

ELSA ECOMO™ 660

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Aachen, July 2000

Preface

Thank you for placing your trust in this product.

With the *ELSA ECOMO 660* you have selected one of ELSA's high-end monitors. ELSA products are subject to the highest of standards in production and quality control which are the foundation for consistently high product quality. This monitor was especially designed to satisfy the ergonomic requirements of professional users, and distinguishes itself with an extraordinary degree of reliability.

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.

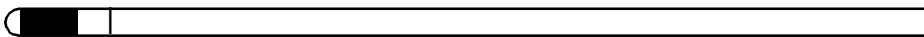
Further information on the Internet at 'www.elsa.com'

Our online services 'www.elsa.com' are available to you around the clock should you have any queries regarding your *ELSA ECOMO 660* or require any further support.

Our KnowledgeBase can be found at 'www.elsa.com/support'. In the 'Support' file section under 'Know-How', you can find answers to frequently asked questions (FAQs). Current drivers, firmware, tools and manuals can be downloaded at any time.

The KnowledgeBase can also be found on the CD.

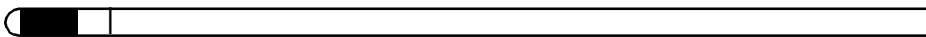




**To switch the monitor on or off,
press and hold the adjuster wheel for
about 5 seconds.**

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1 Introduction

1.1 General information

With its support for the new DVI (Digital Visual Interface) standard, the *ELSA ECOMO 660* is the state of the art in digital LCD monitor technology. It features a thin-film transistor (TFT) LCD panel with active matrix control and a visible diagonal size of 18.1" (46 cm). It is capable of displaying resolutions of up to 1280 x 1024. The *ECOMO 660* can satisfy even the most demanding user with optimal sharpness and brilliant colors. Its housing can be rotated by 90° for portrait-mode display.

The *ECOMO 660* has a very small footprint and is ideal when you need plenty of free space on your desk.

1.2 Features

- 18.1" TFT liquid-crystal panel
- Antireflective and protective coating
- High contrast and brightness
- Extremely wide viewing angle (140°)
- Maximum resolution: 1280 x 1024 (SXGA graphic format)
- Fully digital signal transmission for perfect picture quality
- Compatible to DVI (Digital Visual Interface) standard
- Compatible to DFP (Digital Flat Panel) standard with optional adapter
- Analog interface
- 24-bit color depth, 16.7 million colors
- Compact design, low weight (9.5kg)
- Power management function (VESA-DPMS-compatible)
- Plug&play (VESA-DDC2B)
- VESA-compatible mount for support arms or wall mounting
- USB self-powered hub (1 upstream port and 2 downstream ports)
- Provision for Kensington safety lock as theft protection
- Rotatable by 90° for portrait-mode display

1.3

Checklist

Before setting your monitor up for use, please check that all of the parts listed below have been included in the package:

- *ELSA ECOMO 660*
- AC adapter (230 V~)
- Power cable (between AC socket and AC adapter)
- DVI signal cable
- VGA signal cable
- USB cable (B type)
- Documentation
- CD including ELSA drivers, utilities and electronic documentation

1.4

For your safety

1.4.1

Power supply

Use the monitor only with the AC voltage specified on the AC adapter.

1.4.2

AC adapter



Use only the AC adapter designed for this monitor. Using the incorrect adapter may result in improper function or damage to the monitor and/or danger for the user.

1.4.3

Plug

- Do not modify or replace the AC plug of the monitor under any circumstances.
- Unplug the monitor from the AC socket if you will not be using it for an extended period.

1.4.4

Power cable and extension cable

- Always use the appropriate power cable with the correct plug type. For an AC voltage of 230 V (Europe), use a power cable with an approved plug corresponding to the safety regulations of your country. For 120 V AC (USA), use a UL- and CSA-approved power cable.

- We recommend using the supplied power cable. In the event that you need a different cable, use a H05VV-F or VW-1, 18AWG x 3G type cable.
 - Do not overload power cables or sockets. Ensure that the devices connected to a single AC socket do not exceed a total power consumption of 7.0A.
 - Also be sure that the total power consumption of the devices connected to an extension cable do not exceed the rated maximum capacity of the cable.
 - If the monitor is to be plugged into the power supply of the PC rather than an AC socket, ensure that the computer is UL-approved and is capable of delivering at least 2.0A at 100~240V AC, 50/60Hz.
- Do not place heavy objects on the power cable. Do not place the cable in any location where persons might trip over it.

1.4.5

Ambient conditions

- Place the monitor on an even, horizontal surface.
- Set the monitor up in a well-ventilated room and ensure that the ventilation slots remain clear.
- Ensure that no foreign objects fall into the housing through the ventilation slots.
- Do not expose the monitor to
 - rain or water
 - excessive heat, cold or humidity
 - direct sunlight
 - dusty environments
 - equipment that generates strong magnetic fields

1.4.6

Servicing and repairs

- Do not open the housing of the monitor (with the exception of the flaps and covers that are expressly covered in the manual). If servicing or repairs should ever become necessary, please contact ELSA's support.

2 Installation

The installation of the *ELSA ECOMO 660* is a two-part process:

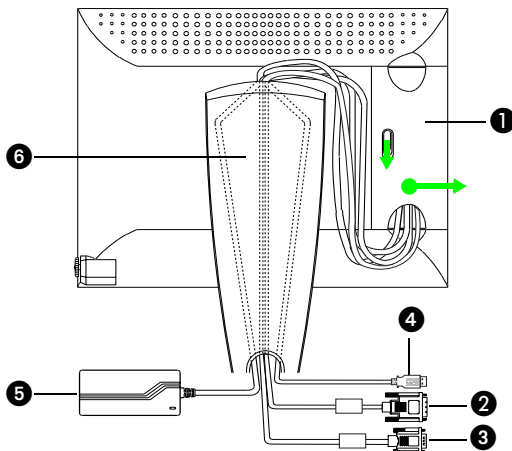
- the connection of the LCD monitor to your PC
- the installation of the drivers under Windows

In addition, this chapter covers adjusting the display position, provides information on the proper care for the display and explains the function of the USB hub under Windows.

2.1 Connecting the LCD monitor



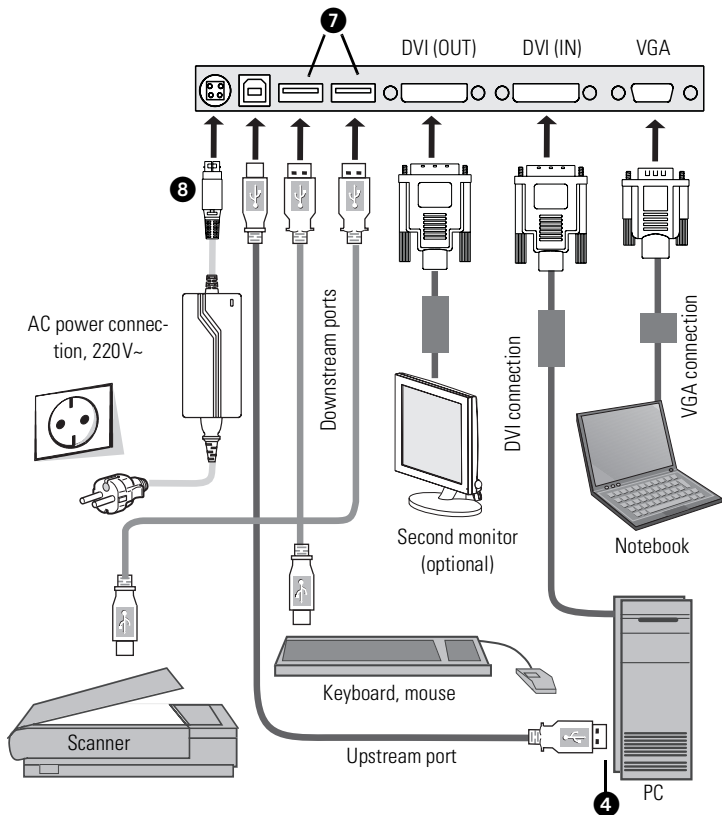
When removing connector cables from your PC, always pull on the plug rather than on the cable to prevent damage to the cable.



- ① Make sure that your computer is switched off.
- ② Open the connector cover ①. Push the button on the cover downwards and move the cover toward the outer edge of the unit to remove it.
- ③ Connect the display to the computer. The *ECOMO 660* features both an analog and a digital input. Parallel operation is not possible, so a decision is called for:
 - if your graphics board has a digital output (DVI or DFP), then use the DVI cable ② to connect that output to the DVI input (DVI-IN) of the

ECOMO 660. Connecting to a DFP graphics board requires the optional DVI-DFP adapter.

- Connect a conventional VGA graphics board (analog RGB output) with the VGA signal cable ③.
- ④ USB devices can also be connected to the *ECOMO 660*.
 - Connect the square type B plug of the USB cable to the USB upstream port of the monitor and the other end (flat type A plug, ④) to your computer or to another USB hub.
 - Connect your USB devices (mouse, keyboard, scanner, etc.) to the USB downstream ports ⑦.



- ⑤ A second *ECOMO 660* monitor (or DVI-D compatible unit) can be connected to the DVI-OUT port. This second monitor will display the

same picture as the first. A second monitor can only be connected to the DVI-OUT port if the first monitor is using the digital DVI-IN port.

- ⑥ Replace the connector cover. Place the cover against the three retainer openings along the outer edge of the unit, press the button downwards and fit the cover into the unit.
- ⑦ Connect the output plug ③ of the AC adapter ⑤ to the monitor and the other end to an AC power socket.
- ⑧ The power and data cables can be run through the integrated cable duct in the base ⑥ of the monitor to ensure that the unit also makes a good impression when viewed from the back.

Open the cover of the cable duct on the rear of the unit by pulling the retaining clips behind the cover at the top upwards slightly and remove the cover. The various cable thicknesses are accommodated by the cable clips inside the duct. When all cables have been neatly installed, insert the cover into the two retainer openings at the base and press it against the duct until the retainer clips snap into place. Ensure that no cables are pinched by the cover and that no suppressors (iron cores) are preventing the cover from fitting properly.

- ⑨ Switch the computer on.

2.2

Installing the drivers under Windows

The first time you boot your computer with the new display, Windows (versions 95, 98 or 2000) will recognize the presence of new hardware and will launch the hardware wizard. The use of the hardware wizard is very similar in all Windows versions.

Most of the dialog boxes displayed by the hardware wizard can be acknowledged with **OK**, **Next** or **Finish**.

Be sure, however, to select the *ELSA ECOMO 660* on the *ECOMware* CD as the device to be installed. If the hardware wizard doesn't suggest the *ELSA ECOMO 660* as an installation option, help it along by having it search the 'drivers' folder of the *ECOMware* CD for drivers.

Once the hardware wizard has successfully completed the installation, please restart your PC. Your *ELSA ECOMO 660* is now ready!

For further information on using the hardware wizard, please refer to your Windows manual.



2.3

Adjusting the screen position

EN



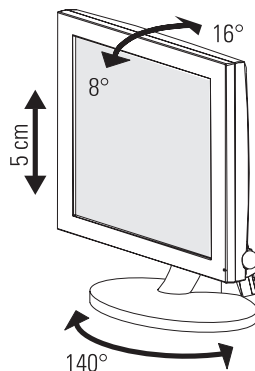
To prevent damage, do not touch the surface of the panel when adjusting the screen position.

2.3.1

Swiveling, tilting, adjusting the display height

The LCD panel can be tilted forward (up to 8°) or back (up to 16°), or swiveled on its base to the right or left (70° in either direction) in order to set the optimal viewing angle.

In addition, the height of the LCD panel can be adjusted by a total of 5 cm.



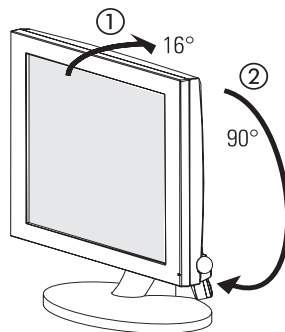
2.3.2

Rotation

The orientation of the LCD panel (landscape or portrait) can be changed.

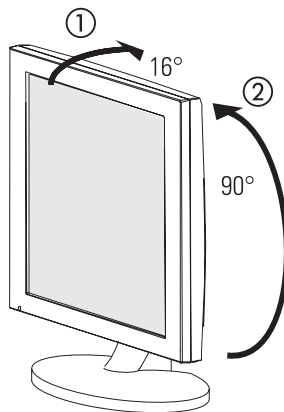
From landscape to portrait

Tilt the LCD panel all the way back to ensure that the housing does not strike the base when turning ①. Turn it **clockwise** until it locks in the vertical position ②.



From portrait to landscape

Tilt the LCD panel all the way back to ensure that the housing does not strike the base when turning ①. Turn it **counterclockwise** until it locks in the horizontal position ②.



EN



Additional software is required to be able to use the ECOMO 660 in portrait mode. This software is not included with the ECOMO 660 and must be ordered separately.

2.4

The proper care for your monitor

The surface of the monitor panel features an antireflective coating. Never touch the surface of the panel with rough, sharp or pointed objects such as screwdrivers or ballpoint pens to prevent damage to the coating.

To clean the panel, use a mild detergent such as normal hand soap. Use a soft cotton cloth to apply the detergent and to wipe the panel dry. Take care not to apply excessive pressure, as small particles of dust on the panel might otherwise scratch the surface.

Never use abrasive cleansers, scrubbing sponges, or solvents such as alcohol or lighter fluid.



2.5

The USB function under Windows

2.5.1

What does USB stand for?

USB stands for “Universal Serial Bus”, a new interface standard offering the PC user a substantial gain in convenience when connecting and configuring peripheral devices. Up to 127 devices such as keyboards, mice, modems,

removable drives or digital cameras for videoconferencing can be connected to a USB system. The configuration of each individual peripheral device is handled automatically by the USB.

The USB standard involves a standardized plug type and cable that makes special plugs, cables and additional software superfluous. This eliminates the old, familiar cabling confusion and the risk of hardware damage through incorrect connections. A major advantage is that all devices can be interconnected—in much the same manner as in a network. This also permits great planning flexibility: Not all peripheral devices need to be connected centrally to the computer.

2.5.2

Who can use USB?

The USB function is only available if your hardware and operating system support it. In this case, Windows identifies the hardware, sets up the USB and controls the connected devices.

USB support is integrated in Windows 98 and Windows 2000. The situation can be different for earlier versions, however. Not all versions of Windows 95 support the USB function.

2.5.3

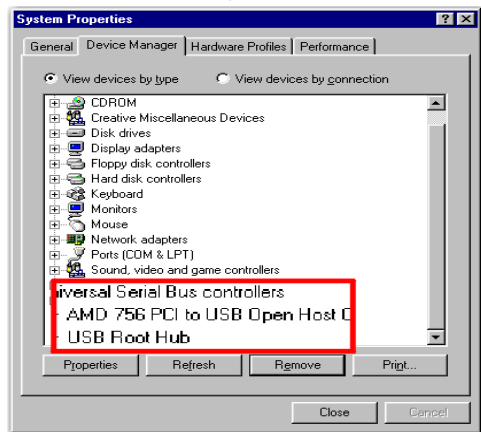
Checking USB compatibility



System

Click on **Start ► Settings ► Control Panel ► System** and have Windows display the existing devices on the 'Device Manager' tab.

The Device Manager will show whether or not a USB controller is currently installed.



For further information on USB, please visit www.usb.org.

3

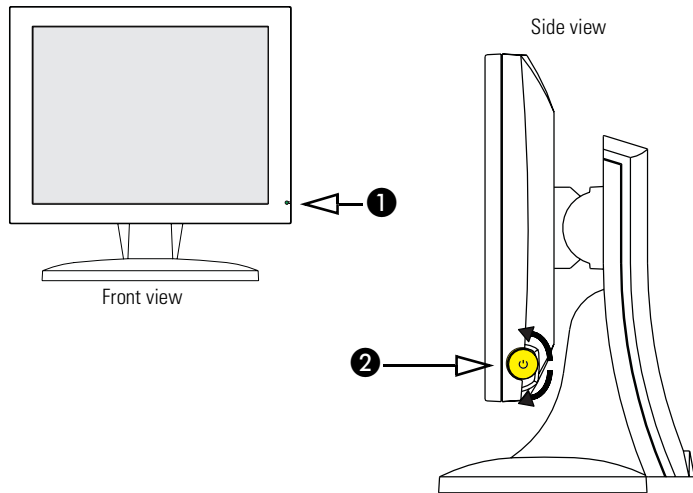
Front control panel and functions



Please save the monitor's carton and packing material for future storage or shipping purposes. Be sure to store the monitor in accordance with the safety marks on the carton and the ambient conditions described in this manual (temperature, humidity).

3.1

Aspects of your monitor



- ❶ The signal light provides information on the monitor's current operating status:

green	The monitor is switched on and works in the normal mode .
amber	The monitor is in the power saver mode . The monitor will "wake up" and return to normal mode at the next key-stroke or movement of the mouse.

- ❷ The lateral adjuster wheel is located behind the signal light ❶. The adjuster wheel can be turned upwards and downwards, and can be pressed into the monitor. All of the monitor's settings and functions can be controlled using this adjuster wheel.

3.2 Switching the monitor on and off

To switch the monitor on or off, press the adjuster wheel ② and hold it for approx. **5 seconds**.

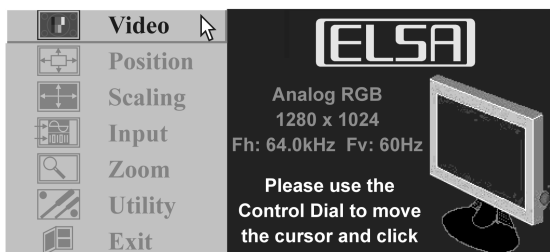
3.3 On screen display (OSD)

The on screen display (OSD) makes light work of fine tuning the picture on your monitor. Its adjustment options range from simply changing the brightness to setting the monitor's sharpness and color temperature.

When the monitor is using a digital connection via the DVI-IN port, the display is automatically set for optimal quality. As a result, a number of settings can no longer be made manually when using digital control. The functions only available in analog mode are marked with an asterisk (*) in the following overviews.

3.3.1 Launching the OSD

To call up the on screen display, briefly press the adjuster wheel into the monitor. The monitor must be running in normal mode (green signal light).



3.3.2 Using the OSD

The main selection is on the left-hand side of the on screen menu. Select a menu item by turning the adjuster wheel. Press the adjuster wheel briefly to confirm your choice.

All of the OSD functions are set in this manner. The displayed values can be increased by turning the adjuster wheel upwards and reduced by turning it downwards. Confirm the selected function or setting by briefly pressing the adjuster wheel.



The mouse cursor in the on screen menu is not controlled by the mouse of your computer. The menu items can only be selected using the adjuster wheel of the display.

There are two ways to exit the OSD function: Either select **Exit** in the main menu, or wait several seconds for the OSD to close automatically. Changes are saved automatically in both cases.

Display of current picture parameters

The most important picture parameters can be found in the main menu below the ELSA logo:

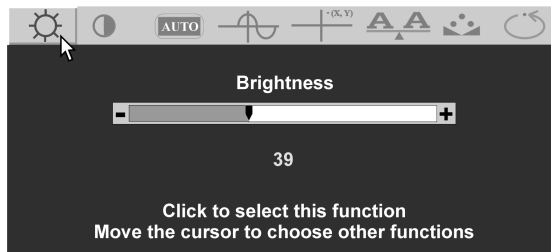
- Digital/analog control: 'Analog RGB'
- Screen resolution: '1280 x 1024'
- Horizontal frequency: 'Fh: 64.0kHz'
- Refresh rate: 'Fv: 60Hz'









3.3.3

Functions of the OSD




The OSD has one main menu and six submenus. All of the functions of these menus are covered in the following function reference. The functions have been sorted according to submenus. Functions that are not available under digital control have been marked with an asterisk (*).

Video



Symbol	Function	Description
	Brightness	Increase or decrease the brightness
	Contrast *	Increase or decrease the contrast
	Auto-adjustment *	Automatic adjustment of picture width and height, horizontal and vertical picture position
	Frequency *	Sets the refresh rate to the output values of the graphics board
	Phase *	Adjusts the analog/digital signal conversion; affects the clarity and sharpness of the picture
	Sharpness *	Adjusts the sharpness of the picture
	Color temperature *	4 color temperatures may be selected: 5000 K, 6500 K, 8000 K and 9500 K
	Return to main menu	Return to main menu

Position *

Symbol	Function	Description
	Horizontal position *	Horizontal picture position (left/right)
	Vertical position *	Vertical picture position (up/down)
	Return to main menu	Return to main menu

Scaling

The scaling menu lets you adjust the output of your graphics board to suit the aspect ratio of your display. Changing the scaling parameters permits you to project partial contents of the display, such as PowerPoint presentations, onto the full display area. The scaling function can also prove useful when using multiple displays.

The default value is 'Full Screen'.

Please note that changing the scaling values may lead to a distortion of the picture. If circles no longer display as round, for example, change the value to 'Maintain aspect ratio'.



Input

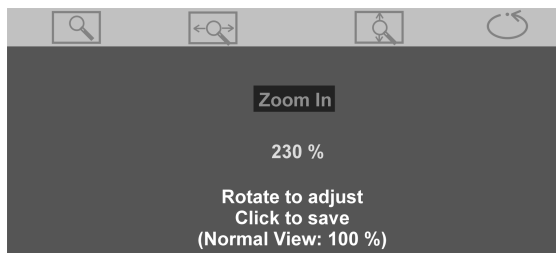
Choice of signal input:





Analog VGA	Connection via the analog VGA port
Digital DVI	Connection via the digital DVI port










After changing the input signal, the display will go dark briefly and the OSD will close automatically.

ZOOM



Symbol	Function	Description
	Zoom in	Enlarges the picture. The zoom factor is displayed in percent. The normal display setting is 100%.
	Horizontal Panning	Moves the enlarged section to the left or right (only with zoom factors > 100%)
	Vertical panning	Moves the enlarged section up or down (only with zoom factors > 100%)
	Return to main menu	Return to main menu

Utility

Symbol	Function	Description
	OSD horizontal position	Horizontal on-screen menu position
	OSD vertical position	Vertical on-screen menu position
	OSD background	Selects the OSD background. You may choose between 'Translucent' and 'Opaque'.
	OSD display timer	Duration of the OSD display. If the adjuster wheel has not been used in this time, all settings are saved and the OSD closes.
	DPMS power saving	Sets the power saving mode. This setting has no effect on the settings of the graphics board.
	Restore to factory default setting	This command returns all of the OSD settings to their factory defaults.
	Return to main menu	Return to main menu

Exit

Saves the modified settings and closes the on screen menu.

4 Advice and help

4.1 The monitor does not switch on

- Ensure that you are pressing the adjuster wheel on the right behind the signal light for approx. **5 seconds**.
- Check whether the monitor is connected to a source of AC power.
- If the signal light is lit orange: Ensure that the signal cable is properly connected. Switch the computer off and back on.

4.2 The monitor does not respond when you start the computer

- Check whether the monitor is switched on (the light on the front right-hand side should be lit green).
- Switch the monitor off and check whether the power supply of the monitor and the signal cable are properly connected.
- Check whether the BIOS and drivers of the graphics board are the current versions.

4.3 The screen is black

- The monitor may switch off automatically during use due to the power saving function. Move the mouse or strike a key to restore the monitor to normal operation.
- Use the adjuster wheel as described in the 'Front control panel and functions' section.

4.4 The display does not properly show individual pixels

- Individual pixels may be defective for technical reasons related to the production of the panel. For the *ECOMO 660* the following number of defective pixels are within the tolerance range for a Class A panel:
 - max. 9 subpixels (red, green, black or blue)
 - max. 3 full pixels (white)

4.5 The picture is too dark

- Correct the brightness in the on screen menu with the **Video ► Brightness** function (see page 19).

4.6 The monitor displays colors incorrectly

- Check the connections of the signal cable.

4.7 Digital or analog connection?

- The monitor can be used with conventional VGA graphics boards thanks to its RGB input (15-pin D shell connector). The digital DVI connector is designed for use with modern graphics boards with a suitable interface. The DVI connection ensures outstanding picture quality thanks to the loss-free digital transmission of the video data. For the best possible picture quality, use the *ELSA ECOMO 660* with a digital graphics board.
- Connect your computer to one port only: either the digital or the analog connection. If your graphics board has both types, use the digital connection.

4.8 What is DVI, what is DFP?

- 'Digital Visual Interface' (DVI) and 'Digital Flat Panel' (DFP) are modern industry standards for the control of monitors. Both are based on purely digital technology. The essential difference between the two standards is the design of the connector. An optional DVI-DFP adapter is required to connect the *ECOMO 660* to a DFP board.

4.9 Two computers on a single monitor

- The *ELSA ECOMO 660* has two inputs: an analog VGA and a digital DVI input. It is possible to connect two computers to these inputs, one to the analog and one to the digital input.
- The *ECOMO 660* can only display one picture at a time and automatically selects the computer that was booted first.
- You can use the OSD to switch manually to the other computer: In the menu item **Input**, select the required signal input (see page 21).

4.10 The picture isn't sharp

- Correct the sharpness in the on screen menu with the **Video ▶ Sharpness** function (see page 19).
- If the edges of letters and graphics appear softer than expected but the sharpness is already at its maximum level, then this is due to a technical characteristic typical of LCD displays. All LCD displays have a fixed number of pixels—the *ELSA ECOMO 660* has a resolution of 1280 columns and 1024 rows (= 1,310,720 physical pixels). The display achieves its maximum picture quality when using this “natural” resolution. Unlike tube monitors, LCD monitors can only simulate other resolutions. This is accomplished using interpolation methods that result in a loss of sharpness.

4.11 The display of circles and squares is distorted

- In the on screen menu, select **Scaling** and 'Maintain Aspect Ratio' to ensure a correctly proportioned display.

4.12 How can I change the resolution?

- The screen resolution is set via the graphics board. The monitor recognizes the signal and adjusts itself accordingly (see 'Adapting the monitor to the graphics board' on page 28.).

4.13 How can I change the refresh rate?

- Unlike tube monitors, there is no visible advantage to using a higher refresh rate with an LCD monitor. LCD panels display all pixels simultaneously, resulting in a stable picture. They are thus flicker-free, even at low refresh rates. A refresh rate of only 60 Hz is recommended for LCD monitors.

The display of stereoscopic 3D graphics in conjunction with LCD shutter glasses such as the *ELSA 3D REVELATOR*, on the other hand, requires a refresh rate of at least 120 Hz. LCD monitors do not support such high refresh rates.

4.14

Does the monitor also work under Linux and MacOS?

- Yes. If your computer does not have a digital DVI or DFP interface, please use the analog VGA interface. Certain computers (especially Apple Macintosh) require an adapter.

5 Technical data

5.1 Performance data and specifications

LCD panel	18.1" TFT LCD panel, antireflective and protective coating
Pixel size	0.2805 mm x 0.2805 mm
Monitor	
Visible monitor size	18.1" (46 cm diagonal) = 359 mm x 287 mm
Resolution (maximum)	SXGA 1280 x 1024
Maximum color depth	24 bit, 16.7 million colors
Color temperatures	5000 K, 6500 K, 8000 K, 9500 K
Brightness	200 Cd/m ² (typical)
Contrast	300:1 (typical)
Viewing angle	± 70° horizontal, 70° upward, 40° downward
Response time	45 ms (typical)
USB	1 upstream port, 2 downstream ports
Plug&play	VESA DDC2B
Digital interface	DVI (Digital Visual Interface), compatible to DFP (Digital Flat Panel) with adapter
Analog interface	DP9-15P; RGB signal 0.7 V; input impedance 75 Ω, separate horizontal/vertical synchronization; frequency range: horizontal 30–95 kHz, vertical 50–85 Hz (UXGA 50–60 Hz)
AC adapter	
Power supply	100–240 V AC, 60/50 Hz
Maximum power consumption (normal operation)	< 40 W
Power saver mode	< 5 W
Dimensions and weight	
Dimensions	431 mm x 467 mm x 239 mm (W x H x D)
Weight	9.4 kg
Ambient conditions	
Temperature	Operation: 5°–35° C, storage: -20°–55° C
Humidity	Operation: 20%–80% (non-condensing) storage: 10%–90% (non-condensing)
Maximum altitude	Operation: up to 3,000 m, storage: up to 10,000 m
Certifications	UL, FCC-B, TCO '99, CUL, CE, TÜV/GS, UL1950, EPA Energy Star



ELSA reserves the right to change technical specifications without notice in the course of ongoing product improvement. ELSA AG shall not be liable for technical or printing errors in this manual, nor for damages resulting from the delivery or use of the supplied material.

5.2

The power management function

The *ELSA ECOMO 660* complies with the guidelines set by VESA and EPA Energy Star. The *ELSA ECOMO 660* will automatically reduce power consumption if the monitor is connected to a graphics board complying with VESA DPMS.

Mode	Power consumption	Power-On indicator
Normal operation	< 40 W	green
Power saver mode	< 5 W	amber

5.3

Adapting the monitor to the graphics board

The *ELSA ECOMO 660* can be controlled via a modern DVI digital interface, as well as by a traditional RGB analog signal. The monitor supports a maximum resolution of 1280 x 1024 when being controlled via the DVI interface. The modern design of the DVI interface ensures that the monitor and graphics board are automatically set to their optimal frequencies.

The situation is different when using an analog RGB signal, however: here the *ECOMO 660* supports horizontal frequencies between 30 kHz and 95 kHz; the vertical frequency (refresh rate) can range from 50 Hz to 85 Hz.

The monitor identifies analog signals with an integrated multiscan function. If the signal is within the valid frequency range, the *ECOMO 660* will automatically set the picture position, phase, refresh rate and contrast with the auto-adjustment function to suit the identified signal. In some cases, minor manual corrections may improve the results (see 'On screen display (OSD)' on page 18).

The optimal settings for the 20 most common analog signals have been preset by the factory. If the monitor identifies one of the standards stored in this table, the display image will be adjusted accordingly.

Mode	Resolution		Frequency	
	Horizontal	Vertical	Fh (kHz)	Fv (Hz)
VGA	720	400	31.5	70
	640	480	31.5	60
VESA	640	480	37.9	72
	640	480	37.5	75
	640	480	43.3	85
	800	600	35.1	56
	800	600	37.9	60
	800	600	48.1	72
	800	600	46.9	75
	800	600	53.7	85
	1024	768	48.4	60
	1024	768	56.5	70
	1024	768	60.0	75
	1024	768	68.7	85
	1280	1024	64.0	60
	1280	1024	80.0	75
Mac	640	480	35.0	67
	832	624	49.7	75
	1024	768	60.2	75

5.4

Monitor inputs

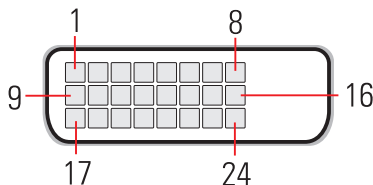
5.4.1

The DVI interface

The Digital Visual Interface (DVI) permits a direct connection between an LCD monitor and the digital output of a graphics board. This eliminates the conversion of the signal from digital to analog and back and the loss in quality that this entails.

Contact assignment

The *ECOMO 660* features a 24-pin connection with the following pin assignment:



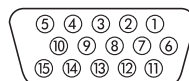
Pin	Signal assignment	Pin	Signal assignment
1	TMDS data 2-	13	TMDS data 3+
2	TMDS data 2+	14	+5 V power supply
3	TMDS data 2/4 shield	15	Ground (for +5 V)
4	TMDS data 4-	16	Hot-plug recognition
5	TMDS data 4+	17	TMDS data 0-
6	DDC clock	18	TMDS data 0+
7	DDC data	19	TMDS data 0/5 shield
8	No connection	20	TMDS data 5-
9	TMDS data 1-	21	TMDS data 5+
10	TMDS data 1+	22	TMDS clock shield
11	TMDS data 1/3 shield-	23	TMDS clock+
12	TMDS data 3-	24	TMDS clock-

TMDS = Transition Minimized Differential Signalling

5.4.2

The VGA D shell socket

The input is a 15-pin VGA socket for the transfer of analog RGB video signals (0.714 Vp-p, positive) and SYNC signals.



5.4.3

Contact assignment

Port	Signal assignment	Port	Signal assignment
1	red	9	+5V (for DDC supply)
2	green	10	sync ground
3	blue	11	not assigned
4	reserved	12	DDC data
5	ground	13	horizontal synchronization
6	red ground	14	vertical synchronization
7	green ground	15	DDC data clock
8	blue ground		

6 Appendix

6.1 TCO '99



Congratulations! You have just purchased a TCO '99 approved and labeled product! Your choice has provided you with a product developed for professional use. Your purchase has also contributed to reducing the burden on the environment and also to the further development of environmentally adapted electronics products.

Current information regarding TCO '99 approved and labeled products may be obtained via the Internet, using the address:

- www.tco-info.com

The complete criteria document may also be ordered from:

- TCO Development
114 94 Stockholm, Sweden
Fax: +46 8 782 92 07
E-mail: development@tco.se

6.2 CE conformity and FCC radiation standard

CE

This equipment has been tested and found to comply with the limits of the European Council Directive on the approximation of the laws of the member states relating to electromagnetic compatibility (89/336/EEC) according to EN 55022 class B.

FCC

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the Federal Communications Commission (FCC) Rules.



Caution to the user: 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.

We would be pleased to supply additional information on the CE and FCC if required.

6.3

ELSA-ServiceDirect for *ELSA ECOMO* monitors

NE

3-year warranty including ELSA-Onsite

As of the purchase date, ELSA grants a three-year warranty on *ELSA ECOMO* monitors including ELSA-ServiceDirect. ELSA strives to offer its customers top product quality with its extensive quality assurance measures. If, however, the customer makes a complaint, this service program guarantees perfect support and repair procedures to minimize any inconvenience. As well as repairs carried out free of charge, the following ServiceDirect services are offered within the extended scope of the warranty.

ELSA-Onsite: 3 years of onsite exchange service for ELSA monitors —free of charge

You can avail of the numerous advantages of our onsite exchange services for *ELSA ECOMO* monitors throughout Europe. If you discover a fault with your monitor, you first contact our support team. If your monitor requires repairs within the warranty period of three years, you are provided with a replacement unit within 24 hours¹⁾ which we deliver to your workplace. Your repaired monitor will be returned to you as soon as possible. The advantage of this offer is that you have no downtime or transport expenses. ELSA's customer service ensures that all transporting procedures are dealt with in the correct manner.

Your direct contact partner at ELSA-ServiceDirect

As an ELSA customer, you will receive support and advice from ELSA's customer service at all stages of the warranty services being carried out.

The ELSA Support hotline is the first number to dial if you discover a malfunction or fault on your monitor.

ELSA monitor support hotline
+49-(0)241-606-6135

1. Provided that the complete documentation reaches the ELSA Support team by 11.00 a.m. Please note that warranty services are only granted for faults which are covered within the framework of our warranty conditions, valid for the Federal Republic of Germany.

If the ELSA service cannot find fault with the unit claimed to be defective, we will invoice you for DM 200 plus tax and bus system to cover inspection costs and replacement of the unit.

6.4 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

- c) 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.
- d) 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.
- e) Replaced parts become property of ELSA.
- f) 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 monitors and ELSA videoconferencing systems with a warranty period of 3 years. This period begins at the day of delivery from the ELSA dealer. Warranty services do not result in an extension of the warranty period nor do they initiate a new warranty period. The warranty period for installed replacement parts ends with the warranty period of the device as a whole.

3 Warranty procedure

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

4 Suspension of the warranty

All warranty claims will be deemed invalid

- a) if the device is damaged or destroyed as a result of acts of nature or by environmental influences (moisture, electric shock, dust, etc.),
- b) if the device was stored or operated under conditions not in compliance with the technical specifications,
- c) if the damage occurred due to incorrect handling—especially to non-observance of the system description and the operating instructions—,

- d) if the device was opened, repaired or modified by persons not authorized by ELSA,
- e) if the device shows any kind of mechanical damage,
- f) if in the case of an ELSA monitor, damage to the cathode ray tube (CRT) has been caused especially by mechanical load (e.g. from shock to the pitch mask assembly or damage to the glass tube), by strong magnetic fields near the CRT (colored dots on the screen), or through the permanent display of an unchanging image (phosphor burnt), if, and in as far as, the luminance of the TFT panel backlighting gradually decreases with time, or
- 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.