally uses only a very narrow range of the available frequency band for transfer. If precisely this range is also in use by another transmitter, this will cause interference in the transfer. In the DSSS process the transmitter uses a broader section of the possible frequency band and so is less sensitive to narrow-band interference. This process is also used by the military to make eavesdropping more difficult.

1.5 The three *AirLancer*s

The *ELSA AirLancer* series offers you three models. This way, you can obtain access to the wireless LAN with conventional PCs and a variety of notebooks:

- ***ELSA AirLancer MC-11***
PC card (according to PCMCIA standard) for notebooks
- ***ELSA AirLancer USB-11***
Wireless LAN adapter for the link to a USB interface
- ***ELSA AirLancer PCI-11***
PCI adapter for the installation of an *ELSA AirLancer MC-11* in a PC. An *ELSA AirLancer MC-11* card is delivered with the product.

Each of the three *ELSA AirLancer* come in four versions. An EU and a WORLD version exist for different international regions. These come in two security levels: WEP64 and WEP128. The abbreviations of the versions are added to the name of the product, as extensions.



Specific features of the devices cannot be altered by software updates. For example, it is not possible to change an EU version into a WORLD version by updating the firmware, or to upgrade a WEP64 product to a WEP128.

1.5.1 Matching versions for international use

In the ISM range, up to 13 radio channels can be used. Some countries have only released 11 out of 13 channels for public use. This is why there are two versions of every ELSA wireless LAN adapter:

- The EU version can be used in the entire EU and in most of the associated European countries. The card supports 13 radio channels and meets the European CE standard.

- The WORLD version is meant for use in Europe and other countries, especially the USA. Apart from the European CE standard, it also meets the American FCC standard. The maximum number of channels is 11.

Accessing an EU access point with an *AirLancer*WORLD version

In order to be able to access an EU access point (supports 13 radio channels) with an *AirLancer*WORLD version (only supports 11 radio channels), you must choose a channel between 1 and 11 on the access point.

For guidance regarding the manual setting of channels please refer to the documentation of your access point. A list of the radio channels that are supported by the two versions is available in paragraph 9.2 'Radio channels' on page 54.

1.5.2

Encryption in two levels of security

Some countries regulate the use of encryption technology. This is why there are two versions of every *ELSA AirLancer* wireless LAN adapter:

- WEP64—for the encryption according to **W**ired **E**quivalent **P**rivacy (WEP) keys are used with an effective length of 40 bits.
- WEP128—this model version uses keys with a length of 104 bits. The encryption attained is considerably stronger, compared to the models using WEP64.



*Please inform yourself on the current legal regulations for the use of encryption technology in the country where you want to use an *ELSA AirLancer*. Make sure not to use devices that support illegal encryption's techniques.*

Detailed information on the use of WEP encryption can be found in chapter 8 'Security in the wireless LAN' on page 49.

1.6

What now?

The following three chapters will give you detailed descriptions and installation instructions for each of the three *AirLancer*. Every chapter covers one product. Just move straight on to the chapter for your product. Don't worry about skipping the other chapters.

The section of the documentation from chapter 5 onwards once again applies to all *AirLancer* network cards.

2

ELSA AirLancer MC-11

This chapter describes the *ELSA AirLancer MC-11* and a step-by-step instruction for the installation of the card. After successfully setting up hardware, drivers and ELSA software, we are left with setting up access to a wireless LAN. This configuration is described for all *AirLancer* in chapter 5.

2.1

Package contents

Please ensure first that the delivery is complete. The package should include the following components:

- *ELSA AirLancer MC-11*
- *AirLancer* CD including drivers, AirLancer Client Manager and electronic documentation
- User Manual

If anything should be missing, please contact your dealer.

2.2

The card

The wireless network card *ELSA AirLancer MC-11* is a PC card for notebooks and mobile computers with PC card interfaces according to the PCMCIA standard. It is slightly longer than other PC cards. The internal radio antenna of the *ELSA AirLancer MC-11* is located in the protruding part of the card.



- 1 PCMCIA slot
- 2 Connector for optional external antenna
- 3 LED for the operating mode of the card:

- Lit green – standard mode
- Blinking green – the card is in energy-saving mode

4 LED for the transmission and receiving mode:

- Off – no wireless activity
- Blinking – wireless data being sent or received

5 Integrated antenna

2.3 Installation

The installation of the *ELSA AirLancer MC-11* takes place in four steps:

- ① Checking the system requirements
- ② Plugging in the *ELSA AirLancer MC-11* into your PC
- ③ Installation of the drivers
- ④ Settings for the access to the wireless LAN—you will find the instruction for this configuration in chapter 5 'The AirLancer Client Manager' on page 37.

2.3.1 Checking the system requirements

Before starting the installation process, you should check if your computer fulfills all system requirements:

- Your PC or handheld /pocket PC must have at least one vacant PC card slot (PCMCIA, type II or type III)
- CD ROM drive (or, in case of Windows CE: an ActiveSync connector to a PC with CD ROM drive and Windows operating system).
- One of the following operating systems:
 - Windows 98, Windows 95
 - Windows Millennium Edition (Me)
 - Windows 2000
 - Windows NT 4.0
 - Windows CE 2.11/2.12 or Windows CE 3.0
 - Linux



- **Secure power supply**

If during the installation, the firmware of your *ELSA AirLancer MC-11* turns out not to be up to date, the setup program will suggest to you the automatic updating of the firmware. This action needs your confirmation.

Please ensure before beginning with the updating of the firmware that a stabile power supply is guaranteed during the installation. Avoid carrying out the installation on a notebook running on its battery. Please also ensure that your computer does not shut down or go into standby during the updating process. Close all applications before starting.

- **Additional system requirements for Windows NT 4.0**

For the installation under Windows NT 4.0 please ensure that the required system resources are available before placing the card into your computer. The procedure is as follows:

The *ELSA AirLancer MC-11* will be installed with IRQ 10 and the address range '400–437' by default. The interrupts and addresses can be viewed under **Start ► Programs ► Administrative Tools (Common) ► Windows NT Diagnostics**.

If the required resources are not available, please make a note of other free resources and specify them during the installation. It is also possible to change the resource allocations at a later time with **Start ► Settings ► Control Panel ► Network ► Adapters ► Properties**.

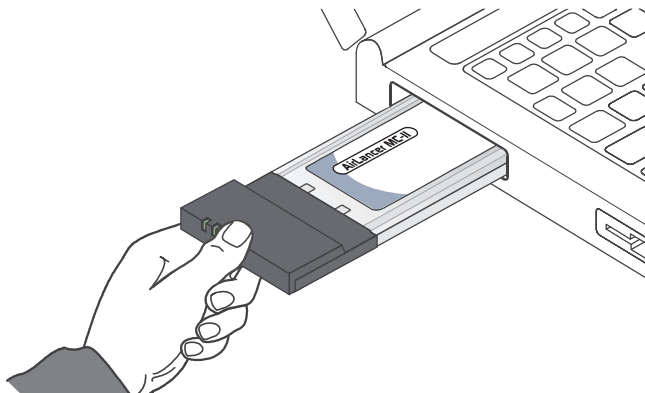
- **Additional system requirements for Windows CE**

The drivers for Windows CE require a firmware status of 6.06 or higher for *ELSA AirLancer MC-11*. Older cards may require updating of the firmware. This updating takes place automatically if you first install the card in a computer under Windows 98, Windows 95, Windows Me or Windows 2000.

2.3.2

Inserting the card in the computer

Insert the card into a free PC card slot of your enabled computer. Please ensure that the side with the product name faces up, while the side with the serial number faces downwards.



The operating systems Windows 98, Windows 95, Windows 2000 and Windows Me will generate a message on the screen shortly after inserting the card, announcing the detection of the new hardware.

The installation of the required driver differs for various operating systems. The following sections describe the installation procedure for your specific operating system.

2.3.3

Driver installation under Windows 98 and Windows 95

- ① Please confirm the 'Add New Hardware Wizard' window with **Next**, select the option **Search for the best driver for your device** from the list and click **Next**.
- ② Enable the option **Specify a location** in the following dialog window and disable all other options. Insert the *AirLancer* CD into the CD-ROM drive (e. g. 'D:\').
- ③ Use **Browse...** to switch to the folder containing the driver for your operating system (in which 'D:' is always the drive letter of your CD-ROM drive):
 - Windows 95: 'D:\driver\Win95\Elsaal11'
 - Windows 98: 'D:\driver\Win98\Elsaal11'
- ④ Confirm with **Next**, to start copying.
- ⑤ Click **Finish** to exit installation.

On the screen the window 'Add/Edit Configuration Profile' opens. This is where you will later configure the access to your wireless LAN. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

2.3.4

Installation of the drivers under Windows Me

- ① After starting the 'Add New Hardware Wizard', select the option **Specify the location of the driver** and click **Next**.
- ② In the following dialog window, select **Search for the best driver for your device (Recommended)**.
- ③ Disable the option **Removable Media (Floppy, CD-ROM...)**.
- ④ Please select the **Specify a location** option.
- ⑤ Insert the *AirLancer* CD in your CD-ROM drive (e. g. 'D:\'), use the **Browse** option to switch to the folder 'D:\driver\Winme\Elsaal11' (in which 'D:' is the drive letter of your CD-ROM drive) and click **Next**.
- ⑥ Confirm the display of the search results by clicking **Next**. When the wizard is ready, click **Finish** to end the installation.

On the screen, the window 'Add/Edit Configuration Profile' opens. This is where you will later configure the access to your wireless LAN. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

2.3.5

Installation of the drivers under Windows 2000

- ① Confirm the 'Found New Hardware Wizard' dialog window with **Next**.
- ② Select the **Search for a suitable driver for my device** option and click **Next**.
- ③ In the 'Locate Driver Files' dialog, select **Specify a location** and click **Next**.
- ④ Insert the *AirLancer* CD in your CD-ROM drive (e. g. 'D:') use the **Browse...** option to switch to the folder 'D:\driver\Win2k\Elsaal11' (in which 'D:' is the drive letter of your CD-ROM drive) and confirm with **OK**.
- ⑤ Confirm the display of the search results by clicking **Next**.

- ⑥ Windows 2000 then installs the driver. When the wizard is ready, press **Finish**.

On the screen the 'Add/Edit Configuration Profile' window opens. This is where you will later configure the access to your wireless LAN. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

2.3.6

Installation of the drivers under Windows NT 4.0

- ① Start the installation with **Start ► Settings ► Control Panel ► Network**. Select the 'Network Adapter' register tab and click the **Add** button.
- ② In the 'Select Network Adapter' window please select the button **Have Disk...**, and then enter the following path for the driver data on the *AirLancer* CD: 'D:\driver\Winnt\Elsaal11' (in which 'D:' is the drive letter of your CD-ROM drive). Accept the following prompts to log *ELSA AirLancer MC-11* as a network card.
- ③ Finish the installation and restart your computer.

In the next step you will configure the access to your wireless LAN. Please move on to chapter 5 'The AirLancer Client Manager' on page 37, where you will find the description of the required settings.

2.3.7

Installation of the drivers under Windows CE



Updated and additional information on the Windows CE driver and the supported devices can be found in the 'README.TXT' in the folder in the folder '\driver\Wince' on the AirLancer CD.

- ① Connect your Windows CE computer to a Windows PC that has a CD-ROM drive at its disposal. Start up both computers and establish an ActiveSync connection.
- ② Place the *AirLancer* CD in your CD-ROM drive. The setup program will start automatically. If the CD does not start automatically, please start 'AUTORUN.EXE' from the root folder on the CD.
- ③ Select **Windows CE driver** from the setup main menu.
- ④ From the following menu, select the Windows CE version of your mobile device.

- ⑤ The setup program will then start. Please follow the instructions. The drivers are installed on the Windows CE computer via the synchronization connection.

In the next step you will configure access to your wireless LAN. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, where you will find the description of the required settings.

2.3.8

Installation of the drivers under Linux

It is not necessary to recompile the kernel in the current Linux distributions. The PCMCIA components are included as modules. This short description is based on SuSE version 7.0.

The adaptations required to the parameters in the file `/etc/rc.config` will be made automatically during installation of the PCMCIA packet with the aid of YaST.

To continue setting up the card the file `/driver/mc/linux/AirLancer.conf` on the *AirLancer* CD must be copied to the directory `/etc/pcmcia`.

Then the card will log on to the first access point that it finds.

In order to configure a fixed network name, the following line must be commented out in the file `/etc/pcmcia/AirLancer.conf`:

```
module "wavelan2_cs" opts "network_name=MyNetwork"
```

`MyNetwork` must be replaced by the network names.

*See the file `Readme.txt` on the *AirLancer* CD for additional settings options.*



3

ELSA AirLancer USB-11

This chapter describes the wireless network adapter *ELSA AirLancer USB-11* and its setup step by step. The chapter ends with the successful installation of hardware and drivers. The following configuration of the access to a wireless LAN is described in chapter 5.

3.1

Package contents

Please ensure first that the delivery is complete. The package should include the following components:

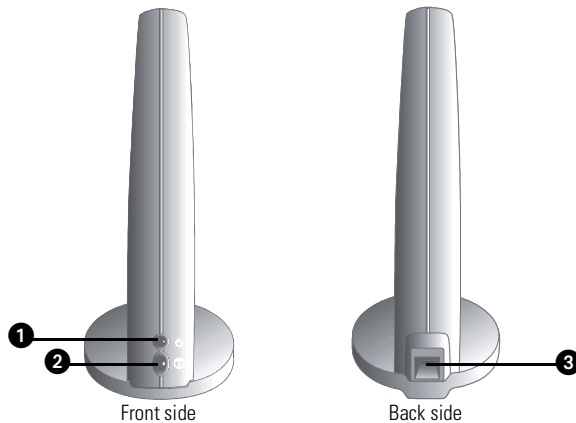
- *ELSA AirLancer USB-11*
- USB connector cable
- *AirLancer* CD including drivers, AirLancer Client Manager and electronic documentation
- User manual

If anything should be missing, please contact your dealer.

3.2

The adapter

The wireless LAN adapter *ELSA AirLancer USB-11* is connected externally to the USB interface of a PC. Power is supplied via the USB interface.



- 1 LED for the operation mode of the adapter

- Off – Device is switched off
- Orange – Device is switched on

2 LED for the transmission and reception status:

- Off – no wireless activity
- Blinking – wireless data being sent or received
- Green – The device is ready

3 USB connection

3.3 Installation

The installation of the *ELSA AirLancer MC-11* takes place in four steps:

- ① Checking the system requirements
- ② Connecting the *ELSA AirLancer USB-11* to your PC
- ③ Installation of the drivers
- ④ Settings for the access to the wireless LAN—you will find the instruction for this configuration in chapter 5 'The AirLancer Client Manager' on page 37.

3.3.1 Checking the system requirements

Before starting the installation process, you should check if your PC fulfills all system requirements:

- At least one free USB port
- CD-ROM drive
- One of the following operating systems:
 - Windows 98
 - Windows Millennium Edition (Me)
 - Windows 2000

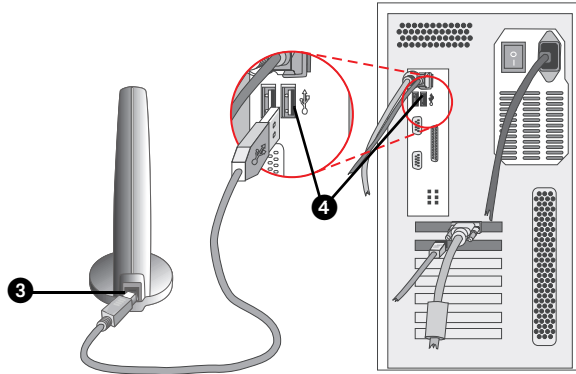
3.3.2 Connecting the adapter to your PC

USB supports so-called hot plugging, i.e. connecting devices while they are running. Insert the supplied USB cable into the connection **3** of the *ELSA AirLancer USB-11* and to the USB port of your PC while it is running **4**.



Only use the USB connector cable supplied for connecting the device to your PC.

The ELSA AirLancer USB-11 will be identified automatically (plug&play) and the installation of the operating software will be started.



If you connect your ELSA AirLancer USB-11 with the PC turned off, continue by booting the computer and starting the installation under your operating system.

Shortly after connecting the adapter, Windows displays a message reporting the detection of the new hardware.

You will find the appropriate instructions for the installation of any supported Windows version in the following sections.

3.3.3

Installation of the drivers under Windows 98

- ① Please confirm the 'Add New Hardware Wizard' dialog window with **Next**, then select the option **Search for the best driver for your device** from the list and click **Next**.
- ② Enable the option **Specify a location** in the following dialog window and disable all other options. Insert the *AirLancer* CD into the CD drive (e. g. 'D:\').
- ③ Use **Browse** to switch to the folder 'D:\driver\Win98\Eltaal11' (in which 'D:' is the drive letter of your CD-ROM drive).
- ④ Confirm with **Next** to start copying.

- ⑤ Click **Finish** to exit installation.

On the screen, the window 'Add/Edit Configuration Profile' opens. This is where you will configure access to your wireless LAN later. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

3.3.4

Installation of the drivers under Windows Me

- ① After starting the 'Add New Hardware Wizard' select the option **Specify the location of the driver** and click **Next**.
- ② In the following dialog window, select **Search for the best driver for your device (Recommended)**.
- ③ Disable the option **Removable Media (Floppy, CD-ROM...)**.
- ④ Please select the **Specify a location** option.
- ⑤ Insert the *AirLancer* CD in your CD drive (e.g. 'D:\'), use the **Browse** option to switch to the folder 'D:\driver\Winme\Elsa11' (in which 'D:' is the drive letter of your CD-ROM drive) and click **Next**.
- ⑥ Confirm the display of the search results by clicking **Next** When the wizard is ready, click **Finish** to end the installation.

On the screen, the window 'Add/Edit Configuration Profile' opens. This is where you will configure access to your wireless LAN later. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

3.3.5

Installation of the drivers under Windows 2000

- ① Confirm the 'Found New Hardware Wizard' dialog window with **Next**.
- ② Select the **Search for a suitable driver for my device** option and click **Next**.
- ③ In the 'Locate Driver Files' dialog, select **Specify a location** and click **Next**.
- ④ Insert the *AirLancer* CD in your CD drive (e. g. 'D:'), use the **Browse...** option to switch to the folder 'D:\driver\Win2k\Elsa11' (in which 'D:' is the drive letter of your CD-ROM drive) and confirm with **OK**.
- ⑤ Confirm the display of the search results by clicking **Next**.

- ⑥ Windows 2000 then installs the driver. When the wizard is ready, press **Finish**.

On the screen, the window 'Add/Edit Configuration Profile' opens. This is where you will configure access to your wireless LAN later. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

4

ELSA AirLancer PCI-11

This chapter describes the wireless network card *ELSA AirLancer PCI-11* and its setup step by step. The chapter ends with the successful installation of hardware and drivers. The following configuration of access to a wireless LAN is described in chapter 5.

4.1

Package contents

Please ensure first that the delivery is complete. The package should include the following components:

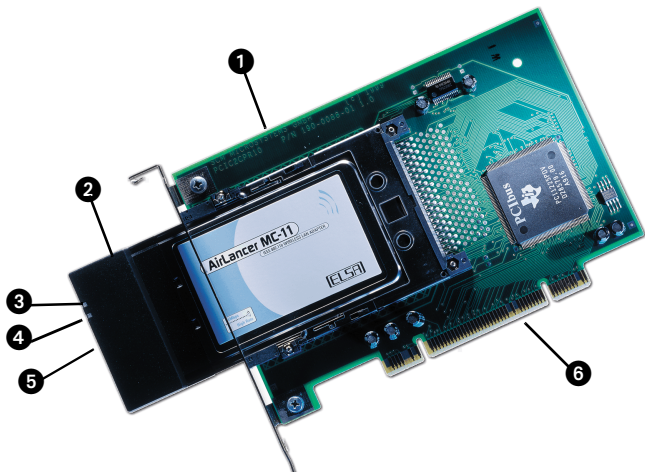
- PCI adapter *ELSA AirLancer PCI-11*
- *ELSA AirLancer MC-11* wireless network card
- *AirLancer* CD including drivers, AirLancer Client Manager and electronic documentation
- User manual

If anything should be missing, please contact your dealer.

4.2

The adapter

The *ELSA AirLancer PCI-11* allows the installation of an *ELSA AirLancer MC-11* into a PC. An *ELSA AirLancer MC-11* is included in the package contents.



- ❶ *ELSA AirLancer PCI-11* – PCI adapter for *ELSA AirLancer MC-11*
- ❷ *ELSA AirLancer MC-11* – Wireless LAN card (already inserted into *ELSA AirLancer PCI-11*)
- ❸ LED for the transmission and reception status:
 - Off – no wireless activity
 - Blinking – wireless data being sent or received
- ❹ LED for the operation mode of the card:
 - Lit green – standard mode
 - Blinking green – the card is in energy-saving mode
- ❺ Contact strip for PCI bus

4.3 Installation

The installation of the *ELSA AirLancer PCI-11* consists of five steps:

- ❶ Checking the system requirements
- ❷ Inserting the *ELSA AirLancer PCI-11* into your PC
- ❸ Inserting the *ELSA AirLancer MC-11* into the adapter
- ❹ Installation of the drivers
- ❺ Settings for access to the wireless LAN—you will find the instructions for this configuration in chapter 5 'The AirLancer Client Manager' on page 37.

4.3.1 Checking the system requirements

Before starting the installation process, you should check if your computer fulfills all system requirements:

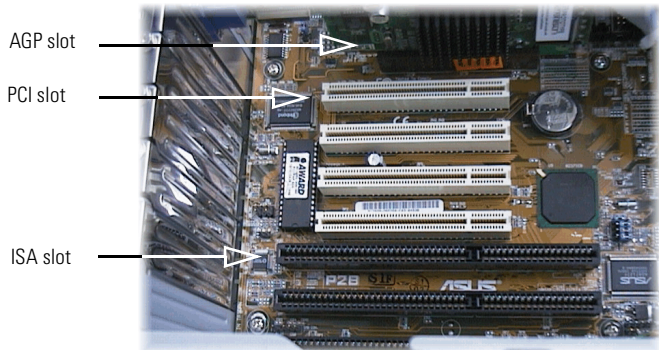
- Your PC must have at least one vacant PCI slot (PCI specification 2.1 or later)
- CD-ROM drive
- One of the following operating systems:
 - Windows 98
 - Windows Millennium Edition (Me)
 - Windows 2000

- Windows NT 4.0
- Linux

4.3.2

Installing the **ELSA AirLancer PCI-11**

- 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 *ELSA AirLancer PCI-11*. Before installing the card, remove the blind bracket for the slot you intend to use.



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

- ④ Carefully insert the *ELSA AirLancer PCI-11* into the free slot. Ensure that the card is correctly seated in its slot and tighten the screw of the mounting plate.
- ⑤ Replace the computer case and screw it tight.



Important step for installation under Windows NT 4.0

The ELSA AirLancer MC-11 will be installed with IRQ 10 and the address range '400–437' by default. For the installation under Windows NT 4.0 please

ensure that the relevant system requirements are available, before inserting the card into your computer. The procedure is as follows:

Switch the computer on. The interrupts and addresses can be viewed under **Start ► Programs ► Administrative Tools (Common) ► Windows NT Diagnostics**.

If the required resources are not available, please make a note of other free resources and specify them during the installation. It is also possible to change the resource allocations at a later time with **Start ► Settings ► Control Panel ► Network ► Network Adapters ► Properties**.

4.3.3

Inserting the *ELSA AirLancer MC-11*

- ⑥ Please insert the *ELSA AirLancer MC-11* into the PC card slot of the *ELSA AirLancer PCI-11*. Ensure that the PC card is in the correct position. Please refer to the picture on page 29 for a guide.
- ⑦ Switch the computer on.

After switching the PC on, Windows reports the detection of the hardware in a message that appears on the screen. Windows will then install the driver. You will find the appropriate instructions for the installation of any Windows supported version in the following paragraphs.

4.3.4

Installation of the drivers under Windows 98

- ① Please confirm the dialog window 'Add New Hardware Wizard' with **Next**, then select the option **Search for the best driver for your device** from the list and click **Next**.
- ② Enable the option **Specify a location** in the following dialog window and disable all other options. Insert the *AirLancer* CD into the CD-ROM drive (e. g. 'D:\').
- ③ Use **Browse...** to switch to the folder 'D:\driver\Win98\Elsaal11' (in which 'D:' is the drive letter of your CD-ROM drive)
- ④ Confirm with **Next**, to start copying.
- ⑤ Click **Finish** to exit installation.

On the screen, the window 'Add/Edit Configuration Profile' opens. This is where you will later configure the access to your wireless LAN. Now please

move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

4.3.5

Installation of the drivers under Windows Me

- ① After starting the 'Add New Hardware Wizard' select the option **Specify the location of the driver** and click **Next**.
- ② In the following dialog window, select **Search for the best driver for your device (Recommended)**.
- ③ Disable the option **Removable Media (Floppy, CD-ROM...)**.
- ④ Please select the **Specify a location** option.
- ⑤ Insert the *AirLancer* CD in your CD drive (e.g. 'D:\'), use the **Browse** option to switch to the folder 'D:\driver\Winme\Elsaal11' (in which 'D:' is the drive letter of your CD-ROM drive) and click **Next**.
- ⑥ Confirm the display of the search results by clicking **Next**. When the wizard is ready, click **Finish** to end the installation.

On the screen, the window 'Add/Edit Configuration Profile' opens. This is where you will later configure the access to your wireless LAN. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

4.3.6

Installation of the drivers under Windows 2000

- ① Confirm the 'Found New Hardware Wizard' dialog window with **Next**.
- ② Select the **Search for a suitable driver for my device** option and click **Next**.
- ③ In the 'Locate Driver Files' dialog, select **Specify a location** and click **Next**.
- ④ Insert the *AirLancer* CD in your CD drive (e. g. 'D:'), use the **Browse...** option to switch to the folder 'D:\driver\Win2k\Elsaal11' (in which 'D:' is the drive letter of your CD-ROM drive) and confirm with **OK**.
- ⑤ Confirm the display of the search results by clicking **Next**.
- ⑥ Windows 2000 then installs the driver. When the wizard is ready, press **Finish**.

On the screen, the window 'Add/Edit Configuration Profile' opens. This is where you will configure the access to your wireless LAN later. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, in order to change these settings.

4.3.7

Installation of the drivers under Windows NT 4.0

- ① Start the computer and log in with administrator rights.
- ② Insert the *AirLancer* CD into the CD drive and click **Install ELSA AirLancer PCI** in ELSA Setup.
- ③ Follow the on-screen instructions and restart your computer. Please note that the PCI Enabler must also be installed!

Perform the following steps to start the PCMCIA card services:

- ④ Please open **Start ► Settings ► Control Panel**, and double-click **Devices**.
- ⑤ Select the **PCMCIA** entry in the list. Click on the **Startup** button on the right-hand side of the window and select 'Boot'.
- ⑥ Click **OK** and restart Windows NT.
- ⑦ Start the installation with **Start ► Settings ► Control Panel ► Network**. Select the 'Network Adapter' register tab and click the **Add** button.
- ⑧ Press the **Have Disk...** button in the 'Select Network Adapter' window, and enter the following path for the driver data on the *AirLancer* CD: 'D:\driver\Winnt\Elsaal11' (in which 'D:' is the drive letter of your CD-ROM drive). Accept the following prompts to log *ELSA AirLancer MC-11* as a network card.
- ⑨ Finish the installation and restart your computer.

In the next step you will configure access to your wireless LAN. Now please move on to chapter 5 'The AirLancer Client Manager' on page 37, where you will find the description of the required settings.

4.3.8

Installation of the drivers under Linux

It is not necessary to recompile the kernel in the current Linux distributions. The PCMCIA components are included as modules. This short description is based on SuSE version 7.0.

The adaptations required to the parameters in the file `/etc/rc.config` will be made automatically during installation of the PCMCIA packet with the aid of YaST.

To continue setting up the card the file `/driver/mc/linux/AirLancer.conf` on the *AirLancer* CD must be copied to the directory `/etc/pcmcia`.

Then the card will log on to the first access point that it finds.

In order to configure a fixed network name, the following line must be commented out in the file `/etc/pcmcia/AirLancer.conf`:

```
module "wavelan2_cs" opts "network_name=MyNetwork"
```

`MyNetwork` must be replaced by the network names.

See the file README.TXT on the AirLancer CD for additional settings options.



5

The AirLancer Client Manager

When you insert the *AirLancer* CD into the CD-ROM drive in Windows 95, Windows 98 and Windows 2000, ELSA setup starts automatically. In Windows NT—or if the Autostart function is disabled—start ELSA setup with AUTORUN.EXE in the CD root directory.



When installing the ELSA AirLancer driver and software, please observe the licensing regulations.

5.1

Installation

- ① In ELSA setup select **AirLancer Client Manager**.

ELSA setup creates a new folder in the status menu for the AirLancer Client Manager. You will find the setup program for the AirLancer Client Manager in the \Program Files\ClientManager folder (unless you selected a different folder for the installation).

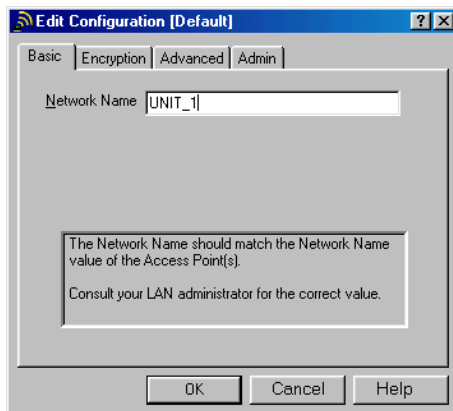


Depending on the operating system, it may be necessary to update the system. In this case the computer must be restarted during the installation. This will not interrupt the installation process.

5.2

Basic configuration

- ② After a successful installation a window opens for the configuration of the standard profile (default) or creating a new profile for the *ELSA AirLancer MC-11*.
- ③ First you can set in the selected profile whether you wish to access an access point or set up an ad hoc connection (peer-to-peer group).
- ④ For advanced settings, please click the **Edit Profile** button. In the case of an ad hoc network, the following window will ask you for the name of the network. In the case of an infrastructure network, a further window opens with four tabs:



- ⑤ Input the network name. If you are not sure of it, you can get it from your network administrator.



*The network name has to match with the other devices in the network (access points or radio cards). In case you have an access point with a disabled 'Closed Network' function within radio range, you can also enter **ANY** as a network name. The wireless station will then log on to the next available wireless LAN. Further information can be found in the 'Closed network' on page 49 and in the documentation of your access point.*

5.3 Overview of functions

5.3.1 Administration of profiles

- Setup of profiles
- Changing to another profile

5.3.2 Configuration

Created profiles can be configured with the **Edit Profile** button.

- For ad hoc networks, the network and the key names are listed in one menu.

- For access points, the following settings are available:
 - Assignment of WEP encryption key (**Encryption**)
 - Settings regarding power management and radio transmission (**Advanced** and **Admin**)

5.3.3

Analysis, diagnostics and information

In the **Advanced** menu of the AirLancer Client Manager you will find the diagnostics functions for the wireless LAN and your own wireless LAN interface:

- Card test and diagnostics (**Card Diagnostics**)
- Signal strength monitoring (**Link Test**)
- Monitoring and analysis of the wireless network (**Site Monitor**)
- Display of the available access points (**Site Monitor** ► **Selection**)

5.3.4

Further information

For more detailed information see the AirLancer Client Manager online help.

5.4

Encryption settings

Under **Encryption**, you enter the key to secure the connection in the entire wireless LAN.

5.4.1

General rules for WEP keys

Please note the following instructions:

- Matching keys must be used between devices.
In ad hoc networks, all devices use a common key. In infrastructure networks, all keys between the access point and the radio stations must match.
- WEP64 (40-bit key length) and WEP128 (104-bit key length) cannot be used parallel at an access point. To give users encrypted access to an access point with WEP64 devices, the encryption settings at the access point must be set to WEP64.
- Wireless LAN interfaces with WEP128 are backwards compatible to WEP64. A WEP128 device automatically logs onto the WEP64 encrypted access point using the short key.

5.4.2

Valid key characters

Keys consist of either alphanumerical strings of numbers '0'–'9', lower-case letters 'a'–'z' and upper-case letters 'A'–'Z' or of hexadecimal values '0'–'9' and 'a'–'f'.



Special characters are not valid.

On entering hexadecimal values, the number of characters for a key is doubled. For WEP64, 10 hexadecimal numbers must be entered, for WEP128 26 are entered.

Many WEP-compatible wireless LAN devices from other manufacturers only accept a hexadecimal format for the key or even generate their own special key values on the basis of user-defined passwords.

You may have trouble entering a key that accepts your *ELSA AirLancer* without a problem, when using a device from another manufacturer. In this case, we recommend that you use the key of the less flexible device for the connection.

5.4.3

Continuous change of key

Using an infrastructure network, you can enter up to four keys in the key list of the access point. This simplifies the changing of keys. In this case, all entered keys are valid in the wireless LAN during the transitional period. As soon as all stations have been set, the old key can be deleted from the list.



The continuous change of keys of an access point should not be mistaken for the optional four entries in the key list of an ELSA AirLancer. For each ELSA AirLancer only one key is used, i.e. the currently selected entry from the key list.

6 Example configurations

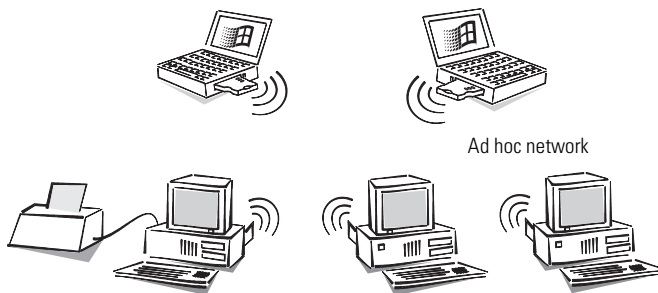
In this chapter we present two examples of the use of *ELSA AirLancer*.

6.1 Direct PC connection

Even small companies, branches and offices with small numbers of employees are increasingly using their computer workstations not simply as isolated solutions but they are also linking the individual computers, printers etc. to form a common structure, a network.

The Windows operating systems, used in most cases, include everything required for connecting several computers to a network. The wireless network cards from ELSA even make it unnecessary to wire the computers together. A small Windows network in which every computer can have “wireless” access to the released files, folders and printers on the other computers can be set up very quickly.

We shall take a small architectural office as an example of a peer-to-peer network (or ad hoc network). Two architects and one assistant work in the office. Each of the three has a desktop PC, and a printer, used by all three, is connected to the assistant's computer. The two architects also have notebook computers to keep them up to date during external appointments. It should be possible to exchange data between the notebooks and the desktop PCs and the notebooks should also be able to access the printer quickly at any time.



In this case all computers are fitted with *ELSA AirLancer MC-11* wireless network cards, and the desktop PCs are also fitted with the *ELSA AirLancer PCI-11* PCMCIA adapters.

Setting up the
wireless network
cards

To enable the wireless network cards to detect one another and exchange data with one another, the various parameters must have the same values.

Open the configuration for *ELSA AirLancer MC-11* with **Start ► Programs ► AirLancer ► PC Card Settings**.

Different profiles can be set up in the dialog window. For the 'Default' profile change the entry 'Access Point' to 'Peer-to-Peer Group'. Then click **Edit Profile** to set the network name.

Setting the network name

This setting is always required. Enter the name of the network in the 'Basic' tab. This name must be the same for all PCs in the wireless network.

The question mark has the answer! If you have questions about a specific setting, first try clicking on this symbol and then on the area that you wish to know more about.



Operating system
settings

After installing and setting up the drivers for *ELSA AirLancer PCI-11* and *ELSA AirLancer MC-11* in all computers, some components in the operating system—using Windows 98 as an example—still need to be set up.

- Network protocol

The network protocols TCP/IP and NetBEUI are required to implement a peer-to-peer network with the ELSA wireless network cards. Install the protocols if they are not already installed and check the protocol links to the *ELSA AirLancer MC-11* wireless network card in the control panel.

- Client

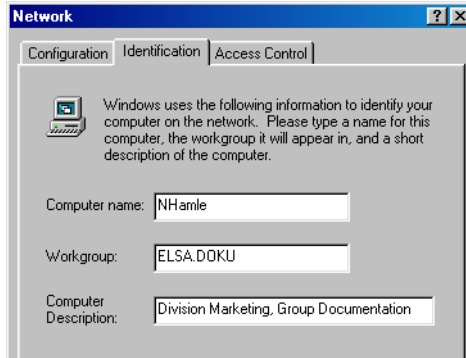
The Windows network client is required to permit all of the workstations in the Windows network to log on with names and passwords.

- Service

File and printer sharing permits drives and printers to be shared with other users in the Windows network.

- Name and group designation

Click **Start ► Settings ► Control Panel ► Network** and switch to the 'Identification' tab.



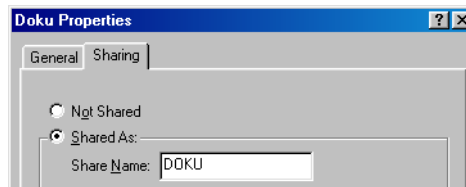
The name of the workstation must be unique. Names also may not recur in different groups.

The workgroup must be set the same for all computers that are intended to exchange data and resources.

- File and printer sharing

Ensure that file and printer sharing is enabled after the installation is complete. Click **Start ► Settings ► Control Panel ► Network ► File and Print Sharing**. Specify whether other users in the Windows network should be allowed access to the printer and/or files of this workstation.

In the Windows Explorer, right-click the drives, folders or printers that you would like to share with others on the network and select the item 'Sharing' from the context menu.



Enter a name for the shared resource and a description if required. The manner in which the resource can be accessed can be selected under access type, and by entering passwords as required.



It's easy to check whether the Windows network settings have been made correctly: the local computer must appear with its name in the Network Neighborhood.

*Access to other
resources*

Shortly after a computer has been started in a Windows network, the user can see the names of all other currently accessible computers in the network in the Windows Explorer Network Neighborhood (including the user's own computer).

The released folders and files are as easily accessible in Explorer as the hard disks and drives in the user's computer.

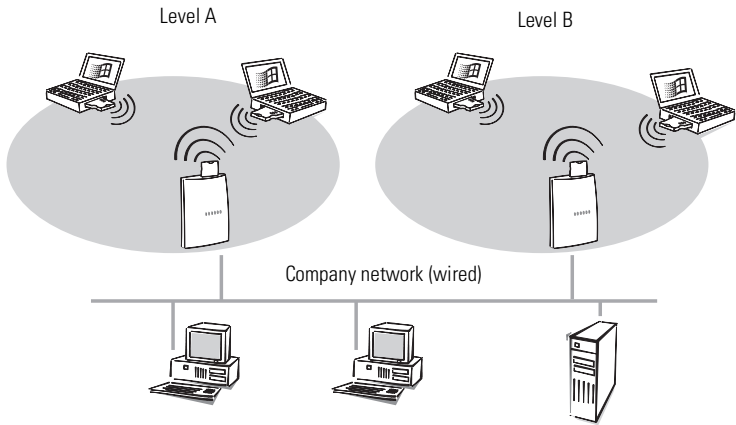
6.2

Link to a company network

As well as setting up independent networks, the second great advantage of the wireless network is the ability to expand existing wired networks. It makes no difference here whether the existing LAN is to be extended but wiring the new workstations is uneconomical or impossible or whether, for example, external employees should have a mobile link to the LAN during an internal assignment.

*For example: In the
sales department*

We shall use the sales department of a medium-sized company as an example for an infrastructure network. The sales employees are transferred to another floor. Because they are usually out in the field in any case, the new workstations are not fully wired but an access point, such as the *ELSA LANCOM Wireless L-11*, is used to access the company LAN. Additional access points are installed because the sales employees need network access for their notebooks in other departments of the company. They enable a sales employee to access the network anywhere inside the company premises. When the employee moves into another wireless cell, the stations automatically log off from the former access point and log on to the new access point. The procedure is known as roaming.



Every sales employee receives an *ELSA AirLancer MC-11* wireless network card for the notebook computer so the employee can log into the company network while in the office. To enable the sales employees to print, a network printer connected to the wired LAN is installed in their office.

To enable the wireless network cards in the notebooks to log on to the access point and exchange data with the LAN, the various parameters must have the same values as the wireless network card in the access point. You only need to specify the domain setting to be able to set up the first network contact.

Setting the network name

This setting is always required. Input the name of the network in the 'Basic Settings' tab. This name must be the same for all PCs in the wireless network.

You can set your own profile for multiple wireless LANs in the AirLancer Client Manager.

If you use your notebook both in the office and at home, it is wise to create two profiles: one 'Work' profile for the office and a 'Home' profile for private use. In case you wish to work at home at night or during the weekend, just switch to the 'Home' profile, and switch back to the 'Work' profile the next morning.

Encryption of wireless data

*Encryption based
on WEP*

On the 'Encryption' index card you can specify up to four different alphanumeric (5 or 13 characters) or hexadecimal (10 or 26 characters)

codes, thereby ensuring that the transmission of the wireless data cannot be easily intercepted. This is also backed up by the standardized WEP process, which encrypts the wireless data.

Checking the network protocols

Check the properties for *ELSA AirLancer MC-11* in **Start ► Settings ► Control Panel ► Network**. The TCP/IP protocol should always be marked in the list window of the 'Bindings' tab. Novell networks will require additional IPX/SPX protocols.

For information on configuring the access points, please refer to the documentation on ELSA LANCOM Wireless L-11 and ELSA LANCOM Wireless IL-11 and to the electronic documentation on the CD.



Access to the LAN

After setting up the wireless network cards, all functions and services available on the desktop PCs in the wired network will be available for the sales employees with their notebook computers. These include:

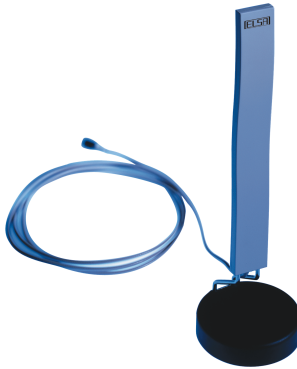
- File server (Novell, NT or other)
- Network printer in the sales department
- Internal mail system
- Internet through the LAN

7

ELSA AirLancer Extender

The *ELSA AirLancer Extender* is the optimal addition to a wireless LAN if you wish to extend your range. The omnidirectional antenna offers about 2.5 dBi more transmission and reception capacity (taking into consideration line losses). The *ELSA AirLancer Extender* can be flexibly positioned for optimized range and transmission characteristics.

It can be connected to both *AirLancer* wireless adapters (MC-11, USB-11, PCI-11) and *LANCOM Wireless* access points (*L-11* and *IL-11*).



The installation is quite simple: Every ELSA wireless LAN device has a socket where the *ELSA AirLancer Extender* is plugged in.

8 Security in the wireless LAN

Significant security considerations apply to the use of wireless LANs. It is often assumed that unauthorized access to transmitted data is relatively easy.

However, ELSAs wireless LAN devices permit the use of modern security technology:

- Closed network
- Access control via MAC address
- Encryption of the data transfer (WEP)

8.1 Closed network

Every IEEE 802.11 wireless LAN has a network name (IBSS-ID). This network name is used for the identification and administration of wireless LANs.

A wireless LAN can be set up in such a way as to give access to the network to any user. These networks are called open networks. A user can log onto an open network without the network name. Access is gained by entering the network name 'ANY'.

Access through 'ANY' is impossible in a closed network. Here the user must enter the correct network name. Unknown networks remain out of reach.

Ad hoc networks are automatically set up as closed networks and cannot be opened. Infrastructure networks can be operated in an open or a closed mode. The settings can be changed at the access point.

8.2 Access control via MAC address

Every network device has an unambiguous serial number. This serial number is called a MAC address (**M**edia **A**ccess **C**ontrol) and is unique to the world.

The MAC address is hardwired and cannot be altered. You will find the MAC address on the case of your ELSA wireless LAN device.

Access to an infrastructure network can be set for specific wireless LAN devices by specifying the MAC addresses. Filter lists are included in the access stations containing the MAC addresses controlling access.

This access control method is not available in the ad hoc network.

8.3

Encryption of the data transfer (WEP)

The encryption of the transferred data plays a special part in the wireless LANs. The supplementary encryption standard WEP is available for IEEE 802.11 radio transfer. WEP means **W**ired **E**quivalent **P**rivacy. The aim of WEP is to guarantee the degree of security of cable-based LANs in wireless LANs.

8.3.1

How WEP works

WEP encrypts frames on level 2 of the OSI model. WEP automatically protects any data of higher protocols (especially IP packets).

WEP uses the established RC4 encryption algorithm of the American cryptography specialist RSA Data Security, Inc. Two versions with different key lengths are used:

- **WEP64**

The nominal key length is 64 bits, of which 40 bits (5 characters of 8 bits each) are user-defined.

- **WEP128**

The nominal key length is 128 bits, of which 104 bits (13 characters of 8 bits each) are user-defined.



The shorter effective key lengths are related to the encryption method of the RC4 algorithm. RC4 uses the remaining 24 bits to generate a unique key for every block that needs to be encrypted. These 24 bits form the so-called “initialization vector”.

Encryption requires computing resources on the part of the wireless LAN device and has an impact on the transmission rate. With *ELSA AirLancer* the speed loss may reach up to 15% independent of the key length used.

8.3.2

Notes for the correct use of keys

By following some important rules regarding the use of keys, you can improve the security of the encryption process considerably.

- **Keep your keys as secret as possible.**

Never write a key down. Popular, but completely unsuitable storage options include: note-books, wallets, and text files in your computer. Do not pass on your key unnecessarily.

- **Choose a random key.**

Use randomly chosen letter and number sequences. Keys that consist of actual words are not secure.

- **Change your keys at a regular basis.**

Keys should be changed as often as possible. This requires some effort but improves security considerably. In the infrastructure network, it is possible to gradually change keys (see page 40).

- **If you have any suspicions, immediately change a key.**

When an employee who has access to a key leaves the company, change the keys of the wireless LAN immediately. Even if only the slightest indication of a leak exists, the key should be changed.

8.3.3

Further security improvements

Using WEP, it becomes difficult or even impossible for outsiders to gain access to the transmitted data. Like any technology, WEP has its limitations, although it offers a sufficient level of security in most practical cases.

It may therefore be useful to apply additional security technologies at a more advanced protocol level. Modern IPSec products (on level 3 of the OSI model) allow separate protection of the users in the wireless LAN. They also simplify the administration through automatic key management. The applies to applications such as SSL, PGP and S/MIME.

Any of these technologies can be applied to a WEP secured wireless connection, just as they use the "naturally" protected cable in the conventional network as a basis of communication.

9

Appendix

9.1

Technical data

Frequency band	2.4 GHz: 2400–2483.5 MHz (ISM)				
Range		11 Mbps	5.5 Mbps	2 Mbps	1 Mbps
	open environment	150 m	250 m	300 m	400 m
	closed environment	30 m	35 m	40 m	50 m
Delay Spread		65 ns	225 ns	400 ns	500 ns
Modulation technology	CCK for high and medium transmission rates (High and Medium)				
Antenna	integrated 2 dBi dipole antenna				
Bit error rate	better than 10 ⁻⁵				
Transmission power	15 dBm				
Standard	IEEE 802.11b, DSSS (Direct Sequence Spread Spectrum)				
Safety	WEP64 models: RC4 with 40-bit effective key length WEP128 models: RC4 with 104- or 40-bit effective key length				
	<i>AirLancer MC-11</i>	<i>AirLancer USB-11</i>		<i>AirLancer PCI-11</i>	
Connects	PC card (PCMCIA, type II)	USB interface		PCI bus (Spec. 2.1 or higher)	
Operating systems	Windows 98, Windows 95, Windows Me, Windows 2000, Windows NT 4.0, Windows CE, Linux	Windows 98, Windows Me, Windows 2000		Windows 98, Windows Me, Windows 2000, Windows NT 4.0, Linux	
Power intake (PC card)	doze mode -9 mA, receive mode -185 mA, transit mode -285 mA				
Package contents	elaborated documentation in German, English, French and Italian				
Service	warranty: 2 years support: via hotline and Internet				

9.2

Radio channels

Up to 13 DSSS channels are available in the usable frequency range of 2400 to 2483 MHz. The following overview shows which channels are supported by the different device versions (EU/WORLD).

Frequency range	2400–2500 MHz	
Channel no.	EU (CE)	WORLD (CE + FCC)
1	2412	2412
2	2417	2417
3	2422	2422
4	2427	2427
5	2432	2432
6	2437	2437
7	2442	2442
8	2447	2447
9	2452	2452
10	2457	2457
11	2462	2462
12	2467	–
13	2472	–

The values in bold are the default settings with which the *AirLancer* wireless adapter in the access point operates.

9.3

Restrictions for use within EU countries

At the time of printing, the following restrictions applied to the use of wireless LAN devices in the following EU countries:

Country	Restriction
France	Only the channels 10 (2457 MHz) and 11 (2462 MHz) can be used. A license is needed for both outdoor and indoor use.
Italy	A license is needed for indoor use. Outdoor use is not allowed.



Please inform yourself on the current radio regulations of the country where you are planning to use a wireless LAN device.

9.4 Declarations of conformity

9.4.1 European Union (CE)

The declarations of conformity for the CE standard of the European Union are available for download on the ELSA web site (www.elsa.com/download).

9.4.2 Federal Communications Commission (FCC)

ELSA AirLancer MC-11 and ELSA AirLancer USB-11

The radio adapters *ELSA AirLancer MC-11* and *ELSA AirLancer USB-11* have been tested and meet the requirements for digital class B devices in accordance with section 15C of the guidelines as provided by the Federal Communications Commission (FCC). The FCC ID is: IMR WLPCE24H.

These limits are designed to provide reasonable protection against radio frequency interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may interfere with radio communications if not installed and used in accordance with the instructions.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception (this can be determined by turning this equipment off and on), the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between this equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician.



The Federal Communications Commission warns the user that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ELSA AG AirLancer USB-11

Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

Compliance Information Statement

(Declaration of Conformity Procedure)

Responsible Party: ELSA Inc.

Address: 1630 Zanker Road
San Jose, CA 95112
USA

Phone: +1-408-961-4600

Type of Equipment: Wireless LAN USB device

Model Name: AirLancer USB-11

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

See user manual instructions if interference to radio reception is suspected.

On behalf of the manufacturer / importer
this declaration is submitted by

Aachen, February 22nd 2001

A handwritten signature in black ink, appearing to read 'Stefan Kriebel'.

Stefan Kriebel
VP Engineering
ELSA AG, Germany

ELSA AirLancer PCI-11**Compliance Information Statement**

(Declaration of Conformity Procedure)

Responsible Party: ELSA Inc.

Address: 1630 Zanker Road
San Jose, CA 95112
USA

Phone: +1-408-961-4600

Type of Equipment: Wireless LAN PCI device

Model Name: AirLancer PCI-11

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

See user manual instructions if interference to radio reception is suspected.

On behalf of the manufacturer / importer
this declaration is submitted by

Aachen, March 15th 2001



Stefan Kriebel
VP Engineering
ELSA AG, Germany

9.5

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 the *ELSA AirLancer* wireless adapter is two 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.

