

m70L Installation & Configuration Guide



PLANARTM

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RoHS Compliance Statement

The m70Ls are fully RoHS compliant.

Part Number: 020-0843-00A

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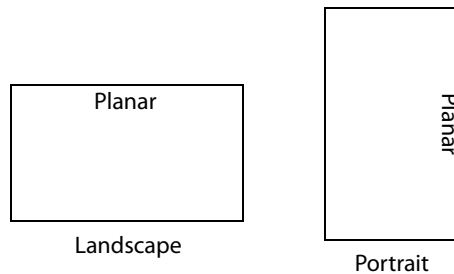
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Introduction

The m70L is a 70" diagonal direct-view LCD monitor that can be wall-mounted, ceiling mounted or mounted on a stand. The display can be portrait or landscape. Mounting should be done so the logo is shown as below.



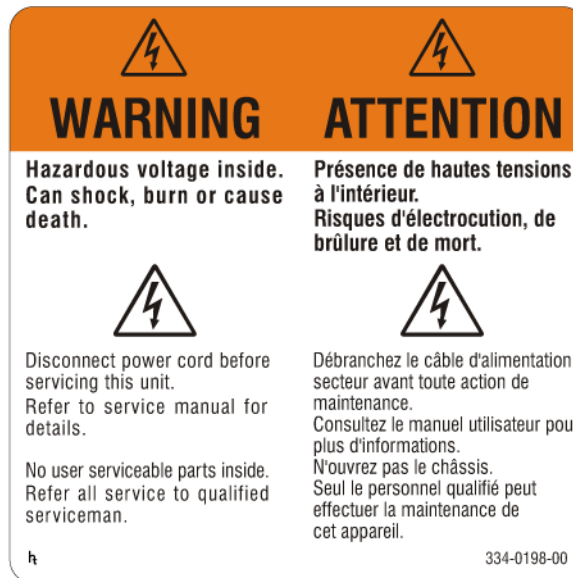
The m70L is only 5.8" deep. It has an aspect ratio of 1.77 (16:9). Its native resolution is HD (1920 x 1080). It accepts a wide range of input pictures from VGA to 1080p.

With the optional Video Input Module, the m70L accepts NTSC and PAL as composite, component, S-Video or SDI. The m70L also accepts composite SECAM and component VGA to 1080p video inputs through the analog connection, as well as HD-SDI input (1080i, 720p).

Caution: This manual is intended for use by qualified service persons and end users with experience installing LCD displays.

Safety for You and the m70L

This display was designed with safety in mind. If you don't heed the safety warnings and cautions, you could get hurt. The safety warnings are on stickers in various places in and on the display.



General Safety Precautions

There are some other things you should know related to safety:

WARNING! Wall mounts must be secure.

If the display is hung on a wall, the wall must be strong enough to hold it. The m70L weighs about 163lbs (74kg). Simply mounting it to wallboard or wall paneling won't be adequate or safe. The mounting method must be capable of holding several times this weight.

Caution: The screen could be damaged by heavy pressure.

Slight pressure on the LCD will cause distortion of the image. Heavier pressure will cause permanent damage. m70Ls should be mounted where viewers cannot touch the screen or insert small objects in the openings that will create hazards by contacting bare conductive parts.

Caution: The front polarizer is soft and subject to scratches from sharp objects.

The polarizer is a thin sheet of film laminated to the outside layer of glass on the LCD screen. Take care when handling items near the screen.

Caution: This product contains a lithium battery. There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of the battery according to the instructions on the next page.

WARNING! The backlight contains mercury.

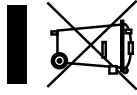


Lamp(s) inside this product contain mercury. This product may contain other electronic waste that can be hazardous if not disposed of properly. Recycle or dispose in accordance with local, state, or federal Laws. For more information, contact the Electronic Industries Alliance at www.eiae.org. For lamp specific disposal information, check www.lamprecycle.org.

Disposal Information

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

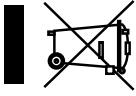
This symbol found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product 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.

- Destrucción 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 entregarse 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 desecha del producto de forma inadecuada. El reciclado de materiales ayuda a conservar los recursos naturales.

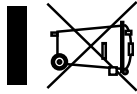


Este símbolo solamente es válido en la Unión Europea. Si desea deshacerse de este producto, póngase en contacto con las autoridades locales o con su distribuidor y pida información sobre el método de disposición adecuado.

English

- 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)

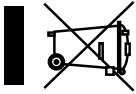
Ce symbole appliqué sur votre produit ou sur son emballage indique que ce produit ne doit pas être traité comme un déchet ménager lorsque vous voulez le mettre au rebut. Il doit au contraire être remis à un site de collecte agréé pour le recyclage des équipements électriques et électroniques. En veillant 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 risqueraient de se produire 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 l'enseigner-vous sur la méthode de mise au rebut correcte.

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

Il simbolo trovato sul prodotto, o sulla sua confezione, indica che il prodotto non può essere trattato come il domestico 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 eviterà 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.

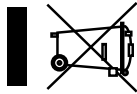


Questo simbolo è valido solo nell'Unione Europea. Per smaltire questo prodotto, mettersi in contatto con le autorità locali - o con il rivenditore - e chiedere informazioni sul corretto metodo di smaltimento.

Français

- Entsorgung von elektrischen & elektronischen Allgeräten (gültend 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 Allgeräten gegeben werden. Helfen Sie mit, potenziell schädliche Einflüsse 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.

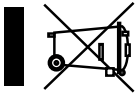


Dieses Symbol ist nur innerhalb der europäischen Gemeinschaft gültig. Wenn Sie dieses Produkt entsorgen möchten, wenden Sie sich bitte an Ihre örtliche Behörde und fragen Sie nach der ordnungsgemäßen Entsorgungsmethode.

Italiano

- Verwijderen van oude elektrische en elektronische apparatuur (toepas- selijk 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 weggewpen. U moet het afgeven bij een specifiek verzamelpunt voor de recycling van elektrische en elektronische apparatuur. Door te garanderen dat u dit product op de correcte manier wegwepnt, helpt u potentiële negatieve gevolgen voor het milieu en de menselijke gezondheid, die zouden kunnen worden veroorzaakt door een onechtmatig weggewpen 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 wens weg te gooien, dient u contact op te nemen met uw lokale instanties voor details over de gepaste methode voor afvalverwijfing.

Nederlands

Deutsch

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

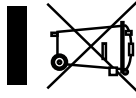
Este símbolo, colocado no produto ou na respectiva embalagem, indica que o produto não deve ser tratado como lixo doméstico aquando da sua eliminação. Em vez disso, deve ser entregue num ponto de recolha de equipamentos eléctricos e electrónicos para posterior reciclagem. Ao garantir a correcta eliminação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

Português

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

Obeznaczenie tego symbolu na produkcie lub na opakowaniu z produktem oznacza, że tego produktu nie można wyrzucać razem z odpadkami domowymi. Należy go przekazać do punktu zbiórki w celu poddania recyklingowi podzespółów elektrycznych i elektronicznych. Usunięcie tego produktu w prawidłowy sposób, ponieważ w zabezpieczeniu przed negatywnym wpływem odpadów na środowisko i zdrowie ludzi, powodowanym przez niewłaściwe użycie produktu. Przetwarzanie materiałów pomaga w zachowaniu zasobów naturalnych.

Polski

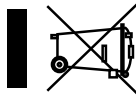


Este símbolo apenas é válido na União Europeia. Se quiser eliminar este produto, contacte as entidades locais ou o seu fornecedor para ficar a saber qual o método de eliminação correcta.

Svenska

- Avfall av förbrukad 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 dåmpling och smältning av den här produkten. Återvinning av material kommer att hjälpa till att bevara naturtillgångar.

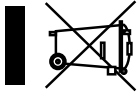


Ten symboli odowizuje wyłącznie w krajach Unii Europejskiej. Informacje dotyczące prawidłowej metody usunięcia tego produktu, można uzyskać u władz lokalnych lub u dostawcy.

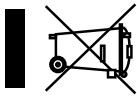
Suomi

- Vanhojen sähkö- ja elektroniikkalaitteiden hävittäminen (Soveltuva kaikkialla Euroopan unionin alueella, sekä muissa Euroopan maissa, jolla on erilliset keräysohjelmat)

Jos tuotteessa tai sen pakkauksessa on tämä symboli, sitä ei pidä hävittäässä käsitellä tavallisena kotitalousjätteenä, vaan se kuuluu toimittava sähkö- ja elektroniikkalaitteiden keräyspisteeseen. Varmistamalla, että tämä tuote hävitetään asianmukaisella tavalla autat estämään mahdollisia ympäristölle ja ihmisille kovia negatiivisia seurauksia, joita sen väärinlämmen hävittäminen voi aiheuttaa. Materiaalien kierrättäminen auttaa säilyttämään luonnonvaroja.



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 och fråga efter lämplig avfallsmetod.



Tämä symboli on voimassa ainoastaan Euroopan unionin alueella. Jos haluat hävittää tämän tuotteen, ota yhteyttä paikallisiin viranomaisiin tai jälleenvyyjiään ja tiedustele asianmukaisuuksia hävittämismenetelmistä.

Recommended Usage

In order to get the most out of your m70L, use the following recommended guidelines to optimize the display.

Burn-In Versus Temporary Image Retention

Burn-in causes the screen to retain an image essentially forever, with little or no way to correct the problem. Under normal use, an m70L will not experience burn-in, as plasma displays do, nor will it retain images in any way.

Normal use of an m70L is defined as displaying continuously changing video patterns or images. However, m70Ls can experience *temporary* image retention when recommended usage guidelines are not followed.

What is Temporary Image Retention?

Temporary image retention (TIR) can occur when a static image is displayed continuously for extended periods of time (12 hours or longer). An electrical charge differential may build up between the electrodes of the liquid crystal, which causes a negative-color video image (color-inverted and brightness-inverted version of the previous image) to be retained when a new image is displayed. This behavior is true for any LCD device from any LCD manufacturer.

Here are some guidelines to help you avoid TIR:

- Use the m70L to show a screen saver, moving images or still pictures that change regularly. When using high-contrast images, reposition the images frequently.
- Turn off the display when it is not in use. There are several ways to do this automatically:
 - To use the display's real-time clock, see "Scheduling an Event" on page 60.
 - To use your source computer's Power Options Properties, set up your computer to turn off the monitor when not in use. You also need to check the DPMS checkbox and set the DPMS DELAY box in the BACKLIGHT CONTROL menu.
 - To use RS232 commands, see "RS232 Communication" on page 21.

Caution: We suggest turning off the backlight power for six hours per day. Normal use of any LCD device does not cause TIR.

Static Image Applications

Typical static image applications include airports, transit stations, stock markets, banks, and command/control installations, or anywhere a fixed image is displayed continuously for 12 or more hours.

Normal Use Thermal Guidelines

Normal use of an m70L is defined as operating in the open air to prevent heat buildup, and without direct or indirect heat sources such as adjacent displays, lighting fixtures, heating ducts, or direct sunlight that can cause the display to experience high operating temperatures. At 2000 meters or below, the maximum ambient operating temperature cannot be above 35° C nor below the minimum ambient operating temperature of 0° C. If one of these conditions exists, it is up to the installer to ensure that display placement is changed, thermal shielding is provided and/or additional ventilation is provided to keep the display within its nominal operating parameters.

VESA Mounts, General Description

VESA mounts are used to secure the m70L for display. The m70L can be installed using a variety of VESA mounts available through Planar. If you do not have a VESA mount and would like to purchase one, contact Planar.

If you purchased a VESA mount, you should have received a separate box with mounting supplies and an Installation manual. Follow these instructions carefully.

Keep in mind the following general installation guidelines:

- Screw length is crucial and will vary depending on the type of mount you use. Total screw length will include the penetration length plus the length required by the type of VESA mount in use.

Caution: Shorter screws will result in insufficient mounting strength and longer screws could puncture parts inside the display.

- Prior to installation, make sure you know where all of the mounting points are located.
- Follow all safety precautions outlined in the VESA Installation manual.
- Verify the parts received with the list shown in the VESA Installation manual.

Installing an m70L

This section explains how to install an m70L. We suggest that you read the entire section before you attempt to install the unit.

Before You Begin

Make sure you have all the items in these checklists before you begin unpacking and installing your m70L(s).

Plan Your Installation

You should have a detailed plan of how the units are to be configured. The plan should include calculations for the following:

- Power (maximum of two units per 20A circuit for 115V operation)
- Cable runs
- Ventilation and cooling requirements - If the display is enclosed, you must provide a space for exhaust air from the display to get away. If the space behind the display has no air circulation, the display will get too hot. If the air does not circulate well enough naturally, consider planning for A/C venting. The installer is responsible for ensuring that the ambient temperature is always within specifications.

Caution: Because the m70L has an airflow that pulls air from the bottom of display and pushes it out the top, you cannot stack displays directly on top of each other. (In Portrait mode air would be pulled from left to right.) Placing displays directly above or next to each other will cause the warm exhaust air from one display to flow into the other display.

- If hanging display on a wall, location of studs in the wall

Prepare Your Installation Location

You should have prepared the area where you will install the unit. If custom enclosures are part of the installation, they must be fully designed to accommodate the installed unit and ventilation and cooling requirements.

Tools and Other Things You May Need

- Tools:
 - Needle nose pliers to remove staples from the bottom of the shipping box
 - Utility knife to cut shrink wrap or box banding
 - Stud finder (if hanging display on a wall)
- Computer network LAN cables (straight through - no crossover) to interconnect multiple displays for RS232 control
- LCD screen cleaner or LCD wipes, available at most electronics stores
- At least two very strong people to help lift unit into place. If possible, more than two people are recommended.

Installation Checklist

Use this quick checklist to ensure you have performed the installation steps in the correct order.

- 1 Unpack the display and check the contents see "Unpacking and Checking Accessories" on page 11.
- 2 Install power and source cables:
 - See "Connecting Source Cables" on page 17.
 - See "Connecting Power" on page 19.

Unpacking and Checking Accessories

Accessories With Each m70L Display

Quick Start Guide, Installation & Configuration Guide

The Quick Start Guide provides the basic setup needed to get the m70L up and running. It does not contain the detailed information included in this Installation & Configuration Guide.

Remote Control

The batteries are already installed.



Power Cord

For use in North America.

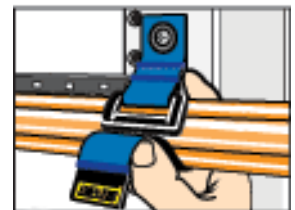
VGA Cable

15-pin cable for analog computer pictures (although this is called a VGA cable, it carries anything up to UXGA).

Note: Although VGA and DVI cables are included with every unit, you may wish to obtain a long-run VGA or DVI cable if your source is located far away from the display(s).

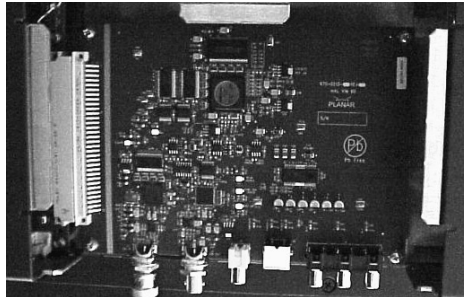
Rip-Ties

These are included if you want to bundle cables. They can be attached to the chassis or to a mount.



Optional Accessories

VIMs For composite, S-Video, component and SDI sources. This is typically installed before the display is shipped.



Customer-Supplied Accessories

Make sure you have the following customer-supplied items as needed to complete your installation:

- RJ45 to 9-pin adapter, if you will use RS232 commands to control the displays
- RJ45 cable, computer network type
- Component video cables
- S-Video cables
- DVI cables
- SDI cables
- RS232 cable



Installing the Video Input Module (VIM)

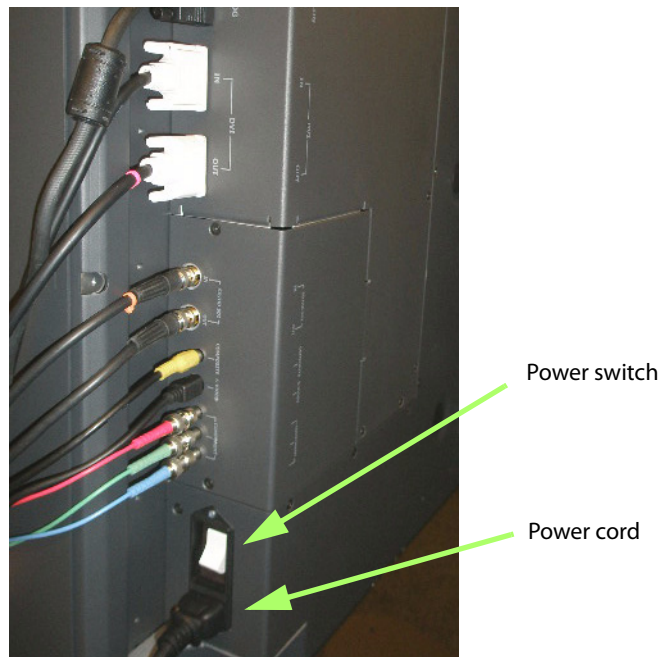
If you receive the optional Video Input Module (VIM) separately, use the following instructions to install it.

Your VIM shipment should include the following items:

- VIM board
- New VIM cover
- Mounting screws
- Washers/nuts
- Ground strap

- 1 Attach the ground strap to your wrist and the chassis.
- 2 Turn off the AC power and unplug all cables.

WARNING! Always turn off power and remove the power cord when adding or removing an electronic part.

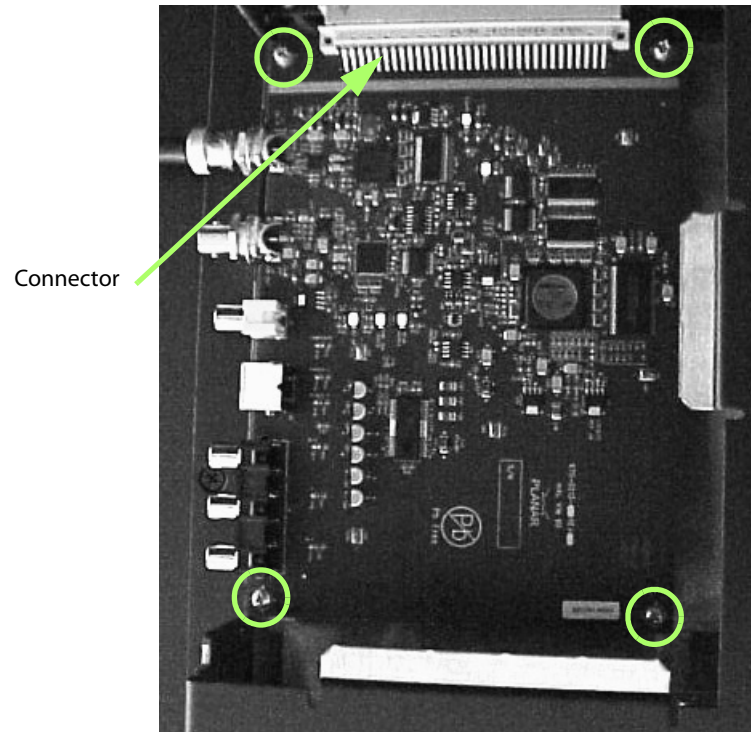


- 3 Remove the screws that secure the old VIM cover. Place the screws aside.
- 4 Remove the old VIM cover.

WARNING! Failure to properly use a grounding strap can destroy sensitive electronic components in the VIM board.

- 5 Remove the VIM board from its shipping pouch and anti-static bag.

- 6 Install the VIM board in its place, pressing the VIM board connector into the control board connector; it is a snug fit.
- 7 Install the four screws that secure the VIM board.

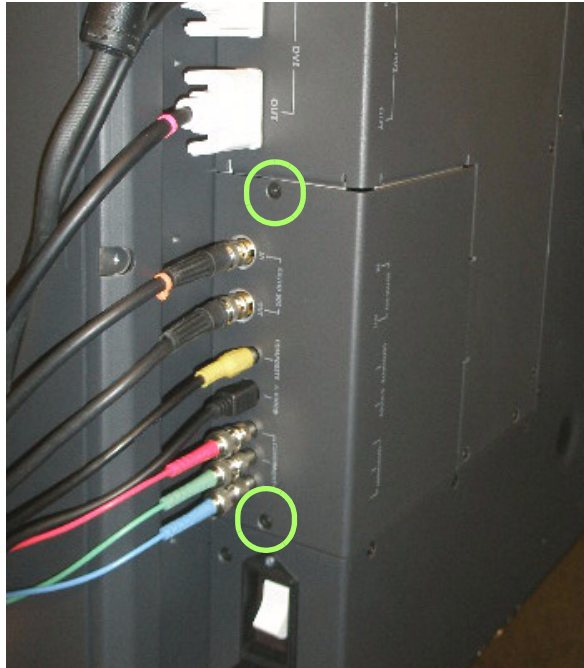


- 8 Slide the new VIM board cover in place, making sure the connectors are aligned over the holes in the cover.



- 9 Secure the washers and nuts on the SD/HD SDI connectors.

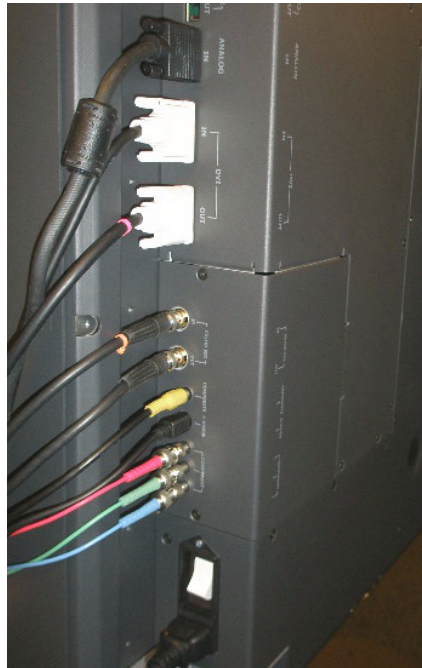
10 Install the screws that secure the new VIM cover.



11 Reconnect all cables, including the power cord. It is now safe to turn on the AC power.

Connecting Source Cables

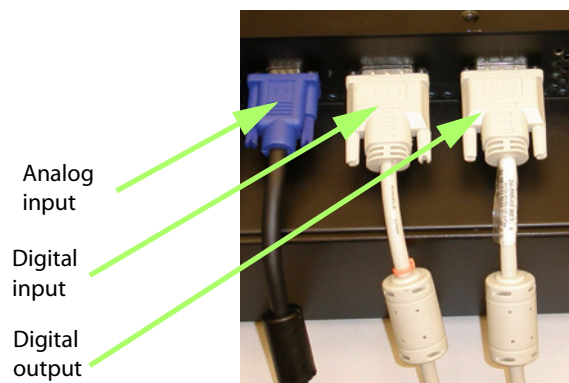
All cabling for the m70L must be run through the rear of the display.



Connecting Picture Sources

The three main types of inputs are:

- Analog computer (from UXGA down to VGA)
- Digital computer
- Video (optional with VIM)
 - Composite (NTSC, PAL or SECAM)
 - S-Video (50Hz or 60 Hz)
 - Component (480i, 480p, 576i, 576p, 720p, 1080i)
 - SDI (Serial digital interface inputs from 480i to 1080p)



Video Inputs

Using the DVI Out Connector

Digital Video Interface (DVI) digitally connects computers to their monitors or connects to any display with a DVI input.

The m70L converts the analog inputs to DVI and makes this available at the Digital Out connector. This means you can bring in a picture source - UXGA, SXGA, VGA, 1080p - to the first display and connect the rest of the displays in the loop with DVI. The **advantages** of DVI are:

- DVI is less subject to picture degradation than analog methods of loop-through. (However, even with DVI, loop-through is not infinite.)
- DVI inputs require much less setup and adjustment. You adjust the picture in the first unit only, the unit with the analog input. Setup time is reduced.

Note: When the analog source is selected, the signal coming from the DVI out connector will be accepted and displayed by other m70L displays. However, it does not strictly conform to the DVI standard. Non-Planar units will not be able to display this signal.

Depending on which input is selected, the Digital Out connector will show the picture from the analog input or the digital input.

Selecting the Correct Input

The following table gives you common examples of which devices have which inputs. In terms of input quality, the table is in order of the most desirable input to the least desirable input.

Input	Found on the Following Devices
DVI	Computers with digital out capability
SDI	Studio quality video equipment
Analog	Computers, laptops RGB and RGBS from video processors or other professional equipment (may need BNC to DB15 adapter cable). These may have separate sync, composite or sync on green.
Component	DVD players Set top boxes (e.g. for cable TV or satellite TV) Any YPbPr signal
S-Video	DVD players Set top boxes VCRs
Composite	TV tuners VCRs Set top boxes

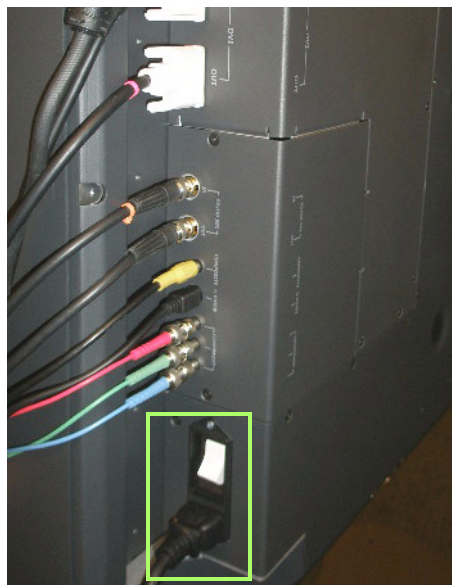
Connecting Power

The display typically draws 6.5A at 115V or 3.25A at 230V. For countries outside of North America, it is the responsibility of the installer to provide the power supply cord certified for use in the destination country.

Connect a power cable to the power supply and to an AC source. The power supply is auto-ranging, so it works with any source from 100 to 240 VAC, 50 to 60 Hz.

Note: Not for connection to two-phase systems. For connection to single-phase supplies only.

The AC Master switch is next to the power receptacle, both of which are located in the rear of the display.



Power receptacle and power switch location

About UPS Supplies

Some installations use a UPS - Uninterruptible Power Supply. Most UPS devices will work with the m70L. Review the power specifications of your UPS device to make sure it is compatible with the m70L.

RS232 Communication

RS232 control is not necessary for operation, but it is a convenient way to control displays from a computer at a distance. If your installation will not use RS232 control, skip this section.

Everything you can do with the remote, you can do with RS232 commands. Plus, you can send inquiries to the displays and find out the current settings and values.

RS232 connections are made with cables like Ethernet straight-through cables.

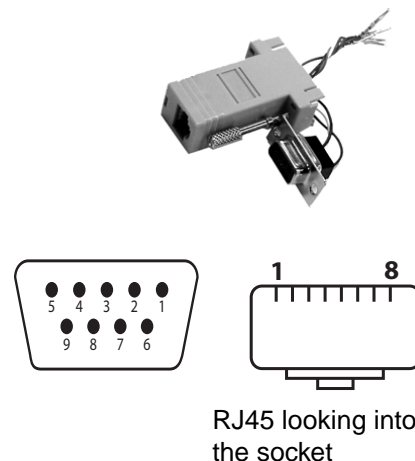
You need an adapter to go from the computer's 9-pin serial output connector to an RJ-45 connector. Adapters of this type are readily available at computer and electronic supply stores. You will only need one adapter. The adapter is not pre-wired. You will make three connections inside the adapter, as described below.

Note: It is important that the RJ-45 cable has "straight through" connections. To see if your cable is correct, hold the two connectors side by side with the ends pointing in the same direction. Look at the sides of the connectors that do not have the locking tab. If the colors of the wires inside the connectors are the same left to right for both connectors, this is the correct cable. If the colors are mirror reflections of each other, it is the wrong type.

Wiring the adapter

To go from 9-pin D-sub serial connector on the back of the computer to an RJ45 connector, use a standard RJ45-to-9-pin adapter. Wire it internally as shown. The wiring shown for this adapter is correct for *straight-through* cables. Straight-through cables are wired 1-to-1, 2-to-2, etc.

	RJ45	9-pin
Yellow wire	6	3
Black wire	3	2
Green wire	5	5



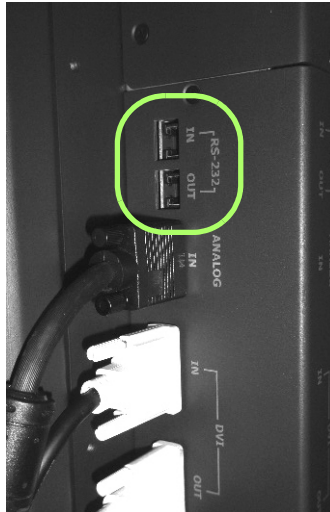
RJ45 looking into the socket

Connecting RS232 Cables

- 1 Connect the 9-pin adapter to the serial output connector of the controlling computer. (This computer does not have to be the same one as the computer used as a picture source.) The serial output is sometimes called the Comm Port, and sometimes there is more than one.

For more information about configuring RS232 communications, see "Serial Port Settings and Diagnostics" on page 67.

RS232 port connection is on the control board.



Configuring an m70L

After you select the picture source, most of the remaining setup is automatic, although you can override the automatic settings and adjust them manually.

The source picture - from computer, video, DVD player - is not always perfect in its size or resolution; it does not always conform exactly to a standard. The display can compensate for this.

You'll find it easier to configure your displays when you perform the steps in the following order:

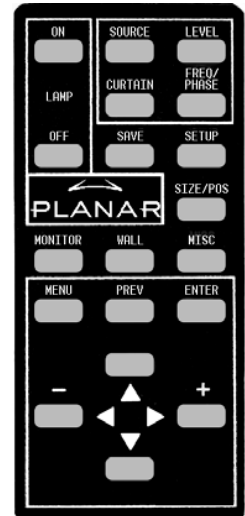
- Select the Source (Picture) (See "Selecting the Source" on page 25)
- Adjust the Input Levels (See "Adjusting Input Levels" on page 31)
- Adjust Frequency and Phase (See "Adjusting Frequency and Phase" on page 37)
- Select the Scale Mode (See "Scale Mode Settings" on page 39)
- Adjust the Sharpness (See "Sharpness Settings" on page 43)
- Check the Image Position (See "Adjusting Position" on page 45)
- Adjust Scaling and Cropping (See "Viewport" on page 47)
- Color Balance the display (See "Adjusting Color Balance" on page 49)

Using the Remote

The remote control operates with IR (infrared) signals going to the IR receiver (located in the lower right corner of the screen for landscape and in the lower left corner for portrait).

(Later, to prevent accidental adjustment of the display, you can disable the remote control function using an RS232 command.)

Note: The remote control has a large spread of its IR radiation. It is difficult from a distance to control only one display in an array; step closer.



If the Remote Doesn't Work

- The batteries in the remote are dead or installed wrong.
- The remote was not aimed at the screen.
- Something is blocking the IR receiver in the display.
- IR remote action was disabled by an RS232 command.

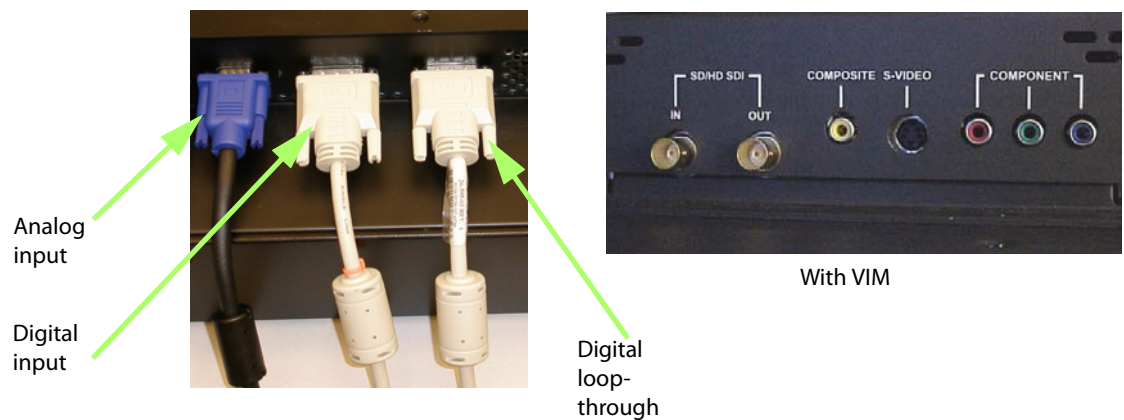
Selecting the Source

Selecting the source means choosing the input connector from where the picture is coming. Selecting the source (picture) manually is usually quicker than using the SOURCE button.

You'll choose from the connectors shown in the table below, depending on whether your display has the optional VIM installed.

Source Connectors

Without VIM	With VIM
Analog	Analog
Digital	Digital
	Component
	S-Video
	Composite
	SD/HD SDI



Connect the power cord and turn on the power switch. If the power was already on, and the backlights are off, press the ON button on the remote.

Computer Sources

Use the HD-15 connector for standard analog inputs, the type used for years with computers. For digital inputs, use the DVI connector. Either of these accept pictures of the following common standards as well as many, many others:

Type	Resolution
VGA	640 x 480
SVGA	800 x 600
XGA	1024 x 768
SXGA	1280 x 1024
WXGA	1360 x 768, 1366 x 768
UXGA	1600 x 1200
HD1920	1920 x 1080
VESA	640 x 400

Component Video Sources

Component video sources are assumed to be YPbPr and the colorspace is set accordingly.

DVD and Component Video Sources

DVD players have composite video and S-Video outputs, and sometimes have component video outputs from three RCA connectors.

Note: HDCP (High-bandwidth Digital Content Protection) is not supported.

Composite Video and S-Video

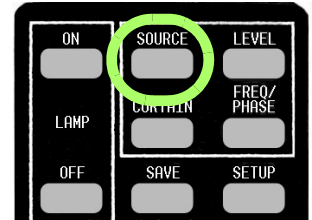
These two inputs accept NTSC and PAL. The composite connector also accepts SECAM video.

SD/HD SDI

This input accepts NTSC, PAL, 720p and 1080i.

Automatically Selecting the Source

- 1 Aim the remote control at the screen and press SOURCE.



- a The display looks at each of the connectors and stops on the first one that is receiving a valid picture.
- b If this is successful (it may take 10 seconds) *stop here*.
- c If you have several sources connected, press SOURCE again to go to the next one with a picture.
- d If you get no picture or have other trouble, see "Manually Selecting the Source" on page 27.

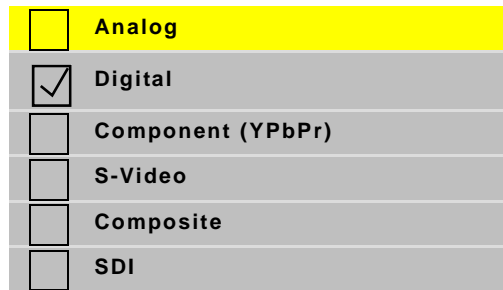
Manually Selecting the Source

- 1 After the display is on, press FREQ/PHASE on the remote. This opens the PICTURE menu.
- 2 Using the up/down arrows, select the SOURCE line and press ENTER.



Picture		PLANAR
	Source	Analog ▶
	Sync Type	Separate H&V
	Vertical Frequency (frame locked)	60Hz
	Horizontal Frequency	50.00kHz
	Pixel Frequency	80.10MHz
	Mode ID: 31	HPer: 3178 VLines: 525
	Horizontal Resolution	1366
	Vertical Resolution	768
	Frequency	- [slider] + 1602
	Phase	- [slider] + 22.5°
	Sharpness	4
	Input Levels	▶

- The SOURCE popup menu displays to the right of the PICTURE menu.









Note: If the display does not have a VIM (Video Input Module) installed, only the first two items will appear in this menu.





- With the arrow keys, select the input connector you want and press ENTER. Within a second or two the display analyzes the picture, adjusts to it, and displays it. If you see no picture:
 - If you see an “out of range” message on the display, the input from the source cannot be displayed. Try changing what the source is outputting.
 - If you see a “source absent” message on the display, the data from the source is not reaching the display. Try disconnecting and reconnecting the cables between the source and the display, and make sure the source is powered on. If the source is a laptop, ensure that the VGA output on the rear of the source is enabled.
 - If no message is displayed, maybe the source has timed out and is displaying a blank screen.

- 5 The next pictures show examples of the how the PICTURE menu appears when different sources are selected. When you are finished, press MENU.



- **Analog**

Picture		PLANAR	
	Source	Analog ▶	
	Sync Type	Separate H&V	
	Vertical Frequency (frame locked)	60Hz	
	Horizontal Frequency	50.00kHz	
	Pixel Frequency	80.10MHz	
	Mode ID: 31	HPer: 3178	VLines: 525
	Horizontal Resolution	1366	
	Vertical Resolution	768	
	Frequency	- <input type="range"/> +	1602
	Phase	- <input type="range"/> +	22.5°
	Sharpness	4	
	Input Levels	▶	



- **Digital**

Picture		PLANAR	
	Source	Digital ▶	
	Vertical Frequency (frame locked)	60Hz	
	Horizontal Frequency	50.00kHz	
	Horizontal Resolution	1366	
	Vertical Resolution	768	
	Sharpness	4	
	Input Levels	▶	







- **S-Video**

Picture		PLANAR	
	Source	S-Video ▶	
	Video Standard	NTSC 60 Hz/3.58 MHz	
	Vertical Frequency (frame locked)	60Hz	
	Sharpness	4	
	Input Levels	▶	





- **Composite**

Picture	PLANAR	
 Source	Comp Video ▶	
Video Standard	NTSC 60 Hz/3.58 MHz	
Vertical Frequency (frame locked)	60Hz	
 Sharpness	4	
Input Levels	▶	

- **Component (YPbPr)**

Picture	PLANAR	
 Source	Component (YPbPr)	
Video Standard	NTSC 60 Hz/3.58 MHz	
Vertical Frequency (frame locked)	60Hz	
Horizontal Frequency	50.00kHz	
 Horizontal Resolution	1366	
 Vertical Resolution	768	
 Frequency	- <input type="text" value="1602"/> +	1602
 Phase	- <input type="text" value="22.5"/> +	22.5°
 Sharpness	4	
Input Levels	▶	

- **SDI**

Picture	PLANAR	
 Source	SDI ▶	
Vertical Frequency (frame locked)	60Hz	
Horizontal Frequency	50.00kHz	
 Horizontal Resolution	1366	
 Vertical Resolution	768	
 Sharpness	4	

Note: For additional information about source selection, see "Preferred Source Detection" on page 54.

Adjusting Input Levels

For all sources, adjusting to the source's picture means learning what that source means by black and white.

For analog sources, black is supposed to be a voltage of zero coming from the computer's video card, but it almost never is. White is supposed to be a voltage of 0.7 volts, but it usually isn't either.

For digital sources, black is supposed to be a code of 0, but in some cases it is a code of 16. White is supposed to be a code of 255, but in some cases it is a code of 235.

The Input Level adjustment process asks you to provide a picture from the source that is black, then one that is pure white. With these, you can quickly and automatically make the display "learn" what *this* source means by black and white.

The result? Good pictures, using all the dynamic range of color coming from the source.

Note: For Input Levels, you must use the computer or source you will use for the program. For example, don't make this adjustment with your work laptop and then switch to another computer for the display's program of pictures.

Adjusting Levels for Analog Sources

This section applies to Analog RGB (computer) pictures only. The levels are best adjusted semi-automatically.

Why Adjust Levels?

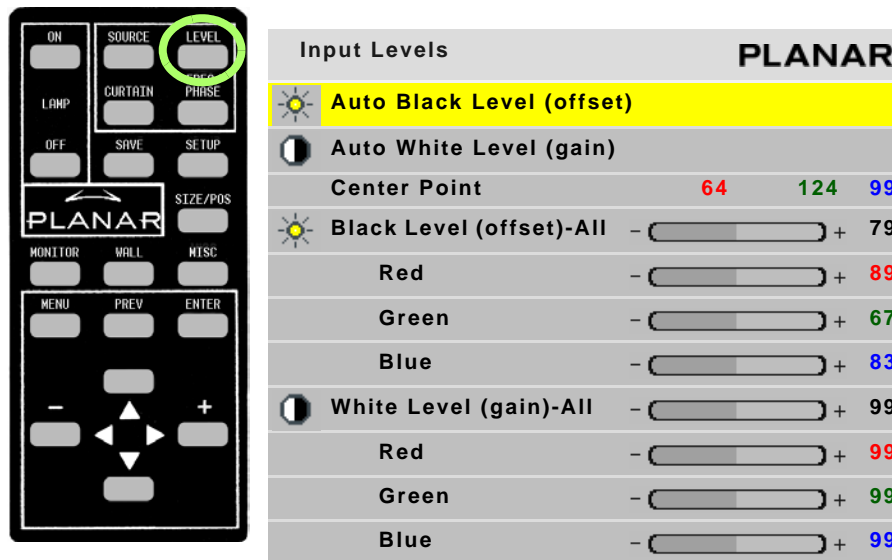
For Analog RGB pictures, the levels for black and white vary from one computer to another, or from one video processor to another. They even vary between video outputs from a multiple-output video card in a computer.

Your pictures will not look their best on the display until you adjust for these differences. This is *not* about adjusting color or contrast. It's about telling the display what the computer or processor means by black and by white.

Semi-Automatic Level Adjustment

- 1 Select a source in the PICTURE menu.

- 2 To access the INPUT LEVELS menu, press LEVEL on the remote.



- 3 From the computer source, display an all-black picture. *This must come from the computer source that will be used for the program. We suggest you display a black screen using the Windows Paint program.*

Note: Black Level *must* be done before White Level.

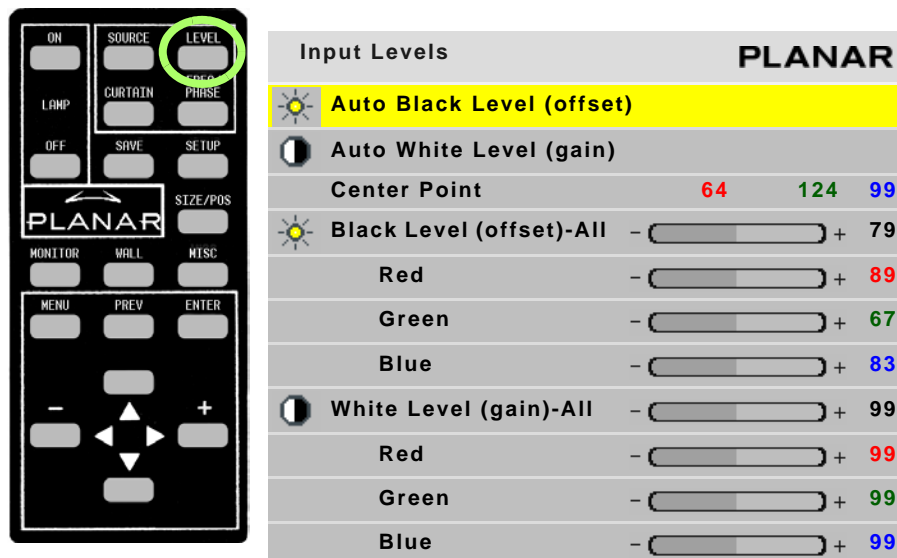
- 4 In the INPUT LEVELS menu, select AUTO BLACK LEVEL and press ENTER. This menu line says "Working..." until the process is complete.

Note: When doing Auto Black and Auto White with an interlaced analog input, the color of the picture will change while it is working and then will change back to normal.

- 5 From the computer source, display an all-white picture.
- 6 In the INPUT LEVELS menu select AUTO WHITE LEVEL and press ENTER. Wait for "Working..." to disappear. The display is now adjusted to the black and white levels of *this* computer using *this* video card. If you change computers or video output cards in the computer, you must do this again.
- 7 Although it is not required, we recommend that you save the configuration to a memory slot. (See "Saving Configurations" on page 74.)
- 8 If you have more than one source coming through the same connector, adjust Input Levels for each source.

Manual Level Adjustment

- 1 Select a source in the PICTURE menu.
- 2 To access the INPUT LEVELS menu, press LEVEL on the remote.



The image shows a remote control on the left with the 'LEVEL' button circled in green. To the right is a screenshot of the 'Input Levels' menu for 'PLANAR'. The menu is as follows:

Input Levels		PLANAR		
	Auto Black Level (offset)			
	Auto White Level (gain)			
	Center Point	64	124	99
	Black Level (offset)-All	-		+ 79
	Red	-		+ 89
	Green	-		+ 67
	Blue	-		+ 83
	White Level (gain)-All	-		+ 99
	Red	-		+ 99
	Green	-		+ 99
	Blue	-		+ 99

- 3 Display an all-black picture from the source computer.

Note: Black Level *must* be done before White Level.

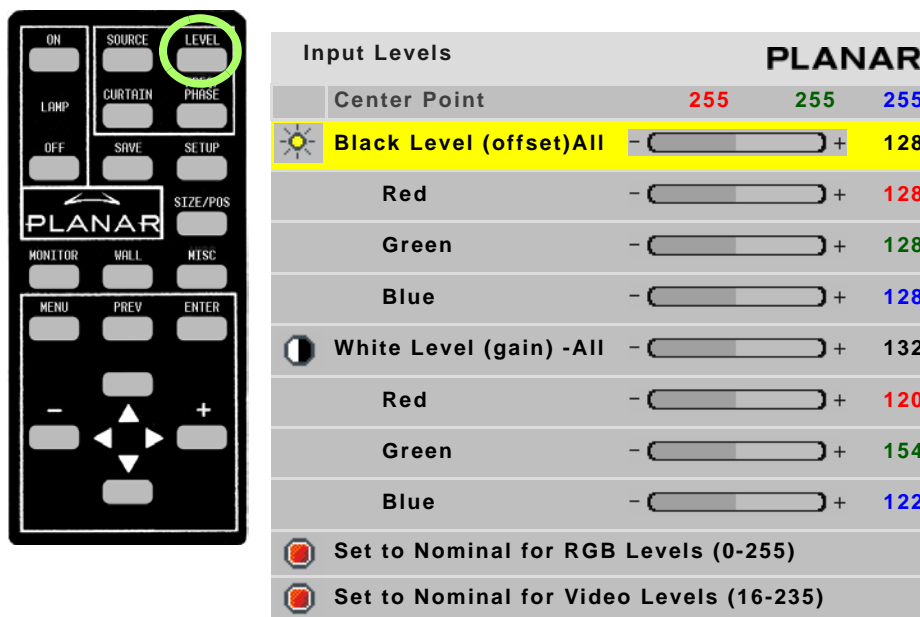
- 4 In the INPUT LEVELS menu, select BLACK LEVEL and adjust it up and down with the + or - keys to make the three CENTER POINT values go to zero. Once any value reaches zero, use the individual colors under BLACK LEVEL to adjust the other two values to zero.
- 5 Display an all-white picture from the source computer.
- 6 Adjust WHITE LEVEL (GAIN) until the CENTER POINT values go to 255. Once any value reaches 255, use the individual colors under WHITE LEVEL to adjust the other two values to 255 (or 254).
- 7 Although it is not required, we recommend that you save the configuration to a memory slot. (See "Saving Configurations" on page 74.)
- 8 If you have more than one source coming through the same connector, adjust Input Levels for each source.

Adjusting Levels for Digital Sources

Caution: These controls are advanced level controls and should not be adjusted unless you have been instructed by the factory or are familiar with black level adjustments.

Digital computer sources do not normally need adjustment, but the controls are there if you need them. They are used to correct the digital blacks that come from video cards that have incorrect levels.

- 1 Select a source in the PICTURE menu.
- 2 To view the INPUT LEVELS menu, press LEVEL on the remote. (The INPUT LEVELS menu looks different for different colorspace. The INPUT LEVELS menu for Digital RGB sources is shown below).



- 3 If you have changed black and white levels, select the SET TO NOMINAL FOR RGB LEVELS line to change them back to the default. This is the default for most sources.
- 4 It would be rare for you to adjust black and white levels for a digital source. However, depending on the source, what black and white "mean" can be different. In most cases, black will be 0 and white will be 255. However, for some sources, such as DVD players, black can be 16 and white can be 235. If this is the case, select the SET TO NOMINAL FOR VIDEO LEVELS line and press ENTER. This will change the black and white levels to the required values to correctly display the range of colors in the display.
- 5 Although it is not required, we recommend that you save the configuration to a memory slot. (See "Saving Configurations" on page 74.)

- 6 If you have more than one source coming through the same connector, adjust Input Levels for each source.

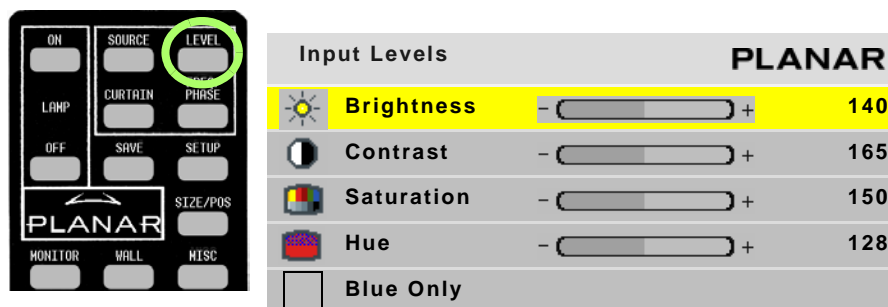
Adjusting Levels for Video Sources

Video sources are best adjusted if a color bar test pattern is available from the video source: the DVD or VCR player. If you do not have access to a color bar test pattern, you will have to adjust the picture by eye from the video source using the INPUT LEVELS menu.

Note: When a video source is selected, Auto Setup Options are not available. Adjustments must be made manually.

Adjusting the Picture With Color Bars

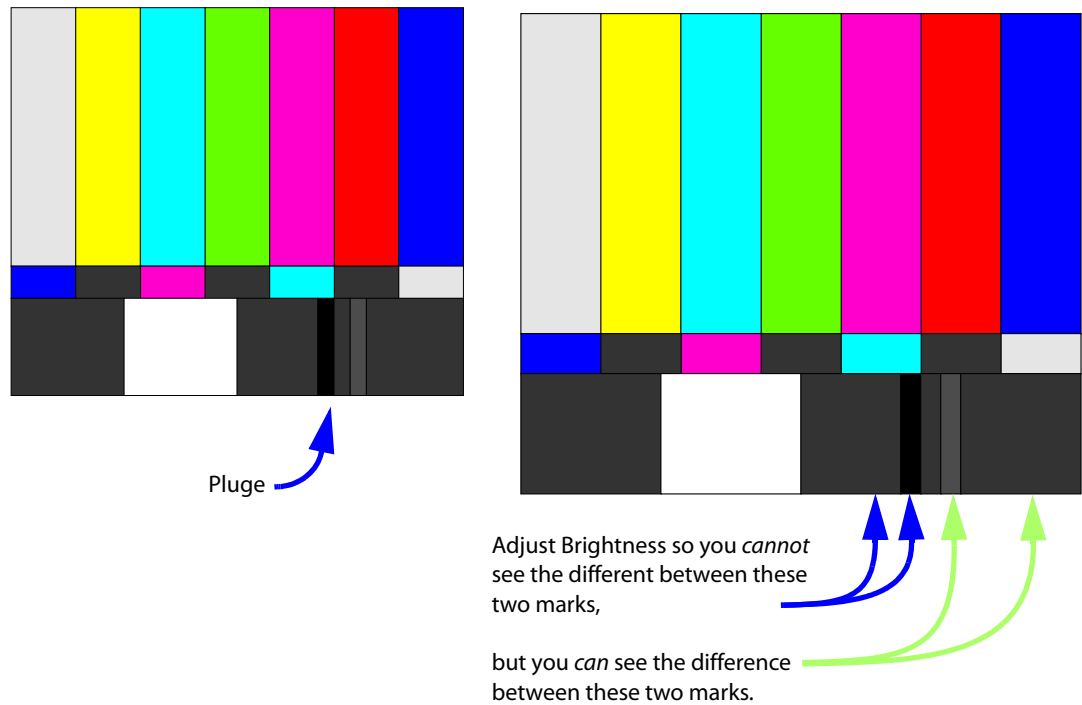
- 1 Select a source in the PICTURE menu.
- 2 To access the INPUT LEVELS menu, press LEVEL on the remote.



Note: These controls are also used for analog sources when you select component video.

- 3 If possible, use a SMPTE color bar pattern from the video source you will use for the program material.
- 4 In the INPUT LEVELS menu, check BLUE ONLY. You should only see the alternate color bars, all of them blue.
- 5 Adjust SATURATION to make the outer two color bars match. Match them in brightness; they will already match in color.
- 6 Adjust HUE to make the inner two color bars match.
- 7 Uncheck BLUE ONLY.

- 8** If the color bar pattern has a pluge, you can use it to adjust Brightness. Pluge stands for Picture Line-Up Generation Equipment. A pluge is used to calibrate the black level on a video monitor.



- 9** Although it is not required, we recommend that you save the configuration to a memory slot. (See "Saving Configurations" on page 74.)
- 10** If you have more than one source coming through the same connector, adjust Input Levels for each source.

Adjusting Frequency and Phase

Frequency and Phase are mostly adjusted for computer sources and *must* be made using the computer that has, or will have, program content. Although Frequency and Phase can also be adjusted for component sources, it is not usually necessary.

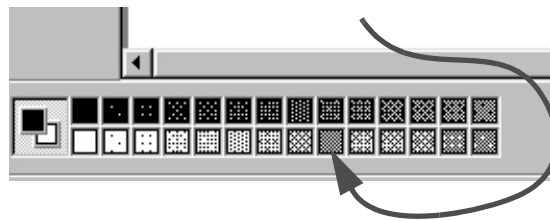
If you press the SETUP button on the remote, the automatic adjustment of Frequency and Phase is usually good enough. (See "Auto Setup Options" on page 55.) If automatic adjustment is not good enough, adjust it manually. (See "Adjusting Frequency Manually" on page 38.) If the image shows vertical banding, adjust the Frequency. If the image has noticeable horizontal streaks moving through the image, adjust the Phase.

Note: Auto Setup Options rely on the content displayed on the screen. You will get best results with something that has a lot of changes, such as a checkerboard pattern.

Making a Checkerboard Pattern With Paint

You will need to display a checkerboard pattern from the source computer. You can make one with the Windows Paint program.

- 1 Choose Image > Attributes to open a dialog box.
- 2 In the Units section, choose pixels. In the Color section, choose Black and White.
- 3 Set the Width and Height in pixels to match the *native* resolution of the Planar display.
- 4 When you click OK, the program gives you a warning about losing color. Click Yes.
- 5 At the bottom of the window, click on the checkerboard pattern. This is the 9th box from the left on the bottom row.



- 6 Choose the paint bucket icon and click in the picture area. It will fill with a checkerboard pattern.



- 7 Save this picture as a bit map (.BMP) file to the hard drive so you can use it again.

Adjusting Frequency Manually

- 1 Press **FREQ/PHASE** on the remote. This opens the **PICTURE** menu. Confirm that the source is **ANALOG**.
- 2 Display a checkerboard pattern from the computer.
- 3 Select **FREQUENCY** in the menu and use the **+** or **-** keys to change the Frequency.

Don't worry about the number that appears in the menu. Look at the screen. As the Frequency is moved away from the ideal setting, more and more vertical bands will appear in the picture. Adjust Frequency so there are no vertical bands.

Note: Be sure there are no zoom adjustments in effect when adjusting Frequency. If there are, you will not be able to get rid of all the vertical bands.

Adjusting Phase Manually

- 1 With the checkerboard pattern still on the screen, select **PHASE** in the menu.
- 2 Adjust the Phase with the **+** or **-** keys on the remote. As the Phase changes, at some points you will notice more horizontal streaking. Find a point that has no streaking or minimal streaking. There is usually a fairly broad range of no streaking, so settle for the point in the middle of this range.

Aspect Ratio Settings

The aspect ratio of any picture is its width divided by its height. $W/H = \text{Aspect Ratio}$


The native aspect ratio of the m70L is 1.77. This is sometimes referred to as 16:9. This is the HDTV picture format. The native resolution is HD (1920 x 1080).

Many pictures do not have this aspect ratio. Standard television, VGA, SVGA, and XGA signals are 1.33. Movies from DVDs vary depending on the original film format, but are often 1.85. The larger the number, the "wider" the picture seems.

When the incoming picture is a different aspect ratio from the screen, the display gives you six choices (see SCALE MODE submenu page 39) to make it fit.

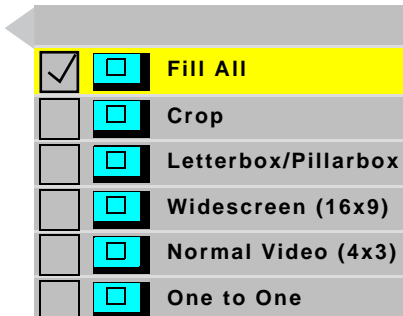
Scale Mode Settings

- 1 To select the Scale Mode, press WALL on the remote to display the ASPECT RATIO & WALL menu.



Aspect Ratio & Wall		PLANAR
<input checked="" type="checkbox"/>	Scale Mode	Crop ▶
	Justify	Center
	Overscan	0%
	Wall Width	1
	Wall Height	1
	Unit Column	1
	Unit Row	1
<input type="checkbox"/>	Wall Mode	
<input type="checkbox"/>	Frame Compensation	
⬆	Frame Height	97 pixels
⬆	Frame Width	157 pixels

- 2 With SCALE MODE highlighted, press ENTER. The SCALE MODE submenu displays.

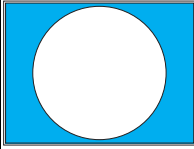
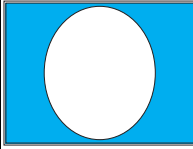
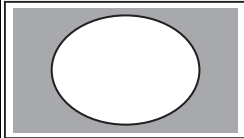
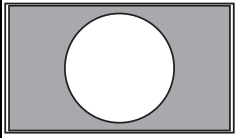
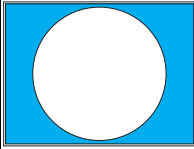
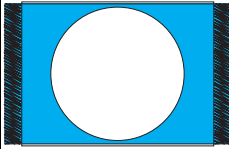
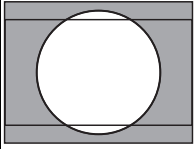
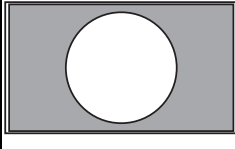
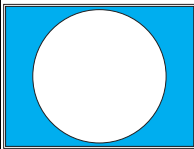
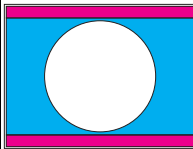
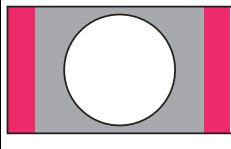
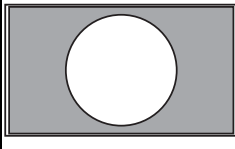


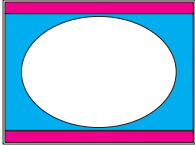
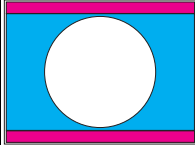
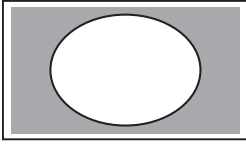
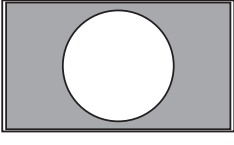
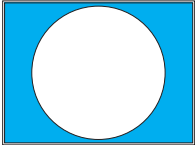
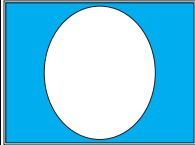
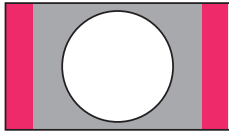
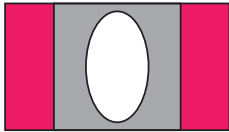
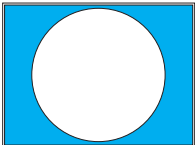
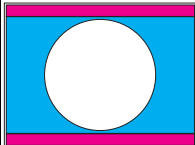
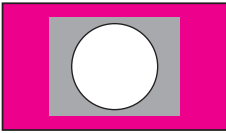
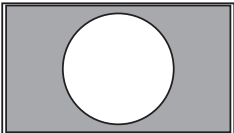
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Fill All
<input type="checkbox"/>	<input type="checkbox"/>	Crop
<input type="checkbox"/>	<input type="checkbox"/>	Letterbox/Pillarbox
<input type="checkbox"/>	<input type="checkbox"/>	Widescreen (16x9)
<input type="checkbox"/>	<input type="checkbox"/>	Normal Video (4x3)
<input type="checkbox"/>	<input type="checkbox"/>	One to One

The scale modes are "radio" buttons; you can only choose one at a time.

Note: The display is not capable of compressing the image in one direction while stretching it in the other. For example, if you try to display a UXGA (1600 x 1200) on an m70L (1920 x 1080) at Fill All, the display will letterbox the image and the following note will appear at the bottom of the menu: "Can't display - Change Scale Mode." You can leave the scale mode at Fill All or change it to Letterbox. You can also select Crop or One to One.

Note: The SCALE MODE menu icons change to indicate the effect each mode will have on the picture based on the JUSTIFY and SCALE MODE settings, and the source resolution.

Scale Mode	Affect on Input Type on 4 x 3 Display		Affect on Input Type on 16 x 9 Display	
	4 x 3 source (e.g. Standard Video or VGA/SVGA/XGA)	16 x 9 source (e.g. 1080i or WXGA computer source)	4 x 3 source (e.g. Standard Video, VGA/SVGA/XGA)	16 x 9 source (e.g. 1080i or WXGA computer source)
Fill All	No distortion 	Compresses width to fit 	Stretches width of image 	Displays full image without distortion 
Fill All makes the picture fit top-to-bottom and left-to-right, regardless of how this stretches or compresses the picture. Fill All distorts the picture, when the aspect ratio of the incoming picture is not the same as the display.				
Crop	No distortion 	Crops width of image; fits height of image without distortion 	Crops top and bottom of image; fits width of image without distortion 	Displays full image without distortion 
Crop expands non-native aspect ratio pictures until the <i>second</i> edges touch the border and lets the other edges of the picture fall outside the display and get cropped.				
Letterbox/Pillarbox	No distortion 	Fits width of image without distortion; fills height with border 	Fits height of image without distortion; fills width with border 	Displays full image without distortion 
Letterbox/Pillarbox expands the picture until the first edges (top-bottom or left-right) touch the border of the display, and then fills in the other sides with a solid color.				

Scale Mode	Affect on Input Type on 4 x 3 Display		Affect on Input Type on 16 x 9 Display	
	4 x 3 source (e.g. Standard Video or VGA/SVGA/XGA)	16 x 9 source (e.g. 1080i or WXGA computer source)	4 x 3 source (e.g. Standard Video, VGA/SVGA/XGA)	16 x 9 source (e.g. 1080i or WXGA computer source)
Wide-screen	Stretches width of image; fills Top and Bottom with border 	Fits width of image without distortion; fills height with border 	Stretches image to fill width without affecting height 	Displays full image without distortion 
Widescreen (16x9) forces the aspect ratio to 16 x 9 (1.77), the standard for many DVD movies. This will distort any picture other than 16 x 9 aspect ratio pictures. Widescreen can be used to display anamorphic DVDs on an array.				
Normal Video	No distortion 	Compresses width to fit, no border 	Fits height and width of image without distortion; fills width with border 	Fits height of image, compresses width and fills with border 
Normal Video (4x3) forces a 4 x 3 (1.33) aspect ratio, the ratio of standard television. Normal Video is used to display standard video on the analog or component inputs. Its resolution is 720 x 640, which is not 4 x 3, but it should be displayed as 4 x 3 (the pixels aren't square).				
One to One	No distortion 	Fits width of image without distortion; fills height with border 	Displays image without distortion at actual size with border on all sides 	Displays full image without distortion 
Example above represents an XGA input on an XGA resolution display (1024 x 768)		Example above represents a 1080i (1920 x 1080) resolution		Example above is for 1366 x 768 input on 1366 x 768 native resolution or 1920 x 1080 input on 1920 x 1080 native resolution
One to One maintains the original size and aspect ratio of the picture. This may leave blank areas on all four sides. For instance, a VGA picture (640 x 480) on a 16 x 9 display will occupy only a small area in the center of the screen. For UXGA sources on a 16 x 9 display, this will crop the picture top, bottom, and sides. The primary use of One to One is to display the image without scaling artifacts and with minor cropping.				
The One to One Scale Mode will produce different cropping results and the image size will be different for each input resolution.				

Justify Settings

Justify determines how the picture will be placed in a wall of displays. For a single display, Justify determines placement on the screen. If the image is not large enough to fill all the displays in the wall, some will be left blank.

Top/Left

Positions the image starting with the top, leftmost display, then across and down.

Center

Positions the image starting with the center of the image in the center of the wall spreading out equally to all displays.

Bottom/Right

Positions the image starting with the bottom, rightmost display, then across and up.

Overscan

This is used to hide blank areas and stray lines in the edges of an image. The lower the overscan setting, the more of the optical image that is seen. Planar displays have a default overscan of 3% for S-Video and composite video images. Standard CRT televisions have an overscan of about 5%, which may actually hide content or images that you want to see.

Wall Width and Wall Height

These show the number of displays wide and high for the *picture*. This may be different from the physical size of the wall. You could build a 4 x 3 array of displays and use WALL MODE to put a single picture on the four displays in the upper left corner, for instance.

Unit Column and Unit Row

These represent the position of the display in this "array." For example, in the 4 x 3 array of displays shown below, Unit numbering starts at the top left corner of the array. This display would have a Unit Column value of 1 and a Unit Row value of 1.

Wall Mode

When checked, this turns on the Planar Big Picture™ feature. When not checked, the display shows the whole picture.



Adjusting Sharpness

After you set the Scale Mode to the one you will use for the program, select the Sharpness level in the PICTURE menu to reduce scaling artifacts. If you are not scaling your image, you may skip this section. (For instructions on how to set Scale Mode, see "Scale Mode Settings" on page 39.)

Sharpness Settings



The Sharpness setting is in the PICTURE menu (press FREQ/PHASE on the remote).

Picture		PLANAR
	Source	S-Video ▶
	Video Standard	NTSC 60 Hz/3.58 MHz
	Vertical Frequency (frame locked)	60Hz
	Sharpness	4
	Input Levels	▶

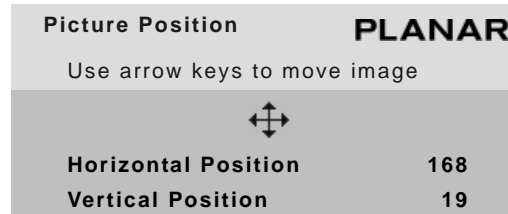
Sharpness settings determine how crisp the image should be. There are sixteen levels of sharpness, where 0 is the softest and 15 is the sharpest. Seven is the default.

Adjusting Position

Position moves the picture on the screen but does not move the menus.

Picture Position

Press the SIZE/POS button once on the remote to open the PICTURE POSITION menu. The four arrow keys move the picture on the screen.



The numbers for HORIZONTAL POSITION and VERTICAL POSITION refer to the number of pixels from sync to the first displayed pixel. These numbers get smaller as the picture moves up and to the left.

Horizontal Position

This number shows the number of pixels from the beginning of H sync to the first active pixel. Because there are many black pixels after H sync, this number will not be zero when the picture is at the left border of the screen.

Vertical Position

This number is the number of lines from V sync to the first active line, so it will not be zero when the picture is at the top of the screen.

Note: Adjusting the VERTICAL POSITION too far may cause the image to jump or hop. If the image appears to flicker or hop, readjust the VERTICAL POSITION.

Viewport

Use the VIEWPORT menu (MAIN > SIZE & POSITION > VIEWPORT WINDOW) to adjust the number of pixels actually used on the display. You can't increase this number, but you can reduce it.

Main Menu	PLANAR
Picture	▶
Size & Position	▶
Aspect Ratio & Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Size & Position	PLANAR
Picture Position	▶
Zoom Window Top & Left	▶
Zoom Window Bottom & Right	▶
Viewport Window Top & Left	▶
Viewport Window Bottom & Right	▶
Reset All Windows to Default	

Display Resolution

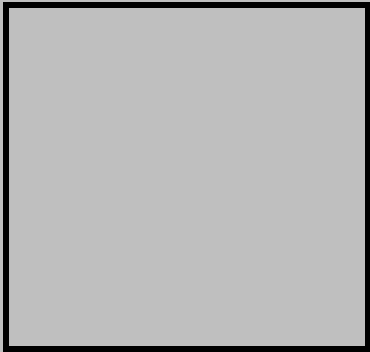
Shows the resolution of the unit. This has nothing to do with the resolution of the source picture.

Viewport

Shows the number of display pixels being used.

Viewport Top & Left **PLANAR**

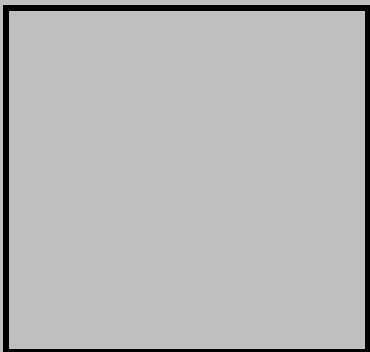
Arrows move top and left

0


Display Resolution	1920 x 1080
Viewport	1920 x 1080

Viewport Bottom & Right **PLANAR**

Arrows move bottom and right

0


Display Resolution	1920 x 1080
Viewport	1920 x 1080

Adjusting Color Balance

Color Balance is used to match the colors of adjacent displays when several displays are arranged in an array. You may also use it to adjust the color of a single display.

Understanding Color Temperature

Different “pure white” light sources do not always have the same color. For instance, light from an incandescent bulb has more yellow than light from direct sunlight. “Color Temperature” is a way of measuring these color differences. In general, higher color temperature numbers are bluer or “cooler.” You may have a reason for wanting your display to be a specific color temperature. For instance, if you are using the m70L in a television studio where you will be videotaping the content, you will want a low color temperature. The m70L defaults to the brightest setting possible, which is 100 in the RED, GREEN and BLUE lines under WHITE BALANCE. You may choose a different color temperature by setting it in the COLOR BALANCE menu.

Adjusting Color Temperature

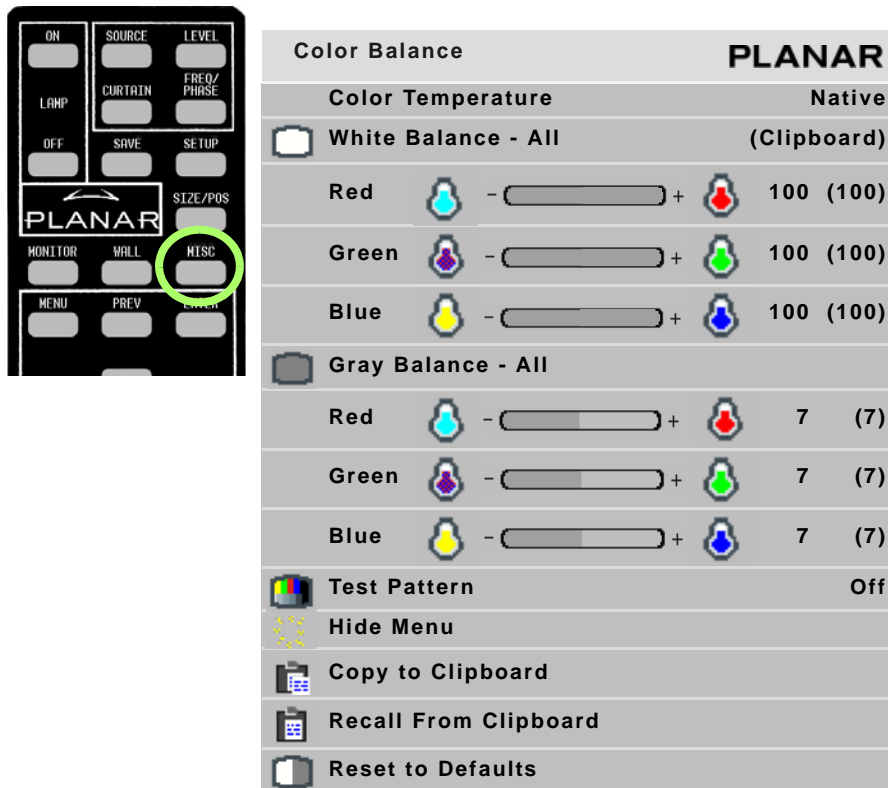
Select the COLOR TEMPERATURE line in the COLOR BALANCE menu and then select from 3200°K (Warm), 5500°K, 6500°K, 8500°K (Cool) or NATIVE. If you want the brightest display, select the NATIVE option.

Changing the color temperature changes the three WHITE BALANCE values. You can also change the WHITE BALANCE values individually to create a custom color temperature. Once you have changed the values, a new CUSTOM option is available on the COLOR TEMPERATURE line.

Color Balancing a Single Display

If you have only one display, the Color Balance controls can be used to set the color temperature of the single display.

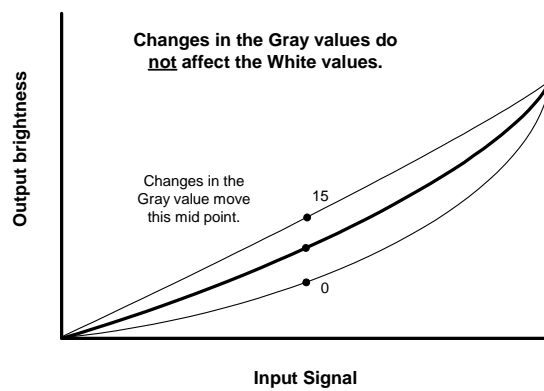
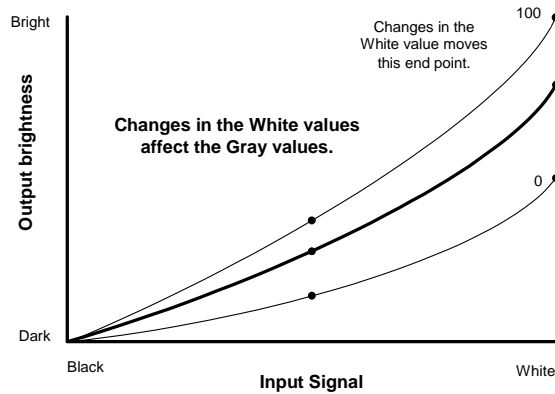
To access the COLOR BALANCE menu, press MISC once on the remote.



Tips for Color Balancing

- COPY TO CLIPBOARD will save all the current settings to a temporary memory. You can then make more adjustments to see if it gets better or worse. RECALL FROM CLIPBOARD will restore these saved settings. The clipboard is only for testing.

Color Balance values are saved for all input sources in the same memory location.



- Removing red has the same effect on hue as increasing blue and green together. The COLOR BALANCE menu slider bars have colored bulbs at each end to tell you what the effect will be of moving a color toward that end.

Advanced Options

Some options on the ADVANCED OPTIONS menu (MAIN > ADVANCED OPTIONS) are covered in other sections of this manual:

- Color Balance: see "Adjusting Color Balance" on page 49
- Backlight Settings: see "Backlight Control" on page 63
- Serial Port Settings: see "Serial Port Settings and Diagnostics" on page 67

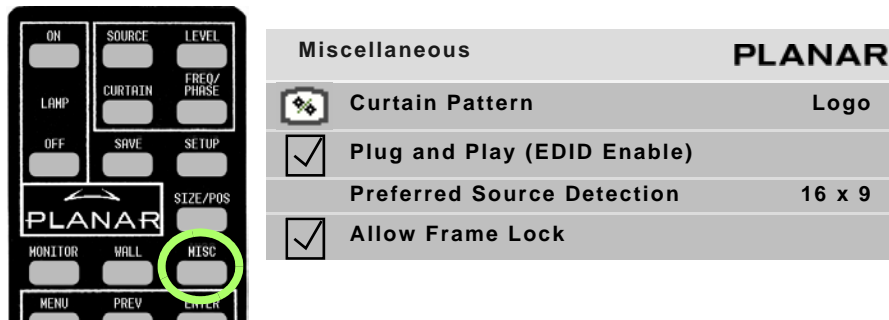
The remaining options are covered in this section.

Main Menu	PLANAR	Advanced Options	PLANAR
Picture	▶	Color Balance	▶
Size & Position	▶	Miscellaneous Options	▶
Aspect Ratio & Wall	▶	Backlight Settings	▶
Memory	▶	Serial Port Settings	▶
Diagnostics	▶	Auto Setup Options	▶
Advanced Options	▶	Menu Options	▶
Program Information	▶	Message in Picture	▶
		Set Clock / Schedule Events	▶

- Miscellaneous Options: see "Miscellaneous Options" on page 54
- Auto Setup Options: see "Auto Setup Options" on page 55
- Menu Options: see "Menu Options" on page 56
- Message in Picture: see "Message in Picture" on page 57
- Set Clock/Schedule Events: see "Setting the Clock/Scheduling an Event" on page 58

Miscellaneous Options

The MISCELLANEOUS menu contains several unrelated settings. To access the MISCELLANEOUS menu, press MISC twice on the remote.



Curtain Pattern

The curtain pattern determines what the m70L will show when you press the CURTAIN button.

Plug and Play (EDID Enable)

Plug and Play allows the source computer's video card to query the display and send the correct resolution. Most video cards work with Planar displays. For the few that don't, you may need to turn off Plug and Play and manually specify the video card settings based on the display's capabilities.

Preferred Source Detection

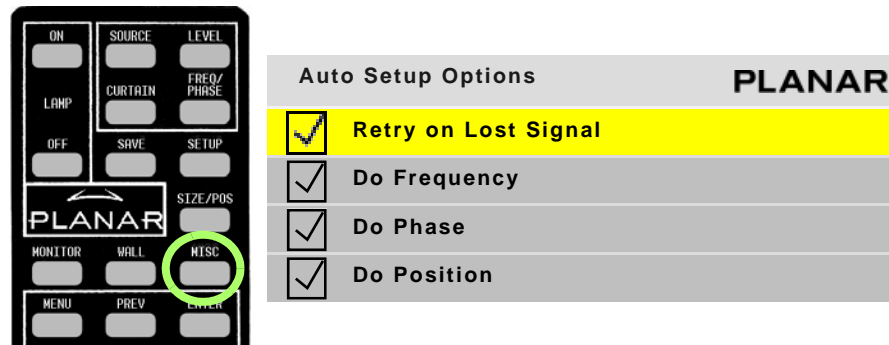
Analog computer video cards provide only vertical and horizontal frequencies. Sometimes, this is not enough information for the display to properly detect the signal. In certain cases, a display receiving such "ambiguous" signal modes could misinterpret the resolution to be any of three different modes. For example, 1024 x 768, 1280 x 768, and 1360 x 768 all have the same respective horizontal and vertical frequencies but represent different aspect ratios, 4 x 3, 15 x 9, and 16 x 9, respectively. By specifying the correct source detection mode, the display can correctly interpret the signal and display the incoming image in the proper aspect ratio. The default preferred source detection is 16 x 9. This is the native aspect ratio of this display. If you are attempting to display a 4 x 3 signal and it is not working, try changing the preferred source detection to 4 x 3.

Allow Frame Lock

Frame lock causes the display to synchronize its vertical refresh timing with that of the incoming source. This prevents frame tearing or frame dropping. To frame lock, the incoming signal must be within the refresh parameters of the display itself, which is from 49.3Hz to 64.8 Hz.

Auto Setup Options

Auto Setup Options determine what will happen automatically and what will not. To access the AUTO SETUP OPTIONS menu, press MISC five times on the remote.



Each checkbox in the AUTO SETUP OPTIONS menu can be turned on or off by selecting it (using the up/down arrows) and pressing ENTER.

Retry on Lost Signal

Occurs only when the present signal (picture) disappears or changes in some way. If this item is not checked, the display will not try to sync to a new signal. Keep this menu item checked.

Note: Searching will *not* occur because the picture goes black. Black, from video or from a computer, is a valid picture. The signal itself (the sync pulses) must be lost to trigger a search.

“Do” Checkboxes

Each DO that is checked will adjust the display, one process at a time, until all the processes are completed.

In the following situations, each of the checked DO boxes will be done in the order shown in the menu:

- If a new signal is acquired, either through selecting a different connector or because the source picture has changed modes, such as from WXGA to UXGA.
- When you press the SETUP button on the remote.

Do Frequency and Do Phase

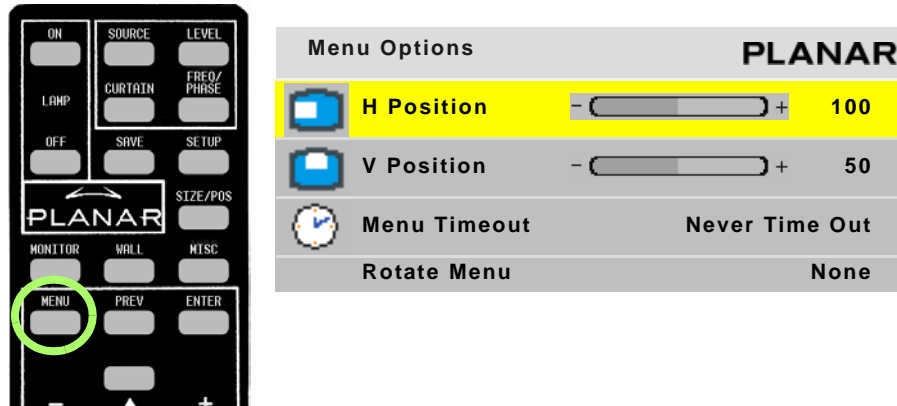
Work separately to find the frequency and phase of the computer picture and adjust to them. These work best on a picture that has a lot of sharp changes in brightness, such as text (adjacent white and black pixels).

Do Position

Centers the picture on the screen.

Menu Options

Menu Options determine the position, orientation and time duration of the menus on the screen. To access the MENU OPTIONS menu, press MENU on the remote and from the MAIN MENU, select ADVANCED OPTIONS > MENU OPTIONS.



H Position

Moves the menus (all of them) left and right on the screen. Use the + or - arrows on the remote to increase or decrease the distance from the left side of the screen to the left side of the menu. The number indicates in percent, how far across the screen the menu starts.

V Position

Moves the menus up and down on the screen. Use the + or - arrows on the remote to move the menu. The number indicates in percent, how far the menu is down the screen. It is not possible to move the menu to the bottom of the screen.

Menu Timeout

Determines how many seconds the menu will stay on the screen without any activity. NEVER TIME OUT means the menu will not automatically disappear. The maximum timeout is 60 seconds. The shortest possible timeout is 5 seconds. The default value is NEVER TIME OUT.

Rotate Menu

Makes the menus readable when the display is arranged in portrait or landscape orientation. ROTATE MENU does not rotate the picture. It only arranges the menus so they read the same way the picture does. To use the display in portrait mode, your source image must be rotated.

Message in Picture

Message in Picture enables text messages to be displayed on a single display or an array. To access the MESSAGE IN PICTURE menu, press MENU on the remote and from the MAIN MENU, select ADVANCED OPTIONS > MESSAGE IN PICTURE.

Note: The MESSAGE IN PICTURE menu is only available if the computer connected by RS232 has enabled the Message in Picture feature.

Message In Picture	PLANAR
Recall Last MIP	
Timeout	60 seconds

Recall Last MIP

Redisplays the last Message in Picture that was displayed.

Timeout

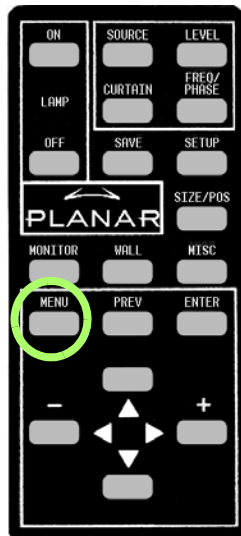
Determines how long this message will be displayed; the range is 0-120 seconds; 0 seconds means it will not time out.

To generate and administer text messages, you must download the MIP Maker software application from Planar's website. We suggest you also download the user guide. For more information, see "Accessing Planar's Technical Support Website" on page 85.

Setting the Clock/Scheduling an Event

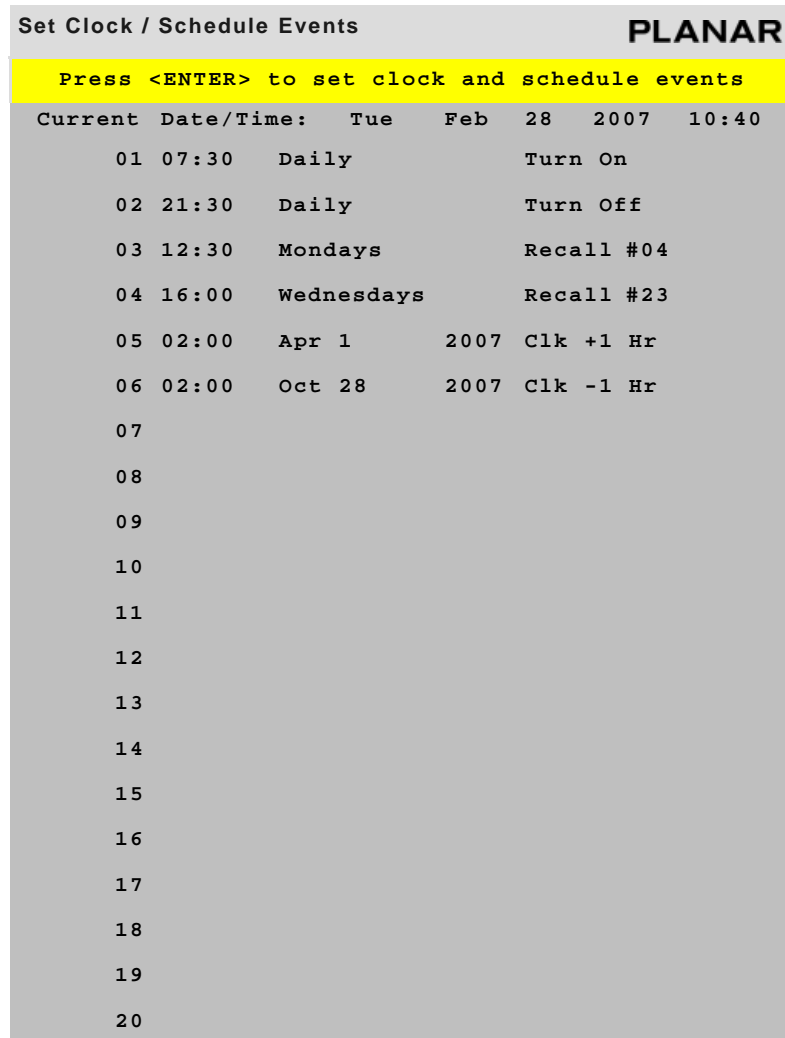
The m70L can be easily programmed to update the clock during annual time changes, as well as to schedule specific events, such as turning the unit on or off.

- 1 To access the SET CLOCK/SCHEDULE EVENTS menu, press MENU on the remote and from the MAIN MENU, select ADVANCED OPTIONS > SET CLOCK/SCHEDULE EVENTS.



Main Menu	PLANAR
Picture	▶
Size & Position	▶
Aspect Ratio & Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Advanced Options	PLANAR
Color Balance	▶
Miscellaneous Options	▶
Backlight Settings	▶
Serial Port Settings	▶
Auto Setup Options	▶
Menu Options	▶
Message in Picture	▶
Set Clock / Schedule Events	▶



- 2** Press ENTER to open the EVENT popup menu.
- 3** Do one of the following:
 - To set the clock, see "Setting the Clock" on page 60.
 - To schedule an event, see "Scheduling an Event" on page 60.

Setting the Clock

Use the following instructions to set the clock.

- 1 If 0 is not already selected in the Event # line, use the -/+ keys to select it.

Event # (0= set clock)	0
Frequency	Never
Action	No Action
Slot to Recall	1
Day of Week	Tuesday
Year	2007
Month	03
Date in Month	05
Hour	21
Minute	30

- 2 Depending on the changes you want to make, update any of the following lines:
 - Year
 - Month
 - Date in Month
 - Hour
 - Minute

Note: Time is calculated using a 24-hour clock. For example, if the current time is 9:30 p.m., set the Hour line to 21 and the Minute line to 30.

- 3 When you are finished making the appropriate changes, press ENTER to see the new time at the top of the SET CLOCK / SCHEDULE EVENTS menu.
- 4 Press MENU to close the menu system.

Scheduling an Event

The most important event that can be “scheduled” for the m70L is to turn it on or off. Scheduling an automatic shut off time for the m70L helps ensure that Temporary Image Retention does not occur. The following events can be scheduled:

- Turn unit off/on
- Set the clock ahead/back 1 hour
- Recall a memory slot

Use the following instructions to schedule an event.

- 1 Use the -/+ keys to select the “event number” you want to correspond to this event.

- 2 Use the up/down arrows to select the Frequency line. Use the -/+ keys to scroll through the list until you find the selection you want. The following frequencies can be selected:
- One Time (e.g. to set clock ahead one hour in the spring)
 - Daily (e.g. to turn the unit on/off)
 - Weekly

Event # (0= set clock)	1
Frequency	Daily
Action	No Action
Slot to Recall	1
Day of Week	Wednesday
Year	2007
Month	02
Date in Month	28
Hour	0
Minute	0

Note: If you have set up a one time event, the frequency will show "Never" once the event has occurred. You can schedule the event to occur again by changing the frequency back to "One Time" and then correcting the date and time.

- 3 Use the up/down arrows to select the Action line. Use the -/+ keys to scroll through the list of Action items until you find the one you want. The following actions can be selected:
- Turn Unit Off
 - Turn Unit On
 - Recall Slot
 - Set Clock Ahead 1 Hour
 - Set Clock Back 1 Hour
- 4 Do one of the following:
- If you selected "Recall Slot" in the previous step and want to recall a memory slot other than the one shown, go to 5.
 - If you did **not** select "Recall Slot" in the previous step, go to 6.

- 5 Use the up/down arrows to select the Slot to Recall line. Use the -/+ keys to scroll through the list until you find the selection you want.

Event # (0= set clock)	3
Frequency	Weekly
Action	Recall Slot
Slot to Recall	4
Day of Week	Monday
Year	2007
Month	05
Date in Month	28
Hour	12
Minute	30

Note: If you select a memory slot that has not been set up, no action will occur.

- 6 Depending on the frequency you selected and the change you want to make, update any of the following lines:
- Day of Week
 - Year
 - Month
 - Date in Month
 - Hour
 - Minute

Note: Time is calculated using a 24-hour clock. For example, if you want your unit to turn off at 9:30 p.m., set the Hour line to 21 and the Minute line to 30.

- 7 Continue setting up events until you are finished. Changes are automatically saved each time you move from line to line.
- 8 When you are finished making the appropriate changes, press ENTER to see the new events on the SET CLOCK / SCHEDULE EVENTS menu.
- 9 Press MENU to close the menu system.

Backlight Control

Backlight control can automatically adjust the screen brightness as ambient light conditions change.

Note: To extend the backlight life, it is recommended that you use the lowest backlight brightness that makes sense for your application. This will reduce power consumption, heat output and the chances of TIR from occurring. See "Recommended Usage" on page 6.

To open the BACKLIGHT CONTROL menu, go to MAIN MENU > ADVANCED OPTIONS > BACKLIGHT SETTINGS.

Main Menu	PLANAR
Picture	▶
Size & Position	▶
Aspect Ratio & Wall	▶
Memory	▶
Diagnostics	▶
Advanced Options	▶
Program Information	▶

Advanced Options	PLANAR
Color Balance	▶
Miscellaneous Options	▶
Backlight Settings	▶
Serial Port Settings	▶
Auto Setup Options	▶
Menu Options	▶
Message in Picture	▶
Set Clock / Schedule Events	▶

Backlight control has two options: automatic and manual. In manual mode, you adjust the backlight brightness to suit ambient conditions that are not likely to change.

In the automatic mode, you let the ambient light in the area of the m70L determine the image brightness. This is useful when the m70L is in a location that sometimes has daylight, which can vary.


When there is less ambient light, the screen can be darker and still be easily read. When there is more light, the screen must be brighter to see it clearly.

The backlight is optimized for the LCD operation. For normal operating conditions, the backlight can be adjusted for maximum brightness if desired. If you are operating at higher altitudes up to 2000 meters, it is recommended that you run the backlight at a reduced intensity. Running at maximum intensity at high altitudes can affect the lifetime expectancy.

Manual Backlight Control

This mode is useful when the m70L is in a room with no outside windows and unchanging ambient light levels.

- 1 Set the BACKLIGHT CONTROL MODE to MANUAL.




Backlight Control		PLANAR
<input checked="" type="checkbox"/>	Auto Backlight on	
<input type="checkbox"/>	Turn Backlight off with no Source (DPMS)	
	DPMS Delay	1 hr
	Backlight Control Mode	Manual
	Backlight Intensity - <input type="text" value="10"/> +	10

- 2 Adjust the BACKLIGHT INTENSITY to a comfortable brightness. A lower brightness will increase backlight life.

Caution: Changing a failed backlight is a job for a qualified service technician. It is done at the factory, not in the field. Contact your Planar dealer for more information.

Auto Backlight Control

- 1 Set the BACKLIGHT CONTROL MODE to AUTO.

Backlight Control		PLANAR
<input checked="" type="checkbox"/>	Auto Backlight on	
<input type="checkbox"/>	Turn Backlight off with no Source (DPMS)	
	DPMS Delay	1 hr
	Backlight Control Mode	Auto
	Backlight Intensity - <input type="text" value="10"/> +	10
	Ambient Threshold - <input type="text" value="99Lux"/> +	99Lux
	Ambient Light	239 Lux

- 2 Set the AMBIENT THRESHOLD to an ambient light level at which the backlight changes intensity. If the current AMBIENT LIGHT (shown on the bottom line) drops below the threshold, the backlight dims; if it rises above the threshold, the backlight brightens.

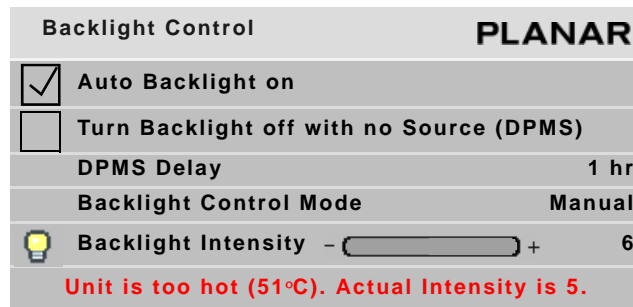
Note: Ambient light is a relative value, and is pertinent only to the m70L. It is not an absolute value. You may get different ambient light values with a handheld light meter.

Note: The m70L has a nominal time delay of three minutes before it changes light levels. This time delay prevents flickering if the ambient light level is near the ambient threshold.

High Temperature Warning

The m70L has a feature that allows the display to recognize when it is too hot and to automatically reduce the backlight intensity in an effort to cool itself down.

When this occurs, the display will show a warning message on the BACKLIGHT CONTROL menu to let you know the display is not as bright as you want it to be. This message includes the temperature and the backlight intensity the display is actually using. See "Normal Use Thermal Guidelines" on page 7 for more information about temperature guidelines.



Auto Backlight On

If AUTO BACKLIGHT ON is checked, the display turns on the backlights soon after AC power is applied. It won't wait for a remote control or RS232 command.

This is the normal mode for applications where the displays will be on 24 hours a day. This way, no one has to manually turn on the backlights after a power failure.

Caution: To prevent temporary image retention (TIR), it is recommended that you do **not** leave the m70L on for 24 hours a day. To get the most out of your display, see "Recommended Usage" on page 6.

If the displays normally have the backlights off for part of the day or night, do not check this box. Otherwise a power failure at night would turn on the backlights.

Turn Backlight Off With No Source and DPMS Delay

When checked, TURN BACKLIGHT OFF WITH NO SOURCE (DPMS) causes the backlights to turn off after the source goes absent for the length of time specified in the DPMS DELAY line. If this line is not checked, the backlights remain on indefinitely. To specify an amount of time after which the source is absent that the backlights will shut off, enter that number in the DPMS DELAY line.

Serial Port Settings and Diagnostics

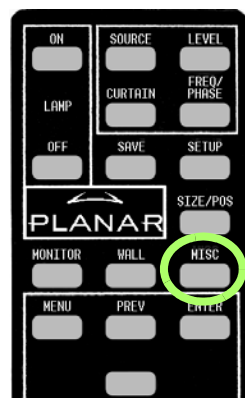
If you want to control the displays remotely with RS232 commands from a computer, read this section. Otherwise, skip it.

Multiple displays can be linked together for RS232 control using a straight-through Ethernet cable. This is the common type of LAN connection cable sometimes called a Cat-5 cable. For more information, see "RS232 Communication" on page 21.

RS232 is also used to upgrade the firmware of the display.

Serial Port Settings

To access the SERIAL PORT SETTINGS menu, press MISC four times on the remote.



Serial Port Settings	PLANAR
Group ID	1
Unit ID	1
ASCII Response Type	Symbolic
ASCII Response Terminator	CR
Baud Rate	19200

Group ID and Unit ID

Each display in the loop must have a unique ID.

The RS232 ID has two parts, Group ID and Unit ID. Each part has a range of 0–9, A–Z. This range results in 1300 possible addresses.

You can group the displays by using the same letter or number of the Group ID, such as A. In this way you can address the group as A*, and all the displays in the string that have Group ID A and any Unit ID will execute the command.

Note: It does not matter what order you use to set IDs for the displays. It is common practice to use Unit IDs that are in order, left to right and top to bottom, but this is not mandatory. The only rule is: DO NOT USE THE SAME ID FOR DIFFERENT DISPLAYS.

Part of the RS232 command will be an address. This address may take several forms. For example, suppose you have eight displays in one area divided into two groups. You might set the IDs of the displays like this:

Group ID	Unit ID
A	1
A	2
A	3
A	4
B	1
B	2
B	3
B	4

With this scheme, you have four ways to address these displays:

Address	Affect on Displays
A3 B4 etc.	Only the specific display addressed will obey the command. Also, the display will respond to the host computer.
**	All displays in this serial loop will obey the command.
*4	Both the displays whose IDs end in "4" will obey this command.
B*	All four displays in Group B will obey the command.

ASCII Response Type

Determines what type of data will be returned to the computer. For human-readable text in a serial program, choose SYMBOLIC. For computer-read data, use NUMERIC or DATA ONLY.

ASCII Response Terminator

Will be determined by what your serial program wants to see at the end of every transmission from the display.

Baud Rate

Must be the same as that used by the controlling computer. The baud rate is *not* automatically set, as it is with modem communications. It must be manually set here **and** at the computer to match each other.

Note: For firmware upgrades, you don't need to adjust the baud rate.

Serial Port Status

To view RS232 port status, press MONITOR twice on the remote.

Serial Port Status		PLANAR
<ENTER> to clear		
Commands Received		34
Replies Sent		34
Last Packet Type		Operation
Last Packet Address		Not Addressed
Bytes Received		921
Bytes Sent		773
UART Framing Errors		4
UART Overflow Errors		0
Group 0	Unit: 0	19200 Baud
Most Recent		
...115, 111, 108, 117, 105, 111, 110, 63, 13		
.st--1?.st--2?.st--3?.lcd.vertical-resolution?.		

The SERIAL PORT STATUS menu provides diagnostic information for the serial port.

Controlling With RS232 Commands

The RS232 protocol - the "rules" for controlling displays with RS232 commands - are described in a separate document. See "Accessing Planar's Technical Support Website" on page 85 to see how to get to the web page. Then look for m70L and under that the *RS232 Guide*.

Saving and Recalling Configurations

Some settings are saved automatically, but there are big advantages to saving a configuration manually. You can use the 40 numbered memory "slots" to save and recall settings, which is the fastest way to change configurations.

Some display settings (such as position, brightness/contrast, and color balance) are saved automatically five seconds after you make a change. The display caches the last ten settings. Whenever a picture is shown from a new source with the same resolution as a previous picture, the display recalls the previous settings rather than readjusting everything. This happens regardless of the check marks in the AUTO SETUP OPTIONS menu. (See "Auto Setup Options" on page 55.)

For example, suppose you display an NTSC picture in the composite input and set the Brightness to your liking. Then you feed in a composite PAL picture and set a different Brightness. If you then send a new NTSC picture, the previous NTSC picture's settings for Brightness are used.

Note: Aspect Ratio is specific to the source, which means it applies to all modes. It does not change when the system recalls a memory from cache.

How Automatic Save Works

Whenever you change settings on the display with the remote control or RS232 commands, they are saved automatically. If you change to a new source (switch to another input connector) then switch back to the previous source, everything you did before will be "recalled." Things will look like they did before.

Suppose you make adjustments to an SVGA source on analog, then you feed a UXGA source to analog and make new adjustments. Then you switch to the S-Video connector and do some more setup for it. Later, you switch to the analog input again, and this time it has the SVGA source from before. The display will recognize that it has seen this source before, or at least a source with these characteristics, and will recall the SVGA settings you established before.

The settings recalled by Automatic Save include Input Levels, Position and Frequency. However, Wall Mode and Big Picture adjustments are not saved with Automatic Save. Those settings can only be recalled from memory slots.

The fastest, most efficient way to change from one source to another, or to change a wall from individual pictures to one big picture, is to recall a memory.

Advantages of Saving Configurations to Memory Slots

- You can compare multiple settings quickly
- You don't have to repeat settings when comparing entire configurations
- You can revert to a known good setting when testing new configurations

What the Memories Store

The following settings can be stored in a memory slot and recalled when needed:

- Selected source
- Resolution (and much more about the signal)
- Frequency
- Phase
- Sharpness
- Position and size (zoom settings)
- Everything in the WALL & ASPECT RATIO menu
- Brightness, Contrast, Hue and Saturation for video sources

All of this is stored separately for each memory slot. As an example, you could store multiple different wall setups and switch between them quickly.

Global Storage

The following settings are stored globally; that is, they are stored at the display level and are the same for all memory slots.

- Everything in the MISCELLANEOUS menu
- Everything in AUTO SETUP OPTIONS
- Everything in MENU OPTIONS
- All the HOURS settings
- All the COLOR BALANCE settings

Memory: What Is Saved? And Where?

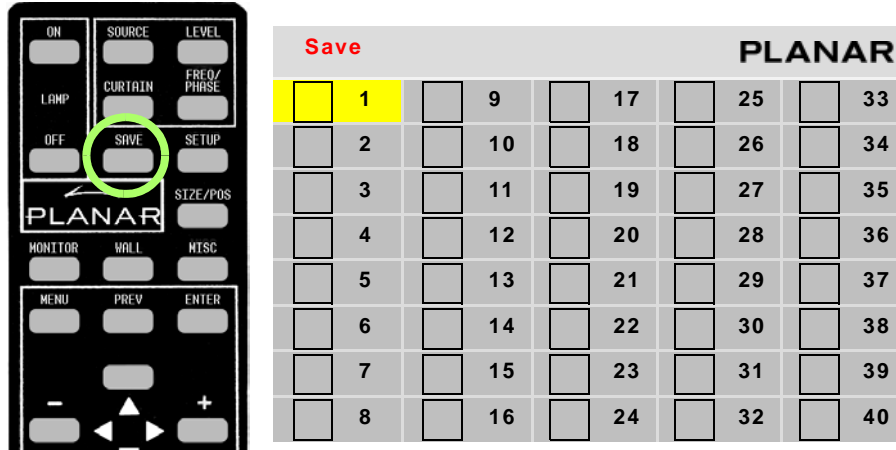
In the display, some parameters (values) are associated with the mode. The mode is primarily the horizontal and vertical resolution and the vertical frequency of the incoming source picture. It is more than that, but if you think of it this way, you will be close enough. Some parameters are associated with the input. The input in this instance means the input connector: Analog, digital, composite video, etc. The parameters specific to mode and input are saved in memory slots.

Some parameters are global. They are independent of the mode or input, and are not saved to memory slots, as shown in the table below.

Parameter	Specific to the		Global	Parameter	Specific to the		Global
	Mode	Input			Mode	Input	
ASCII Response Term.			x	Position, Horizontal	x		
ASCII Response Type			x	Position, Vertical	x		
Auto Codes			x	Resolution, Horizontal	x		
Auto Backlight On			x	Resolution, Vertical	x		
Baud Rate			x	Retry On Lost Signal			x
Black Level: R, G, & B	x			Saturation	x		
Brightness (video)	x			Sharpness		x	
Color Balance (all values)			x	Unit ID			x
Contrast (video)	x			Viewport Window Bottom		x	
Curtain Pattern			x	Viewport Window Left		x	
Do Frequency			x	Viewport Window Right		x	
Do Phase			x	Viewport Window Top		x	
Do Position			x	Wall Height		x	
Frequency	x			Wall Mode		x	
Group ID			x	Wall Unit Column		x	
Hue	x			Wall Unit Row		x	
Justify		x		Wall Width		x	
Menu H Position			x	White Level: R, G, & B	x		
Menu Timeout			x	Zoom Window Bottom		x	
Menu V Position			x	Zoom Window Left		x	
Overscan		x		Zoom Window Right		x	
Phase	x			Zoom Window Top		x	
Plug and Play (EDID)			x				

Saving Configurations

- 1 Set up the display the way you want it.
- 2 Press the SAVE button twice.



The SAVE grid menu displays. This menu contains 40 numbered memory slots.

- 3 Using the arrow keys on the remote, navigate to a slot:
 - An unchecked slot number allows you to save new settings.
 - A checked slot has settings already saved to it. If you want, you can overwrite what's already saved.
- 4 Press ENTER. The SAVE SLOT menu displays.

Save		PLANAR	
Slot Number	(Current)	1	
Save Now	(will overwrite occupied slot)		
Name	AN 1366x768		
Source	Analog		
Colorspace	RGB		
Resolution	1366 x 768		
Wall	2 x 2	1:1	
Scale/Justify	One to One / Center		
Postion/Overscan	168,19 / 0%		
Zoom UL/ LR	+0,+0 /	+0,+0	
Viewport UL/LR	+0,+0/	+0,+0	
Frequency/Phase	1602 / 22.5°		
Sharpness	Normal		
Black Level	63	55	57
White Level	166	170	169








Note: This menu shows all the settings that will be saved. You can't change anything but the name in this menu. The appearance of this menu is somewhat different for digital and video sources, reflecting what is saved for them.

- a If the current settings exactly match what is already in the memory, (CURRENT) will appear in the SLOT NUMBER line.
 - b If the memory already had data, and the only change is to the name, the phrase "will update name of occupied slot" appears in the SAVE NOW line.
 - c If this memory already has something stored in it, the phrase "will overwrite occupied slot" appears in red on the SAVE NOW line. This is the only warning.
 - d If none of these messages appear, this slot is empty.
- 5 Select SAVE NOW and press ENTER. The display instantly stores all the current settings into that memory slot.

Changing the Name of the Memory Slot

The default name is an abbreviation of the source connector, resolution, and if Wall Mode is on, wall settings. In the following example, the name tells you that the source is connected to Analog, which displays 1366 x 768, is part of a 2 x 2 array, and is the display in the upper left corner (column 1, row 1).

- 1 If you want a more descriptive name, select NAME and press ENTER. A little bar appears beneath the NAME line.

Save		PLANAR	
Slot Number	1		
Save Now			
Name	AN 1366x768 2x2 1:1		
 Source	Analog		
 Colorspace	RGB		
 Resolution	1366 x 768		
Wall	2 x 2	1:1	
Scale/Justify	One to One / Center		
Position/Overscan	168,19 / 0%		
Zoom UL/ LR	+0,+0	/	+0,+0
Viewport UL/LR	+0,+0/	+0,+0	
 Frequency/Phase	1602 / 22.5°		
 Sharpness	Normal		
 Black Level	63	55	57
 White Level	166	170	169

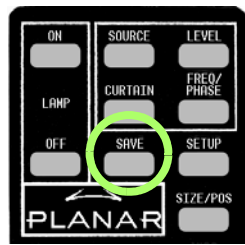
- a Use the + or - keys to move the yellow selector under the character you want to change.

- b** Use the up/down arrows to change the character.
- 2** When you are finished, press PREV.
- 3** Select SAVE NOW and press ENTER.

Note: If you use RS232 controls, you can also use commands to send a string name to a memory slot, saving time.

Recalling Stored Configurations

- 1 Press SAVE once to open the RECALL grid menu.



Recall				PLANAR					
<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	9	<input checked="" type="checkbox"/>	17	<input type="checkbox"/>	25	<input type="checkbox"/>	33
<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	10	<input type="checkbox"/>	18	<input type="checkbox"/>	26	<input type="checkbox"/>	34
<input type="checkbox"/>	3	<input checked="" type="checkbox"/>	11	<input type="checkbox"/>	19	<input type="checkbox"/>	27	<input type="checkbox"/>	35
<input type="checkbox"/>	4	<input type="checkbox"/>	12	<input type="checkbox"/>	20	<input type="checkbox"/>	28	<input type="checkbox"/>	36
<input type="checkbox"/>	5	<input type="checkbox"/>	13	<input type="checkbox"/>	21	<input type="checkbox"/>	29	<input type="checkbox"/>	37
<input type="checkbox"/>	6	<input type="checkbox"/>	14	<input type="checkbox"/>	22	<input type="checkbox"/>	30	<input type="checkbox"/>	38
<input type="checkbox"/>	7	<input type="checkbox"/>	15	<input type="checkbox"/>	23	<input type="checkbox"/>	31	<input type="checkbox"/>	39
<input type="checkbox"/>	8	<input type="checkbox"/>	16	<input type="checkbox"/>	24	<input type="checkbox"/>	32	<input type="checkbox"/>	40

- 2 Navigate to the slot you want to recall. When navigating, you can only go to the checked numbers. All the slots with checks have something stored in them. The others are grayed out.
- 3 Press ENTER to open the RECALL SLOT menu.

Recall	PLANAR		
Slot Number	17		
Recall Now			
Name	AN 1366x768		
Source	Analog		
Colorspace	RGB		
Resolution	1366 x 768		
Wall	2 x 2	1:1	
Scale/Justify	One to One / Center		
Postion/Overscan	168,19 / 0%		
Zoom UL/ LR	+0,+0 /	+0,+0	
Viewport UL/LR	+0,+0 /	+0,+0	
Frequency/Phase	1602 / 22.5°		
Sharpness	Normal		
Black Level	63	55	57
White Level	166	170	169

Note: If this slot number has exactly the same settings that are currently being used, a (CURRENT) message appears on the top line.

The name of the memory is listed here, as well as all the important parameters (data) stored in that memory slot.

- 4 If the name is *not* the one you want, press PREV and choose another memory.
- 5 In the RECALL SLOT menu, RECALL NOW is selected. Press ENTER to recall the parameters currently displayed in the menu.
- 6 We suggest that you create a list of memory slots that contains each slot number, name and description.

Deleting a Configuration

- 1 Go to the MEMORY menu (MAIN > MEMORY).








Memory	PLANAR
Recall	▶
Save	▶
Delete	▶

- 2 Select DELETE and press ENTER.
This opens the DELETE grid menu with 40 numbered memory slots.

Delete		PLANAR							
<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	9	<input checked="" type="checkbox"/>	17	<input type="checkbox"/>	25	<input type="checkbox"/>	33
<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	10	<input type="checkbox"/>	18	<input type="checkbox"/>	26	<input type="checkbox"/>	34
<input type="checkbox"/>	3	<input checked="" type="checkbox"/>	11	<input type="checkbox"/>	19	<input type="checkbox"/>	27	<input type="checkbox"/>	35
<input type="checkbox"/>	4	<input type="checkbox"/>	12	<input type="checkbox"/>	20	<input type="checkbox"/>	28	<input type="checkbox"/>	36
<input type="checkbox"/>	5	<input type="checkbox"/>	13	<input type="checkbox"/>	21	<input type="checkbox"/>	29	<input type="checkbox"/>	37
<input type="checkbox"/>	6	<input type="checkbox"/>	14	<input type="checkbox"/>	22	<input type="checkbox"/>	30	<input type="checkbox"/>	38
<input type="checkbox"/>	7	<input type="checkbox"/>	15	<input type="checkbox"/>	23	<input type="checkbox"/>	31	<input type="checkbox"/>	39
<input type="checkbox"/>	8	<input type="checkbox"/>	16	<input type="checkbox"/>	24	<input type="checkbox"/>	32	<input type="checkbox"/>	40

- 3 Navigate with the arrow keys to the slot you want to delete and press ENTER.
When navigating, you can only go to the checked numbers. All the slots with checks have something stored in them. The others are grayed out.

4 In the DELETE SLOT menu, DELETE NOW is selected.

Delete		PLANAR	
Slot Number	17		
Delete Now			
Name	AN 1366x768		
 Source	Analog		
 Colorspace	RGB		
 Resolution	1366 x 768		
Wall	2 x 2	1:1	
Scale/Justify	One to One / Center		
Position/Overscan	168,19 / 0%		
Zoom UL/ LR	+0,+0	/ +0,+0	
Viewport UL/LR	+0,+0/	+0,+0	
 Frequency/Phase	1602 / 22.5°		
 Sharpness	Normal		
 Black Level	63	55	57
 White Level	166	170	169

5 Press ENTER.

Confirm Slot Delete		PLANAR	
Are you Sure?	Yes	No	

6 Use the left arrow to make the YES red and press ENTER.

Confirm Slot Delete		PLANAR	
Are you Sure?	Yes	No	

Note: It is not necessary to delete the data in a memory slot before saving new data. Saving will overwrite the stored data. See "Saving Configurations" on page 74.

Basic Troubleshooting

Use the following troubleshooting tables to diagnose and resolve common problems.

If your screen shows black or a test pattern

Do This	Result	Explanation / Further Action
1 Press MONITOR on the remote.	No menu appears	The backlights may not be lit. On the remote, press ON. If the screen is still black, go to 4.
	A menu appears	Check if the "Curtain or Test Pattern is displayed" message (in red) appears on the menu. If it does not appear, go to 3. If the message does appear, go to 2.

Unit Status	PLANAR
m70L 1920 x 1080 010-0781 Rev 00	
Mode ID: 123 HPer: 3178 VLines: 525	
Curtain or Test Pattern is displayed	
Backlight Status	OK
Internal Temperature:	32°C

2 Press CURTAIN once on the remote. If the message does not disappear, press CURTAIN again.	The message has not disappeared	See "m70L doesn't respond to remote control" on page 82.
	The message has disappeared	If the correct source does not appear, go to 3.

If your screen shows black or a test pattern

Do This	Result	Explanation / Further Action
3 Press MENU on the remote until the MAIN MENU appears.	The "source absent" pane is visible	<p>Make sure the correct source is selected by pressing SOURCE. If necessary, change to a different source.</p> <p>Make sure the source is on.</p> <p>Make sure the cable between the source and the display is correctly connected at both ends.</p> <p>If the screen is still a solid color, see "Where to Go From Here" on page 84.</p>
	The source absent pane is not visible	The source is displaying a solid color or a test pattern.
4 Ensure the power cable is connected, the power switch is ON and the front LED is illuminated.		Reconnect cable or turn on unit.
5 On the back of the display, look up into the two middle fans. Make sure there is a green LED lit on the left and right sides of each fan.	All four green power supply LEDs are lit.	If all the LEDs are lit, see "Where to Go From Here" on page 84.
	One or more of the green power supply LEDs are not lit.	If you do not see all four green LEDs, contact the Technical Support Department for more information. See "Where to Go From Here" on page 84.

m70L doesn't respond to remote control

Possible Cause	Possible Resolution
Power is not on	Confirm that the power cable is connected and the power switch is on and the front LED is illuminated.
Remote batteries are dead or improperly installed	Replace or reinstall batteries.
Remote was not aimed at the IR receiver	The IR receiver is in the lower right corner (in landscape mode; in portrait mode, it is in the lower left corner) of the screen bezel behind a small hole.

m70L doesn't respond to remote control

Possible Cause	Possible Resolution
Something is blocking the IR receiver	Remove the obstruction.
Your installer or service provider has disabled the remote control	Contact your installer or service provider.

Checking Unit Status

- 1 Press MONITOR on the remote.

Unit Status	PLANAR
m70L 1920 x 1080 010-0781 Rev 00	
Mode ID: 123 HPer: 3178 VLines: 525	
Curtain or Test Pattern is displayed	
Backlight Status OK	
Internal Temperature: 32°C	

Backlight Status Shows

- OK if both banks of backlights are functioning normally
- FAILED if the backlight banks are not functioning normally

Internal Temperature

Indicates the current internal temperature at one point inside the unit. This is not the highest nor the lowest temperature of the unit, nor an indicator of ambient temperatures.

Where to Go From Here

If none of the suggestions offered thus far have solved your problem, contact Planar's Technical Support Department.

via mail: Planar Systems, Inc.
Control Room and Digital Signage
1195 NW Compton Drive
Beaverton, OR 97006

via e-mail: planarsupport@planar.com

via phone: +1-503-748-5799

via fax: +1-503-748-5532

Accessing Planar's Technical Support Website

- 1 Go to www.planarsignage.com/partners
Under "Partner login", click on CONSULTANTS AND DESIGNERS
User name: tech
Password: help
- 2 From there, you can access downloadable utility software, new firmware, user manuals, and service manuals.
- 3 To access information for a specific model, click on that model name. For example, to download an electronic copy of this manual, click on m70L.

PLANAR Display Innovation You Depend On.

Partners

CONTROL ROOM DIGITAL SIGNAGE SUPPORT PARTNERS CONTACT US

CONSULTANTS AND DESIGNERS

Overview
Technical Resources
Field Replaceable Unit (FRU) List
Policies and Processes
Utility Software
CAD Drawings
Tools
List Pricing
Training
Service Training

Consultants and Designers

For consultants and designers, the following information is available for download:

Technical Resources

- Bay Cat (SN-4610-1080)
- Bay Cat X (SN-4620-1080)
- Bengal (SN-6010-720)
- Bobcat I (SN-4025-WX)
- Bobcat II (SN-4035-WX)
- Bobcat X (SN-4045-WX)
- c50SP/c67SP/c70SPw
- c50X/c67X
- c50RP/c67RP & c50RX/c67RX
- Cheetah (VN-4020-V)
- Cougar (VN-5220-S)
- Jaguar (VN-5220-V)
- Leopard (VN-3820-VA)
- Lion X, SX, UX (VN-6720-X, VN-6720-SX, VN-6720-UX)
- Lion XP, SXP, LXP (VN-6720-XP, VN-6720-SXP, VN-6720-LXP)
- Lion XL, UXL (VN-6750-XL, VN-6750-UXL)
- Lynx (SN-4215-P)
- Margay (VN-5040-720)
- m40L & m46L
- m57L
- Panther (PN-6730-LUX & PN-6740-LUX)
- Panther LXP (PN-6740-LXP)
- Puma (VN-5010-X, VN-5020-XP, VN-5020-LXP)
- Tiger (VN-5240-S)
- Tigress (VN-5230-S)
- Tigress S (VN-5230A-S)
- Tigress X (VN-5230A-X)
- Wildcat (VN-4030-S)
- Wildcat SE (VN-4030-SE)
- WallNet (N-1010)

• Lion Distance Courier (DC-450, DC-1500)

Contact Information

Planar Systems, Inc.
Control Room & Digital Signage Business Unit
1195 NW Compton Drive
Beaverton, OR 97006-1992
Toll-free: 866-475-2627
Fax: 503-582-8570
Email:
Control Room: controlroom@planar.com
Digital Signage: digitalsignage@planar.com

Technical Support
Phone: 503-748-5799
Toll-free: 1-866-PLANAR1
(1-866-752-6271)
Fax: 503-748-5532
Email: ts@planar.com

To access user guides, service manuals, firmware, and other resources for a particular model, click the model name.

Downloading Additional Documentation and Firmware

Some of the other documents for the m70L, which are or will be available from the Technical Support Department website, are listed below:

Document Name	Contents
Installation & Configuration Guide	Information for installers and technicians to install and configure displays.
Quick Start Guide	Gives you the basic information you need to get displays up and running.
RS232 Reference Manual	Technical information about the product, such as display mode information and how to use RS232 commands to control displays.

Downloading Utility Software

- 1 Read the instructions listed under "Accessing Planar's Technical Support Website" on page 85.
- 2 Click Utility Software.
- 3 From the list of available software, click on the tool you need.
For example, to control the m70L using RS232 commands, download Serial Talk. You may also want to download the document "Using Serial Talk."

Specifications

Mechanical Specifications

Specification	m70L		Notes
Outside dimensions	in/lbs	mm/kg	
Width	66"	1664mm	
Height	39"	984mm	
Depth	5.8"	147mm	
Weight	163lbs	43kg	
Shipping weight	224lbs	102kg	
Orientation	vertical and horizontal		
Display color	charcoal		
Rear clearance required	.5"	12mm	
Screen dimensions			
Diagonal	70"	1778mm	
Width	62"	1564mm	
Height	35"	886mm	
Aspect ratio	16:9		
Pixel pitch	0.807mm x 0.807mm		

Electrical and Heat Specifications

Specification	Max.	Min.	Typical	Notes	Unit
Video input amplitude					
Separate RGB Analog	1.0V p-p	0.5V p-p	0.7V p-p	75 ohm termination	
Composite Analog	5.0V p-p	0.3V p-p		75 ohm termination	
TTL H and V sync	5.0V	2.5V	3.5V	TTL at 330 ohm termination	
Input connectors					
DVI-D x 1				Digital	
15-pin HD D-sub x 1				Analog VGA	

Electrical and Heat Specifications (Continued)

Specification	Max.	Min.	Typical	Notes	Unit
RCA (composite video) x 1				NTSC, PAL, SECAM	
RCA (component video) x 3					
Mini-DIN 4-pin (S-Video) x 1					
RJ45 x 2				RS232 In/Out	
HD-SDI				BNC female In/Out	
AC Requirements					
Line voltage					
115V range	130V	100V	115V	50-60 Hz auto switching	
230V range	240V	200V	230V	50-60 Hz auto switching	
Power			750W		
Current					
115V			6.5A		
230V			3.25A		
Heat, BTUs per hour			2559		
Analog Inputs					
Horizontal Timing	91.1	31.47			KHz
Vertical Timing	120	50			Hz
Pixel Clock	170	10			MHz
Input Amplitude	1.0	0.5	0.7		Vp-p
Input Impedance			75		Ohms
Digital (DVI) Input					
Horizontal Timing	91.1	31.47			KHz
Vertical Timing	120	50			Hz
Pixel Clock	165	25			MHz
Component (YPbPr) Input - Video					
Horizontal Timing	33.749	15.625		480i/p, 576i/p, 720p and 1080i	KHz
Vertical Timing	60	50		480i/p, 576i/p, 720p and 1080i	Hz

Electrical and Heat Specifications (Continued)

Specification	Max.	Min.	Typical	Notes	Unit
Pixel Clock	74.25	13.5		480i/p, 576i/p, 720p and 1080i	MHz
Input Impedance			75		Ohms
Input Impedance			75		Ohms
Composite Input					
Horizontal Timing			15.625 15.734	PAL/SECAM NTSC	KHz
Vertical Timing			50 60	PAL/SECAM NTSC	Hz
Pixel Clock			16.406 16.521	PAL/SECAM NTSC	MHz
Input Impedance					
S-Video Input					
Horizontal Timing			15.625 15.734	PAL NTSC	KHz
Vertical Timing			50 60	PAL NTSC	Hz
Pixel Clock			16.406 16.521	PAL NTSC	MHz
Input Impedance			75		Ohms
SDI Input					
Horizontal Timing	33.749	15.625		480i/p, 576i/p, 720p and 1080i	KHz
Vertical Timing	60	50		480i/p, 576i/p, 720p and 1080i	Hz
Pixel Clock	74.25	13.5		480i/p, 576i/p, 720p and 1080i	MHz
Input Impedance			75		Ohms

Optical Specifications

Specification	Maximum	Minimum	Typical	Notes
Screen Brightness			600 nits/175 ftL	
Contrast Ratio			1500:1	
Full Viewing Angle			178°	C/R ≥10
Color Gamut			72% 100%	NTSC EBU
Color CIE				±0.03 for R, G, B, W
Red (x, y)			0.648, 0.333	
Green (x, y)			0.271, 0.592	
Blue (x, y)			0.144, 0.066	
White (x, y)			0.280, 0.290	
Color Temperature			10,000K	user customizable
Response time			8 msec	gray-to-gray
Number of colors			16.7 M	
Resolution			1920 x 1080 pixels	
Backlight life, hours		50,000		Until brightness reduced to 50% of original starting value.

Environmental Specifications

Specification	Maximum	Minimum	Typical	Notes
Temperature operating	35° C 95° F	0° C 32° F		All performance specifications are maintained within this temperature range.
non-operating	60° C 140° F	-20° C -4° F		
Altitude (barometric pressure)	2,000 meters above sea level			Maximum temperature 30° C
Humidity	80% R.H.	20% R.H.		non-condensing

Mounting Specifications

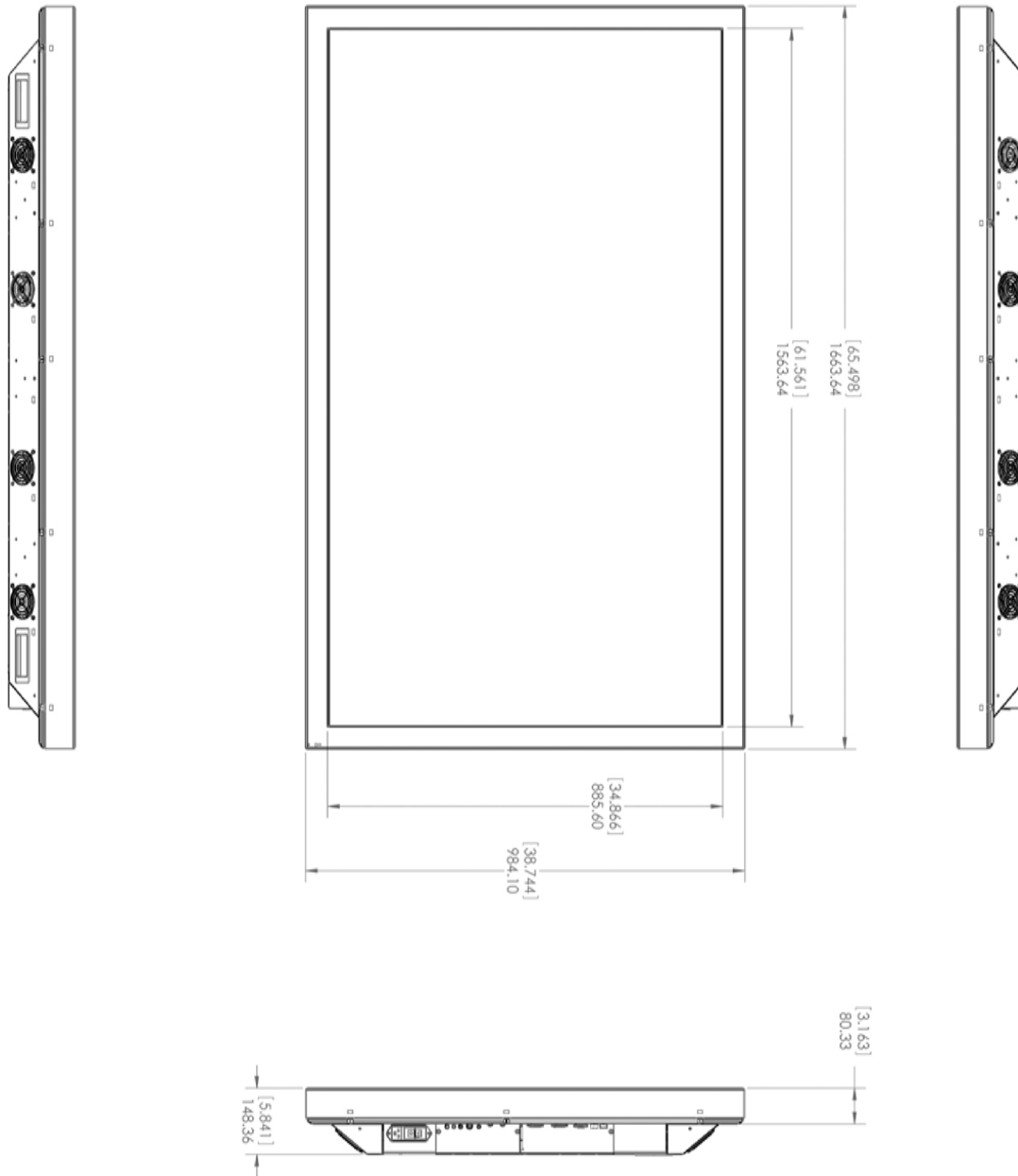
Specification	End to End, Longer Side of Display	End to End, Shorter Side of Display	Screw Size
VESA MIS-F	600mm	600mm	M8

Note: Minimal screw penetration is 10mm and maximum is 15mm.

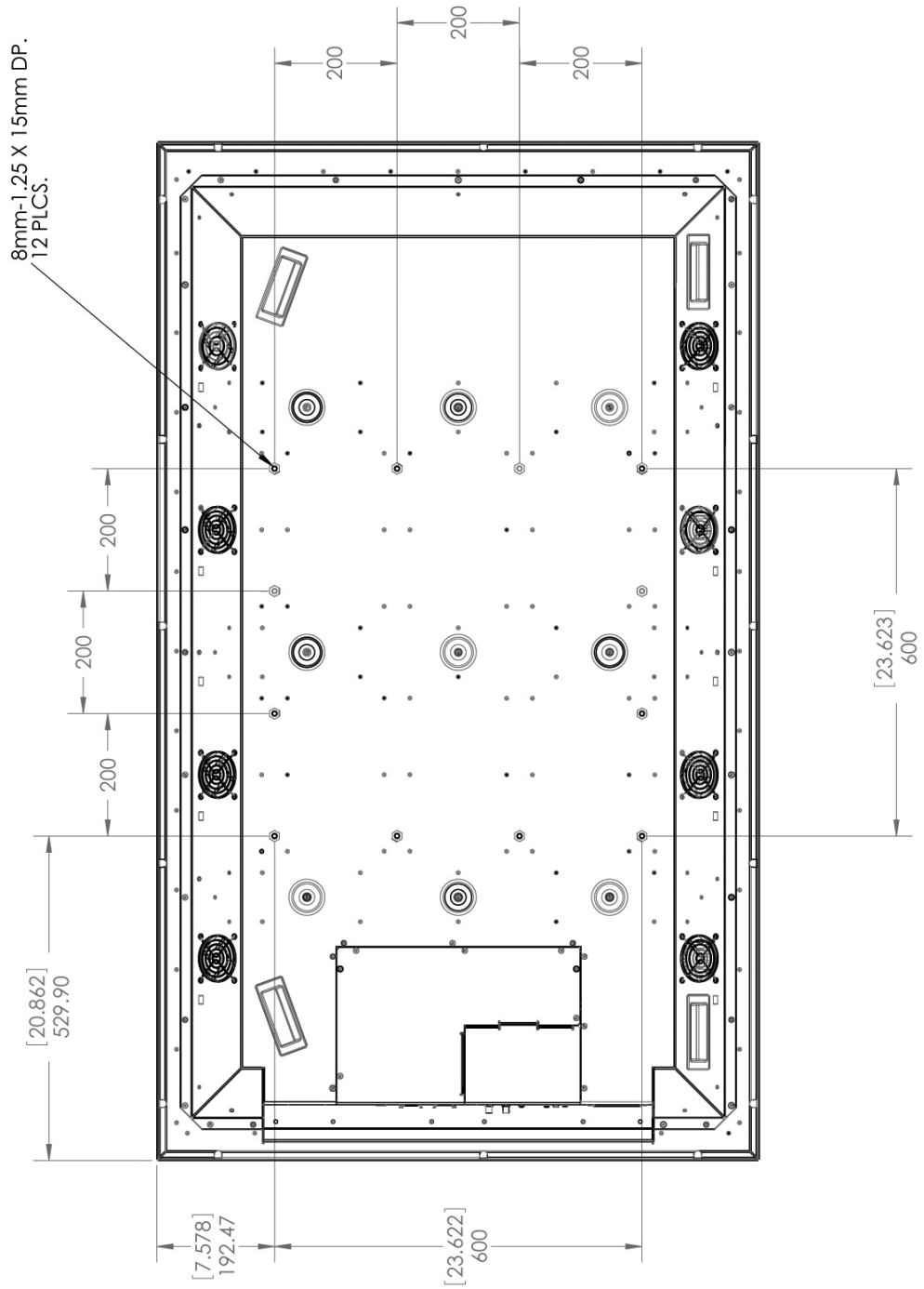
m70L Dimensions

Dimensions shown in parentheses are in inches. All other dimensions are in millimeters.

Front and Side View



Rear View



Regulatory Information

Manufacturer's Name: Planar Systems, Inc.
Manufacturer's Address: 1195 NW Compton Drive
Beaverton, OR 97006

declares that the products Model Numbers:m70L (Direct-view LCD)

conforms with the provisions of:

Council Directive 2004/108/EC on Electromagnetic Compatibility;

EN55022:1998 Radiated and Conducted Emissions from IT Equipment

EN55024:1998 Immunity of IT Equipment

Including:	EN61000-4-2	Electrostatic Discharge
	EN61000-4-3	Radiated Immunity
	EN61000-4-4	Electrical Fast Transients
	EN61000-4-5	Line Surge
	EN61000-4-6	RF Conducted Susceptibility
	EN61000-4-8	Magnetic Field Immunity
	EN61000-4-11	Voltage Dips and Interrupts

And:	EN61000-3-2	Harmonic Current Emissions
	EN61000-3-3	Voltage fluctuations and Flicker

Council Directive 2006/95/EC on Low Voltage Equipment Safety:

EN60950:2001 Safety of IT Equipment

The Technical Construction File required by this Directive is maintained at the corporate headquarters of Planar Systems, Inc., 1195 NW Compton Drive, Beaverton, OR 97006.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada (ICES-003): This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Any changes or modifications to the display not expressly approved by Planar could void the user's authority to operate this equipment.

Other Certifications

CISPR 22

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