

User's Manual



PIP 422 and PIP 444 Picture-in-Picture Video Processors

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.

Conservier 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 podrían 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'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément 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 Erdschluß, und stellt eine Sicherheitsfunktion dar. Dieses 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 Stromversorgung (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.

Lithium-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 puentearla ni eliminarla.

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 baterías 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。不要有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。按照生产厂家的建议处理废弃电池。

Quick Start — PIP 422 and PIP 444

Installation

Step 1

For tabletop placement, install the four rubber feet on the bottom of the PIP picture-in-picture processor. Otherwise, mount the processor in a rack using the included rack ears or install the processor in furniture.

Step 2

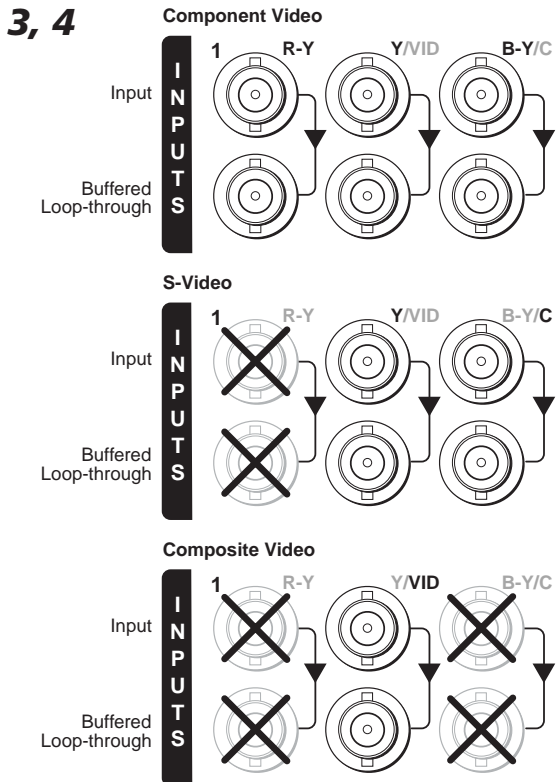
Turn off power to the input and output devices, and remove the power cords from them.

Step 3

Input connectors — Connect up to two (PIP 422) or four (PIP 444) component video, S-video, or composite video input devices to the top (input) set of rear panel Inputs BNC connectors (3, 4).

Step 4

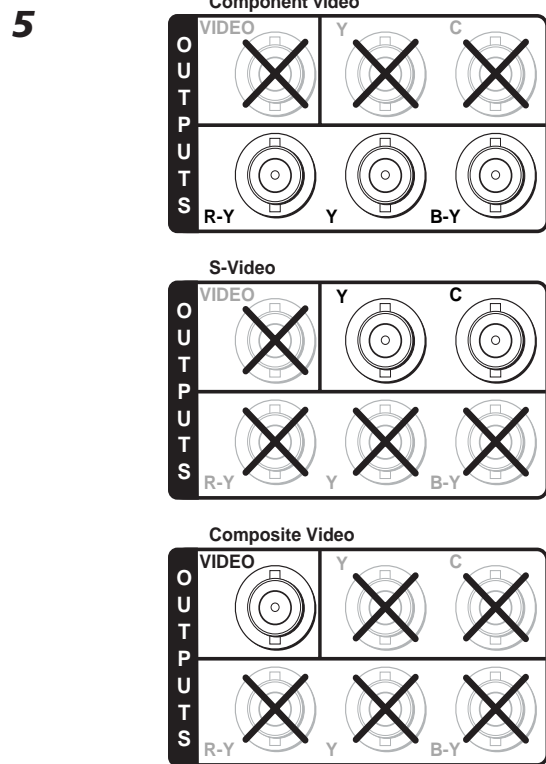
Loop-through connectors — If desired, connect up to two (PIP 422) or four (PIP 444) component video, S-video, or composite video display devices to the bottom (buffered loop-through) set of rear panel Inputs BNC connectors (3, 4).



Step 5

Output connectors — Connect a component video, S-video, and/or composite video display device to the rear panel Output BNC connectors (5).

NOTE *The component video, S-video, and composite video outputs are all active simultaneously, so multiple displays can be connected.*



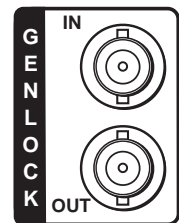
Step 6 (PIP 444 only)

Genlock connectors — **6**

In(put) connector — If desired, connect an external black burst signal to the rear panel Genlock Input BNC connector for genlocking the video signal in broadcast or other sync-critical applications (6).

Out(put) connector — Connect any downstream equipment that requires genlocking to the rear panel Genlock Output BNC connector to route the black burst signal throughout the system in broadcast or other sync-critical applications.

NOTE *If no device is connected to the output, terminate the Genlock output with the included 75-ohm terminator.*

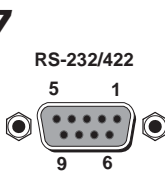


Quick Start — PIP 422 and PIP 444, cont'd

Step 7

RS-232/422 connector — For optional remote control of the PIP, connect a host computer or third party controller to the rear panel RS-232/RS-422 female 9-pin D connector (7).

7



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Xmit data	TX-	Xmit data(-)
3	RX	Rcv data	RX-	Rcv data(-)
4	—	Not used	—	Not used
5	Gnd	Signal gnd	Gnd	Signal gnd
6	—	Not used	—	Not used
7	—	Not used	RX+	Rcv data(+)
8	—	Not used	TX+	Xmit data(+)
9	—	Not used	—	Not used

Step 8

Plug the PIP, the input devices, and the output device(s) into a grounded AC power source and then turn on the input and output devices.

Using the Menu System

The PIP's LCD menu system displays status changes, and it provides access to menus that allow the adjustment of the image and its parameters. The LCD normally cycles continuously through default screens that identify the detected format of the inputs and the assigned standard of the output.

The **Menu** button exits the default cycle and advances from one menu to the next.

The **Next** button steps through the adjustment/selection submenus within a menu.

Setup and Operation

Configure the inputs

1. Press **Menu** until the LCD reads *Input Config*.
2. Press **Next**.
3. Rotate the Adjust ◀ knob to select an input. The LCD shows the selected input in the message *Input #n Fmt*.
4. Rotate the Adjust ▶ knob to select the format of the connected video input (Video, S-video, or YUV).
5. Repeat steps 3 and 4 for each connected input.
6. **PIP 444** — Press **Menu** > **Menu** > **Menu** > **Menu** (*Menu 4 times*) > **Next** to return the default display cycle.

PIP 422 — Press **Menu** > **Menu** > **Menu** (*Menu 3 times*) > **Next** to return the default display cycle.

Configure the output

1. Press **Menu** until the LCD reads *Output Config*.
2. Press **Next**.
3. Rotate either Adjust knob to select the output format (NTSC or PAL).
4. **PIP 444** — Press **Menu** > **Menu** > **Menu** > (*Menu 3 times*) **Next** to return to the default display cycle.

PIP 422 — Press **Menu** > **Menu** (*Menu twice*) > **Next** to return the default display cycle.

Select a preset

(PIP size and position)

The PIP has 10 (PIP 422) or 20 (PIP 444) presets that define the number, size, position, the priority of the picture-in-picture windows and window text, and the border and background colors. See chapter 3, "Operation", for a graphical representation of the factory presets for both PIPs.

Select a preset as follows:

1. Press and release the Window Presets: **Preset** button. The LCD display reads *Recall Preset #n*.
2. Rotate either Adjust knob to select the desired preset (1 through 10 [PIP 422] or 20 [PIP 444]).
3. Press the Windows Presets: **Enter** button.

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PIP 422 and PIP 444 Picture-in-Picture Processors

Chapter One

Introduction

About the Picture-in-Picture Processors

Features

Introduction

About the Picture-in-Picture Processors

The Extron PIP 422 is a 2-input video picture-in-picture processor. The PIP 444 is a 4-input picture-in-picture video processor. The processors accept up to two (PIP 422) or four (PIP 444) composite video, S-video, or component video input signals. Both units can output the signals simultaneously to three displays: one composite, one S-video, and one component. Both PIPs feature window effects and freeze control. The PIP 444 also features genlock capability. Ten (PIP 422) or twenty (PIP 444) factory presets or user-defined presets save picture number, size, position, and priority information as well as window text, and border and background colors.

Features

Inputs — The PIP 422 has two video inputs that can be configured for composite video, S-video, or component video. The PIP 444 has four video configurable inputs.

Buffered loop-throughs — Each input is buffered, looped through, and output for viewing on a local monitor.

Output — The processor has three simultaneous video outputs, one each for composite video, S-video, and component video. All three outputs can be configured for NTSC or PAL video.

Picture controls — Picture controls allow you to adjust size, position, brightness/contrast, color/tint, detail, and zoom for each window.

Window presets — The processor has 10 (PIP 422) or 20 (PIP 444) factory presets that the user can change to set custom presets. The presets save sizing, positioning, priority, text, and color information for the windows.

Window effects — These effects enable or disable inputs using either a cut, wipe, or dissolve effect.

Swap function (PIP 422 only) — A press of a button swaps (exchanges) configuration settings (size, position and overlay priority) between the two windows.

Freeze control — Freeze control freezes (locks) selected windows of the current image.

Remote control — Operate the processor remotely via an optional RS-232/RS-422 control device.

Genlock (PIP 444 only) — Allows seamless switching between inputs by using an external black burst generator to synchronize devices.

Front panel security lockout (Executive mode) — Locks the picture control and menu buttons on the front panel to avoid accidental changes to settings. Input selection, freeze control, and recall of presets are still available while the processor is locked.

Rack mountability — The 1U high and full rack wide metal enclosure can be mounted in a rack.

RS-232/RS-422 port — The rear panel RS-232/RS-422 port provides for remote control of the PIP from a PC or control system. Remote control can be via either the Extron Windows[®]-based control program or the Extron Simple Instruction Set[™] (SIS[™]). The SIS is a set of simple ASCII commands that allow you to perform most of the PIP operations.



PIP 422 and PIP 444 Picture-in-Picture Processors

Chapter Two

Installation

Mounting the Processor

Rear Panel Connections

Setting Up Genlock and Vertical Interval Switching

Installation

Mounting the Processor

The PIP 422 and PIP 444 are housed in 1U high, 17.4" wide metal enclosures that are rack- or desk-mountable. The appropriate rack/desk mounting kit (#70-077-03) is included with the processor. The processor may also be surface-mounted under a table, desk, or podium, or on a wall, using an optional Extron 1U enclosure under-desk mounting kit (#70-222-01).

UL requirements

The following Underwriters Laboratories (UL) requirements pertain to the installation of the PIP into a rack (figure 2-1) or furniture (figure 2-3).

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. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits 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)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Rack mounting

Rack mount the PIP as follows:

1. Remove the feet from the underside of the PIP, if installed.
2. Attach the supplied rack mounting brackets to the processor with the eight provided #8 machine screws (figure 2-1).

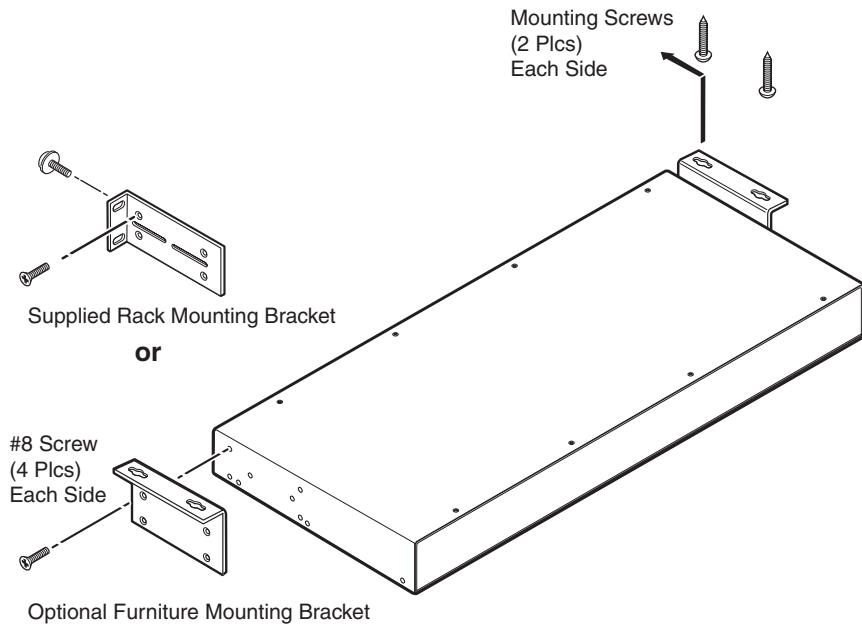


Figure 2-1 — Mounting a PIP

3. Insert the processor into the rack, align the holes in the mounting bracket with those of the rack.
4. Secure the processor to the rack using the supplied machine screws.

Table or wall mounting

The table/wall mounting brackets extend approximately 1/4" (6.4 mm) above the top surface of the processor enclosure. This design allows for an air space between the enclosure and the surface to which it is mounted. Table or wall mount the PIP as follows:

1. Remove the feet from the underside of the PIP, if installed.
2. Attach the table/wall mounting brackets to the processor with the eight provided #8 machine screws (figure 2-1).
3. Hold the processor with the attached brackets against the underside of the table or other furniture, or against the wall. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill 3/32" (2 mm) diameter pilot holes, 1/4" (6.4 mm) deep in the mounting surface at the marked screw locations.
5. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" (6 mm) of the screw's head protrudes.
6. Align the mounting screws with the slots in the brackets and place the processor against the surface, with the screws through the bracket slots.
7. Slide the PIP slightly forward or back, then tighten all four screws to secure the processor in place.

Installation, cont'd

Through-desk mounting

Mount the PIP through a desk or podium as follows:

1. Remove the feet from the underside of the PIP, if installed.
2. Attach the supplied mounting brackets to the processor with the machine screws provided (figure 2-1).
3. Cut the proper sized hole in the mounting surface (figure 2-2).

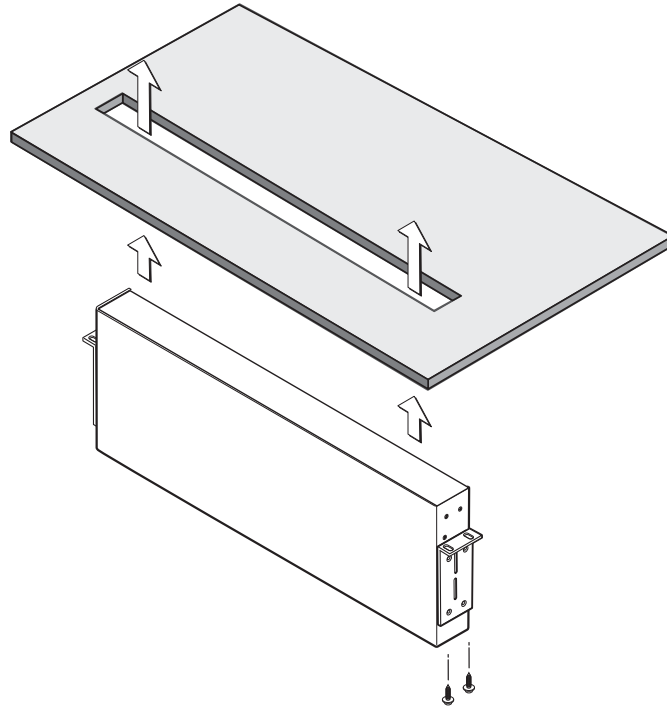


Figure 2-2 — Through desk mounting a PIP

4. Hold the processor with the attached brackets against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
5. Drill $3/32$ " (2 mm) diameter pilot holes, $1/4$ " (6.3 mm) deep in the mounting surface at the marked screw locations.
6. Insert four #8 wood screws through the bracket and into the four pilot holes. Tighten all four screws to secure the processor in place.

Rear Panel Connections

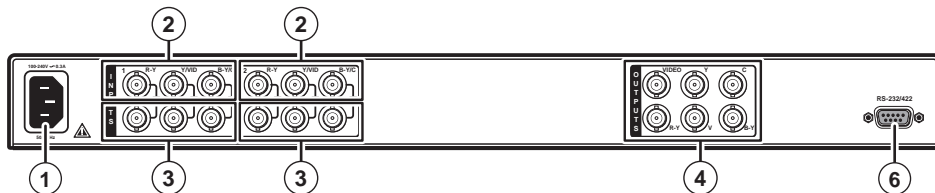


Figure 2-3 — PIP 422 rear panel

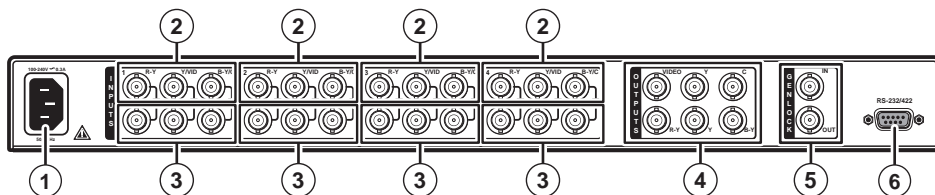


Figure 2-4 — PIP 444 rear panel

- ① **Power connector** — Plug the provided IEC power cord into this connector.
- ② **Input (top) connectors** — Connect up to two (PIP 422) or four (PIP 444) component video, S-video, or composite video input devices to these BNC connectors. Figure 2-5 shows how to connect the various video formats.

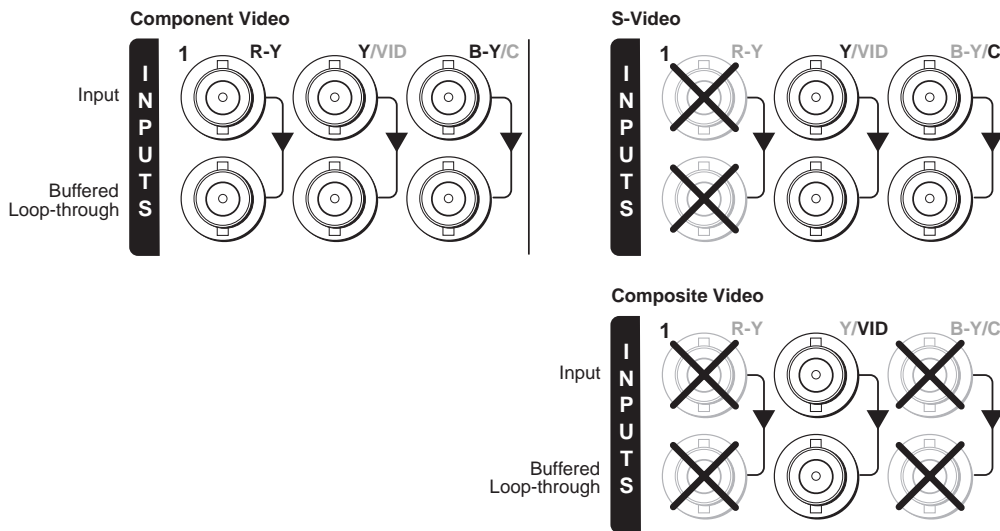


Figure 2-5 — Video input and buffered loop-through connections

NOTE Connect only one video format to each input.

You must configure each input to identify the connected video format. See chapter 3, "Operation".

Installation, cont'd

- ③ **Input loop-through (bottom) connectors** — If desired, connect local monitors to these female BNC connectors. The processor buffers the video input and loops it out on these connectors.

NOTE *The processor does not alter the video signal between the input and the buffered loop-through in any way. The processor's buffered loop-through output is in the same format as the input.*

- ④ **Output connectors** — Connect a component video, S-video, and/or composite video display device to these BNC connectors. Figure 2-6 shows how to connect the various video formats.

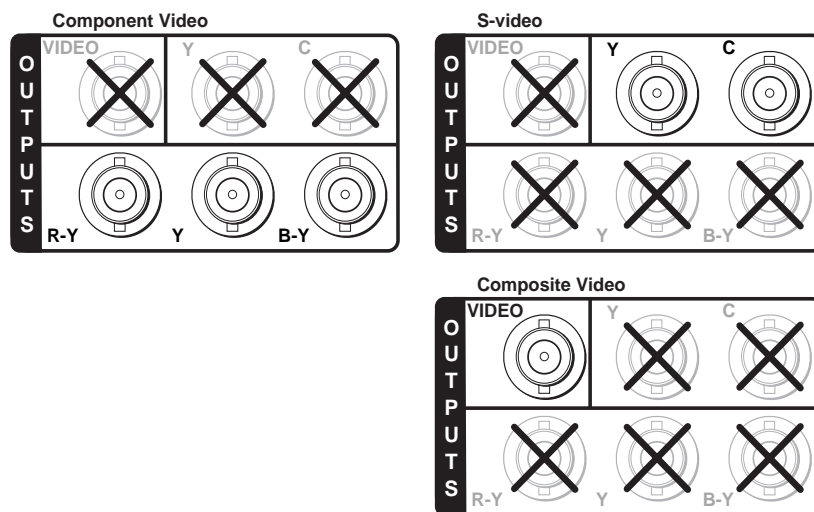


Figure 2-6 — Video output connections

NOTE *The component video, S-video, and composite video outputs are all active simultaneously, so multiple displays can be connected.*

- ⑤ **Genlock connectors (PIP 444 only)** —

In(put) connector — Connect an external black burst signal to this BNC connector for genlocking the video signal in broadcast or other sync-critical applications.

Out(put) connector — Connect any downstream equipment that requires genlocking to this BNC connector to route the black burst signal throughout the system in broadcast or other sync-critical applications.

NOTE *If no device is connected to the output, terminate the Genlock output with the included 75-ohm terminator.*

See “Setting Up Genlock and Vertical Interval Switching”, on the next page, for detailed Genlock instructions.

- ⑥ **RS-232/RS-422 connector** — Connect a host computer or control system to this female 9-pin D connector to allow remote control of the PIP using Extron's Simple Instruction Set™ (SIS™) or control software for Windows®. (See Chapter 4, “Remote Control”, for more information.)

Setting Up Genlock and Vertical Interval Switching

For vertical interval switching (to allow clean switching between signals from several devices during the vertical blanking period of each signal), a composite sync signal can be applied at the Genlock In connector, and also passed to another device via the Genlock Out connector.

If the genlock connectors are used only for vertical interval switching, no horizontal or subcarrier phase adjustments are required.

Genlock setup

Genlock differs from simple vertical interval switching in that an external device (a black burst generator) generates a reference sync signal for the system, and every device that uses that signal has its output signal's horizontal and subcarrier phases adjusted to exactly match that of the generator, allowing precise timing and full synchronization. Genlocked systems produce cleaner switches between inputs than do those without this type of synchronization.

An oscilloscope is required for genlock setup, and a vectorscope is recommended. Waveform monitors of types other than a vectorscope may give the appearance that timing is adjusted correctly when it is 180 degrees out of phase, which will result in incorrect colors or picture artifacts.

NOTE *All equipment in the system must be powered up and turned on for at least 15 to 20 minutes before genlock setup adjustments can be made and before the equipment is used in a genlocked application.*

To synchronize the PIP's video output with a genlock signal, follow these steps:

1. Power up and turn on all the devices that will use the genlock signal. The devices must be on for at least 15 to 20 minutes before proceeding with any adjustments.
2. Connect the active timing source signal to the Genlock In connector on the rear panel.
3. Connect the video input devices to the PIP, as described previously in this chapter.
4. Connect the oscilloscope ("scope") probe A to the Genlock Out connector. This will provide the scope's reference signal. In order to avoid altering the genlock signal, use the cabling configuration that will be used in the installation. Either connect the genlock signal cable from the scope to the next device in the system to be timed, or provide 75 ohm termination at the scope's genlock output.
5. Connect scope probe B to the PIP's composite video output connector.
6. Using the instructions for the scope you are using, set the scope to view the signals' horizontal phases. Adjust the horizontal phase until there is no (0°) difference between the composite video output's horizontal sync phase and the genlock signal's horizontal phase. See "Genlock configuration menu (PIP 444 only)" in chapter 3, "Operation", and "Oscilloscope displays" later in this chapter for details on adjusting the horizontal phase.
7. Set the scope to view the subcarrier signals. Adjust the subcarrier phase until there is a zero phase difference between the genlock signal and the NTSC/PAL output. See "Genlock configuration menu (PIP 444 only)" in chapter 3, "Operation", and "Oscilloscope displays" later in this chapter for details on adjusting the color subcarrier phase.

Installation, cont'd

8. View the horizontal phases again. If the phase difference is not zero, repeat steps 6 and 7 until the settings do not change.
9. Once the settings are stable, disconnect the oscilloscope, and reconnect the genlock cables.
10. Check the display(s) for proper colors and for undesirable artifacts in the image(s). Make adjustments as necessary.
11. If other PIPs are part of this genlock daisy chain, connect the oscilloscope to each device, and repeat this procedure.

Oscilloscope displays

What you see on the oscilloscope while adjusting the PIP to match the genlock signal depends on the type of signal used, the type of oscilloscope, and the procedure the scope requires. This section shows some examples of oscilloscope displays.

Figure 2-7 below shows the genlock input signal (top) and an out-of-alignment NTSC composite sync output signal (bottom) displayed on a waveform monitor to check for alignment. When the phases are aligned, the wave peaks on the bottom waveform should line up with those in the reference signal above it.

With this method there is no way to know if the signals are 180° out of phase. A delayed sweep on a time-based scope would allow a more accurate display of the input and output signal phase relationships.

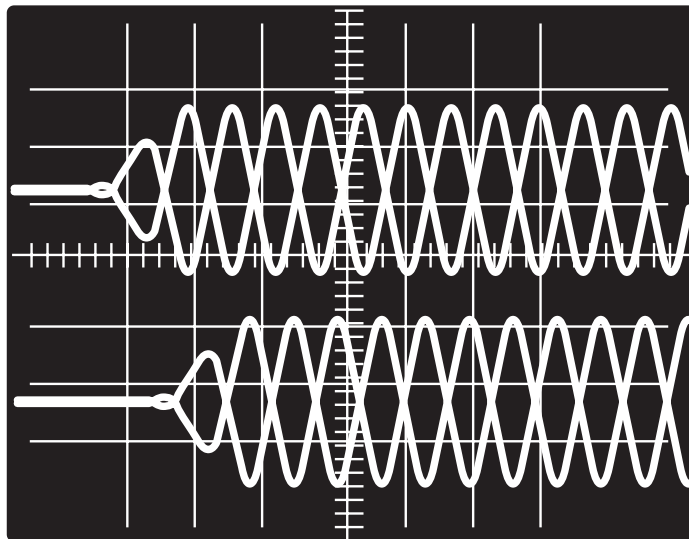


Figure 2-7 — Superimposed waveforms

A vectorscope is more accurate than a waveform monitor. Figure 2-8 shows an example of a vectorscope display when the horizontal phase is adjusted to align it with the burst (genlock) vector. Adjust the horizontal phase by accessing the Genlock configuration menu and rotating either of the Adjust knobs until the difference between the two vectors is 0° (see “Genlock configuration menu (PIP 444 only)” in chapter 3, “Operation” for more information). This example shows black burst only (with no color). The burst vector is pointing to the left from the center.

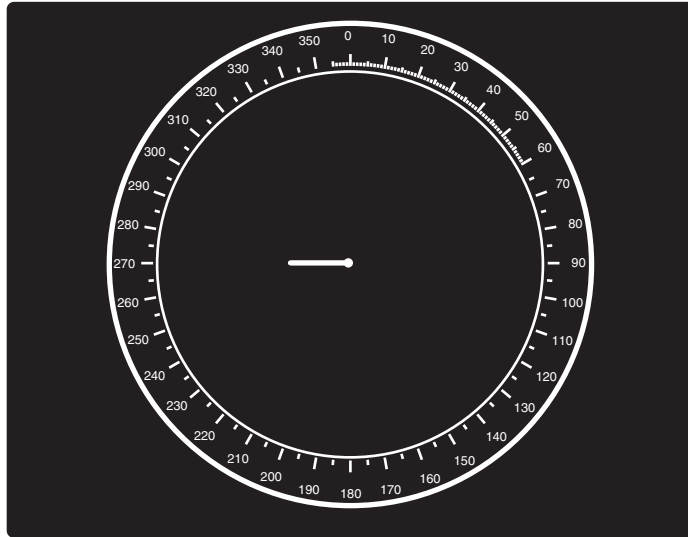


Figure 2-8 — Vectorscope screen during horizontal phase adjustment

Figure 2-9 below shows an example of a view of a vectorscope during adjustment of the color subcarrier phase (SC/H). The subcarrier phase should be aligned to 0° (indicated in the figure by the triangle).

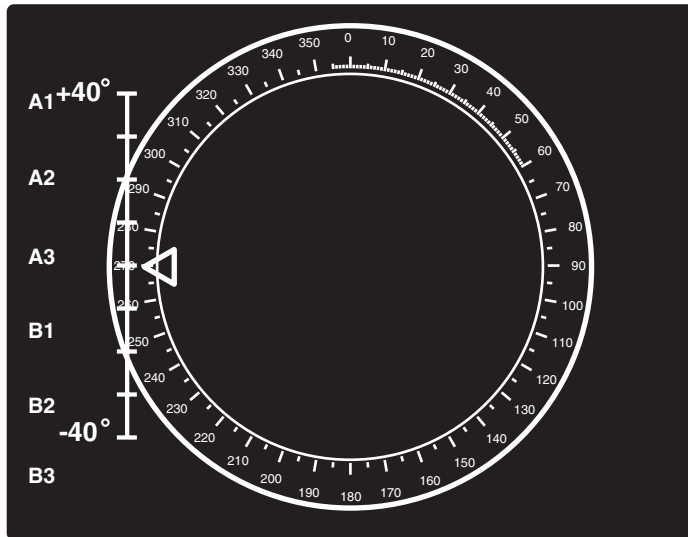


Figure 2-9 — Vectorscope screen during color subcarrier phase adjustment

Installation, cont'd



PIP 422 and PIP 444 Picture-in-Picture Processors

Chapter Three

Operation

Front Panel Features

Power-on Indications

Menu System

Picture Controls

Window Presets

Additional Functions

Optimizing the Image

Operation

Front Panel Features

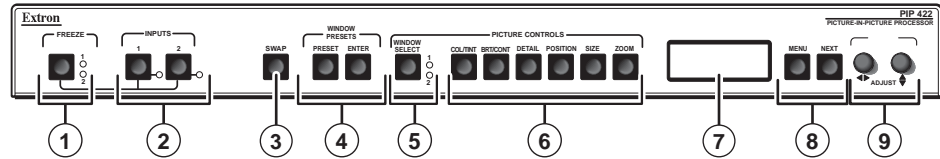


Figure 3-1 — PIP 422 front panel features

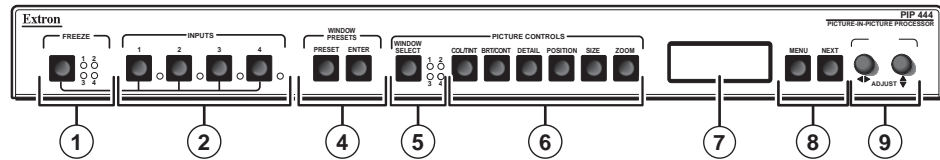


Figure 3-2 — PIP 444 front panel features

- ① **Freeze button and LEDs** — Simultaneously press this button and an input button (②) to freeze that input's window in the displayed image. The Freeze LED for the input lights. Repeat to unfreeze the window.
- ② **Input selector buttons** — Press these buttons to enable or disable the inputs for display. The LEDs next to the buttons light to indicate the inputs are enabled.

These buttons are also used with the Freeze button (①) to toggle the freeze function for a specific input on or off.
- ③ **Swap button (PIP 422 only)** — Press the Swap button to exchange all window sizing, positioning, and priority settings. Press the SWAP button again to return the windows to their previous settings.
- ④ **Window preset buttons** — Press these buttons to save or recall a preset. See "Window Presets" later in this chapter for more information.
- ⑤ **Window Select button and LEDs** — Press this button to select a window to adjust using the picture control buttons (⑥) and Adjust knobs (⑨) or using the Input Configuration submenu. The lit LED indicates which window is selected.

-
- ⑥ **Picture Control buttons** — The Picture Control buttons select individual image adjustments that are adjusted using the Adjust ◀▶ and Adjust ⬆ knobs (⑨).

- **Color/Tint control button** — The Color/Tint button selects the display color and tint adjustments. See “Picture Controls” in this chapter.

NOTE *Tint control is not available for PAL inputs.*

- **Brightness/Contrast control button** — The Brightness/Contrast button selects the display brightness and contrast adjustments. See “Picture Controls” in this chapter.
- **Detail button** — The Detail button selects the display image detail (sharpness) adjustment and the anti-aliasing adjustment.

The **sharpness** adjustment compensates for long cable runs. There are separate horizontal and vertical filters for component video. There is a single filter for S-video and composite video.

The **anti-aliasing** adjustment reduces or eliminates the aliasing effect.

- **Position button** — The Position button selects the window display centering adjustment and toggles between the window and image adjustments. See “Picture Controls” in this chapter.
 - **Size control button** — The Size button selects the window display size adjustment and toggles between the window and image adjustments. See “Picture Controls” in this chapter.
 - **Zoom control button** — The Size button selects the window zoom in/out adjustment and toggles between the window and image adjustments. See “Picture Controls” in this chapter.
- ⑦ **LCD display** — This 12 x 2 LCD displays configuration menus and status information. See “Menu System” in this chapter for more information on the menus.
- ⑧ **Menu button** — The Menu button enters and moves through the main menu system in the PIP. See “Menu System” in this chapter for details.
- Next button** — The Next button steps through the submenus in the PIP menu system. See “Menu System” in this chapter for details.
- ⑨ **Adjust ◀▶ (horizontal) and Adjust ⬆ (vertical) knobs** — The Adjust ◀▶ and Adjust ⬆ knobs change settings when used in conjunction with the picture adjustment buttons or the menu system. Rotate these knobs to change picture settings when one of the picture adjustment buttons is selected. In the menu system, rotate these knobs to scroll through the selection options and make adjustments. See “Menu System”, “Picture Controls”, and “Window Presets” in this chapter for more information.

Power-on Indications

Power is automatically applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that blinks all of the front panel LEDs and then lights only the LEDs for the inputs previously selected for the display. The self-test also displays the model name, part number, and the firmware version in the LCD display. After approximately 2 seconds, the LCD reverts to its default display cycle, alternating among several displays; one for each input that shows that input's configuration, and the last showing the selected output standard (figure 3-3). An error-free power up self-test sequence leaves all of the LEDs, with the exception of the selected inputs' LED(s), off and the LCD displaying the default display cycle.

The selected inputs and their size and position on the display, the picture adjustments, and other current settings are saved in nonvolatile memory. When power is applied, the latest configuration is retrieved.

NOTE On figure 3-3 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.

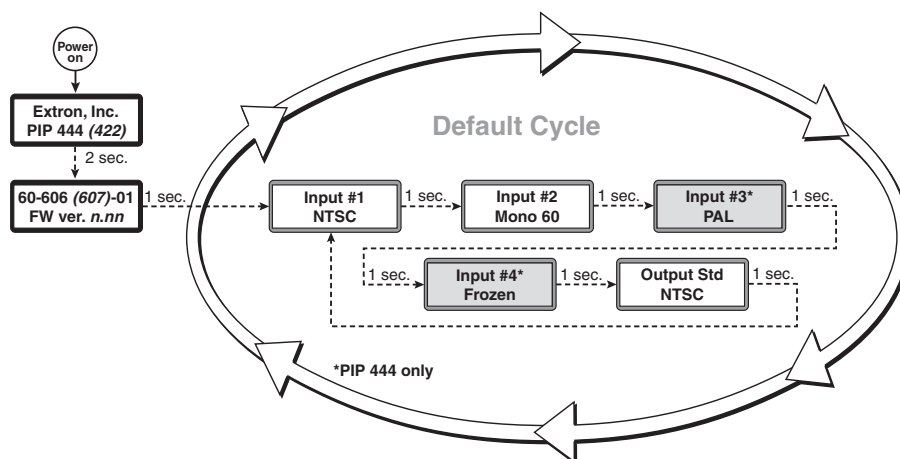


Figure 3-3 — PIP 444 default display cycle

Menu System

Menu system overview

Figure 3-4 shows a flowchart of the main menu system.

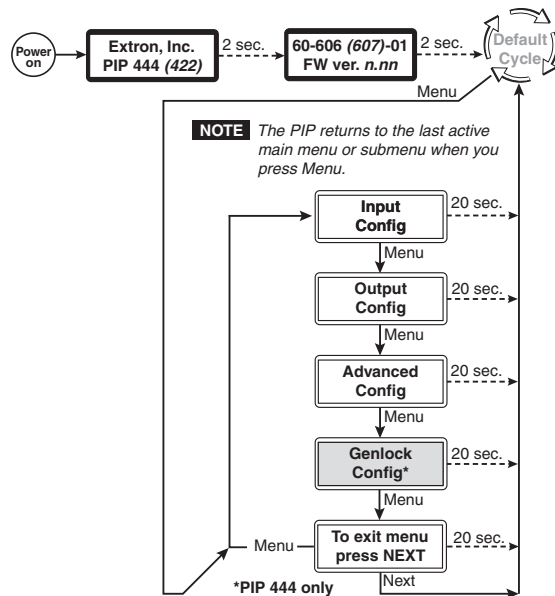


Figure 3-4 — PIP 444 menu system flowchart

Menu button — Press the Menu button to activate the menu system and to scroll through the four main menus.

Next button — Press the Next button to move between the submenus of a selected main menu, to activate one for viewing or configuration, and to save a selection. Pressing the Next button during input configuration causes the current input's number and format type to be displayed on the LCD.

Adjust ◀▶ and Adjust ▲▼ knobs — When in a submenu, rotate the Adjust ◀▶ knob and Adjust ▲▼ knob to scroll through the submenu options and select a setting. Refer to the flowcharts in this chapter and to specific sections for explanations on knob adjustments.

NOTE If you press the Menu button while a main menu or a submenu is active, the next main menu becomes active. For example, the display changes from the Input Configuration main menu or the Input Format submenu to the Output Configuration main menu.

NOTE To return to the default screens, let the processor remain idle for 10 seconds until the selected screen times out, or press the Menu button until the Exit menu appears, then press the Next button.

NOTE From any menu or submenu, after 10 seconds of inactivity, the PIP saves all adjustment settings and times-out to the default LCD display cycle.

Input Configuration menu

Figure 3-5 is a flowchart that shows an overview of the Input Configuration menu and the available settings.

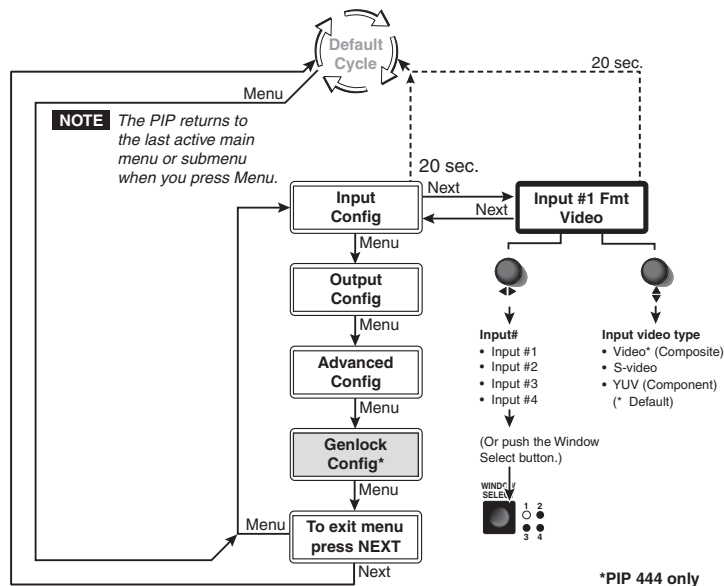


Figure 3-5 — Input Configuration menu flowchart

The Input Configuration menu consists of one submenu that allows you to select the type of video signal that each of the four inputs will pass. You can configure each input to accept Video (composite video), S-video, or YUV (component video). Rotate the Adjust ◀ knob to select the input and the Adjust ▲ knob to select the video signal type.

NOTE Only one video format can be assigned to each input.

Output Configuration menu

Figure 3-6 is a flowchart that shows an overview of the Output Configuration menu and the available settings.

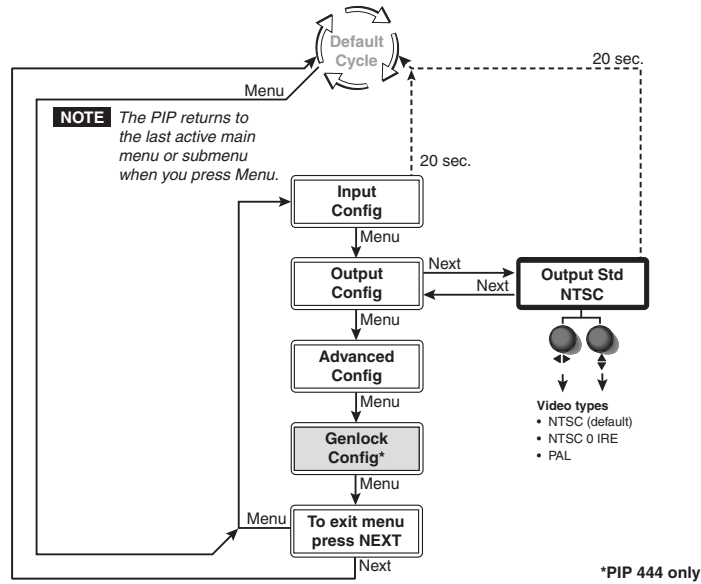


Figure 3-6 — Output Configuration menu flowchart

The Output Configuration menu consists of one submenu that allows you to select a video standard for the output signal. Rotate either Adjust knob to choose between NTSC, NTSC 0 IRE, and PAL video.

Advanced Configuration menu

Figure 3-7 is a flowchart that shows an overview of the Advanced Configuration menu, the submenus, and the available settings.

The Advanced Configuration menu has four submenus that allow you to view and select the border color, background color, window transition effect, priority, and anti-aliasing mode for the windows and a fifth submenu that displays the device's temperature. Rotate either of the Adjust knobs to select settings from each of the submenus.

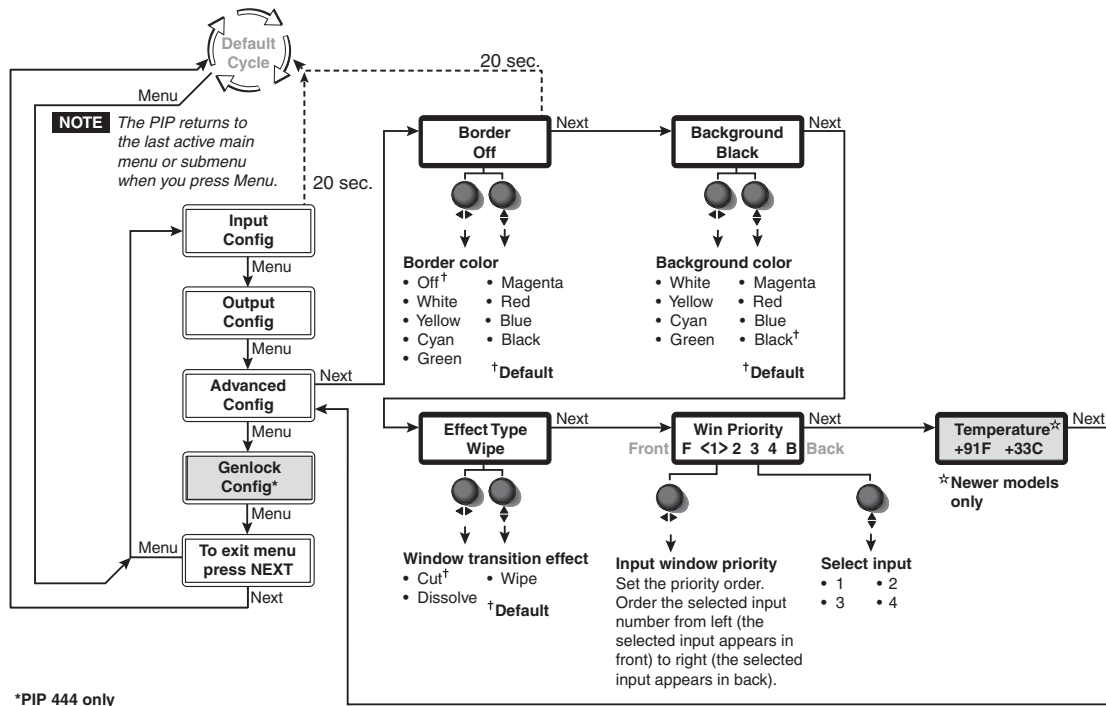


Figure 3-7— Advanced Configuration menu flowchart

Border Color submenu

Use this submenu to select a border color for all the windows. Available colors are white, yellow, cyan, green, magenta, red, blue, or black. You can also select off, which is the default setting.

Background Color submenu

This submenu allows you to select a background color for all the windows. Available colors are white, yellow, cyan, green, magenta, red, blue, or black. Black is the default setting.

Window Effect submenu

Use this submenu to select a transition effect for the PIP to use when enabling, disabling, or swapping windows. You can choose from the following three options:

Cut — The window turns seamlessly on and off. No effect is applied to the transition. This is the default setting.

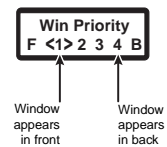
Wipe — The window appears to unroll over the old screen, from left to right.

Dissolve — The window appears to dissolve on or off.

NOTE *The wipe and dissolve effects are set to a fixed 0.5 second transition interval, which cannot be changed.*

Window Priority submenu

The Window Priority submenu allows you to set how the windows will overlap one another. The submenu lists the inputs in order of their priority, from left to right. The input that appears in the leftmost position in the submenu will appear in front of all the other windows. Rotate the Adjust \blacktriangledown knob to select an input to adjust. Rotate the Adjust \blacktriangleleft knob to set the priority of the input.



Temperature submenu

This display only submenu shows the temperature of the PIP in degrees Fahrenheit and Celsius.

NOTE *The Temperature submenu is available only on newer models.*

Genlock Configuration menu (PIP 444 only)

Figure 3-8 is a flowchart that shows an overview of the Genlock Configuration menu, the submenus, and the available settings.

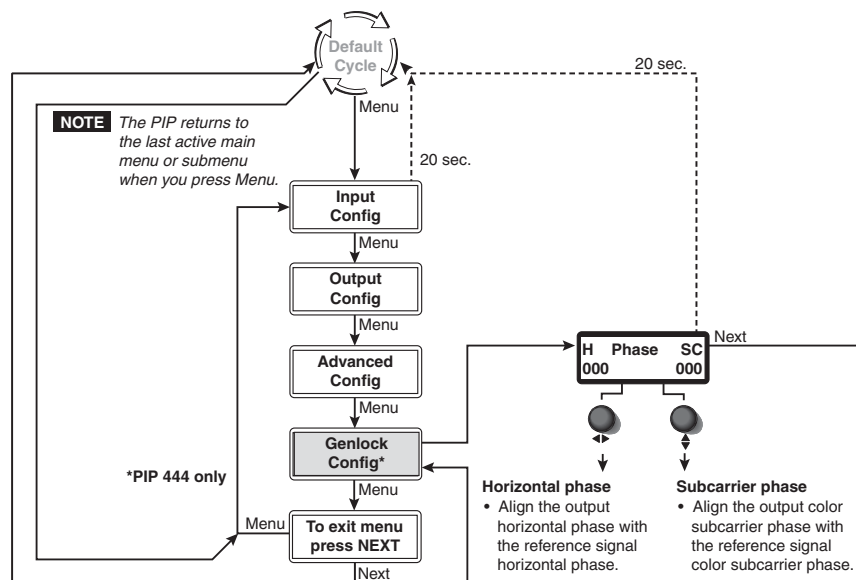


Figure 3-8 — Genlock Configuration menu flowchart

The Genlock Configuration menu allows you to align the horizontal phase and color subcarrier phase of the output signal with those of the genlock reference (black burst) signal. Rotate the Adjust \blacktriangleleft knob to align the horizontal phase and the Adjust \blacktriangledown knob to align the subcarrier phase through a range from 0 to 255.

Operation, cont'd

Exit menu

From the Exit menu (figure 3-9), press the Next button to return to the default display cycle, or press the Menu button to return to the Input Configuration menu.

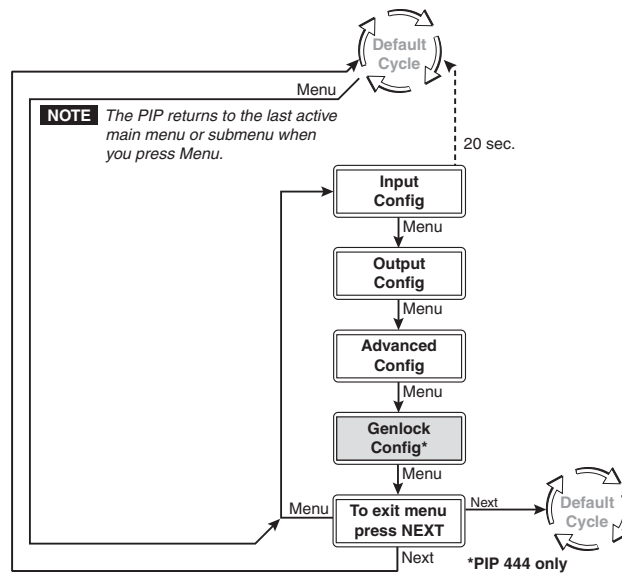


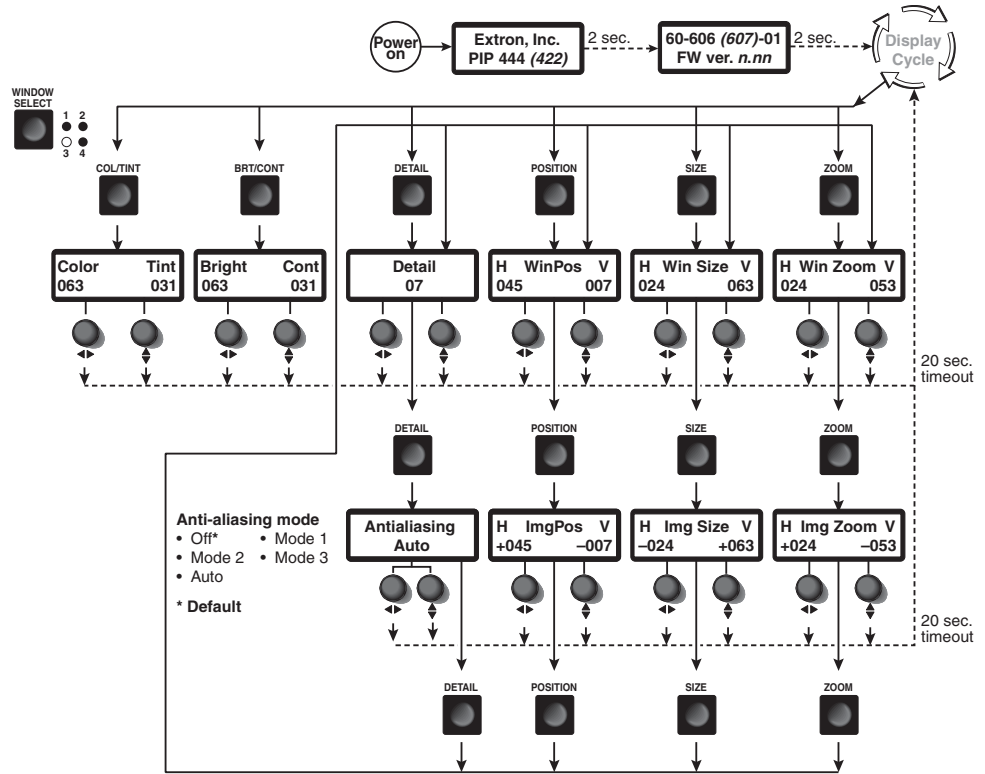
Figure 3-9 — Exit menu flowchart

Picture Controls

The picture adjustments allow you to fine tune the image quality of the selected window. When you press one of the Picture Control buttons (Color/Tint, Brightness/Contrast, Detail (filter), Position, Size, or Zoom), the corresponding picture adjustment menu for the selected window appears in the LCD (figure 3-10). For Position, Size, and Zoom, press the button again, and the corresponding image adjustment menu for the image within the window appears. In either screen, adjustments can then be made by rotating the Adjust ◀ knob or Adjust ▶ knob. Picture control settings are stored in nonvolatile memory; when the processor is powered down and then powered up, the settings are restored.

NOTE See Auto-center the image on page 3-12 to automatically center the image within the active window.

When a window or image adjustment is selected, the window that is selected for adjustment by using the Window Select button is indicated on the displayed image by a blinking border. Borders on the unselected windows are temporarily turned off.



NOTE The Window Select button selects the window to which the adjustment is applied.

The Adjust ◀ knob and the Adjust ▶ knob adjust the image settings on the left and right sides of the LCD.

Push the Position, Size, and Zoom buttons to toggle between the window adjustment and the overall image adjustment.

Push the Detail button to toggle between the detail adjustment and the anti-aliasing adjustment.

Image size, image position, and image zoom adjustments are relative to the currently selected window's size and position settings.

Figure 3-10 — Picture controls flowchart

Adjust an image as follows (figure 3-10):

1. Press the Window Select button repeatedly until the Window Select LED for the desired window lights.
2. Press the button for the picture control you want to adjust. The LCD displays the appropriate adjustment menu for that window and picture control.
3. Press the Size, Position, or Zoom button as necessary to toggle between the adjustment menus that allow you to adjust the window itself and the adjustment menus that allow you to adjust the image within the window.

Operation, cont'd

4. Rotate the Adjust ◀ knob or Adjust ◆ knob to vary the settings within the following adjustment ranges:

NOTE *The Adjust knobs have no mechanical limits to their rotation.*

- **Color/Tint:** The range for both adjustments is 0 to 127.
- **Brightness/Contrast:** The range for brightness is 50 to 127. The range for contrast is 38 to 107.
- **Filter:** Push the Detail button to toggle between the detail filter adjustment and the anti-aliasing adjustment.

Detail: Either knob sets the detail filter within a range from 0 (the softest detail) to 15 (the crispest detail). The default is 8 (no filtering).

NOTE *The Detail filter is only available for inputs that are configured as S-video or composite video.*

Anti-aliasing: Either knob sets the anti-aliasing filter within a range from off (default), mode 0 to 3, or auto. In auto, the PIP selects the auto-aliasing setting by the size of the window.

- **Position:** Push the Position button to toggle between the position adjustment for the selected window (indicated by the lit Window Select LED) and for the image within the selected window.

Window Position: Observe the display and turn the Adjust ◀ knob to move the selected window side to side. Turn the Adjust ◆ knob to move the selected window up and down.

Image Position: Observe the display and turn the Adjust ◀ knob to move the image side to side in the selected window. Turn the Adjust ◆ knob to move the image up and down in the selected window.

- **Size:** Push the Size button to toggle between the size adjustment for the selected window and for the image within the window.

Window Size: Observe the display and turn the Adjust ◀ knob to stretch or shrink the selected window from side to side. Turn the Adjust ◆ knob to stretch or shrink the selected window up and down.

Image Size: Observe the display and turn the Adjust ◀ knob to stretch or shrink left and right the image within the selected window. Turn the Adjust ◆ knob to stretch or shrink in the selected window up or down.

- **Zoom:** Push the Zoom button to toggle between the zoom adjustment for the selected window and for the image within the window.

Window Zoom: Observe the display and turn either Adjust knob to zoom in on or zoom out from the selected window.

Image Zoom: Observe the display and turn either Adjust knob to zoom in on or zoom out from the image in the selected window.

5. Repeat steps 2 and 4 for each image adjustment to be made for the selected window.

Repeat steps 1, 2, 4, and 5 for each window.

6. To exit to the default cycle, do nothing for approximately 20 seconds; the PIP times out and return to the default display cycle.

Auto-center the image

To automatically center the image within the currently selected window, press and hold the Position and Size buttons for approximately half a second.

NOTE *The auto-center function does not work if the image size is set extremely small, relative to the window size.*

Window Presets

The PIP 422 has 10 preset slots that save settings for the number, size, position, priority, text and colors of the windows' borders and background. The PIP 444 has 20 preset slots. Both processors come with default window presets saved in these slots (figure 3-11 and figure 3-12). You can replace the default presets with your own settings by following the save procedure that follows the figures.

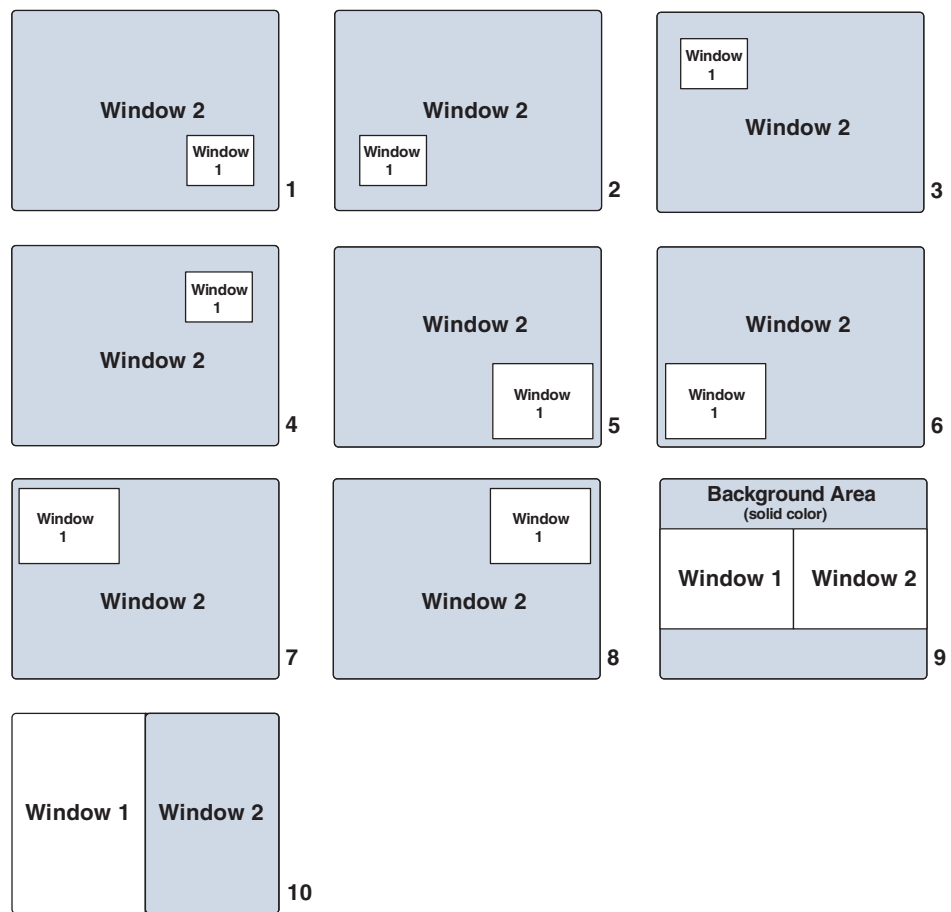


Figure 3-11 — PIP 422 default window presets

Operation, cont'd

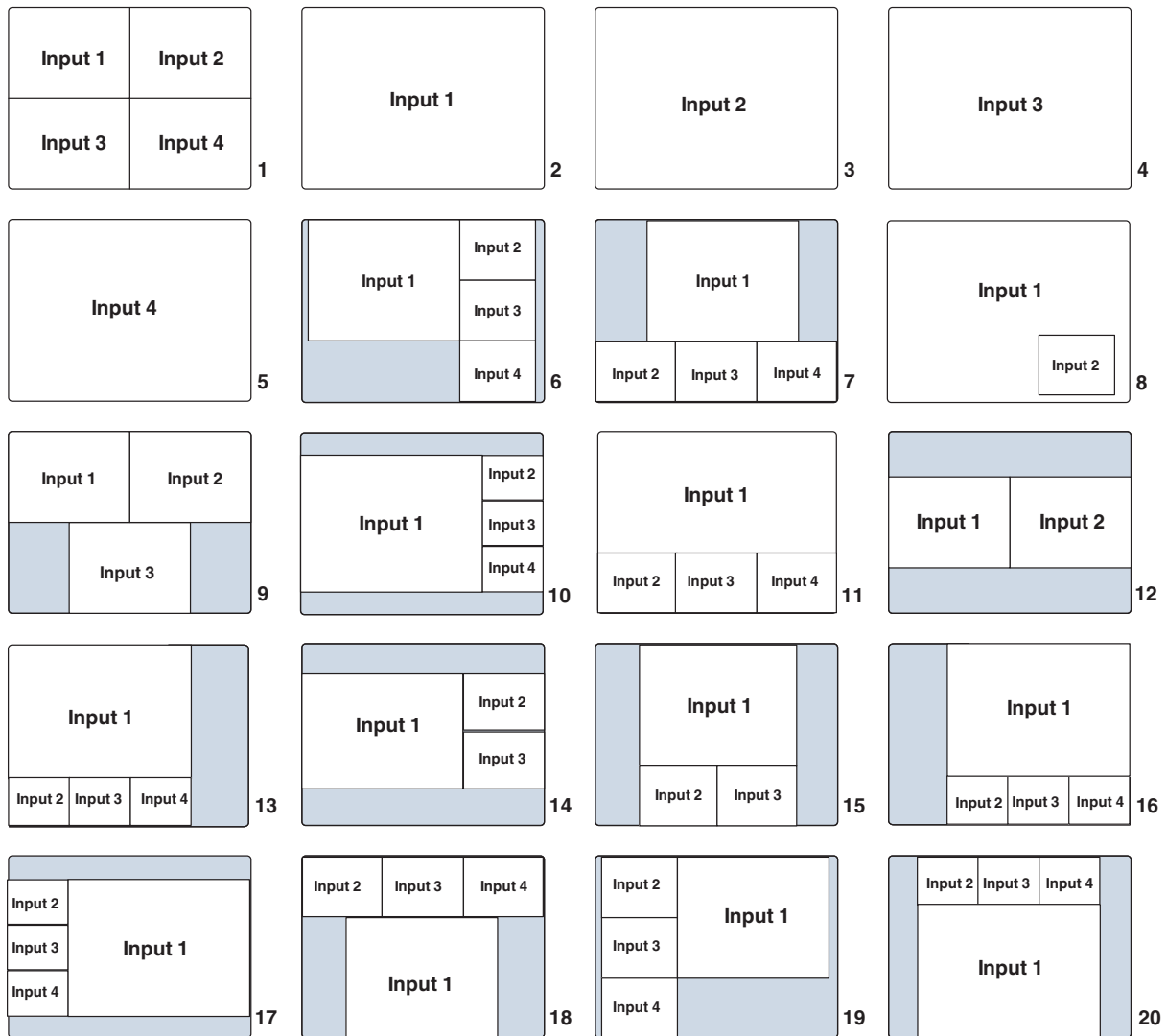


Figure 3-12 — PIP 444 default window presets

Recall a preset

1. Press the Preset button. The Recall menu appears on the LCD.
2. Turn either Adjust knob to select the preset you want to recall.
3. Press the Enter button.

Save the current window settings as a preset

1. Press and **hold** the Preset button for 2 seconds. The Save menu appears on the LCD. Release the Preset button.
2. Turn either Adjust knob to select the preset you want to replace.
3. Press the Enter button.

Additional Functions

Freeze mode

The PIP 444's *Freeze* mode lets you freeze an input to the current image. When frozen, the image is saved in the PIP's memory and will not be lost if you disconnect the input.

To freeze an input's window in the currently-displayed image, simultaneously press the Freeze button and the desired input's selection button (figure 3-13). The LED for the input lights. Repeat to unfreeze the window.

NOTE *Recalling a preset or adjusting the size of a frozen image unfreezes the image.*

Simultaneously press Freeze and the desired input button.

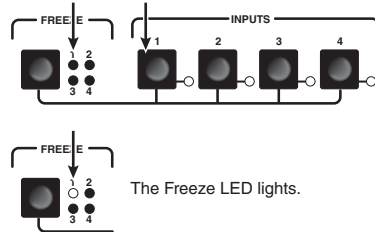


Figure 3-13— Freeze mode flowchart

Front panel security lockout (Executive mode)

To prevent accidental changes to the PIP 444's settings, you can lock the front panel picture control and Menu and Next buttons. The input, freeze, and preset recall functions are still active when the front panel is locked.

To toggle the front panel lock on and off, press and **hold** the Color/Tint and Zoom buttons simultaneously for 2 seconds (figure 3-14). Alternatively, you can use the appropriate SIS command (see chapter 4, "Remote Control" for more information). The LCD panel displays the message **Lockout Mode Enabled** for two seconds and then returns to the default display cycle. This message appears again if you press any of the picture control or the Menu or Next buttons while they are locked.

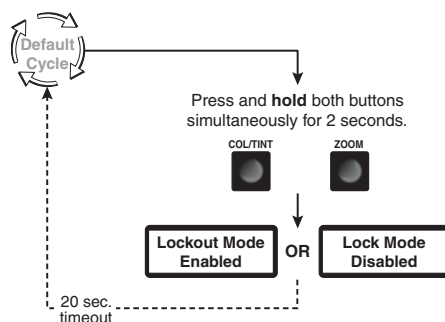


Figure 3-14 — Front panel security lockout flowchart

Unit reset

To reset the PIP to its factory default settings, press and hold the Menu and Next buttons while you power up the processor (figure 3-15). The LCD panel displays the message **System Reset** for two seconds and then begins the default display cycle.

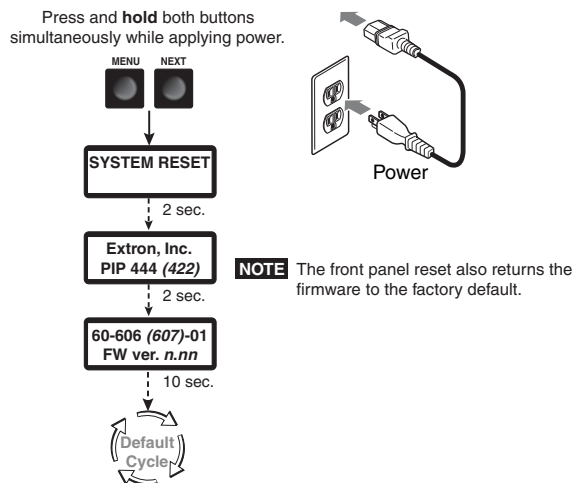


Figure 3-15 — System reset flowchart

Selecting the baud rate and RS-232/RS-422 protocol

The processor can operate at 9600, 19200, 38400, and 115200 baud rates and support either RS-232 or RS-422 serial communication protocol. The settings of these variables can be viewed and changed from the front panel.

View and configure the switcher's serial communications settings as follows:

1. To enter *Serial Port Configuration* mode, simultaneously press and **hold** the Freeze button and Preset button while you apply power to the processor (figure 3-16). The processor's LCD displays the baud rate upon completion of the power up process.

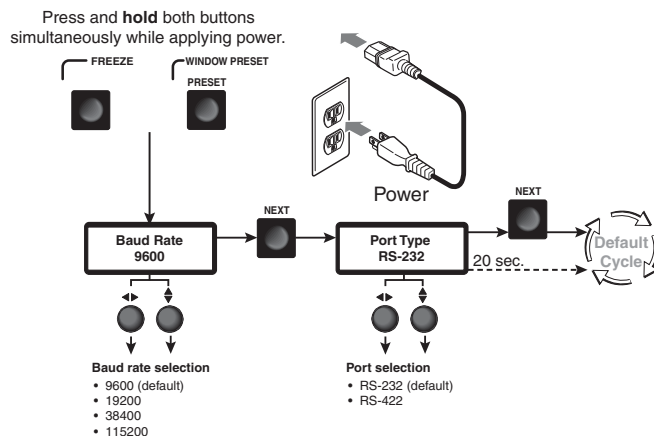


Figure 3-16 — RS-232/RS-422 and baud rate selection

-
2. Release the Freeze and Preset buttons.
 3. **To change the baud rate**, rotate either Adjust knob.
 4. Press and release the Next button. The LCD displays the serial port protocol.
 5. **To change the serial port protocol**, rotate either Adjust knob.
 6. Press and release the Menu button **or** wait approximately 20 seconds. The processor reverts to the default display cycle.

Optimizing the Image

Before storing any user presets, adjust the input window images for optimum color, tint, brightness, contrast, detail filter, positioning, sizing, and zoom. Upon initial power up of the PIP, factory pattern #01 in figure 3-11 (PIP 422) or figure 3-12 (PIP 444) is the default windows preset. Using this preset, all four input windows may be optimized, as shown in the following steps. See the flowchart in the “Menu system overview” section for further details.

1. As necessary, press the Window Select button to select the desired window to adjust. The appropriate Window Select LED lights.
2. As necessary perform the following picture control adjustments:
 - a. **Color** — Press the Color/Tint button and then rotate the Adjust ◀ knob to increase or decrease the window color from 0 to 127 (the default is 64).
 - b. **Tint** — Press the Color/Tint button and then rotate the Adjust ▲ knob to increase or decrease the window tint from 0 to 127 (the default is 64).
 - c. **Brightness** — Press the Brightness/Contrast button and then rotate the Adjust ▶ knob to increase or decrease the window brightness from 50 to 127 (the default is 64).
 - d. **Contrast** — Press the Brightness/Contrast button and then rotate the Adjust ▼ knob to increase or decrease the window contrast from 38 to 107 (the default is 68).
 - e. **Detail filter** — Press the Detail button and then rotate either Adjust knob to change the filter setting from 0 (the softest detail) to 15 (the crispest detail). The default is 8 (no filtering).
 - f. **Anti-aliasing filter** — Press the Detail button **twice** and then rotate either Adjust knob to change the anti-aliasing setting from off, 0 to 3, or auto (the default is off).
 - g. **Horizontal window positioning** — Press the Position button and then rotate the Adjust ▶ knob to move the left edge of the selected window to the desired location.

NOTE *Keep in mind that **sizing** the window horizontally moves the right edge of the window only.*

- h. **Horizontal image positioning within the window** — Press the Position button a second time and then rotate the Adjust ▶ knob to move the left edge of the image within the selected window to the desired location.
- i. **Horizontal window sizing** — Press the Size button and then rotate the Adjust ▶ knob to set the right edge of the window.
- j. **Horizontal image sizing within the window** — Press the Size button a second time and then rotate the Adjust ▶ knob to set the right edge of the image within the selected window.

Operation, cont'd

- k. **Vertical window positioning** — Press the Position button and then rotate the Adjust \blacklozenge knob to move the top edge of the selected window to the desired location.

NOTE *Keep in mind that **sizing** the window vertically moves the bottom edge of the window only.*

- l. **Vertical image positioning within the window** — Press the Position button a second time and then rotate the Adjust \blacklozenge knob to move the top edge of the image in the selected window to the desired location.
- m. **Vertical window sizing** — Press the Size button and then rotate the Adjust \blacklozenge knob to set the bottom edge of the window.
- n. **Vertical image sizing within the window** — Press the Size button a second time and then rotate the Adjust \blacklozenge knob to set the bottom edge of the image within the selected window.
- o. **Automatic image positioning within the window** — Press and **hold** the Size and Position buttons for approximately half a second to automatically center the image within the currently selected window. Release the buttons.

NOTE *The auto-center function does not work if the image size is set extremely small, relative to the window size.*

- p. **Zoom** — Press the Zoom button and then rotate the Adjust \blacktriangleleft knob to set the bottom right corner of the window. The aspect ratio is maintained.
3. If any of the windows requires further positioning/sizing, repeat steps 1 and 2.
 4. After optimizing the window image(s), save the configuration, as follows: Press the **Preset** button for 2 seconds. When the LCD displays “**Save to Preset #n**”, rotate either Adjust knob to select a preset location in which to save the settings. Press the Enter button. See the “Window Presets” section for a detailed explanation.



PIP 422 and PIP 444 Picture-in-Picture Processors

4 Chapter Four

Remote Control

Simple Instruction Set Control
Control Software for Windows®

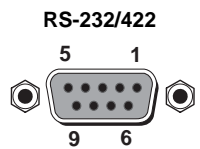
Remote Control

The PIP's RS-232/422 port is used to connect to a host or external controlling device, such as a computer or control system, which can generate the proper command codes and recognize the processor's responses.

NOTE *The cable used to connect the RS-232/RS-422 port to a computer or control system may need to be modified by removing pins or cutting wires. If unneeded pins are connected, the processor may hang up. See chapter 2, "Installation", for more information on wiring the connectors.*

The RS-232/RS-422 connector is a 9-pin D female (figure 4-1). The default protocol is RS-232, 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control.

NOTE *See "Selecting the baud rate and RS-232/RS-422 protocol" in chapter 3, "Operation", to change the protocol.*



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit data	TX-	Transmit data (-)
3	RX	Receive data	RX-	Receive data (-)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive data (+)
8	—	Not used	TX+	Transmit data (+)
9	—	Not used	—	Not used

Figure 4-1 — RS-232/RS-422 pinout

Simple Instruction Set Control

Host-to-PIP communications

The PIP 444 and PIP 422 accept SIS™ (Simple Instruction Set™) commands through the RS-232/RS-422 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 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.

PIP-initiated messages

(C) Copyright 2005, Extron Electronics, PIP 422 (444), V. x.xx

Error responses

When the PIP receives a valid SIS command, it executes the command and sends a response to the host device. If the processor is unable to execute the command because the command is invalid or contains invalid parameters, it 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

E11 — Invalid preset

E13 — Invalid value (out of range)

E23 — Checksum error

Using the command/response tables

The command/response table is shown beginning on page 4-5. Symbols, defined on page 4-4 are used throughout the table to represent variables in the command/response fields. An ASCII-to-hexadecimal (HEX) conversion table is provided below. Symbol definitions are provided below. Command and response examples are shown throughout the command/response table.

ASCII to HEX Conversion Table										Esc 1B	CR 0D	LF 0A		
Space 20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27
(28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0 30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8 38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@ 40	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 50	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
` 60	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 70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x 78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

NOTE Lower case characters are acceptable in the command field in all cases except where the command is preceded by the `Esc` character.

Remote Control, cont'd

Symbol Definitions

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

← = Carriage return (no line feed, hex 0D)

• = Space character

Esc = Escape key (hex 1B)

X1 = Input number (1 - 2, PIP 422; 1 - 4, PIP 444):

1 = Input 1 3 = Input 3
2 = Input 2 4 = Input 4

X2 = On/off status:

0 = Off 1 = On

X3 = Input video format:

1 = Composite 3 = YUV
2 = S-video

X4 = Output standard:

1 = NTSC 3.58 2 = NTSC 0 IRE
3 = PAL

X5 = Color/tint value (000 - 127)

X6 = Brightness range (50 to 127)

X7 = Contrast range (38 to 107)

X8 = Window/image adjust mode (1 or 2):

1 = Window 2 = Image within window

X9 = Horizontal position — Window (0 to 720)

Image (-360 to +360)

X10 = Vertical position — Window (0 to 486 [NTSC] or 576 [PAL])

Image (-243 to +243)

X11 = Horizontal size — Window (16 to 360)

Image (-360 to +360)

X12 = Vertical size — Window (16 to 243 [NTSC] or 288 [PAL])

Image (-288 to 288)

X13 = Detail filter settings

(00 - 15 in order of increasing sharpness, 08 = Off [default])

X14 = Window preset (1 - 10, PIP 422; 1 - 20, PIP 444)

X15 = Window text

(16 characters max., can use ASCII characters 32-126)

X16 = Controller firmware version

(listed to two decimal places, i.e., x.xx)

?? = Invalid/not loaded x.xx* = Currently active firmware

X17 = Firmware partition:

1 = Factory microcontroller firmware
2 = Factory FPGA firmware
3 = Updated microcontroller firmware
4 = Updated FPGA firmware

X18 = Input standard (automatically detected):

0 = Unknown 3 = SECAM
1 = NTSC 4 = YUV 50
2 = PAL 5 = YUV 60

X19 = Firmware build number (4 digits, 0001 - 9999)

X20 = Temperature in degrees Fahrenheit*

X21 = Temperature in degrees Celsius*

NOTE * Available on new models only.

X22 = Window text position (0 - 6):

0 = Off 4 = Bottom left
1 = Top left 5 = Bottom center
2 = Top center 6 = Bottom right
3 = Top right

X23 = Window text style:

1 = Solid 2 = Translucent

X24 = Background color (1 - 8):

1 = White 5 = Magenta
2 = Yellow 6 = Red
3 = Cyan 7 = Blue
4 = Green 8 = Black

X25 = Border color (0 - 8):

0 = Off (no border)
1 = White 5 = Magenta
2 = Yellow 6 = Red
3 = Cyan 7 = Blue
4 = Green 8 = Black

X26 = Window effect type:

1 = Cut 3 = Dissolve
2 = Wipe

X27 = Anti-aliasing filter mode:

0 = No filter (off) 3 = Mode 3
1 = Mode 1 4 = Auto-adjust
2 = Mode 2 (mode based on image size)

X28 = RS-232 baud rate:

0 = 9600 baud 2 = 38,400 baud
1 = 19,200 baud 3 = 115,200 baud

Command/response table for SIS commands

Command	ASCII Command (host to PIP)	Response (PIP to host)	Additional description
Window mute			
Blank window	[X1]*1B	Blk[X1]*0↵	Turn window [X1] off.
Enable window	[X1]*0B	Blk[X1]*1↵	Turn window [X1] on.
View window status	[X1]B	[X2]	
Swap (PIP 422 only)			
Swap main and PIP windows	%	Tke0↵	Swap the main and PIP windows.
Input video format			
Set video type	[X1]*[X3]\	Typ[X1]*[X3]↵	Set video format for input [X1] to [X3].
<i>Example:</i>	1*2\	Typ1*2↵	Set video format for input 1 to S-video.
View video type	[X1]\	[X3]↵	Show video signal type for input [X1].
<i>Example:</i>	2\	3↵	Show input 2 video type (type 3 = YUV).
Output video standard			
Set output video standard	[X4]=	Rte[X4]↵	Select output standard.
<i>Example:</i>	2=	Rte2↵	Set output rate to PAL.
View output video standard	=	[X4]↵	Show the output video standard.
Color			
Specific color value	[X1]*[X5]C	Col[X1]*[X5]↵	Set the color value to [X5].
Increment color up	[X1]+C	Col[X1]*[X5]↵	Select the next higher color value.
Decrement color down	[X1]-C	Col[X1]*[X5]↵	Select the next lower color value.
View color value	[X1]C	[X5]↵	View the current setting.
Tint			
Specific tint value	[X1]*[X5]T	Tin[X1]*[X5]↵	Set the tint value to [X5].
Increment tint up	[X1]+T	Tin[X1]*[X5]↵	Select the next higher tint value.
Decrement tint down	[X1]-T	Tin[X1]*[X5]↵	Select the next lower tint value.
View tint value	[X1]T	[X5]↵	View the current setting.
Brightness			
Specific brightness value	[X1]*[X6]Y	Brn[X1]*[X6]↵	Set the brightness value to [X6].
Increment brightness up	[X1]+Y	Brn[X1]*[X6]↵	Select the next higher brightness value.
Decrement brightness down	[X1]-Y	Brn[X1]*[X6]↵	Select the next lower brightness value.
View brightness value	[X1]Y	[X6]↵	View the current setting.
Contrast			
Specific contrast value	[X1]*[X7]^	Con[X1]*[X7]↵	Select contrast [X7].
Increment contrast up	[X1]+^	Con[X1]*[X7]↵	Select the next higher contrast value.
Decrement contrast down	[X1]-^	Con[X1]*[X7]↵	Select the next lower contrast value.
View contrast value	[X1]^	[X7]↵	View the current setting.

Remote Control, cont'd

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

Command	ASCII Command (host to PIP)	Response (PIP to host)	Additional description
Horizontal shift			
<p>NOTE For the image shift command, a negative (-) value is a left shift and a positive value (+) is a right shift. To enter a negative value for the image positioning, enter a minus sign before the $\overline{x9}$ value. Entry of a positive sign is optional, but not required; if no sign is included in the SIS command, the PIP assumes a positive value. The PIP returns a negative sign in its response when the value is negative, but does not return a positive sign.</p>			
Specific window shift value	$\overline{x8}^* \overline{x1}^* \overline{x9}H$	Hph1* $\overline{x1}^* \overline{x9}$ ←	Set the window's horizontal positioning value to $\overline{x9}$.
Example:	1*1*323H	Hph1*1*323 ←	Set window 1's horizontal positioning value to 323.
Example:	2*3*231H	Hph2*3*231 ←	Set the image in window 3's horizontal positioning value to +231.
Increment shift up	$\overline{x8}^* \overline{x1}+H$	Hph1* $\overline{x1}^* \overline{x9}$ ←	Shift the window to the right.
Decrement shift down	$\overline{x8}^* \overline{x1}-H$	Hph1* $\overline{x1}^* \overline{x9}$ ←	Shift the window to the left.
View shift value	$\overline{x8}^* \overline{x1} H$	$\overline{x9}$ ←	Show the window's horizontal positioning value.
Vertical shift			
<p>NOTE For the image shift command, a negative (-) value is an up shift and a positive value (+) is a down shift. To enter a negative value for the image positioning, enter a minus sign before the $\overline{x10}$ value. Entry of a positive sign is optional, but not required; if no sign is included in the SIS command, the PIP assumes a positive value. The PIP returns a negative sign in its response when the value is negative, but does not return a positive sign.</p>			
Specific shift value	$\overline{x8}^* \overline{x1}^* \overline{x10}/$	Vph $\overline{x8}^* \overline{x1}^* \overline{x10}$ ←	Set the vertical centering value to $\overline{x10}$.
Example:	1*2*323/	Vph1*2*323 ←	Set window 2's vertical positioning value to 323.
Example:	2*4*-231/	Vph2*4*-231 ←	Set the image in window 4's vertical positioning value to -231.
Increment shift down	$\overline{x8}^* \overline{x1}+ /$	Vph $\overline{x8}^* \overline{x1}^* \overline{x10}$ ←	Shift down.
Increment shift up	$\overline{x8}^* \overline{x1}- /$	Vph $\overline{x8}^* \overline{x1}^* \overline{x10}$ ←	Shift up.
View shift value	$\overline{x8}^* \overline{x1} /$	$\overline{x10}$ ←	Show the vertical centering value.
Horizontal size			
<p>NOTE For the image size command, a negative (-) value shrinks the image and a positive value (+) enlarges the image. To enter a negative value for the image size, enter a minus sign before the $\overline{x11}$ value. Entry of a positive sign is optional, but not required; if no sign is included in the SIS command, the PIP assumes a positive value. The PIP returns a negative sign in its response when the value is negative, but does not return a positive sign.</p>			
Specific size value	$\overline{x8}^* \overline{x1}^* \overline{x11}:$	Hsz $\overline{x8}^* \overline{x1}^* \overline{x11}$ ←	Set horizontal sizing to $\overline{x11}$.
Increment size up	$\overline{x8}^* \overline{x1}+:$	Hsz $\overline{x8}^* \overline{x1}^* \overline{x11}$ ←	Make window or image wider.
Increment size down	$\overline{x8}^* \overline{x1}-:$	Hsz $\overline{x8}^* \overline{x1}^* \overline{x11}$ ←	Make window or image narrower.
View size value	$\overline{x8}^* \overline{x1} :$	$\overline{x11}$ ←	Show horizontal sizing value.

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

Command	ASCII Command (host to PIP)	Response (PIP to host)	Additional description
Vertical size			
<p>NOTE For the image size command, a negative (-) value shrinks the image and a positive value (+) enlarges the image. To enter a negative value for the image size, enter a minus sign before the $[X12]$ value. Entry of a positive sign is optional, but not required; if no sign is included in the SIS command, the PIP assumes a positive value. The PIP returns a negative sign in its response when the value is negative, but does not return a positive sign.</p>			
Specific size value	$[X8]^* [X1]^* [X12];$	Vsz $[X8]^* [X1]^* [X12]$ ↵	Set vertical sizing to $[X12]$.
Increment size up	$[X8]^* [X1]^+;$	Vsz $[X8]^* [X1]^+ [X12]$ ↵	Make picture or image taller.
Increment size down	$[X8]^* [X1]^-;$	Vsz $[X8]^* [X1]^- [X12]$ ↵	Make picture or image shorter.
View size value	$[X8]^* [X1];$	$[X12]$ ↵	Show vertical sizing value.
Zoom mode			
Zoom in	$[X8]^* [X1]^+{$	Zom $[X8]^* [X1]$ ↵	Zoom in.
Zoom out	$[X8]^* [X1]^-{$	Zom $[X8]^* [X1]$ ↵	Zoom out.
Detail filter			
Specific detail filter value	$[X1]^* [X13]d$	Dhz $[X1]^* [X13]$ ↵	Select detail level $[X13]$.
Increment filter value up	$[X1]^+d$	Dhz $[X1]^+ [X13]$ ↵	Select next higher detail level.
Decrement filter value down	$[X1]^-d$	Dhz $[X1]^- [X13]$ ↵	Select next lower detail level.
View filter value	$[X1] d$	$[X13]$ ↵	Show detail level.
Window priority			
Set window priority	$[X1]^{P1}* [X1]^{P2}* [X1]^{P3}* [X1]^{P4}~$	Pri $[X1]^{P1}, [X1]^{P2}, [X1]^{P3}, [X1]^{P4}$ ↵	Set priority of all input windows. $[X1]^{P1}$ is the highest priority window and is displayed on top. $[X1]^{P4}$ is the lowest priority window and is on the bottom.
View window priority	~	$[X1]^{P1}, [X1]^{P2}, [X1]^{P3}, [X1]^{P4}$ ↵	Show the priority of all windows.
Window presets			
Recall preset	$[X14].$	Rpr $[X14]$ ↵	Command character is a period. Recall window preset $[X14]$.
Save preset	$[X14],$	Spr $[X14]$ ↵	Command character is a comma. Save window preset $[X14]$.
Window freeze			
Freeze the window	$[X1]^*1F$	Frz $[X1]^*1$ ↵	Output a "frozen" video image.
Unfreeze the window	$[X1]^*0F$	Frz $[X1]^*0$ ↵	Turn off freeze (output motion video).
View freeze status	$[X1]F$	$[X2]$ ↵	Show the freeze status.
Write window text			
Write text	$[Esc]N [X1], [X15]←$	Nam $[X1]$ ↵	Write text $[X15]$ to window $[X1]$.
View text	$[Esc]N [X1]←$	Nam $[X1] [X15]$ ↵	

Remote Control, cont'd

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

Command	ASCII Command (host to PIP)	Response (PIP to host)	Additional description
Front panel lockout (Executive mode)			
Lock front panel	1X	Exe1 ↵	Lock front panel picture control and menu system adjustments, RS-232/422 adjustments only.
Unlock front panel	0X	Exe0 ↵	All adjustments and selections can be made from the front panel.
View front panel lock status	X	[X2] ↵	Show executive mode status.
Zap (reset to default settings)			
Total reset	[Esc]zXXX ←	ZapXXX ↵	“z” must be lower case, “XXX” must capitalized. Reset all settings and adjustments to the factory defaults.
Reset all presets	[Esc]ZG ←	Zpg ↵	Clear all presets and their names.
Reset individual preset	[Esc]ZG[X14] ←	Zpg[X14] ↵	Clear preset [X14].
Query firmware version			
General	Q	[X16] ↵	Show the controller firmware version.
All firmware	0Q	[X16], [X16], [X16], [X16] ↵	Show the firmware versions for all partitions.
Specific firmware	[X17]Q	[X16] ↵	Show the firmware version for partition [X17].
View build number	+Q	[X16].[X19] ↵	Show the firmware build number.
Request part number			
Request part number	N	60-607 (606)-01 ↵	Show the PIP's part number.
Request information			
View all inputs' video standards	I ↵	[X18], [X18], [X18], [X18] ↵	Display each input's video standard. The video standards are automatically detected; you cannot change these entries.
View a specific input's video standard	[X1]i	[X18] ↵	Display the input video standard for input [X1]. The video standard is automatically detected; you cannot change this entry.
Unsolicited report	None	Std [X1]* [X18] ↵	Display the input video standard for input [X1] in response to a change in input signal.
Show temperature	20S	[X20]F • [X21]C ↵	Show the PIP's temperature in degrees Fahrenheit and Celsius.
NOTE The show temperature (20S) command is only available on newer model PIPs.			

Command/response table for special function SIS commands

The syntax for setting a special function is $\boxed{x_n}*\boxed{x_?}\#$ where $\boxed{x_n}$ is the value or variable (such as 1 in the first example below), $\boxed{x_?}$ is the function number (such as “Set text location” in the first example below), and # is the execute command. To view a function’s setting, use $\boxed{x_?}\#$ where $\boxed{x_?}$ is the function number. Command/response table for special function SIS commands

Command	ASCII Command (host to PIP)	Response (PIP to host)	Additional description
Text location			
Set text location	$\boxed{x_{22}}*1\#$	Tlc $\boxed{x_{22}}\leftarrow$	Set window text position to $\boxed{x_{22}}$.
View text location	1#	$\boxed{x_{22}}\leftarrow$	Show text position.
Text style			
Set text style	$\boxed{x_{23}}*2\#$	Txs $\boxed{x_{23}}\leftarrow$	Set window text style to $\boxed{x_{23}}$.
View text style	2#	$\boxed{x_{23}}\leftarrow$	Show text style.
Background color			
Set background color	$\boxed{x_{24}}*3\#$	Bkg $\boxed{x_{24}}\leftarrow$	Set background color to $\boxed{x_{24}}$.
<i>Example:</i>	2*3#	Bkg2 \leftarrow	Set background color to cyan.
View background color	3#	$\boxed{x_{24}}\leftarrow$	Show background color.
Border color			
Set border color	$\boxed{x_{25}}*4\#$	Bdr $\boxed{x_{25}}\leftarrow$	Set border color to $\boxed{x_{25}}$.
<i>Example:</i>	3*4#	Bdr3 \leftarrow	Set border color to green.
View border color	4#	$\boxed{x_{25}}\leftarrow$	Show border color.
Window insertion effect type			
Set effect type	$\boxed{x_{26}}*5\#$	Eff $\boxed{x_{26}}\leftarrow$	Select insertion effect type.
<i>Example:</i>	2*5#	Eff2 \leftarrow	Set insertion effect type to wipe.
View effect type	5#	$\boxed{x_{26}}\leftarrow$	Show insertion effect type.
View window preset parameters			
Initiate view mode	$\boxed{x_{14}}*6\#$ {view command}	Vpr $\boxed{x_{14}}\leftarrow$ {command response} \leftarrow	Enters preset view mode for preset $\boxed{x_{14}}$; the next view command applies to the parameters stored in that preset. This mode will end after 5 seconds of inactivity or immediately following the next command. This mode only applies to view commands; other commands are unaffected.
<i>Example:</i>	2*6# 1*2;	Vpr2 \leftarrow 150 \leftarrow	View the window vertical sizing for input 2 stored in preset 2.

Remote Control, cont'd

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

Command	ASCII Command (host to PIP)	Response (PIP to host)	Additional description
Window anti-aliasing filter			
Set anti-aliasing filter	[X1]*[X27]*7#	Aaf[X1]*[X27]↵	Set anti-aliasing filter for window [X1] to mode [X27].
<i>Example:</i>	3*4*7#	Aaf3*4↵	Set anti-aliasing filter for window 3 to auto-adjust.
View anti-aliasing mode	[X1]*7#	[X27]↵	View anti-aliasing filter for window [X1].
Baud rate			
Change baud rate	[Esc][X28]CP↵	Ccp[X28]↵	Change the baud rate to [X28].

Control Software for Windows®

The Windows-based Extron PIP 422 & 444 Control Program, which communicates with the processor via the RS-232/RS-422 port, provides an easy way to configure and operate the PIP. The program is compatible with Windows 2000 and Windows XP.

Installing the software

The program is contained on the Extron Software Products CD-ROM, disk B. Install the software as follows:

NOTE For full functionality, install both of the following programs:

- The PIP 422 & 444 Control Program
- The Firmware Loader

1. Insert the CD-ROM into the drive. The installation program should start automatically. If it does not self-start, run Launch.exe from the CD.

The Extron software CD window appears (figure 4-2).

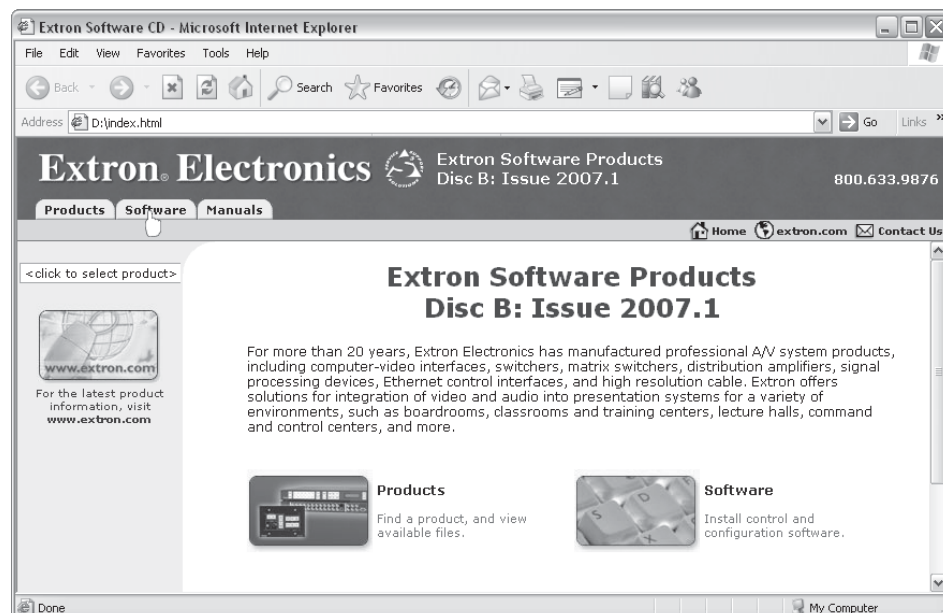


Figure 4-2 — Software CD window

2. Click the Software tab (figure 4-2).
3. Scroll to the desired program and click Install (figure 4-3).

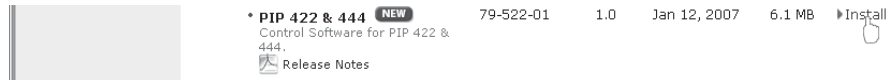


Figure 4-3 — Software installation

4. Follow the on-screen instructions. By default, the Windows installation of the PIP 422 & 444 Control Program creates a C:\Program Files\Extron\PIP 422 & 444 directory, and it places four icons into a group folder named “Extron Electronics\PIP 422 & 444.” The four installed icons are:
 - PIP 422 & 444
 - PIP 422 & 444 Help
 - Check for PIP 422 & 444 Update
 - Uninstall PIP 422 & 444

Starting the control program

To run the software:

1. Click *Start > Programs > Extron Electronics > PIP 422 & 444 > PIP 422 & 444*. The Communication Connection Settings window appears (figure 4-4).

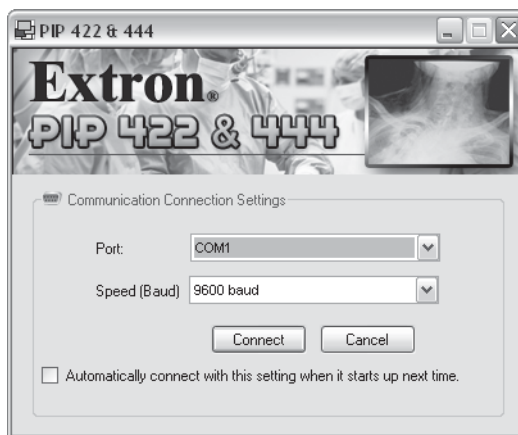
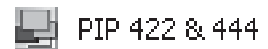


Figure 4-4 — Communication Connection Settings window

2. Select the comm port that is connected to the PIP’s remote connector and the baud rate at which the PIP is operating. Click *Connect*.

Remote Control, cont'd

NOTE *If you don't want to take this step every time, select the Automatically connect with this setting when it starts up next time check box.*

The PIP 422 & 444 program window appears (figure 4-5).

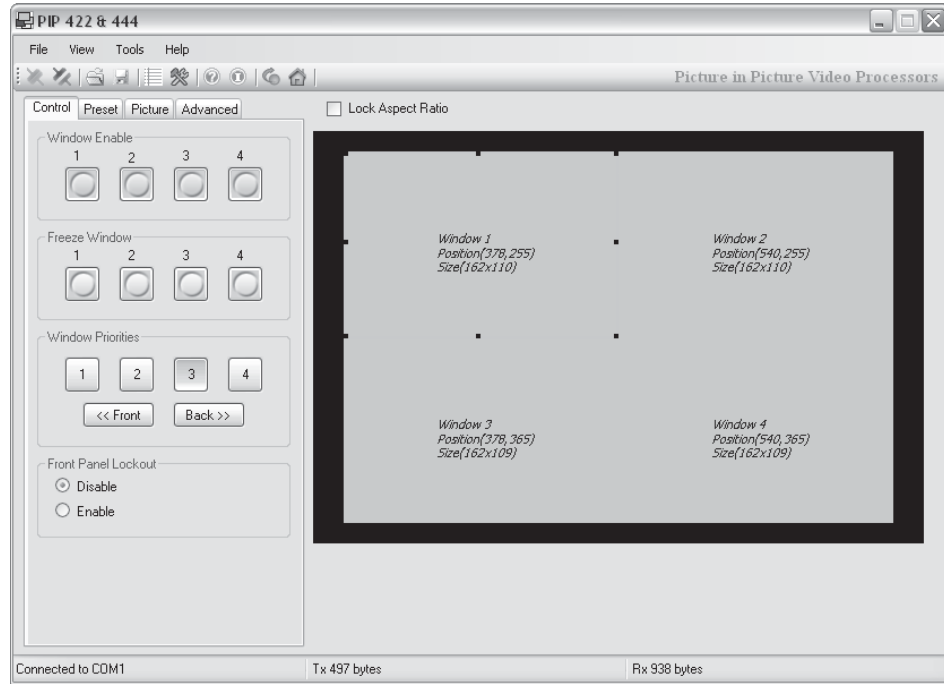


Figure 4-5 — PIP 422 & 444 program window

The program window is divided into three areas: a tool bar on the top of the window, a graphic area on the right side of the window, and a controls area on the left side of the window.

Tool bar

The tool bar (figure 4-6) provides a number of buttons that provide shortcuts for common tasks such as connecting and disconnecting, saving and recalling the current configuration, uploading new firmware, and system help. Saving and restoring the current configuration and uploading firmware are covered in more detail below.



Figure 4-6 — Tool bar

Open and Save buttons

Any changes that you make to the display, including size, position, border and background color, and selected inputs, can be saved in a file with the extension *.pip. To save the values, click the Save button shown at right. If you haven't already saved the values before, the program prompts you to name the file.

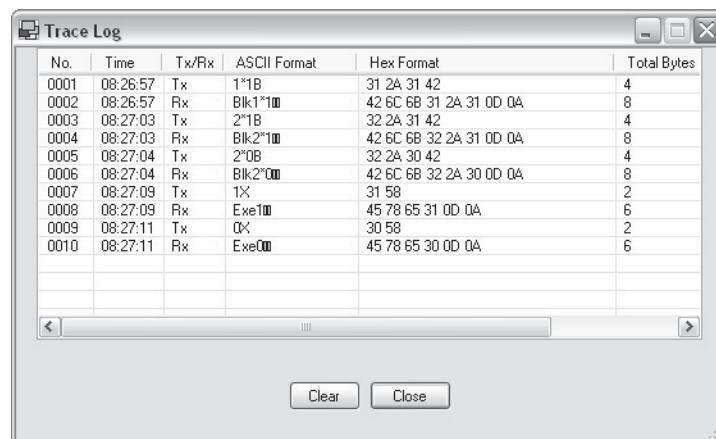


To restore the settings from the *.pip file, click the Open button, shown at right, and select the desired file.



Data trace button

The data trace button calls the trace log window (figure 4-7), which shows the serial communications, in ASCII and Hex, between the controller and the PIP. Reference to this window can be helpful when writing your own control scripts.



No.	Time	Tx/Rx	ASCII Format	Hex Format	Total Bytes
0001	08:26:57	Tx	1*1B	31 2A 31 42	4
0002	08:26:57	Rx	Blk1*100	42 6C 6B 31 2A 31 0D 0A	8
0003	08:27:03	Tx	2*1B	32 2A 31 42	4
0004	08:27:03	Rx	Blk2*100	42 6C 6B 32 2A 31 0D 0A	8
0005	08:27:04	Tx	2*0B	32 2A 30 42	4
0006	08:27:04	Rx	Blk2*000	42 6C 6B 32 2A 30 0D 0A	8
0007	08:27:09	Tx	1X	31 58	2
0008	08:27:09	Rx	Exe100	45 78 65 31 0D 0A	6
0009	08:27:11	Tx	0X	30 58	2
0010	08:27:11	Rx	Exe000	45 78 65 30 0D 0A	6

Figure 4-7 — Trace log window

Upgrade firmware button

The firmware upgrade utility provides a way to replace the firmware that is coded on the processor's control board without taking the processor out of service.



NOTE Upgrading the firmware does *not* overwrite the settings or presets.

Update the processor firmware as follows:

1. Start the PIP 422 & 444 control program and connect to the processor. See "Starting the control program" in this chapter, starting on page 4-10.
2. Visit the Extron web site (www.extron.com), click the Download tab, and select either the PIP 422 or PIP 444. Select the appropriate firmware file to download and copy it to your computer. Note the folder to which you save the firmware file.

Remote Control, cont'd

3. Click the update firmware button (figure 4-8). The Extron Firmware Loader appears.

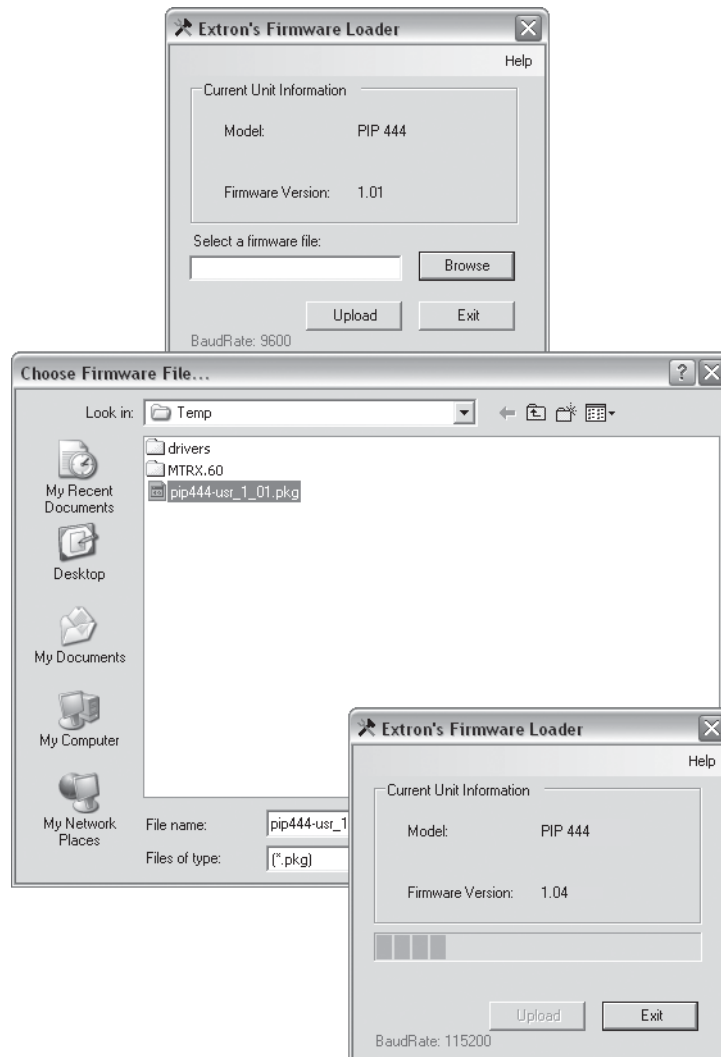


Figure 4-8 — Open window

- 4a. Click *Browse*. The open file window appears.
- 4b. Navigate to the folder where you saved the firmware upgrade file. Select the file. The Firmware Loader returns to the top.

NOTE Ensure that the firmware upgrade is for the PIP.

NOTE Valid PIP firmware files must have the file extension “.pkg”. Any other file extension is **not** a firmware upgrade for your PIP.

- 4c. Click *Upload*. The File Loader reports, “*This process could take several minutes. Please wait...*” and then displays a scroll bar that shows the status of the upload.
- 4c. When the Firmware Loader reports, “*Transfer complete!*”, click *Exit*.

NOTE If the firmware loader utility exits before the status bar has progressed completely across the indicator window, try using a control cable with only pins 2, 3, and 5 connected. If necessary, modify the cable by removing pins or cutting wires.

Check for software updates button

This button forces the controlling computer, if connected to the Internet, to check the Extron Web site to see if any firmware update (firmware of a version newer than that installed in the PIP) is available for the PIP. If a newer firmware version is available, the program prompts you to download and install the firmware.

Graphic area

The graphic area (figure 4-9) represents the PIP's video output and the associated four (PIP 444) or two (PIP 422) picture-in-picture windows.

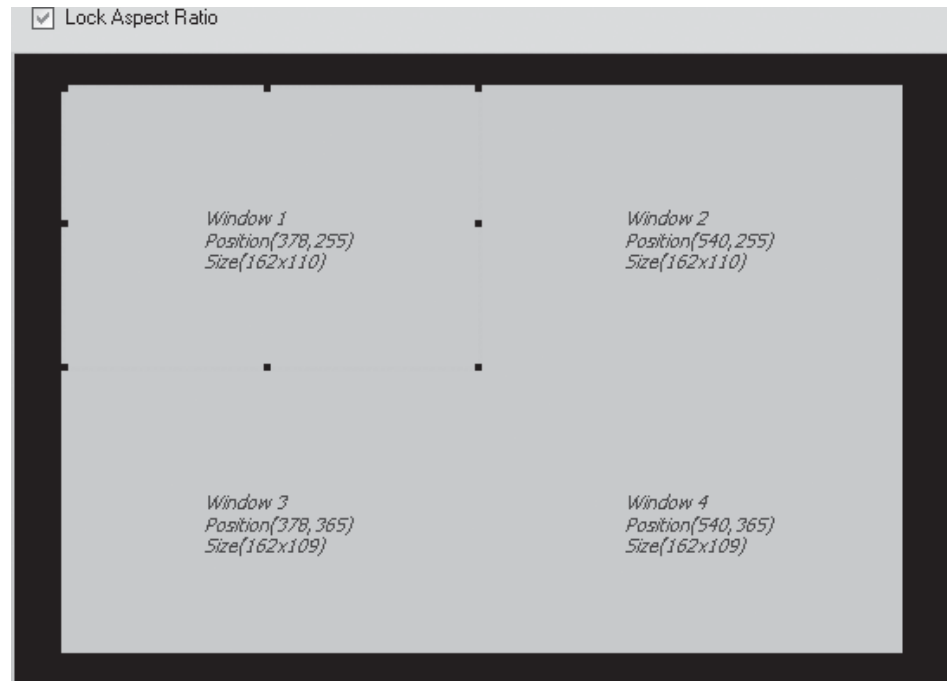


Figure 4-9 — Graphic area

- To resize a window, click an anchor point (■) and drag it to resize the window.
- To move a window, click in the desired window and drag it to the new location.

NOTE To retain the aspect ratio when resizing, select the Lock Aspect Ratio checkbox.

NOTE If you have dragged a window so far out of the picture that you have “lost” it, click View > Expanded View to show the entire horizontal and vertical video stream.

- Right click any window area to bring up the image area for the associated window or to execute the center image function.
- Right click outside of the window area to change the the border color, background color, or to change the text position and style.
- Double-click any window to activate the image view for that window (indicated in dark blue). To return to the window view, double-click the image again.

Remote Control, cont'd

Controls area

The controls area, figure 4-10, consists of four tabs, Control, Preset, Picture, and Advanced, that allow you to perform many of the same functions as the PIP's front panel.

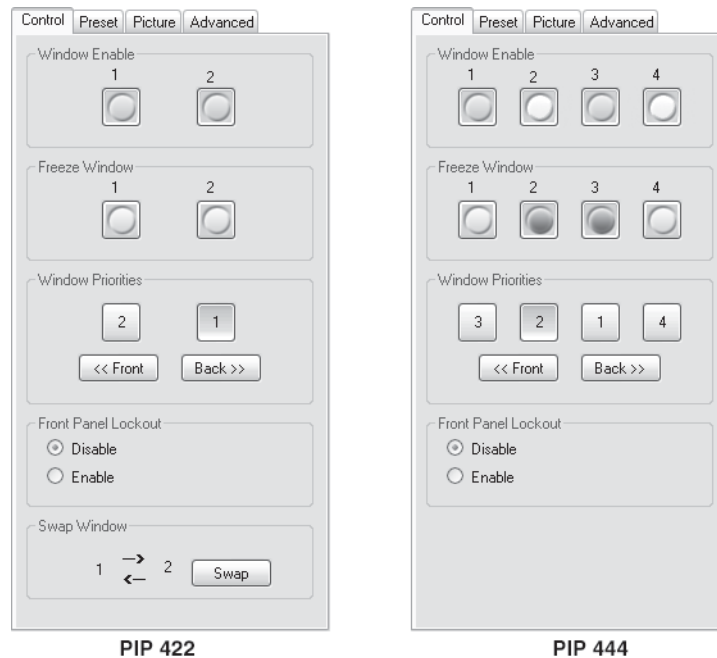


Figure 4-10 — Controls area, Control tab

Control tab

Figure 4-10 shows the controls area with the Control tab selected.

- **Windows Enable** — Select and deselect a window for display by clicking the associated window's button. A button appears green when selected and the window appears in the graphic area of the screen. A button appears gray when deselected and the window does not appear in the graphic area.
- **Freeze Window** — Select and deselect an input to freeze or unfreeze that input's window in the displayed image. A button appears red when selected (that input is frozen) and appears gray when deselected (the input video is in motion).
- **Window Priorities** — Select a window button and click the <<Front and Back>> buttons to reorder the window priorities. The highest priority window is to the left and the lowest priority window is to the right.
- **Front Panel Lockout** — Select the Disable or Enable radio button to unlock (Disable) or lock (Enable) the front panel.
- **Swap (PIP 422 only)** — Click the Swap button to exchange the size, position, and priority information between windows 1 and 2.

Preset tab

Figure 4-11 shows the controls area with the Preset tab selected.

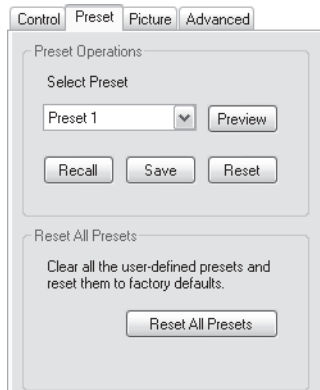


Figure 4-11 — Controls area, Preset tab

- **Preview** — To see a preset's settings without recalling the preset, select the desired preset using the drop box and click the Preview button. The program pops up a window that resembles the graphic area (figure 4-9).

NOTE *The graphic area displayed as a result of the Preview function is for display only. The settings cannot be changed on this screen.*

- **Recall** — To recall a preset, select the desired preset using the drop box and click the Recall button. The recalled preset's settings are applied to the output image.
- **Save** — To save a preset, select the desired preset using the drop box and click the Save button. All of the current settings are saved for later use at the specified preset location.
- **Reset** — To reset an individual preset, select the desired preset using the drop box and click the Reset button. All of the settings for the selected preset are reset to the factory defaults. See figure 3-11 (PIP 422) or figure 3-12 (PIP 444) in chapter 3, "Operation", to identify the factory defaults.
- **Reset All Presets** — To reset all presets, click the Reset All Presets button. All of the settings for all presets are reset to the factory defaults. See figure 3-11 (PIP 422) or figure 3-12 (PIP 422) to identify the factory defaults.

Remote Control, cont'd

Picture tab

Figure 4-12 shows the controls area with the Picture tab selected.

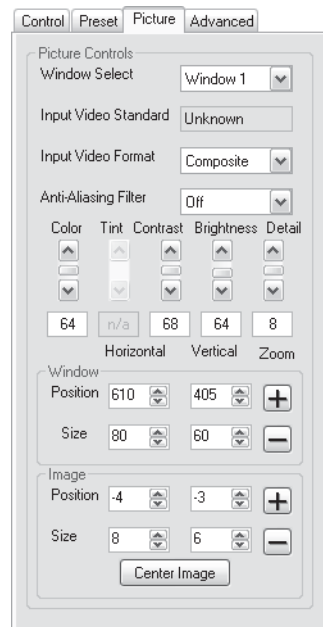


Figure 4-12 — Controls area, Picture tab

- **Picture Controls** — The picture controls allow you to set the input video format, anti-aliasing filter, color, tint, contrast, brightness, and detail filter for each window. To set a picture control, select the desired window using the Window Select drop box and set the desired value.
- **Window controls** — The window controls allow you to precisely set the position and size of the window selected in the Window Select drop box. For both Position and Size, the left adjustment is horizontal and the right adjustment is vertical. The + and - buttons resize the window while maintaining the aspect ratio.

NOTE *Size and position adjustments are updated live in the graphic area.*

- **Image controls** — The image controls allow you to precisely set the position and size of the image within the window selected by the Window Select drop box. For both Position and Size, the left adjustment is horizontal and the right adjustment is vertical. The + and - buttons resize the image within the window while maintaining the aspect ratio. The Center Image button automatically centers the image within the window.

NOTE *Size and position adjustments are updated live in the graphic area.*

Advanced tab

Figure 4-13 shows the controls area with the Advanced tab selected.

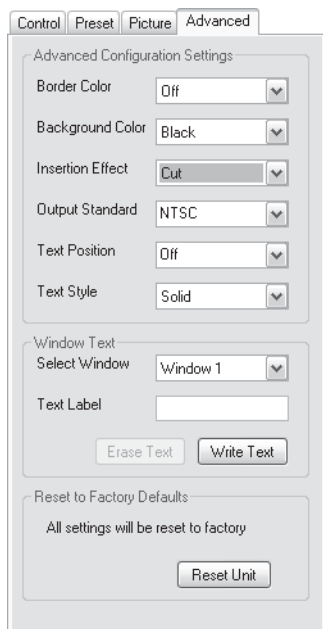


Figure 4-13 — Controls area, Advanced tab

The Advanced Configuration Settings area has drop boxes that allow you to select:

- The background and border colors
- The insertion effect (cut, wipe, or dissolve)
- The output standard (NTSC, NTSC 0 IRE, or PAL)
- The position of the text that you insert in a window
- The text style (solid or translucent)

The Window Text area allows you to select one of the windows (using the Select Window drop box) and then enter or erase text in the window.

The Reset Unit button restores the factory defaults.

Using the help system

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics group folder, click on the PIP Help icon.
- From within the PIP Control Program, click on the Help menu on the main screen.

Remote Control, cont'd



PIP 422 and PIP 444 Picture-in-Picture Processors

A

Appendix A

Specifications and Part Numbers

Specifications

Part Numbers

Specifications and Part Numbers

Video

Gain	Unity
Differential phase error	1.5° at 3.58 MHz and 4.43 MHz
Differential gain error	1.5% at 3.58 MHz and 4.43 MHz

Video input and loop-through

Number/signal type	
PIP 444	4 component video, S-video, composite video inputs 4 identical, buffered loop-throughs
PIP 422	2 component video, S-video, composite video inputs 2 identical, buffered loop-throughs

Connectors

PIP 444	4 x 3 female BNC for inputs 4 x 3 female BNC for loop-throughs
PIP 422	2 x 3 female BNC for inputs 2 x 3 female BNC for loop-throughs
Nominal level	1 Vp-p for Y of component video and S-video 1 Vp-p for composite video 0.7 Vp-p for R-Y and B-Y of component video 0.7 V p-p for C of S-video
Minimum/maximum levels	0.3 V to 2.0 V p-p with no offset
Impedance	75 ohms
Horizontal/vertical frequency ..	NTSC 3.58, NTSC 4.43, PAL, SECAM
Resolution range	NTSC 3.58, NTSC 4.43, PAL, SECAM
Return loss	<-30 dB @ 5 MHz
DC offset (min./max.)	-0.3 V to +1.3 V
External sync (genlock)	0.3 V to 1.0 Vp-p

Video processing

Encoder	10 bit digital
Digital sampling	24 bit, 8 bits per color; 80 MHz standard
Colors	16.8 million
Anti-aliasing filtering	5 levels: 0 (off), 1, 2, 3, auto (which uses 0-3)
Detail filtering	16 levels: 0-7, 8 (no filtering), 9-15

Video output

Number/signal type	1 component video 1 S-video 1 composite video
Connectors	3 female BNC for component video 2 female BNC for S-video 1 female BNC for composite video
Nominal level	1 Vp-p for Y of component video and S-video 1 Vp-p for composite video 0.7 Vp-p for R-Y and B-Y of component video 0.7 V p-p for C of S-video
Minimum/maximum levels	0.0 V to 1.0 Vp-p
Impedance	75 ohms
DC offset	350 ±25 mV (max.) with input at 0 offset (for Y of component and S-video and for composite video) 650 ±25 mV (max.) with input at 0 offset (for R-Y and B-Y of component video and for C of S-video)

Sync

Genlock connectors (PIP 444) 1 BNC female for genlock input
1 BNC female for genlock output (terminate with 75 ohms if unused)

Standards

Input NTSC 3.58, NTSC 4.43, PAL, SECAM
Output NTSC 3.58, PAL

Control/remote — processor

Serial control port RS-232 or RS-422, 9-pin female D connector
Baud rate and protocol 115200, 38400, 19200, or 9600 (default) baud (configurable); 8 data bits; 1 stop bit; no parity
Serial control pin configurations RS-232: 2 = TX, 3 = RX, 5 = GND
RS-422: 2 = TX-, 3 = RX-, 5 = GND, 7 = Rx+, 8 = Tx+
Program control Extron's control/configuration program for Windows®
Extron's Simple Instruction Set (SIS™)

General

Power 100 VAC to 240 VAC, 50/60 Hz, 10 watts, internal, autoswitchable
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
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%.*

NOTE *Specifications are subject to change without notice.*

Specifications and Part Numbers, cont'd

Part Numbers

Included parts

These items are included in each order for a PIP 422 or PIP 444:

Included parts	Replacement part number
PIP 444	60-606-01
PIP 422	60-607-01
Rack/desk mounting brackets	70-077-03
IEC power cord	
Rubber feet (self-adhesive) (4)	
User's manual	
Label holder (self-adhesive)	
Extron Software Products CD, disk B	

Accessories

These items may be ordered separately:

Accessories	Part number
MBD 149 Under-desk mounting kit	70-077-03
SVHSF-BNCM 1' adapter	26-541-02
SVHSM-BNCM 1' adapter	26-353-02
SVHSM-BNCM 3' adapter	26-353-03
SVHSM-BNCM 6' adapter	26-353-04
SVHSM-BNCF 8" adapter	26-353-01

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

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.



www.extron.com

Extron Electronics, USA

1230 South Lewis Street
Anaheim, CA 92805
800.633.9876 714.491.1500
FAX 714.491.1517

Extron Electronics, Europe

Beeldschermweg 6C
3821 AH Amersfoort, The Netherlands
+800.3987.6673 +31.33.453.4040
FAX +31.33.453.4050

Extron Electronics, Asia

135 Joo Seng Rd. #04-01
PM Industrial Bldg., Singapore 368363
+800.7339.8766 +65.6383.4400
FAX +65.6383.4664

Extron Electronics, Japan

Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan
+81.3.3511.7655 FAX +81.3.3511.7656