

ELSA ECOMO™ 640

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Aachen, August 2000

Preface

Thank you for placing your trust in this product.

With the *ELSA ECOMO 640* 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.

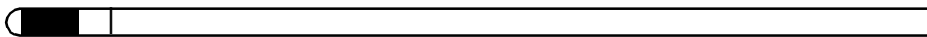
Further information on the Internet at 'www.elsa.com'

Our online services 'www.elsa.com' are available to you around the clock should you have any queries regarding your *ELSA ECOMO 640* 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.

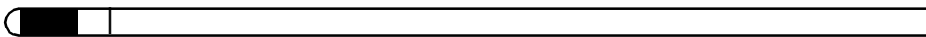
The KnowledgeBase can also be found on the CD.





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1

Introduction

This chapter provides you with important operational advice and general information about your new LCD monitor.

1.1

Monitor features

- The *ELSA ECOMO 640* is compatible with most analog RGB signals (red, green, blue). It displays text and graphics in conjunction with VGA, SVGA, XGA (non-interlaced) and the common Macintosh-compatible color graphics boards.
- Auto-Scanning is performed digitally by a microprocessor. The monitor synchronizes itself automatically on all horizontal frequencies between 24.0kHz and 82.5kHz and on all vertical frequencies between 30.0Hz and 105.0Hz (up to 125 Hz refresh rate at horizontal frequencies up to 65 kHz). The micro-processor-based control mechanism allows the monitor to operate in any frequency mode with the precision of a fixed frequency monitor.
- In addition to the preprogrammed monitor display standards, the *ELSA ECOMO 640* also provides the option of saving user-specific settings for these and other timings.
- The *ELSA ECOMO 640* supports a maximum resolution of 1280 horizontal pixels by 1024 vertical lines. This makes it excellent for graphical user interfaces like Windows, Apple MacOS or Linux.
- The *ELSA ECOMO 640* includes the DDC1 and DDC2B functions. DDC (Display Data Channel) is a transmission channel by which the monitor can automatically inform the computer of its capabilities (e.g. supported graphics modes). The system can only perform this function if both the monitor and the computer (the graphics board) support the DDC function.
- The *ELSA ECOMO 640* has an energy saving function conforming to the VESA DPMS standard. When properly set, the power consumption is reduced to less than 3 watts when the monitor is not in use.
- The automatic adjustment to the input signal (Auto Adjust), the automatic brightness control and the digital sharpness function ensure that the display quality is always optimum.
- The sRGB mode supports the platform-independent standard color space of modern display systems.

1.2 Operating instructions

1.2.1

Setup and operation

Please keep the following in mind when setting up and using the monitor:

- To avoid straining your eyes, do not place the monitor in front of a bright background or where sunlight or other light sources shine directly onto the monitor. To ensure the best ergonomical position, the monitor should be below eye-level.
- Do not cover the monitor's air vents. Make sure that there is sufficient ventilation so that heat from the monitor can properly dissipate.
- Avoid exposing the monitor to damp and dust as this can cause fire or electric shock hazard.
- Ensure that neither the monitor, nor any other heavy item is placed on the power supply cord. A damaged power supply cord can cause fire or short circuits.
- When transporting the monitor, handle it with care.
- Do not shake or scratch the monitor because it is fragile.

1.2.2

Cleaning the monitor

Please follow these guidelines when cleaning the monitor:

- Always remove the power plug from the socket before cleaning.
- Clean the display and the casing with a soft cloth.
- If the monitor requires more than dusting, clean it with a mild cleaning solution and a soft cloth.

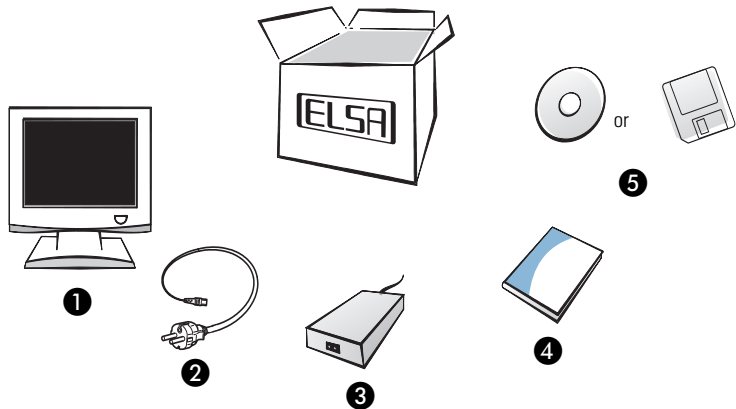


Do not clean the device with benzene, thinner or other volatile substances because the surface could get damaged. Never leave the monitor in contact with rubber or vinyl products for an extended time period.

2 Unpacking and connecting

2.1 Is it all there?

After unpacking the *ELSA ECOMO 640*, check that all parts are there. The scope of supply includes:

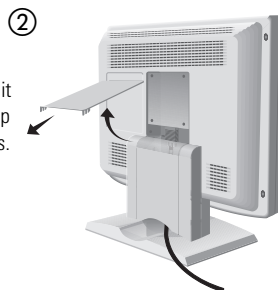


- ❶ Monitor *ELSA ECOMO 640*
- ❷ Power supply cord
- ❸ Power supply adapter
- ❹ User's Guide
- ❺ Disk (CD or diskette)

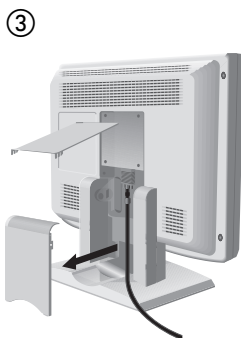
2.2 Cable connections



- ① Position the monitor so that you can view the rear of the device.

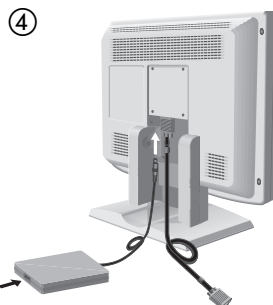


Release the upper flap, pull it upwards and remove the flap from its hinges.



Now remove the lower flap by slightly pressing it.

Insert the power adapter cable into the left socket below the cover. Connect the power supply cord with the power supply adapter and the power socket.



If the monitor is to remain switched off for an extended period, please remove the power cord from the socket to disconnect the unit from the power supply. Therefore, the power socket should be close to the device and easily accessible. Do not use the power supply adapter for other devices as this can cause damage or fire!

2.3 Connecting a second computer

The *ELSA ECOMO 640* has a second socket for connecting a second computer. You will need a VGA connector cable for this to connect the socket on your monitor to the graphics board outlet of the other computer. The signals are selected by using the **SIGNAL A/B** key on the *ELSA ECOMO 640*.

3

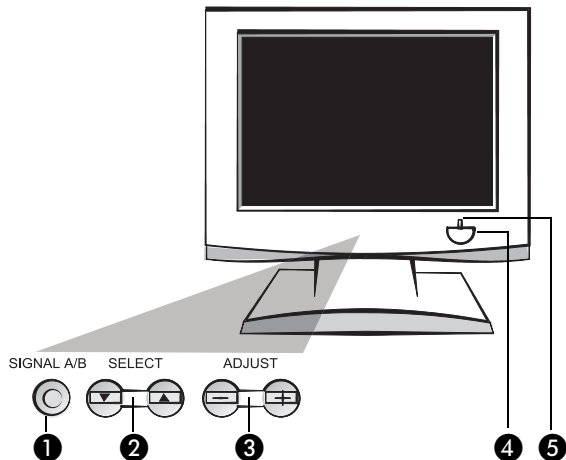
Operating and adjusting

Due to its LCD technology the *ELSA ECOMO 640* generates a geometrically perfect image that normally does not require correction after Auto Setup (page 15) has been run. For manual adjustments use the controls on the *ELSA ECOMO 640*.

3.1

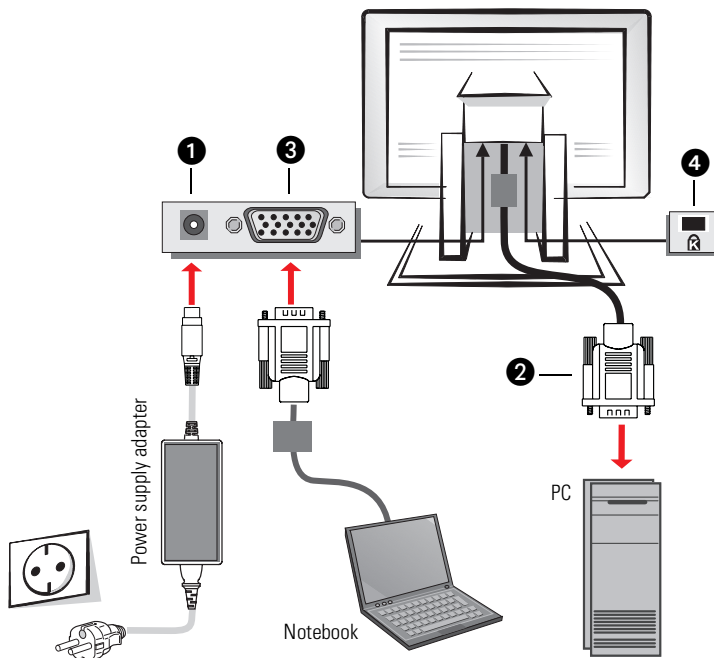
Controls on the front

There is a row of keys on the front of your monitor with which you can perform the fine adjustment of the display in the OSD menu.



	Function
①	Signal A/B and OSD OFF – When the on-screen display (OSD) is not active: change the signal input. When the OSD is active: close the OSD.
②	Select – You can select the individual positions on the OSD menu with these keys.
③	Adjust – To modify the settings on the selected OSD menu page.
④	Power switch – Switches the monitor on and off.
⑤	Power indicator – This indicator lights up when the monitor is switched on.

3.2 The connections at the rear



	Function
①	Power socket – Plug the power adapter in here.
②	Graphics input no. 1 – Connect your PC with this cord.
③	Graphics input no. 2 – You can connect a second computer or a second graphics board to the monitor at this socket.
④	Connector for theft protection – The Kensington MicroSaver security system connector is attached to this connection socket.

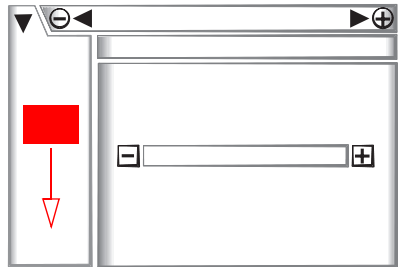
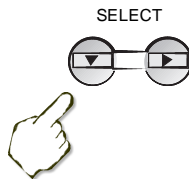
3.3

The on-screen display

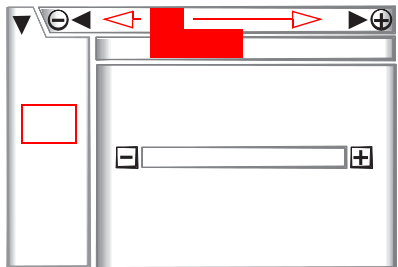
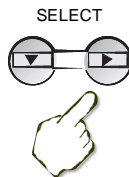
The on-screen display menu (OSD) is a useful utility for the precise configuration and adjustment of the display on your monitor. If you press one of the select keys on the monitor's keypad, the OSD menu will appear on the screen. Use the keys to access the individual menu pages within the OSD menu.

How to navigate the OSD

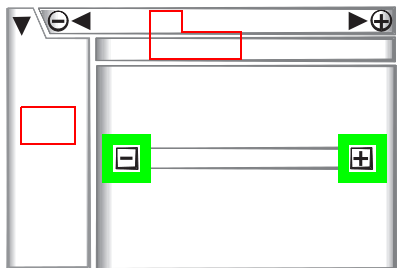
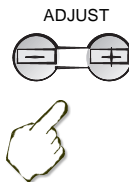
- ① Press one of the **SELECT** buttons to display the OSD screen.
- ② Select the group icon within the main menu by pressing the ▼ button.



- ③ Select the item within the sub menu by pressing the ► button.



- ④ Adjust values and functions by pressing the +/- buttons.



After 30 seconds of inactivity, the OSD screen automatically disappears. Press the **OSD OFF** button to switch the OSD off immediately.



4 Registration and configuration

You learnt how to operate the keypad and the On Screen Display menu on page 13, 'The on-screen display'. This chapter will explain how you should continue.

4.1 Registration with the operating system

The monitor can be registered with some operating systems. The advantage is that the system can be supplied with the monitor's particulars, thereby enabling an optimum interaction between the computer system and the monitor.

Registration under Windows 95, Windows 98 and Windows 2000

After you connect the monitor and start Windows the system normally detects the new device and requests the manufacturer's driver. Insert the accompanying disk (CD or diskette) into the computer, and follow the Windows prompts. Indicate the drive on the computer into which you have inserted the disk.



To make sure you get a viewable image when you connect the monitor, you should set a resolution and a refresh rate that is supported by the monitor before connecting it. If the system is a new installation, start it with the standard VGA driver and a plug&play monitor driver. This will enable you to configure the system starting from the default settings.

4.2 Adjusting the display

Because different graphics boards have different signal characteristics it is usually necessary to adjust the display settings. You do not need to do any of this work: the *ELSA ECOMO 640* has an Auto Setup function. This function automatically optimizes the monitor display. This function can be called within the OSD menu.

4.3

On-screen menu language

The *ELSA ECOMO 640* can display its on-screen menus in a variety of languages. To change the language used for the on-screen menu, simply call up the menu page illustrated here and select the language you want.


















4.4



Overview of all OSD functions

The following overview has been drawn up to help you navigate your way through the nine menu pages and their contents.

Main menu	Symbol	Function	Key '-'	Key '+'
		Brightness	To decrease the brightness	To increase the brightness
		Contrast	To decrease the contrast	To increase the contrast
		Black level	To increase the proportion of black	To decrease the proportion of black
		Automatic brightness	Switch on the 'Automatic brightness' function	Switch off the 'Automatic brightness' function
		Clock	To reduce the width of the image on the screen to the left	To expand the width of the image on the screen to the right
		Clock phase	To change the snow noise of the image	
		Horizontal position	To move the image to the left	To move the image to the right
		Vertical position	To move the image down	To move the image up
		H-Resolution	The displayed image becomes narrower	The displayed image becomes wider



Main menu	Symbol	Function	Key '-'	Key '+'
		V-Resolution	To reduce the height of the image on the screen	To increase the height of the image on the screen
	AUTO SET	Auto Setup	—	To conduct Auto Setup
	AUTO Adj.	Automatic correction	Switching off the automatic correction function	Switching on the automatic correction function
		Automatic Zoom (full screen)	To switch off the full-screen mode	To switch on the full-screen mode
		Sharpness	Increase image sharpness	Reduce image sharpness
		Display mode	To display by TEXT mode	To display by GRAPHIC mode
		Color mode	Select the desired color mode: 'sRGB', 'VIDEO', 'NATIVE' or 'User'	
		Color temperature ¹⁾	To decrease the color temperature	To increase the color temperature
		Color control ¹⁾	Correcting individual colors: red, yellow, green, cyan, blue, magenta and black. The selected color is shifted in the color spectrum with '+' and '-'.	
		Reset color ¹⁾	—	Resets color temperature and color control to default values
		Reset all values	—	To restore to the factory preset mode
		OSD position	To move the OSD position for 5 places	
		Power save function	To select the constant power mode	To select the power save mode
		Automatic input selection	Switch off automatic input selection	Switch on automatic input selection

¹⁾ These functions are only available in the 'User' color mode.

Main menu	Symbol	Function	Key '-'	Key '+'
		Clamp pulse position	The clamp pulse position prevents an overwhelmingly green or white background	
		Language	To choose the language used for the OSD: ENG ... English ITA..... Italian ESP.... Spanish	Clamp pulse position to the rear clamp pulse (common with older Macintosh computers) FRA.... French GER ... German JPN ... Japanese

4.4.1



Automatic correction function

The *ELSA ECOMO 640* has an automatic correction function with which the clock phase and the horizontal and vertical display position can be optimized. This function is not activated in new monitors. It can be called in the on-screen display with  ►  and activated there.

When activated the automatic correction function automatically adjusts the monitor settings to the input signal and the ambient temperature at 30-minute intervals. When animations are running or during mouse movements it may happen that the display seems to stop moving – this is not a malfunction but is caused by the automatic correction function.

4.4.2



Automatic zoom function (full screen)

This function automatically enlarges resolutions of 1024 x 768 or less on the full screen and smooths any edges. This enables clear display even of lower resolutions. With some less common resolutions the enlarged display may not cover the entire screen area or may not be enlarged in one direction. In addition, the display may not be completely sharp. The function is called in the on-screen display with  ► .

4.4.3


Automatic input selection

When automatic input selection is activated, the input that receives an input signal is automatically selected. When two computers (or two graphics boards) are connected simultaneously, the display of the computer that was

ready for operation first appears on the monitor. If a computer switches to energy-saving mode, the other computer will have access to the monitor after a short time. The function is switched on and off in the on-screen display with  ► .

4.4.4

Automatic brightness function

This function can be used to reduce distracting glare. Glare tends to occur when there are large areas of white on the monitor. In this case the automatic brightness function reduces the luminosity of the monitor. It can be switched on and off in the on-screen display with  ► **AUTO BRT**.

4.4.5

Advanced color settings

The color display mode  ►  can be selected from four options in the screen function:

Mode sRGB

The sRGB mode provides a worldwide standardized RGB color environment. This allows true-color display of RGB data on different standardized output devices without requiring additional color management software. However, the sRGB color range has significantly fewer colors than the *ECOMO 640* can display. The sRGB mode is provided for working with fixed colors without a color management system. To obtain brilliant screen displays that fully use the entire color spectrum of the monitor the native or user mode should be selected.

VIDEO mode

Ideal for showing animations or films.

Native mode

The default mode of the *ECOMO 640*. It shows the entire color spectrum.

User mode

Selection of user mode provides three additional functions for configuring the color reproduction:

- **Color temperature**

The color temperature can be set to any value between 5000K and 9600K.

● Color control

This function allows you to set the six base colors of red, green, blue, cyan, magenta and yellow and the color saturation (black) independently of one another. Every one of the seven sliders in the '+' field and the '-' field shows the target color, which can be changed to the selected color with the '+' and the '-' key.

● Color reset

Use this function to reset color temperature and color control to the default factory values.

4.4.6

Blocking the on-screen display

You can block access to the pages of the OSD menu. You can then only regulate the brightness of the monitor display. The **SIGNAL A/B / OSD OFF** key will also remain active. Other functions cannot be selected.

To remove the lock, press the '-' key first and then one of the **SELECT** or **ADJUST** keys. When the OSD menu is removed from the display, you can access the ADJUST-LOCK page again and remove the lock by pressing the '-' key.



Press both these keys simultaneously to access the 'CONTROL LOCK' page.



Then press the '+' key to lock the OSD menu.

4.5

Messages on display

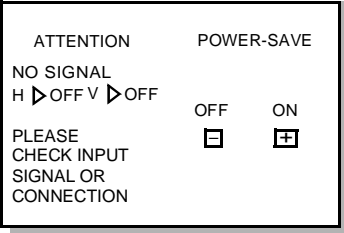
If the monitor detects no synchronization signal, an incorrect input connection or an input frequency outside its frequency range, the following warnings will be shown on the display.

In such a case please check the connections of the video signal cable and the settings of your graphics board. These should lie within the permissible ranges.

4.5.1

POWER-SAVE function is 'Off'

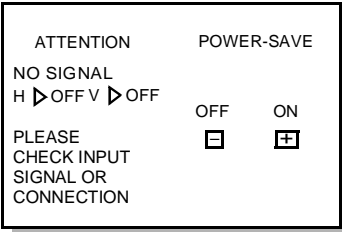
If the POWER-SAVE function is off and there is no synchronization signal, the following message is displayed:



4.5.2

POWER-SAVE function is 'On'

The first message is displayed if you press any key while the POWER-SAVE function is active. The second message is displayed two seconds before the POWER-SAVE function is activated.



Message 1

Message 2



4.5.3

POWER-SAVE Function either 'On' or 'Off'

If the signal frequency is outside the possible range the following message is displayed:

ATTENTION

SIGNAL FREQUENCY IS
OUT OF RANGE

FH ▶ 96.8KHz FV ▶ 73Hz

PLEASE CHANGE SIGNAL
TIMING

5 Advice and help



5.1 The monitor does not respond when you start the computer

- Check whether the monitor is switched on (the light on the front side should be green). Otherwise check the connection to the power supply adapter (see page 10).
- If the signal light is orange: the monitor is presumably in the power saver mode. Move the mouse or strike a key to restore the monitor to normal operation.
- Switch the monitor off and check whether the power supply of the monitor and the signal cable are properly connected.
- Check the contrast and brightness settings: are both in normal position?
- Check whether the BIOS and drivers of the graphics board are the current versions.

5.2 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 640* 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)

5.3 The picture is too dark

- Correct the brightness in the on-screen display with  ► .



5.4 The monitor displays colors incorrectly

- Check the connections of the signal cable.

5.5 Two computers on a single display

- The *ECOMO 640* has two inputs: you can connect two computers or two graphics boards at these inputs.
- The *ECOMO 640* can only display one picture at a time and automatically selects the computer that was booted first.
- Use the **SIGNAL A/B / OSD OFF** key to switch the signal input manually.

5.6 The picture isn't sharp

- Correct the sharpness in the on-screen display with  .
- 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 *ECOMO 640* 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 CRT monitors, LCD monitors can only simulate other resolutions. This is accomplished using interpolation methods that result in a loss of sharpness.

5.7 The display of circles and squares is distorted

- If possible, set your graphics board to a resolution of 1280 x 1024 pixels. Lower resolutions should have a horizontal to vertical ratio of 5:4.
- In other resolutions you can also try to improve the display with the on-screen display functions (see also 'Overview of all OSD functions' on page 16).

5.8 How can I change the resolution?

- The screen resolution is set via the graphics board. The monitor recognizes the signal and adjusts itself accordingly.

5.9 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.

5.10

Does the display also work under Linux and MacOS?

- Yes. Connect computer and display, for more information see 'Cable connections' on page 10. Certain computers (especially older Apple Macintosh) require an adapter.

6

Technical data

6.1

Performance data and specifications

LCD monitor	Monitor	46cm / 18,1"
	Display area	359.0mm x 287.2 mm
	Panel	Active matrix
	Resolution	1280 pixels x 1024 lines
	Pixel pitch	0.2805mm
	Color depth	256 per color, total 16.7 million colors
	Color filters	R, G, B vertical stripe type
	Face finish	anti-reflective, antistatic coating
	Viewing angle	approx. 140° horizontal, 110° vertical
	Color temperature	5000–9600 K adjustable
Input signal	Video	0.7V, RGB, analog
	Synchronization	2.5 – 5,0 V separate horizontal/vertical synchronization
	Input impedance	75Ω (video) 2.2kΩ (sync)
Frequency range	Horizontal: 24.0–82.5kHz, vertical: 30–105.0Hz (up to 125 Hz at horizontal frequencies up to max. 65 kHz)	
Brightness	200cd/m ² for full white video signal, contrast ratio 300:1 (typ.)	
Input connector	Integrated cable connection with VGA D-sub connector, 15-pin and an additional plug for VGA D-shell connector, 15-pin.	
Power supply	Power plug, AC 100–120 V/220–240V ± 10 %, 50–60Hz, 55W (max.)	
Operating environment	Temperature	5° – 35°C
	Humidity	10 – 90% rel. humidity, non-condensing
Housing	460 x 481 x 220mm (width x height x depth)	
Weight	approx. 9kg, excluding power supply and connection cords	
Tilt base	Tilt angle	-5° – +35°
Approvals/certifications	Safety (CE)	EN 60950 (TÜV GS), IEC 950, UL 1950 (UL), CSA C22.2 No.950 (C-UL)
	EMV (CE/FCC)	EN 55022 class B, EN 50082-1, FCC class B, DOC class B, EN 50082-1 VCCI class B, EN 61000-3-3
	Others	TCO '99, VESA DPMS, EPA Energy Star ¹⁾ , MPR-II, ISO 9241-3, ISO 9241-8, ISO 9241-8 (TÜV-ERGO), Energy 2000 Labeling Award

¹⁾ As an Energy Star Partner, ELSA has determined that this product meets the Energy Star guidelines for energy efficiency.

6.2

The power save function

The *ELSA ECOMO 640* complies with the guidelines set by VESA and EPA Energy Star. If the monitor is connected to a graphics board that meets the VESA DPMS requirements the *ELSA ECOMO 640* automatically reduces power consumption to three levels. The power save function must be enabled by means of the OSD menu (page 17).

The energy-saving mode is activated approximately 10 seconds after you switch your computer off or after the operating system has requested energy-saving mode. In this mode the *ECOMO 640* reduces its power consumption to less than 3 watts. The screen is black and the power indicator is orange. Reactivation from energy-saving mode to normal operation takes about three seconds.

6.3

Factory default settings

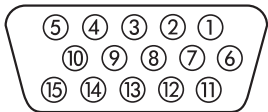
To minimize the user's configuration effort, some display standards were already preset by the factory. If the monitor detects one of these standards, the position and size of the display will be adjusted automatically. Up to 15 more timings can be saved in addition to the factory-set timings (PRESET). To be recognized as a new timing, a video signal must differ from all timings already saved in terms of horizontal frequency by a minimum of 1 KHz, vertical frequency by a minimum of 5 Hz or synchronization signal polarity.

Preset timing	Horizontal frequency (kHz)	Vertical frequency (Hz)	Polarity	
			H	V
640 x 480	35.0	66.7	–	–
832 x 624	49.7	74.6	–	–
1152 x 870	68.7	75.0	–	–
640 x 350	31.4	70.0	+	–
640 x 480	31.5	59.9	–	–
640 x 480	37.5	75.0	–	–
640 x 480	43.3	85.0	–	–
720 x 400	31.5	70.0	–	+
800 x 600	37.9	60.3	+	+
800 x 800	48.1	72.2	+	+

Preset timing	Horizontal frequency (kHz)	Vertical frequency (Hz)	Polarity	
			H	V
800 x 600	46.9	75.0	+	+
800 x 600	53.7	85.0	+	+
1024 x 768	48.4	60.0	–	–
1024 x 768	56.5	70.1	–	–
1024 x 768	58.1	72.1	–	–
1024 x 768	60.2	75.0	+	+
1024 x 768	68.7	85.0	+	+
1280 x 1024	64.0	60.0	–	–
1280 x 1024	80.0	75.0	+	+

6.4

The VGA D-shell socket



Pin assignments

Pin	Signal	Pin	Signal
1	red	9	+5V
2	green	10	Sync ground
3	blue	11	ground
4	ground	12	bi-directional data (SDA, DDC1/2B)
5	DDC ground	13	horizontal synchronization
6	red ground	14	vertical synchronization
7	green ground	15	Data clocking rate (SCL, DDC2B)
8	blue ground		

The *ELSA ECOMO 640* produces analog signals according to the RS-170 regulation. Synchronization information is transmitted separately.

7 Appendix

7.1 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.

The complete criteria document may be ordered from TCO:

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

7.2 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.



7.3 ELSA-ServiceDirect for *ELSA ECOMO* monitors

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 on-site exchange service for ELSA monitors—free of charge

You can use the numerous advantages of our on-site exchange services for *ELSA ECOMO* monitors throughout Europe. If you discover a fault with your monitor, you first contact our support team. If repairs are required during the three-year guarantee period, you will receive a loan monitor free of charge¹⁾. Your repaired monitor will be returned to you as soon as possible.

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 any fault in the unit claimed to be defective, we will invoice you for DM 200 plus tax to cover inspection costs and replacement of the unit.

7.4 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

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

2 Warranty period

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

3 Warranty procedure

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

4 Suspension of the warranty

All warranty claims will be deemed invalid

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

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

5 Operating mistakes

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

6 Additional regulations

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