



Touchmonitor User Guide

1937L 19" LCD Rear-Mount Touchmonitor



Our commitment. Your advantage.

Elo TouchSystems

19" LCD REAR-MOUNT Touchmonitor

User Guide

Revision B

P/N E508220

Elo TouchSystems
1-800-ELOTOUCH
www.elotouch.com

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1

INTRODUCTION

Product Description

Your new touchmonitor combines the reliable performance of touch technology with the latest advances in (LCD) display design. This combination of features creates a natural flow of information between a user and your touchmonitor.

This LCD monitor incorporates a 19" color active matrix thin-film-transistor (TFT) to provide superior display performance. A maximum resolution of SXGA 1280 x 1024 is ideal for displaying graphics and images. Other outstanding features that enhance this LCD monitor's performance are Plug & Play compatibility, and On Screen Display (OSD) controls.

Precautions

Follow all warnings, precautions and maintenance as recommended in this user's manual to maximize the life of your unit. See Appendix B for more information on touchmonitor safety.

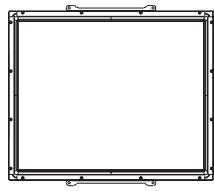
2

INSTALLATION AND SETUP

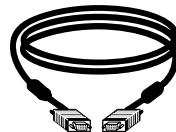
This chapter discusses how to install your LCD touchmonitor and how to install the driver software.

Unpacking Your Touchmonitor

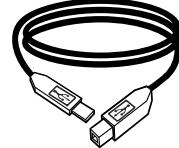
Check that the following 7 items are present and in good condition:



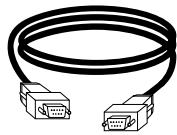
LCD monitor



Video cable



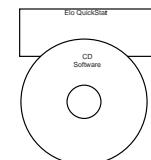
USB cable



Serial cable



Brackets



Touch Tools CD + Quick Install Guide

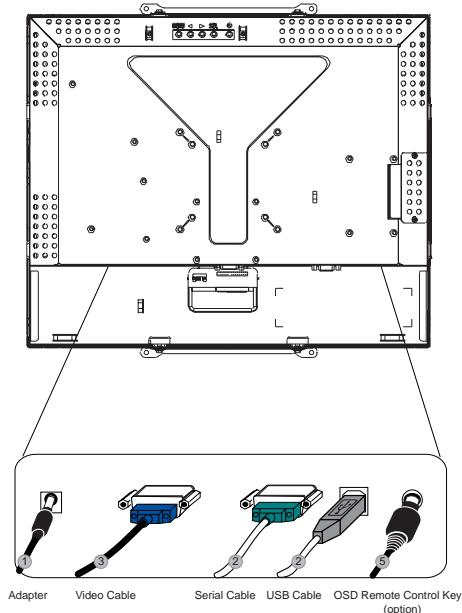
(exclude APR model)

*Optional external DC (power brick)

Power brick and cables: 12V, 4.16A, 50W-R, available at additional cost.

Interface Connection

NOTE: Before connecting the cables to your touchmonitor and PC, be sure that the computer and touchmonitor are turned off.



1. Connect one end of the **power adapter** to the monitor and the other end to the connector of the power cord.
2. Connect one end of either the **touchscreen serial (RS232) cable** or the touchscreen USB cable (but not both) to the rear side of the computer and the other end to the LCD monitor. Tighten by turning the two thumb screws clockwise to ensure proper grounding (USB cable does not have thumb screws).
3. Connect one end of the **video cable** to the rear side of computer and the other to the LCD monitor. Tighten by turning the two thumb screws clockwise to ensure proper grounding.
4. Press the **power button** on the rear panel to turn the monitor power on.
5. Connect one end of **OSD remote control key**(option) to the monitor.

Power Requirements

NOTE: This monitor operates at 12V 4A

DC Input:

Plug shape: Tuning Fork Type

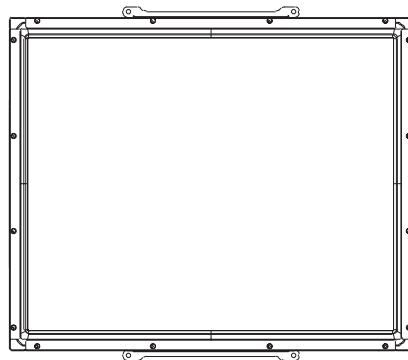
Plug polarity: (+) (-)

Outside dimension: Ø 5.5 ± Ø.1

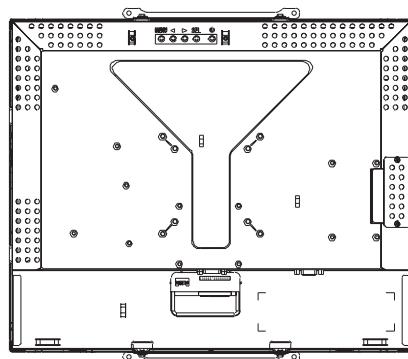
Inside dimension: Ø 2.1 ± Ø.1

Product Overview

Main Unit



Rear View



Installing the Driver Software

Elo TouchSystems provides driver software that allows your touchmonitor to work with your computer. Drivers are located on the enclosed CD-ROM for the following operating systems:

- Windows 7
- Windows Vista
- Windows XP
- Windows 2000
- Windows Me
- Windows 98
- Windows 95
- Windows NT 4.0
- Windows 3.1
- MS-DOS

Additional drivers and driver information for other operating systems are available on the Elo TouchSystems web site at www.elotouch.com.

The Elo touchmonitor is plug-and-play compliant. Information on the video capabilities of your touchmonitor is sent to your video display adapter when Windows starts. If Windows detects your touchmonitor, follow the instructions on the screen to install a generic plug-and-play monitor.

Refer to the following appropriate section for driver installation instructions.

Depending upon whether you connected the serial communication cable or the USB communication cable, only the serial driver or the USB driver should be installed.

Installing the Serial Touch Driver (not applicable to Acoustic Pulse Recognition monitor)

Installing the Serial Touch Driver for Windows 7, Windows Vista, Windows XP, Windows 2000, ME, 95/98 and NT4.0.

NOTE: For Windows 2000 and NT4.0 you must have administrator access rights to install the driver.
Make sure the serial connector (RS232) is plugged into the monitor and an open com port on the PC.

- 1 Insert the Elo CD-ROM in your computer's CD-ROM drive.
- 2 If the AutoStart feature for your CD-ROM drive is active, the system automatically detects the CD and starts the setup program.
- 3 Follow the directions on the screen to complete the driver setup for your version of Windows.
- 4 If the AutoStart feature is not active:
 - 5 Click **Start > Run**.
 - 6 Click the **Browse** button to locate the EloCd.exe program on the CD-ROM.
 - 7 Click **Open**, then **OK** to run EloCd.exe.
 - 8 Follow the directions on the screen to complete the driver setup for your version of Windows.

Installing the Serial Touch Driver for MS-DOS and Windows 3.1

You must have a DOS mouse driver (MOUSE.COM) installed for your mouse if you wish to continue using your mouse along with your touchmonitor in DOS.

To install Windows 3.x and MS-DOS touch driver from Windows 95/98, follow the directions below:

- 1 Insert the CD-ROM in your computer's CD-ROM drive.
- 2 From DOS, type d: and press the **Enter** key to select the CD-ROM (your CD-ROM drive may be mapped to a different drive letter).
- 3 Type cd\elodos_w31 to change to the correct directory.
- 4 Type **Install** and press **Enter** to start the installation.
- 5 Calculate the touchscreen.

Installing the USB Touch Driver

Installing the USB Touch Driver for Windows 7, Windows Vista, Windows XP, Windows 2000, ME and Windows 98.

- 1 Insert the Elo CD-ROM in your computer's CD-ROM drive.
If Windows 98 or Windows 2000 starts the Add New Hardware Wizard, do the following:
 - 2 Choose **Next**. Select "Search for the best driver for your device (Recommended)" and choose **Next**.
 - 3 When a list of search locations is displayed, place a checkmark on "Specify a location" and use **Browse** to select the \EloUSB directory on the Elo CD-ROM.
 - 4 Choose **Next**. Once the Elo USB touchscreen driver has been detected, choose **Next** again.
 - 5 You will see several files being copied. Insert your Windows 98 cd if prompted. Choose **Finish**.

If Windows 98 or Windows 2000 does not start the Add New Hardware Wizard, do the following:

NOTE: For Windows 2000 you must have administrator access rights to install the driver.

- 1 Insert the Elo CD-ROM in your computer's CD-ROM drive. If the AutoStart feature for your CD-ROM drive is active, the system automatically detects the CD and starts the setup program.
- 2 Follow the directions on the screen to complete the driver setup for your version of Windows.

If the AutoStart feature is not active:

- 1 Click **Start > Run**.
- 2 Click the **Browse** button to locate the EloCd.exe program on the CD-ROM.
- 3 Click **Open**, then **OK** to run EloCd.exe.
- 4 Follow the directions on the screen to complete the driver setup for your version of Windows.

Installing APR USB Touch Driver for Windows XP and Windows VISTA

Insert the Elo APR CD-ROM in your computer's CD-ROM driver.

Follow the directions on the screen to complete the APR 3.1 driver setup for your version of Windows. Do not plug USB cable until software is fully loaded. When finished, plug USB cable and alignment data is transferred.

NOTE: For the latest driver, go to elotouch.com and download it from the driver download section.

3

OPERATION

About Touchmonitor Adjustments

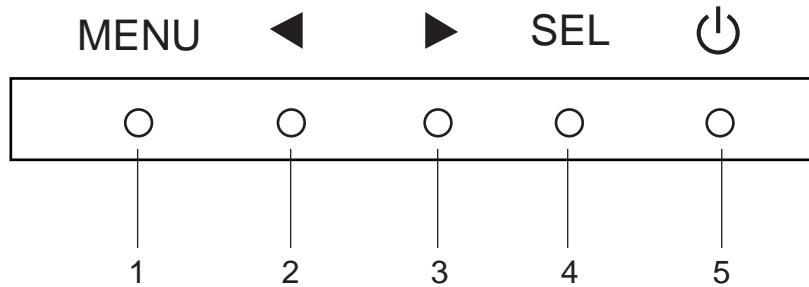
Your touchmonitor will not likely require adjustment. However, variations in video output and application may require adjustments to the touchmonitor to optimize the quality of the display.

For best performance, your touchmonitor should be operating in native resolution, that is 1280 x 1024 at 80k-75 Hz. Use the Display control panel in Windows to choose 1280 x 1024 resolution.

Operating in other resolutions will degrade video performance. For further information, please refer to Appendix A.

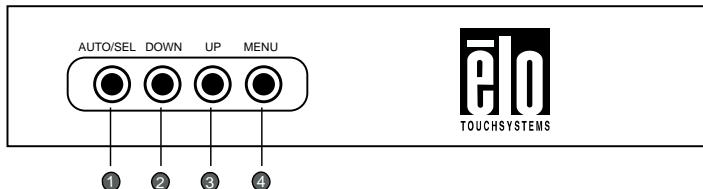
All adjustments made to the controls are automatically memorized. This feature saves you from having to reset the choices every time the touchmonitor is unplugged or powered off and on. If there is a power failure, the touchmonitor settings will not default to the factory specifications.

Rear Panel Controls



Control	Function
1 Menu/Exit	Display/exits the On Screen Display (OSD) menus.
2 <	<ol style="list-style-type: none">Enter contrast of the OSD.Increase value of the adjustment item.Select item clockwise.
3 >	<ol style="list-style-type: none">Enter brightness adjustment.Decrease value of the adjustment item.Select item counter-clockwise.
4 Select	Selects the adjustment items from the OSD menus.
5 Power Switch	Switches the power of the monitor.

Remote OSD Buttons(option)



Control	Function
1 AUTO/SEL	Selects the adjustment items from the OSD menus.
2 DOWN	<ol style="list-style-type: none">Enter brightness adjustment.Decrease value of the adjustment item.Select item counter-clockwise.
3 UP	<ol style="list-style-type: none">Enter contrast of the OSD.Increase value of the adjustment item.Select item clockwise.
4 MENU	Display/exits the On Screen Display (OSD) menus.

Controls and Adjustment

On Screen Display (OSD) Menu Functions

To Display and Select the OSD Functions:

- 1 Press the Menu key to activate the OSD menu.
- 2 Use **◀** or **▶** to move clockwise or counter-clockwise through the menu. Press the Select key, the parameter will be highlighted when selected.
- 3 To quit the OSD screen at any time during the operation, press the Menu key. If no keys are pressed for a short time period, the OSD automatically disappears.

NOTE: The OSD screen will disappear if no input activities are detected for 45 seconds(default).

On Screen Display (OSD) Control Options

Control	Description
Contrast	Increases or decreases contrast.
Brightness	Increases or decreases brightness.
V-Position	Moves the screen up or down.
H-Position	Moves the screen left or right.
Recall Defaults	Returns the monitor to its default settings.
RGB	Press ◀ or ▶ to select 9300, 6500, 5500, 7500 and USER. Only when selecting USER you can make adjustments to the R/G/B content. Press Enter to restore to factory default setting.
Exit	Exit the menu.
Sharpness	Adjusts the sharpness.
Phase	Increases or decreases the snow noise of the image after auto adjustment is made.
Clock	The dot clock is fine-adjusted after auto adjust.
OSD H-Position	Moves the OSD position horizontally on the screen.
OSD V-Position	Moves the OSD position vertically on the screen.
OSD Time	Determines how long (in seconds) the OSD menu waits before closing automatically after no action has been performed.
Auto-Adjust	Press Auto to enable this function. The Auto-Adjust will automatically adjust V-Position, H-Position, Clock and Clock-Phase.
OSD Language	Select from English, French, German, Spanish, and Japanese.
Information Description	Indicates the current resolution, H-Frequency and V-Frequency.

Preset Modes

To reduce the need for adjustment for different modes, the monitor has default setting modes that are most commonly used as given in the table below. If any of these display modes are detected, the monitor automatically adjusts the picture size and centering. When no mode is matched, the user can store their preferred modes in the user modes. The monitor is capable of storing up to 7 user modes. The only condition to store as a user mode is the new display information must have 1 KHz difference for horizontal frequency or 1 Hz for vertical frequency or the sync signal polarities are different from the default modes.

Mode	Resolution	H. Freq.	Band Width		
		(KHz)	(MHz)	H	V
1	CGA 512 x 247 60 Hz	16.858	11.059	-	-
2	CGA 512 x 256 60 Hz	16.158	11.059	+	-
3	VGA 640 x 350 70 Hz	31.47	28.322	+	-
4	VGA 720 x 400 70 Hz	31.47	28.322	-	+
5	VGA 640 x 480 60 Hz	31.47	25.175	-	-
6	MAC 640 x 480 66 Hz	35.00	32.24	-	-
7	VESA 640 x 480 72 Hz	37.86	31.5	-	-
8	VESA 640 x 480 75 Hz	37.50	31.5	-	-
9	VESA 800 x 600 56 Hz	35.16	36	+	+
10	VESA 800 x 600 60 Hz	37.88	40	+	+
11	VESA 800 x 600 75 Hz	46.88	49.5	+	+
12	VESA 800 x 600 72 Hz	48.08	50	+	+
13	MAC 832 x 624 75 Hz	49.72	57.283	-	-
14	VESA 1024 x 768 60 Hz	48.36	65	-	-
15	SUN 1024 x 768 65 Hz	52.45	70.49	-	-
16	VESA 1024 x 768 70 Hz	56.48	75	-	-
17	VESA 1024 x 768 75 Hz	60.02	78.75	+	+
18	SXGA 1280 x 1024 60 Hz	64	108	+	+
19	SXGA 1280 x 1024 75 Hz	80	135	+	+
20	SXGA 1152 x 864 75 Hz	67.5	108	+	+
21	SXGA 1280 x 960 60 Hz	60	108	+	+

Power

Mode	Power Consumption
On	<50W
Sleep	<4W
Off	<2W

We recommend switching the monitor off when it is not in use for a long time.

NOTE: Complies to VESA Power Management (DPM) standards. To activate the monitor, press any key on the keyboard or move the mouse or touch the touchscreen. In order for the touchscreen to bring the monitor from the DPM system, the touchscreen function must be fully operational.

4

TROUBLESHOOTING

If you are experiencing trouble with your touchmonitor, refer to the following table. If the problem persists, please contact your local dealer or our service center.

Solutions to Common Problems

Problem	Suggestion(s)
The monitor does not respond when turning on the system.	1. Check that the monitor's Power Switch is on. 2. Turn off the power and check the monitor's DC power cord and signal cable for proper connection.
Characters on the screen are dim	Refer to the About Touchmonitor Adjustments section to adjust the brightness.
The video is blank	1. During operation, the monitor screen may automatically turn off as a result of the Power Saving feature. Press any key to see if the screen reappears. 2. Refer to the About Touchmonitor Adjustments section to adjust the brightness.
Screen flashes when initialized	Turn the monitor off then turn it on again.
"Out of Range" display	Reconfigure the resolution of your computer to make one of the monitor's supported video mode (see Appendix C). See Appendix A for more information on resolution.
Touch doesn't work	Make sure the touch cable is securely attached at both ends.

A

NATIVE RESOLUTION

The native resolution of a monitor is the resolution level at which the LCD panel is designed to perform best. For the LCD touchmonitor, the native resolution is 1280 x 1024 for the 19 inch size. In almost all cases, screen images look best when viewed at their native resolution. You can lower the resolution setting of a monitor but not increase it.

Input Video	19" LCD
512 x 247 (CGA)	Transforms input format to 1280 x 1024
512 x 256 (CGA)	Transforms input format to 1280 x 1024
640 x 480 (VGA)	Transforms input format to 1280 x 1024
800 x 600 (SVGA)	Transforms input format to 1280 x 1024
1024 x 768 (XGA)	Transforms input format to 1280 x 1024
1280 x 1024 (SXGA)	Displays in Native Resolution

The native resolution of an LCD is the actual number of pixels horizontally in the LCD by the number of pixels vertically in the LCD. LCD resolution is usually represented by the following symbols:

CGA	512 x 247
CGA	512 x 256
VGA	640 x 480
SVGA	800 x 600
XGA	1024 x 768
SXGA	1280 x 1024

As an example, a SXGA resolution LCD panel has 1280 pixels horizontally by 1024 pixels vertically. Input video is also represented by the same terms. SXGA input video has a format of 1280 pixels horizontally by 1024 pixels vertically. When the input pixels contained in the video input format match the native resolution of the panel, there is a one to one correspondence of mapping of input video pixels to LCD pixels. As an example, the pixel in column 45 and row 26 of the input video is in column 45 and row 26 of the LCD. For the case when the input video is at a lower resolution than the native resolution of the LCD, the direct correspondence between the video pixels and the LCD pixels is lost. The LCD controller can compute the correspondence between video pixels and LCD pixels using algorithms contained on its controller. The accuracy of the algorithms determines the fidelity of conversion of video pixels to LCD pixels. Poor fidelity conversion can result in artifacts in the LCD displayed image such as varying width characters.

B

TOUCHMONITOR SAFETY

This manual contains information that is important for the proper setup and maintenance of your touchmonitor. Before setting up and powering on your new touchmonitor, read through this manual, especially Chapter 2 (Installation), and Chapter 3 (Operation).

- 1 To reduce the risk of electric shock, follow all safety notices and never open the touchmonitor case.
- 2 Turn off the product before cleaning.
- 3 The slots located on the sides and top of the touchmonitor case are for ventilation. Do not block or insert anything inside the ventilation slots.
- 4 It is important that your touchmonitor remains dry. Do not pour liquid into or onto your touchmonitor. If your touchmonitor becomes wet do not attempt to repair it yourself.

Ensure that your installation/setup is designed/equipped to maintain operating temperature within the specified operating conditions (refer to the section TouchMonitor Specifications).

Care and Handling of Your Touchmonitor

The following tips will help keep your touchmonitor functioning at the optimal level.

- To avoid risk of electric shock, do not disassemble the brick power supply or display unit cabinet. The unit is not user serviceable. Remember to unplug the display unit from the power outlet before cleaning.
- Do not use alcohol (methyl, ethyl or isopropyl) or any strong dissolvent. Do not use thinner or benzene, abrasive cleaners or compressed air.
- To clean the display unit cabinet, use a cloth lightly dampened with a mild detergent.
- Avoid getting liquids inside your touchmonitor. If liquid does get inside, have a qualified service technician check it before you power it on again.
- Do not wipe the screen with a cloth or sponge that could scratch the surface.
- To clean the touchscreen, use window or glass cleaner. Put the cleaner on a clean cloth and wipe the touchscreen. Never apply the cleaner directly to the touchscreen.



Warning

This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or federal laws. (Within this system, the backlight lamps in the monitor display contain mercury.)



Waste Electrical and Electronic Equipment(WEEE) Directive

In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

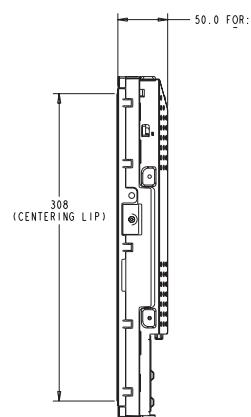
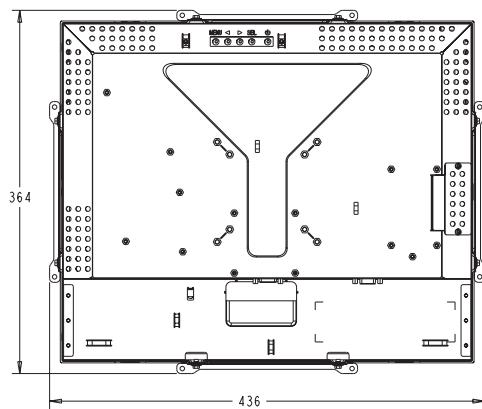
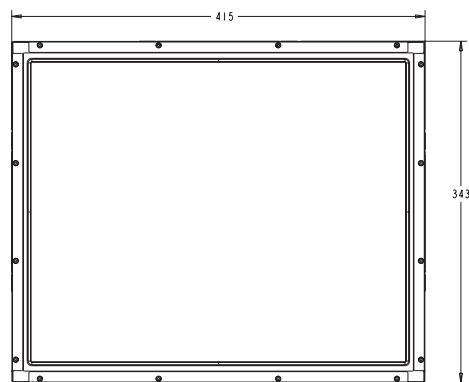
C

TECHNICAL SPECIFICATIONS

Touchmonitor Specifications

Model	1937L
LCD Display	19" TFT Active Matrix Panel
Display Size	376.32(H) x 301.056(V) mm
Pixel Pitch	0.294(H) x 0.294(V) mm
Display Mode	512 x 247 @ 60Hz 512 x 248 @ 60Hz 640 x 350 @ 70Hz 640 x 480 @ 60, 61, 66, 72, 75Hz 720 x 400 @ 70Hz 800 x 600 @ 56, 60, 72, 75Hz 832 x 624 @ 75Hz 1024 x 768 @ 60, 65, 70, 75Hz 1280 x 1024 @ 60, 75Hz 1280 x 1024
Native Resolution	1280 x 1024
Contrast Ratio	800 : 1 (typical)
Brightness	No touch screen: typical 250 cd/m ² IntelliTouch: typical 225 cd/m ² AccuTouch: typical 200 cd/m ² Acoustic Pulse Recognition: typical 225 cd/m ²
Response Time (Rise or Fall)	5ms (typical)
Display Color	16.7M
Viewing Angle (CR>10, typical)	Looking Up: 80° Looking Down: 75° Looking Left: 80° Looking Right: 80°
Input Signal	Video Sync
Signal Connector	Mini D-Sub 15 pin
Rear Controls	Menu, ▲, ▼, Select, Power
On Screen Display (OSD) Controls	Contrast, Brightness, H-Position, V-Position, Color Temperature, Phase, Clock, OSD Time, Recall, Language: English, French, German, Spanish, Japanese DDC2B
Plug & Play	IntelliTouch/AccuTouch /APR.
Touch Panel (optional)	
Operating Conditions	Temperature: 0°C ~ 40°C (32°F ~ 104°F) Humidity: 20% ~ 80% (No Condensation) Altitude: To 12,000 Feet
Storage Conditions	Temperature: -20°C ~ 60°C (-4°F ~ 140°F) Humidity: 10% ~ 90% (No Condensation)
Dimensions (HxWxD)	343 x 415 x 51mm
Weight (Net)	5.2Kg
Certifications	UL, CUL, TUV, CE, FCC, ICES-003, VCCI, C-Tick, NOM, Argentina S-mark, CCC, China RoHS, KCC, BSMI

19" LCD Touchmonitor (1937L) Dimensions



REGULATORY INFORMATION

I. Electrical Safety Information:

- A) Compliance is required with respect to the voltage, frequency, and current requirements indicated on the manufacturer's label. Connection to a different power source than those specified herein will likely result in improper operation, damage to the equipment or pose a fire hazard if the limitations are not followed.
- B) There are no operator serviceable parts inside this equipment. There are hazardous voltages generated by this equipment which constitute a safety hazard. Service should be provided only by a qualified service technician.
- C) Contact a qualified electrician or the manufacturer if there are questions about the installation prior to connecting the equipment to mains power.

II. Emissions and Immunity Information

- A) Notice to Users in the United States: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

- B) Notice to Users in Canada: This equipment complies with the Class B limits for radio noise emissions from digital apparatus as established by the Radio Interference Regulations of Industrie Canada.

- C) Notice to Users in the European Union: Use only the provided power cords and interconnecting cabling provided with the equipment. Substitution of provided cords and cabling may compromise electrical safety or CE Mark Certification for emissions or immunity as required by the following standards:

This Information Technology Equipment (ITE) is required to have a CE Mark on the manufacturer's label which means that the equipment has been tested to the following Directives and Standards: This equipment has been tested to the requirements for the CE Mark as required by EMC Directive 89/336/EEC indicated in European Standard EN 55022 Class B and the Low Voltage Directive 73/23/EEC as indicated in European Standard EN60950.

D) General Information to all Users: This equipment generates, uses and can radiate radio frequency energy. If not installed and used according to this manual the equipment may cause interference with radio and television communications. There is, however, no guarantee that interference will not occur in any particular installation due to site-specific factors.

- 1) In order to meet emission and immunity requirements, the user must observe the following:
 - a) Use only the provided I/O cables to connect this digital device with any computer.
 - b) To ensure compliance, use only the provided manufacturer's approved line cord.
 - c) The user is cautioned that changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- 2) If this equipment appears to cause interference with radio or television reception, or any other device:
 - a) Verify as an emission source by turning the equipment off and on.
 - b) If you determine that this equipment is causing the interference, try to correct the interference by using one or more of the following measures:
 - i) Move the digital device away from the affected receiver.
 - ii) Reposition (turn) the digital device with respect to the affected receiver.
 - iii) Reorient the affected receiver's antenna.
 - iv) Plug the digital device into a different AC outlet so the digital device and the receiver are on different branch circuits.
 - v) Disconnect and remove any I/O cables that the digital device does not use. (Unterminated I/O cables are a potential source of high RF emission levels.)
 - vi) Plug the digital device into only a grounded outlet receptacle. Do not use AC adapter plugs. (Removing or cutting the line cord ground may increase RF emission levels and may also present a lethal shock hazard to the user.)

If you need additional help, consult your dealer, manufacturer, or an experienced radio or television technician.

III. Agency Certifications

The following certifications have been issued for this monitor:

- Argentina S-Mark
- Australia C-Tick
- Canada CUL
- China CCC
- China RoHS
- Germany TUV
- Europe CE
- Japan VCCI
- Mexico NOM
- United States FCC
- United States UL
- Korea KCC
- Taiwan BSMI

WARRANTY

Except as otherwise stated herein or in an order acknowledgment delivered to Buyer, Seller warrants to Buyer that the Product shall be free of defects in materials and workmanship. The warranty for the touchmonitors and components of the product is 3 (three) years.

Seller makes no warranty regarding the model life of components. Seller's suppliers may at any time and from time to time make changes in the components delivered as Products or components.

Buyer shall notify Seller in writing promptly (and in no case later than thirty (30) days after discovery) of the failure of any Product to conform to the warranty set forth above; shall describe in commercially reasonable detail in such notice the symptoms associated with such failure; and shall provide to Seller the opportunity to inspect such Products as installed, if possible. The notice must be received by Seller during the Warranty Period for such product, unless otherwise directed in writing by the Seller. Within thirty (30) days after submitting such notice, Buyer shall package the allegedly defective Product in its original shipping carton(s) or a functional equivalent and shall ship to Seller at Buyer's expense and risk.

Within a reasonable time after receipt of the allegedly defective Product and verification by Seller that the Product fails to meet the warranty set forth above, Seller shall correct such failure by, at Seller's options, either (i) modifying or repairing the Product or (ii) replacing the Product. Such modification, repair, or replacement and the return shipment of the Product with minimum insurance to Buyer shall be at Seller's expense. Buyer shall bear the risk of loss or damage in transit, and may insure the Product. Buyer shall reimburse Seller for transportation cost incurred for Product returned but not found by Seller to be defective. Modification or repair, of Products may, at Seller's option, take place either at Seller's facilities or at Buyer's premises. If Seller is unable to modify, repair, or replace a Product to conform to the warranty set forth above, then Seller shall, at Seller's option, either refund to Buyer or credit to Buyer's account the purchase price of the Product less depreciation calculated on a straight-line basis over Seller's stated Warranty Period.

THESE REMEDIES SHALL BE THE BUYER'S EXCLUSIVE REMEDIES FOR BREACH OF WARRANTY, EXCEPT FOR THE EXPRESS WARRANTY SET FORTH ABOVE, SELLER GRANTS NO OTHER WARRANTIES, EXPRESS OR IMPLIED BY STATUTE OR OTHERWISE, REGARDING THE PRODUCTS, THEIR FITNESS FOR ANY PURPOSE, THEIR QUALITY, THEIR MERCHANTABILITY, THEIR NON-INFRINGEMENT, OR OTHERWISE. NO EMPLOYEE OF SELLER OR ANY OTHER PARTY IS AUTHORIZED TO MAKE ANY WARRANTY FOR THE GOODS OTHER THAN THE WARRANTY SET FORTH HEREIN. SELLER'S LIABILITY UNDER THE WARRANTY SHALL BE LIMITED TO A REFUND OF THE PURCHASE PRICE OF THE PRODUCT. IN NO EVENT SHALL SELLER BE LIABLE FOR THE COST OF PROCUREMENT OR INSTALLATION OF SUBSTITUTE GOODS BY BUYER OR FOR ANY SPECIAL, CONSEQUENTIAL, INDIRECT, OR INCIDENTAL DAMAGES.

Buyer assumes the risk and agrees to indemnify Seller against and hold Seller harmless from all liability relating to (i) assessing the suitability for Buyer's intended use of the Products and of any system design or drawing and (ii) determining the compliance of Buyer's use of the Products with applicable laws, regulations, codes, and standards. Buyer retains and accepts full responsibility for all warranty and other claims relating to or arising from Buyer's products, which include or incorporate Products or components manufactured or supplied by Seller. Buyer is solely responsible for any and all representations and warranties regarding the Products made or authorized by Buyer. Buyer will indemnify Seller and hold Seller harmless from any liability, claims, loss, cost, or expenses (including reasonable attorney's fees) attributable to Buyer's products or representations or warranties concerning same.

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