

## User's Manual



## MMX 42/62 Series Compact Matrix Switchers

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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.

**Conserv**er 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 présents 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.

### Precaución

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

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

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

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

### Warning

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

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

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

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

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

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

### Avertissement

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

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

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

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

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

**Lithium Batterie** • Il a danger d'explosion s'il y a un remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type equivalent recommande par le constructeur. Mettre au reut les batteries usages conformément aux instructions du fabricant.

### Vorsicht

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

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

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

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

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

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

### Advertencia

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

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

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

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

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

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

# 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 non-Extron authorized modification to the product.

*If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.*

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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## 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.*

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## MMX 42/62 Series Matrix Switchers

# Chapter One

## Introduction

About the MMX 42/62 Series Matrix Switchers

Features

*All trademarks mentioned in this manual are the properties of their respective owners.*

## About the MMX 42/62 Series Matrix Switchers

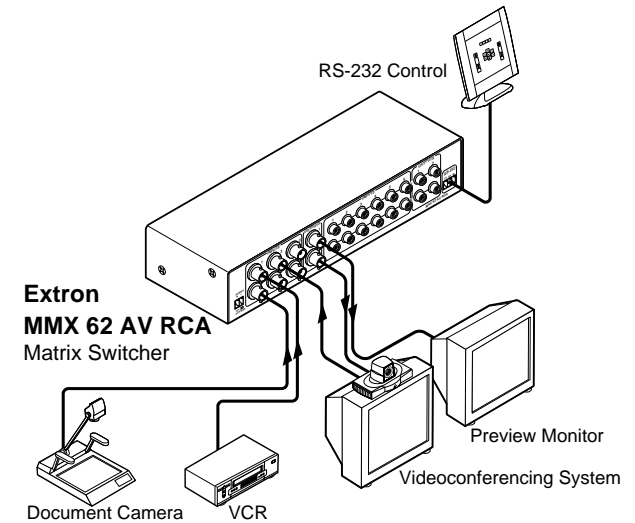
The Extron MMX 42/62 series of compact matrix switchers consists of four models of 4-input, 2-output video and audio matrix switchers, and four models of 6-input, 2-output video and audio matrix switchers, including the following:

MMX switcher model	Description
MMX 42 AV	4 x 2 composite video (BNC) and audio (captive screw) switcher
MMX 42 SVA	4 x 2 S-video (4-pin mini DIN) and audio (captive screw) switcher
MMX 42 AV RCA	4 x 2 composite video (BNC) and audio (RCA) switcher
MMX 42 SVA RCA	4 x 2 S-video (4-pin mini DIN) and audio (RCA) switcher
MMX 62 AV	6 x 2 composite video (BNC) and audio (captive screw) switcher
MMX 62 AV RCA	6 x 2 composite video (BNC) and audio (RCA) switcher

The switchers are compatible with NTSC 3.58 and 4.43, PAL, and SECAM video, and feature a 150 MHz bandwidth at -3 dB, fully loaded. When external sync is applied (to Input 1), video switching occurs during the vertical interval, providing glitch-free switching when all sources are genlocked.

All models feature front panel controls as well as an RS-232 connector (3-pin captive screw) to permit external remote control.

The MMX 42 switchers distribute any of four video and/or audio inputs to either or both outputs. The MMX 62 switchers distribute any of six video and/or audio inputs to either or both outputs. Any input can be switched to either or both outputs. The RCA models route unbalanced stereo audio and the AV and SVA models route balanced or unbalanced stereo audio. The audio switching can either be linked with the video (audio follow) or independent of the video (audio breakaway). Adjustable audio gain and attenuation (available via RS-232 control) compensates for level differences between audio inputs.



**Figure 1-1 — Typical MMX 62 switcher application**

These half-rack width switchers can be mounted to an optional 3-inch deep 1U rack shelf, a 6-inch deep rack shelf, or a standard 9.5-inch rack shelf. They can also be mounted under a desk or podium, using an optional under-desk mounting kit. See appendix A, "Reference Information", for all mounting kit part numbers. The units ship with external, desktop 12 VDC power supplies, which accept 100 VAC to 240 VAC, 50/60 Hz input.

## Features

### Composite video (AV) models

**Inputs** — Composite video switchers accept up to four (MMX 42) or six (MMX 62) composite video inputs on BNC female connectors.

**Outputs** — Two composite video signals are output on BNC female connectors.

### S-video (SV) models

**Inputs** — S-video switchers accept up to four S-video inputs (MMX 42) or six S-video inputs (MMX 62) on 4-pin mini DIN connectors.

**Outputs** — Two S-video signals are output on 4-pin mini DIN connectors.

### All models

**Audio inputs** — MMX switchers accept up to four (MMX 42) or six (MMX 62) stereo audio inputs. AV and SVA models accept balanced or unbalanced stereo on 3.5 mm, 5-pole captive screw terminals. RCA models accept unbalanced stereo on RCA terminals.

**Audio outputs** — MMX switchers output two stereo audio outputs. AV and SVA models output balanced or unbalanced stereo on 3.5 mm, 5-pole captive screw terminals. RCA models output unbalanced stereo on RCA terminals.

**Audio input gain and attenuation** — Users can set the level of audio gain or attenuation (-18 dB to +24 dB) for each input via the RS-232 link. Individual input audio levels can be adjusted so there are no noticeable volume differences between sources.

**Front panel control** — The operator can select the inputs and outputs, as well as audio follow or breakaway, using the front panel buttons.

**RS-232 control** — The operator can control the MMX 42/62 from a remote computer or other host using a link to the RS-232 port. RS-232 control uses the Extron Simple Instruction Set (SIS™) or the Windows®-based control software.

**Simple Instruction Set** — The Simple Instruction Set lets a host computer control the MMX with simple commands.

**Windows control software** — Windows-based Extron control software provides a graphic way to set up and control the MMX with an on-screen control panel. It allows the operator to remotely select inputs, make audio adjustments, and store settings for future use.

**Mounting options** — The MMX 42 and MMX 62 are 1U high and a half-rack width wide. They can be installed on an optional 1U 3-inch rack shelf, 6-inch rack shelf, or a standard Universal rack shelf, or under a desk or podium using an optional under-desk mounting kit.

**Auto-switching power supply** — An external power supply with an IEC connector, which can be used internationally with any power input from 110 VAC to 240 VAC at 50-60 Hz, and adapts automatically to the input type.



## MMX 42/62 Series Matrix Switchers

# Chapter Two

## Installation

Installation Overview

Mounting the Switcher

Rear Panel Cabling

# Installation

## Installation Overview

To install and set up an Extron MMX 42/62 switcher for operation, follow these steps:

- 1 Turn off all of the equipment. Ensure that the video sources and the output display are all turned off and disconnected from the power source.
- 2 Mount the switcher. See "Mounting the Switcher", below.
- 3 Attach the cables. See "Rear Panel Cabling" in this chapter.
- 4 Plug in the power supply, then turn on the display devices and the input devices.
- 5 Set the audio gain and attenuation. See the "Set input audio level" SIS commands in chapter 4, "Remote Control".

## Mounting the Switcher

**CAUTION** *Installation and service must be performed by authorized personnel only.*

The 1-inch high, quarter-rack width switcher can be placed on a tabletop, mounted on a rack shelf, mounted under a desk or tabletop, or mounted on a projector bracket.

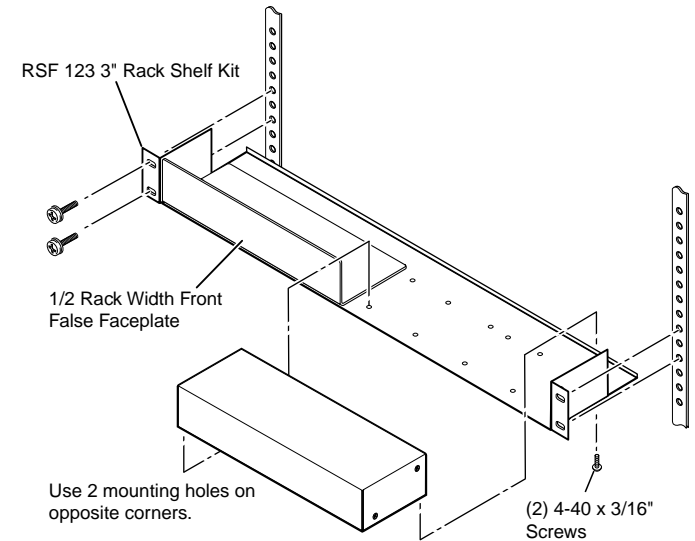
### Tabletop placement

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

### Rack mounting

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

- RSF 123 3.5-inch deep rack shelf kit (part #60-190-20) (figure 2-1, on the next page)
- RSB 123 3.5-inch deep rack shelf (part #60-604-21)
- RSU 126 6-inch deep universal rack shelf kit (part #60-190-10)
- RSB 126 6-inch deep basic rack shelf (part #60-604-11)
- RSU 129 9.5-inch deep universal rack shelf kit (part #60-190-01) (figure 2-2, on page 2-4)
- RSB 129 9.5-inch deep basic rack shelf (part #60-604-02)



**Figure 2-1 — Mounting the switcher on a 3-inch rack shelf**

### UL guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the matrix switcher into a rack.

1. **Elevated operating ambient temperature** — If the equipment 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 matrix switcher in an environment compatible with the maximum ambient temperature (TMA = 122 °F, +50 °C) specified by Extron.
2. **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment 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.

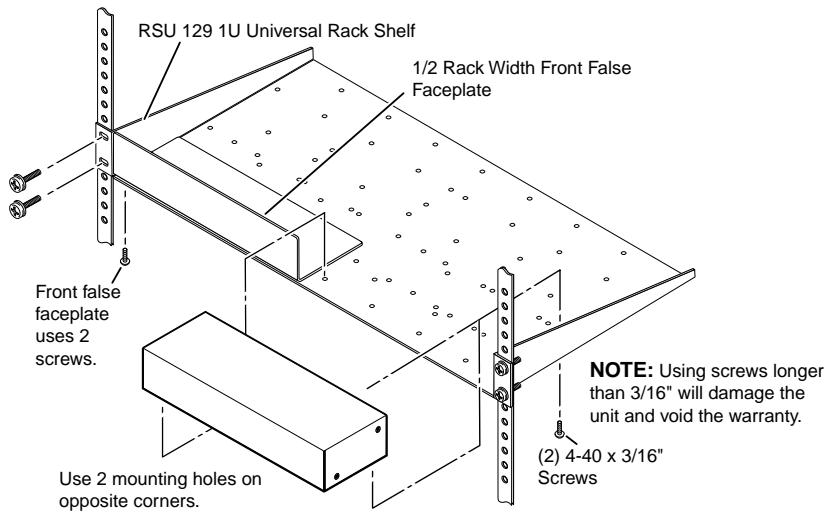


5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

### Mounting instructions

On the 6-inch and 9.5-inch deep rack shelves, the switcher can be mounted in the front or the rear of the rack.

1. Remove the feet from the bottom of the switcher, if they are installed.
2. Mount the switcher using two 4-40 x 3/16 inch screws in opposite (diagonal) corners to secure the unit to the shelf (figure 2-2).



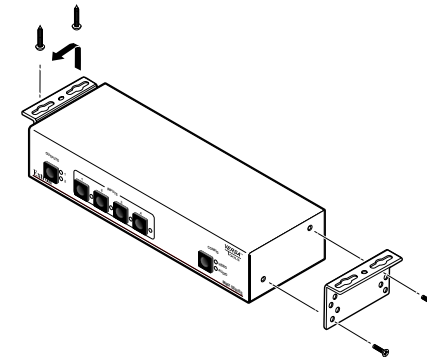
**Figure 2-2 — Mounting the switcher on a standard (9.5-inch) rack shelf**

3. Install false faceplate(s) or other unit(s) to the rack shelf.

## Under-desk mounting

Mount the unit to a desk or podium using the optional MBU 123 under desk mounting kit (part #70-212-01) as follows:

1. If rubber feet were previously installed on the bottom of the unit, remove them.
2. Attach the mounting brackets to the switcher with the machine screws provided (figure 2-3).
3. Hold the unit with the brackets attached against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.



**Figure 2-3 — Under-desk mounting the MMX**

4. Drill 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 (6.3 mm) of the screw head protrudes.
6. Align the mounting screws with the slots in the brackets and place the unit against the surface, with the screws through the bracket slots.
7. Slide the unit slightly forward or back, then tighten all four screws to secure the unit in place.

## Rear Panel Cabling

All connectors are on the rear panel. The type and layout of the connectors on the rear panel will vary, depending on the model of the switcher. The rear panels of the MMX 42 series switchers are similar to the MMX 62 series switcher, except they have four rather than six video and audio input connectors.

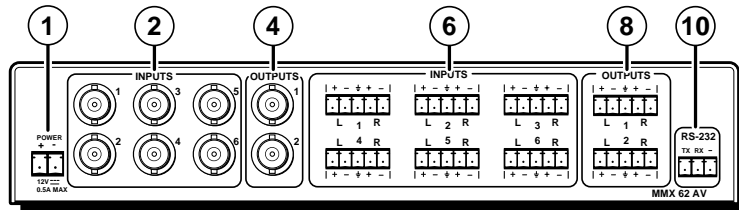


Figure 2-4 — MMX 62 AV rear panel

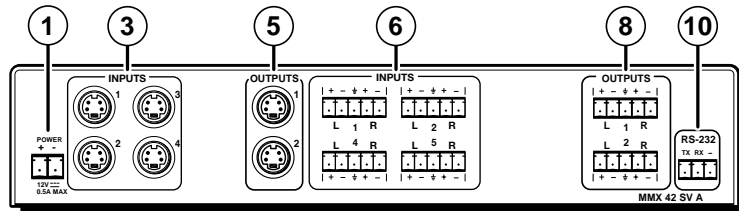


Figure 2-5 — MMX 42 SVA rear panel

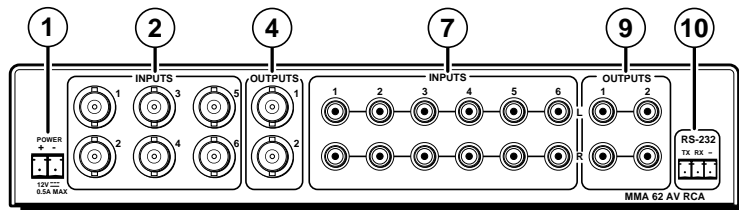


Figure 2-6 — MMX 62 AV RCA rear panel

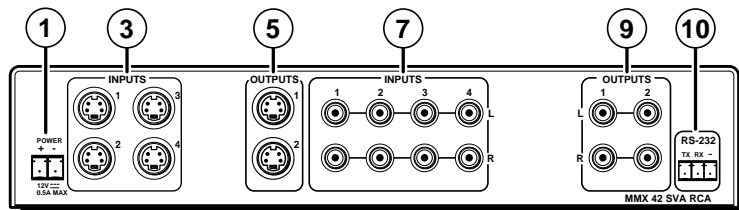


Figure 2-7 — MMX 42 SVA RCA rear panel

## Power connection

- 1 **Power connector** — Plug the external 12 V power supply into this 2-pole captive screw connector. The power supply is included with the unit. No damage will result if the power supply connector is wired incorrectly, but the unit will not power up.

Figure 2-8 shows how to wire the connector.

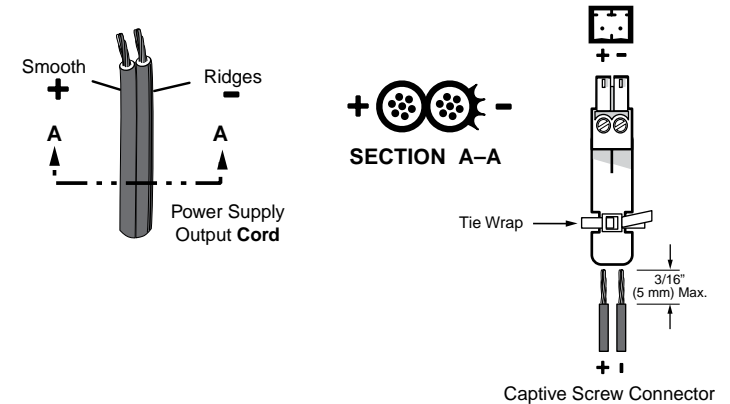


Figure 2-8 — Power connector wiring

**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 direct insertion connectors and could be pulled out.

Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.

**NOTE** Do not tin the power supply leads before installing in the direct insertion connector. Tinned wires are not as secure in the connectors and could be pulled out of the connector.

## Video signal input connections

**NOTE** The MMX switchers do not alter the video signal in any way. The signal output by the switcher is in the same format as the input.

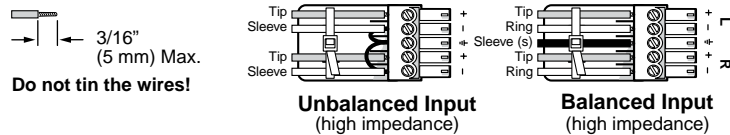
- ② **Composite video input connectors** — Connect composite video sources to these female BNC connectors.
- ③ **S-video input connectors** — Connect S-video sources to these 4-pin mini DIN connectors.

## Video signal output connections

- ④ **Composite video output connectors** — Connect composite video displays to these two female BNC connectors.
- ⑤ **S-video output connectors** — Connect S-video displays to these two 4-pin mini DIN connectors.

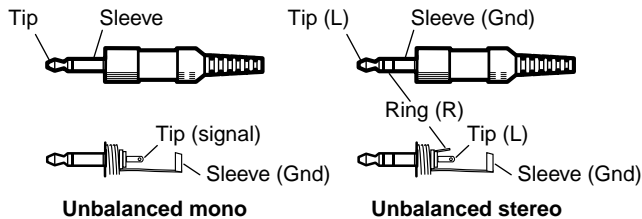
## Audio signal input connections

- ⑥ **3.5 mm, 5-pole captive screw connectors** — Connect balanced and unbalanced stereo audio inputs to these connectors using captive screw connectors which are included with each MMX VA and SVA (non RCA) switcher (you must supply the audio cable). Figure 2-9 shows how to wire a connector for the appropriate input type and impedance level.



**Figure 2-9 — Captive screw connector wiring for input**

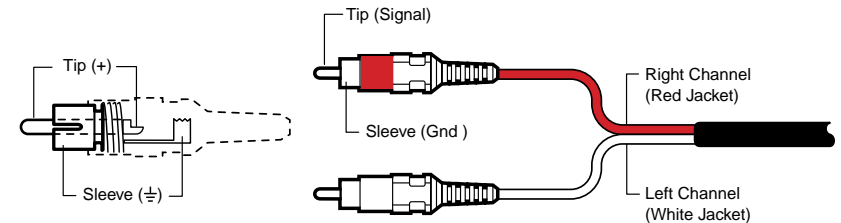
**CAUTION** When making connections for the switcher from existing audio cables, see figure 2-10. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring and sleeve.



**Figure 2-10 — Phono audio connectors**

The audio level for each input can be individually set, via RS-232 link, to ensure that the level on the output does not vary from input to input. See chapter 4, "Remote Control", for details.

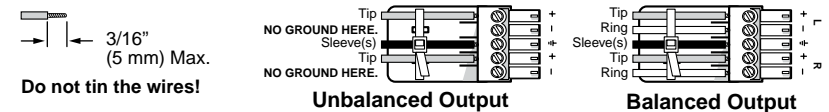
- ⑦ **RCA audio connectors** — Connect unbalanced stereo audio inputs to these RCA connectors. See figure 2-11 for an illustration on how to wire the RCA connector.



**Figure 2-11 — RCA connector wiring**

## Audio signal output connections

- ⑧ **3.5 mm, 5-pole captive screw connectors** — Connect balanced and/or unbalanced stereo audio outputs to these sockets using connectors which are included with each MMX SVA switcher (you must supply the audio cable). See figure 2-12 for an illustration on how to wire a connector for the appropriate output type.



**CAUTION** For unbalanced audio, connect the sleeve(s) to the ground contact. DO NOT connect the sleeve(s) to the negative (-) contacts.

**Figure 2-12 — Captive screw connector wiring for audio output**

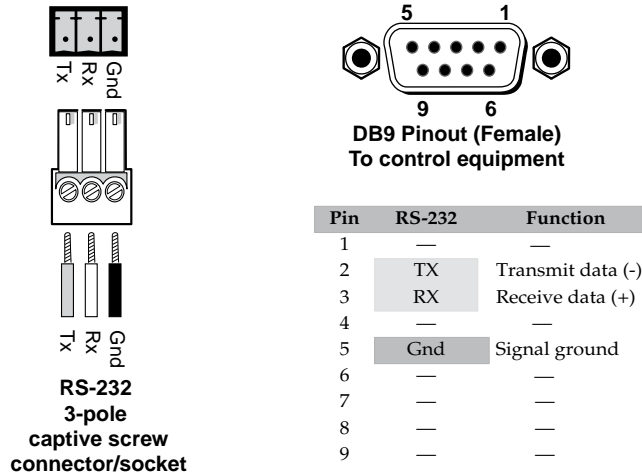
- ⑨ **RCA audio connectors** — Connect unbalanced stereo audio outputs to these RCA connectors. See figure 2-11 for an illustration on how to wire the RCA connector.

By default, the audio output follows the video switch. Audio breakaway, commanded via the RS-232 link, allows the user to select from any one of the audio input sources. See chapter 4, "Remote Control" for details on the RS-232 connection.



## RS-232 connection

- ⑩ **Remote connector** — Connect a host device, such as a computer or a touch control panel, to the MMX switcher via this 3-pole captive screw connector (figure 2-13) for remote control using the SIS or Windows-based control program.



**Figure 2-13 — Wiring the remote connector**

The RS-232 protocol of the rear panel RS-232/Remote connector is 9600 baud, 1 stop bit, no parity, and no flow control.

See chapter 4, "Remote Control", for definitions of the SIS commands and details on how to install and use the control software.

# Chapter Three

## Operation

Front Panel Controls and Indicators

Front Panel Operations

Memory

Front Panel Security Lockout (Executive Mode)

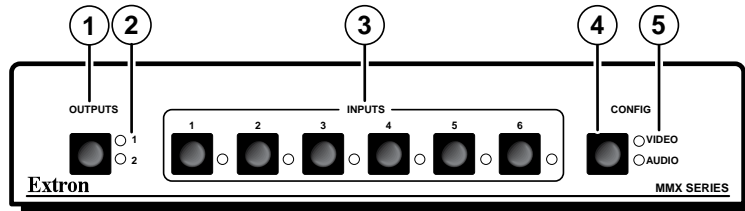
Genlock Sync

System Reset

Troubleshooting — If no Image Appears

## Front Panel Controls and Indicators

Figure 3-1 shows the controls and indicators on the front panel of the MMX 62 compact matrix switcher.



**Figure 3-1 — Front panel controls and indicators (MMX 62 shown)**

- ① **Outputs button** — The Outputs button toggles between output 1 and output 2.
- ② **Output LEDs** — The Output LEDs indicate the selected output. When an output is muted (audio and/or video) the input LED for the muted output will be off (audio and/or video).
- ③ **Input buttons and LEDs** — The input buttons (1 through 4 on the MMX 42 and 1 through 6 on the MMX 62) select an input for output. The input LEDs indicate the selected input and the video and audio mutes as follows:

	Input LED indications		
	Video only tie	Audio only tie	Video and audio tie
Input selected	Lit	Blinking	Lit
Audio muted	Lit	Off	Lit
Video muted	Off	Blinking	Blinking
Video and audio muted	Off	Off	Off

- ④ **Configuration (Config) button (video and/or audio selection)** — When pressed and released, the Configuration button cycles through video and audio, audio only, and video only selection.
- ⑤ **Video and Audio LEDs** — The Video and Audio LEDs indicate whether video, audio, or both are selected for display and/or selection. If audio is broken away and video and audio are selected for display, the Audio LED blinks.

## Front Panel Operations

Plug in all system components and turn on the input devices (such as DVD players and DSS receivers) and the output devices. Set the input devices to output video using each device's own operating instructions.

### Creating ties

A **Tie** is an input-to-output connection. An input can be **typed** to both outputs. (An output can never be **typed** to more than one input.)

Create video and/or audio ties using the front panel buttons as follows:

1. Press and release the Outputs button to select the desired output. The LED for the selected output lights.
2. Press and release the Configuration button as necessary to select either video and audio (audio follow) or video or audio (audio breakaway).
3. Press and release the button for the desired input. The LED for the selected input lights.

**NOTE** *If audio and video are tied from different inputs (audio breakaway), and if you select video and audio for display, the Video LED and the LED for the selected video input light steadily and the Audio LED and the LED for the selected audio input blink.*

A tie can also be created by an RS-232 device (see chapter 4, "Remote Control").

**NOTE** *If an output is muted via RS-232, pressing any input button unmutes the output.*

### Memory

Audio settings are saved in nonvolatile memory. When the switcher is powered off, the settings are retained. When the switcher is powered on again, the switcher recalls the connections made prior to power down and the saved settings are active. On initial power on, the switcher defaults to input 1 tied to output 1 and output 2.



### Front Panel Security Lockout (Executive Mode)

When front panel is locked, the front panel input and Configuration buttons' functions are blocked. To toggle the front panel lock on or off, press and **hold** down the Output and Configuration buttons for more than 3 seconds. All LEDs flash to indicate that the command has been accepted.

**NOTE** *When the front panel is locked, you still can view the tied inputs by pressing the Outputs button to toggle between the selection of output 1 and output 2.*

### Genlock Sync

When switching between inputs, the resulting image change should be seamless and clean. The MMX switchers reference the external sync signal on input #1 to synchronize switching during the vertical interval. This allows vertical interval switching between genlocked sources. Without the external sync locking feature, switching between inputs can result in a brief rolling (sync loss) or a brief change in the picture size.

### System Reset

To reset the unit to factory defaults, press and hold the Config button while power is applied. This resets the audio input settings to unity (0 dB) and connects input 1 to outputs 1 and 2, audio and video. The audio and video Config LEDs are lit.

### Troubleshooting — If No Image Appears

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if the Power LED is lit.
2. Ensure an active input and output are selected on the MMX switcher.
3. Ensure that the proper signal format is supplied.
4. Check to see if the output is muted via an SIS command.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S<sup>3</sup> Sales & Technical Support Hotline if necessary. See the rear cover of this manual for the phone number in your region of the world.

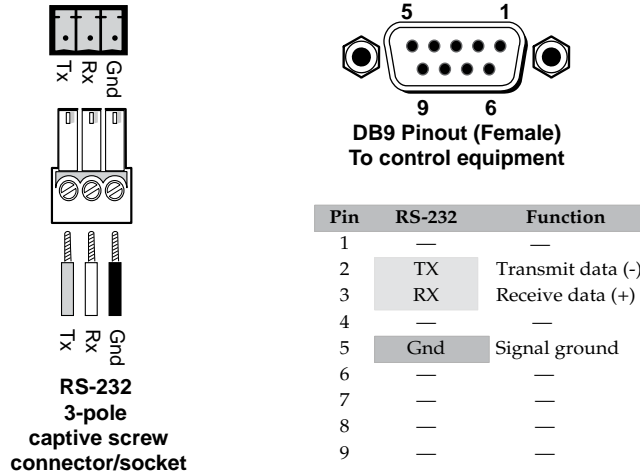
# Chapter Four

## Remote Control

Simple Instruction Set Control  
Windows<sup>®</sup>-Based Program Control

# Remote Control

The switcher's rear panel Remote connector (figure 4-1) can be connected to the serial port output of a host device. Remote communications with the switcher are via the Extron Simple Instruction Set or using the Windows-based Extron control program.



**Figure 4-1 — Remote connector pinout**

The RS-232 protocol of the rear panel RS-232/Remote connector is 9600 baud, 1 stop bit, no parity, and no flow control.

## Simple Instruction Set Control

### Host-to-interface communications

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 2004, Extron Electronics MMX (42 or 62), Vx.xx, 60-*nnn-*nn**↵

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

Outy•Inn•All↵

Outy•Inn•Vid↵

Outy•Inn•Aud↵

The switcher sends the Outy•Inn message whenever the selected input is changed using the front panel buttons. y is the output number and n is the input number. All, Vid, or Aud indicates both video and audio, video only, or audio only. The power-up default is video and audio input 1 tied to output 1 and output 2.

## 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)

E10 - Invalid command

E12 - Invalid output number (out of range)

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.

# Remote Control, cont'd

## Using the command/response table

The command/response table begins on page 4-5. Either upper case or lower case letters are acceptable in the command field except where indicated for the audio level (gain and attenuation) commands. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command/response table.

ASCII to HEX Conversion Table										Esc 1B	CR 0D	LF 0A					
Space 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			

### Symbol definitions

- ↵ = CR/LF (carriage return/line feed)
- = space
- X1** = Input 01 through maximum
- X2** = Input number (for tie) 00 through maximum  
(Input 0 = deselected output)
- X3** = Output number 01 or 02
- X4** = Gain /attenuation value -18 to +24 (43 steps)
- X5** = Gain value (+dB) Numeric value, 00 to 24 (default = 00)
- X6** = Attenuation value (-dB) Numeric value, 00 to 18
- X7** = On or off status 0 (off) or 1 (on)
- X8** = Software version x.xx



## Command/response table for SIS commands

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
<b>Create and view ties</b>			
<b>NOTE</b> <i>Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!02*02%3*03\$.</i>			
Create a video and audio tie	$\overline{X2}*\overline{X3}!$	Out $\overline{X3}$ •In $\overline{X2}$ •All ←	Tie input $\overline{X2}$ 's video and audio to output $\overline{X3}$ .
<i>Example:</i>	5*2!	Out02•In05•All ←	Tie input 5's video and audio to output 2.
Create a video only tie	$\overline{X2}*\overline{X3}\%$	Out $\overline{X3}$ •In $\overline{X2}$ •Vid ←	Tie input $\overline{X2}$ 's video to output $\overline{X3}$ (video is broken away).
Create an audio only tie	$\overline{X2}*\overline{X3}\$$	Out $\overline{X3}$ •In $\overline{X2}$ •Aud ←	Tie input $\overline{X2}$ 's audio to output $\overline{X3}$ (audio is broken away).
View video output tie	$\overline{X3}\%$	In $\overline{X2}$ ←	Video output $\overline{X3}$ tied to input $\overline{X2}$ .
View audio output tie	$\overline{X3}\$$	In $\overline{X2}$ ←	Audio output $\overline{X3}$ tied to input $\overline{X2}$ .
<b>Video mute commands</b>			
Video mute	$\overline{X3}*1B$	Vmt $\overline{X3}*1$ ←	Mute output $\overline{X3}$ video (blank screen).
Video unmute	$\overline{X3}*0B$	Vmt $\overline{X3}*0$ ←	Unmute output $\overline{X3}$ video.
Video mute	$\overline{X3}B$	$\overline{X7}$ ←	Output $\overline{X3}$ video mute status is $\overline{X7}$ (0 = off, 1 = on).
Global video mute	1*B	Vmt1 ←	Mute all video outputs.
Global video unmute	0*B	Vmt0 ←	Unmute all video outputs.
<b>Audio mute commands</b>			
Audio mute	$\overline{X3}*1Z$	Amt $\overline{X3}*1$ ←	Mute (silence) output $\overline{X3}$ audio.
Audio unmute	$\overline{X3}*0Z$	Amt $\overline{X3}*0$ ←	Unmute output $\overline{X3}$ audio (audio on).
Read audio mute	$\overline{X3}Z$	$\overline{X7}$ ←	Output $\overline{X3}$ audio mute status is $\overline{X7}$ (0 = off, 1 = on).
Global audio mute	1*Z	Amt1 ←	Mute all audio outputs.
Global audio unmute	0*Z	Amt0 ←	Unmute all audio outputs.

## Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
<b>Set input audio level</b>			
<b>NOTE</b> The set gain (G) and set attenuation (g) commands <i>are</i> case sensitive.			
Set gain (+dB)	<b>X1</b> * <b>X5</b> G	In <b>X1</b> •Aud <b>X4</b> ←	Set input <b>X1</b> 's audio level to <b>X4</b> dB.
Example:	4*3G	In04•Aud+03←	Set input 4's audio level to +3 dB gain.
Set attenuation (-dB)	<b>X1</b> * <b>X6</b> g	In <b>X1</b> •Aud <b>X4</b> ←	Set input <b>X1</b> 's audio level to <b>X4</b> dB.
Increment level	<b>X1</b> +G	In <b>X1</b> •Aud <b>X4</b> ←	Increase <b>X1</b> 's audio level by 1 dB.
Decrement level	<b>X1</b> -G	In <b>X1</b> •Aud <b>X4</b> ←	Decrease <b>X1</b> 's audio level by 1 dB.
View audio level	<b>X1</b> G	<b>X4</b> ←	
<b>Front panel lockout (executive mode)</b>			
Lock front panel	1X	Exe1←	Lock front panel.
Unlock front panel	0X	Exe0←	Unlock front panel.
View front panel lock status	X	<b>X7</b> ←	Show lock status. 0 =unlocked, 1 = locked.
<b>Reset commands</b>			
Reset all audio levels to 0 dB	<b>Esc</b> ZA←	Zpa←	Reseat all audio levels to 0 dB.
Unmute all video outputs	<b>Esc</b> ZB←	Zpb←	Unmute all video outputs.
Unmute all audio outputs	<b>Esc</b> ZZ←	Zpz←	Unmute all audio outputs.
System reset to defaults	<b>Esc</b> ZXXX←	Zpx←	Reset switcher to factory default settings.
<b>Miscellaneous commands</b>			
Information request	I	V1* <b>X2</b> •A1* <b>X2</b> •V2* <b>X2</b> •A2* <b>X2</b> •Vmt1* <b>X7</b> •Amt1* <b>X7</b> •Vmt2* <b>X7</b> •Amt2* <b>X7</b> ←	
Request part number	N	Nnn- <i>nnn</i> -nn←	See appendix A, "Reference Information", for part numbers
Query firmware version	Q	<b>X8</b> ←	Controller firmware version is <b>X8</b> .

## Windows®-Based Program Control

The Windows-based Extron Universal Switcher Control Program, which communicates with the switcher via the RS-232 port, provides an easy way to configure and operate the MMX Series matrix switchers. The program is compatible with Windows 2000 and Windows XP.

### Installing the software

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

1. Insert the DVD into the drive. The Extron software DVD window (figure 4-2) should appear automatically.



**Figure 4-2 — Software DVD window**

**NOTE** If the window does not self-start, run *Launch.exe* from the DVD.

2. Click the Software tab (figure 4-2).
  3. Scroll to the desired program and click Install (figure 4-3).
- **Universal Switcher** 79-533-01 4.0.1 May 5, 2009 7.6 MB **Install**  
Control software for the MAV 62, MMX Switchers, YCS SW6 MX, SW 4&6 MX, SW 6 Component, Model 8/10 Plus, and AV Switchers.

**Figure 4-3 — Software installation**

## Remote Control, cont'd

- Follow the on-screen instructions. By default, the Windows installation of the Universal Switchers Control Program creates a C:\Program Files\Extron\UnivSW, and it places the following four icons into a group folder named "Extron Electronics\Universal Switcher":
  - Check for Universal Switcher Updates
  - Uninstall Universal Switcher
  - Universal Switcher Control Program
  - Universal Switcher Help

### Using the software

Run the program as follows:

- Click **Start > Programs > Extron Electronics > Universal Switcher > Universal Switcher Control Pgm.**
- Click the comm port that is connected to the switcher's RS-232 port (figure 4-4).

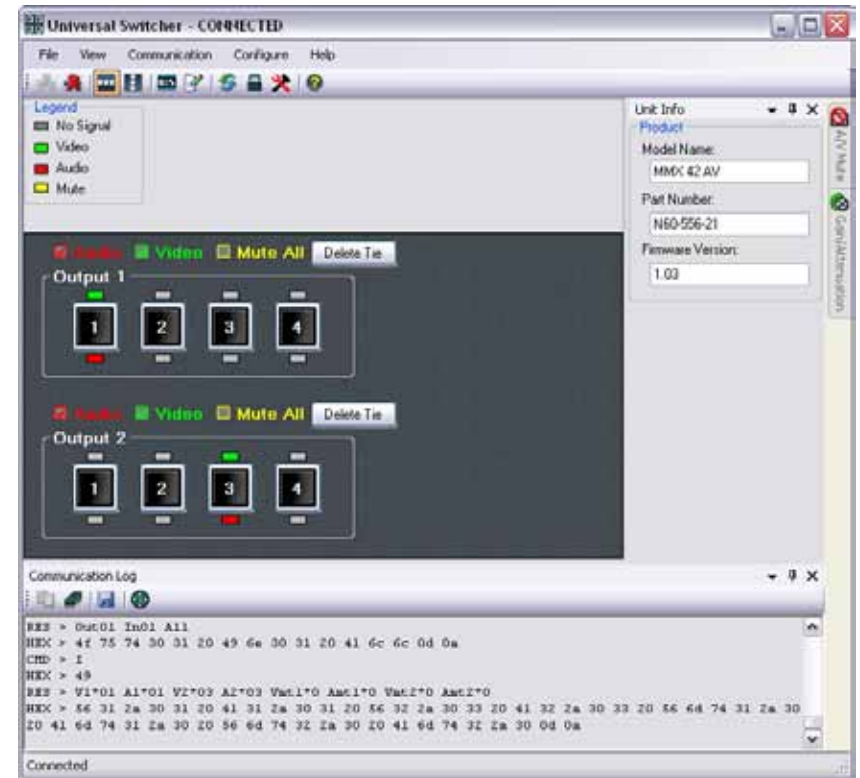


**Figure 4-4 — Comm Port Selection window**

- The Extron Universal Switcher Control Program window (figure 4-5) displays the current ties.

In figure 4-5:

- indicates that the video input is selected.
- indicates that the audio input is selected.
- indicates that the input is not selected.



**Figure 4-5 — Universal Switcher Control program window**

### Input selection

See figure 4-5. The top row of inputs is available for output 1 and the bottom row of inputs is available for output 2. The same input can be routed to both outputs, but an output can only be tied to a single input.


Tie an input to an output by clicking the numbered input button you want to tie to each output (figure 4-5).

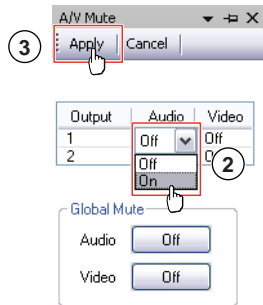
**NOTE** To switch the video or audio plane independently (video breakaway or audio breakaway) click the Video or Audio checkbox as desired to deselect that plane (the default is both boxes on).

Input selection from the switcher's front panel causes the program to "light" the associated indicators in the program to reflect the change.

## Muting the video and audio signals

To mute one or both of the switcher's video or audio outputs:

1. Place the mouse cursor over the **A/V Mute** tab at the side of the window. The A/V Mute field (figure 4-6) replaces the Unit Info field that was shown in figure 4-5. 1 



**Figure 4-6 — A/V mute field**

- TIP** Click the pushpin icon (📌) to anchor the field in place.
2.
    - a. Click in the field for the desired output (1 or 2) and plane (Audio or Video).
    - b. The field becomes a drop-down box.
    - c. Select the desired condition (Off or On) for the mute.
  3. Click the **Apply** button to save the change or **Cancel** to abandon the change. The associated Audio or Video check box turns yellow when that plane is muted. ☑ Audio


The mute function is not available from the switcher's front panel and can only be achieved under RS-232 control. When an output is muted, and if the muted output's front panel Outputs LED is lit, the front panel Input LED for the input tied to that output is off.

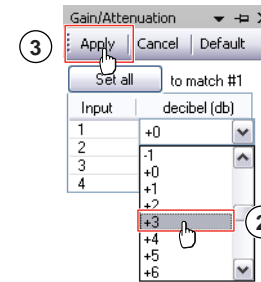
**NOTE** If an output is muted, any tie made from the front panel to that output unmutes it.

**NOTE** You can also mute all inputs (effectively muting ☐ Mute All the output) by clicking the **Mute All** check box.

## Setting audio levels

To set or changes the levels for audio inputs:

1. Place the mouse cursor over the **Gain/Attenuation** tab at the side of the window. The Gain/Attenuation field (figure 4-7) replaces the Unit Info field that was shown in figure 4-5. 1 



**Figure 4-7 — Gain/Attenuation field**

- TIP** Click the pushpin icon (📌) to anchor the field in place.
2.
    - a. Click in the decibel field for the desired input.
    - b. The field becomes a drop-down box.
    - c. Select the desired decibel level (-18 dB through +24 dB) for the input.

**NOTE** Settings are changed in 1 dB increments and affect both left and right channels equally.

3. Click the **Apply** button to save the change or **Cancel** to abandon the change.

The level function is not available from the switcher's front panel and can only be achieved under RS-232 control.

**NOTE** You can set all inputs to the input 1 level by clicking the **Set All** button.  to match #1

**NOTE** You can set all inputs to the default level (0 dB) by clicking the **Default** button.

### Front panel security lockout (Executive mode)

If the switcher is installed in an accessible area, where operation by unauthorized personnel may be a problem, a security lock-out feature can be implemented that locks all Input buttons and the Configuration button. When the front panel is locked, it cannot be operated. Either an RS-232 function (SIS command or program operation) or front panel operation (press and hold the Outputs and Configuration buttons for 3 seconds) is required to unlock the front panel before it can be operated.

Toggle the front panel lock on and off by clicking the tool bar's Lock button (🔒).

**NOTE** When the front panel is locked, the switcher still responds to SIS and control program commands.

**NOTE** When the front panel is locked, you still can view the tied inputs by pressing the Outputs button to toggle between the selection of output 1 and output 2.

### Updating the firmware

If firmware updates are implemented for the MMX, they are made available on the Extron Web site, [www.extron.com](http://www.extron.com). The Firmware Loader software is also available from the Extron site.

Use the SIS "Q" command to determine the switcher's current firmware level.

### Downloading the firmware from the Web site

To obtain the latest version of firmware for your MMX switcher:

1. Visit the Extron Web site ([www.extron.com](http://www.extron.com)), click the Download tab, then click the Firmware link on the left sidebar menu (figure 4-8).



Figure 4-8 — Extron Web site Download Center

2. On the Download Center screen (figure 4-9), click the MMX 42 and 62 Series Download link.

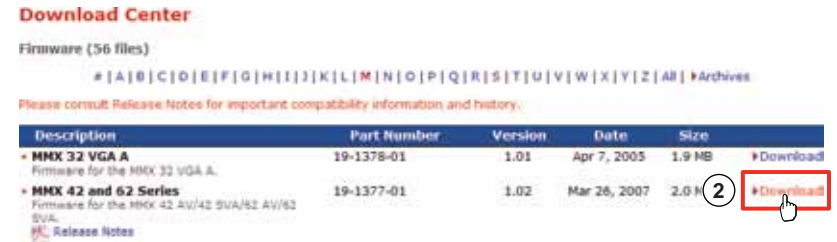


Figure 4-9 — MMX firmware

3. Complete the Personal Information form (figure 4-10) and click the Download button.

Figure 4-10 — Personal information form

4. Follow the instructions on the rest of the download screens to save the executable firmware file to your computer. Note the folder to which you save the file.
5. In the Windows Explorer or other file browser, locate the downloaded executable file, and double-click on it to open it.
6. Follow the instructions on the Installation Wizard screens to install the new firmware on your computer. A Release Notes file, which contains information on what has changed in the new firmware version, and a set of instructions for updating the firmware are also loaded.

### Loading the firmware to the switcher

To load a new version of firmware to your MMX switcher, call the Firmware Loader software from within the Universal Switcher Control Program. Your computer's serial port must be connected to the switcher's serial port. See chapter 2, "Installation," for more information.

1. If necessary, download the Firmware Loader installer executable file to your computer, as follows:
  - a. On the Extron Web site, click the **Download** tab.
  - b. On the Download Center page, click **Software** on the left sidebar menu.
  - c. Locate the "Firmware Loader" line and click the Download link at the far right.
  - d. Follow the instructions on the download screens to save the installer file to your computer.
  - e. In Windows Explorer or another file browser, locate the Firmware Loader executable file in your computer's file system and double-click on it to open it.
  - f. Follow the instructions on the Installation Wizard screens to install the Firmware Loader on your computer. Unless you specify otherwise, the installer program places the Firmware Loader file, "FWLoader.exe" in C:\Program Files\Extron\FWLoader.

**NOTE** If the Extron and FWLoader folders do not yet exist in your Program Files folder, the installer creates them.

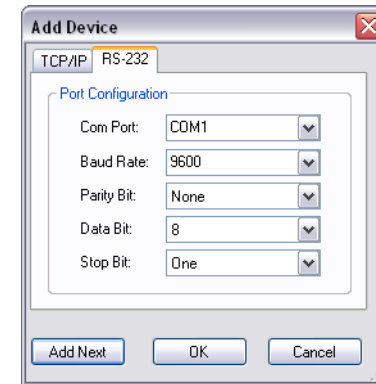
2. In the Universal Switcher Control Program, click the toolbar's Firmware Loader button (🔌).

**NOTE** If the Firmware Loader button does not appear in the Universal Switcher Control Program window, the Firmware Loader software is not installed.

3. If you have not previously updated firmware for the MMX switcher before, on the Add Device screen (figure 4-11), select the RS-232 tab.

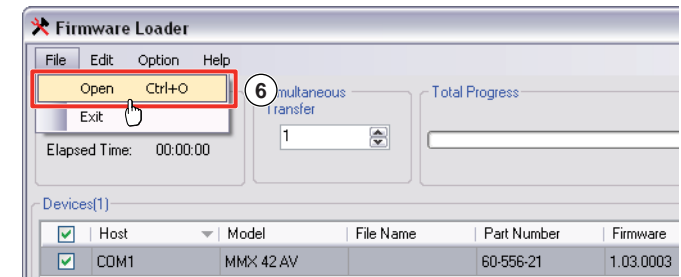
If you have previously updated firmware for this model, click **Cancel**. The Firmware Loader window appears. Proceed to step 6.

**NOTE** Although the screen also has a TCP/IP tab, the switcher does not have a LAN port. Do not select the TCP/IP tab.



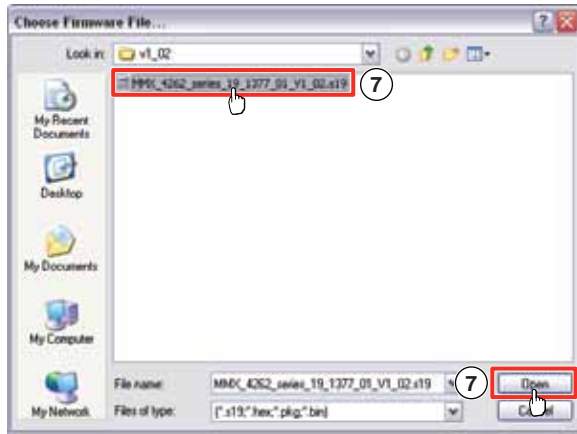
**Figure 4-11 — Add Device screen**

4. From the drop-down menus on the RS-232 screen, select the appropriate Com port number and baud rate (the default is 9600).
5. Click **OK**. The Firmware Loader window appears (figure 4-12).



**Figure 4-12 — Extron Firmware Loader window**

6. Select the MMX and click **File > Open**. The Choose Firmware File screen appears (figure 4-13, on the next page).



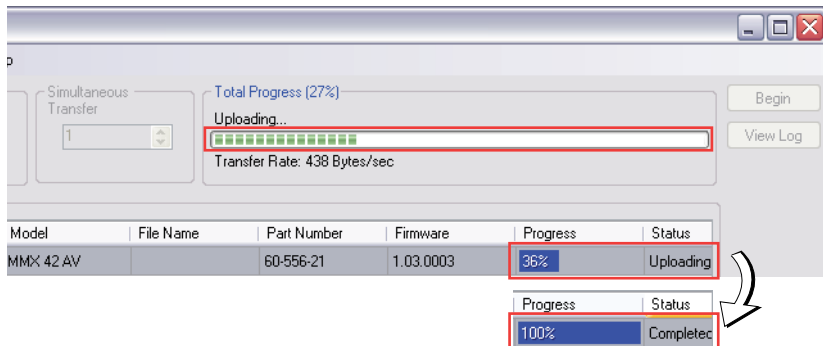
**Figure 4-13 — Choose Firmware File window**

- Navigate to and select the new firmware file. Click **Open**. The Choose Firmware File window closes.

**NOTE** When downloaded from the Extron Web site, the firmware is placed at C: Program Files\Extron\Firmware\MMX4262.

**CAUTION** The firmware file must have a .s19 extension. Other file types can cause the switcher to stop functioning.

- In the Firmware Loader window, click **Begin** (figure 4-14). The Total Progress and Progress status bars show the progress of the upload. The firmware upload to the switcher may take several minutes. Once the status bars have progressed from 0% to 100%, and Status is listed as Complete, the firmware loader utility resets the switcher.



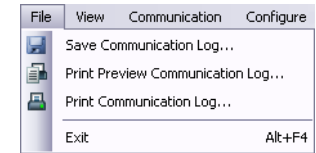
**Figure 4-14 — Firmware Loader screen**

- Click **Exit** to close the Firmware Loader.

## Windows menus

### File menu

**Save Communications Log ...** — Opens a Save Log window that allows you to save all SIS commands from the current session to a text (\*.txt) file.



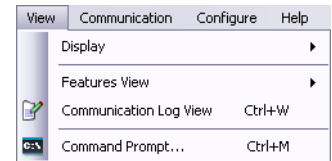
**Print Preview Communications Log ...** — Opens a window that presents a preview of a printed log of all SIS commands from the current session.

**Print Communications Log ...** — Prints all SIS commands from the current session.

**Exit** — Closes the Universal Switchers Control Program.

### View menu

**Display** — Allows you to select between horizontal (figure 4-5) and vertical (figure 4-15) display of the input and output selection window. These selections are also available via the tool bar's Horizontal button (☰) and Vertical button (⌵).



**Figure 4-15 — Vertical display**

**Features View** — Allows you to select which field, Unit Info, or A/V Mute, Gain/Attenuation to display as the default field in the top right of the Universal Switcher Control Program window.

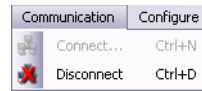
**Communications Log View** — Opens the communications log if it is not already open. This selection is also available via the tool bar's Communications Log View button (📄).

**Command Prompt ...** — Opens an MS-DOS window.



### Communication menu

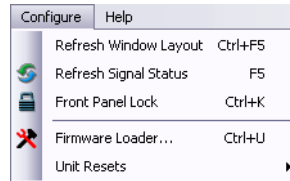
**Connect (shown unavailable)** — Available only when no switcher is connected to the program, this selection opens the Communications Setup window, from where you can connect to a switcher. This selection is also available via the tool bar's Connect button (🔗).



**Disconnect** — Available only when a switcher is connected to the program, this selection disconnects the switcher from the program. This selection is also available via the tool bar's Disconnect button (🔌).

### Configure menu

**Refresh Window Layout** — Restores the Universal Switchers Control Program to its default display layout (Unit Info field displayed and Communications Log turned on).



**Refresh Signal Status** — Issues the SIS "I" command and displays the results (all video and audio ties and all video and audio mutes) in the window. This selection is also available via the tool bar's Refresh button (🔄).

**Front Panel Lock** — Locks or unlocks all Input buttons and the Configuration button. See "Front panel security lockout (Executive mode)". This selection is also available via the tool bar's Lock button (🔒).

**Firmware Loader ...** — Calls the Extron Firmware Loader utility (if installed on the PC) to replace the switcher's firmware. See "Updating the firmware". This selection is also available via the tool bar's Firmware Loader button (🔧).

**Unit Resets** — Allows you to execute several switcher resets: System, Audio Input Gain, Video Mute, and Audio Mute. See the "Reset Commands" SIS commands for more information.

### Using the help system

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

- Click **Start > Programs > Extron Electronics > Universal Switcher > Universal Switcher Control Help**.
- From within the Windows-based switcher control program, click on the Help entry on the task bar.
- From within the Windows-based switcher control program, press the F1 key.



# Appendix A

## Reference Information

Specifications

Part Numbers

# Reference Information

## Specifications

### Video

#### Routing

MMX 42 Series.....	4 x 2 matrix
MMX 62 Series.....	6 x 2 matrix

Gain..... Unity

Bandwidth.....	150 MHz (-3 dB), fully loaded
0 - 10 MHz.....	No more than +0.1 dB to -0.1 dB
0 - 130 MHz.....	No more than +0.5 dB to -0.5 dB

Phase between I/Os..... <1.28° at 3.58 MHz

Differential phase error..... 0.1° at 3.58 MHz and 4.43 MHz

Differential gain error..... 0.1% at 3.58 MHz and 4.43 MHz

Max. propagation of delay..... 5 ns typical (±1 ns)

Crosstalk..... -50 dB @ 5 MHz

Switching speed..... 200 ns (max.)

### Video input

#### Number/signal type

MMX 42 and MMX 62 composite video models	4 or 6 composite video
MMX 42 SVA.....	4 S-video

#### Connectors

MMX 42 and MMX 62 composite video models	4 or 6 female BNC
MMX 42 SVA.....	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

Minimum/maximum levels..... Analog: 0.5 V to 2.0 Vp-p with no offset

Impedance..... 75 ohms

Return loss..... <-30 dB @ 5 MHz

DC offset (max. allowable)..... 1.5 V

### Video output

#### Number/signal type

MMX 42 and MMX 62 composite video models	2 composite video
MMX 42 SVA.....	2 S-video

#### Connectors

MMX 42 and MMX 62 composite video models	2 female BNC
--	--------------

MMX 42 SVA.....	2 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

Minimum/maximum levels..... 0 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

### Audio

#### Routing

MMX 42 Series.....	4 x 2 stereo matrix
MMX 62 Series.....	6 x 2 stereo matrix

#### Gain

Captive screw models..... Unbalanced output: -6 dB; balanced output: 0 dB

RCA connector models..... Unbalanced output: 0 dB

Frequency response..... 20 Hz to 20 kHz, ±0.05 dB

THD + Noise..... 0.03% @ 1 kHz at rated nominal level

S/N..... >90 dB, output 21 dBu, balanced, at maximum output (unweighted)

Crosstalk..... <-80 dB @ 1 kHz, fully loaded

Stereo channel separation..... >90 dB @ 1 kHz

CMRR..... >75 dB @ 20 Hz to 20 kHz

## Specifications, Part Numbers, Accessories, cont'd

### Audio input

Number/signal type	
Captive screw models .....	4 or 6 stereo, balanced/unbalanced
RCA connector models.....	4 or 6 stereo, unbalanced
Connectors	
Captive screw models .....	(4 or 6) 3.5 mm captive screw connectors, 5 pole
RCA connector models.....	4 or 6 pairs of female RCA connectors
Impedance.....	>10k ohms unbalanced/balanced, DC coupled
Nominal level .....	-10 dBV (316 mV)
Maximum level.....	+19.5 dBu, (balanced or unbalanced) at 1%THD+N
Input gain adjustment .....	-18 dB to +24 dB, adjustable per input via RS-232 only

**NOTE**     $0 \text{ dBu} = 0.775 \text{ V}_{\text{rms}}$ ,  $0 \text{ dBV} = 1 \text{ V}_{\text{rms}}$ ,  $0 \text{ dBV} \approx 2 \text{ dBu}$

### Audio output

Number/signal type	
Captive screw models .....	2 stereo, balanced/unbalanced
RCA connector models.....	2 stereo, unbalanced
Connectors	
Captive screw models .....	(2) 3.5 mm captive screw connectors, 5 pole
RCA connector models.....	2 pairs of female RCA connectors
Impedance.....	50 ohms unbalanced, 100 ohms balanced
Gain error .....	$\pm 0.1$ dB channel to channel
Maximum level (Hi-Z) .....	>+21 dBu, balanced or unbalanced at 1%THD+N
Maximum level (600 ohm).....	>+15 dBm, balanced or unbalanced at 1%THD+N

### Control/remote — switcher

Serial control port.....	RS-232, female 3.5 mm captive screw connector, 3 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
Program control.....	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS™)

### General

External power supply .....	100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, 1 A, regulated
Power input requirements .....	12 VDC, 0.5 A
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
Cooling .....	Convection, no vents
Mounting	
Rack mount .....	Yes, with optional 1U rack shelf
Enclosure type .....	Metal
Enclosure dimensions.....	1.75" H x 8.75" W x 3.0" D (1U high, half rack wide) 4.4 cm H x 22.2 cm W x 7.6 cm D (Depth excludes connectors.)
Product weight .....	4.0 lbs (1.8 kg)
Shipping weight .....	5 lbs (3 kg)
Vibration .....	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Listings.....	CE, c-UL, UL
Compliances.....	CE, C-tick, FCC Class A, ICES, VCCI
MTBF.....	30,000 hours
Warranty .....	3 years parts and labor

**NOTE**    *All nominal levels are at  $\pm 10\%$ .*

**NOTE**    *Specifications are subject to change without notice.*

### Part Numbers

#### MMX part numbers

Model	Part number
MMX 42 AV 4 x 2 video/audio switcher	60-556-21
MMX 42 SVA 4 x 2 S-video/audio switcher	60-556-22
MMX 42 AV RCA 4 x 2 video/audio switcher	60-556-31
MMX 42 SVA RCA 4 x 2 S-video/audio switcher	60-556-32
MMX 62 AV 6 x 2 video/audio switcher	60-557-21
MMX 62 AV RCA 6 x 2 video/audio switcher	60-557-31

#### Included Parts

These items are included in each order for an MMX matrix switcher:

Model	Part number
12 VDC external power supply	
Tweezer (small screwdriver)	
IEC power cord	
2-pole captive screw connector	
3-pole captive screw connector	
5-pole captive screw connector (6 or 8) (non RCA models only)	
Extron Software Products DVD (Matrix Switchers Control Program)	
<i>MMX 42/62 Series Setup Guide</i>	

#### Mounting accessories

Accessory	Part number
<b>RSF 123</b> 3.5-inch deep rack shelf kit	60-190-20
<b>RSB 123</b> 3.5-inch deep rack shelf	60-604-21
<b>RSU 126</b> 6-inch deep universal rack shelf kit	60-190-10
<b>RSB 126</b> 6-inch deep basic rack shelf	60-604-11
<b>RSU 129</b> 9.5-inch deep 1U universal rack shelf kit	60-190-01
<b>RSB 129</b> 9.5-inch deep 1U basic rack shelf	60-604-02
<b>MBU 123</b> Under desk mounting kit	70-212-01

### Cables

Extron MHR-2 SVM-M cable is suitable for S-video. This cable is terminated with male 4-pin mini DIN connectors on both ends.

Cable	Part number
MHR-2 SVM-M/6 (6 feet/1.8 meters)	26-316-02
MHR-2 SVM-M/12 (12 feet/3.6 meters)	26-316-03
MHR-2 SVM-M/20 (20 feet/6.0 meters)	26-316-01
MHR-2 SVM-M/30 (30 feet/9.1 meters)	26-316-04
MHR-2 SVM-M/50 (50 feet/15.2 meters)	26-316-05
MHR-2 SVM-M/75 (75 feet/22.8 meters)	26-316-06
MHR-2 SVM-M/100 (100 feet/30.4 meters)	26-316-07

Extron super high resolution RG6 BNC cable is suitable for composite video. This cable is terminated with male BNC connectors on both ends.

Cable	Part number
RG6 BNC/3 (3 feet/0.9 meter)	26-383-01
RG6 BNC/6 (6 feet/1.8 meters)	26-383-12
RG6 BNC/12 (12 feet/3.6 meters)	26-383-07
RG6 BNC/25 (25 feet/7.6 meters)	26-383-04
RG6 BNC/35 (35 feet/10.6 meters)	26-383-13
RG6 BNC/50 (50 feet/15.2 meters)	26-383-05
RG6 BNC/75 (75 feet/22.8 meters)	26-383-06
RG6 BNC/100 (100 feet/30.4 meters)	26-383-03

## **Specifications, Part Numbers, Accessories, cont'd**