Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

User's Manual

MSW 4V rs and MSW 4SV rs Series

Mini Video Switchers

68-1267-01 **Rev. B**
02 10

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 baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

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

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

电源线保护 • 妥善布线，避免被踩踏，或重物挤压。

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

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

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

FCC Class A Notice

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

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

Table of Contents

Introduction

About the MSW 4V rs and MSW 4SV rs Switchers

The Extron MSW 4V rs and MSW 4SV rs are four-input, two parallel output, mini video switchers (MSWs).

The **MSW 4V rs** switches between a maximum of four NTSC, PAL, or SECAM composite video inputs on female BNC connectors and produces two identical video outputs on female BNC connectors (see **figure 1** on page 2). The video output is a buffered, composite signal.

The **MSW 4SV rs** switches four S-video (luminance [Y] and chrominance [C]) inputs on 4-pin mini DIN connectors. The selected S-video input is split, buffered, and output on two connectors (see **figure 2** on page 2):

- One S-video output on a 4-pin mini DIN connector
- One composite video output on a female BNC connector

These mini video switchers can be operated from the front panel or via a contact closure device connected to the rear panel, such as an Extron CCR 204 Four-Button Contact Closure Remote or an IR 102 Remote Control Kit. The MSW Series include RS-232 communication, allowing control via the Extron Simple Instruction Set™ (SIS™) or the Universal Switcher Control Program software.

They also feature a front panel selectable auto switch mode that automatically switches to the highest numbered input with active sync pulses present.

Features

- Inputs: four female 4-pin mini DIN connectors for S-video or four female BNC connectors for composite video
- Outputs: one BNC and one 4-pin mini DIN for S-video or two BNC connectors for composite video (both models feature two parallel outputs for simultaneous monitor and projector viewing)
- An RS-232 port for serial control
- Compatibility with NTSC, PAL, and SECAM video formats
- Retention of unit settings after power loss
- Flash upgradeable firmware
- Downloadable firmware updates
- Contact closure remote control
- Ability to detect an active signal

- Built-in video encoder to output composite video to a monitor (MSW 4SV rs model only)
- Auto switching capabilities
- Vertical interval switching to ensure glitch-free transitions
- 1U, quarter rack width metal enclosure
- External universal power supply

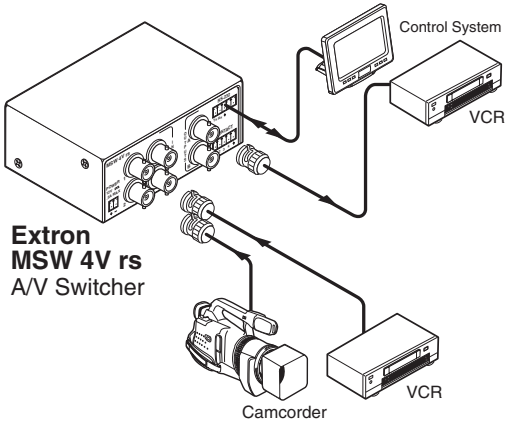


Figure 1 — Typical setup for the MSW 4V rs

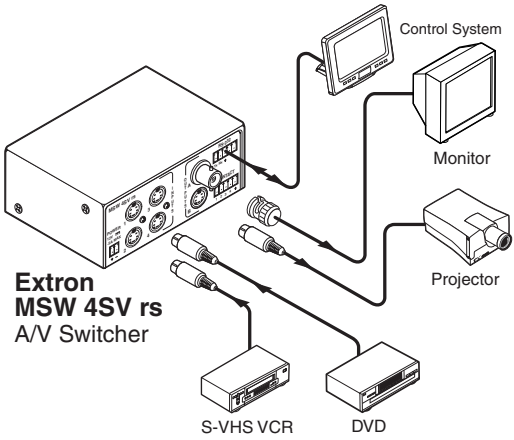


Figure 2 — Typical setup for the MSW 4SV rs

Installation and Operation

Mounting

The 1U high, quarter rack width, MSW 4V rs and MSW 4SV rs can be mounted on a rack shelf, under a desk, or on a tabletop.

Rack mounting

For optional rack mounting, mount the MSW on any of the following rack shelves:

- RSF 123 1U 3.5 inch Deep Rack Shelf Kit (part #**60-190-20**, see **figure 3** on page 4)
- RSB 123 1U 3.5 inch Deep Basic Rack Shelf (part #**60-604-21**)
- RSU 126 1U 6 inch Deep Universal Rack Shelf Kit (part #**60-190-10**)
- RSB 126 1U 6 inch Deep Basic Rack Shelf (part #**60-604-11**)
- RSU 129 1U 9.5 inch Deep Universal Rack Shelf Kit (part #**60-190-01**, see **figure 4** on page 4)
- RSB 129 1U 9.5 inch Deep Basic Rack Shelf (part #**60-604-02**)

UL requirements

The following Underwriters Laboratories (UL) requirements pertain to the safe installation of the MSW on a rack.

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

Mounting instructions

On the standard rack shelf, the MSW mounts in one of four locations to the rear of the rack or in one of four locations to the front of the rack.

1. If they are installed, remove the feet from the bottom of the MSW.
2. Mount the MSW on the rack shelf, using two 4-40 x 3/16 inch screws in opposite (diagonal) corners to secure the MSW to the shelf.
3. Install blank panel(s) or other unit(s) to the rack shelf.

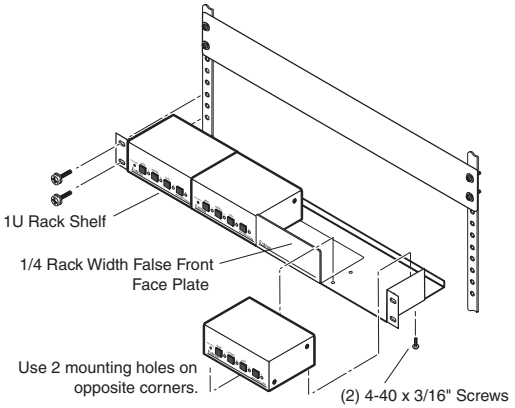


Figure 3 — MSW mounted on a 3.5 inch rack shelf

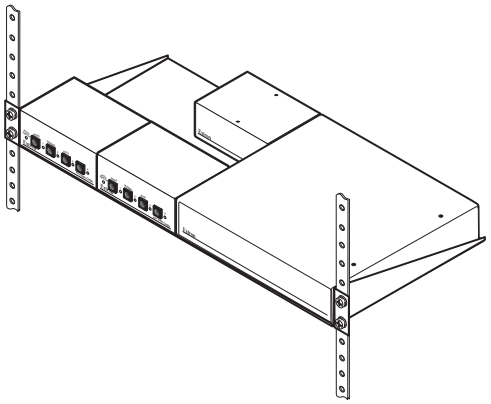


Figure 4 — MSW mounted on a standard rack shelf

Furniture mounting

Furniture mount the MSW using the optional MBU 123 under-desk mounting kit (part **#70-212-01**) as follows:

1. If necessary, remove the feet from the bottom of the MSW.
2. Attach the mounting brackets to the MSW with the provided machine screws (see figure 5).

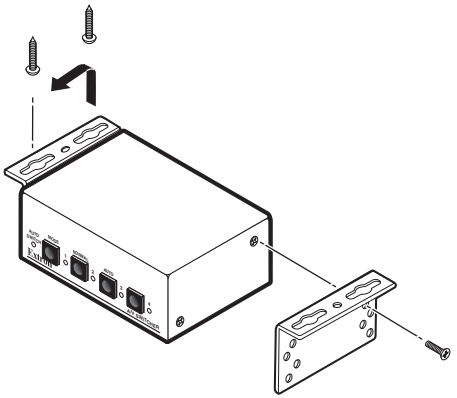


Figure 5 — Furniture mounting the MSW

3. Hold the MSW with the attached brackets against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill four 3/32 inch (2 mm) diameter pilot holes, 1/4 inch (6.3 mm) deep in the mounting surface at the marked screw locations.
5. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4 inch of the screw head protrudes.
6. Align the mounting screws with the slots in the brackets and place the MSW against the surface, fitting the screws through the bracket slots.
7. Slide the switcher slightly forward or back, then tighten all four screws to secure the MSW in place.

Rear Panel Connections

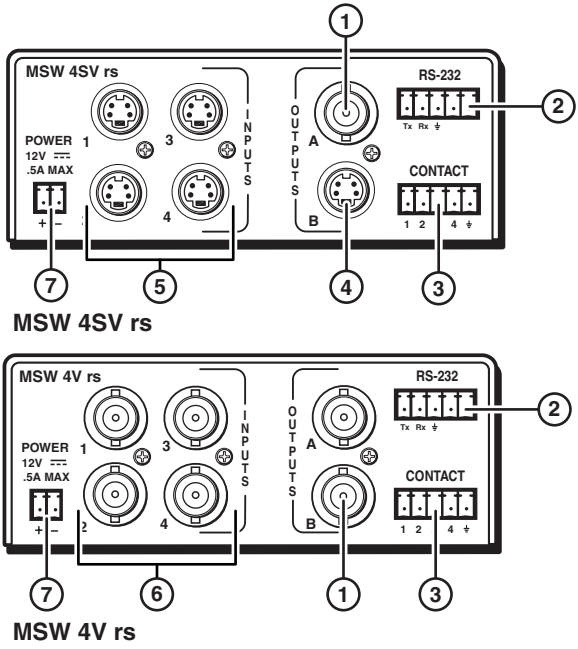


Figure 6 — MSW 4SV rs and MSW 4V rs rear panel

NOTE *The MSW switches during the vertical interval of input 1. For seamless switching, ensure one of the genlocked devices is connected to input 1.*

(1) **Composite video output(s) (both switcher models)** — For each composite video output, connect a composite video display or other output device to this BNC connector.

NOTE *Outputs A and B output only one selected input signal.*

NOTE *The MSW 4SV has a built-in encoder; however, you can use both outputs simultaneously.*

(2) **RS-232 connector** — Connect a cable with a 3.5 mm, 5-pole captive screw connector to this port for bidirectional RS-232 communication. Wire the connectors as shown on **page 7**.

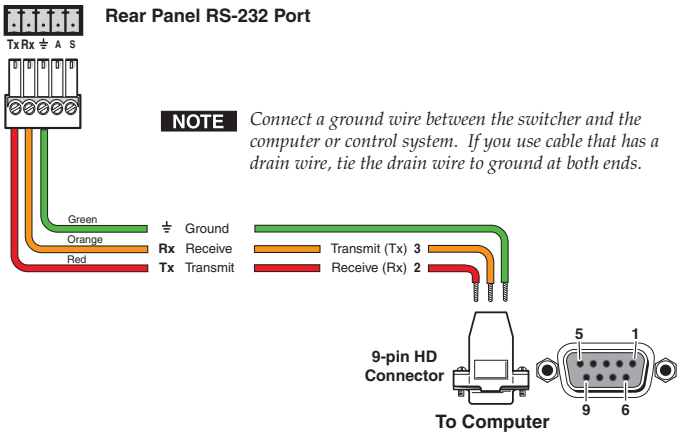


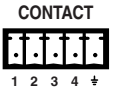
Figure 7 — RS-232 connector wiring

This port has the following **RS-232 protocol**:

- 9600 baud
- 1 stop bit
- No parity
- 8 data bits

See "**Using the command/response table**" section on page 15 for the Extron Simple Instruction Set (SIS) commands to communicate with the MSW switcher via RS-232.

③ **Contact connector** — Connect a remote contact closure device to the MSW for remote control of the switcher. You can also daisy chain the unit to other MSWs using this 5-pole captive screw connector. This allows remote control of the other switchers.



NOTE *The switcher must be in normal (manual) mode for contact closure to work. See "**Mode selection**" on page 11.*

To select an input using a contact closure device, such as an Extron CCR 204 Contact Closure Remote Control or a locally constructed device, momentarily short the pin for the desired input number to logic ground (pin 5). To force one of the inputs to be always selected, leave the short in place. The short overrides any front panel input selections.

You can also daisy chain multiple MSWs by using the contact connector. This allows for front panel control of all switchers (for example, touch the input button on one MSW to switch all MSWs). Wire pin 1 to pin 1, pin 2 to pin 2, and so on.

④ **S-video output (MSW 4SV rs only)** — Connect an S-video display or other device to this 4-pin mini DIN connector for the S-video output.

⑤ **S-video inputs 1 through 4 (MSW 4SV rs only)** — For each input, connect an S-video source to one of these 4-pin mini DIN connectors.

⑥ **Composite video inputs 1 through 4 (MSW 4V rs only)** — For each input, connect a composite video source to one of these BNC connectors.

⑦ **Power connector** — Plug the external 12 VDC power supply into this 2-pole, 3.5 mm captive screw connector. The power supply is included with the unit.

In the event that power is disconnected from the MSW, the unit retains mode and input settings.

NOTE *The power connector on the rear panel is orange; however, the plug for the provided power cord may be either orange or blue. Either color plug can be connected to the rear panel receptacle.*

CAUTION *Always use a power supply supplied or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product. Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.*

To wire the connector, do the following:

1. Cut the DC output cord to the length needed.
2. Strip the jacket to expose **3/16 inch (5 mm)** of the conductors.

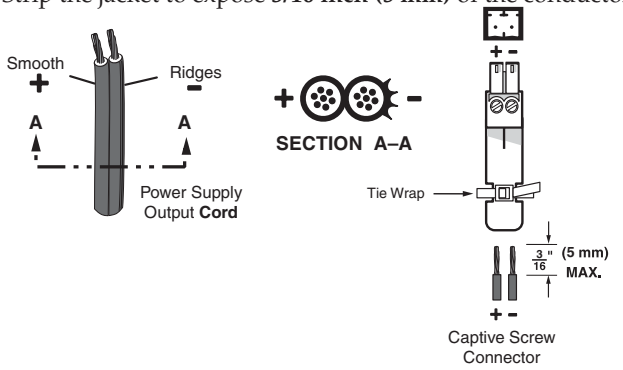


Figure 8 — Power wiring

CAUTION *The length of the exposed (stripped) copper wires is important. **The ideal length is 3/16 inch (5 mm).** Longer bare wires can short together. Shorter wires are not as secure in the connector and could be pulled out.*

3. Slide the leads into the supplied captive screw plug and secure them using a small screwdriver.
4. Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.
5. Before connecting the power cord, verify the polarity by plugging it into the power supply with no load and checking the output with a voltmeter.

CAUTION *Do not tin the stripped power supply leads before installing the captive screw connector. Tinned wires are not as secure in the captive screw connectors and can be easily pulled out. They may also break after being bent several times.*

WARNING *The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.*

Alternately, an Extron PS 124 Universal 12 VDC power supply (part **#60-1022-01**) can power up to eight MSWs or other Extron 12 VDC devices using only one AC power connector.

Front Panel Controls and Indicators

Figure 9 shows the front panels of the MSW 4V rs and MSW 4SV rs.

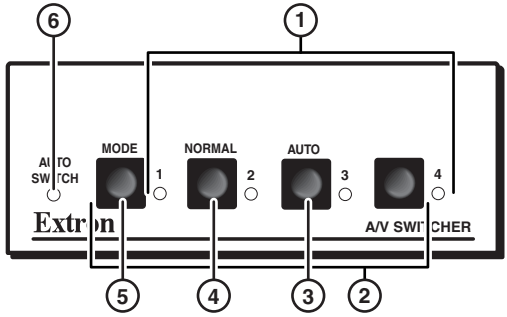


Figure 9 — MSW 4V rs and MSW 4SV rs front panel

Input selection

(1) **Input 1 through 4 LEDs** — The Input LEDs light to identify the selected input.

(2) **Input 1 through 4 buttons** — Each Input button selects the associated input for output.

The Input 1 (5), Input 2 (4), and Input 3 (3) buttons are also used to toggle auto switch mode on and off. See "Auto switch mode controls and indicators" below.

Auto switch mode controls and indicators

(3) **Auto (switch) button** — The Auto button is used with the Mode button (5) to select auto switch mode. Auto is a secondary function of the Input 3 button.

(4) **Normal button** — The Normal button is used with the Mode button (5) to select normal mode. Normal is a secondary function of the Input 2 button.

(5) **Mode button** — The Mode button is used with the Normal button (4) or Auto button (3) to select the switching mode. Mode is a secondary function of the Input 1 button. See "**Mode selection**" on page 11.

(6) **Auto Switch LED** — When lit, the Auto Switch LED indicates that the switcher is in auto switch mode. In this mode, the MSW automatically switches to the highest numbered input with active sync pulses. When this LED is unlit, the switcher is in normal (manual) mode.

Mode selection

To turn auto switch mode **on**:

1. Press and hold the **Mode (Input 1)** button.
2. Press and hold the **Auto (Input 3)** button.
3. Release the Mode and Auto buttons simultaneously.
   The Auto Switch LED turns on, indicating that auto switch is enabled.

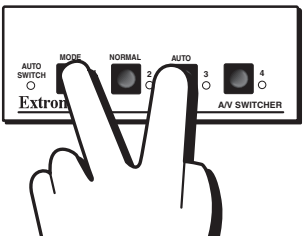


Figure 10 — Turning on auto switch mode

To turn auto switch mode **off** (Normal mode):

1. Press and hold the **Mode (Input 1)** button.
2. Press and hold the **Normal (Input 2)** button.
3. Release the Mode and Normal buttons simultaneously.
   The Auto Switch LED is unlit and the MSW switches to the previously selected input.

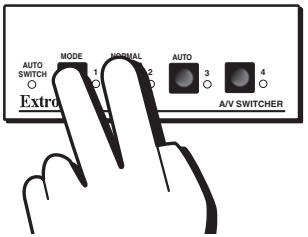


Figure 11 — Turning off auto switch mode

NOTE *In the event that power is disconnected from the MSW, the unit retains mode and input settings.*

Vertical Interval Switching

The MSWs switch inputs during the vertical interval of the video signal that is on input 1. In a genlocked system, switching to any input is glitch-free if one of the genlocked devices is connected to input 1.

Using Simple Instruction Set™ (SIS™) Control

Host-to-switcher communications

The Extron Simple Instruction Set (SIS) commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the switcher executes the command and sends a response to the host device. All responses from the switcher 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.

Switcher-initiated messages

When a local event (such as a front panel operation or error condition) occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below:

(c) Copyright 2010, Extron Electronics, MSW Series Switchers, V*x.xx*↵

The switcher issues the copyright message and the input selected message when it first powers on. V*x.xx* is the firmware version number.

In*n*↵

The switcher sends the In*n* message whenever the selected input is changed using the front panel buttons. "*n*" is the input number.

Error responses

When the switcher receives a valid SIS command, it executes the command and sends a response to the host device. If the switcher is unable to execute the command because the command is invalid or it contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 – Invalid input channel number (out of range)

E06 – Invalid input channel change (auto switch is active)

E10 – Invalid command

E13 – Invalid parameter

Timeout

Pauses of 10 seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.

RS-232 communication

Wire the RS-232 connector as shown on **page 7**. Connect the MSW to a PC via the RS-232 port. Use a communication utility, such as Telnet, to send SIS commands (see **page 16**) and view the responses.

Using the command/response table

The command/response table for **Simple Instruction Set (SIS) commands** is shown on page 16. The symbols used throughout the table represent variables in the command/response fields. Lower and upper case letters are interchangeable, and command and response examples are shown throughout the table.

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

Space →

ASCII to Hex Conversion Table																			
	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Esc 1B | CR 0D | LF 0A

Symbol definitions

- ↵ = CR/LF (carriage return with line feed)
- • = space
- X1 = Input number (1 through 4)
- X2 = Input signal status: 0 = no signal detected, 1 = signal detected
- X3 = On/off status: 0 = off, 1 = on
- X4 = Switch mode: 1 = normal, 2 = auto switch
- X5 = Input number response (1 through 4)

Command/response table for Simple Instruction Set (SIS) commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional Description
Input selection	X1!	InX5↵	Select input X1. For X1: input 1 through 4.
Input video sensing			
Request all inputs' status	0S	Sig • X2 • X2 • X2 • X2↵	Each X2 response is the signal status of an input, from input 1 to 4. X2 = 0 (no signal) or 1 (signal detected).
Example:	0S	Sig • 1 • 0 • 0 • 1↵	Input 1 = signal present; input 2 = no signal present; input 3 = no signal present; input 4 = signal present.
Request the status of an individual input	X1S	X2↵	X1 signal status = X2.
Video mute			
Mute/unmute video	X3B	Vmt X3↵	Video mute. For X3: 0 = off; 1 = on.
Read mute status	B	X3↵	Video mute status.
Mode select			
Normal/auto switch mode	X4#	FX4↵	Set to normal or auto switch mode. For X4: 1 = normal, 2 = auto.
General information	I	VX5 • FX4 • VmtX3↵	For X5: current selected input 1-4. For X4: switcher is in normal (1) or auto (2) mode. For X3: video mute is off (0) or on (1).
Example:	I	V2 • F1 • Vmt0↵	Video is selected on input 2 (V2); switcher is in normal mode (F1); video mute is off (Vmt0).
Query firmware version	Q	x.xx↵	View the firmware version.
Query part number	N	60-480-xx↵	View the part number (60-480-11 or 60-480-12).
Upload firmware	EscUpload↵	Go↵	Upload firmware.
System reset (factory default)	EscZxxx	Zpx↵	Resets unit to factory defaults.

Universal Switcher Control Program

The Windows®-based Extron Universal Switcher Control Program (part **#79-533-01**) provides an alternative way to configure and operate the switcher and is compatible with Windows 2000 and Windows XP or later.

Installing the software

The control program is contained on the Extron Software Products disk. Install the software as follows:

1. Insert the disk into the drive. The installation program should start automatically. If it does not self-start, run Launch.exe from the disk. The Extron software disk window appears as shown in figure 12.
2. Click the **Software** icon.

Figure 12 — DVD switcher software opening screen

3. Scroll to the Universal Switcher Control program and click the **Install** link at right (see figure 13).

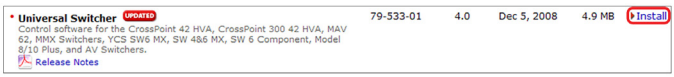


Figure 13 — Software install screen

By default, the Windows installation creates a *C:\Program Files\Extron\UnivSW* folder and places a Universal Switcher icon onto the desktop.

Visit the Extron Web site (**www.extron.com/download**) if the disk is unavailable for installation or to check if new software is available.

Using the software

1. To run the software, double-click the **Universal Switcher Control Program** icon on your desktop (see figure 14).

Figure 14 — Universal switcher software icon

2. In the Communication Setup window (see figure 15), select the comm port that is connected to the RS-232 port on the MSW. Click **OK**.

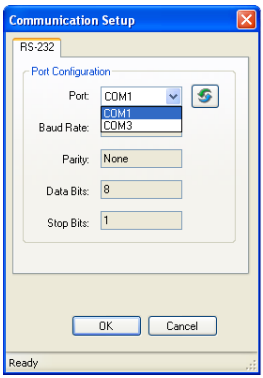


Figure 15 — Communication Setup window

3. The Universal Switcher Control Program window (see figure 16) displays the selected input and panel mode (Front Panel [normal] or Auto Switch).

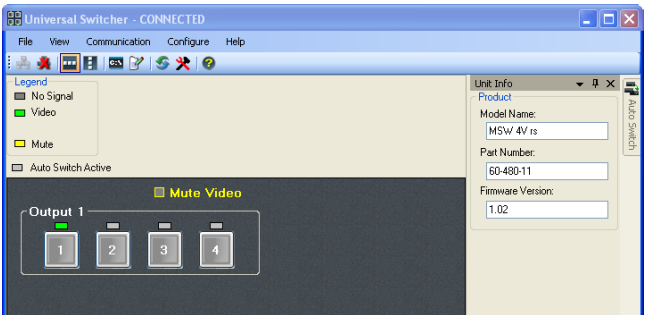
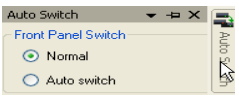


Figure 16 — Universal Switcher output window

4. Select and click the desired input button. Symbols for the state of each LED are shown below:

No Signal	Indicates that the input signal is not present and not selected
Video	Indicates that the input signal is selected
Mute	Supresses the video image

Auto Switch Active — When unlit (as shown), the switcher is in normal mode; when lit (green), the switcher is in auto switch mode



The **Auto Switch** radio buttons indicate the current mode

Click the Mute Video check box to suppress the video image.

Using the help system

For information on how to use the Universal Switcher Control Program and explanations of its features and functions, access the help program using any of the following methods:

- On your desktop Start menu, click **Start** > **All Programs** > **Extron Electronics** > **Universal Switcher** > **Universal Switcher Help**.
- From within the switcher control program, select **Help** > **Contents** on the task bar.
- With the switcher control program open, press the F1 key.

Updating the Firmware

Downloading the MSW 4V rs and 4SV rs firmware

Extron periodically updates product firmware in conjunction with the release of new software revisions. When updating any Extron software to the latest revision level, please be sure to read the supplied release notes, or contact an Extron Application Engineer to determine if your Extron product requires a firmware update.

To find the latest MSW firmware, do the following:

1. Go to **www.extron.com/download**.
2. From the sidebar menu, click the **Firmware** link.
3. Find the **MSW 4 rs Series** on the alphabetical list (you may need to click the "Next" arrow).
4. Click the **Download** link for the product and follow the instructions that appear on the screen.
5. The file will be saved onto your computer. Note the folder where you saved the firmware file.

CAUTION *Do not interrupt the firmware upload before it is 100% complete. Interrupting the upload corrupts the firmware and the switcher will not operate properly afterwards. If you experience problems with this procedure, call the Extron S3 Sales and Technical Support Hotline.*

Downloading and installing the Firmware Loader

Extron recommends using the Firmware Loader software to update the firmware on the MSW 4V rs and MSW 4SV rs. If you do not already have the Firmware Loader software installed on your computer, download it as follows:

1. Go to **www.extron.com/download**.
2. On the Download Center screen, click the **Software** link on the left sidebar menu.
3. On the next Download Center screen, locate and click the **Download** link for the Firmware Loader (see figure 17).

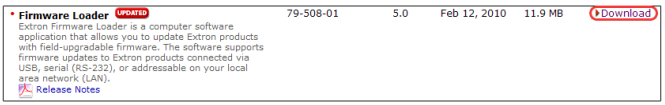


Figure 17 — Firmware Loader download link

4. On the next screen, enter the requested information, then click the **Download fw_loadernxnxn.exe** button (where **n** is the Firmware Loader version number).
5. Follow the instructions on the rest of the download screens to save the executable Firmware Loader installer file to your computer. Note the folder to which you saved the file.
6. In Windows Explorer or another file browser, locate the downloaded executable installer file and double-click it to open it.
7. Follow the instructions on the Installation Wizard screens to install the Firmware Loader to your computer. Unless you specify otherwise, the installer program places the Firmware Loader file at C:\Program Files\Extron\FWLoader.

Using the control program to update the firmware

To upload the latest firmware to the MSW using the control program, do the following:

1. Open the Universal Switcher Control Program (see the previous section, "**Using the software**, on page 18 for instructions).
2. From the **Configure** menu, choose **Firmware Loader**.

NOTE *Firmware Loader must be installed on the PC for this option to work.*

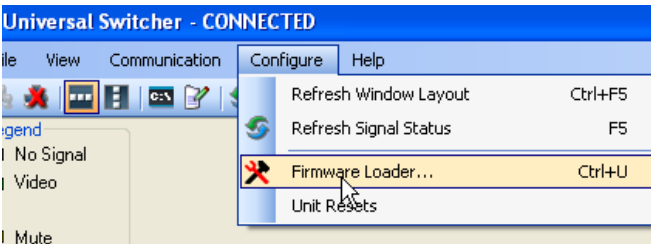


Figure 18 — Choosing Cfrmware Ioader

3. The Add Device window appears. On the Add Device window, select the appropriate device and connection method.

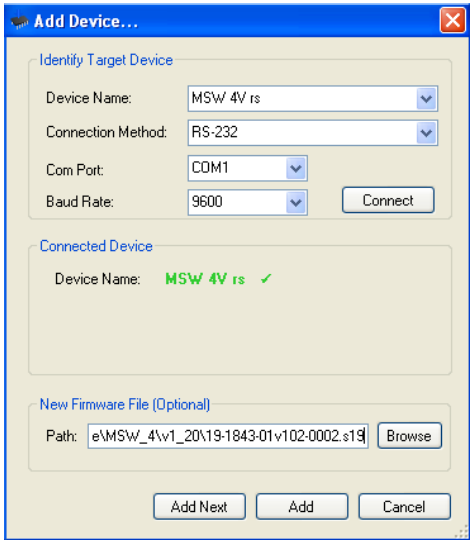


Figure 19 — Add device window

4. From the remaining drop-down menus, select the appropriate port configuration parameters (obtained from your system administrator). The defaults are 9600 baud rate, no parity, 8 data bits, and one stop bit.
5. Click on the **Connect** button. The name of the selected device should appear in green text with a check mark next to it.
6. Click on the **Browse** button to locate the appropriate firmware file for the device. Select the file and click on the **Open** button. **The file extension must be .S19.**

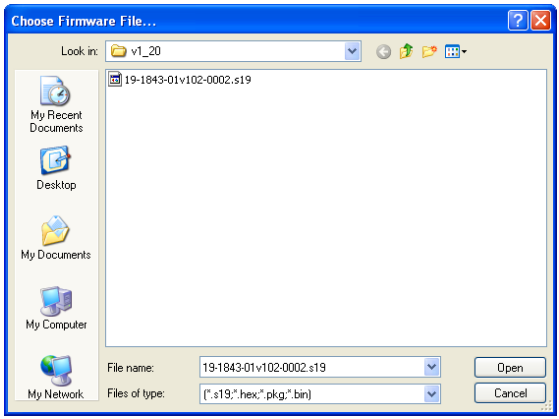


Figure 2- — Choose firmware file window

7. If you will be uploading firmware to multiple MSW switchers, do the following:
   a. Click **Add Next**. Your first device is added to the Devices field in Firmware Loader window, and the Add Device window remains open.
   b. Enter the connection information for the device and click the **Connect** button.
   c. Select the appropriate firmware for the device by using the **Browse** button.
   d. Repeat steps **a** through **c** until all desired devices have been added to the Firmware Loader window.
8. When finished adding devices, click **Add**. The Add Device window closes, leaving the Firmware Loader window open with the added MSW device(s) highlighted and selected.
9. If you want to remove a device from the Firmware Loader window, do the following:
   a. Highlight the name(s) of the device(s) to be deleted from the Firmware Loader window.
   b. Select **Remove Selected Device(s)** from the **Edit** menu.

   To remove all devices from the Firmware Loader window, select **Remove All Devices** from the **Edit** menu.

CAUTION *Before clicking on the* **Begin** *button, check to make sure the appropriate firmware file(s) is applied to the device(s). Uploading a file with an incorrect extension may cause the unit to stop functioning.*

10. Click **Begin** to start the firmware uploading process. While the firmware is being updated, a progress bar shows the status of the upload, while the Transfer Time field displays the time elapsed and the time remaining in the process. In addition, the percent of the file that has been uploaded is displayed in the Total Progress field until the entire firmware file is uploaded.

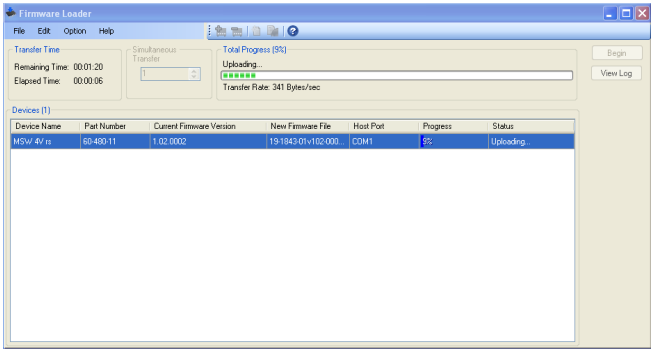


Figure 2. — Firmware upload in progress

11. When the firmware update is finished, "Completed" appears above the progress bar in the Total Progress field. The Total Progress field displays "100%" and the status displays "Completed". Close the Firmware Loader window.

CAUTION *If the Firmware Loader utility exits before the status bar has progressed completely across the indicator window, the firmware may be corrupted and may no longer respond to the Universal Switcher Control Program. If you experience problems with this procedure, call the Extron S3 Sales and Technical Support Hotline.*

Specifications, Part Numbers, and Accessories

Specifications

Video — MSW 4V rs, MSW 4SV rs

Gain	Unity
Bandwidth	
MSW 4V	300 MHz (-3 dB)
MSW 4SV	250 MHz (-3 dB)
Crosstalk	<-60 dB @ 3.58 MHz
Switching speed	20 ms (max.)

Video input

Number/signal type	
MSW 4V rs	4 composite video
MSW 4SV rs	4 S-video
Connectors	
MSW 4V rs	4 female BNC
MSW 4SV rs	4 female 4-pin mini DIN
Nominal level	1 Vp-p for Y of S-video and for composite video 0.3 Vp-p for C of S-video 0.8 Vp-p for SDI
Minimum/maximum levels	0.4 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Return loss	
MSW 4SV rs	<-25 dB, DC @ 10 MHz
MSW 4V rs	<-40 dB, DC @ 10 MHz
DC offset (max. allowable)	5.0 V
Input coupling	DC

Video output

Number/signal type	
MSW 4V rs	2 composite video
MSW 4SV rs	1 S-video, 1 composite video
Connectors	
MSW 4V rs	2 BNC female
MSW 4SV rs	1 BNC female, (1) 4-pin mini DIN female
Nominal level	1 Vp-p for Y of S-video and for composite video 0.3 Vp-p for C of S-video 0.8 Vp-p for SDI
Minimum/maximum levels	0.4 V to 2.0 Vp-p
Impedance	75 ohms

Return loss	<-30 dB @ 5 MHz
DC offset	±5 mV maximum with input at 0 offset
Switching type	Vertical interval

Sync

Standards	NTSC 3.58, NTSC 4.43, PAL, SECAM

Control/remote — switcher

Serial control port	1 RS-232, 3.5 mm captive screw connector, 5 pole
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	1 = TX, 2 = RX, 3 = GND
Contact closure	(1) 3.5 mm captive screw connector, 5 pole
Contact closure pin configurations	1 = input 1, 2 = input 2, 3 = input 3, 4 = input 4, 5 = GND
Program control	Extron Universal Switcher Program for Windows® Extron Simple Instruction Set™ (SIS™)

General

External power supply	100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, regulated
Power input requirements	12 VDC, 0.2 A
Cooling	Convection, no vents
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
Mounting	
Rack mount	Yes, with optional 1U rack shelf
Furniture mount	Yes, with optional mini under-desk mounting kit
Enclosure type	Metal
Enclosure dimensions	1.7" H x 4.3" W x 3.0" D (1U high, quarter rack wide) 4.3 cm H x 10.9 cm W x 6.5 cm D (Depth excludes connectors.)
Product weight	0.6 lbs (0.3 kg)
Shipping weight	3 lbs (2 kg)

Specifications, Part Numbers, Accessories, cont'd

Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, CUL
EMI/EMC	CE, C-tick, FCC Class A, VCCI, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Parts

Included parts

These items are included in each order of an MSW series mini video switcher:

Included parts	Part number
MSW 4V rs	60-480-11
or	
MSW 4SV rs	60-480-12
12 VDC, 1A universal power supply	70-775-01
IEC power cord	
Female 3.5 mm, 5-pole captive screw connectors	100-460-01
Female 3.5 mm, 2-pole captive screw connectors (orange)	100-454-01
Rubber feet (not attached)	
MSW 4V rs & 4SV rs Series Setup Guide	

Optional accessories

These items are optional accessories that can be used with the MSW Series mini video switchers:

Accessories	Part number
CCR 204 Four-Button Contact Closure Remote	60-794-02
IR 102 Remote Control Kit	70-224-01
RSF 123 1U 3.5 inch Deep Rack Shelf Kit	60-190-20
RSB 123 1U 3.5 inch Deep Basic Rack Shelf	60-604-21
RSB 126 1U 6 inch Deep Basic Rack Shelf	60-604-11
RSU 126 1U 6 inch Deep Universal Rack Shelf Kit	60-190-10
RSU 129 1U 9.5 inch Deep Universal Rack Shelf Kit	60-190-01
RSB 129 1U 9.5 inch Deep Basic Rack Shelf	60-604-02
MBU 123 Low-profile Mount Kit	70-212-01

Extron Warranty

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

USA, Canada, South America, and Central America:
Extron USA
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

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

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

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

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

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

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or modifications to the product that Extron did not authorize.

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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+1.919.863.1797 FAX

Extron **Europe**

+800.3987.6673
Inside Europe Only

+31.33.453.4040
+31.33.453.4050 FAX

Extron **Asia**

+800.7339.8766
Inside Asia Only

+65.6383.4400
+65.6383.4664 FAX

Extron **Japan**

+81.3.3511.7655
+81.3.3511.7656 FAX

Extron **China**

+400.883.1568
Inside China Only

+86.21.3760.1568
+86.21.3760.1566 FAX

Extron **Middle East**

+971.4.2991800
+971.4.2991880 FAX