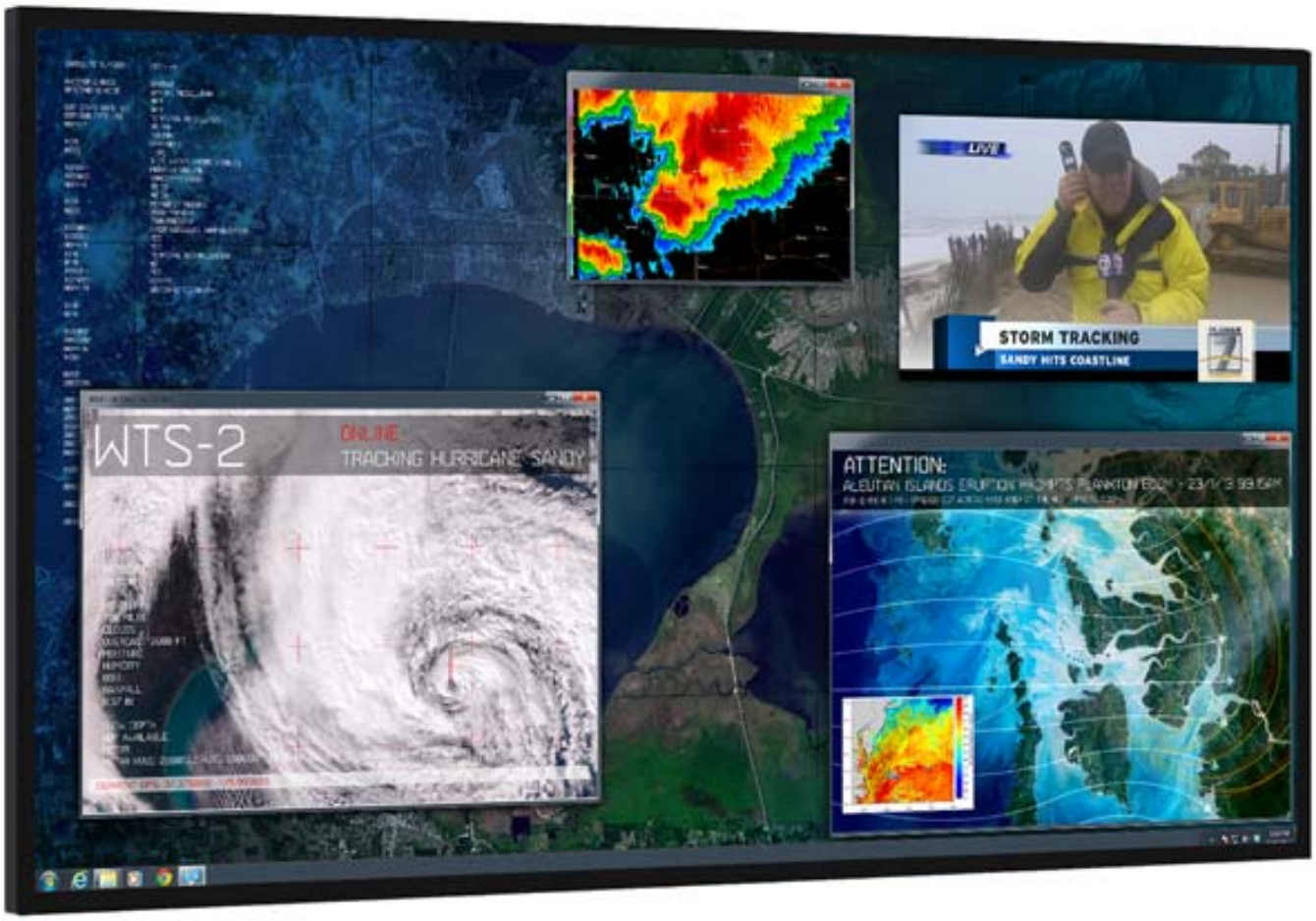
Planar UltraRes™ User Manual



PLANAR™

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RoHS Compliance Statement

The Planar UltraRes 4K professional displays are fully RoHS compliant.

ADA Compliance Statement

All Planar UltraRes 4K professional displays are compliant with the Americans with Disabilities Act.

Part Number: 020-1229-01A

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Introduction

Planar UltraRes 4K professional display is a family of 84" Ultra HD displays that produce resolution and picture quality not before seen in large format LCD displays. There are three different offerings: the UR8450-LX, UR8450-MX and the UR8450-3D. Designed specifically for resolution-rich commercial applications, Planar UltraRes displays offer the image quality, connectivity, industrial design and configuration options required in leading control rooms, collaboration rooms and digital branding installations.

Some of the features of the UltraRes display are:

- Ultra HD (3840 x 2160) resolution @ 120Hz vertical refresh
- Outstanding picture quality - 4x pixel density of a comparably-sized Full HD display
- Slim design with Planar Profile™ Mounting System (about 3" deep when mounted)
- Supports range of 4K sources and timings
- Energy-saving features include LEDs, <0.5 watt standby mode and auto-off signal detection

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

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use any of the Planar UltraRes products near water.
6. Clean the LCD screens with an LCD screen cleaner or LCD wipes.
7. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
8. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for the replacement of the obsolete outlet.
9. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from any of the Planar UltraRes products.
10. Only use the attachments/accessories specified by the manufacturer.
11. Unplug all Planar UltraRes displays during lightning storms or when unused for long periods of time.
12. You must follow all National Electrical Code regulations. In addition, be aware of local codes and ordinances when installing your system.
13. Refer all servicing to qualified service personnel. Servicing is required when any of the Planar UltraRes products have been damaged in any way, such as the AC power cord or plug is damaged, liquid has been spilled or objects have fallen into a product, the products have been exposed to rain or moisture, do not operate normally or have been dropped.
14. Keep the packing material in case the equipment should ever need to be shipped.
15. Wall mounts must be secure. The wall must be strong enough to hold the UltraRes display, mounts and cables.

16 Slight pressure on the LCD will cause distortion of the image. Heavier pressure will cause permanent damage. Planar UltraRes configurations 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.

17 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.

European Union Disposal Information

English

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

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

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

Français

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

Ce symbole appliqué sur votre produit ou sur son emballage indique que ce produit ne doit pas être traité comme un déchet ménager lorsque vous voulez le mettre au rebut. Il doit au contraire être remis à un site de collecte agréé pour le recyclage des équipements électriques et électroniques. En veillant à ce que ce produit soit mis au rebut de façon adéquate, vous contribuerez à prévenir les conséquences potentiellement négatives sur l'environnement et sur la santé humaine qui 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 renseignez-vous sur la méthode de mise au rebut correcte.

Deutsch

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

Dieses Symbol, zu finden auf Ihrem Produkt oder dessen Verpackung, macht Sie darauf aufmerksam, dass dieses Produkt bei der Entsorgung nicht als Hausmüll behandelt werden darf. Statt dessen sollte es an eine Sammelstelle zum Recycling von elektrischen und elektronischen Altgeräten gegeben werden. Helfen Sie mit, potenziell schädliche 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.

Español

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

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

Italiano

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

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

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

Nederlands

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

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

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

Português

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, estará a evitar consequências potencialmente negativas tanto para o ambiente como para a saúde humana. A reciclagem de materiais ajuda a preservar os recursos naturais.

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

Polski

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

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

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

Waste Electrical and Electronic Equipment (WEEE) Directive In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling. EEE complies with Directive 'Regulation on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment'

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

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

Suomi

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

Jos tuotteessa tai sen pakkauksessa on tämä symboli, sitä ei pidä hävitettäessä käsitellä tavallisena kotitalousjätteenä, vaan se kuuluu toimittaa sähkö- ja elektroniikkalaitteiden kierrätyspisteeseen. Varmistamalla, että tämä tuote hävitetään asiaankuuluvalla tavalla autat estämään mahdollisia ympäristölle ja ihmisille koituvia negatiivisia seuraamuksia, joita sen vääränlainen hävittäminen voi aiheuttaa. Materiaalien kierrättäminen auttaa säilyttämään luonnonvaroja.

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

Waste Electrical and Electronic Equipment (WEEE) Yönergeleri Avrupa Birliği'nde bu etiket, ürünün ev elektroniği aletleri atıkları ile imha edilemeyeceğini gösterir. Kurtarmak ve geri dönüşümünü sağlamak için uygun şartlarda saklanması gerekir. EEE Yönetmeliğine Uygundur Ve Elektronik Eşyalarda Bazi Zararli Maddelerin Kullaniminin Sinirlandirilmasina Dair Yönetmelik.

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Recommended Usage

In order to get the most out of your LCD modules, 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 LCD module will not experience burn-in, as plasma displays do, nor will it retain images in any way.

Normal use of an LCD module is defined as displaying continuously changing video patterns or images. However, LCD modules 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. 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.

TIR is not covered under warranty. See standard warranty terms and conditions for details. Here are some guidelines to help you avoid TIR:

- Use the LCD module 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 Planar UltraRes when it is not in use.

Caution: For optimal performance, we suggest turning off the LED power on the Planar UltraRes for four hours per day.

Normal Use Thermal Guidelines

Normal use of the LCD module is defined as operating in the open air to prevent heat buildup, and without direct or indirect heat sources such as lighting fixtures, heating ducts, or direct sunlight that can cause the modules to experience high operating temperatures. If the LCD module will be installed in a recessed area with an LCD surround or enclosure, ensure adequate openings are applied for proper air flow and ventilation.

At 3000 meters or below, the maximum ambient operating temperature for the LCD module cannot be above 40° 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 module placement is changed, thermal shielding is provided and/or additional ventilation is provided to keep the display within its nominal operating parameters.

Cooling Requirements

For optimal performance, active cooling by the installer should be planned for when the ambient temperature anywhere in the wall is predicted to be above the specified ambient temperature for the display.

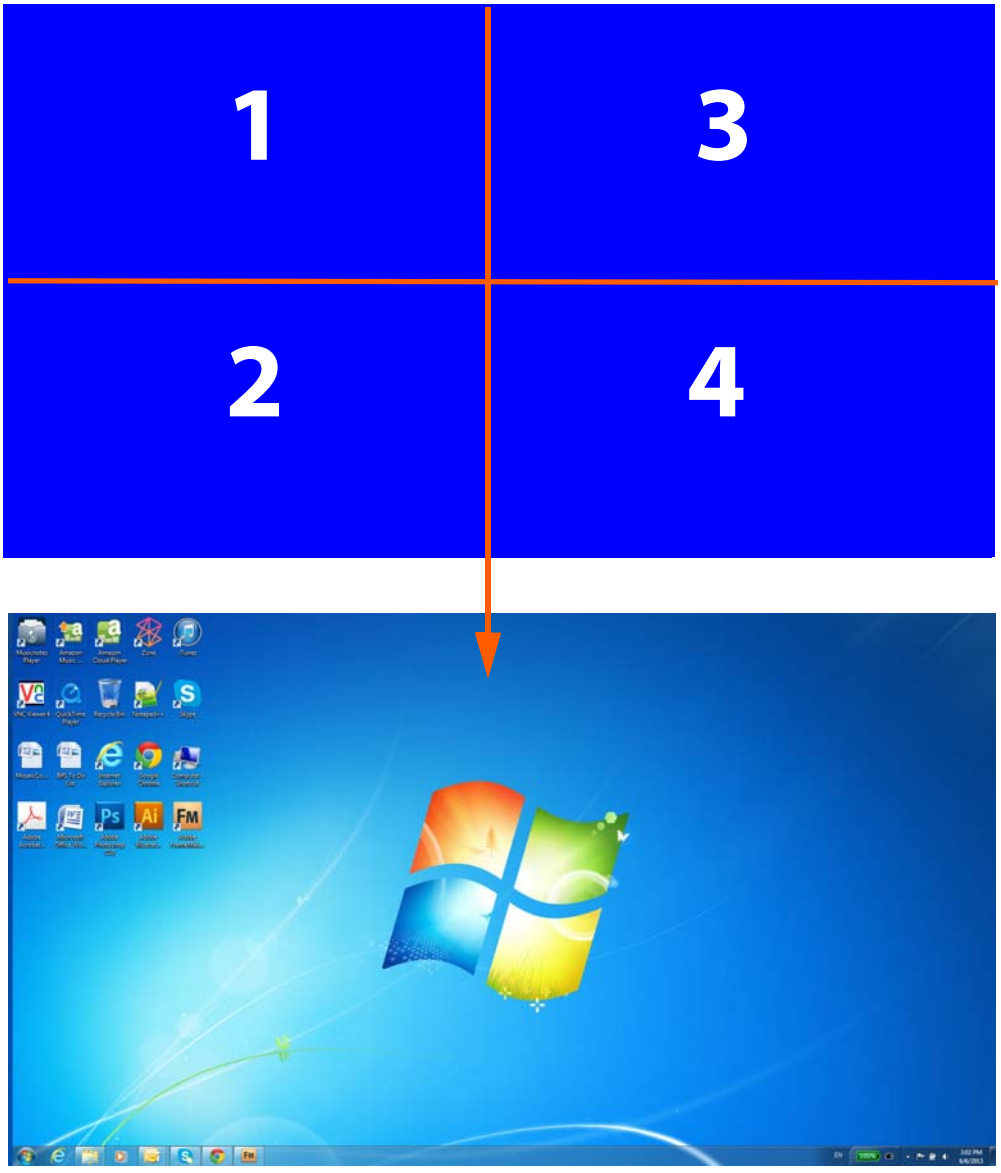
Basic Concept of Planar UltraRes Display

The Planar UltraRes display uses four separate outputs that feed into the 84" display as one image. You can use any combination of HDMI, DisplayPort or DVI.

There are two main modes of operation for the UltraRes Display:

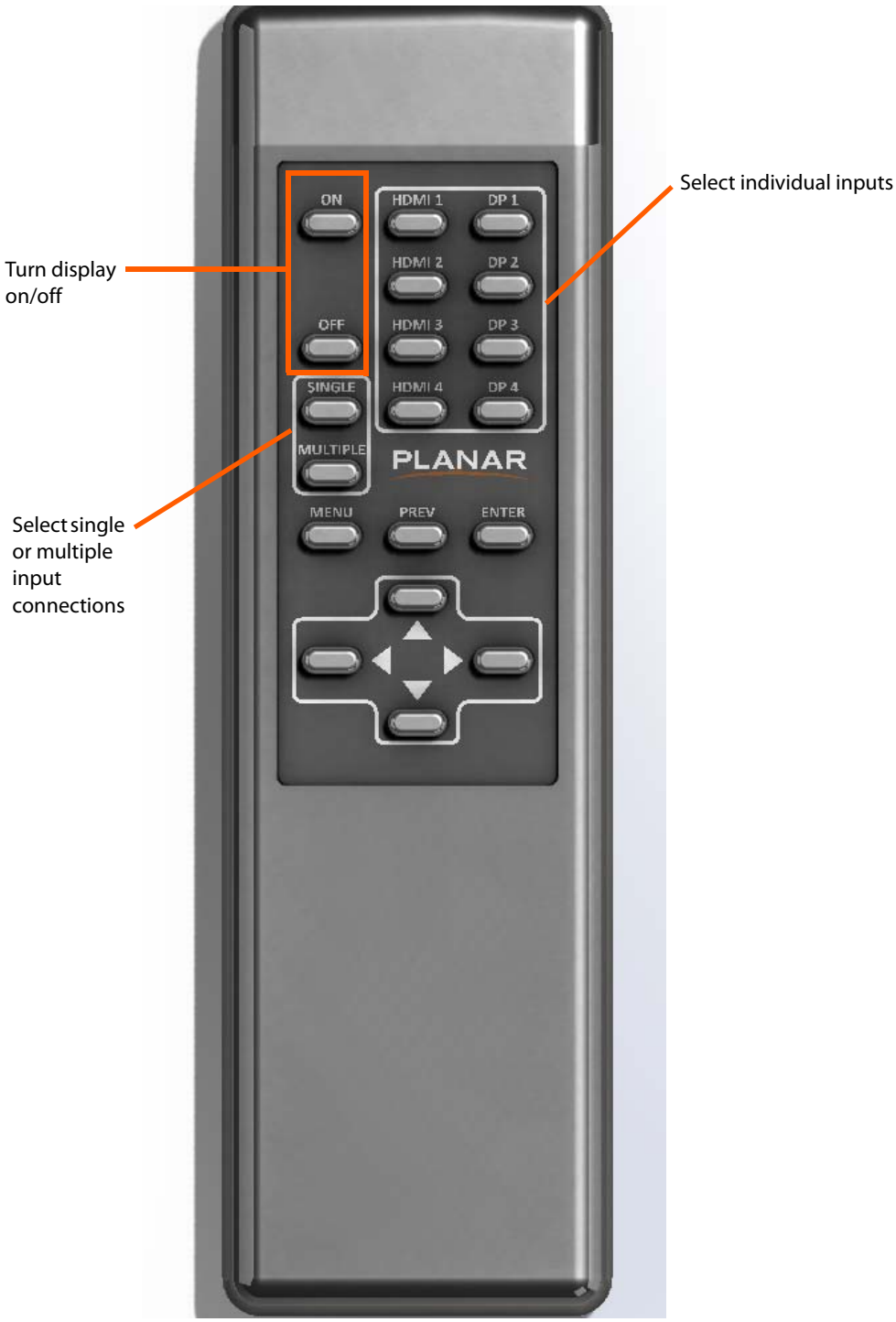
- Single 4K inputs @ 24/25/30Hz
- Four-headed input (4K @ 60Hz)

Using four separate outputs provides the Ultra HD resolution needed for superior image quality. In the following example, each number represents an output. All four "quadrants" (outputs) are fed into the 84" display and turned into one ultra high-resolution image.



Using the Remote Control

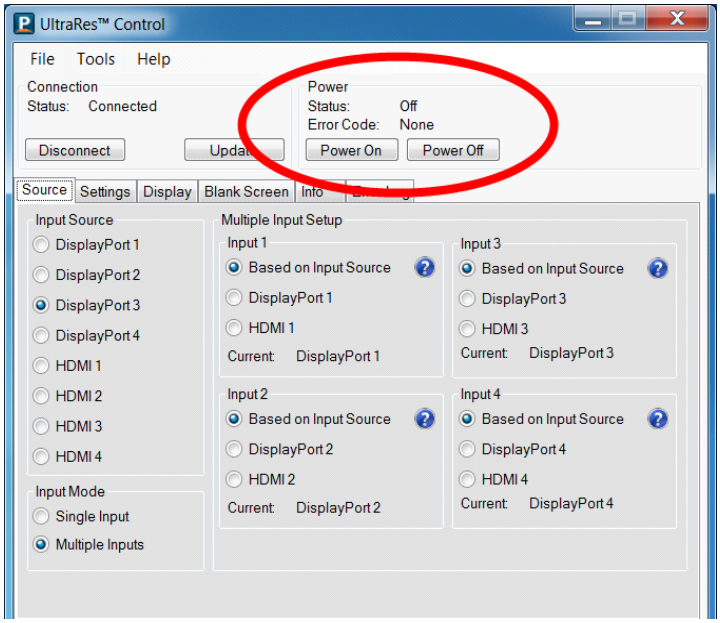
The UltraRes remote control can be used for a variety of functions, including turning the display on and off and assigning individual inputs.



Powering On/Off Planar UltraRes Displays

There are several different ways to turn on or off the Planar UltraRes Display:

- Using the **On/Off** buttons on the remote control. See "Using the Remote Control" on page 8 for more information.
- Using the **Power On/Power Off** buttons in the UltraRes Control software tool. See "Using the UltraRes Control Software" on page 43 for detailed information about the UltraRes Control software.



- Use the UltraRes Remote Monitoring software. See "Planar UltraRes Remote Monitoring Software" on page 59.

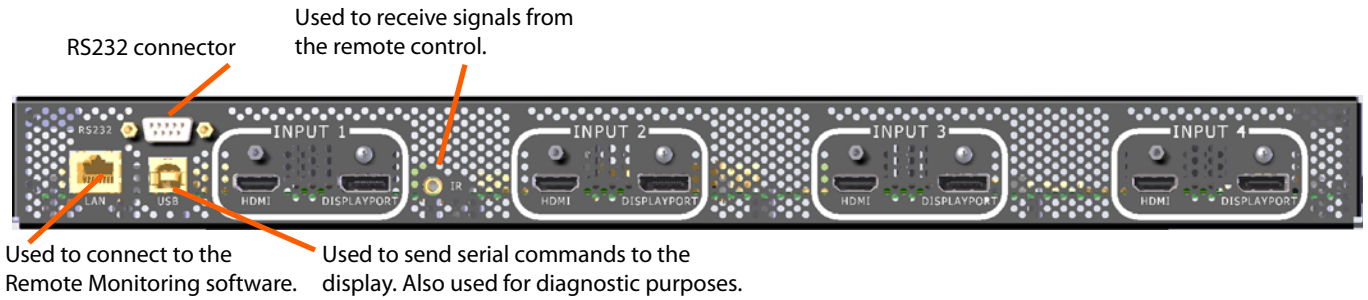
Planar UltraRes in Standby Mode

If you are unsure about whether or not the display is on but in standby mode, look for the small Standby LED. If it is off, you will not see the LED. If it is on but in Standby mode, you will see a red LED. As the display starts, the LED blinks until it is on. Once it is on, the LED turns off.

Insert IR sensor cord into the IR input on the bottom of the display.

Input Setup

You can set up your Planar UltraRes display using multiple or single inputs. Both are explained below. You can select multiple or single input mode using the remote control, the UltraRes Control tool or by using RS232 commands. For more information see "Setting Up UltraRes Using Multiple Inputs" on page 32 and "Setting Up UltraRes Using Single Inputs" on page 35.



Supported Formats for Multiple Inputs

The following formats are supported for multiple inputs:

- (4x) DisplayPort or HDMI/DVI 1080p @ 24/50/60Hz
  - PC with DisplayPort or HDMI/DVI (or mix of both)
  - External video processors
- (4x) DisplayPort or HDMI/DVI 960 x 2160 @ 60Hz
  - Needs a PC with a special graphics card set up

Supported Formats for Single Inputs

The following formats are supported for single inputs:

- (1x) DisplayPort or HDMI 4K @ 24/25/30Hz
  - PC with DisplayPort 1.1a or 1.2 output
  - 4K Blu-ray player

Installing a Planar UltraRes Display

This section explains how to install a Planar UltraRes display. We suggest that you read this entire section before you attempt to install a display.

Before You Begin

Make sure you have all the items in the following lists before you begin unpacking and installing your display.

Tools/Equipment List

Depending on your installation, you may need one or more of the following items:

- #1 and # 2 Phillips screwdriver
- Drill and bits
- Pencil
- Digital/laser level
- Ladders/lift
- Back brace
- Stud finder (if hanging on a wall)

Other Things You May Need

- LCD screen cleaner or LCD wipes - available at most electronics stores
- Three strong people to lift display into place

Plan Your Installation

You should have a detailed plan of how the Planar UltraRes display is to be configured. The plan should include calculations for the following:

- Floor/wall load. Make sure the floor/wall is strong enough to support the weight of the Planar UltraRes.
- For passive cooling, it is recommended that a minimum of 1" of top clearance is provided. This can be reduced if the LCD is actively cooled.
- Ventilation and cooling requirements. Although the rear cover of the display is perforated and provides better airflow than other displays, it is still important that you consider room cooling and ventilation.

Supported Graphics Cards

UltraRes supports a variety of graphics cards from leading manufacturers, such as Nvidia and AMD. In general, you should be looking for graphics cards that have the following features:

- Can output 3840 x 2160 at 24 Hz or 30 Hz over a single DisplayPort or HDMI connection.
- Four-output graphics cards that can output synchronized (genlocked) 1920 x 1080 outputs at up to 60 Hz.
- Each program will have application-specific 3D settings that must be set up. Consult the specific graphics card user manual for more information.
- Cards that support Planar's support timings, as listed in the following section "Compatible Video Sources" on page 87.

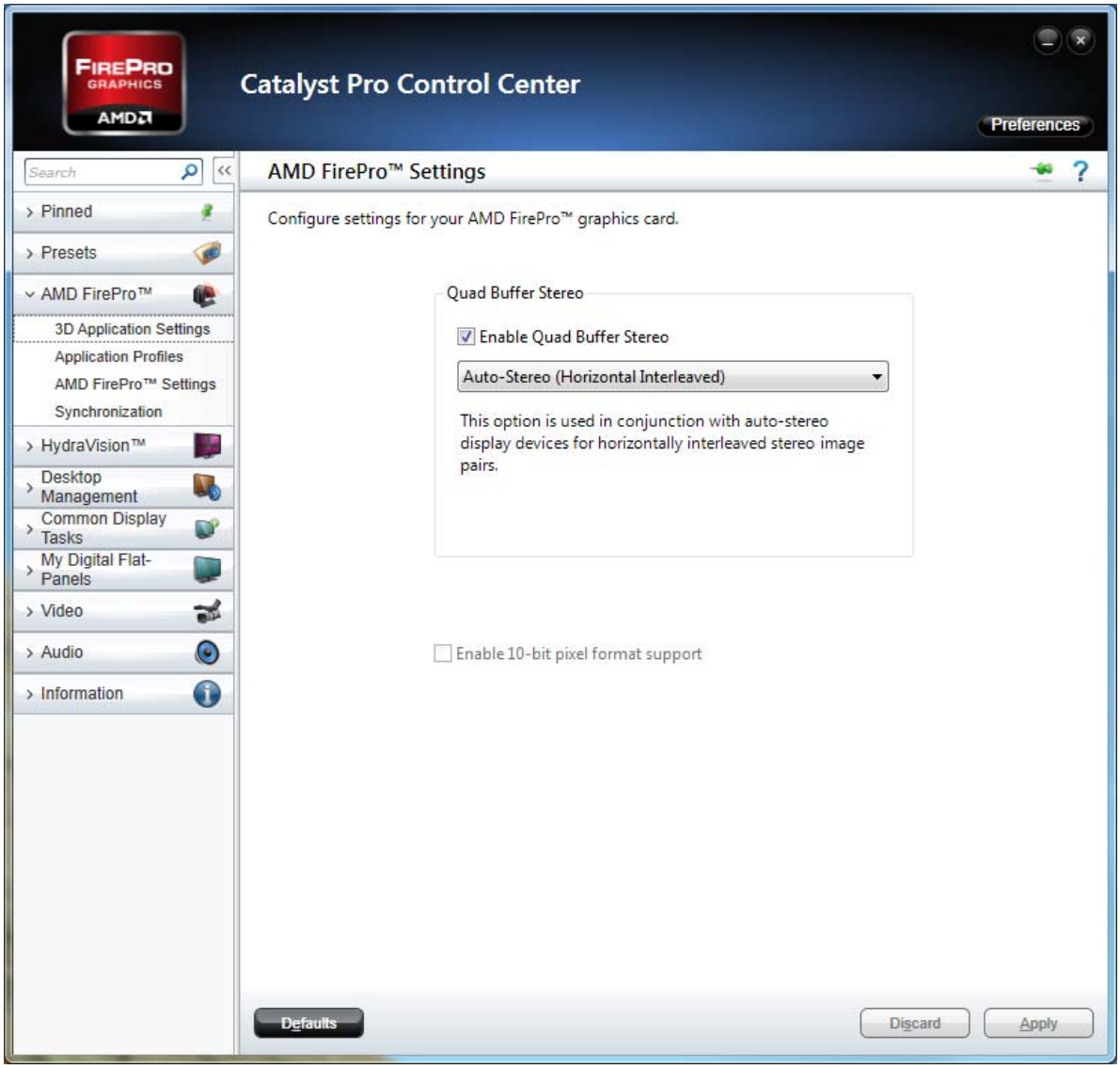
Caution: Before you purchase a graphics card for your source, contact your Sales Representative to get the most current information on Planar's compatibility with leading graphics cards.

The following professional grade graphics cards support 3D capabilities:

- AMD FirePro W7000, W8000, W9000
- NVIDIA Quadro K5000

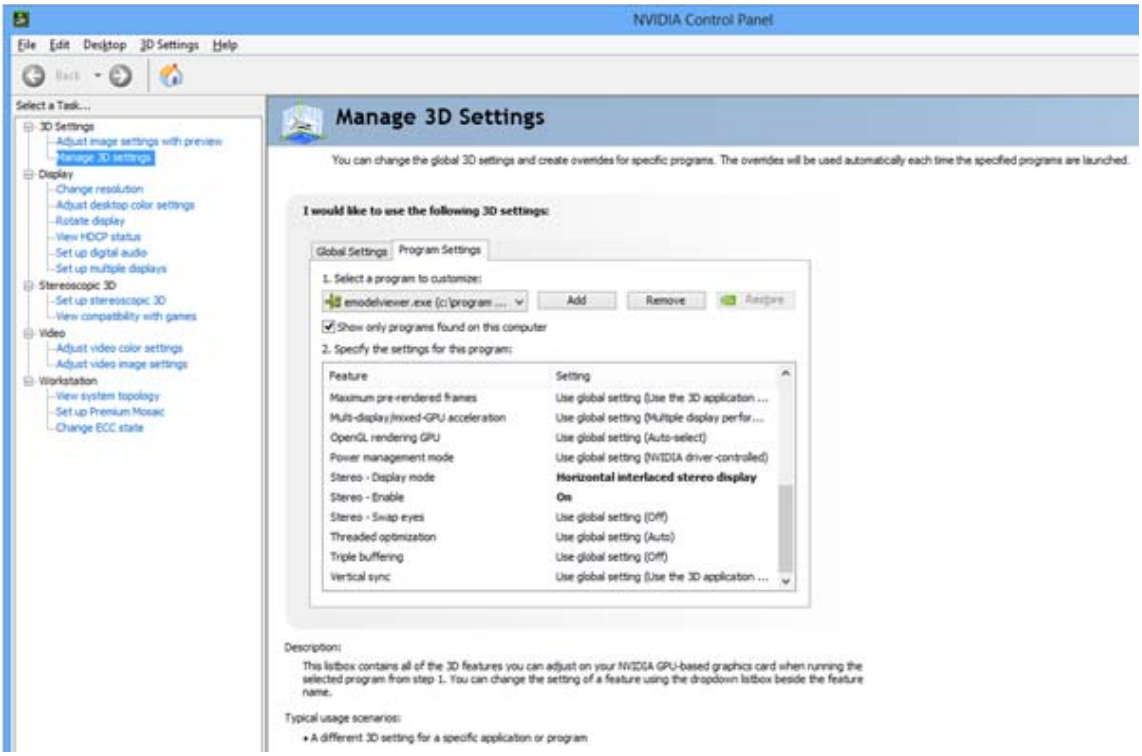
Setting Up AMD Graphics Cards For 3D Content

Note: If you do not plan to display 3D content, you can skip this section.



1. Right click on the desktop and select **Catalyst Control Center**.
2. Select AMD FirePro, then select **3D Application Settings**.
3. Check the **Enable Quad Buffer Stereo** box.
4. Select **Auto-Stereo (Horizontal Interleaved)** from the selection box
5. Click **Apply**.
6. Open the 3D application and perform application-specific 3D setup.

Setting Up NVIDIA Graphics Cards



1. Right click on the desktop and select **NVIDIA Control Panel**.
2. Under 3D Settings, select **Manage 3D Settings**.
3. Select the **Program Settings** tab.
4. In section 1, select the program for which its 3D capabilities will be used. If the program is not listed, click **Add** and search for the program's **.exe** file.
5. In section 2, use the following settings:
   a **Stereo – Display mode** = Horizontal interlaced stereo display
   b **Stereo – Enable** = On
6. Repeat steps 4 and 5 for each 3D-enabled application that you wish to use.
7. Click **Apply**.
8. Open the 3D application and perform application-specific 3D setup.

Recommended PCs

In order to use 4K video, it is crucial that you have a high-powered PC. We also recommend using a single 4K output whenever possible. Doing so eliminates the requirement of multi-output synchronization.

Unpacking and Checking Accessories

LCD Module Box

The following items are included in the LCD module box.

Part	Description	Number	Picture
LCD module	One per box.	1	
LCD mounts (optional)	If ordered, this will be inside a separate box inside the LCD box. **Note:** If you do not use Planar's mounts, you need to ensure the mounts that you purchase can adequately support the display.	1	
Mounting template	Used to line up where the wall mounts will be installed. This is included with Planar's optional LCD mounts.	1	

Part	Description	Number	Picture
Kickstand bracket	Mounts to the display when Planar mounts are purchased.	1	
M4 x 8 Panhead screws	Used to mount the kickstand bracket.	4	

Accessory Kit

The following items are included in the accessory kit.

Part	Description	Number Included	Picture
AC power cord	Power cord.	1	
IR sensor	Used to receive signals from the remote control.	1	
Double-sided tape	Used to help in mounting the IR sensor module.	2	
USB drive	Contains the User Manual and setup software.	1	
Passive USB cable	Used to set up display software.	1	
Remote control	Used to power the display on/off, select multiple or single inputs. **Note:** Batteries are included but not installed.	1	

LCD Installation

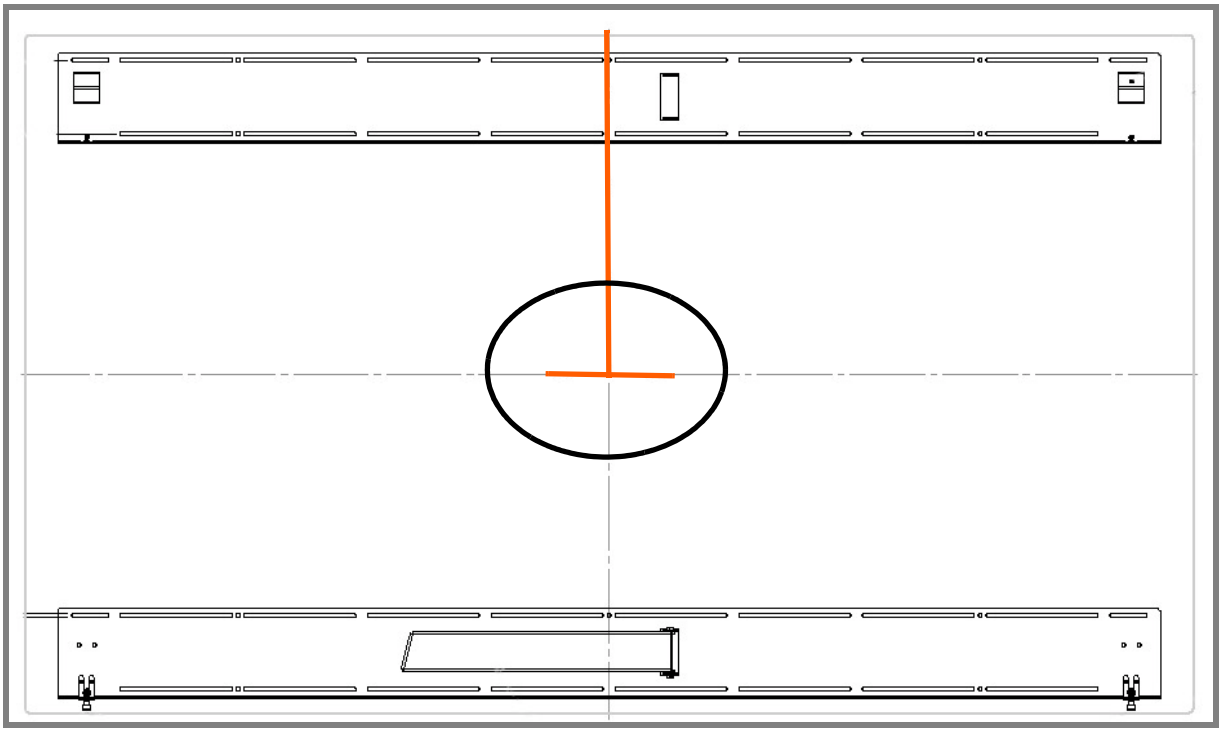
Before installation, keep the following points in mind:

- These displays are heavy. Make sure that you have adequate studs to support the weight of each display if installing on a wall.
- The UltraRes must be installed on a flat surface.
- If you ordered the optional wall mounts, use the supplied UltraRes mounting template for the center point of the display, as well as for top and bottom bracket installation.
- The wall mounts for a landscape and portrait installation look very similar. The process to install them is almost exactly the same. The only difference is the way in which you use the wall mount template. This will be pointed out in the relevant step.

Installing an UltraRes Display on a Wall

Caution: For whatever structure is used to mount the display, be sure that it is sufficiently engineered to handle the weight of the display. Also be sure to purchase the correct hardware needed to support the display mounted to that structure.

1 Find the center point of the display on the wall where you intend to install it.



2 Draw a short (about 1″) horizontal line and then a vertical line to match the edge of the display.

3 Use the provided template to determine the center points of the wall mounts. The “V” notches are labeled “L” for a landscape display or “P” for a portrait display. Use the appropriate “V” notch to align with the horizontal line drawn in the previous step.

4 In the hole marked “Top” on the template, mark the center of the hole on the wall.

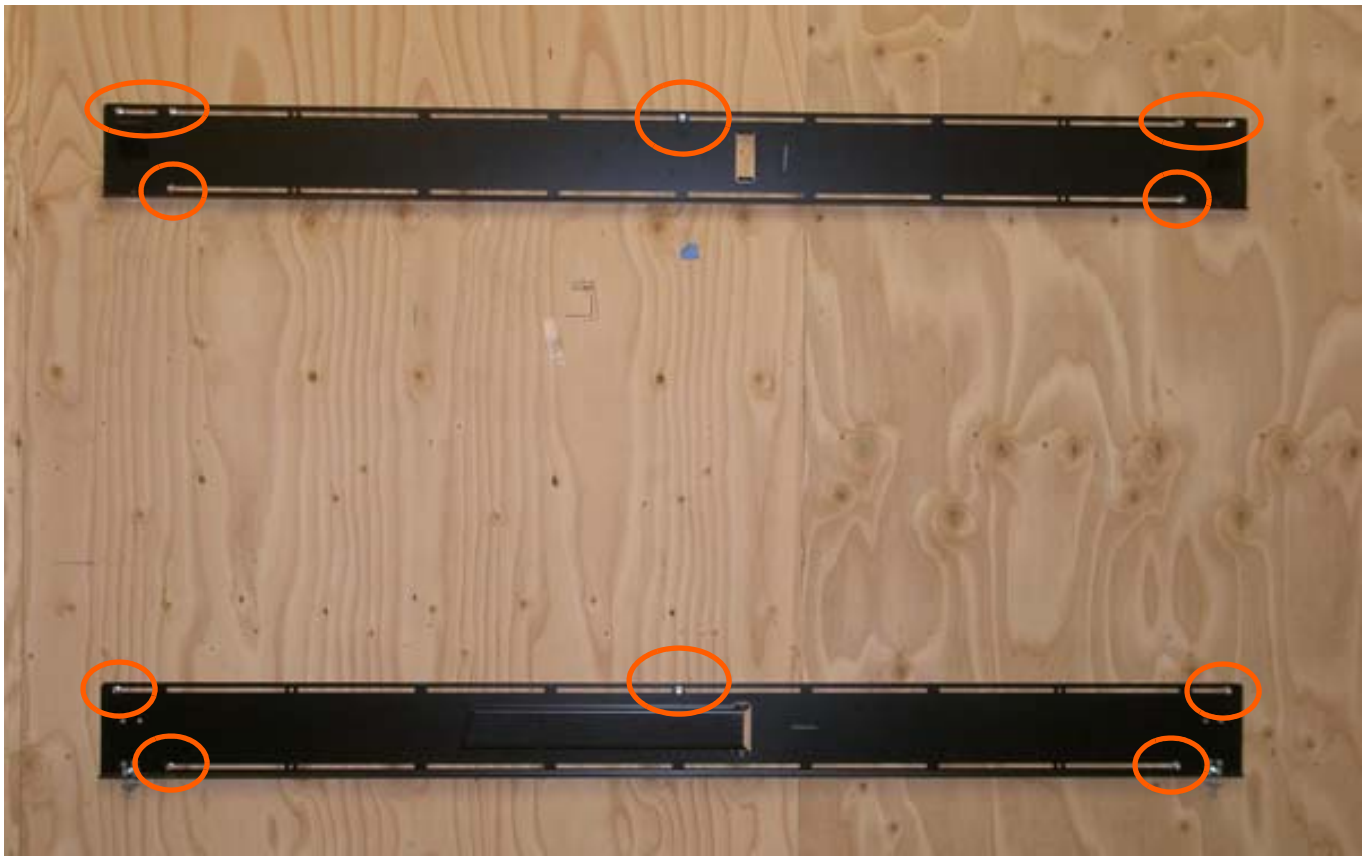
Note: If you are installing a landscape display and the template is too long, you can break the template at the notch labeled “P.”

5 Let the template hang vertically so it is plumb, as the bottom hole in the template determines where the bottom mount will be installed.

6 Screw the appropriate hardware into the bottom hole of the template that corresponds with your display orientation.

7 Remove each screw and the template.

8 Line up the middle hole of the top wall mount with the screw hole drilled from the template.



Note: This picture shows mounts for a landscape installation.

9 Tighten the screw into the mount.

10 Use a level to make sure the mount is level.

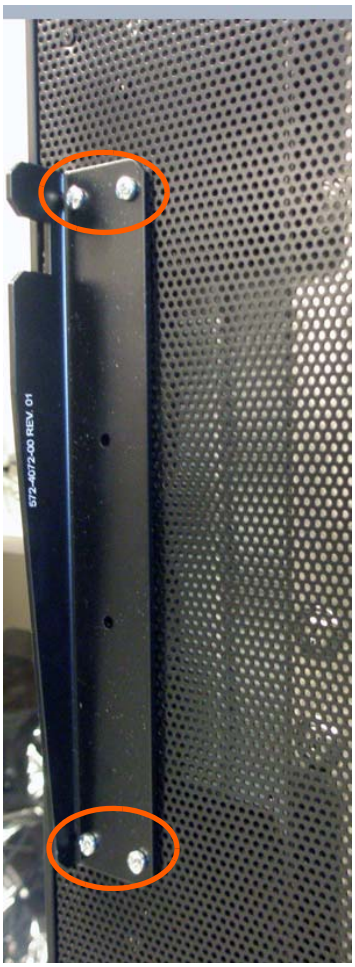
11 Then install additional screws as needed.

Note: Screws installed near the mount hooks provide the best support.

12 Install the center screw in the bottom mount and repeat steps **10**-**11** for any additional screws that you want to install. Note that there are open mount channels on the brackets. So you can install the screws wherever necessary along those channels.

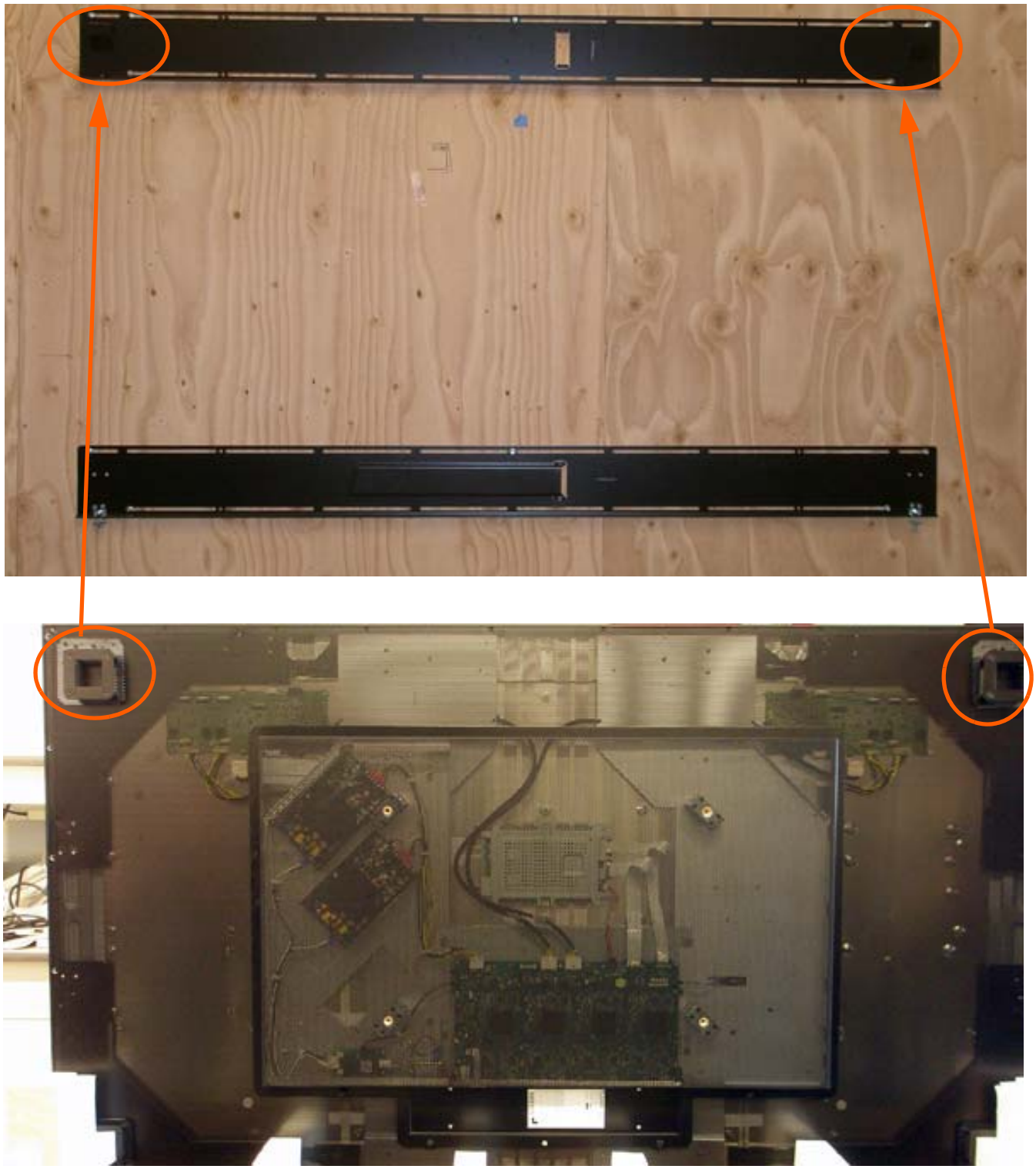
13 Install the kickstand bracket to the back of the display using four M4 x 8 Panhead screws.

Landscape holes for kickstand bracket installation



Portrait kickstand installed on display

14 Using three strong people, carefully hang the back of the display onto the top wall mount bracket using the square brackets on the back of the display.



Caution: Be sure these are securely hung, as the top of the wall mount will hold most of the weight of the display.

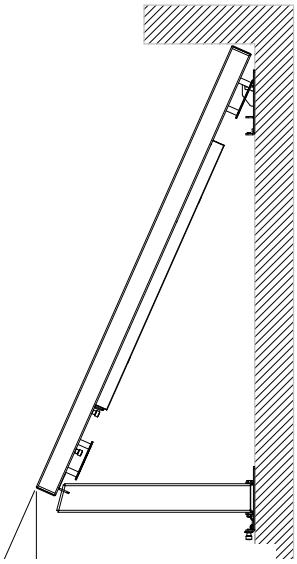
15 On the bottom wall mount, there is locking hardware in the lower corners of the mount. Push the hardware up and finger tighten the captive screws on the bottom to secure the display to the wall.

Using the Kickstand Bracket

The kickstand bracket is used for service mode, without having to remove the display from the wall. Use the following instructions to put the display in service mode.

1 Loosen the captive locking screws on both sides of the bottom mount.

2 Pull the display out and then swing out the kickstand to hold it in place. The kickstand will nest into the kickstand bracket notch.



Service position - with kickstand supporting display

Connections

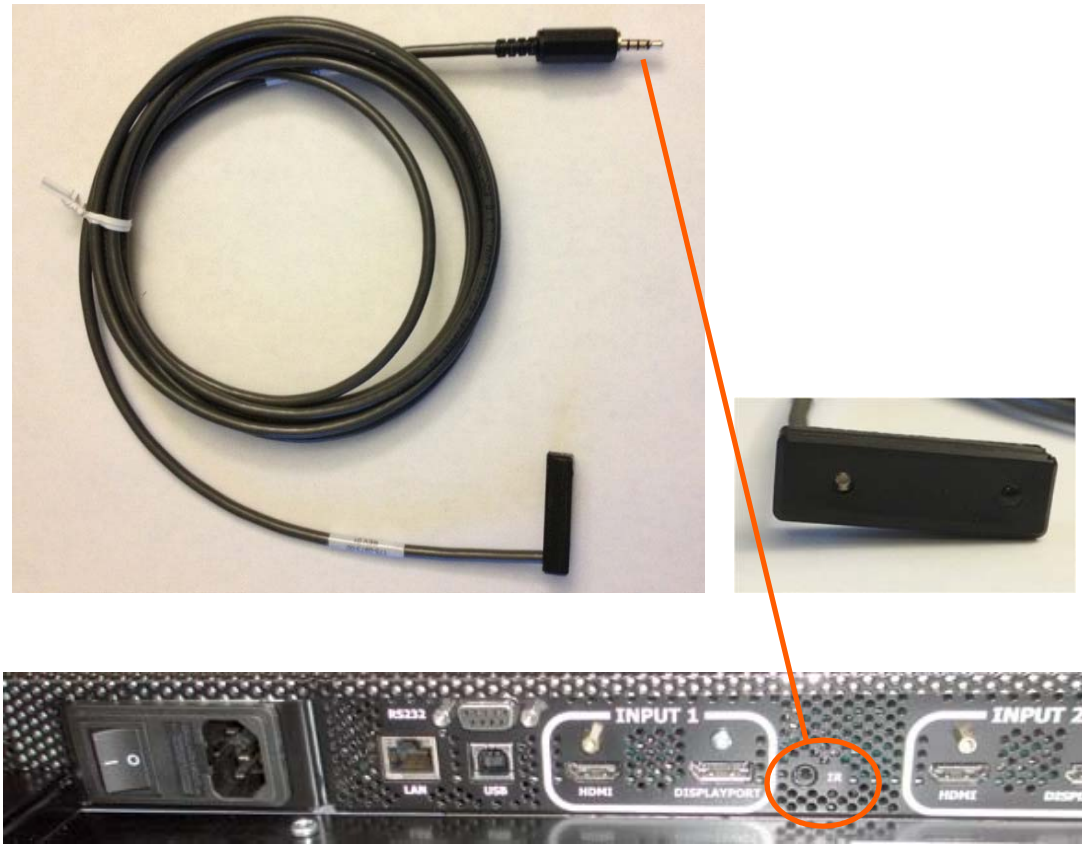
In order to get your UltraRes display up and running, you need to make three main connections: AC power, the wired IR module and your sources.

Connecting AC Power

Using the supplied AC power cord, connect one end to a grounded outlet and the other to the AC power input next to the I/O panel the bottom of the UltraRes display.

Connecting the Wired IR Module

In order for the remote control to work, you need to connect the wired IR module to the display, also on the bottom of the I/O panel. Then place the IR receiver in the desired place on or near the display.



Connecting Sources

The graphics card that you install on your main PC will determine what outputs will be plugged into the Planar UltraRes display. For example, some graphics cards have two HDMI outputs and two DisplayPort outputs. Any combination of these outputs is fine. Below is a visual example of how a basic connection might look.

In the example below, using four input channels on a computer, you would use one connector for each input on the I/O panel on the UltraRes display, as shown below.

As an example, you could use the following:

- Input 1 - HDMI 1
- Input 2 - DisplayPort 2
- Input 3 - DisplayPort 3
- Input 4 - HDMI 4

Note: You cannot plug into two ports on the same input channel. For example, you can't plug into HDMI 1 and DisplayPort 1 in Input 1 as shown above. You can only connect to **one** input for each input channel.

Setting Up UltraRes Using Multiple Inputs

In order to set up the UltraRes using multiple inputs, you must have a computer that contains four video outputs. All four outputs will then be connected to the UltraRes display. The following formats are supported for multiple inputs:

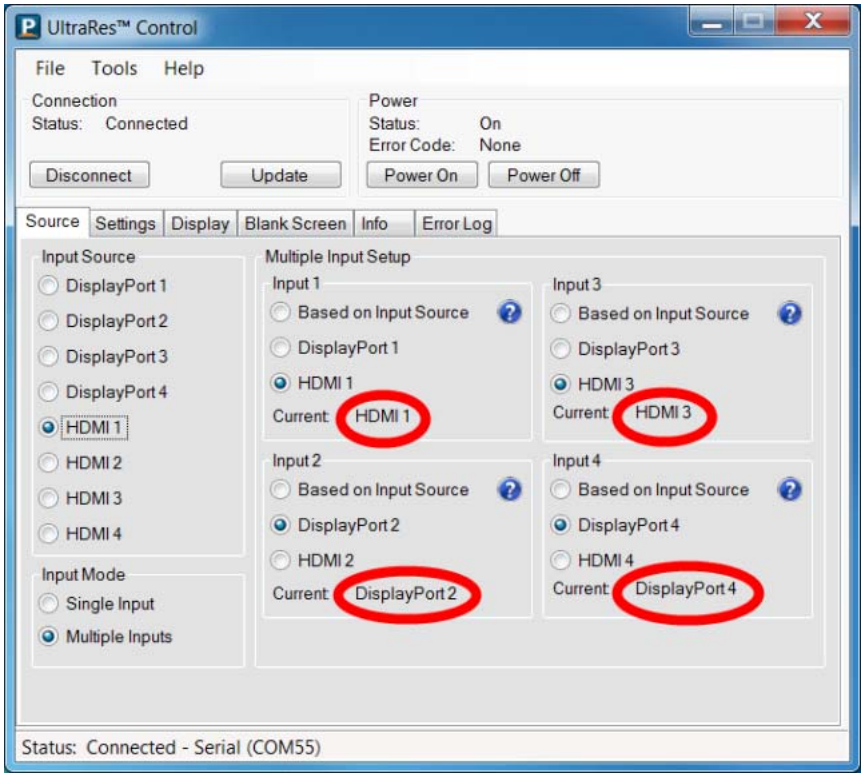
- (4x) DisplayPort or HDMI/DVI 1080p @ 24/50/60Hz
  - PC with DisplayPort or HDMI/DVI (or mix of both)
  - External processors
- (4x) DisplayPort or HDMI/DVI 960 x 2160 @ 60Hz
  - Needs a PC with a special graphics card setup
- (2x) DisplayPort or HDMI 1920 x 2160 @ 60Hz
  - Needs a PC with a special graphics card setup

Note: When using (2x) 1920 x 2160 @ 60Hz, the connections must be: Input 1 and Input 3 or Input 2 and Input 4. For example, using 1920 x 2160 @ 60Hz on Input 1 and Input 3 is allowed but using 1920 x 2160 @ 60Hz on Input 1 and Input 2 is **not** allowed.

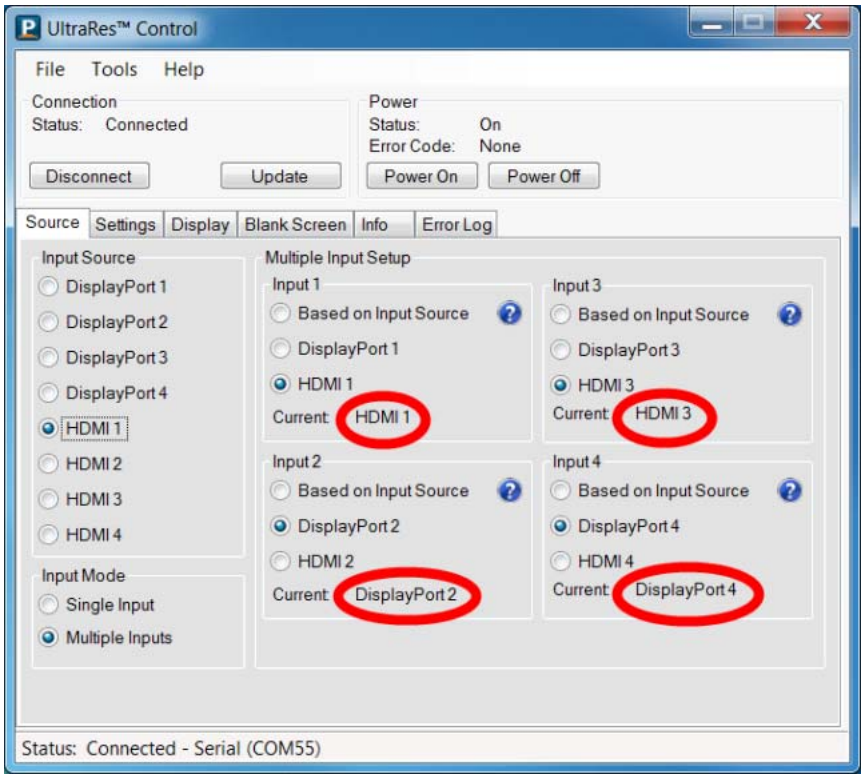
Using UltraRes Control Software to Set Up Multiple Inputs

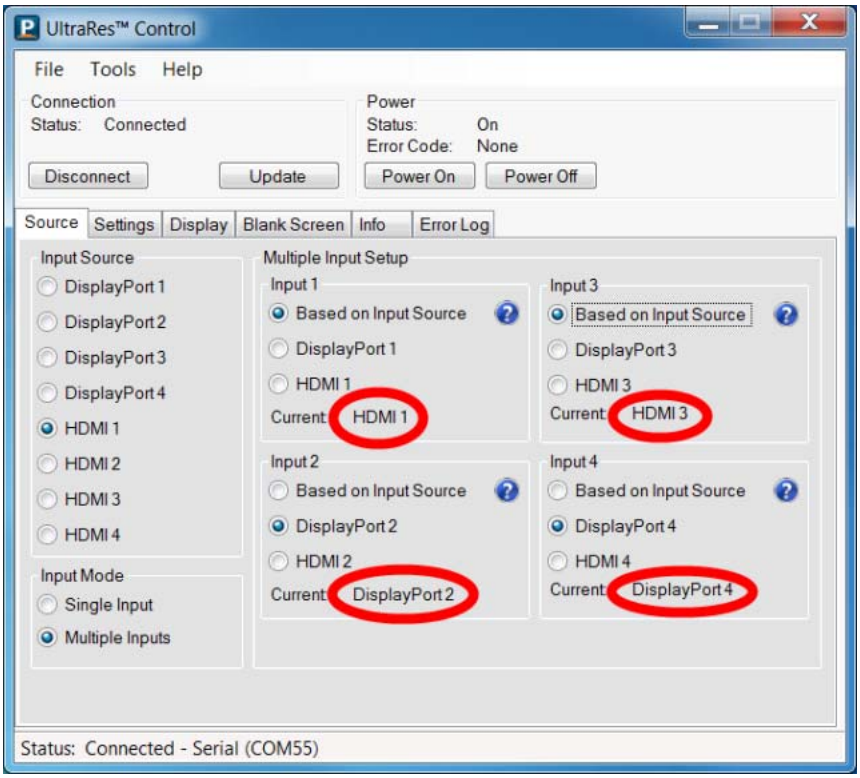
If you use the UltraRes Control software to set up multiple sources, there are three different settings per input channel. Before continuing, make sure you have selected the **Multiple Inputs** radio button in the lower left corner.

- Based on Input Source - This default option automatically selects the same type of input as the current Input Source setting. For example, if you have four HDMI input sources, this feature should detect that your sources are connected to HDMI 1-4.
- Select Individual Inputs - The example below shows the circled inputs that were selected individually.



Below are two examples of setups in UltraRes Control software that are acceptable. When you are finished, click **Update** to save your changes.





Setting Up UltraRes Using Single Inputs

Instead of having one central device into which you can connect and define your source inputs, single source setup requires connecting from a single-headed source to the display. For example, connecting one input directly from a Blu-ray player into the 84" display.

The example below uses the following:

- PC with 4K @ 24/25/30HZ output
- 4K Blu-ray player

The following formats are supported for single inputs:

- (1x) DisplayPort or HDMI 4K @ 24/25/30Hz
  - PC with DisplayPort 1.1a or 1.2 output
  - 4K Blu-ray player

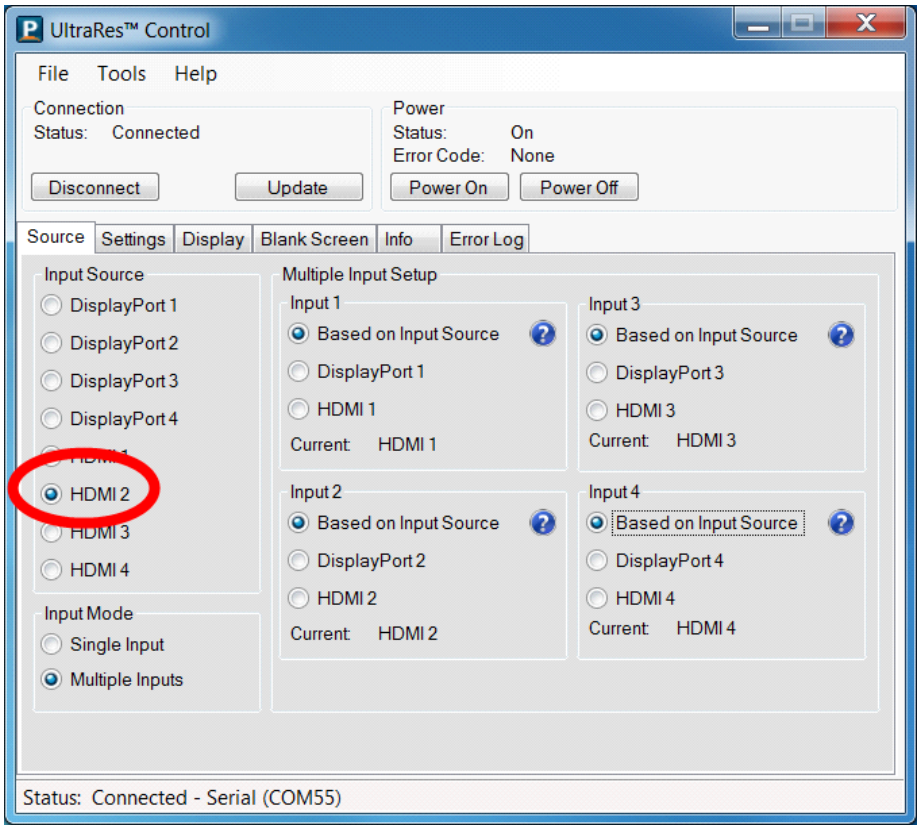
There are two preferred ways in which you can select individual inputs. They are described on the following pages.

Selecting Individual Inputs Using the Remote Control

The UltraRes remote control has individual inputs that can be selected. For example, if this UltraRes input is connected to HDMI 2, press the HDMI 2 button on the remote control.

Selecting Individual Inputs Using the UltraRes Control Software

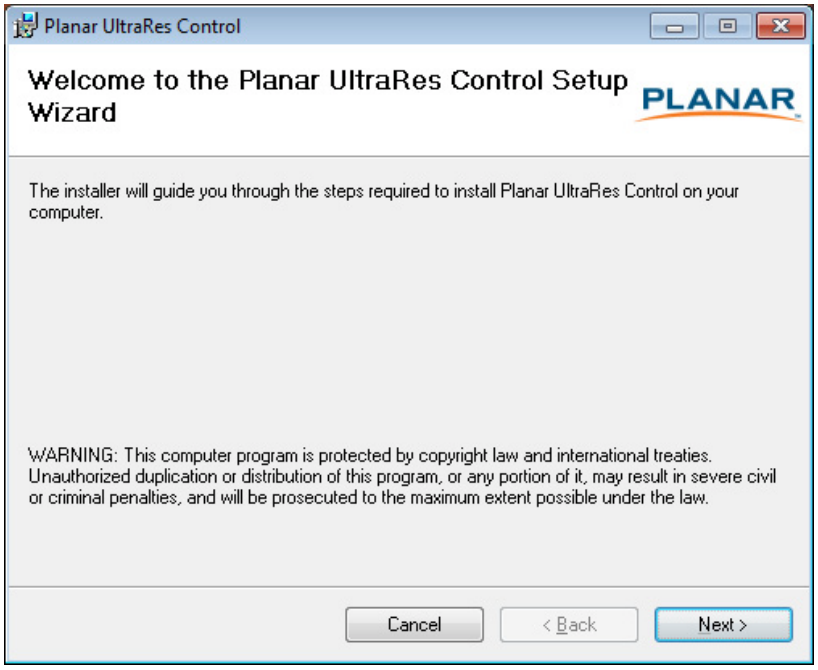
On the Source tab, select the input that is connected to the UltraRes display. For example, if this UltraRes input is connected to HDMI 2, select the **HDMI 2** radio button in the Input Source section on the left.



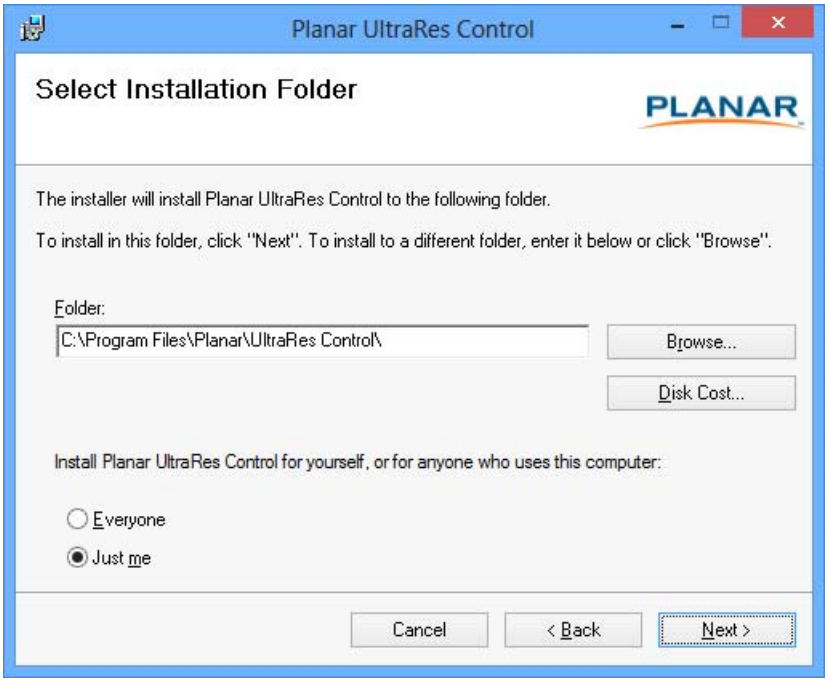
Installing the UltraRes Control Software

The UltraRes Control software is used as your primary tool for display setup. Use the following instructions to install the UltraRes Control software.

1. Save the **UltraRes Control.msi** program to your computer's hard drive.
2. Double click the **.msi** file to open the installer program.



3 Click **Next** to continue.



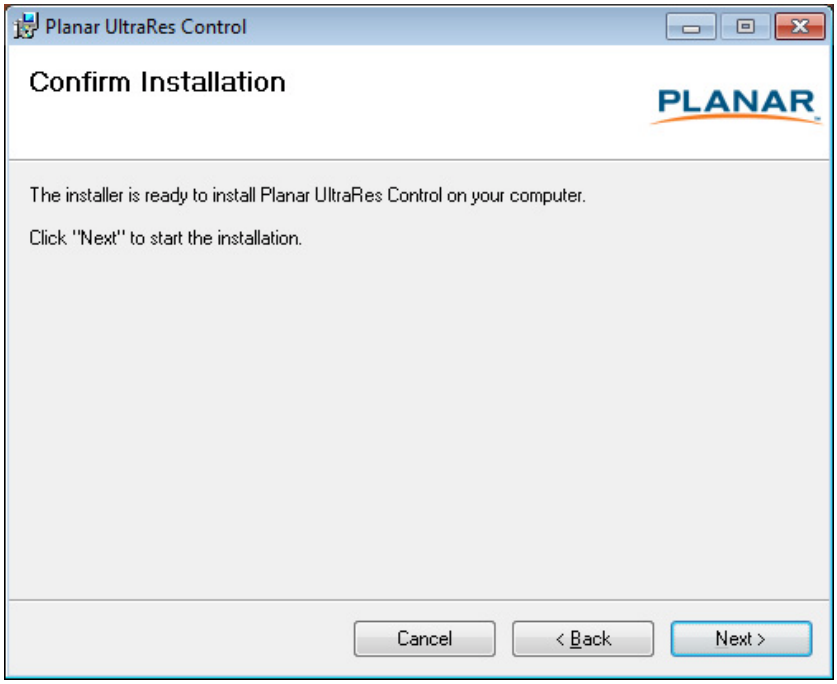
4 If you want to save the UltraRes Control files to a different location, click the **Browse** button and save to the folder of your choice.

5 If you want to see how much space is on your hard drive, click the **Disk Cost...** button to review storage capacity.

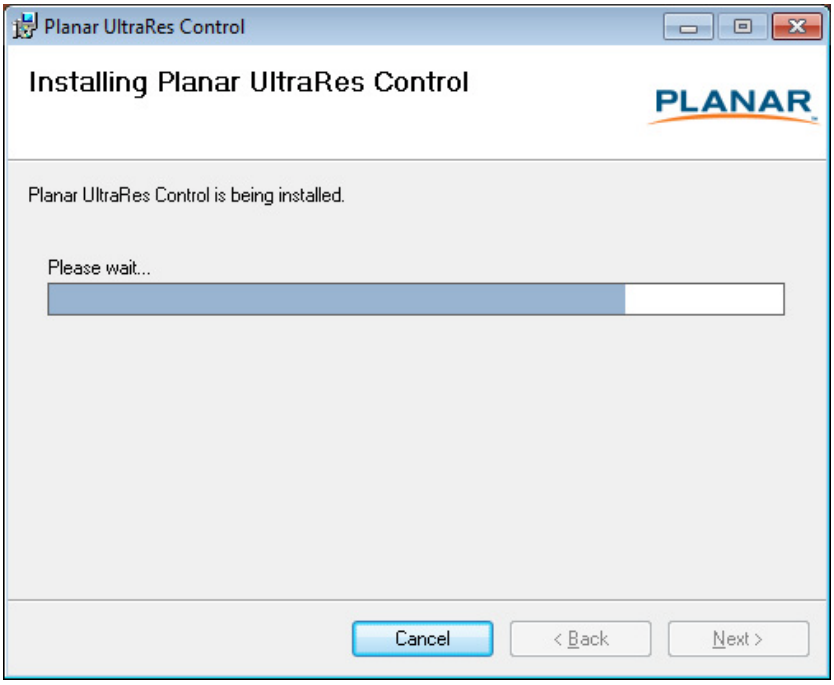
6 Do one of the following:
- If you want other users to have access to the UltraRes Control software, select the **Everyone** radio button.
- If you want to be the only user who can access the UltraRes Control software, select the **Just me** radio button.

7 Click **Next** to continue.

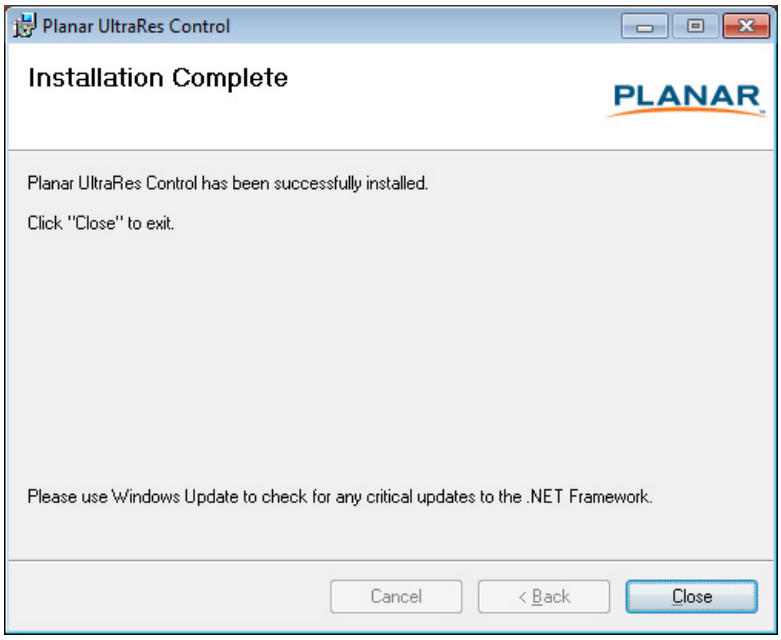
8 Click **Next** to continue.



9 As the installation is occurring, you will see the status bar for up to a couple of minutes.



10 Once the installation is complete, click **Close** to close the program.



Installing USB Drivers

When you install the UltraRes Control software, it will automatically install the necessary USB drivers needed for communication between your computer and to the UltraRes display. You only need to complete a few steps to finish the installation process.

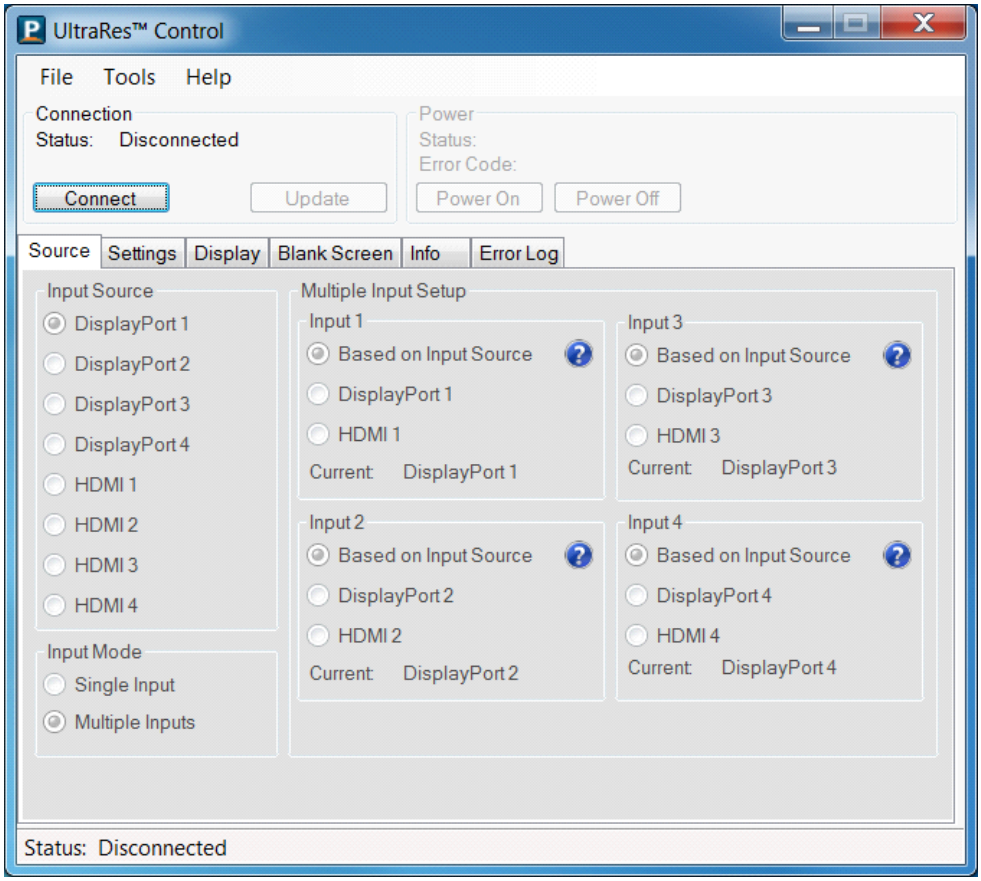
1 Plug one end of the USB cable into your computer and the other into the UltraRes display.

2 Windows will detect the new hardware and attempt to install the drivers. If this occurs, you should see a message similar to the following example.

3 If the USB driver installation is successful, you will see a message similar to the example below. You are now done with the USB driver installation process.

Using the UltraRes Control Software

When you first open the UltraRes Control software, you will see a window similar to the following. Notice that until you connect the inputs to the display, the “Status” at the top of the window will show “Disconnected.”

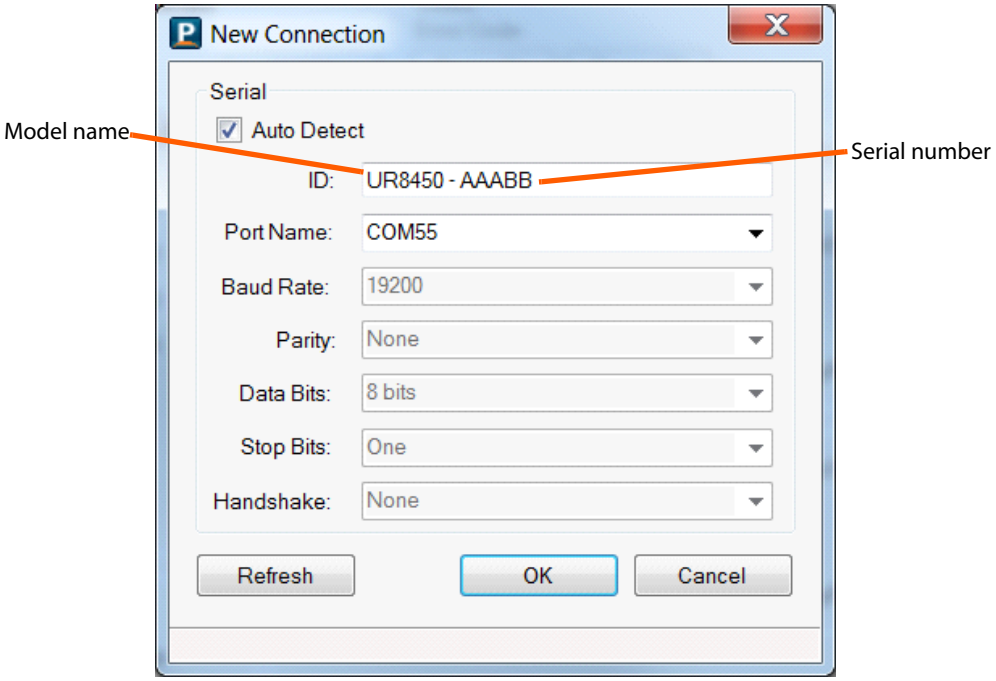


1. Connect from the PC on which the software is installed to the UltraRes display using a USB connection.

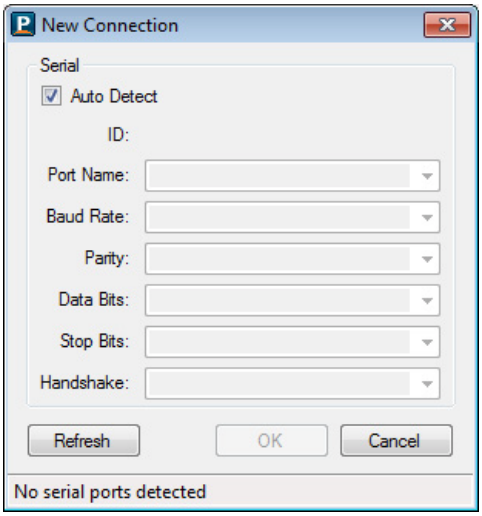
2. Click the **Connect** button to start the connection process.

3 The tool will then attempt to auto detect any inputs that are already connected. One of the following will occur:

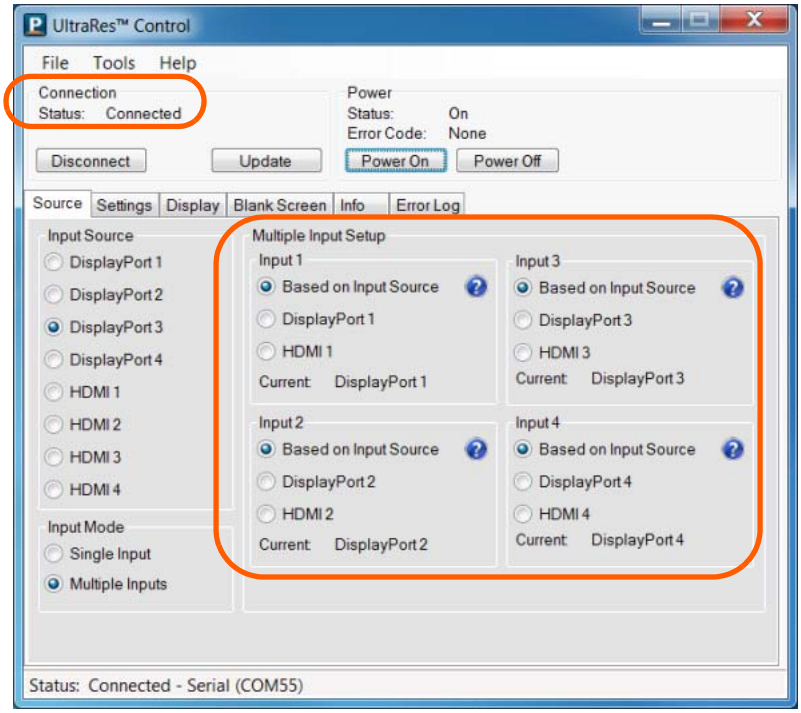
- If an input is detected, the following window appears with information already filled in.



- If no input is auto-detected, you will see a window similar to the following. Notice all fields are grayed out and cannot be changed.



4 If the connection is successful, the “Status” at the top of the window will show “Connected.” Note that all tabs are now accessible and can now be changed if needed.

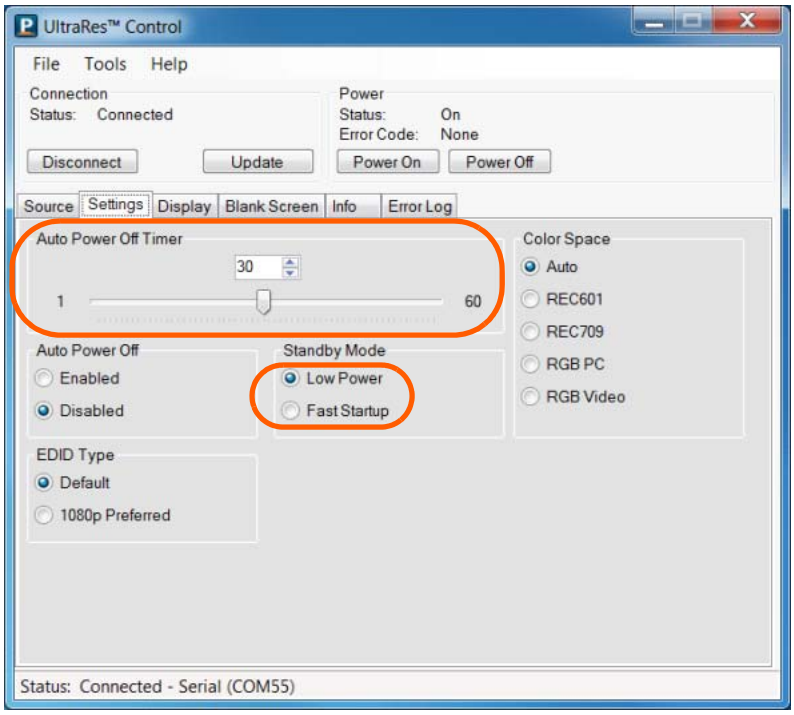


Setting Up Sources

This information is covered earlier in the manual. Please see "Setting Up UltraRes Using Multiple Inputs" on page 32 and "Setting Up UltraRes Using Single Inputs" on page 35 for setup information.

Auto Power Off Timer

If there is no incoming source for a certain amount of time and you want to turn power off automatically, use the **Auto Power Off Timer** slider on the Settings tab and select between 1-60 seconds.



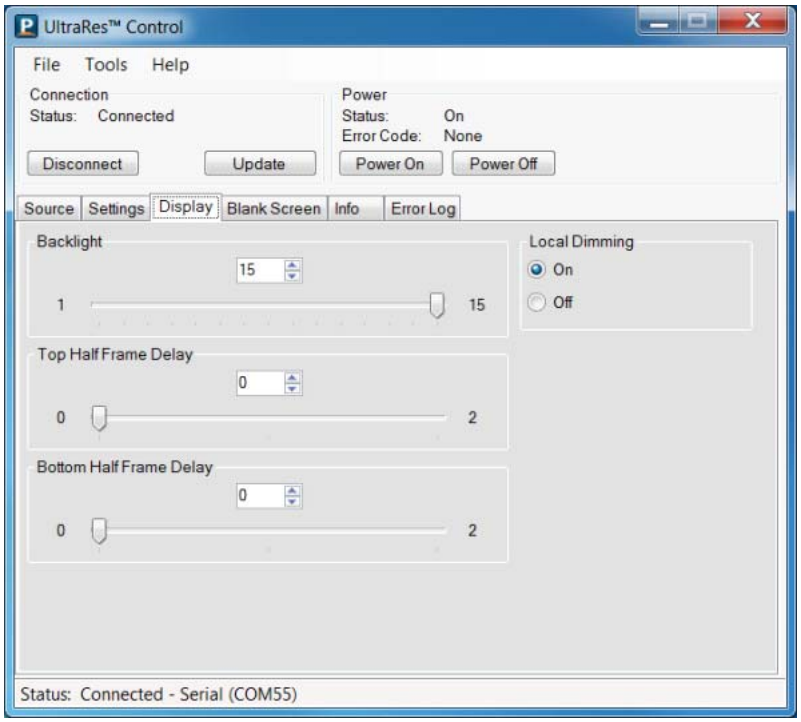
Standby Mode

This mode allows you to choose between a low power setting, which saves energy, or a “fast startup” mode that keeps the AC power supplies running. Each option is described below.

- Low Power - Powers off every component and board possible, which helps conserve energy. In standby mode, the low power option only uses 0.5W of power.
- Fast Startup - Keeps AC power supplies running and takes a little less time to power up. If you intend to continually use networking capabilities, select this option.

Changing Backlight Intensity

To change the brightness of the display, use the **Backlight** slider on the Display tab. If you want a brighter display, move the slider towards a higher number. If you want to conserve power and increase backlight life, move the slider towards a lower number.



Turning Local Dimming On or Off

Local Dimming allows the LED edge lighting to dynamically adjust based on the source content. Turning this feature on shows darker black levels, which in turn has a higher contrast ratio.

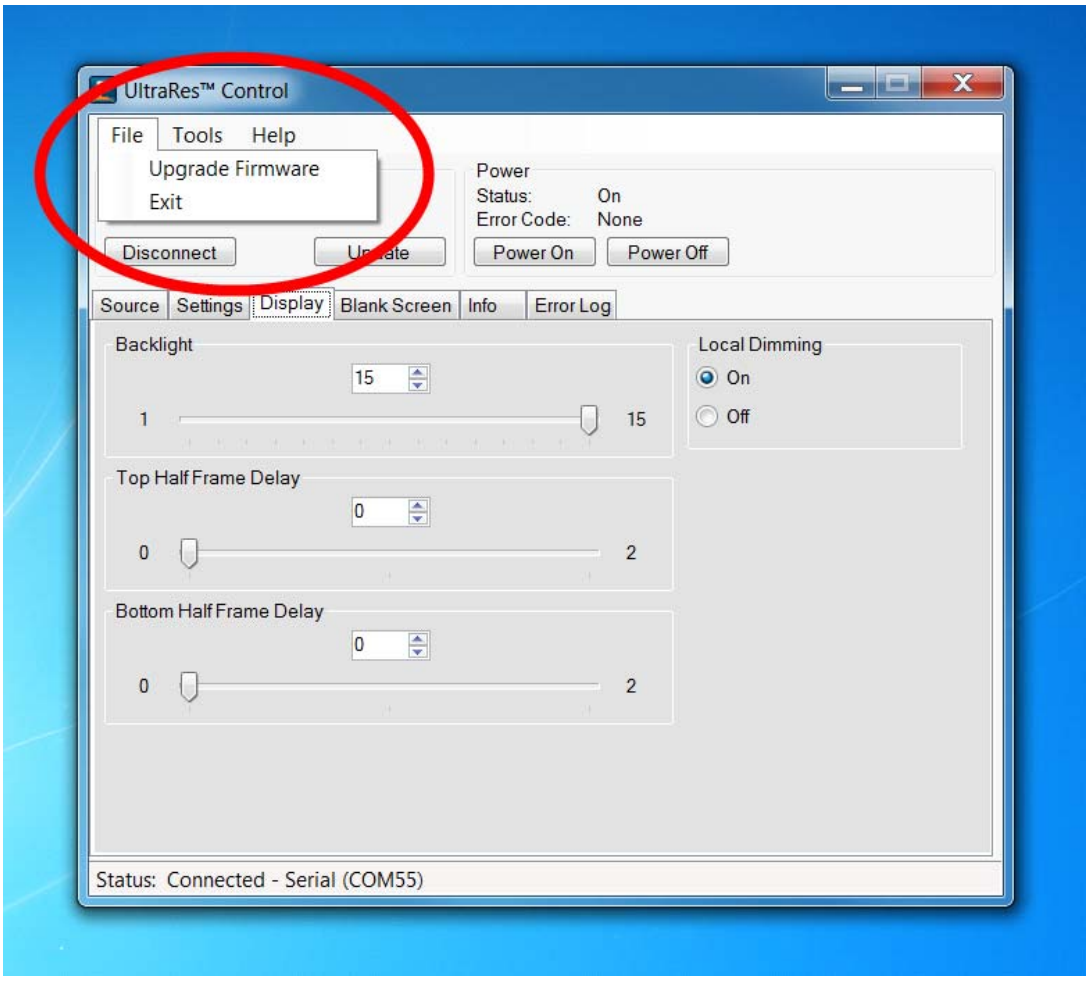
Changing Frame Delay

With some quadrant sources, the top and bottom halves of display can show frame tearing, at a delay of one frame per second. If you see frame tearing, use the **Top Half Frame Display** and **Bottom Half Frame Delay** sliders to compensate.

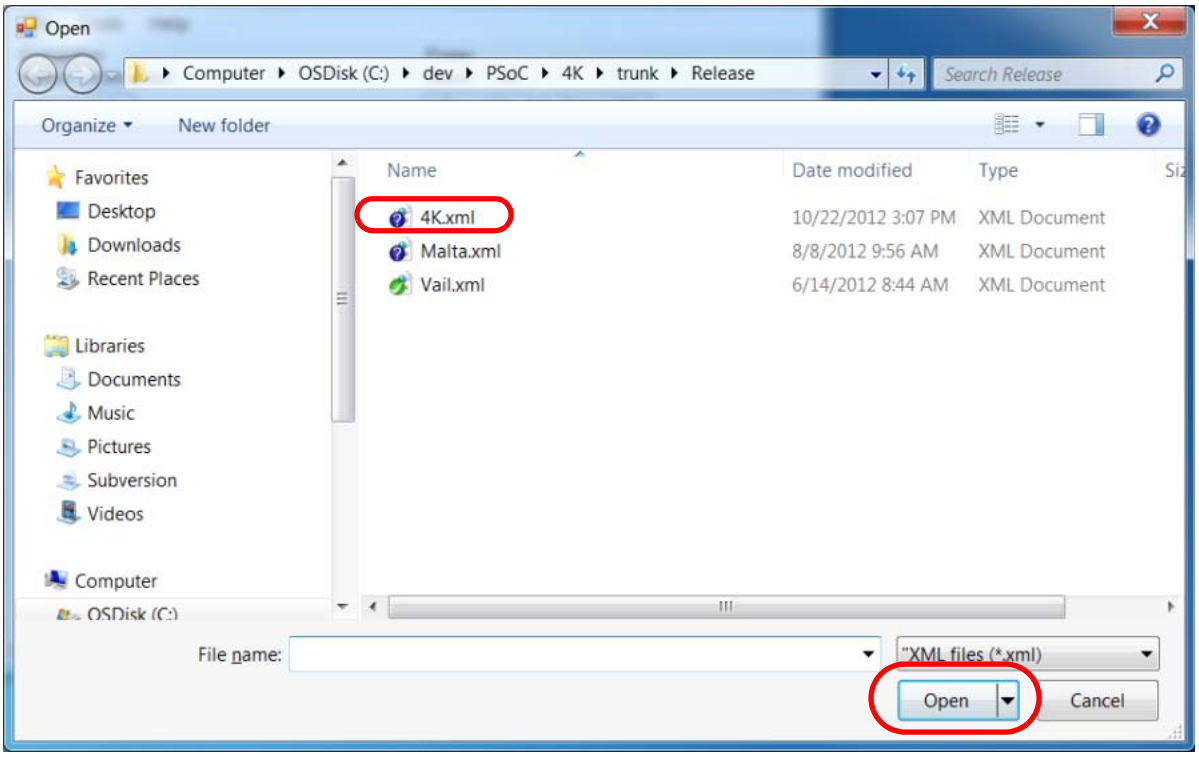
Upgrading Firmware

Upgrading firmware can only be done through the UltraRes Control software using a USB connection.

1 Select the File menu bar and then **Upgrade Firmware**.

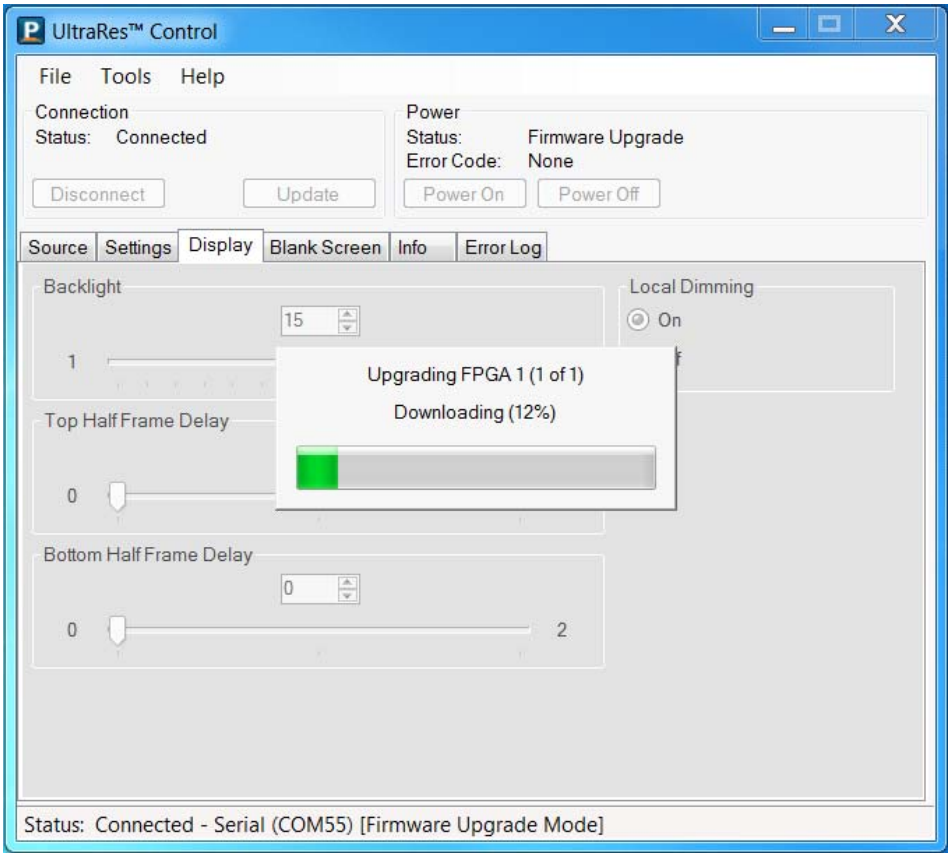


2 A file called **4K.xml** will be part of the release package. Navigate to this section and click **Open** to begin the upgrade process.



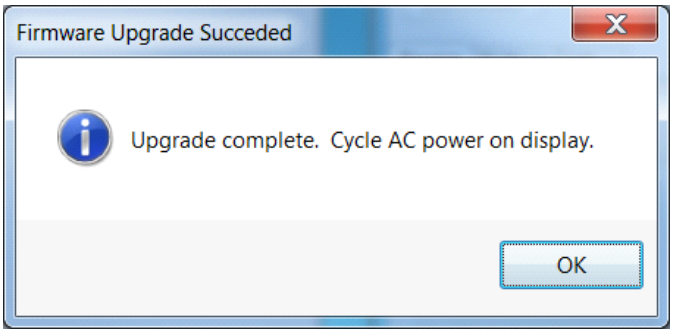
Note: The upgrade can be initiated from ON or standby mode.

3 The upgrade process will take about **40 minutes**. Be sure you are prepared for this amount of time before you initiate the upgrade process.



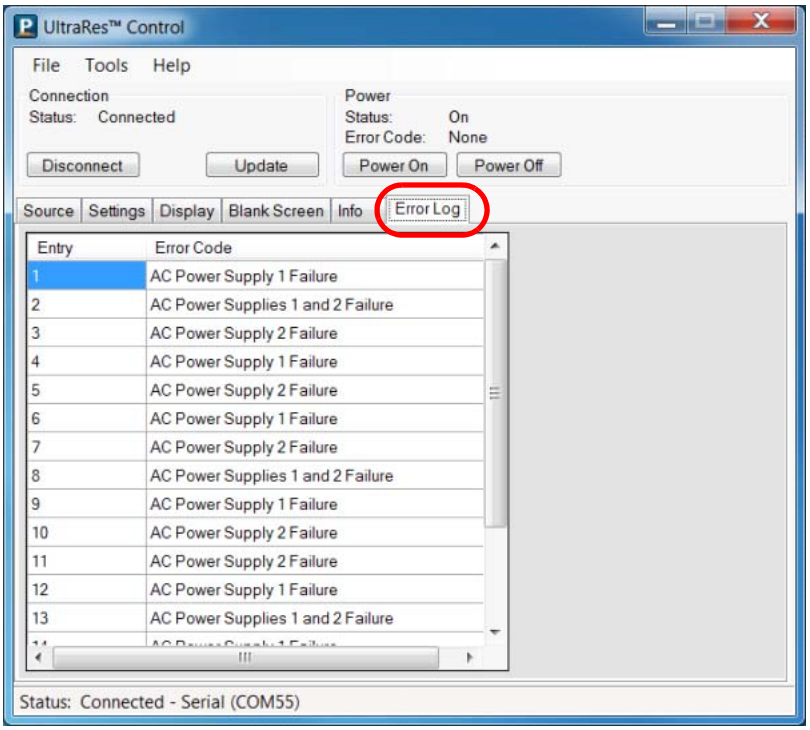
4 The upgrade process status bar will show where you are in the upgrade process as it proceeds.

5 When the upgrade is complete, you will see a message box similar to the following example.



Error Codes

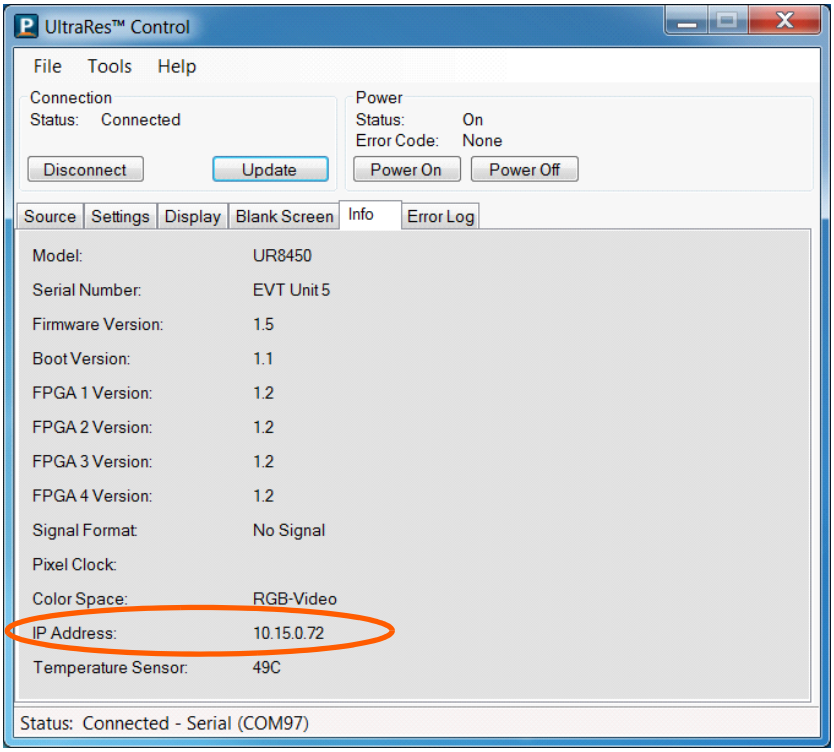
To see the last 50 errors that have occurred, select the Error Log tab in the UltraRes Control software, as shown below. For a complete list of the error codes, see "Error Codes in the UltraRes Control Software" on page 102.



Network Settings

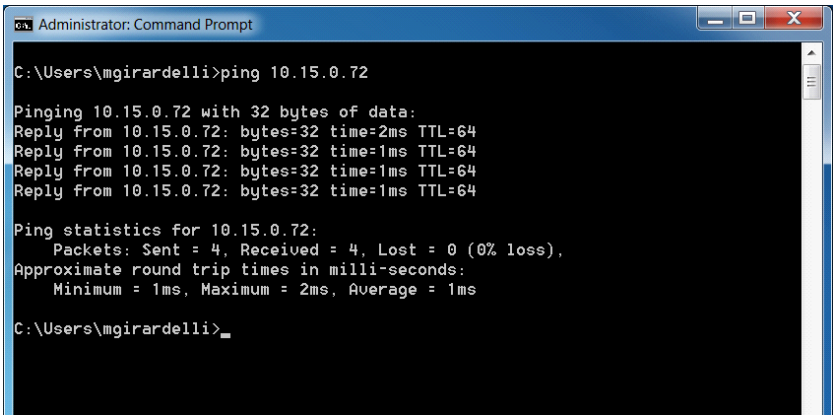
DHCP Network Setup

1. Turn on the display.
2. Open the UltraRes Control tool and connect to the display.
3. Select the Info tab. The IP address is shown towards the bottom of the tab.



4. One of the following will occur:
   - If the IP address is 192.168.12.12, then DHCP failed. Use the Static IP Network Setup instructions in the following section.

5 If the IP address shows anything else, then DHCP succeeded. To confirm the connection, open a Windows command prompt and use the “ping” command with the IP address shown in UltraRes Control.



Note: If you cannot confirm a connection, check with your Network Administrator for more information.

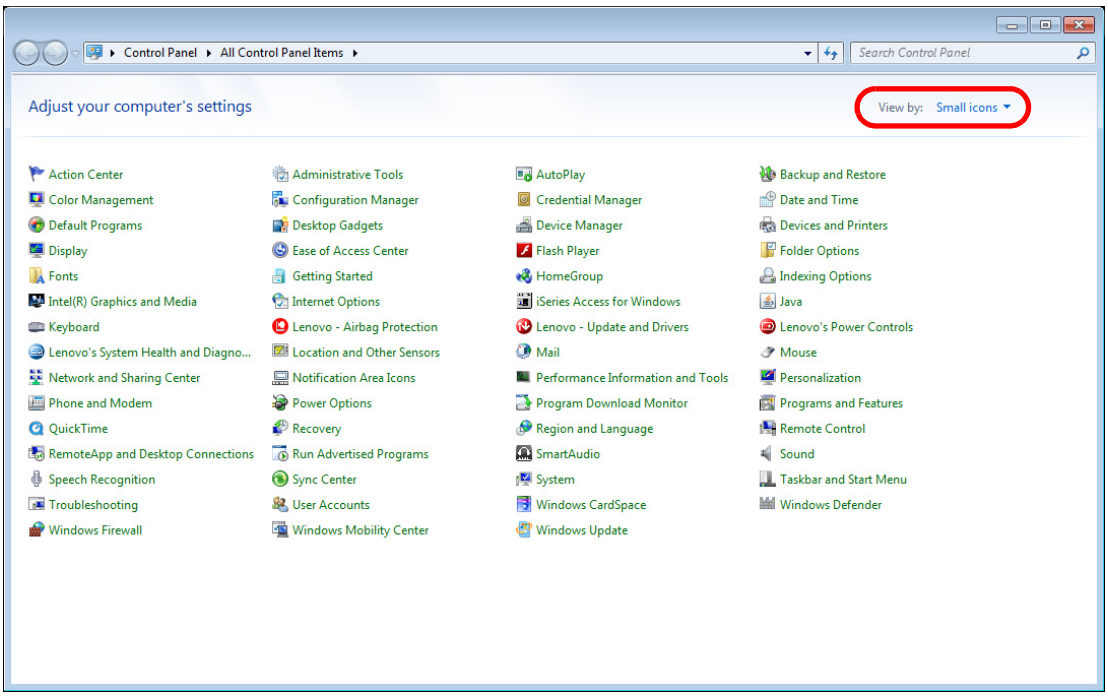
Static IP Network Setup

If DHCP is unsuccessful, the Remote Monitoring Ethernet interface defaults to a static IP address of 192.168.12.12/24.

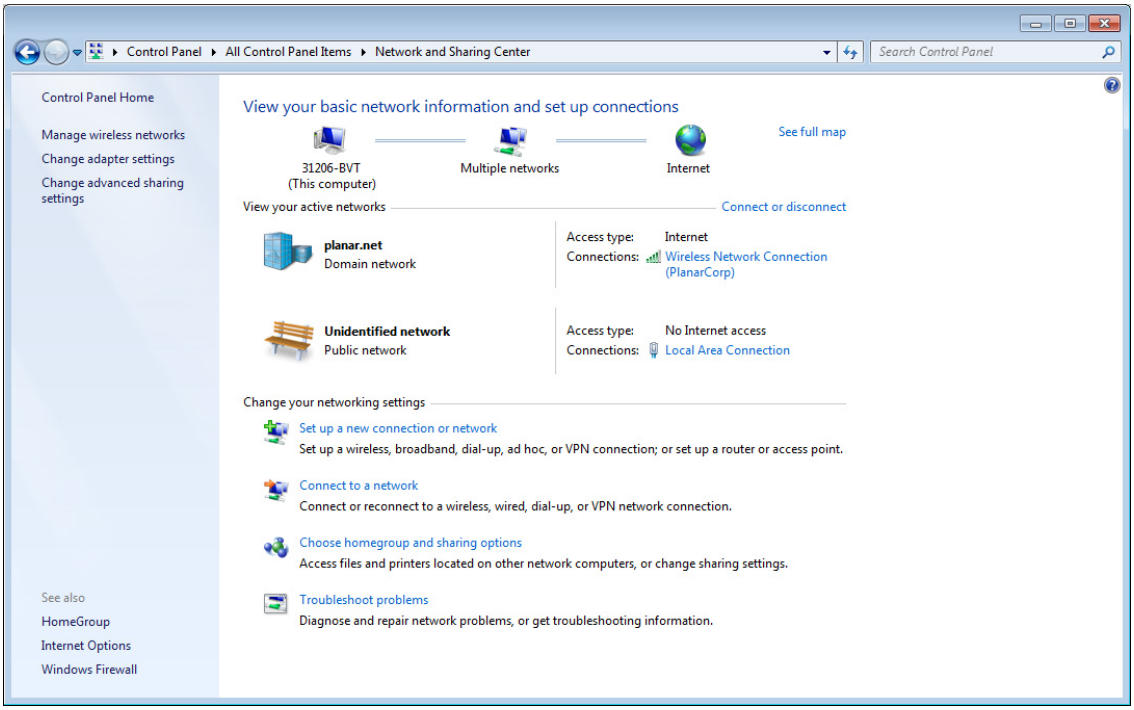
1. The PC must be configured to an IP address on the 192.168.12 network. We recommend 192.168.12.100.

2. Assuming the operating system is Windows 7, you can follow these instructions to configure the PC network interface.

3. On the PC, select **Start**, **Control Panel** and choose the **View by** dropdown in the top right corner of the window. Choose large icons or small icons.

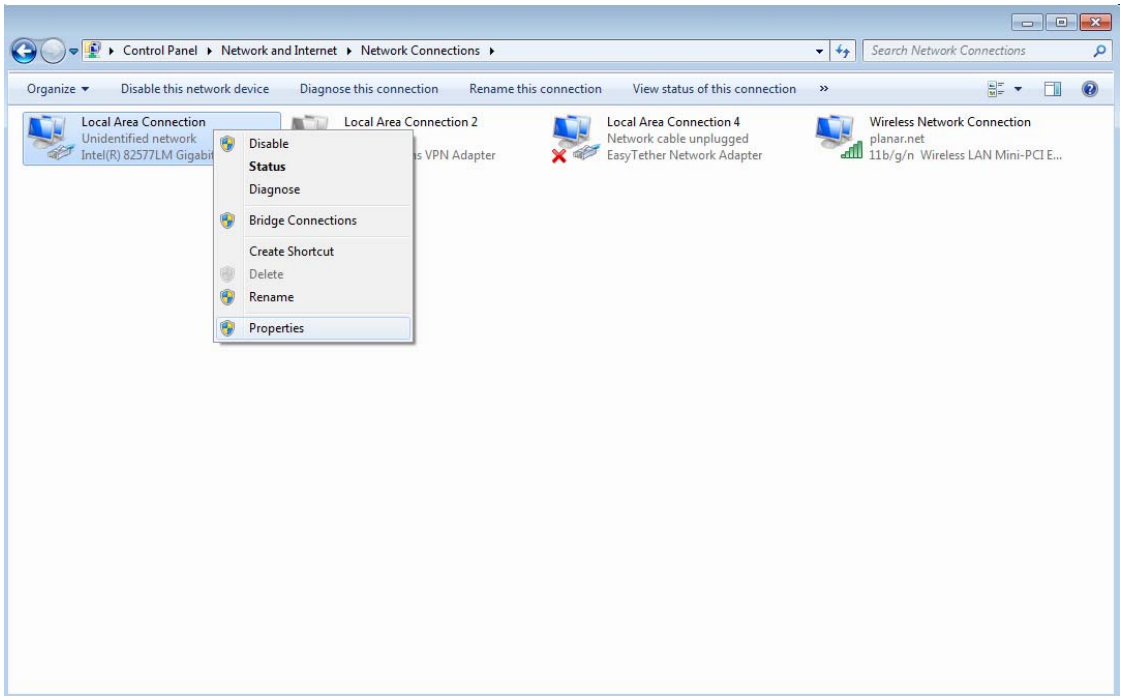


4 Open **Network and Sharing Center**.

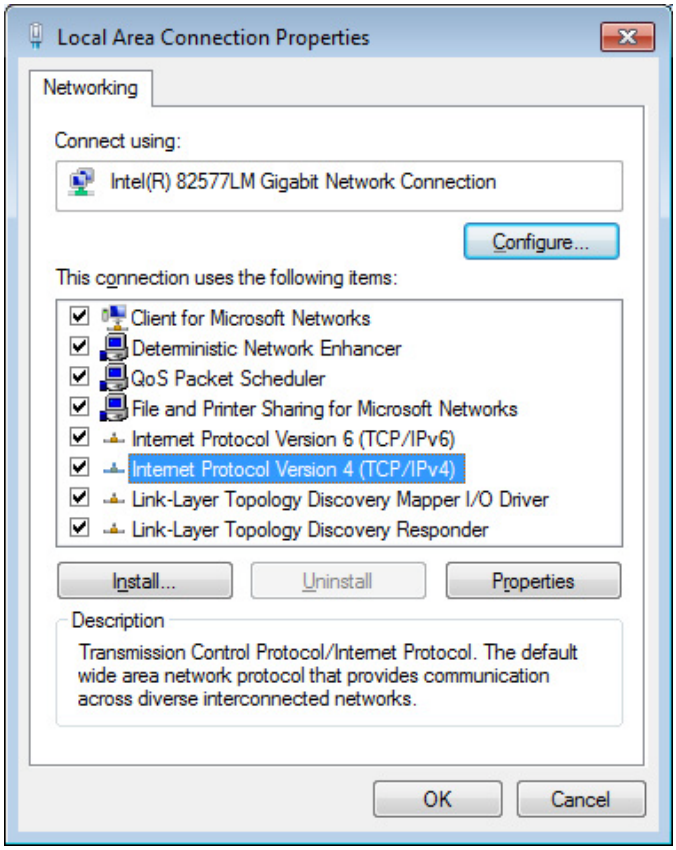


5 Click **Change adapter settings** in the left side pane.

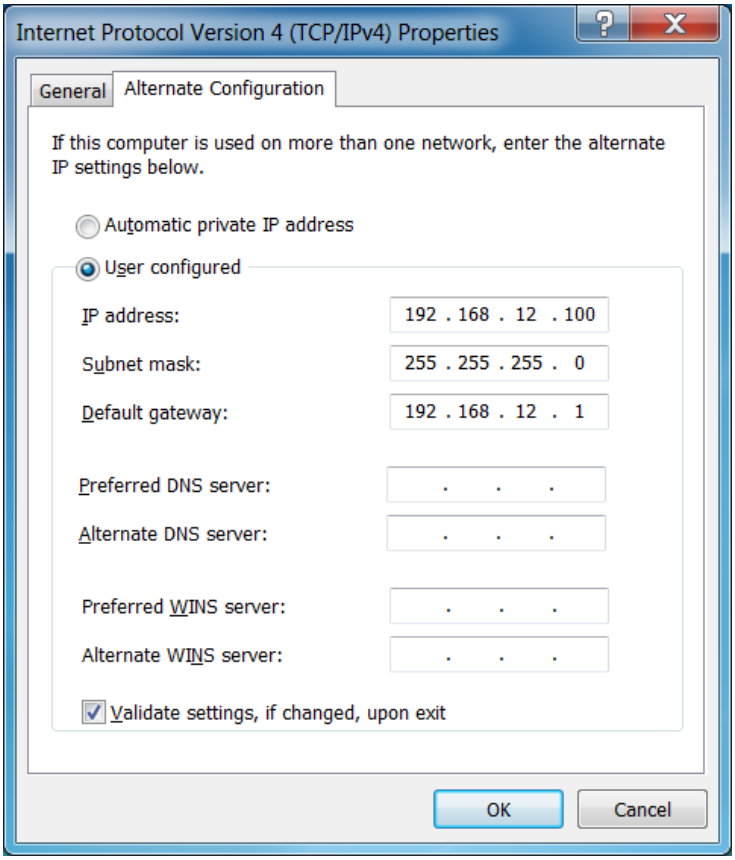
6 Right-click on the local area connection that corresponds to the network interface that is connected to the UltraRes and then select **Properties**.



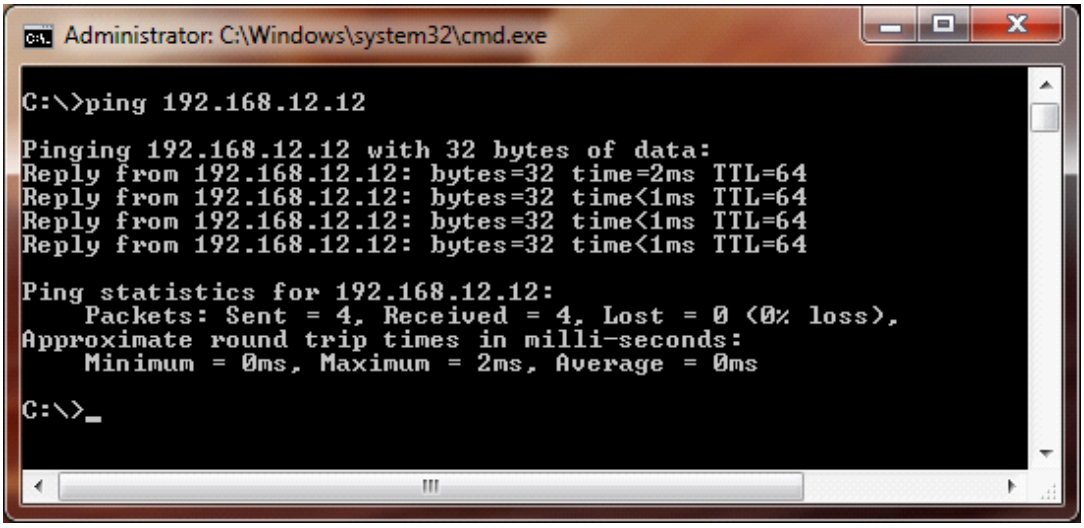
7 Select **Internet Protocol Version 4 (TCP/IPv4)** and then click the **Properties** button.



8 Select the **Use the following IP address** radio button and then enter 192.168.12.100 for the **IP address**, 255.255.255.0 for the **Subnet mask** and 192.168.12.1 for the **Default gateway**. Click **OK** to dismiss the IPv4 Properties window. Then click **Close** to dismiss the **Local Area Connection Properties** window.



9 To confirm the connection, open a Windows command prompt and enter **ping 192.168.12.12**, as shown below.

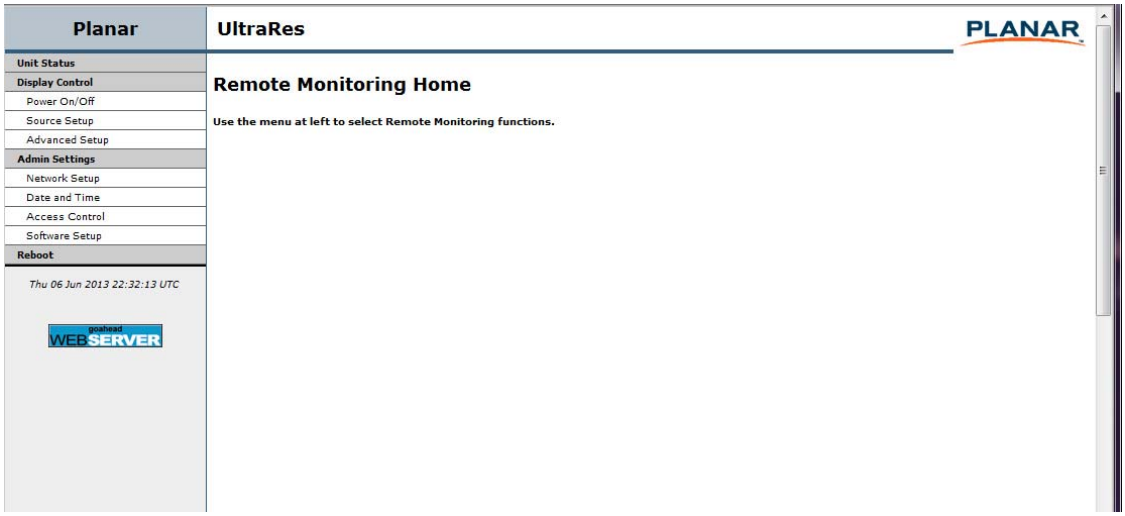


Planar UltraRes Remote Monitoring Software

Planar UltraRes Remote Monitoring is a software tool that displays information about the display via a web browser. It is used primarily for monitoring, reporting and some control (for example, manually powering the displays on and off).

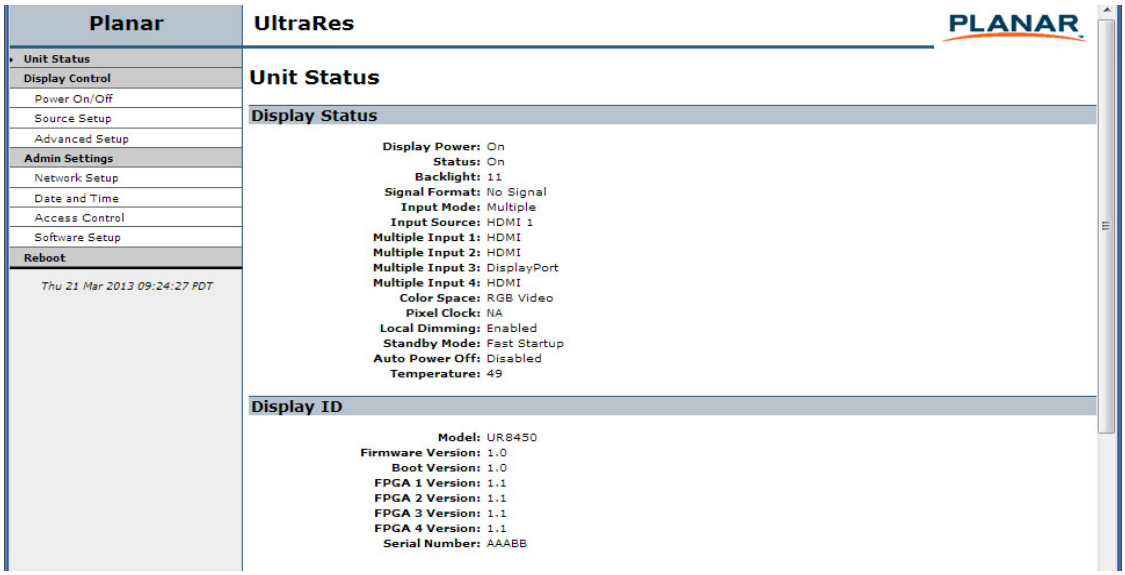
Remote Monitoring Home

Launch a web browser. If you are using DHCP, enter in the IP address shown on the Info tab of UltraRes Control. If you are not using DHCP, enter http://192.168.12.12 in the address bar. For either web address entered, you should see a page similar to the following.



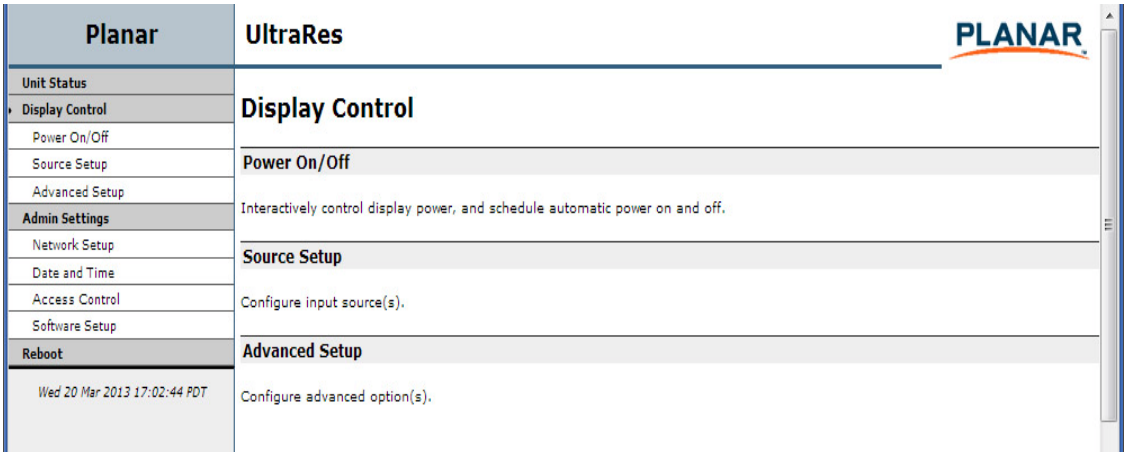
Remote Monitoring Unit Status

The Unit Status page shows a list of the different system settings for the display, including power, signal format and which sources are connected with which inputs. It also shows all current firmware information, the display ID and the serial number of the specific display.



Remote Monitoring Display Control

The Display Control page contains three sub-pages: Power On/Off, Source Setup and Advanced Setup. These are described in the following pages.



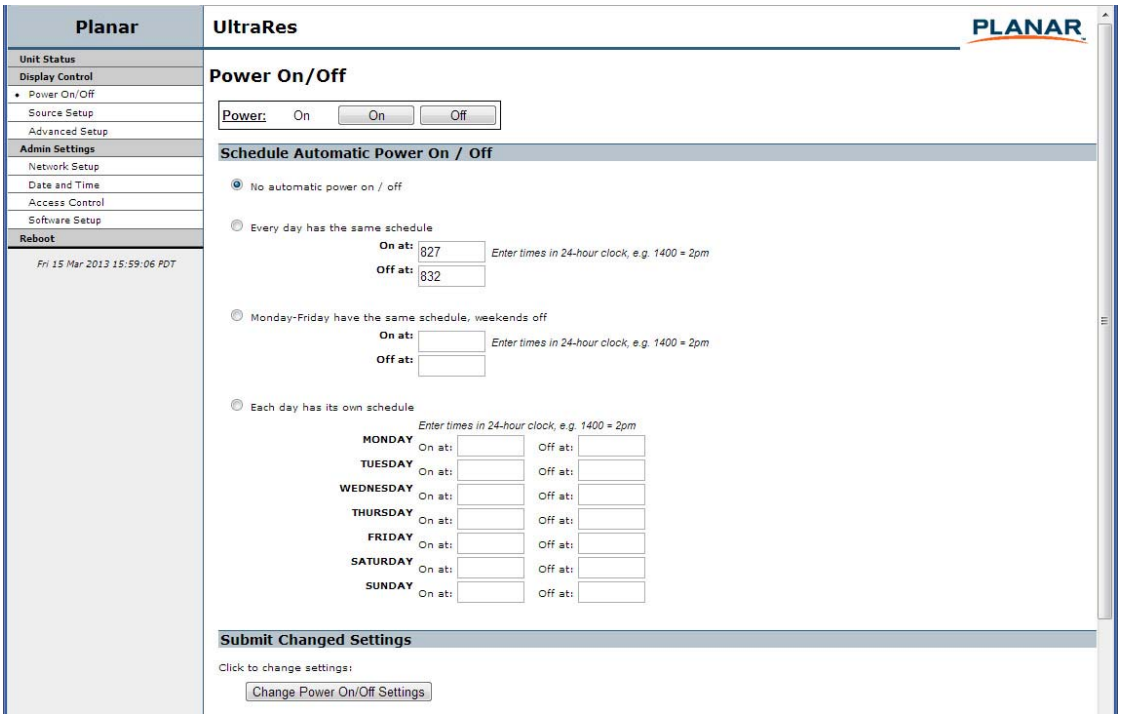
Remote Monitoring Power On/Off

Power On/Off buttons control the LED power, not the AC power. You cannot control AC power through Planar UltraRes Remote Monitoring.

This section has four options for which you can schedule an automatic power on/off. The options are:

- No automatic power on/off
- Same daily schedule
- Same Monday-Friday schedule and weekends off
- Each day has its own schedule. You can only select one of the schedule types.

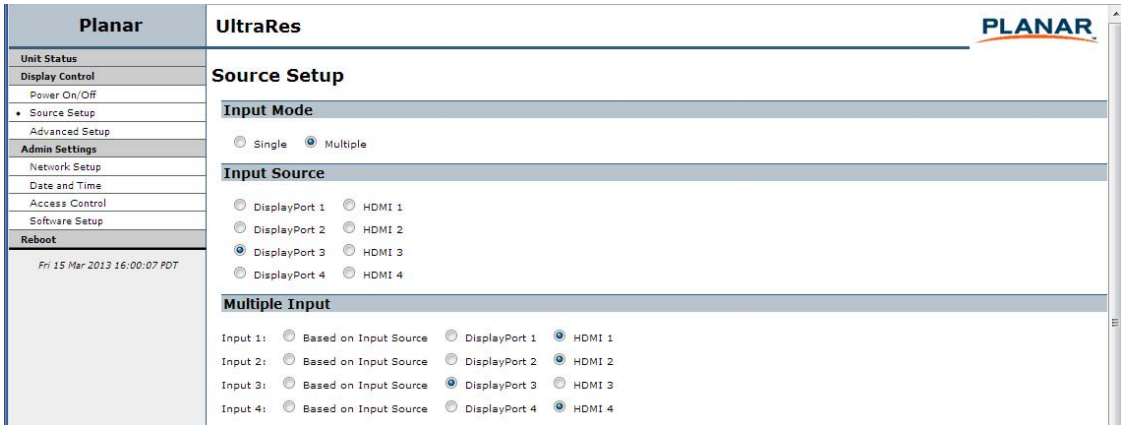
Note: The default is **No automatic power on/off**.



Remote Monitoring Source Setup

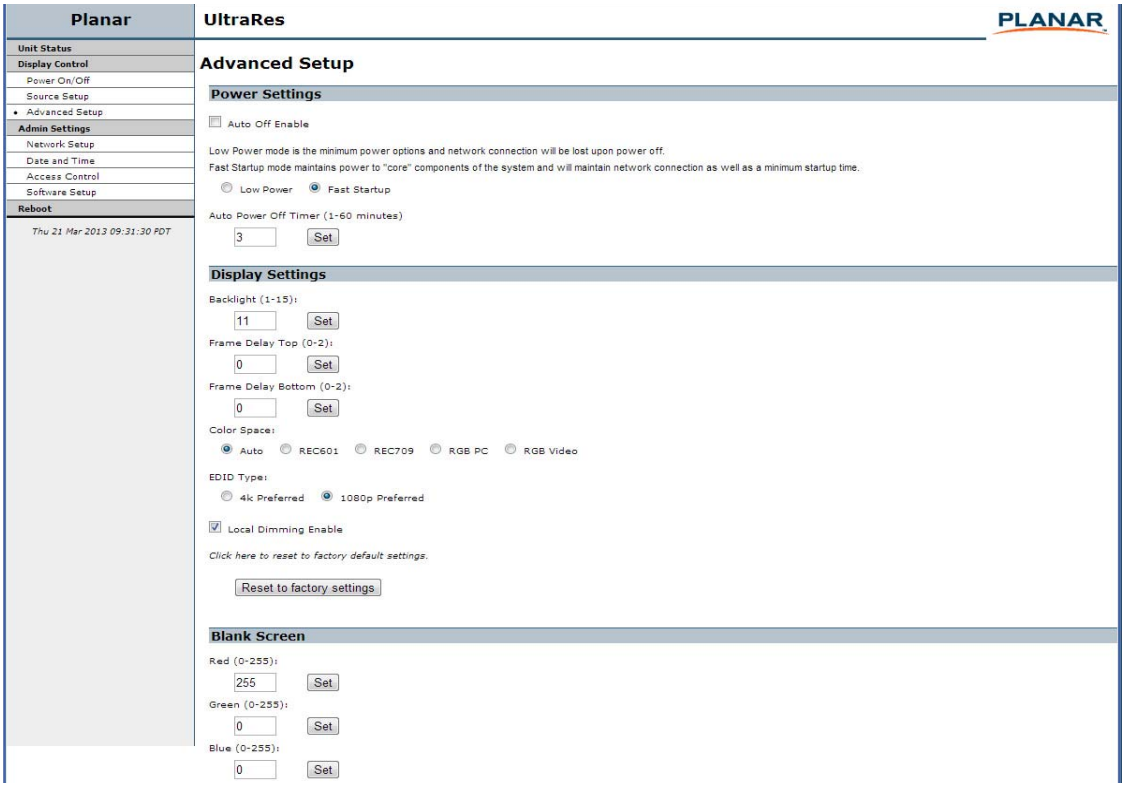
The Source Setup page allows you to perform the same tasks that you can using the UltraRes Control software:

- Select single or multiple input mode
- Select an input source for each input in single input mode
- Select different options for inputs in multiple input mode



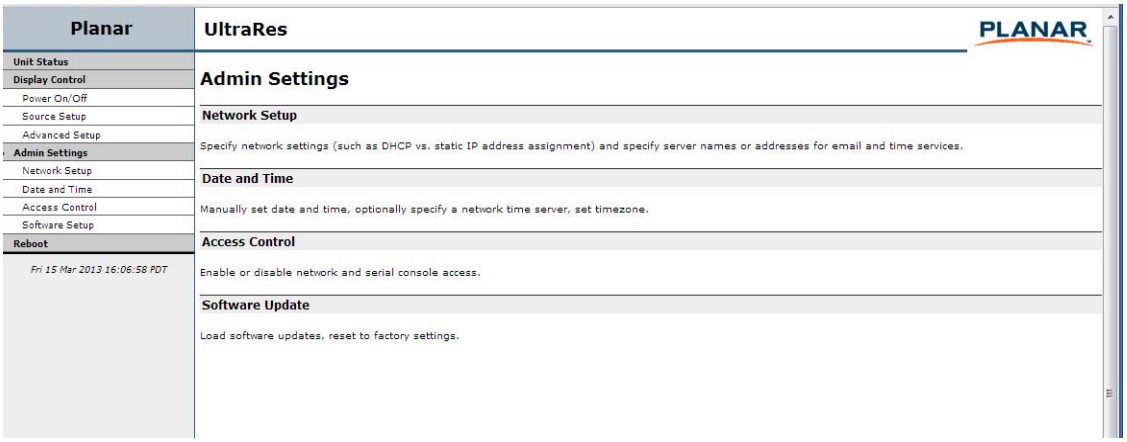
Remote Monitoring Advanced Setup

The Advanced Setup page allows you to perform many of the same tasks that you can on the UltraRes Control software program. This includes selecting the power mode that works best for your display, either low power or fast startup. You can also select many display settings such as backlight intensity, frame delay, color space definitions and RGB settings.



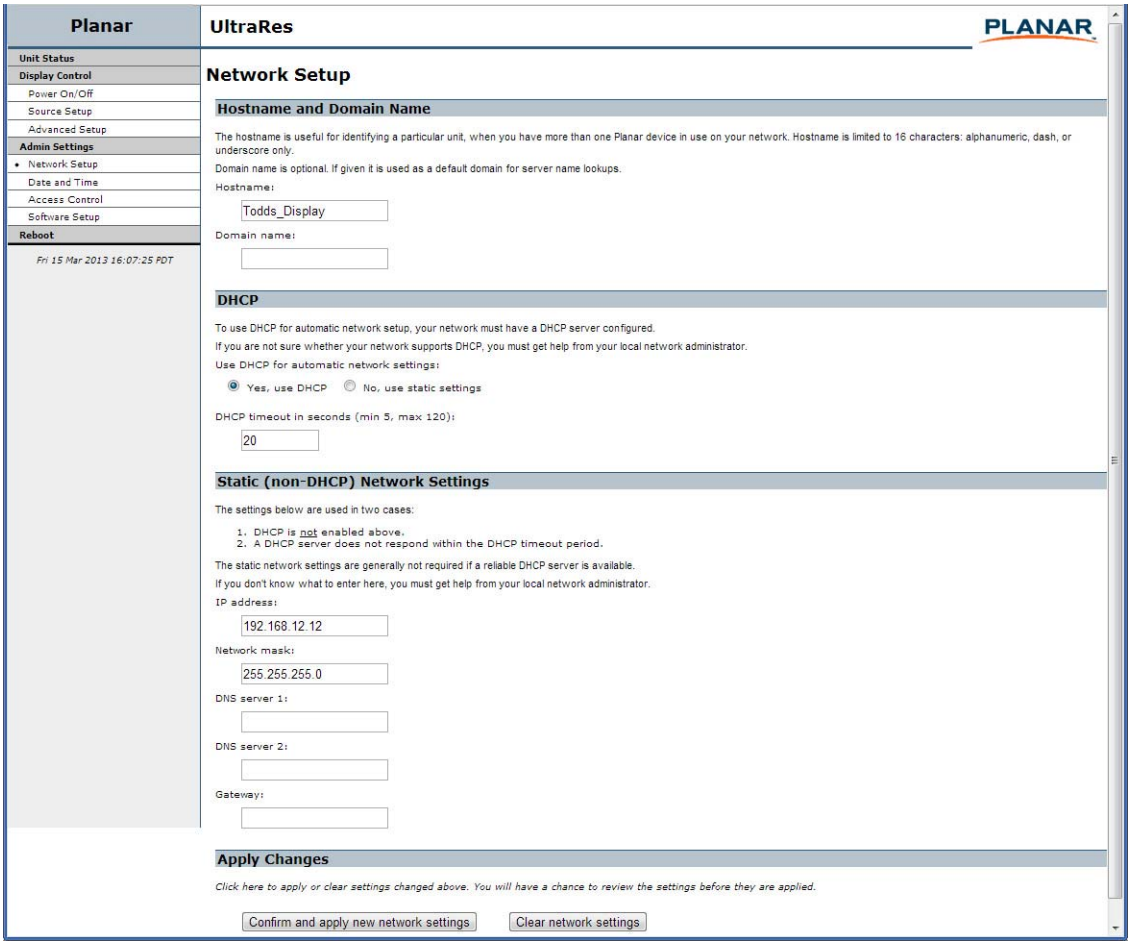
Remote Monitoring Admin Setup

The Admin Setup page contains four sub-pages: Network Setup, Date and Time, Access Control and Software Setup. These are described in the following pages.



Remote Monitoring Network Setup

This page allows you to configure network settings and whether or not you use DHCP. For more information about setting up DHCP, see "DHCP Network Setup" on page 53.



1. The **Hostname** box will display Planar as the default. Change this name to something more appropriate for this particular server. The hostname is limited to 16 characters: alphanumeric, dash, or underscore only.

2. If you want to enter a domain name for server name lookups, type it in the **Domain name** box.

3. Do one of the following:
   - If you will use DHCP, go to step **4**.
   - If you will **not** use DHCP, go to step **5**.

4 Under the DHCP section, select the **Yes, use DHCP** radio button.

   a Change the default DHCP timeout (ten seconds) only if instructed by your network administrator.

   b You do not need to fill in anything under the Static (non-DHCP) Network Settings section. However, if you do, these settings will be used in the event that the DHCP attempts to time out.

   c Go to step **6**.

5 Under the DHCP section, select the **No, use static settings** radio button.

   a In the Static (non-DHCP) Network Settings section, enter the **IP address** provided by your Network Administrator.

   b Enter the **Network mask, DNS server(s)**, and **Gateway** as instructed by the network administrator.

   c Go to step **6**.

6 Scroll to the bottom of the page and click **Confirm and apply new network settings** to receive the Confirm Network Change page.

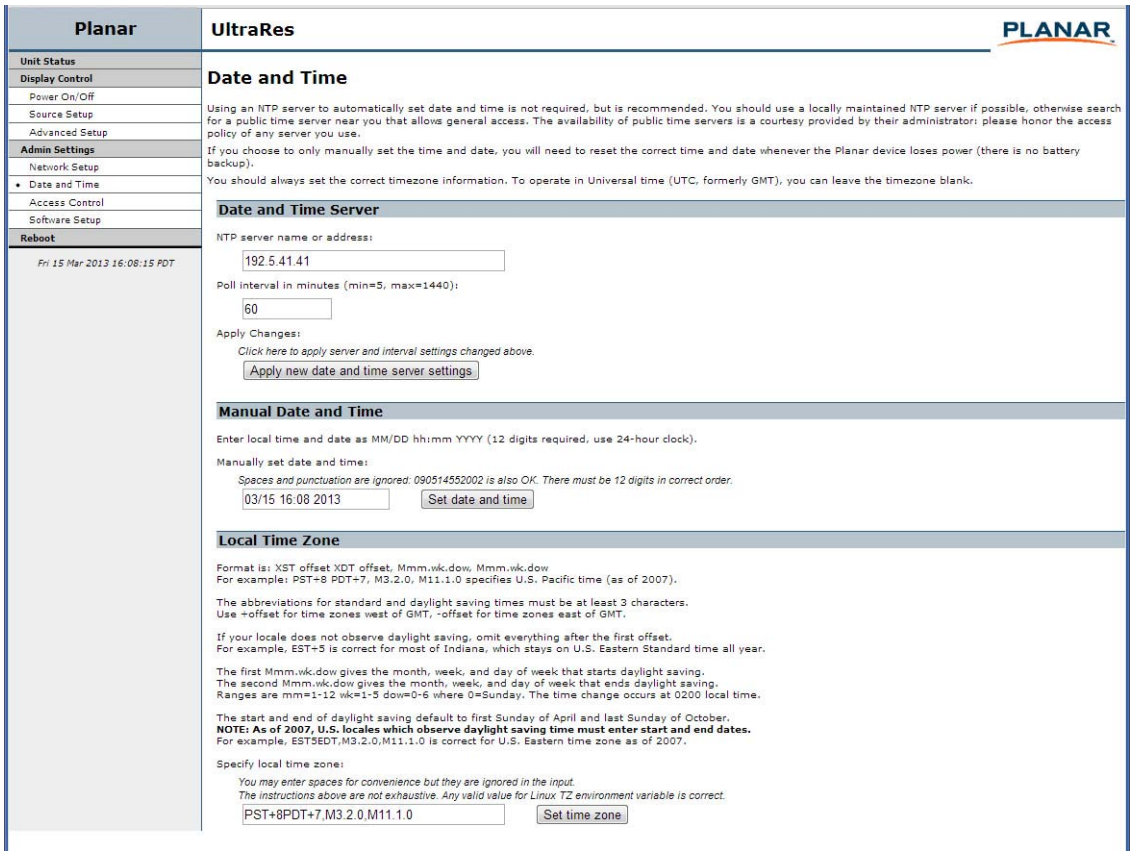
7 Review the settings to make sure they are correct. Click **OK, apply changes now** to receive the Applying Network Changes page. This shows the network settings that will be used.

Note: If you have changed the static IP address or changed from static to DHCP setup, you may need to point your browser at the new address.

8 You may have to click the **Refresh** button on your browser to see the new name in the upper left corner of the page.

Remote Monitoring Date and Time

Use this page to change date and time information as needed.



1. Set the date and time manually in the box under the Manual Date and Time section. The date format is very exact. Fill in the current date and time using exactly the format shown on the page. Click **Set date and time**.

2. If you want to have the server periodically check the time from a network source, fill in the NTP server name or address, and poll interval in the Date and Time Server section. Click **Apply new date and time server settings**.

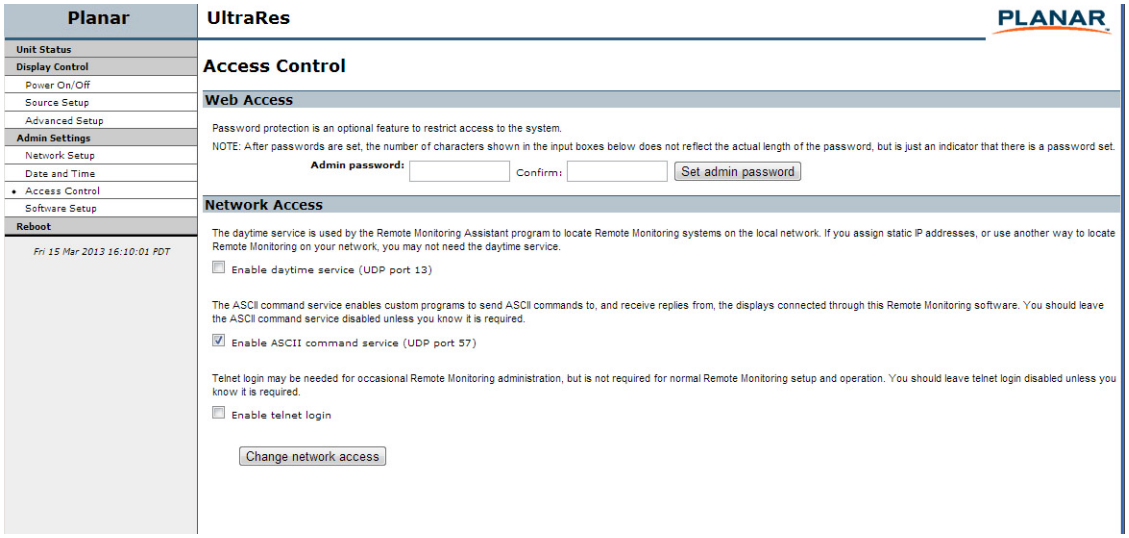
Note: If you don't have a preferred NTP server, then **pool.ntp.org** is a good choice for most installations.

3. Carefully read the instructions in the Local Time Zone section. Fill in the text box and click **Set time zone**.

Note: The start and end of daylight saving time default to the first Sunday of April and the last Sunday of October. As of 2007, U.S. locales that observe daylight saving time must enter start and end dates in this section. For example, EST5EDT,M3.2.0,M11.1.0 is correct for U.S. Eastern time zone as of 2007.

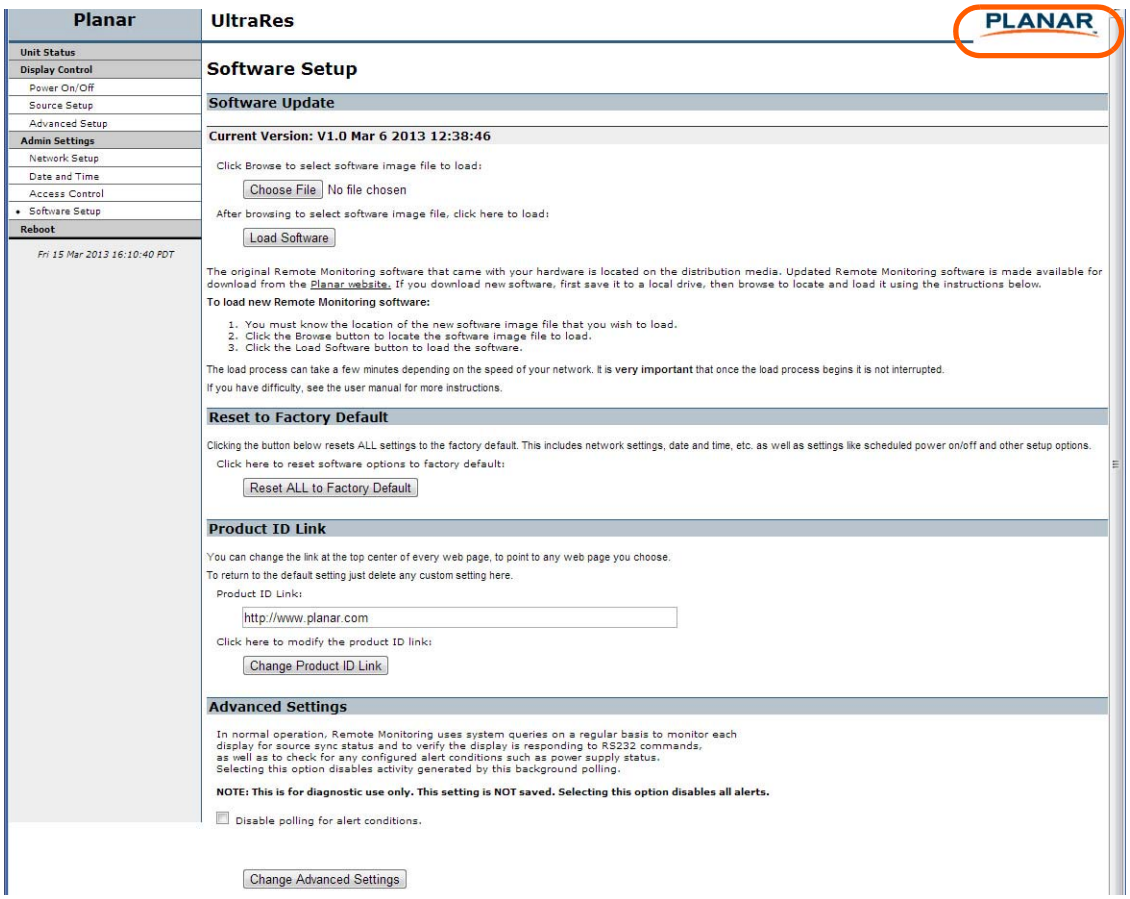
Remote Monitoring Access Control

The Access Control page allows you to set parameters needed to access the web, the Remote Monitoring network and RS232 commands. It also allows you to select the correct baud rate.



Remote Monitoring Software Setup (Upgrading Network Firmware)

This page allows you to upload the latest UltraRes Remote Monitoring software. You can also reset all of your settings to the factory defaults, as well as choose the web page link that is associated with the Planar logo in the top right corner of the page.



1 Click **Choose File** to locate the latest UltraRes software that you downloaded from Planar's website.

Note: Make sure the software is downloaded to a local drive.

2 Click **Load Software** to load the new software. This process can take a few minutes, depending on the speed of your network. It is **very important** that you do not interrupt the load process once it begins!

3 If you want to reset **ALL** settings to the factory default, click **Reset ALL to Factory Default**. This includes network settings, date and time, etc., as well as display settings.

Caution: Using this option will reset all of your configurations and reboot the remote monitor. Because this includes network settings, be aware that the UltraRes Remote Monitoring software may not configure to the same network address after the system reboots.

4 When you click **Reset ALL to Factory Default**, you receive the Confirm Factory Reset page. Click **OK, Reset to Factory Defaults and Reboot** if you are sure you want to reset ALL settings to the factory default.

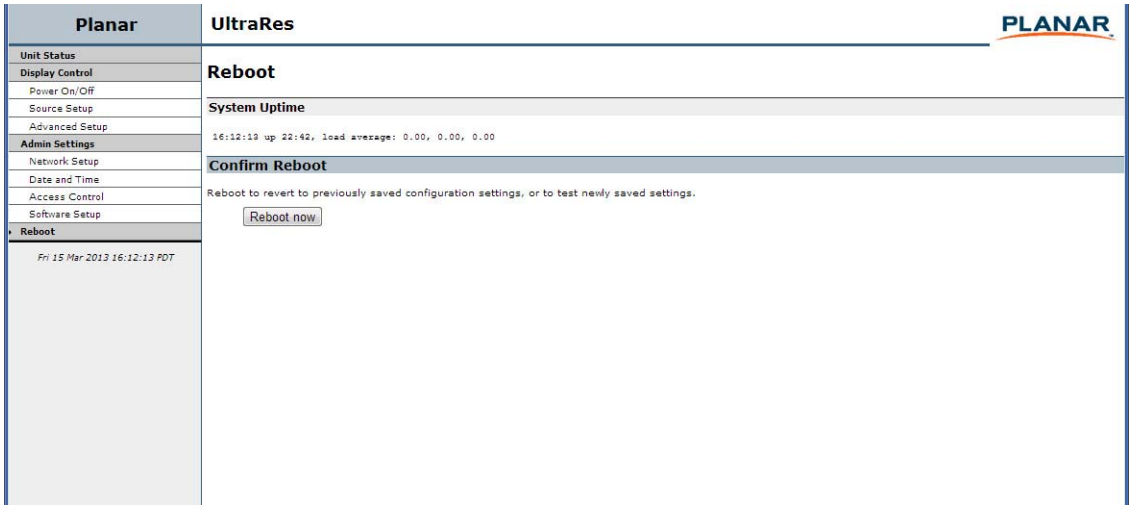
5 The top of each page shows the Planar logo, which is a link to http://www.planar.com. You can change this link to refer to any URL that you find useful by typing it into the **Product ID Link** box.

6 To make this link live, click **Change Product ID Link**.

7 In normal operations, Remote Monitoring polls the displays at a rate of one per second to look for user requests that have been made using the IR remote control and the on-screen menus. In some situations, this polling can have a noticeable performance impact. If you want to disable this polling, select the **Disable polling for alert conditions** checkbox. When you are finished, click **Change Advanced Settings**.

Remote Monitoring Reboot

Click **Reboot now** to reboot your system. The reboot takes about 90 seconds.



External Control

In addition to using the UltraRes remote control and display, there are other methods of controlling the UltraRes externally:

- Using a serial (RS232) link to send ASCII commands and to receive responses to those commands.
- Using discrete infrared (IR) codes to program a third-party remote control.
- Using SNMP (Simple Network Management Protocol) controls using web browser settings.

RS232 Communication

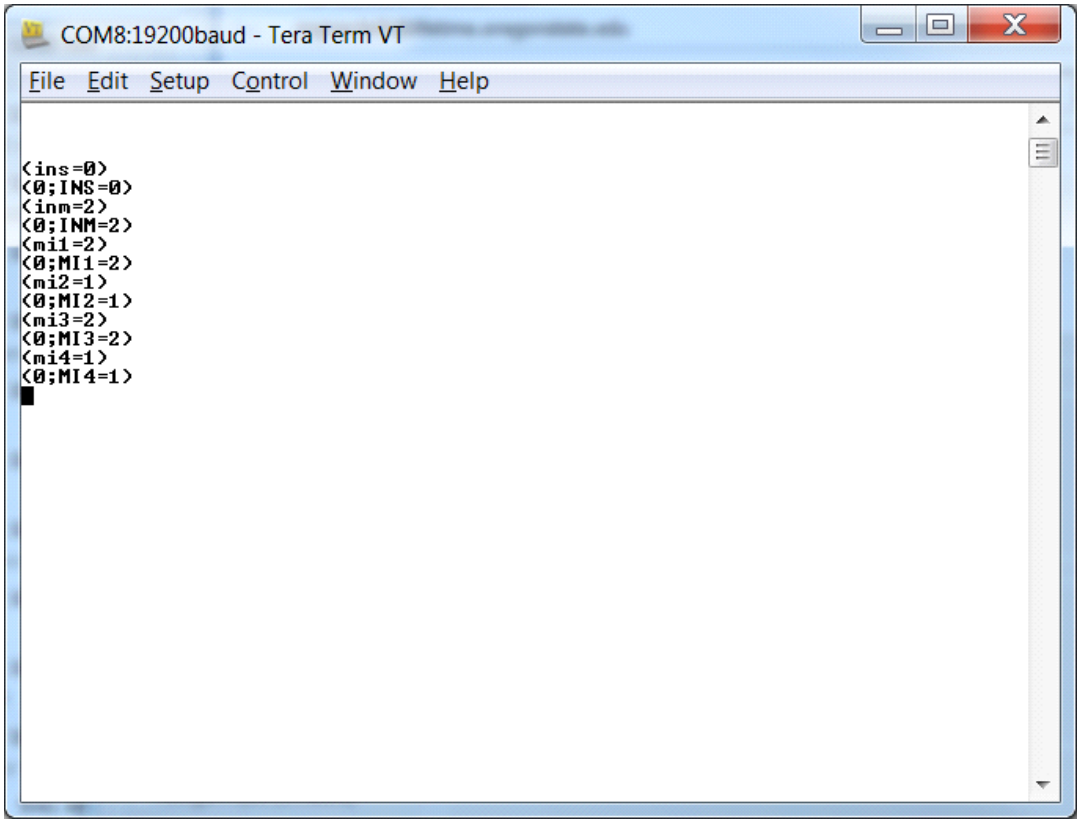
RS232 control is not necessary for operation, but is a convenient way to control displays from a computer at a distance. If your installation will not use RS232 control, you can skip this section. Most things you can do with the remote, you can do with RS232 commands. Plus, you can send inquiries to the displays and find out the current settings and values. RS232 connections are made with standard straight-through cables.

Connecting the RS232 Cable

The RS232 cable will connect to a PC or control system, depending on your setup.

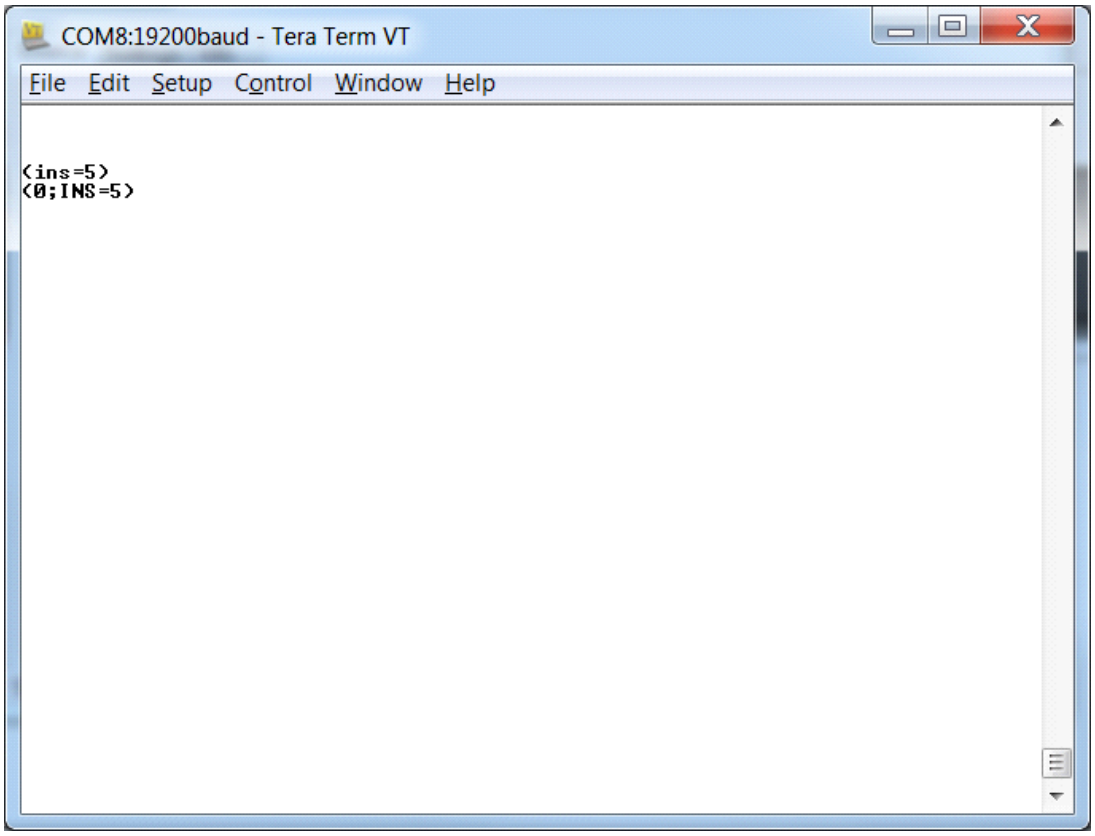
Setting Up Multiple Inputs Using RS232 Commands

You can also set up multiple inputs using RS232 commands. As is typical with using RS232 commands, you can pull up a basic program such as Tera Term to send commands. Below is a short example.



Setting Up Single Inputs Using RS232 Commands

You can set up single inputs using RS232 commands. As is typical with using RS232 commands, you can pull up a basic program such as Tera Term to send commands. Below is a short example.



RS232 Commands

The RS232 connection must use the following settings:

- 19200 baud rate
- 8 data bits
- 1 stop bit
- No parity bit
- No HW (RTS/CTS) or SW (XON/XOFF) flow control

RS232 Command Format

Commands sent from the initiator to the follower must have the following format:

```
(www:xyz) [CR]
```

Where:

- '(' and ')' indicate the start and end of the command data. If these characters are present, the display processor shall assume that "valid" display data is present in the command string. If these characters are not present in the command, the display processor shall assume the data is not valid display data and ignore it.
- "www" indicates the command code. This field is case insensitive (i.e. "PWR", "pwr" and "PwR" should all be treated as "PWR").
- ":x" is the destination parameter. This is an optional parameter that indicates which memory the command is referencing. This parameter is reserved and shall not be used at this time.
- "y" is the operand, which can have one of the following values:
  - '?' = "Get" operand
  - '=' = "Set" operand
  - '+' = "Increment" operand (not supported on UltraRes)
  - '-' = "Decrement" operand (not supported on UltraRes)
- "z" is the value to set for this parameter. It can have one of two formats:
  - Integer value: Any positive or negative number (example: 100)
  - String value: Any string surrounded by double quotes (example: "This is a string")
- "[CR]" is the ASCII carriage return key (0x0D).

RS232 Response Format

Responses sent from the follower to the initiator shall have the following format:

```
(u;www:x=z) [CR]
```

Where:

- '(' and ')' indicate the start and end of the command data. If these characters are present, the display processor shall assume that "valid" display data is present in the command string. If these characters are not present in the command, the display processor shall assume the data is not valid display data and ignore it.
- "u;" indicates the response code. This is only used by followers responding to a valid display command received. For any response code other than 0, the follower shall echo back the command received rather than filling in the fields listed below. The following response codes can be used:
  - 0 = Command successfully processed
  - 1 = Unknown command code
  - 2 = Invalid operator
  - 3 = Destination parameter not supported
  - 4 = Setting not available
  - 5 = Setting value not available
  - 6 = Setting value not supported
  - 7 = String too long
  - 8 = Command not supported in standby mode
  - 9 = Invalid parameter
  - 10 = Error processing command
  - 11 = Password not entered
- "www" indicates the command code sent by the follower. This field is case insensitive (i.e. "PWR", "pwr" and "PwR" should all be treated as "PWR").
- ":x" is the destination parameter. This is an optional parameter that indicates which memory the response is referencing. This parameter is reserved and shall not be used at this time.
- "z" is the new value (for set/increment/decrement commands) or the current value (for get commands) for this parameter. It can have one of two formats:
  - Integer value: Any positive or negative number (example: 100)
  - String value: Any string surrounded by double quotes (example: "This is a string")
- "[CR]" is the ASCII carriage return key (0x0D).

RS232 Command/Response Examples

The following section gives examples of commands and their responses:

```
Example:   Power query when unit is powered on
Command:   (PWR?) [CR]
Response:  (0;PWR=1) [CR]

Example:   Set power to 0 (off)
Command:   (PWR=0) [CR]
Response:  (0;PWR=0) [CR]

Example:   Increment brightness from 24 to 25
Command:   (BRT+) [CR]
Response:  (0;BRT=25) [CR]

Example:   Invalid command code
Command:   (ZZZ=0) [CR]
Response:  (1;ZZZ=0) [CR]

Example:   Invalid parameter (string instead of int)
Command:   (CON=”Some string”) [CR]
Response:  (9;CON=”Some string”) [CR]
```

Supported UltraRes RS232 Commands

The following section lists the commands that are currently support on the UltraRes display.

Setting	Command Code	Read/ Write	Min Value	Max Value	String?	Notes
Auto Power Off Enable	APE	R/W	0	1	No	0 = Off 1 = On
Auto Power Off Timer	APT	R/W	1	60	No	Value is in minutes
Backlight	BKL	R/W	1	15	No	
Blank Screen Blue	BSB	R/W	0	255	No	
Blank Screen Green	BSG	R/W	0	255	No	
Blank Screen Red	BSR	R/W	0	255	No	
Color Space	CLS	R/W	0	4	No	0 = REC601 1 = REC709 2 = RGB 3 = RGB Video 4 = Auto
EDID Type	EDT	R/W	0	1	No	0 = 4K Preferred EDID 1 = 1080p Preferred EDID
Error Code	ERR	R	0	TBD	No	0 = None 1 = AC Power Supply 1 Failure 2 = AC Power Supply 2 Failure 3 = AC Power Supplies 1 and 2 Failure 4 = AC Power Supply 3 Failure 5 = AC Power Supplies 1 and 3 Failure 6 = AC Power Supplies 2 and 3 Failure 7 = AC Power Supplies 1, 2 and 3 Failure 8 = AC Power Status Cable Disconnected 9 = DC Power Supply Failure 10 = FPGA Initialization Failure 11 = Calibration EEPROM Failure 12 = Overtemp
Error Log 1	EL1	R	N/A	N/A	Yes	Response contains 50 hex digits representing the first 25 entries in the error log
Error Log 2	EL2	R	N/A	N/A	Yes	Response contains 50 hex digits representing the second 25 entries in the error log
Firmware Upgrade	FWU	W	N/A	N/A	No	Action will be performed on any setting value
Information Boot Version	IBV	R	N/A	N/A	Yes	
Information Current Color Space	ICC	R	0	3	No	0 = REC601 1 = REC709 2 = RGB 3 = RGB Video

Setting	Command Code	Read/ Write	Min Value	Max Value	String?	Notes
Information Firmware Version	IFV	R	N/A	N/A	Yes	
Information FPGA 1 Version	IF1	R	N/A	N/A	Yes	
Information FPGA 2 Version	IF2	R	N/A	N/A	Yes	
Information FPGA 3 Version	IF3	R	N/A	N/A	Yes	
Information FPGA 4 Version	IF4	R	N/A	N/A	Yes	
Input Mode	INM	R/W	0	2	No	0 = Single Input 2 = Multiple Inputs
Input Source	INS	R/W	0	15	No	0 = DisplayPort 1 1 = DisplayPort 2 2 = DisplayPort 3 3 = DisplayPort 4 4 = HDMI 1 5 = HDMI 2 6 = HDMI 3 7 = HDMI 4
Information Pixel Clock	IPC	R	N/A	N/A	Yes	
Information Signal Format	ISF	R	N/A	N/A	Yes	
Information Serial Number	ISN	R	N/A	N/A	Yes	
Information Temperature Sensor	ITS	R	N/A	N/A	No	Value returned is in Celsius
IP Address	IPA	R	N/A	N/A	Yes	
Local Dimming	LDM	R/W	0	1	No	0 = Off 1 = On
Model Name	MDL	R	N/A	N/A	Yes	
Multiple Input 1	MI1	R/W	0	2	No	0 = Auto 1 = DisplayPort 1 2 = HDMI 1
Multiple Input 2	MI2	R/W	0	2	No	0 = Auto 1 = DisplayPort 2 2 = HDMI 2
Multiple Input 3	MI3	R/W	0	2	No	0 = Auto 1 = DisplayPort 3 2 = HDMI 3
Multiple Input 4	MI4	R/W	0	2	No	0 = Auto 1 = DisplayPort 4 2 = HDMI 4

Setting	Command Code	Read/ Write	Min Value	Max Value	String?	Notes
Power	PWR	R/W	0	1	No	0 = Off 1 = On
Remote Key	KEY	W	0	92	No	1 = On 2 = Off 3 = Menu 4 = Enter 5 = Up 6 = Down 7 = Left 8 = Right 19 = HDMI 1 20 = HDMI 2 21 = HDMI 3 22 = HDMI 4 85 = DisplayPort 1 87 = DisplayPort 2 88 = DisplayPort 3 89 = DisplayPort 4 90 = Single Input 91 = Multiple Inputs 92 = Previous
Standby Mode	STB	R/W	0	1	No	0 = Low Power 1 = Fast Startup
Status	STA	R	0	4	No	0 = Standby 1 = Powering Up 2 = On 3 = Powering Down 4 = Error
System Reset	SYS	W	N/A	N/A	No	Action will be performed on any setting value
Test Video	TST	R/W	0	4		
Top Frame Delay	FDT	R/W	0	2	No	

SNMP Monitoring

The current settings and status of UltraRes units can be remotely monitored using SNMP (Simple Network Management Protocol), if the SNMP option is enabled through the web browser settings. The MIB (Management Information Base) used for all Planar display products is available by electronic distribution in the file PLANAR-DISPLAY-MIB.txt. The table below shows the objects that can be monitored – all Planar SNMP objects are read-only, and no traps are used. The default read-only community string for all Planar SNMP objects is "public". Once the PLANAR-DISPLAY-MIB is loaded in your SNMP manager, you can walk all the available objects from the top-level object PlanarSystems(1.3.6.1.4.1.19125) or its sub-object PlanarDisplayProduct(1).

Most object values are integer type, except where noted. Generally, for integer types, the value -1 is returned if there is any internal system or communication error, and normal return values are zero or positive integers.

Object Name	Description	Value
plnrModel	Model name (string)	UltraRes
plnrSWPart	Part number (string) for the Remote Monitoring software	010-01412
plnrSN1	Serial number (string)	
plnrVersion1	SNMP agent version (string)	
plnrVersion2	Firmware version (string)	See RS232 code "IFV"
plnrVersion3-6	FPGA 1-4 version (string)	See RS232 code "IF1" through "IF4"
plnrDisplayStatus	General display status	0 = Error 1 = OK -1 = N/A
plnrPowerStatus	Power status information	0 = Power off or error 1 = OK -1 = N/A
plnrDisplayBacklight	Backlight value	1-15. See RS232 code "BKL"
plnrDisplayColorSpace	User-selected color space	0-4. See RS232 code "CLS"
plnrInputSelect	User-selected input source	0-7. See RS232 code "INS"
plnrInputStatus	Input source status	0 = source absent 1 = source present
plnrInputHResolution	Horizontal resolution	Pixels
plnrInputVResolution	Vertical resolution	Pixels
plnrInputVRefresh	Vertical refresh rate	Hz x 100
plnrInputPixelClock	Dot clock value	MHz x 100
plnrTemp1	Internal temperature sensor value	Degrees C. See RS232 code "ITS"

Sending RS232 Commands Via UDP

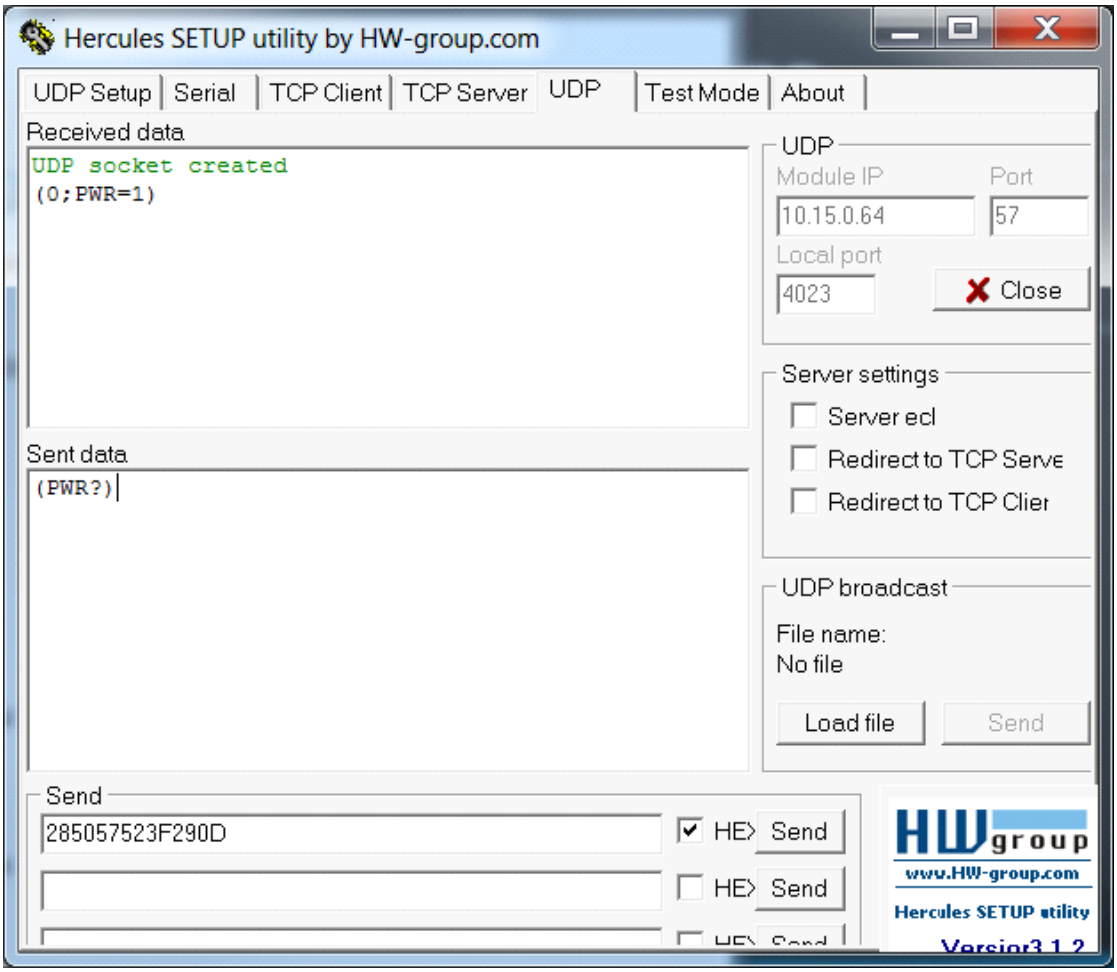
The UDP port 57 accepts the same command sets as RS232. It is convenient for IP control applications and can be tested with a UDP terminal program such as Hercules.

Note: Ensure that the **Enable ASCII command service (UDP port 57)** box is checked on the Access Control page of the UltraRes Control software.

Notice the following in the example below:

- The IP address is 10.15.0.64
- Port 57 is selected
- "285057523F290D" in the **Send** box is hex for "(PWR?)"

Note: Most UDP terminal programs won't automatically send the [CR] at the end of the command, so the hex command is used to do this manually.



Using Discrete IR Codes

The UltraRes display accepts commands in the form of IR signals that conform to the NEC protocol. Each UltraRes remote control has an NEC control code associated with it. You can use these codes to program a third-party “universal” remote control to work with the UltraRes. These third-party products usually come with a computer software application for this purpose. For more information, consult the documentation provided with the remote control.

IR Command Protocol

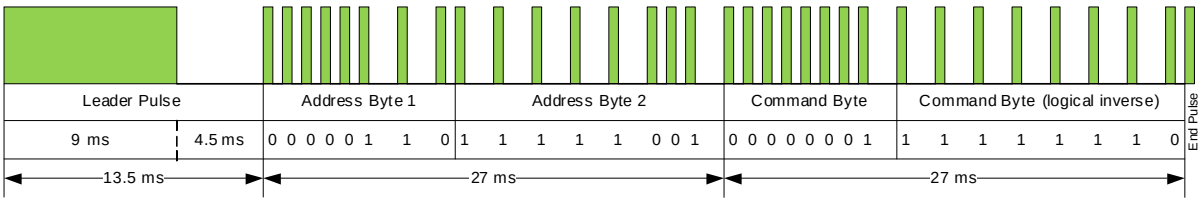
The IR control codes have the following characteristics:

- Each code consists of the following:
  - A leader pulse (a modulated pulse of 9 ms followed by a non-modulated pulse of 4.5 ms)
  - 16 address bits. The default address is 1784 (0x06F9, binary 00000110 11111001)
  - 16 data bits: eight (8) bits for the command followed by the logical inverse of the command
  - An end pulse (a modulated pulse of 0.56 ms, similar to the modulated pulse in the ‘0’ and ‘1’ bits). The end of the modulated pulse constitutes the end of the data transmission.
- The carrier frequency is 38 kHz, with the modulated pulses having a 33% duty cycle.
- Commands are sent at a maximum rate of 9 Hz.

For example, below is the NEC control code for the ON button of the UltraRes remote control (assuming the default address is used).

Hex	**06**	**F9**	**01**	**FE**
Binary	00000110	11111001	00000001	11111110
Function	**Address Byte 1**	**Address Byte 2**	**Command**	**Command (Logical Inverse)**

The following example shows the pulse train for this command.



Supported UltraRes IR Commands

Remote Control Button Name	Address	Data	NEC Data From Remote
On	1785	1	0x06F901FE
HDMI 1	1785	2	0x06F902FD
DisplayPort 1	1785	3	0x06F903FC
HDMI 2	1785	6	0x06F906F9
DisplayPort 2	1785	7	0x06F907F8
Off	1785	9	0x06F909F6
HDMI 3	1785	10	0x06F90AF5
DisplayPort 3	1785	11	0x06F90BF4
Single Input	1785	13	0x06F90DF2
HMDI 4	1785	14	0x06F90EF1
DisplayPort 4	1785	15	0x06F90FF0
Multiple Inputs	1785	17	0x06F911EE
Menu	1785	21	0x06F915EA
Previous	1785	22	0x06F916E9
Enter	1785	23	0x06F917E8
Up	1785	26	0x06F91AE5
Left	1785	29	0x06F91DE2
Right	1785	31	0x06F91FE0
Down	1785	24	0x06F918E7

Specifications

LCD Module Specifications

Specification	UltraRes Display	
Dimensions	in/lbs	mm/kg
Width	75.5"	1918.7mm
Height	43.7"	1110.7mm
Diagonal overall	87.28"	2217mm
Depth - without mount	3.05"	77.5mm
Depth - with mount	3.17"	80.5mm
Weight		
LCD only	180lbs	82kg
Landscape mounts	32lbs	14.5kg
Portrait mounts	20lbs	9kg
Orientation	Landscape (LX, MX) or Portrait (MX version only)	
Rear clearance required	None if using Planar's mount system	
Aspect ratio	16:9 (landscape) 9:16 (portrait)	
LED life Minimum (half brightness) Typical (half brightness)	 30,000 50,000	

LCD Optical Specifications

Specification	Maximum	Minimum	Typical
Screen brightness			
UR8450-3D		336 cd/m^2	420 cd/m^2
UR8450-LX		280 cd/m^2	350 cd/m^2
UR8450-MX		400 cd/m^2	500 cd/m^2
Sequential contrast (local dimming enabled)			
UR8450-3D		1100:1	1600:1
UR8450-LX		1100:1	1600:1
UR8450-MX		1000:1	1400:1
Sequential contrast (local dimming disabled)			
UR8450-3D		1100:1	1600:1
UR8450-LX		1100:1	1600:1
UR8450-MX		1100:1	1400:1
Uniformity		70%	

LCD Optical Specifications (Continued)

Specification	Maximum	Minimum	Typical
Viewing Angle			
2D content		89° in all directions	
3D content left/right		89° in all directions	
3D content up/down		26° combined	30° combined
Color gamut			72% NTSC 100% REC709
Red (x,y)			0.645, 0.335
Green (x,y)			0.300, 0.620
Blue (x,y)			0.150, 0.060
White (x,y)			0.279, 0.292
Native color temperature			10,000K
Number of colors			1 billion
Native resolution			3840 x 2160

Environmental Specifications

Specification	Maximum	Minimum	Optimal	Notes
Temperature				
operating	40° C 104° F	0° C 32° F	20-25° C	All performance specifications are maintained within this temperature range.
non-operating	60° C 140° F	–20° C –4° F	20° C +/- 10° C	
Altitude (barometric pressure)	3000m			
Humidity				
operating	85% R.H.			non-condensing
non-operating	90% R.H.			non-condensing
Low line voltage range			100-120V	
High line voltage range			200-240V	
Line frequency range			49-61Hz	
Acoustic Noise				Fanless
Inrush current			60A	
Power consumption				
Standby			< 0.5W	
Normal operation	550W		465W typ.	550W x 3.42 BTU = 1881 BTU/hr max. 465W x 3.42 BTU = 1590 BTU/hr typ.

Signal Compatibility

The UltraRes display supports the following video modes.

Compatible Video Sources

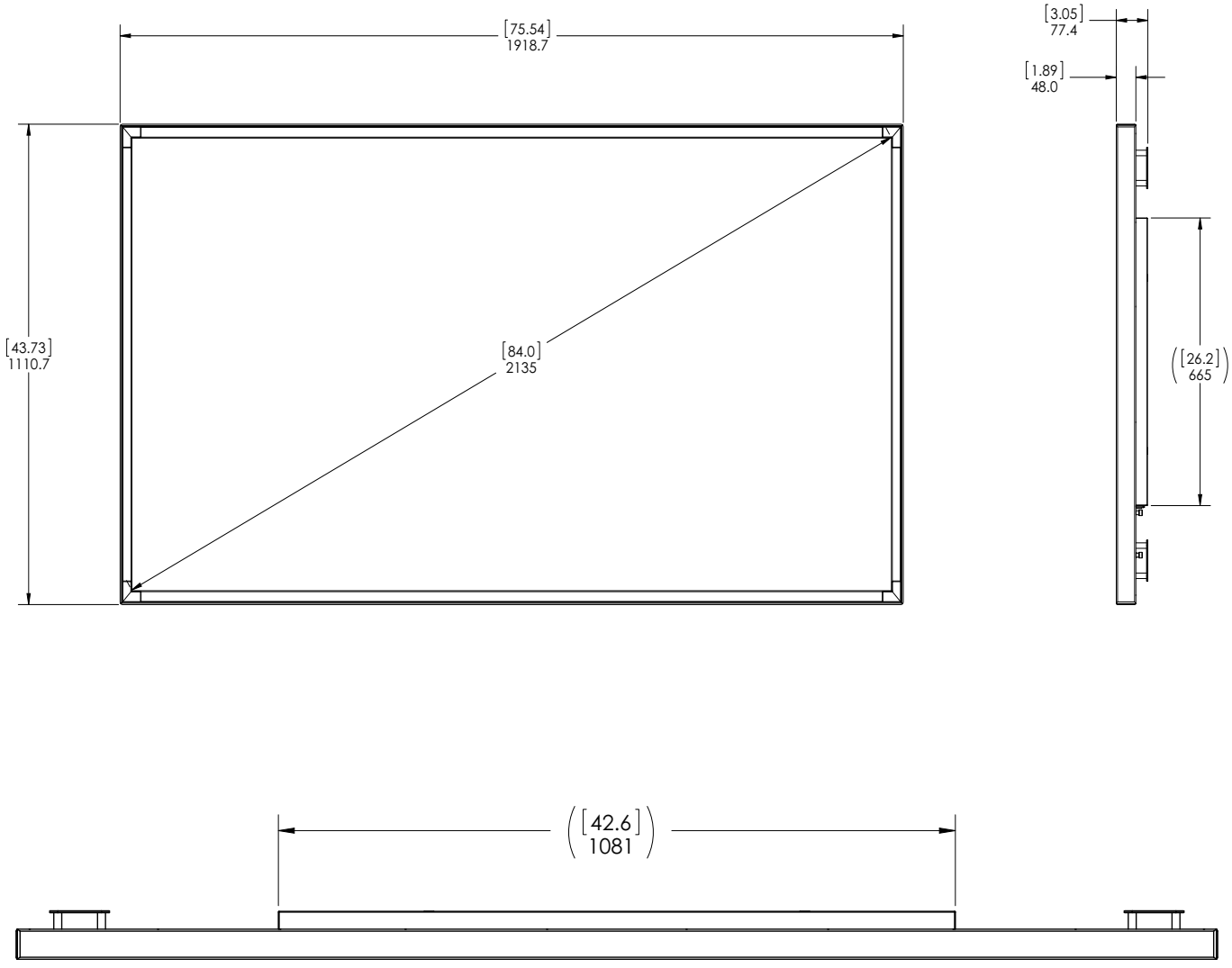
Signal Type	Resolution	Frame Rate (Hz)	Line Rate (kHz)	Pixel Rate (MHz)
PC	960 x 2160	60	135.000	148.500
	1920 x 2160	60	135.000	297.000
HDTV	1080p	24	27.000	74.250
	1080p	25	28.125	74.250
	1080p	30	33.750	74.250
	1080p	50	56.250	148.500
	1080p	60	67.500	148.500
UHDTV	3840 x 2160	24	54.000	297.000
	3840 x 2160	25	56.250	297.000
	3840 x 2160	30	67.500	297.000

Multiple Input Compatibility

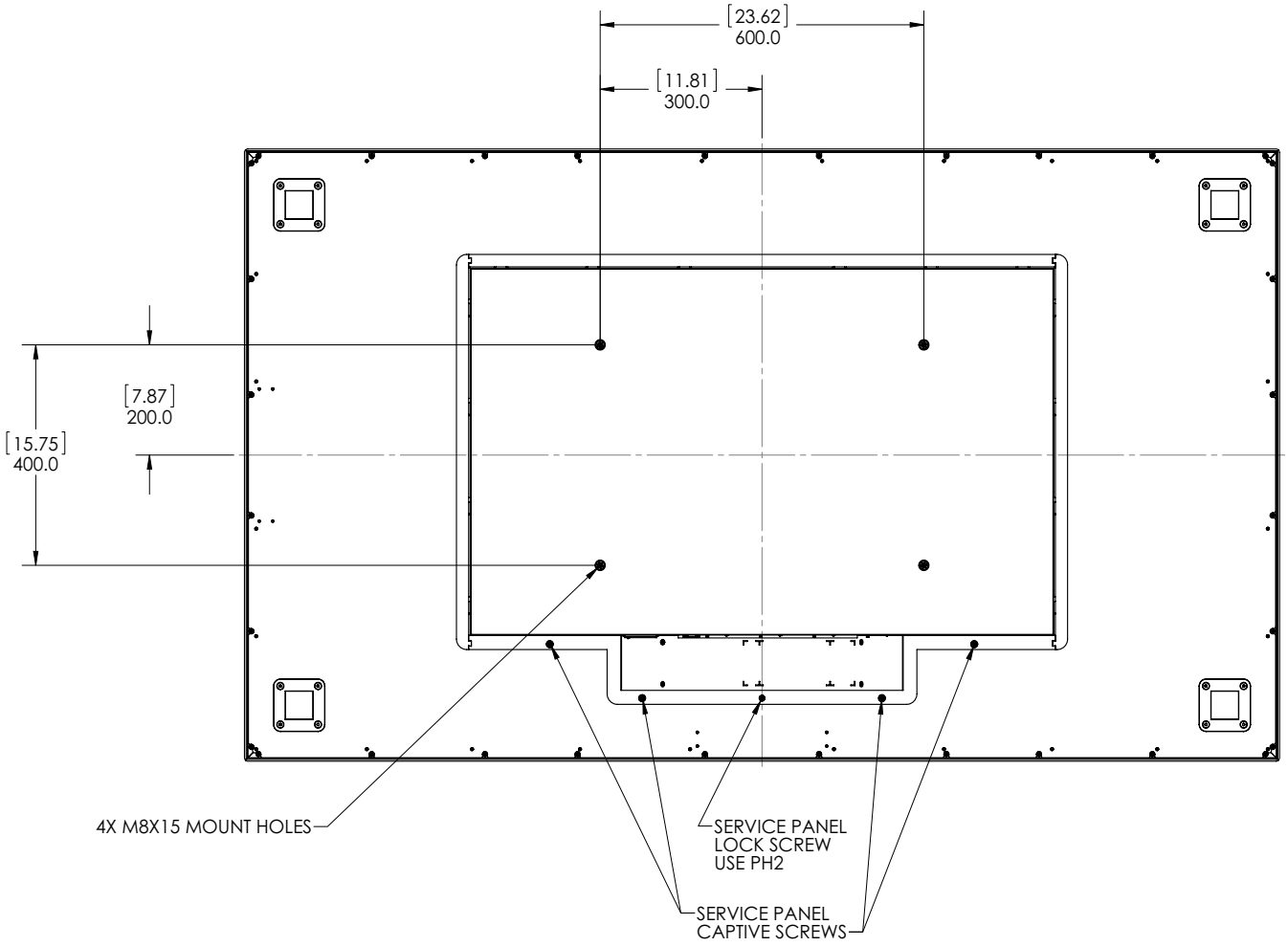
Signal Type	Resolution	Frame Rate (Hz)	HDMI -1 Input	HDMI -1-4	DisplayPort -1 Input	DisplayPort 1-4
PC	960 x 2160	60		✓		✓
	1920 x 2160	60		✓		✓
HDTV	1080p	24	✓	✓	✓	✓
	1080p	25	✓	✓	✓	✓
	1080p	30	✓	✓	✓	✓
	1080p	50	✓	✓	✓	✓
	1080p	60	✓	✓	✓	✓
UHDTV	3840 x 2160	24	✓		✓	
	3840 x 2160	25	✓		✓	
	3840 x 2160	30	✓		✓	

UltraRes Dimensions

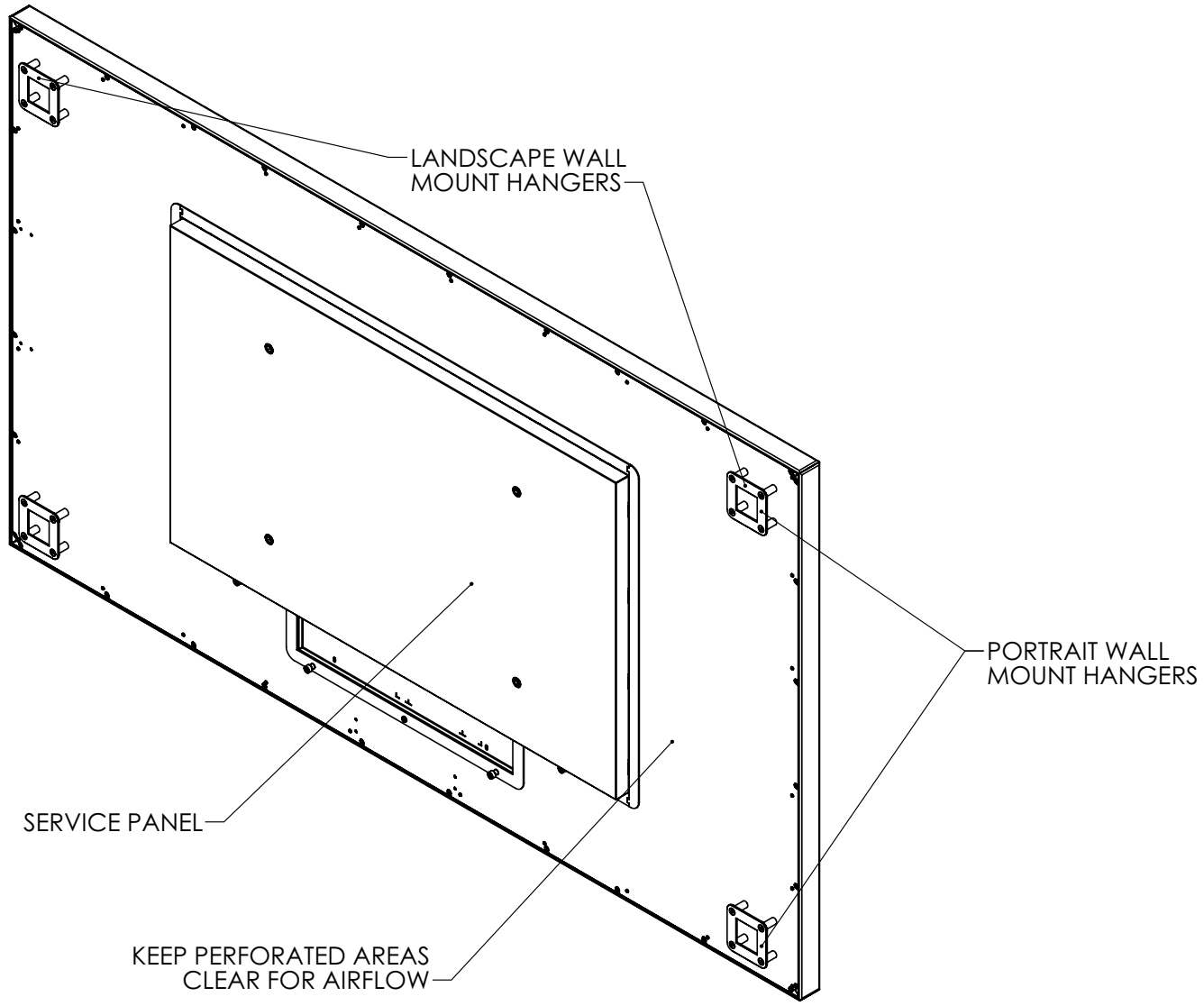
Display Dimensions - Front, Side and Top Views



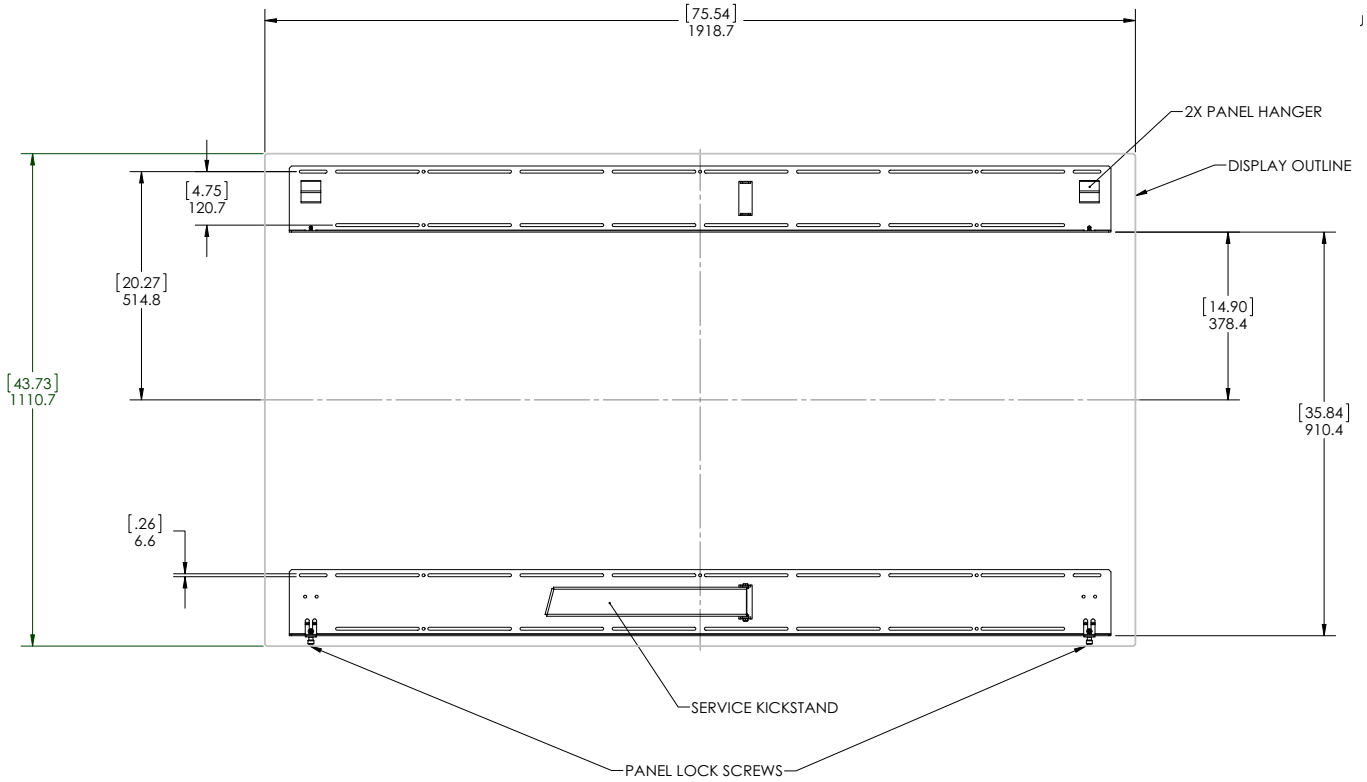
Display Dimensions - Rear View

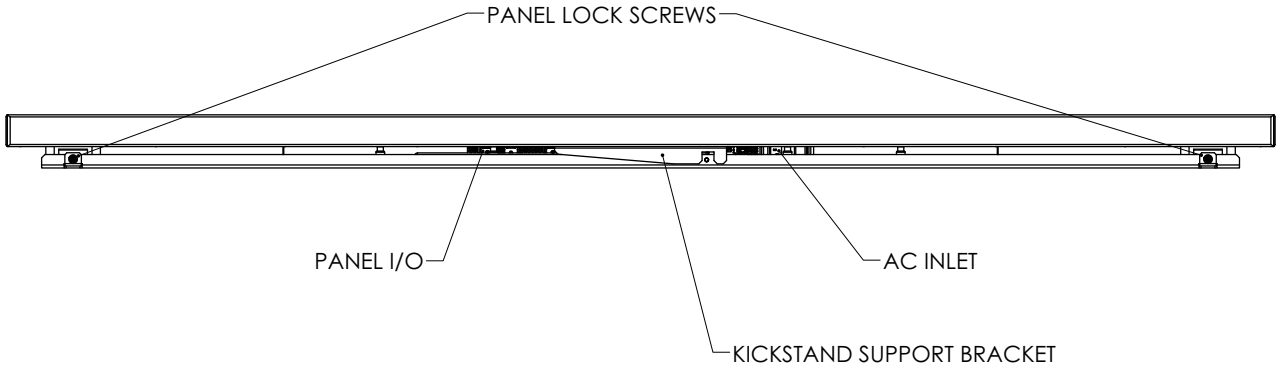


Rear View - Wall Mount Hangers and Service Panel Locations



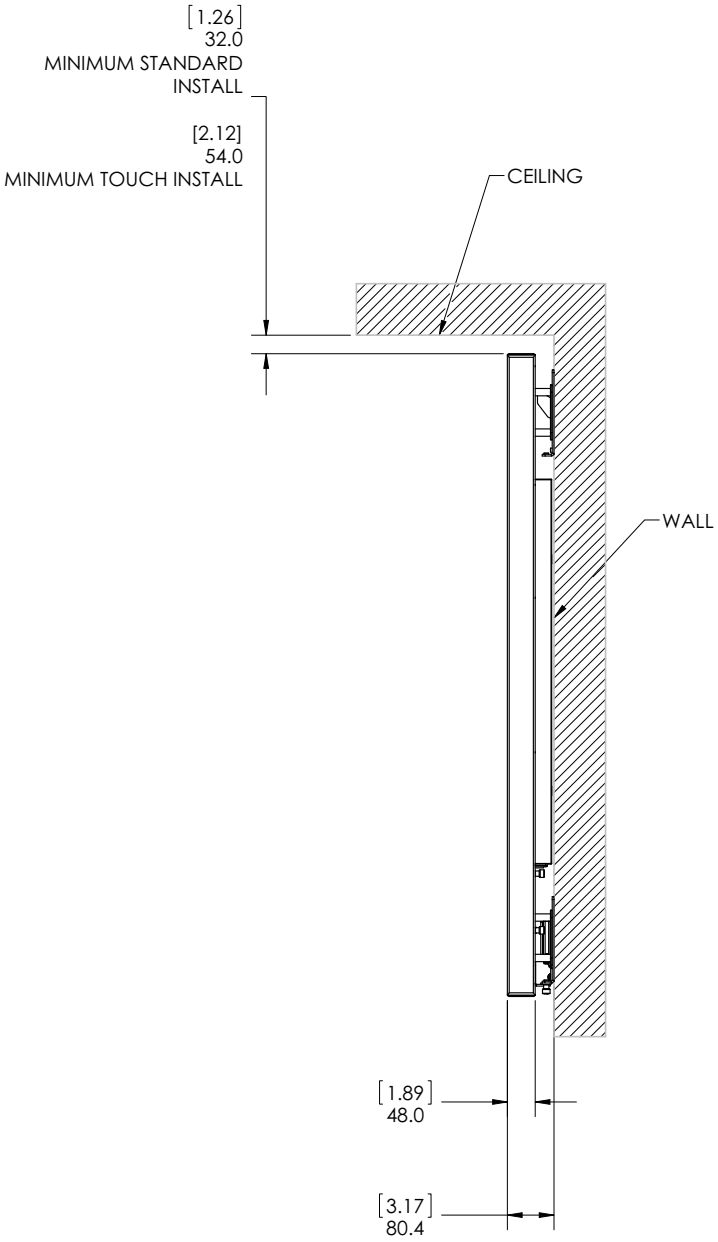
Landscape Wall Mounts - Front and Bottom Views



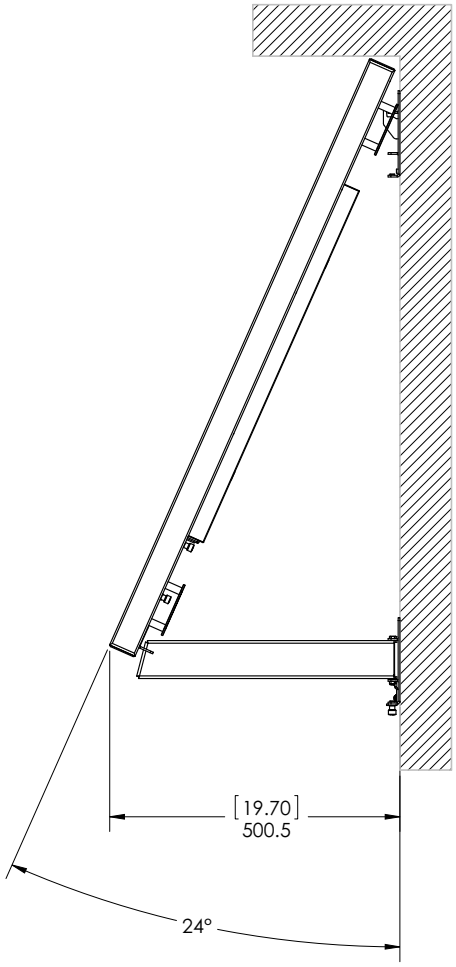


Note: Shown from the bottom of the panel.

Landscape Wall Mounts - Sides Views

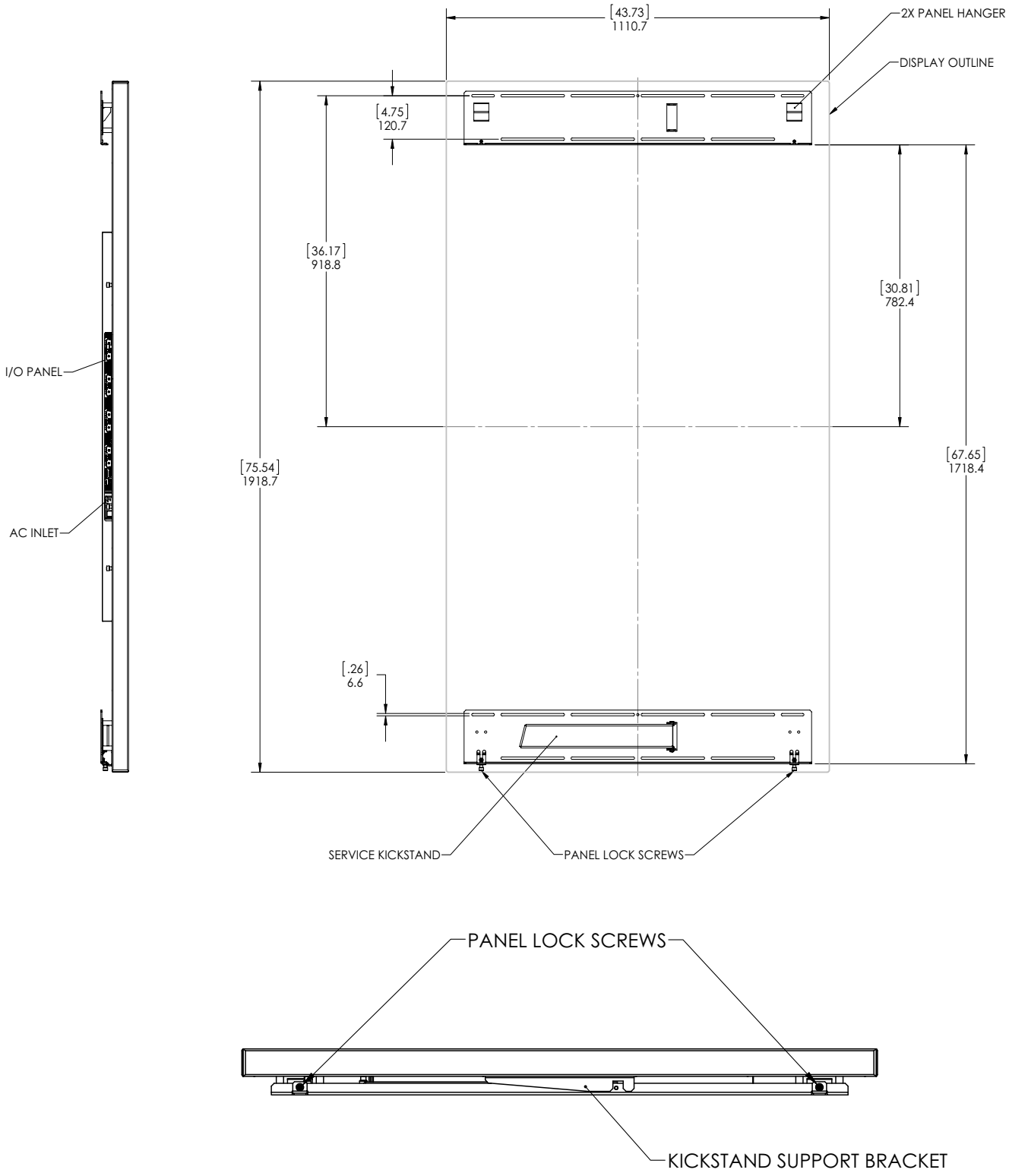


Installed position



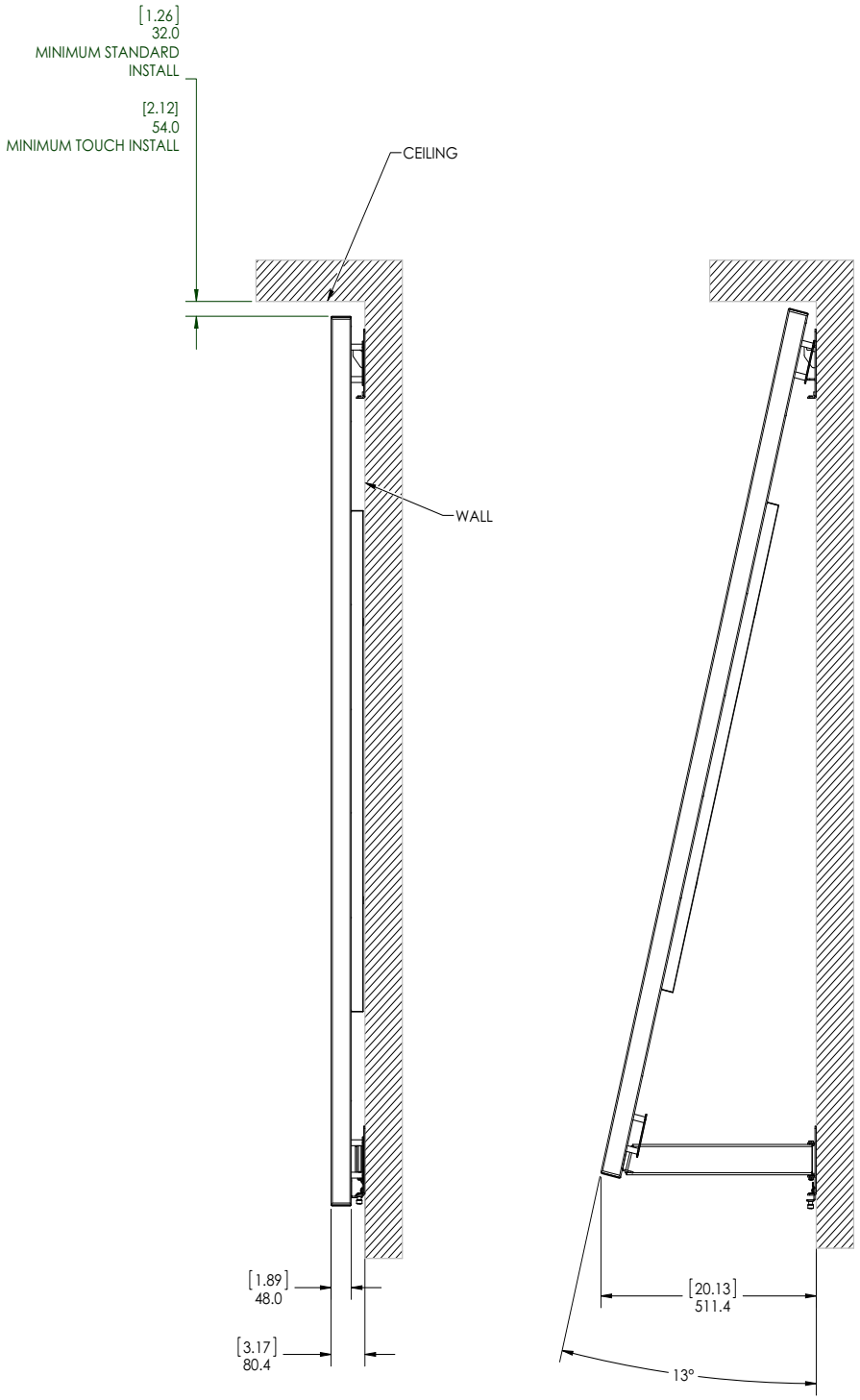
Service position - with kickstand supporting display

Portrait Wall Mounts - Front View



Note: Shown from the bottom of the panel.

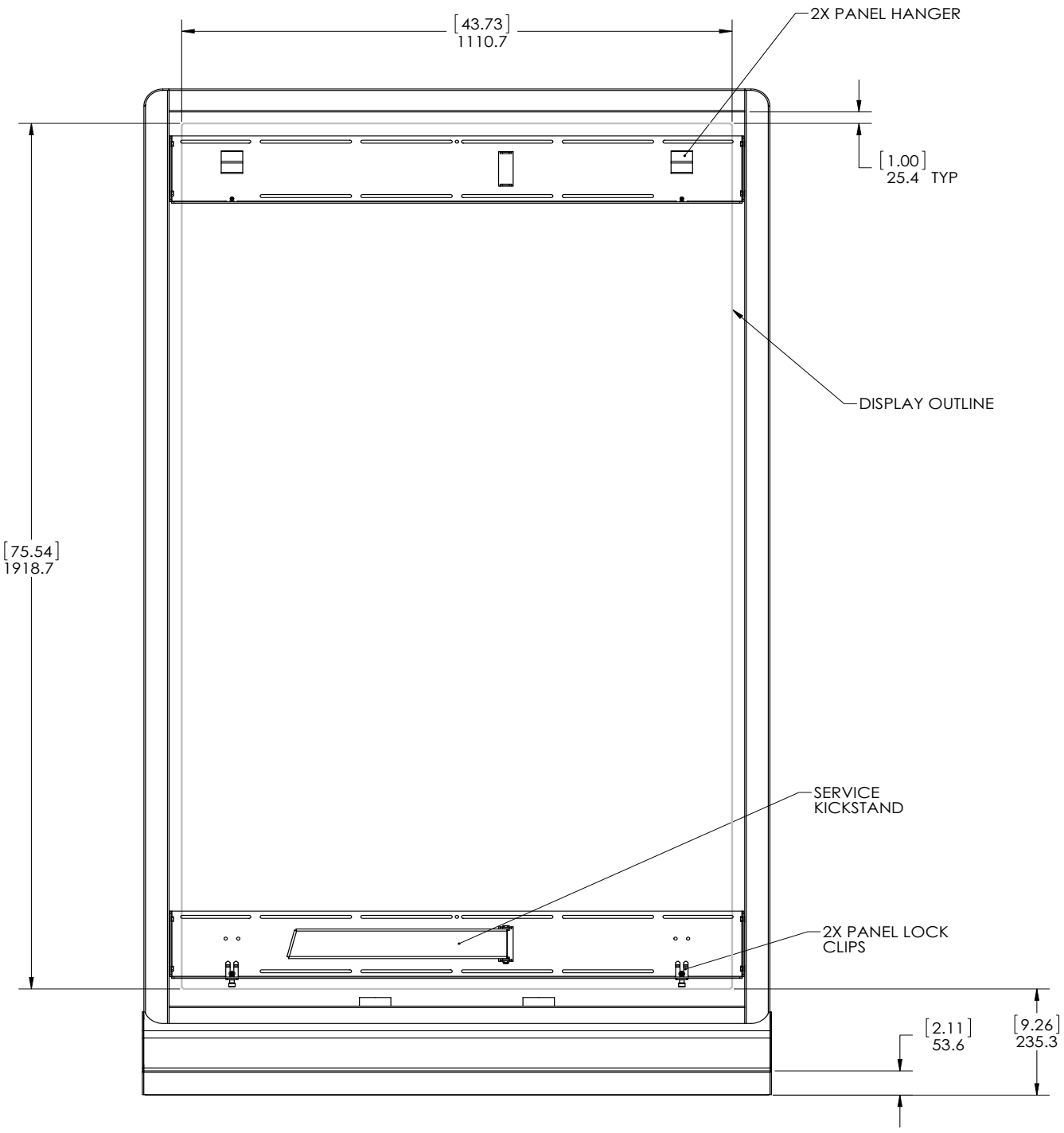
Portrait Wall Mounts - Sides Views



Installed position

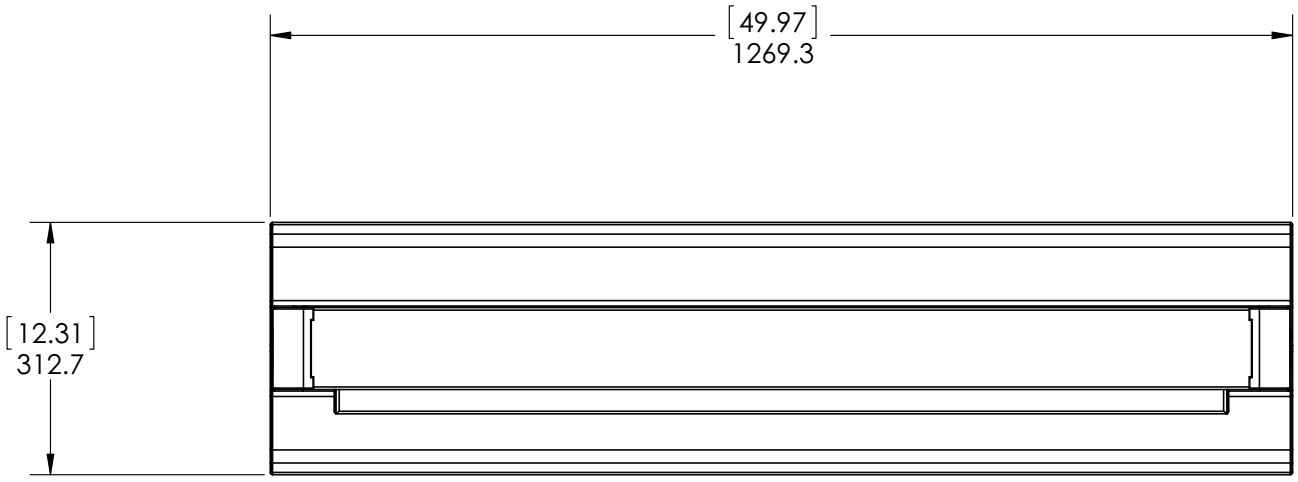
Service position - with kickstand supporting display

Optional Pedestal Mount - Front View

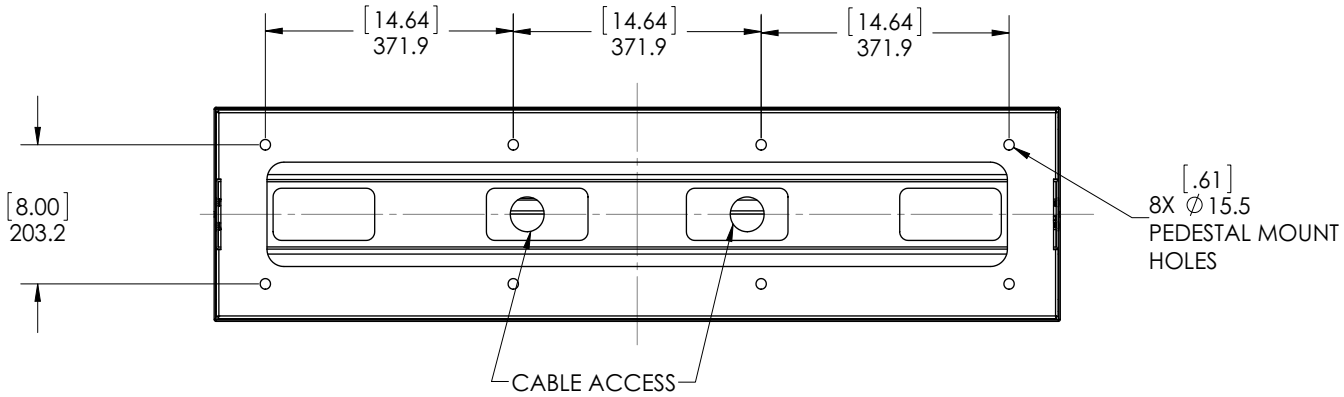


Note: This view shows the pedestal without the display mounted on it.

Optional Pedestal Mount - Top and Bottom Views

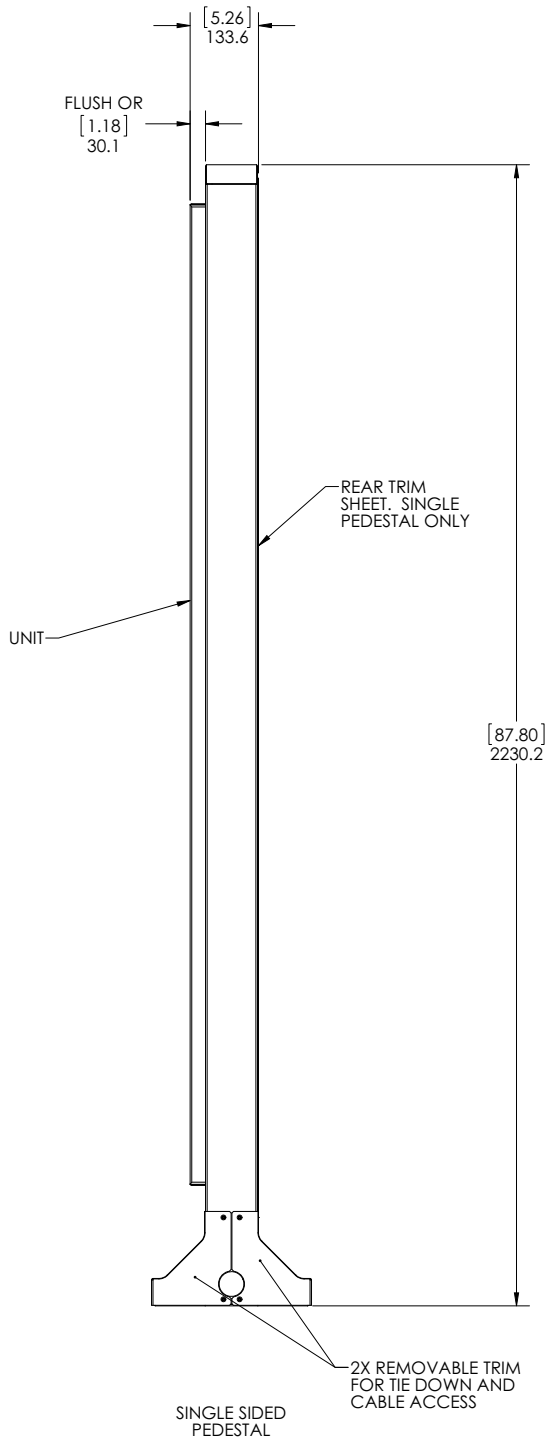


Note: This view is shown as if looking from above the top of the pedestal.

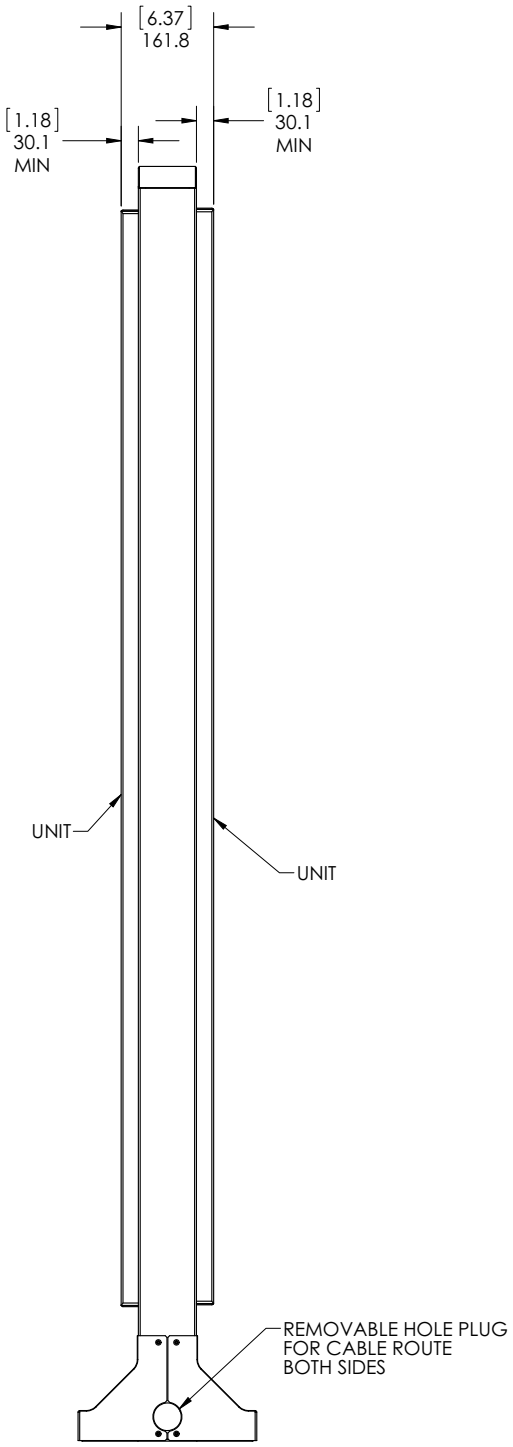


Note: This view is shown as if looking at the bottom of the pedestal.

Optional Pedestal Mount - Single and Double Sided



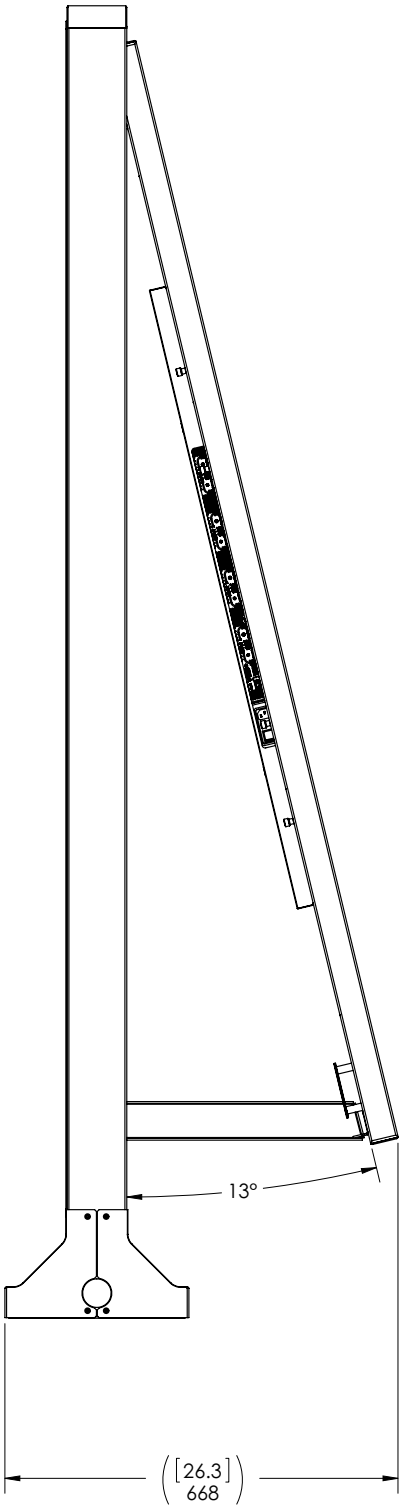
Single sided pedestal with display installed on one side



Double sided pedestal with display installed on each side

Optional Pedestal Mount - Double Sided in Service Position

The following drawing shows what the UltraRes display looks like when in service mode on a double sided pedestal.



Troubleshooting During Installation

This section includes troubleshooting information about different issues you may encounter during the installation process or after your display has been running for some time. If you are not able to solve your issue in this section, please contact Planar's Technical Support team for assistance.

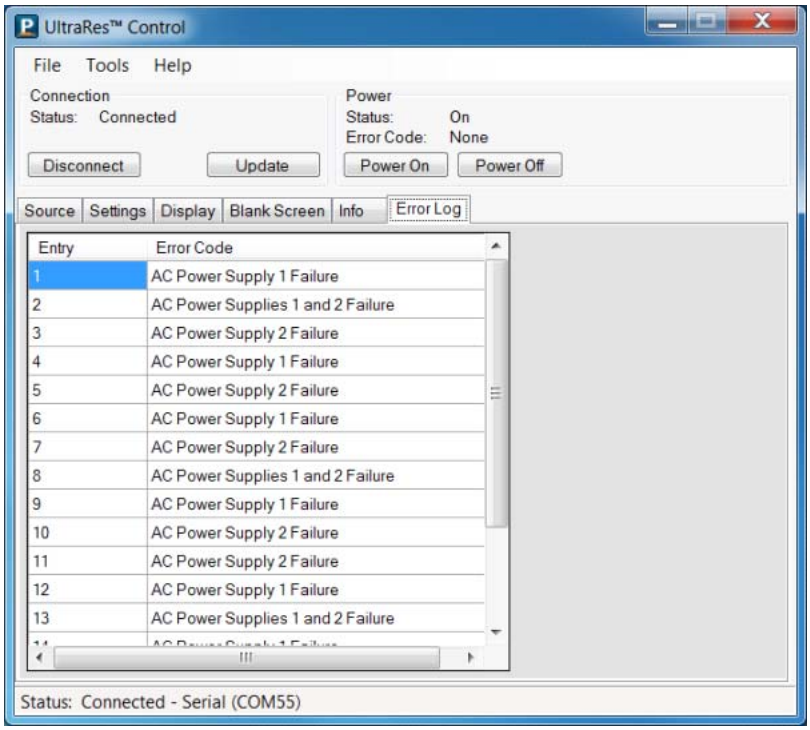
UltraRes LED Codes

The LED on the UltraRes display will show different things, depending on the state of the display.

System State	LED Behavior
Power Up	LED blinks on and off every 500 ms until it goes into standby mode.
Standby	After the LED is powered on, the LED will be red while in standby mode.
Error	LED blinks on for 2 seconds and off for 4 seconds.
Firmware Upgrade	LED blinks on for 1 second and off for 1 second.
Cool Down	Off

Error Codes in the UltraRes Control Software

To see the last 50 errors that have occurred, select the Error Log tab in the UltraRes Control software, as shown below. For a complete list of the error codes that may appear in the error log, see the table below.



Error Code	Meaning	Display Behavior and Solution
AC Power Supply 1 Failure AC Power Supply 2 Failure	One of the two AC power supplies is not working properly.	The backlight will be dimmed to a maximum setting of 10, which is necessary in order to reduce power consumption. **Solution**: Replace the failing power supply.
AC Power Supplies 1 and 2 Failure	Both power supplies are not working.	The issue could be either the AC power supplies or the standby power board. **Solution**: First check the AC power status cable to make sure it's connected. **Solution**: If you have checked the connections and both power supplies are still not working, we recommend replacing the entire power tray.

Error Code	Meaning	Display Behavior and Solution
DC Power Supply Failure	One of the DC-DC converters on the main board of the display has failed.	The display will not start up if this occurs. **Solution**: The main board needs to be replaced.
FPGA Initialization Failure	One of the FPGAs on the main board did not start up correctly.	There are two possible causes: one of the FPGAs has corrupt code or is damaged. **Solution**: First check the FPGA status LEDs on the main board. If one is not blinking, that FPGA didn't start up. The FPGA code may need to be programmed again. **Solution**: If reprogramming an FPGA doesn't work, it is likely the FPGA is damaged. If this is the case, the main board needs to be replaced.
Calibration EEPROM Failure	The main board could not communicate with the calibration EEPROM.	It is likely that the calibration EEPROM cable is disconnected. **Solution**: Connect the EEPROM cable.

Symptoms, Possible Causes and Solutions

Below are different symptoms that you might encounter as you install your UltraRes display. First look at the different symptoms to see if you can find your issue. And then look at the possible cause and try the suggested solution(s). If you still are not able to resolve your issue, please contact Planar's Technical Support Department.

Symptom: Can't Get PC to Output 4K @ 24/30Hz

Possible Cause

Your graphics card may not support a 4K output.

Solution

Make sure that your graphics card can support a 4K output. See "Supported Graphics Cards" on page 14 for a list of the current graphics cards that Planar supports for the UltraRes display.

Solution

Confirm that you are using a DisplayPort output. You can't use a DisplayPort-to-HDMI adapter to output 4K content.

Solution

Make sure you are using a high-speed HDMI cable. Standard HDMI cables might work but are not guaranteed.

Solution

Verify that the selected **EDID Type** radio button in the UltraRes Control software is **4K Preferred**. If you change the EDID setting, you may need to disconnect and reconnect the cable.

Note: You can also change the **EDID Type** setting on the Advanced Setup page of the Remote Monitoring software.

Symptom: Can't Get PC to Output 4K @ 60Hz

Solution

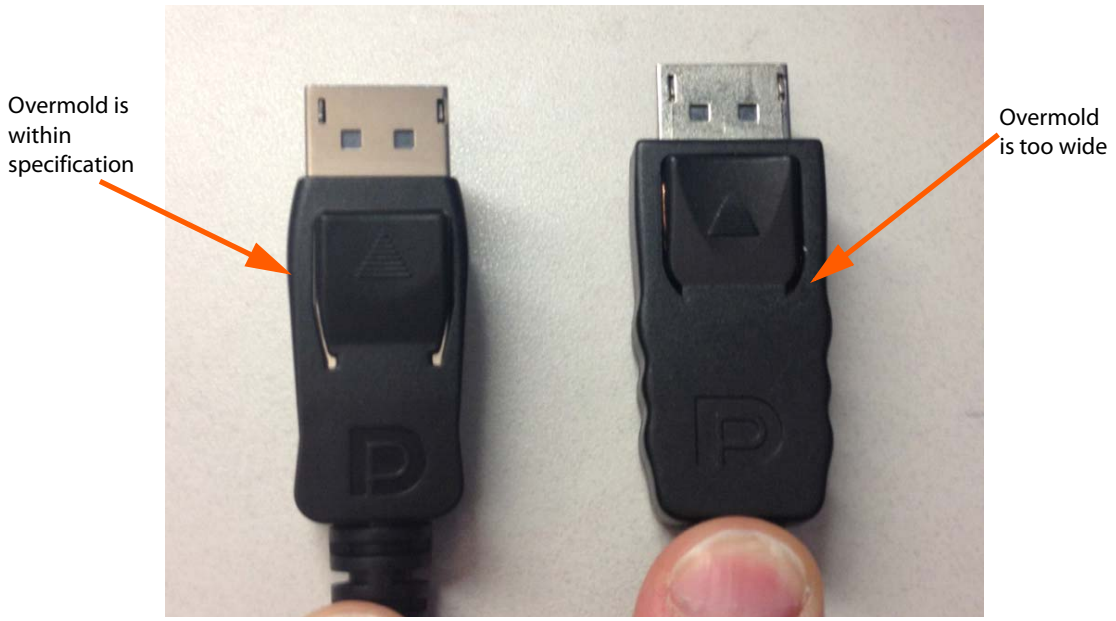
Change the Input Source setting to one of the other quadrant inputs. For example, if you are using HDMI 1-4 and the current Input Source is HDMI 1, change it to HDMI 2.

Possible Cause

The connector overmold is too large, which can cause the pins not to contact properly on some cards.

Solution

If using DisplayPort, make sure the connector overmold isn't too large.



Symptom: My Scheduled Network Power On/Off Settings Aren't Working

Possible Cause

The Standby Mode setting in the UltraRes Control software may not be set to Fast Startup. If the Standby Mode is not set to Fast Startup, the LAN module power will be disabled in standby. Also, when then scheduler powers off the system, it won't be able to power back on later if Standby Mode is set to Low Power.

Solution

Make sure Standby Mode is set to Fast Startup in the UltraRes Control software. See "Standby Mode" on page 46 for more information.

Symptom: IR Isn't Working Properly

Possible Cause

The wired IR module may not be fully connected.

Solution

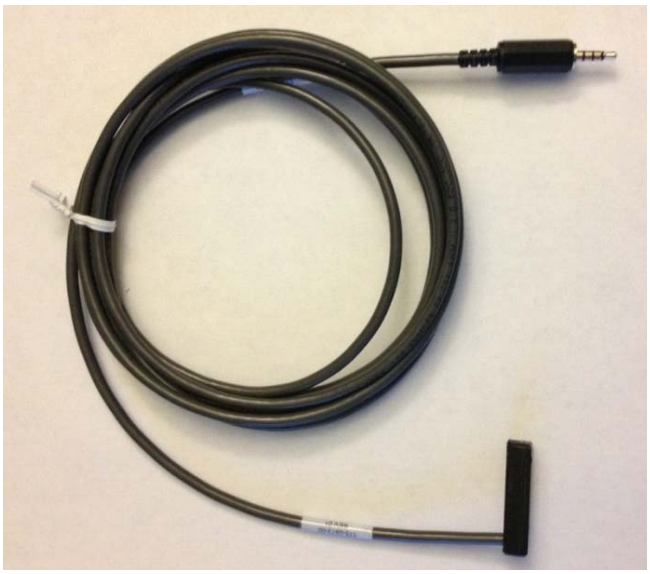
Make sure the IR is fully connected by pressing hard to unsure it is inserted as far as possible.

Possible Cause

The UR8450 wired IR module cable is not being used.

Solution

Make sure that the UR8450 wired IR module cable. See "Connecting the Wired IR Module" on page 30 for more information.



Accessing Planar's Technical Support Website

1. Go to www.planarpartners.com
2. Once you enter your login and password, you can access downloadable utility software, new firmware, user manuals, and service manuals.

Downloading Additional Documentation and Firmware

Some of the other documents for the UltraRes 4K professional display, which are or will be available on www.planar.com.

Downloading Utility Software

1. Go to www.planarpartners.com.
2. Enter your login and password information.
3. Navigate to the section that contains software updates and then look for Planar UltraRes.
4. From the list of available software, click on the tool you need.

Regulatory Information

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

Declares that the products Model Numbers: Planar UR8450-3D, UR8450-LX, UR8450-MX

Conforms with the provisions of:

Council Directive 2004/108/EC on Electromagnetic Compatibility;

EN55022:2010 Radiated and Conducted Emissions from IT Equipment

EN55024:2010 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:

EN60950:2006+A11+A1+A12 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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