Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

SW Switchers

SW 4/6 AR MX HV
SW 2/4/6 AR MX
SW 6 Component
SW 2/4/6 AR HVxi
SW 2/4 ARxi

68-376-01
Printed in the USA

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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.

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

Consignes de Sécurité • Français

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

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

Attention

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

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

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

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

Sicherheitsanleitungen • Deutsch

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

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

Achtung

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

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

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

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

Instrucciones de seguridad • Español

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

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

Precaucion

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

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

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

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

Warning

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

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

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

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

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

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

Avertissement

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

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

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

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

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

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

Vorsicht

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

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

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

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

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

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

Advertencia

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

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

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

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

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el 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 baterias 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 workman–ship 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
1230 South Lewis Street
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
Daisan DMJ Bldg. 6F,
3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074
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.

Table of Contents

Table of Contents, cont'd

68-376-01 **Rev. D**
Printed in the USA
03 02

Chapter One

Introduction

About this Manual

About the Switchers

Features

About this Manual

The Extron SW series of switchers includes these models:

- SW AR*xi* (SW 2 AR*xi*, SW 4 AR*xi*)
- SW AR HV*xi* (SW 2 AR HV*xi*, SW 4 AR HV*xi*, SW 6 AR HV*xi*)
- SW AR MX (SW 2 AR MX, SW 4 AR MX, SW 6 AR MX)
- SW AR MX HV (SW 4 AR MX HV, SW 6 AR MX HV)
- SW 6 Component

About the Switchers

The SW series switchers provide switching between analog video sources and destination devices using BNC input and output connectors. Multiple switchers can be looped to increase the number of inputs. Audio signals can also be switched via the BNC connectors for composite video or S-video type inputs.

All of the switchers except the SW 6 Component provide RGBS, RGsB, component video, S-video, and NTSC/PAL composite video switching. The HV switchers can also switch RGBHV signals. The SW 6 Component switcher switches component video, S-video, and composite video.

The number in the model name indicates the number of inputs available. For example, the SW 6 AR HV*xi* includes six inputs.

Figures 1 through 5 show the SW AR*xi* and AR HV*xi* switchers. Figures 6 through 10 show the SW AR MX and SW AR MX HV switchers. Figure 11 shows the SW 6 Component switcher.

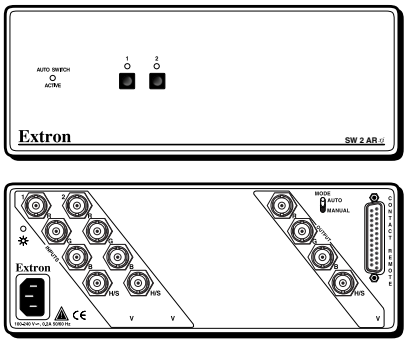


Figure 1 — SW 2 ARxi

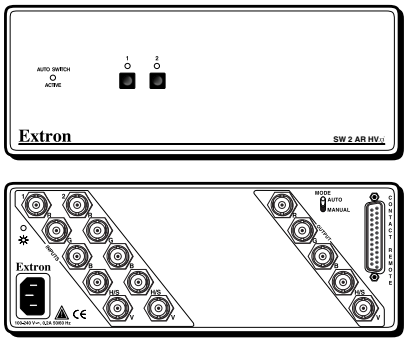


Figure 2 — SW 2 AR HVxi

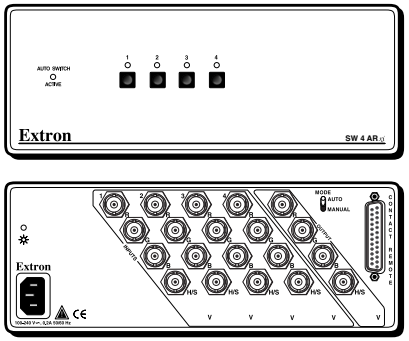


Figure 3 — SW 4 ARxi

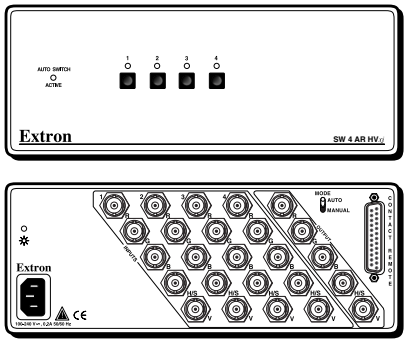


Figure 4 — SW 4 AR HVxi

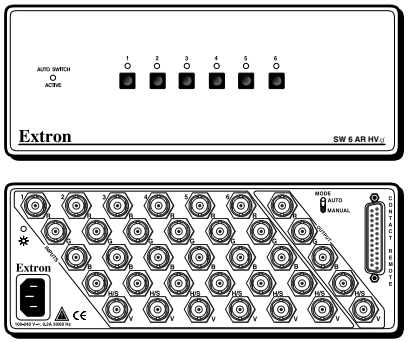


Figure 5 — SW 6 AR HVxi

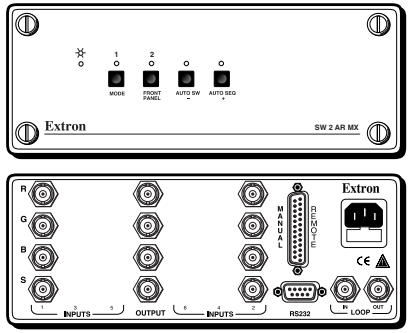


Figure 6 — SW 2 AR MX

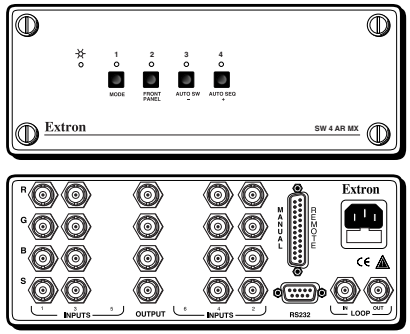


Figure 7 — SW 4 AR MX

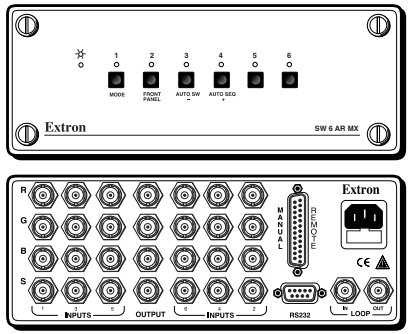


Figure 8 — SW 6 AR MX

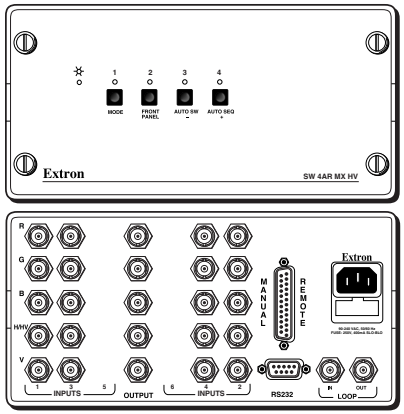


Figure 9 — SW 4 AR MX HV

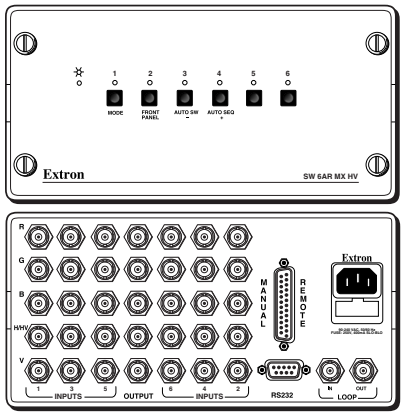


Figure 10 — SW 6 AR MX HV

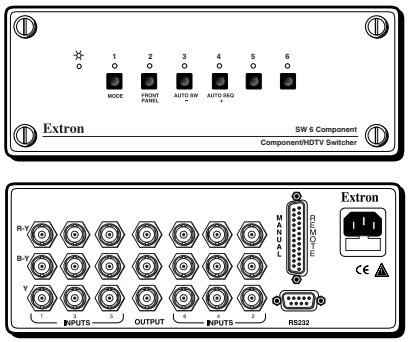


Figure 11 — SW 6 Component

Features

The SW series of switchers includes the following features:

Auto-switch mode — Auto-switch mode allows the switcher to automatically select the highest input number that has a sync signal on the sync input connector.

Battery backup (SW AR MX, SW AR MX HV, and SW 6 Component only) — If power to the switcher is lost, a battery backup saves the mode and input settings and restores them when power returns.

Bidirectional inputs (SW AR MX, SW AR MX HV, and SW 6 Component only) — With bidirectional inputs, the input connectors can act as output connectors. Thus, you are not limited to one output device. The same input image appears on all output devices.

Remote control connector — This contact closure connector allows the switcher to be controlled by remote devices, such as the IR-10 infrared or KP-10 wired remote controls, and third-party remote controls.

Input selection options — Input selection can be made using the front panel buttons or using optional remote control devices.

Looping — Looping allows you to increase the number of inputs available on a switcher by connecting one of its inputs to the output of another switcher.

Chapter Two

Installation

Front and Rear Panels

Installing the Switcher

Troubleshooting

Front and Rear Panels

Front panel features

Figure 12 shows an SW 6 AR HV*xi* front panel, and figure 13 shows an SW 6 AR MX HV front panel. The front panel controls are the same for all models of SW AR*xi* and SW AR HV*xi* switchers, and for all models of SW AR MX, SW AR MX HV, and SW 6 Component switchers, except for the number of front panel buttons and LEDs (light-emitting diodes).

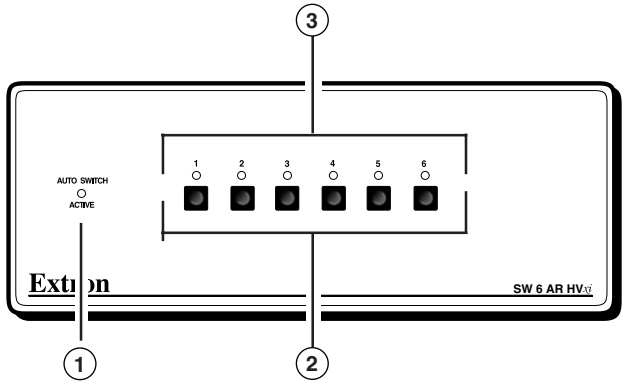


Figure 12 — SW 6 AR HV*xi* front panel

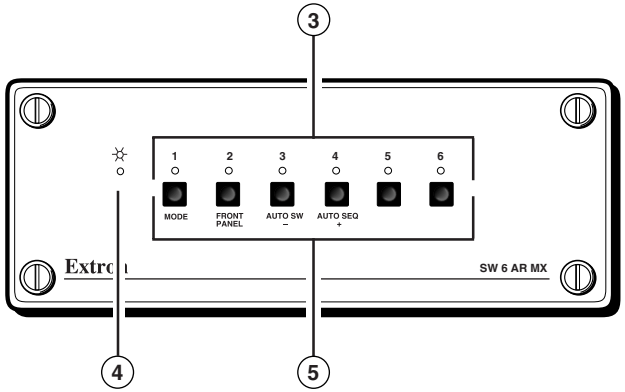


Figure 13 — SW 6 AR MX HV front panel

1. **Auto switch active LED** (SW AR*xi* and SW AR HV*xi* only) — Lights to indicate that auto-switch mode is On. The input mode/selection LEDs on SW AR MX, SW AR MX HV, and SW 6 Component switchers accomplish the same function.

2. **Input selection buttons** — Allow you to select the input to be displayed. The number of buttons available depends on the model.

NOTE *If the Mode switch on the rear panel is set to Auto, pressing the input selection buttons has no affect.*

3. **Input/mode selection LEDs** — Light to indicate the active input and, in the case of the SW AR MX, SW AR MX HV, and SW 6 Component switchers, to indicate the mode in which the switcher is operating.

4. **Power LED** — Lights to indicate that power is supplied to the switcher.

5. **Input/mode selection buttons** — Allow you to select the input to be displayed and to select the mode in which the switcher is operating.

NOTE *If either Auto-switch mode or Auto-sequence mode is selected, the buttons do not select the input.*

Rear panel features

Figure 14 shows an SW 6 AR HV*xi* rear panel, and figure 15 shows an SW AR MX HV rear panel. The rear panel features are the same for all models of SW AR*xi* and SW AR HV*xi* switchers, and for all models of SW AR MX, SW AR MX HV, and SW 6 Component switchers, except for the number of available inputs, the presence or absence of vertical sync input connectors, and in the case of the SW 6 Component, the names of the input connectors.

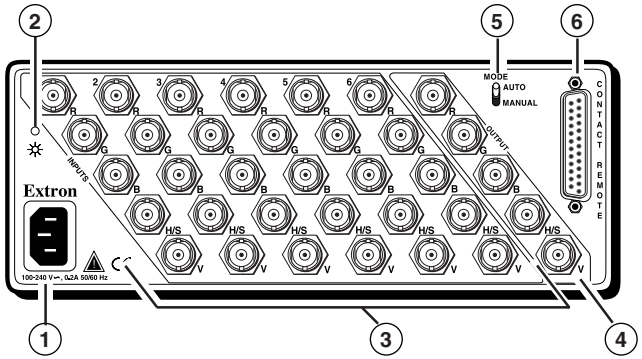


Figure 14 — SW 6 AR HVχi rear panel

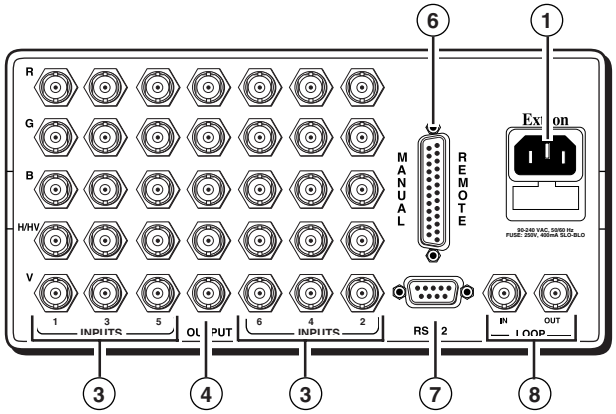


Figure 15 — SW 6 AR MX HV rear panel

(1) **AC power connector —** Standard AC power connector attaches the switcher to any power source from 100VAC to 240VAC, operating at 50 Hz or 60 Hz.

(2) **Power LED** (SW AR*χi* and SW AR HV*χi* only) — Lights to indicate that power is supplied to the switcher. (The power LED on an SW AR MX, SW AR MX HV, and SW 6 Component switcher is located on the front panel.)

(3) **Input connectors —** BNC female input connectors. See page 2-7 for information about cabling the connectors.

NOTE *SW AR MX, SW AR MX HV, and SW 6 Component switchers have bidirectional capability. This allows the inputs to be used as outputs. See "Features" on page 1-8.*

(4) **Output connectors —** BNC female output connectors See page 2-7 for information about cabling the connectors.

(5) **Mode switch** (SW AR*χi* and SW AR HV*χi* only) — Toggles between auto-switch mode and manual mode. (The same functionality is provided on SW AR MX, SW AR MX HV, and SW 6 Component via front panel buttons.)

Auto — Allows the switcher to automatically select the highest input number that has a sync signal on the sync input connector.

Manual — Allows you to select the input by pressing the front panel buttons or by using a remote control device.

(6) **Contact/manual remote connector —** One 25-pin D female connector that allows you to connect an optional remote control device or a third-party remote control device. See page 2-14 for more information.

(7) **RS-232 connector —** One 9-pin D female connector that allows you to attach a computer or another device for remote control of the switcher. See page 4-7 for more information. (SW AR MX, SW AR MX HV, and SW 6 Component only.)

(8) **Looping BNCs —** Provide communications between switchers when two or more switchers are looped together. (SW AR MX, SW AR MX HV, and SW 6 Component only. The same functionality is provided on the SW AR*χi* and SW AR HV*χi* switchers via pins 12 and 24 of the contact remote connector.)

NOTE *The SW 2 AR MX and SW 6 Component switchers do not provide looping capability.*

Installing the Switcher

Installation overview

To install a switcher, perform the following general steps:

1. If desired, mount the switcher in a rack (see "Mounting the switcher" below).
2. Turn off power to the input and output devices, and unplug the power cords from them.
3. Attach the input and output devices to the switcher (see "Cabling the switcher" on page 2-7).
4. If you are setting up the switcher in looping mode, see "Looping" on page 2-11.
5. If you are attaching an optional or third-party remote control device, see "Attaching remote control devices" on page 2-14.
6. Plug the switcher, input devices, and output device into a grounded AC source, and turn on the input and output devices.
7. The image from the selected input device should appear on the output device. If it does not, double-check steps 3 through 5 and make adjustments as needed.

Mounting the switcher

All of the switchers can be rack-mounted on a 19-inch shelf as described below. SW AR MX, SW AR MX HV, and SW 6 Component switchers can also be mounted in a front panel, as described on page 2-7.

Shelf mounting

To mount the switcher on a shelf, do the following:

1. Using a small Phillips screwdriver, remove the four rubber feet from the bottom of the switcher, and slide the feet off the screws.
2. Place the switcher on the mounting shelf, aligning the holes on the bottom of the switcher with the holes on the bottom of the shelf (figure 16).
3. Using the screws you removed in step 1, secure the switcher to the rack shelf.
4. Secure the rack shelf to the rack with the hardware provided.

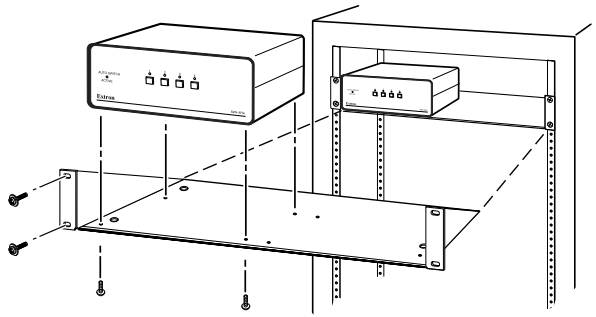


Figure 16 — Rack mounting a switcher

Panel mount

The SW 6 AR MX HV switcher enclosure is 2.5U high and requires a 3U-high rack panel (part number 60-141-02). Other AR MX switchers can be mounted in a rack using 2U-high rack mount panels (#60-141-01). The following procedure works for both panels.

To panel mount SW AR MX, SW AR MX HV, and SW 6 Component switchers, do the following:

1. Remove the four corner screws and beveled (dress) washers from the front of the switcher, and set them aside.
2. Position the rack panel in front of the switcher, aligning the holes on the switcher with the corresponding holes on the panel.

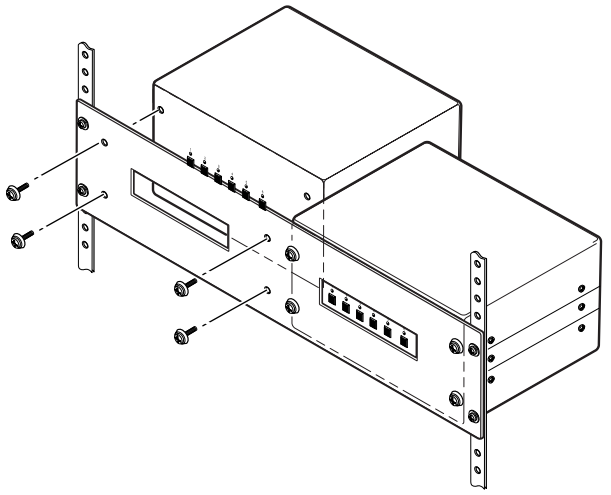


Figure 17 — Panel mounting a switcher

3. Secure the switcher to the rack panel by reinstalling the four corner screws and beveled (dress) washers through the panel. To avoid shifting, ensure that the switcher is placed firmly against the panel.
4. Secure the rack panel to the rack with the hardware provided.

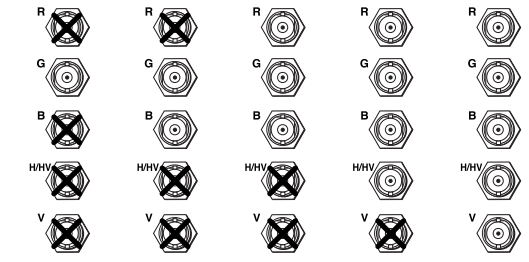
Cabling the switcher

The switcher can connect to two, four, or six input devices, depending on the model, and to one output device (SW AR*xi* and SW AR HV*xi* switchers) or more than one output device (SW AR MX, SW AR MX HV, and SW 6 Component switchers).

NOTE *If auto-switching is required, see "Input cabling for auto-switching" on page 2-10. If audio follow is required, see "Input cabling for audio follow" on page 2-10.*

To cable the switcher, do the following:

1. Use BNC connectors to connect each input device to the input connectors (figure 18). MBC cables or MBC buffers may be required for computer/monitor/switcher connections, as shown in figures 19 and 20.



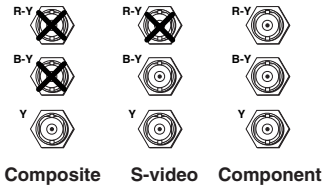


Figure 18 — Connecting the switcher

2. Use BNC connectors to connect the switcher to the output device.

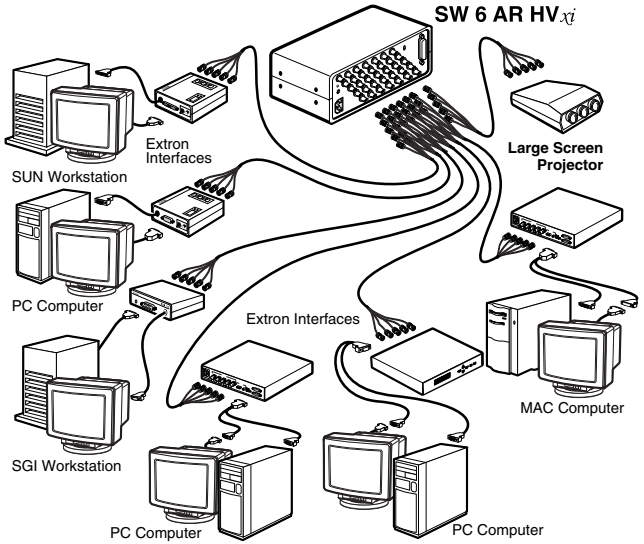


Figure 19 — SW 6 AR HV*xi* cabling

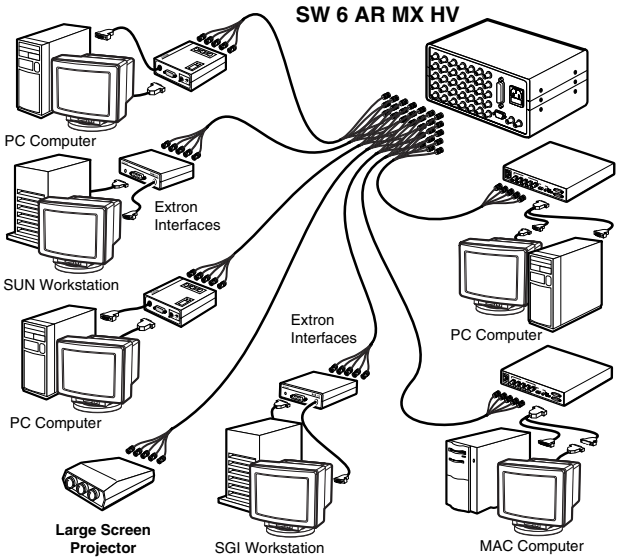


Figure 20 — SW 6 AR MX HV cabling

Input cabling for auto-switching

NOTE *This section applies to SW ARxi, SW AR HVxi, SW AR MX, and SW AR MX HV switchers only. It does not apply to the SW 6 Component switcher.*

For proper auto-switch operation, the switcher control logic must detect horizontal or composite sync pulses on the H/S sync input connector. Video on the sync input connectors is not passed to the output. This means the sync portion of composite video, S-video, component video, and RGsB signals must be connected to a video input and to the H/S input through a T connector. Connect the input cables as follows:

Composite video — Connect the input cable through a T connector to the R, G, or B input and to the H/S input.

S-video — Connect the luminance cable through a T connector to the R, G, or B input and to the H/S input. Connect the chrominance cable to one of the remaining R, G, or B inputs.

Component video — Connect the Y cable through a T connector to the G input and to the H/S input. Connect the R-Y and B-Y cables to the R and B inputs, respectively.

RGsB — Connect the green video signal cable through a T connector to the G input and to the H/S input. Connect the red and blue signal cables to the R and B inputs, respectively.

Input cabling for audio follow

Audio follow can be used with composite or S-video to allow switching of both audio and video signals. S-video requires two of the three video input connectors, leaving only one input available for audio (audio on sync inputs will not be passed to the output). Use the following guidelines for audio follow cabling:

- For composite video input, connect the video cable to the R, G, or B input (Y input for SW 6 Component), and connect the two audio channels to the remaining video inputs.
- For S-video input, connect the luminance (Y) and chrominance (C) input cables to any combination of the R, G, or B video inputs. Use the remaining video input for one channel of audio. For an SW 6 Component switcher, connect the luminance (Y) cable to the Y input, and connect the chrominance (C) input cable to either the R-Y or the B-Y input.

NOTE *If auto-switching for composite or S-video is required, use a T connector as described in "Input cabling for auto-switching" on the previous page.*

Looping

Looping is a configuration technique that enables the total number of inputs to a switcher to be increased by connecting its highest input to the output of another switcher. Extron's SW switchers are restricted to the daisy chain looping configuration, which is described in this section.

A path is created through the connected switchers for the video signals from the selected input:

- For SW ARxi and SW AR HVxi switchers, the path is created by contact remote connector loop control signals. See page 2-16 for contact remote connector pin assignment information.
- For SW AR MX and SW AR MX HV switchers, the path is created by loop control signals "Loop Out" and "Loop In".

NOTE *The SW 2 AR MX and SW 6 Component switchers do not support looping.*

Looping switchers — how it works

Examples of daisy chain looping configurations using three switchers are shown on page 2-12. Figure 21 shows three SW 6 AR HVxi switchers, and figure 22 shows the same configuration for three SW 6 AR MX HV switchers. In the example:

- Switcher C has six inputs available, and its output is connected to input 6 of switcher B.
- Switcher B has five inputs available, plus the six from switcher C, for a total of 11 inputs. Switcher B's output is connected to input 6 of switcher A.
- Switcher A has 5 inputs available, plus the 11 from switcher B (switcher B's five plus switcher C's six), for a total of 16 inputs.

Additional switchers could be connected to the string of switchers in the example. However, video signal degradation could become a serious factor as cable length increases. Signal degradation is also affected by the quality of the cables used.

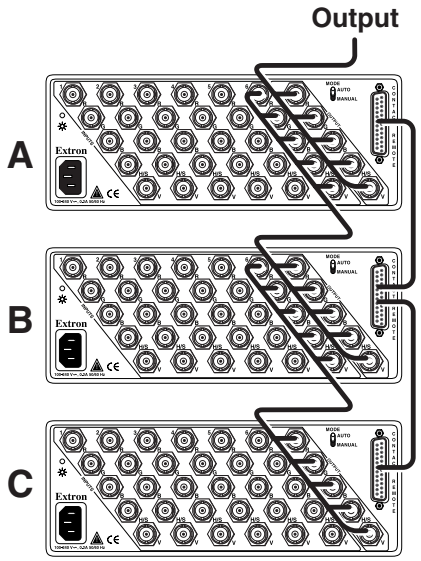


Figure 21 — Looping SW AR HVxi switchers

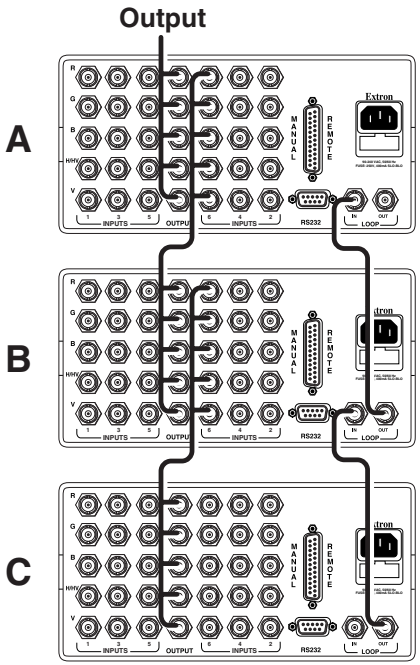


Figure 22 — Looping SW AR MX HV switchers

With the switchers connected as shown on page 2-12, input selection occurs as shown below.

NOTE *For SW ARxi and SW AR HVxi switchers, Loop Out is on pin 24 of the 25-pin connector, and Loop In is on pin 12. For SW AR MX and SW AR MX HV switchers, Loop Out is on the Loop Out BNC connector, and Loop In is on the Loop In BNC connector.*

- Any input selected by switcher A is seen at the output.
- An input selected on switcher B sends a loop control signal (Loop Out) to switcher A (Loop In), causing switcher A to select its input 6. Switcher B's selected input is seen at the output.
- An input selected on switcher C sends a loop control signal (Loop Out) to switcher B (Loop In), and then from switcher B (Loop Out) to switcher A (Loop In). Both switcher A and switcher B select input 6. Switcher C's selected input is seen at the output.

NOTE *Use high resolution cable, such as Extron's BNC-4 HR (BNC-5 HR for HV type switchers), for input and output connections. BNC-4 and BNC-5 are available in various lengths. To limit signal loss, use the shortest possible cable length.*

For SW ARxi and SW AR HVxi switchers, the loop control cables can be any standard wire.

For SW AR MX and SW AR MX HV switchers, the loop control cables can be any 75-ohm coaxial cable with BNC connectors.

Configuring switchers for looping

To configure three switchers for looping, do the following:

1. Connect a BNC cable between the highest numbered input of switcher A and the output of switcher B.

NOTE *Refer to page 2-7 for instructions for cabling input and output connections.*

2. Connect switcher A's output to the display device. Connect another BNC cable from the highest numbered input of switcher B to the output of switcher C.
3. *For SW ARxi and SW AR HVxi switchers:* Connect switcher C's contact remote connector pin-24 (Loop Out) to switcher B's contact remote connector pin 12

(Loop In). Connect switcher B's contact remote connector pin 24 (Loop Out) to switcher A's contact remote connector pin 12 (Loop In).

For SW AR MX and SW AR MX HV switchers: Connect switcher C's Loop Out connector to switcher B's Loop In connector. Connect switcher B's Loop Out connector to switcher A's Loop In connector.

Attaching remote control devices

The contact/manual remote connector provides a way to control the switcher using contact closure devices such as the following:

- Extron KP-10 wired remote keypad (see below)
- Extron IR-101 infrared remote (see the next page)
- Third-party remote controls (see page 2-16)
- Extron RS-232 2-4-6-8 contact closure adapter and a host device/computer (SW AR*xi* and SW AR HV*xi* switchers only). See page 3-3 for cabling information, and page 3-4 for software information.
- RS-232 port and a host computer (SW AR MX, SW AR MX HV, and SW 6 Composite switchers only). See page 4-8 for cabling and software information.

KP-10 cabling

Figure 23 shows an optional KP-10 wired keypad remote connected to an SW 6 AR HV*xi* switcher.

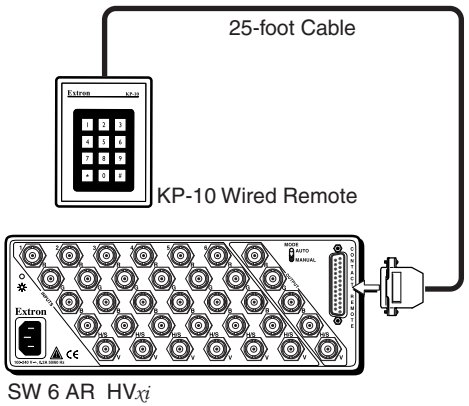


Figure 23 — KP-10 wired keypad remote

To connect the switcher to the KP-10 wired remote keypad, attach the keypad's cable to the contact/manual remote 25-pin connector on the switcher.

NOTE *To change the selected input to 1 on an SW AR MX, SW AR MX HV, or SW 6 Component switcher, remote connector pin 1 must be shorted to ground for less than 2 seconds. If pin 1 is shorted for 2 seconds or longer, the mode is displayed by a blinking LED, and the selected input does not change.*

IR-101 cabling

The Extron IR-101 infrared (IR) remote control is a hand-held unit. It communicates with all models of SW switchers through an external IR detector that is connected to an adapter. The adapter connects to the remote connector on the switcher's rear panel, and it gets its power from the +5 volts on pin 13. (See "Remote control design information" on page 2-16 for connector pin assignment information.)

Figure 24 shows an optional IR-101 infrared remote adapter connected to an SW 6 AR MX HV switcher.

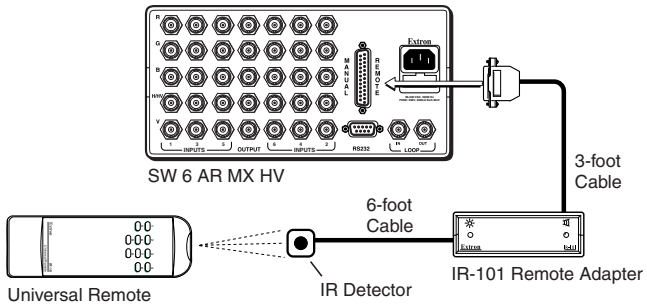


Figure 24 — IR-10 infrared remote

To install the IR-101 remote control system, do the following:

1. Power off the switcher.
2. Connect the IR-101 adapter's 25-pin plug to the remote connector on the rear panel of the switcher.
3. Plug the RJ-11 male connector into the IR-101 adapter's RJ-11 female connector.
4. Position the IR detector for best reception of the infrared light from the IR-101 hand-held remote controller (limited by a 6-foot cable).

5. Power the switcher on.

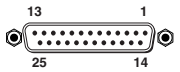
To operate the IR-101, press the key for the desired input while aiming the hand-held unit at the IR detector. The approximate operating range is 30 feet.

NOTE *To change the selected input to 1 on an SW AR MX, SW AR MX HV, or SW 6 Component switcher, remote connector pin 1 must be shorted to ground for less than 2 seconds. If pin 1 is shorted for 2 seconds or longer, the mode is displayed by a blinking LED, and the selected input does not change.*

The IR detector receives infrared signals from the hand-held IR-101 remote control, and it converts them to logic signals. The logic signals are used by the adapter to duplicate front panel input selection.

Remote control design information

Contact/manual remote connector pin assignments are shown in the table on the next page. To select a different switcher input number through the remote connector, momentarily connect the pin for the desired input number to pin 25 (logic ground).



DB25 Pin Locations
Female

NOTE *The duration of a momentary connection is defined as 250 – 500 milliseconds.*

NOTE *To change the selected input to 1 on an SW AR MX, SW AR MX HV, or SW 6 Component switcher, remote connector pin 1 must be shorted to ground for less than 2 seconds. If pin 1 is shorted for 2 seconds or longer, the mode is displayed by a blinking LED, and the selected input does not change.*

Pin	Signal	Pin	Signal
1	Input 1	2	Input 2
3	Input 3	4	Input 4
5	Input 5	6	Input 6
7	Unused	8	Unused
9	Unused	10	Unused
11	Unused	12	See note
13	+5VDC	14	Tally 1
15	Tally 2	16	Tally 3
17	Tally 4	18	Tally 5
19	Tally 6	20	Unused
21	Unused	22	Unused
23	Unused	24	See note
25	Ground		

NOTE *For SW ARxi and SW AR HVxi , pins 12 and 24 are Loop In and Loop Out, respectively. For SW AR MX, SW AR MX HV, and SW 6 Composite, pins 12 and 24 are unused.*

The tally pins can be used for remote indication of the switcher's selected input. Tally 1 – 6 (pins 14 – 19) indicate the switcher's selected input number with a logic low (0V); the tally pins are normally at logic high (5V). For example, with switcher input 2 selected, the front panel LED for that input would be on, tally 2 (pin 15) would be 0V, and the remaining tally pins would be 5V.

You can use the schematics in figure 25 as a guide to design and build indicator circuits for the tally pins. An example of an LED circuit is shown to the left, and two versions of incandescent lamp driver circuits are shown to the right.

The +5V source on remote connector pin 13 is limited to 100 mA. If a different voltage or a higher current is required, an external voltage source is required.

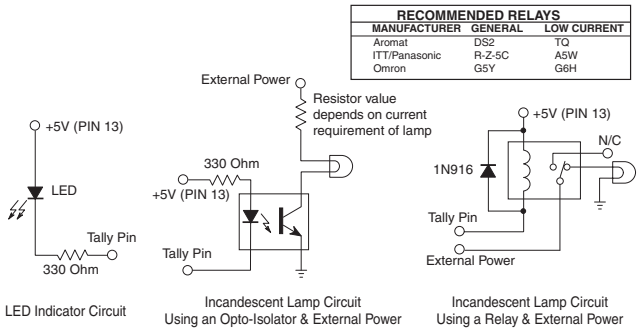


Figure 25 — Tally pin indicator circuits

Troubleshooting

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

All models

Problem — Pressing an input selection button does not change the input.

Solution — Verify the operating mode. The input selection buttons do not change the input if the switcher is in auto-switch mode or (for SW AR MX, SW AR MX HV, and SW 6 Component switchers only) auto-sequence mode.

Problem — Auto-switch does not work under composite video, S-video, component video, or RGsB format.

Solution — The sync portion of these video formats must be connected to a video input and to the H/S input through a T connector. See page 2-10.

SW AR MX, SW AR MX HV, and SW 6 Component models

Problem — You pressed input selection button 1, but the input did not change, and one of the input/mode selection LEDs is blinking (SW AR MX, SW AR MX HV, and SW 6 Component switchers only).

Solution — Holding input selection button 1 for too long causes the button to act as the front panel mode selection button. To select an input, do not hold the button after pressing it.

Problem — The switcher is plugged into a functioning power source, but does not turn on.

Solution — Replace the fuse. See page 4-11.

Chapter Three

SW AR*xi* and SW AR HV*xi* Operation

Operating Modes

Remote Operation

This chapter applies to SW AR*xi* and SW AR HV*xi* switchers only. For SW AR MX, SW AR MX HV, and SW 6 Component switcher operation information, see chapter 4.

Operating Modes

SW AR*xi* and SW AR HV*xi* switchers operate in two modes: front panel mode and auto-switch mode.

The Mode switch on the switcher's rear panel toggles between modes.

Front panel mode

In front panel mode, you can select the switcher input in the following ways:

- Front panel buttons (see below)
- Optional remote control device (contact closure type) via the remote connector (see "Attaching remote control devices" on page 2-14)
- Optional host device/computer via the RS-232 2-4-6-8 adapter (see "Remote operation" below)

To select the input from the front panel, press the button corresponding to the input number.

Auto-switch mode

In auto-switch mode, the switcher selects the highest numbered input that has sync pulses available on the sync BNC connector. In the event that sync is lost on the selected input, the switcher will automatically switch to the next highest input with sync available.

When auto-switch mode is enabled, the Auto Switch Active LED on the switcher's front panel is lit.

The auto-switch sync sensing circuitry monitors the "S" (sync) BNC connector for all video formats except RGBHV. The "V" (vertical sync) BNC connector is monitored if RGBHV video format is used (SW AR HV*xi* models only).

NOTE *See "Input cabling for auto-switching" on page 2-10 for special cabling requirements.*

Remote Operation

In addition to the KP-10 wired remote keypad, IR-10 infrared remote, and third-party remote controls described on pages 2-13 through 2-16, SW AR*xi* and SW AR HV*xi* switchers support the Extron RS-232 2-4-6-8 Contact Closure Adapter. The adapter, connected to the switcher's contact remote connector, allows an RS-232 host computer/device to duplicate SW AR*xi* front panel operations. (See page 2-16 for contact remote connector pin assignment information.)

Communication between the adapter and the host is in only one direction. The adapter receives two decimal codes and converts them to a momentary switch contact closure that parallels the switcher's front panel switch through the 25-pin contact remote connector. There is no response from the adapter to the host.

The first decimal code is the input selection code, and the second decimal code must be code 255, which is the clear code. The clear code is required to clear the RS-232 2-4-6-8 adapter buffer. The input selection codes representing each switcher input number are listed in the second table on page 3-4.

Connecting the RS-232 2-4-6-8 adapter

To connect the RS-232 2-4-6-8 adapter, do the following:

1. Connect the RS-232 cable from the PC serial port to the RS-232 2-4-6-8 adapter's RS-232 input connector (figure 26).
2. Connect the RS-232 2-4-6-8 adapter's 25-pin connector to the switcher's contact remote connector.

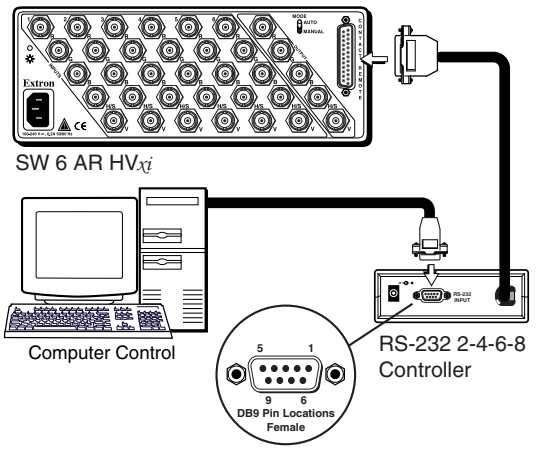


Figure 26 — RS-232 2-4-6-8 adapter

RS-232 2-4-6-8 adapter software

DOS and Windows® -compatible software, for controlling SW AR*xi* and SW AR HV*xi* switchers through the RS-232 2-4-6-8 adapter, is provided on a 3.5-inch diskette. Both versions enable the switcher input number to be selected from the host computer/device.

DOS-compatible software

The DOS version of software for SW AR*xi* and SW AR HV*xi* switcher input selection is a program called "Switch". The program can be run on the PC computer from the 3.5 inch diskette, but it may be more convenient to copy the program to the PC's hard drive. To copy Switch from the diskette to the hard disk, do the following:

1. Insert the 3.5 inch diskette into the PC's floppy disk drive.
2. At the DOS prompt, type the following command:

   Copy A:\SWITCH.COM C:\↵

DOS command format for "Switch"

The DOS command format for Switch is:

SWITCH sc [cp br db sb pt]↵

Parameters are described in the table below.

Code	Description	Selections	Defaults
sc	selection code	See table below	
cp	comm port	Serial port number (1 - 4)	**1**
br	baud rate	300,600,1200,2400,4800,9600	**4800**
db	data bits	7 or 8	**8**
sb	stop bits	0, 1, 2	**2**
pt	parity type	N=None, E=Even, O=Odd	**N**

Input Number	Selection Code
1	254
2	253
3	251
4	247
5	239
6	223
Clear buffer	255

Following are two examples of Switch DOS commands.

Example 1

Switch 254↵
Switch 255↵

Explanation:

Line 1: Switch to input 1, using default parameters.

Line 2: Clear the RS-232 2-4-6-8 buffer, using default parameters.

Example 2

Switch 223 2 4800 8 2 N↵
Switch 255 2 4800 8 2 N↵

Explanation:

Line 1: Switch to input 6, using comm port 2 at 4800 baud, 8 data bits, 2 stop bits, no parity

Line 2: Clear the RS-232 2-4-6-8 buffer, using comm port 2 at 4800 baud, 8 data bits, 2 stop bits, no parity

NOTE *You can create batch files to simplify input selection.*

Windows-compatible software

The *RS-232 2-4-6-8 Control Program* is used with SW AR*xi* and SW AR HV*xi* switchers and the RS-232 2-4-6-8 adapter. It is compatible with Windows 3.1, 3.11, 95/98, and NT.

Installing the software

The program is contained on a single 3.5-inch diskette, and it can run from the floppy drive. However, it is usually more convenient to load and run the program from the hard drive.

To install the software from the floppy disk onto the hard drive, run SETUP.EXE from the floppy disk, and follow the instructions that appear on the screen.

By default, the Windows installation places two icons (RS-232 2-4-6-8 Control Pgm and 2-4-6-8 ctrlr notes) into a group or folder named "Extron Electronics".

Using the software

To run the RS-232 2-4-6-8 Control Program, do the following:

1. Double-click on the RS-232 2-4-6-8 Control Pgm icon in the Extron Electronics group or folder.

   The RS-232 2-4-6-8 Control Program appears.

2. From the Com menu, click on the comm port that is connected to the RS-232 2-4-6-8 adapter port.
3. From the Size menu, click on the switcher type.

   Numbered buttons representing the switcher front panel buttons appear in the window (figure 27).

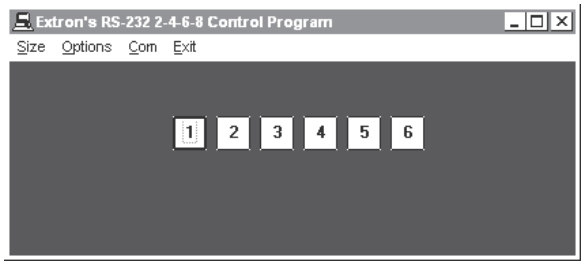
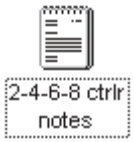


Figure 27 — RS-232 2-4-6-8 Control Program

4. Using the mouse, click on the desired input.
5. When you are finished, click on Exit.

For information about program features, click on the 2-4-6-8 ctrlr notes icon in the "Extron Electronics" group or folder.



Chapter Four

SW AR MX, SW AR MX HV, and SW 6 Component Operation

Operating Modes

Slaving to a System 4LD/C

RS-232 Control

Power Supply

This chapter applies to SW AR MX, SW AR MX HV, and SW 6 Component switchers only. For SW AR*xi* and SW AR HV*xi* operation information, see chapter 3.

Operating Modes

SW AR MX, SW AR MX HV, and SW 6 Component switchers operate in three modes: front panel mode, auto-switch mode, and auto-sequence mode. To determine the current mode, press and hold front panel button #1 until LED #2, 3, or 4 begins blinking. The blinking LED identifies the mode, as shown below.

Mode:				
Front panel	●	☼	●	●
Auto-switch	●	●	☼	●
Auto-sequence	●	●	●	☼

Symbols: ☼ = blinking LED, ● = LED in Off state.

Regardless of the mode the switcher is in, you can select the mode in the following ways:

- Through the front panel buttons (see below)
- Through the manual remote connector (see "Attaching remote control devices" on page 2-14)
- From a host device/computer connected to the switcher's RS-232 port (see "RS-232 Control" on page 4-7)

Selecting the mode from the front panel

The front panel has four or six buttons, each with an LED indicator above it. Buttons 1 and 2 (SW 2 AR MX), buttons 1 through 4 (SW 4 AR MX and SW 4 AR MX HV), or buttons 1 through 6 (SW 6 AR MX, SW 6 AR MX HV, and SW 6 Component) select the switcher input in front panel mode. Buttons 1 through 4 are also used to select the mode.

See the mode sections beginning on the next page for information on selecting inputs when the switcher is in each mode.

To select the mode from the front panel, press and hold button 1 until LED 2, 3, or 4 begins blinking, then press and hold the button corresponding to the mode you want (see the next page) while continuing to press button 1. When a blinking LED indicates the selected mode, you can release the buttons.

- Front panel mode: Button 2
- Auto-switch mode: Button 3
- Auto-sequence mode: Button 4

NOTE *Input selection from the front panel buttons is not possible when the switcher is in auto-switch or auto-sequence mode. However, all other front panel operations function normally.*

Front panel mode

In front panel mode, you can select the switcher input in the following ways:

- Front panel buttons
- Optional remote control device (contact closure type) via the manual remote connector (see "Attaching remote control devices" on page 2-14)
- Optional host device/computer via the RS-232 port (see "RS-232 Control" on page 4-7)

To select the input from the front panel, press the button corresponding to the input number, and release it immediately.

NOTE *If you hold button 1 for too long, the mode is indicated by a blinking LED 2 (indicating front panel mode), and the input does not change.*

Auto-switch mode

In auto-switch mode, the switcher selects the highest numbered input that has sync pulses available on the sync BNC connector. In the event that sync is lost on the selected input, the switcher automatically switches to the next higher input with sync available.

The auto-switch sync sensing circuitry monitors the "S" (sync) BNC connector for all video formats except RGBHV. The "V" (vertical sync) BNC connector is monitored if RGBHV video format is used (SW AR MX HV models only).

NOTE *See page "Input cabling for auto-switching" on page 2-10 for special cabling requirements.*

Auto-sequence mode

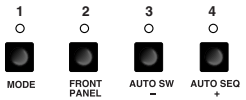
In auto-sequence mode, the switcher scans all inputs at a rate defined by the sequence rate. The sequence rate is set through the front panel buttons for time periods ranging from 4 to 60 seconds. In this mode, an input remains selected for the period of time specified by the sequence rate, then the next input in sequence is selected. This process cycles through all inputs repeatedly until the mode changes.

In auto-sequence mode, buttons 3 and 4 change the sequence rate. Each time you press button 4, the sequence rate increases by 4 seconds, up to a maximum of 60 seconds. Each time you press button 3, the sequence rate decreases by 4 seconds, down to a minimum of 4 seconds.

Sequence rate decoding

The sequence rate can be decoded using the information shown below. To determine the sequence rate, find the LED configuration in the table that matches switcher LEDs 1 – 4. The sequence rate is shown to the left of the LED configuration.

Symbols: ☼ = blinking LED.
● = LED in Off state.



4 seconds	☼	●	●	●
8 seconds	●	☼	●	●
12 seconds	☼	☼	●	●
16 seconds	●	●	☼	●
20 seconds	☼	●	☼	●
24 seconds	●	☼	☼	●
28 seconds	☼	☼	☼	●
32 seconds	●	●	●	☼
36 seconds	☼	●	●	☼
40 seconds	●	☼	●	☼
44 seconds	☼	☼	●	☼
48 seconds	●	●	☼	☼
52 seconds	☼	●	☼	☼
56 seconds	●	☼	☼	☼
60 seconds	☼	☼	☼	☼
Decimal value	4	8	16	32

Sequence rate decoding — alternate method

An alternate method of determining the sequence rate is to add the assigned decimal values for each blinking LED. The sum of these values equals the current sequence rate. The decimal value represented by each LED is shown at the bottom of each column in the table on the previous page.

Example: (see the gray bar in table)

LEDs 1, 3, and 4 are blinking. The decimal values at the bottom of those columns are 4, 16, and 32.

4 + 16 + 32 = 52 seconds

Slaving to a System 4LD/C

The SW AR MX, SW AR MX HV, and SW 6 Component switchers contain one internal, user-configurable jumper, E2. It enables the switcher to operate in either "stand-alone" or "slave" mode. In stand-alone mode, the switcher functions as an independent switcher. In slave mode, it functions as a slave to a System 4 switcher.

WARNING *Changes to internal jumper settings must be performed by authorized service personnel only.*

Configuring as a slave

By default, jumper E2 is set to stand-alone operation. To configure the switcher for System 4 slave operation, do the following:

1. If the power cord is attached, disconnect it from the switcher.
2. Remove the cover (the top portion of the enclosure) as shown in figure 28. Remove the top two screws on each end of the enclosure, lift the cover, and place the cover upside down next to the base of the enclosure.

WARNING *Do not pull on the cable that attaches the cover to the base. Doing so could disconnect the cable from its connectors.*

WARNING *Do not touch any electronic components inside the switcher. Doing so could damage the switcher.*

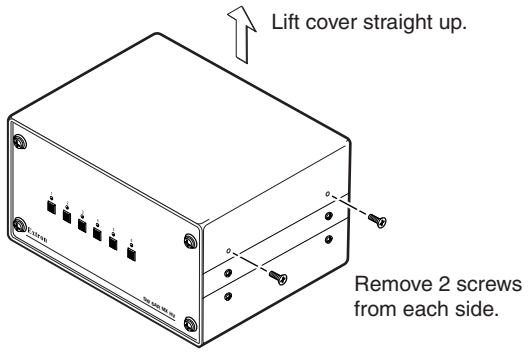


Figure 28 — Removing the switcher cover

3. Locate jumper E2 (figure 29). A jumper shunt is on pins 1 and 2.

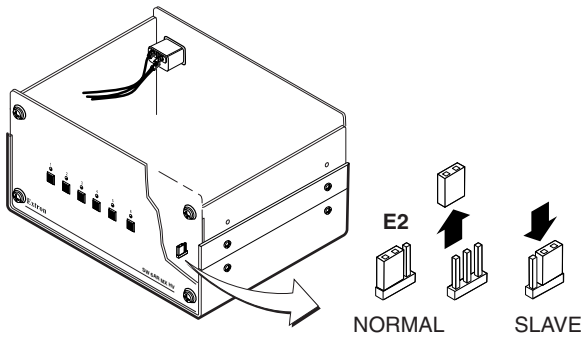


Figure 29 — Circuit board jumper location

4. To change the jumper location, use pliers to pull the jumper shunt off pins 1 and 2, and place the shunt on pins 2 and 3.
5. Replace and fasten the enclosure cover, reversing step 2.

Operating as a slave

Figure 30 shows an example of an SW 6 AR MX switcher operating as a slave to a System 4 switcher. The SW 6 AR MX provides the System 4 with inputs 4 – 9.

The SW 6 AR MX responds to commands from the System 4 through the RS-232 communications interface.

NOTE *See the System 4 Series Switcher manual for configuration information regarding the connection of an SW AR MX type switcher as a slave to a System 4 switcher.*

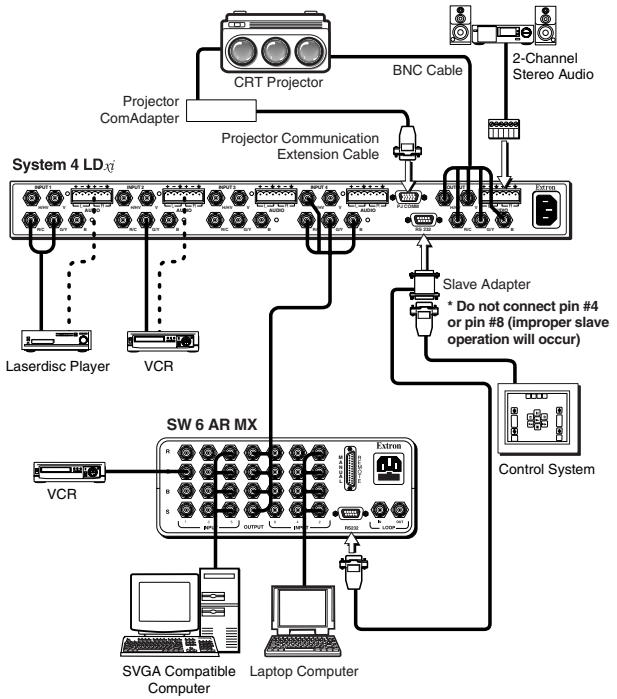


Figure 30 — SW 6 AR MX operating as a slave

RS-232 Control

The switcher can be controlled through the RS-232 port by a host device/computer. Cable connection, pinouts, and protocol are shown in figure 31 on the next page.

Host/switcher communications

The switcher treats any character that comes in from the RS-232 port as a possible command, but it accepts only a limited set of characters as legal commands. There are no codes required to say that a command is being transmitted, or that a command has ended. A simple command may be a single character typed on a keyboard, and it does not require any special characters before or after it. For example, it is not necessary to press the Enter key from the keyboard. Simple commands could be from a terminal or any other controlling device.

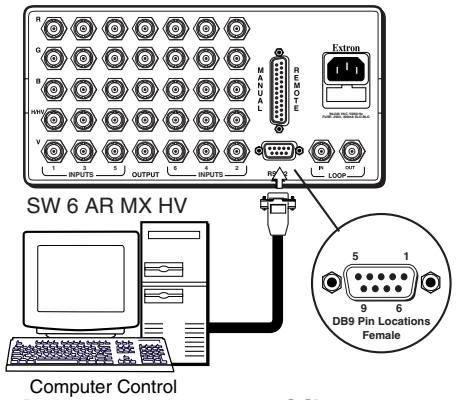


Figure 31 — RS-232 cabling

When the switcher receives a command and determines that it is valid, it executes the command and sends a response back to the controlling (host) device. If the switcher determines that the command is invalid, an error response is returned to the host. All responses from the switcher to the host begin and end with a carriage return and a line feed (CR/LF, ↵).

Using the command/response table

The table on the next page lists the commands that the switcher recognizes as valid, and the responses that are returned to the host. The Description column defines the command, describes the results of executing the command, or displays the response.

Error code descriptions

E01 — An attempt was made to select channel 0 or channels higher than the switcher's M value of 2, 4, or 6.

E06 — An attempt was made to change the channel while in either of the auto modes (auto-switch or auto-sequence).

E09 — An attempt was made to change the mode with the command # followed by any character other than 1, 2, or 3.

E10 — The delimiter character was not entered within three seconds of entering the channel number.

Command/response table

Definitions and abbreviations:

↵ = CR/LF

V = Video input — Q = Software version

F = Function (mode) — C = Channel (input)

M = Maximum inputs (2, 4, or 6) — E = Error (E01,6,9,10)

! = Delimiter character = Indicates end of input selection. Characters also accepted as delimiters are: @ &

X1 = 1 - 6 X2 = 1 - 3 X3 = 2, 4 or 6 X4 = 0.00 - 9.99

ASCII/HEX: **1**/31 **2**/32 **3**/33 **4**/34 **5**/35 **6**/36 **i**/69 **I**/49 **#**/23 **!**/26

ASCII Command	Response (switcher to host)	Description
i	(Same as I below)	Information Request
I	↵V X1 F X2 M X3 Q X4 ↵	(V,F,M,Q defined above)
#1	↵F1↵	Go to front panel mode
#2	↵F2↵	Go to auto-switch mode
#3	↵F3↵	Go to auto-sequence mode
1!	↵C1↵	Switch to channel 1
2!	↵C2↵	Switch to channel 2
3!	↵C3↵	Switch to channel 3
4!	↵C4↵	Switch to channel 4
5!	↵C5↵	Switch to channel 5
6!	↵C6↵	Switch to channel 6
(See	↵E01↵	Invalid channel number
"Error Code	↵E06↵	Invalid channel change
Descriptions"	↵E09↵	Invalid mode parameter
on page 4-8)	↵E10↵	Invalid command input

Universal SW control program

The *Universal SW Control Program*, which is used by SW AR MX, SW AR MX HV, and SW 6 Component switchers, is compatible with Windows 3.1, 3.11, 95/98, and NT. It provides remote control of input selection and function (mode) selection.

Installing the software

The Universal SW Control Program is contained on a single 3.5" diskette, and it can run from the floppy drive. However, it is usually more convenient to load and run the program from the hard drive.

To install the software from the floppy disk onto the hard drive, run SETUP.EXE from the floppy disk, and follow the

instructions that appear on the screen. The program occupies approximately 1 MB (megabyte) of hard drive space.

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

Using the software

To run the software, do the following:

1. Double-click on the Universal Switcher 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 switcher's RS-232 port.

   The Universal SW Control Program window appears (figure 32). It displays the current mode and input selection.

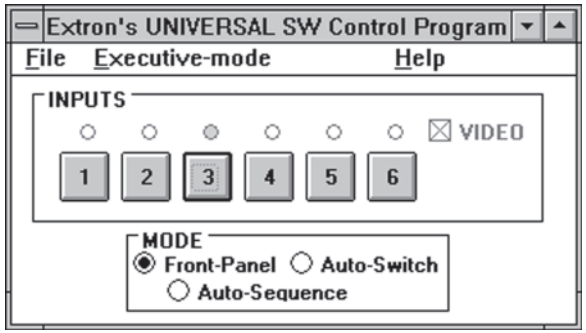


Figure 32 — Universal SW Control Program

3. Using normal Windows controls, you can perform the same adjustments as from the front panel.

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

- From the Extron Electronics program folder or group, double-click on the Universal Switcher Help icon.

Universal Switcher Help

- From within the Universal SW Control Program, click on the Help menu on the main screen.
- From within the Universal SW Control Program, press the F1 key.

Power Supply

The SW AR MX, SW AR MX HV, and SW 6 Component switchers are equipped with an internal power supply that operates from any AC line voltage in the 100—240VAC, 50/60Hz range. No configuration is required.

Replacing the fuse

The power supply is protected by a 400 mA, 250V, slow blow fuse. The fuse is in a holder located below the AC connector on the rear panel.

To change the fuse, do the following:

1. If the power cord is attached, disconnect it from the switcher.
2. Insert a small screwdriver blade into the slot provided at the top of the fuse holder, and pry the holder open (figure 33).

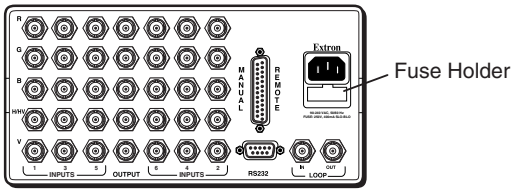


Figure 33 — Opening the fuse holder

3. Pull the fuse holder out.
4. Place a new fuse in the fuse holder. Each switcher ships with a spare fuse mounted inside the fuse holder.

Battery backup

If a loss of AC line voltage occurs, the current operating mode and the selected input are saved. When AC line voltage returns, the saved mode and input are restored and, the switcher resumes operation.

NOTE *The battery backup feature normally preserves the information for up to one hour. However, this time may be less if the switcher has been powered on for less than three minutes prior to the loss of AC line voltage.*

Appendix A

Reference Information

SW AR*xi* and SW AR HV*xi* Specifications

SW AR MX and SW AR MX HV Specifications

SW 6 Component Specifications

Part Numbers

SW2 AR*xi*,SW4 AR*xi*, SW2/4/6 AR HV*xi* Specifications

Video

Gain	Unity
Bandwidth	350 MHz (-3dB)
Switching speed	5 mS (max.)

Video input

Number/signal type	
SW2/4 ARxi	2 or 4 RGBS, RGsB, RsGsBs, component video, S-video, NTSC/PAL/SECAM composite video
SW2/4/6 AR HV*xi*	2, 4, or 6 (depending on the model) VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs component video, S-video, NTSC/PAL/SECAM composite video
Connectors	
SW 2 ARxi	2 x 4 BNC female
SW 4 ARxi	4 x 4 BNC female
SW2/4/6 AR HV*xi*	2, 4, or 6 x 5 BNC female (depending on the model)
Minimum/maximum levels	Analog ..... 0.3V to 1.5V p-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	-30dB @ 5 MHz

Video output

Number/signal type	
SW 2 ARxi	1 RGBS, RGsB, RsGsBs, component video, S-video, NTSC/PAL/SECAM composite video
SW2/4/6 AR HV*xi*	1 VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs component video, S-video, NTSC/PAL/SECAM composite video
Connectors	
SW 2 ARxi	4 BNC female
SW2/4/6 AR HV*xi*	5 BNC female
Minimum/maximum levels	Analog ..... 0.3V to 1.5V p-p
Impedance	75 ohms

Sync

Input/output types	
SW 2 ARxi	RGBS, RGsB, RsGsBs
SW2/4/6 AR HV*xi*	RGBHV, RGBS, RGsB, RsGsBs
Standards	NTSC, PAL, SECAM
Input level	1V to 5V p-p
Output level	5V p-p
Input impedance	510 ohms
Output impedance	75 ohms
Polarity	Positive or negative

Control/remote — switcher

Contact closure	1 25-pin D female connector
Extron remote key pad control	1 25-pin D female connector ... use with the Extron KP-10
IR controller module	1 25-pin D female connector ... use with the Extron IR-101

General

Power	100VAC to 240VAC, 50/60 Hz, 10 watts, internal, auto-switchable
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	Yes, with optional shelf, part #60-030-01
Enclosure type	Metal
Enclosure dimensions	3.4" H x 8.5" W x 6.25" D (2U high, 1/2 rack width) 8.5 cm H x 21.6 cm W x 15.9 cm D (Depth excludes connectors.)
Product weight	
SW2 AR*xi*	3.3 lbs (1.5 kg)
SW4 AR*xi*	3.7 lbs (1.7 kg)
SW2 AR HV*xi*	3.5 lbs (1.6 kg)
SW4 AR HV*xi*	3.9 lbs (1.8 kg)
SW6 AR HV*xi*	4.4 lbs (2.0 kg)
Shipping weight	
SW2 AR*xi*	5 lbs (2.3 kg)
SW4 AR*xi*	6 lbs (2.7 kg)
SW2 AR HV*xi*	5 lbs (2.3 kg)
SW4 AR HV*xi*, SW6 AR HV*xi*	6 lbs (2.7 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *Specifications are subject to change without notice.*

SW AR MX Specifications

Video

Gain	Unity
Bandwidth	600 MHz (-3dB), fully loaded
Crosstalk	-70dB @ 10 MHz
Switching speed	5 mS (max.)

Video input

Number/signal type	2, 4, or 6 analog VGA-UXGA RGBS, RGsB, RsGsBs, component video, S-video or NTSC/PAL/SECAM composite video
Connectors	2, 4, or 6 x 4 BNC female
Minimum/maximum levels	Analog ..... -5.0V to +5.0V p-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	-30dB @ 10 MHz
External sync (genlock)	SW 4 and 6 AR MX only ..... 0.3V to 0.4V p-p

Video output

Number/signal type	1 analog VGA-UXGA RGBS, RGsB, RsGsBs, component video, S-video or NTSC/PAL/SECAM composite video
Connectors	4 BNC female
Minimum/maximum levels	Analog ..... -5.0V to +5.0V p-p
Impedance	75 ohms
Return loss	-30dB @ 5 MHz
DC offset	±5mV maximum

Sync

Input type	2, 4, or 6 analog RGBS, RGsB, RsGsBs
Output type	1 analog RGBS, RGsB, RsGsBs
Standards	NTSC, PAL, SECAM
Input level	0.5V to 5V p-p
Output level	Same as input
Input impedance	510 ohms
Output impedance	75 ohms
Max. propagation delay	40 nS
Max. rise/fall time	4 nS
Polarity	Positive or negative

Control/remote — switcher

Serial control port	RS-232, 9-pin D female connector
Baud rate and protocol	9600, 8-bit, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Contact closure	25-pin D female connector
Extron remote key pad control	Extron KP 10 keypad ..... connects to the 25-pin D female connector
IR controller module	Extron IR 101 ..... connects to the RS-232 9-pin D female connector
Program control	Extron's control program for Windows® Extron's Simple Instruction Set™ – SIS™

General

Power	100VAC to 240VAC, 50/60 Hz, 10 watts, internal, auto-switchable
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	Yes, with optional 2U front panel #60-141-01 or 2U universal rack shelf #60-032-01
Enclosure type	Metal
Enclosure dimensions	3.4" H x 8.5" W x 6.25" D (2U high, 1/2 rack width) 8.5 cm H x 21.6 cm Wx 15.9 cm D (Depth excludes connectors.)
Product weight	
SW 2 AR MX	3.7 lbs (1.7 kg)
SW 4 AR MX	3.9 lbs (1.8 kg)
SW 6 AR MX	4.4 lbs (2.0 kg)
Shipping weight	6 lbs (2.7 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Certifications	CE, CSA
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *Specifications are subject to change without notice.*

SW 4/6 AR MX HV Specifications

Video

Gain	Unity
Bandwidth	600 MHz (-3dB), fully loaded
Crosstalk	-70dB @ 10 MHz
Switching speed	5 mS (max.)

Video input

Number/signal type	4 or 6 (depending on the model) analog VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs, component video, S-video or NTSC/PAL/SECAM composite video
Connectors	4 or 6 x 5 BNC female (depending on the model)
Minimum/maximum levels	Analog ..... -5.0V to +5.0V p-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	-30dB @ 10 MHz

Video output

Number/signal type	1 analog VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs, component video, S-video or NTSC/PAL/SECAM composite video (same as input)
Connectors	5 BNC female
Minimum/maximum levels	Analog ..... -5.0V to +5.0V p-p
Impedance	75 ohms
Return loss	-30dB @ 5 MHz
DC offset	±5mV maximum with input at 0 offset

Sync

Input type	4 or 6 analog RGBHV, RGBS, RGsB, RsGsBs
Output type	1 analog RGBHV, RGBS, RGsB, RsGsBs (same as input)
Standards	NTSC, PAL, SECAM
Input level	0.5V to 5V p-p
Output level	Same as input
Input impedance	510 ohms
Output impedance	75 ohms
Max. propagation delay	40 nS
Max. rise/fall time	4 nS
Polarity	Positive or negative

Control/remote — switcher

Serial control port	RS-232, 9-pin D female connector
Baud rate and protocol	9600, 8-bit, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Contact closure	25-pin female D connector
Extron remote key pad control	Extron KP 10 keypad ..... connects to the 25-pin D female connector
IR controller module	Extron IR 101 ..... connects to the RS-232 9-pin D female connector
Loop signal	Momentary low, 1 mS min., 5 mS max.
Program control	Extron's control program for Windows® Extron's Simple Instruction Set™ – SIS™

General

Power	100VAC to 240VAC, 50/60 Hz, 10 watts, internal, auto-switchable
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	Yes, with optional 3U front panel #60-141-02 or 2U universal rack shelf #60-032-01
Enclosure type	Metal
Enclosure dimensions	4.3" H x 8.5" W x 6.25" D (3U high, 1/2 rack width) 10.9 cm x 21.6 cm x 15.9 cm (Depth excludes connectors.)
Product weight	
SW 4 AR MX HV	4.6 lbs (2.1 kg)
SW 6 AR MX HV	5.0 lbs (2.3 kg)
Shipping weight	
SW 4 AR MX HV	7 lbs (3.2 kg)
SW 6 AR MX HV	8 lbs (3.6 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, CSA

MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *Specifications are subject to change without notice.*

SW 6 Component Specifications

Video

Gain	Unity
Bandwidth	180 MHz (-3dB), fully loaded
Crosstalk	-70dB @ 10 MHz

Video input

Number/signal type	6 analog RGsB, component (R-Y, B-Y, Y), S-video, NTSC/PAL/SECAM composite video
Connectors	6 x 3 BNC female
Minimum/maximum levels	Analog ..... -5.0V to +5.0V p-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	-30dB @ 10 MHz

Video output

Number/signal type	1 analog RGsB, component (R-Y, B-Y, Y), S-video, NTSC/PAL/SECAM composite video
Connectors	3 BNC female
Minimum/maximum levels	Analog ..... -5.0V to +5.0V p-p
Impedance	75 ohms
Return loss	-30dB @ 5 MHz
DC offset	±5mV maximum with input at 0 offset

Sync

Input type	6 analog RGsB, component (R-Y, B-Y, Y)
Output type	1 analog RGsB, component (R-Y, B-Y, Y)
Standards	NTSC, PAL, SECAM
Input level	0.5V to 5V p-p
Output level	Same as input
Input impedance	510 ohms
Output impedance	75 ohms

Control/remote — switcher

Serial control port	RS-232, 9-pin D female connector
Baud rate and protocol	9600, 8-bit, 1 stop bit, no parity
Serial control pin configurations	TX = 2, RX = 3, GND = 5
Contact closure	25-pin D female connector
Extron remote key pad control	Extron KP 10 keypad ..... connects to the 25-pin D female connector
IR controller module	Extron IR 101 ..... connects to the RS-232 9-pin D female connector
Program control	Extron's control program for Windows® Extron's Simple Instruction Set™ – SIS™

General

Power	100VAC to 240VAC, 50/60 Hz, 10 watts, internal, auto-switchable
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	Yes, with optional front panel #60-141-01, or universal rack shelf #60-032-01
Enclosure type	Metal
Enclosure dimensions	3.5" H x 8.5" W x 6.3" D (2U high, half rack width) 8.9 cm H x 21.6 cm W x 16.0 cm D (Depth excludes connectors.)
Product weight	4.0 lbs (1.8 kg)
Shipping weight	6 lbs (2.7 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, CSA
MTBF	30,000 hours
Warranty	3 years parts and labor
Extron part number	60-309-01

NOTE *Specifications are subject to change without notice.*

Part Numbers

SW AR*xi* and SW AR HV*xi* part numbers

Extron Part	Part #
SW 2 AR*xi*	60-262-01
SW 2 AR HV*xi*	60-263-01
SW 4 AR*xi*	60-264-01
SW 4 AR HV*xi*	60-265-01
SW 6 AR HV*xi*	60-266-01

SW AR MX and SW AR MX HV part numbers

Extron Part	Part #
SW 2 AR MX	60-197-01
SW 4 AR MX	60-109-01
SW 4 AR MX HV	60-109-03
SW 6 AR MX	60-110-01
SW 6 AR MX HV	60-110-03

SW 6 Component part numbers

Extron Part	Part #
SW 6 Component	60-309-01

Accessory part numbers

Extron Part	Part #
19″ 2U Universal Rack Shelf	60-032-01
SW MX Series Rack Front Panel (SW AR MX / SW 6 Component)	60-141-01
SW MXHV Series Rack Front Panel (SW AR MX HV)	60-141-02
KP-10 Hard Wired Keypad Remote	60-111-01
IR-101 Universal Remote Control	70-036-01
RS-232 2-4-6-8 Controller	60-112-01
S-VHS BNC - Male to Male S-video to BNC Cable Adapter	26-353-01

Cable part numbers

Extron Part	Part #
BNC-4 HR cable	
BNC-4-3′HR (3 feet/0.9 meters)	26-210-01
BNC-4-6′HR (6 feet/1.8 meters)	26-210-02
BNC-4-12′HR (12 feet/3.6 meters)	26-210-03
BNC-4-25′HR (25 feet/7.5 meters)	26-210-04
BNC-4-50′HR (50 feet/15.0 meters)	26-210-05
BNC-4-75′HR (75 feet/23.0 meters)	26-210-06
BNC-4-100′HR (100 feet/30.0 meters)	26-210-07
BNC-4-150′HR (150 feet/45.0 meters)	26-210-08
BNC-4-200′HR (200 feet/60.0 meters)	26-210-09
BNC-4-250′HR (250 feet/75.0 meters)	26-210-54
BNC-4-300′HR (300 feet/90.0 meters)	26-210-53
BNC-4 Mini-HR Bulk (300′/90m up to 5000′/1500m)	22-073-01
BNC-5 HR cable	
BNC-5-3′HR (3 feet)	26-260-15
BNC-5-6′HR (6 feet/1.8 meters)	26-260-01
BNC-5-12′HR (12 feet/3.6 meters)	26-260-02
BNC-5-25′HR (25 feet/7.5 meters)	26-260-03
BNC-5-50′HR (50 feet/15.0 meters)	26-260-04
BNC-5-75′HR (75 feet/23.0 meters)	26-260-16
BNC-5-100′HR (100 feet/30.0 meters)	26-260-05
BNC-5-150′HR (150 feet/45.0 meters)	26-260-12
BNC-5-200′HR (200 feet/60.0 meters)	26-260-06
BNC-5-250′HR (250 feet/75.0 meters)	26-260-18
BNC-5-300′HR (300 feet/90.0 meters)	26-260-14
BNC-5 Mini-HR Bulk (300 feet up to 5000 feet)	22-008-01