A WORLD OF A/V SOLUTIONS

INTERFACES

IN2013HR HIGH RESOLUTION VIDEO INTERFACE
FOR 13W3 WORKSTATIONS

IN2013HR

OPERATION MANUAL

High Resolution Video Products • A/V System Integration Tools • Interactive Training Systems

Installation and Safety Instructions

For Models without a Power Switch:

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

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.

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 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.

Installations- und Sicherheitshinweise

Für Geräte ohne Netzschalter:

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

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.

Instalacion E Instrucciones de Seguridad

Modelos Sin Interruptor:

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

Para Todos Los Modelos:

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

Modelos con Fusibles Internos o Externos:

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

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.

CE

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.

Product Overview

DESCRIPTION

The **IN2013HR** is a high performance dedicated computer video interface for Sun, SGI, IBM PowerPC, NeXT, and other graphic workstations with 13W3 video ports. Like other INLINE interfaces, the **IN2013HR** 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 a large screen data projector or presentation monitor.

- **Physical Interfacing and Adaptation -** Because computers employ many different types of video output connectors, it is sometimes difficult to directly connect them to data projection devices. The **IN2013HR** connects to workstations with special video connectors (13W3) and provides an output signal on standard BNC connectors.

- **Electronic Interfacing -** The interface accepts video in a wide variety of sync formats and converts the signal to RGsB, RGBS, RGBHV or Composite Monochrome as required by the display device, cabling, and video routing system.

PRODUCT FEATURES

Universal Compatibility for Graphic Workstations with 13W3 Video Ports - Factory set for automatic operation with Sun and SGI computers, the unit will accept other workstation signals by adjusting one or two dipswitches.

Exceptional Video Performance - Featuring advanced video amplification circuitry, the **IN2013HR** offers a video bandwidth of 230 MHz, ensuring that even the highest resolution workstation video signals will be interfaced with complete signal clarity.

Local Monitor Output - provides a buffered signal for the local computer monitor.

Automatic Output Sync Format Selection - The **IN2013HR** senses the number of cables connected to the outputs at power up and automatically sets the output sync format to RGsB, RGBS, RGBHV or Composite Monochrome.

Dual Outputs - the **IN2013HR** can drive two display devices in addition to the local monitor.

Flexible Monitor Emulation - The interface automatically sets itself to the appropriate resolution / refresh rate, or can be used without a local display device (dipswitches are provided to emulate virtually any monitor).

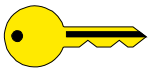
Convenient Controls - The **IN2013HR** offers intuitive front panel controls for the most important signal adjustments.

- **Gain Control -** adjusts the voltage level of the RGB components simultaneously (ensuring that gray scale is maintained), and may be used to compensate for signal loss due to long cable runs.

- **Sharpness Control -** provides effective image enhancement for high-resolution video signals by increasing clarity and edge detail.

- **Horizontal Position Control -** allows the picture to be centered precisely on the data display screen.

KEY CONCEPT



*The **IN2013HR** is not a scan converter. The data projector, monitor or other output device must be compatible with the horizontal scan rate, vertical scan rate and resolution output by the computer video card.*

Compatibility

INPUT

The **IN2013HR** will accept high-resolution video signals from Sun SPARC, Silicon Graphics, IBM PowerPC, NeXT and virtually any other graphic workstation that outputs analog video through a 13W3 female connector. Input signal compatibility parameters are:

Video Signal:	Analog RGB Video
Connector:	13W3 female video port on computer
Signal format:	RGsB, RGBS, RGBHV
Horizontal Frequency Range:	30 KHz to 130 KHz
Vertical Refresh Rates:	50 Hz to 120 Hz

OUTPUT

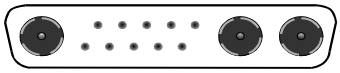
The **IN2013HR** outputs an analog RGsB, RGBS, RGBHV or Composite Monochrome signal on female BNC connectors. This output signal is compatible with high-resolution data grade monitors and data / graphics projectors. Graphic workstations operate in several video modes encompassing a wide range of resolutions and scan rates. Many workstation video signals run as high as 70 KHz or more, with the newest workstations offering output resolutions 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. Check the documentation for both the computer graphics card and the data display device to ensure compatibility.

Installation

This section offers step-by-step instructions for installing the **IN2013HR** Computer Video Interface. An Application Diagram is included on page 5.

1. **Turn the Computer and Computer Monitor Off -** Disconnect the computer monitor from the computer's video port.

2. **Connect the Permanently Attached IN2013HR Input Cable -** to the computer's video output port (see illustration on the right). For cable runs that are longer than 3', the **IN8400 Series** 13W3 Workstation Extension Cables are available in lengths ranging from 6' to 50'.



3. **Check the Input Signal Configuration Settings -** (SWITCH 1 - Dipswitches 8 / 9 / 10) which are on the bottom of the **IN2013HR**. The factory default settings for dipswitches 8, 9 and 10 will work with Sun workstations and most SGI computers. For other computers, carefully set dipswitches 8, 9 and 10 as indicated in the chart below:

Note: These settings only relate to the input signal from the computer and have no effect on the output sync format.

Computer Input Selection Dipswitch Chart		
Workstation	**Input Signal**	**8/9/10 Dipswitch Setting - Switch Bank 1**
SUN	RGBS (most common)	000 - Composite Sync on pin 5
	RGBHV	101 - Hor. sync on pin 6; Vert. sync on pin 2
SGI	RsGsBs (most common)	001 - Sync on green
	RGBS	011 - Composite Sync on pin 3
	RGBHV	100 - Hor. sync on pin 4; Vert. sync on pin 5
NeXT Color	RGsB	001 - Sync on green
IBM PowerPC	RGBHV	010 - Hor. sync on pin 5; Vert. sync on pin 9

4. **Connect the IN2013HR Video 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 Series, IN7200 Series, IN7300 Series** and **IN7400P Series** high-resolution cables are well suited for this purpose. Take care while making connections to insure that the red output is connected to the red input, green output to the green input, etc.

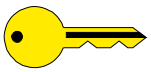
5. **Select the Output Sync Format -** The interface normally selects an output format automatically according to the number of cables connected to the output. If you wish to override the automatic output format feature and manually select a specific format, set the dipswitches as necessary according to the chart on page 8 (see **Output Sync Format - Manual Mode**).

6. **Connect the Local Computer Monitor -** (if present) to the **IN2013HR** local monitor output port. Check the Monitor Emulation Dipswitch Settings on the bottom of the **IN2013HR**.

   - **When Using a Local Monitor -** make sure that all dipswitches in the box labeled MONITOR EMULATION are set to "0".

   - **If No Local Monitor is Required -** using the **IN9339** alignment tool (provided), gently set the monitor emulation dipswitches according to the **Monitor Emulation Dipswitch Chart** provided on page 9.

KEY CONCEPT

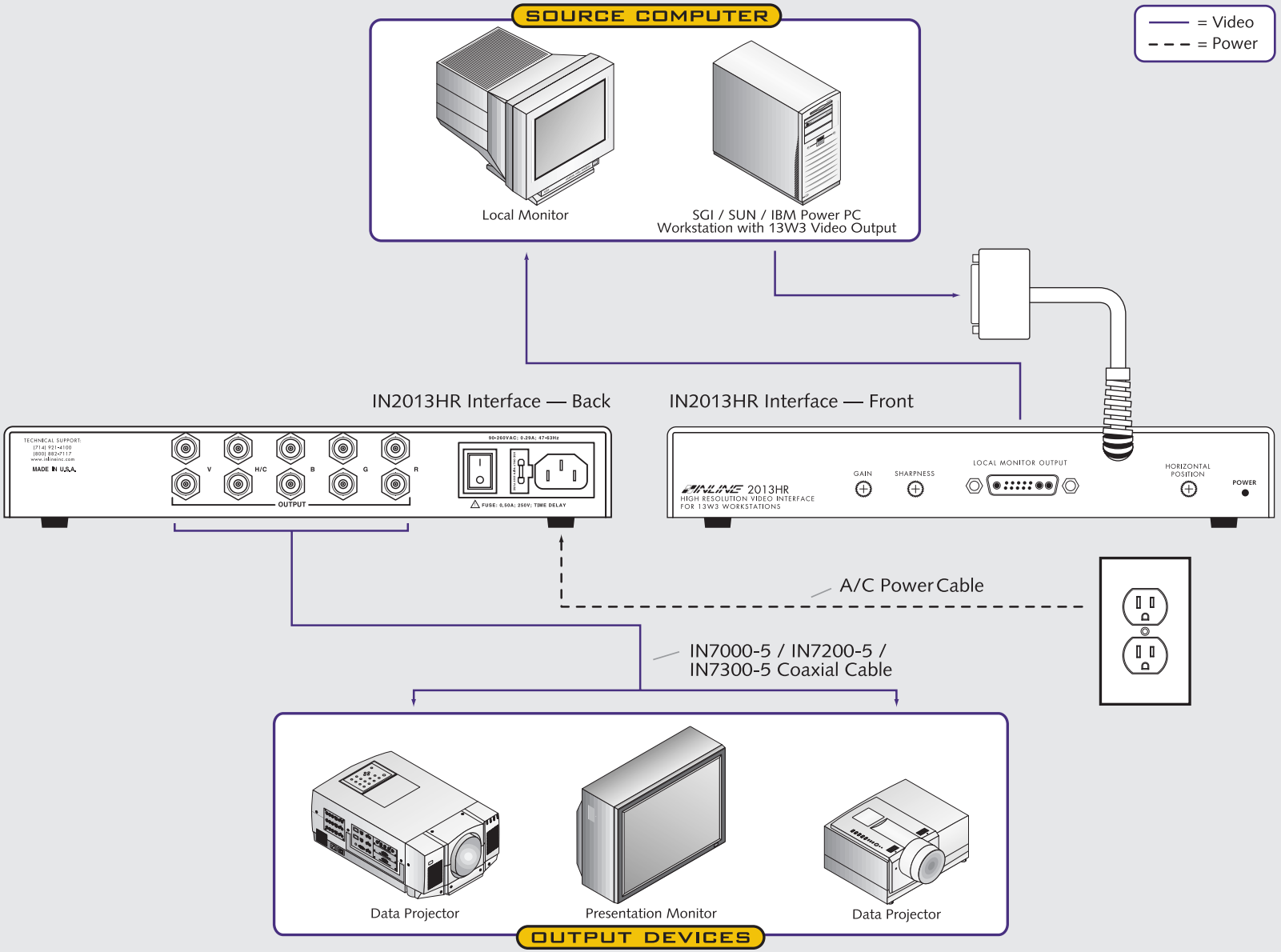


Check the Monitor Emulation chart and dipswitch settings carefully. Any improper setting of the emulation dipswitches may lead to improper operation and could even result in severe damage to the computer video port or the monitor. If you are in doubt as to which monitor emulation to choose, set all the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

6. **Apply Power -** to the **IN2013HR** using the **IN9230** IEC power cable (included).

7. **Turn On -** the computer, the **IN2013HR**, the local monitor (if applicable) and the display device. If necessary, adjust the gain, sharpness and / or horizontal position control as detailed on pages 6 and 7.

IN2013HR **HIGH RESOLUTION VIDEO INTERFACE** APPLICATION DIAGRAM



Front Panel Controls

The **IN2013HR** features fully automatic operation, however, the interface offers several external controls that allow users to optimize the unit's performance to meet the needs of specialized applications. Gain, sharpness and horizontal position control adjustments are located on the front of the **IN2013HR**. Turning the adjustments clockwise will increase the value, and counterclockwise will decrease it. Each control has an adjustment range of 15 turns.

GAIN CONTROL

The gain control is a small black knob located on the left side of the unit's front panel. The gain control adjusts the output voltage of the red, green, and blue outputs simultaneously (ensuring that gray scale is maintained), and may be used to compensate for signal loss due to long cable runs. The gain adjustment range is .7 in the minimum position (30% decrease) and 1.3 in the maximum position (30% increase). The factory default setting is 1.0 (unity gain).

SHARPNESS CONTROL

The **IN2013HR** sharpness / peaking circuitry provides variable high frequency equalization that can compensate for high frequency losses due to long output cable runs. The amount of high frequency boost required will vary depending on the length and bandwidth performance of the video output cables, and, to a lesser extent, the resolution and frequency of the input signal. When using short output cables, the sharpness control should usually be placed at the minimum setting to avoid over-peaking.

The sharpness control is located between the gain control knob and the local monitor output port. Using the **IN9339** Alignment Tool (included), turn the sharpness control clockwise to increase the sharpness setting, and counterclockwise to decrease the sharpness setting. The factory default setting is minimum (no sharpness / peaking enhancement). The following guidelines are useful in selecting the optimal sharpness / peaking setting:

If the image is soft and / or fine details in the picture lack clarity:

The sharpness is probably set too low. Increase the sharpness control setting.

If a white, ghosted image appears to the right side of the lines / characters:

The sharpness is probably set too high (over-peaked). Decrease the sharpness control setting.

HORIZONTAL POSITION CONTROL

The horizontal position control is a small black knob located adjacent to the front panel power LED display. This adjustment allows users to shift the position of the image on the data display device from left to right. The horizontal position control does not effect the local monitor.

If the horizontal position adjustment is set to an extreme position on either the display device or the **IN2013HR**, the output image may appear dark and / or the colors may be displayed improperly. To position the video image and achieve optimum picture quality:

1. Set the display device's horizontal position control to the center of its adjustment range.
2. Adjust the horizontal position control on the **IN2013HR** until the picture is centered properly on the display device.

Horizontal Position Control Enable / Disable
The factory default setting is horizontal position control enabled. In rare cases (depending on the design of the display device sync circuitry), you may have to disable the horizontal position control to achieve a solid image on the display device. The horizontal position control may be enabled or disabled by setting the dipswitch 1 in SWITCH Bank 1 as indicated in the chart at the bottom of the page.

Dipswitch Settings

Two dipswitch panels are easily accessed through windows on the bottom of the **IN2013HR**. The SWITCH 1 panel regulates the output sync format (dipswitches 1-7) and controls the input signal configuration (dipswitches 8-10). The SWITCH 2 panel determines the monitor emulation settings.

SWITCH 1

For most installations, the **IN2013HR** will be operated in the factory default mode and will not require any changes to the dipswitch settings. The factory default settings are:

SWITCH 1 Dipswitches ON: 1, 3, 5, 6, 7 & 8
Output Signal Format: Auto Sense Enabled - Interface Selects Format
Horizontal Position Control: Enabled
H & V Sync Polarity: Mirror Input Polarities
Monitor Emulation (SWITCH 2): Disabled (all Dipswitches on SWITCH 2 panel are set to 0)

The following table lists the functions of the first 7 dipswitches in SWITCH 1:

Dipswitch	Function	Setting
1	Horizontal Position Control	1 = Enabled* 0 = Disabled
2	Output Sync Format: Sync on Green	1 = Sync on Green 0 = RGBHV / RGBS*
3	Output Sync Format RGBHV / RGBS	1 = RGBHV* 0 = RGBS
4	Output Sync Polarity	1 = Forced Negative 0 = Mirror Input*
5	Output Sync Format: Auto Sense / Manual	1 = Auto Sense* 0 = Manual
6	Serration Pulses	1 = Serrations Present* 0 = No Serrations
7	Output Video Format: Green / Monochrome Video	1 = Green* 0 = Monochrome on Green BNC

*Factory Default Settings

OUTPUT SIGNAL FORMAT SELECTION

Output Format: Automatic Sense Mode (Dipswitch 5 = 1)

In factory default configuration, the **IN2013HR** automatically senses the number of cables connected to the output BNC connectors and selects an appropriate output signal format. LED indicators located next to the V/Sync, H/Comp Sync and Green output BNCs (on the back of the interface) provide clear visual confirmation of the current output sync format. In order for output format auto sense circuit to operate, dipswitch 5 on Switch Bank 1 must be set to 1.

Number of Cables Connected to Output	Output Format
(3) Cables connected to RGB BNCs	RGsB
(4) Cables connected to RGBS BNCs	RGBS
(5) Cables connected to RGBHV BNCs	RGBHV

Output Sync Format : Manual Mode (Dipswitch 5=0)

For some applications, you may wish to force the interface to operate in a specific output format. To set the output sync format manually, you must first disable the auto sense circuit by setting dipswitch 5 on Switch Bank 1 to 0. Next, set dipswitches according to the table below to select the desired output format.

Output Format	Dipswitch Settings (Switch Bank 1)
RGBHV (Factory Default)	2 = 0 3 = 1 5 = 0
RGBS	2 = 0 3 = 0 5 = 0
RGsB	2 = 1 3 = 1 5 = 0 7 = 1
Composite Monochrome on Green BNC	2 = 1 3 = 1 5 = 0 7 = 0

INPUT SIGNAL FORMAT SELECTION

The **IN2013HR** is set at the factory for automatic operation with SUN and most SGI computers (*dipswitches 8 / 9 / 10 off). For other computers or signal formats, carefully set dipswitches 8, 9 and 10 as indicated in the chart below.

INPUT SIGNAL CONFIGURATION - SWITCH BANK 1						
DIPSWITCH	**SUN RGBS***	**SUN RGBHV**	**SGI / NeXT RsGsBs**	**SGI RGBS**	**SGI RGBHV**	**IBM POWER PC**
8	0	1	0	0	1	0
9	0	0	0	1	0	1
10	0	1	1	1	0	0

*Factory Default Settings

SWITCH 2 (MONITOR EMULATION)

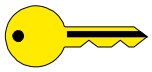
The **IN2013HR** includes a bank of 10 dipswitches (SWITCH 2) on the bottom side of the interface for monitor emulation. Setting the dipswitches to the appropriate positions allows the unit to emulate the appropriate sense signals, thus setting the video card to the desired frequency, refresh rate and resolution, even without a local monitor. When configured properly, the interface can emulate virtually any type of monitor.

Using the IN2013HR with a Local Monitor

Many high-resolution graphic workstations use sense signals to set resolution, horizontal frequency and vertical refresh rate. The **IN2013HR** passes all sense pins between the computer video port and the Local Monitor, ensuring that the computer can sense the attached monitor and set itself to an appropriate resolution and scan rate for that device. **The Monitor Emulation dipswitches 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 IN2013HR without a Local Monitor - The **IN2013HR**'s 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 display device. If you are not using a local monitor, but need to emulate a specific mode, locate your workstation type and desired mode in the chart at the bottom of the page. If you are not sure of the exact mode to select for your computer, select the setting shown in **bold** since it is the most common mode. Using the **IN9339** Alignment Tool (provided), gently set the dipswitches to the appropriate settings.

KEY CONCEPT



Check the Monitor Emulation chart and the IN2013HR dipswitch settings carefully. *An improper setting of the emulation dipswitches may lead to improper operation and could even result in severe damage to the computer video port or the monitor. Some modes listed on the following page may not be supported by certain workstations / graphics cards.*

Monitor Emulation Dipswitch Chart

Make / Model	Dipswitch Settings
SUN	
1152x900 / 66 Hz / 61.8 KHz	**0011000000**
1152x900 / 76 Hz / 71.7 KHz - 16" / 17" Monitor	1001000000
1152x900 / 76 Hz / 71.7 KHz - 19" Monitor	1001000100
1280x1024 / 76 KHz / 81 KHz	1011000000
1600x1280 / 76 Hz / 100.8 KHz	0011000100
SGI	
Single Scan 15" (Indy) 1024x768 / 60 Hz / 48.48 KHz	0100000000 or 0100000010
Single Scan 19" (Personal Iris / 4D) 1280x1024 / 60 Hz / 63.9 KHz	0000000000
Hitachi 19" 1280x1024 / 60 Hz	0100011000
Dual Scan 16" (Original Indigo) 1280x1024 & 1024x768 / 60 Hz / 63.9 & 48.48 KHz	0000010000
Dual Scan 19" (Original Indigo) 1280x1024 & 1024x768 / 60 Hz / 63.9 & 48.48 KHz	0100010000
Multiscan 16" Up to 1280x1024 / 76 Hz / 30 - 82 KHz	0100001000 or 0100001010
Multiscan 19" Up to 1280x1024 / 76 Hz / 30 - 82 KHz	**0000011000** or 0000011010
Multiscan 21" Up to 1280x1024 / 76 Hz / 30 - 82 KHz	0000001000

Specifications

IN2013HR Computer Video Interface	
Input	
Connector type	(1) 13W3 male
RGB Video Signals	Analog, 0.7 Vp-p Nominal
Input Impedance	75 Ohms
Sync Signals	TTL compatible
Horizontal Scan Range	15 KHz - 135.0 KHz
Vertical Scan Range	50 Hz - 120 Hz
Local Monitor Output	
Connector Type	(1) 13W3 female connector, buffered output, sync format same as input
Data Display Outputs	
Connector Type	2 Sets of (5) BNC female
Output Signal Formats	RGsB, RGBS, RGBHV, Composite Monochrome
RGB Signals	Analog Video, 75 ohm impedance
Bandwidth	230 MHz @ -3 dB
Rise and Fall Times	1.5 nano seconds
Video Gain (Terminated)	Variable Control - Adjustable from .7 (30% voltage decrease) to 1.3 (30% voltage increase)
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 µSec > 40 KHz: 0.7 µSec
Vertical Pulse Width	Same as the input for H & V, ≈ 120 µSec for Sync on Green or Composite Sync
Controls	
External	Horizontal Position, Video Gain, Sharpness, Output Sync, Input Computer Select, Monitor Emulation
Dimensions	
Size	1.75" x 11.75" x 6.5" / 4.4cm x 29.9cm x 16.5cm
Product Weight	2 lb. / 1kg.
Shipping Weight	5 lb. / 2.5kg.
Power	
Power Supply	Internal Switch Mode: 90 - 260 VAC; 0.29A; 47 - 63 Hz
Power Consumption	14.5 Watts
Regulatory Compliance	
Safety & EMI	UL 1950, CAN/CSA-22.2 No. 950 3rd Ed. FCC class A; CE: EN50022 (1987), EN50081-1 (1991), EN50082-1 (1992 & 1994), EN60950-92

Parts Included
(1) **IN2013HR:** Interface (1) **IN9230:** IEC Power Cable (U.S. only) (1) **IN9333:** Alignment Tool (1) Operation Manual

Optional Accessories
Extension Cables
IN8400 Series: 13W3 Workstation Extension Cable (available in lengths from 6' to 50')

RGB Installation Cables			
Coaxial Cables	**3-Conductor**	**4-Conductor**	**5-Conductor**
Standard Resolution		**IN7000-4**	**IN7000-5**
Standard Resolution, Plenum		**IN7000P-4**	**IN7000P-5**
Super High Resolution	**IN7300-3**	**IN7300-4**	**IN7300-5**
Super High Resolution, Plenum			**IN7400P-5**
Ultra High Resolution	**IN7200-3**	**IN7200-5**	**IN7200-6**

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

Troubleshooting

Problem: There is no image on the display device.

- **Solution 1:** Make sure that the **IN9230** IEC power cable is securely plugged into the unit and the A/C source.
- **Solution 2:** Make sure the A/C source is live.
- **Solution 3:** Verify that the power switch is turned on for the video source, the **IN2013HR** and the display device.
- **Solution 4:** Verify the connections to the video source and the output display device(s).

Problem: The power switch is turned on, but the front panel LED is dark.

- **Solution 1:** Make sure that the **IN9230** IEC power cable is securely plugged into the unit and the A/C source.
- **Solution 2:** Make sure the A/C source is live.
- **Solution 3:** The **IN2013HR** contains a 0.5A / 250V time delay fuse. To change the fuse, first remove power from the unit and then slide out the fuse holder (located on the rear panel between the power switch and the IEC cable receptacle) using the **IN9339** Alignment Tool (included).

Problem: The display device connected to the IN2013HR output has a bad / scrambled image.

- **Solution 1:** Check the dipswitch settings to make sure the unit is outputting a sync format that is compatible with the display device. For most applications the default dipswitch settings will work best (see page 7).
- **Solution 2:** The RGB cable may have a bad sync line. 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.)
- **Solution 3:** The display device connected to the **IN2013HR** may not be compatible with the computer output. Adjust the output resolution of the computer video card accordingly.

Problem: The output image is very dark.

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

Problem: The output image is missing a color.

- **Solution:** The RGB cable may be damaged / defective. 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.)

Problem: The output image is very bright and appears "overdriven" with poor contrast.

- **Solution 1:** Verify the gain setting on the **IN2013HR**. If it is set to a very high level, reduce the gain control setting as required.
- **Solution 2:** Check the contrast and brightness settings on the display device. Many display devices look best with the contrast set toward the upper end of the adjustment range (75 - 95%) and the brightness set towards the middle of the adjustment range (40 - 60%).

Problem: The output image is green.

- **Solution:** The dipswitches may be set for Sync on Green output. Not all data displays operate well with an RGsB signal. Try changing the dipswitches to factory default so the unit outputs an RGBHV signal (see page 7).

Problem: 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.

If problems persist, call INLINE Technical Services at (714) 921-4100 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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INLINE, INC. ♦ 810 West Taft ♦ Orange, CA 92865

800-882-7117 ♦ 714-450-1800 ♦ FAX 714-450-1850 ♦ www.inlineinc.com