

elo



Touchmonitor User Guide

1529L 15" LCD Desktop Touchmonitor, 3000 series
(Optional Magnetic Stripe Reader and Customer Display)

ELO Touch Solutions

15" LCD Touchmonitor

**Optional Magnetic Stripe Reader,
Customer Display, Barcode Scanner**

User Guide

Revision G

P/N 008603E

ELO Touch Solutions

1-800-ELOTOUCH

www.elotouch.com

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INTRODUCTION

Product Description

The 1529L is a retail terminal designed to present information to the operator and the customer. The 1529L is available in serial and USB versions or combo touch monitor. The 1529L consists of a 15.0" LCD main display with a touchscreen and the following optional peripherals: customer display, vacuum fluorescent display (VFD) Customer Display, fingerprint reader, barcode scanner, credit card reader, and a 6 port USB (USB version only) Hub. The main display element is a 15.0 inch diagonal XGA resolution (1024 x 768) LCD display. The main display will consist of an LCD Display and touchscreen. Four types of touchscreens can be selected in the 1529L as options. They are AccuTouch, Intellitouch.

The credit card reader reads all three stripes on a standard credit card or drivers license. The credit card is read by sliding the credit card, stripe side toward the display through the credit card reader forward or backward. There is a USB credit card reader only. The Hub provides 2 internal USB ports to be used by the credit card reader and the touchscreen. The hub also supplies two USB ports to the outside of the back of the 1529L for external use. The hub is only used by the USB version of the 1529L. The 1529L is powered by a universal AC power source or 12 VDC from external power source.

Detailed LCD Display Performance Requirements

15 inch TFT LCD Display Panel

Display Format	1024 x 768
Display area 15"	304.1mm(H) x 228mm(V)
Pixel Pitch 15"	0.297mm(H) x 0.297mm(V)
Contrast Ratio	700:1 typical
Brightness	
LCD	350 cd/m ² (Typical) ; 270 cd/m ² (Minimum)
AccuTouch	280 cd/m ² (Typical) ; 203 cd/m ² (Minimum)
IntelliTouch	315 cd/m ² (Typical) ; 230 cd/m ² (Minimum)
Accutouch Transmission	80% typical ; 75% minimum
IntelliTouch Transmission	90% typical ; 85% minimum
Response Time	Tr+Tf=8msec typical
Display Color	16.2 million colors, 8 Bit-
Vertical Viewing Angle	Typical Viewing Angle: 80deg/ 80deg @ CR>=10
Horizontal Viewing Angle	Typical Viewing Angle: 80deg/ 80deg @ CR>=10

Credit Card Reader

There is a USB credit card reader only. The USB version is available in HID and Key- board emulation versions. The reader reads all three stripes on a standard credit card or drivers license.

Reference Standards-Conform to applicable standards	International Standards Organization, American National Standards Institute, California Drivers License, American Association of Motor Vehicle Administrators
Message Format	ACCII
Card Speed	3 to 50 IPS
MTBF Electronics	125,000 hrs; Head 1,000,000 passes

Two Port USB Hub

The Hub provides 2 internal USB ports to be used by the credit card reader and the touchscreen. The hub also supplies two USB ports to the outside of the back of the 1529L for external use. The hub is only used by the USB version of the 1529L. The hub meets the following requirements:

Specification Full compliance with USB specification **1.0, 1.1 and 2.0** and HID Class Definition Rev 1.0. Hub shall be self powered Hub shall provide 2 external and 4 internal downstream ports with individual port over current detection, protection and recovery. Supports both Open Host Controller Inter- face (OHCI) and Universal Host Controller Interface (UHCI). Supports Suspend and Resume operation. Bus fault detection and recovery.

External Power Supply

The 1529L shall be powered by a universal AC power source or 12 VDC from external power source. The power supply shall provide the following capability: AC power: Input voltage **90 to 264 vac**
Input frequency 47 to 63hz
DC power: Input voltage 12 vdc
Input line and load regulation +/-2%

INSTALLATION AND SETUP

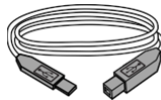
This chapter discusses how to install your LCD touchmonitor and how to install Elo TouchSystems driver software.

Unpacking Your Touchmonitor

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



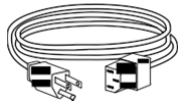
Touchmonitor



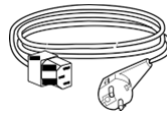
USB Cable



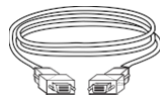
Video cable



Power cable US/Canadian



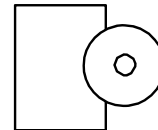
European power cable



DVI cable



Speaker



CD and Quick Install Guide

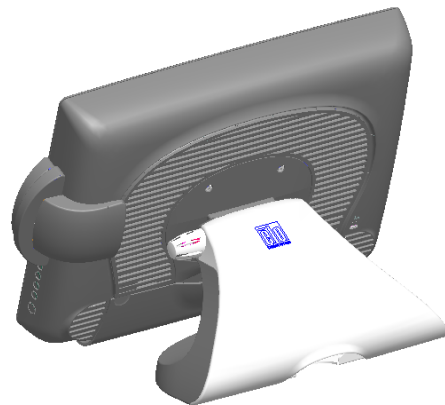
Product Overview

Main Unit



Note: Shown with optional Biometric & MSR.

Rear View



Note: Shown with optional Rear Facing Customer Display.

Side View



Base Bottom View



Kensington™ Lock



The Kensington™ lock is a security device that prevents theft. To find out more about this security device, do to <http://www.kensington.com>.

ccUSB Interface Connection

Your touchmonitor comes with only one touchscreen connector cables: **USB** cable. (For Windows 2000, Me and XP systems only.)

To set up the display, please refer to the following figures and procedures:

Remove the Cable Cover

The cables are connected at the back of the monitor.



cable cover

To remove the cover, grasp the lip of the cover and pull towards you until it snaps off.

CAUTION

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



NOTE

Before connecting the cables to the touchmonitor, route all the cables through the hole in the second as shown in the picture above.

The following illustrations guide you step by step in connecting your touchmonitor using a USB cable connection.



Power cord

Connect one end of the **power cord** to the monitor and the other end to wall. Connect the power cable to the power port in the monitor.



Video cable

Connect one end of the **video cable** to the rear side of computer and the other to the LCD. Tighten by turning the two thumb screws clockwise to ensure proper grounding. You can select DVI video cable or D-SUB15 video cable.



DVI cable



Speaker cable

Connect one end of the **speaker cable** to the speaker port in the computer and the other end to the port in the monitor.

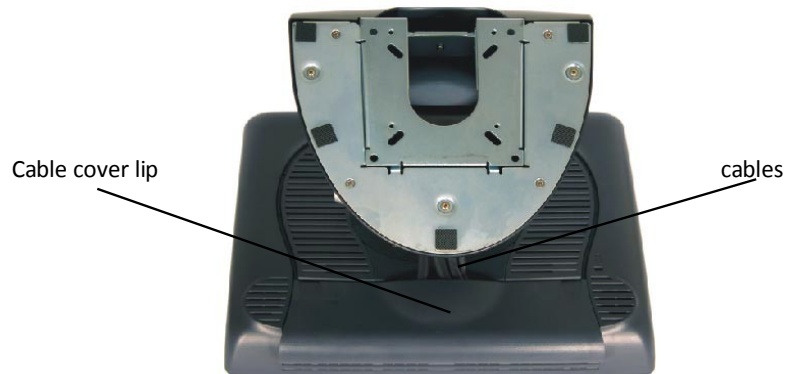


USB cable

Connect one end of the **USB cable** to the rear side of the computer and the other to the LCD monitor.

The USB cable is for optional touch, MSR. Only one USB cable is needed because the device contains a self powered USB 1.1 Hub. Two self powered ports are available for running other USB devices. For touch only, no USB Hub is present.

Replace the Cable Cover



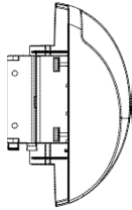
Then you have attached all the cables to the monitor, gently bring all the cables toward the standard so they fit under the cover lip.
Snap the Cable cover in place over the connections.

Optimizing the LCD Display

To ensure the LCD display works well with your computer, configure the display mode of your graphic card to make it less than or equal to 1024 x 768 resolution, and make sure the timing of the display mode is compatible with the LCD display. Refer to Appendix A for more information about resolution. Compatible video modes for your touchmonitor are listed in Appendix C.

Installing the Peripheral Device Drivers

Magnetic Stripe Reader



No device are needed.

Testing the USB MSR Keyboard Emulation

- 1 Plug in the device.
- 2 Open MS Word.
- 3 Slide the card through the MSR to view the data.

Testing the USB-HID Class MSR

- 1 On the CD, browse to **Touch Monitor Peripherals\Magnetic Stripe Card Readers\Demo**.
- 2 Open the **Readme.txt** and follow instructions to test the unit.

Convert MSR from HID to keyboard Emulation

- 1 To convert from HID mode to Keyboard Emulation mode
 - 1.1 Double-click on the "MSR Change Mode" icon on the desktop.
The following will appear:

Installing the Driver Software

ELO Touch Solutions 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

Installing the Serial Touch Driver for Windows 7, Windows Vista, indows 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.

OPERATION

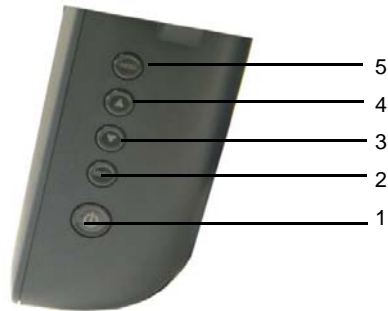
About Touchmonitor Adjustments

Your touchmonitor will not likely require adjustment. Variations in video output and application may require adjustments to your 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 80 k-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 features saves you from having to reset the choices every time the touchmonitor is unplugged or powered off and on. If there is a power fail here, the touchmonitor settings will not default to the factory specifications.

15" LCD Function Key



	Controls	Function
1	Power Switch	Turns the display system power on or off .
2	Select	Displays the OSD menus on the screen and used to select ("Clockwise" and "Counter-clockwise" direction) the OSD control options on the screen.
3		Adjusts the decreasing value of the selected OSD control option.
	▼	
4		Adjusts the increasing value of the selected OSD control option.
5	Menu	Menu display and menu exit.
	▲	

Controls and Adjustment

OSD Lock/Unlock

You are able to lock and unlock the OSD feature. The monitor is shipped in the unlocked position.

To lock the OSD:

- 1 Press the Menu button and ▲ button simultaneously for 2 seconds. A window will appear displaying “OSD Unlock”. Continue to hold the buttons down for another 2 seconds and the window toggles to “OSD Lock”.

Power Lock/Unlock

You are able to lock/unlock the Power feature. The monitor is shipped in the unlocked position. To lock the power:

- 1 Press the Menu button and the ▼ simultaneously for 2 seconds. A window for another 2 seconds and the window toggles to —Power Lock“.

OSD Menu Functions

To display the OSD Menu press the **Menu** button.

- 1 Press the ▲ button or ▼ button to select the different OSD control option.
- 2 When the function you want to change is displayed, press the **Select** button.

To adjust the Value of the function:

- 1 Pressing the ▲ button increases the value of the selected OSD control option.
- 2 Pressing the ▼ button decreases the value of the selected OSD control option.

After adjusting the values, the monitor will automatically save the changes.

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

OSD Control Options

Brightness

- Background Luminance of the LCD panel is adjusted.

Contrast

- Adjusts the contrast or the values of color gain (RED, GREEN or BLUE).

Sharpness

- The sharpness can be adjustable.

Phase

- Adjusts the phase of the dot clock.

Auto Adjust

- Clock system auto adjustment (under 5 seconds).

OSD Left/Right

- The OSD screen is moved vertically right and left.

OSD Up/Down

- The OSD screen is moved vertically up and down.

Clock

- Adjusts the ratio of dividing frequency of the dot clock.

Color Temperature

- Sets R, G, B gain.

Current Input

- The frequency of the horizontal/vertical synchronizing signal under the input indicated. (This information is under Auto Adjust icon)

OSD Position

- Allows the OSD indication position to be selected.

Language

- Select the language used for the OSD menu from among English, France, Deutsch, Spanish and Japanese.

Recall Defaults

- All data copy from factory shipment data.

OSD Timeout

- Adjust time for OSD to disappear.

Input Video Select

- Select D-SUB Analog, DVI Digital signal.

Volume

- To increase or decrease the sound level.

Power-Save (No Input)

- The LCD panel background is cut when there is no signal input (AC line power consumption of 4w or less).

Power LED Display & Power Saving

General Power Saving Mode

When the power switch are switch **on**, this LED lights in **green**.

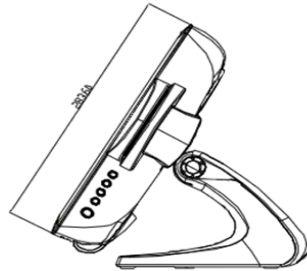
The LED indicates the different power status with altered LED colors when monitor operates in different modes (see following table).

	Power	
Mode	Consumption	Indicator
On	41w max.	Green Orange
Sleep	1.7w max.	NO
Off	0.5w	

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

Display Angle

For viewing clarity, you can tilt the LCD forward up 67 to 90 degrees.



Tilt 30° from vertical



Tilt 75° from vertical

CAUTION

In order to protect the LCD, be sure to hold the base when adjusting the LCD, and take care not to touch the screen.

Controls and Adjustment

OSD Lock/Unlock

You are able to lock and unlock the OSD feature. The monitor is shipped in the unlocked position.

To lock the OSD:

- 1 Press the Menu button and **▲** button simultaneously for 2 seconds. A window will appear displaying “OSD Unlock”. Continue to hold the buttons down for another 2 seconds and the window toggles to “OSD Lock”.

Power Lock/Unlock

You are able to lock/unlock the Power feature. The monitor is shipped in the unlocked position. To lock the power:

- 1 Press the Menu button and the **▼** simultaneously for 2 seconds. A window for another 2 seconds and the window toggles to —Power Lock”.

OSD Menu Functions

To display the OSD Menu press the **Menu** button.

- 1 Press the **▲** button or **▼** button to select the different OSD control option.
- 2 When the function you want to change is displayed, press the **Select** button.

To adjust the Value of the function:

- 1 Pressing the **▲** button increases the value of the selected OSD control option.
- 2 Pressing the **▼** button decreases the value of the selected OSD control option.

After adjusting the values, the monitor will automatically save the changes.

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

OSD Control Options

Brightness

- Background Luminance of the LCD panel is adjusted

Contrast

- Gain of R, G, and B signal is adjusted.

Sharpness

- The sharpness can be adjustable.

Phase

- The phase of the dot clock is adjusted.

Auto Adjust

- Automatically adjusts the systems dot clock(takes approximately 5 seconds).

OSD Left/Right

- The osd screen is moved horizontally left and right.

OSD Up/Down

- The OSD screen is moved vertically up and down.

Clock

- The ratio of dividing frequency of the dot clock is adjusted.

Color Temperature

- Sets the R, G, and B gains.

Current Input

- The frequency of the horizontal/vertical synchronizing signal under the input is indicated.(These information is under auto Adjust icon)

OSD Position

- The osd indication position can be selected.

Language

- Select the language for the OSD menu from among English, France, Deutsch, Spanish and Japanese.

Recall Defaults

- Restore all original factory defaults.

OSD Timeout

- Adjust how long the OSD menu is displayed.

Input Video Select

- Select D-SUB Analog, dvi Digital signal.

Volume

- To increase or decrease the sound level.

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.	<ol style="list-style-type: none">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	<ol style="list-style-type: none">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

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.

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.

TECHNICAL SPECIFICATIONS

Touchmonitor Specifications

Model	1529L
LCD Display	15.0" TFT Active Matrix Panel
Display Size	304.1(H) x 228(V) mm
Pixel Pitch	0.297(H) x 0.297(V) mm
Display Mode	VGA 640 x 350 (70 Hz) VGA 720 x 400 (70 Hz) VGA 640 x 480 (60 / 72 / 75 Hz) SVGA 800 x 600 (56 / 60 / 72 / 75Hz) XGA 1024 x 768 (60 / 70 / 75Hz)
Native	XGA 1024 x 768
Contrast Ratio	700 : 1 (typical)
Brightness	350 cd/m ² , AT 280 cd/m ² , IT 315 cd/m ²
LCD	350 cd/m ² (Typical); 270 cd/m ² (Minimum)
AccuTouch	280 cd/m ² (Typical); 203 cd/m ² (Minimum)
IntelliTouch	315 cd/m ² (Typical); 230 cd/m ² (Minimum)
Response Time	16 msec typical
Display Color	16.2 million color, 8 bit
Viewing Angle	(L/R)= -80 °/+80 ° (typical), (U/D) -80 °/+80 ° (typical)
Input Signal	VGA Video DVI Video
Signal Connector	15 Pin D-Sub, DVI-D
Front Control	Power on / off , Menu, ▲ , ▼ , Select
OSD	Contrast, Brightness, H/V-Position, Recall default, Color Temperature, Volume, Sharpness, Phase, Clock OSD H/V position, OSD Time, Auto Adjust, OSD Language, Input Select
Plug & Play	DDC 2B
Touch Panel (optional)	AccuTouch, IntelliTouch
Power	Input: AC 90-264V, 47-63Hz, or DC 12V/4.16A (max.)

Operating Conditions

Temp 0 °C ~ 40 °C (41 °F ~ 95 °F)

Humidity 20% ~ 80% (No

Condensation) Altitude To 10,000 Feet

Dimensions (HxWxD)

354 x 301 x 285mm

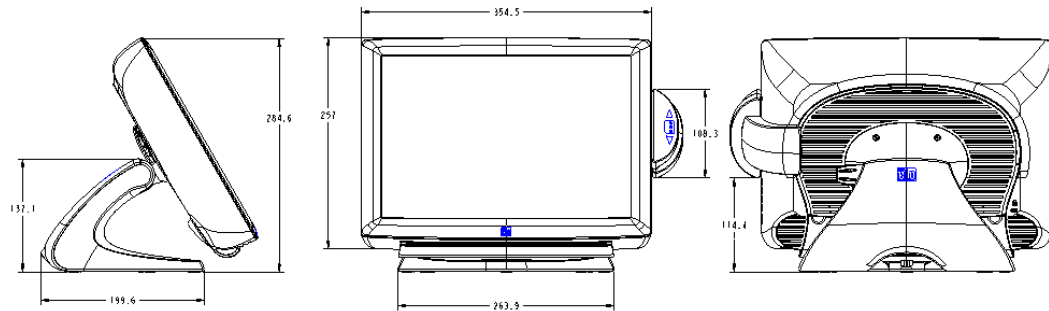
Weight (Net)

20.1lbs., monitor weight 16.2 lbs.

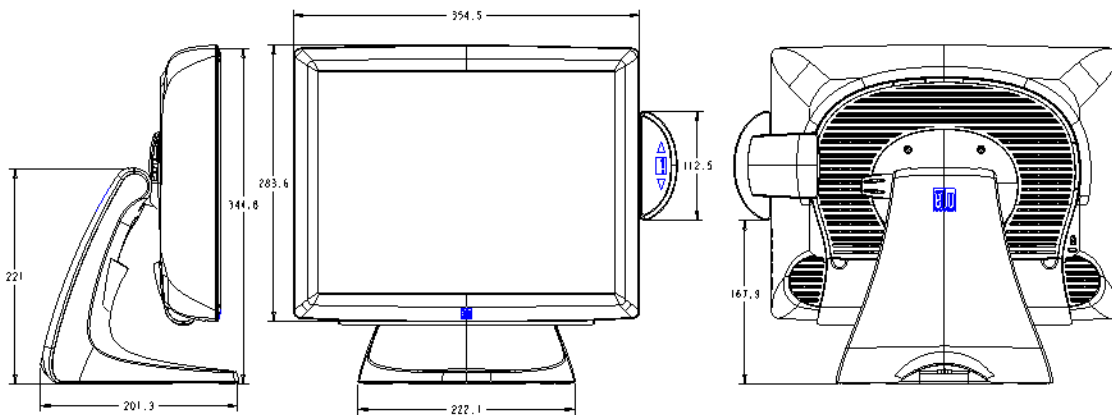
Certifications

UL, C-UL, FCC-B, CE, Semko, VCCI, MPRII, C-TICK, Argentina S-Mark

15" LCD Touchmonitor(1529L) Dimensions



15" LCD Touchmonitor(1529L) 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 EN 60950.

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
 - 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
- Canada IC
- Europe CE
- Japan VCCI
- Europe Semko
- United States UL
- FCC
- Sweden MPR II

Laser Notice

CAUTION: Laser radiation when open. DO NOT STARE INTO BEAM.

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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