



LC1502R SERIES

USER'S GUIDE

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European Union 2002/95/EC Directive on the Restriction of Hazardous Substances (RoHS)

In February 2003, the European Union issued Directive 2002/95/EC on the Restriction of Hazardous Substances, commonly known as RoHS, in certain electrical and electronic equipment. It restricts the use of six hazardous substances, including lead (Pb).

The Directive states that all new products within its scope, placed on the European market after July 1, 2006 must be compliant with its requirements.

Planar Systems Inc. is fully in support of and compliant with EU Directive 2002/95/EC for applicable products within its scope.

A Planar part number will be modified with an "LF" suffix designation to indicate RoHS compliance, as shown on the part number label affixed to the display and on the box containing the display.

Important Recycle Instruction:



LCD Lamp(s) inside this product contain mercury. This product may contain other electronic waste that can be hazardous if not disposed of properly. Recycle or dispose in accordance with local, state, or federal Laws. For more information, contact the Electronic Industries Alliance at [HYPERLINK "http://WWW.EIAE.ORG"](http://WWW.EIAE.ORG) WWW.EIAE.ORG For lamp specific disposal information check WWW.LAMPRECYCLE.ORG.

Deutsch

- Entsorgung von elektrischen & elektronischen Altgeräten (geltend für die europäische Gemeinschaft und andere europäische Länder mit separaten Sammelprogrammen)

Dieses Symbol, zu finden auf Ihrem Produkt oder dessen Verpackung, macht Sie darauf aufmerksam, dass dieses Produkt bei der Entsorgung nicht als Hausmüll behandelt werden darf. Statt dessen sollte es an eine Sammelstelle zum Recycling von elektrischen und elektronischen Altgeräten gegeben werden. Helfen Sie mit, potenziell schädliche Einwirkungen auf Umwelt und Gesundheit, die durch eine unsachgemäße Entsorgung dieses Produktes entstehen können, zu vermeiden und entsorgen Sie dieses Produkt ordnungsgemäß. Recycling hilft, natürliche Rohstoffe einzusparen.



Dieses Symbol ist nur innerhalb der europäischen Gemeinschaft gültig. Wenn Sie dieses Produkt entsorgen möchten, wenden Sie sich bitte an Ihre örtliche Behörde und fragen Sie nach der ordnungsgemäßen Entsorgungsmethode.

Français

- Mise au rebut des équipements électriques et électroniques usagés (Valable dans l'ensemble de l'Union Européenne ainsi que dans les pays européens disposant de programmes distincts de collecte des déchets)

Ce symbole appliqué sur votre produit ou sur son emballage indique que ce produit ne doit pas être traité comme un déchet ménager lorsque vous voulez le mettre au rebut. Il doit au contraire être remis à un site de collecte agréé pour le recyclage des équipements électriques et électroniques. En veillant à ce que ce produit soit mis au rebut de façon adéquate, vous contribuerez à prévenir les conséquences potentiellement négatives sur l'environnement et sur la santé humaine qui résulteraient de sa production en cas de mise au rebut inappropriée de ce produit. Le recyclage des matériaux contribuera également à économiser les ressources naturelles.



Ce symbole n'est valable que dans l'Union Européenne. Si vous souhaitez mettre ce produit au rebut, veuillez prendre contact avec les autorités locales ou avec votre revendeur et renseignez-vous sur la méthode de mise au rebut correcte.

English

- Disposal of old Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collection programs)

This symbol found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources.



This symbol is only valid in the European Union. If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

Nederlands

- Verwijderen van oude elektrische en elektronische apparatuur (toepasbaar in de volledige Europese Unie en andere Europese landen met afzonderlijke programma's voor afvalverzameling)

Dit symbool dat op het product of zijn verpakking is aangebracht, geeft aan dat dit product niet mag worden behandeld als huishoudelijk afval als u het wilt wegwerpen. U moet het afgeven bij een speciaal verzamelpunt voor de recycling van elektrische en elektronische apparatuur. Door te garanderen dat u dit product op de correcte manier wegwerpt, helpt u potentiële negatieve gevolgen voor het milieu en de menselijke gezondheid, die zouden kunnen worden veroorzaakt door een onechtmatig wegwerpen van het product, te voorkomen. De recycling van materialen helpt het behoud van natuurlijke bronnen.



Dit symbool is alleen geldig in de Europese Unie. Als u dit product wenst weg te gooien, dient u contact op te nemen met uw lokale instanties voor details over de gepaste methode voor afvalverwijdering.

Italiano

- Smaltimento delle attrezzature elettriche ed elettroniche usate (applicabile in tutta la Comunità Europea ed altri Paesi Europei che applicano programmi di raccolta differenziata)

Il simbolo trovato sul prodotto, o sulla sua confezione, indica che il prodotto non può essere trattato come i domestici quando è il momento di smaltirlo. Al contrario, deve essere consegnato ad un centro di raccolta specializzato nel riciclaggio di attrezzature elettriche ed elettroniche. Assicurando che il corretto smaltimento di questo prodotto, si aiuterà a prevenire potenziali conseguenze negative sull'ambiente e sulla salute umana, che possono essere provocate da uno scorretto smaltimento di questa attrezzatura. I materiali riciclati aiuteranno a conservare le risorse naturali.



Questo simbolo è valido solo nell'Unione Europea. Per smaltire questo prodotto, mettersi in contatto con le autorità locali – o con il rivenditore – e chiedere informazioni sul corretto metodo di smaltimento.

Español

- Deshecho de equipos eléctricos y electrónicos (aplicable a la Unión Europea y a otros países europeos con programas de reciclaje independientes)

La presencia de este símbolo en el propio producto o en su material de embalaje, indica que no se debe tratar como residuo doméstico cuando desee deshacerse de él. En su lugar, debe entregarlo en el punto limpio correspondiente de reciclaje de equipos eléctricos y electrónicos. Asegurándose de que este producto se desecha de forma correcta, ayudará a evitar posibles consecuencias negativas para la conservación del medioambiente y la salud humana, consecuencias que podrían darse si se deshecha el producto de forma inadecuada. El reciclado de materiales ayuda a conservar los recursos naturales.



Este símbolo solamente es válido en la Unión Europea. Si desea deshacerse de este producto, póngase en contacto con las autoridades locales o con su distribuidor y pida información sobre el método de disposición adecuado.

Portugués

- Eliminação de equipamentos eléctricos e electrónicos usados (aplicável na União Europeia e noutros países europeus com programas próprios de recolha destes equipamentos)

Este símbolo, colocado no produto ou na respectiva embalagem, indica que o produto não deve ser tratado como lixo doméstico aquando da sua eliminação. Em vez disso, deve ser entregue num ponto de recolha de equipamentos eléctricos e electrónicos para posterior reciclagem. Ao garantir a correcta eliminação deste produto, esnara a evitar consequências potencialmente negativas tanto para o ambiente como para a saúde humana. A reciclagem de materiais ajuda a preservar os recursos naturais.



Este símbolo apenas é válido na União Europeia.
Se quiser eliminar este produto, contacte as entidades locais ou o seu fornecedor para saber qual o método de eliminação correcto.

Polski

- Usowanie zużytego sprzętu elektrycznego i elektronicznego (Dotyczy krajów Unii Europejskiej i innych krajów europejskich z oddzielnymi programami zbiórki odpadów)

Obecność tego symbolu na produkcie lub na opakowaniu z produktem oznacza, że tego produktu nie można wyrzucić razem z odpadkami domowymi. Należy go przekazać do punktu zbiórki w celu poddania recyklingowi zgodnie z owymi elektrycznych i elektronicznych. Usunięcie tego produktu w prawidłowy sposób, pomoże w zabezpieczeniu przed negatywnym wpływem odpadów na środowisko i zdrowie ludzi, powodowanym przez niewłaściwe usuwanie produktu. Przetwarzanie materiału pomaga w zachowaniu zasobów naturalnych.



Ten symbol obowiązuje w krajach Unii Europejskiej.
Informacje dotyczącej metody usunięcia tego produktu, można uzyskać u dostawcy.

Svenska

- Avfall av förbrukat elektrisk och elektronisk utrustning (Tillämpbart i hela Europeiska unionen och andra europeiska länder med separata samlingsprogram)

Den här symbolen som finns på din produkt eller på dess förpackning påvisar att produkten inte ska behandlas som hushållsavfall när du vill slänga bort den. Istället ska den lämnas över till en lämplig uppsamlingspunkt för återvinning av elektriska och elektroniska utrustningar. Genom att tillförsäkra att den här produkten återvinns på ett riktigt sätt hjälper du till med att förhindra möjliga negativa konsekvenser för miljön och mänsklig hälsa. Det kan annars orsakas på grund av olämplig sophantering av den här produkten. Återvinning av material kommer att hjälpa till att bevara naturligtgänger.



Den här symbolen är endast giltig inom den Europeiska unionen.
Om du vill slänga bort den här produkten ska du kontakta lokala myndigheter eller återförsäljare för att fråga efter lämplig avfallsmetod.

Suomi

- Vanhojen sähkö- ja elektroniikkalaitteiden hävittäminen (Sovellettu kaikilla Euroopan unionin alueilla, sekä muissa Euroopan maissa, joilla on erilliset keräysjärjestelmät)

Jos tuotteessa tai sen pakkauksessa on tämä symboli, sitä ei pidä hävittää tavallisella tavalla kotitalousjätteenä, vaan se kuuluu toimittava sähkö- ja elektroniikkalaitteiden keräytysjärjestelmään. Varmistamalla, että tämä tuote hävitetään asianmukaisella tavalla autat estämään mahdollisia ympäristölle ja ihmisille koituvia negatiivisia seurauksia, jolla sen vääränlainen hävittäminen voi aiheuttaa. Materiaalien kierrättäminen auttaa säilyttämään luonnonvarjoja.



Tämä symboli on voimassa ainoastaan Euroopan unionin alueella.
Jos haluat hävittää tämän tuotteen, ota yhteyttä paikallisiin viranomaisiin tai jälleenmyyjään ja tiedustele asiaankuuluvia hävittämisohjelmia.

Table of Contents

Usage Notice	
Safety and Use Precautions	6
Introduction	
About the LC1502R	7
Package Overview	8
Installation	
Product Overview	9
Connector Descriptions	10
Mounting	11
Start Your Installation	12
User Controls	
Control Buttons	13
How to Use the OSD Menus	14
On-Screen Display Menus	15
Brightness Control	
Automatic Brightness Control	16
Manual Brightness Control	17
Minimum Brightness Limit	18
Maximum Brightness Mode	19
Specifications	
Electrical and Optical	20
Mechanical and Environmental	21
Compatible Video Modes	21
Reliability and Life	22
Safety and Regulatory Certifications	22
Available Options	
Power Supply and AC Power Cord	23
Cooling Kit	24
Touch Screens	25
Appendix	
Troubleshooting	26
Warning Signal	26
Mechanical Outline	27
Support and Service	28

Usage Notice

- Warning - To prevent the risk of fire or shock hazards, do not directly expose this product to rain or moisture.
- Warning - Please do not open or disassemble the product as this may cause electric shock.

Safety and Use Precautions

Follow all warnings, precautions and maintenance as recommended in this User's Manual to maximize the life of your monitor.

- Turn off the product before cleaning.
- Use only a dry soft cloth or clean room wiper when cleaning the LCD panel surface.
- Use a soft cloth moistened with mild detergent to clean the monitor housing.
- Use only a high-quality and safety-approved 12V power supply.
- Do not touch the LCD panel surface with sharp or hard objects.
- Do not use abrasive cleaners, waxes or solvents for cleaning.

Introduction

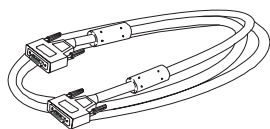
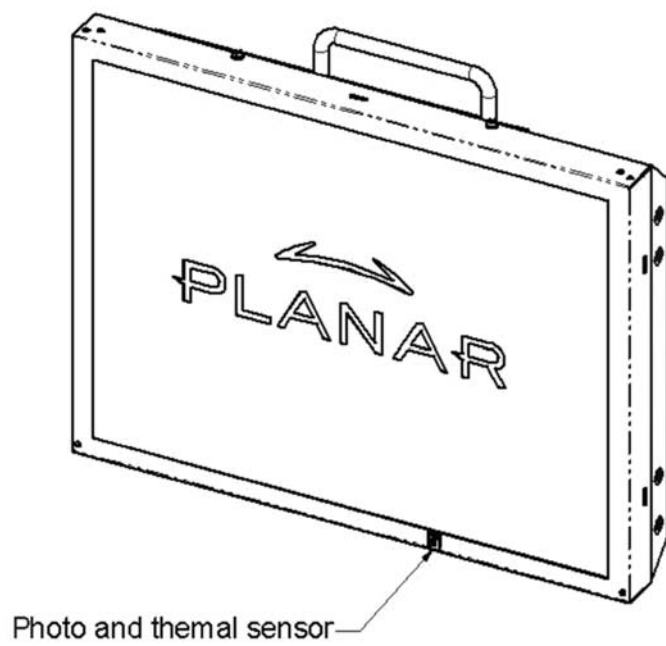
About the LC1502R

The LC1502R is a high performance monitor designed for demanding applications. The monitor consists of a 15" diagonal flat panel liquid crystal display (LCD) housed in a metal enclosure with an integrated ambient light sensor to facilitate automatic brightness control.

Features include:

- Very high bright 1200 cd/m² brightness for sunlight readability
- Automatic brightness control to auto adjust the brightness to ambient conditions
- Manual brightness control mode to allow the user to control the brightness
- Wide -10 - 60°C operating temperature range
- Long backlight life: >40000 hours operating time before reaching half brightness
- Rugged vibration and shock characteristics
- Conformance to FCC/EN55022 Class B for low EMI
- 1024 x 768 XGA resolution
- Auto-adjustment function for jitter-free operation
- Optional cooling kit to reduce solar loading
- Optional 12V AC/DC power supply

Package Overview



VGA Signal Cable

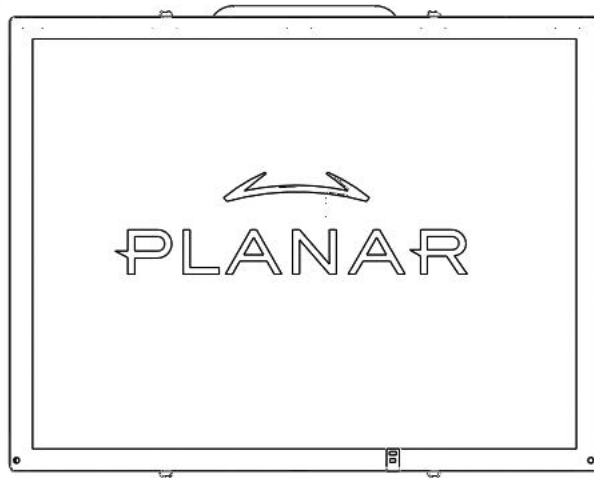


Quick Start Guide

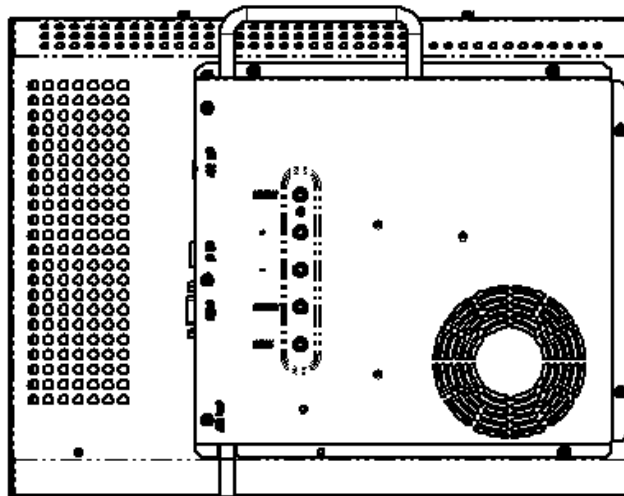
Installation

Product Overview

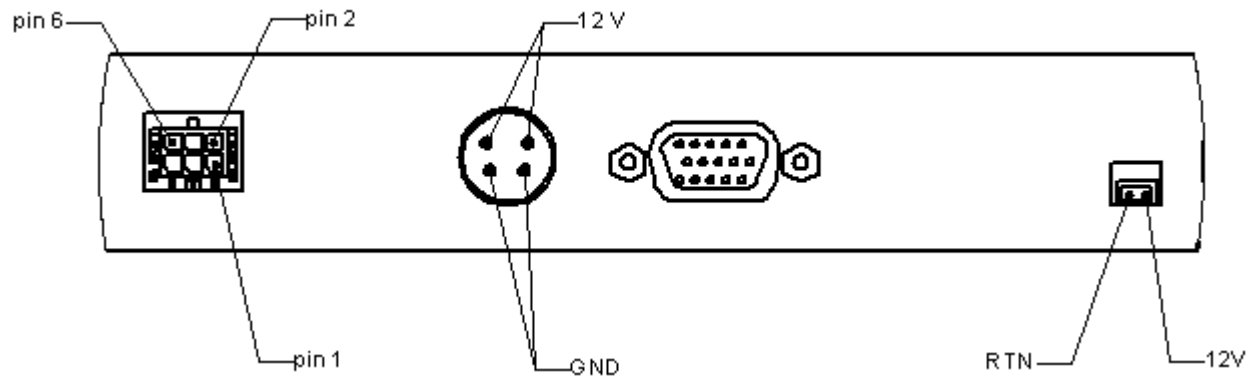
- Front View



- Rear View



Connector View



Connector Descriptions

1. Video Interface Connector

Standard D-sub Analog; 15-pin D-sub connector

2. Power Input Connector

Connector type: 4-pin mini DIN socket

Manufacturer: Singatron Enterprise Co. (Taiwan)

Part Number: 2MJ-0402A120

Mating Connector: 2MP-0402 series

Power Connector Pin Configuration

Pin	Description
1	+12V DC
2	+12V DC
3	Ground
4	Ground

3. External Dimming Connector

Connector type: Molex Micro Fit 3.0

Mating connector: Molex 43025-0600 (housing) and Molex 43030 (terminals)

External Dimming Connector Pin Configuration and Description

Pin	Name	Description
1	Ground	Electrical ground
2	Reserved	For factory use only, leave unconnected
3	DIM_Input	0-5V analog input for external dimming, connect to wiper of dimming pot if used
4	/Ext_DIM,	Input to determine brightness control mode; has 10k pull up to +5V Logic high (or unconnected) = Automatic Brightness Control mode Logic low = Manual Brightness Control mode
5	Ground	Electrical ground; connect to lower leg of dimming potentiometer if used
6	Vref	+5V reference voltage output with 470 ohm series resistance; connect to upper leg of dimming potentiometer if used

4. Cooling Kit Power Output Connector

Note: There is no need to connect to this connector. Information is shown for reference only. If a Cooling Kit option is ordered, the required cooling kit power cable will be installed at the factory.

Optional Cooling Kit Pin Configuration

Pin	Description
1	Switched Return
2	+12V output

Mounting

M4 threaded holes are provided in the sides of the monitor housing for mounting purposes. The blind holes will accommodate 10 mm long screws. See the mechanical outline drawing 076-0579-xx at www.planar.com/support for details. Planar does not supply mounting fasteners.

Start Your Installation

Connecting the Display (Figure 1.0)

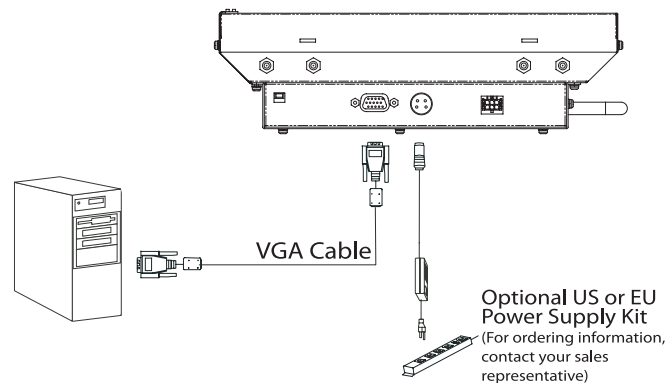
To configure the monitor, please refer to the following figure and procedures.

1. Be sure the computer or video source is turned off.
2. Connect the 12V DC power(1.0). During initial turn on with no video applied, the display will automatically power on with a self test pattern displayed. The self test pattern consists of alternating screens of black, white, red, green, and blue.
3. Connect the VGA signal cable from display VGA input connector to the 15-pin connector of your host computer and tighten the screws(1.0).
4. If needed, connect to the external dimming connector(1.0). See details in the Brightness Control section of this document.
5. Turn on your computer or video source.

Note: Once video is applied, self test mode is automatically cancelled and will no longer function when video is removed.

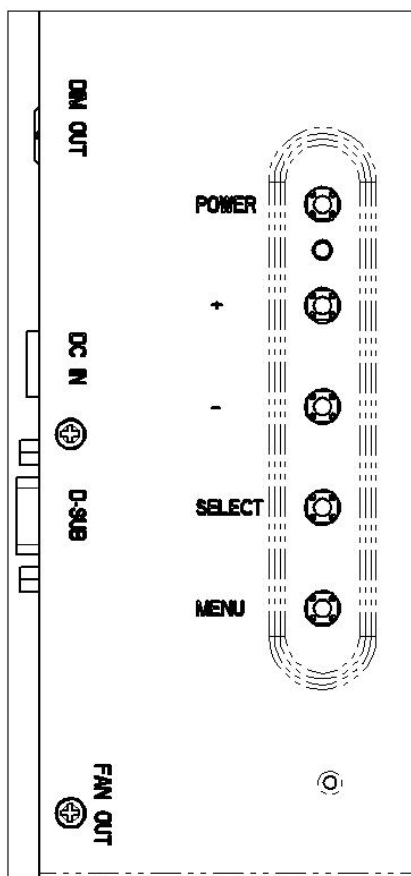
Notice: To ensure the LCD display will work well with your system, please configure the display mode of your graphic card for a 1024 x 768 resolution and a 75 Hz refresh rate.







Figure 1.0



User Controls

Control Buttons



No./ Icon	Control	Function
	Menu button	Displays the OSD menu
	Select/Auto	<i>Select-</i> To select the adjustment items from OSD menus. <i>Auto-</i> To activate the Auto Adjustment function to obtain an optimum image.
	Brightness Minus/Minus	1. Decreases the value of the adjustment items. 2. Decreases the minimum brightness limit of the display image.
	Brightness Plus/Plus	1. Increases the value of the adjustment items. 2. Increases the minimum brightness limit of the display image.
	Power Switch	Switches on/off the power of the LCD display.
	Power LED	1.Green indicates the display is turned on. 2. Amber indicates the display in power-saving mode.

How to Use the OSD Menu

1. Press the "Menu" button to pop up the on-screen menu and to select between the four main menus.
2. Choose the adjustment items by pressing the "Select/Auto" button.
3. Adjust the value of the adjustment items by pressing the "+" or "-" button.
4. The OSD menu will automatically close if you have left it idle for a pre-set time.

On-Screen Display Menus

MAIN MENU	SUB MENU		FUNCTION DESCRIPTION	
MIN BRIGHTNESS	0-100		Adjusts the Minimum brightness limit of the display.	
CONTRAST	0-100		Adjusts the contrast of the image.	
LCD ADJUSTMENT	CLOCK	0-100	Adjusts the clock to obtain an optimum image..	
	PHASE	0-63	Adjust the sampling timing for converting the analogue input signal to a digital input signal.	
	H. POSITION	0-100	Changes the horizontal position of the image.	
	V. POSITION	0-100	Changes the vertical position of the image.	
	RETURN		Returns to the previous page.	
COLOR TEMPERATURE	sRGB		Adjusts the color temperature.	
	9300K			
	7200K			
	6500K			
	5000K			
	USER	RED	Allows you to adjust the red, green and blue colors of the display.	
		GREEN		
	BLUE			
	RETURN			
	RETURN		Returns to the previous page.	
ECO MODE	ON		Enables the power saving mode.	
	OFF		Disables the power saving mode.	
	RETURN		Returns to the previous page.	
LANGUAGE	-		Allows you to choose the OSD menu language.	
	ENGLISH			
	FRANÇAIS			
	DEUTSCH			
	ESPAÑOL			
	ITALIAN			
	-			
	RETURN		Returns to the previous page.	
OTHER SETUP	SMOOTH	0-3	Adjusts the smoothness of the image.	
	OSD H. POSITION	0-100	Allows you to move the horizontal position of the OSD window.	
	OSD V. POSITION	0-100	Allows you to move the vertical position of the OSD window.	
	OSD TRANSPARENCY	ON		Changes the opaqueness of the OSD background
		OFF		
		RETURN		Returns to the previous page
	OSD TIME OUT	0-60	Adjusts the time period for OSD menu disappear	
	MODE MESSAGE	ON		Enables the display resolution.
		OFF		Disables the display resolution.
		RETURN		Returns to the previous page.
	RESET		Returns the display parameters of the current mode to its default settings.	
	RETURN		Returns to the previous page.	
EXIT			Exits the OSD Menu	

Brightness Control

The brightness of the monitor may be controlled automatically or manually, and the minimum brightness is adjustable. By default, the monitor is configured for automatic brightness control with a minimum brightness setting of approximately 250 cd/m².

Automatic Brightness Control

In automatic brightness control mode, a photo sensor mounted on the front of the display measures the ambient lighting condition (the illuminance). The monitor automatically and continually adjusts its brightness to accommodate the ambient environment. In moderately bright environments the monitor will reach maximum brightness. In dimly lit environments the monitor will operate at minimum brightness.

The graph below shows the factory set response to ambient lighting conditions. Note that a typical office environment is 300 to 500 lux, while a typical cloudy day is roughly 1000 lux.

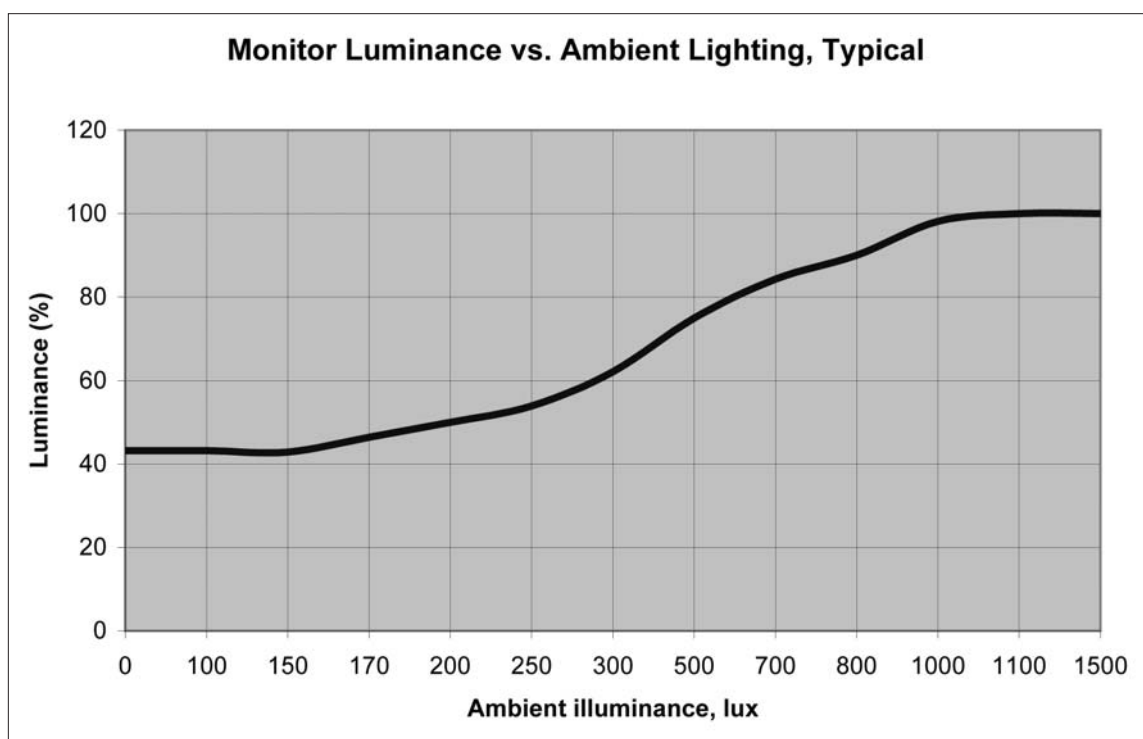
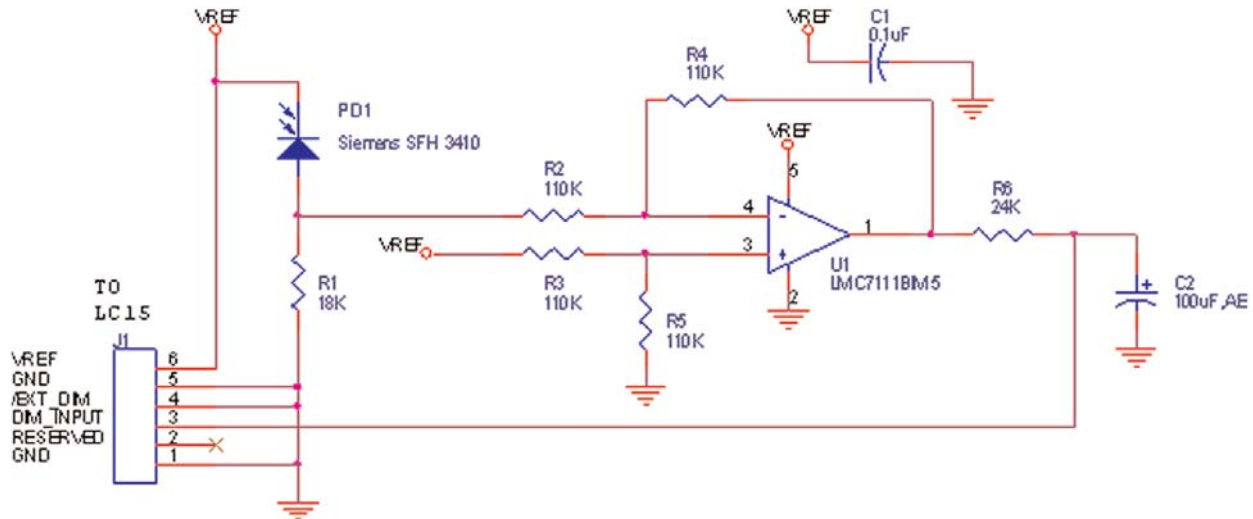


Figure 1

The schematic below is a reference design for the user to install the photo sensor remotely from the display.



Reference Design for Remote Photo Diode Brightness Control

Manual Brightness Control

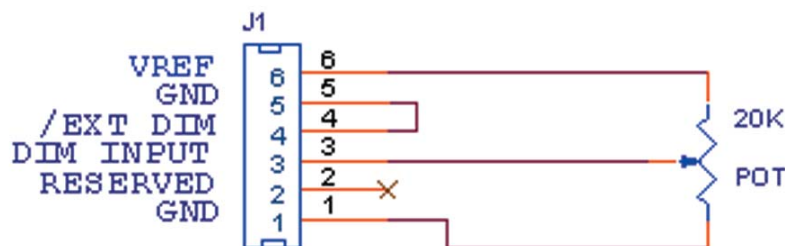
In manual brightness control mode, an externally supplied voltage determines the monitor brightness.

To use manual brightness control mode instead of the default automatic brightness control mode:

1. set pin 4 (/EXT_DIM) of the external dimming connector (J1) to a logic low
2. apply a 0 to 5V analog input to pin 3 (DIM_INPUT) of the external dimming connector

A potentiometer may be used to apply the voltage to the DIM_INPUT, as shown in the figure below. A 20k pot or higher is recommended. Note that VREF is a 5V regulated voltage supplied through a 470 ohm series resistance.

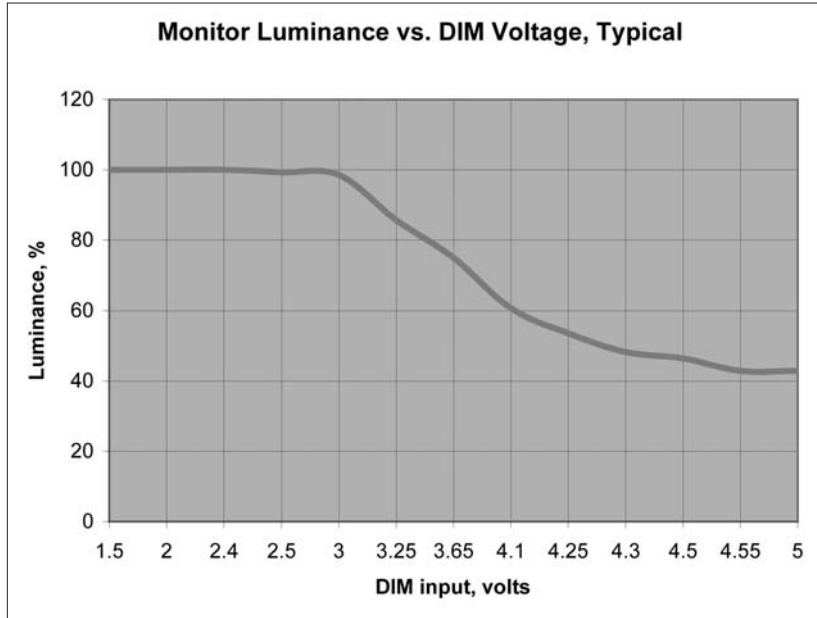
Important note! Do not connect to pin 2!



Manual brightness control using a potentiometer

The graph below shows the typical factory set response to the DIM_INPUT voltage when in manual brightness control mode.

Figure 2

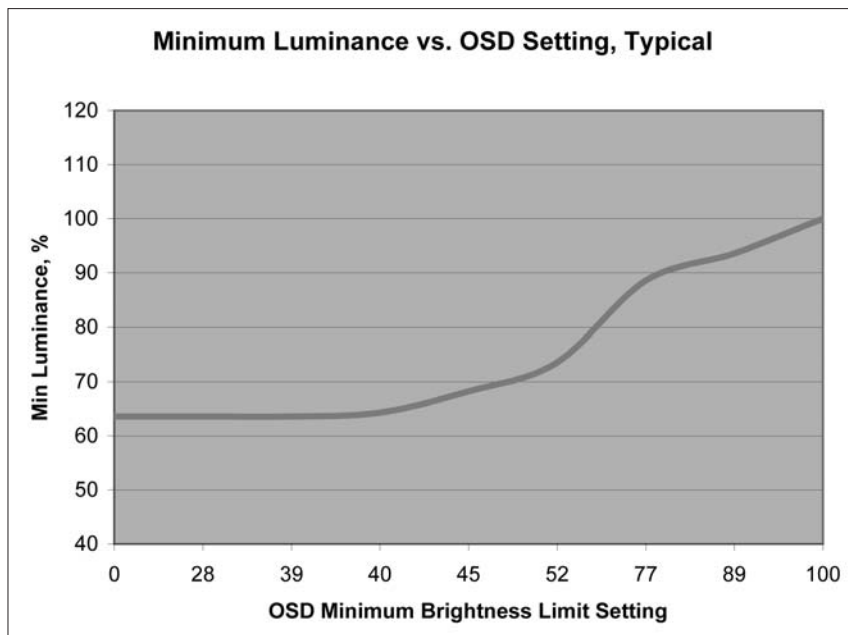


Minimum Brightness Limit

The factory set minimum brightness is approximately 300 cd/m². In most applications the factory setting is desired to maintain the widest dimming range possible. But for applications where 300 cd/m² is too low but some dimming is still desired, the minimum brightness limit may be increased. The OSD controls are used to access and change the minimum brightness limit setting, as described in the User Controls section of this manual.

Below is a graph showing the typical minimum brightness limit for a given OSD setting:

Figure 3



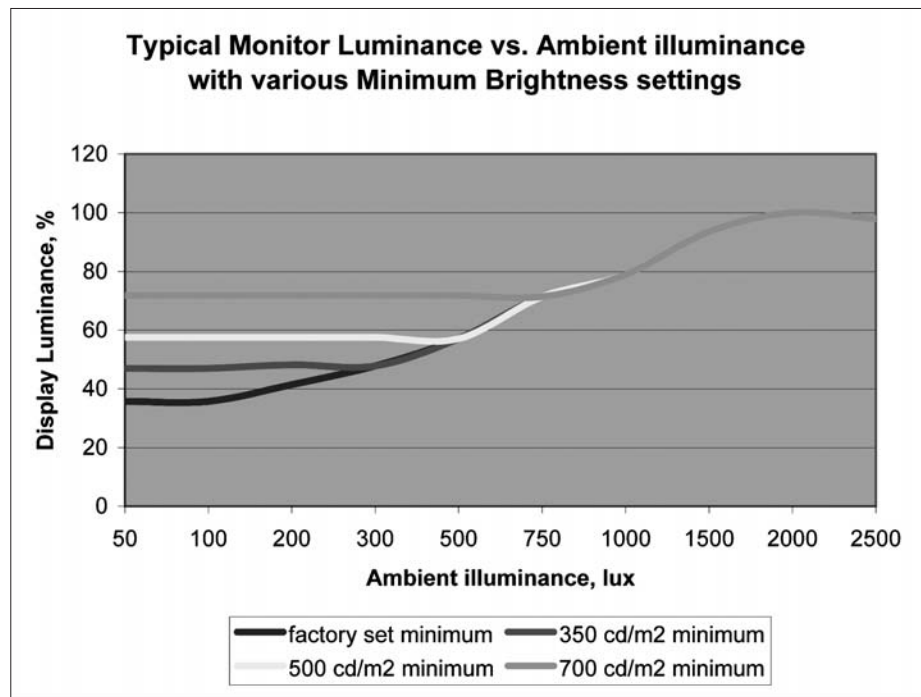
To change the minimum brightness limit, one of three basic methods can be used:

1. If one wishes to set an approximate minimum brightness, the above graph may be used. For instance, to set the minimum to approximately 500 cd/m², set the minimum brightness limit to an OSD setting of 60. Note, however, that there may be significant (+/- 50%) luminance variation for a given OSD setting due to display variation. Also note that decreasing the Minimum Brightness Limit from its factory-set value has no effect; only increasing the limit has an effect.
2. To set the minimum brightness visually, one may set the dimming to a minimum (by covering the photo sensor on the front of the monitor if in automatic brightness control mode, or by setting the DIM_INPUT to 5V if in manual brightness control mode) and then adjust the OSD setting to visually give the desired result.
3. To quantitatively set the minimum brightness to a desired luminance, one may set the dimming to a minimum and then adjust the OSD setting to give the desired result as measured by a photometer (such as the Tektronix J17 with a J1803 luminance head.) Note that a ten minute monitor warm up period with the monitor set near its minimum brightness is recommended to allow for an accurate measurement.

As with any OSD setting, a change to the minimum brightness limit will be permanently stored and will be unaffected by turning off the monitor power.

The minimum brightness limit will affect the minimum brightness of both the automatic brightness control mode and the manual brightness control mode identically. Below is a graph showing the impact of various minimum brightness limit settings on the automatic brightness control mode.

Figure 4



Maximum Brightness Mode

If a constant maximum brightness is desired, simply connect both the DIM_INPUT and the /EXT_DIM inputs of connector J1 to ground. The monitor will then be set to the maximum brightness.

Specifications

Electrical and Optical

Parameter	Min	Typ	Max	Units	Conditions/Notes
Input Power, Voltage	11.4	12.0	12.6	volts	
Input Power, Current		3.95	4.3	amps	
Monitor Power Consumption		47.4	49.2	watts	
Logic High	4.0	5	5.4	volts	For logic inputs
Logic Low	-0.4	0	1.0	volts	For logic inputs
DIM input voltage	0		5	volts	Analog input
Maximum White Luminance ^{1,2}	1050	1250		cd/m ²	Center; Normal
Minimum White Luminance ^{1,3}		350		cd/m ²	Center; Normal
Dimming range ⁴	2:1	4:1			Ratio of max lum/min lum
Luminance Uniformity ²	69	78		%	9-point; 10% from edge
Contrast Ratio ^{1,2}		600			White/black, Center
Horizontal Viewing Angle		±80		deg	Contrast ratio > 5
Vertical Viewing Angle		+55/-54		deg	Contrast ratio > 5
Response Time		16	23	msec	rise time + fall time
Screen Diagonal, viewable		15		inches	
Active Display Area		304.1 x 228.1		mm	
Resolution		1024 x 768		pixels	
Pixel Pitch		0.297		mm	
Number of Supported Colors		262144			

Note 1: 25°C steady state conditions at initial use

Note 2: No dimming

Note 3: With maximum dimming and factory set minimum brightness limit

Note 4: With factory set minimum brightness limit

Mechanical and Environmental

Parameter	Specification
Operating Temperature	-10 to 60°C
Operating Humidity	30 to 85% RH, non-condensing
Storage Temperature	-20 to 65°C
Storage Humidity	10 to 85% RH, non-condensing
Active Area Surface Treatment	Anti-glare, 3H hard coating
Weight	< 3 kg
Mechanical Shock shocks per axis	Half sine wave, 30g, 11ms, 3
Sine sweep vibration, operating	10~500 Hz, 0.25g o-p, 0.25 oct / min
Random sweep vibration, operating	10~500 Hz, 0.002 g ² /Hz, 1 grms, 1 hr / axis
Sine sweep vibration, non-operating	10~500 Hz, 0.75g o-p, 0.5 oct / min
Random sweep vibration, non-operating	10~500 Hz, 0.0082 g ² /Hz, 2 grms, 1 hr / axis

Compatible Video Modes

Mode	Resolution	V. Frequency (Hz)	H. Frequency (kHz)
IBM VGA	640 x 350	70	31.5
IBM VGA	640 x 400	70	31.5
IBM VGA	640 x 480	60	31.5
IBM VGA	720 x 400	70	31.5
VESA VGA	640 x 480	72	37.9
VESA VGA	640 x 480	75	37.5
VESA SVGA	800 x 600	56	35.2
VESA SVGA*	800 x 600	60	37.9
VESA SVGA	800 x 600	72	48.1
VESA SVGA	800 x 600	75	46.9
VESA XGA*	1024 x 768	60	48.4
VESA XGA	1024 x 768	70	56.5
VESA XGA	1024 x 768	75	60.0
Apple Mac	640 x 480	67	34.9
Apple Mac	640 x 480	67	35.0
Apple Mac	832 x 624	75	49.7
Apple Mac	1024 x 768	75	60.2

* Not recommended

Reliability and Life

Parameter	Specification
Mean Time Between Failures	20k hours at 25°C, 90% confidence level
Time to 50% brightness decay from initial brightness	40k hours minimum at 25°C, operating continuously at maximum brightness

Safety and Regulatory Certifications

- A. FCC Certification
FCC Part 15, Subpart B, Class B - Conducted and Radiated Tests
- B. CE Certification

Emission

EN 55022:1998+A1:2000+A2:2003; Class B	Conducted & Radiated Test
EN61000-3-2:2000, Class D	Harmonic Current Emissions
EN61000-3-3:1995+A1:2001	Voltage Fluctuations and Flicker

Immunity (EN 55024:1998+A1:2001)

IEC 61000-4-2: 2001	Electrostatic discharge immunity test
IEC 61000-4-3: 2002	Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4: 1995+A1:200+A2:2001	Electrical fast transient/ burst immunity test
IEC 61000-4-5: 2001	Surge immunity test
IEC 61000-4-6: 2001	Immunity to conducted disturbances, induced by radio-frequency fields
IEC 61000-4-8: 2001	Power frequency magnetic field immunity test
IEC 61000-4-11: 2001	Voltage dips, short interruptions and voltage variations immunity tests

C. UL/CUL Certification

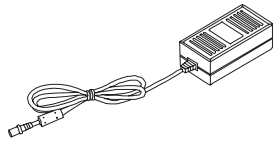
TUV Certification

Available Options

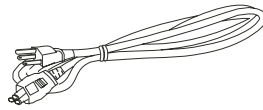
Power Supply and AC Power Cord

The LC1502R requires a 12VDC power input. Many users will have the required 12VDC available in their existing system. Alternatively, a power supply that is appropriately rated for the LC1502R is available from Planar. The supply is available with the AC power cord configured with either a European plug or a US plug.

12V Power Supply Kit, Euro type	997-2825-xx
12V Power Supply Kit, US type	997-2826-xx
Input voltage	90-265 VAC, 47-63 Hz
Output voltage	12 VDC
Rated Output Current	6.67A max
Case Dimensions	129 x 77 x 40 mm
DC output cord length	1.8 meters
AC input power cord length	1.8 meters

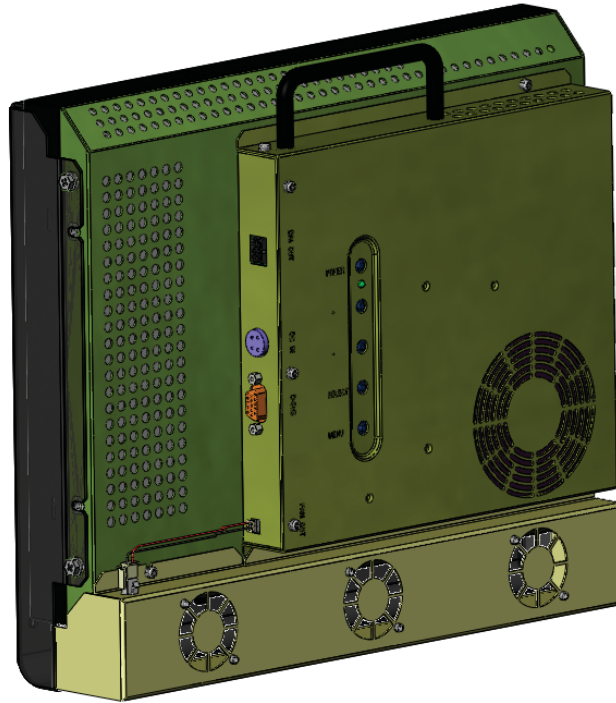


Power Adapter



Power Cord

Cooling Kit



For outdoor applications, a cooling kit may be desired to prevent excessive heating of the LCD display.

In direct sunlight, the front surface of the display (the LCD cell) may reach temperatures well above the ambient temperature. Possible effects of extreme surface temperatures include:

- LCD polarizer damage (permanent degraded image)
- LCD fluid clearing (display unreadable)
- Latent image (image burn-in visible)
- Flicker (image jitter)
- Localized non-uniformity (permanent spotty appearance).

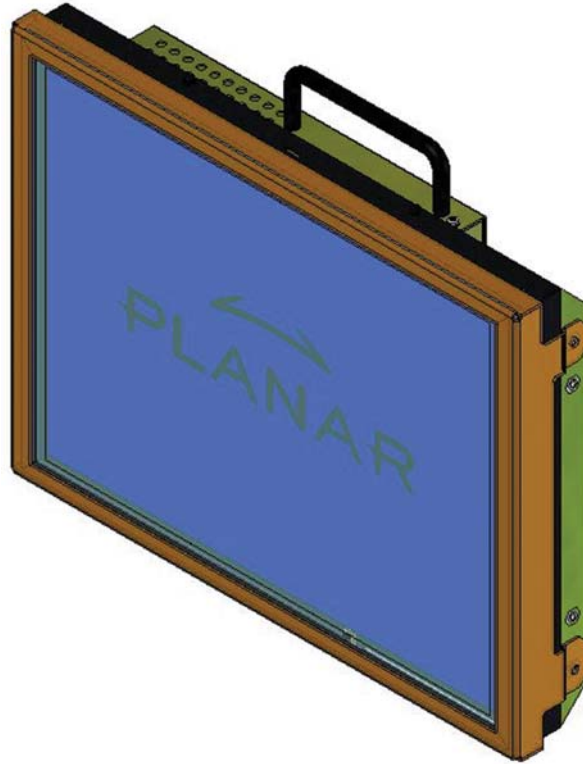
The cooling kit consists of a rear-mounted housing containing three fans and a front-mounted baffle that channels the air flow across the display surface. The fans' speed is governed by a temperature sensor adjacent to the photo sensor that is mounted on the front of the monitor. At temperatures above 15°C the fans will turn on at low speed and reach maximum speed at 25°C, thus minimizing the effects of sun loading and high temperatures.

The total fan kit power consumption is approximately 3.6 watts with fans at max speed. Fan power is derived from the 12V input (4-pin DIN connector.)

All cooling kit version monitors are shipped with the cooling kit pre-installed.

Touch Screen Options

LC1502R with Capacitive or Infrared (IR) Touch Screens



The LC1502R can be ordered with two touch screen technologies: Capacitive (model LC1502RTC) and IR (model LC1502RTI). The technologies respective benefits and drawbacks are explained below.

Capacitive (3M*)	Indoor Use	Occasional Recalibration Required	Any size Stylus or finger	Excellent Optical Clarity	USB Interface	Scratch Resistant
IR	Indoor/ Outdoor	No recalibration Required	Stylus must be larger than 3mm	Best in class optical clarity	USB Interface	Impervious to scratching

Set Up:

1. Refer to Planar mechanical outline drawing for the mounting hole locations.
2. Connect the USB cable from display to USB port on computer.
3. Power on computer and install the touchscreen driver found on the provided CD. Follow instructions to calibrate the touch screen.

For more information on 3M touch products, visit 3Mtouch.com.

Appendix

Troubleshooting

If you are experiencing trouble with the LCD display, refer to the following. If the problem persists, please contact your local stat or visit Planar Support at www.Planar.com/support. See support contact information on rear cover. For all video image problems, first try using the Auto-Adjustment in the OSD menu.

Problem: No image appears on screen.

- Check that all the I/O and power connectors are installed correctly and well connected as described in the " Installation " section.
- Make sure the pins of the connectors are not bent or broken.

Problem: Partial image or incorrectly displayed image.

- Check to see if the resolution of your computer is higher than that of the LCD display.
- Reconfigure the resolution of your computer to make it less than or equal to 1024 x 768

Problem: Image has flickering vertical line bars.

- Use " Frequency " to make an adjustment.
- Check and reconfigure the display mode of the vertical refresh rate of your graphic card to make it compatible with the LCD display.

Problem: Image is unstable and flickering

- Use " Tracking " to make an adjustment.

Problem: Image is scrolling

- Check and make sure the VGA signal cable (or adapter) is well connected.
- Check and reconfigure the display mode of the vertical refresh rate of your graphic card to make it compatible with the LCD display.

Problem: Vague image (characters and graphics)

- Use " Frequency " to make an adjustment. If this problem persists, use "Tracking" to make an adjustment.

Warning Signal

If you see warning messages on your LCD screen, this means the LCD display cannot receive a clean signal from the computer graphics card. There may be three sources for this problem. Please check the cable connections or contact Planar for more information.

No Signal

This message means the LCD display has been powered on but it cannot receive any signal from the computer graphic card. Check all the power switches, power cables, and VGA signal cable.

Going to Sleep

This message means the LCD display is under the power saving mode. In addition, the LCD display will go to this sleeping mode when experiencing a sudden signal disconnecting problem.

Unsupport Mode

This message means the signal of the computer graphic card is not compatible with the LCD display. When the signal is not included in the compatibility mode we have listed in the Appendices of this manual, the LCD display will appear this message.

Out of Range

This typically means the refresh rate or resolution is set too high. Set the resolution to 1024 x 768 and set the refresh rate to 75 Hz or lower. On a PC, these adjustments are typically made using "Display Properties" in the Control Panel folder.

Faint Horizontal Dark Lines Across the Screen

This display is directly backlit by cold cathode fluorescent lamps. Slight brightness nonuniformity is normal.

Mechanical Outline

See mechanical outline drawing on www.planar.com/support

Support and Service

Planar is a US company based in Beaverton, Oregon and Espoo, Finland with a worldwide sales distribution network.

Visit Planar at <http://www.planar.com/support> for product registration, operations manuals, line drawings, touch screen drivers, warranty information and access to Planar's Technical Library for online troubleshooting.

To speak with Planar Customer Support please have your model and serial number available and dial one of these numbers:

Americas Support

Tel: 1-866-PLANAR1 (866-752-6271) or +1 503-748-1100

Hours: M-F, 8am - 8pm Eastern Time | M-F, 5am - 5pm Pacific Time

Europe and Asia-Pacific Support

Tel: +358-9-420-01

Hours: M-F, 7:00am - 4pm CET

Toll or long distance charges may apply.

Planar Systems, Inc.
Customer Service
24x7 Online Technical Support: <http://www.planar.com/support>

Americas Support
Tel: 1-866-PLANAR1 (866-752-6271)
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Hours: M-F, 5am-5pm Pacific Time

Europe and Asia-Pacific Support
Tel: +358-9-420-01
Email: IntlTech_Support@Planar.com
Hours: M-F, 7am-4pm CET

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