Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

IN1508

Scaling Presentation Switcher

Precautions

Safety Instructions • English

⚠ **This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.**

⚡ **This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.**

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

⚠ **Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).**

⚡ **Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.**

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

⚠ **Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.**

⚡ **Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.**

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

⚠ **Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.**

⚡ **Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.**

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrian implicar riesgos.

安全须知 • 中文

⚠ 这个符号提示用户该设备用户手册中有重要的操作和维护说明。

⚡ 这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterias usadas siguiendo las instrucciones del fabricante.

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线 （地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线，避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔,它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE *This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.*

Quick Start — IN1508
Scaling Presentation Switcher

Installation

Step 1

If desired, mount the switcher in a rack. See "Mounting the switcher" in chapter 2, "Installation".

Step 2

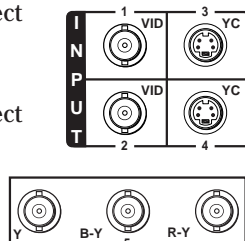Turn off power to the input and output devices, and remove the power cords from them.

Step 3

Connect source video devices to the switcher's inputs.

Inputs 1 and 2 — Connect two composite video sources.

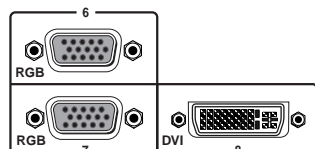**Inputs 3 and 4** — Connect two S-video sources.

Input 5 — Connect an interlaced, progressive, or HDTV component video source.

NOTE *Once power is applied, use the menu system to set the video type (interlaced, progressive, or HDTV) for input 5. See "Configure input 5" on page QS-2.*

Inputs 6 and 7 — Connect two VGA – UXGA (RGB) video sources.

Input 8 — Connect a single link DVI-D video source.

Step 4

Connect source audio devices to the switcher's inputs.

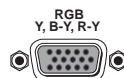**Inputs 1 through 5** — Connect unbalanced stereo or mono audio sources to the left and right RCA connectors.

Inputs 6 and 8 — Connect unbalanced stereo or mono audio sources to the 3.5 mm mini stereo jack, shown at right.

Step 5

Connect an RGB or component video (Y, B-Y, R-Y) display or other output device to the switcher's 15-pin HD video output connector, shown at right.

Step 6

Connect audio devices to the switcher's audio outputs.

Output A — Connect an audio device, such as an amplifier or powered speakers, to these left and right RCA connectors.

Output B — Connect an audio device, such as powered speakers, to this 3.5 mm, 5-pole captive screw connector for balanced or unbalanced audio output as shown below.

Unbalanced Output

Balanced Output
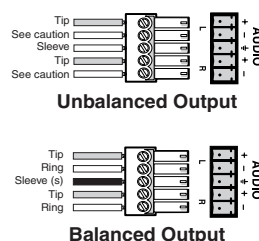
CAUTION *Connect the sleeve to ground. Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.*

CAUTION *Incorrect audio connector wiring can damage the switcher. See the captive screw output audio connections drawing, above for balanced or unbalanced audio output connections.*

Step 7

If desired, connect a PC or control system to the IN1508's RS-232 port as shown below.

Pin	RS-232	Function
1	—	Not used
2	TX	Transmit data
3	RX	Receive data
4	—	Not used
5	Gnd	Signal ground
6	—	Not used
7	—	Not used
8	—	Not used
9	—	Not used

Step 8

Plug the switcher and input and output devices into a grounded AC source, and turn on the input and output devices. Ensure that the connected video display is turned on and operating normally so that you can observe the on-screen displays.

Front Panel Controls

Input buttons and LEDs select and identify inputs. The green input LED indicates the input that is scaled and displayed in the main image window. If the Picture-in-picture (PIP) feature is turned on (the PIP On LED is lit), the red input LED indicates the input that is displayed in the PIP image window.

Output Rate button and LEDs select and identify the switcher's output rate. The Output Rate button cycles through the available output screen resolutions. The Output Rate LEDs indicate the selected resolution.

> **NOTE** *The Output Rate button selects the resolution **only**; the refresh rate defaults to 60 Hz for each resolution selection.*

> **NOTE** *The available 1400 x 1050, 480p, and 576p rates can be selected only by using the menu system or SIS commands.*

> **NOTE** *There is a 1-second delay between selecting an output resolution from the front panel (the Output Rate LED lights) and the selected change taking effect.*

PIP On button and LED select and identify the on status of the PIP feature.

PIP Swap button toggles the primary and secondary pictures between the main image and the PIP window.

> **NOTE** *With regard to the PIP function, there are two groups of inputs: **low resolution** (inputs 1 through 4 [and input 5 if it is configured as interlaced component video]) and **high resolution** (inputs 6 through 8 [and input 5 if it configured as progressive component video/HDTV]).*
>
> *The PIP function toggles between the selected input in each group. The PIP function **cannot** toggle between two inputs in the same group.*

> **NOTE** *If PIP mode is off, the Swap function toggles between the most recently selected low resolution input and the most recently selected high resolution input.*

Picture Control buttons select individual picture control status bar indicators that you can use to make adjustments to the centering, size, PIP centering, PIP size, contrast, brightness, color, and tint.

Menu button activates the menu system, or a submenu, or backs up one level within the menu system.

◄, ▲, ▼, **and ▶ buttons** maneuver through the menu system, move the slider on status bar indicators, and move the ■ marker in check box indicators.

Enter button selects a menu item, exits a status bar indicator, or activates a selected ■.

Setup and Operation

Configure input 5

1. Press **Menu** > **Enter** > ▲ > **Enter** to activate the Input 5 selection box.

2. Press ▲ or ▼ as necessary to move the ■ marker next to the appropriate input video type.

3. Press **Enter** to activate the selected input video type.

4. Allow the on-screen timeout to expire.

Configure the output

1. Press **Menu** > ▼ > ▼ > **Enter** > **Enter** to activate the output resolution selection box.

2. Press ▲ or ▼ as necessary to move the ■ marker next to the desired output resolution.

3. Press **Enter** to activate the selected resolution.

> **NOTE** *The screen goes blank while the switcher changes to the newly selected resolution.*

4. If necessary, press **Menu** to back up one level from the resolution selection box.

5. Press ▼ > **Enter** to activate the output rate selection box.

6. Press ▲ or ▼ as necessary to move the ■ marker next to the desired output rate.

7. Press **Enter** to activate the selected rate.

> **NOTE** *The screen goes blank while the switcher changes to the newly selected rate.*

8. If necessary, press **Menu** to back up one level from the rate selection box.

9. Press ▼ > ▼ > **Enter** to activate the signal type selection box.

10. Press ▲ or ▼ as necessary to move the ■ marker next to the desired output signal type.

11. Press **Enter** to activate the selected rate.

> **NOTE** *The screen goes blank while the switcher changes to the newly selected signal type.*

12. Allow the on-screen timeout to expire.

Table of Contents

Table of Contents, cont'd

Table of Contents, cont'd

Chapter One

Introduction

About this Manual

About the Switcher

Features

Introduction

About this Manual

This manual contains installation, configuration, and operating information for the Extron IN1508 Scaling Presentation Switcher (referred to in this manual as the "IN1508" or the "switcher").

- Chapter 1 identifies the switcher's features.

- Chapter 2 details how to install the switcher.

- Chapter 3 describes how to operate the switcher from its front panel and use all of its features.

- Chapter 4 provides information about programming and operating the switcher under RS-232 control, such as from a PC or host controller. You can control the switcher using the Simple Instruction Set (SIS™) commands.

- Appendix A lists the switcher's specifications and pertinent part numbers.

About the Switcher

The Extron IN1508 is an eight-input video and stereo audio switcher that incorporates a video scaler (figure 1-1). The switcher accepts:

- Two NTSC/PAL/SECAM/NTSC 4.43 composite video inputs on female BNC connectors

- Two S-video (Y/C) inputs on 4-pin mini DIN connectors

- One component (YUV) video input (progressive [Y, B-Y, R-Y] or interlaced [Y, B-Y, R-Y]) on female BNC connectors

- Two VGA – UXGA (RGBHV or RGBS) inputs on 15-pin HD connectors

- One digital visual interface (DVI), direct digital input on a DVI-I female connector (see "DVI video" in this chapter for an introduction to the DVI video format)

NOTE *With the proper adapters, the IN1508 can also be used with High Definition Multimedia Interface (HDMI™) signals.*

- Eight unbalanced stereo or mono audio inputs (five inputs on RCA connectors and three inputs on 3.5 mm mini stereo jacks)

The IN1508 scales the video inputs to a variety of standard VGA and HDTV resolutions and any of up to 3 available refresh rates. The switcher outputs RGBHV, RGBS, RGsB, or progressive component (Y, B-Y, R-Y) video on a 15-pin HD (VGA) connector. It outputs stereo or mono audio on left and right RCA connectors and a 3.5 mm 5-pole captive screw connector. The IN1508 allows all of the input formats listed above to be displayed on a device with a fixed resolution and aspect ratio, such as a liquid crystal display (LCD) projector, digital light processor (DLP) projector, or plasma display.

The IN1508 seamlessly switches between the VGA and low-resolution video inputs. Seamless switching allows switching between sources without a loss of sync.

The switcher's scaler upscales or downscales, converting the horizontal and vertical sync timing and the number of lines of the video input to match the native resolution of the display. This produces an undistorted, brighter picture.

The switcher is housed in a 1U high, 17.5" wide metal enclosure. With the included mounting ears, the switcher is rack-mountable. With optional mounting hardware, the switcher can be mounted under or through furniture or other mounting surface. The switcher has an internal 100 VAC to 240 VAC, 50/60 Hz, 40 watts, autoswitchable power supply that provides worldwide power compatibility.

RS-232 Control

Sound System

**Extron
IN1508**
Scaling Presentation Switcher

LCD Projector

VCR

DVD Player

Computer

Laptop
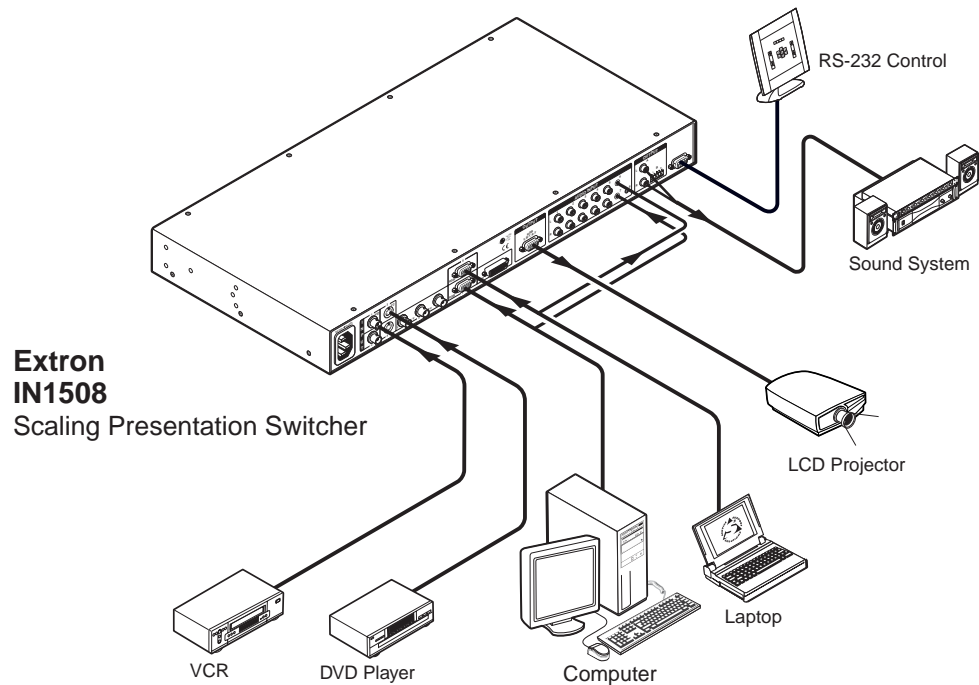
Figure 1-1 — Typical IN1508 Scaling Presentation Switcher application

DVI video

DVI is a digital transmission standard for high-speed, lossless video interfaces, such as between a computer and a direct digital monitor. The DVI standard, which Silicon Image Corporation also refers to as PanelLink and PanelLink Digital, specifies single link and dual link digital versions for either the digital only (DVI-D) or digital and analog combined (DVI-I) connectors. A single link supports resolutions higher than HDTV at a reduced blanking interval. The dual link configuration supports the higher bandwidth demands of displays that do not support reduced blanking. The IN1508 switcher supports a single link of DVI-D video.

DVI uses a process called transmission minimized differential signaling (TMDS) for sending graphics data to a compatible monitor. TMDS is based on an encoding algorithm that converts 8 bits of data into a 10-bit transition-minimized DC-balanced signal. The DVI standard, as supported by the switcher, allows for a single link of 3 channels (red, green and blue) of data, enabling the use of large pixel format digital display devices.

The IN1508 switcher converts direct digital video to analog RGB video. The switcher accepts a single link of DVI-D video from a computer or other digital video source device on a standard 25-pin female DVI-D connector. The Digital Flat Panel (DFP) video format can be input using a DFP-to-DVI adapter.

Standard DVI cable

DVI/DFP signals run at a very high frequency and are especially prone to bad video connections, too many adapters, or excessive cable length. To avoid the loss of an image or jitter, follow these guidelines:

- Do not exceed 16.4 feet (5 meters) on the switcher's input when using standard DVI cables.

NOTE   *Extron's IN9700 extension cable can be used to extend the length of the input cable. See "IN9700 cable", below.*

- Only use an input cable specifically designed for DVI signals.

- Limit or avoid the use of adapters.

- Use only approved DVI/HDMI connectors.

NOTE   *Use only cables specifically intended for DVI or HDMI interfaces. Use of non-DVI or non-HDMI cables or modified cables can cause the switcher to be unable to receive the DVI input.*

IN9700 cable

Extron's IN9700 extension cable can be used to stretch the length of the input cable, so long as **no adapters are used** in the cable run. Use the following lengths as a guideline:

Resolution	Recommended maximum cable length
1024 x 768	75 feet
1280 x 1024	60 feet
1600 x 1200	35 feet

Features

Inputs —

Video inputs — The switcher switches among:

- Two fully-configurable RGB video inputs on 15-pin HD connectors

- One HDTV component video, interlaced component video, or progressive scan video on three BNC connectors

- Two S-video inputs on 4-pin mini-DIN connectors

- Two composite video inputs on single BNC connectors.

- One single link of DVI-D on a DVI connector with EDID emulation

Audio inputs — The switcher switches among eight unbalanced stereo audio inputs, five inputs on left and right RCA connectors and three inputs on 3.5 mm mini stereo jacks. Inputs can come from sources such as a VCR, DVD player, computer audio card, or other audio device that outputs a stereo line-level signal.

Outputs —

Video outputs — The IN1508 outputs scaled video signals as progressive RGBHV, RGBS, RGsB, or component video, from 640 x 480 (VGA) up to 1600 x 1200 (UXGA), to match the optimum or native resolution of virtually any display device, on a 15-pin HD connector.

The output refresh rate is selectable as desired through the on-screen display menu. When used with LCD or DLA displays, Extron recommends the 60 Hz setting. Higher output refresh rates can be used with CRT displays to reduce flicker.

Audio outputs — The switcher provides an unbalanced line level signal that is identical to the input signal. This output can drive any line level compatible audio unit, or a local device such as powered speakers.

Video output resolutions — The IN1508 outputs an image scaled up to the following output resolutions:

- 640 x 480 (VGA) at 50 Hz, 60 Hz, and 75 Hz
- 800 x 600 (SVGA) at 50 Hz, 60 Hz, and 75 Hz
- 852 x 480 at 50 Hz and 60 Hz
- 1024 x 768 (XGA) at 50 Hz, 60 Hz, and 75 Hz
- 1280 x 768 at 60 Hz
- 1280 x 800 at 50 Hz and 60 Hz
- 1280 x 1024 (SXGA) at 50 Hz, 60 Hz, and 75 Hz
- 1024 x 852 at 50 Hz, 60 Hz, and 75 Hz
- 1024 x 1024 at 50 Hz, 60 Hz, and 75 Hz
- 1366 x 768 (wide XGA) at 50 Hz, 60 Hz, and 75 Hz
- 1365 x 1024 (plasma) at 50 Hz, 60 Hz, and 75 Hz
- 1400 x 1050 at 50 Hz and 60 Hz
- 1440 x 900 at 60 Hz and 75 Hz
- 1600 x 1200 (UXGA) at 50 Hz and 60 Hz
- 1680 x 1050 at 60 Hz
- 720 x 480 (HDTV 480p) at 60 Hz
- 720 x 576 (HDTV 576p) at 50 Hz
- 1280 x 720 (HDTV 720p) at 50 Hz and 60 Hz
- 1920 x 1080 (HDTV 1080i) at 50 Hz and 60 Hz
- 1920 x 1080 (HDTV 1080p) at 60 Hz

Seamless Switching — The IN1508 provides a seamless transition between scaled low resolution video inputs (inputs 1 through 4 [or inputs 1 through 5 if input 5 is configured as interlaced component video]) and the high resolution inputs (inputs 6 and 7 [or inputs 5 through 7 if input 5 is configured as progressive component video or HDTV]).

Picture-in-picture — One input from either the low resolution (interlaced component, S-video, and composite video) video inputs or the high resolution (VGA, progressive component, and DVI) video inputs can be selected as the primary picture. A second high resolution or low resolution input can be selected as the secondary picture. The secondary picture is displayed in a user-determined area of the output image. The primary and secondary picture can be swapped with a touch of a button.

Introduction, cont'd

Inverse 3:2 pulldown detection for NTSC video sources and 2:2 film detection for PAL video sources — This advanced film mode processing feature helps maximize image detail and sharpness for video sources that originated from film. When film is converted to NTSC video, the film frame rate has to be matched to the video frame rate in a process called 3:2 pulldown. Jaggies and other image artifacts can result if conventional deinterlacing techniques are used on film-source video. The IN1508's advanced film mode processing recognizes signals that originated from film. The switcher then applies video processing algorithms that optimize the conversion of video that was made with the 3:2 pulldown process. This results in richly detailed images with sharply defined lines.

A similar process is used for PAL film-source video.

Quad-standard decoding — The IN1508's video decoder provides accurate video decoding of composite video and S-video in the NTSC, PAL, SECAM, and NTSC 4.43 standards. The advanced 3-line adaptive comb filter that decodes composite video reduces cross-color interference and hanging dots while maintaining maximum image bandwidth and detail.

Picture controls — A wide variety of picture controls are available for fine picture adjustments:

- Position
- Size
- Brightness and contrast
- Color and tint
- Sharpness

Once these adjustments are made, the settings are stored in non-volatile memory and automatically recalled when the same input source is selected again.

On-screen menus — The switcher puts its menu displays on the output video stream, for display by the output monitor or projector. The menu system provides easy control of video adjustments. The on-screen menus also make it easy to verify and adjust advanced settings such as output signal resolution, refresh rate, sync format, and the reset to factory defaults function.

Audio follow — When an input is selected on the front panel, the audio input follows its corresponding video input signal (audio follow). Under RS-232 control, the audio input can be switched to follow either the main window selection or the PIP window selection.

Operational flexibility — Operations such as input and scaling selection and picture controls can be performed on the front panel or over the RS-232 link. The RS-232 links allow remote control via a PC or control system.

- **Front panel control** — The switcher's front panel controller and on-screen menus support individual input selection, resolution selection, volume control, and complete configuration of the switcher.

- **Infrared remote control** — The switcher includes an Infrared (IR) remote control that duplicates all of the front panel functionality and some RS-232 functionality.

- **Simple Instruction Set (SIS) commands** — The remote control protocol uses Extron's SIS commands for easy programming and operation.

Freeze mode — Provides a high quality still image for applications that require close examination of a specific video frame.

Blank mode — Suppresses the output video image. Blank silences the R, G, and B video outputs but the switcher still outputs sync. This ensures that the output device does not lose sync lock. Blank mode operates for video and RGB signals that are processed by the scaling circuitry. On-screen displays are not blanked.

Rack mountable — The 1U high switcher can be mounted in any conventional 19" wide rack using the included rack mounting brackets.

Power — The 100 VAC to 240 VAC, auto-switchable, internal power supply of the IN1508 provides worldwide power compatibility.

Introduction, cont'd

Chapter Two

Installation

Mounting the Switcher

Cabling and Rear Panel Views

Remote Control Battery Installation

Configuration

Installation

Mounting the Switcher

The IN1508 comes with rubber feet and a set of rack mounting brackets.

Tabletop use

Attach a self-adhesive rubber foot to each corner of the bottom of the switcher.

Rack mounting

UL requirements

The following Underwriters Laboratories (UL) requirements pertain to the installation of the switcher into a rack (figure 2-1).

1. **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the MLC in an environment compatible with the maximum ambient temperature (Tma = +122 °F, +50 °C) specified by Extron.

2. **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.

3. **Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.

4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Mounting instructions

Rack mount the switcher as follows:

1. Attach the rack mounting brackets to the switcher with the supplied eight #8 machine screws (figure 2-1).

2. Insert the switcher into the rack, aligning the holes in the mounting bracket with those in the rack.

Rack-mount
Bracket
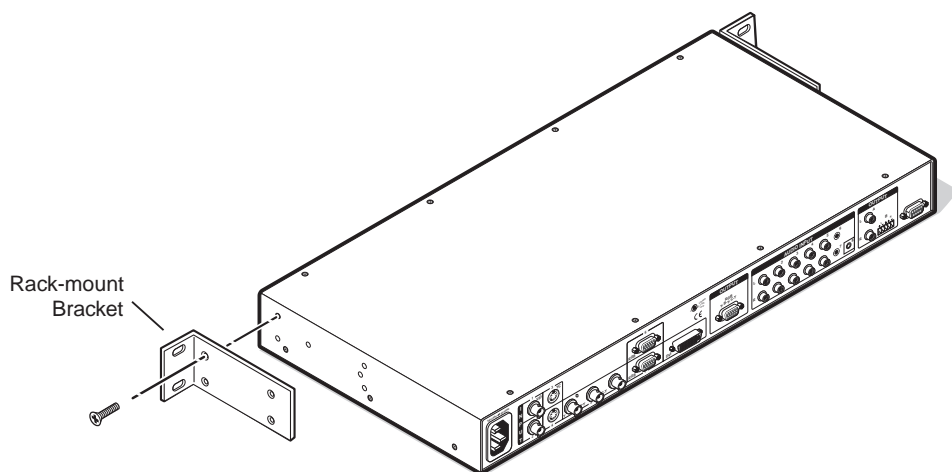
Figure 2-1 — Mounting the switcher

3. Secure the switcher to the rack using the supplied machine screws.

Cabling and Rear Panel Views

All connectors are on the rear panel (figure 2-2).
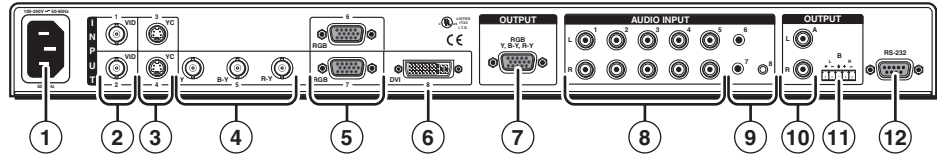
Figure 2-2 — IN1508 rear panel connectors

Power connection

① **AC power connector** — Plug a standard IEC power cord into this connector to connect the switcher to a 100 to 240 VAC, 50 Hz or 60 Hz power source.

Video connections

② **Input 1 and Input 2 composite video connectors** — Connect composite video sources to these female BNC connectors.
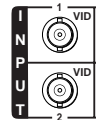
③ **Input 3 and Input 4 S-video connectors** — Connect S-video sources to these 4-pin mini DIN connectors.
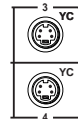
④ **Input 5 component video connectors** — Connect a progressive or interlaced component video (Y, B-Y, R-Y) source to these female BNC connectors.
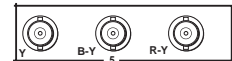
⑤ **Input 6 and Input 7 RGB video connectors** — Connect RGBHV or RGBS sources to these female 15-pin HD connectors.
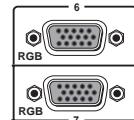
⑥ **Input 8 DVI video connector** — Connect a single link of DVI-D direct digital video to this female DVI connector. This connector supports only a digital DVI source.

NOTE *With the proper adapters, the IN1508 can also be used with HDMI signals.*

⑦ **Video output 15-pin HD connectors** — Connect an RGB video or progressive/HDTV component video display to this female 15-pin HD connector.
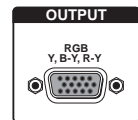
Installation, cont'd

Audio connections

8   **Input 1 through Input 5 connectors** — Connect unbalanced stereo or mono audio sources (such as DVD players or VCRs) to these pairs (left and right) of RCA connectors for audio input.

9   **Input 6 through Input 8 connectors** — Connect unbalanced stereo audio sources (such as computers) to these 3.5 mm mini stereo jacks for unbalanced audio input. Figure 2-3 shows how to wire the audio jack.
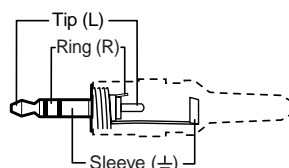
Figure 2-3 — Input 6 through input 8 audio connector wiring

10 **Output A connector** — Connect an audio device, such as an amplifier or powered speakers, to these left and right RCA connectors.

11 **Output B connector** — Connect an audio device, such as powered speakers, to this 3.5 mm, 5-pole captive screw connector for balanced or unbalanced audio output.

Figure 2-4 shows how to wire the captive screw audio connector. The connector is included with the switcher, but you must obtain the cable. Insert the wires into the appropriate openings in the captive screw connector. Tighten the screws on top to fasten the wires.

CAUTION   *Connect the sleeve(s) to ground (⏚). Connecting the sleeve(s) to a negative (-) terminal will damage audio output circuits.*
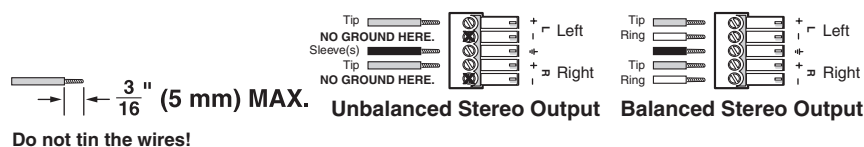
Figure 2-4 — Wiring the audio output connector

NOTE   *The length of exposed wires is critical. The ideal length is 3/16" (5 mm).*

- *If the stripped section of wire is longer than 3/16", the exposed wires may touch, causing a short circuit between them.*

- *If the stripped section of wire is shorter than 3/16", wires can be easily pulled out even if tightly fastened by the captive screws.*

By default, the audio output follows the video switch.

RS-232 connection

⑫ **Remote port** — Connect a host device, such as a computer or touch panel control, to the IN1508 switcher via this 9-pin D connector for serial RS-232 control (figure 2-5).
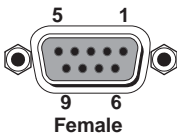
Pin	RS-232	Function
1	—	Not used
2	TX	Transmit data
3	RX	Receive data
4	—	Not used
5	Gnd	Signal ground
6	—	Not used
7	—	Not used
8	—	Not used
9	—	Not used

Figure 2-5 — Remote port pin assignments

See chapter 4, "Serial Communications", for definitions of the SIS commands.

Remote Control Battery Installation

Install two AAA batteries as shown (figure 2-6).
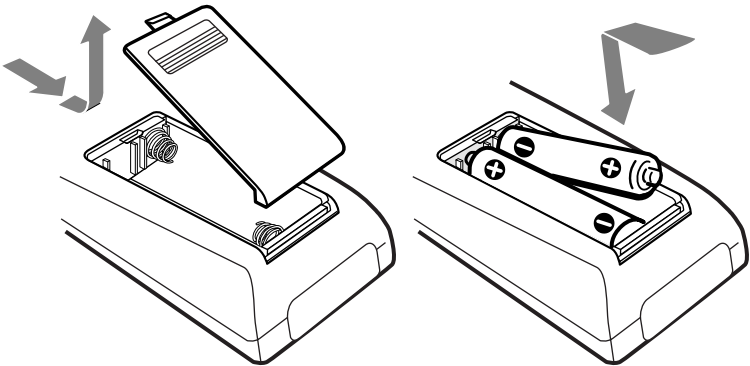
Figure 2-6 — Battery installation

Configuration

The switcher must be configured for the video that is connected to input 5 and for the output video device. Configuration can be accomplished using either the front panel controls, the IR remote control, or the Simple Instruction Set. See chapter 3, "Operation", and chapter 4, "Serial Communications".

3

Chapter Three

Operation

Operation

Front Panel Controls and Indicators

All of the switcher's controls are on the front panel (figure 3-1). Many controls are duplicated on the IR remote control (figure 3-8 on page 3-7). Front panel LEDs provide graphic indication of some of the basic system functions. For more complex tasks, such as system configuration, the switcher has a menu system that is operated by using the front panel or IR remote control buttons. The menu system reports via an on-screen display on the connected output device (figure 3-2).
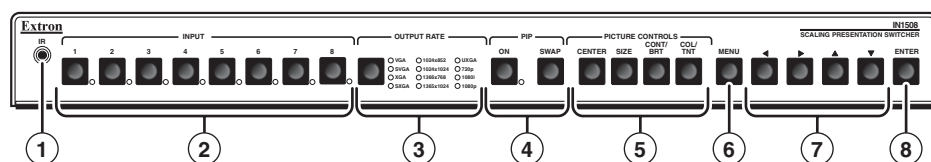
Figure 3-1 — IN1508 video switcher and switcher front panel
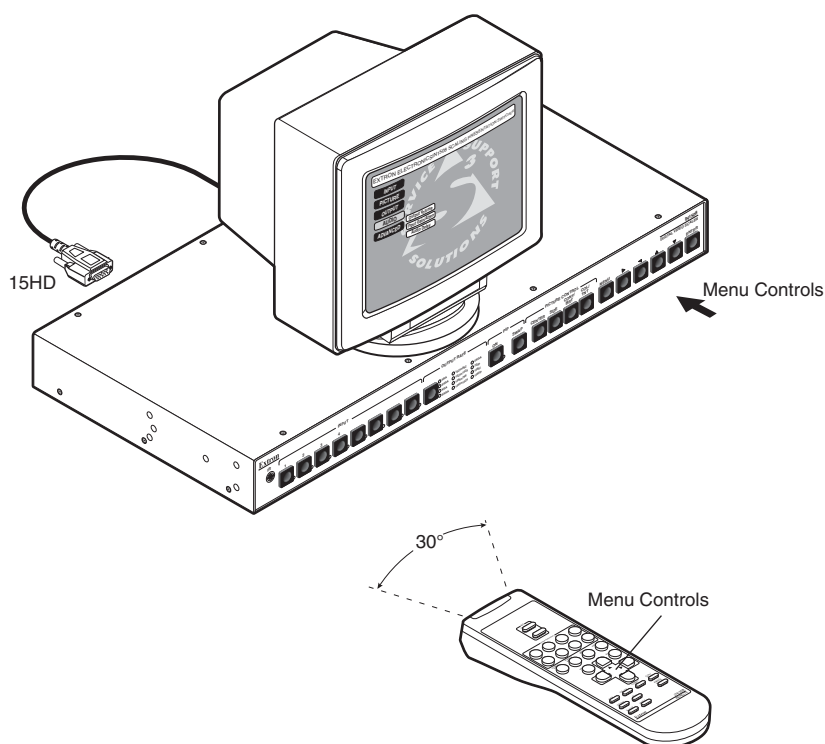
Figure 3-2 — Menu system display

Infrared sensor

① **Infrared remote sensor** — This sensor receives infrared (IR) signals from the included IN1508 remote control. The IR remote control must be pointed within 30 degrees of this sensor (figure 3-2) for best results.

See "Remote Control Buttons", later in this chapter, for operation of the remote control.

| NOTE | *The switcher's IR receiver can be disabled to avoid conflicts with other remotes. See the IR receiver enable SIS command in chapter 4, "Serial Communications" to disable the IR receiver.* |

Input controls

② **Input buttons** — The Input 1 through Input 8 buttons (figure 3-3) select the associated video input to scale and output. The switch can be a cut or a fade, depending on the switch mode; see "Fade Switch selection box", on page 3-24. Audio always follows (switches with) the front panel video selection.

INPUT

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
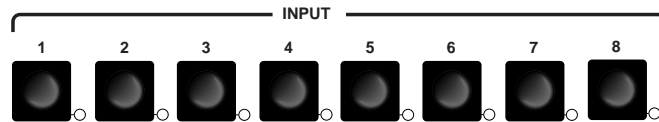
Figure 3-3 — Input selection buttons and LEDs

NOTE *If the picture-in-picture (PIP) feature is turned on (the PIP On LED, ④, is lit), the input buttons select an input for either the primary (main) window or the secondary (PIP) window. If the PIP feature is turned off, the input buttons select the main output only. See "Input selection operation" on page 3-10 for details.*

NOTE *If the PIP feature is turned on, when an input is selected, the audio associated with that input in the PIP window is muted. The audio does not become unmuted until either:*

- *It is swapped to the main window.*

- *A Simple Instruction Set **Audio follow source** command has been issued to configure the switcher to make the audio follow the PIP window. See chapter 4, "Serial Communications".*

Input LEDs — The Input 1 through Input 8 LEDs indicate the selected video and audio input(s).

An Input LED that is lit **green** indicates the **primary** (main) output.

An Input LED that is lit **red** indicates the **secondary** output (the input that is displayed in the PIP window).

NOTE *No input LED lights red if the PIP feature is turned off.*

Operation, cont'd

Output Rate selection

③ **Output Rate button** — The Output Rate button (figure 3-4) cycles through the available output screen resolutions. Use this button to select the "sweet spot" resolution of the connected video display device. The switcher defaults to a refresh rate of 60 Hz with each resolution selection using the Output Rate button.

NOTE *Eight IN1508 output resolutions are not available from the front panel. These eight resolutions can be selected using the menu system (see "Resolution selection box", on page 3-21) and SIS commands (see chapter 4, "Serial Communications"). The eight output resolutions **not** available from the front panel are:*

- *852 x 480*
- *1400 x 1050*
- *1280 x 768*
- *1280 x 800*
- *1440 x 900*
- *1680 x 1050*
- *480p*
- *576p*
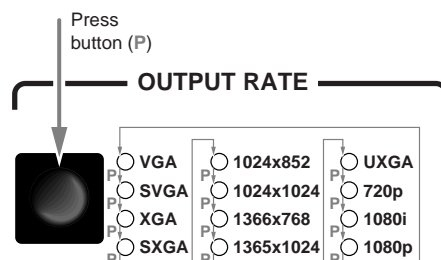
Figure 3-4 — Output Rate buttons

The Output Rate LEDs indicate the selected resolution.

NOTE *If any of the rates **not** available from the front panel are selected using the menu system or SIS commands, no Output Rate LED is lit.*

NOTE *The Output Rate button allows you to select the resolution **only**; the refresh rate defaults to 60 Hz for each front panel resolution selection. You can select a different refresh rate using the menu system; see "Refresh Rate selection box" later in this chapter for details.*

NOTE *There is a 1-second delay between selecting an output resolution from the front panel (the desired Output Rate LED lights) and the selected change taking effect. This ensures that the screen does not try to change resolutions while you cycle through the available resolutions to the desired setting.*

The switcher reports the selected resolution for approximately 3 seconds on the connected output display.

Picture-in-Picture controls

④ **PIP buttons —**
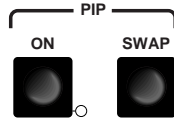
Figure 3-5 — Picture-in-Picture buttons

On button — The PIP On button toggles the PIP function on and off.

`NOTE` *If you press and* **hold** *the PIP On button while you apply power to the switcher, the switcher toggles the output signal type between RGB and progressive component video. If an RGB signal type (RGBHV, RGBS, or RGsB) was selected the last time the switcher was powered, the signal type switches to component. If component video was selected, the signal type switches to RGB.*

`NOTE` *The audio breakaway switching function, normally available under RS-232 control* **only***, is not available when the PIP function is on.*

On LED — When lit, the PIP On LED indicates that the switcher's PIP function is on.

Swap button — The PIP Swap button toggles the primary and secondary pictures between the main image and the PIP window.

`NOTE` *With regard to the PIP function, there are two groups of inputs:*

- *Low resolution — Inputs 1 through 4 (and input 5 if it is configured as interlaced component video; see "Input 5 selection" on page 3-18)*

- *High resolution — Inputs 6 through 8 (and input 5 if it configured as progressive component video/HDTV; see "Input 5 selection" on page 3-18)*

The PIP function toggles between the selected input in each group. The PIP function **cannot** *toggle between two inputs in the same group.*

`NOTE` *The size of the PIP window is set in the menu system, see "PIP Mode selection box", on page 3-24, for details. The position of the PIP window is set with the centering adjustment; see "Picture adjustments", on page 3-25, for details.*

`NOTE` *If PIP mode is off (the PIP Mode On LED is off), the Swap function continues to work, toggling between the most recently selected low-resolution input and the most recently selected high-resolution input. Unlike when PIP mode is on, however, the input that is replaced in the main window is* **not** *displayed in the PIP window.*

Picture Controls buttons
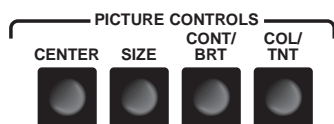
Figure 3-6 — Picture Control buttons

(5) **Picture Controls buttons** — The Picture Controls buttons provide a shortcut to select individual or groups of image adjustments that are adjusted using the ◄, ▲, ▼, and ▶ buttons (⑦). These adjustments are also available via the menu system.

Center control button — The Center button selects and deselects the display centering adjustment. The adjustment range depends on the output resolution selected. See "Picture adjustments", on page 3-25.

Size control button — The Size button selects and deselects the display size adjustment. The adjustment range depends on the output resolution selected. See "Picture adjustments", on page 3-25.

Contrast/Brightness control button — The Brightness/Contrast button selects and deselects the display brightness and contrast adjustments. The adjustment range for both brightness and contrast is from 0 to 128. See "Picture adjustments", on page 3-25.

Color/Tint control button — The Color/Tint button selects and deselects the display color and tint adjustments. The color adjustment range is from 0 to 128. The tint adjustment range is from 0 to 128. See "Picture adjustments", on page 3-25.

NOTE *The Color/Tint control affects only interlaced component video, S-video inputs, and composite video inputs.*

Menu control buttons

Figure 3-7 — Menu control buttons

(6) **Menu button** — The Menu button enters the IN1508's main menu system and backs out of the currently active submenu or selection. See "Main menu system", on page 3-16, and "Picture adjustments", on page 3-25, for details.

(7) **Menu ◄, ▲, ▼, and ▶ buttons** — The Menu buttons navigate the main and picture control menu systems. See "Main menu system", on page 3-16, and "Picture adjustments", on page 3-25, for details.

NOTE *When the connected output device is **not** displaying a menu or other switcher-generated message, pushing the Menu ◄, ▲, ▼, or ▶ button pops up an output volume status indicator bar on the output device. Use the Menu ◄ or ▼ button to decrease the output volume. Use the Menu ▶ and ▲ button to increase the volume.*

⑧ **Enter button** — The Enter button:

•   Activates a highlighted submenu or function in the IN1508 main menu system.

•   Exits a slider-type status indicator bar control.

•   Saves a changed value in a selection box control.

See "Main menu system", on page 3-16, and "Picture adjustments", on page 3-25, for details.

Remote Control Buttons

To control the switcher with the hand-held IN1508 Remote control (figure 3-8), aim the hand-held unit at the IR detector on the switcher and press the desired buttons on the remote. The maximum operating range is 30 feet.

⑨ **Picture-In-Picture (PIP) buttons** — The PIP buttons function identically to the front panel PIP buttons. See "Picture-in-picture controls" and ④, on page 3-5.

On/Off button — The PIP On/Off button toggles the PIP function on and off. When lit, the front panel PIP On LED indicates that the switcher's picture-in-picture function is on.

Swap button — The PIP Swap button toggles the primary and secondary pictures between the main image and the PIP window.

NOTE *If PIP mode is off (the front panel PIP Mode On LED is off), the Swap function continues to work, toggling between the most recently selected low-resolution input and the most recently selected high-resolution input. Unlike when PIP mode is on, however, the unselected input is not displayed in a PIP window.*

⑩ **Input Selection buttons** — The Input Selection buttons select an input to scale and output. The front panel Input LEDs indicate the selected input.

Figure 3-8 — IR remote control

The Input Selection buttons function identically to the front panel Input buttons. See "Input controls" and ② on page 3-3.

⑪ **Mute/Freeze buttons** — The Mute and Freeze buttons blank the screen and/or silence the audio and freeze the video. Press the buttons to toggle the mutes and freeze mode on and off.

Video Mute — The Video Mute button switches the output to a blank screen. The blank screen is deselected when a new input is selected. On-screen displays are still available when the video is muted.

NOTE *Video mute mutes the video signals only. Separate H and V sync, composite sync, or sync-on-green (depending on the output format selected) is always output to ensure that the connected display does not lose sync.*

Audio Mute — The Audio Mute button silences the audio output. The audio mute is deselected when a new input is selected.

A/V Mute — The A/V Mute button switches the output to a blank screen and silences the audio output. The blank screen and muted audio are deselected when a new input is selected.

Freeze — The Freeze button toggles the freeze feature on and off. Freeze stops the image at the moment you activate the feature and outputs a still image. Freeze is deselected when a new input is selected.

⑫ **Menu buttons** — The Menu buttons function identically to the front panel Menu buttons. See "Menu control buttons" and ⑥, ⑦, and ⑧, starting on page 3-6.

Menu button — The Menu button enters the main menu system and backs out of the currently active submenu or selection. See "Main menu system" and "Picture adjustments", later in this chapter, for details.

◄, ▲, ▼, and ▶ buttons — The ◄, ▲, ▼, and ▶ buttons navigate the main and picture control menu systems. See "Main menu system", on page 3-16, and "Picture adjustments", on page 3-25, for details.

NOTE *When the connected output device is **not** displaying a menu or other switcher-generated message, pushing the Menu control ◄, ▲, ▼, or ▶ button pops up an output volume status indicator bar on the output device. Use the Menu control ◄ or ▼ button to decrease the output volume. Use the Menu control ▶ and ▲ button to increase the volume.*

Enter button — The Enter button:

• Activates a highlighted submenu or function in the IN1508 main menu system.

• Exits a slider-type status indicator bar control.

• Saves a changed value in a selection box control.

See "Main menu system", later in this chapter, for details.

⑬ **Picture control buttons** — The picture control buttons are a short cut to selecting individual or groups of image status indicator bar displays that can be adjusted using the ◄, ▲, ▼, and ▶ buttons (⑭).

NOTE *Size, Centering, Contrast/Brightness, and Color/Tint are also available from the front panel (see "Picture Controls buttons" and ⑤ on page 3-6).*

NOTE *Sharp and Phase are not available from the front panel picture control buttons and are front-panel accessible only by navigating through the main menu system.*

Size button — The Size button selects and deselects the display size adjustment status indicator bars. The adjustment range depends on the output resolution selected.

Center button — The Center button selects and deselects the display centering adjustment status indicator bars. The adjustment range depends on the output resolution selected.

Contrast/Brightness button — The Contrast/Brightness button selects and deselects the display brightness and contrast adjustment status indicator bars. The adjustment range for both brightness and contrast is from 0 to 127.

Color/Tint control button — The Color/Tint button selects and deselects the display color and tint adjustment status indicator bars. The adjustment range for both color and tint is from 0 to 127.

NOTE *The Color/Tint control affects only certain interalaced component video, composite video, and S-video, as shown in the following table.*

Input type	Color	Tint
RGB	No	No
YUVp	No	No
RGBcvS	No	No
YUVi	Yes	No
NTSC S-video	Yes	Yes
PAL S-video	Yes	No
Composite NTSC	Yes	Yes
Composite Pal	Yes	No

Zoom button — The Zoom button selects and deselects the Zoom status indicator bar. Use the ◄ and ► buttons to increase or decrease how much zoom (enlargement) is applied to the image.

Pan button — The Pan button selects and deselects the horizontal and vertical Pan status indicator bars. Use the ▲ and ▼ buttons to highlight the horizontal (H) or vertical (V) pan status indicator bar. Use the ◄ and ► buttons to pan left and right or up and down.

NOTE *Pan is available only for an image that has been zoomed in.*

Aspect Ratio button — The Aspect Ratio button selects and deselects the aspect ratio setting selection box control. The aspect ratio options are 4:3 and 16:9. The default is 4:3.

Sharp button — The Sharp button selects and deselects the sharpness setting adjustment status indicator bar. Sharpness uses variable filtering to affect input picture detail and definition.

Phase button — The Phase button selects and deselects the phase setting adjustment status indicator bar. The phase adjustment range is 0 to 31.

Operations

The following paragraphs detail the power-up process and then describe the menu system, the picture, and the selection of the front panel security lockout.

Power

Power is applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that cycles all of the front panel LEDs on and off from left to right. An error-free power up self-test sequence leaves the selected input LED and the selected Output Rate LED on. If the picture-in-picture feature was turned on when the switcher was powered down, the PIP On LED and a secondary input LED are also lit.

The selected input, the picture adjustments, and other current settings are saved in non-volatile memory. When power is applied, the latest configuration is retrieved.

Input selection operation

Each of the eight inputs is assigned to one of two groups (see figure 3-9 on the next page):

- **Low resolution** — Inputs 1 through 4 (and input 5 if it is configured as interlaced component video; see "Input 5 selection", on page 3-18)

- **High resolution** — Inputs 6 through 8 (and input 5 if it configured as progressive component video/HDTV; see "Input 5 selection", on page 3-18)

Input selection acts differently, depending on whether PIP mode is on or off:

- **PIP mode on** — If the PIP mode is on (the PIP On LED is lit), pushing the input button selects a new input for display in **either** the main window **or** the PIP window. The window in which the selected input is displayed depends on which group (high resolution or low resolution) the input is in. The selected input replaces the previously selected input from the same group in whichever window that input had been displayed.

  - ○ In figure 3-9, when you push the Input 3 button, input 3 replaces input 1 in the PIP window.

  - ○ In figure 3-9, when you push the Input 8 button, input 8 replaces input 6 in the main window.

- **PIP mode off** — If the PIP mode is off (the PIP On LED is off), pushing the input button selects a new input for display in the main window.

Picture-in-picture mode operation

The two images displayed when the PIP feature is on (the PIP On LED is lit) must come from different input groups (one **high resolution** and one **low resolution**).

- If the primary input (the image displayed in the main window) is a **high-resolution input**, the secondary input (the image displayed in the PIP window) **must** be a **low-resolution input** (figure 3-9).

- If the primary input is a **low-resolution input**, the secondary input **must** be a **high-resolution input** (figure 3-9).

The PIP function toggles between the selected input in each group. In figure 3-9, when you push the Swap button:

- Input 3 replaces input 8 in the main window.

- Input 8 replaces input 3 in the PIP window.

The PIP feature **cannot** toggle between two inputs in the same group.

NOTE *If PIP mode is off (the PIP Mode On LED is off), the Swap function continues to work, toggling between the most recently selected low-resolution input and the most recently selected high-resolution input. Unlike when PIP mode is on, however, the input that is replaced in the main window is **not** displayed in the PIP window.*
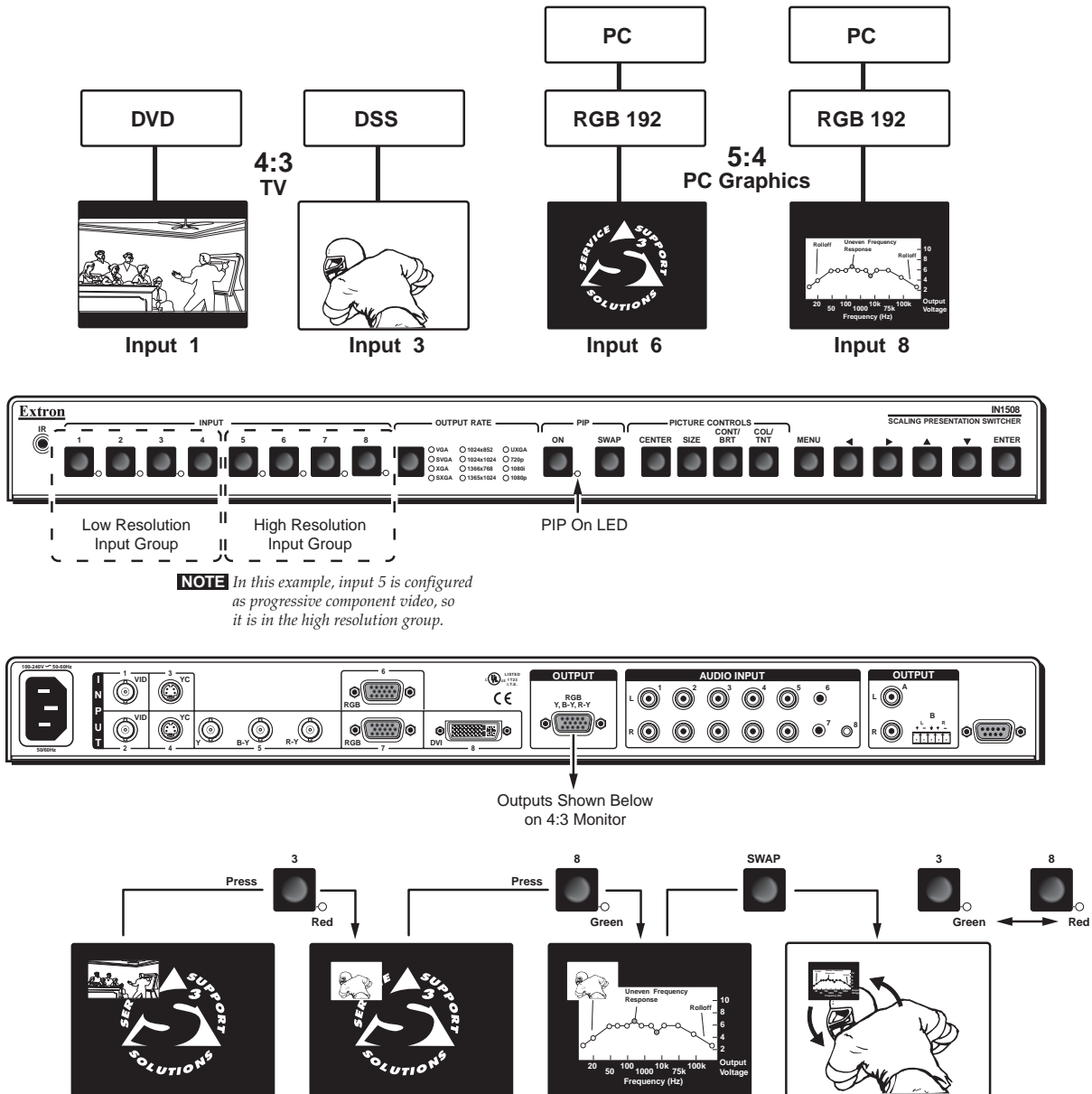
Figure 3-9 — PIP mode input selection and swap operations

Operation, cont'd

Menu system operation

Figure 3-10 shows a flowchart of the submenus in the main menu system. Each submenu leads to a series of submenus or to "slider" type status indicator bar controls that accomplish individual tasks or groups of tasks.

NOTE *In figure 3-10, and all other flowcharts in this chapter, solid lines indicate screen changes initiated by the operator. Dashed lines indicate screen changes that are the result of a timeout function.*
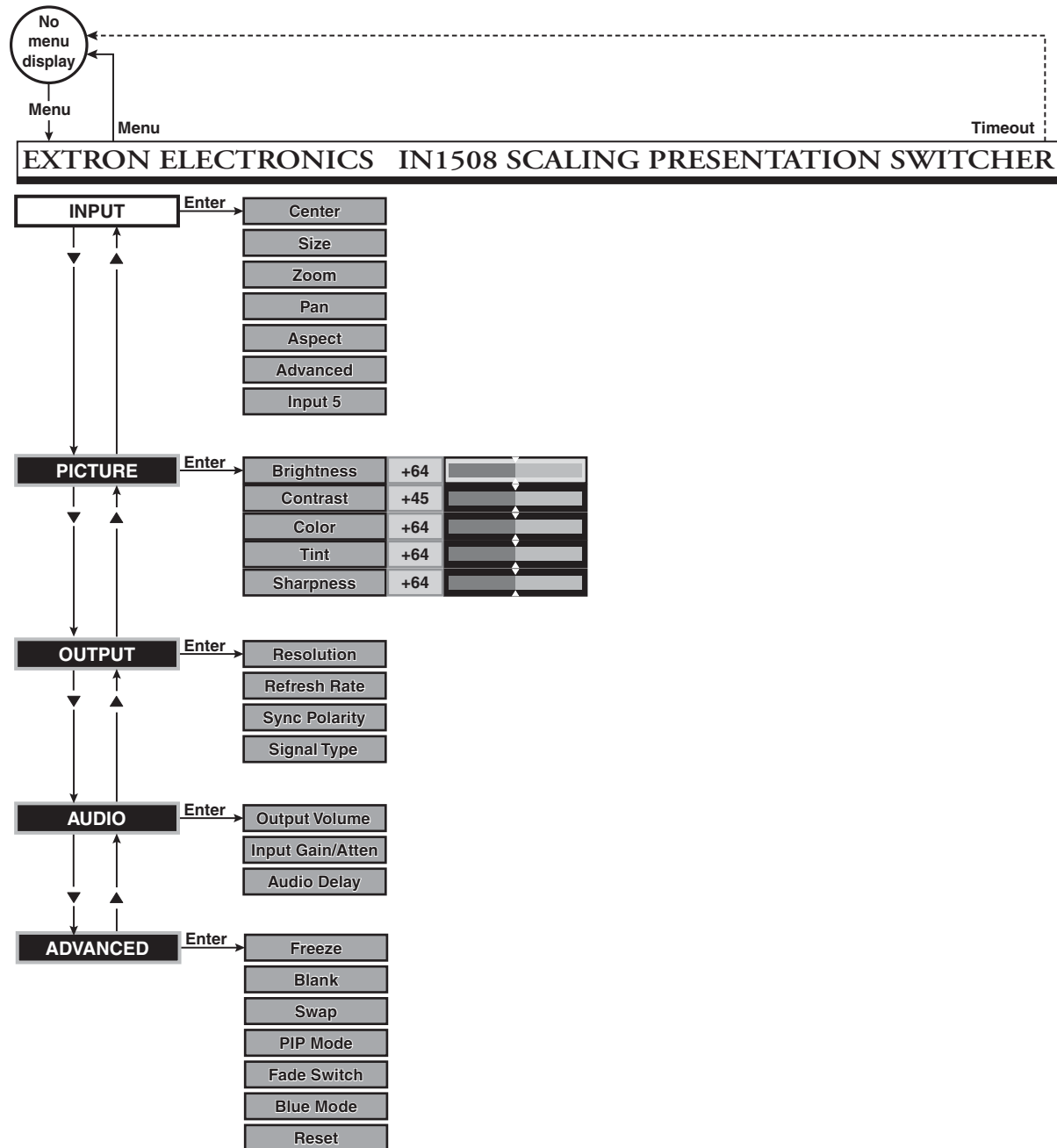
Figure 3-10 — Menu system flowchart

Menu button — Press the front panel or IR remote control Menu button to activate the menu system or to back up one level from the currently selected submenu or selection. (For example, pressing the Menu button in the Picture submenu turns off the Picture submenu selections and the switcher displays the main menu only.)

◀, ▲, ▼, and ▶ **buttons** —

Press the front panel or IR remote control ◀, ▲, ▼, and ▶ buttons to maneuver around the menu system, highlighting submenus or selections or increasing and decreasing selected picture control settings.

Enter button — Press the front panel or IR remote control Enter button to:

- Activate a highlighted submenu or function in the IN1508 main menu system
- Exit a slider-type status indicator bar control
- Save a changed value in a selection box control

NOTE *To return to normal operation (no menus), let the switcher remain idle for 20 seconds until the selected screen times out, or press the front panel or IR remote control Menu button repeatedly until the Main Menu is deselected.*

Selection boxes and status indicator bars

Most of the menu system selections are made using either on-screen selection box controls (the top example in figure 3-11) or "sliding" status indicator bar controls (the bottom example in figure 3-11). The two types of controls operate differently.

Typical selection box control

■ Y,B-Y,R-Y ▲
RGBHV ▼
RGBS
RGsB

Change does not take affect until **Enter** is pressed to activate the selection.

Timeout

No menu display

Return to higher level screen.

Press **Menu** or ◀ to exit the screen.

Typical status indicator bar control

◀(0 to 128)▶

| Brightness | +96 |
| Contrast | +64 |

▲ ▼

◀(0 to 128)▶ Changes take affect as you move the slider controls.

Timeout

No menu display

Return to higher level screen.

Push **Menu** or **Enter** to exit the screen.

Figure 3-11 — Selection box vs. status indicator bar operation

Operation, cont'd

Selection box control

The selection boxes (figure 3-11) show a list of possible selections. When you first activate the selection box control, the selected option is marked with a ∎. Use the front panel or IR remote control ▲ and ▼ buttons to move the ∎ to highlight other options.

NOTE *Highlighting a different option by moving the ∎ does not automatically select that option. You must push the front panel or IR remote control Enter button to change the selection.*

Press the front panel or IR remote control Enter button to make changes. The selection box remains displayed until the on-screen timeout expires or until you exit the screen by pushing the Menu or ◀ button.

Status indicator bar control

The status indicator bars (figure 3-12) resemble slide bars. Use the front panel or IR remote control ◀ and ▶ buttons to shift the "slides" to the right and left, increasing and decreasing the variable setting.

NOTE *Changes made using the status indicator bar controls take effect as soon as you increase or decrease the setting with the ◀ and ▶ buttons. If you decide that you do not like the affect of the changes that you make, you have to change the settings back to their original values.*
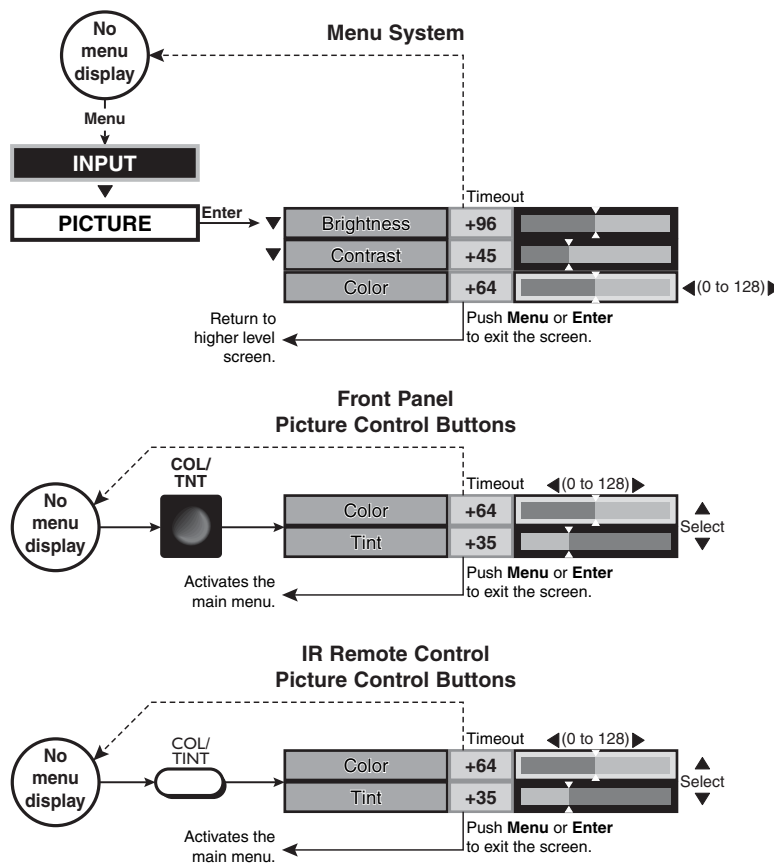
Figure 3-12 — Accessing and operating typical status indicator bars

Many status indicator bar controls can be activated in three ways (figure 3-12):

- By navigating to the status indicator bar via the menu system
- By pushing one of the front panel Picture Control buttons (such as Color/Tint)
- By pushing one of the IR remote control picture control buttons (such as Color/Tint)

Use the status indicator bars as follows:

1. If necessary, select the input that you want to adjust by pressing the appropriate input button.

2. **For menu system operation:**

   a. Press the front panel or IR remote control Menu button. The on-screen Main Menu display appears on the connected monitors, overlaid on top of the output image.

   b. Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired submenu (such as Picture) and press the front panel or IR remote control Enter button. The selected submenu or a group of status indicator bars appears on the on-screen display.

   c. If necessary, use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired status indicator bar on the selected submenu (such as Color).

   For picture control button operation:

   a. Press the desired front panel or IR remote control picture control button.

   b. If necessary, press and release the front panel or IR remote control ▲ and ▼ buttons to highlight the desired adjustment status indicator bar.

3. Press and release the front panel or IR remote control ◄ and ► buttons to decrease and increase the selected level by 1 step or press and **hold** the buttons to flow through the adjustment range.

   NOTE *To make another adjustment to the same input, return to step **2**.*

   *To adjust another input, select that input. The switcher clears the on-screen displays. Return to step **2**.*

4. Allow the on-screen display timeout to occur.

Operation, cont'd

Main menu system

The main menu includes the following submenus:

- **Input submenu** — Size, centering, and aspect ratio
- **Picture submenu** — Image quality adjustments
- **Output submenu** — Resolution, refresh rate, sync, and signal format
- **Audio submenu** — Input audio volume and audio delay
- **Advanced submenu** — Advanced options

Input submenu

Figure 3-13 is a flowchart that shows an overview of the Input submenu, its available selections, and their available settings. Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired selection and press the Enter button.

Figure 3-13 — Input submenu flowchart

Center selection

The Center selection displays two status indicator bars that show, and allow you to adjust, the horizontal and vertical position of the main or picture-in-picture output on the monitor.

If the PIP feature is turned off (the front panel PIP On LED is unlit), Center adjusts the position of the main window.

If the picture-in-picture feature is turned on (the front panel PIP On LED is lit), Center adjusts the position of the PIP window.

The center adjustments do not crop the image or add blank lines.

Use the front panel or IR remote control ▲ and ▼ buttons to highlight the horizontal (H) or vertical (V) centering status indicator bar. Use the front panel or IR remote control ◄ and ► buttons to move the image.

Size selection

The Size selection displays two status indicator bars that show, and allow you to adjust, the horizontal and vertical size of the output. Use the front panel or IR remote control ▲ and ▼ buttons to highlight the horizontal (H) or vertical (V) size status indicator bar. Use the front panel or IR remote control ◄ and ► buttons to increase or decrease the size.

Zoom selection

The Zoom selection displays a status indicator bar that allows you to adjust the zoom level of the output. Use the front panel or IR remote control ◄ and ► buttons to increase or decrease how much zoom (enlargement) is applied to the image.

Pan selection

The Pan selection displays two status indicator bars that allow you to pan (move) horizontally and vertically on a zoomed image. Use the front panel or IR remote control ▲ and ▼ buttons to highlight the horizontal (H) or vertical (V) pan status indicator bar. Use the front panel or IR remote control ◄ and ► buttons to pan left and right or up and down.

Aspect ratio selection

The Aspect ratio selection displays a selection box that shows the currently selected aspect ratio and allows you to select another aspect ratio.

Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired aspect ratio. Press the Enter button to change to the highlighted value. The default is 4:3.

Advanced screen

NOTE *The Input submenu's Advanced settings are a comprehensive set of adjustments to optimize the switcher for non-standard video inputs. Most users do not encounter such signals. For those users who do, the switcher automatically adjusts these settings. The switcher's automatic adjustments are adequate for most inputs.*

The Advanced screen provides a submenu of advanced selection options: active pixels, active lines, phase, horizontal and vertical start, and total pixels. These advanced settings are rarely needed for standard video and computer video signals, but provide the user with manual control over scaling parameters that are automatic. The knowledgeable user may need to adjust these settings to optimize his or her input signal(s). Possible reasons to adjust these settings include tolerance issues and nonstandard resolutions and frequencies. The settings are described in more detail as part of the discussion on optimizing the video. See "Input submenu's Advanced selections", on page 3-33.

To select one of the advanced settings, use the front panel or IR remote control ▲ or ▼ button to highlight the desired status indicator bar.

Input 5 selection

The Input 5 selection displays a selection box that shows the currently assigned component video format (interlaced [NTSC/PAL/SECAM], progressive [480p/576p], or HDTV [720p/1080i/1080p]) for input 5 and allows you to select a different format.

Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired component video format. Press the Enter button to change to the highlighted value. The default is progressive.

Picture submenu

Figure 3-14 is a flowchart that shows an overview of the Picture submenu, its available status indicator bars, and their available settings. Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired status indicator bar.

Figure 3-14 — Picture submenu flowchart

Brightness status indicator bar

The Brightness status indicator bar shows, and allows you to adjust, the brightness setting for the selected input. Brightness adjusts the light intensity of the image on the screen. Use the front panel or IR remote control ◄ and ► buttons to adjust the brightness control through a range of 0 to 128. The default setting is 64.

Contrast status indicator bar

The Contrast status indicator bar shows, and allows you to adjust, the contrast setting for the selected input. Contrast adjusts the difference between the input signal's brightest and darkest settings. Use the front panel or IR remote control ◄ and ► buttons to adjust the contrast through a range of 0 to 128. At the minimum setting, 0, the entire picture is shown at about the same brightness (gray). At the maximum setting, 128, there is a marked difference between the dark and light areas of the image. The default setting is 45 for high resolution inputs and 59 for low resolution inputs.

Color status indicator bar

NOTE *The color adjustment is available for interlaced component video, S-video, and composite video inputs only. See the table on page 3-9.*

The Color status indicator bar shows, and allows you to adjust, the color setting for the selected input. Color increases and decreases the color intensity of the picture. Use the front panel or IR remote control ◄ and ► buttons to adjust the contrast through a range of 0 to 128. At the minimum setting, 128, the switcher removes most of the color. The default setting is 64.

Tint status indicator bar

NOTE *The tint adjustment is available for S-video and composite video inputs only. See the table on page 3-9.*

The tint status indicator bar shows, and allows you to adjust, the tint setting. Tint is a relative measure of the amount of white in a given color and adjusts the picture's color toward red or green. Use the front panel or IR remote control ◄ and ► buttons to adjust the tint control through a range of 0 to 128. Press the ► button to increase the green (and decrease the red). Press the ◄ button to increase the red (and decrease the green). The default setting is 64.

Sharpness status indicator bar

The Sharpness status indicator bar shows and allows you to adjust the sharpness setting. Sharpness uses variable filtering to affect input picture detail and definition. Use the front panel or IR remote control ◄ and ► buttons to increase or decrease the sharpness filtering through a range of 0 to 128. The default setting is 64.

Operation, cont'd

Output submenu

Figure 3-15 is a flowchart that shows an overview of the Output submenu, its available selections, and their available settings. Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired selection and press the Enter button.
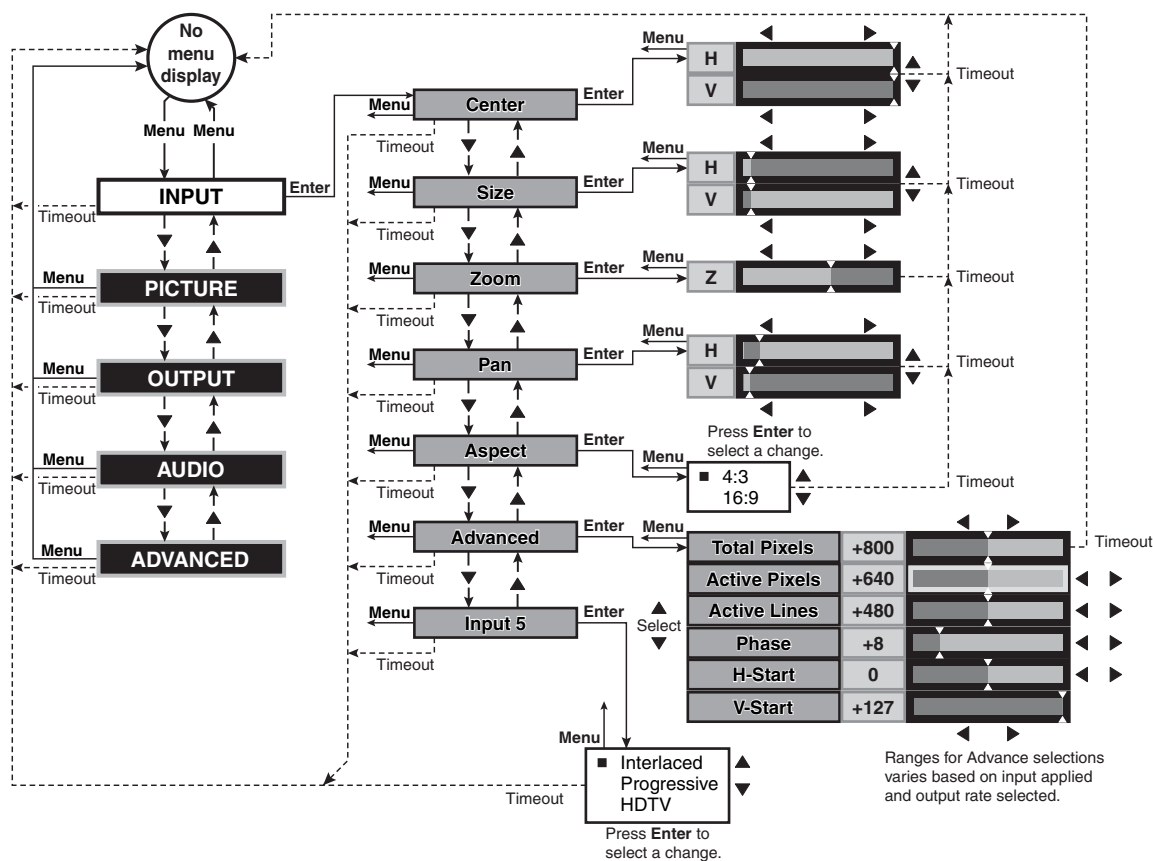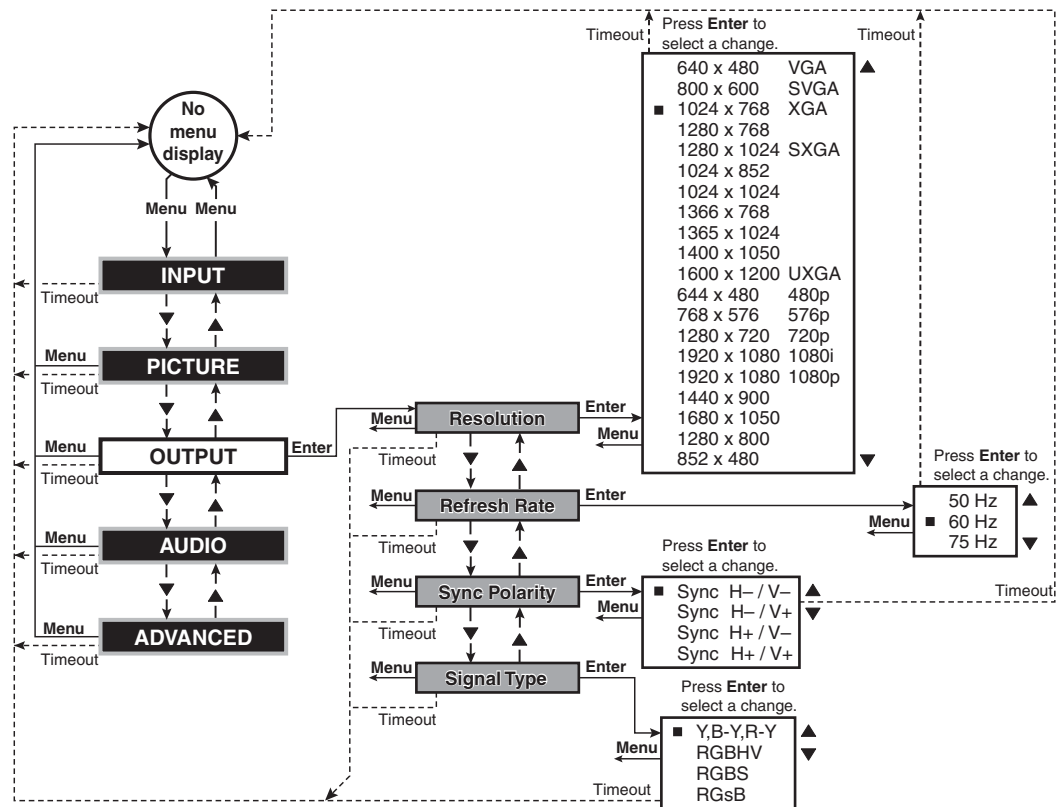

Figure 3-15 — Output submenu flowchart

Resolution selection box

- *852 x 480*
- *1440 x 900*
- *1400 x 1050*
- *1680 x 1050*
- *1280 x 768*
- *480p*
- *1280 x 800*
- *576p*

The Resolution selection box identifies the currently selected output resolution and allows you to select a different output resolution. The table at right defines the combinations of resolutions and refresh rates that the switcher can output.

The default resolution is XGA. To select a different resolution, use the front panel or IR remote control ▲ or ▼ button to highlight the desired resolution and press the Enter button.

Resolution		Aspect ratio	50 Hz	60 Hz	75 Hz
640 x 480	VGA	4:3	●	●	●
800 x 600	SVGA	4:3	●	●	●
1024 x 768	XGA	4:3	●	●	●
1280 x 768		16:9	●		
1280 x 1024	SXGA	5:4	●	●	●
1024 x 852		4:3	●	●	●
1024 x 1024		1:1	●	●	●
1366 x 768		16:9	●	●	●
1365 x 1024		4:3	●	●	●
1400 x 1050		4:3	●	●	
1600 x 1200	UXGA	4:3	●	●	
644 x 480	480p	4:3		●	
768 x 576	576p	4:3	●		
1280 x 720	720p	16:9	●	●	
1920 x 1080	1080i	16:9	●	●	
1920 x 1080	1080p	16:9		●	
1440 x 900		16:10		●	●
1680 x 1050		16:10		●	
1280 x 800		16:10	●	●	
852 x 480		4:3	●	●	

NOTE *Resolution and refresh rate are crucial variables for optimum image quality. For best results, set the switcher output to match your display's capabilities. See "Optimizing the Video", on page 3-30,*

Refresh Rate selection box

NOTE *The front panel Output Rate button can be used to select the resolution, but every front panel rate selection defaults to 60 Hz. Different refresh rates can be selected only by using this screen or RS-232 control.*

The Refresh Rate selection box identifies the currently selected output refresh rate and allows you to select a different rate.

To select a different rate, use the front panel or IR remote control ▲ or ▼ button to highlight the desired resolution and press the Enter button.

Sync Polarity selection box

The Sync Polarity selection box identifies the currently selected sync polarity and provides the ability to select different sync polarities. The display or projector may require video with positive or negative horizontal (H) and/or vertical (V) sync polarity; consult the diplay or projector manual.

To select a different sync polarity, use the front panel or IR remote control ▲ or ▼ button to highlight the desired sync format and press the Enter button. The default setting is H–/V–.

Operation, cont'd

Signal Type selection box

The Signal Type selection box identifies the currently selected output signal format (RGBHV, RGBS, RGsB, or progressive component video [Y, B-Y, R-Y]) and provides the ability to select a different type. To select a different sync type, use the front panel or IR remote control ▲ or ▼ button to highlight the desired sync type and press the enter button. The default setting is RGBHV.

> **NOTE** *Another way to select the output signal type is to press and **hold** the PIP On button while you apply power to the switcher. This action toggles the signal type between RGBHV and progressive component video. If RGB was selected the last time the switcher was powered, the signal type switches to component video. If component video was selelected, the signal type switches to RGB.*

Audio submenu

Figure 3-16 shows an overview of the Audio submenu, its available selections, and their available settings. Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired selection and press the Enter button.
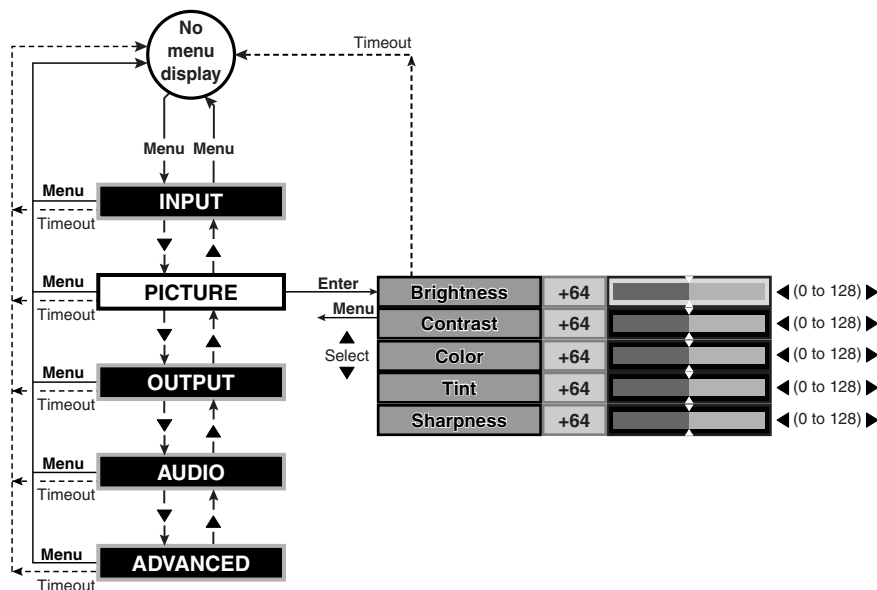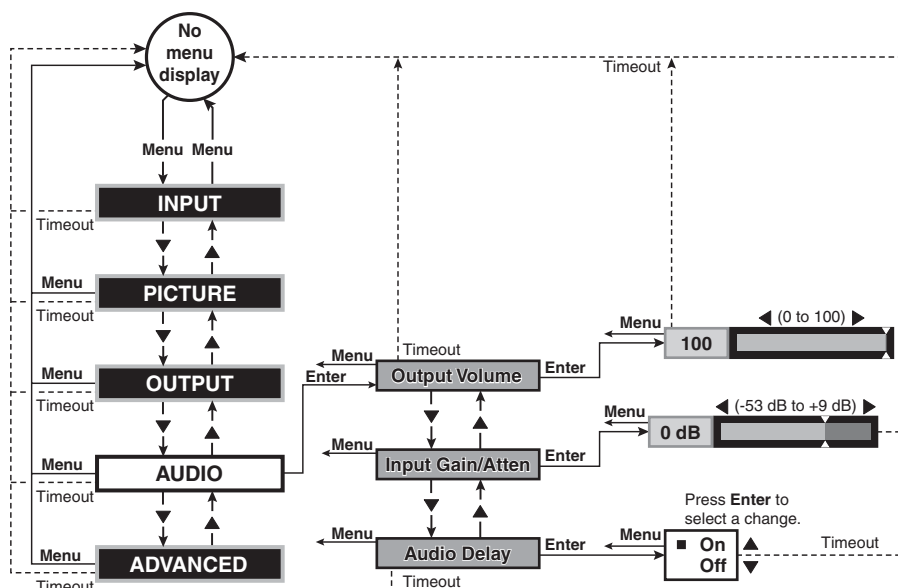

Figure 3-16 — Audio submenu flowchart

Output Volume status indicator bar

The Output Volume status indicator bar shows and allows you to adjust the audio output level (attenuation). Use the front panel or IR remote control ◄ and ► buttons to increase or decrease the volume through a range of 0 to 100. The default setting is 100, that is, no attenuation (full volume).

Input Gain/Attenuation status indicator bar

The Input Gain/Attenuation status indicator bar shows and allows you to adjust the audio level (gain or attenuation) for the selected input. Use the front panel or IR remote control ◄ and ► buttons to increase or decrease the level frequencies through a range of –53 dB to +9 dB. The default setting is 0 dB, no gain or attenuation.

Audio Delay selection box

The Audio Delay selection box provides the ability to turn audio delay on and off. Audio delay compensates for the latency period that is inherent in deinterlacing NTSC, PAL, and SECAM video by delaying the audio output to match the video output. Use the front panel or IR remote control ▲ and ▼ buttons to select On or Off. The default is On.

Advanced submenu

Figure 3-17 is a flowchart that shows an overview of the Advanced submenu, its available selections, and their available settings.
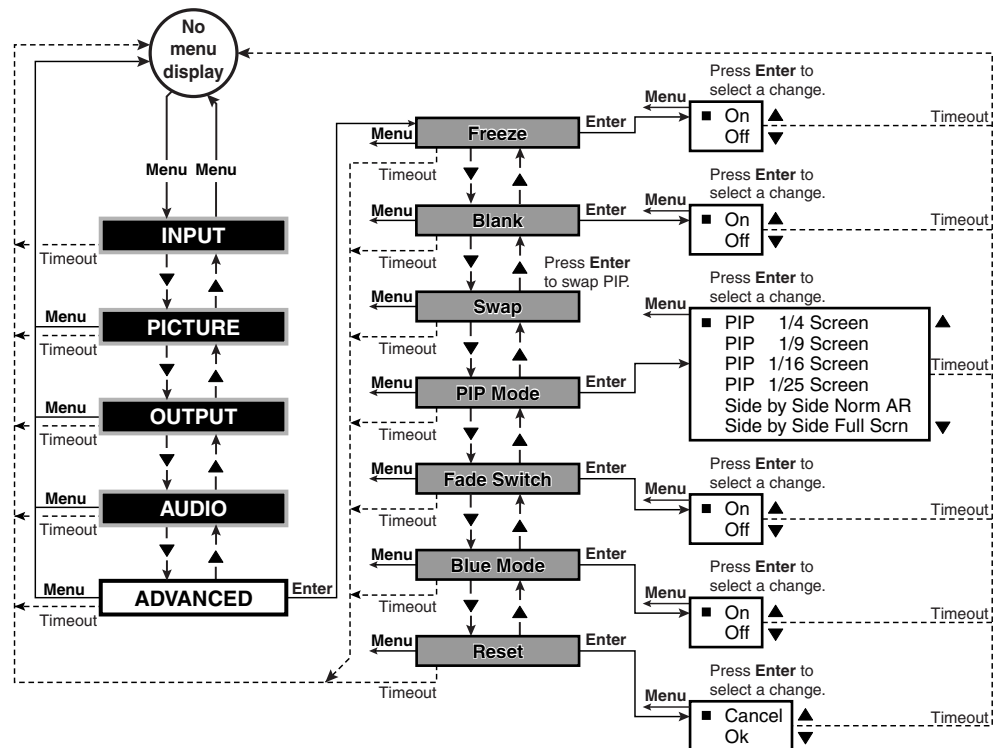
Figure 3-17 — Advance submenu flowchart

Freeze selection box

The Freeze selection box provides the ability to turn the freeze feature on and off. Freeze stops the image at the moment you activate the feature and outputs a still image. Use the front panel or IR remote control ▲ and ▼ buttons to select On or Off and press the Enter button.

> **NOTE** *When the output is frozen, the video input can be removed without losing the displayed image.*

If a different input is selected (see ② on page 3-3), the switching action deselects the freeze function and the frozen image is lost.

Blank selection box

The Blank selection box provides the ability to mute the scaled video, resulting in a black screen (except for any active on-screen displays). Use the front panel or IR remote control ▲ and ▼ buttons to select On or Off and press the Enter button.

If a different input is selected (see ② on page 3-3), the blanking action is deselected and the newly selected input is scaled and displayed.

Operation, cont'd

Swap selection

The Swap selection toggles the primary and secondary inputs between the main image and the PIP window. Select swap by highlighting the Swap selection and pressing the Enter or ▶ button. Repeatedly press the Enter or ▶ button to toggle between the main and PIP windows. Press the ◄, ▲, or ▼ button to deselect Swap, or allow the menu timeout (from the final button push) to clear the on-screen displays. This on-screen display's function is identical to pushing the front panel Swap button.

> **NOTE** *If PIP mode is off (the front panel PIP Mode On LED off), the Swap function continues to work, toggling between the most recently selected low-resolution input and the most recently selected high-resolution input. Unlike when PIP mode is on, however, the unselected input is not displayed in a PIP window.*

PIP Mode selection box

The PIP Mode selection box displays the currently selected size and position for the picture-in-picture window (if PIP mode is turned on) and allows you to select another size and position.

> **NOTE** *The two side-by-side options are available only via this menu or a Simple Instruction Set command (see chapter 4, "Serial Communications"). If either side-by-side option is selected, the PIP size adjustment does not work.*

Use the front panel or IR remote control ▲ and ▼ buttons to highlight the desired size and position and press the Enter button.

Fade Switch selection box

The Fade Switch selection box provides the ability to select between cuts and fades when you select a new input. A fade switch fades the output to black, switches to the new input, and then fades in from black. A cut selects the new input with no masking affect.

Use the front panel or IR remote control ▲ and ▼ buttons to select On for fade switches or Off for cuts and press the Enter button.

Blue Mode selection box

The Blue Mode selection box provides the ability to turn the blue mode feature on and off. Blue mode is helpful in the setup of the color and tint of the incoming video signal. In the blue mode, only the sync and blue video signals are passed to the display. Use the front panel or IR remote control ▲ and ▼ buttons to select On or Off and press the Enter button.

Reset selection box

The Reset selection box provides the ability to perform a system reset. Reset returns the output rate selection to the XGA, 1024 x 768 at 60 Hz, setting; resets the picture controls to their default values; sets all input audio levels to 0 dB; and selects input 1. Use the front panel or IR remote control ▲ and ▼ buttons to select Ok and press the Enter button to perform the reset or select Cancel and press the Reset button to exit the screen without performing the reset.

Performing a system reset from the front panel

The front panel reset is identical to the $\boxed{\text{Esc}}$ z*XXX*← SIS command (see chapter 4, "Serial Communications") and the system reset that is available through the reset system (see "Reset selection box" earlier in this chapter). But the front panel reset does not require a connected computer or a connected monitor to view the on-screen displays.

A system reset returns the output rate selection to the XGA, 1024 x 768 at 60 Hz, setting; resets the picture controls to their default values; sets all input audio levels to 0 dB; and selects input 1.

Reset the switcher to the factory default settings by pressing and **holding** the Output Rate button **while** you apply AC power to the switcher (figure 3-18).

Press and hold the Output Rate button while you apply power to the switcher.

○ VGA
○ SVGA
○ XGA
○ SXGA

Power

After a brief delay, the switcher cycles all of the front panel LEDs on and off from left to right and then back to the left. Continue to hold the Output Rate button until the front panel cycle is complete.

Release the Output Rate button.
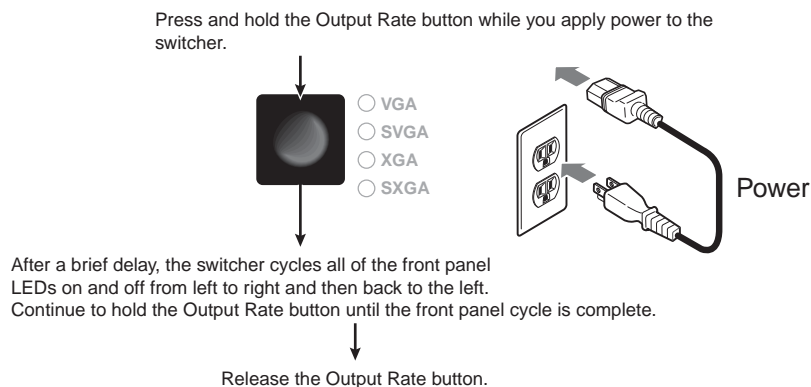
Figure 3-18 — Front panel system reset

Picture adjustments

The Picture Control buttons on the front panel and on the IR remote control provide shortcuts to the fine tuning adjustments for the selected input. All of these adjustments are also available using the main menu system. When you press one of the front panel or IR remote control picture control buttons, the on-screen display shows the corresponding image adjustment screen. The individual descriptions in step **2** on page 3-27 identify the menu navigation required to reach the screen using the main menu system.

Shortcuts for the centering, sizing, brightness, contrast, color, and tint adjustments are available from the front panel and the IR remote control (figure 3-19 on page 3-26). Shortcuts for the zoom, pan, aspect ratio, sharpness, and pixel phase shift are available from the IR remote control only (figure 3-20 on page 3-27).

Operation, cont'd
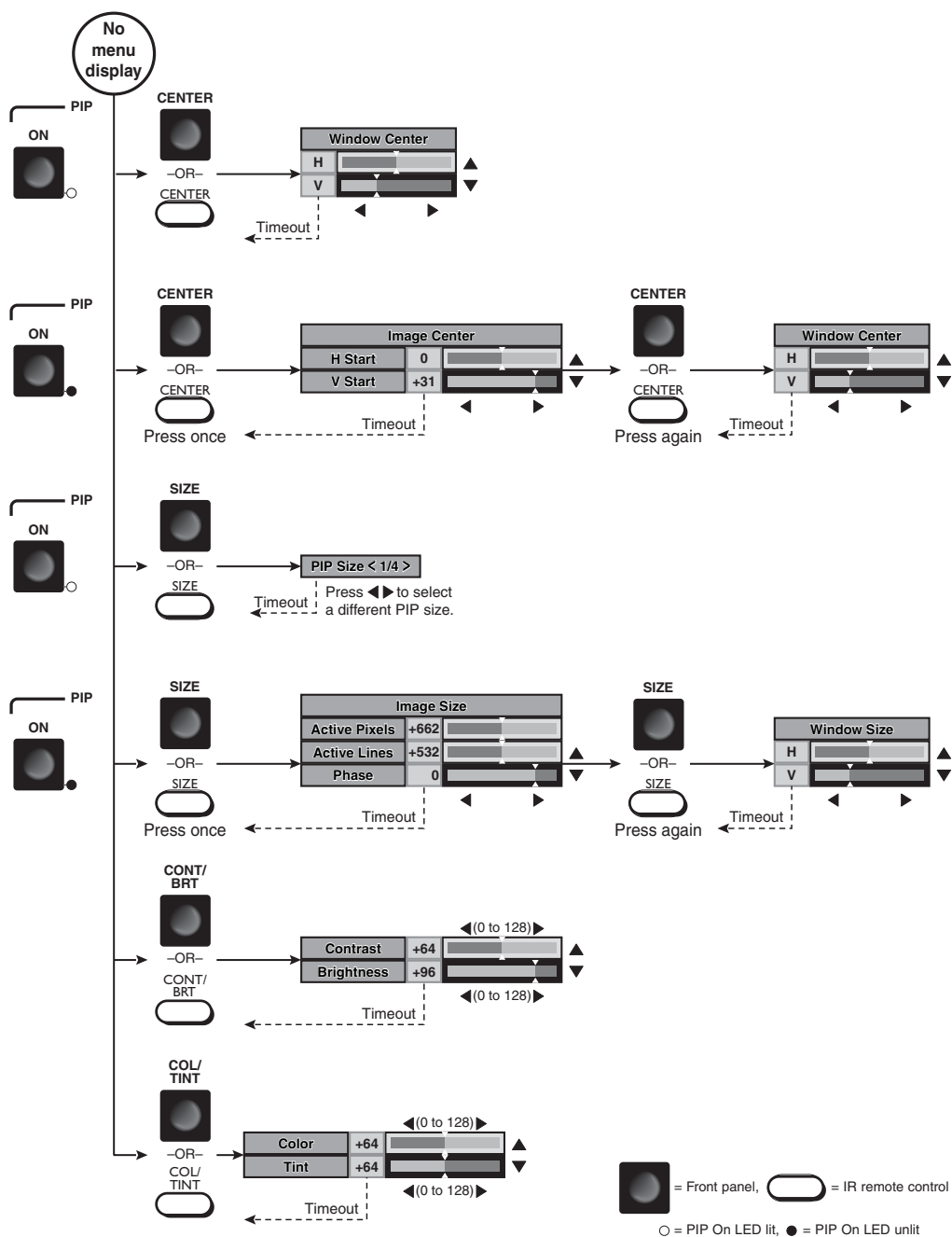
NOTE *The ▲ and ▼ buttons toggle between the top and bottom selection where applicable. The ◄ and ▶ buttons move the slider on the selected status bar indicator.*

Figure 3-20 — Picture adjustments flowchart, IR remote control buttons

NOTE ***Color*** *and **Tint** adjustments are available only for interlaced component video, S-video, and composite video inputs.*

1. Press the appropriate picture adjustment button: centering (Center), sizing (Size), brightness and contrast (Brt/Cont), color and tint (Col/Tnt), sharpness filter (Sharp), fine pixel phase shift (Phase), or aspect ratio (Aspect). The on-screen display shows the name of the adjustment and the current setting value.

2. **For multiple status bar indicators**, use the ▲ and ▼ buttons to highlight the desired status bar indicator. Use the ◄ and ▶ buttons to move the slider on the highlighted status indicator bar (change the value) for the following adjustments:

  • **Center**: Press the Center button once to toggle between the Window Centering display and the Image Centering display.

NOTE *The Image Centering display is never shown if the PIP mode is on.*

  Image Centering display — This display consists of the Horizontal Start and Vertical Start status indicator bars, which are advanced adjustments that should be attempted only by knowledgeable A/V professionals. See "Horizontal Start and Vertical Start status indicator bars", on page 3-35.

Operation, cont'd

Window Centering display — This display consists of two status indicator bars that show, and allow you to adjust, either the position (centering) of the main image or the position of the PIP window, depending on whether the PIP feature is off or on.

PIP is off — Center adjusts the horizontal and vertical position of the main image on the monitor.

The adjustment range depends on the input rate applied and the output resolution selected.

This adjustment is also available by using the front panel or IR remote control to select *Menu > Input > Center* in the main menu system (see "Center selection", on page 3-17).

PIP is on — Center adjusts the position of the PIP window.

- **Size**: The Size button calls one of three displays, depending on whether PIP mode is on or off.

PIP is on — Size displays a single status indicator bar that allows you to cycle through the 1/4, 1/9, 1/16, and 1/25 sizes of the PIP window. Use the ◄ and ► buttons to cycle through the options.

This adjustment is also available by using the front panel or IR remote control to select *Menu > Advanced > PIP Mode* in the main menu system (see "PIP Mode selection box", on page 3-24).

PIP is off — Size toggles between the Image Size display and the Window Size display.

Image Size display — This display consists of the Active Pixels, Active lines, and Phase status indicator bars, which are advanced adjustments that should be attempted only by knowledgeable A/V professionals. See "Active Pixels and Active Lines status indicator bars" on page 3-36 and "Phase status indicator" bar on page 3-38.

Window Size display — This display consists of two status indicator bars that show, and allow you to adjust, either the position (centering) of the main image or position of the PIP window, depending on whether the PIP feature is off or on.

The adjustment range depends on the input rate applied and the output resolution selected.

This adjustment is also available by using the front panel or IR remote control to select *Menu > Input > Size* in the main menu system (see "Size selection", on page 3-17).

- **Brightness/Contrast**: Brightness adjusts the light intensity of the image on the screen. Contrast adjusts the difference between the input signal's brightest and darkest settings.

The brightness adjustment is also available by using the front panel or IR remote control to select *Menu > Picture > Brightness* in the main menu system (see "Brightness status indicator bar", on page 3-19).

The contrast adjustment is also available by using the front panel or IR remote control to select *Menu > Picture > Contrast* in the main menu system (see "Contrast status indicator bar", on page 3-19).

- **Color/Tint**: Color increases and decreases the color intensity of the picture. Tint is a relative measure of the amount of white in a given color and adjusts the picture's color toward red or green.

  The color adjustment is also available by using the front panel or IR remote control to select *Menu > Picture > Color* in the main menu system (see "Color status indicator bar", on page 3-19).

  The tint adjustment is also available by selecting *Menu > Picture > Tint* in the main menu system (see "Tint status indicator bar", on page 3-19).

- **Zoom (IR remote control only)**: Zoom enlarges a portion of the scaled image.

  This adjustment is also available by using the front panel or IR remote control to select *Menu > Input > Zoom* in the main menu system (see "Zoom selection", on page 3-17).

- **Pan (IR remote control only)**: Pan shifts the center of the image on an image that has been zoomed in on.

NOTE *Pan is available only for an image that has been zoomed in.*

  This adjustment is also available by using the front panel or IR remote control to select *Menu > Input > Pan* in the main menu system (see "Pan selection", on page 3-17).

- **Sharpness filter (IR remote control only)**: The adjustment range is from 0 to 63.

  This adjustment is also available by using the front panel or IR remote control to select *Menu > Picture > Sharpness* in the main menu system (see "Sharpness status indicator bar", on page 3-19).

- **Fine pixel phase (IR remote control only)**: The adjustment range is from 0 to 31.

  This adjustment is also available by using the front panel or IR remote control to select *Menu > Input > Advance > Phase* in the main menu system (see "Phase status indicator bar", on page 3-38).

3. **For the aspect ratio selection box**, use the ◄ and ► buttons to toggle back and forth between the two selections: 4:3 and 16:9.

   This adjustment is also available by using the front panel or IR remote control to select *Menu > Input > Aspect* in the main menu system (see "Aspect ratio selection", on page 3-17).

4. Repeat steps **1** and **2** for each image adjustment to be made for that input.

5. If you want to set picture adjustment on another input, press the appropriate input button.

Front panel security lockout

The front panel security lockout limits the operation of the IN1508 from the front panel. When the switcher's front panel is locked out, all of the front panel image adjustment functions are disabled. You can still select inputs.

To toggle executive mode on or off, simultaneously press and **hold** the Color/Tint and Center buttons (figure 3-21) for approximately 2 seconds. Release the buttons. The on-screen display shows **Front Panel Locked** or **Front Panel Unlocked** to indicate the mode. The on-screen display also shows **Front Panel Locked** if you push a locked out button.
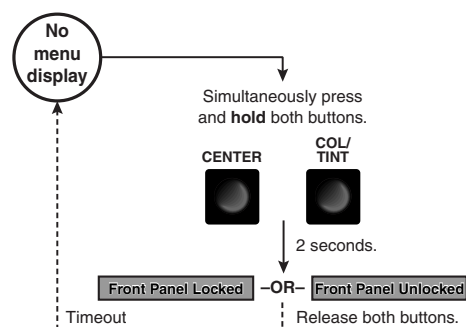
Figure 3-21 — Toggle front panel lockout on or off

Optimizing the Video

Setting up a DVD source

To get the best results when using a DVD as a video source, Extron recommends that the DVD player itself be set up to output an aspect ratio of 16:9 and not 4:3. Because all DVDs are mastered as 16:9, having them set up for anything else causes the player to internally scale and compress the signal. The DVD player's scaling and compression defeats the advantage of having 3:2 pulldown detection in the IN1508.

All sizing adjustments to correct the aspect ratio should be done using the IN1508.

To change the output aspect ratio of most DVD players:

1.   Enter the DVD player's setup or action menu while the disc is stopped.

2.   Select the 16:9 aspect ratio.

Resolution and refresh rates

Resolution and refresh rate are probably the most crucial variables for optimum image quality. Every display has an optimal or native resolution and an optimal refresh rate. These vary, depending on:

• The type of display technology

• Whether the display has a fixed number of pixels (a native resolution)

• The size of the pixels

• The size of the display or screen

• The distance of the viewer from the screen

For best results, set the switcher's output resolution and refresh rate to match the capabilities of your display.

CRT displays — selecting the optimum resolution

While CRT displays do not have a native resolution, they do have a "sweet spot" for input signal resolution. When the switcher is set to output at the sweet spot of the CRT, it results in a detailed image with no visible scan lines. If the switcher is set to output below the sweet spot, the displayed image has small scan lines between the image lines. If the switcher is set to output above the sweet spot, the image's lines overlap and the image loses detail because there are more lines and pixels than the display can clearly resolve. When experimenting to find the sweet spot, start with the output refresh rate set at 75 Hz and the resolution shown in the table on the next page. Then, with a critical eye, try lower resolutions until you achieve a solid image with optimum image detail.

CRT displays — selecting the optimum refresh rate

CRTs tend to flicker at refresh rates below 70 Hz. To achieve a flicker-free image, try an output refresh rate of 75 Hz.

Note that as the refresh rate increases, the horizontal scan rate also increases, placing greater bandwidth demands on the video distribution system and the display. If the bandwidth is too high, you may see a softer image because the signal exceeds the bandwidth of the distribution system and the display. An extremely high refresh rate can also create a compatibility problem in which the video signal is beyond the scan rate of the display.

Fixed pixel displays — selecting the optimum resolution and refresh rate

Display devices that are based on LCD, DLP, D-ILA, and plasma technology have a specific number of pixels, a native resolution. These displays typically can show higher or lower resolution signals, but can do so only by scaling the image up or down to the native resolution. To avoid additional image scaling by the display (and more processing is inherently bad for image quality), it is important to know your display's native resolution.

Check the display's operation manual to determine its native resolution. Set the switcher to match this native resolution. The switcher's refresh rate should be set to 60 Hz for most LCD, plasma, D-ILA, and DLP projectors.

NOTE *Higher refresh rates are **not** recommended for these display technologies. They usually do not improve the image and may cause compatibility problems.*

Operation, cont'd

Display type	Suggested sweet spot/native resolution	Suggested refresh rate	Comments
CRT Displays			
15" data monitor	800 x 600, 1024 x 768	72 Hz / 75 Hz	
17" data monitor	1024 x 768	72 Hz / 75 Hz	
19"-21" data monitor	1024 x 768, 1280 x 1024	72 Hz - 85 Hz	
27"-42" presentation monitor	800 x 600, 1024 x 768	72 hz / 75 Hz	
Data projector or retro display with 7" CRTs	800 x 600, 1024 x 768	72 Hz - 85 Hz	
Data projector or retro displays with 9" CRTs	1024 x 768, 1280 x 1024	72 Hz - 85 Hz	
Projectors, flat panels, and plasma displays			
DLP projectors	800 x 600, 1024 x 768, 1280 x 720, 1280 x 1024	60 Hz	Check the display's native resolution. For 848 x 600, set the scaler to 800 x 600.
D-ILA projectors	1364 x 1024	60 Hz	
LCD projectors	800 x 600, 1024 x 768, 1280 x 1024, 1365 x 768	60 Hz	Check the display's native resolution. Very old units may be 640 x 480.
LCD 14"/15" flat panel display	1024 x 768	60 Hz	
LCD 18" flat panel display	1280 x 1024	60 Hz	
LCD 28" flat panel display	1280 x 768	60 Hz	
Plasma 40" display (4:3)	640 x 480	60 Hz	
Plasma 42" display (16:9)	852 x 480, 1024 x 768, 1280 x 768	60 Hz	For Fujitsu / Sony 42" plasmas with 1024 x 1024, set the scaler to output 1024 x 768.
Plasma 50" / 60" (16:9) (Boxlight, Eizo, LG, Pioneer, Runco, Sharp, Viewsonic)	1280 x 768	56 Hz, 60 Hz, 65 Hz	For Pioneer PDP-505HD, use 56 Hz.
Plasma 50" / 60" (16:9) (Fujitsu, JVC, Luce, Marantz, NEC, Panasonic, RCA, Runco, Samsung, Toshiba)	1365 x 768	60 Hz	For NEC 50", set sync format to RGBHV++.

Input submenu's Advanced selections

Figure 3-22 shows the selections that are available from the Input > Advanced screen. The switcher automatically adjusts for different input and output modes. However, if the input signal has slightly different timing or is non-standard, some settings may need to be manually adjusted. All settings for each input and output mode (including non-standard input modes) are stored in non-volatile memory so that the adjustments do not need to be repeated after the settings are optimized.
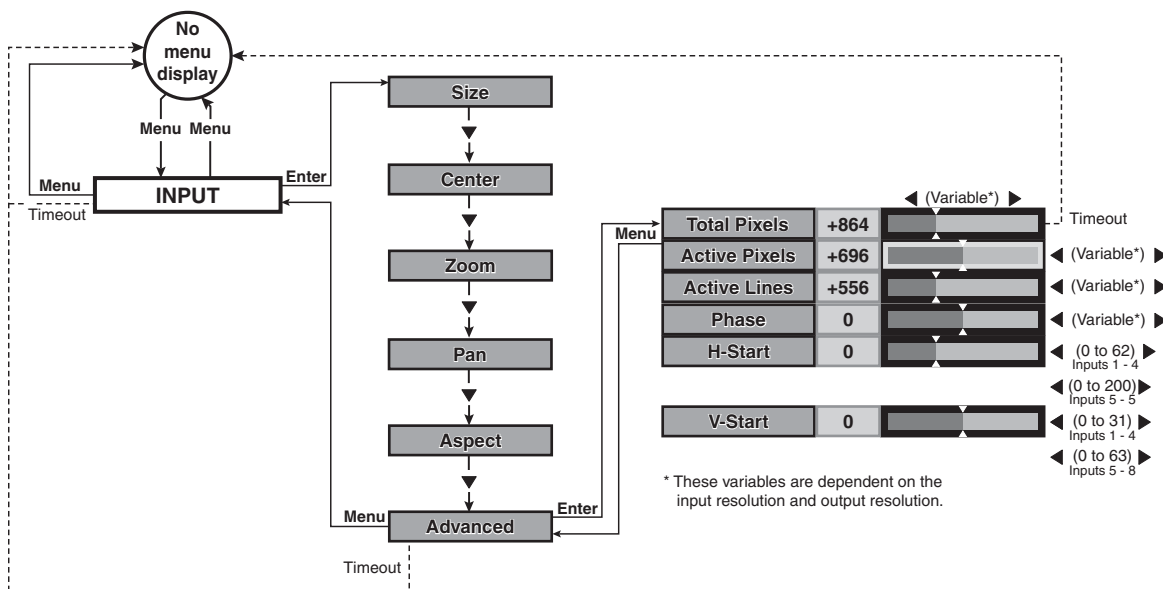
Figure 3-22 — Input submenu's Advanced selections

To select one of the advanced settings, use the Menu ▲ or ▼ button to highlight the desired status indicator bar.

| NOTE | *The Input submenu's Advanced settings are a comprehensive set of adjustments to optimize the switcher for non-standard video inputs. Most users do not encounter such signals. For those users who do, the switcher automatically adjusts these settings. The switcher's automatic adjustments are adequate for most inputs.* |

Several Input submenu Advanced selections define the active (image) area of the input (see figure 3-23 on the next page):

- **Active pixels** — The number of pixels per line that are inside the input active area. The baseline for the active pixels adjustment is the right edge of the image. This value is often referred to as horizontal resolution.

- **Active lines** — The number of lines per frame that are inside the input active area. The baseline for the active lines adjustment is the bottom edge of the image. This value is often referred to as vertical resolution.

  For interlaced input signals, this variable refers to the total number of lines per frame after deinterlacing, not the number of lines per field.

- **Horizontal start** — The number of pixels per line that are inside the blanking area to the left of the active area.

- **Vertical start** — The number of lines per frame that are inside the blanking area above the active area.

Operation, cont'd
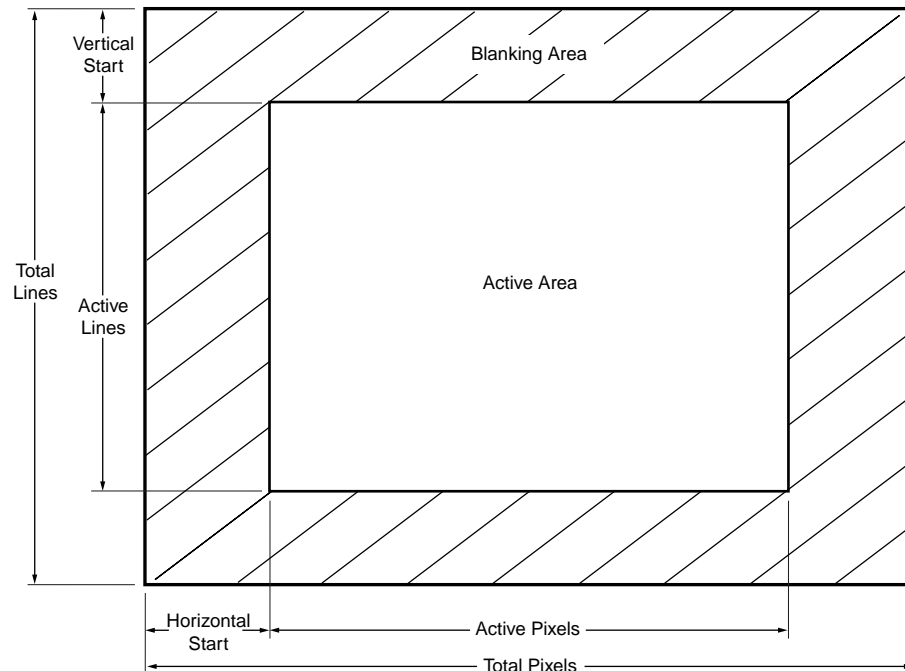
Figure 3-23 — Advanced input settings

- **Total pixels (RGBHV/RGBS/RGsB and progressive/HDTV component only)** — The total number of pixels per line, including the blanking on both sides of the input active area (active, horizontal sync width, back porch, and front porch).

NOTE *The total number of lines per frame, including the blanking above and below the active area, is determined by the input signal and is not user adjustable.*

Use these controls to match the input video signal and to frame the active area.

NOTE *The active pixels and total pixels adjustments are interactive. Setting one of these variables may require adjusting the other.*

Horizontal Start and Vertical Start status indicator bars

The input start controls adjust where the electronic scaling process takes effect. The input start and active area should be manually adjusted, if necessary, to match the input video signal, framing the active area of the input signal. If the start is set incorrectly, the switcher may add blank borders on the leading edges (top or left side) or it may crop the active area on the trailing edges (bottom or right side).

Figure 3-24 shows an image that is improperly started (as indicated by the dashed lines). If the horizontal start adjustment is set to less than the amount of actual blanking, the IN1508 starts scaling the input before the start of the active image. This early scaling results in a blank border on the left side and cropping on the right side, and *looks* as if the image is shifted to the right.
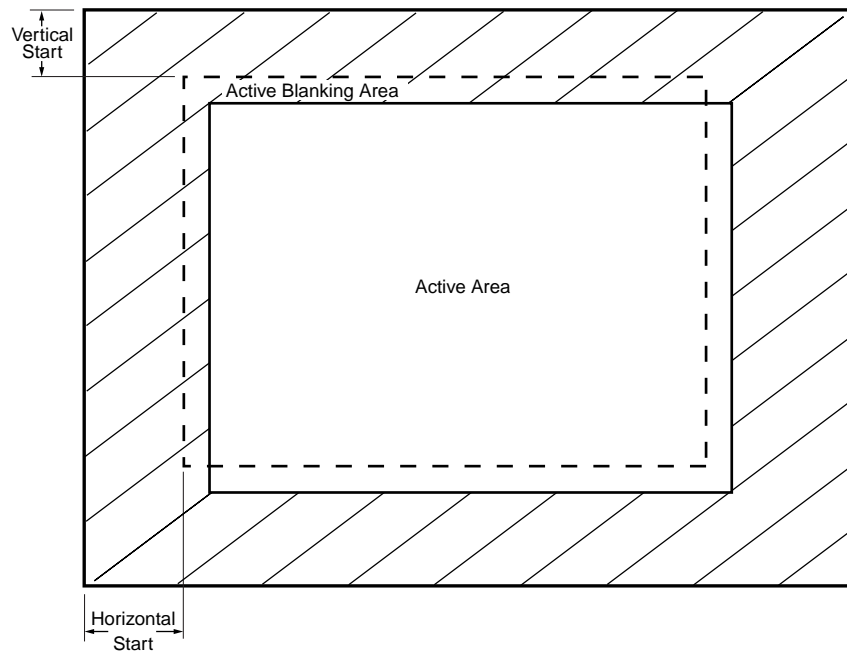
Figure 3-24 — Incorrectly started image

Operation, cont'd

Similarly, if the vertical start adjustment is set to less than the amount of actual blanking, the IN1508 starts scaling before the first line of the active image. This early scaling results in a blank border on the top and cropping on the bottom, and *looks* as if the image is shifted down.

Adjust the H Start status indicator bar to shift the switcher's starting point horizontally on the screen. Adjust the V Start status indicator bar to shift the starting period vertically on the screen.

If improperly adjusted, the output position variable can result in an image similar to figure 3-24. But, position only moves the image on the monitor. It does not add blank borders or crop any part of the image. However, the apparent effect of blank borders and a cropped image can be caused by the image being improperly positioned on the monitor.

Active Pixels and Active Lines status indicator bars

Figure 3-25 shows an image whose active area is improperly set, as indicated by the dashed lines. If the number of active image pixels that the switcher is set to scale are less than the amount of actual active pixels that are input, the IN1508 only scales the set active area and skips some of the input pixels. This early end to the scaling process results in an output with fewer pixels than it should have, and *looks* as if the image is stretched horizontally.
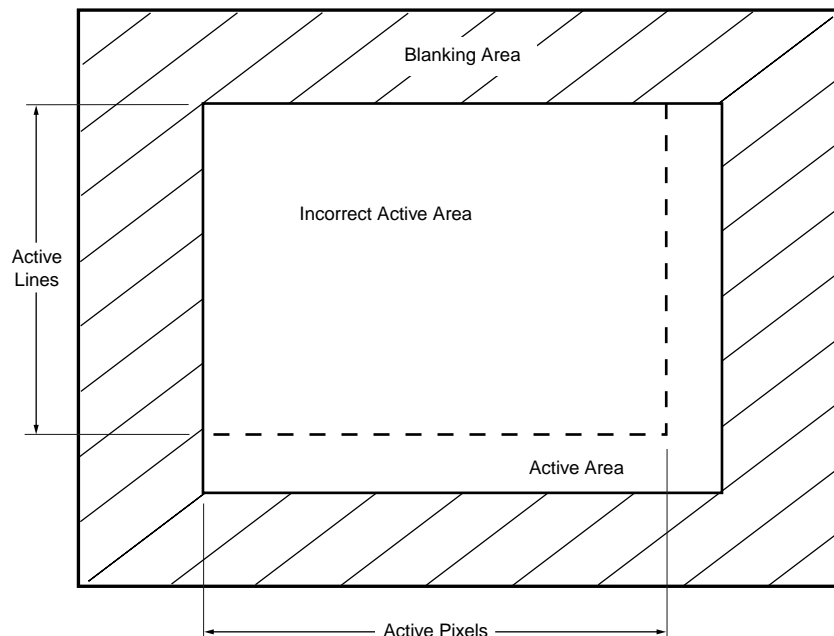
Figure 3-25 — Incorrect active area setting

Similarly, if the number of active image lines that the IN1508 is set to scale is less than the amount of actual active lines that are input, the IN1508 scales only the set active area and skips some of the input lines. This early end to the scaling process results in an output that has fewer lines than it should have, and *looks* as if the image is stretched vertically.

Depending on the RGB source, the input sampling rates in the following table may have the same horizontal scan rate and vertical refresh rate. The switcher does not detect pixel space differences (you can have different numbers of pixels in the same horizontal and vertical rates) between input rates. The switcher applies the

default capture rate to the specified input frequency. It then maintains the aspect ratio based on the difference between the input active area and the output resolution (active area) by inserting blank borders around the images. If, however, you want to fill the entire monitor, you can adjust the input aspect ratio by slightly changing the number of active pixels and active lines to stretch the image. You may also need to adjust the number of total pixels.

Adjust the Active Pixels status indicator bar to increase and decrease the number of active pixels, shifting the starting period horizontally on the screen. Adjust the Active Lines status indicator bar to increase and decrease the number of lines.

Active pixels	Active lines	Aspect ratio	Total pixels	Comment
Horizontal rate = 31.5 kHz, vertical rate 60 Hz				
640	480	4:3	780	Progressive NTSC
640	350	64:35	800	
640	400	8:5	800	
640	480	4:3	800	Factory default
720	350	72:35	900	
720	400	9:5	900	
Horizontal rate = 15.7 kHz, vertical rate 60 Hz				
768	480	8:5	910	NTSC 14.3
720	480	3:2	858	NTSC 13.5
640	480	4:3	780	NTSC 12.3 (default)

Operation, cont'd

Total Pixels status indicator bar

There are several methods to determine the correct value to use in the total pixels variable. Usually, the best method is to use the input signal specifications. For some input sampling rates, the switcher's setting can result in fine vertical lines (figure 3-26).
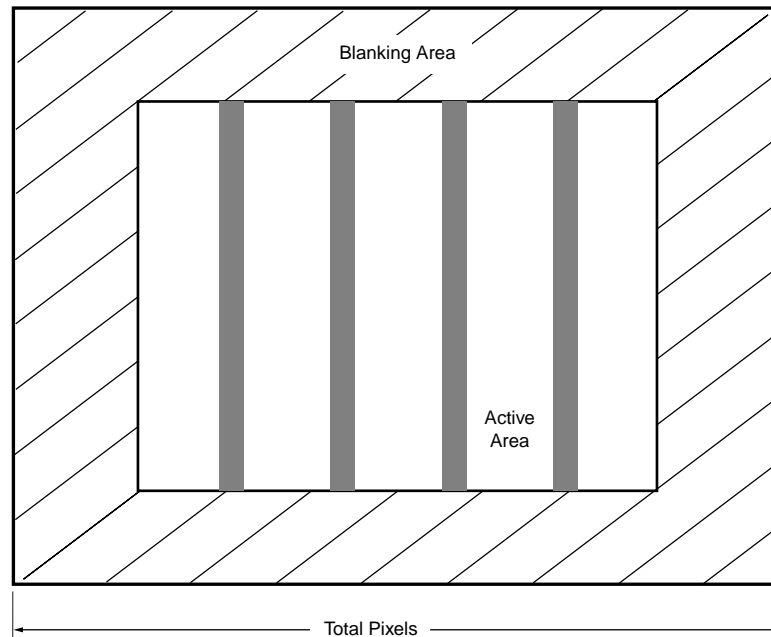
Figure 3-26 — Incorrect total pixels variable

These lines appear as fuzzy vertical bars when an alternating pixels pattern is applied. When the total pixels setting is improperly adjusted the entire image can have a noisy or darkened appearance. Adjusting the phase corrects this.

As an approximate setting, multiply the active pixels setting (see "Active Pixels and Active Lines status indicator bars", earlier in this chapter) by a factor of 1.3.

If the input pixel clock rate is known, the input total pixels setting can be calculated with this equation:

total pixels = input pixels clock ÷ input horizontal scan rate

Once a preliminary setting is saved, some faint vertical lines may remain. Adjust the total pixels variable as necessary until the lines are completely out of view or as far apart as you can make them. If one line remains, it can be moved out of view using the Phase status bar (see "Phase status indicator bar", below).

> **NOTE** *The active pixels and total pixels adjustments are interactive. Setting one of these variables may require adjusting the other.*

Phase status indicator bar

> **NOTE** *The Phase adjustment is available for RGBHV, RGBS, RGsB, and progressive component video inputs only.*

The Phase status indicator bar shows, and allows you to adjust, the phase adjustment setting. The phase control adjusts the amount of phase shift applied to the input video signal. Use the front panel or IR remote control ◀ and ▶ buttons to increase or decrease the amount of phase shift through a range of 0 to 31.

Optimizing the Audio

Each individual input audio level can be adjusted within a range of -53 dB to +9 dB, so there are no noticeable volume differences between sources and for the best headroom and signal-to-noise ratio. Adjust the audio gain and attenuation as follows:

1. Connect audio sources to all desired inputs and connect the audio output to an output device such as an audio player. See "Audio connections", in chapter 2, "Installation".

2. Power on the audio sources, the switcher, and the audio players.

3. Select an input, listening to the audio with a critical ear.

4. As necessary, adjust each variable for the input (see "Input Gain/Attenuation status indicator bar", on page 3-22) for optimum audio quality.

5. Select each input in turn and repeat step **4** for each input.

Troubleshooting

This section gives recommendations on what to do if you have problems operating the switcher, and it provides examples and descriptions for some image problems you may encounter.

The following tips may help you in troubleshooting.

- Some symptoms may resemble others, so you may want to look through all of the examples before attempting to solve the problem.

- Be prepared to backtrack in case the action taken does not solve the problem.

- It may help to keep notes and sketches in case the troubleshooting process gets lengthy. This will also give you something to discuss if you call for technical support.

- Try simplifying the system by eliminating components that may have introduced the problem or made it more complicated.

- For sync-related problems: Portable digital projectors are designed to operate close to the video source. Sync problems may result from using long cables or from improper termination. A sync adapter, such as Extron's ASTA (Active Sync Termination Adapter), may help solve these problems.

- For LCD and DLP projectors and plasma displays: In addition to the sync-related information above, check the user's manual that came with the projector for troubleshooting tips, as well as for settings and adjustments. Each manufacturer may have its own terms, so look for terms like "auto setup", "auto sync", "pixel phase", and "tracking".

General checks

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if one of the Input LEDs is lit.

2. Ensure that the input selected is active.

3. Ensure that the proper signal format is supplied.

4. Check the cabling and make corrections as necessary.

5. Call the Extron S[3] Sales & Technical Support Hotline if necessary.

Operation, cont'd

Specific problems

The table below shows some common operating problems and their solutions.

Problem	Possible cause	Solution
No image appears.	Power.	Ensure that the video source, the switcher, and the display are plugged into a live AC power source and that the switcher is turned on.
	No video input.	Check that the input device is outputting a video signal.
	No video output.	Press the Menu button. If the on-screen display does not appear, check the output connection.
	The output signal is incompatible.	Select an output rate that is compatible with the display.
	The output format is incompatible for the display.	Press and **hold** the front panel PIP On button while powering up. the switcher. The IN1508 toggles between the RGB and YUV output formats.
	The display may not accept the output sync format.	Check the display's sync capability and select the correct output sync.
	Freeze mode was entered when the image was black.	Issue the SIS command 0F to deactivate freeze mode.
	Video may be muted.	Issue the SIS command 1B to disable video mute.
No audio output.	Power.	Ensure that the audio source, the switcher, and the amplifier/ speakers are plugged into a live AC power source and the switcher is turned on.
	The source is incorrect.	Ensure that the source is connected to the correct input and that the volume has not been turned down or muted.
	The output is incorrect.	The IN1508 outputs line level audio *only*. Ensure that it is connected to a mixer/amplifier or to amplified speakers.
	Volume is too low.	Increase the volume using the Audio submenu.
	Audio may be muted.	Issue the SIS command 1Z to disable audio mute.
The image is scrambled.	The output signal is incompatible.	Use the power up shortcuts to select an output rate that is compatible with the display.

Problem	Possible cause	Solution
The image is stretched horizontally.	Total pixels may be set too high.	Select Picture>Advanced>Total Pixels and reduce the setting to match the input signal.
	Active pixels may be set too low.	Select Picture>Advanced>Active Pixels and increase the setting to match the input signal.
The image is compressed horizontally.	Total pixels may be set too low.	Select Picture>Advanced>Total Pixels and increase the setting to match the input signal.
	Active pixels may be set too high.	Select Picture>Advanced>Active Pixels and reduce the setting to match the input signal.
The image is stretched vertically	Active lines may be set too low.	Select Picture>Advanced>Active Lines and increase the setting to match the input signal.
The image is compressed vertically.	Active lines may be set too high.	Select Picture>Advanced>Active Lines and reduce the setting to match the input signal.
The image is cropped on the left.	Input horizontal start may be set too high.	Select Picture>Advanced> H Start and reduce the setting to match the input signal.
	Horizontal position may be set too far to the left.	Press the front panel Center button and shift the image to the right.
	Display may be set incorrectly.	Use the display's position or size controls to fit the image on the display.
The image is cropped on the right.	Input horizontal start may be set too low.	Select Picture>Advanced> H Start and increase the setting to match the input signal.
	Horizontal position may be set too far to the right.	Press the front panel Center button and shift the image to the left.
	Display may be set incorrectly.	Use the display's position or size controls to fit the image on the display.
The image is cropped on the top.	Input vertical start may be set too high.	Select Picture>Advanced> V Start and reduce the setting to match the input signal.
	Vertical position may be set too far to the top.	Press the front panel Center button and shift the image down.
	Display may be set incorrectly.	Use the display's position or size controls to fit the image on the display.

Operation, cont'd

Problem	Possible cause	Solution
The image is cropped on the bottom.	Input vertical start may be set too low.	Select Picture>Advanced> V Start and increase the setting to match the input signal.
	Vertical position may be set too near to the bottom.	Press the front panel Center button and shift the image up.
	Display may be set incorrectly.	Use the display's position or size controls to fit the image on the display.
Frozen image.	Freeze is activated.	Issue the SIS command 0F to deactivate freeze mode.
Output resolution cannot be increased.	Active pixels and/or active lines may be too high.	Select Input>Advanced>Active Area and reduce the active lines and/or active pixels to match the input signal.
The output size cannot be increased.	Output resolution is too high.	Press the front panel Output Rate button to decrease the resolution.
Multiple faint vertical lines appear.	Input total pixels setting is incorrect.	Select Picture>Advanced>Total Pixels and experiment with settings until the lines move completely out of view or only one remains. See "Single faint vertical line appears", below, if necessary.
Single faint vertical line appears.	Input phase setting is incorrect.	Select Input>Phase and experiment with settings until the line moves completely out of view.
The entire image is too soft.	Sharpness setting is too low.	Select Picture>Sharpness and increase the sharpness setting.
	The refresh rate may be too high.	Select Output>Refresh Rate and lower the refresh rate.
Some characters are too soft.	Total pixels setting is incorrect.	Select Picture>Advanced>Total Pixels and experiment with settings until the characters are sharp.
	Input phase setting is incorrect.	Select Picture>Advance>Fine Phase and experiment with settings until the characters are sharp.
Total pixels setting cannot be decreased.	Horizontal start may be too high.	Select Picture>Advanced>H Start and reduce the setting to match the input signal.
	Active pixels setting may be too high.	Select Picture>Advanced>Active Pixels and reduce the setting to match the input signal.

Problem	Possible cause	Solution
Total pixels setting cannot be increased.	Active pixels setting may be too low.	Select Picture>Advanced>Active Pixels and increase the setting to match the input signal.
	Horizontal start may be too high.	Select Picture>Advanced>H Start and reduce the setting to match the input signal.
	Output resolution may be too low.	Press the front panel Output Rate button to select a setting that is greater than or equal to the active area.
Active lines setting cannot be increased.	Vertical start may be too high.	Select Picture>Advanced> V Start and reduce the setting to match the input signal.
	Output resolution may be too low.	Press the front panel Output Rate button to select a setting that is greater than or equal to the active area.
Horizontal start setting cannot be increased.	Total pixels setting may be too low.	Select Picture>Advanced>Total Pixels and increase the setting to match the input signal.
	Active pixels setting may be too high.	Select Picture>Advanced>Active Pixels and reduce the setting to match the input signal.
Vertical start.	Active lines setting may be too high.	Select Picture>Advanced>Active Lines and reduce the setting to match the input signal.

Chapter Four

4

Serial Communications

Host-to-Switcher Instructions

Switcher-Initiated Messages

Switcher Error Responses

Using the Command/Response Table

Serial Communications

The switcher's rear panel Remote 9-pin D female connector (figure 4-1) can be connected to the RS-232 serial port output of a host device such as a computer running the HyperTerminal utility or a control system. This connection makes software control of the switcher possible.
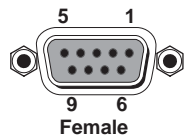
Pin	RS-232	Function
1	—	Not used
2	TX	Transmit data
3	RX	Receive data
4	—	Not used
5	Gnd	Signal ground
6	—	Not used
7	—	Not used
8	—	Not used
9	—	Not used

Figure 4-1 — Remote connector pin arrangement

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control.

Host-to-Switcher Instructions

The switcher accepts (Simple Instruction Set) SIS™ commands through the RS-232 port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

When a power-up occurs, the switcher responds by sending the following message to the host:

Copyright 2005, Extron Electronics, IN1508, Version *x.xx* ↵

Version *x.xx* is the firmware version number.

The switcher does not expect a response from the host; but, for example, the host program might request a new status.

Switcher Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (too large)
E09 — Invalid function number (too large)
E10 — Invalid command
E13 — Invalid value (out of range)
E17 — Invalid command for signal type

Using the Command/Response Table

The command/response table begins on the next page. Except for the gain and attenuation settings, upper or lower case letters are acceptable in the command field. Command and response examples are shown throughout the table.

The table below shows the hexadecimal equivalent of each ASCII command.

ASCII to HEX		Conversion Table						Esc	1B	CR	ØD	LF	ØA
Space	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(| 28 |)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	I	7C	}	7D	~	7E	DEL	7F

Symbol definitions

Symbols (X_n values), defined below, are used throughout the command/response table that begins on page 4-4. The symbols represent variables in the command/response table fields.

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = CR (no line feed)

• = Space

Esc = Escape key

X_1 = Input number 1 through 8

X_2 = Switcher resolution:

01	= 640 x 480 (VGA)	11	= 480p
02	= 800 x 600 (SVGA)	12	= 576p
03	= 1024 x 768 (XGA)	13	= 720p
04	= 1280 x 1024 (SXGA)	14	= 1080i
05	= 1024 x 852	15	= 1080p
06	= 1024 x 1024	16	= 1280 x 768
07	= 1366 x 768	17	= 1440 x 900
08	= 1365 x 1024	18	= 1680 x 1050
09	= 1400 x 1050	19	= 1280 x 800
10	= 1600 x 1200 (UXGA)	20	= 852 x 480

X_3 = Video refresh rate:

1	= 50 Hz	3	= 75 Hz
2	= 60 Hz		

X_4 = On/off status (0 = off, 1 = on)

X_5 = Picture adjustment range (000 through 128)

X_6 = Horizontal shift range (000 through current horizontal output resolution)

X_7 = Vertical shift range (000 through current vertical output resolution)

X_8 = Sharpness level (00 through 128)

X_9 = Horizontal start position (000 thru 200)

X_{10} = Vertical start position (000 thru {variable})

X_{11} = Pixel phase value (0 to 31)

X_{12} = Gain value (numeric dB value, 0 to +9)

X_{13} = Attenuation value (numeric dB value, -1 to -53)

X_{14} = Gain/attenuation (-53 dB to +9 dB, each step = 1 dB)

X_{15} = Output volume (0 to 100)

X_{16} = Detected input signal standard (input 1 through 4 or 5):

0	= none	3	= NTSC 4.43
1	= NTSC 3.58	4	= SECAM
2	= PAL		

X_{17} = Input 5 video type:

0	= Interlaced component	2	= HDTV
1	= Progressive component		

X_{18} = PIP size:

00	= 1/4 (default)	03	= 1/25
01	= 1/9	04	= Side-by-side normal
02	= 1/16	05	= Side-by-side full screen

X_{19} = Output video type:

0	= Y, B-Y, R-Y	2	= RGBS
1	= RGBHV	3	= RGsB

X_{20} = Output sync polarity:

0	= H−/V−	2	= H+/V−
1	= H−/V+	3	= H+/V+

X_{21} = Aspect ratio (0 = 4:3, 1 = 16:9)

X_{22} = Menu buttons:

00	= Menu	03	= Left
01	= Up	04	= Right
02	= Down	05	= Enter

X_{23} = Pixel and line values (The range depends on the input resolution applied and the output resolution selected.)

X_{24} = Audio follow:

0	= Follow main window	2	= Toggle audio source
1	= Follow PIP window		

X_{25} = Window size (The range depends on the input resolution applied and the output resolution selected.)

Serial Communications, cont'd

Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Input selection and PIP swap			
Select video and audio input	[X1]!	Chn[X1]↵	Select video and audio input [X1].
Example:	2!	Chn02↵	Select video and audio input 2.
View video and audio input	!	Chn[X1]↵	Input [X1] is selected.
Swap PIP and main windows	%	Pch[X1]↵	[X1] is the input in the PIP window.
Audio/video breakaway switching			
NOTE *Audio/video breakaway switching is only available when the switcher's PIP function is off (the front panel PIP On LED is unlit). The switcher responds with an E10 error if the PIP On is lit (the PIP function is active.*			
Switch audio input	[X1]$	In[X1]•Aud↵	Select audio input [X1].
Switch video input	[X1]&	In[X1]•Vid↵	Select video input [X1].
Switcher output video resolution			
Set output resolution and rate	[X2]*[X3]=	Rte[X2]*[X3]↵	Command character is "equals".
Example:	5*3=	Rte5*3↵	Set the output to 1024x852 at 75Hz.
View resolution and rate	=	Rte[X2]*[X3]↵	
Video mute			
Set video mute on	1B	Vmt[X4]↵	Set the video output to black.
Set video mute off	0B	Vmt[X4]↵	Set the video output to the selected input 1 through 8.
View video mute status	B	Vmt[X4]↵	Video mute is [X4] (on or off).
Color			
NOTE ***Color*** *adjustments are available only for inputs 1 through 4. If input 5 is configured as interlaced component video, its color can also be adjusted. Color adjustments are made to the selected input only.*			
Set a specific color value	[X5]C	Col[X5]↵	Specify the color adjustment.
Increment color value	+C	Col[X5]↵	Increase the color setting by one.
Decrement color value	–C	Col[X5]↵	Decrease the color setting by one.
View the color value	C	Col[X5]↵	Show the color setting.
Tint			
NOTE ***Tint*** *adjustments are available only for inputs 1 through 4. Tint adjustments are made to the selected input only.*			
Set a specific tint value	[X5]T	Tin[X5]↵	Specify the tint adjustment.
Increment tint value	+T	Tin[X5]↵	Increase the tint setting by one.
Decrement tint value	–T	Tin[X5]↵	Decrease the tint setting by one.
View the tint value	T	Tin[X5]↵	Show the tint setting.
Brightness			
Set a specific brightness value	[X5]Y	Brt[X5]↵	Specify the brightness adjustment.
Increment brightness value	+Y	Brt[X5]↵	Increase the brightness by one.
Decrement brightness value	–Y	Brt[X5]↵	Decrease the brightness by one.
View the brightness value	Y	Brt[X5]↵	Show the brightness setting.

Command/response table for SIS commands (cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Contrast			
Set a specific contrast value	[X5]^	Con[X5] ↵	Specify the contrast adjustment.
Increment contrast value	+^	Con[X5] ↵	Increase the contrast by one.
Decrement contrast value	−^	Con[X5] ↵	Decrease the contrast by one.
View the contrast value	^	Con[X5] ↵	Show the contrast setting.
Horizontal size (window)			
Increase the horizontal size	+:	Hsz[X25] ↵	Widen the picture.
Decrease the horizontal size	−:	Hsz[X25] ↵	Make the picture narrower.
View the window width	:	Hsz[X25] ↵	Window width is [X25].
Vertical size (window)			
Increase the vertical size	+;	Vsz+ ↵	Make the picture taller.
Decrease the vertical size	−;	Vsz− ↵	Make the picture shorter.
View the window height	:	Vsz[X25] ↵	Window height is [X25].
Horizontal shift			
Set specific value	[X6]H	Hph[X6] ↵	Set the horizontal position to [X6].
Nudge picture right (+4)	+H	Hph[X6] ↵	Shift the picture right.
Nudge picture left (−4)	−H	Hph[X6] ↵	Shift the picture left.
View position setting	H	Hph[X6] ↵	Horizontal setting is [X6].
Vertical shift			
Set specific value	[X7]/	Vph[X7] ↵	Set the vertical position to [X7].
Nudge picture up (+4)	+/	Vph[X7] ↵	Shift the picture up.
Nudge picture down (−4)	−/	Vph[X7] ↵	Shift the picture down.
View position setting	/	Vph[X7] ↵	Vertical setting is [X7].
Sharpness filter			
Set a specific detail filter level	[X8]D	Shp[X8] ↵	Set the detail level.
Increment detail filter value	+D	Shp[X8] ↵	Select the next higher detail level.
Decrement detail filter value	−D	Shp[X8] ↵	Select the next lower detail level.
View the detail filter value	D	Shp[X8] ↵	Detail level is [X8].
Horizontal start			
Set a horizontal start value	[X9])	Hst[X9] ↵	Set the horizontal location of the first active pixel.
Example:	5)	Hst5 ↵	Shift active video 5 pixels to the right from the current position.
Increment horizontal start value	+)	Hst[X9] ↵	Shift video to the right 1 pixel.
Decrement horizontal start value	−)	Hst[X9] ↵	Shift video to the left 1 pixel.
View the horizontal start value	)	Hst[X9] ↵	Horizontal starting point is [X9].
Vertical start			
Set a vertical start value	[X10](	Vst[X10] ↵	Set the vertical location of the first active pixel.
Example:	2(	Vst2 ↵	Shift active video down 2 lines from the current position.
Increment vertical start value	+(	Vst[X10] ↵	Shift video down 1 line.
Decrement vertical start value	−(	Vst[X10] ↵	Shift video up 1 line.
View the vertical start value	(	Vst[X10] ↵	Vertical starting point is [X10].

Command/response table for SIS commands (cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Pixel phase			
Set a pixel phase value	[X11]U	Phs[X11] ↵	
Example:	6U	Phs6 ↵	Use a pixel phase setting of 6.
Increment pixel phase value	+U	Phs[X11] ↵	Increase the pixel phase setting.
Decrement pixel phase value	–U	Phs[X11] ↵	Decrease the pixel phase setting.
View the pixel phase value	U	Phs[X11] ↵	Pixel phase value is [X11].
Freeze			
Enable freeze	1F	Frz1 ↵	Output a "frozen" video image.
Disable freeze	0F	Frz0 ↵	Turn off freeze (output motion video).
View the freeze status	F	Frz[X4] ↵	Show the freeze status.
Example:	F	Frz0 ↵	Freeze mode is off.
Zoom			
Zoom in	+{	Zom ↵	Zoom in on the video image.
Zoom out	–{	Zom ↵	Zoom out from the video image.
Audio gain and attenuation			

> **NOTE**   *The SIS commands for setting audio gain and attenuation are case sensitive. "G" sets gain and "g" sets attenuation. Increment, decrement, and view are not case sensitive.*

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Set gain	[X12]G	Aud[X14] ↵	Set gain for the selected input to [X12] dB.
Example:	3G	Aud+03 ↵	Set gain for the selected input to 3 dB.
Set attenuation	[X13]g	Aud[X14] ↵	Set attenuation for the selected input to [X13] dB.
Example:	15g	Aud-15 ↵	Set attenuation for the selected input to -15 dB.
Increment level	+G	Aud[X14] ↵	Increase the selected input's audio level by +1 dB.
Decrement level	-G	Aud[X14] ↵	Decrease the selected input's audio level by -1 dB.
View audio level	G	Aud[X14] ↵	View gain for the selected input.
Example	G	Aud-03 ↵	The IN1508 reports that the audio level for the selected input is at -3 dB of attenuation.
Audio output volume			
Set the output volume	[X15]V	Vol[X15] ↵	Set the volume for the audio output.
Increment the output volume	+V	Vol[X15] ↵	Increase the output's volume level by 1 step.
Decrement the output volume	-V	Vol[X15] ↵	Decrease the output's volume level by 1 step.
View the output volume	V	Vol[X15] ↵	Show the volume level.
Audio delay			
Set the audio delay on	1@	Ad1 ↵	Delay audio to match the delay inherent in video scaling.
Set the audio delay off	0@	Ad0 ↵	
View the audio delay	@	Ad[X4] ↵	
Example:	@	Ad1 ↵	Audio delay is on.

Command/response table for SIS commands (cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Audio mute			
Set audio mute on	1Z	Amt[X4]↵	Mute the audio output.
Set audio mute off	0Z	Amt[X4]↵	Unmute the audio output.
View audio mute status	Z	Amt[X4]↵	Audio mute is [X4] (on or off).
Front panel lock			
Enable front panel lock (lock image adjustments)	1X	Exe1↵	Lock front panel adjustments; adjust the image via RS-232 only.
Disable front panel lock	0X	Exe0↵	Adjustments and selections can be made from the front panel.
View the lock status	X	Exe[X4]↵	Show lock status.
Example:	X	Exe0↵	Front panel lock is off.
Information requests			
Query firmware version	Q	*x.xx* ↵	Show the firmware version.
Request part number	N	60-569-01↵	Show the IN1508's part #.
Request general information	I	(See below)	Show the IN1508's status.
		Chn[X1]•Pch[X1]•Std[X16] ↵	*Chn* is the input selected for the main window. *Pch* is the input selected for the PIP window (0 when PIP mode is off). *Std* is the autodetected input 1 through 4 (or 5) video standard.
Resets			
Zap all IN1508 settings	[Esc] zXXX←	ZapXXX ↵	Reset all settings and adjustments to the factory default and erase all presets.

Serial Communications, cont'd

Command/response table for special function SIS commands

The syntax for setting a special function is Xn̄*X?#̄ where Xn̄ is the value or variable (such as X17 in the second example below), X? is the function number (such as "2" = "Set input 5 video format" in the second example below), and # is the execute command. To view a function's setting, use X?#, where X? is the function number.

Command/Response Table for Special Function SIS Commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Pan			
Pan right	–*0#	Pan↵	Pan right on a zoomed image.
Pan left	+*0#	Pan↵	Pan left on a zoomed image.
Pan up	–*1#	Pan↵	Pan up on a zoomed image.
Pan down	+*1#	Pan↵	Pan down on a zoomed image.
Input 5 video type			
Set input video format	X17*2#	In5 X17 ↵	Specify the video format connected to input 5.
Example:	1*2#	In51 ↵	Input 5 is set to progressive video.
View input video format	2#	In5 X17 ↵	
Switch mode			
Enable fade mode	1*3#	Fad1 ↵	Video fades to black during switches.
Disable fade mode (cut mode)	0*3#	Fad0 ↵	Video cuts from one input to another during switches.
View fade mode	3#	Fad X4 ↵	1 = fade, 0 = cut.
PIP			
Set PIP size	X18*4#	Pmd X18 ↵	Set PIP window size.
Example:	2*4#	Pmd2 ↵	PIP window is 1/16 screen size.
View PIP size	4#	Pmd X18 ↵	
Set PIP mode	X4*5#	Pip X4 ↵	0 = PIP off, 1 = PIP on.
Example:	1*5#	Pip1 ↵	PIP is on.
View PIP mode	5#	Pip X4 ↵	
Switcher output settings			
Set output sync format	X19*6#	Syn X19 ↵	0 = Y, B-Y, R-Y. 1 = RGBHV (default). 2 = RGBS. 3 = RGsB.
Example:	1*6#	Syn1 ↵	RGBHV output.
View output sync format	6#	Syn X19 ↵	
Set output sync polarity	X20*7#	Pol X20 ↵	0 = H–/V– (default). 1 = H–/V+. 2 = H+/V–. 3 = H+/V+.
Example:	1*7#	Pol1 ↵	H–/V+ polarity.
View output sync polarity	7#	Pol X20 ↵	
Blue screen			
Set blue screen (blue & sync output only)	X4*8#	Blu X4 ↵	0 = off (normal output). 1 = on (blue video & sync output).
Example:	1*8#	Blu1 ↵	Blue & sync output for setup.
View blue mode on/off	8#	Blu X4 ↵	

Command/response table for special function SIS commands (cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Input aspect ratio			
Set the input aspect ratio to 16:9	1*9#	Asp1 ↵	
Set the input aspect ratio to 4:3	0*9#	Asp0 ↵	
View the selected aspect ratio	9#	Asp[X21] ↵	
Example:	9#	Asp0 ↵	The aspect ratio is set to 4:3.
Menu buttons			
Presses of the menu buttons	[X22]*10#	Mnu[X22] ↵	Emulate pushing a menu button.
Example:	3*10#	Mnu3 ↵	Direct the switcher to respond as if the front panel ◄ button was pushed.
Total pixels			
Set a total pixel value	[X23]*11#	Tpx[X23] ↵	
Example:	1344*11#	Tpx1344 ↵	Use a total pixel setting of 1344.
Increment total pixel value	+*11#	Tpx[X23] ↵	Increase the total pixel setting.
Decrement total pixel value	−*11#	Tpx[X23] ↵	Decrease the total pixel setting.
View the total pixel value	11#	Tpx[X23] ↵	
Active pixels			
Set an active pixel value	[X23]*12#	Apx[X23] ↵	
Example:	1024*12#	Apx1024 ↵	Use an active pixel setting of 1024.
Increment active pixel value	+*12#	Apx[X23] ↵	Increase the active pixel setting.
Decrement active pixel value	−*12#	Apx[X23] ↵	Decrease the active pixel setting.
View the active pixel value	12#	Apx[X23] ↵	
Active lines			
Set an active line value	[X23]*13#	Aln[X23] ↵	
Example:	768*13#	Aln768 ↵	Use an active line setting of 768.
Increment active line value	+*13#	Aln[X23] ↵	Increase the active line setting.
Decrement active line value	−*13#	Aln[X23] ↵	Decrease the active line setting.
View the active line value	13#	Aln[X23] ↵	
Audio follow source			
Set the audio to follow	[X24]*14#	Afp[X24] ↵	Set audio to follow the main or PIP window selection.
View the audio follow setting	14#	Afp[X24] ↵	
Example:	14#	Afp1 ↵	Audio follows the PIP window.
IR receiver enable			
Disable IR receiver	0*65#	IRD0 ↵	Disable the IR receiver (do not allow control by the infrared remote).
Enable IR receiver	1*65#	IRD1 ↵	Enable the IR receiver (allow control by the infrared remote).
Read IR receiver enable	65#	[X4] ↵	0= disable, 1 = enable (default).

Serial Communications, cont'd

Command/response table for special function SIS commands (cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
EDID emulation (DVI input 8 only)			
Set EDID emulation	X2*X3*41#	DDCX2*X3↵	Set the EDID to emulate a specific resolution (default: 1024 x 768 at 60 Hz).
Example:	15*2*41#	DDC15*2↵	Set EDID emulation to 1080p at 60 Hz.
Read EDID emulation	41#	DDCX2*X3↵	
DVI auto-detect (DVI input 8 only)			
NOTE *When DVI auto-detect is enabled, the horizontal start and vertical start adjustments are disabled. If you need to change these settings, disable DVI auto-detect.*			
Disable DVI auto detect	0*76#	IRD80↵	Disable the auto adjust feature (allow the user to set horizontal start and vertical start).
Enable DVI auto-detect	1*76#	DVI81↵	Allow the IN1508 to auto adjust the DVI settings (default).
Read DVI auto-detect	76#	DVI8X4↵	0= disable, 1 = enable (default).

Appendix A

Specifications and Part Numbers

Specifications

Part Numbers

Specifications and Part Numbers

Specifications

Video input

Number/signal type .... 2 composite video
2 S-video
1 component video (interlaced, progressive, or HDTV)
2 RGBHV, RGBS, RGsB
1 DVI-D digital video (single link)

Connectors .... 2 female BNC (composite video)
2 female 4-pin mini DIN (S-video)
3 female BNC (component video)
2 female 15-pin HD (RGB)
1 DVI female (DVI-I)

Nominal level .... 1 Vp-p for Y of component video and S-video, and for composite video
0.7 Vp-p for RGB and for R-Y and B-Y of component video
0.3 Vp-p for C of S-video

Minimum/maximum levels .... 0 V to 1.0 Vp-p with no offset

Impedance .... 75 ohms

Horizontal frequency .... 24 kHz to 100 kHz

Vertical frequency .... 50 Hz to 120 Hz

Resolution range .... 640 x 480 to 1600 x 1200, 480p, 576p, 720p, 1080i, and 1080p

Return loss .... <-30 dB @ 5 MHz

DC offset (max. allowable) .... 0.5 V

Video processing

Encoder .... 9 bit digital

Decoder .... 10 bit digital

Digital sampling .... 24 bit, 8 bits per color; 140 MHz standard

Colors .... 16.78 million

Video output

Number/signal type .... Scaled RGBHV, RGBS, RGsB; Y, R-Y, B-Y

Connectors .... 1 female 15-pin HD

Nominal level .... 1 Vp-p for Y of component video
0.7 Vp-p for RGB and for R-Y and B-Y of component video

Minimum/maximum levels .... 0 V to 2.0 Vp-p

Impedance .... 75 ohms

Vertical frequency .... 50 Hz, 60 Hz, or 75 Hz, depending on selected output resolution

Scaled resolution .... 640x480[1,2,3], 800x600[1,2,3], 852 x 800[1,2], 1024x768[1,2,3], 1024x852[1,2,3], 1024x1024[1,2,3], 1280x768[2], 1280 x 800[1,2], 1280x1024[1,2,3], 1366x768[1,2,3], 1365x1024[1,2,3], 1400x1050[1,2], 1440 x 900[2,3], 1600x1200[1,2], 1680 x 1050[2], 480p[2], 576p[1], 720p[1,2], 1080i[1,2], 1080p[2]
[1] = at 50 Hz; [2] = at 60 Hz; [3] = at 75 Hz

Return loss .... -21 dB @ 5 MHz

DC offset .... ±300 mV maximum with input at 0 offset

Sync

Input type .... RGBHV, RGBS, RGsB

Output type .... RGBHV, RGBS, RGsB; Y, R-Y, B-Y (tri-level)

Standards .... NTSC 3.58, NTSC 4.43, PAL, SECAM

Input level .... 0 V to 5 Vp-p

Output level .... TTL: 5.0 Vp-p, unterminated

Input impedance .... 75 ohms

Output impedance .... 75 ohms

Max input voltage	5V p-p
Polarity	Positive or negative (switch-selectable)

Audio

Gain	Unbalanced output: 0 dB; balanced output: +6 dB
Frequency response	20 Hz to 20 kHz, ±1.1 dB
THD + Noise	0.03% @ 1 kHz at nominal level, 0 dB gain
S/N	>90 dB at rated maximum output
Crosstalk	<-80 dB @ 1 kHz
Stereo channel separation	>84 dB @ 1 kHz

Audio input

Number/signal type	8 stereo, unbalanced
Connectors	5 pairs of RCA (tip-ring) jacks
	(3) 3.5 mm mini stereo (tip-ring-sleeve) jacks
Impedance	>10k ohms unbalanced, DC coupled
Nominal level	+4 dBu (1.23 Vrms), -10 dBV (316 mVrms)
Maximum level	+10.4 dBu, (unbalanced) at 1% THD+N
Input gain adjustment	-53 dBu to +9 dBu, adjustable per input

NOTE   *0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu.*

Audio output

Number/signal type	1 stereo, unbalanced
	1 stereo, balanced/unbalanced
Connectors	1 pair of RCA (tip-ring) jacks
	(1) 3.5 mm captive screw connector, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	>+21 dBu, balanced at 1% THD+N
	>+11 dBu, unbalanced at 1% THD+N
Maximum level (600 ohm)	>+14 dBm, balanced at 1% THD+N
	>+10 dBm, unbalanced at 1% THD+N

Control/remote — decoder/scaler

Serial control port	RS-232, 9-pin female D connector
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
IR controller module	IN1508 Remote
Program control	Extron's Simple Instruction Set (SIS™)

General

Power	100 VAC to 240 VAC, 50/60 Hz, 30 watts, internal
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing
	Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection
Rack mount	Yes, with included brackets
Enclosure type	Metal
Enclosure dimensions	1.75" H x 17.5" W x 8.5" D (1U high, full rack wide)
	4.4 cm H x 44.4 cm W x 21.6 cm D
	(Depth excludes connectors and knobs. Width excludes rack ears.)
Product weight	7.0 lbs (3.2 kg)

Shipping weight .... 10 lbs (5 kg)
Vibration .... ISTA 1A in carton (International Safe Transit Association)
Listings .... UL, CUL
Compliances .... CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF .... 30,000 hours
Warranty .... 3 years parts and labor

NOTE *All nominal levels are at ±10%.*
Specifications are subject to change without notice.

Part Numbers

Included parts

These items are included in each order for an IN1508:

Included parts	Part number
IN1508 Scaling Presentation Switcher	60-569-01
IN1508 infrared remote control	
Rubber feet (self-adhesive) (4)	
MBD 149 Rack and through-desk mounting kit	70-077-03
IEC power cord	27-044-01
Tweeker (small screwdriver)	
IN1508 User's Manual	

Suggested adapters

Adapter	Part number
SVHSM-**BNCF** S-video male to 2 BNC adapter, female, 8"	26-353-02
BNC male to RCA female adapter	10-264-01
HDMIF-**DVIDM** HDMI female to DVI-D male adapter	26-616-01
HDMIM-**DVIDF** HDMI male to DVI-D female adapter	26-617-01

Cables

Bulk cables

Cable	Part number
RG6-1 bulk , 500'	22-098-02
RG6 male crimp connectors, qty. 50	100-260-01
MHR-2 mini high resolution 500' (150 m)	22-123-03
MHR-2P Plenum mini high resolution 500' (150 m)	22-129-03
BNC Mini HR crimp connectors, qty. 50	100-250-51
RG59 high resolution 500' (150 m)	22-145-02
RG59P Plenum high resolution 500' (150 m)	22-146-02
RG59 BNC male crimp connectors, qty. 30	100-257-51

Precut cables

Cable	Part number
RG6-1 3' (3 feet/0.9 meters)	26-383-01
SVHS cable, various lengths	26-316-*xx*
BNC-4-25' MHR (25 feet/7.5 meters)	26-210-04
BNC-5-25' MHR (25 feet/7.5 meters)	26-260-03

High performance DVI cables

Cable	Part number
IN9700/6 DVI male to male 6' (1.8 meters)	26-584-06
IN9700/25 DVI male to male 25' (7.6 meters)	26-584-01
IN9700/35 DVI male to male 35' (10.6 meters)	26-584-02
IN9700/50 DVI male to male 50' (15.2 meters)	26-584-03
IN9700/75 DVI male to male 75' (22.8 meters)	26-584-04

Specifications and Part Numbers, cont'd

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Japan:

Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.