Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

RGB-DVI 300 and RGB-HDMI 300

Video Scalers

68-1407-01
Rev. A
03 09

Precautions

Safety Instructions • English

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

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

Caution

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

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

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

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

Consignes de Sécurité • Français

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

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

Attention

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

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

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

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

Sicherheitsanleitungen • Deutsch

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

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

Achtung

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

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

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

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

Instrucciones de seguridad • Español

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

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

Precaucion

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

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

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

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

Warning

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

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

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

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

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

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

Avertissement

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

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

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

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

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

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

Vorsicht

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

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

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

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

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

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

Advertencia

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

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

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

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

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento 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.

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。

警告

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

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

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

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

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

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

声明

所使用电源为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

FCC Class A Notice

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

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

NOTE *For complete safety information about these products please read the Safety Compliances sheet, which available online at www.extron.com.*

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Chapter One

Introduction

About this Manual

RGB-DVI 300 and RGB-HDMI 300 Description

RGB-DVI 300 and RGB-HDMI 300 Features

Introduction

About this Manual

This manual contains information about the Extron RGB-DVI 300 and RGB-HDMI 300 video scalers/converters with instructions on how to install, configure, and operate the equipment.

Unless otherwise specified, references in this manual to the "video converter" or "video scaler" relate to the features or operation of both models.

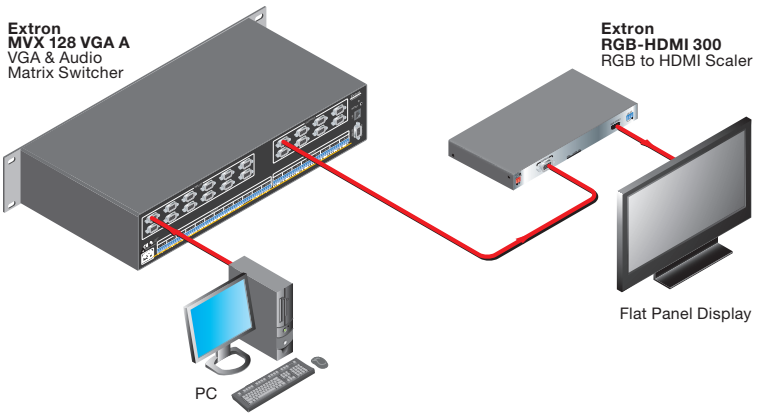
RGB-DVI 300 and RGB-HDMI 300 Description

The RGB-DVI 300 and RGB-HDMI 300 are analog to digital video converters with built-in scaling.

The units accept a single RGB or HDTV component (R-Y, Y, B-Y) input video signal at any standard RGB or HDTV component resolution, through a female 15-pin HD connector.

A single video output at any of large range of resolutions and/or refresh rates is provided through a DVI-I (RGB-DVI 300) or HDMI (RGB-HDMI 300) connector.

Input and output settings, picture controls, and advanced settings can be adjusted through the front panel menu with on-screen display, or RS-232, using Extron's Simple Instruction Set (SIS™) commands.



RGB-DVI 300 and RGB-HDMI 300 Features

Accept all standard RGB and HDTV YUV inputs — through a female 15-pin HD connector.

Multiple output resolutions — These units can output an extensive range of unique DVI (or HDMI) combinations of resolution/ refresh rate. Resolutions range from 640x480 to 1920x1200, including 1080p, with refresh rates ranging from 23.98 to 75 Hz.

Auto Image™ — This feature automatically optimizes the image to the scaled output rate, eliminating complex setup.

Simple Instruction Set commands — RS-232 ports on the front and back panels allow easy configuration by a host device, using Extron SIS commands.

Complete picture control adjustment — Input and output video signals can be fully adjusted through the front panel menu or through serial SIS commands.

Front panel menu selection — The front panel buttons can be used to navigate and select menu options with the on-screen display.

Preset values — 16 Input Presets and 3 User Presets make it easy to save and recall commonly used input sources.

Front panel security lockout — This feature locks all front panel controls to prevent accidental or unauthorized reconfiguration.

Easy mounting — The 1" H x 8.75" W x 6" D (2.6 cm H x 22.2 cm W x 15.2 cm D) size of the units allows a wide range of mounting options.

Chapter Two

Installation

Mounting the Scalers

Front Panel Layout

Rear Panel Layout

Mounting the Scalers

The 1" height and half rack width of the RGB-DVI 300 and RGB-HDMI 300 units allow them to be mounted on a tabletop, on racks, under furniture, or through furniture.

Tabletop placement

Attach the four provided rubber feet to the bottom of the unit and place it in any convenient location.

Rack Mounting

UL guidelines for rack mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

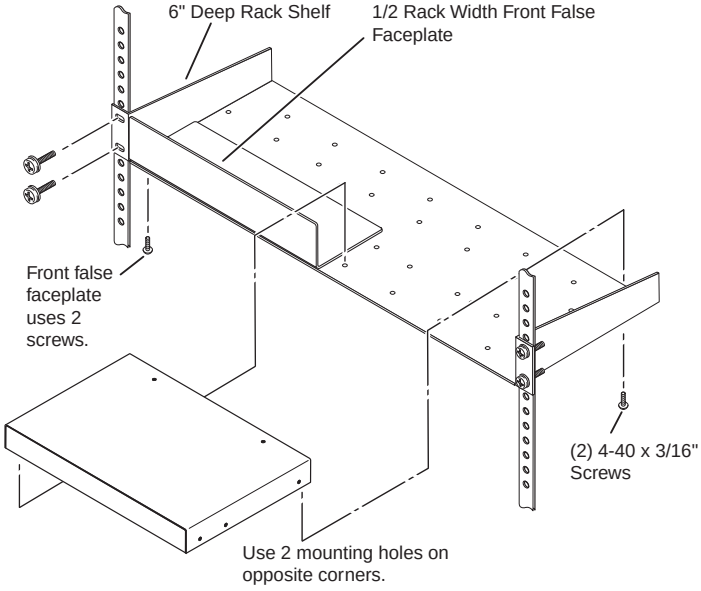
1. **Elevated operating ambient temperature —** If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma: +122 °F, +50 °C) specified by Extron.
2. **Reduced air flow —** Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.
3. **Mechanical loading —** Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
4. **Circuit overloading —** Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of the equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding) —** Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack mounting procedure

The unit can be mounted on any of these rack systems:

- RSU 129: 9.5" deep, 1U rack shelf kit (part # 60-190-01)
- RSB 129: 9.5" deep, 1U basic rack shelf (part # 60-604-01)
- RSU 126: 6" deep, 1U rack shelf kit (part # 60-190-10)
- RSB 126: 6" deep, 1U basic rack shelf (part # 60-604-10)

1. Remove rubber feet if these have been installed on the bottom of the unit.
2. Align the holes in the base of the unit with holes in the shelf. Secure the unit to the shelf with two 4-40 x 3/16" screws in diagonally opposite corners (see the figure below).
3. Install false faceplate(s) or other unit(s) on the rack shelf.
4. Attach the shelf to the rack with the four provided 10-32 x 3/4" bolts



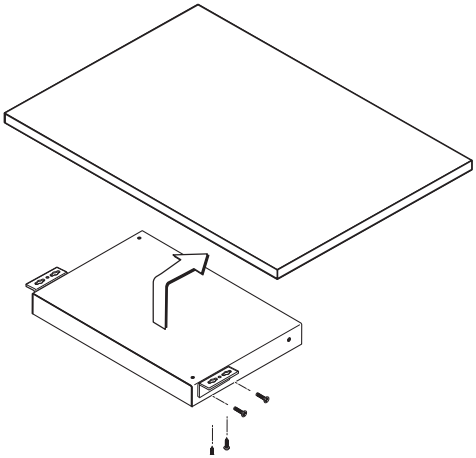
Rack mounting

Under-desk/wall mounting

Mount the unit under a desk or podium or to a wall, using the optional Extron MBU 125 under-desk mounting kit (part # 70-077-01) as follows:

1. Remove rubber feet if these have been attached.
2. Secure the mounting brackets to the scaler, using the four 4-40 x 3/16" screws provided.

NOTE *Because of the position of the mounting holes, the units must be mounted upside-down under the desk or podium, or with the bottom surface facing the wall.*



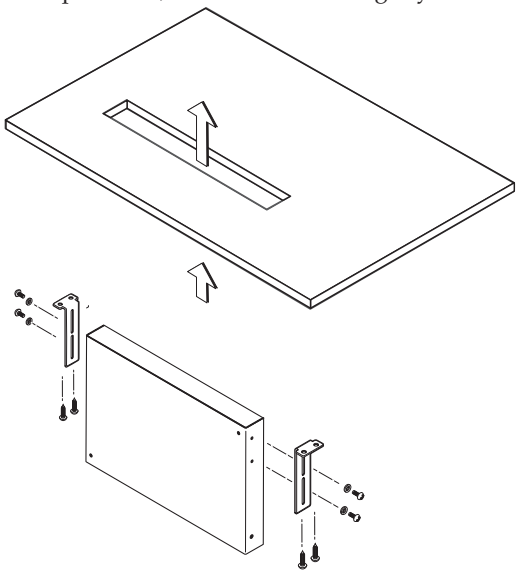
Under-desk mounting

3. Hold the unit, with the brackets attached, against the wall or under the table or other furniture. Mark the location of the bracket s' screw holes on the mounting surface.
4. Drill four pilot holes, each 3/32" (2 mm) in diameter by 1/4" (6.3 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" (6.3 mm) of the screw head protrudes.
6. Guide the mounting screws through the slots in the brackets and place the unit tight against the surface.
7. Slide the unit slightly in or out so that the brackets are resting on the screws and support the weight of the unit; tighten all four screws to secure the unit in place (see the figure above).

Through-desk mounting

Mount the unit through a desk or podium using the optional Extron MBD 129 through desk mounting kit (part # 70-077-02) as follows:

1. Remove rubber feet if these have been attached.
2. Attach the brackets to the scaler, using the four 4-40 screws provided; leave the screws slightly loose.

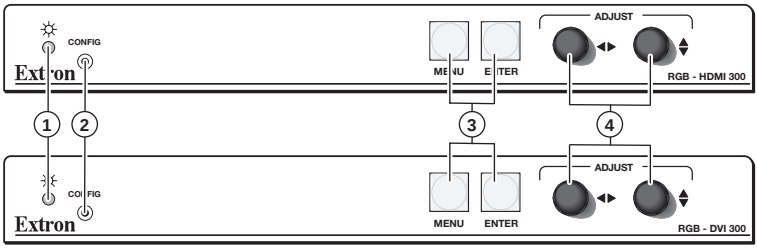


Through-desk mounting

3. Hold the unit in position, under the mounting surface. Mark the location of the four screw holes and the mounting hole to be cut in the table.
4. Remove the table material. Test the fit by inserting the front of the device through the hole. If necessary, use a rasp or coarse file to enlarge the hole.
5. Drill four pilot holes, each 3/32" (2 mm) in diameter by 1/4" deep (6.3 mm) deep.
6. Attach the brackets to the mounting surface, using the four #8 wood screws provided with the kit.
7. Slide the device in or out until the front panel is flush with the table surface. Tighten the screws installed in step 2.
8. If these screws are inaccessible to a screwdriver, mark the location of the unit relative to the brackets, remove the unit and brackets, tighten the screws, and replace the unit.

Front Panel Layout

The illustration below shows the front panel features and controls of the RGB-HDMI 300 (upper image) and RGB-DVI 300 (lower image):



Front panel layout

1. **LED indicator —** A solid green light indicates the unit is receiving power and has an active video input. A solid amber light indicates the unit is receiving power but no video input.

2. **Config port —** Both models can be configured using the Extron Simple Instruction Set (SIS™) commands or through the Signal Processing Products Control Program (SPPCP). Either type of control is provided through this 2.5 mm Tip Ring Sleeve (TRS) serial configuration port or the RS-232 captive screw connector on the rear panel (8). See chapter 4 for instructions about SIS commands and the control software.

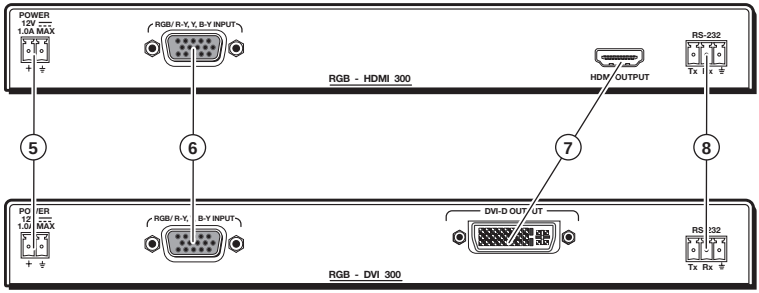
3. **Menu and Enter buttons —** These buttons are used to navigate the menu when configuring the input and output video signals (see page 3-8) and to enable and disable the Front Panel Security Lockout (Executive mode; see page 3-8).

   NOTE *To see menu selections, a display device must be attached to the output of the video converter.*

4. **Rotary encoders —** The horizontal and vertical rotary encoders highlight menu items and adjust the value of items that have been selected from the menu.

Rear Panel Layout

The illustration below shows the rear panel features of the RGB-HDMI 300 (upper image) and RGB-DVI 300 (lower image):



Rear panel layout

⑤ **Power input —** Connect the 12 VDC external power supply (provided) to this 3.5 mm, 2-pole captive screw connector.

⑥ **RGB input —** Connect an analog RGB or HDTV YUV video input signal to this female 15-pin HD connector.

⑦ **Digital signal output —** Both models output digital signals. The RGB-DVI 300 outputs a DVI-D signal through a female DVI-I connector; the RGB-HDMI 300 outputs an HDMI signal through a female HDMI connector.

⑧ **RS-232 input —** Both models can be configured by using SIS commands or through the SPPCP. Either means of control is provided through this 3.5 mm, 3-pole captive screw RS-232 serial port connector or the TRS config port on the front panel (②). See chapter 4 for instructions about SIS commands and control software.

3

Chapter Three

Operation

Input and Output Configuration

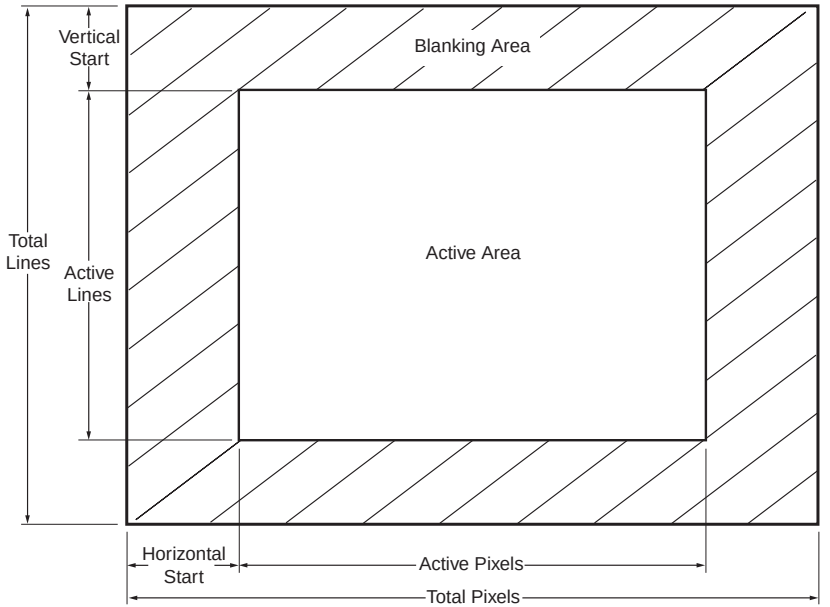
Front Panel Connections and Controls

Rear Panel Connections

Input and Output Configuration

The on-screen display menu and the serial ports can be used to configure the unit's input and output signals. "Front panel menu controls" later in this chapter has instructions on using the front panel menu. Chapter 4 has instructions for SIS commands to the unit.

The figure below shows how some of the settings of a video signal are defined. The active area is the image seen on the screen. The blanking area is the part of each frame containing additional information that allows the display device to position the image.



Input signal

Signal type — RGB or HDTV component (Y, R-Y, B-Y)

Total pixels — The total number of pixels in a line, including blanking on both sides of the input active area (active, horizontal sync width, back porch, and front porch). The values can be adjusted from the default value ± 512.

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

NOTE *Default values for the detected input rate for total pixels, active pixels, and active lines are shown with an asterisk (*) in the on-screen display.*

Start — The horizontal start defines the number of pixels in the blanking area to the left of the active area; the vertical start defines the number of pixels above the active area.

NOTE *The vertical and horizontal starts and the active area must be set to frame the active area of the input signal. If these values are set incorrectly, the scaler may crop trailing edges (right or bottom) or partially mask the leading edges (left or top).*

Active pixels — The number of pixels per line that are inside the active area. The baseline for the active pixels adjustment depends on the horizontal and vertical resolutions of the input signal. The values can be adjusted from the default value ± 512.

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

Active lines — The number of horizontal lines inside the active area. The baseline for the active lines adjustment depends on the input and output resolutions. The values can be adjusted from the default value ± 256.

Phase — The timing of the digital scaler's sampling. Sampling at the optimum pixel phase results in a bright, stable output.

NOTE *Total pixels and active pixels must be correctly set before adjusting phase.*

Output Signal

Auto Image — Automatically sizes and centers the input signal to fill the screen of the output device. Auto Image can be used to configure each input rate separately, or it can be enabled, in the advanced menu, to automatically size and center each new input rate.

Picture position — Sets the horizontal and vertical centers for the output image.

Picture size — Sets the size of the output image so that it can fill the entire display device.

Detail filter — Uses variable filters to increase or decrease the detail and definition of the displayed image. The value can be adjusted on a scale from 0 to 127. The default setting is 64.

Brightness — Brightness adjusts the black level of the image on the screen, on a scale from 0 to 127. The default setting is 64.

Contrast — Contrast adjusts the difference between the input's darkest and brightest settings, on a scale from 0 to 127 (the default is 64).

Table of Output Resolutions and Refresh Rates

Resolution	Refresh Rate (Hz)								
	23.98	24	25	29.97	30	50	59.94	60	75
640 x 480						X		X	X
800 x 600						X		X	X
852 x 480						X		X	X
1024 x 768						X		X	X
1024 x 852						X		X	X
1024 x 1024						X		X	X
1280 x 768						X		X	X
1280 x 800						X		X	X
1280 x 1024						X		X	X
1360 x 765						X		X	X
1360 x 768						X		X	X
1365 x 768						X		X	X
1366 x 768						X		X	X
1365 x 1024						X		X	
1440 x 900						X		X	X
1400 x 1050						X		X	

Resolution	Refresh Rate (Hz)								
	23.98	24	25	29.97	30	50	59.94	60	75
1680 x 1050						X		X	
1600 x 1200						X		X	
1920 x 1200						X		X	
480p							X	X	
576p						X			
720p			X	X	X	X	X	X	
1080i						X	X	X	
1080p	X	X	X	X	X	X	X	X	
2048 x 1080	X	X	X	X	X	X	X	X	
AUTO		Output resolution based on display EDID							
LOCK		Output rate will match input resolution and refresh rate							

Zoom — Zoom enlarges a portion of the scaled image.

NOTE *Zoom values match picture size values.*

Output Resolution and refresh rate — Every display device has an optimal (native) resolution and refresh rate. It is essential that the output resolution and refresh rate match the display device's capabilities. The table on the two previous pages shows the full range of resolutions and refresh rates available for output signals with these scalers. There are two additional settings:

- When Auto is selected, the video converter receives EDID information from the display device and adjusts the output signal to match the requirements of the display
- When Lock is selected, the video converter matches the resolution and refresh rate of the output signal with those of the input signal.

Other

User presets — When contrast, brightness, detail, horizontal and vertical centering, and horizontal and vertical size have been adjusted, the values can be saved as presets. This allows the values for the three most commonly used picture control settings to be instantly recalled, which is useful for handling inputs with different aspect ratios.

Test pattern — Test patterns help in the configuration of the output signal. The available patterns include Color Bars, grayscale, cross-hatch, alternating pixels, crop, 1.33 aspect ratio, 1.78 aspect ratio, 1.85 aspect ratio, 2.35 aspect ratio, and off (no test pattern).

Freeze — When freeze is enabled, the video output is a still image of the last active frame. The output will remain frozen even if the input signal is removed.

Blank — When blank is enabled, no video signal is sent to the output device, although the on-screen display is still available.

Reset — There are two types of reset. Firmware reset returns all options, including the firmware to the factory defaults. Factory reset returns all image options to the factory defaults but keeps the current version of the firmware. For more information, see page 3-17.

Front Panel Connections and Controls

The front panels of both the RGB-DVI 300 and the RGB-HDMI 300 have a green/amber LED indicator, a config port, menu and enter buttons, and two rotary encoders (see page 2-6).

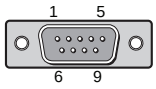
LED indicator

A green light indicates the unit is receiving power and has an active video input. An amber light indicates the unit is receiving power but no video input.

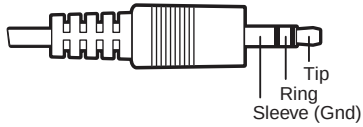
Config port

Both the video scaler/converters accept SIS commands from a host device such as a computer running the HyperTerminal utility or other control system.

To connect the host device to the config port on the front panel, use the optional Extron 9-pin D female to 2.5 mm TRS Configuration Cable (PN 70-335-01). The same port can also be used to provide control by the SPPCP. For more information about SIS and the control software, see chapter 4.



Male DB9 Connector



2.5 mm TRS Connector

Pin Configuration

Male Pin	TRS	RS-232 Function
2	Tip	Transmit (Tx)
3	Ring	Receive (Rx)
5	Sleeve	Ground (⏚)

Control commands can also be sent through the 3-pin captive screw connector on the rear panel (see page 3-20).

NOTE *Only one serial port can be used at a time. If the front port is in use, the rear captive screw connector must be disconnected from the computer or other control device. Likewise, if the captive screw port is in use, the Config port on the front panel must be disconnected from the computer or other control device.*

Front panel menu controls

The menu and enter buttons and rotary encoders are used to configure and optimize the unit's input and output signals.

NOTE *The menus for the RGB-DVI 300 and RGB-HDMI 300 are On-Screen Dipslay (OSD). To see menu selections, a display device must be attached to the output of the video scaler/converter.*

Front panel security lockout (executive mode)

When the front panel security lockout, also known as executive mode, is enabled, all front panel controls are locked. RS-232 control remains available.

Front panel security lockout is enabled by pressing and holding the menu and enter buttons simultaneously for two seconds. It can also be enabled using an SIS command (see page 4-14). When front panel security lockout has been enabled, the following message will appear on-screen for approximately two seconds:

This message also displays if the user attempts to use any of the front panel controls while the executive mode is enabled.

Front panel security lockout is disabled by pressing and holding the menu and enter buttons simultaneously for two seconds. It can also be disabled by sending the appropriate SIS command (see page 4-15). When front panel security lockout has been disabled, the following message will appear on-screen for approximately two seconds:

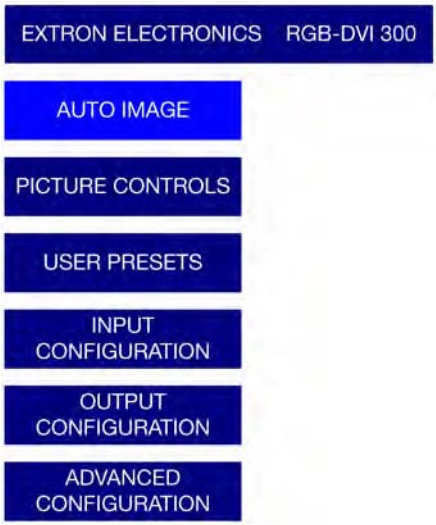
When front panel security lockout is disabled, the unit can be fully configured from the front panel without restrictions.

Main menu

The menu and enter buttons and the two rotary encoders are used to enter and navigate the menu, which is displayed on the output screen.

Press the Menu button to open the menu. A header that identifies the model and the top-level menu appears on the output display.

NOTE *In all following figures the RGB-DVI 300 has been used in the illustrations. Apart from the heading, the RGB-HDMI 300 menu is identical in all respects.*



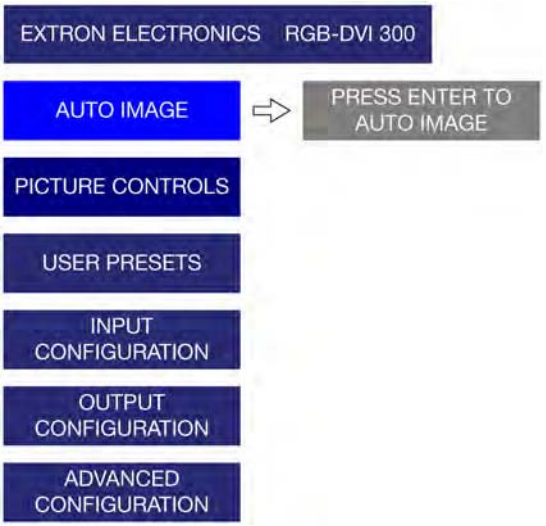
The six options of the top-level menu are Auto-Image, Picture Controls, User Presets, Input Configuration, Output Configuration, and Advanced Configuration.

The option that is currently highlighted appears as white text in a light blue box, with a white border. The other options and the header are shown as white text in a dark blue box. Turn the ▲▼ rotary encoder to move between menu items and highlight the desired option.

Press the Enter to select the highlighted button and move deeper into the menu. Press the Menu button to return to a higher level of the menu system. When a sub-menu item is highlighted, it appears as a light blue box with white text and a white border. To select that item, press the Enter button again. The selected item will appear as a gray box with white text and a white border.

Auto Image

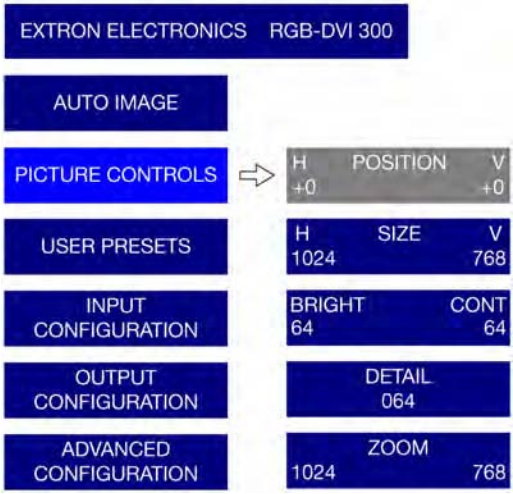
The **Auto Image** function automatically sizes and centers the input to fill the screen. It is activated by pressing the enter button after Auto Image has been selected.



NOTE *This feature initiates a one-time auto image on the current input. Auto image can also be set globally, using the Advanced Configuration menu, to size and center each new input rate, automatically.*

Picture controls

The picture controls sub-menu sets horizontal and vertical centering, sizing, brightness and contrast, and detail (sharpness) and controls the zoom feature. Use the ▲▼ knob to select from the sub-menu, and press the enter button.



The values for **position (H)**, **size (H)**, and **brightness** are adjusted using the ◄► knob. The values for **position (V)**, **size (V)**, and **contrast** are adjusted using the ▲▼ knob. The values for **detail** and **zoom** can be adjusted using either knob.

Zoom locks the aspect ratio as the image is resized. Zoom is pixel based (not percentage based), so the current Zoom values for H and V will match the current Size values for H and V. Once the input has been zoomed, the H and V positions can be adjusted to obtain a panning effect.

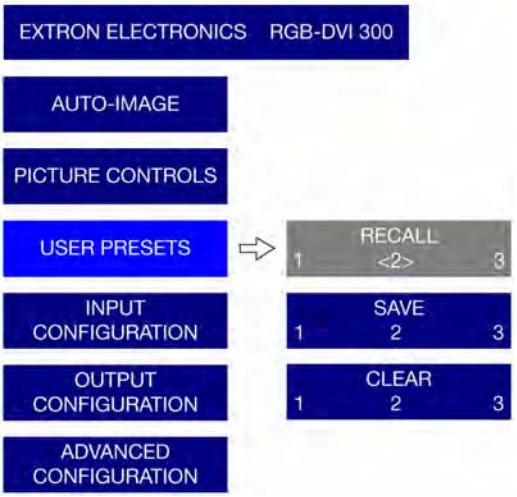
Option	Minimum	Maximum
Position	Depends on output resolution	
Size	Depends on output resolution	
Brightness	0	127
Contrast	0	127
Zoom	Depends on output resolution	

User presets

User presets are a user defined set of picture control settings for up to three commonly used aspect ratio settings. When picture controls and input configuration have been set, as described elsewhere in this section, the current values for contrast,

brightness, detail, horizontal and vertical centering, and horizontal and vertical size can be saved. **User presets can be saved on one input rate and recalled for a different input rate.**

To **save** user presets, navigate to the User Presets > Save sub-menu. Use the ▲▼ knob to select user preset 1, 2, or 3 and press Enter to save, and press Menu to exit.



When a preset has been saved, it can be recalled or cleared using the **Recall** or **Clear** options. Select a memory preset (1, 2, or 3) to be recalled or cleared and press Enter.

NOTE *The brackets <> around the current selection are only visible when that function (recall, save, or clear) has been activated. Attempts to recall a memory preset that has not yet been saved, and "Invalid Preset" message will appear on the on-screen display.*

User Presets	
	H position
	V position
Contrast	H size
Brightness	V size
Detail	Zoom

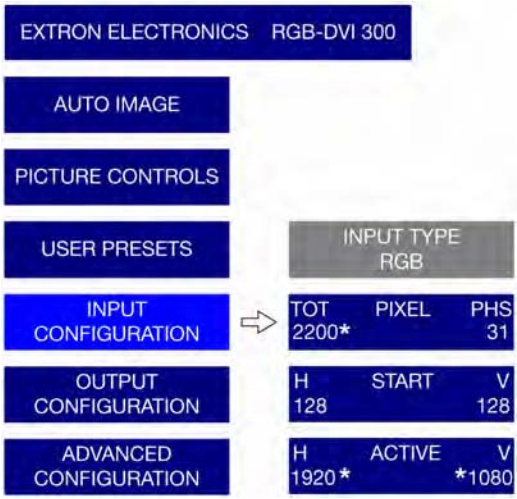
Input Presets		
Input type	H start	H position
Total Pixel	V start	V position
Contrast	H active	H size
Brightness	V active	V size
Detail	Phase	Zoom

An additional sixteen presets (input presets) are available through SIS commands only. Input presets save picture control settings (the same values saved by user presets) and input configuration values (input type, total pixels, horizontal and vertical starts, horizontal and vertical active areas and phase). The exact settings of a source are saved and can be recalled each

time that source is used. **Input presets are only valid for the source/resolution that was active when the preset was saved.**

Input configuration

The input configuration submenu is used to adjust **input type**, total pixels, phase, horizontal and vertical video start, and horizontal and vertical active areas.



NOTE *On the on-screen menu display, default values for the current input rates, total pixels, H active, and V active are accompanied by an asterisk (*).*

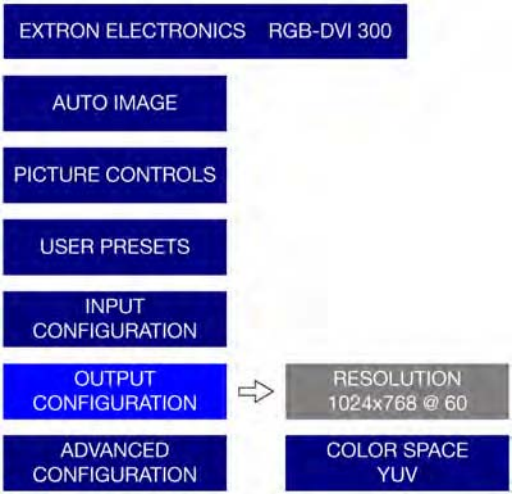
With the **start** or **active** options, use the ◄► knob to adjust the horizontal values and the ▲▼ knob to adjust the vertical values. **Total pix** and **phase** are adjusted by the ◄► and ▲▼ knobs, respectively.

Option	Minimum	Maximum
Input	RGB (default) or YUV	
Total Pix	default value (depends on input resolution) ± 512	
Phase	0	31
Horizontal start Vertical start	0 0	255 255
Active Pixels	default value (depends on input resolution) ± 512	
Active Lines	default value (depends on input resolution) ± 256	

Output configuration

The output configuration is used to select a scaler output rate from the various available resolution and refresh rates. Both the RGB-DVI 300 and the RGB-HDMI 300 have a large range of combinations of resolution and refresh rate (see table on pages 3-4 and 3-5).

Select output configuration from the main menu. Use the ◄► knob to select a resolution. Then use the ▲▼ knob to select a refresh rate. Apply the settings by pressing the enter button, or they will be applied automatically after 5 seconds.



In addition to the **resolutions** and **refresh rates** available in the menu, two other options are available:

Auto — The unit receives EDID information from the display device and adjusts the output signal to match the requirements of the display.

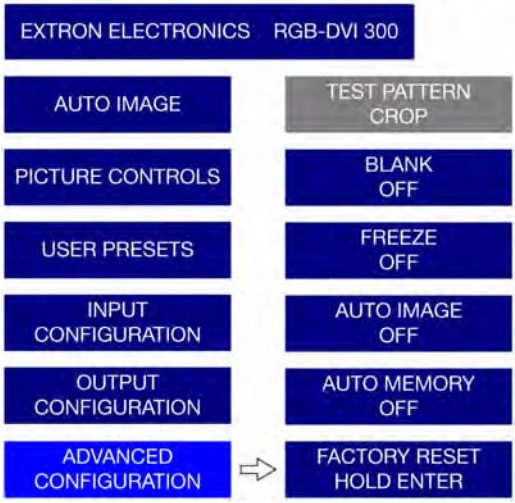
Lock — The unit matches the resolution and refresh rate of the output signal with those of the input signal.

When **color space** is selected, the two available options are RGB (default) and YUV. Use the up/down rotary encoder to select the desired value and then apply the setting by pressing the enter button.

Advanced configuration

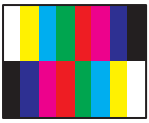
The advanced configuration menu configures global settings, including Test Patterns, Blank, Freeze, Global Auto Image, Auto Memory, and Factory Reset.

The advanced configuration is activated by pressing the menu button to display the main menu, using either rotary encoder to select advanced configuration and pressing the enter button.



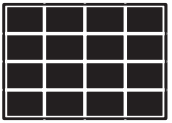
Test pattern can be set to Color Bars, grayscale, crosshatch, alternating pixels, crop, four different aspect ratios, or off. These patterns are used to configure the output signal.

Color Bars

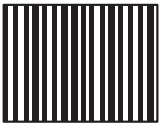


Split Grayscale

4x4 Crosshatch



Alternating Pixels



Crop

1.33 Aspect

1.78 Aspect

1.85 Aspect

2.35 Aspect

NOTE *All aspect ratio patterns also include a 1 pixel wide crop pattern at the edge of the video output raster.*

When **Blank** is enabled, there is no video output (aside from the on-screen display).

When **Freeze** is on, the video output is a still picture of the last active frame.

The **Auto Image** and **Auto Memory** functions work interactively. Either function can be on or off, giving four possible combinations.

Auto Image on and Auto Memory on — If the Auto Image function is on, the output signal is sized and centered to fill the screen. If the Auto Memory function is on, these parameters are saved. The next time the unit encounters the same signal, the parameters saved by the Auto Memory are applied automatically.

When all 64 memories are filled, the oldest is overwritten by new ones.

Auto Image off and Auto Memory on — If the Auto Image is off, the unit applies the values from the input lookup table. If no further adjustments are made, the Auto Memory does not save an entry, since all the parameters already match the input lookup table. However, if the user adjusts the input manually or carries out an Auto Image, the new parameters is automatically stored by the Auto Memory function.

Auto Image on and Auto Memory off — Each new signal is compared with the values in the input lookup table and an Auto Image carried out. However, the parameters are not saved and the next time this signal is encountered, it is, once again, compared with the lookup table and Auto Imaged.

Auto Image off and Auto Memory off — Each new signal is set up with the default values. There is no Auto Image and the parameters are not saved by the Auto Memory.

To reset all user settings, but keep the current version of the firmware, enter the menu, select advanced configuration, and **Factory Reset**. Press and hold the enter button until the "Factory Reset" message is displayed on the screen. This is the same as the Zap SIS command (Esc ZXXX ←), as shown on page 4-16.

To reset all options, including the original shipped firmware to the factory defaults, press and hold the enter button while applying power; the "Firmware Reset" message is displayed on the on-screen display.

When the output display has an incompatible output rate, it is often difficult to get an image on the display. An additional reset mode allows the user to toggle between two almost universally applicable output rates of 1024 x 768 at 60 Hz (XGA) and 720p at 60 Hz.

Applying power to the unit while holding the Menu button initially changes to output rate to 1024 x 768 at 60 Hz. On the next occasion power is applied to the unit while holding the Menu button, the output rate toggles to 720p at 60 Hz.

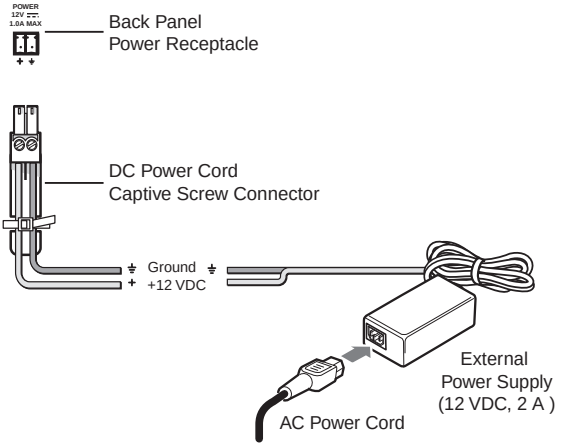
These values were chosen because most PC monitors with a digital input will accept an XGA signal and most other consumer/professional displays will accept 720p.

Rear Panel Connections

The rear panels of both the RGB-DVI 300 and the RGB-HDMI 300 have a power input, RGB/HDTV YUV signal input, digital signal output, and RS-232 port.

Power Connections

1. Connect the captive screw connector from the supplied 12 VDC power supply into the power receptacle.

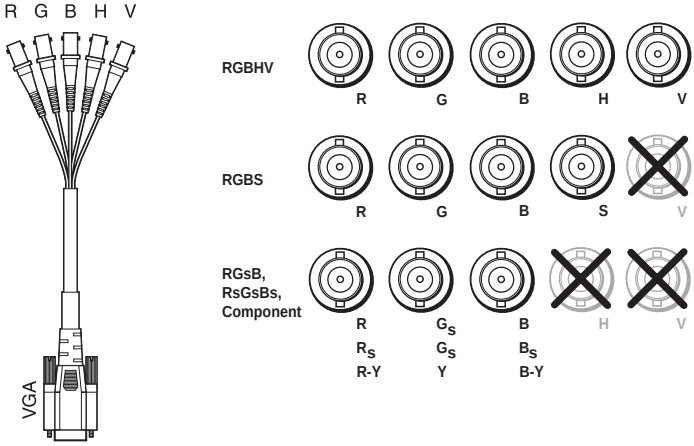


2. Connect the AC power cord of the power supply unit to a 110 or 220 VAC electrical source.

Input Connections

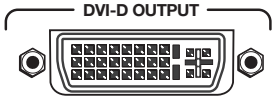
The RGB-DVI 300 and RGB-HDMI 300 accept RGB (RGBHV, RGBS, RGsB, and RsGsBs) and HDTV component (YUV) signals. Connect the input signal to the 15 pin female HD connector on the back of the scaler.

If necessary, use a BNC to VGA adapter cable, such as the Extron SY BNCM series (PN 26-533-xx; see the figure below).



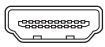
Output Connections

Use the Female DVI-I connector (RGB-DVI 300) or the Female HDMI connector (RGB-HDMI 300) to pass the output signal to the display device.



Rear panel DVI connector (RGB-DVI 300)

NOTE *Although the RGB-DVI 300 has a rear panel DVI-I connector, the output signal is DVI-D (digital only).*



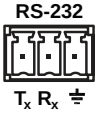
HDMI OUTPUT

Rear panel HDMI connector (RGB-HDMI 300)

RS-232 Connection

Both the video scaler/converters accept SIS commands from a host device such as a computer running the HyperTerminal utility or other control system.

The same port can also be used to provide control by the SPPCP. For more information about SIS and the SPPCP, see chapter 4.



3 Pin Captive Screw Connector

Pin	Function
T_x	Transmit data
R_x	Receive data
⏚	Signal ground

NOTE *The wiring in the RS-232 cables must cross over so that the transmit port of the control device connects with the receive port of the video converter and vice versa.*

Control commands can also be sent through the TRS Config port on the front panel (see page 3-7).

NOTE *Only one serial port can be used at a time. If the front port is in use, the rear captive screw connector must be disconnected from the computer or other control device. Likewise, if the captive screw port is in use, the config port on the front panel must be disconnected from the computer or other control device.*

Chapter Four

Controls

Introduction to SIS™

Symbols used in this manual

Command/response table for SIS commands

Signal Processing Products Control Program

Introduction to SIS™

Both the RGB-DVI 300 and the RGB-HDMI 300 accept SIS commands from a host device such as a computer running the HyperTerminal utility or other control system. The host device can be connected to the 3-pin captive screw connector on the rear panel or to the Config port on the front panel. To connect to the config port, use the optional Extron 9-pin D female to 2.5 mm TRS Configuration cable (part # 70-335-01).

The protocol is 9600 baud, 8 data bit, 1 stop bit, and no parity.

NOTE *The wiring in the RS-232 cables crosses over so that the video scaler/converter Tx connects with the control device Rx and vice versa.*

NOTE *Only one serial port can be used at a time. If the front port is in use, the rear captive screw connector must be disconnected from the computer or other control device. Likewise, if the captive screw port is in use, the config port on the front panel must be disconnected from the computer or other control device.*

SIS commands consist of a string (one or more characters per command field). Unless otherwise stated, upper and lower case characters may be used interchangeably. Commands do not require any special characters to begin or end the command string. Each response from the video converter ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string.

When the RGB-DVI 300 or RGB-HDMI 300 is first switched on, depending on the model, it sends the message:

(c) COPYRIGHT 2009, EXTRON ELECTRONICS,
RGB-DVI 300, V x.xx, 60-906-01↵ or

(c) COPYRIGHT 2009, EXTRON ELECTRONICS,
RGB-HDMI 300, V x.xx, 60-907-01↵

where V x.xx is the firmware version number and 60-90x-01 is the part number.

Symbols used in this manual

When programming in the field, certain characters are most conveniently represented by their hexadecimal rather than their ASCII values. The table below shows the hexadecimal equivalent of each ASCII character:

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

↵ — carriage return with line feed

← — carriage return (no line feed)

• — space character

Esc — Escape key

The Xn values defined in this section are the variables used in the fields of the command response table (see page 4-6).

X1 — Input video format: 1 = RGB (default) 2 = YUV

X2 — Auto image, blanking, freeze or executive mode status: 0 = disabled 1 = enabled

X3 — Horizontal start value: from 0 to 255 (the midpoint of 128 is the default value in the input lookup tables)

X4 — Vertical start value: from 0 to 255 (the midpoint of 128 is the default value in the input lookup tables)

X5 — Pixel phase value: from 1 to 31 (default = 16)

X6 — Total pixels value for high resolution video is the default value ± 512 (the default value depends on the the input resolution)

X7 — Active pixels value for high resolution video is the default value ± 512 (the default value depends on the the input resolution)

X8 — Active lines value for high resolution video is the default value ± 256 (the default value depends on the the input resolution)

X10 — Picture adjustment (contrast, brightness, and detail): from 0 to 127 (default = 64)

X11 — Horizontal and vertical shift values (depend on output resolution)

X12 — Horizontal and vertical size (depend on output)

X15 — Output resolutions:

1 = 640 x 480	17 = 1680 x 1050
2 = 800 x 600	18 = 1600 x 1200
3 = 852 x 480	19 = 1920 x 1200
4 = 1024 x 768 (default)	20 = 480p
5 = 1024 x 852	21 = 576p
6 = 1024 x 1024	22 = 720p
7 = 1280 x 768	23 = 1080i
8 = 1280 x 800	24 = 1080p
9 = 1280 x 1024	25 = 2048 x 1080
10 = 1360 x 765	30 = AUTO (display EDID controlled). Not valid for EDID emulation.
11 = 1360 x 768	31 = LOCK (output rate locked to input resolution and refresh). Not valid for EDID emulation.
12 = 1365 x 768	32 = OUTPUT RATE (VGA EDID emulation matches current ouput rate — valid for VGA EDID emulation only; not valid for output rate setting.)
13 = 1366 x 768	
14 = 1365 x 1024	
15 = 1440 x 900	
16 = 1400 x 1050	

X16 — Output refresh rates:

0 = Auto, Lock, or "Output Rate" EDID emulation	5 = 30 Hz
1 = 23.98 Hz	6 = 50 Hz
2 = 24 Hz	7 = 59.94 Hz
3 = 25 Hz	8 = 60 Hz (default)
4 = 29.97 Hz	9 = 75 Hz

X17 — Ouput format (color space)
0 = RGB (default) 1 = YUV

X18 — User presets: from 1 to 3

X19 — Input presets: from 1 to 16

NOTE *Input presets are available only through SIS commands.*

The parameters saved in memory presets and input presets are:

User Presets	
	H position
	V position
Contrast	H size
Brightness	V size
Detail	Zoom

Input Presets		
Input type	H start	H position
Total Pixel	V start	V position
Contrast	H active	H size
Brightness	V active	V size
Detail	Phase	Zoom

X20 — Test patterns:

0 = Off (default)	5 = Crop
1 = Color Bars	6 = 1.33 Aspect Ratio
2 = Grayscale	7 = 1.78 Aspect Ratio
3 = 4 x 4 Crosshatch	8 = 1.85 Aspect Ratio
4 = Alternating Pixels	9 = 2.35 Aspect Ratio

X21 — RGB delay (0 to 50 in tenths of a second – 0 to 5 seconds; default 0.5 seconds). The screen blanks during transition between inputs of different resolutions, to avoid glitches.

X22 — On-screen menu time out in seconds (default = 10)
0 = menu never times out; 1 to 64 in seconds

X23 — Horizontal and Vertical Frequencies (format is three digits with single decimal and leading zeros).

X24 — Internal temperature (in degrees Celsius)

X25 — Off/disabled (0) or on/enabled (1)

X26 — Overscan: applied only to SMPTE (480p - 1080p) input rates.
0 = 0% (Default for RGB input type) A "true" auto image is executed on SMPTE inputs
1 = 2.5% (Default for YUV input type) An auto image command will snap to a 2.5% table; no true auto image
2 = 5% An auto image command will snap to a 5% table; no true auto image

X27 — User Preset Availability: 0 = empty; 1 = saved

Error messages

E10 = Invalid command	E14 = Not valid for this config.
E11 = Invalid preset number	E17 = Invalid command for signal type
E13 = Invalid parameter	E22 = Busy

NOTE *If the RGB-DVI 300 or RGB-HDMI 300 does not support or recognize the entered commands, nothing will happen and no response is issued.*

Command/response table for SIS commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Input video format			
Set Format	1*X1\	Typ1* X1↵	Sets input format X1. 1 = RGB (default) 2 = YUV
View Format	1\	TypX1↵	View current video input format.
Auto image			
Enable	1*1A	Img1*1↵	Auto image input when selected.
Disable	1*0A	Img1*0↵	Disable auto image.
Execute	A	Img↵	Execute auto image on current input.
View auto image status	1A	Img1* X2↵	View current auto image setting X2. 0 = Off (Disabled) 1 = On (Enabled)
VGA input EDID Emulation			
Specify a value	EscX15*X16EDID←	Edid X15*X16↵	Sets EDID resolution X15 and refresh rate X16 (see tables on page 4-4). (Default 32*0 sets EDID to current output and refresh rates). **NOTE** *An incompatible combination of resolution and refresh rate results in an error message.*
View	EscEDID←	Edid X15*X16↵	View EDID resolution and refresh rate.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Horizontal start			
Set a horizontal start value	Esc X3 HSRT ←	Hsrt X3 ↵	Set the horizontal location of the first active pixel X3 (from 0 to 255) for active input.
Increment horizontal start value	Esc +HSRT ←	Hsrt X3 ↵	Increases the horizontal start value by 1.
Decrement horizontal start value	Esc -HSRT ←	Hsrt X3 ↵	Decreases the horizontal start value by 1.
View horizontal start value	Esc HSRT ←	Hsrt X3 ↵	View the horizontal location of the first active pixel.
Vertical start			
Set a vertical start value	Esc X4 VSRT ←	Vsrt X4 ↵	Set the vertical location of the first active pixel X4 (from 0 to 255) for active input.
Increment vertical start value	Esc +VSRT ←	Vsrt X4 ↵	Increases the vertical start value by 1.
Decrement vertical start value	Esc -VSRT ←	Vsrt X4 ↵	Decreases the vertical start value by 1.
View vertical start value	Esc VSRT ←	Vsrt X4 ↵	View the vertical location of the first active pixel.
Pixel phase			
Specify a value	Esc X5 PHAS ←	Phas X5 ↵	Adjust pixel phase to specified value X5 (from 1 to 31) for active input.
Increment pixel phase value	Esc +PHAS ←	Phas X5 ↵	Increases pixel phase value by 1.
Decrement pixel phase value	Esc -PHAS ←	Phas X5 ↵	Decreases pixel phase value by 1.
View pixel phase value	Esc PHAS ←	Phas X5 ↵	View the pixel phase value.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Total pixels			
Specify a value	Esc X6 TPIX ←	Tpix X6 ↵	Adjust total number of pixels to specified value for active input. X6 Total pixels = default value ± 512
Increment total number of pixels	Esc +TPIX ←	Tpix X6 ↵	Increases total number of pixels by 1.
Decrement total number of pixels	Esc -TPIX ←	Tpix X6 ↵	Decreases total number of pixels by 1.
View total number of pixels	Esc TPIX ←	Tpix X6 ↵	View total number of pixels.
Active pixels			
Specify a value	Esc X7 APIX ←	Apix X7 ↵	Adjust number of pixels to specified value for active input. X7 Active pixels = default value ± 512
Increment number of active pixels	Esc +APIX ←	Apix X7 ↵	Increases number of active pixels by 1.
Decrement number of active pixels	Esc -APIX ←	Apix X7 ↵	Decreases number of active pixels by 1.
View number of active pixels	Esc APIX ←	Apix X7 ↵	View number of active pixels.
Active lines			
Specify a value	Esc X8 ALIN ←	Alin X8 ↵	Adjust number of active lines to specified value for active input. X8 Active lines = default value ± 256
Increment number of active lines	Esc +ALIN ←	Alin X8 ↵	Increases number of active lines by 1.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Decrement number of active lines	Esc-ALIN←	AlinX8↵	Decreases number of active lines by 1.
View number of active lines	EscALIN←	AlinX8↵	View number of active lines.
Video mute			
Enable mute	1B	Vmt1↵	Blanks selected input.
Disable mute	0B	Vmt0↵	Displays selected input.
View mute status	B	VmtX2↵	View blanking status X2. 0 = Off (Disabled) 1 = On (Enabled)
Contrast			
Specify contrast level	EscX10CONT←	ContX10↵	Sets contrast level to X10 (from 0 to 127).
Increment the contrast level	Esc+CONT←	ContX10↵	Increases the contrast value by 1.
Decrement the contrast level	Esc-CONT←	ContX10↵	Decreases the contrast value by 1.
View the current contrast level	EscCONT←	ContX10↵	View the current contrast value.
Brightness			
Specify brightness level	EscX10BRIT←	BritX10↵	Sets brightness level to X10 (from 0 to 127)
Increment the brightness level	Esc+BRIT←	BritX10↵	Increases the brightness value by 1.
Decrement the brightness level	Esc-BRIT←	BritX10↵	Decreases the brightness value by 1.
View the current brightness level	EscBRIT←	BritX10↵	View the current brightness value.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Detail filter			
Specify detail level	Esc X10 HDET←	HdetX10↵	Sets detail level to X10 (from 0 to 127).
Increment the detail level	Esc+HDET←	HdetX10↵	Increases the detail level by 1.
Decrement the detail level	Esc-HDET←	HdetX10↵	Decreases the detail level by 1.
View the current detail level	EscHDET←	HdetX10↵	View the current detail level.
Horizontal shift			
Specify horizontal shift value	EscX11HCTR←	HctrX11↵	Sets horizontal centering to X11 (depends on output resolution).
Increment horizontal shift value	Esc+HCTR←	HctrX11↵	Increases horizontal centering by 1.
Decrement horizontal shift value	Esc-HCTR←	HctrX11↵	Decreases horizontal centering by 1.
View the current horizontal shift value	EscHCTR←	HctrX11↵	View current horizontal centering value.
Vertical shift			
Specify vertical shift value	EscX11VCTR←	VctrX11↵	Sets vertical centering to X11 (depends on output resolution).
Increment vertical shift value	Esc+VCTR←	VctrX11↵	Increases vertical centering by 1.
Decrement vertical shift value	Esc-VCTR←	VctrX11↵	Decreases vertical centering by 1.
View the current vertical shift value	EscVCTR←	VctrX11↵	View current vertical centering value.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Horizontal size			
Specify horizontal size	Esc X12 HSIZ ←	Hsiz X12 ↵	Sets horizontal sizing to X12 (depends on output resolution).
Increment horizontal size	Esc +HSIZ ←	Hsiz X12 ↵	Increases horizontal sizing by 1.
Decrement horizontal size	Esc -HSIZ ←	Hsiz X12 ↵	Decreases horizontal sizing by 1.
View current horizontal size	Esc HSIZ ←	Hsiz X12 ↵	View current horizontal sizing value.
Vertical size			
Specify vertical size	Esc X12 VSIZ ←	Vsiz X12 ↵	Sets vertical sizing to X12 (depends on output resolution).
Increment vertical size	Esc +VSIZ ←	Vsiz X12 ↵	Increases vertical sizing by 1.
Decrement vertical size	Esc -VSIZ ←	Vsiz X12 ↵	Decreases vertical sizing by 1.
View current vertical size	Esc VSIZ ←	Vsiz X12 ↵	View the current value of vertical sizing.
Zoom mode			
Zoom in	Esc +ZOOM ←	Zoom X12 * X12 ↵	Zooms in, making window larger. The first X12 is the horizontal size, the second X12 is the vertical size.
Zoom out	Esc -ZOOM ←	Zoom X12 * X12 ↵	Zooms out, making window smaller.
View current zoom value	Esc ZOOM ←	Zoom X12 * X12 ↵	View the current zoom value.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Output scaler rate			
Set output rate	Esc X15 * X16 RATE ↵	Rate X15 * X16 ↵	Selects scaler resolution X15 and refresh rate X16 (see tables on page 4-4). **NOTE** *An incompatible combination of resolution and refresh rate results in an error message. See the table on pages 3-4 and 3-5.*
View output rate	Esc RATE ↵	Rate X15 * X16 ↵	View current output resolution and refresh rate.
Video output format			
Set	Esc X17 VTPO ↵	Vtpo X17 ↵	Sets the video output format (color space) to X17 (0 = RGB, 1 = YUV).
View	Esc VTPO ↵	Vtpo X17 ↵	View current video output format.
User presets			
Save preset	1* X18 ,	1Spr X18 ↵	Saves current settings for selected input as user preset X18 (1 to 3). **NOTE** *The final character of the command is a comma (,).*
Recall user preset	1* X18 .	1Rpr X18 ↵	Recalls user preset X18 (1 to 3) for selected input. **NOTE** *The final character of the command is a period (.).*

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Input presets			
Save preset	2*X19,	2SprX19↵	Saves current settings as memory preset X19 (1 to 16). **NOTE** *The final character of the command is a comma (,).*
Recall preset	2*X19.	2RprX19↵	Recalls input preset X19 (1 to 16). **NOTE** *The final character of the command is a period (.).*

The parameters saved in Memory Presets and Input Presets are:

Memory Presets	
	H position
	V position
Contrast	H size
Brightness	V size
Detail	Zoom

Input Presets		
Input type	H start	H position
Total Pixel	V start	V position
Contrast	H active	H size
Brightness	V active	V size
Detail	Phase	Zoom

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Auto memories			
Enable	Esc 1AMEM ←	Amem1 ↵	Sets auto memory on. Previous settings for incoming signals are auto recalled.
Disable	Esc 0AMEM ←	Amem0 ↵	Sets auto memory to off. Defaults to input lookup table values to configure input.
View Auto Memory status	Esc AMEM ←	Amem X2 ↵	View current auto memory status X2. 0 = Off (Disabled) 1 = On (Enabled)
Test pattern			
Set Test Pattern	Esc X20 TEST ←	Test X20 ↵	Set test pattern to X20 (see list of test patterns on page 4-5).
View Test Pattern	Esc TEST ←	Test X20 ↵	View current test pattern status.
Freeze			
Enable	1F	Frz1 ↵	Freezes input.
Disable	0F	Frz0 ↵	Unfreezes input.
View freeze status	F	Frz X2 ↵	Shows the current freeze status X2. 0 = Off (Disabled) 1 = On (Enabled)
RGB delay time			
Set delay time	Esc X21 VDLY ←	Vdly X21 ↵	Set RGB delay time X21 (in tenths of a second - 0 to 5 seconds).
View delay time	Esc VDLY ←	Vdly X21 ↵	View current RGB delay setting

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Front panel security lockout (executive mode)			
Enable	1X	Exe1↵	Enables front panel security lockout (executive mode; limits front panel adjustments).
Disable	0X	Exe0↵	Disables front panel security lockout (restores ability to make adjustments from font panel).
View front panel security lockout status	X	Exe[X2]↵	View current front panel security lockout status. 0 = Off (Disabled) 1 = On (Enabled)
Menu time out			
Set menu time out	[Esc][X22]MDUR ←	Mdur[X22] ↵	Sets the on-screen menu time out [X22] default = 10 seconds. (0 = menu never times out; 1 to 64 in seconds).
View menu time out status	[Esc]MDUR ←	Mdur[X22]↵	View the current menu time out status.
Overscan Mode (Applies only to SMPTE (480p - 1080p) input rates)			
Set value	[Esc][X1]*[X26]OSCN ←	Oscn[X1]*[X26]↵	Sets input type [X1] (1 = RGB; 2 = YUV) to overscan mode [X26] (0 = 0%; 1 = 2.5%; 2 = 5%).
View status	[Esc][X1]OSCN ←	Oscn[X1]*[X26]↵	View overscan mode status for input type [X1].

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
Information requests			
General information	I/i	Vid 1 • Typ X1 • Blk X2 • Pre X27 X27 X27 • Hrt X23 • Vrt X23 ↵	View input type X1, mute status X2, the availability of the three user presets X27 (0 = empty; 1 = saved), input horizontal scan rate X23, and input vertical scan rate X23.
Query model name	1I	RGB-DVI 300↵ or RGB-HDMI 300↵	
Query model description	2I	Extron Electronics Digital Video Scaler↵	
Query firmware version	Q	x.xx↵	View the firmware version.
Query firmware version (full)	*Q	x.xx.xxxx↵	View the full firmware version.
Query part number	N	xx-xxx-xx↵	View the unit part number. (RGB-DVI 300 is 60-906-01; RGB-HDMI 300 is 60-907-01)
View internal temperature	Esc 20STAT↵	Stat20•X24↵	View the internal temperature of the unit (in degrees Celsius).
Reset (zap)/erase commands			
Reset all settings to factory	Esc zXXX↵	Zpx↵	Resets all user device settings and image adjustments.
Reset image settings to factory	Esc zI↵	Zpi↵	Resets all image adjustments of scaler.

Signal Processing Products Control Program

All the features of the RGB-DVI 300 and RGB-HDMI 300 that can be controlled by SIS commands, can also be controlled by a computer that is running the Signal Processing Products Control Program (SPPCP).

Installing the SPPCP

The control program is available on the disk provided with the RGB-DVI 300 or RGB-HDMI 300. It can also be downloaded from the Extron Web site (www.extron.com).

The minimum system requirements for installing the program on the computer are:

Operating System — Microsoft® Windows® 2000 or later

CPU — Intel® Pentium® II processor with a 400 MHz clock speed

Hard Disk space — 10 MB

Memory — 256 MB of RAM

Device connection — Serial COMM Port

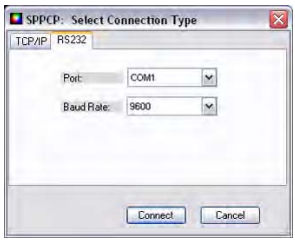
When the installation program has been located on the Extron Software Product disk or the Extron Web site, double click to start it and follow the on-screen instructions to download and install the program.

Running the SPPCP

The computer can be connected to the video scaler using a 9-pin D female connector from the PC to either the RS-232 captive screw connectors on the rear panel or the Config port on the front panel of the RGB-DVI 300 or RGB-HDMI 300.

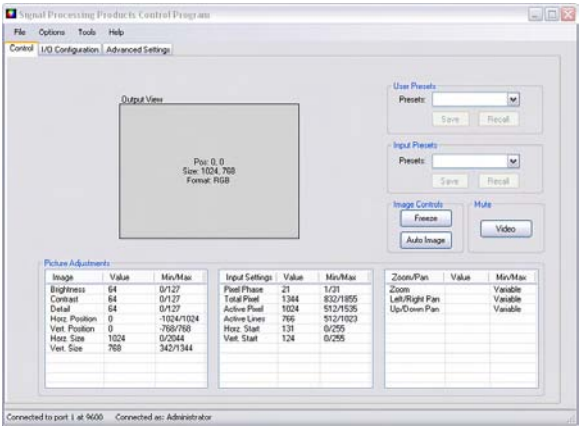
To start the program, click on the desk-top icon (shown at right) or click on the Windows **Start** button and select **All Programs** > **Extron Electronics** > **Signal Processing**"> **Signal Processing Products Control Program**.

First, the "Select Connection Type" dialog box opens:



Select the **RS-232 tab** and then select the computer port (typically **COM1** or **COM3**) and the baud rate to use (the default rate is 9600).

Click on **Connect** and program opens to the main screen. By default the control tab is selected:



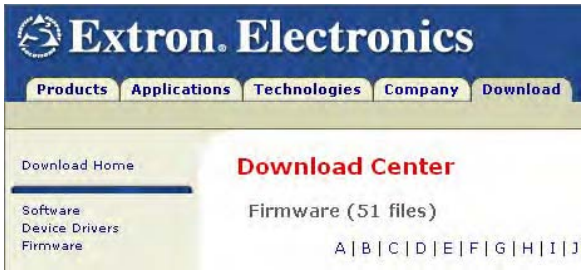
For complete instructions on controlling the RGB-DVI 300 or RGB-HDMI 300 using the SPPCP, refer to the Help File, which can be selected from the **Help** drop-down menu or by pressing the F1 key.

Firmware Upgrades

Firmware for the RGB-DVI 300 or RGB-HDMI 300 can be upgraded using the Extron Firmware Loader utility by following the steps below:

1. Power on the scaler and a computer with internet access.
2. Connect the computer to the video scaler through either the front Config port or the rear RS-232 captive screw connectors.
3. If necessary, install the Extron Firmware Loader utility. This is on the software disk that ships with unit or can be downloaded, free of charge, from the Extron web site (www.extron.com).
4. From the same site, download the firmware for the scaler.

   To download either the Firmware Loader or the firmware for the scaler, click on the Download tab on the Extron home page:

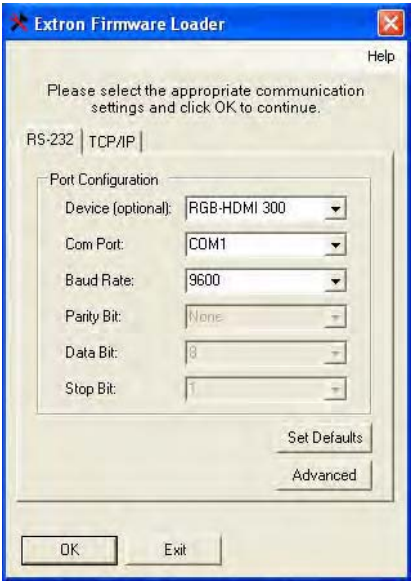


   Make a note of the folder in which the firmware file is saved. The file name is in the format RGB_XXX_300_v1.01.BIN.

NOTE *The same firmware can be used with either the RGB-DVI 300 or the RGB-HDMI 300.*

5. Open the Extron Firmware Loader by clicking on the desktop icon.

6. Choose the **RS-232** tab.
7. Select the correct com port and baud rate (default rate is 9600) from the drop-down menus and click **OK**.



8. Click the **Browse** button and navigate to the folder where the firmware file was saved (see step 4).
9. Click **Upload**. The firmware transfer begins and takes approximately 3 minutes.

NOTE *During the firmware upload, the front panel LED and video output are disabled.*

10. When the "*Transfer Complete!*" message appears, click the **Exit** button and exit the Firmware Loader.

Appendix A

Reference Information

Specifications

Included Parts

Accessories

Reference Information

Specifications

Video input

Number/signal type	1 RGBHV, HDTV component video (Y, R-Y, B-Y)
Connectors	1 female 15-pin HD
Nominal level	1.0 Vp-p for Y of component video 0.7 Vp-p for RGB and for R-Y and B-Y of component video
Minimum/maximum levels	Analog: 0.0 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	30 kHz to 100 kHz
Vertical frequency	50 Hz to 120 Hz
Resolution range	640x480 to 1920x1200*, 480p, 576p, 720p, 1080i, 1080p

NOTE **Only the reduced blanking version of the 1920x1200 resolution is sampled at full bit rate.*

Formats	RGB and HDTV Y, R-Y, B-Y
Return loss	<-30 dB @ 5MHz

Video processing

Digital sampling	24 bit, 8 bits per color; 162 MHz standard
Colors	16.78 million

Video Output

Number/signal type	
RGB-DVI 300	1 single link DVI-D
RGB-HDMI 300	1 single link HDMI
Connectors	
RGB-DVI 300	1 female DVI-I (digital output only)
RGB-HDMI 300	I female HDMI

Scaled resolutions	640x480 [6,8,9], 800x600 [6,8,9], 852x480 [6,8,9], 1024x768 [6,8,9], 1024x852 [6,8,9], 1024x1024 [6,8,9], 1280x768 [6,8,9], 1280x800 [6,8,9], 1280x1024 [6,8,9], 1360x765 [6,8,9],1360x768 [6,8,9], 1365x768 [6,8,9], 1365x1024 [6,8], 1366x768 [6,8,9], 1400x900 [6,8,9], 1400x1050 [6,8], 1680x1050 [6,8], 1600x1200 [6,8], 1920x1200 [6,8], 480p [7,8], 576p [6], 720p [3,4,5,6,7,8], 1080p [1,2,3,4,5,6,7,8], 1080i [6,7,8], 2048x1080 [1,2,3,4,5,6,7,8] [1] = at 23.98 Hz, [2] = at 24 Hz, [3] = at 25 Hz, [4] = at 29.97 Hz, [5] = 30 Hz, [6] = 50 Hz, [7] = at 59.94 Hz, [8] = 60 Hz, [9]= 75 Hz; *or* automatic based on display device or current input rate; *or* locked to the input's resolution and refresh rate
Formats	RGB and YCbCr digital video

Sync

Input type	RGBHV, RGBS, RGsB, bi-level YUVp component video or tri-level HDTV component video
Output type	DVI-D or HDMI digital video
Standards	DVI 1.0, HDMI 1.2
Input level	2.75 V to 5.0 Vp-p
Input impedance	10k ohms

Control/remote — Decoder/Scaler

Serial control ports	1 RS-232, 3.5 mm captive screw connector, 3-pole (rear panel) 1 RS-232, 2.5 mm mini stereo jack (front panel)
Baud rate and protocol	9600, 8 data bits, 1 stop bit, no parity
Serial control pin configurations.	1 = TX, 2 = RX, 3 = GND
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

General

External power supply	100 VAC to 240 VAC, 50/60 Hz external; to 12 VDC, 2A, regulated
Power input requirements	12 VDC, 1.0 A
Temperature/humidity	Storage -40 to +158 °F (-40 to +70 °C)/ 10% to 90% non-condensing Operating +32 to + 122 °F (0 to +50 °C)/ 10% to 90% non-condensing
Cooling	Convection, side and top vents
Mounting	
Rack mount	Yes, with optional 1U, 9.5" deep rack shelf or 1U, 6" deep rack shelf
Furniture mount	Furniture or wall mountable using optional mounting kit
Enclosure type	Metal
Enclosure dimensions	1.0" H x 8.75" W x 6.0" D (half rack wide) (2.5 cm H x 22.2 cm W x 15.2 cm D) (Depth excludes connectors and knobs)
Product weight	1.6 lbs (0.7 kg)
Shipping weight	4 lbs (2 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, CUL, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI
Environmental	Complies with the appropriate requirements of WEEE
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are ±10%*

NOTE *Specificatons are subject to change without notice.*

Included Parts

Included part	Replacement part number
RGB-DVI 300	60-906-01
or RGB-HDMI 300	60-907-01
Rubber feet (not attached) (4)	
External 12 VDC power supply (1)	
3.5 mm, 3-pole captive screw connector for RS 232 connections	
IEC Power cord (1)	
Setup Guide - RGB-DVI 300 and RGB-HDMI 300 (1)	
Extron software disk (1)	

Accessories

Optional accessories	Part number
RSU 129 (1U 9.5" deep rack shelf kit)	60-190-01
RSB 129 (1U 9.5" deep basic rack shelf)	60-604-01
RSU 126 (1U 6" deep rack shelf kit)	60-190-10
RSB 126 (1U 6" deep basic rack shelf)	60-604-10
MBU 125 (under desk mounting kit)	70-077-01
MBD 129 (through desk mounting kit)	70-077-02

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 USA
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Europe, Africa, and the Middle East:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

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

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

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

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), 65.6383.4400 (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.

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