

# OPERATION MANUAL DEDICATED VIDEO INTERFACE SERIES



**IN2022R High Resolution Video Interface  
for VGA and MAC Computers**





## Installation and Safety Instructions

### For Models without a Power Switch:

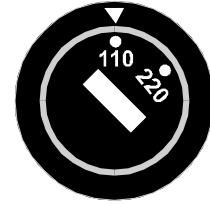
The socket outlet shall be installed near the equipment and shall be accessible.

### For Models with 110 / 220V Power Selector:

**Caution:** Before applying power to this unit, the voltage selector must be set to the appropriate setting to match local A/C line voltage. Improper setting of the voltage selector may cause damage to the unit and create a potential fire hazard.

The voltage selector is a round switch located next to the A/C power input connector which looks like this:

Using a straight slot screwdriver or small coin, rotate the selector to the correct position so that the arrow lines up with 110 or 220 as appropriate for local power line voltage as indicated in the chart below:



Local A/C Voltage	Voltage Selector Setting
110 ~ 120 VAC	110
220 ~ 240 VAC	220

### For all Models:

No serviceable parts inside the unit. Refer service to a qualified technician.

### For Models with Internal or External Fuses:

For continued protection against fire hazard, replace only with same type and rating of fuse.

### For IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:

**Caution:** Double pole / neutral fusing.

### For all Models with Integral Lithium Battery:

**Caution:** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



## Instructions d'installation et de sécurité

### Pour les modèles sans interrupteur de courant:

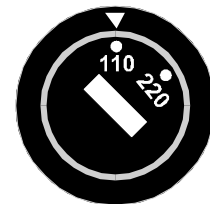
La prise de courant d'alimentation sera installée près de l'équipement et sera accessible.

### Pour les modèles avec un sélecteur d'alimentation 110V/220V:

**Attention:** Avant de connecter l'appareil au circuit d'alimentation, le sélecteur de courant doit être positionné sur la sélection appropriée correspondant au voltage du circuit de courant alternatif local. Une mauvaise sélection peut engendrer des dommages à l'appareil et créer un danger d'incendie.

Le sélecteur d'alimentation est un commutateur rond positionné près du connecteur d'alimentation. Il se présente comme suit:

A l'aide d'un tourne-vis plat ou d'une pièce de monnaie, le sélecteur peut être tourné dans la position adéquate en veillant que la flèche corresponde avec 110 ou 220, en fonction de la valeur du circuit de courant local. (Voir tableau ci-dessous)



Circuit local AC	Position Sélecteur
110 ~ 120 VAC	110
220 ~ 240 VAC	220

### Pour tout les modèles:

Pas de composants à entretenir à l'intérieur. Confiez toute réparation à un technicien qualifié.

### Pour les modèles équipés de fusibles internes ou externes:

Afin d'éviter tout danger d'incendie, ne remplacer qu'avec le même type et la même valeur de fusible.

### Pour IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:

**Attention:** Double pôle / fusible au neutre.

### Pour tout les modèles avec une batterie au lithium interne:

**Attention:** Danger d'explosion si la batterie est incorrectement remplacée. Ne remplacez la batterie qu'avec le même modèle, ou avec un modèle recommandé par le constructeur. Traitez les batteries usagées selon les instructions du fabricant, ou selon les normes écologiques en vigueur.



## Installations und Sicherheitshinweise

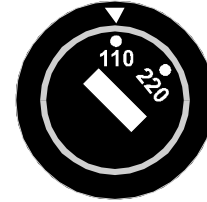
### Für Geräte ohne Netzschalter:

Die Netzsteckdose soll in der Nähe des Gerätes installiert und frei zugänglich sein.

### Für Geräte mit 110 / 220V Spannungswähler:

**Achtung:** Bevor Sie dem Gerät Spannung zuführen, muß der Spannungswähler entsprechend der Spannung des lokalen Wechselspannungsnetzes eingestellt werden. Die falsche Stellung des Spannungswählers kann eine Beschädigung des Gerätes und möglicherweise ein Feuer verursachen.

Der Spannungswähler ist ein runder Schalter in der Nähe der Netzeingangsbuchse mit folgendem Aussehen:



Drehen Sie den Wähler mit einem normalen Schraubenzieher oder einer kleinen Münze so, daß der Pfeil auf die 110 oder 220 zeigt, entsprechend der Spannung Ihres lokalen Netzes wie hier angezeigt:

Lokale Netzwechselspannung	Stellung des Spannungswählers
110 ~ 120 V	110
220 ~ 240 V	220

### Für alle Geräte:

Keine Wartung innerhalb des Gerätes notwendig. Reparaturen nur durch einen Fachmann!

### Für Geräte mit interner oder externer Sicherung:

Für dauernden Schutz gegen Feuergefahr darf die Sicherung nur gegen eine andere gleichen Typs und gleicher Nennleistung ausgewechselt werden.

### Für IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:

**Achtung:** Allpolige Absicherung

### Für alle Geräte mit eingebauter Lithium Batterie:

**Achtung:** Explosionsgefahr bei falschem Batterieeinsatz. Batterie nur ersetzen durch den gleichen oder entsprechenden Typ wie vom Hersteller empfohlen. Entsorgung verbrauchter Batterien nur nach den Anweisungen des Herstellers.



## Instalacion E Instrucciones de Seguridad

### Modelos Sin Interruptor:

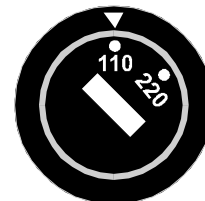
La conexión debe ser instalada cerca del equipo y debe ser accesible.

### Modelos con Selector de Voltaje de 110/220V:

**Precaución:** Antes de operar esta unidad, el selector de voltaje debe instalarse de forma que corresponda a la línea de voltaje local. Instalación inadecuada del selector de voltaje puede causar daño a la unidad y originar un incendio.

El selector de voltaje es un cambiavía redondo localizado cerca de la conexión eléctrica, como se ve en el dibujo:

Use un destornillador común o una moneda pequeña, mueva el selector a la posición correcta, de forma que las flechas indiquen 110 o 220 de acuerdo con el voltaje local, como está indicado a continuación.



Voltaje Local A/C	Selector de Voltaje
110 ~ 120 VAC	110
220 ~ 240 VAC	220

### Para Todos Los Modelos:

Dentro de la unidad, no hay partes para reparar. Llame un técnico calificado.

### Modelos con Fusibles Internos o Externos:

Para prevenir un incendio, reemplace solo con el mismo tipo de fusible.

### Modelos IN2001 / IN3234 / IN3236 / IN3502 / IN3504 / IN3506 / IN3562 / IN3564 / IN3566 / IN3572 / IN3574 / IN3576:

**Precaución:** Double Pole / Fusible Neutral.

### Modelos con Batería de Lithium Interna:

**Precaución:** Peligro de explosión si la batería es reemplazada incorrectamente. Reemplace solamente con la misma clase de batería, o una equivalente recomendada por el fabricante. Deseche las baterías usadas de acuerdo con las instrucciones del fabricante.

**CE COMPLIANCE**

All products exported to Europe by Inline, Inc. after January 1, 1997 have been tested and found to comply with EU Council Directive 89/336/EEC. These devices conform to the following standards:

EN50081-1 (1991), EN55022 (1987)

EN50082-1 (1992 and 1994), EN60950-92

**Shielded interconnect cables must be employed with this equipment to ensure compliance with the pertinent Electromagnetic Interference (EMI) and Electromagnetic Compatibility (EMC) standards governing this device.**

**FCC COMPLIANCE**

This device 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 against harmful interference when 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 equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

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## PRODUCT OVERVIEW

### DESCRIPTION

The **IN2022R** is a high performance, dual-function computer video interface for VGA-type and MAC II-type video signals. Like other **INLINE** interfaces, the **IN2022R** carries out three primary functions. This first function is signal splitting as the interface allows for the simultaneous connection and viewing of both the computer's local monitor and a second display device such as a large data monitor or data projector. The second function is physical interfacing and adaptation. The **IN2022R** connects to VGA PC compatible computers or Macintosh family computers with 15-pin D video connectors and provides output signal on standard BNC connectors. The final function is electronic interfacing. The interface accepts video in a wide variety of sync formats and converts the signal to RGsB, RGSB, or RGBHV as required by the display device, cabling, and video routing system.

### PRODUCT FEATURES

- **Universal Compatibility for VGA and MAC II Computers-** The **IN2022R** was designed as the ultimate VGA / MAC video interface, offering input compatibility with the following standards at resolutions up to 2000 x 2000:
  - VGA Type     VGA, SVGA, XGA, XGA2
  - MAC II Type  MAC II, Quadra, Centris, Performa, Power MAC, Daystar MP, Radius
- **Exceptional Video Performance** - Featuring advanced video amplification circuitry, the **IN2022R** offers video bandwidth in excess of 230 MHz, ensuring that even the highest resolution VGA and MAC modes will be interfaced with complete signal clarity.
- **Buffered Local Monitor Output** - Ensures highest quality display on the local monitor. This buffered output provides the flexibility to place the local monitor anywhere since the local monitor cable may be extended if necessary.
- **Dual Outputs** – With two sets of BNC connectors for output, the **IN2022R** can drive two data displays in addition to the local monitor.
- **Automatic Output Sync Format Selection** - The **IN2022R** senses the number of cables connected to the output at power up and automatically sets the output sync format to RGBHV, RGSB or RGsB. LED indicators located next to the Green, H/Comp Sync, and V Sync output BNCs provide clear visual confirmation of the current output sync format.
- **Flexible Monitor Emulation** - The interface is set at the factory to pass all sense pins through to the local monitor, ensuring that the graphics card sees the sense signals from the attached monitor and sets itself to the appropriate resolution, refresh rate or frequency. For applications where the **IN2022R** will be used without a local monitor, dip switches are provided to emulate virtually any monitor.
- **Universal Power Supply** – An internal switch mode power transformer operates with line conditions worldwide. Compatible with 90 – 260 VAC; 47 – 63 Hz.
- **Multi-Step Sharpness Control** - optimized to provide maximum visible sharpness enhancement with high resolution video signals.

## INPUT COMPATIBILITY

The **IN2022R** will accept high resolution video signals from VGA video cards with a 15-pin HD connector or MAC II-type video cards with a 15-pin D video connector. Input signal compatibility parameters are listed below.

Video Signal:	Analog RGB Video
Connector:	VGA: 15-Pin HD female video port on computer MAC: 15-Pin D female video port on computer
Signal format:	RGsB, RGBS, RGBHV, RGBSHV, RGsBS, RGsBSHV
Horizontal Frequency Range:	20 KHz to 130 KHz
Vertical Refresh Rates:	30 Hz to 120 Hz

## OUTPUT COMPATIBILITY

The **IN2022R** outputs an analog RGsB, RGBS, RGBHV or Composite Monochrome signal on female BNC connectors. This output signal is compatible with high resolution data grade monitors and data / graphics projectors. PCs and MACs operate in several video modes encompassing a wide range of resolutions and scan rates, and many of the video signals from the newest models may have very high scan rates (60 KHz or more) and very high resolution (1280 x 1024 is common). The data projector or monitor must be compatible with the horizontal scan rate and vertical refresh rate of the computer's video signal. Please check the documentation for both the computer graphics card and the data display device to ensure compatibility.

### KEY CONCEPT



*The **IN2022R** is not a scan converter or encoder. This unit does not change the horizontal scan rate, resolution, or convert the signal to NTSC composite video. The display device connected to the **IN2022R** output must be compatible with the horizontal scan rate, vertical refresh rate and resolution of the workstation video signal.*

## INSTALLATION

Installation steps are listed below and outlined in Diagram 1 on page 5.

### **#1 Turn the computer and computer monitor off.**

Disconnect the computer monitor from the computer's video port.

### **#2 Check the Monitor Emulation dip switch settings on the bottom side of the IN2022R.**

**Using Local Monitor** - If you are using a local monitor (most installations) make sure that all dip switches in the box labeled MONITOR EMULATION are set to "0".

**No Local Monitor** - If you are not using a local monitor, gently set the dip switches using the Inline tool provided according to the chart found on page 7.

### KEY CONCEPT




*Check the Monitor Emulation chart and dip switch settings carefully. An improper setting of the emulation dip switches may lead to improper operation and could even result in severe damage to the computer video port or the monitor. If you are in doubt as to which monitor emulation to choose, set all the Monitor Emulation dip switches to "0" and connect a local monitor.*


**#4 Connect the IN2022R input cable to the computer's video port.**

The input cable is the 4' long "Y" cable permanently attached to the interface. Connect one of the connectors on this cable to the computer's video port as detailed below.

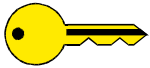
**PC Compatible Computers (VGA)**

Locate the video port on the computer, a 15-Pin HD connector which looks like this:  Connect the 15-Pin HD connector on the **IN2022R** input cable to the computer video port. **Do not connect anything to the MAC input connector (15-pin D).**

**MAC Computers**

Locate the video port on the computer, a 15-pin D connector which looks like this:  Connect the 15-Pin D connector on the **IN2022R** input cable to the computer video port. **Do not connect anything to the VGA input connector (15-pin HD).**

**KEY CONCEPT**



*Some MAC computers such as the PowerBook and PowerMAC A/V models have a proprietary connector which must be adapted to a standard 15-pin D video connector. This video port adapter is available from Apple distributors.*

*Some PowerBook models do not have a video output port. You must purchase a third-party video output adapter in order to provide a video signal for external video displays.*

**#5 Connect the local computer monitor (if present) to the appropriate LOCAL MONITOR OUTPUT on the IN2022R.** If you have no local monitor you must set the emulation dip switches (see page 7).

**#6 Connect the IN2022R output(s) to the RGB input on the display device(s).**

Using high quality video cables, connect the output BNCs on the **IN2022R** to the RGB input on your large screen monitor or data projector. The interface will automatically set the output sync format according to the number of cables you have connected to the output:

<b>Cables Connected to BNCs</b>	<b>Output Format</b>
RGB	RGsB
RGBS	RGBS
RGBHV	RGBHV

Cable selection is extremely important to the performance of any high resolution graphics display system, especially when using long cable runs. The following Inline cables are available in a variety of lengths from 6' to 100' (longer cables available by special order) and are recommended for all system connections:

**IN7000 Series** Standard Resolution Coax Cables - 3, 4 or 5 conductors

**IN7100 Series** High Resolution Coax Cables - 3, 4, or 5 conductors

**IN7200 Series** Ultra High Resolution Coax Cables - 3, 4 or 5 conductors

**#7 Connect the power cord to the IN2022R.**

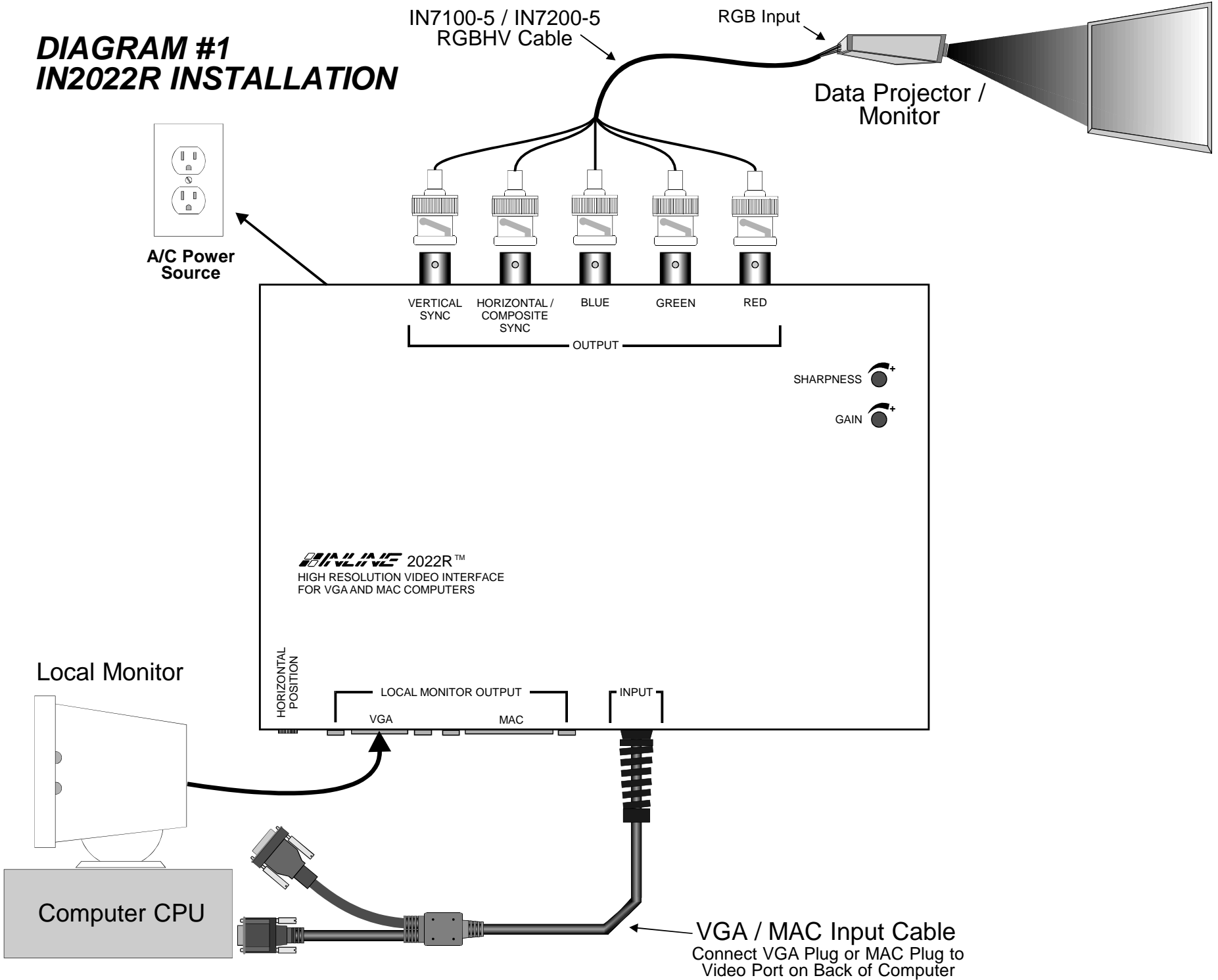
Connect a power cord to the interface power input module and then to an A/C power source.

**#8 Complete the installation by powering up the computer and computer monitor.**

If necessary, adjust the horizontal position control as detailed on page 6.

# DIAGRAM #1 IN2022R INSTALLATION

5



## EXTERNAL CONTROLS

Once you have installed the **IN2022R** as described in the previous section, operation is fully automatic. You may wish to make certain adjustments, however to optimize the interface for your computer video source and display device. All adjustments and settings described in this section are accessible via controls or dip switches on the top, bottom or side of the **IN2022R**.

### HORIZONTAL POSITION CONTROL

The horizontal position control is a small black knob located on the side of the **IN2022R** adjacent to the Local Monitor Output connectors. This control shifts the image to the left or to the right on the data display connected to the **IN2022R** output (the local monitor is not affected). With an adjustment range of 15 turns from stop to stop, the horizontal position control allows for very fine horizontal centering control.

Most data projectors and monitors have their own image centering controls, and it is possible for the display device's horizontal position control setting to interact with the **IN2022R** horizontal position control, resulting in a dark display, strange color reproduction or no image at all. The following procedure is recommended to ensure best results:

1. Adjust the **IN2022R** horizontal position control so a good quality image is displayed. Avoid any extreme settings or any setting which causes the displayed image to darken.
2. Adjust the display device horizontal position control until the image is centered as desired.
3. If the image appears dark or the colors are not properly displayed, fine tune the controls on both the display device and the **IN2022R** until the picture is centered and a good quality image is attained.

### Disabling the Horizontal Position Control

For some installations you may wish to disable the horizontal position control. The control may be enabled or disabled by flipping a dip switch located on the bottom of the **IN2022R**. Use the Inline adjustment tool to change dip switch settings. The factory default setting is horizontal position control enabled.

### SHARPNESS CONTROL / GAIN CONTROL

The Sharpness and Gain controls are located on the top of the interface in the upper right hand corner. Both controls feature recessed control pots to increase durability and help prevent accidental changes to their settings. To adjust the Sharpness or Gain controls, insert the Inline adjustment tool into the desired adjustment control and turn gently. Turn clockwise to increase the value and counter clockwise to decrease the value. These adjustment pots have a rotational range of just over half a turn.

#### Sharpness Control

This control may be used to enhance the visibility of fine details by increasing the sharpness of the displayed image. The factory default setting is minimum (no sharpness enhancement).

#### Gain Control

The Gain Control adjusts the output voltage of the Red, Green, and Blue outputs simultaneously, ensuring that gray scale is maintained. The Gain adjustment range is .7 in the minimum position and 1.3 in the maximum position. The factory default setting is 1.0 (unity gain).

## MONITOR EMULATION

### Using the IN2022R With a Local Monitor

Many computers use sense signals to sense whether a monitor is attached to the video port. If a monitor is attached, the computer makes the video port active and in the case of Macintosh type video cards, also sets resolution, horizontal frequency, and vertical refresh rate as appropriate for the monitor. Using factory default settings, the **IN2022R** passes all sense pins between the computer video port and the local monitor attached to the Local Monitor Output, ensuring that the computer can sense the attached monitor and set itself to an appropriate resolution and scan rate for that monitor. **The Monitor Emulation dip switches must all be set to “0” when using a local monitor. This allows all sense pins to pass through, ensuring proper operation of the graphics card and monitor.**

### Using the IN2022R Without a Local Monitor

The **IN2022R** design makes it easy to use the interface without a local monitor. Because the Local Monitor Output port is buffered, there is no need for a termination plug to terminate the video signals when used without a local monitor.

The **IN2022R** includes a bank of 10 dip switches on the bottom side of the interface for monitor emulation, permitting the interface to emulate virtually any type of monitor. By setting these switches to the appropriate positions, the user may emulate the appropriate sense signals, setting the video card to the desired frequency, refresh rate and resolution even without a local monitor.

If you are not using a local monitor, locate your workstation type and desired mode in the chart below (also shown on the bottom of the interface). If you are not sure of the exact mode to select for your computer, select the mode shown in bold since it is the most common mode. Using the Inline adjustment tool provided with the interface, carefully set the dip switches to the appropriate settings. ***Check the Monitor Emulation chart and the IN2022R dip switch settings carefully. An improper setting of the emulation dip switches may lead to improper operation and could even result in severe damage to the computer video port or the monitor. Some modes listed below may not be supported by certain workstations / graphic cards.***

### Monitor Emulation Chart

Make / Mode	Dip Switch Settings
PC Compatibles	Switch 12345678910
VGA Color (also SVGA, XGA, XGA2)	<b>0100000000</b>
<b>MAC II Type Video Cards</b>	
12" RGB Monitor - 512 x 384 / 24.5 KHz	1010000000
13"/14" RGB Monitor - 640 x 480 / 35 KHz	<b>1000000000</b>
15" RGB Monitor - 640 x 870 / 68.9 KHz	0100000000
16" RGB Monitor - 832 x 624 / 49.7 KHz	0000001100
19" RGB Monitor - 1024 x 768 / 60.24 KHz	0000000011
21" RGB Monitor - 1152 x 870 / 68.7 KHz	1110000000
14"/15" Multi Scan Monitor - 640 x 480 or 832 x 624	1000110101
16"/17" Multi Scan Monitor - 640 x 480, 832 x 624 or 1024 x 768	1000010101
20"/21" Multi Scan Monitor - 640x480, 832x624, 1024x768, 1152x870	1000100101
15" Full Page Monochrome Monitor - 640 x 870 / 68.9 KHz	0110000000
Dual Page 21" Monochrome Monitor - 1152 x 870 / 68.7 KHz	0010000000
VGA / SVGA Emulation - 640 x 480 or 800 x 600 / 31.5 KHz or 35.2 KHz	0000110000

## INTERNAL CONTROLS

The controls needed for most installations and typical daily operation are all located on the exterior of the interface. A few controls for advanced options have been placed inside the unit. These controls are designed for qualified technicians and should not be adjusted by the casual user.

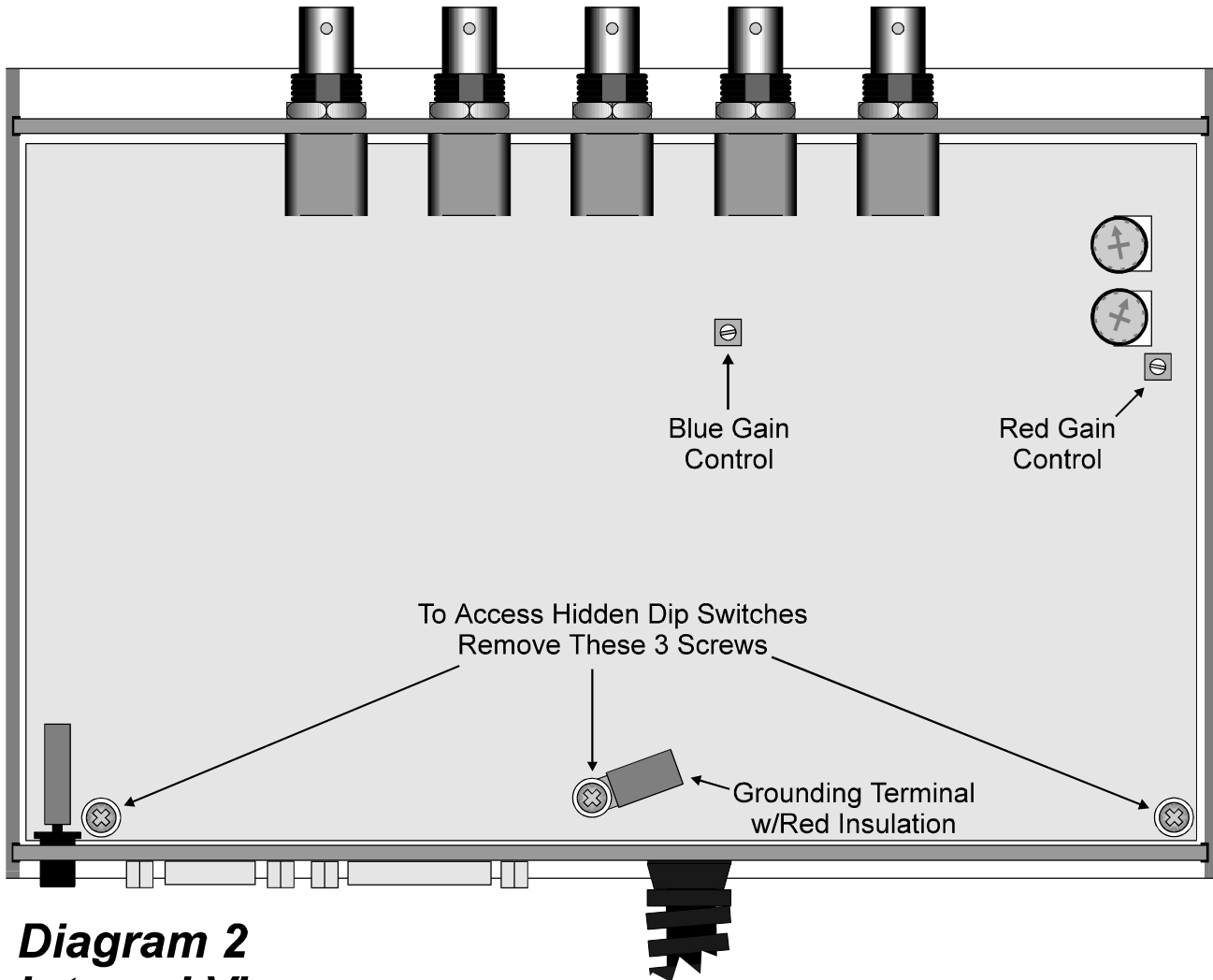
### KEY CONCEPT



*Internal control adjustment requires the IN2022R case to be opened, making the interface's sensitive electronic components vulnerable to physical damage or damage from static discharge. The case opening procedure as outlined below should only be carried out by qualified technicians located in an approved field force protective workstation. Physical damage to internal components and damage caused by static discharge is not covered under warranty.*

### OPENING THE IN2022R CASE

1. Remove power from the interface and place the unit in a static free environment to ensure protection to the internal components.
  2. Using a small Phillips screwdriver, remove the four screws on the sides of the interface. Pull the top half of the interface case straight up.
  3. If you are only adjusting the Red and Blue gain controls no further disassembly is required. Make adjustments and reassemble the interface as described in steps 10 & 11. If you need to change the internal dip switch settings, continue with the steps below.
- 
4. Remove the three Phillips screws (located in the corners and center on the input cable side of the interface) which hold the printed circuit board (PCB) to the lower case. To assist in reassembly, make note of the red ground strap terminal on the center screw.
  5. Lift the PCB / Input / Output connector assembly away from the lower case. Flip this assembly over to expose the dip switches on the underside of the PCB and place the assembly on a clean, flat surface, making sure that nothing touches the components on the PCB.
  6. Make dip switch adjustments as necessary.
  7. Flip the PCB assembly back over and place it back in the bottom half of the interface case, aligning the front and rear metal panels on the PCB assembly with the channels in the case bottom.
  8. Replace the 3 Phillips screws. Be sure to thread the center screw through the red grounding strap terminal before placing it in the PCB.
- 
9. Replace the top metal case, carefully aligning the top and side metal with the front and rear metal panels on the bottom case.
  10. Replace the 4 side screws.



**Diagram 2**  
**Internal View**

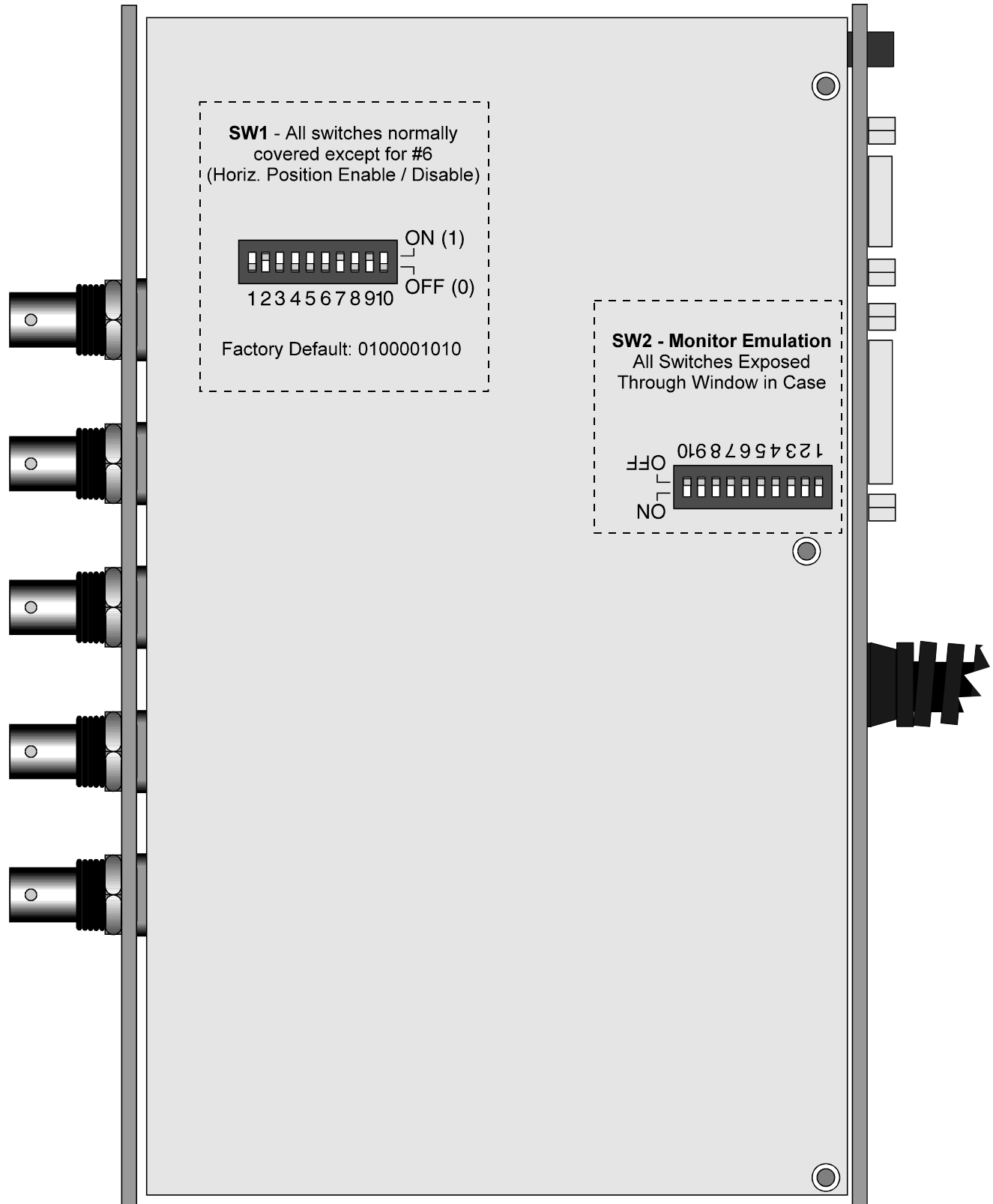
### BLUE AND RED GAIN CONTROLS

The locations of the Blue Gain control (R182) and Red Gain control (R145) are shown in Diagram 2 above. These controls have been precisely calibrated at the factory to provide the same gain characteristics as the Green circuit.

*Any adjustments made to the Blue or Red gain controls may adversely affect gray scale reproduction and color accuracy, therefore, these controls should only be adjusted by qualified technicians having the necessary test equipment. Since the gain pots must be adjusted with power applied to the interface, great care must be taken to avoid touching any exposed circuit paths and to avoid creating short circuits between adjacent components. The Blue and Red gain controls are light duty adjustment pots and should be carefully adjusted using a small plastic alignment tool.*

- To increase the gain turn the adjustment pot counterclockwise.
- To decrease the gain turn the pot clockwise.

### Diagram 3 - Dip Switches



## INTERNAL DIP SWITCHES

In order to simplify operation, the **IN2022R** was designed so that dip switches needed by most users are exposed through windows in the case metal while reserved switches and other dip switches for highly specialized functions are covered. This helps prevent operational problems which might occur if the dip switches were set to unusual settings but also provides the flexibility so that advanced technicians may fully customize the interface settings if necessary. The **IN2022R** will function properly for the vast majority of installations using the factory default dip switch settings for all hidden dip switches.

*Hidden dip switches must only be adjusted by qualified technicians as this requires the interface to be opened and disassembled, raising the possibility of physical damage or static discharge damage to sensitive internal components (not covered under warranty).*

The **IN2022R** has two banks of dip switches as described below and shown in Diagram 3 on the preceding page. Dip switches are made of thin, soft plastic and should be gently adjusted using the Inline alignment tool provided or using another small tool.

### **SW1 - Output Sync / Horizontal Position Control      Factory Default Settings: 0100001010**

These dip switches are normally all covered except for #6.

<b>Switch Number</b>	<b>Function When Set to ON (1)</b>
1	N/C
2	Green Out (set opposite of Switch #3)
3	Monochrome Out (set opposite of Switch #2)
4	Manual Output Sync - RGBS (only works when #7 is set to OFF)
5	Manual Output Sync - RGSB (only works when #7 is set to OFF)
6	Horizontal Position Control Disable
7	Automatic Output Sync (Set to OFF for Manual Output Sync Select)
8	N/C
9	Reserved
10	N/C

### **Select RGB Output or Composite Monochrome Output**

RGB Output (factory default)	#2 ON, #3 OFF
Composite Monochrome Output on the Green Connector (RGB summed together, Sync is located on the H or H/V Sync Connectors)	#2 OFF, #3 ON

### **Setting Output Sync Format**

The **IN2022R** with factory default settings automatically sets the output sync according to the number of cables connected to the output BNCs. A green LED located next to three of the output BNCs indicates that sync is present and also indicates the current sync format. If desired, you may manually force the interface into a specific output mode. Please note that when the interface is set for manual sync selection, 2 or 3 of the output LED indicators will always be on.

Automatic Output Sync Selection (factory default)	#7 ON
Manual Output Sync Selection	#7 OFF
Select RGBHV Output Sync	#4 OFF, #5 OFF
Select RGBS Output Sync	#4 ON, #5 OFF
Select RGSB Output Sync	#4 OFF, #5 ON

**SW2 - Monitor Emulation Switches****Factory Default Settings: 000000000**

These dip switches are normally exposed. Setting a switch to ON (1) affects a specific pin (or pins) on the input connector for purposes of monitor emulation. Setting a switch to OFF (0) passes the pin through the **IN2022R**. If you don't know what to do, set all dip switches to 0. See pages 7 & 8 for detailed instructions.

**PIN OUTS - INPUT CABLE / LOCAL MONITOR OUTPUTS**

Pin	15-HD VGA	15-D MAC	Pin	15-HD VGA	15-D MAC
1	Red Signal	Red Ground	9	N/C	Blue Signal
2	Green Signal	Red Signal	10	Ground	Sense Pin 3
3	Blue Signal	Composite Sync	11	ID Bit 0	C & V Sync Grounds
4	ID Bit 2	Sense Pin 1	12	ID Bit 1	Vertical Sync
5	N/C	Green Signal	13	Horizontal Sync	Blue Ground
6	Red Ground	Green Ground	14	Vertical Sync	H. Sync Ground
7	Green Ground	Sense Pin 2	15	ID Bit 3	Horizontal Sync
8	Blue Ground	N/C			

**TROUBLESHOOTING****The display device connected to the RGB output has a bad/scrambled image.**

**Solution 1:** The display device connected to the output of the **IN2022R** may not be compatible with the computer output. While VGA runs at 31.5 KHz, SVGA modes may run as high as 60 - 90 KHz! MACII type computers have horizontal scan rates ranging from 24.48 to 68.9 KHz.

**Solution 2:** The output cable may have a bad sync line. Try running the sync through another cable.

**Solution 3:** The **IN2022R** output sync format may not be compatible with the display device.

**The output image is very dark.**

**Solution:** The horizontal position control may be set off to an extreme position or may be interacting poorly with the horizontal position control on the display device. Follow the horizontal position adjustment procedure listed on page 6.

**I have a PC and MAC connected to the IN2022R simultaneously and the image is scrambled.**

**Solution:** You may not connect both a PC and a MAC simultaneously! Connect one or the other.

**The output image is missing a color.**

**Solution:** Possibly the output RGB cable is bad. Try switching connections on the output to verify that the bad color's cable is OK (*Example:* If there is no red, try running the green output through the red cable and see if green is displayed or not.)

**I'm using a 16" RGB monitor but my MAC is not booting up in the right video resolution mode.**

**Solution:** The monitor emulation dip switches on the bottom of the **IN2022R** are probably forcing the computer into the wrong mode. When using a local monitor, set all monitor emulation dip switches to 0 (page 7).

**I'm using a laptop computer with the IN2022R and not getting any signal from the interface.**

**Solution:** You must set the **IN2022R** monitor emulation switches (page 7) and connect it to the laptop before powering up the laptop. This tells the laptop to make the video port active.

## SPECIFICATIONS

<b>Input</b>	
Connector type	VGA: 15-Pin HD male MAC: 15-Pin D male
RGB Video Signals	Analog, 0.7 Vp-p Nominal
Input Impedance	75 Ohms
Sync Signals	TTL compatible
Signal Format	RGBHV, RGBS, RsGsBs, RGSB
Horizontal Scan Range	15.0 KHz - 135.0 KHz
Vertical Scan Range	30 Hz - 120 Hz
<b>Local Monitor Output</b>	
Connector Type	VGA: 15-Pin HD male MAC: 15-Pin D male, buffered output, sync format same as input
<b>Data Display Outputs</b>	
Connector Type	2 Sets of (5) BNC female
Output Signal Formats	RGBHV, RGBS, RGSB, Composite Monochrome
RGB Signals	Analog Video, 75 ohm impedance
Bandwidth	230 MHz @ -3 dB
Rise and Fall Times	1.5 nano seconds
Gain	Adjustable from .7 - 1.3
Sync Signal	H, V and S: 5V unterminated and 2Vp-p 75 ohm terminated Sync on Green: 0.3 Vp-p 75 Ohm terminated
Horizontal Pulse Width	30 KHz - 40 KHz: 1.5 $\mu$ Sec >40 KHz: 0.7 $\mu$ Sec
Vertical Pulse Width	Same as the input signal + 11 $\mu$ Sec
<b>Controls</b>	
External	Horizontal Position Control, Video Gain, Sharpness, Input Computer Select, Monitor Emulation
Internal	Red Gain, Blue Gain, Hidden Dip Switches
<b>Dimensions</b>	
Size	2.75" H x 9" W x 6.85" D
Product Weight	2 lb.
Shipping Weight	5 lb.
<b>Power</b>	
Power Supply	Internal Switch Mode: 90 - 260 VAC; 47 - 63 Hz
Power Consumption	14.5 Watts
<b>Regulatory Compliance</b>	
Safety	UL 1950, 3 <sup>rd</sup> Ed.; CE: EN60950-92; CAN/CSA-22.2 No. 950 3 <sup>rd</sup> Ed.
EMI	FCC class A; CE: EN50081-1, EN55022, EN50082-1

## PARTS INCLUDED

- (1) **IN2022R** Interface
- (1) **IN9230** IEC to Edison Power Cord (US Only)
- (1) Inline Alignment Tool
- (1) Operation Manual

**OPTIONAL ACCESSORIES****IN7100-4 Series RGBS High Resolution Coaxial Cables****IN7100-5 Series RGBHV High Resolution Coaxial Cables****IN7200-3 Series RGsB Ultra High Resolution Coaxial Cables****IN7200-4 Series RGBS Ultra High Resolution Coaxial Cables****IN7200-5 Series RGBHV Ultra High Resolution Coaxial Cables**

All cables available in a variety of lengths from 6' to 250'

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- ◆ INLINE warrants the equipment it manufactures to be free from defects in materials and workmanship.
- ◆ If equipment fails because of such defects and INLINE is notified within two (2) years from the date of shipment, INLINE will, at its option, repair or replace the equipment at its plant, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications.
- ◆ Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of re-shipment to the Buyer.
- ◆ This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

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