



ELSA ECOMO™ 730

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Preface

Thank you for placing your trust in this product.

Thank you for placing your trust in this product. With the *ELSA ECOMO 730* 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 for the demands of professional users, and distinguishes itself with an extraordinary degree of reliability.



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 under 'Know-How', you can find answers to frequently asked questions (FAQs). The KnowledgeBase also contains a large pool of information. Current drivers, firmware, tools and manuals can be downloaded at any time.

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Introduction

This manual tells you how to connect, adjust and care for your monitor. This manual also provides technical specifications and instructions for troubleshooting problems you may experience with your monitor.

Monitor features

The Diamond monitor is an intelligent, microprocessor-based monitor compatible with most analog RGB (red, green, blue) display standards, including PS/V, PS/2, Apple Macintosh, Centris, Quadra, Macintosh II and Power Macintosh products. It provides crisp text and vivid color graphics with VGA, SVGA, XGA (non-interlaced), and most Macintosh compatible color graphics boards.

- The monitor's wide auto-scanning compatibility range makes it possible to upgrade graphics boards or software without needing to purchase a new monitor.
- Digitally controlled auto-scanning is done using an internal microprocessor, for horizontal scan frequencies between 30kHz and 109 kHz, and vertical scan frequencies between 48Hz and 160Hz. The microprocessor-based intelligence allows the monitor to operate in each frequency mode with the precision of a fixed frequency monitor.
- The monitor contains resident memory for pre-programmed screen display standards and is also capable of storing additional user adjustment parameters.
- The monitor is capable of producing a non-interlaced maximum addressable resolution format of 1800 dots x 1350 lines with systems based on IBM. This display is well suited for windowing environments.
- Because of the analog signal inputs, the monitor can display an unlimited palette of colors that can be manually adjusted to suit your specific needs.
- The monitor has a power management function according to the standard of VESA-DPMS, NUTEK and Energy Star. To save energy, the monitor must be connected to a system compliant with this standard. (Refer to your computer and/or graphics board instructions for proper operation.)
- To ensure the easy installation and operation of this monitor, a moiré clear function and an on-screen display (OSD) present all of the functions for setup and adjustment.
- The monitor complies with the safety standards UL 1950, CSA C22.2 No. 950 and EN60950, FCC Class-B, VCCI Class-B and EN55022 Class-B for EMI, MPR II, and with the ergonomics standards ISO 9241-3, ISO9241-7, ISO9241-8 and ZH1/618.
- Digital chassis design for lighter, more compact housing and improved display performance.

- The monitor complies with Video Electronics Standards Association (VESA) DDC1/2B(EDID) specification. If your computer provides DDC1/2B(EDID) function, the setup takes place automatically.
- The innovative tube technology makes a naturally flat and completely planar picture possible, free of any curvature.
- The planar screen allows for an optically perfect picture over the entire display surface.
- The flat surface and antireflective coating reduce the reflection of environmental light.

Package contents

Please ensure that the delivery is complete. When opening the package, please check that the following components are included:

- Documentation
- Monitor
- Power cord and monitor cord
- Data media including additional software and electronic documentation

Please contact your dealer if any part is missing or damaged.

ELSA reserves the right to make changes to the package contents without prior notice.

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.

CE and FCC

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.
- Caution: To comply with the limits for an FCC Class B computing device, always use a shielded signal cable.



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.

Installation

This chapter will assist you to get your monitor working as quickly as possible. It takes just a few straightforward maneuvers to connect the monitor to your computer. Before you start please carefully read the safety and operating hints below.



Use the power cord supplied to connect the monitor. In order to avoid electric shock, the power cord must be connected to a properly grounded plug.

Do not on any account open up the appliance to carry out your own repairs.

Very high voltages exist within the appliance, even when disconnected from the mains. Repairs should only be made by trained technicians. Please contact ELSA Services for any repairs.

Do not locate the monitor close to sources of electromagnetism. These can include halogen desk lamps or electric motors, but can also include high voltage cables or steel pillars. Magnetic or electromagnetic radiation causes picture distortion and can eventually cause your monitor to fail.

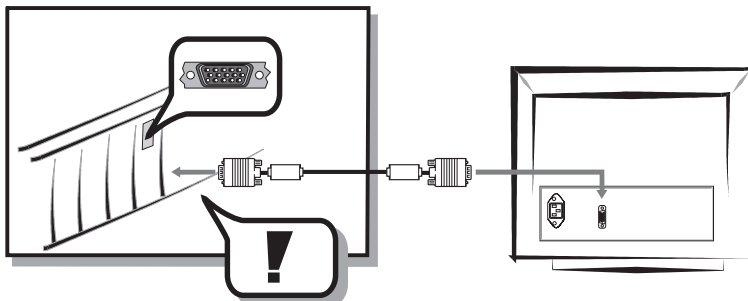
Ensure that your monitor has sufficient ventilation. The air vents on your monitor must not be obstructed. Heat produced from the picture tube must be allowed to escape freely.

Protect the monitor from damp and dust. Damp can cause short circuits, and a build-up of dust can mean that the monitor is not properly ventilated.

The power cord must be unobstructed. Avoid allowing heavy objects to stand on it.

Connecting to the computer

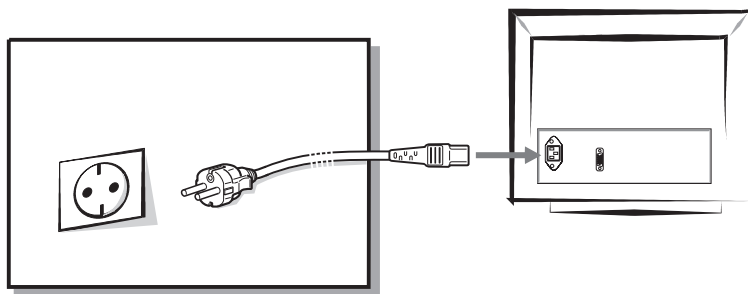
Use the monitor cable to connect your computer with the signal graphics input on the monitor.



For connecting your monitor to a Macintosh computer, make use of the special adapter available from your dealer. See the chapter ('Connecting the monitor to a Macintosh computer') for information on the connection of this adapter and the dip switch settings.

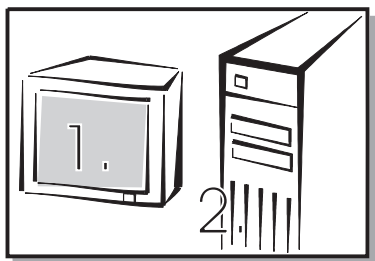
Connecting to the mains

With the monitor switched off connect the power cord supplied to the monitor and to the mains. The monitor automatically adjusts itself to the rated voltage (110V–230 V).



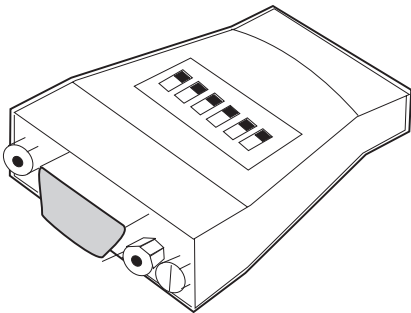
Switch on

The monitor is now connected to your computer and the mains. First switch on your monitor, then the computer.



Connecting the monitor to a Macintosh computer

Your dealer can supply you with a special adapter for connecting your ELSA monitor to Macintosh computers. The adapter is to be located between the computer's graphics output and the VGA connector cable. The DIP switches on the upper side of the adapter should be set according to the resolution with which your monitor will be operating.



The optional adapter is for connecting your ELSA monitor to Macintosh computers. Set the DIP switches according to the table below.

DIP switch settings connections with Macintosh computers:

ELSA monitors	DIP switch setting
17" multi-mode start resolution 1024 x 786	
19" multi-mode start resolution 1152 x 870	
20" multi-mode start resolution 1152 x 870	
21" multi-mode start resolution 1152 x 870	
22" multi-mode start resolution 1152 x 870	
24" multi-mode start resolution 1152 x 870	

What next?

Because there are so many types of graphics boards you may need to fine tune the monitor picture settings.

In the following chapters you can read how to fine tune for picture and color. The manual also contains technical information and additional assistance for the operation of your ELSA monitor.

The manual is supplied in printed form in the English and German languages.

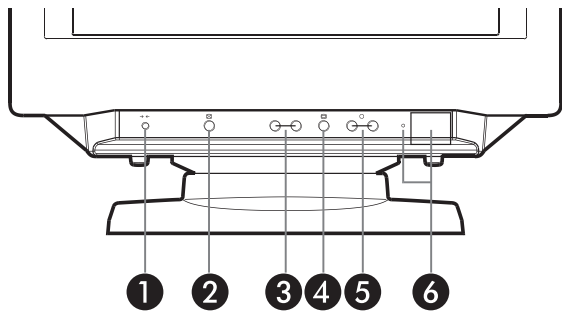
The versions in French and Italian are available in PDF-format on the CD.

The Spanish/Dutch translation describes the installation only. If you require more information, please refer to the documentation in the other languages.

Aspects of your monitor

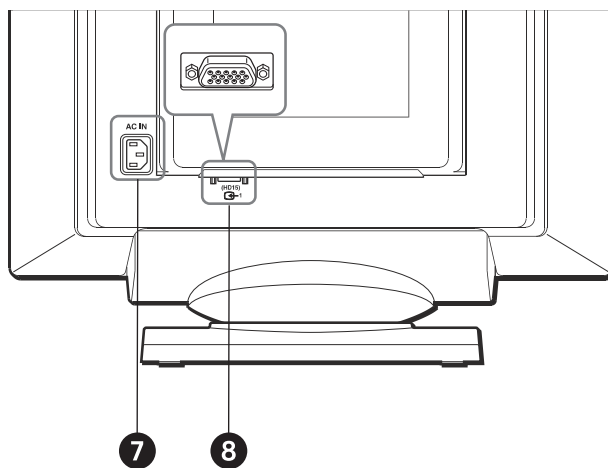
The front control panel

The lower front of the monitor features a row of switches and buttons which allow you to tune the picture settings precisely.



	Function
1	Reset button This key is to reset the values to the factory settings.
2	Quick align The ASC button (Auto Sizing and Centering) automatically centers the picture. At the same time the picture size adjusted to fit the diagonals of the monitor.
3	Brightness Use the arrow keys to adjust the brightness of the picture. The arrow keys are used to move the cursor in the on-screen menu and alter the settings.
4	Menu button The menu button is the central control button for the on-screen menu: Pressing it opens and closes the on-screen menu and confirms the settings on the on-screen menu page.
5	Contrast Use the arrow keys to adjust the brightness of the picture. The arrow keys are used to move the cursor in the on-screen menu and alter the settings.
6	On/Off switch, Power-On indicator This indicator lights up green when the monitor power is on. It shows amber when the monitor is in the power saving function.

Rear connectors panel



	Function
7	AC power connector Plug the power cord in here.
8	Signal input (HD15) This plug connects your monitor with the video output of the graphics card in your computer.

Operating the monitor

The on-screen display

The on-screen menu (OSD) makes light work of fine tuning the picture on your monitor. The range of settings includes the simple brightness adjustment to the detailed correction of pin-cushion curvature or distortion. The on-screen display appears as soon the 'Menu' button on the control panel is pressed. Once in the on-screen display, you can use the buttons to access the various pages of the menu.

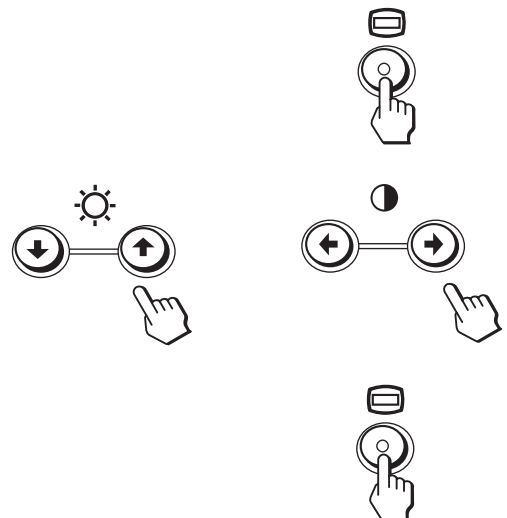
What you need to know

You need to be familiar with the buttons for navigating within the pages and from one page to another. You should bear the following in mind if you wish to adjust the monitor settings:

Use the 'Menu' button to access the menu page of the on-screen display and to confirm the selection of the on-screen page.

Use the arrow keys to move the selection to the position you want and to alter the values and settings.

Use the 'Menu' button to confirm the alteration. After pressing the 'Menu' button again you can leave the OSD.



Monitor settings

The monitor settings can be fine tuned according to your preferences. Don't be afraid to experiment with the monitor and try out all of the options for adjustment. If the picture has gone completely astray, just press the RESET "emergency button" to restore the factory settings.

After switching on

Plug&play

Modern graphics boards and the *ELSA ECOMO 730* can communicate using the DDC (Display Data Channel). The *ELSA ECOMO 730* can send its parameters to the graphics board and, in turn, the graphics board ensures that the monitor operates at the highest possible refresh rate for the resolution selected. This means that you will immediately get a picture that requires only minor adjustment. Check the fine tuning of the picture and make adjustments for the relative light levels within your working environment.

You will now find out what settings are possible and how to solve any problems.

Language

















The *ELSA ECOMO 730* 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.












LANGUAGE

An overview of all functions

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

Main menu	Symbol	Function	Keys '←/↵'	Keys '→/↵'
END		Fade out the on-screen menu		
SIZE/POS.		H-SIZE	To decrease the horizontal size of the screen.	To increase the horizontal size screen.
		V-SIZE	To decrease the vertical size of the screen.	To increase the vertical size of the screen.
		H-PHASE	To move the image on the screen to the left.	To move the image on the screen to the right.
		V-PHASE	To move the image down.	To move the image up.
		ZOOM	To decrease the image size in all directions.	To increase the image size in all directions.
GEOMETRY		ROTATION	To rotate the image counterclockwise.	To rotate the image clockwise.
		PCC-CENTER	To narrow the center of the screen horizontally.	To expand the center of the screen horizontally.
		PIN-BALANCE	To move the top and bottom of the screen image to the left.	To move the top and bottom of the screen image to the right.
		PCC-PHASE	To decrease the width at the top of the screen image and to increase the width at the bottom.	To increase the width at the top of the screen image and to decrease the width at the bottom.
		KEY-BALANCE	To slant the screen to the left.	To slant the screen to the right.
CONVERGENCE		H-CONVERGENCE	To move the red to the right and the blue to the left.	To move the red to the left and the blue to the right.
		V-CONVERGENCE	To move the red up and the blue down.	To move the red down and the blue up.
	 TOP	V-CONVERGENCE TOP	To move the red down and the blue up at the top of the screen.	To move the red up and the blue down at the top of the screen.
	 BOT	V-CONVERGENCE BOTTOM	To move the red down and the blue up at the bottom of the screen.	To move the red up and the blue down at the bottom of the screen.
SCREEN		CORNER PURITY(TL)	To adjust the purity of the top-left corner.	
		CORNER PURITY (TR)	To adjust the purity of the top-right corner.	

Main menu	Symbol	Function	Keys '←/↵'	Keys '→/↵'
		CORNER PURITY (BL)	To adjust the purity of the bottom-left corner	
		CORNER PURITY (BR)	To adjust the purity of the bottom-right corner	
		MOIRE CANCEL	Moiré Cancel mode off.	Moiré Cancel mode on.
COLOR		Color temperature	To select one of the three modi SIMPLE, COMPLEX or sRGB.	
		Mode SIMPLE	To set continuously adjustable color temperature.	
		Mode COMPLEX	To match the black the proportion (BIAS) and the white proportion (GAIN) of each of the two color temperatures 5000K and 9300K for the red, green and blue (RGB) color channels.	
		Mode sRGB	To set the brightness and contrast for sRGB.	
LAN-GUAGE		To select the language used by the OSD.		
OPTION		Degauss	—	To eliminate possible color shading or impurity.
		H-OSD position	To move the OSD to the left.	To move the OSD to the right.
		V-OSD position	To move the OSD down.	To move the OSD up.
		OSD lock	To unlock the OSD.	To lock OSD.

1

This locks the OSD function to prevent changes being made to your settings.

You can now operate only the on-off switch, the option END and the option  (OSD lock).

Resetting the values to the factory settings

You can use the reset button to return all settings you have changed back to the factory settings.

Resetting a specific adjustment

Navigate through the on-screen menus to select the adjustment item you want to reset, and press the RESET button. You can do this while you are adjusting an item.

Resetting all of the adjustments for the current input signal

Press the RESET button when no menu is displayed on the screen. Note that the following items are not reset by this method:

- on-screen menu language
- on-screen menu position
- control lock

Resetting all of the adjustments for all input signals

Press and hold the reset button for more than two seconds when no menu is displayed on the screen. This resets everything to the factory preset mode.

Resetting all of the adjustment data to the factory presets

Press and hold the reset button for more than five seconds when no menu is displayed on the screen. This resets everything to the factory presets including the input selection.

The RESET button does not function when the control lock is set to ON.



An optimized working environment

You have already taken a significant step towards this goal: you have acquired a monitor with technology guaranteeing optimized ergonomics and a minimum of stress at your place of work. Equally important is the overall arrangement of your working environment, which includes some basic rules about working with a monitor.

The ELSA ELSA ECOMO 730 complies with the latest EU ergonomics guidelines (90/270/EEC) for work places with monitors, which came into effect on the 1.1.97.

Monitor picture quality

The screen must display a stable picture. How can you check this? Simply focus on a fixed point next to your screen. If you can see a perceptible flickering of the picture, you can try and adjust the brightness and contrast to stabilize the picture. If this does not help, then try to increase the display refresh rate with your graphics card driver.

Tips for an ergonomic working environment

Lighting in your working environment

The lighting in your place of work should not perceptibly flicker. Avoid placing monitors directly next to windows and be sure that there is the possibility to reduce the intrusion of strong sunlight such as with a blind. When arranging desks, make sure that the direction of view is parallel with the lighting. The direction of view to the monitor should be parallel to the windows. Glare and reflections can be reduced by an anti-reflective layer (Lambda/4 anti-reflection) on the screen.

You can check whether or not your place of work meets these basic rules:

- Are you facing a window when looking at your monitor?
- Does your monitor screen show any reflections from windows or lighting?

The work desk

The top of the work desk should be at a height of 72cm. The desk top should be around 80 cm deep and of sufficient width. There should be a suitable separation between the operator and the monitor which, for a 17" monitor, is recommended to be at least 45cm and for a 21" monitor, should be about 80cm.

The seating position

The seating position is most important for work in comfort and without problems. A rule of thumb is: sit with a straight back and ensure that your arms and legs are bent at appro-

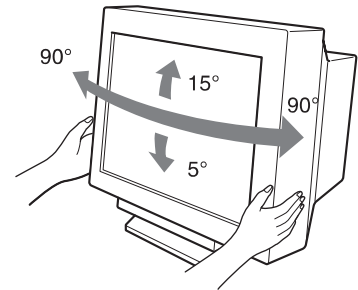
ximately 90°. Your feet should also rest flat on the floor.

It is important that you frequently shift your seating position—to practice the so-called “dynamic sitting”—and that you stand up once in a while.

The monitor position

The *ELSA ECOMO 730* can be tilted and swiveled so that you can set up the monitor position to your liking.

When swiveling or tilting, please support the monitor with both hands



When selecting the monitor position, be sure not to place it directly on the computer housing.

Cleaning your monitor

When cleaning the monitor, please follow these guidelines:

- Always unplug the monitor before cleaning
- Wipe the screen and cabinet front and sides with a soft cloth
- If the screen requires more than dusting, apply household window cleaner to a soft cloth to clean the monitor screen

Do not use benzene, thinner or any volatile substances to clean the unit as the finish may be permanently marked. Never leave the monitor in contact with rubber or vinyl for an extended period.



Technical data

CRT	Diagonal	54cm/21", viewable display size 403.8 x 302.2 mm/20"
	Gun	In-line
	Deflection angle	90 °
	Phosphors	Red, green, blue, EBU (P22, medium short persistence)
	Phosphor color coordinates	Red, Green, Blue X = 0.625 X = 0.280 X = 0.155 Y = 0.34 Y = 0.605 Y = 0.070
	Slot mask	0.24mm
Input signal	Face plate	anti-glare, anti-reflective, anti-static coating
	Focusing method	Dynamic beam forming
	Video	0.7V or 1V RGB analog
Interface	Synchronization	Synchronization signals on green or separate horizontal/ vertical synchronization
	Input connector	D sub 15HD
Frequency range	Input impedance	75Ω (video) 2,2kΩ (sync)
	Horizontal: 30–109kHz, vertical: 48–160Hz	
Resolution	Horizontal: up to 1800 pixels, vertical: up to 1350 lines at 75Hz	
Warm-up time	30min. to reach optimum performance temperature	
Brightness	110cd/m ² standard full white video with 9300 K (+8MPCD)	
Blanking time	Horizontal	≥ 2.3μs
	Vertical	≥ 450μs
Viewable display	403.8mm x 302.2mm, relation 4:3	
	9300K	6500K
	X = 0.283 ± 0.015	X = 0.313 ± 0.015
	Y = 0.298 ± 0.015	Y = 0.329 ± 0.015
Color temperature	9300K–5000K	
Power supply	AC 100–120 V/220–240 V; ±10 %, 50–60 Hz, 145 W (max.)	
Operating environment	Temperature	10° – 40 °C
	Humidity	10 – 80 % relative air humidity
Housing	498 x 491 x 478mm (W x H x D)	
Weight	32kg approx.	
Tilt and swivel base	Tilt angle	-5° – +15°
	Swivel angle	± 90°
Approvals and certifications	Safety (CE)	UL1950 (UL), CSA C22.2, No. 950 (C-UL), EN 60950
	EMC (CE/FCC)	FCC Class B, EN 55022, EN 50082-1, EN 61000-3-2, EN61000-3-3
	X-radiation	DHHS, German X-ray regulations dated 1987-01-08
	Others	CE-Marking, MPR II/TCO '91, ISO 9241-3, ISO 9241-7, ISO 9241-8, (certified by TÜV safety approved), TCO '99, International Energy Star Program

Power management function

The *ELSA ECOMO 730* complies with the guidelines set by VESA and Energy Star together with the stringent standards of NUTEK. The *ELSA ECOMO 730* will automatically reduce power consumption if the monitor is connected to a graphics board complying

with VESA DPMS. You can set the delay time before the monitor enters the power saving mode using the on-screen menu.

Mode	Power Consumption	Power Indicator
Normal	≤145 W	green
Readiness	≤15 W	alternating green and amber
Interruption	≤15 W	alternating green and amber
Deactivated	approx. 1 W	amber
Switched off	0 W	off

Factory settings

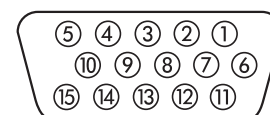
To minimize the need for adjustment, the factory settings include popular display standards. Picture size and centering are automatically adjusted if any of these display standards is detected. All the factory presets may be overwritten by adjusting the user controls. The monitor is capable of automatically storing up to 15 additional display standards. The new display information must differ from any of the existing display standards by at least 1 kHz for the horizontal scan frequency or 1 Hz for the vertical scan frequency or the sync signal polarities must be different.

Preset Timing	Fh (kHz)	Fv (Hz)	Polarity	
			H	V
VGA (640x480/60 Hz)	31,47	59,94	N	N
VESA (640x480/75 Hz)	37,50	75,00	N	N
VESA (640x480/85 Hz)	43,27	85,01	N	N
VGA (720x400/70 Hz)	31,47	70,09	N	P
VESA (720x400/85 Hz)	37,93	85,04	N	P
VESA (800x600/60 Hz)	37,88	60,32	P	P
VESA (800x600/75 Hz)	46,88	75,00	P	P
VESA (800x600/85 Hz)	53,67	85,06	P	P
VESA (1024x768/60 Hz)	48,36	60,00	N	N
VESA (1024x768/70 Hz)	56,48	70,07	N	N
VESA (1024x768/75 Hz)	60,02	75,03	P	P
VESA (1024x768/85 Hz)	68,68	85,00	P	P
VESA (1152x864/75 Hz)	67,50	75,00	P	P
VESA (1280x960/60 Hz)	60,00	60,00	P	P
VESA (1280x960/85 Hz)	85,94	85,00	P	P
VESA (1280x1024/60 Hz)	63,98	60,02	P	P

Preset Timing	Fh (kHz)	Fv (Hz)	Polarity	
			H	V
VESA (1280x1024/75 Hz)	79,98	75,02	P	P
VESA (1280x1024/85 Hz)	91,15	85,02	P	P
VESA (1600x1200/60 Hz)	75,00	60,00	P	P
VESA (1600x1200/65 Hz)	81,25	65,00	P	P
VESA (1600x1200/70 Hz)	87,50	70,00	P	P
VESA (1600x1200/75 Hz)	93,75	75,00	P	P
VESA (1600x1200/85 Hz)	106,25	85,00	P	P
MAC 16" (832x624)	49,73	74,55	N	N
MAC 19" (1024x768)	60,24	74,93	N	N
MAC2PAGE (1152x870)	68,68	75,06	N	N
VESA (1152x864/85 Hz)	77,49	85,06	P	P

Sync. type = separate

The VGA D-shell socket

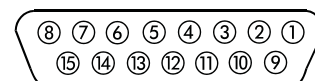


Pin assignment

Connection	Signal	Connection	Signal
1	Red	9	not used
2	Green	10	Sync ground
3	Blue	11	Ground
4	Ground	12	Bidirectional data (SDA, DDC1/2B)
5	CPU host ground	13	Horizontal synchronization
6	Red ground	14	Vertical synchronization
7	Green ground	15	Data timing (SCL, DDC2B)
8	Blue ground		

The *ELSA ECOMO 730* issues analog signals in accordance with the requirements of directive RS-170. The synchronization information is sent separately.

Video input connection to an Apple Macintosh computer



Your ELSA monitor can be connected to a Macintosh computer. The graphics output port of the Macintosh has a 15-pin connector. To match up with the monitor's VGA connector you require a suitable adapter. Contact your retailer for details.

Pin assignment

Pin	Signal	Pin	Signal
1	Red ground	9	BLUE video
2	RED video	10	Sense 2
3	C-sync	11	C & V sync ground
4	Sense 0	12	V-sync
5	GREEN video (mono video)	13	Blue ground
6	Green ground	14	H-sync ground
7	Sense 1	15	H-sync
8	Not used		

H-sync = scan frequency, V-sync = refresh rate

Troubleshooting

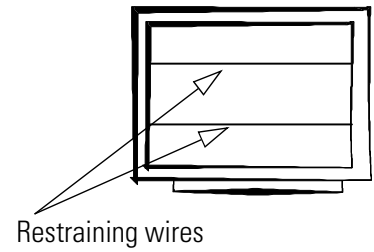
Problem solving

Problem		What you can do
No picture	LED On? (Green)	Check, if AC power chord is disconnected or monitor switched of.
	LED Off	Is the monitor switched on? Is the AC power cord properly connected?
	LED On? (Amber)	Signal cable disconnected?
		Computer power switch
		Power Management function active
The following message appears ATTENTION NO SIGNAL		Signal cable disconnected.
		Computer power switch.
		Power management function is active.
The following message appears ATTENTION SIGNAL FREQUENCY IS OUT OF RANGE		Input signal frequency range is out of range
		CGA mode is not available. MDA mode is not available. EGA mode is not available.
Parts of the picture are missing, picture not centered, picture too small or too large		Do GEOMETRY-RESET or ALL RESET for a standard signal.
		Adjust H-SIZE, V-SIZE, H-PHASE, and V-POSITION with non-standard signals.
		Monitor may not be able to get full-screen image depend on signal. In this case, please select other resolution, or other vertical refresh timing.
		Make sure you wait a few seconds after adjusting the size of the image before changing or disconnecting the signal.

Restraining wires

You may notice two thin, horizontal lines in the picture. This is not a defect, but a phenomenon common to monitors which use the aperture grille CRT technology.

These lines are shadows produced by the restraining wires which reduce the aperture grille's sensitivity to vibration.



Appendix



TCO '99

Congratulations! You have just purchased a TCO '99 approved and labelled 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.

Why do we have environmentally labelled computers?

In many countries, environmental labelling has become an established method for encouraging the adaptation of goods and services to the environment. The main problem, as far as computers and other electronics equipment are concerned, is that environmentally harmful substances are used both in the products and during their manufacture. Since it is not so far possible to satisfactorily recycle the majority of electronics equipment, most of these potentially damaging substances sooner or later enter nature.

There are also other characteristics of a computer, such as energy consumption levels, that are important from the viewpoints of both the work (internal) and natural (external) environments. Since all methods of electricity generation have a negative effect on the environment (e.g. acidic and climate-influencing emissions, radioactive waste), it is vital to save energy. Electronics equipment in offices is often left running continuously and thereby consumes a lot of energy.

What does labelling involve?

This product meets the requirements for the TCO '99 scheme which provides for international and environmental labelling of personal computers. The labelling scheme was developed as a joint effort by the TCO (The Swedish Confederation of Professional Employees), Svenska Naturskyddsforeningen (The Swedish Society for Nature Conservation) and Statens Energimyndighet (The Swedish National Energy Administration).

Approval requirements cover a wide range of issues: environment, ergonomics, usability, emission of electric and magnetic fields, energy consumption and electrical and fire safety.

The environmental demands impose restrictions on the presence and use of heavy metals, brominated and chlorinated flame retardants, CFCs (freons) and chlorinated solvents, among other things. The product must be prepared for recycling and the manufacturer is obliged to have an environmental policy which must be adhered to in each country where the company implements its operational policy.

The energy requirements include a demand that the computer and/or display, after a certain period of inactivity, shall reduce its power consumption to a lower level in one or more stages. The length of time to reactivate the computer shall be reasonable for the user.

Labelled products must meet strict environmental demands, for example, in respect of the reduction of electric and magnetic fields, physical and visual ergonomics and good usability.

Below you will find a brief summary of the environmental requirements met by this product. The complete environmental criteria document may be ordered from:

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

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

- www.tco-info.com

Environmental requirements

Flame retardants Flame retardants are present in printed circuit boards, cables, wires, casings and housings. Their purpose is to prevent, or at least to delay the spread of fire. Up to 30% of the plastic in a computer casing can consist of flame retardant substances. Most flame retardants contain bromine or chloride, and those flame retardants are chemically related to another group of environmental toxins, PCBs. Both the flame retardants containing bromine or chloride and the PCBs are suspected of giving rise to severe health effects, including reproductive damage in fish-eating birds and mammals, due to the bio-accumulative* processes. Flame retardants have been found in human blood and researchers fear that disturbances in foetus development may occur.

The relevant TCO '99 demand requires that plastic components weighing more than 25 grams must not contain flame retardants with organically bound bromine or chlorine. Flame retardants are allowed in the printed circuit boards since no substitutes are available.

Cadmium* * Cadmium is present in rechargeable batteries and in the color-generating layers of certain computer displays. Cadmium damages the nervous system and is toxic in high doses. The relevant TCO '99 requirement states that batteries, the color-generating layers of display screens and the electrical or electronics components must not contain any cadmium.

Mercury* * Mercury is sometimes found in batteries, relays and switches. It damages the nervous system and is toxic in high doses. The relevant TCO '99 requirement states

that batteries may not contain any mercury. It also demands that mercury is not present in any of the electrical or electronics components associated with the labelled unit.

CFCs (freons) The relevant TCO '99 requirement states that neither CFCs nor HCFCs may be used during the manufacture and assembly of the product. CFCs (freons) are sometimes used for washing printed circuit boards. CFCs break down ozone and thereby damage the ozone layer in the stratosphere, causing increased reception on earth of ultraviolet light with e.g. increased risks of skin cancer (malignant melanoma) as a consequence.

Lead* * Lead can be found in picture tubes, display screens, solders and capacitors. Lead damages the nervous system and in higher doses, causes lead poisoning. The relevant TCO '99 requirement permits the inclusion of lead since no replacement has yet been developed.

* Bio-accumulative is defined as substances which accumulate within living organisms

** Lead, cadmium and mercury are heavy metals which are bio-accumulative.

Advice and help

If you encounter any problems during the installation or operation of your ELSA product, please consult this manual first. If you have further questions, you can contact our Support team. Ensure that you can provide the following information.

- Exact model name of your ELSA monitor.
- The type of graphics board and the BIOS version (displayed when starting the computer).
- Operating system and hardware environment.
- ELSA serial number in the format 7740.xxx xxx (see rear side of the device)

Software updates

The latest versions of the ELSA software are always available for download from our Internet site www.elsa.de and direct via FTP from [ftp.elsa.com](ftp://ftp.elsa.com). You will also find a wealth of information and answers to frequently asked questions (FAQs). Before you contact the ELSA Support team, please make sure that you are using the latest ELSA software (driver, firmware or INF file) versions.

Who to contact?

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

■ **ELSA on the Internet**

ELSA WWW site	www.elsa.com
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■ **ELSA by Mail**

Or write to ELSA	ELSA AG Computergrafik Support Sonnenweg 11 52070 Aachen Germany
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If you are not sure whether your product is defective or if the problem is just a driver which is incorrectly installed, please call the ELSA Support hotline before you send the board for repair.

■ **ELSA Support hotline**

+49-241-606-6135

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

■ ELSA world wide

You can contact the ELSA subsidiaries:

ELSA, Inc.

1630 Zanker Road
San Jose, CA 95112
USA

Phone:	+1-408-961-4600
	+1-800-272-ELSA
Fax:	+1-408-895-4700

ELSA Asia, Inc.

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

Phone:	+886-2-27685730
Fax:	+886-2-27660873

ELSA Japan, Inc.

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

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

ELSA-ServiceDirect for *ELSA ECOMO* monitors

3-year warranty including ELSA-Onsite

As of the purchase date 01.01.1998, ELSA grants a three-year warranty on *ELSA ECOMO*¹⁾ 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 service for ELSA monitors—free of charge

You can avail of the numerous advantages of our onsite services for *ELSA ECOMO* monitors throughout Europe²⁾. 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 hours³⁾ 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) Applies to all *ELSA ECOMO* monitors purchased after January 1, 1998.

2) For *ELSA ECOMO 21H97*, a 4 week DoA warranty is granted outside of Germany instead.

3) 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 V.A.T. to cover inspection costs and replacement of the unit.

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 CRT monitors and ELSA videoconferencing systems with a warranty period of three years. Also expected are the ELSA TFT monitors with a warranty period of 12 months. This period begins at the day of delivery from the ELSA dealer. Warranty services do not result in an extension of the warranty period nor do they initiate a new warranty period. The warranty period for installed replacement parts ends with the warranty period of the device as a whole.

3 Warranty procedure

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

4 Suspension of the warranty

All warranty claims will be deemed invalid

- a) if the device is damaged or destroyed as a result of acts of nature or by environmental influences (moisture, electric shock, dust, etc.),
- b) if the device was stored or operated under conditions not in compliance with the technical 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 backups have been made.
- f) The warranty is valid only for the first purchaser and is not transferable.
- g) The court of jurisdiction is located in Aachen, Germany in the case that the purchaser is a merchant. If the purchaser does not have a court of jurisdiction in the Federal Republic of Germany or if he moves his domicile out of Germany after conclusion of the contract, ELSA's court of jurisdiction applies. This is also applicable if the purchaser's domicile is not known at the time of institution of proceedings.
- h) The law of the Federal Republic of Germany is applicable. The UN commercial law does not apply to dealings between ELSA and the purchaser.