

# OPERATION MANUAL



## Installation Interface Series IN2116 Table Mountable Interface





## Installation and Safety Instructions

### *For Models without a Power Switch:*

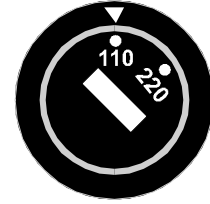
The socket outlet shall be installed near the equipment and shall be accessible.

### *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:*

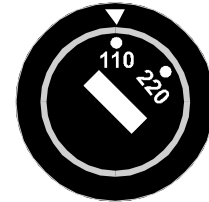
La prise de courant d'alimentation sera installé près de l'équipement et sera accessible.

### *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 représente 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:

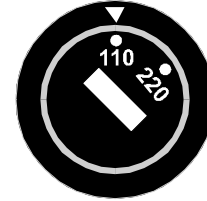
Die Netzsteckdose soll in der Nähe des Gerätes installiert und frei zugänglich sein.

### 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:

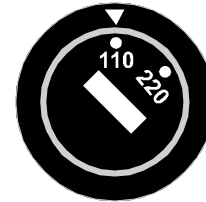
La conexión debe ser instalada cerca del equipo y debe ser accesible.

### 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 cambio vía 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 Polo / Fusible Neutral.

### Modelos con Bateria 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

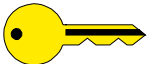
### DESCRIPTION

The **IN2116** is a high performance computer video interface for analog video signals including VGA, SVGA, XGA, MAC, SUN and other high-resolution workstations. The **IN2116** combines high-resolution computer interfacing and modular A/V connector plates into a unit that mounts neatly under a conference or boardroom table, computer workshop, or a podium using integral mounting brackets and (4) #6 wood screws (included). The unit can also be configured with an optional audio buffer module that converts unbalanced stereo audio signals to balanced stereo audio. This highly integrated approach gives audiovisual professionals the ability to quickly design and install functional, customized computer interfacing and A/V connectivity solutions for a broad spectrum of applications.

Like other **INLINE** interfaces, the **IN2116** performs the following functions:

- **Signal Splitting** - allows the simultaneous connection and viewing of both the computer's local monitor and a second output device such as an LCD data projector or a presentation monitor.
- **Physical Interfacing** - Because computers employ many different types of video output connectors, it is sometimes difficult to directly connect them to data projection devices. The **IN2116** simplifies interfacing, routing and switching tasks by acting as a universal adapter. Through the use of removable input cables, the **IN2116** can be attached to different computers and will provide a video output signal on five BNC connectors. The output signal may be set to RGBHV (default), RGBS or RGsB formats.

#### KEY CONCEPT



*The **IN2116** is not a scan converter. The data projector, monitor or other output device must be compatible with the horizontal scan rate output by the computer video card.*

### PRODUCT FEATURES

**Easy Operation** - The user simply brings in a computer and connects to the nearest **IN2116** table mountable interface. The **IN2116** includes a front panel A/C convenience outlet to power a laptop computer. Tucked away under the table or podium shelf, the **IN2116** provides easy access for making computer and A/V connections, reduces equipment clutter and compliments the décor of boardroom, conference room and training room installations.

**15-Pin HD VGA Standard Connectors** - The **IN2116** connects directly to VGA graphics cards and VGA local monitors using high-resolution coaxial VGA extension cables such as the **IN8000** series. Input / output adapter cable sets (see table on page 5) are also available in a variety of lengths for MAC (15-Pin D), SUN (13W3) and workstations (4 or 5 BNC).

**Modular A/V Connector Plates** - In addition to its interface capability, the **IN2116** also acts as a modular A/V connector plate. The **IN2116** front panel accepts up to four A/V connector modules, available with a variety of popular connectors. Two of the most commonly used modules for table mounted installations are the RJ45 jack (for quick access to the computer network) and the 3.5mm stereo mini or dual RCA jacks (to connect the computer's sound card output to the room's sound system). The **IN2116** can hold double size connector plates to accommodate large connectors such as XLR. The **IN2116** simplifies the design and installation process since a single unit fills the function of both video interface and A/V connector plate. Available A/V modules are listed on pages 11-12.

**Ultra High-Resolution Amplification** - The **IN2116** provides superb performance and maximum image clarity at any resolution. Several design elements combine to provide this level of performance: video bandwidth in excess of 400 MHz, buffered local monitor output, and input / local monitor output cables constructed of high-resolution coaxial materials.

**Stereo Audio Signal Balancing** - The **IN2116** can be ordered with a **IN9370** Balanced Audio Buffer Module. An optional factory installed module, the **IN9370** takes an unbalanced stereo audio signal (applied to a 3.5mm stereo mini or other front panel audio connector) and converts it to balanced audio. Balanced audio signals are output in a 5-pin captive screw terminal connector.

**CRT / LCD / DMD / ILA / HDLV / Plasma Friendly Output Signal** - Dipswitches are available to set the output sync format, polarity and horizontal position control characteristics as needed to match the requirements of virtually any compatible data display device.

**Selectable Output Sync Format** - The unit can be set for RGBHV, RGBS or RGsB output sync as required by the data display device and signal distribution system. The **IN2116** does not strip green off the sync signal (i.e. RGsB input signals appear at the output as RGsB).

**Convenient Controls and Features** - A hand-adjustable **horizontal position control** on the **IN2116** front panel allows for precise centering of the image within the data display area. The **dipswitch access plate**, located on the underside of the interface, provides quick access to the dipswitches for setting the output sync format, sync polarity mirroring, serration pulse enable / disable, and VGA / MAC monitor emulation enable / disable.

In addition the **IN2116** features:

- **Analog Interface** - the unit will operate with Analog Video with TTL level sync signals. The signal can be separate H & V or composite sync.
- **Monitor Emulation Switch** - eliminates the need for a termination plug if a local monitor is not used. Emulates a color VGA monitor or a 13/14" 640 x 480 MAC monitor.
- **Sync Polarity Preservation Switch** - enables the sync polarity to be preserved, or to be set for negative polarity (for RGBHV signals in and out).
- **Serration Pulse Removal Switch** - (for RGBS or RGsB output) enables the user to remove serration pulses from the sync output.
- **Internal Universal Power Supply** - plugs directly into any available A/C outlet.
- **Available in Two Finishes** - **IN2116B** - Black. **IN2116W** - White (PMS Cool Grey 3).

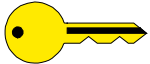
## Compatibility

### INPUT

The **IN2116** will accept high-resolution video signals from virtually any computer that outputs an analog video signal (VGA, SVGA, XGA, MAC, SUN, SGI and other high-resolution computers) at virtually any refresh rate. Input signal compatibility parameters are:

|                             |                    |
|-----------------------------|--------------------|
| Video Signal:               | Analog RGB Video   |
| Signal Format:              | RGBHV, RGSB, RGsB* |
| Horizontal Frequency Range: | 30 KHz to 130 KHz  |
| Vertical Refresh Rates:     | 30 Hz to 120 Hz    |

#### KEY CONCEPT

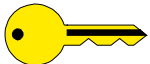


*\* The **IN2116** will operate with RGsB input signals. However, the unit will not strip sync off of the green. RGsB input signals are always output as RGsB (they cannot be output as RGSB or RGBHV). Also, the horizontal position control will not operate when used with RGsB input signals.*

### OUTPUT

The output signal of the **IN2116** is analog RGB video with TTL sync on 3, 4 or 5 female BNC connectors. The output format can be set to RGBHV, RGSB or RGsB using dipswitches. This output signal is compatible with high-resolution data grade monitors and data / graphics projectors.

#### KEY CONCEPT



*VGA, MAC, SUN, SGI and other high-resolution workstations operate in several video modes encompassing a wide range of resolutions and scan rates. Many of the video signals from the newest models can run as high as 70 KHz or more, with the newest VGA cards offering an output resolution of 1600 x 1200 (some can even go as high as 1920 x 1080). The data projector or monitor connected to the interface output 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.*

## ADAPTER / EXTENSION CABLES FOR INPUT AND LOCAL MONITOR OUTPUT

The **IN2116** has 15-pin HD VGA-type connectors for input and local monitor output. The following input and local monitor output cables are available:

| Computer  | 3'            | 6'            | 12'           | 25'               |
|---|---------------|---------------|---------------|-------------------|
| <b>VGA: 15-Pin HD</b>   |               |               |               |                   |
| Input Cable   |               | <b>IN8006</b> | <b>IN8012</b> | <b>IN8025</b>     |
| Output Cable (Optional)                                       |               | <b>IN8006</b> | <b>IN8012</b> | <b>IN8025</b>     |
| <b>MAC with 15-Pin D:</b>                                     |               |               |               |                   |
| Input Cable   |               | <b>IN9140</b> |               | <b>IN9144</b>     |
| Output Cable  | <b>IN9141</b> |               |               | <b>IN9145</b>     |
| <b>MAC G3, G4 and PowerBook with 15-Pin HD*:</b>              |               |               |               |                   |
| Input Cable   |               | <b>IN8006</b> | <b>IN8012</b> | <b>IN8025</b>     |
| Output Cable  |               | <b>IN8006</b> | <b>IN8012</b> | <b>IN8025</b>     |
| <b>SUN: 13W3 (may also be used with SGI with RGsB output)</b> |               |               |               |                   |
| Input Cable   |               | <b>IN9142</b> |               | <b>IN9146</b>     |
| Output Cable  | <b>IN9143</b> |               |               | <b>IN9147</b>     |
| <b>Workstation: 5 BNC</b>                                     |               |               |               |                   |
| Input Cable   |               | <b>IN9048</b> | <b>IN9046</b> | <b>IN9046-L25</b> |
| Output Cable  |               | <b>IN9047</b> | <b>IN9045</b> | <b>IN9046-L25</b> |
| <b>Workstation: 4 BNC</b>                                     |               |               |               |                   |
| Input Cable   |               | <b>IN9100</b> |               |                   |

\*Newer Mac G3 models (with translucent cases) have 15-Pin HD connectors (pins arranged in 3 rows). Older G3 models (with solid white enclosures) incorporate 15-Pin D connectors (pins arranged in 2 rows).

*Note: The input / output cables listed above can be used with any of the following interfaces, distribution amplifiers and switchers:*

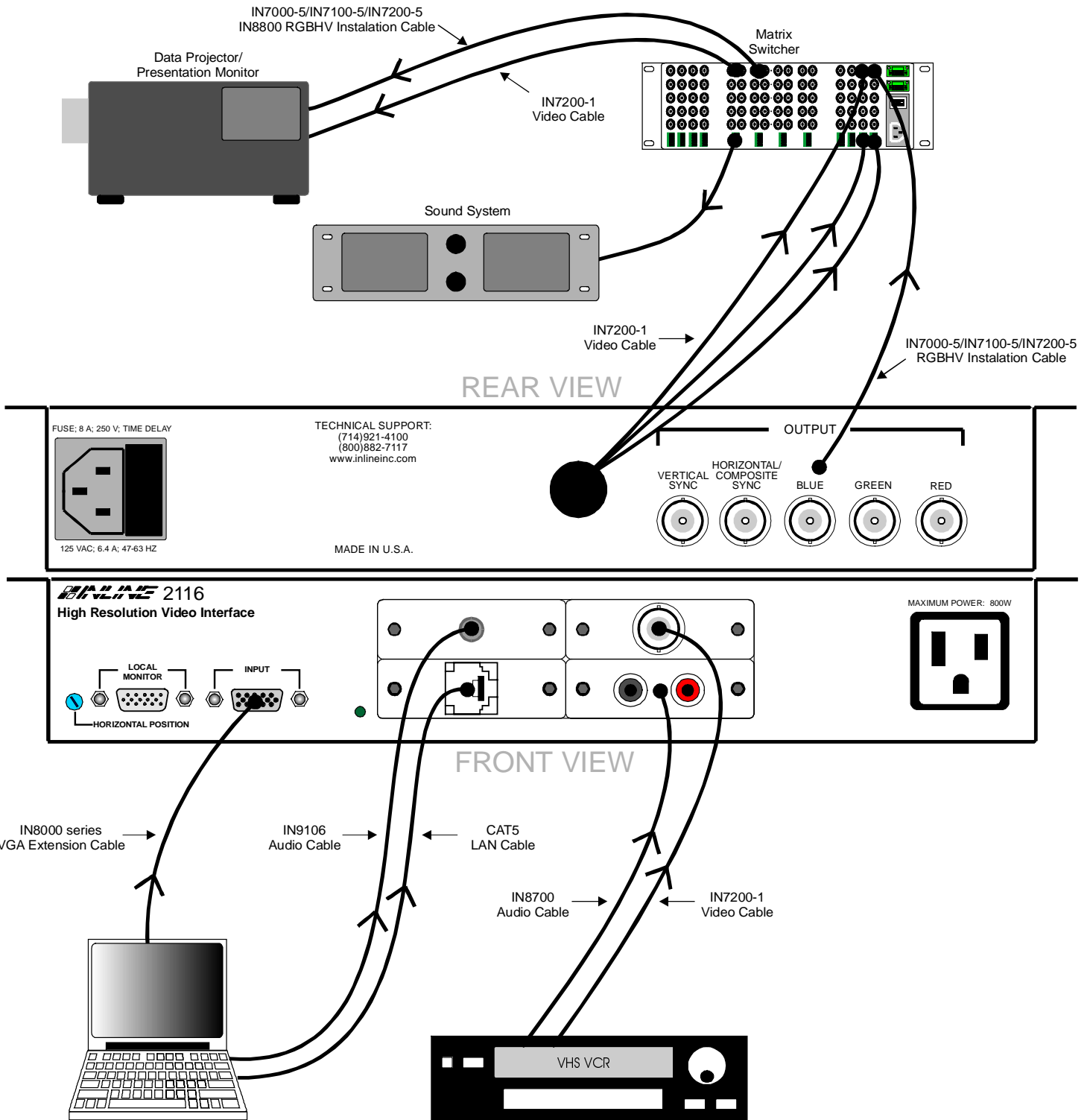
|                      |                      |
|----------------------|----------------------|
| <i>IN2100</i>        | <i>IN2200</i>        |
| <i>IN2110</i>        | <i>IN3260</i>        |
| <i>IN2111 Series</i> | <i>IN3262 Series</i> |
| <i>IN2112 Series</i> | <i>IN3264</i>        |
| <i>IN2114 Series</i> | <i>IN3268</i>        |
| <i>IN2116</i>        | <i>IN3600 Series</i> |

## Installation

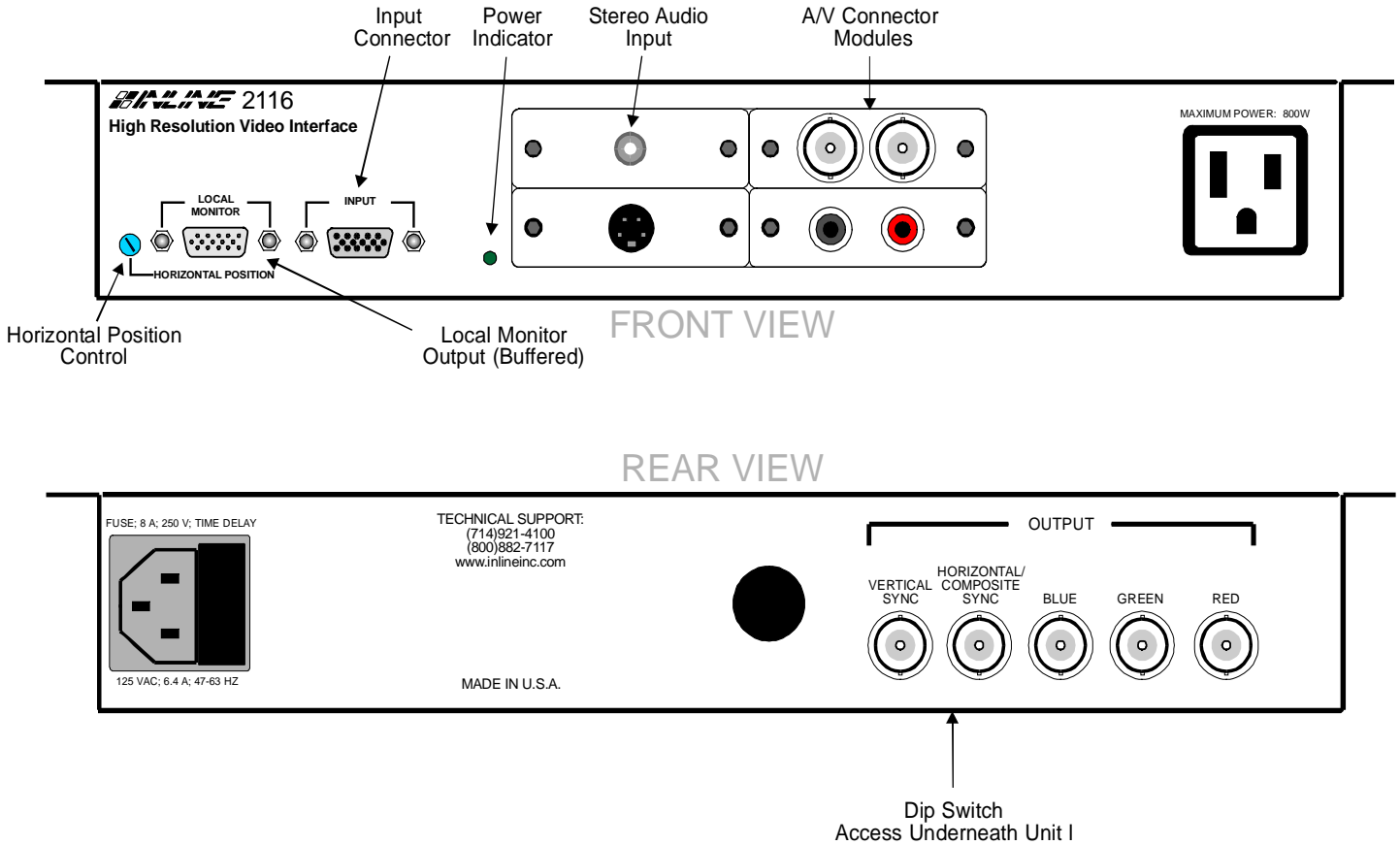
This section offers step-by-step instructions for installing the **IN2116** (see Application Diagram on page 7).

1. Set the dipswitches for the requirements of your installation (see Dipswitch Settings on page 9). The **IN2116** factory default output format is RGBHV. If your display device, routing system or cabling requires a different format, use the dipswitches to change the output signal to RGBS or RGSB as desired.
2. Utilizing the #6 wood screws (included), mount the unit under a conference or boardroom table, computer workshop, or a podium using the integral mounting brackets. Run the necessary video coax, power and accessory cables to it.
3. Connect the **IN2116** output (5 BNC connectors) to the data display device's RGB input, using three, four or five high-resolution BNC cables or a multi-conductor RGBHV, RGBS or RGB "snake". The **IN7000 / IN7100 / IN7200 / IN7300 Series** high-resolution cables and the **IN8800 Series** installation cables are well suited for this purpose. While making connections, take care to insure that the red output is connected to the red input, green output to the green input, etc.
4. Connect the accessory cables as required by your installation.
5. Connect the **IN9230** Power Cord (included) to the **IN2116**. The LED on the front of the unit should light-up to indicate it is on.
6. Turn the computer and computer monitor off. Disconnect the computer monitor (if present) from the video output port on the computer.
7. Connect the local computer monitor (if present) to the local monitor output of the **IN2116**. VGA monitors will attach directly to the local monitor output. For other types of monitors, use the appropriate local monitor output adapter cable (see list on page 5). If no local monitor is used, set the monitor emulation dipswitch to emulate a color VGA monitor or a 13" / 14" MAC RGB monitor (see Dipswitch Settings on page 9).
8. Connect the output of the computer to the Input of the **IN2116** with the appropriate input cable.
9. Complete the installation by turning the computer and computer monitor on. If required, adjust the horizontal position control.

# IN2116 APPLICATION DIAGRAM



## IN2116 FRONT PANEL CONNECTORS AND CONTROLS



### HORIZONTAL POSITION CONTROL

The location of the horizontal position control is shown above. The horizontal position control adjusts the position of the image on the data display device from left to right (it has no effect on the local computer monitor).

Many data projectors and monitors have their own horizontal position control, and the interaction of the display devices and the interface's horizontal controls may result in a dark image on the data display. The following procedure is suggested to ensure best results:

1. Adjust the **IN2116** horizontal position control so a good quality image is displayed. This control should not be set to an extreme position.
2. Adjust the display device's 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 interface until the picture is centered and a good quality image is attained.

## DIPSWITCH SETTINGS

Most installations will not require any changes to the dipswitch settings, and the **IN2116** will generally be operated with the factory default settings. The factory default and specialized dipswitch settings are indicated below.

### Factory Default Settings:



**Dipswitches ON:** 2 & 4  
**Signal Format:** Red / Green / Blue / Horizontal and Vertical Sync  
**Horizontal Position Control:** Enabled  
**H & V Sync Polarity:** Negative, Negative  
**Monitor Emulation:** Disabled

The following table lists the functions of the 6 dipswitches:

| DIPSWITCH | FUNCTION  | SETTING  |
|-----------|---|--|
| 1         | Horizontal Position                                 | 1 = Disabled<br>0 = Enabled                              |
| 2         | RGsB Output (sync on green)                         | 1 = RGSB or RGBHV<br>0 = RGsB                            |
| 3         | RGSB or RGBHV Output (dipswitch 2 must be set to 1) | 1 = RGSB<br>0 = RGBHV                                    |
| 4         | RGBHV Output Sync Polarity                          | 1 = Negative, Negative<br>0 = Mirror Input Polarities    |
| 5         | Serration Pulse Removal (for RGSB or RGsB output)   | 1 = Remove Serration Pulses<br>0 = Pass Serration Pulses |
| 6         | Monitor Emulation (VGA color/MAC* 640 x 480)        | 1 = Emulation Disabled<br>0 = Emulation Enabled          |

\*If monitor emulation is desired when using a MAC G3 (with 15-pin HD connector) or G4, dipswitch #6 must be set to 1.

## OPTIMAL SETTINGS FOR LCD / DMD / ILA / D-ILA / PLASMA DISPLAYS

The following output sync settings provide maximum signal preservation and are recommended for the best image quality with LCD, DMD, ILA, D-ILA and Plasma Display devices. Depending on the design of the display device's sync processing circuitry, you may be able to set the horizontal position control (dipswitch #1) to the enabled position. However, experimentation with your display device is the best way to determine whether you can achieve a stable image with the horizontal position enabled. Many LCD displays include a fine phase control, which can be adjusted to optimize picture quality.

**Dipswitches ON:** 1 & 2  
**Signal Format:** Red / Green / Blue / Horizontal and Vertical Sync  
**Horizontal Position Control:** Disabled  
**H & V Sync Polarity:** Mirror Input Polarities

## IN9370 AUDIO BUFFER MODULE

The **IN2116** can be ordered with a **IN9370** audio buffer module. This factory installed optional module takes an unbalanced stereo audio input, buffers the signal and outputs it as balanced stereo audio. This is desirable for systems where the **IN2116** audio signal will be connected to equipment with balanced audio inputs, and is helpful in preserving signal integrity and minimizing outside signal interference (which often occurs while sending the audio signal over lengthy cable runs). The output can also be set for unbalanced stereo audio if desired.

### IN9370 Input Signal Factory Pre-Wiring

In the factory default installation, the **IN9370** is pre-wired to accept unbalanced stereo audio input from a 3.5mm stereo mini audio input connector located on one of the four A/V connector modules (any alternative-wiring / connector configurations must be requested at time of order).

### IN9370 Jumper Settings

J2 and J3 set the output for either balanced or unbalanced audio signals. J4 balances or unbalances the left side audio signal, and J5 balances or unbalances the right. All four jumpers (J2, J3, J4 and J5) need to be set in the same position.

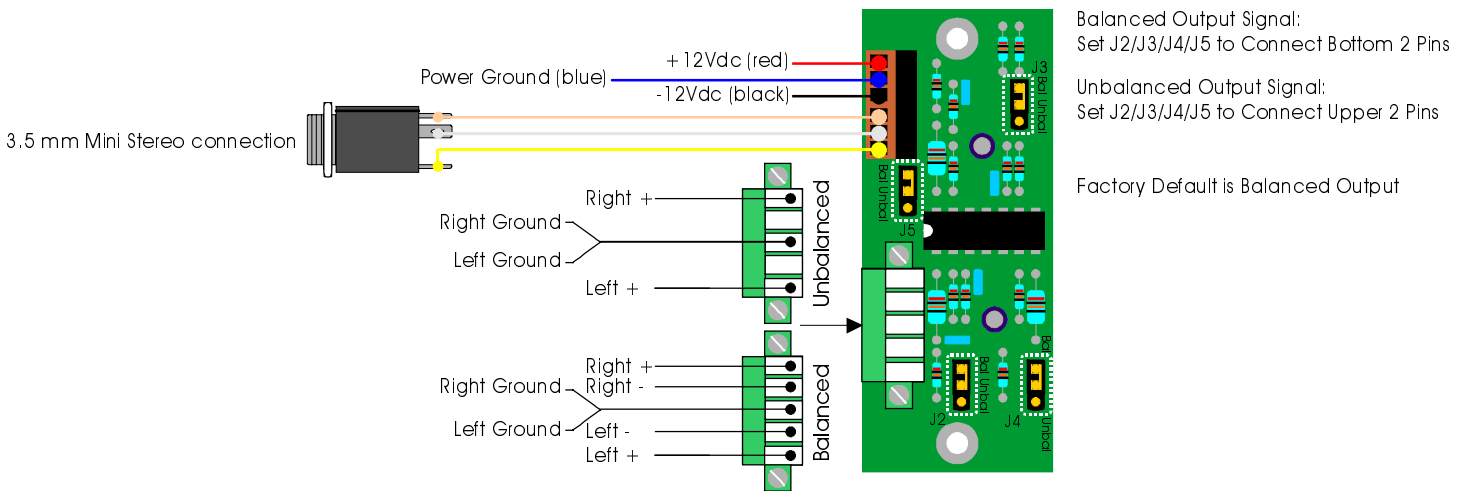
**Balanced Output Signal:** Set J2 / J3 / J4 / J5 to Connect Bottom 2 Pins

**Unbalanced Output Signal:** Set J2 / J3 / J4 / J5 to Connect Upper 2 Pins

*Note: Connections to J1 and J7 are pre-wired at the factory and may only be modified by trained technicians. J7 is used for power input, and J1 is the audio input.*

### IN9370 Output Connector

A balanced or unbalanced stereo audio output signal is provided on a 5-pin captive screw connector. It is important that connections are made appropriately for balanced or unbalanced output as indicated in the diagram below:



## AUDIO / VIDEO / PHONE / DATA / SWITCH / COMPUTER CONNECTOR MODULES

### Modular A/V Connector Plates & Accessories for: IN2111 Series / IN2112 Series / IN2114 Series / IN2116 / IN3260 / IN9166 / IN9167 / IN9168

| Connector Module<br>Black/White | Description  | Front Connector /<br>Termination                       | Back Connector /<br>Termination                     | Module<br>Size |
|---------------------------------|--|--|---|----------------|
| IN9350B / IN9350W               | Blank Plate - Single Size  | None   | None  | Single         |
| IN9351B / IN9351W               | (2) BNC Barrel   | (2) BNC Female   | (2) BNC Female                                      | Single         |
| IN9352B / IN9352W               | (1) S-Video  | 4-pin Mini DIN Female                                  | 4 Bare Wires  | Single         |
| IN9353B / IN9353W               | (2) RCA  | (1) RCA Female - Red<br>(1) RCA Female - Black         | (2) Solder Lug Terminal<br>(2) Solder Lug Terminals | Single         |
| IN9354B / IN9354W               | (2) ¼" Stereo Phono  | (2) ¼" Stereo Phono Female                             | (3) Solder Lug Terminals                            | Single         |
| IN9355B / IN9355W               | (2) 3.5mm Mini Stereo  | (2) 3.5mm Mini Stereo Female                           | (3) Solder Lug Terminals                            | Single         |
| IN9356B / IN9356W               | (1) 5-PIN Captive Screw<br>Terminal  | Phoenix Brand 5-pin<br>Captive Screw Terminal          | (5) Solder Lug Terminals                            | Single         |
| IN9357B / IN9357W               | (2) F-Connector Barrel   | (2) F-Connector Female                                 | (2) F-Connector Female                              | Single         |
| IN9358B / IN9358W               | (1) RJ11   | RJ11 Female - Leviton Brand                            | 6-pin Punch Block                                   | Single         |
| IN9359B / IN9395W               | (1) RJ45   | RJ45 Female - Leviton Brand                            | 8-pin Punch Block for<br>Cat 5 Cable                | Single         |
| IN9360B / IN9360W               | (1) Contact Closure<br>Switch With LED &<br>(1) 3.5mm Mini Stereo          | Square White Single Pole<br>Switch with Integrated LED | (4) Solder Lug Terminals                            | Single         |
|                                 |  | 3.5mm Mini Stereo Female                               | (3) Solder Lug Terminals                            |                |
| IN9361B / IN9361W               | (1) 15-pin HD  | 15-pin HD Female                                       | 15-pin HD Female                                    | Single         |
| IN9362B / IN9362W               | (1) 15-pin HD  | 15-pin HD Male   | 15-pin HD Male                                      | Single         |
| IN9363B / IN9363W               | (1) S-Video Barrel &<br>(1) BNC Barrel                                     | 4-pin Mini DIN Female                                  | 4-pin Mini DIN Female                               | Single         |
|                                 |  | BNC Female   | BNC Female  |                |
| IN9364DB /<br>IN9364DW          | (1) 4-pin XLR  | Neutrik Brand 4-pin XLR<br>Female                      | (4) Solder Cups                                     | Double         |
| IN9365DB /<br>IN9365DW          | (1) 3-pin XLR  | Neutrik Brand 3-pin XLR<br>Female                      | (3) Solder Cups                                     | Double         |
| IN9366DB /<br>IN9366DW          | (1) 6-pin XLR  | Neutrik Brand 6-pin XLR<br>Female                      | (6) Solder Cups                                     | Double         |
| IN9367DB /<br>IN9367DW          | Blank Plate - Double   | None   | None  | Double         |
| IN9372DB /<br>IN9372DW          | A/V Super Module:<br>(2) RCA - Audio &<br>(1) RCA - Video &<br>(1) S-Video | RCA Female - Red                                       | (2) Solder Lug Terminals                            | Double         |
|                                 |  | RCA Female - Black                                     | (2) Solder Lug Terminals                            |                |
|                                 |  | RCA Female - Yellow                                    | (2) Solder Lug Terminals                            |                |
|                                 |  | 4-pin Mini DIN Female                                  | 4 Bare Wires  |                |
| IN9373B / IN9373W               | (2) RCA Barrel   | (2) RCA Female   | (2) RCA Female                                      | Single         |
| IN9374B / IN9374W               | (1) 9-Pin D Gender<br>Changer – Female                                     | (1) 9-pin D Female                                     | (1) 9-pin D Female                                  | Single         |

| Connector Module<br>Black/White | Description   | Front Connector /<br>Terminal | Back Connector /<br>Terminal | Module<br>Size |
|---------------------------------|---|-------------------------------|------------------------------|----------------|
| IN9375B / IN9375W               | (2) Keyboard / Mouse Connectors   | (2) 6-pin Mini DIN Female     | (2) 6-pin Mini DIN Female    | Single         |
| IN9376B / IN9376W               | A/V Super Module with Barrel Connectors:<br>(2) RCA - Audio &<br>(1) RCA - Video &<br>(1) S-Video | RCA Female - Red              | RCA Female                   | Double         |
|                                 |   | RCA Female - Black            | RCA Female                   |                |
|                                 |   | RCA Female - Yellow           | RCA Female                   |                |
|                                 |   | 4-pin Mini DIN Female         | 4-pin Mini DIN Female        |                |
| IN9377DB /<br>IN9377DW          | (2) RCA - Audio &<br>(1) RCA - Video  | RCA Female - Red              | (2) Solder Lug Terminals     | Double         |
|                                 |   | RCA Female - Black            | (2) Solder Lug Terminals     |                |
|                                 |   | RCA Female - Yellow           | (2) Solder Lug Terminals     |                |
| IN9378B / IN9378W               | (1) 9-pin D Gender Changer - Male   | (1) 9-pin D Male              | (1) 9-pin D Male             | Single         |
| IN9381B / IN9381W               | (1) BNC Barrel  | (1) BNC Female                | (1) BNC Female               | Single         |
| IN9382B / IN9382W               | (1) F-Connector Barrel  | (1) F-Connector Female        | (1) F-Connector Female       | Single         |
| IN9383B / IN9383W               | (1) RCA Barrel  | (1) RCA Female                | (1) RCA Female               | Single         |
| IN9384B / IN9384W               | (1) ¼" Stereo Phono   | (1) ¼" Stereo Phono Female    | (3) Solder Lug Terminals     | Single         |
| IN9385B / IN9385W               | (1) 3.5mm Mini Stereo   | (1) 3.5mm Mini Stereo Female  | (3) Solder Lug Terminals     | Single         |
| IN9386B / IN9386W               | (1) BNC Barrel &<br>(1) 3.5mm Mini Stereo   | BNC Female                    | BNC Female                   | Single         |
|                                 |   | 3.5mm Mini Stereo             | (3) Solder Lug Terminals     |                |
| IN9387B / IN9387W               | (1) S-Video &<br>(1) 3.5mm Mini Stereo  | 4-pin Mini DIN Female         | 4 Bare Wires                 | Single         |
|                                 |   | 3.5mm Mini Stereo             | (3) Solder Lug Terminals     |                |
| IN9388B / IN9388W               | (1) RCA for Video &<br>(1) 3.5mm Mini Stereo  | Yellow RCA Female             | (2) Solder Lug Terminals     | Single         |
| IN9389B / IN9389W               | (1) 6-PIN Mini DIN Barrel<br>(PS/2 Keyboard /<br>Mouse)   | (1) 6-pin Mini DIN Female     | (1) 6-pin Mini DIN Female    | Single         |
| IN9394DB /<br>IN9394DW          | (1) 4-pin XLR   | Switchcraft 4-pin XLR Female  | (4) Solder Cups              | Double         |
| IN9395DB /<br>IN9395DW          | (1) 3-pin XLR   | Switchcraft 3-pin XLR Female  | (3) Solder Cups              | Double         |
| IN9396DB /<br>IN9396DW          | (1) 6-pin XLR   | Switchcraft 6-pin XLR Female  | (6) Solder Cups              | Double         |

*Note: When ordering the IN2116, please specify the necessary A/V connector modules.*

## Specifications

| <b>Input</b>   |   |
|--|---|
| Connector Type   | 15-pin HD male - standard VGA pin-outs  |
| RGB Video Signals  | Analog, 1.5 Vp-p max.   |
| Input Impedance  | 75 ohm  |
| Sync Signals   | TTL compatible  |
| Horizontal Scan Rate   | 30 KHz - 130 KHz  |
| Vertical Scan Rate   | 30 Hz - 120 Hz  |
| <b>Output</b>  |   |
| Buffered Local Monitor   | 15-pin HD female - standard VGA pin-outs  |
| Stereo Audio Output with<br><b>IN9370</b> Installed (Buffered) | 5-pin Phoenix captive screw terminal  |
| Main Output  | 5 BNC female connectors   |
| Output Signal Formats  | RGBHV - Negative sync polarities (default)<br>RGBHV - Mirror input sync polarities, RGBS or RGsB  |
| RGB Signals  | Analog Video, 75 ohm impedance  |
| Bandwidth  | 400 MHz @ -3 dB with .7 volt input signal   |
| Rise and Fall Times  | 0.875 nano seconds  |
| Gain   | 1.0 +/- 5% (unity)  |
| Sync Signal  | H, V and S: 4V Unterminated; 2V when 75 ohm terminated<br>Gs: 0.3V when 75 ohm terminated   |
| Horizontal Pulse Width   | Horizontal Position Enabled: Approximately 1.5 usec<br>Horizontal Position Deleted: Approximately the same<br>as the input signal       |
| Vertical Pulse Width   | Approximately the same as the input signal  |
| <b>Controls</b>  |   |
| External   | Dipswitches located underneath the unit   |
| Internal   | 75 ohm / High Z termination for red, green and blue (3 jumpers)   |
| <b>Dimensions</b>  |   |
| Size (including faceplate)                                     | 1.8" H x 12.5" W x 4.78" D / 4.6cm x 31.7cm x 12.1cm  |
| Shipping Weight  | 4 lbs. / 2 kg.  |
| <b>Power</b>   |   |
| Power Supply   | Internal Switch Mode Power Supply   |
| Front Panel A/C Outlet   | U.S. Version: Edison Female - 800 Watts Max.<br>Call for A/C Outlet Connector Information<br>on British, European and Australian Models |
| <b>Regulatory Compliance</b>                                   |   |
| Safety   | UL 1950. 3 <sup>rd</sup> Ed.; CE: EN50081-1<br>CAN/CSA-22.2 No. 950 3 <sup>rd</sup> Ed.   |
| EMI  | FCC class A; CE: EN50022 (1987), EN50081-1 (1991),<br>EN50082-1 (1992 & 1994), EN60950-92   |

**Parts Included**

- (1) **IN2116** Table Mountable Installation Interface
- (1) **IN9334** 3/32 Allen Wrench for **IN2116** Connector Module Set Screws
- (1) IEC Power Cable
- (1) Operation Manual

**Required Accessories (Ordered Separately)****Input and Local Monitor Adapter and Extension Cables:**

**VGA:** **IN8000 Series** 15-pin HD male to 15-pin HD female, various lengths from 3' to 100'

**For Other Computers:** See list on page 4

**Optional Accessories****Balanced Audio Module**

**IN9370:** Audio Buffer Module - converts unbalanced stereo audio signals to balanced audio. The **IN9370** input is normally connected to the 3.5mm audio input connector. The module may also be wired to accept stereo audio input from RCA, 3.5mm mini or 1/4" connector modules.

**Audio Input Cables (for use with optional IN9370 with 3.5mm input connector):**

**IN9106:** 3.5mm stereo mini male to 3.5mm stereo mini male, 6' long

**IN9107:** (1) 3.5mm stereo mini male to (2) RCA male, 6' long

**Installation Cables**

**IN7000P-5 Series RGBHV Cable:** Standard Resolution, Plenum Cable available in bulk lengths

**IN7000P-5K Series RGBHV Cable:** Standard Resolution, Plenum Cable available in 1000' bulk length

**IN8800:** 18 Conductor Super High-Resolution Cable: (3) Super High-Res. Coax., (3) Mini Coax., (5) 26 Gauge Twisted Pairs, (1) Gauge Pair

**Connectors and Tools:**

**IN9301** BNC Connectors

**IN9320** Crimp Tool Frame

**IN9321** Die (**IN9320** and **IN9321** are used to terminate bulk cables)

**RGB OUTPUT CABLES**

| Cables                               | 3-Conductor | 4-Conductor | 5-Conductor | 6-Conductor |
|--------------------------------------|-------------|-------------|-------------|-------------|
| <b>Standard Resolution</b>           |             | IN7000-4    | IN7000-5    |             |
| <b>Standard Resolution, Plenum</b>   |             | IN7000P-4   | IN7000P-5   |             |
| <b>High Resolution</b>               | IN7100-3    | IN7100-4    | IN7100-5    |             |
| <b>Ultra High Resolution</b>         | IN7200-3    | IN7200-4    | IN7200-5    | IN7200-6    |
| <b>Super High Resolution</b>         |             |             | IN7300-5    | IN7300-6    |
| <b>Super High Resolution, Plenum</b> |             |             |             | IN7300P-6   |

All cable grades are available in lengths from 3' to 250' pre-terminated with high quality BNC connectors or as bulk cable.

## Troubleshooting

### The display device connected to the IN2116 output has a bad / scrambled image.

**Solution 1:** Verify that the correct input cable is being used (see list on page 5).

**Solution 2:** The display device connected to the output of the interface may not be compatible with the computer output. Standard 640 x 480 VGA runs at 31.5 KHz, and SVGA can be as high as 48 - 58 KHz, depending on the vertical refresh rate. PC, MAC, SUN and other high-resolution workstations have new and ultra high-resolution modes such as 1600 x 1200 and 1800 x 1440, and can output a video signal with a horizontal scan rate of over 100 KHz! Many data monitors and data projectors are not compatible with these resolutions and frequencies.

**Solution 3:** Check the dipswitch settings to make sure the unit is putting out a sync format that the display device can use. For most applications, the default dipswitch settings (see page 9) will work best. For LCD / DMD displays, you may have to disable the horizontal position control.

**Solution 4:** The RGBS or RGBHV cable may have a bad sync line. Try running the sync through another cable.

**Solution 5:** The IN2116 output sync range may not be compatible with the display device. Check the resolution and refresh rate for both the computer graphics card and the data display device to ensure compatibility.

### The output image is very dark.

**Solution:** The horizontal position control may be set off to an extreme setting or may be interacting poorly with the horizontal position control on the display device. Follow the horizontal position adjustment procedure on page 8.

### The local monitor looks fine but the image on the LCD projector is wavy or has vertical bars in the picture.

**Solution 1:** LCD / DMD displays work best when the sync signal has minimum sync processing. Set the interface dipswitches as indicated in the section **OPTIMAL SETTINGS FOR LCD / DMD DISPLAYS** on page 9. Setting the interface to RGBHV output and disabling the horizontal position control may alleviate this problem.

**Solution 2:** LCD / DMD displays often have an adjustment called Phase Adjust or Fine Phase Control. This control should be adjusted to provide the best image.

### The output image is missing a color.

**Solution:** Possibly the RGBS or RGBHV 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 the green is displayed or not).

### The output image is too green.

**Solution:** The dipswitch settings may be set for sync on green output and the display device doesn't like that format. Try changing the dipswitches to output an RGBS or RGBHV signal (see dipswitch settings on page 9).

### The horizontal position control is not working.

**Solution 1:** Check the dipswitch settings (page 9) to see if the horizontal position control has been disabled.

**Solution 2:** The input setting may be RGsB (sync on green). The horizontal position control does not work with RGsB input signals.

**The output image is doubled, with two images displayed side-by-side.**

**Solution:** The display device may not be compatible with the horizontal scan rate of the computer. This problem often occurs when a 31.5 KHz VGA signal is sent into an RGB monitor that is only compatible with signals at 15.75 KHz.

If problems persist, call INLINE Technical Services at (800) 882-7117 for further assistance.

## Warranty

- ◆ 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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