Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

VSC 500/700/700D

Video Scan Converter

68-633-01 **Rev. C**
04 05

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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.

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.

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.

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.

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

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.

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.

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.

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

Vorsicht

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

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

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

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

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

Lítium-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.

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

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.

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

Europe, Africa, and the Middle East:

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

Asia:

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

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), 65.6383.4400 (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.

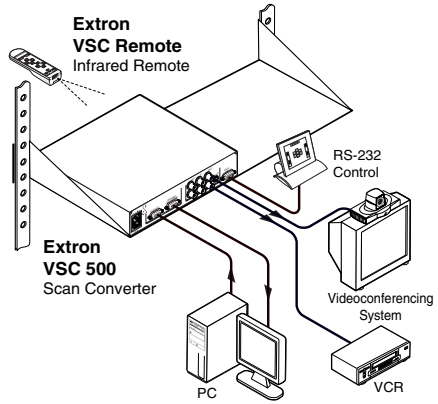
Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect 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.

Quick Start Guide — VSC 500/700/700D

CAUTION *Installation and service must be performed by authorized personnel only. These units must be installed in accordance with national and local electrical codes.*

To install the VSC 500/700/700D, follow these steps and see the appropriate section of this manual:



Step 1

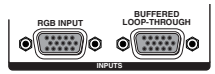
Disconnect all power from the VSC and any input/output devices. If the scan converter is to be set on top of a table top or other furniture, install the self-adhesive feet on the bottom corners of the VSC. If the VSC is to be rack mounted, mount the scan converter in a rack. See *Mounting the VSC* in chapter two for more details.

Step 2

Attach an input device and a loop-through device to the rear panel of the VSC 500.

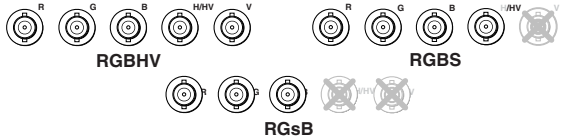
RGB input (VGA) connector

Buffered loop-through (VGA) connector



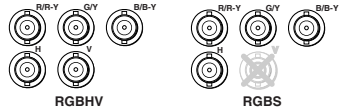
Attach an input device and a loop-through device to the rear panel of the VSC 700/700D.

RGB input connectors and buffered loop-through connectors



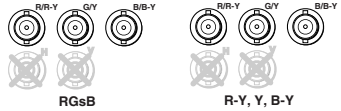
Step 3

Attach an RGB output device to the rear panel BNC connectors.



Step 4

Attach an S-video device to the S-video mini DIN connector and an SDI device (700D only) to the SDI BNC connector.



Quick Start Guide — VSC 500/700/700D, cont'd

Step 5

Plug the VSC, and input and output devices into a grounded AC source, and turn on the input and output devices.

Step 6

Use the LCD menu screens or RS-232 programming to configure the VSC. See chapter two for installation and operation procedures, and see chapter three for programming information.

Step 7

Use the front panel Adjust horizontal (◄►) and Adjust vertical (▲▼) adjustment knobs to center the image, then press the Size button and rotate the knobs to fill the display screen. See *Front Panel Features* in chapter two for further details.

Step 8

Use the front panel Menu and Next buttons to navigate to the Filters menu. Using the front panel Adjust horizontal (◄►) or Adjust vertical (▲▼) adjustment knobs, adjust the flicker level from the Flicker filter submenu and adjust the detail level from the Horizontal filter submenu. See *Filters menu* in chapter two for further details.

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Chapter One

Introduction

About the VSC 500/700/700D

Features

About the VSC 500/700/700D

The Extron VSC 500, 700, and 700D are computer-to-video scan converters that can convert computer images up to 1600 x 1200 for output as composite video, S-video, component video, SDI (VSC 700D), and/or RGB video. Applications include videoconferencing, video recording, and viewing of images on an NTSC or PAL monitor or other display device.

Key features include automatic setup of centering and sizing controls, horizontal filtering, an LCD window for user-friendly menu selections, memory presets (IR remote control feature), and a buffered loop-through for local monitor output. The VSCs can be controlled via the front panel, the optional IR remote control, or RS-232 commands.

Features

Autoscanning — Automatically recognizes and down converts the incoming computer image, up to 1600 x 1200 resolution and 100 kHz horizontal and 120 Hz vertical scan rates.

Input — Via a 15-pin HD female VGA connector (VSC 500) and BNC connectors (VSC 700/700D).

Outputs — Simultaneously outputs RGB or component video, composite video, S-video, and SDI (VSC 700D).

Memory — Recall up to eight user presets that can be stored and accessed via the included IR remote.

Auto-Image™ setup — Automatic sizing and centering function to fill the output display screen.

Sizing and centering controls — Allow for user-friendly positioning and sizing of the image on-screen.

Freeze/Reset button — The freeze function locks the output display to the current image that is stored in memory.

Front panel security lockout — Locks out all front panel functions except centering (shifting) to prevent accidental changes to adjustments.

RS-232 remote control — An RS-232/RS-422 control port utilizes Extron's Simple Instruction Set (SIS™) of basic ASCII commands.

Genlocking — Allows for the synchronizing of multiple input devices to a common external timing signal so that the switch between input devices will be clean.

Chapter Two

Installation and Operation

Application Example

Mounting the VSC

Rear Panel Connectors and Cabling

Genlock and Vertical Interval Switching

Optimizing the System

Front Panel Features

Menus, Configuration, and Adjustments

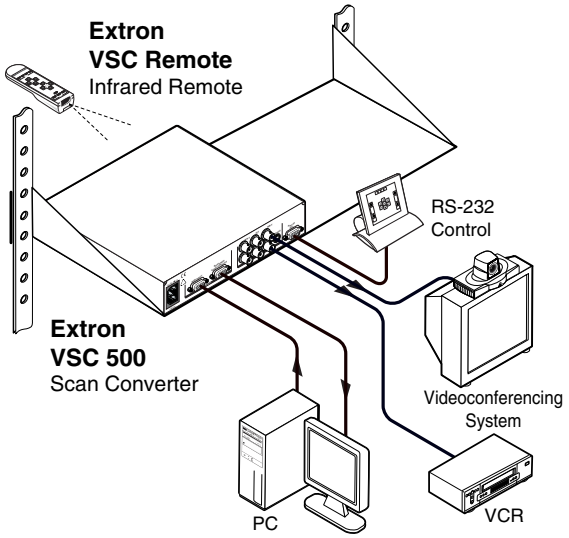
Additional Functions

Troubleshooting

VSC Infrared Remote Control

Application Example

The illustration below is one example of using the VSC 500.



Mounting the VSC

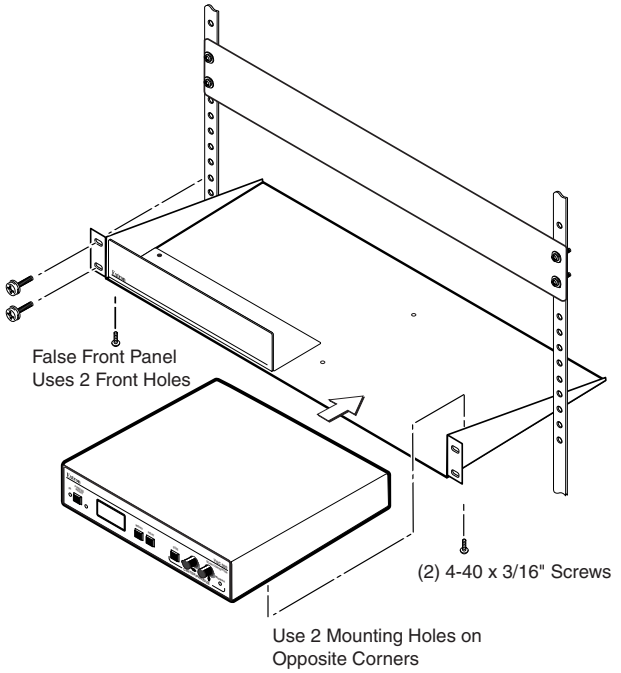
Select tabletop placement or rack mounting. Follow the appropriate installation instructions on the following pages.

Tabletop/desktop placement

For tabletop or desktop placement only, install the self-adhesive rubber feet/pads (provided) onto the four corners of the bottom of the enclosure.

Rack mounting

1. If feet were installed on the bottom of the VSC, remove them.
2. Place the scan converter on one half of the 1U (one unit high, one unit wide) rack shelf (part #60-190-01). Align the front of the VSC with the front of the shelf, and align the threaded holes on the bottom of the VSC 500/700 with the holes in the rack shelf.
3. Attach the VSC to the rack shelf with the two provided 4-40 x 1/8 inch machine screws. Insert the screws from the underside of the shelf, and securely fasten them into diagonally opposite corners, as shown in the following illustration.



4. Attach the false front panel (provided with the rack shelf) to the unoccupied side of the rack (as shown above), or install a second half-rack width device in that side by repeating steps 1 – 3.
5. Attach the rack shelf to the rack using four 10-32 x ¾ inch bolts (provided). Insert the bolts through #10 beveled washers, then through the holes in the rack ears and rack, as shown above.

Rear Panel Connectors and Cabling

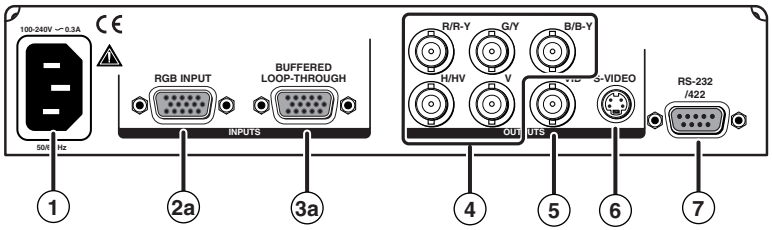


Figure 2-1 — VSC 500 rear panel connectors

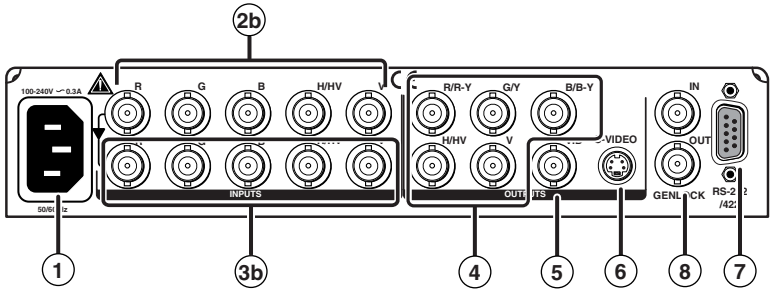


Figure 2-2 — VSC 700 rear panel connectors

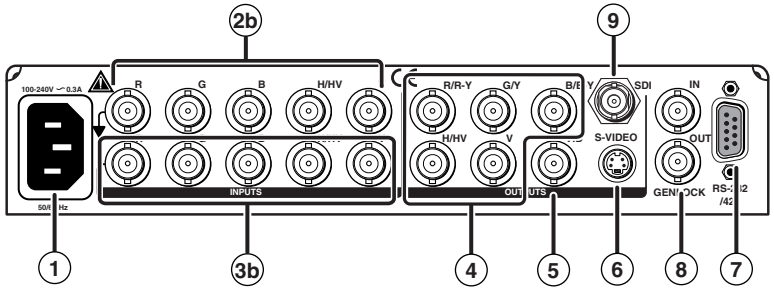


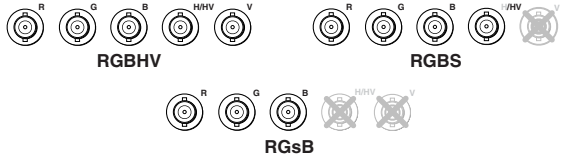
Figure 2-3 — VSC 700D rear panel connectors

NOTE *RGB, component video, composite video, S-video, and SDI video (VSC 700D only) are output simultaneously.*

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

(2a) **RGB (computer) input VGA connector —** Connect a computer video source (RGBHV, RGBS, RGsB) via this female VGA 15-pin HD connector. Pins 4, 10, and 11 are internally grounded for ID bit termination.

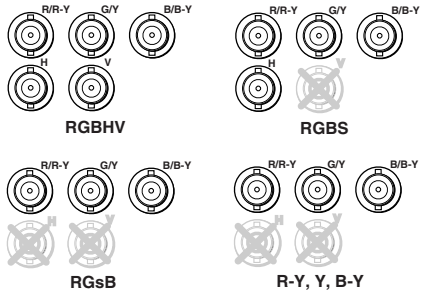
(2b) **RGB (computer) input BNC connectors —** Connect a computer video source (RGBHV, RGBS, RGsB) via these five female BNC connectors. Connect cables for the appropriate signal type, as shown here.



(3a) **Buffered loop-through VGA connector —** For local monitor output of the input, connect a monitor to this female VGA 15-pin HD connector.

(3b) **Buffered loop-through BNC connectors —** For local monitor output of the input, connect a monitor to these five female BNC connectors. Connect cables for the appropriate signal type as shown in (2b) above.

(4) **Output BNC connectors —** Connect coaxial cables from a display device to these five female BNC connectors for RGBHV, RGBS, RGsB, or component video output, as follows:



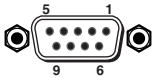
(5) **Composite video output connector —** Using a coaxial cable, connect a composite video display device to this female BNC connector.

(6) **S-video output connector —** Connect an S-video output device to this female 4-pin mini DIN connector.

⑦ **RS-232/RS-422 port —** This connector provides for two-way RS-232/RS-422 communication. See chapter three, "Serial Communication", for information on how to install and use the control software and SIS commands.

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

The rear panel RS-232/RS-422, 9-pin connector has the following pin assignments:



DB9 Pin Locations
Female

Pin	RS-232 function	Description
1	–	No connection
2	Tx	Transmit data
3	Rx	Receive data
4	Tx 2	Transmit data
5	Gnd	Signal ground
6	–	No connection
7	–	No connection
8	Rx 2	Receive data
9	–	No connection

Pin	RS-422 function	Description
1	–	No connection
2	Tx-	Transmit ground
3	Rx-	Receive ground
4	–	No connection
5	Gnd	Signal ground
6	–	No connection
7	Rx+	Receive data
8	Tx+	Transmit data
9	–	No connection

⑧ **Genlock input and output connectors —** Connect an external blackburst signal to the input (In) female BNC connector for genlocking the video signal in broadcast or other sync-critical applications.

Connect any downstream equipment, which requires genlocking, to the output (Out) female BNC connector to route the blackburst signal throughout the system in broadcast or other sync-critical applications.

See *Genlock and Vertical Interval Switching* in this chapter.

⑨ **SDI (serial digital interface) connector —** Connect an SDI signal to this female BNC connector.

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 it can also be 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

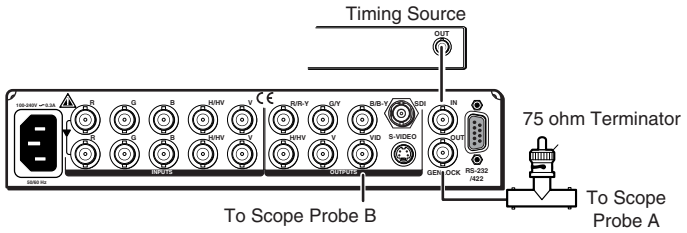
Genlock differs from simple vertical interval switching in that an external device (a black burst generator) generates a reference sync signal for the system, and every device that uses that signal has its output signal's horizontal and subcarrier phases adjusted to exactly match that of the generator to allow 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.

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

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.*

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 signals to the VSC, 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.

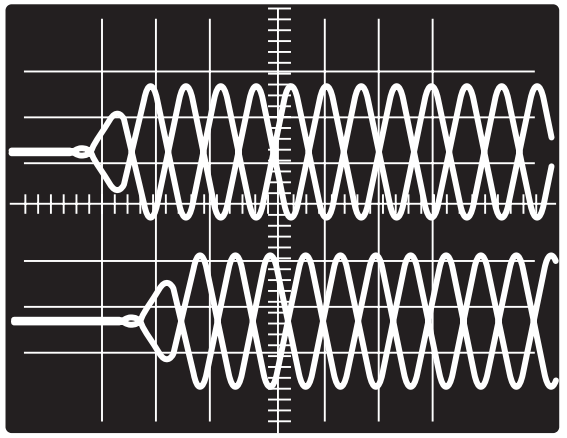


5. Connect scope probe B to the VSC's composite video output connector.
6. Using the instructions for the scope you are using, set the scope to view the signal's horizontal phases. Adjust the horizontal phase by rotating the Adjust horizontal (◄►) knob (see the "Genlock menu" section in this chapter). 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 the "Oscilloscope displays" section in this chapter.
7. Set the scope to view the subcarrier signals. Adjust the sub phase by rotating the Adjust vertical (▲▼) knob until there is a zero phase difference between the genlock signal and the NTSC/PAL output (see the "Genlock menu" section in this chapter).
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 VSCs 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 VSC 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.

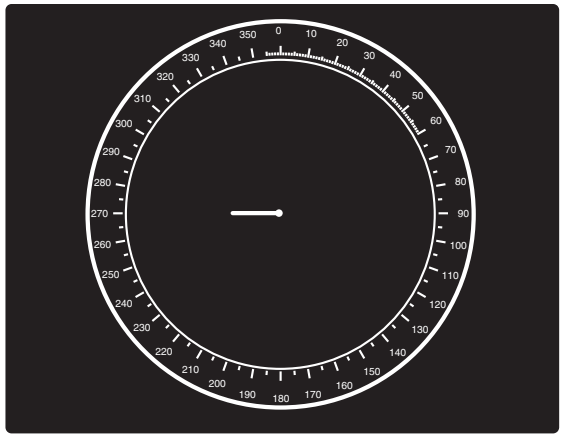
The following diagram shows the genlock input signal (top) and an out-of-alignment NTSC composite sync output signal (bottom) displayed on a waveform monitor to check for alignment. When the phases are aligned, the wave peaks on the bottom waveform should line up with those in the reference signal above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



Superimposed waveforms

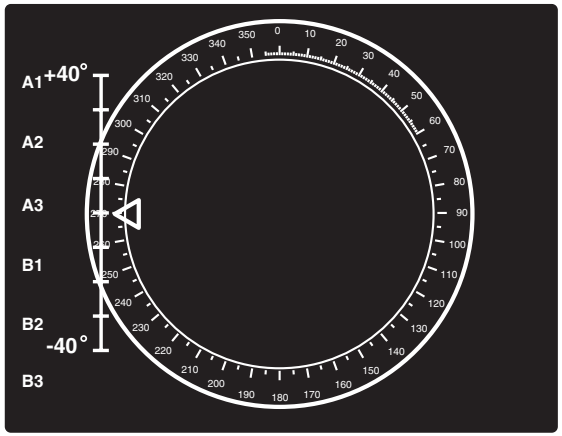
With this method there is no way to know if the signals are 180° out of phase. A delayed sweep on a time-based scope would allow a more accurate display of the input and output signal phase relationships.

A vectorscope is more accurate than a waveform monitor. The following diagram 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 rotating the Adjust horizontal (◄►) knob until the difference between the two vectors is 0°. This example shows black burst only (with no color). The burst vector is pointing to the left from the center.



Vectorscope screen during horizontal phase adjustment

The following diagram 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 0º (indicated in the figure by the triangle).



Vectorscope screen during color subcarrier phase adjustment

Optimizing the System

For optimal performance, follow the steps in this section in order when setting up the VSC and its input and output devices.

Select the output standard

1. From the Video standard submenu, select the output standard. See the *Video standard submenu* section in this chapter.
   - NTSC (default)
   - PAL

Size the image to fill the screen

1. Press the Size button on the front panel. See the *Front Panel Features* section in this chapter.
2. Rotate the Adjust horizontal and Adjust vertical adjustment knobs to resize the displayed image. Observe the picture on screen as you adjust the controls. The Min/Max LED will light red whenever the minimum or maximum limit of an adjustment knob is reached.
3. Press the Size button again to turn the size feature off.
4. Center the picture by rotating the Adjust horizontal and Adjust vertical adjustment knobs. Observe the picture on screen as you adjust the controls. The Min/Max LED will light red whenever the minimum or maximum limit of an adjustment knob is reached.
5. Repeat steps 1 through 4 as needed.

Select the filtering levels

1. From the Filters menu, select the Flicker filter adjustment submenu. See the *Filters menu* section in this chapter. Rotating the Adjust horizontal or Adjust vertical adjustment knob and observing the image, select the filtering level that produces the least amount of flickering.
2. From the Horizontal filter adjustment submenu, rotate the Adjust horizontal or Adjust vertical adjustment knob to reduce loss of detail in the scan converted image.
3. From the Encoder adjustment submenu, rotate the Adjust horizontal or Adjust vertical adjustment knob to select from among encoding levels to maintain image sharpness.

NOTE *If the filters are set before the image size is adjusted, you must set the filters again after adjusting the image size.*

Front Panel Features

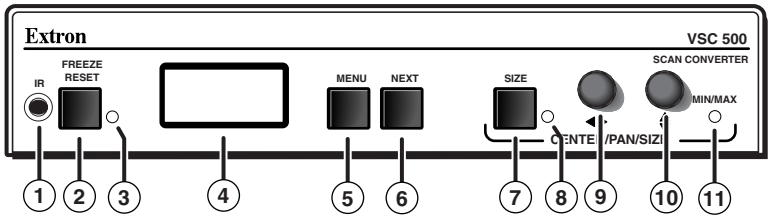


Figure 2-4 — VSC front panel features

(1) **Infrared remote sensor —** This sensor is used to receive infrared (IR) signals from the IR remote control. The IR remote control must be pointed directly at this sensor for best results. See the *VSC Infrared Remote Control* section in this chapter.

(2) **Freeze/Reset button —** Press this button to "freeze" or lock the output display of the scan-converted image to the current image. While in this mode, all front panel controls will be disabled and the LED will light green. Pressing this button again will reset (disable) the freeze function and enable the front panel controls.

Pressing this button while in the sizing, centering (shifting), or filtering menus will reset those menu settings to the factory default. See the *Size function* section, *Shift function* section, and *Filters menu* section in this chapter.

NOTE *The scan converter stores the current input image and will not drop the frozen output display when the input signal is lost.*

The image on the buffered loop-through display will not be frozen.

(3) **Freeze/Reset LED —** When the Freeze/Reset button is pressed, this indicator lights green.

(4) **LCD —** This two-row liquid crystal display provides a way to see the menus and options for setting up the scan converter.

(5) **Menu button —** Press this button to enter the setup main menus and to move from menu to menu.

(6) **Next button —** Press this button to enter a specific submenu of a selected main menu.

NOTE *Press the Next and Size buttons simultaneously for two seconds to enable/disable the* ***front panel security lockout*** *feature. When this feature is enabled, adjustments and changes to the scan converter setup cannot be made from the front panel controls, but centering adjustments can still be made using the horizontal and vertical adjustment knobs. See the* Front panel security lockout (executive mode) *section in this chapter.*

NOTE *Pressing the Menu button while applying power to the VSC will reset the VSC to factory default settings. See* Unit reset function *in this chapter.*

(7) **Size button —** Press this button and rotate the horizontal and vertical adjustment knobs to resize the displayed image horizontally and vertically.

(8) **Size LED —** When the Size button is pressed, this indicator lights green.

(9) **Horizontal adjustment knob (◄►) —** In the menu system, rotate this knob to scroll through menu options and make adjustments. Horizontal sizing and centering are also adjusted with this knob when the image size does not exceed screen size. When the image size exceeds screen size, horizontal panning can be adjusted from the Zoom menu (see *Zoom menu* in this chapter).

(10) **Vertical adjustment knob (▲▼) —** In the menu system, rotate this knob to scroll through menu options and make adjustments. Vertical sizing and centering can be adjusted with this knob when the image size does not exceed screen size. When the image size exceeds screen size, vertical panning can be adjusted from the Zoom menu (see *Zoom menu* in this chapter).

(11) **Min(imum)/Max(imum) LED —** This indicator lights red whenever the minimum or maximum limit of an adjustment using the horizontal (◄►) or vertical (▲▼) adjustment knob has been reached.

Menus, Configuration, and Adjustments

VSC configuration and adjustments can be performed by using the Windows-based control program (see chapter three for details) or by using the front panel controls and the menus that are displayed on the VSC's LCD screen.

Moving through menus by using front panel controls

Menu button — Press the Menu button to activate menus and to scroll to the main menus. After ten seconds of inactivity, the VSC will time-out and return to the default menu cycle.

Next button — Press the Next button to move between the submenus of a selected main menu.

Adjust (◄►, ▲▼) knobs — In configuration mode rotate the Adjust horizontal **(◄►)** knob and Adjust vertical **(▲▼)** knob to scroll through submenu options and to make adjustment selections. Refer to the flowcharts in this chapter and to specific sections for explanations on knob adjustments.

Menu overview

The default menus appear on the LCD when no adjustments are actively being made. They cycle between the screen showing the name of the VSC (VSC 500/700/700D) and the screen that shows the horizontal and vertical frequencies of the input signal, as shown below.

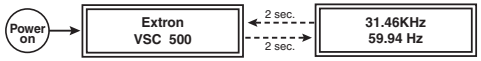


Figure 2-5 — Default menu cycle with input signal

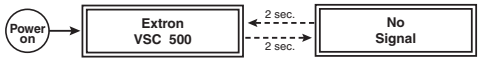


Figure 2-6 — Default menu cycle without input signal

NOTE *From any menu or submenu, after ten seconds of inactivity the VSC will save all adjustment settings and time-out to the default menus.*

The main menus are as shown in the following flowcharts. The main menus for the VSC 500, 700, and 700D are identical except for the additional genlocking menu for the VSC 700/700D. Use the Menu button to scroll between main menus.

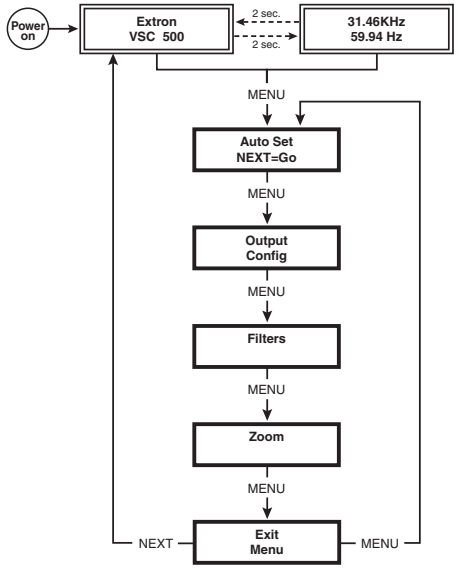


Figure 2-7 — Main menus for the VSC 500

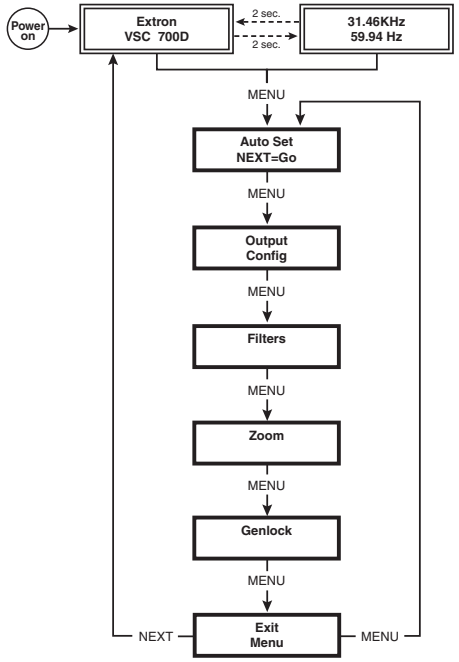


Figure 2-8 — Main menus for the VSC 700/700D

Auto Imaging menu (Auto Set)

The following flowchart illustrates the Auto-Image™ feature. Pressing the Next button will display the submenu and automatically size and center the displayed image to fill the output screen.

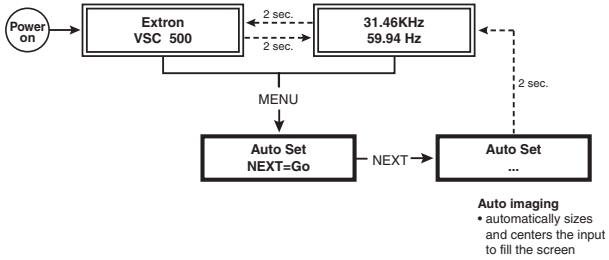


Figure 2-9 — Auto imaging menu

NOTE *If you press the Menu button while a submenu is active, the next main menu will become active. For example, the menu will change from the Auto Imaging submenu to the Output Configuration main menu.*

NOTE *To return to the default menu cycle, let the VSC time-out for 10 seconds, or press the Menu button until the Exit Menu menu appears, then press the Next button.*

Output Configuration menu (Output Config)

The following flowchart provides an overview of the Output Configuration menu.

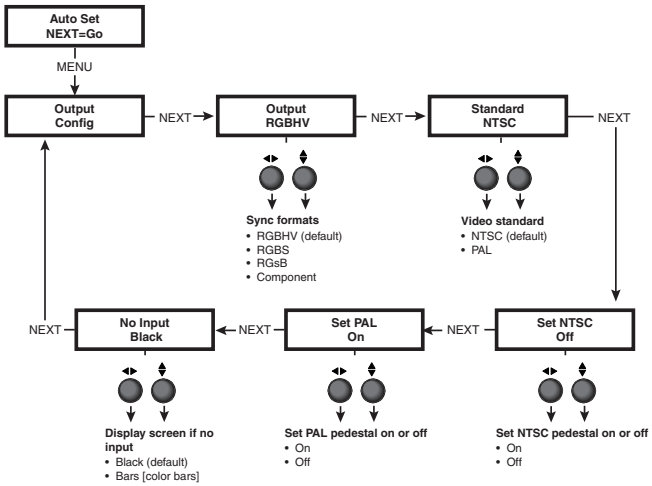


Figure 2-10 — Output configuration menu

Output signal submenu (Output)

The VSC will simultaneously output RGB, Composite video, S-video, and SDI (VSC 700D only). The RGB type must be selected from this submenu.

The VSC Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to select from among the following sync formats:

- RGBHV (default)
- RGBS
- RGsB
- Component

Video standard submenu (Standard)

The VSC offers a choice of video standards. Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to select from among the following video standards:

- NTSC (default)
- PAL

Set NTSC pedestal submenu (Set NTSC)

The pedestal for NTSC video format may be turned on or off. See the note below. Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to turn the pedestal On or Off.

NOTE *Pedestal is an offset that separates the active video from the blanking level. When pedestal is set to Off, black and blanking level are the same because there is no longer an offset between blanking level and active video.*

Set PAL pedestal submenu (Set PAL)

The pedestal for PAL video format may be turned on or off. See the note above. Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to turn the pedestal On or Off.

No input signal display type submenu (No Input)

When no input is present, the VSC offers two types of outputs. Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to select from among the following display types when no input signal is present:

- Black screen (default)
- Bars (color bars)

Filters menu (Filters)

The following flowcharts provides an overview of the Filters menu.

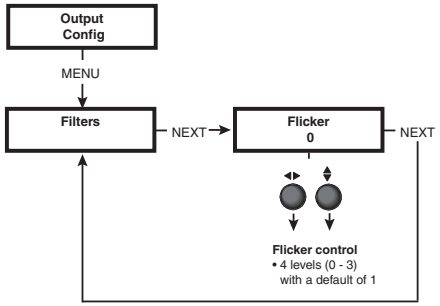


Figure 2-11 — VSC 500 Filters menu

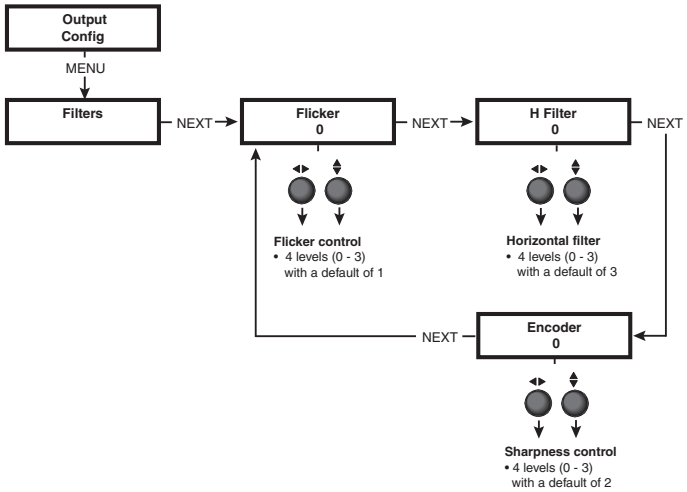


Figure 2-12 — VSC 700/700D Filters menu

Flicker filter adjustment submenu (Flicker)

Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to select from among four levels (0 to 3) of filtering to reduce display output flicker. The default is 1.

Horizontal filter adjustment submenu (H Filter)

Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to select from among four levels (0 to 3) of horizontal filtering to reduce loss of detail in the scan converted video image. The default is 3.

Encoder adjustment submenu (Encoder)

Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to select from among four levels (0 to 3) of encoding to maintain image sharpness. The default is 2.

Zoom menu (Zoom)

The following flowchart provides an overview of the Zoom menu.

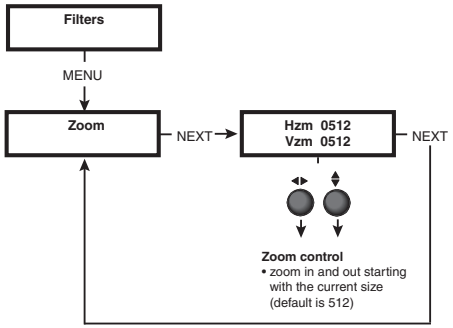


Figure 2-13 — Zoom menu

Zoom in/out adjustment submenu (Zoom)

Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to adjust the zoom settings of a displayed image. The zoom adjustment increases or decreases the overall size of an image and is based on the current size setting. See *Front Panel Features* in this chapter for a description of the Size button. The default size is 512 both horizontally and vertically.

NOTE *The default value for horizontal and vertical size is 0512. The default values for the horizontal and vertical shift are 2048 and 1024, respectively. The actual minimum and maximum values will vary and are based on the incoming scan rate.*

Genlock menu (Genlock)

The following flowchart describes the Genlock menu. Genlocking is available on the VSC 700/700D.

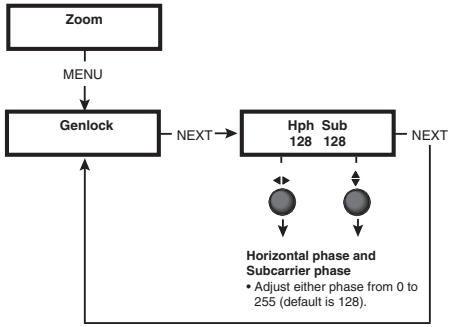


Figure 2-14 — VSC 700/700D Genlock menu

Horizontal and Subcarrier Phase submenu (Hph Sub)

Rotate the Adjust horizontal knob (◄►) and Adjust vertical knob (▲▼) to adjust the horizontal phase and color subcarrier phase, respectively. See *Genlock and Vertical Interval Switching* in this chapter. Adjust either phase from 0 to 255. The default is 128.

Exit menu (Exit Menu)

The following flowchart describes the Exit menu. Pressing the Next button from this menu will return you to the default menu cycle.

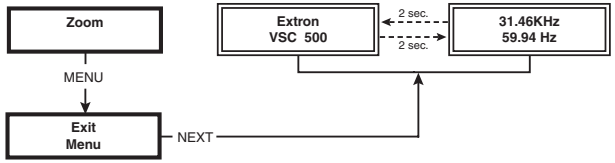


Figure 2-15 — Exit menu

Additional Functions

In addition to the main menu system, there are several other functions that are featured by the VSC 500/700/700D. Image sizing, shifting, freezing, a unit reset function, and an executive mode to disable the front panel controls are also available.

Size function

Press the Size button at any time to adjust the size of a displayed image.

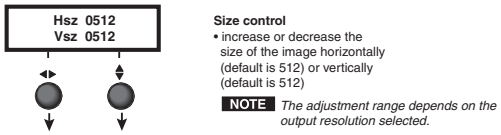


Figure 2-16 — Size adjustment

Rotate the Adjust horizontal knob (◄►) and Adjust vertical knob (▲▼) to adjust the horizontal and vertical dimensions, respectively, of the image. The adjustment setting, which is displayed in the menu display, varies according to the resolution of the display device. The defaults are 512 for both the horizontal and vertical size.

The Size LED will light green when the Size button is pressed, and the Min/Max LED will light red whenever the adjustment range has reached its limit. Pressing the Size button again returns you to the default menu cycle, and pressing the Next button advances you to the Shift menu, as described below. See *Front Panel Features* in this chapter.

Shift function

The following flowchart describes the shift feature. Shift an image to center it or move it horizontally and vertically. From the default cycle, rotating either Adjust knob will display the Shift menu. The Shift menu will also display when the Next button is pressed from the Size menu.

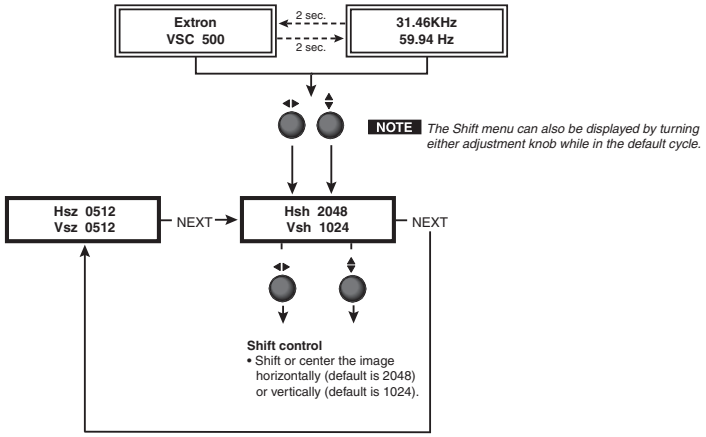


Figure 2-17 — Shift adjustment

Rotate the Adjust horizontal knob (◄►) or Adjust vertical knob (▲▼) to shift the image horizontally or vertically, respectively.

The Min/Max LED will light red whenever the adjustment range has reached its limit. The defaults are 2048 and 1024 for the horizontal and vertical shift, respectively. Pressing the Next button returns you to the Size menu.

NOTE *The default value for horizontal and vertical size is 0512. The default values for the horizontal and vertical shift are 2048 and 1024, respectively. The actual minimum and maximum values will vary and are based on the incoming scan rate.*

Freeze mode

The displayed image may be prevented from being changed by pressing the Freeze/Reset button at any time to enable this function. The Freeze/Reset LED will light green when this button is pressed. Pressing the Freeze/Reset button again disables this function (see note below). See *Front Panel Features* in this chapter.

NOTE *If freeze mode is enabled, pressing the Next button from the Auto Imaging main menu will disable freeze mode.*

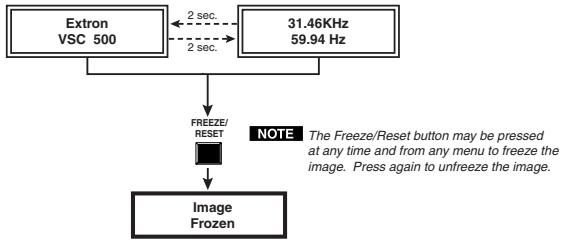
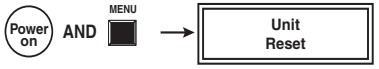


Figure 2-18 — Freeze function

Unit reset function

To reset the VSC to the factory default settings, apply power to the VSC while pressing the Menu button.



NOTE *Press and hold the Menu button, while applying power, to reset the VSC to factory default values.*

Figure 2-19 — Unit reset function

Front panel security lockout (executive mode)

To prevent accidental changes to settings, simultaneously press the Next and Size buttons for two seconds to enable the VSC's front panel security lockout (executive mode). Executive mode locks all front panel functions except centering (shifting). When executive mode is active, all functions and adjustments can still be made through RS-232 control. For details on RS-232 control, see chapter three.

To disable executive mode, simultaneously press the Next and Size buttons again for two seconds.

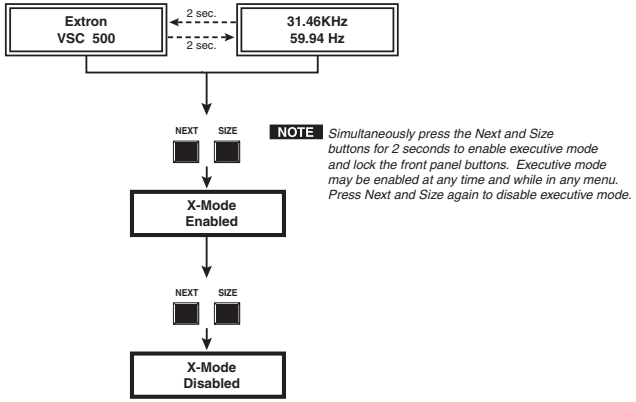


Figure 2-20 — Front panel security lockout

Troubleshooting

The image should appear properly on the screen(s).

If the image does not appear

1. Ensure that all devices are plugged in.
2. Make sure that each device is receiving power.
3. Check the cabling, wiring, and grounding, and make adjustments as needed.
4. To test the system setup and output, substitute a video test generator for the computer input.
5. Confirm that the input is receiving a signal with a compatible scan rate (horizontal frequency between 24 kHz and 100 kHz, and a vertical frequency of 50 Hz to 120 Hz).
6. Call Extron's customer support hotline if needed. Be prepared to discuss the steps you have taken and the equipment involved.

If the image does not display correctly

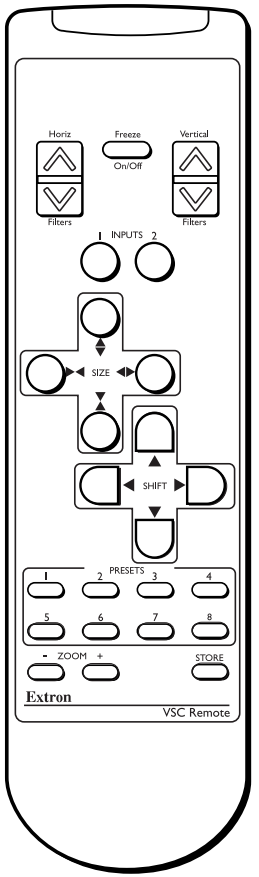
Symptoms	Solutions
The picture is shifted off the screen edges.	Adjust the centering and sizing controls (◀▶ , ▲▼).
The picture appears without color.	Adjust the hue/ tint/ color controls on display device. Make sure that the video display/ recording equipment is using the same standard (NTSC or PAL) as the VSC.
In a genlocked system, displayed color is incorrect.	The color subcarrier phase (Sub Phase) might require readjustment.
The image still does not display correctly.	Call Extron's customer support hotline.

If the scan converter does not respond to controls

Symptoms	Solutions
The picture does not move on screen when the horizontal and vertical centering controls are rotated.	The VSC may be set for executive mode. Adjustments can be made via RS-232 control, or exceutive mode can be disabled by simultaneously pressing the Next and Size buttons for 2 seconds.
The VSC responds to adjustments made via the front panel, but not to selections from the IR remote control.	Signals from the IR remote control may not be reaching the VSC. Change the placement of the scan converter so that the IR signals have a clear transmission path between the remote control and the VSC.
There is no response to commands from the RS-232 controller.	Ensure that the baud rate (9600 baud) and communication protocol are set correctly.

VSC Infrared Remote Control

The VSC IR remote control, shown at right, replicates all of the front panel controls except the Menu and Next buttons. If executive mode has been enabled on the VSC, input selection and adjustments can still be made from the remote control or the Windows-based control program (via an RS-232 device) to configure the video scan converter. See chapter three, "Serial Communication", for details.



The topmost part of the remote control features a Horizontal filter button, a Freeze On/Off button, and a Vertical filter button. Select input 1 or 2 via the Inputs buttons.

The middle portion of the VSC remote control features the Size and Shift buttons.

The bottom portion of the remote control features Presets 1 - 8. The presets will save the input rate, the output type, sizing, shifting, and filtering information. After properly setting up an image, press the Store button, then press a preset button to save the settings to the selected preset button. To retrieve a preset, press the desired preset button.

Use the Zoom button to zoom in and zoom out of an image.

NOTE *The presets feature is only available through the IR remote control. For a detailed description of the other VSC features and functions that are accessed by the remote control, see earlier sections of this chapter.*

Chapter Three

Serial Communication

RS-232 Programmer's Guide

Control Software for Windows

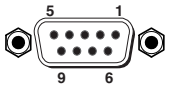
Firmware Upgrade from the Extron Web Site

The VSC 500/700/700D can be remotely controlled via a host computer or other device (such as a control system) attached to the rear panel RS-232/422 connector. The control device (host) can use either Extron's Simple Instruction Set (SIS) commands or the graphical control program for Windows.

The video scan converter uses a protocol with:

- 9600 baud
- 1 stop bit
- no parity
- no flow control

The rear panel RS-232/422 9-pin D connector has the following pin assignments:



DB9 Pin Locations
Female

Pin	RS-232 function	Description
1	–	No connection
2	Tx	Transmit data
3	Rx	Receive data
4	–	No connection
5	Gnd	Signal ground
6	–	No connection
7	–	No connection
8	–	No connection
9	–	No connection

Pin	RS-422 function	Description
1	–	No connection
2	Tx-	Transmit ground
3	Rx-	Receive ground
4	–	No connection
5	Gnd	Signal ground
6	–	No connection
7	Rx+	Receive data
8	Tx+	Transmit data
9	–	No connection

RS-232 Programmer's Guide

Host-to-VSC communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the VSC determines that a command is valid, it executes the command and sends a response to the host device. All responses from the VSC to the host end 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.

Video scan converter-initiated messages

When a local event such as a front panel selection or adjustment takes place, the VSC responds by sending a message to the host. No response is required from the host. The VSC-initiated messages are listed here (underlined).

(C) Copyright 2002, Extron Electronics, VSC 500, Vx.xx ↵
The VSC sends the copyright message when it first powers on. Vx.xx is the firmware version number.

Error responses

When the VSC receives a valid SIS command, it executes the command and sends a response to the host device. If the video scan converter is unable to execute the command because the command is invalid or it contains invalid parameters, it returns an error response to the host.

The error response codes and their descriptions are as follows:

E01 – Invalid input channel number (the number is too large)
E09 – Invalid function number (the number is too large)
E10 – Invalid command
E13 – Invalid value (the number is out of range/too large)

Using the command/response tables

The command/response table lists valid command ASCII codes, the video scan converter's responses to the host, and a description of the command's function or the results of executing the command. Lower case characters are acceptable in the command field unless otherwise indicated. The following ASCII to HEX conversion table is for use with the command/response table.

ASCII to HEX Conversion Table																				Esc	1B	CR	ØD	LF	ØA
	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	|	7C	}	7D	~	7E	DEL	7F										

Symbol definitions

[X10] = Picture adjustment range *See the note below.*
[X11] = Filter adjustment range (1 - 5)
[X14] = Adjustment range (0 - 127)
↵ = Escape key
↵ = CR/LF (carriage return/line feed) (hex 0D 0A)
← = Carriage return (hex 0D)
• = Space
[X1] = Horizontal and vertical frequencies (listed to two decimal places, e.g. xx.xx)
[X2] = On/off status where: 0 = off/disable, 1 = on/enable

NOTE *The default value for horizontal and vertical size is 0512. The default values for the horizontal and vertical shift are 2048 and 1024, respectively. The actual minimum and maximum values will vary and are based on the incoming scan rate.*

Command/response table for SIS commands: VSC 500/700/700D

Command description	ASCII Command (host to VSC)	Response (VSC to host)	Additional description
Horizontal shift			
Specify the horizontal centering value	X10 H	Hph X10 ↵	Specify the centering value
Decrement one step	-H	Hph X10 ↵	Shift left one step
Increment one step	+H	Hph X10 ↵	Shift right one step
View the horizontal centering value	H	X10 ↵	Show the horizontal centering value
Vertical shift			
Specify the vertical centering value	X10 /	Vph X10 ↵	Specify the centering value
Decrement one step	-/	Vph X10 ↵	Shift down one step
Increment one step	+/	Vph X10 ↵	Shift up one step
View the vertical centering value	/	X10 ↵	Show the vertical centering value
Horizontal size			
Specify the horizontal size value	X10 :	Hsz X10 ↵	Specify the horizontal size value
Decrease horizontal size one step	-:	Hsz ↵	Decrement the horizontal size
Increase horizontal size one step	+:	Hsz ↵	Increment the horizontal size
View the horizontal size value	:	X10 ↵	Show the horizontal size value
Vertical size			
Specify the vertical size value	X10 ;	Vsz X10 ↵	Specify the vertical size value
Decrease vertical size by one step	-;	Vsz ↵	Decrement the vertical size
Increase vertical size by one step	+;	Vsz ↵	Increment the vertical size
View the vertical size value	;	X10 ↵	Show the vertical size value
Zoom mode			
Zoom in	+{	Zom ↵	Zoom in
Zoom out	-{	Zom ↵	Zoom out

Command description	ASCII Command (host to VSC)	Response (VSC to host)	Additional description
Freeze mode			
Enable freeze mode	1F	Frz 1 ↵	Freeze the video output
Disable freeze mode	0F	Frz 0 ↵	Unfreeze the video output
View freeze mode status	f/F	X2 ↵	Show freeze mode status (on = 1, off = 0)
Front Panel Security Lockout (executive mode)			
Enable executive mode	1X	Exe 1 ↵	Lock front panel adjustments; adjust image via RS-232 only
Disable executive mode	0X	Exe 0 ↵	Unlock front panel adjustments
View executive mode status	X	X2 ↵	Show executive mode status (on=1, off = 0)
Zap - reset to default settings			
System reset	Esc zXXX ←	ZapXXX ↵	Reset all settings to factory defaults
Firmware version, part number & information requests			
Query firmware version number	Q/q	x.xx ↵	Display firmware version
Request part number for VSC 700	N/n	60-477-01 ↵	Display part # for VSC 700
Request part number for VSC 700D	N/n	60-477-02 ↵	Display part # for VSC 700D
Request information	I/i↵	(see response below) Response = Hrt X1 • Vrt X1 ↵	Display status of VSC

Command/response table for SIS commands: VSC 700/700D only

Command description	ASCII Command (host to VSC)	Response (VSC to host)	Additional description
Horizontal filter (detail)			
Specify the horizontal filter value	X11 D	Dhz X11 ↵	Specify the detail value
Decrement one step	-D	Dhz X11 ↵	Decrease the detail level by one step
Increment one step	+D	Dhz X11 ↵	Increase the detail level by one step
View the horizontal filter value	D	X11 ↵	Show the horizontal detail level
Flicker filter			
Specify the flicker filter value	X11 d	Dvz X11 ↵	Specify the flicker value
Decrement one step	-d	Dvz X11 ↵	Decrease the flicker by one step
Increment one step	+d	Dvz X11 ↵	Increase the flicker by one step
View the flicker filter value	d	X11 ↵	Show the flicker value

The syntax for setting a special function is X! *_ # where _ is the function number and X! is the value. To view a function's setting, use _# where _ is the function number. In the following table the values of the X! variable are different for each command/function. These values are given in the rightmost column.

Command/response table for special function SIS commands: VSC 700/700D only

Command description	ASCII Command (host to VSC)	Response (VSC to host)	Additional description
Encoder filter (sharpness)			
Specify the encoder filter level	X! * 10#	Enc X! ↵	Specify the encoder filter level (0 - 12)
Example:	3 * 10#	Enc 03 ↵	*Example*: set the encoder filter level to 3
View the encoder filter level	10#	X! ↵	Show the encoder filter level

Command/response table for special function SIS commands: VSC 500/700/700D

Command description	ASCII Command (host to VSC)	Response (VSC to host)	Additional description
Output video type			
Set the output video type	X! *6#	Tpo X! ↵	Specify the output video type: 0 = RGBHV (default) 1 = RGBS 2 = RGsB 3 = YUV
Example:	1* 6#	Tpo 1 ↵	*Example*: specify output video as RGBS
View the output video type	6#	X! ↵	View the output video type
Video standard			
Set the video standard	X! *14#	Rte X! ↵	Select the output standard: 0 = NTSC (default) 1 = PAL
Example:	1*14#	Rte 1 ↵	*Example*: set output rate as PAL
View the video standard	14#	X! ↵	View the output standard
No input signal			
Set the output display when no input signal	X! *13#	Out X! ↵	Specify the output pattern when no input 0 = Black screen (default) 1 = Color bars
Example:	1*13#	Out 1 ↵	*Example*: specify color bars as the output when there is no input signal
View the output display when no input signal	13#	X! ↵	View the output pattern when no input
Auto imaging			
Set the VSC to auto image	55#	Img ↵	Automatically center and size the image to fill the display screen.

Control Software for Windows

The included control software for Windows offers another way to control the VSC via RS-232 connection in addition to the Simple Instruction Set commands. The control program's graphical interface includes the same functions as those on the VSC's front panel and some additional features that are only avilable through the Windows-based software.

The control software is compatible with Windows 95/98, Windows NT, and Windows 2000.

Installing the software

The control program is contained on a set of 3.5-inch diskettes, and it requires approximately 2 MB (megabytes) of hard disk space.

To install the software on the hard drive.

1. Run SETUP.EXE from the floppy disk.
2. Follow the instructions that appear on the screen.

By default the installation creates a C:\VSC500 directory, and it places two icons (VSC Control Pgm and VSC Help) into a group or folder named "Extron Electronic".

Using the control program

1. To run the control program, double-click on the VSC Pgm icon in the Extron Electronics group or folder. The Comm menu appears on the screen.

2. Click on the comm port that is connected to the VSC's RS-232 port. The Extron VSC Control Program window appears. The VSC 500 Control Program window is shown in figure 3-1 and the VSC 700D Control Program window is shown in figure 3-2.

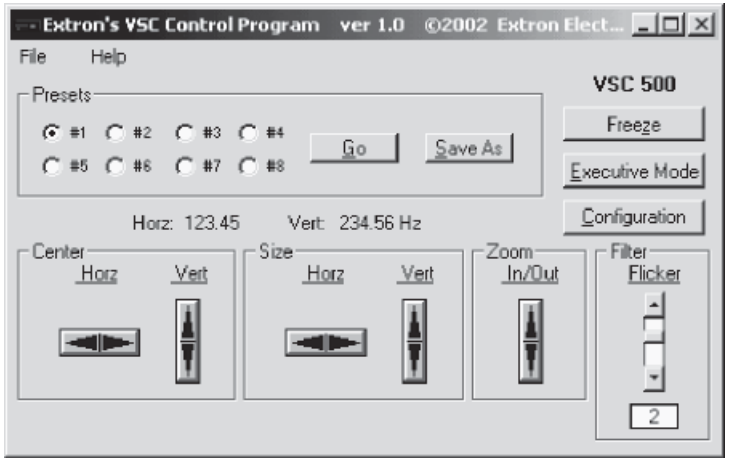


Figure 3-1 — VSC 500 Control Program window

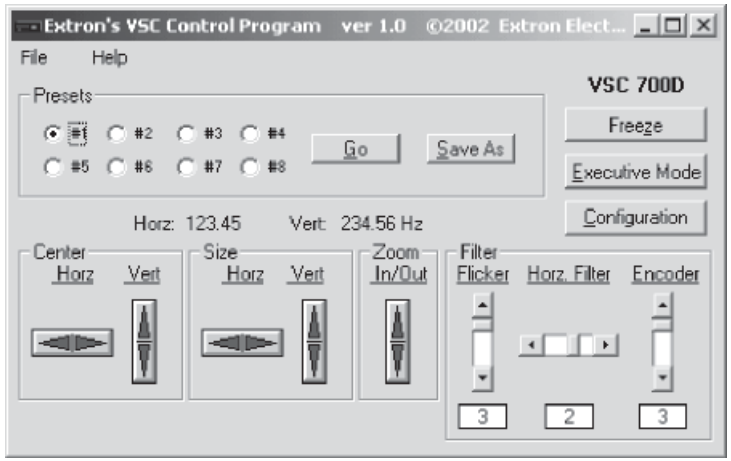


Figure 3-2 — VSC 700D Control Program window

3. Click on the Configuration button to configure the VSC from the I/O Configuration window, as shown in the next illustration.

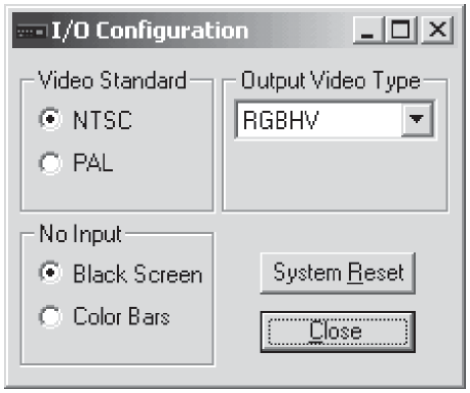


Figure 3-3 — VSC I/O Configuration window

Using the help program

For information on program features, press the F1 computer key, or click on the Help menu from within the VSC Control Program, or double-click on the VSC Help icon in the Extron Electronics group or folder.

For explanations of buttons or functions, click on the tabs in the help screen to reach the desired screen. Use a mouse or the Tab and Enter keys to select a button/function. A description and tips on using the program will appear on screen.

Firmware Upgrade from the Extron Web Site

The VSC 500/700/700D's firmware may be upgraded by going to the Extron web site, downloading the latest firmware to the PC, then uploading and installing the new firmware from the PC to the VSC 500/700/700D via the scan converter's RS-232 port. The whole process takes only a few minutes and is very simple.

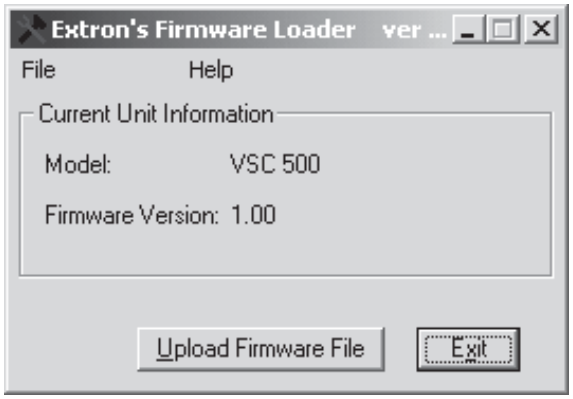
Downloading the latest firmware to the PC

Go to the Extron website (www.extron.com), select the product category, and download the latest firmware to your PC.

Uploading the firmware from the PC to the VSC

Connect the PC to the VSC 500/700/700D via the scan converter's RS-232 port. Start the control program (see *Using the control program* in this chapter). Next, select "Update Firmware" from the Control Program window and follow the instructions.

Select "Update Firmware File" from the following window. The uploading of the firmware to the VSC 500/700/700D will take a few minutes.



NOTE *The original factory-installed firmware is permanently available on the VSC 500/700/700D. If the attempted upload of new firmware fails for any reason, the VSC will automatically revert to the factory-installed firmware.*

Appendix A

Reference Information

Specifications: VSC 500

Specifications: VSC 700/700D

Included Parts

Accessories

Firmware Upgrade Chip Installation

Specifications: VSC 500

Video input

Number/signal type	1 RGBHV, RGBS, RGsB with 1 buffered loop-through
Connectors	(1) 15-pin HD for input, (1) 15-pin HD for loop-through
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels	0 V to 2.0 Vp-p with no offset at unity gain
Impedance	75 ohms
Horizontal frequency	Autoscan 24 kHz to 100 kHz
Vertical frequency	Autoscan 50 Hz to 120 Hz
Resolution range	Autoscan 560 x 384 to 1600 x 1200
Maximum DC offset	2.0 V

Video processing

Encoder	10 bit digital
Digital sampling	24 bit, 8 bits per color
Colors	16.8 million
Horizontal filtering	1 fixed level
Flicker filtering	3 levels (selectable)
Encoder filtering	4 levels

Video output

Number/signal type	1 RGBHV, RGBS, RGsB, or component video 1 S-video, 1 composite video (NTSC 15.75 kHz, 525 lines; or PAL, 15.5 kHz, 625 lines)
Connectors	5 BNC female: RGBHV/RGBS/RGsB/ component video (1) 4-pin mini-DIN female: S-video 1 BNC female: NTSC/PAL composite video
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels	0.0 V to 1.0 Vp-p
Impedance	75 ohms

Sync

Input type	Autodetect RGBHV, RGBS, RGsB
Output type	RGBHV, RGBS, RGsB
Standards	NTSC 3.58, PAL
Input level	1.5 V to 5.0 Vp-p
Output level	TTL: 5.0 Vp-p, unterminated
Input impedance	600 ohms
Output impedance	75 ohms
Max input voltage	5.0 Vp-p
Polarity	Negative

Control/remote — scan converter

Serial control port	RS-232 or RS-422, 9-pin female D connector
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND, 9 = hard-wired IR
IR controller module	VSC IR Remote
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, 40 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 optional rack shelf, part #60-190-01 or 60-604-01
Enclosure type	Metal
Enclosure dimensions	1.75" H x 8.75" W x 10.5" D (1U high, half rack wide) 4.4 cm H x 22.2 cm W x 26.7 cm D (Depth excludes knobs.)
Product weight	2.4 lbs (1.1 kg)
Shipping weight	7 lbs (4 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: VSC 700/700D

Video input

Number/signal type	1 RGBHV, RGBS, RGsB with 1 buffered loop-through
Connectors	2 x 5 female BNC (5 for input, 5 for loop-through)
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels	0 V to 2.0 Vp-p with no offset at unity gain
Impedance	75 ohms
Horizontal frequency	Autoscan 24 kHz to 100 kHz
Vertical frequency	Autoscan 50 Hz to 120 Hz
Resolution range	Autoscan 560 x 384 to 1600 x 1200
DC offset (max. allowable)	2.0 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
Colors	16.8 million
Horizontal filtering	4 levels
Flicker filtering	5 levels
Encoder filtering	4 levels

Video output

Number/signal type	1 RGBHV, RGBS, RGsB, or component video 1 SDI component video (SMPTE 259M-C, VSC 700D only) 1 S-video 1 NTSC/PAL composite video
Connectors	5 BNC female: RGBHV/RGBS/RGsB/ component video 1 BNC female: SDI component video (VSC 700D only) (1) 4-pin mini-DIN female: S-video 1 BNC female: composite video
Nominal level	0.7 Vp-p for RGB
Minimum/maximum levels	0.0 V to 1.0 Vp-p
Impedance	75 ohms

Sync

Input type	Autodetect RGBHV, RGBS, RGsB
Output type	RGBHV, RGBS, RGsB
Genlock connectors	1 BNC female: genlock input 1 BNC female: genlock output (terminate w/75 ohms if unused)
Standards	NTSC 3.58, PAL
Input level	1.5 V to 5.0 V p-p
Output level	TTL: 5.0 V p-p, unterminated
Input impedance	600 ohms
Output impedance	75 ohms
Max input voltage	5.0 Vp-p
Polarity	Negative

Control/remote — scan converter

Serial control port	RS-232 or RS-422, 9-pin female D connector
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND, 9 = hard-wired IR
IR controller module	VSC IR Remote
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, 30 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 brackets
Enclosure type	Metal
Enclosure dimensions	
VSC 700	1.75" H x 8.75" W x 10.5" D (1U high, half rack wide) 4.4 cm H x 22.2 cm W x 26.7 cm D (Depth excludes knobs.)
VSC 700D	1.75" H x 8.75" W x 10.75" D (1U high, half rack wide) 4.4 cm H x 22.2 cm W x 27.3 cm D (Depth excludes knobs.)
Product weight	
VSC 700	2.8 lbs (1.3 kg)
VSC 700D	2.9 lbs (1.3 kg)

Shipping weight	5 lbs (3 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.*

Included Parts

These items are included in each order for a VSC 500/700/700D:

Included parts	Part number to reorder
VSC 500	60-476-01
or VSC 700	60-477-01
or VSC 700D	60-477-02
VSC 500/700/700D User's Manual	
VSC 500/700/700D label	
Rubber feet (not attached)	
SDI output board (700D only)	70-065-02
6' S-video cable (male to male)	26-316-02
6' VGA cable (male to male, VSC 500 only)	26-238-01
SHR 1-12' cable (male to male, VSC 500 only)	26-383-07
75-ohm termination BNC plug for Genlock In/Out (VSC 700/700D only)	26-300-01

Accessories

Accessories	Part number
1U high, universal rack shelf	60-190-01
VSC IR remote control	70-206-01

Firmware Upgrade Chip Installation

In some cases the VSC's firmware may require replacement with an updated version. There is one user-replaceable firmware chip: U29 — the main microcontroller. The number is printed on the circuit board. We recommend that you send the unit in to Extron for service and updates.

WARNING *Changes to firmware must be performed by authorized service personnel only.*

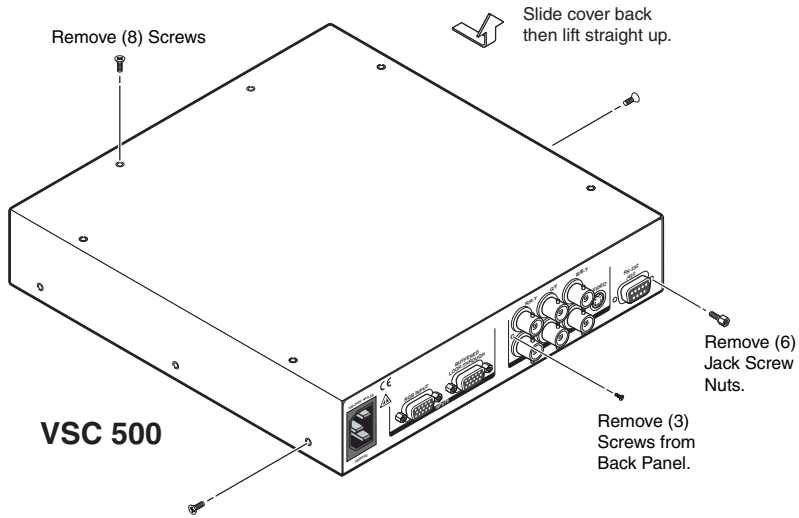
Follow these steps to replace firmware in the VSC.

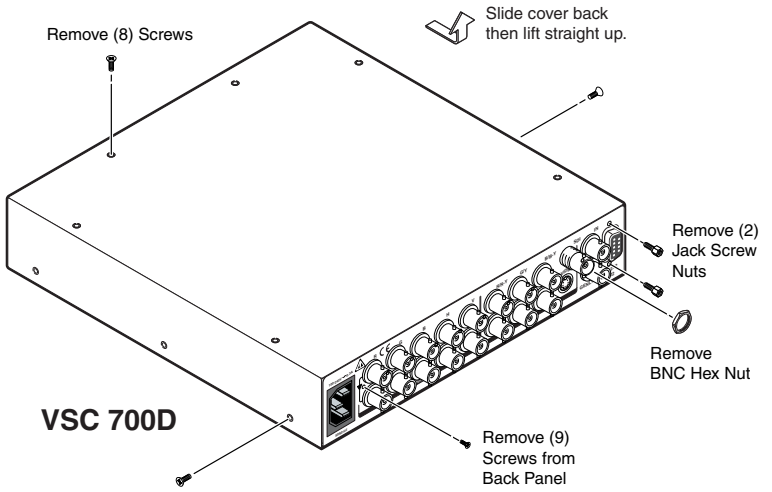
1. Disconnect the AC power cord from the VSC to remove power from the unit.

WARNING *To prevent electric shock, always unplug the VSC video scan converter from the AC power source before opening the enclosure.*

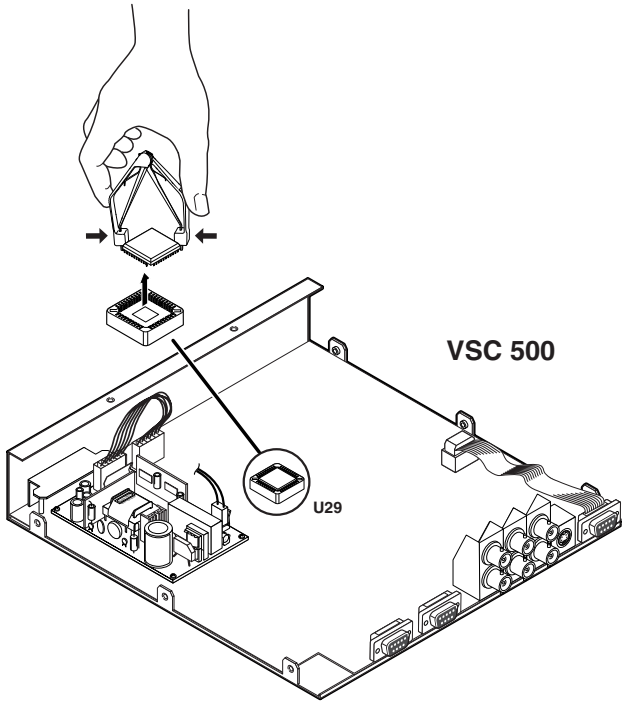
2. Remove the scan converter from the rack or furniture.
3. Remove the cover of the VSC (the top half of the enclosure) by removing the screws, then lifting the cover straight up.

NOTE *VSC 700 and VSC 700D top cover removal and firmware replacement instructions are identical except for a BNC nut which must be removed from the VSC 700D's SDI connector.*

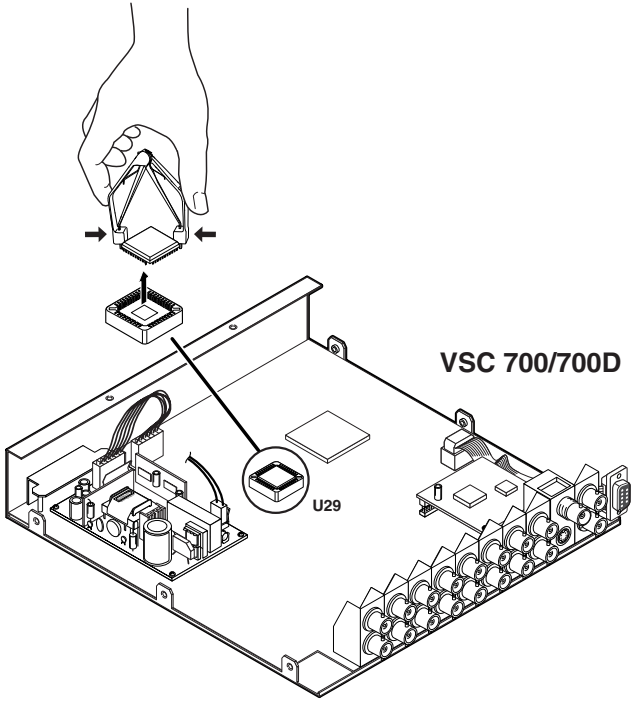




4. Locate the U29 firmware chip to be replaced on the circuit board, as shown in the following illustrations.



WARNING *Do not touch any switches or other electronic components inside the VSC. Doing so could damage the video scan converter. Electrostatic discharge (ESD) can damage IC chips even though you cannot feel it. You must be electrically grounded before proceeding with firmware replacement. A grounding wrist strap is recommended.*



5. After you are electrically grounded, removal of the U29 IC chip requires a PLCC IC puller tool. To remove the U29 chip, align the hooks of a PLCC IC puller tool with the slots located in opposite ends of the firmware chip.
6. Insert the hooks into the slots, and squeeze the tool gently to grasp the chip.
7. Pull the chip straight out of the socket, and set it aside.
8. Align the slots of the new firmware chip with the angled corners of the socket in the same orientation as the old chip.

9. Gently, but firmly, press the chip into place in the socket.
10. Replace the top cover on the VSC, and fasten it with the screws that were removed in step 3.
11. Rack/furniture mount the scan converter, and reconnect the AC power cord.