

User's Manual



VSC 900/900D

Video Scan Converter

Precautions

Safety Instructions • English



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



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

Caution

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

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

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

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

Consignes de Sécurité • Français



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



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

Attention

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

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

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

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

Sicherheitsanleitungen • Deutsch



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



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

Achtung

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

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

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

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

Instrucciones de seguridad • Español



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



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

Precaucion

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

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

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

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

Warning

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

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

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

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

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

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

Avertissement

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

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

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

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

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

Lithium Batterie • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. 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 Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

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

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

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

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

Advertencia

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

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

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

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

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

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

Quick Start — VSC 900/900D

Installation

Step 1

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

Step 2

Install the four rubber feet on the bottom of the VSC, or mount the VSC in a rack.

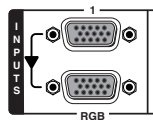
Step 3

Rear panel video inputs

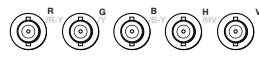
Attach an input device to the scan converter.

NOTE Buffered loop-through connectors allow for local monitor output.

Input VGA connector



Input BNC connectors



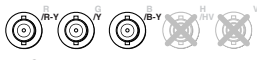
RGBHV input



RGBS input



RGsB input



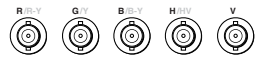
Component video input (R-Y, Y, B-Y)

Step 4

Rear panel video outputs

Attach output devices to the VSC scan converter.

Output BNC connectors



RGBHV output



RGBS output



RGsB output



Component video output (R-Y, Y, B-Y)

Output S-video and composite video connectors



Output SDI connector for SDI output



NOTE The scan converter will simultaneously output RGB or component video, S-video, composite video, and SDI (VSC 900D).

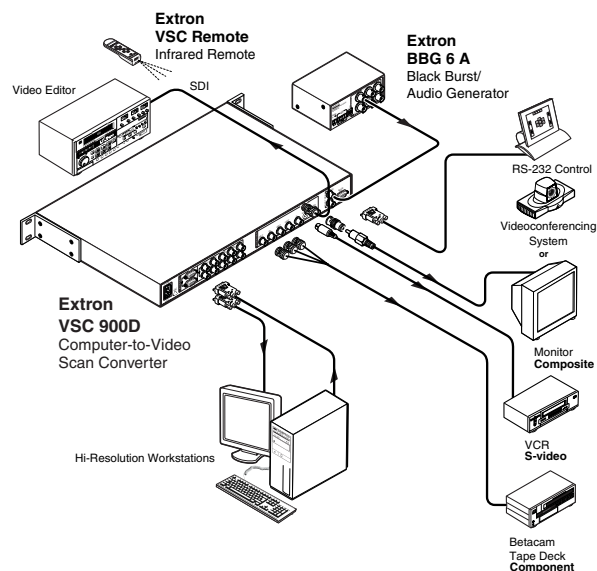
Step 5

Plug the scan converter, 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 (see the next page) or RS-232 programming to configure the VSC. See chapter two for installation and operation procedures, and see chapter three for programming information.

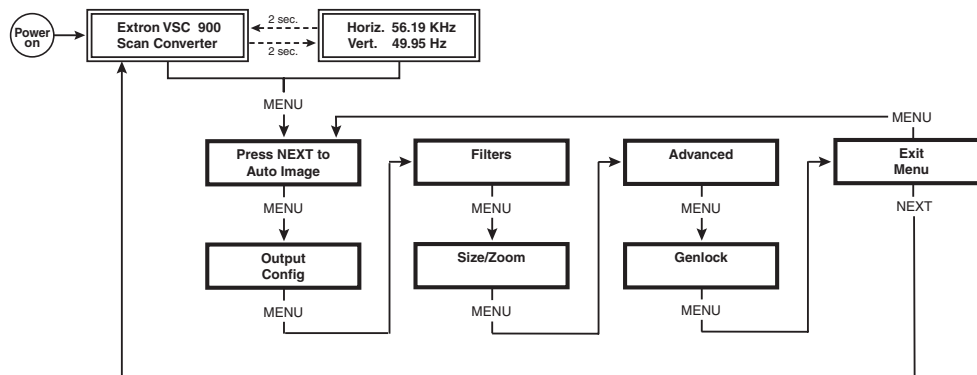
Application Example



Quick Start — VSC 900/900D, cont'd

VSC 900/900D Main Menu System

Main menu



NOTE See chapter two for detailed explanations of the menu system.

Image Optimization

The following steps should be followed in order to optimize image display. See chapter two, *Installation and Operation*, for detailed adjustment features and instructions.

- ① Use Auto Image.
- ② Size and Center the image, if necessary.
- ③ Adjust the Horizontal filter.
- ④ Adjust the Vertical filter (flicker).
- ⑤ Adjust the Encoder.

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VSC 900/900D

1

Chapter One

Introduction

About this Manual

About the VSC 900/900D

Features

Introduction

About this Manual

This manual discusses how to install, configure, and operate the Extron VSC 900/900D video scan converter and how to operate the VSC infrared remote control (part #70-206-01).

Throughout this manual the terms “VSC”, “video scan converter”, and “scan converter” are used interchangeably to refer to the same product.

About the VSC 900/900D

The VSC 900/900D is a two-input, high resolution computer-to-video scan converter that accepts resolutions up to 1600 x 1200 and simultaneously outputs NTSC/PAL composite video, S-video, component or RGB video, and SDI component video (VSC 900D only).

The VSC 900/900D can be genlocked to an external blackburst signal for use in a production or broadcast environment. The scan converter may also be remotely controlled via RS-232/RS-422 Simple Instruction Set (SIS™) commands or with the optional VSC IR remote control.

Features

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

Buffered loop-throughs — Five rear-panel BNC connectors and one VGA-type 15-pin HD connector provide connections for RGB or component video (R-Y, Y, B-Y) buffered loop-through. Both outputs (the BNCs and the 15-pin HD connector) are active at all times for simultaneous output.

Three simultaneous outputs — NTSC or PAL video is output as RGBHV, RGBS, RGsB, or component video, S-video, and composite video. An optional SDI output is available (VSC 900D only) for inclusion of digital video devices.

Input memory presets — Up to 16 user presets, 60 factory presets, and eight zoom presets, accessible via the front panel, RS-232, or the included IR remote. Each memory location stores filter, size, centering, and/or zoom settings for a source that can be instantaneously recalled during a presentation.

Freeze button — The input of the VSC can be frozen by pressing this button. This feature allows the scan converter to capture a frame of video to display for an extended period of time, even after the source has been removed.

Auto-Image™ setup — This feature allows for automatic adjustment of sizing, centering, and filtering to optimize the output image.

Vertical (flicker) filtering — Four levels of vertical (flicker) filtering provide line averaging so that vertical detail is maintained during the scan conversion process and picture flicker is eliminated.

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

Internal test pattern generator — The VSC 900/900D offers four test patterns for quick and easy monitor setup: color bars, 32 x 32 crosshatch, 4 x 4 crosshatch, and grayscale.

Executive mode — Enables the user to lock out all front panel functions except for centering controls; all other functions remain active through the RS-232/RS-422 port.



VSC 900/900D

Chapter Two

Installation and Operation

Application Example

Mounting the VSC

Rear Panel Connectors and Cabling

Genlock and Vertical Interval Switching

Front Panel Features

Menus, Configuration, and Adjustments

Additional Functions

Presets

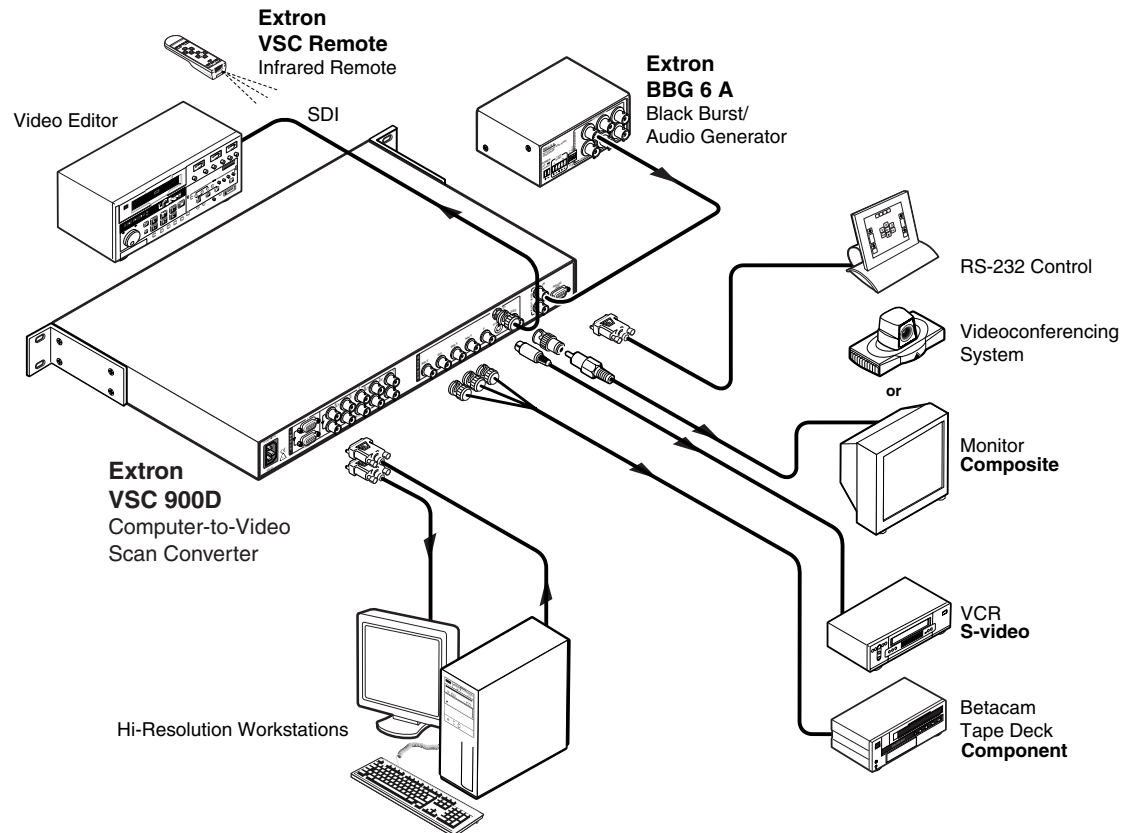
Troubleshooting

VSC Infrared Remote Control

Installation and Operation

Application Example

The illustration below is one example of setting up the VSC 900D. The VSC 900 setup does not include an SDI output.



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. Attach the provided rack mounting brackets (70-077-03) to the VSC 900/900D with machine screws, as shown below.
3. Fasten the VSC to the rack using the supplied machine screws.

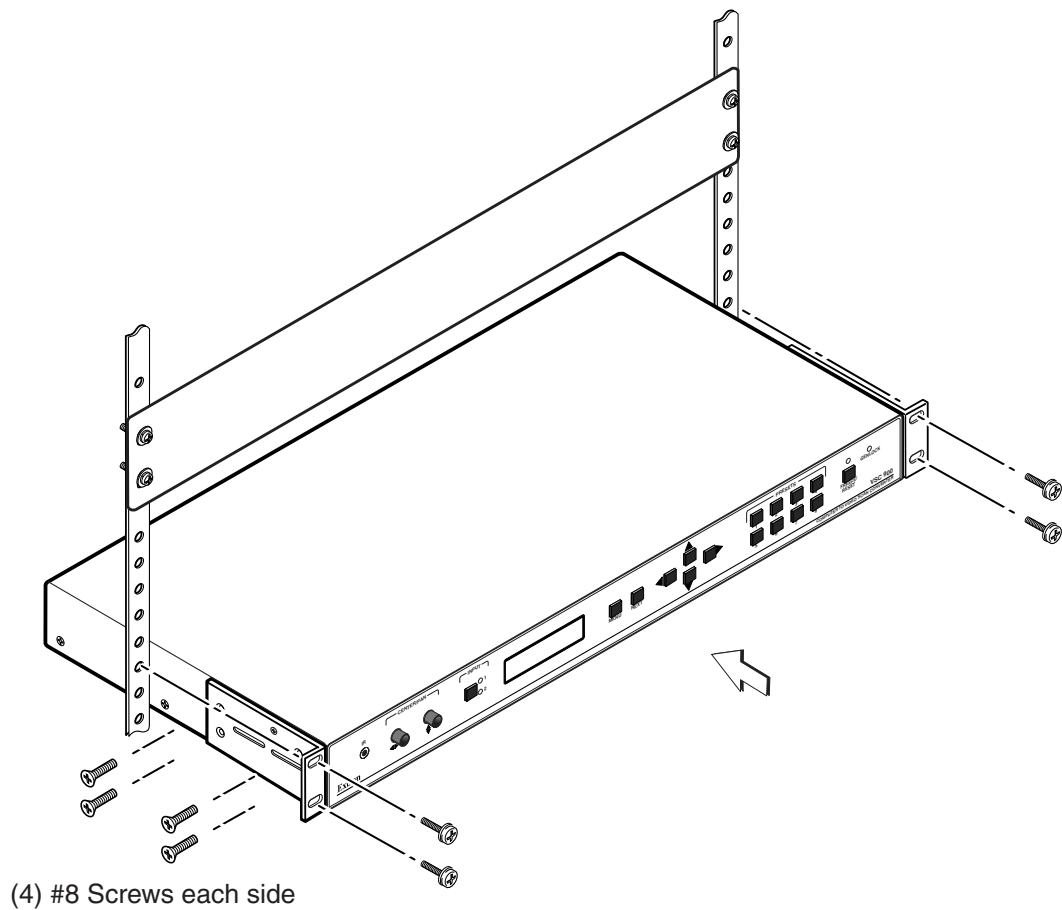


Figure 2-1 — Rack mounting the VSC 900/900D

Installation and Operation

Rear Panel Connectors and Cabling

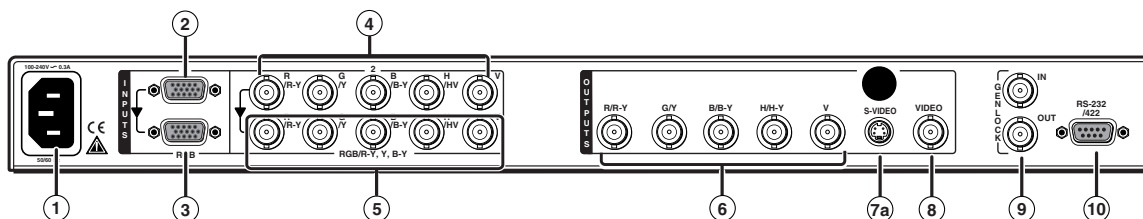


Figure 2-2 — VSC 900 rear panel connectors

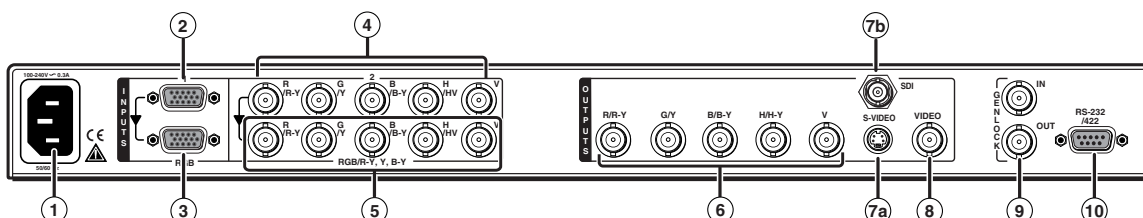
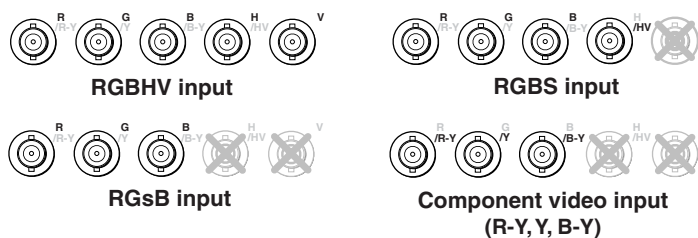


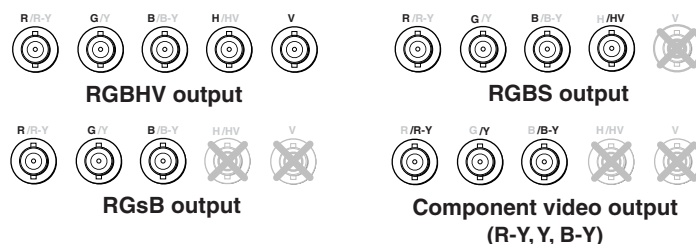
Figure 2-3 — VSC 900D rear panel connectors

NOTE RGB or component video, composite video, S-video, and SDI video (VSC 900D 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.
- ② **RGB (computer) input VGA connector** — Connect a computer video source (RGBHV, RGBS, RGsB) via this female VGA 15-pin HD connector. By default, pins 4, 10, and 11 are grounded for ID bit termination.
- ③ **Buffered loop-through VGA connector** — For local monitor output of the input, connect a monitor to this female VGA 15-pin HD connector.
- ④ **RGB and component video input BNC connectors** — Connect a computer video (RGBHV, RGBS, RGsB) or component video input via these five female BNC connectors. Connect cables for the appropriate signal type, as shown here.



- ⑤ **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 ④ above.
- ⑥ **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:



- 7a **S-video output connector** — Connect an S-video output device to this female 4-pin mini DIN connector.
- 7b **SDI (serial digital interface) output connector** — Connect an output device to this SDI component output female BNC.
- 8 **Composite video output connector** — Using a coaxial cable, connect a composite video display device to this female BNC connector.
- 9 **Genlock input and output connectors** — An external blackburst signal may be connected 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.

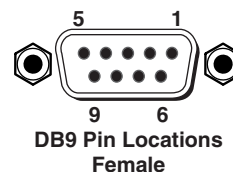
See *Genlock and Vertical Interval Switching* in this chapter.

- 10 **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:

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

Genlock and Vertical Interval Switching

Vertical interval switching provides for clean switching between signals from several devices during the vertical blanking period of each signal. Vertical interval switching between the VSC and another source with an external switcher can be achieved by applying a composite sync signal at the Genlock In connector. The sync signal 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

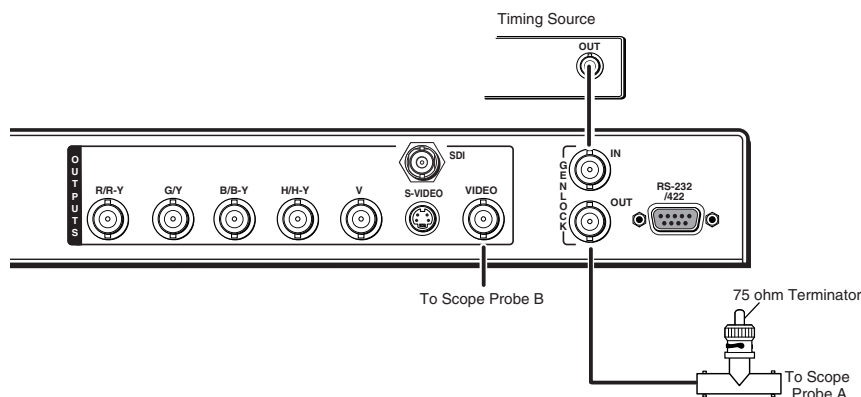
Genlock differs from simple vertical interval switching in that an external device (a black burst generator) generates a reference sync signal for the system, and every device that uses that signal has its output signal's horizontal and subcarrier phases adjusted to exactly match that of the generator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

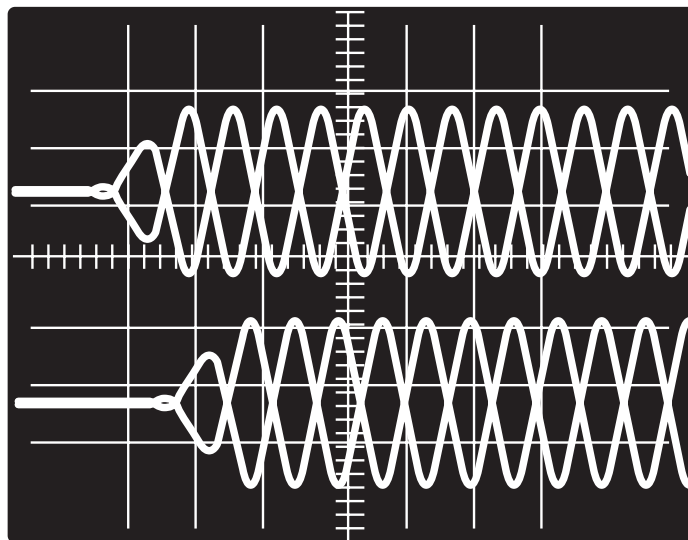


Figure 2-4 — Superimposed waveforms

Installation and Operation, cont'd

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.

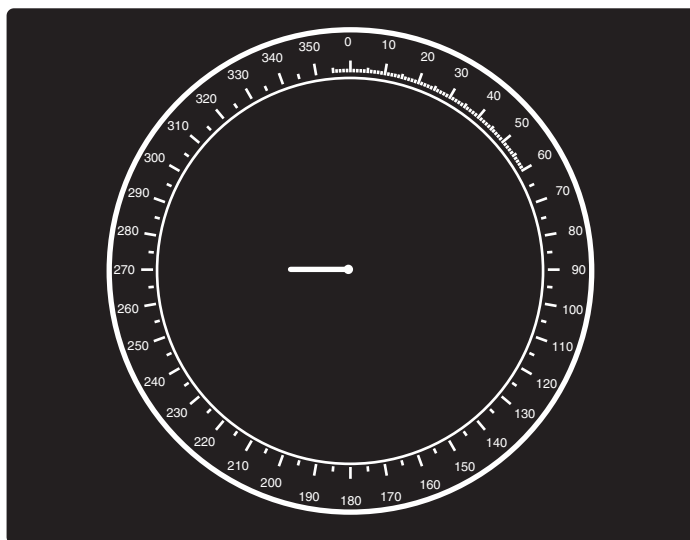


Figure 2-5 — Vectorscope screen during horizontal phase adjustment

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 0° (indicated in the figure by the triangle).

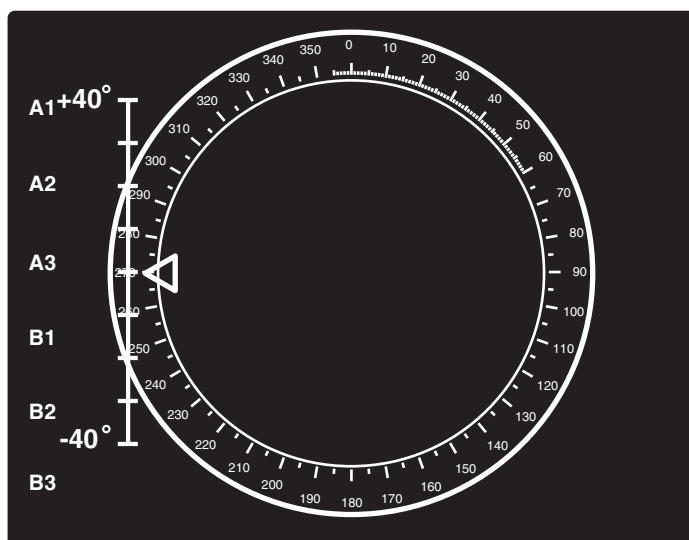


Figure 2-6 — Vectorscope screen during color subcarrier phase adjustment

Front Panel Features

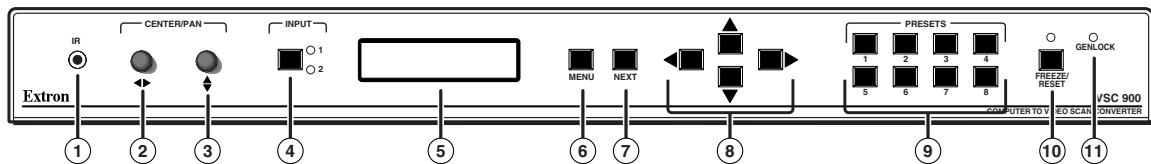


Figure 2-7 — VSC 900/900D front panel features

- 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 *IR Remote Control* section in this chapter.
- ② **Horizontal Adjust 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* submenu (see *Zoom in/out adjustment submenu* in this chapter).
- ③ **Vertical Adjust 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* submenu (see *Zoom in/out adjustment submenu* in this chapter).
- ④ **Input selection button** — Select from either input 1 or input 2. The LED for the selected input lights green.
- ⑤ **LCD** — This two-row liquid crystal display provides a way to see the menus and options for setting up the scan converter.
- ⑥ **Menu button** — Press this button to enter the main menus and to move from menu to menu.
- ⑦ **Next button** — Press this button to enter a specific submenu of a selected main menu.
- ⑧ **Up-Down-Left-Right Cursor buttons** — Use these buttons to make selections from the menu displays.
- ⑨ **Presets buttons** — These eight buttons will store and recall sizing and centering information (see *Presets* in this chapter) for a specific input source. The presets can also be stored and recalled via the IR remote control (see *VSC Infrared Remote Control* in this chapter).
- ⑩ **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 except when selecting a different input (pressing the Input selection button will disable the freeze mode). Pressing the Freeze/Reset button again will reset (disable) the freeze function and enable the front panel controls.

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.

- ⑪ **Genlock status LED** — This indicator lights green whenever genlocking is active.

Menus, Configuration, and Adjustments

VSC configuration and adjustments can be performed by using the Windows-based control program (see chapter 3 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.

Cursor () buttons — Use these buttons to scroll through the submenu options and to make selections. Refer to the flowcharts in this chapter and to specific sections for explanations of cursor button selections.

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 900/900D) and the screen that shows the horizontal and vertical frequencies of the input signal, as shown below.

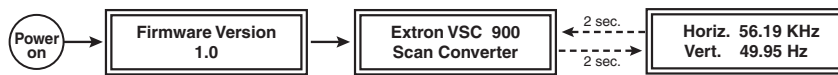


Figure 2-8 — Default menu cycle with input signal

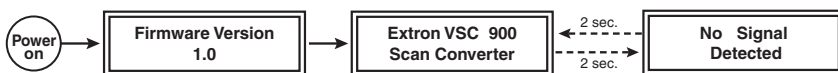


Figure 2-9 — Default menu cycle without input signal

NOTE When there is no input signal present, the LCD will not be backlit.

The main menus are shown in the following flowchart. The main menus for the VSC 900 and 900D are identical. Use the Menu button to scroll between main menus.

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.

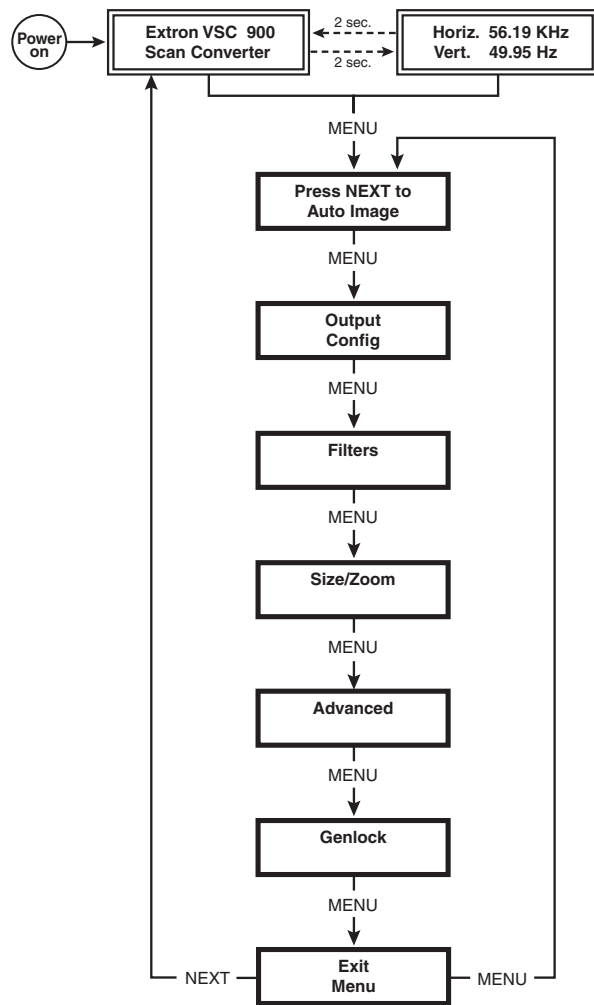


Figure 2-10 — Main menus for the VSC 900/900D

Auto Imaging menu (Auto Image)

The following flowchart illustrates the auto imaging feature. Pressing the Next button will display the submenu and automatically size and center the displayed image to fill the output screen.

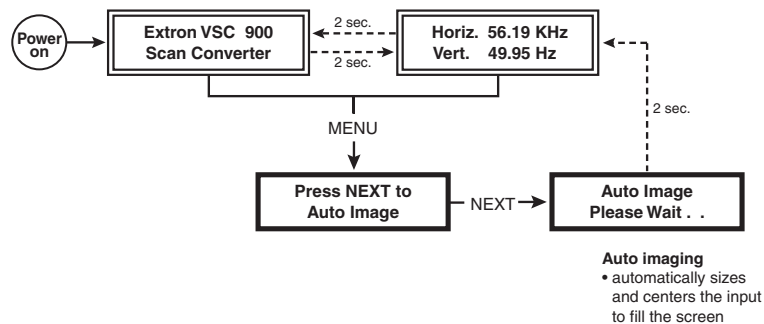


Figure 2-11 — Auto imaging menu

Installation and Operation, cont'd

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.

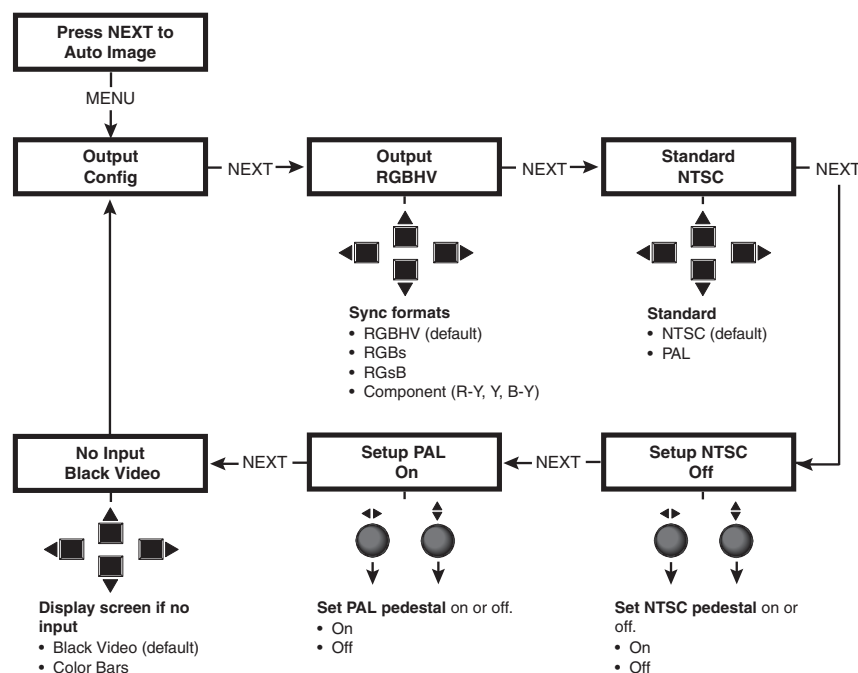


Figure 2-12 — Output configuration menu

Output signal submenu (Output)

The VSC will simultaneously output RGB or component video, composite video, S-video, and SDI component (VSC 900D only). The RGB type must be selected from this submenu.

Use the Cursor buttons 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. Use the Cursor buttons to select from between the following video standards:

- NTSC (default)
- PAL

Set NTSC pedestal submenu (Setup NTSC)

The pedestal for NTSC video format may be turned on or off. See the following note. Rotate the horizontal Adjust knob (◀▶) or vertical Adjust knob (⬆⬇) to turn the pedestal on or off.

NOTE *The signal pedestal is an offset that separates the active video from the blanking level. When the 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 (Setup PAL)

The pedestal for PAL video format may be turned on or off. See the previous note. Rotate the horizontal Adjust knob (◀▶) or vertical Adjust knob (◀▶) to turn the pedestal on or off.

No input signal display type submenu

When no input is present, the VSC offers two types of outputs. Use the Cursor buttons to select from among the following display types when no input signal is present:

- Black Video (default)
- Color Bars

Black video is a blacked out screen display.

Filters menu (Filters)

The following flowcharts provides an overview of the Filters menu.

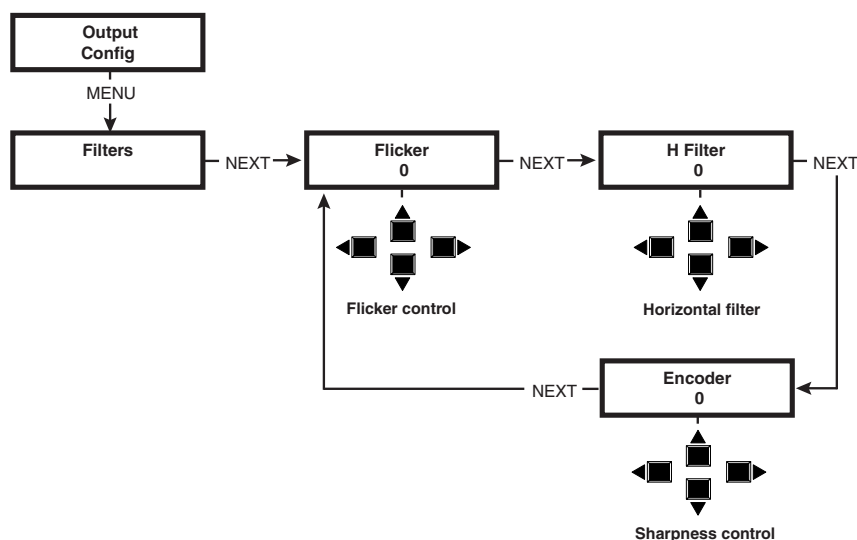


Figure 2-13 — VSC 900/900D Filters menu

Flicker filter adjustment submenu (Flicker)

Use the Cursor buttons to select a flicker filter level to reduce display output flicker.

Horizontal filter adjustment submenu (H Filter)

Use the Cursor buttons to select a horizontal filter level to reduce loss of detail in the scan converted video image.

Encoder adjustment submenu (Encoder)

Use the Cursor buttons to select an encoder level to maintain image sharpness.

Installation and Operation, cont'd

Size and Zoom menu (Size/Zoom)

The following flowchart provides an overview of the Size/Zoom menu.

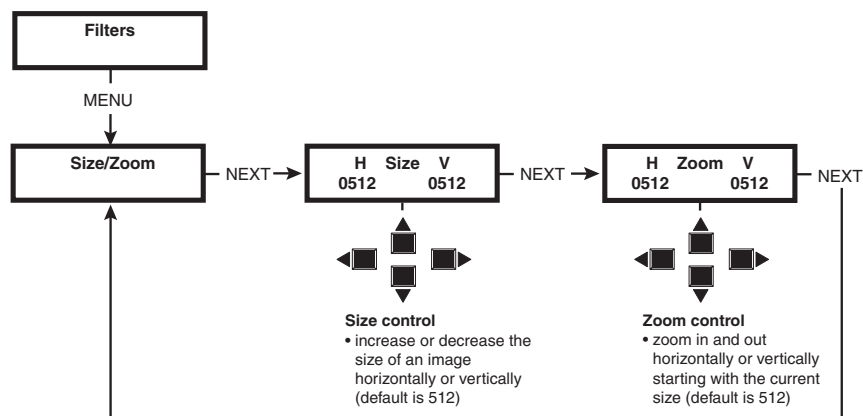


Figure 2-14 — Size/Zoom menu

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.

Size adjustment submenu (Size)

Use the Cursor buttons to increase or decrease the horizontal and vertical size of an image. The default size is 512 both horizontally and vertically.

Zoom in/out adjustment submenu (Zoom)

Use the Cursor buttons to zoom into or zoom out of an image. The zoom adjustment increases or decreases the overall size of an image and is based on the current size setting. The default size is 512 both horizontally and vertically.

Advanced functions menu (Advanced)

The following flowchart describes the Advanced functions menu.

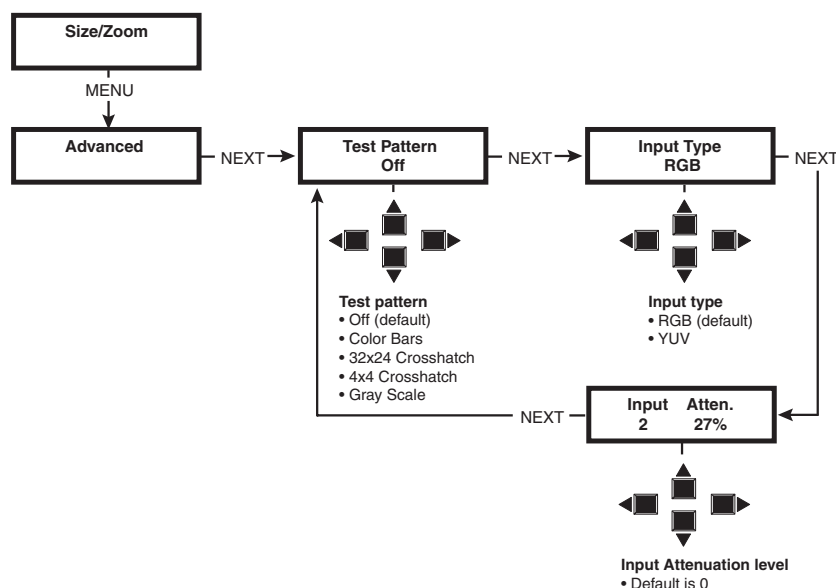
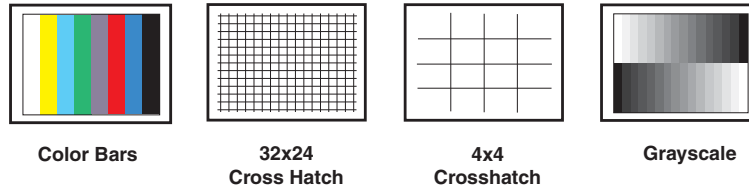


Figure 2-15 — Advanced menu

Test pattern submenu

Use the Cursor buttons to select a test pattern. The choices are: Off (no test pattern selected), Color Bars, 32x24 Crosshatch, 4x4 Crosshatch, or Gray Scale. The default test pattern is set to Off.



Input type submenu

Use the Cursor buttons to select either RGB or YUV as the input type. The default is RGB.

Input chroma attenuation submenu (Atten.)

Use the Cursor buttons to increase or decrease the chroma attenuation level of an input signal. The default attenuation level is 0 (no attenuation of the input signal).

Genlock menu (Genlock)

The following flowchart describes the Genlock menu. Genlocking is available on the VSC 900/900D.

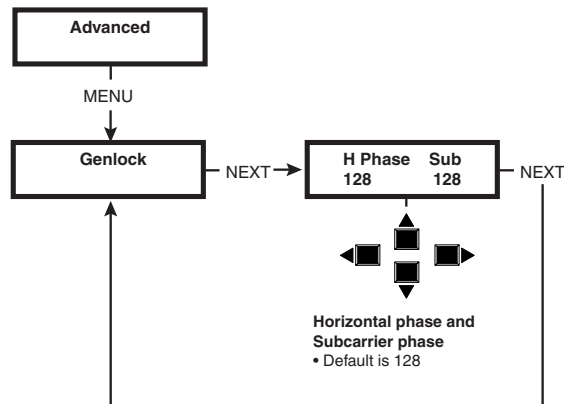


Figure 2-16 — VSC 900/900D Genlock menu

Horizontal and Subcarrier Phase submenu (H Phase Sub)

Use the left/right or up/down Cursor buttons to adjust the horizontal phase and color subcarrier phase, respectively. See *Genlock and Vertical Interval Switching* in this chapter. The range for either phase is 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 returns you to the default menu cycle.

Installation and Operation, cont'd

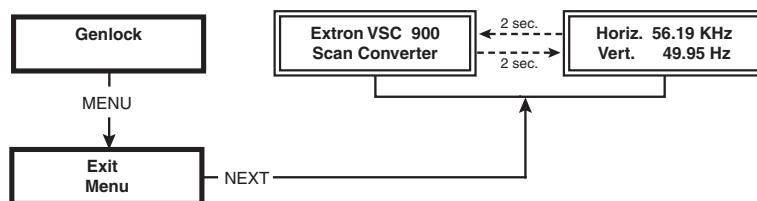


Figure 2-17 — Exit menu

Additional Functions

In addition to the main menu system, there are several other functions that are featured by the VSC 900/900D: image centering, image freezing, unit reset to factory defaults, input reset to return the input to the factory default settings, and executive mode to disable the front panel controls.

Center 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.

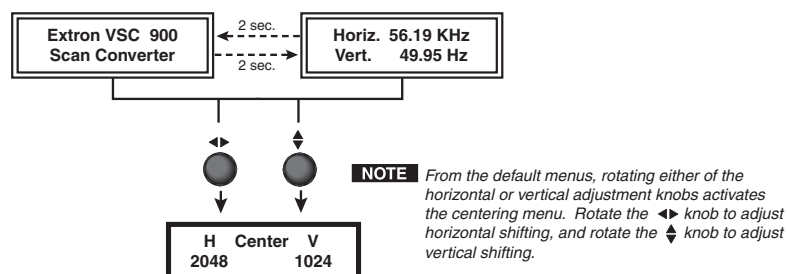


Figure 2-18 — Centering adjustment

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 lights green when this button is pressed. While in freeze mode, menu options cannot be modified. 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 disables freeze mode.

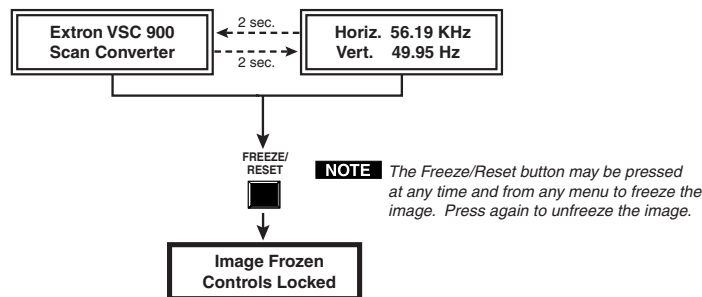


Figure 2-19 — Freeze function

Unit reset function

To reset the VSC to the factory default settings, press and hold the Freeze/Reset button for about two seconds until the Freeze/Reset LED begins to blink, then immediately press the Menu button to reset the VSC to factory defaults. If you wait too long before pressing the Menu button, the freeze mode will be enabled. You will need to press the Freeze/Reset button a second time to disable the freeze mode.

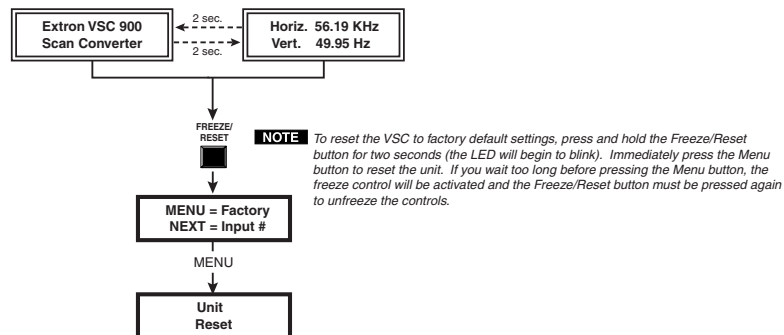


Figure 2-20 — Unit reset function

Input reset function

To reset the VSC's active input to the factory default settings for centering, sizing, and zooming, press and hold the Freeze/Reset button for about two seconds until the Freeze/Reset LED begins to blink, then immediately press the Next button to reset the active input to factory defaults. If you wait too long before pressing the Next button, the freeze mode will be enabled. You will need to press the Freeze/Reset button a second time to disable the freeze mode.

Installation and Operation, cont'd

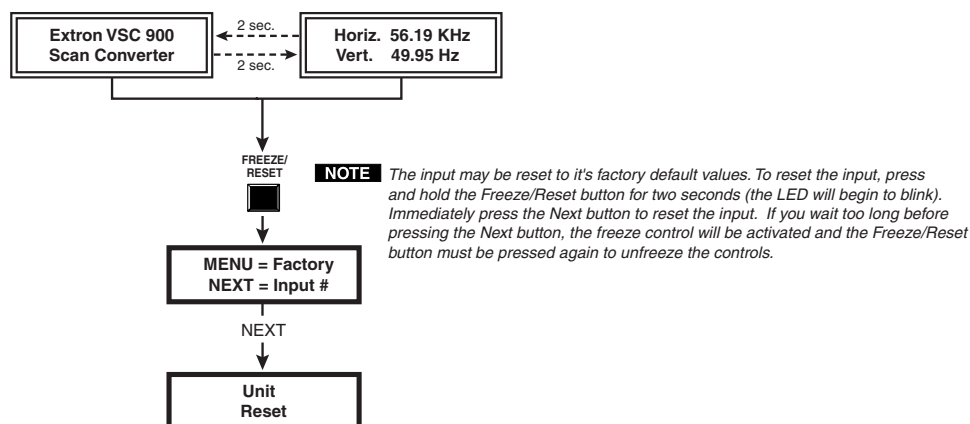


Figure 2-21 — Input reset function

Executive mode

To prevent accidental changes to settings, simultaneously press and hold the Up and Down Cursor buttons for about two seconds to enable the VSC's executive mode. Executive mode locks all front panel functions except centering (shifting), input selection, and presets. 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 and hold the Up and Down Cursor buttons again for about 2 seconds.

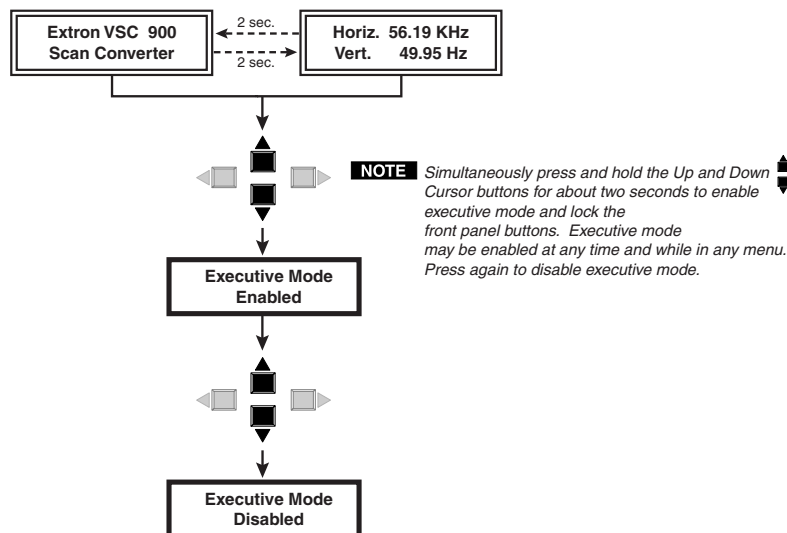
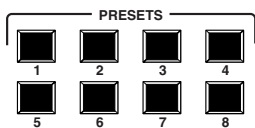


Figure 2-22 — Executive mode

Presets

The eight Presets buttons will allow sizing and centering information for an input to be stored into memory. This preset information can then be recalled at any time. Up to eight presets can be stored and recalled.



To save a preset, press and hold a Preset button until the LCD message is displayed:



To recall a preset, press the appropriate Preset button and the LCD message will display:



NOTE

The stored presets are based upon a specific input type and resolution. If an incompatible preset is recalled for an input source, the output image may not be displayed correctly.

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. Verify that the output configuration is correct for the display being used (RGBHV, RGBs, RGsB, or component).
5. Verify that the input type is correct (RGB or YUV).
6. To test the system setup and output, substitute a video test generator for the computer input.
7. Confirm that the input is receiving a signal with a compatible scan rate (horizontal frequency between 24 kHz and 70 kHz, and a vertical frequency of 50 Hz to 120 Hz).
8. Call Extron's customer support hotline if needed. Be prepared to discuss the steps you have taken and the equipment involved.

Installation and Operation, cont'd

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) 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 executive mode can be disabled by simultaneously pressing and holding down the cursor 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. Check the IR batteries. 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, Next, and Cursor 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.

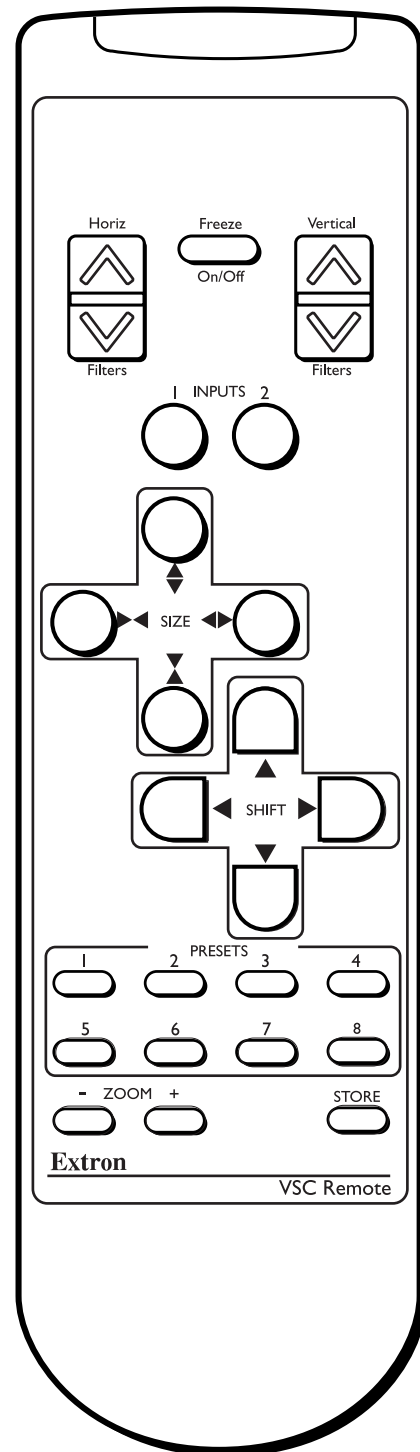
The topmost part of the remote control features a Freeze On/Off button. The Horizontal (Horiz) and Vertical Filters buttons are nonfunctional. The Inputs buttons will select either Inputs 1 or 2.

The middle portion of the VSC remote control features the Size and Shift buttons. The Size buttons are used to size an image and the Shift buttons are used to center an image.

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

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

NOTE The preset feature is available through RS-232 commands, VSC front panel controls, and the IR remote.





VSC 900/900D

Chapter Three

Serial Communication

RS-232 Programmer's Guide

Control Software for Windows

Firmware Upgrade Through the Extron Website

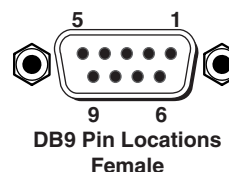
Serial Communication

The VSC 900/900D can be remotely controlled via a host computer or other device (such as a control system) attached to the rear panel RS-232 connector. The control device (host) can use either the Extron Simple Instruction Set (SIS) commands or the graphical control program for Windows.

The scan converter uses a protocol of 9600 baud, 1 stop bit, no parity, and no flow control.

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

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



RS-232 Programmer's Guide

Host-to-scan converter 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 900/900D determines that a command is valid, it executes the command and sends a response to the host device. All responses from the scan converter 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.

It is also possible to send several SIS commands back-to-back in sequence.

Video scan converter-initiated messages

When a local event such as a front panel selection or adjustment takes place, the VSC 900/900D responds by sending a message to the host. No response is required from the host. The scan converter-initiated messages are listed here (underlined).

(C) Copyright 2003, Extron Electronics, VSC 900, Vx.xx ↵

The VSC 900/900D sends the copyright message when it first powers on. Vx.xx is the firmware version number.

Chn[x] ↵ (where [x] is the input number)

The VSC 900/900D sends this response when an input is switched.

Error responses

When the scan converter receives a valid SIS command, it executes the command and sends a response to the host device. If the VSC 900/900D 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 tables on the next page list valid command ASCII codes, the scan converter's responses to the host, and a description of the command's function or the results of executing the command.

The ASCII to HEX conversion table below is for use with the command/response tables.

ASCII to HEX Conversion Table																Esc 1B	CR 0D	LF 0A											
(28	!	21	"	22	#	23	\$	24	%	25	&	26	'	27	(28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0 30	1	31	2	32	3	33	4	34	5	35	6	36	7	37	8 38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	? 3F	
@ 40	A	41	B	42	C	43	D	44	E	45	F	46	G	47	H 48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O 4F	
P 50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57	X 58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_ 5F	
` 60	a	61	b	62	c	63	d	64	e	65	f	66	g	67	h 68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o 6F	
p 70	q	71	r	72	s	73	t	74	u	75	v	76	w	77	x 78	y	79	z	7A	{	7B		7C	}	7D	~	7E	DEL 7F	

The command/response tables use symbols (defined below) to represent variables.

Symbol definitions

- ↵ = CR/LF (carriage return/line feed) (hex 0D 0A)
- ← = CR (carriage return)
- = Space
- Esc** = Escape key
- X1** = Horizontal and vertical frequencies (listed to two decimal places, i.e. xx.xx)
Signal out of range = xx:xx
- X2** = 0 = Off, 1 = On
- X4** = Video input signal type (0 or 1)
0 = RGB
1 = YUV
- X5** = Input (1 or 2)
1 = Input 1
2 = Input 2
- X9** = Input attenuation (0 through 64)
- X10** = Picture adjustment range. *See the note below.*
- X11** = Filter settings (0 through 7)
- X12** = Test pattern (0 through 3)
0 = Off
1 = Color Bars
2 = Crosshatch
3 = Grayscale
- X13** = Flicker/Encoder setting (0 through 3)
- X14** = Adjustment range (0 through 127)
- X19** = Input configuration preset (1 through 8)

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.

Serial Communication, cont'd

Command/response table for SIS commands

Command	ASCII Command (host to scan converter)	Response (scan converter to host)	Additional description
Input selection			
Select input	[X5] !	Chn [X5] ↵	Select input source [X5] (1 or 2).
Example:	1!	Chn1 ↵	Example: select input 1.
Input video type			
Set video type	[X4] \	Typ [X4] ↵	Set current active input to video type [X4] . 0 = RGB, 1 = YUV.
Example:	0 \	Typ 0 ↵	Example: set input type to RGB.
View the video type	\	[X4] ↵	Show active input's video type.
Example:	\	1 ↵	Example: input type is YUV.
Memory preset			
Recall input configuration preset	[X19].	Rpr [X19] ↵	Recall input preset [X19] .
Save input configuration preset	[X19],	Spr [X19] ↵	Save to input preset [X19] .
Horizontal shift			
Set horizontal centering	[X10] H	Hph [X10] ↵	Set horizontal centering to [X10] .
Increment up	+H	Hph [X10] ↵	Shift right.
Increment down	-H	Hph [X10] ↵	Shift left.
View horizontal centering value	H	[X10] ↵	Horizontal centering value is [X10] .
Vertical shift			
Set vertical centering	[X10] /	Vph [X10] ↵	Set vertical centering to [X10] .
Increment up	+ /	Vph [X10] ↵	Shift up.
Increment down	- /	Vph [X10] ↵	Shift down.
View vertical centering value	/	[X10] ↵	Vertical centering value is [X10] .
Horizontal size			
Specify the horizontal size value	[X10] :	Hsz [X10] ↵	Specify the horizontal size value.
Increase the horizontal size	+:	Hsz + ↵	Widen the picture.
Decrease the horizontal size	-:	Hsz - ↵	Make the picture narrower.
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.
Increase the vertical size	+:	Vsz + ↵	Make the picture taller.
Decrease the vertical size	-;	Vsz - ↵	Make the picture shorter.
View the vertical size value	;	[X10] ↵	Show the vertical size value.
Zoom mode			
Zoom in	+{	Zom ↵	Make the picture larger.
Zoom out	-{	Zom ↵	Make the picture smaller.
Horizontal filter			
Set a specific filter value	[X11] D	Dhz [X11] ↵	Set the horizontal detail level.
Increment up	+D	Dhz [X11] ↵	Increase horizontal detail.
Increment down	-D	Dhz [X11] ↵	Decrease horizontal detail.
View the filter level	D	[X11] ↵	Show the horizontal detail level.

Command/response table for SIS commands (continued)

Command	ASCII Command (host to scan converter)	Response (scan converter to host)	Additional description
Flicker filter			
Set a specific filter value	[X13] d	Dvz [X13] ↵	Set the vertical detail level.
Increment up	+d	Dvz [X13] ↵	Increase vertical detail.
Increment down	-d	Dvz [X13] ↵	Decrease vertical detail.
View the filter level	d	[X13] ↵	Show the vertical detail level.
Test pattern			
Set a specific test pattern	[X12] J	Tst [X12] ↵	Set the test pattern.
View the test pattern	J	[X12] ↵	Show the current test pattern.
Freeze			
Enable	1F	Frz1 ↵	Output a “frozen” video image.
Disable	0F	Frz0 ↵	Turn off freeze (output motion).
View the freeze status	F	Frz [X2] ↵	Show the freeze status.
Example:	F	Frz0 ↵	
Executive mode			
Enable (lock image adjustments)	1X	Exe1 ↵	Lock front panel adjustments; adjust image via RS-232 only.
Disable	0X	Exe0 ↵	Adjustments & selections can be made from the front panel.
View the executive mode status	X	Exe [X2] ↵	Show executive mode status.
Example:	X	Exe0 ↵	
Zap (reset to default settings)			
Total reset	[Esc] zXXX ↵	ZapXXX ↵	Reset everything: all settings, and adjustments to the factory default.
Query firmware version			
Query firmware version number	Q/q	x.xx ↵	Show the firmware version.
Request part number			
Request VSC 900 part number	N/n	60-478-01 ↵	Show the VSC 900's part #.
Request VSC 900D part number	N/nI	60-478-02 ↵	Show the VSC 900D's part #.
Request information			
Display information	I/i ↵	Chn [X5] • Hrt • [X1] Vrt [X1] ↵	Show input source, horizontal and vertical frequencies.

(Continued)

Serial Communication, cont'd

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

Command/response table for special function SIS commands

Command	ASCII Command	Response (host to scan converter)	$\boxed{X!}$ values (scan converter to host) and additional descriptions
Encoder filter			
Specify the encoder filter level	$\boxed{X!} * 10 \#$	Enc $\boxed{X!}$ ↵	Specify encoder filter level 0 to 3.
Example:	3 * 10 #	Enc 03 ↵	Example: Set encoder to filter level 3.
View the encoder filter level	10 #	$\boxed{X!}$ ↵	Show encoder filter level.
Output video type			
Set the output video type	$\boxed{X!} * 6 \#$	Tpo $\boxed{X!}$ ↵	Specify the output video type: 0 = RGBHV (default), 1 = RGBS, 2 = RGsB, 3 = YUV
Example:	1 * 6 #	Tpo 1 ↵	Example: Specify output video as RGsB.
View the output video type	6 #	$\boxed{X!}$ ↵	View the output video type.
Video standard			
Set video standard	$\boxed{X!} * 14 \#$	Rte $\boxed{X!}$ ↵	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 #	$\boxed{X!}$ ↵	View the video standard.
No input signal			
Set output pattern if no input	$\boxed{X!} * 13 \#$	Out $\boxed{X!}$ ↵	0 = Black Screen, 1 = Color Bars
Example:	1 * 13 #	Out 1 ↵	Example: Set Color Bars as the default output when there is no input signal.
View the output display when no input	13 #	$\boxed{X!}$ ↵	View the output pattern when there is no input signal
Input attenuation			
Set attenuation	$\boxed{X9} * 15 \#$	Attn $\boxed{X9}$ ↵	Set the input's attenuation value to $\boxed{X9}$.
Example:	64 15#	Attn 64 ↵	Example: Set the current input's attenuation to 64.
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 Extron VSC 900/900D Control Program 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 scan converter's front panel and some additional features that are only available through the Windows-based software.

The control software is compatible with Windows 95/98, Windows NT, and Windows 2000. The Extron VSC 900/900D Control Program is included with the VSC, and updates can be downloaded from the Extron Web site (<http://www.extron.com>).

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:

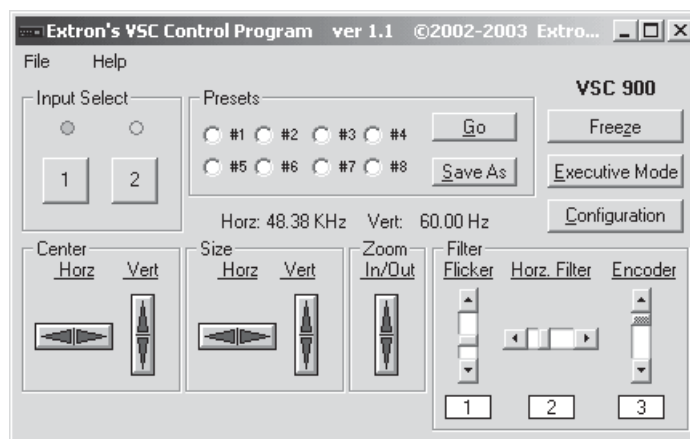
1. Run SETUP.EXE from the floppy disk.
2. Follow the instructions that appear on the screen.

By default the installation creates a C:\VSC 900 directory, and it places two icons (VSC 900 Control Pgm and VSC 900 Help) into a group or folder named "Extron Electronics".

Using the control program

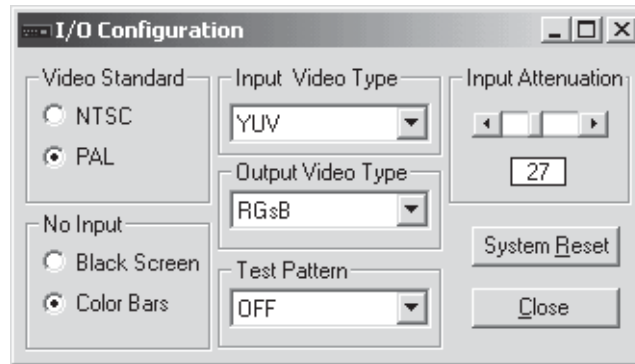
Many items found in the VSC 900 Control Program are also accessible via front panel controls and the LCD menus described in chapter two. Refer to chapter two for details on features and settings. The VSC 900 Help Program provides information on settings and on how to use the control program itself. Some features, including the miscellaneous options, are only available via this control program. These features are described in the sections of this chapter that correspond to the parts of the control program where the features are found.

1. To run the control program, double-click on the VSC 900 Control 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 900/900D's RS-232 port. The Extron VSC Control Program window appears.



Serial Communication, cont'd

3. Click on the Config button to configure the inputs from the 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 900 Control Program, or double-click on the VSC 900 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 Through the Extron Website

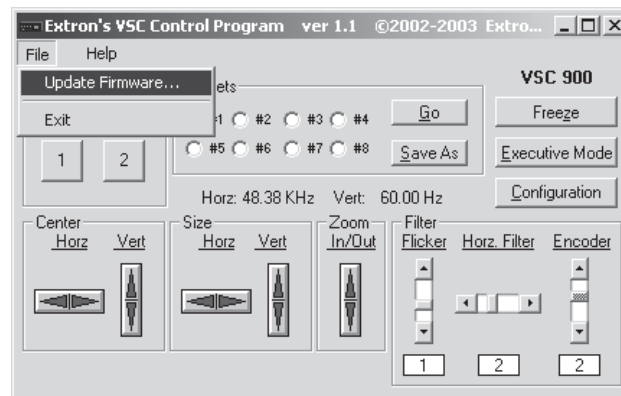
The VSC 900/900D's firmware may be upgraded by going to the Extron website, downloading the latest firmware to the PC, then uploading and installing the new firmware from the PC to the VSC 900/900D via the scan converter's RS-232 port. The whole process takes only a few minutes and is very simple.

Downloading the latest firmware to the PC

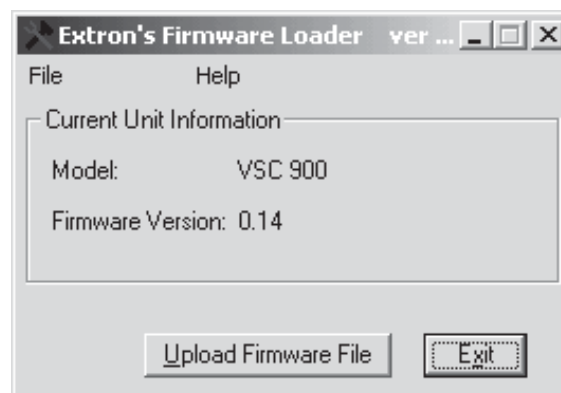
Go to the Extron website (www.extron.com), select the product category, and download the latest firmware to your PC.

Uploading the firmware from the PC to the VSC 900/900D

Connect the PC to the VSC 900/900D 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 900/900D will take a few minutes.



NOTE The original factory-installed firmware is permanently available on the VSC 900/900D. If the attempted upload of new firmware fails for any reason, the VSC 900/900D will automatically revert to the factory-installed firmware.

Serial Communication, cont'd



VSC 900/900D

A

Appendix

Appendix

Specifications

Included Parts

Accessories

Firmware Upgrade Chip Installation

Serial Digital Interface (SDI) Output Card Installation

Appendix

Specifications

Video input

Number/signal type	1 RGBHV, RGBS, RGsB, component video with 1 buffered loop-through 1 RGBHV, RGBS, RGsB with 1 buffered loop-through
Connectors	2 x 5 BNC female (5 BNCs for RGB/component video input, 5 BNCs for RGB/component video loop-through) (1) 15-pin HD female for RGB input, (1) 15-pin HD female for buffered RGB loop-through (RGB)
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	8 levels
Flicker filtering	4 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 900D 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 900D 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 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 and 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 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 optional brackets
Enclosure type	Metal
Enclosure dimensions	1.75" H x 17.5" W x 9.5" D (1U high, full rack width) 4.4 cm H x 44.5 cm W x 24.1 cm D (Depth excludes connectors and knobs.)
Product weight	5.6 lbs (2.5 kg)
Shipping weight	12 lbs (6 kg)
Vibration	ISTA/NSTA 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 $\pm 10\%$.

NOTE Specifications are subject to change without notice.

Appendix, cont'd

Included parts

These items are included in each order for a VSC 900/900D:

Included parts	Part number
VSC 900 (1)	60-478-01
or VSC 900D (1)	60-478-02
Rack mounting kit	70-077-03
IEC power cord	
Tweezer (small screwdriver)	
VSC 900/900D User's Manual	

Accessories

These items can be ordered separately:

Accessories	Part number
SDI Video Output card	70-065-02
VSC IR remote control	70-206-01

Firmware Upgrade Chip Installation

In some cases the VSC 900/900D's firmware may require replacement with an updated version. There is one user-replaceable firmware chip: U1. The number is printed on the circuit board. We recommend that you send the unit to Extron for service and updates.

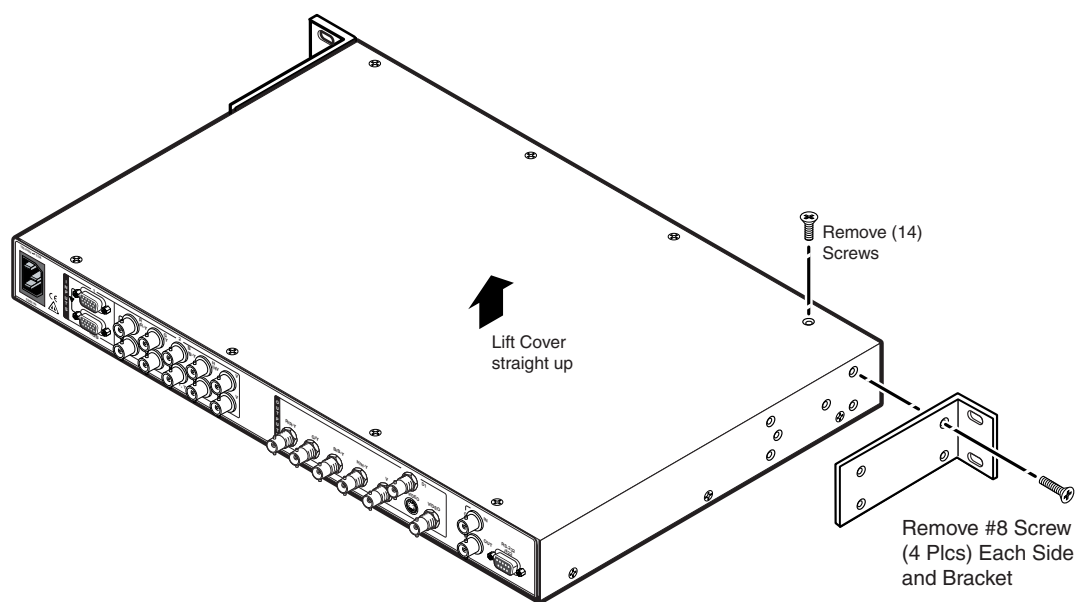
WARNING *Changes to firmware must be performed by authorized service personnel only.*

Follow these steps to replace firmware in the VSC.

1. Disconnect the AC power cord from the VSC to remove power from the unit. Next, remove the input/output cables.

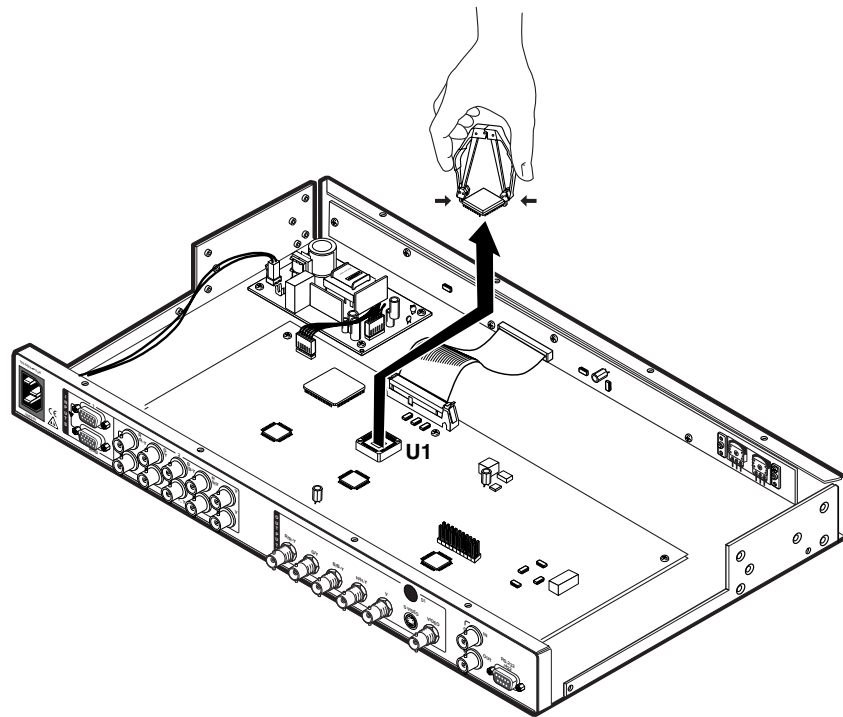
WARNING *To prevent electric shock, always unplug the VSC scan converter from the AC power source before opening the enclosure.*

2. Remove the VSC 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.

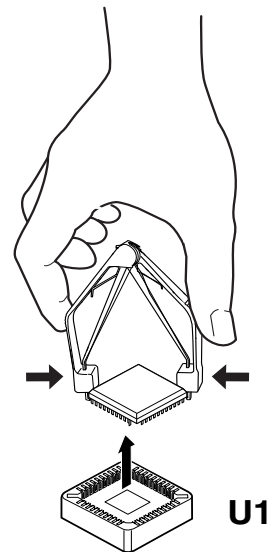


WARNING *Do not touch any switches or other electronic components inside the scaler. Doing so could damage the scan converter. Electrostatic discharge (ESD) can damage IC chips even though you cannot feel it. You must be electrically grounded before proceeding with firmware replacement. A grounding wrist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

4. Locate the U1 firmware chip to be replaced on the circuit board, as shown in the following illustration.



5. Removal of the U1 IC chip requires a PLCC IC puller tool. To remove the chip, align the hooks of a PLCC IC puller tool with the slots located in opposite ends of the U1 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, connect the input/output cables, and reconnect the AC power cord.



Serial Digital Interface (SDI) Output Card Installation

The optional SDI output card may be installed in the VSC if it does not already have an output for a serial digital interface signal. We recommend that you send the unit in to Extron for service and updates.

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

Follow these steps to install an SDI card in the scan converter.

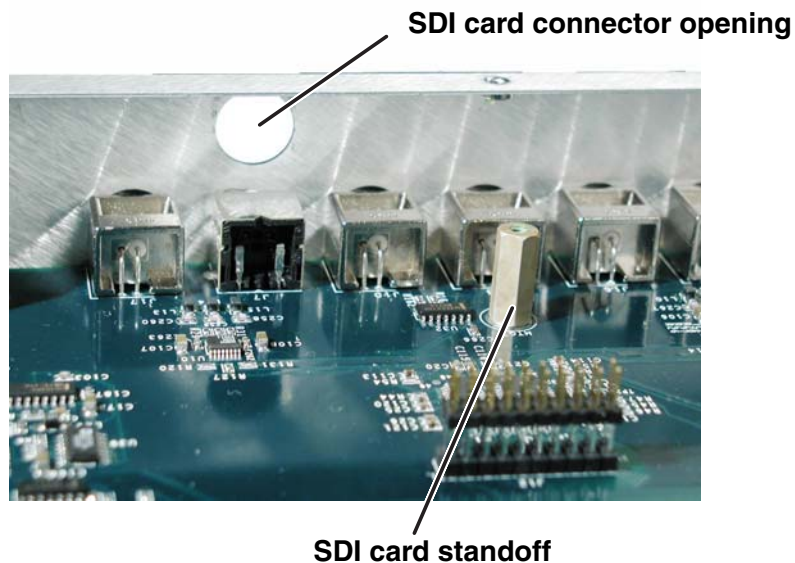
1. Disconnect the AC power cord from the VSC to remove power from the unit. Then disconnect the input/output cables.

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

2. Remove the VSC from the rack or furniture.
3. Remove the cover of the scan converter (the top half of the enclosure) by removing the screws, then lifting the cover straight up. See the top cover removal diagram in the *Firmware Upgrade Chip Installation* section.

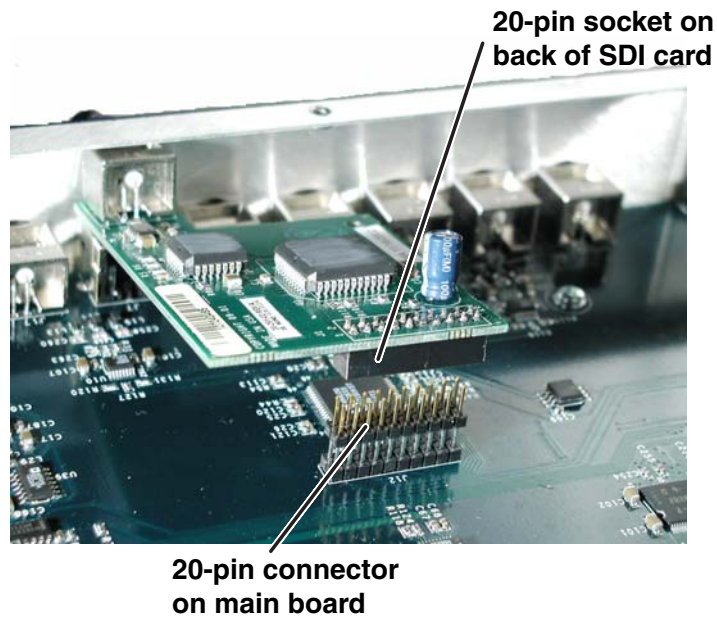
WARNING *Do not touch any switches or other electronic components inside the scan converter. Doing so could damage the scan converter. Electrostatic discharge (ESD) can damage IC chips even though you cannot feel it. You must be electrically grounded before proceeding with any electronic component replacement.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

4. Locate the SDI card standoff located near the left rear portion of the main circuit board (looking from above with the front panel nearest to you).



5. Remove the adhesive SDI cover from the rear SDI connector opening of the scan converter and position the SDI card at an angle with the SDI connector protruding from the rear SDI connector opening.
6. The SDI card has a 20-pin socket on the underside which should align with the 20 pins on the main circuit board. Be sure to align the pins properly, in order to prevent bending the pins, before pressing the SDI card firmly in place against the standoff. The mounting hole on the SDI card should now be directly over the standoff.

Appendix, cont'd



7. Insert the card's installation screw through the SDI card's mounting hole and gently tighten it into the standoff.



8. Install the SDI connector's hex nut and keep the SDI card from twisting as the nut is tightened.
9. Replace the top cover on the VSC, and fasten it with the screws that were removed in step 3.
10. Rack/furniture mount the scan converter, connect the input/output cables, and reconnect the AC power cord.

FCC Class A Notice

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

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

Extron's Warranty

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

USA, Canada, South America, and Central America:

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

Asia:

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

Europe, Africa, and the Middle East:

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

Japan:

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

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

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (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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