User Guide

Matrix Switchers

MMX 32 VGA MTP

3x2 VGA and Audio Matrix Switcher with MTP Twisted Pair Output

Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-2268-01 **Rev. A**
06 12

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.

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。

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.

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.

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.

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. The Class A limits 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 interference; the user must correct the interference at his own expense.

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

For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the "**Extron Safety and Regulatory Compliance Guide**" on the Extron website.

Conventions Used in this Guide

Notifications

WARNING: A warning indicates a situation that has the potential to result in death or severe injury.

CAUTION: A caution indicates a situation that may result in minor injury.

NOTE: A note draws attention to important information.

Contents

Introduction

This section provides information on the following topics:

About this Manual

This manual discusses how to install and operate the Extron MMX 32 VGA MTP matrix switcher.

About the MMX 32 VGA MTP

The Extron MMX 32 VGA MTP is a compact, three-input, two-output matrix switcher suitable for small installations or portable systems. The switcher routes computer video and both balanced and unbalanced audio signals, and features a bandwidth of 300 MHz (-3 dB) to accommodate signals of all resolutions, from VGA to UXGA. The switcher/transmitter can switch computer signals locally or to a remote location up to 750 feet (230 m) away.

The MMX 32 VGA MTP has two outputs. Output 1 provides a video output on a female 15-pin HD connector and an audio output on a 3.5 mm stereo jack. Output 2 provides a video output on an RJ-45 UTP connector that requires an MTP receiver. The audio output is summed stereo to mono on the same RJ-45 UTP connector, with an additional balanced/unbalanced stereo output on a 5-pole captive screw connector.

The switcher can be controlled via the front panel buttons, through remote contact closure, or by RS-232 control.

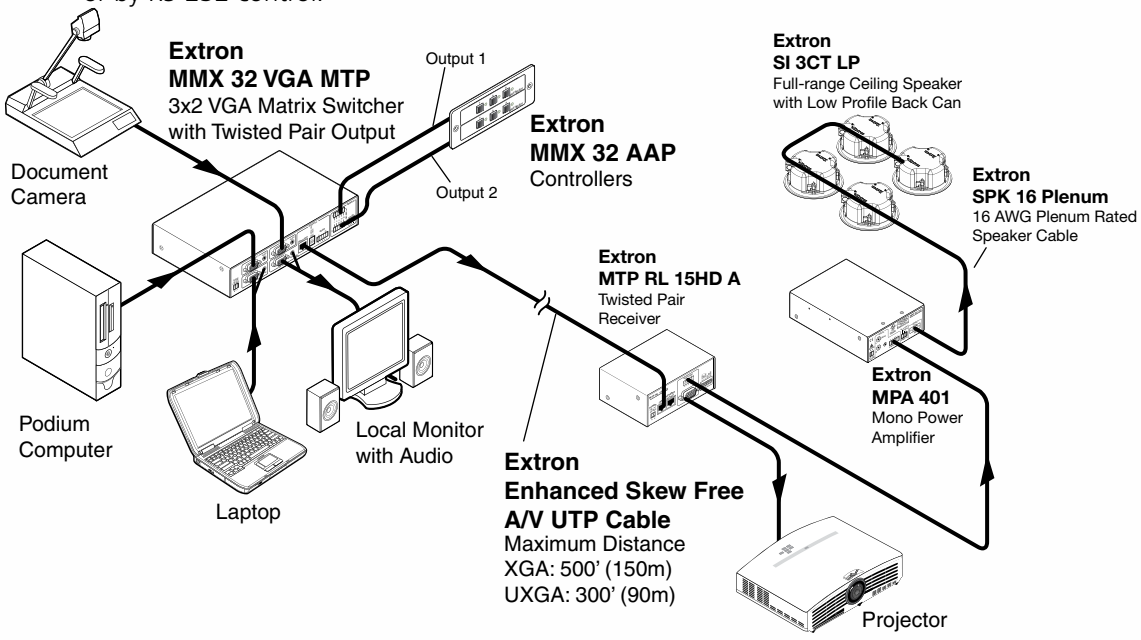


Figure 1. Typical MMX 32 VGA MTP Application

Features

- **Inputs** — The MMX VGA MTP has three female 15-pin HD input connectors, each with a 3.5 mm stereo jack.
- **Outputs** — The unit routes computer video and audio signals to two outputs:
  - Output 1 is a local output, using one female 15-pin HD connector with a 3.5 mm stereo jack.
  - Output 2 is a transmitted output, using an RJ-45 UTP connector for RGBHV video and summed audio, with an additional audio output on a 5-pole captive screw connector.
- **Stereo audio** — The unbalanced stereo audio input can be output as either balanced or unbalanced stereo audio, or it can be output as dual mono audio.
- **Bandwidth** — The switcher features 300 MHz (-3 dB) bandwidth to accommodate any signal resolution.
- **Peaking option** — To compensate for signal loss due to long distance transmission, the MMX 32 VGA MTP offers DIP switch selectable peaking capability.
- **Bi-level/tri-level sync** — Output 2 is compatible with virtually any sync signal. Bi-level or tri-level sync transmission is DIP switch selectable.
- **Front panel control** — Each output has a set of input selector buttons and LEDs for easy input selection.
- **Remote control** — Operate the switcher via optional contact closure and RS-232 remote controllers.
- **Portability** — The switcher is light and compact, with rubber feet for tabletop operation.
- **Rack and furniture mounting** — The MMX 32 VGA MTP can be mounted on a rack shelf or under a desk or podium.
- **Power —** An external 12 VDC power connector is included with the switcher.
- **Optional accessory compatibility** — The MMX 32 VGA MTP is compatible with MMX 32 AAP and MMX 32 MAAP contact closure panels. See the application diagram (**figure 23**) on page **23**.
- **Additional accessories** — Extron twisted pair receivers—MTP U series and MTP RL 15HD A (sold separately)—are required for use with the MMX 32 VGA MTP for output 2. See the application diagram (**figure 1**) on page **1**.

Installation and Operation

This section covers the following topics:

- **Mounting the MMX 32 VGA MTP**
- **Rear Panel Features and Cabling**
- **Front Panel Features and Operation**

Mounting the MMX 32 VGA MTP

The MMX 32 VGA MTP can be set on a table, mounted on a rack shelf, or mounted under a desk, podium, or tabletop.

Tabletop Use

Four self-adhesive rubber feet are included with the switcher. For tabletop use, attach one foot at each corner of the bottom of the unit, and place the unit in the desired location.

UL Requirements for Rack Mounted Devices

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

1. **Elevated operating ambient temperature** — If the equipment is 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 equipment 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).

Rack Mounting

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

- RSU 126, 6" deep 1U rack shelf kit (part number **60-190-10**)
- RSB 126, 6" deep basic 1U rack shelf (part number **60-604-10**)
- RSU 129, 9.5" deep Standard universal 1U rack shelf kit (part number **60-190-01**)
- RSB 129, 9.5" deep Basic universal 1U rack shelf (part number **60-604-01**)

On the standard rack shelf, the switcher mounts in one of four locations to the rear of the rack or in one of four locations to the front of the rack. To rack mount a MMX 32 VGA MTP, do the following:

1. Remove rubber feet if they were previously installed on the bottom of the switcher.
2. Mount the switcher on the rack shelf, using two 4-40 x 3/16 inch screws in opposite (diagonal) corners to secure it to the shelf (see figures **2** and **3** below).
3. Install blank panels or other units on the rack shelf.
4. Attach the rack shelf to the rack using the supplied bolts.

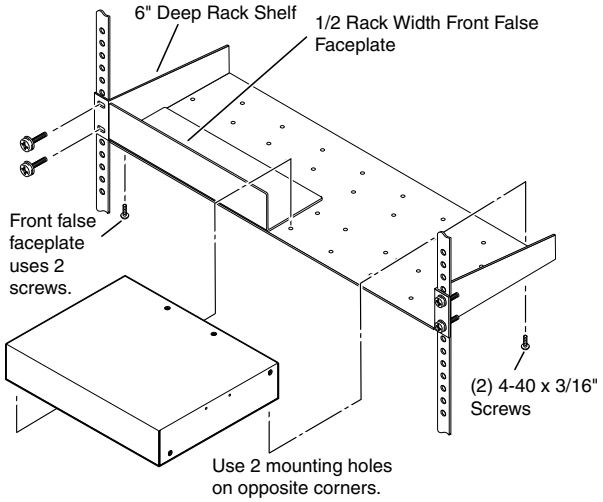


Figure 2. Mounting the MMX 32 VGA MTP on a 6 Inch Rack Shelf

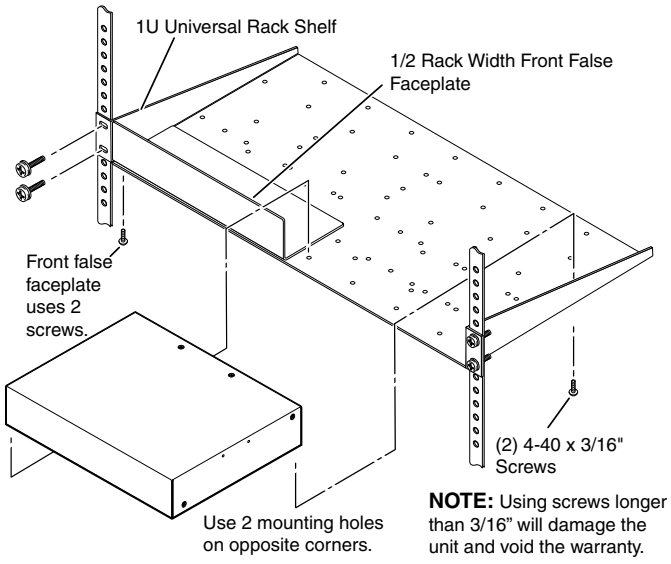


Figure 3. Mounting the MMX 32 VGA MTP on a Standard Rack Shelf

Furniture Mounting

Use the optional MBU 125 mounting kit (part number **70-077-01**) to mount the MMX as follows:

1. Remove the feet from the bottom of the MMX, if installed.
2. Attach the mounting brackets to the MMX with the provided machine screws (figure **4**).

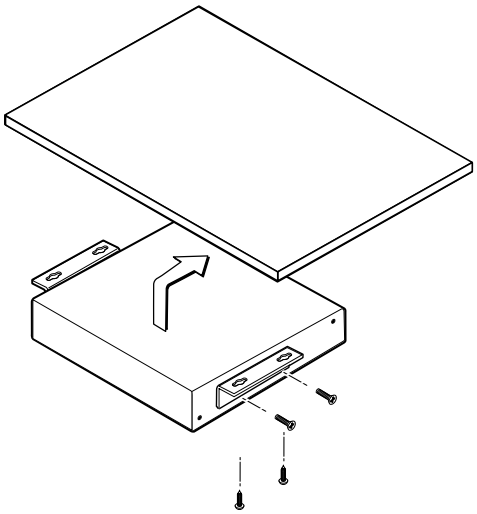


Figure 4. Mounting the MMX 32 VGA MTP Under Furniture

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

Rear Panel Features and Cabling

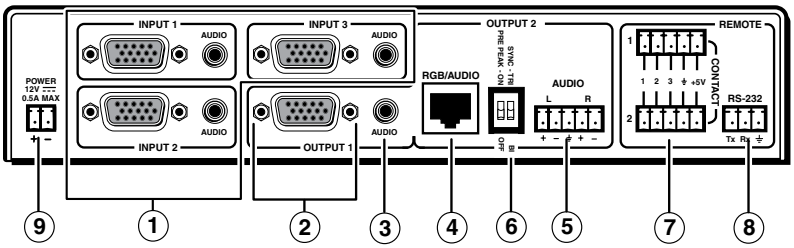
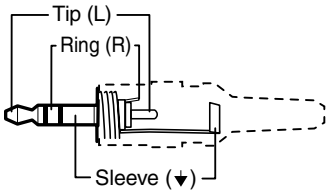


Figure 5. MMX 32 VGA MTP Rear Panel

Inputs

① **Video and audio inputs —** Connect computer video sources to these female 15-pin HD connectors. Connect audio sources to these 3.5 mm stereo jacks. Wire the audio connectors as shown in figure **6**.



3.5 mm Stereo Plug Connector
(unbalanced)

Figure 6. Audio Input Connection

Outputs

② **Video output 1** — Connect an output monitor or other VGA device to this female 15-pin HD connector.

③ **Audio output 1** — Connect speakers to this 3.5 mm stereo jack.

④ **Audio/Video (RGB) output 2** — Connect an MTP R 15 HD A or MTP RL 15HD A receiver to this RJ-45 UTP connector.

> **NOTE:** See "**TP Cable Termination**" on page **9** to properly wire the RJ-45 connectors.

Then connect a projector or other RGB video output device to the receiver, and connect speakers for summed (L and R) mono audio output.

⑤ **Audio output 2** — Connect speakers to this 5-pole, 3.5 mm captive screw connector for balanced/unbalanced audio. Wire the captive screw connector for stereo output as shown in figure **7**.

> **CAUTION:** For unbalanced audio, connect both sleeves to the center (ground) contact. DO NOT connect the sleeves to the negative (-) contacts.

Figure 7. Audio Output Connections

> **CAUTION:** Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.

> **NOTE:** Do not tin the stripped wires before installing the captive screw connector. Tinned wires are not as secure in the captive screw connectors and could be pulled out.

Pre-Peaking and Sync Selection

⑥ **Pre-peaking selection** — To select the correct peaking option to compensate for signal loss over long cable runs, set the DIP switch position as shown in the table below:

Pre-peaking settings table

Video Format	Pre-Peak off	Pre-Peak on	Max. distance (high quality)	Max. distance (variable quality)
Composite, S-video, Component			800 ft. (245 m)	1000 ft. (300 m)
640 x 480	<300 ft. (90 m)	<350 ft. (105 m)	700 ft. (215 m)	750 ft. (240 m)
800 x 600	<300 ft. (90 m)	<350 ft. (105 m)	550 ft. (165 m)	650 ft. (200 m)
1024 x 768	<300 ft. (90 m)	<350 ft. (105 m)	500 ft. (150 m)	600 ft. (185 m)
1280 x 1024	<250 ft. (75 m)	<300 ft. (90 m)	350 ft. (105 m)	450 ft.. (135 m)
1600 x 1200	<250 ft. (75 m)	<300 ft. (90 m)	300 ft. (90 m)	450 ft. (135 m)

Sync selection — To select either bi-level sync or tri-level sync on output 2, set the sync DIP switch to the desired setting.

NOTE: Set when transmitting tri-level sync component video.

Remote Control Connections

⑦ **Contact closure connectors** — These two 5-pole captive screw connectors provide remote contact closure control of outputs 1 and 2 by connecting an Extron MMX 32 AAP (part number **70-277-11**) or MMX 32 MAAP (part number **70-277-12**, or **-22**) contact closure remote control panel. Connect the 5 V and Gnd (-) 2-pole captive screw connector on the AAP or MAAP to either of these connectors. See "**Remote Control**" on page **12** for more information.

⑧ **RS-232 connector** — Connect an RS-232 control module to this 3-pole captive screw connector to allow remote control using the Extron Simple Instruction Set (SIS™) or the Extron Universal Switcher Control Program.

Power Connection

⑨ **Power connector** — An external 12 VDC power supply is included with the unit. Plug it into this 2-pole 3.5 mm captive screw connector. Wire the connector as shown in figure **8**.

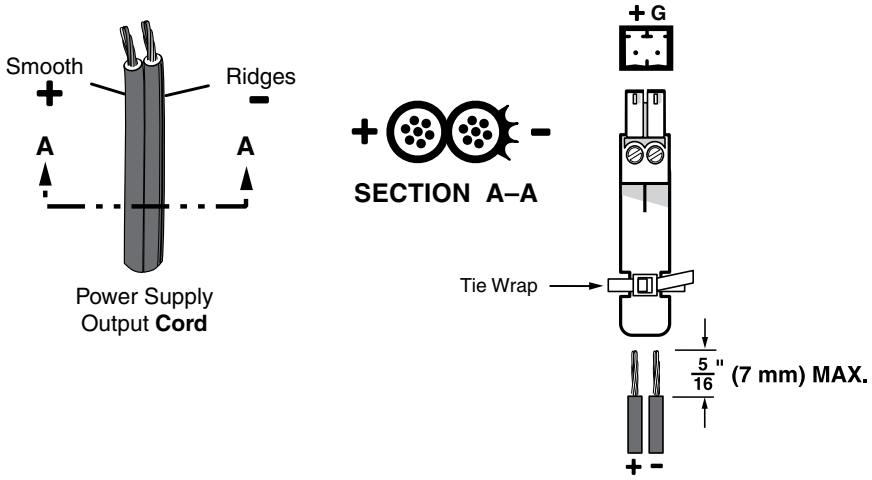


Figure 8. Power Connection Wiring

CAUTION:	Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the MMX. Identify the power cord negative lead by the ridges on the side of the cord (figure **8**).

CAUTION:	The length of the exposed (stripped) copper wires is important. **The ideal length is 5/16 inches (7 mm)**. Longer bare wires can short together. Shorter wires are not as secure in the captive screw connectors and could be pulled out.

NOTE:	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 could be pulled out.

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

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

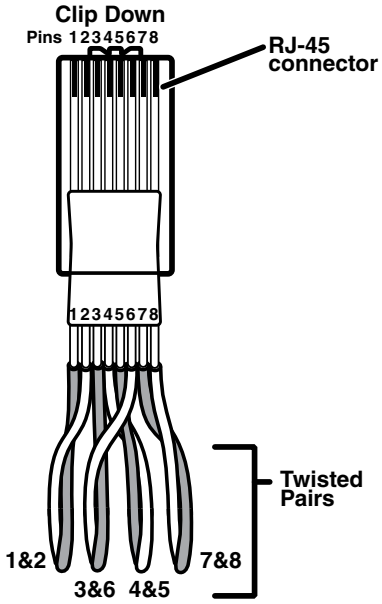
As an alternative, an Extron P/S 123 Universal 12 V DC Power Supply, part number **60-814-01**, can power multiple MMXs or other Extron 12 V DC devices, using only one AC power connector.

CAUTION:	Do not daisy chain power to this unit.

TP Cable Termination

NOTE: RJ-45 termination must comply with the TIA/EIA T 568A or TIA/EIA T 568B wiring standards for all connections. If you are using Skew-Free™ A/V UTP cable, then you should use the TIA/EIA T 568A standard only.

Figure **9** details the recommended termination of TP cables with RJ-45 connectors in accordance with the TIA/EIA T 568A or TIA/EIA T 568B wiring standards. You can use either standard with CAT 5 cable, but ensure that you use the same standard on both ends of the cable.



Pin	568 A Wire color	568 B Wire color	Signal
1	White-green	White-orange	Red+/V. sync+
2	Green	Orange	Red-/V. sync-
3	White-orange	White-green	Mono audio+
4	Blue	Blue	Green+
5	White-blue	White-blue	Green-
6	Orange	Green	Mono audio-
7	White-brown	White-brown	Blue+/H. sync+
8	Brown	Brown	Blue-/H. sync-

NOTE: If you use Skew-Free™ A/V cable, use the TIA/EIA T 568A standard only.

Figure 9. TP Cable Termination

NOTES:
- Skew-Free A/V cable is **not recommended** for Ethernet/LAN applications.
- Skew-Free cable is specially designed for compatibility with Extron Twisted Pair products, wired using the TIA/EIA 568 A standard.
- The green, brown, and blue pairs of this cable have virtually identical lengths and should be used to transmit the RGB signals.
- The orange pair of this cable has a different length and should not be used to transmit the RGB signals.

Front Panel Features and Operation

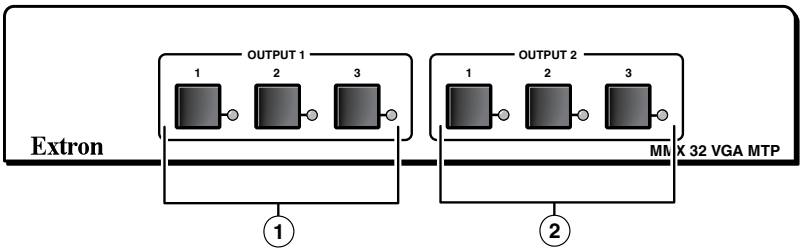


Figure 10. Front Panel Features

① **Input selector buttons and LEDs for output 1** — Press the button corresponding to the desired input. The LED for that input lights.

② **Input selector buttons and LEDs for output 2** — Press the button corresponding to the desired input. The LED for that input lights.

NOTE: When power is applied, the LEDs light sequentially from left to right. For first time power up, the default configuration of the unit is input 1 tied to both outputs 1 and 2, so that the input 1 LEDs for both output 1 and for output 2 are lit. If this is not a first time power up, then the LEDs corresponding to the last valid input selections light.

NOTE: Tying input 0 to an output is done only using RS-232, and it is reflected on the front panel and any optional MMX 32 AAP/MAAP installed. When a tie is made between an input and an output, if that output was previously tied to another input, the older tie is broken when the new input is selected.

NOTE: Audio breakaway is done by RS-232 through the Extron Simple Instruction Set (SIS) or the Universal Switcher Control Program. The LED corresponding to the audio source flashes during breakaway.

Front Panel Security Lock Out (executive mode)

Locking the front panel protects the switcher when it is installed in a location where unwanted tampering may occur. While the switcher is locked, the user can select inputs only through a remote device.

To lock the front panel, press the following buttons simultaneously and hold them for at least 3 seconds:

- Input 1 button for output 1
- Input 3 button for output 2

The front panel LEDs flash to indicate that the front panel is locked.

To unlock the front panel, repeat this procedure.

System Reset

To clear all user settings and reset the switcher to its factory settings, press and hold the input 3 button for output 1 while you power up the switcher (see figure **11**). Continue to hold the button while the switcher lights the front panel LEDs sequentially from left to right. The default settings are: input 1 is tied to both outputs, the front panel is not locked, and all states are unmuted.

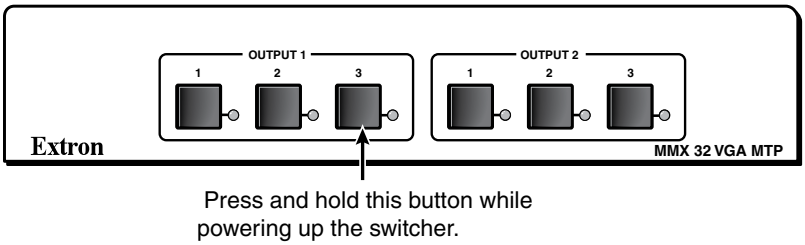


Figure 11. Press and Hold to Reset the Switcher

Audio Switching

When you select an input by pressing a front panel selector button, the audio and video signals from that input are routed together to the appropriate output.

- The MMX 32 VGA MTP also features audio breakaway through the Extron Simple Instruction Set or the Extron Universal Switcher Control Program (see "**Remote Control**" on page **12** for details). When audio breakaway is active, the front panel LED corresponding to the audio source flashes, while the LED corresponding to the video source lights steadily.

Remote Control

This section covers topics relating remote control operation, including:

- **Output Control**
- **RS-232 Control**
- **Contact Closure Control**

The rear panel Remote connectors of the switcher can be connected to the serial port output of a host device such as a computer or control system, or to a contact closure device such as the Extron MMX 32 AAP panel (part number **70-277-11**) or MMX 32 MAAP panel (part number **70-277-12** or **-22**). The contact closure connectors are two 5-pole captive screw connectors, which control outputs 1 and 2 separately.

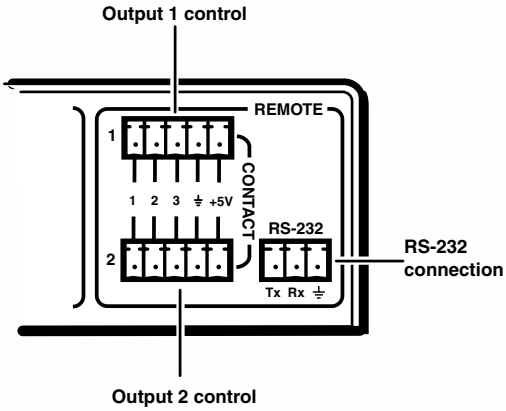


Figure 12. Remote Connectors Arrangement

Output Control

Momentarily short pin 1, 2, or 3 to ground to switch to that input. Use the +5 V port when controlling the output with an MMX 32 AAP/MAAP panel.

RS-232 Control

The RS-232 connection makes software control of the switcher possible via the Extron Simple Instruction Set (SIS) or the Extron Windows®-based control program. The RS-232 connector on the MMX 32 VGA MTP is a 3-pole captive screw connector.

The protocol for this connector is:
•9600 baud •8-bit •1 stop bit •no parity •no flow control

NOTE: For RS-232 connect transmit, receive, and ground connectors to control system or PC.

Simple Instruction Set Control

Host-to-switcher instructions

The switcher accepts SIS commands through the remote connector. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends 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 message

The following copyright message is initiated by the switcher when it is first powered on. Vx.xx is the latest firmware version number.

```
(c) COPYRIGHT 2ØØ5, EXTRON ELECTRONICS
“MMX 32 VGA MTP”, Vx.xx↵
```

Switcher error responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or 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 value (out of range)

Using the command/response table

The SIS command/response table begins on the next page. Lower case letters are acceptable in the command field only where indicated(B/b, for example). Symbols are used throughout the table to represent variables in the command/response fields. Symbol definitions and an ASCII-to-hexadecimal (HEX) conversion table are provided below. Command and response examples are shown throughout the tables.

ASCII to HEX Conversion Table										Esc	1B	CR	ØD	LF	ØA
	2Ø	!	21	“	22	#	23	$	24	%	25	&	26	‘	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
3Ø	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	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	-	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	l	7C	}	7D	~	7E	DEL	7F

Symbol definitions

- • = Space
- ↵ = Carriage return/line feed
- ← = Carriage return (no line feed)
- Esc = "Escape key" or W
- | = Pipe (vertical bar) character. Has the same function as ←.
- W = Has the same function as Esc.
- X1 = Input number 1 – 3
- X2 = Input number (for tie) 0 – 3, 0 = disconnected
- X3 = Output number 1 or 2
- X9 = Mute/lock 0 = off/unlocked, 1 = on/locked
- X19 = Controller software version number to second decimal place
- X20 = Audio/Video mute status 0 = no mute, 2 = audio mute
1 = video mute, 3 = video and audio mute

Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Create ties			
Tie input X2 to output X3, A & V	X2*X3 !	OutX3•InX2•All↵	
Example:	1*2!	Out02•In01•All↵	Tie input 1 audio and video to output 2.
Tie input X2 RGB to output X3	X2*X3 %	OutX3•InX2•RGB↵	
Example:	3*1%	Out01•In3•RGB↵	Tie input 3 RGB to output 1.
Tie input X2 audio to output X3	X2*X3$	OutX3•InX2•Aud↵	
Example:	1*2$	Out02•In1•Aud↵	Tie input 1 audio to output 2.
RGB mute			
RGB mute	X3*1B/b	VmtX3*1↵	Mute RGB output X3.
RGB unmute	X3*0B/b	VmtX3*0↵	Unmute RGB output X3.
Read RGB mute	X3 B/b	X9↵	Show RGB mute status X9 (0 = off and 1 = on).
Global (Where X3 is not included, global RGB mute is activated.)			
RGB mute all	1*B/b	Vmt1↵	Mute all RGB.
RGB unmute all	0*B/b	Vmt0↵	Unmute all RGB.
Audio mute			
Audio mute	X3*1Z/z	AmtX3*1↵	Mute audio output X3.
Audio unmute	X3*0Z/z	AmtX3*0↵	Unmute audio output X3.
Read audio mute	X3Z/z	X9↵	Show audio mute status X9 (0 = off and 1 = on).
Global (Where X3 is not included, global Audio mute is activated.)			
Audio mute all	1*Z/z	Amt1↵	Mute all audio.
Audio unmute all	0*Z/z	Amt0↵	Unmute all audio.

NOTE:
- X2 = Input number (for tie) 0 – 3, 0 = disconnected
- X3 = Output number 1 or 2
- X9 = Mute status 0 = off, 1 = on

NOTES:
- Tie commands can be made back-to-back with no spaces. Example: 1*1!Ø2!Ø3*Ø3!...
- The matrix switcher supports the 2-digit numeric format (Ø1*Ø2).

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Front panel security lock out			
Lock front panel	1 X/x	Exe1↵	Lock front panel.
Unlock front panel	0 X/x	Exe0↵	Unlock front panel.
Lock status	X/x	X9↵	Show lock status (0 = unlocked and 1 = locked)
Reset to factory defaults			
System reset (factory default)	EscZXXX←	Zpx↵	Clear all ties and unmute audio and video.
Unmute RGB	EscZZ←	Zpz↵	Unmute all.
View ties and output mute			
View RGB output tie *Example*:	X3% 2%	X2↵ 3↵	Output 2 video is tied to input 3 video.
View audio output tie *Example*:	X3$ 1$	X2↵ 2↵	Output 1 audio is tied to input 2 audio.
Output mute	X3VM "VM" ***must*** be upper case	X20↵	Output mute X20 (0 = no mute, 1 = video mute, 2 = audio mute, 3 = video and audio mute).
Information requests			
Information request *Example*: See note below for explanation	I/i i	V1*X2•A1*X2•V2*X2•A2*X2•Vmt1*X9•Amt1*X9•Vmt2*X9•Amt2*X9↵ V1*1•A1*1•V2*2•A2*2•Vmt1*0•Amt1*0•Vmt2*0•Amt2*0 ① ② ③ ④	
Request part number	**N/n**	xx-xxx-xx↵	60-565-01 = MMX 32 VGA MTP switcher.
Query firmware version	**Q/q**	X19↵	Show firmware version number.

NOTES: X2 = Input number (for tie) 0 – 3
0 = disconnected

X3 = Output number 1 or 2

X9 = Lock status 0 = unlocked
1 = locked

X19 = Controller software version number to second decimal place

X20 = Mute 0 = no mute 2 = audio mute
1 = video mute 3 = video and audio mute

① Input 1 supplies video and audio for output 1.

② Input 2 supplies video and audio for output 2.

③ Output 1 does not mute video or audio.

④ Output 2 does not mute video or audio.

Loading firmware using an SIS command

Firmware can be uploaded two ways:

1. Using the Universal Switcher Control Program.
2. Using the "Esc*upload*" SIS command entered via a communications utility such as HyperTerminal.

NOTE: Extron recommends that you upload firmware using the Universal Switcher Control Program (see "**Updating the firmware**" on page **21**) and reserve this SIS procedure for correcting firmware that has been corrupted and is unable to respond to the Universal Switcher Control Program.

Firmware can be loaded using SIS commands as follows:

1. Visit the Extron Web site, **www.extron.com**, select the MMX switcher product category, select the latest firmware file for download, and run the executable file. This installs the firmware to your computer. Follow the instructions on the screen. Note the folder where the firmware file is saved.
2. Start a communications utility such as HyperTerminal. Select the Com port that is connected to the switcher's RS-232 port. Use 9600 bits per second, 8 data bits, no parity, 1 stop bit, and no flow control.

NOTE: If you are performing this procedure to recover from corrupted firmware, the switcher responds only to the "n", "q", and "Esc*upload*" SIS commands.

NOTE: The firmware upload can take several minutes. If the HyperTerminal echo function is turned off, there is no indication that the upload is progressing. If desired, turn on the echo function as follows (figure **13**): Select **`File`** > **`Properties`** > **`Settings`** > **`ASCII Setup`**. Ensure that the *Echo typed characters locally* check box is checked. Click **OK** on the ASCII Setup and Settings windows.

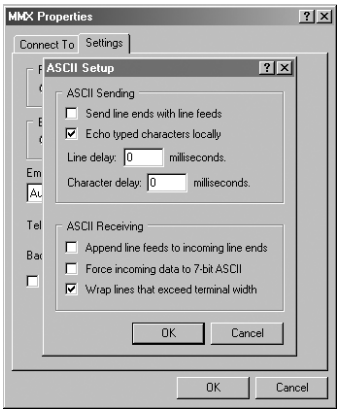


Figure 13. Turn on the Echo Function

3. Press and release the **Esc** key on the keyboard and then type **upload**. The computer responds with the "Go" prompt.
4. Click **`Transfer`** > **`Send text file`**.
5. From the *Files of type:* drop box, select *All files (*.*)*.
6. Navigate to the folder where you saved the firmware upgrade file. Select the file (figure **14**).

NOTE: Ensure that the firmware upgrade is for the MMX Series switcher. Valid firmware files must have the file extension ".s19". Any other file extension is not a firmware upgrade for your switcher.

7. Click **Open**. The firmware upload begins. If the HyperTerminal echo function is turned on, HyperTerminal displays a scroll of the text of the firmware file as it uploads to the switcher (figure **15**).

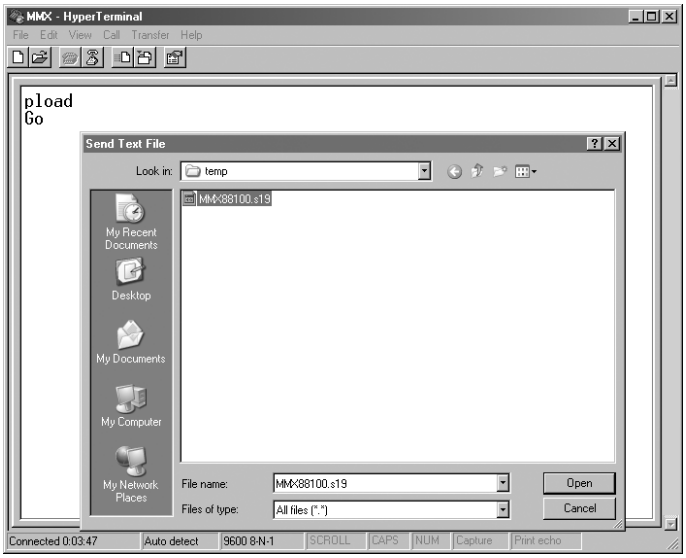


Figure 14. Select the Firmware Upgrade File

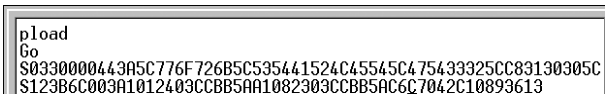


Figure 15. Upload Progress Display

8. After several minutes, the switcher reports the start-up copyright message:
`(c) COPYRIGHT 2ØØ5, EXTRON ELECTRONICS`
`"MMX 32 VGA MTP", V`*`x.xx`* ↵
This message indicates that the firmware upload is complete.

9. Exit HyperTerminal.

Windows®-Based Control Program

The Universal Switcher Control Program is compatible with Windows 98 and later, and provides remote control of the input selection for each output (including video/audio breakaway), audio gain and attenuation adjustments, and front panel lock out.

Updates to this program can be downloaded from the Extron Web site (**www.extron.com**).

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 installation program should start automatically. If it does not self-start, run Launch.exe from the DVD.
   The Extron software DVD window appears (figure **16**).

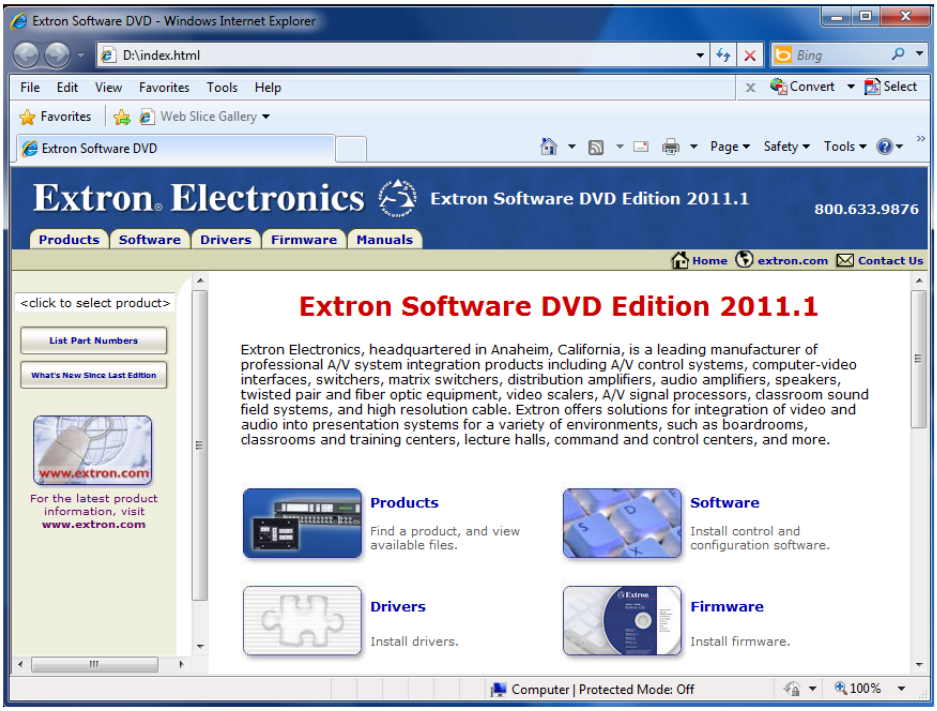


Figure 16. **Software DVD Window**

> **NOTE:** Either select the product tab (page) and then select the switcher from the drop-down list or from the group names; or, alternatively, select the software tab and then select the switcher software listed on the page. Steps **2** through **4** detail accessing the software page.

2. Click the **`Software`** tab (figure **16**).
3. Scroll to the Universal Switcher Control Program and click **`Install`** (figure **17**).

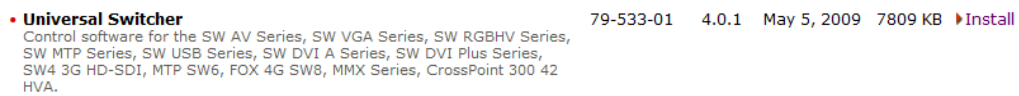


Figure 17. **Software Installation**

4. Follow the on-screen instructions. The program prompts you to choose to either "run" or "save" the software. Click **Run** for the default installation, which creates a `C:\Program Files\Extron\UNIVSW` folder and places three files (UNIVSW.exe, UNIVSW.hlp, and UniversalSwitch_update.exe) into the folder. A shortcut for the Control Program may also be placed on the PC Desktop for quick access.

   Click **Save** if you want to save the software installer on your PC.

NOTE: In some installations, you may be prompted to restart your PC before you can use the software.

Using the software

To run the software after it has been installed, follow these steps:

1. Double-click the Universal Switcher Control Program icon in the Extron program group, or on the PC Desktop.
2. Click the COM port that is connected to the remote connector of the switcher.
3. Click **OK**. The Control Program window displays the selected inputs for each output (figure **18**).

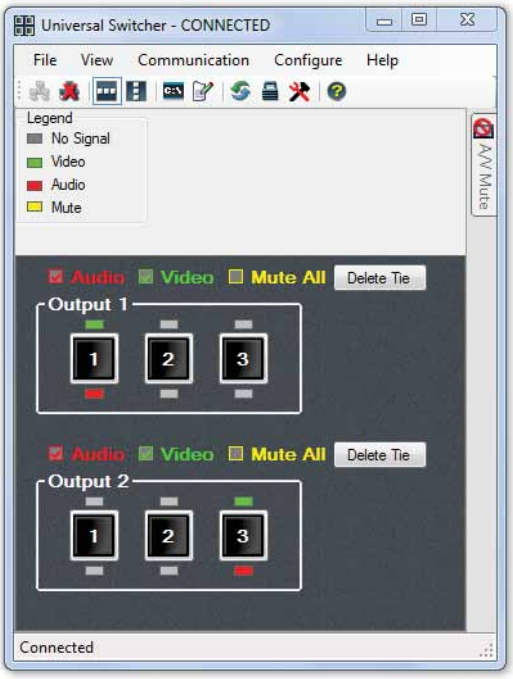


Figure 18. Universal Switcher Control Program Window

Resetting the switcher

The Unit Reset window allows you to clear all user settings and reset the switcher to its factory default settings.

To reset the switcher, click **`System Reset`** on the Configure menu (figure **19**). The switcher will automatically reset to its factory default settings.

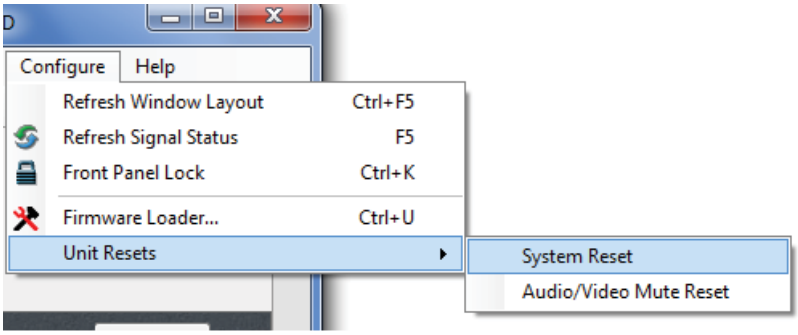


Figure 19. Unit Reset Window

Updating the firmware

Firmware updates periodically become available on the Extron Web site. To load a firmware update:

1. Download the update file from the Extron Web site (**www.extron.com**).
   See "**Loading Firmware Using an SIS Command**" on page **16**.
2. Run the Universal Switcher Control Program.
3. From the Configure menu, select Firmware Loader.
   The Add Device window appears (figure **20**).

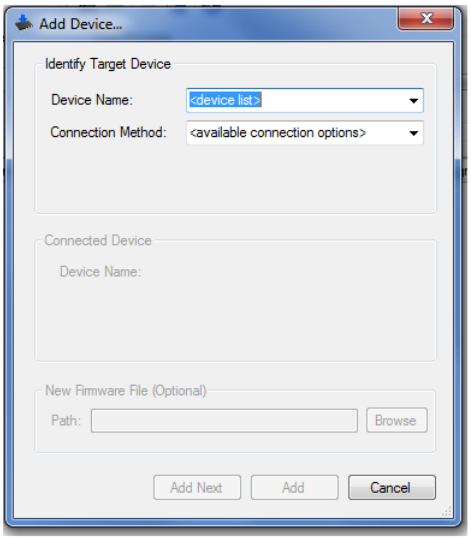


Figure 20. Add Device Window

4. Select the device—MMX 32 VGA MTP—in the Device Name field.
5. Select the Connection Method.
6. Fill in the Com Port and Baud Rate fields if needed.
7. Click **`Connect`**.

8. Click **Browse** in the New Firmware File field. Locate the update file you downloaded from the Web site and click **Open**.

   NOTE: The firmware update file must have an .s19 extension. If it does not have that extension, it could cause the unit to stop functioning.

9. Click **Add**. The Firmware Loader window will appear.
10. Click **Begin** on the upper right hand corner of the Firmware Loader window. The program will begin to load the update.
11. When the program is finished loading the update, click **Exit**. The Universal Switcher Control Program closes.

    NOTE: 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 or the Firmware Loader utility. In this condition, the firmware upload can be accomplished only by using SIS commands. See "**Loading Firmware Using an SIS Command**" on page **16**.

Using the help system

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

- From the Extron program group, double-click the Universal Switcher Help icon.
- From within the Universal Switcher Control Program, click **Help** on the task bar.
- From within the Universal Switcher Control Program, press the F1 key.

Contact Closure Control

The MMX 32 VGA MTP can be controlled remotely using the optional Extron MMX 32 AAP contact closure control panel (part number **70-277-01**, **-11**, or **-21**) or the MMX 32 MAAP contact closure panel (part number **70-277-12** or **-22**). Each panel controls one output and has three input selector buttons and LEDs.

The contact closure system uses the two 5-pole captive screw connectors, which control outputs 1 and 2 separately. Each contact closure pin corresponds to an input/output connection, or tie. A tie is made when one pin is momentarily connected to ground. Each pin returns a signal to the remote control panel after a tie is made, lighting the control panel LED corresponding to the selected input. A +5 V port is used when controlling the output with an MMX 32 AAP/MAAP panel.

Connecting an MMX 32 AAP or MMX 32 MAAP Control Panel

Each Extron MMX 32 AAP and MMX 32 MAAP contact closure remote control panel can control one of the two outputs on the switcher.

To connect a panel to the switcher, wire the captive screw connectors on the rear of the panel as follows:

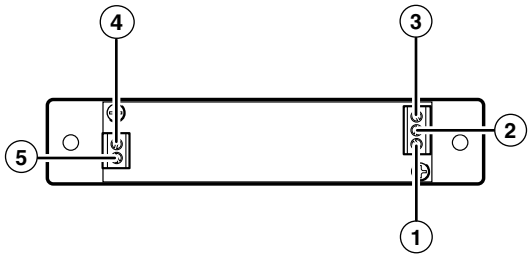


Figure 21. **MMX 32 AAP Rear Panel**

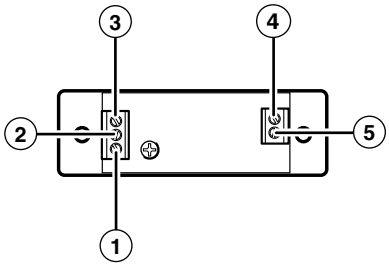


Figure 22. **MMX 32 MAAP Rear Panel**

Input selection connector

① **Input 1 pole** — Connect this pole of the captive screw connector to pin 1 of the captive screw connector on either output 1 or output 2 on the MMX 32 VGA MTP Remote.

② **Input 2 pole** — Connect this pole of the captive screw connector to pin 2 of the captive screw connector on either output 1 or output 2 on the MMX 32 VGA MTP Remote.

③ **Input 3 pole** — Connect this pole of the captive screw connector to pin 3 of the captive screw connector on either output 1 or output 2 on the MMX 32 VGA MTP Remote.

Contact closure connectors

④ **5 VDC pole** — Connect this pole of the captive screw connector to the 5 VDC pole of the captive screw connector on either output 1 or output 2 on the MMX 32 VGA MTP Remote.

⑤ **GND pole** — Connect this pole of the captive screw connector to the ground pole of the captive screw connector on either output 1 or output 2 the MMX 32 VGA MTP Remote.

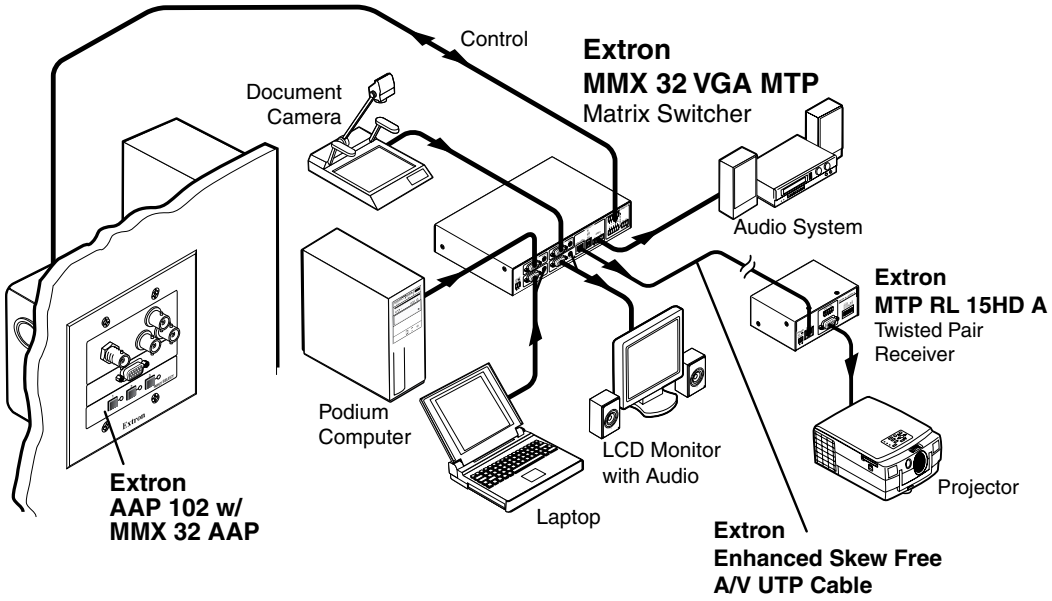


Figure 23. Typical MMX 32 VGA MTP Application Using Contact Closure Remote Control

NOTE: Only one MMX 32 AAP or MMX 32 AAP control panel can be used to control each output.

NOTE: Extron recommends shielded twisted pair cable, such as STP 22 dual plenum cable, number **22-162-03** (or equivalent).
Unsheilded cable can allow crosstalk and interference between the MMX and the control panel.

Reference Information

This section covers the following topics:

Specifications

Video

Routing	3 x 2 matrix
Gain	Unity
Protocols	ARP, ICMP (ping), IP, TCP, UDP, DHCP, HTTP, SMTP, Telnet
Bandwidth	300 MHz (-3 dB), fully loaded
0 – 10 MHz	no more than +0.1 dB to -0.1 dB
0 – 130 MHz	no more than +2 dB to -0.1 dB
Crosstalk	-55 dB @ 10 MHz, -45 dB @ 30 MHz, -37 dB @ 100 MHz
Switching speed	200 ns (max.)

Video input

Number/signal type	3 universal multiformat RGBHV, RGBS, RGsB, RsGsBs, component video, S-video, or composite video
Connectors	(3) 15-pin HD female
Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p and R-Y/B-Y of component video for C of S-video
Minimum/maximum levels	Analog: -0.5 V to 2.0 Vp-p with no offset at unity gain
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	<-42 dB @ 5 MHz
DC offset (max. allowable)	4.0 V

Video output

Number/signal type	2 analog RGBHV, RGBS, RGsB, RsGsBs, component video, S-video, composite video
Connectors	(1) 15-pin HD female 1 RJ-45 female (for proprietary analog signals to be received by MTP U R Series, MTP RL 15HD A, MTP RL 15HD A SEQ)
Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p and R-Y/B-Y of component video for C of S-video
Minimum/maximum levels	0.3 V to 2.0 Vp-p
Impedance	75 ohms
Return loss	<-30 dB @ 5 MHz
DC offset	<±20 mV with input at 0 offset

Sync

Input type	RGBHV, RGBS, RGsB, RsGsBs
Output type	RGBHV, RGBS, RGsB
Input level	2.5 V to 5.0 Vp-p, 4.0 Vp-p normal
Output level	AGC to TTL: 4 V to 5 Vp-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Max input voltage	5 Vp-p
Max. propagation delay	30 ns
Max. rise/fall time	4.2 ns
Polarity	Positive or negative (selectable at receiver)

Audio

Routing	3 x 2 stereo matrix
Gain	
Output 1 (local output)	Unbalanced output: 0 dB
Output 2a (reciever)	Unbalanced output: 0 dB; balanced output: +6 dB
Output 2b	Unbalanced output: 0 dB; balanced output: +6 dB
Frequency response	20 Hz to 20 kHz, ±0.05 dB
THD + Noise	0.15% @ 1 kHz, 0.3% @ 20 kHz nominal level
S/N	>90 dB at rated maximum output
Crosstalk	<-76 dB @ 1 kHz, fully loaded
Stereo channel separation	>-76 dB @ 1 kHz
CMRR	>-75 dB @ 20 Hz to 20 kHz

Audio input

Number/signal type	3 stereo, PC level, unbalanced
Connectors	(3) 3.5 mm mini stereo jacks
Impedance	>3k ohms, balanced/unbalanced, AC coupled
Nominal level	-10 dBV (316 mV)
Maximum level	+8.5 dBu, (unbalanced) at 1%THD+N

NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu

Audio output

Number/signal type	2 stereo, balanced/unbalanced, PC level 1 summed stereo-to-mono on RJ-45
Connectors	(1) 3.5 mm mini stereo audio jack (unbalanced) (1) 3.5 mm captive screw connector 5-pole (1) RJ-45
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	
Output 2	>+17 dBu, balanced or unbalanced at 1%THD+N
Maximum level (600 ohm)	
Output 2	>+14 dBm, balanced or unbalanced at 1%THD+N

Control/remote — switcher

Serial control port	RS-232, 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
Contact closure	(2) 3.5 mm captive screw connector, 5 pole

Contact closure pin configurations	
Output 1:	1= input 1, 2 = input 2, 3 = input 3, 4 = GND, 5 = 5 VDC
Output 2:	1= input 1, 2 = input 2, 3 = input 3, 4 = GND, 5 = 5 VDC
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, autoswitchable; to 12 VDC, 1 A, regulated
Power input requirements	12 VDC, 0.7 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
Rack mount	Yes, with optional 1U rack shelf, part number **60-190-01** or **60-604-01**; or number **60-190-10** or number **60-604-10**. Also furniture mountable with optional under-desk mounting kit number **70-077-01**.
Enclosure type	Metal
Enclosure dimensions	1.75 in. H x 8.75 in. W x 6.0 in. D (1U high, half rack wide) 4.4 cm H x 22.2 cm W x 15.24 cm D (Depth excludes connectors.)
Product weight	2.5 lbs (1.1 kg)
Shipping weight	5 lbs (2.3 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE: All nominal levels are at ±10%.

NOTE: Specifications are subject to change without notice.

Part Numbers

Included Parts

Included Parts	Replacement Part Number
MMX 32 VGA MTP	60-769-01
12 VDC, 1.0 A external power supply	28-071-01
3.5 mm, 5-pole captive screw connector (3)	100-457-01
3.5 mm, 2-pole captive screw connector (2)	100-454-01
3.5 mm, 3-pole captive screw connector (1)	100-456-01
Universal Switcher Control Program (on DVD)	
Tweeker (small screwdriver)	
MMX 32 VGA MTP User Guide	

Accessories

These items can be ordered separately:

Accessories	Part Number
MTP U R A	60-869-03
MTP U R RS	60-869-04
MTP U R RSA SEQ	60-869-01
MTP RL 15HD A	60-690-01
Non-Plenum Enhanced Skew-Free A/V UTP	22-141-03
Plenum Enhanced Skew-Free A/V UTP	22-142-03
RSU 129, 19" 1U Universal Rack Shelf	60-190-01
RSB 129, 19" 1U Basic Rack Shelf	60-604-01
RSU 126, 6" deep 1U rack shelf	60-190-10
RSB 126, 6" deep basic 1U rack shelf	60-604-10
MBU 125, Under-desk mounting kit	70-077-01
MMX 32 AAP panel (black)	70-277-11
MMX 32 MAAP (black, white)	70-277-12, -22
P/S 124 multiple output 12 V power supply	60-1022-01

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 Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

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

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

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

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

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 if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876 **Europe**: 31.33.453.4040
Asia: 65.6383.4400 **Japan**: 81.3.3511.7655

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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