Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

MPX 423 A

Media Presentation Matrix Switcher

68-972-01 **Rev. B**
12 07

Precautions

Safety Instructions • English

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

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

Caution

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

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

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

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

Consignes de Sécurité • Français

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

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

Attention

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

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

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

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

Sicherheitsanleitungen • Deutsch

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

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

Achtung

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

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

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

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

Instrucciones de seguridad • Español

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

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

Precaucion

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

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

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

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

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.

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

Avertissement

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

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

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

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

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

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

Vorsicht

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

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

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

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

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

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

Advertencia

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

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

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

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

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

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

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.*

Quick Start — MPX 423 A Matrix Switcher

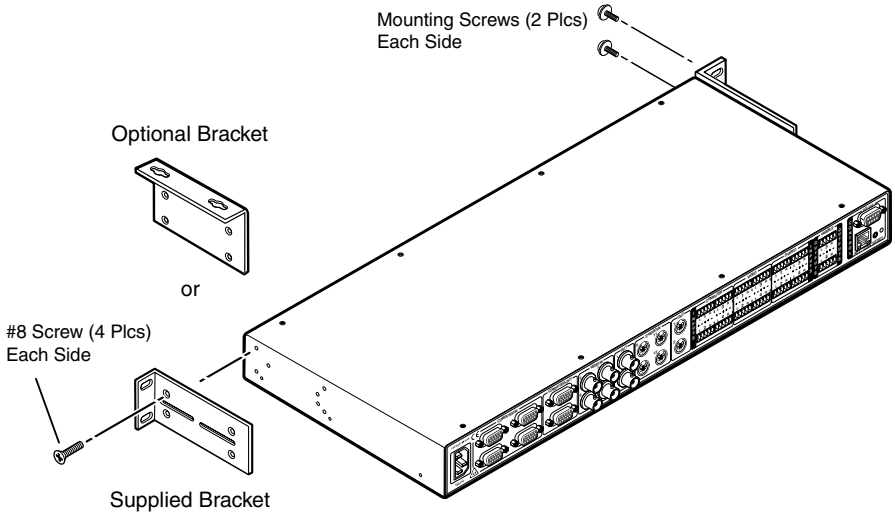
Installation

Step 1

Turn off power to the MPX 423 A switcher and all other devices that will be connected.

Step 2

Select your mounting option and install the appropriate brackets. Mount the switcher as illustrated below (see chapter 2, "Installation").



Step 3

Attach up to four VGA, four S-video, and four Video (composite) input devices (up to four of each type) to the MPX 423 A switcher.

Step 4

Connect up to two VGA, two composite video, or two S-video outputs from the switcher to a projector or other output device. See the following page for an installation diagram.

Step 5

For audio input, connect up to 12 audio sources to the audio inputs of the VGA, Video (composite), or S-video groups (up to four audio sources for each group). Refer to Chapter 2, *Installation*, for wiring diagrams.

Step 6

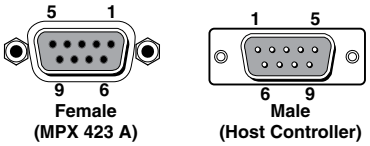
For audio output, connect up to two audio output devices. Refer to Chapter 2, *Installation*, for wiring diagrams.

Step 7

If the MPX 423 A matrix switcher is to be **connected to a computer or host controller for remote control**,

1. Connect the host controller's RS-232 cable to the 9-pin, female RS-232 remote connector of the switcher (see pinout table on the following page).

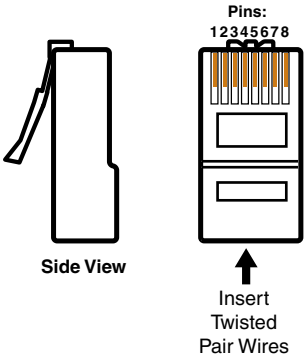
Pin	RS-232	Description
1	—	not used
2	Tx	Transmit data
3	Rx	Receive data
4	—	not used
5	Gnd	Signal ground
6	—	not used
7	—	not used
8	—	not used
9	—	not used



RS-232 remote connector pinout table

And/or

2. Plug one end of a CAT 5, straight-through Ethernet cable to the RJ-45 LAN port of the switcher. See below for pinout instructions.



RJ-45 Connector

Straight-through Cable (for connection to a switch, hub, or router)			
End 1		End 2	
Pin	Wire Color	Pin	Wire Color
1	white-orange	1	white-orange
2	orange	2	orange
3	white-green	3	white-green
4	blue	4	blue
5	white-blue	5	white-blue
6	green	6	green
7	white-brown	7	white-brown
8	brown	8	brown

For more detailed information, see the "Remote Control Port (RS-232)" section in chapter 4.

Step 8

Power up the input and output devices, then connect power to the switcher's rear AC connector.

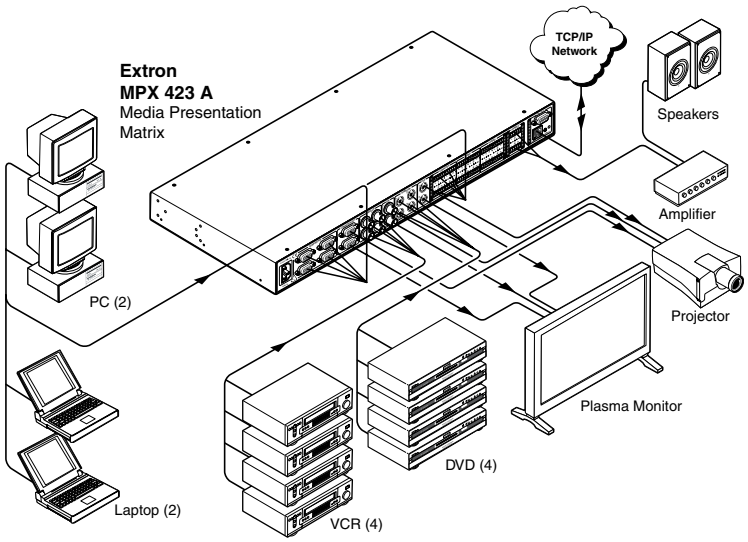


Table of Contents

Table of Contents, cont'd

68-972-01 **B**
12 07

1

Chapter One

Introduction

About This Manual

About the MPX 423 A Media Presentation Switcher

Features

Introduction

About This Manual

This manual describes the installation and operation of the Extron MPX 423 A Media Presentation Matrix Switcher.

About the MPX 423 A Media Presentation Matrix Switcher

The MPX 423 A is a matrix switcher that supports both single and separate switching modes and merges the following independent switchers into a single, compact enclosure:

- a 4x2 VGA —UXGA matrix switcher
- a 4x2 composite video matrix switcher
- a 4x2 S-video matrix switcher
- a 12x2 stereo audio switcher

The MPX 423 A has the following video connector types:

- 15-pin HD input connectors for VGA signals
- BNC input connectors for composite video signals
- 4-pin mini DIN input connectors for S-video signals

The audio functions use captive screw connectors shared between three input groups, and support balanced and unbalanced wiring.

There are three device control options:

- Front panel button control
- Ethernet control (using Telnet or the on-board Web server)
- RS-232 control using Extron SIS™ commands

Features

The features of the MPX 423 A Media Presentation Matrix Switcher include:

Multiple video inputs — Twelve inputs including four VGA (or SVGA or UXGA RGBHV, RGBS, RGsB, or RsGsBs) inputs on 15-pin HD female connectors, four S-video (NTSC, PAL, or SECAM) inputs on 4-pin mini DIN female connectors, and four composite video (NTSC, PAL, or SECAM) inputs on BNC female connectors.

Multiple video outputs — Two outputs per video format for simultaneous (in separate switcher mode), or one at a time (in single switcher mode) display on VGA, composite video, or S-video devices.

Audio switcher — The 12x2 audio switcher selects among the audio outputs of each of the three signal groups.

Audio breakaway — The MPX 423 A provides the capability to break away an audio signal from its corresponding video signal. Audio breakaway switching can be controlled via the front panel, Ethernet, or RS-232.

Multiple audio inputs and outputs — Twelve balanced/unbalanced stereo inputs and two balanced/unbalanced stereo outputs, all using captive screw connectors.

Single switcher mode — Allows for one-touch switching. When one of the 12 inputs is accessed, the signals of the input will be routed to the outputs of its group. Outputs of the other groups are disconnected, while audio output remains unaffected.

Separate switcher mode — Allows for independent switching to the output of any given I/O group. This effectively divides the MPX 423 A into three separate switchers in one box.

Current configuration memory — Allows for ties and audio settings to be saved in nonvolatile memory. When the switcher is powered off and then on again, the switcher recalls the connections made on the last configuration, including audio settings.

IP Link™ — IP Link-enabled products offer an integrated Web server with high performance architecture, global compatibility with industry standard Ethernet communication protocols, multi-user support, and a Web-based asset management application specifically designed to work with products that include IP Link technology.

RS-232 remote control — Allows remote control of the MPX switcher using Extron's Simple Instruction Set SIS™), or a third-party control system.

Downloadable firmware updates — The latest firmware can be conveniently downloaded from the Extron Web site, and updates for new features and capabilities can be easily upgraded through the IP Link Ethernet port.

Bandwidth — Bandwidth is 350 MHz (-3 dB), typical for VGA video, allowing this switcher to switch everything from NTSC video to high-resolution computer signals.

Front panel security lockout — Locks out all front panel functions except for input/output tie viewing to prevent unwanted setting changes.

Genlock sync (for composite and S-video) — Includes video genlock capabilities allowing for vertical interval switching and smooth, glitch-free transitions.

Digital Sync Validation Processing (DSVP™) — Includes Extron's exclusive DSVP, which allows for the monitoring of input signal status information, as well as the scan rate for computer signal inputs.

Input audio gain and attenuation (adjustable via RS-232) — Allows users to set the level of audio gain or attenuation (-18 dB to +24 dB). Individual input audio levels may be adjusted so there are no noticeable volume differences when switching between sources. (The default setting is 0 dB.)

Speed-sensitive volume control — Automatic sensitivity control allows the user to easily fine-tune the audio volume.

Versatile mounting options — The MPX 423 A is housed in a rugged, 1U, full rack width metal enclosure, and can be easily mounted into any rack or podium, or under a desk.

Internal international power supply — The internal power supply provides worldwide power compatibility.

Chapter Two

Installation

Mounting the Matrix Switcher

Rear Panel Connectors

Connecting the Matrix Switcher

RS-232 and Ethernet Control

Installation

Mounting the Matrix Switcher

MPX 423 A Matrix Switchers are housed in 1U high, 17.4" wide metal enclosures that are rack- or desk-mountable. A rack/desk mounting kit (**#70-077-03**) is supplied with each switcher. A switcher may also be mounted under a table, desk, or podium, or on a wall, using the optional under-desk mounting kit (**#70-222-01**).

Tabletop use

Affix a self-adhesive rubber foot to each bottom corner of the switcher.

Rack mounting the switcher

UL requirements for rack mounting

The following Underwriters Laboratories (UL) requirements pertain to the installation of the MPX 423 A into or onto a rack.

1. **Elevated operating ambient** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient termperature. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer (122˚F, 50˚C for the MPX).
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits 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)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack mounting instructions

To rack mount the switcher:

1. Attach the rack mount brackets to the switcher with the eight #8 machine screws provided.
2. Insert the switcher into the rack, align the holes in the mounting bracket with those of the rack.
3. Secure the switcher to the rack using the supplied machine screws.

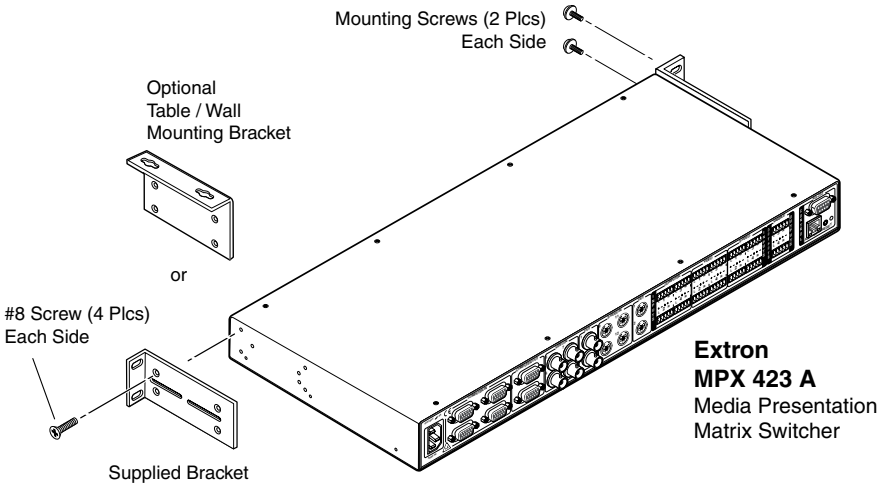


Figure 2-1 — Mounting the switcher

Furniture mounting the switcher

The MPX 423 A can be mounted under a table or other horizontal surface with an optional Extron under-desk mounting kit (part #**70-222-01**).

1. Secure the two table/wall mounting brackets included in the under-desk mounting kit to the switcher with the eight machine screws provided in the kit (figure 2-1).
2. Hold the switcher with attached brackets against the underside of the desk, and mark the location of holes for screws on the underside of the desk.
3. Drill 1/4″ (6.4 mm) deep, 3/32″ (2 mm) diameter pilot holes in the desk at the marked screw locations from the underside of the desk.
4. Insert the four wood screws into the pilot holes. Fasten each screw into the installation surface until just less than 1/4″ of the screw head protrudes.
5. Install the slotted holes of the mounting brackets (with the switcher attached) over the protruding screw heads.
6. Slide the switcher slightly forward or back, then tighten all four screws to secure the switcher in place.

Rear Panel Connectors

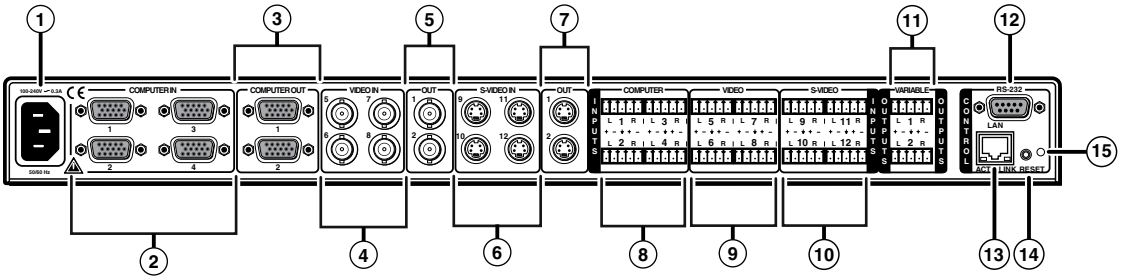


Figure 2-2 — Rear panel of MPX 423 A

① **AC power —** Standard AC power connector for a power source of 100 – 240 VAC, operating at 50/60 Hz.

② **VGA input group —** Four female 15-pin HD connectors for RGB video input (numbered 1 to 4).

③ **VGA output —** Two female 15-pin HD connectors for RGB video output.

④ **Composite input group** — Four female BNC connectors for composite input (numbered 5 to 8).

⑤ **Composite output** — Two female BNC connectors for composite output.

⑥ **S-video input group** — Four female 4-pin mini DIN connectors for S-video input (numbered 9 to 12).

⑦ **S-video output** — Two female 4-pin mini DIN connectors for S-video output.

⑧ **VGA audio input group —** Four 3.5 mm female captive screw connectors for audio input from the VGA group (see "Audio" in chapter 3).

⑨ **Composite audio input group —** Four 3.5 mm, female, captive screw connectors for the composite group input (see "Audio" in chapter 3).

⑩ **S-video audio input group —** Four 3.5 mm, female, captive screw connectors for the S-video group input (see "Audio" in chapter 3).

⑪ **Variable audio output —** Two 3.5 mm, female, captive screw connectors for balanced/unbalanced variable audio output. Only audio output 1 is variable from the front panel volume knob. Both audio outputs (1 and 2) are variable through RS-232 or Ethernet/Telnet via the SIS commands and built-in webpage.

⑫ **RS-232** — One female DB9 connector for a host computer or third party controller using Extron's Simple Instruction Set (SIS).

⑬ **LAN Activity LED —** A blinking yellow LED indicates LAN activity.

LAN connector — Plug an RJ-45 jack into this socket to connect the unit to a computer network. Use a straight-through cable to connect to a switch, hub, or router.

Link LED — The green LED lights to indicate a good LAN connection.

⑭ **Reset button** — A recessed button that allows for a manual reset using a Extron Tweeker, pointed stylus or ballpoint pen. The unit can be reset to five modes (see "Resetting the Unit" in chapter 3).

⑮ **Reset LED** — The green LED flashes to show the reset mode indicators and that power is on (see "Resetting the Unit" in chapter 3).

Connecting the Matrix Switcher

The MPX 423 A matrix switcher connects to up to 12 input devices simultaneously, and can output to as many as six devices simultaneously, or one at a time.

Follow the steps below and see the installation example in figure 2-3.

1. Turn off power to the MPX 423 A matrix switcher and all other devices that will be connected.
2. Mount the MPX 423 A in the desired position on a desk, in a rack, or under a table as described previously in this chapter.
3. Connect up to four VGA, four composite video, and four S-video input devices to the rear panel of the MPX 423 A matrix switcher.
4. Connect the switcher's VGA, Video (composite), and S-video outputs (up to six, two of each video format) to the inputs of the display(s).
5. For audio input, connect up to 12 audio sources to the switcher's audio inputs of the Computer (VGA), Video (composite), or S-video groups (up to 4 for each group).
6. For audio output, connect an audio output device to each of the two audio outputs. See "Audio outputs" in chapter 3 for wiring diagrams.
7. If the matrix switcher is to be connected to a computer or host controller for remote control of the unit, connect the host's RS-232 cable to the RS-232 connector on the rear panel. For the RS-232 pinout table, see "RS-232 and Ethernet Control" later in this chapter.
8. For an Ethernet connection, plug a CAT 5, straight-through Ethernet cable into the RJ-45 LAN port on the rear panel of the switcher. See "RS-232 and Ethernet Control" later in this chapter for pinout instructions.
9. Power up the input and output devices, then connect power to the rear AC connector of the switcher.

NOTE *The boot-up message (hello) reads: <c> Copyright 2007, Extron Electronics, MPX 423A, V1.02, 60-683-01 (for RS-232 connection).*

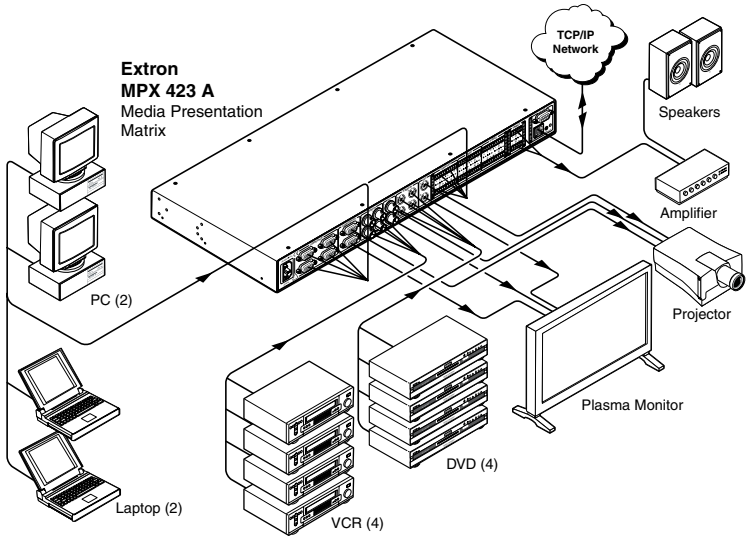


Figure 2-3 — MPX 423 A installation example

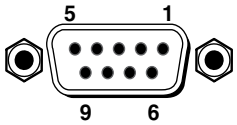
RS-232 and Ethernet Control

For RS-232 control, use a control cable with only pins 2, 3, and 5 connected. Otherwise, either cut the wires to the other pins in hard-shelled connectors or remove the unneeded pins from molded plugs. See chapter 4, "SIS Programming and Control", for definitions of the SIS commands and details on how to install and use the control software.

NOTE *The cable used to connect the RS-232 port to a computer or control system may need to be modified by removing pins or cutting wires. If unneeded pins are connected, communication may not be possible.*

The RS-232 connector is a 9-pin D female with the following pin designations:

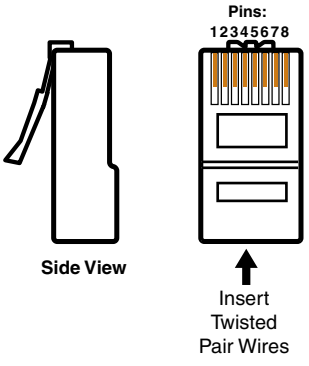
Pin	RS-232	Description
1	—	not used
2	Tx	Transmit data
3	Rx	Receive data
4	—	not used
5	Gnd	Signal ground
6	—	not used
7	—	not used
8	—	not used
9	—	not used



DB9 Pin Locations
Female

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control. The MPX 423 A is also compatible with baud rates 19200, 38400, and 115200.

For Ethernet control, connect a CAT 5, straight-through Ethernet cable to the RJ-45 LAN port of the switcher. See below for pinout instructions.



RJ-45 Connector

Straight-through Cable (for connection to a switch, hub, or router)			
End 1		End 2	
Pin	Wire Color	Pin	Wire Color
1	white-orange	1	white-orange
2	orange	2	orange
3	white-green	3	white-green
4	blue	4	blue
5	white-blue	5	white-blue
6	green	6	green
7	white-brown	7	white-brown
8	brown	8	brown

For more detailed information, see the "Remote Control Port (RS-232)" section in chapter 4.

3

Chapter Three

Operation

Front Panel Operation

Switcher Modes and Operation

Audio

Resetting the Unit

Operation

Front Panel Operation

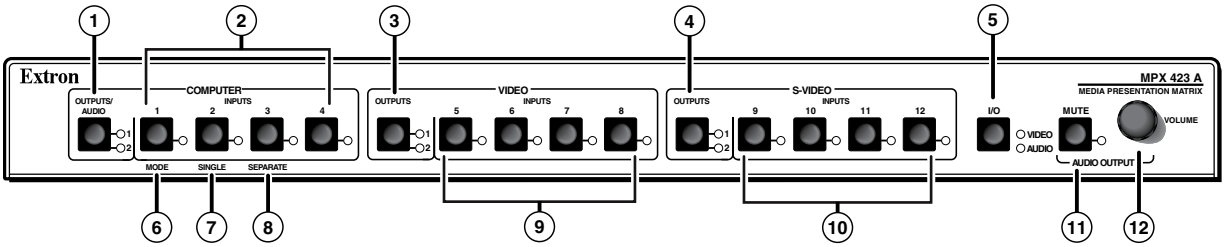


Figure 3-1 — Front panel details of the MPX 423 A matrix switcher

The following sections describe the front panel controls. The controls for the three independent switchers are grouped by input type.

(1) VGA output — These two green LEDs serve four functions:

- Display VGA video output activity.
- Indicate which audio output is active.
- Indicate output selection when setting the switching mode.
- Mute the selected VGA output. See "Muting and un-muting video and/or audio" later in this chapter.

(2) **VGA input —** Buttons 1 through 4 select the input for the VGA input sections of the MPX unit. The LEDs adjacent to each button (when lit) indicate which input has been selected for output.

(3) **Composite video output —** Displays which composite video output (output 1 or output 2) is currently active.

- Mute the selected Composite Video output. See "Muting and un-muting video and/or audio" later in this chapter.

(4) **S-video output —** Displays which S-video output (output 1 or output 2) is currently active.

- Mute the selected S-video output. See "Muting and unmuting video and/or audio" later in this chapter.

(5) **I/O —** This button serves four functions:

- Allows for toggling between video and audio modes, and simultaneous video/audio functionality. The video and audio LEDs to the right of the I/O button indicate the current selection; video, audio, or video & audio.
- Provides a method of accessing the Front Panel Security Lockout function.
- Acts as a system reset button.
- Functions with the Mute button to set an RGB delay.

(6) **Mode —** This is the secondary function of this button (see (2)). The mode function of this button allows the MPX 423 A to be used in either "single" or "separate" mode.

(7) **Single switcher mode —** This is the secondary function of this button (see (2)). Press and release this button when in "switching mode" (see "Using the switching mode" later in this chapter) to select the single switcher mode. The associated LED indicates if the single switcher mode is on (when flashing). When the Mode button is released, the LED resumes input indication.

⑧ **Separate switcher mode —** This is the secondary function of this button (see ②). Press and release this button to select the separate switcher mode. The associated LED indicates if the separate switcher mode is on (when flashing). When the Mode button is released, the LED resumes input indication.

⑨ **Composite video input —** Buttons 5 through 8 select the input for the composite video sections of the MPX unit. The LEDs adjacent to each button (when lit) indicate which input has been selected for output.

⑩ **S-video input —** Buttons 9 through 12 select the input for the S-video group of the MPX unit. The LEDs adjacent to each button (when lit) indicate which input has been selected for output 1.

⑪ **Audio mute —** This button mutes audio output 1. The LED (when lit) indicates that audio output 1 is muted.

⑫ **Audio volume —** This adjustment knob controls the volume of audio output 1.

NOTE *The front panel audio controls (mute and volume) only control audio output 1. Both audio outputs (1 and 2) are controllable through RS-232 or Ethernet/Telnet via the SIS commands and built-in webpage.*

Switcher Modes and Operation

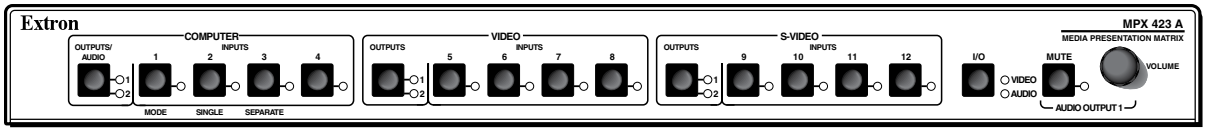


Figure 3-2 — MPX 423 A matrix switcher front panel

Introduction to single switcher mode

In single switcher mode, the switcher emulates a 1 output switcher with 12 inputs. When a video input signal is tied to an output, it is routed to the output of the same video signal format. All other video output signals are muted.

The audio operates independently as a 12 inputs to 2 outputs matrix switcher. See "Audio" later in this chapter for more information.

NOTE *Both audio outputs can be configured in single switcher mode; i.e., the unit emulates two 1-output switchers with 12 inputs each.*

Introduction to separate switcher mode

In separate switcher mode the switcher emulates three 1 output switchers with 4 inputs. There are three input selection groups on the front panel: Computer, Video (composite), and S-video. These three groups operate independently from each other, and each of the twelve inputs can only be routed to its own video output format group.

The audio operates independently as a 12 inputs to 2 outputs matrix switcher.

NOTE *Both audio outputs can be configured in Separate mode; i.e., the unit emulates three 2-output switchers with 4 inputs each.*

Establishing a tie

When you connect an input with an output in video or audio, you are establishing a tie. A tie can be a video-only tie (only a video signal is being transmitted through an output), an audio-only tie (only an audio signal is being transmitted through an output) or an audio and video (A/V) tie (a video signal and audio signal are being transmitted together or apart through one or more outputs).

To establish a tie using the MPX 423 A, do the following:

1. Press the I/O button to select a video-only, audio-only, or A/V tie.
2. Select the output using any of the output buttons.
3. Select the input from any of the 12 inputs.

Reading the LEDs

Reading the LEDs of the MPX 423 A matrix switcher is the primary means of controlling your inputs and outputs. The unit uses a series of LED colors and actions to indicate the status of each group and/or tie.

When in audio-only or video-only mode

- A **lit input** LED represents a tie.
- The **lit I/O** LEDs show the signal type (audio or video).

When in A/V mode

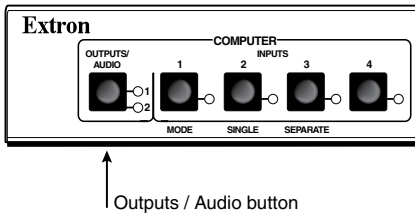
- A lit **input** LED represents a video-only tie.
- A **flashing input** LED represents an audio tie.
- A **flashing audio I/O** LED represents audio that follows the video signal.
- An **active video** LED is always lit.

NOTE *A flashing output LED represents a muted state.*

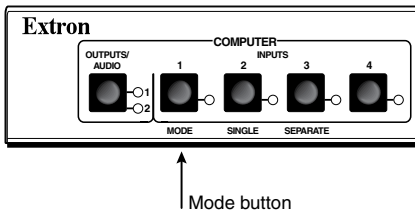
Viewing or changing the switching mode

To view or change the active switching mode (single or separate) for a selected output:

1. Press the Outputs/Audio button to select an output (1 or 2). The LED for the selected output lights.



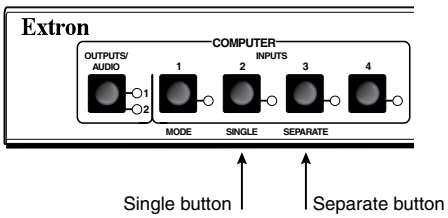
2. Press and hold the Mode button for approximately 3 seconds. The Single and Separate LEDs light. One will be on solid, one will be flashing. The flashing LED indicates the currently active switching mode (single or separate).



3. Press the Single button or the Separate button to select the desired mode.

   When you make a mode selection, the Single and Separate LEDs go out, and the Mode LED begins flashing.

   If a selection is not made within 30 seconds, the currently active mode remains active, the Single and Separate LEDs go out, and the Mode LED begins flashing.



4. Press the Mode button. The Mode LED goes out, and all other front panel LEDs return to their input indications.

NOTE *The switcher mode selection affects only the selected output port. It is possible to have one output port in single switcher mode, and the other output port in separate switcher mode.*

Muting and unmuting video and/or audio

Individual outputs can be muted or unmuted as follows:

NOTE *Regardless of switching modes, you can still mute individual outputs.*

1. Select a video, audio, or both to mute or unmute by pressing the I/O button.

2. One at a time, press and hold the output button for the desired output group for approximately 2 seconds. The output LEDs for the selected output blinks to indicate the mute or return to their previous state to indicate the unmute.

   - Press and hold the VGA output button for 2 seconds to mute the selected VGA outputs.
   - Press and hold the Composite Video output for 2 seconds to mute the selected Composite Video output.
   - Press and hold the S-video output button for 2 seconds to mute the selected S-video output.

NOTE *Since the video groups share the audio outputs, audio outputs can be muted in any video group. To avoid unwanted audio mute, select video only or audio only by pressing the I/O button before muting the selected output.*

NOTE *Mutes are saved to nonvolatile memory. When power is removed and restored, the mute settings are retained.*

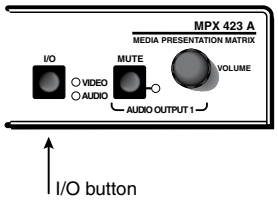
NOTE *To view the mute status, it is recommended to select video only or audio only (I/O button) and toggle output buttons on any video group. The muted output LED will blink.*

NOTE *Selecting video & audio (I/O button) to view muted outputs is not recommended. Blinking output LEDs could also mean an audio or follow-all tie.*

Locking and unlocking the front panel

Front panel security lockout prevents accidental switching of inputs from the front panel. When front panel security lockout is active, the user can only view the ties in each group; all input buttons and audio functions are locked.

To toggle the front panel lockout on and off, press and hold the I/O button for three seconds. The Video and Audio LEDs flash twice to indicate a change in the front panel security status (on or off).



When front panel lockout is on, the user can still view the ties by toggling the I/O and output buttons. The LEDs of the corresponding inputs light according to their tie modes.

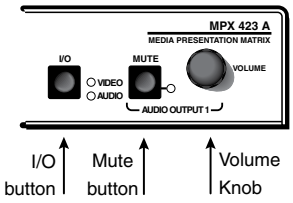
If you attempt to make a tie in lockout mode, the Video and Audio LEDs flash twice, indicating that no ties can be made from the front panel. RS-232 and Ethernet controls are still available when the front panel is locked.

Setting RGB delay

The RGB delay feature clears the screen during transition to a new input source, which prevents a visible glitch from occurring on the output screen. RGB delay can be set between 0 and 5.0 seconds in 0.5 second increments.

To use the front panel to set an RGB delay:

1. Select the desired output (1 or 2).
2. Press and hold the I/O and Mute buttons simultaneously for three seconds. The Video LED and the currently selected Output LED begin flashing.
3. Turn the volume knob clockwise to increase delay time. Input LEDs 1 - 10 come on one at a time as the volume knob is turned clockwise. Each lit input LED represents a 0.5 second delay. When RGB delay reaches its maximum of 5 seconds (LEDs 1 through 10 on), the Mute LED flashes.
4. Press the I/O button to exit.



For setting the RGB delay through RS-232 or Ethernet control, see chapters 4 and 5.

Using Genlock sync

The Genlock sync feature locks the sync generators of multiple devices to a single source which prevents visible glitches from occurring on the output screen during transition to a new input source. The source at input 5 provides the Genlock sync signal to all of the Video group inputs. The source at input 9 provides the Genlock sync signal to all of the S-Video group inputs. This happens automatically when inputs are connected to inputs 5 and 9. No configuration is required.

Audio

The MPX 423 A is also a 12x2 audio matrix switcher, where any of the 12 inputs can be routed to one or both outputs simultaneously.

Establishing an audio tie

Regardless of the video switching mode to which the unit is configured (single or separate), the MPX 423 A also emulates a 12x2 audio switcher.

To make an audio-only tie:

1. Press the I/O button until only the Audio LED is lit.
2. Use any one of the three Outputs buttons to select output 1 or 2 (output LEDs 1 or 2 will be lit in all three video groups to indicate which output, 1 or 2, is selected).
3. Select any of the twelve inputs (buttons 1 - 12).

   The selected input (1 - 12) is routed to the selected output (1 or 2).

NOTE *When establishing an audio tie, please note:*

- The front panel audio controls, Mute and Volume, only control audio output #1. Audio output #2 is controllable via RS-232 and Ethernet.
- A flashing LED indicates an audio tie or a mute.
- When an input LED and the I/O Audio LED are flashing simultaneously, the video input is being followed by its associated audio signal.

Audio breakaway

Audio breakaway allows you to route the audio signal separately from the video signal. Any audio signal can be selected and sent with any video signal to one or all outputs in any combination, simultaneously.

Audio breakaway switching can be done via front panel control, through RS-232, or via Ethernet remote control.

Volume control (output 1 only)

Use the Audio Output 1 Volume knob to adjust the volume of audio output 1. Turn the knob clockwise to increase volume at a rate of 1 dB per step of the digital potentiometer. Turn the knob counterclockwise to decrease volume.

NOTE *Control of audio output 2 is available through RS-232 or Ethernet/Telnet only.*

The volume adjustment is speed sensitive. To avoid large audible volume jumps when the knob is turned quickly, the volume is changed in smaller steps.

Audio mute (output 1 only)

The Mute button toggles between mute and unmute for audio output 1. The Mute LED lights when audio is muted. If a muted output is not at maximum attenuation, it is disconnected. Press the Audio Mute button again to unmute the output and return to the previous output level.

NOTE *Control of audio output 2 is available through RS-232 or Ethernet/Telnet only.*

Adjusting the input audio level

The audio level of each input can be adjusted from -18 to +24 dB. The factory default level is 0 dB.

There is only one audio settting which is applied to both the left and right audio inputs of the selected input device.

Audio level settings are stored in non-volatile memory, and retained through a power cycle.

When performing the procedure below, you may monitor the Input Audio/Gain Attenuation level via RS-232 using HyperTerminal (see chapter 4).

To enter the audio adjust mode and adjust an input audio level:

1. Press and hold the Mute button for 2 seconds. The I/O Audio LED and one of the input LEDs (ex: input 7) flashes indicating the audio adjust mode.
2. Press the desired input button. The selected button's LED begins flashing.

CAUTION *There is no indication of the audio level available by viewing the front panel. You may monitor the volume level adjustments via an RS-232 connection and HyperTerminal (see chapter 4).*

CAUTION *Pressing an input button while in audio adjust mode will activate / de-activate a tie.*

3. Turn the Volume control knob clockwise to increase volume and counterclockwise to decrease the volume level of the selected input.
4. Press and release the I/O button or wait 30 seconds for the unit to exit the audio adjustment mode.

CAUTION *Pressing the Mute button while in audio adjust mode will activate the mute for output 1.*

Audio outputs

Balanced or unbalanced audio output is available on the MPX 423 A using a 3.5 mm, 5-pole captive screw connector, wired as shown below.

Unbalanced Input / Output **Balanced Input / Output**

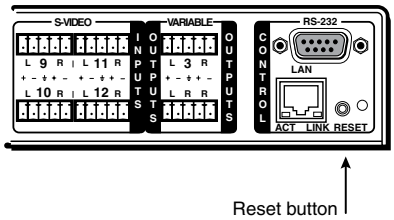
Figure 3-4 — 3.5 mm, 5-pole captive screw audio connectors

CAUTION *Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal damages the audio output circuits.*

Resetting the Unit

There are four reset modes activated by a recessed Reset button on the rear panel.

Use a pointed sytlus, Extron Tweeker, or ballpoint pen to activate the Reset button.



The I/O button on the front panel also has limited reset capabilities, described on the following page.

Hardware reset modes

The available reset modes are listed in the table below.

CAUTION *Reset modes close all open IP and Telnet connections, and all sockets.*

Reset Modes	Description
Mode 1 (Hardware Reset)	Holding the Reset button while applying power defaults the unit back to the base firmware that shipped with the unit from the factory. Event scripting does not start when the unit is powered on in this mode. This allows you to recover a unit that has incorrect code or updated firmware running. All user files and settings are maintained. User Web pages may not work correctly if the unit is using an earlier firmware version.
Mode 3 (Event Reset)	Holding the Reset button until the I/O LED blinks once (3 seconds) followed by a momentary (<1 second) press turns events either on or off, depending on the current state of the events.
Mode 4 (IP Setting Reset)	Holding the Reset button until the I/O LED blinks twice (6 seconds) followed by a momentary (<1 second) press resets IP settings. The I/O LED blinks four times in quick succession, confirming a Mode 4 reset. This mode **1.** Enables ARP program capability **2.** Sets IP address back to factory default **3.** Sets subnet back to factory default 4. Sets gateway address back to factory default **5.** Turns DHCP off **6.** Turns events off Nothing happens if the momentary press does not occur within one second.
Mode 5 (Absolute Reset)	Holding the Reset button until the I/O LED blinks three times (9 seconds) followed by a momentary (<1 second) press causes a complete system reset back to factory default conditions. Nothing happens if the momentary press does not occur within 1 second. The I/O LED *blinks four times in quick succession*, confirming a Mode 5 reset.

Factory reset modes

Factory resets can be set using the front panel I/O button. To reset the MPX 423 A to factory defaults

1. Press and hold the I/O button on the front panel while plugging in AC power.

2. Continue to hold the I/O button until all LEDs on the front panel flash. Once the I/O button is released, power-up continues and the LEDs go back to their default configuration.

4

Chapter Four

SIS Programming and Control

Remote Control Port (RS-232)

Host-to-MPX 423 A Communications

Commands and Responses

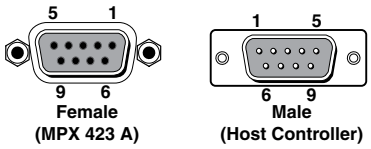
Remote Control Port (RS-232)

The MPX 423 A's RS-232 port connects to a host or controller that generates the proper command codes and recognizes the switcher's responses.

NOTE *The cable used to connect the RS-232 port to a computer or control system may need to be modified by removing pins or cutting wires. If unneeded pins are connected, the switcher may hinder communication. See chapter 2, "Installation", for more information on wiring the connectors.*

The RS-232 connector is a 9-pin D female (see illustration below) with the following pin designations:

Pin	RS-232	Description
1	—	not used
2	Tx	Transmit data
3	Rx	Receive data
4	—	not used
5	Gnd	Signal ground
6	—	not used
7	—	not used
8	—	not used
9	—	not used



The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control. The MPX 423 A is also compatible with the following baud rates: 19200, 38400, & 115200.

Commands and responses for programming the MPX 423 A from a host system connected to the RS-232 port are listed on the following pages.

Host-to-MPX 423 A communications

The MPX 423 A matrix switcher accepts SIS commands through the RS-232 port or via Telnet through the LAN port. SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the unit determines that a command is valid, it executes the command and sends a response to the host device. All responses from the unit 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.

MPX 423 A-initiated messages

If you are communicating with the MPX 423 A via RS-232 or via a verbose Telnet connection, when a local event such as a front panel selection or adjustment takes place, the unit responds by sending a message to the host. No response is required from the host. The unit-initiated messages are listed here (underlined).

(c) Copyright 2007, Extron Electronics, MPX 423 A, Vx.xx , 60-683-01↵
Day, DD Mon YYYY HH:MM:SS↵
Vx.xx is the firmware version number.
The unit sends the boot and copyright messages under the following circumstances:

- If the unit is off and an RS-232 connection is already set up (the PC is cabled to the unit and a serial communication program such as HyperTerminal is open), the connected unit sends these messages via RS-232 when it is first powered on.

- If the unit is on, it sends the boot and copyright messages when you first open a Telnet connection to the unit. You can see the day of the week, date, and time if the unit is connected via Telnet, but not via RS-232. If you are using a Telnet connection, the copyright message, date, and time are followed by a password prompt (if set).

Password information

The "↵Password:" prompt requires a password (administrator level or user level) followed by a carriage return.

If the correct password is entered, the unit responds with "↵Login Administrator ↵" or "↵Login User↵", depending on password entered. If passwords are the same for both administrator and user, the unit defaults to administrator privileges.

Error responses

If the MPX 423 A is unable to execute a command, it returns an error response to the host. The error response codes and their descriptions are as follows:

E01 – Invalid input channel number (the number is too large)
E10 – Invalid command
E12 – Invalid output number / invalid port number
E13 – Invalid value (the number is out of range/too large)
E14 – Not valid for this configuration
E17 – System timed out
E22 – Busy
E23 – Checksum error (for file uploads)
E24 – Privilege violation (Ethernet, Extron software only). User privileges have access to ALL view and read commands, and the following:
- create ties
- set RGB and audio mutes

Exception: User cannot read Admin password
E25 – Device is not present
E26 – Maximum number of connections has been exceeded
E27 – Invalid event number
E28 – Bad filename or file not found

Error response references

The following superscripted numbers are used within the command descriptions on the following pages to identify commands that may respond as shown:

[14] = Commands that give an E14 (not valid for this configuration) response if the unit's current configuration doesn't support that command

[22] = Commands that yield an E22 (busy) response.

[24] = Commands that give an E24 (privilege violation) response if you are not logged in at the administrator level.

[27] = Commands that may yield an E27 (invalid event number) response.

[28] = Commands that may give an E28 (file not found) response.

Copyright information

The following copyright message is initiated by the MPX 423 A matrix switcher at power-up (for an RS-232 connection):

(c) Copyright 2007, Extron Electronics, MPX 423A, Vx.xx, 60-683-01

Vx.xx = the firmware version number.

Commands and Responses

Using the command/response tables

The MPX 423 A can be controlled via a Telnet connection (port 23) or a Web browser connection (port 80). The ASCII and URL commands listed in the tables starting on page 4-9 perform the same functions, but are encoded differently to accommodate the requirements of each port (Telnet or Web browser).

This ASCII to hexadecimal (HEX) conversion table is for use with the command/response 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						
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37						
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F						
@	4Ø	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	|	7C	}	7D	~	7E	DEL	7F						

Figure 4-1 ASCII to Hex conversion table

The command/response tables list ASCII command codes (for Telnet or RS-232), the corresponding URL encoded command codes (for Web browsers), the unit's responses, and a description of the command's function or results.

The following rules apply for commands and responses:

- Upper and lower case characters may be used in the command field unless otherwise specified.
- Commands may be sent back-to-back without spaces (for example, 2!65V1Z).
- Numbers can be entered in 1, 2, or 3 digits, e.g., 8V = 08V = 008V.
- Telnet control versus Web browser control differences include:
    - For a Web browser, "URL" is used to shorten the examples. "URL" refers to the full URL of the control interface and Web page, including all path information (e.g., *http://192.168.100.10/myform.htm*).
    - To send a Web browser command, prefix it with the URL and **?cmd=**.
    - For Web browser, all **non-alphanumeric characters** must be coded with the hexadecimal equivalent, **%xx**, where **xx** is the two-character hex byte. For example, a comma (**,**) is coded as **%2C**. Characters such as **%**, **+**, and space ( ) *must* be coded with hex bytes to be interpreted correctly.
    - Some characters differ depending on the method used.

Telnet	**Web browser**
Escape = W *or* (hex 1B)	Escape = W [must **not** be hex encoded]
CR = Pipe (**|**) *or* (hex OD)	CR = Pipe (**|**) [must **not** be hex encoded]

      In either method, {Data} = data that will be directed to a specified port and **must** be hex encoded if non-alphanumeric.

NOTE *If you make adjustments (changes to volume, etc.), via the front panel, RS-232 or IP, it takes 100 seconds for the new data to be saved to flash memory.*

Symbol definitions

Symbols used in the command/response tables are described below.

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = Carriage return (no line feed, hex 0D)
(use the pipe character, | , instead for Web browser commands)

• = Space character

| = Pipe (vertical bar) character

* = asterisk - In this table, the asterisk does not represent a variable or specific function. It is merely used as a command line character.

Esc = Escape key (hex 1B) (use **W** instead of Esc for Web browsers)

X1 = 1 thru max. number of inputs

X2 = 0 thru max. number of inputs
(Input 0 = muted output)

X3 = Outputs 1 through 6
(1,2 = VGA & Audio, & mode selection outputs;
3,4 = Composite Video;
5,6 = S-Video)

X4 = -18 through +24 (default 0 dB)
(43 steps of audio gain or attenuation)

X5 = 0 dB (default) through 24 dB (audio gain)

X6 = 1 dB through 18 dB (audio attenuation)

X7 = Volume adjustment range (0%-100%)
[min. = 0 through max. = 64 default = (0 dB)]
In 1 dB steps except from 1 to 0 = -30 dB

X9 = On/Off status: 0 = off/disable; 1 = on/enable
For Verbose mode
0 = none (default for Telnet connection)
1 = Verbose mode (default for RS-232/RS-422)
2 = Tagged response for querries
3 = Verbose mode & tagged querries

X10 = Signal/no signal:
0 = no signal at input; 1 = signal at input

X11 = Switcher mode: 1 = Single; 2 = Separate

X13 = Delay in 1/2 second increments
(10 max. = 5.0 seconds / default = 0 seconds)

X14 = Video/Audio Mute:
0 = no mute; 1 = video mute; 2 = audio mute;
3 = video and audio mute

X15 = Frequency in Hz or kHz (xxx.xx)

X17 = 10s of milliseconds wait time for characters coming into a serial port before terminating (default = 10 = 100ms, max = 32767

X18 = 10s of milliseconds wait time between characters coming into a serial port before terminating (default = 2 = 20ms, max.= 32767)

X19 = Controller firmware version to the second decimal place

X20 = Verbose firmware - description - upload date/time. See Query Firmware Version, page 4-8.

X22 = Power supply voltages and temperature (ºF)
(+5.0 V, +3.3 V, =2.5 V, +15.0 V, -15.0 V, temp)

X25 = Matrix name (24 characters max.)
Invalid characters: + ~ @ = ‘ [ ] { } < > : | \ ?

X26 = GMT date [WWW,•DD•MMM•YYYY•HH:MM:SS•GMT]

X27 = IP address (###.###.###.###)

X29 = Default name: combination of model-name and last 3 pairs of MAC address
(e.g., MPX-423-A-00-02-3D)

X30 = Password (12 digits, alphanumeric)

X31 = Connection’s security level:
11 = user
12 = administrator

X34 = Hardware (MAC) address (##-##-##-##-##-##)

X35 = Number of open connections (0 - 255)

X37 = GMT date (MM/DDD/YY•HH:MM:SS)

X38 = Domain name (example = extron.com)

X39 = GMT offset (-12.0 through 14.0 hours and minutes removed from GMT)

X40 = Daylight saving time:
0 = Daylight saving time off/ignore
1 = Daylight saving time on (northern hemisphere)
2 = Daylight saving time (Europe)
3 = Daylight Saving time (Brazil)

X45 = DHCP (0 = off; 1 = on)

X46 = Port # XX. The port number will be represented as two ASCII characters (2 bytes)
(example: port 01 is represented as 30 31 in hex)

X47 = Baud rate: (9600, 19200, 38400, 115200)

X48 = Parity: **O**dd, **E**ven, **N**one, **M**ark, **S**pace

X49 = Data bits: 7 or 8

X50 = Stop bits: 1 or 2

X51 = Port type: 0 = RS-232

X52 = Flow control: **H**ardware, **S**oftware, **N**one

X53 = Data pacing (specified in milliseconds between bytes): 0000 - 1000 (default = 0 ms)

X54 =Web page priority flag (internal use only):
0 = internal (default on power-up)
1 = user

Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Input Selection (in Single and Separate Switcher Mode)			
Tie input (A and V)	X2*X3!	Out X3•InX2•All↵	Tie input X2's video and audio to output X3.
Tie input RGBHV (VGA)	X2*X3&	Out X3•InX2•RGB↵	Tie input X2's video only to output X3.
Tie input video	X2*X3%	Out X3•InX2•Vid↵	Tie input X2's video only to output X3.
Tie input audio	X2*X3$	Out X3•InX2•Aud↵	Audio breakaway
NOTE *Outputs 1 and 2 for each category of video (Computer, Composite Video, S-Video) are assigned as shown below.*			
Tie input to all outputs, A & V	X2*!	InX2•All↵	Tie input X2's video and audio to all outputs.
Example:	5*!	In05•All↵	Tie input 5 video and audio to all outputs.
Tie input to all outputs, RGBHV only	X2*&	InX2•RGB↵	Video breakaway.
Example (see Note):	8*&	In08•RGB↵	Tie input 8 video to all outputs.
Tie input to all outputs, video only	X2*%	InX2•Vid↵	Video breakaway.
Example (see Note):	10*%	In10•Vid↵	Tie input 10 video to all outputs.
NOTE *The & tie all command for RGB and the % tie all command for video can be used interchangeably.*			
Tie an Input to all Outputs (Audio Only)			
Tie input to all outputs, audio only	X2*$	InX2•Aud↵	Tie audio input X2 to all audio outputs.
View			
View current video ties	Esc0*X3*1VC ←	X2¹•X2²•X2³•X2⁴• X2⁵•X2⁶ – – – – – – – – – – Vid↵	Show current video configuration
Example Response: 01 03 06 08 00 12 -- -- -- -- -- -- -- -- -- -- Vid VGA video output 1 is tied to input 01. / VGA video output 2 is tied to input 03. Composite Video output 1 is tied to input 06. / Composite Video output 2 is tied to input 08. S-Video output 1 is tied to no input. / S-Video output 2 is tied to input 12			
View current audio ties	Esc0*X3*2VC ←	X2¹•X2² – – – – – – – – – – – – – – – – Aud↵	Show current audio configuration.
Example Response: 06 12 -- -- -- -- -- -- -- -- -- -- -- -- -- -- Aud Audio output 1 is tied to input 06. / Audio output 2 is tied to input 12.			
Read video output tie	X3%	X2↵	Video input X2 tied to output X3.
Read RGBHV output tie	X3&	X2↵	RGBHV input X2 tied to output X3.

	VGA/Computer	Composite Video	S-Video
Input	X2 = 1-4	X2 = 5 - 8	X2 = 9-12
Output 1	X3 = 1	X3 = 3	X3 = 5
Output 2	X3 = 2	X3 = 4	X3 = 6

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Read audio output tie	X3$	X2↵	Audio input X2 tied to audio output X3.
Read audio gain for input	X1G	X4↵	
Read audio volume for output	X3V/v	X7↵	Read output volume for audio output 1 or 2.
Switcher Mode Select			
Switcher mode selection	X3*X11*1#	X3ModX11↵	Set output X3 to switcher mode X11
View Switcher Mode	X3*1#	X11↵	Read the mode of switcher output X3
NOTE *Switcher mode selection* *1 = Single Mode; 2 = Separate Mode (default)*			
Setting Input Audio Gain/Attenuation **NOTE** *The set gain (G) and atttenuation (g) commands are case sensitive.*			
Gain (+dB)	X1*X5G	InX1•AudX4↵	Set input X1 audio gain to +dB value.
Attenuation (-dB)	X1*X6g	InX1•AudX4↵	Set input X1 audio gain to -dB value.
Increment	X1+G	InX1•AudX4↵	Increase gain by 1 dB.
Decrement	X1-G	InX1•AudX4↵	Decrease gain by 1 dB.
View input gain	X3G/g	X4↵	
Settting Output Audio Volume			
Output level	X3*X7V/v	OutX3•VolX7↵	Set audio volume to specified value.
Increment	X3+V/v	OutX3•VolX7↵	Increase volume by 1 step.
Decrement	X3-V/v	OutX3•VolX7↵	Decrease volume by 1 step.
View volume	X3V	X7↵	
Audio Mute			
Audio mute	X3*1Z/z	AmtX3*1↵	Mute output X3 audio (audio off). 1 = mute on, 0 = mute off
Audio unmute	X3*0Z/z	AmtX3*0↵	Unmute output X3 audio (audio on).
Read audio mute	X3Z/z	X9↵	
Mute on all	1*Z/z	Amt1↵	
Mute off all	0*Z/z	Amt0↵	
RGB Delay (Triple Action Switching)			
Set RGB delay	EscX3*X13D/d←	OutX3•DlyX13↵	Set the RGB interval for switches.
Read RGB delay	EscX3D/d ←	X13↵	

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
RGB/Video Mute			
RGB/video mute	X3*1B/b	Vmt X3 *1 ↵	Mute output X3 RGB (video off) 1 = mute on, 0 = mute off
RGB/video unmute	X3*0B/b	Vmt X3 *0 ↵	Unmute output X3 RGB (video on).
Read RBG/video mute	X3B/b	X9 ↵	1 = mute on, 0 = mute off
NOTE *User may also use input 0 (zero) for mute (i.e., 0*1! = mute output 1 for video and audio)*			
View output mutes	Esc VM ←	X14(1), X14(2), X14(3), X14(4), X14(5), X14(6), ↵	Each X14 response is the mute status of an output, starting from output 1.
NOTE *Outputs 1 and 2 = VGA and audio; Outputs 3 and 4 = video only; Outputs 5 and 6 = S-video only.*			
List DSVP (Digital Sync Validation Processing)			
List sync (DSVP) (VGA inputs only)	X1LS	X15, X15 ↵	Listed as Horz, Vert - xxx.xx,xxx.xx
NOTE *If there is no connection or error, the unit responds with 000.00, 000.00.*			
List all (DSVP)	0LS	X10[1] X10[2] X10[3] X10[4] X10[5] X10[6] X10[7] X10[8] X10[9] X10[10] X10[11] X10[12] ↵	Each X10 response is the connection status of an input, starting from input 1.
Example: "OLS" unit response = 010111001011 ↵ *In this example, signals are present on VGA inputs 2, 4; video inputs 1, 2; and S-video inputs 1,3, and 4.*			
Front Panel Security Lockout Mode			
Lock all front panel functions	1X/x	Exe 1 ↵	Enable lock mode 1.
Unlock all front panel functions	0X/x	Exe 0 ↵	Unlock front panel.
View lock status	X/x	X9 ↵	
Request Information			
	I/i	Vga1*X2•Vga2*X2• Vid1*X2•Vid2*X2• Svd1*X2•Svd2*X2• Aud1*X2•Aud2*X2 ↵	
Request Part Number			
	N/n	XX-XXX-XX ↵	See also Appendix A for part #.
Example:		60-683-01 ↵	MPX 423 A part # is 60-683-01.

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Query Firmware Version			
Read controller firmware version	Q/q	X19↵	
Query verbose version information	0Q	X19 X20 X20↵	Provide a detailed status of the Ethernet protocol firmware, the controller firmware, and any firmware upgrade. The firmware that is running is marked by an asterisk (*). A caret (^) indicates that the firmware has a bad checksum or an invalid load. ?.?? indicates the firmware is not loaded.
NOTE *Response description:* Controller firmware version - update firmware version ↵			
Request System Status			
Read system status	S	X22↵	
System Reset (Factory Default)			
	Esc ZXXX←	Zpx↵	Clears all ties, resets all audio gains to 0 dB, and resets volume to 100%.
Absoluete System Reset			
	Esc ZQQQ←	Zpq↵	Similar to system reset (ZXXX). Resets IP address and subnet mask to defaults of: IP address = 192.168.254.254 subnet mask = 255.255.0.0
IP Setup Commands			
Set matrix name (location)	Esc X25 CN←	Ipn•X25↵	X25 = Matrix name (24 character max.) Invalid characters: + ~ @ = ‘ [ ] { } < > : | \ ?
Set unit name to factory default[24]	Esc• CN←	Ipn•X29↵	X29 = Default name: combination of model-name and last 3 pairs of MAC address (e.g., MPX-423-A-00-02-3D)
Read matrix name (location)	Esc CN←	X25↵	X25 = Matrix name (24 character max.) Invalid characters: + ~ @ = ‘ [ ] { } < > : | \ ?
Set time/date	Esc X37 CT←	Ipt X37↵	X37 = GMT date: (MM/DDD/YY•HH:MM:SS)
Read time/date	Esc CT←	X26↵	X26 = GMT date: [WWW,•DD•MMM•YYYY• HH:MM:SS•GMT]
Set GMT, offset	Esc X39 CZ←	Ipt X39↵	X39 = GMT offset (-12.0 through 14.0 hours and minutes removed from GMT)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Read GMT, offset	Esc CZ ←	X39 ↵	X39 = GMT offset (-12.0 through 14.0 hours and minutes removed from GMT)
Set daylight saving time	Esc X40 CX ←	Ipt X40 ↵	X40 = Daylight saving time 0 = Daylight saving time off/ ignore 1 = Daylight saving time (northern hemisphere) 2 = Daylight saving time (Europe) 3 = Daylight saving time (Brazil)
Read daylight saving time	Esc CX ←	X40 ↵	
Configure parameters[24]	Esc X1 * X47 , X48 , X49 , X50 CP ←	Cpnx1•Ccp, X47 , X48 , X49 , X50 ↵	X47 = Baud rate: (9600, 19200, 38400, 115200) X48 = Parity: **O**dd, **E**ven, **N**one, **M**ark, **S**pace X49 = Data bits: 7 or 8 X50 = Stop bits: 1 or 2
Read port parameters	Esc X46 CP ←	X47 , X48 , X49 , X50 ↵	

Set port mode	Esc X46 * X51 CY	Cpm X46 •Cty X51 ↵	X46 = Port # XX. The port number will be represented as two ASCII characters (2 bytes) (example: port 01 is represented as 30 31 in hex)
			X51 = Port type: 0 = RS-232

Read port mode	Esc X46 CY ←	X51 ↵	

Configure flow control[24]	Esc X46 * X52 , X53 CF ←	Cpn X1 •Cfl X52 , X53 ↵	X46 = Port # XX. The port number will be represented as two ASCII characters (2 bytes) (example: port 01 is represented as 30 31 in hex)
			X52 = Flow control: **H**ardware, **S**oftware, **N**one
			X53 = Data pacing (specified in milliseconds between bytes): 0000 - 1000 (default = 0 ms)

View flow control	Esc X46 CF ←	X52 , X53 ↵	
View receive timeout	Esc X46 CE ←	X17 , X18 ↵	X17 = 10s of milliseconds wait time for characters coming into a serial port before terminating (default = 10 = 100ms, max = 32767 X18 = 10s of milliseconds wait time between characters coming into a serial port before terminating (default = 2 = 20ms, max.= 32767)
Set DHCP on or off	Esc X45 DH ←	Iph X45 ↵	X45 = DHCP (0 = off; 1 = on)
Read DHCP status	Esc DH ←	X45 ↵	X45 = DHCP (0 = off; 1 = on)
Set IP address	Esc X27 CI ←	Ipi X27 ↵	X27 = IP address (###.###.###.###)
Read IP address	Esc CI ←	X27 ↵	X27 = IP address (###.###.###.###)
Read hardware (MAC)	Esc CH ←	X34 ↵	

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Set subnet mask	Esc X27 CS←	Ips X27↵	X27 = IP address (###.###.###.###)
Read subnet mask	Esc CS←	X27↵	X27 = IP address (###.###.###.###)
Set gateway IP	Esc X27 CG←	Ipg X27↵	X27 = IP address (###.###.###.###)
Read gateway IP	Esc CG←	X27↵	X27 = IP address (###.###.###.###)
Set administrator password	Esc X30 CA←	Ipa X30↵	X30 = Password (12 characters, alphanumeric)
Clear administrator password[24]	Esc • CA←	Ipa•↵	
Read administrator password	Esc CA←	X30↵	X30 = Password (12 characters, alphanumeric)
Set user password	Esc X30 CU←	Ipu X30↵	X30 = Password (12 characters, alphanumeric)
Clear user password[24]	Esc • CU←	Ipu•↵	
Read user password	Esc CU←	X30↵	X30 = Password (12 characters, alphanumeric)
NOTE *Password can only be read via RS-232.*			
Switch Web page priority[24]	Esc X54 Cpag←	Iwp X54↵	X54 =Web page priority flag (internal use only): 0 = internal (default power-up) 1 = user
View Web page priority	Esc Cpag←	X54↵	X54 =Web page priority flag (internal use only): 0 = internal (default power-up) 1 = user
Set verbose mode[24]	Esc X9 CV←	Vrb X9↵	X9 = Verbose status: 0 = none (default for Telnet connection) 1 = Verbose mode (default for RS-232/RS-422 connection) 2 = Tagged response for querries 3 = Verbose mode & tagged response for querries
Read verbose mode	Esc CV←	X9↵	X9 = Verbose status: 0 = none (default for Telnet connection) 1 = Verbose mode (default for RS-232/RS-422 connection) 2 = Tagged response for querries 3 = Verbose mode & tagged response for querries
Read connection's security level	Esc CK←	X31↵	X31 = Connection's security level: 11 = user 12 = administrator

5

Chapter Five

Ethernet Control

Accessing and Using the Web Server

Navigating the Default Web Pages

Special Characters

Ethernet Control

The MPX 423 A matrix switcher features an on-board Web server, displayed as a set of default Web pages. These pages allow you to control and operate the MPX unit through its Ethernet port, connected via a LAN or WAN, using a Web browser such as the Microsoft Internet Explorer (version 5.5 or higher), or Netscape Navigator (version 6.0 or higher).

This chapter describes these default Web pages, which are always available and cannot be erased or overwritten.

Accessing and Using the Web Server

Access the switcher through the on-board Web server pages as follows:

1. Double click the Web browser icon on your Windows desktop to launch your Web browser.
2. Click in the browser's Address field.
3. Enter your MPX 423 A's IP address in the browser's Address field.

NOTE *If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.*

4. If you want the browser to display a page other than the default page (such as a custom page that you have created and uploaded), enter a slash (/) and the file name to open.

NOTE *The browser's Address field should display the address in the following format: xxx.xxx.xxx.xxx/{optional_file_name.html}*

NOTE *The following characters are invalid in file names: {space} ~ @ = ' [ ] { } < > ' " ; : | \ and ?.*

5. Press the keyboard Enter key. The switcher checks to see if it is password protected.

   If the switcher is not password protected, proceed to step **7**.

   If the switcher is password protected, the **Connect to** (password prompt) page is displayed (figure 5-1).

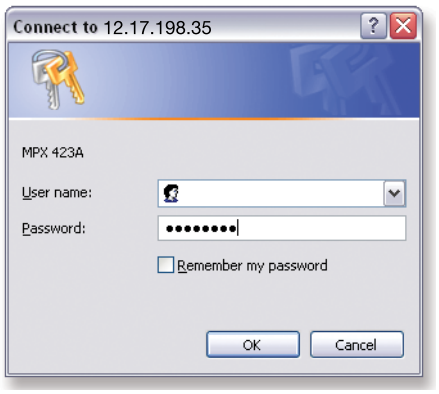


Figure 5-1 — Network Password window

NOTE *A User Name entry is not required.*

6. Click in the Password field and type in the appropriate administrator or user password.
7. Click the **OK** button.

The switcher checks several possibilities, in the following order, and then responds accordingly:

a. Does the address include a specific file name, such as 10.13.156.10/file_name.html? **If so**, the switcher downloads that page.

b. Is there a file in the switcher's memory that is named "index.html"? **If so**, the switcher downloads "index.html" as the default start-up page.

c. **If neither of the above conditions is true**, the switcher downloads the factory-installed default start-up page, "nortxe_index.html" (figure 5-2), also known as the System Status page.

Navigating the Default Web Pages

The MPX 423 A default Web pages include four tabs (**Status**, **Configuration**, **File Management**, and **Control**) for easy navigation of the administrative options including system status, password control, file management, and video/audio settings.

Status tab

The Status tab includes pages that show the current System Status and DSVP data for the MPX 423 A.

System Status page

The System Status page (figure 5-2), is the default page of the on-board Web server, and provides an overview of the matrix switcher's status. It provides immediate system information, power status, and serial port settings for the MPX.

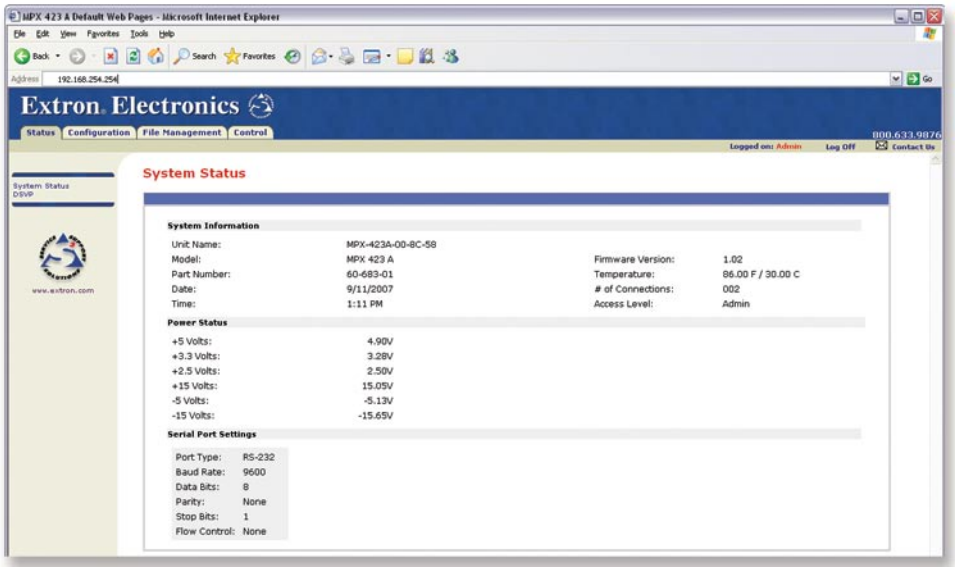


Figure 5-2 — System Status page

DSVP page

The DSVP page, accessible from the Status tab, allows you to view a snapshot-in-time of the input frequencies of connected inputs on the Digital Sync Validation Processing (DSVP) page (see figure 5-3).

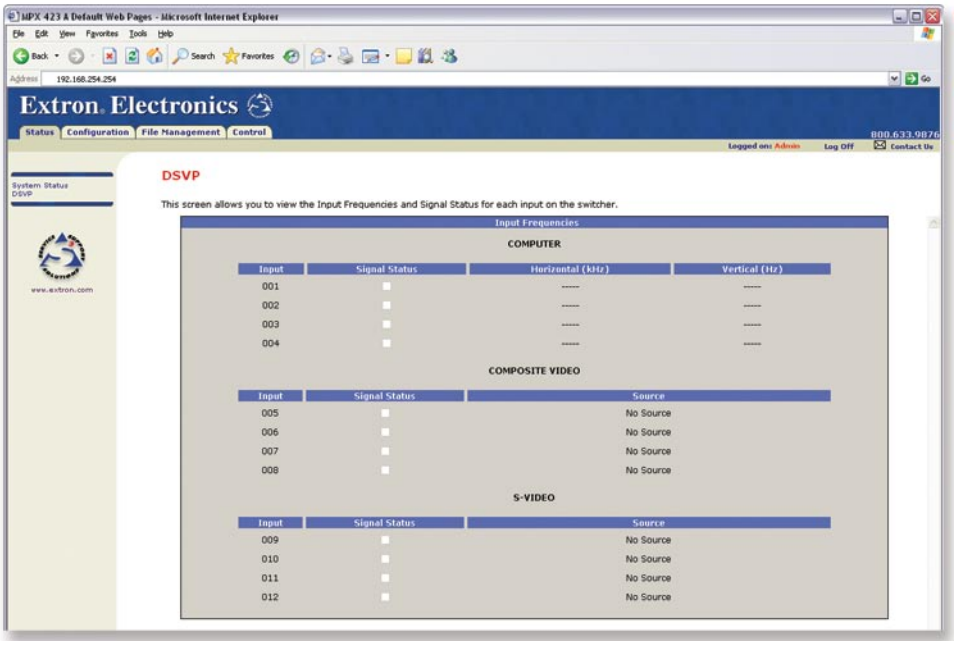


Figure 5-3 — DSVP page

Configuration tab

The Configuration tab includes pages that show the current System Settings, Passwords, and Firmware Upgrade data for the MPX 423 A.

System Settings page

The Systems Settings page (figure 5-4) consists of fields where you can view and edit IP administration and system settings. Date and time information can be easily updated.

NOTE *Access to the MPX 423 A settings using the Ethernet port is not password protected. Ensure only knowledgeable and qualified personnel access the switcher using a Web browser.*

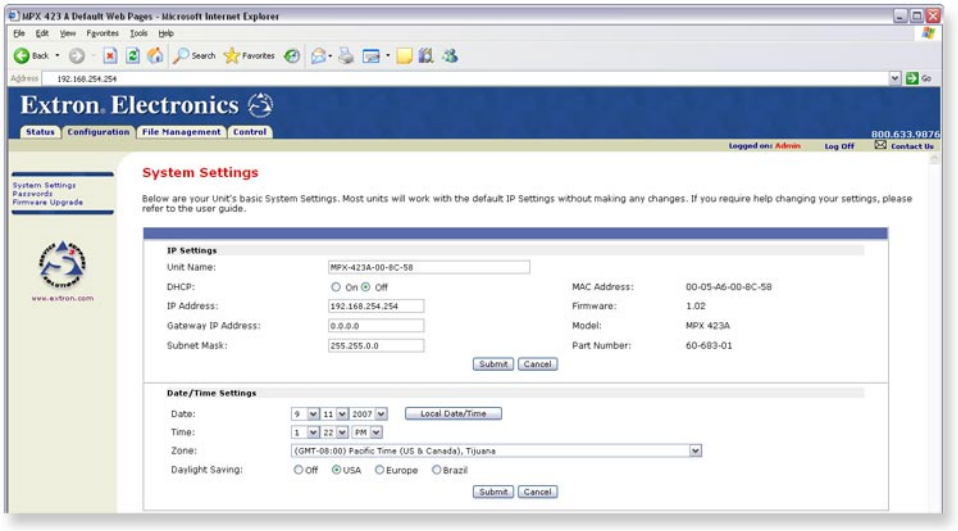


Figure 5-4 — System Settings page

IP settings fields

The IP settings fields provide a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the *Submit* button. Explanations for some of these fields follows.

Unit Name

This name field can be changed to any valid name, up to 24 alphanumeric characters.

NOTE *The following characters are invalid in the matrix name: {space} ~ @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.*

DHCP

The Dynamic Host Configuration Protocol (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and provide other configuration information such as the addresses for printer, time and news servers. For specific settings information, see your system administrator.

IP Address

The MPX 423 A IP Address field contains the IP address of the connected matrix switcher. This value is encoded in the flash memory in the switcher.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

NOTE *Editing the Extron IP address while connected via the Ethernet port can immediately disconnect the user from the matrix switcher. Extron recommends editing this field using the RS-232 link and protecting the Ethernet access to this screen by assigning an administrator's password to qualified and knowledgeable personnel only.*

Edit this field as follows:

1. Click in the IP Address field. The graphic cursor becomes a text cursor.
2. Edit the address as desired.
3. Press the Tab key on the keyboard or click in another field to exit the IP Address field.
4. Click the **Submit** button to make the address change take affect.

Gateway IP Address

The Gateway IP Address field identifies the address of the gateway to the mail server to be used if the MPX 423 A switcher and the mail server are not on the same subnet.

The gateway IP address has the same parameters rules as the system IP address.

Subnet Mask

The Subnet Mask field is used to determine whether the MPX 423 A switcher is on the same subnet as the mail server when you are subnetting.

MAC Address

The hardware address is hard-coded in the switcher and cannot be changed.

Date/Time Settings

The Date/Time Settings fields provide a location for viewing and setting the date and time functions. Click **Local Date/Time** to syncronize the MPX's internal clock with the PC's time setting.

Passwords page

The fields on the Passwords page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 upper case and lower case alphanumeric characters. Each password must be entered twice: once in the Password field and then again in the Re-enter Password field. Characters in these fields are masked by asterisks (*****).

NOTE *The following characters are invalid in passwords: {space} + ~ @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.*

If you do not want to password protect an access level, leave the Password field and the Re-Enter password field blank. After entering the desired password in both fields, click the **Submit** button.

As shown in figure 5-5, password-protected connections allow two levels of protection: *administrator* and *user*. Administrators have full access to all MPX 423 A switching capabilities and editing functions. Users can only create ties, set video and audio mutes, and view all settings, with the exception of passwords.

NOTE *An administrator password must be created before a user password can be created.*

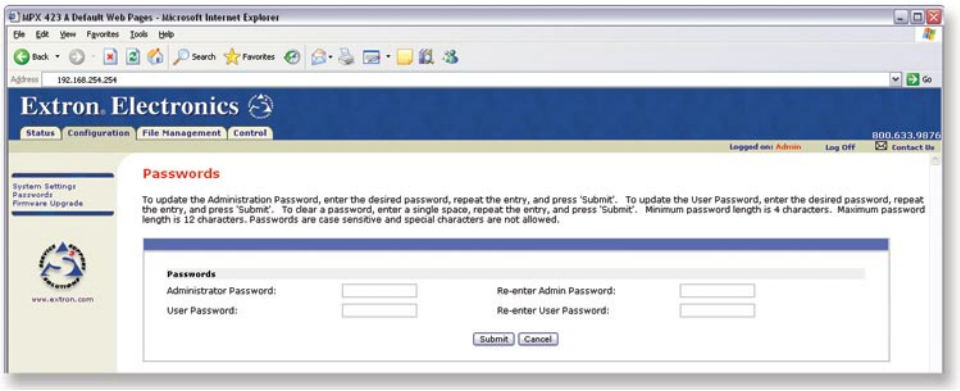


Figure 5-5 — Passwords page

Please keep in mind that:

- connecting via an Ethernet connection and entering SIS commands (see chapter 4, “SIS Programming and Control”) to access the MPX **is** password protected.
- connecting via the RS-232 port and entering SIS commands to access the MPX **is not** password protected.

NOTE *An administrator password must be created before a user password can be created.*

To clear an existing password so that no password is required, delete the asterisks in the Password field and place a blank space in the field. Click the *Submit* button.

Firmware Upgrade page

The Firmware Upgrade page (figure 5-6) provides a way to replace the firmware that is coded on the switcher's control board without taking the switcher out of service, opening the switcher enclosure, and replacing the firmware chip.

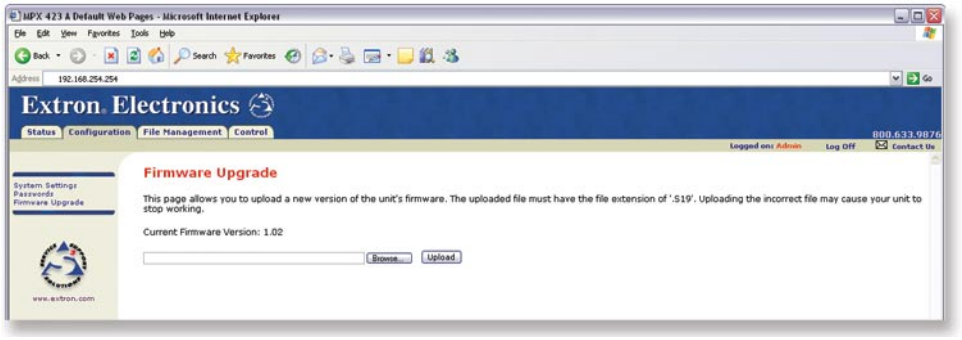


Figure 5-6 — Firmware Upgrade page

NOTE *The Firmware Upgrade page is **only** for replacing the firmware that controls all switcher operation. To insert your own HTML pages, see "File Management" later in this chapter.*

Insure that your PC is connected to the MPX 423 A switcher via the switcher's Ethernet port. Update the switcher firmware as follows:

1. Visit the Extron web site at **www.extron.com**.
2. Click the **Download** tab.
3. Click the **Firmware** link near the top of the left navigation bar.

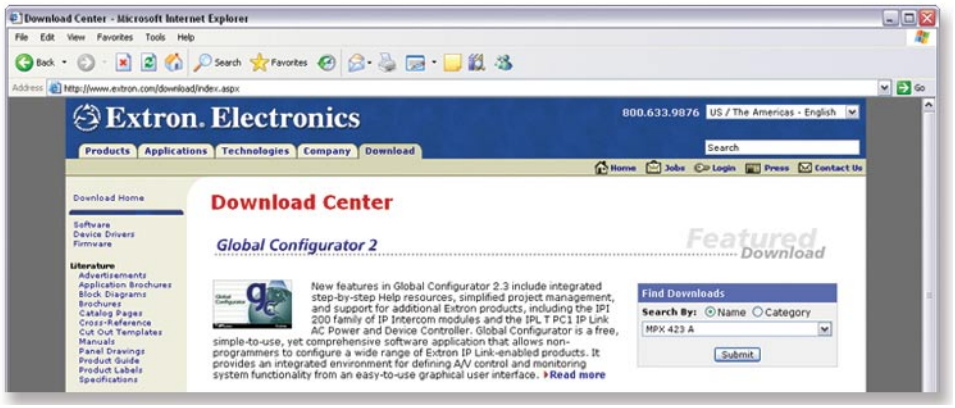


Figure 5-7 — Download Center screen

4. Scroll to the MPX 423 A firmware file.
5. Click the **Download** link in the far right column.

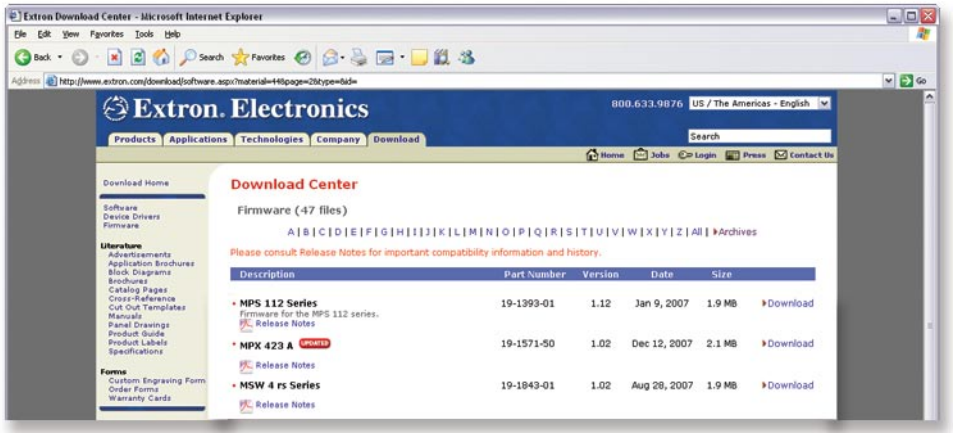


Figure 5-8 — MPX 423 A firmware file and Download link

6. Complete the Personal Information form.
7. Click the **Download MPX423A_FW1x02.exe** button.

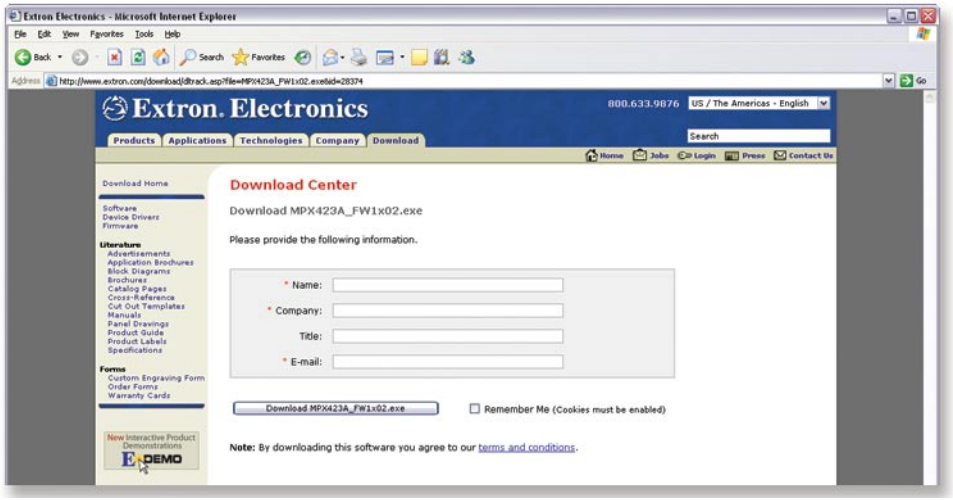


Figure 5-9 — Personal Information form

8. The File Download - Security Warning box is displayed.
9. Click the **Run** button.
10. Follow the remaining system prompts, and the make a note of the file location to which the new firmware file is saved.

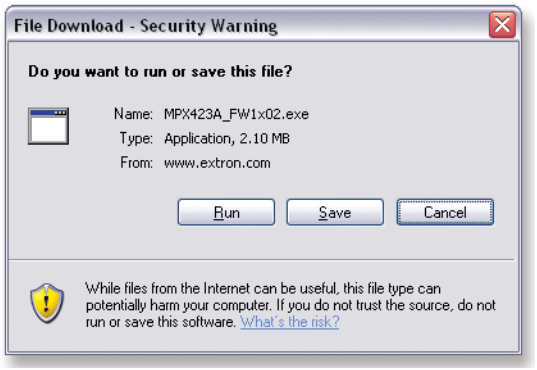


Figure 5-10 — File Download - Security Warning box

11. Access the MPX 423 A switcher via the on-board Web server.
12. Click the **Configuration** tab.
13. Click the **Firmware Upgrade** link.
14. Click the **Browse** button.
15. Navigate to and select the new firmware file.

NOTE *Valid firmware files must have the file extension '.S19'. Any other file extension is* **not** *a firmware upgrade.*

NOTE *The original factory-installed firmware is permanently available on the MPX 423 A switcher. If the attempted firmware upload fails for any reason, the switcher automatically reverts to the factory-installed firmware.*

16. Click the **Open** button.
17. Click the **Upload** button. The firmware upload to the MPX 423 A switcher begins, and may take several minutes to complete.

File Management page

The File Management page (located under the File Management tab), is a useful tool that allows you to use and upload existing and custom Web pages. Custom pages can be developed using a third-party Web page development program such as FrontPage or Dreamweaver. File management also allows you to remove unnecessary or outdated files when they are no longer needed.

To add or update files:

1. Select the **File Management** tab and the File Management screen (figure 5-11) is displayed.

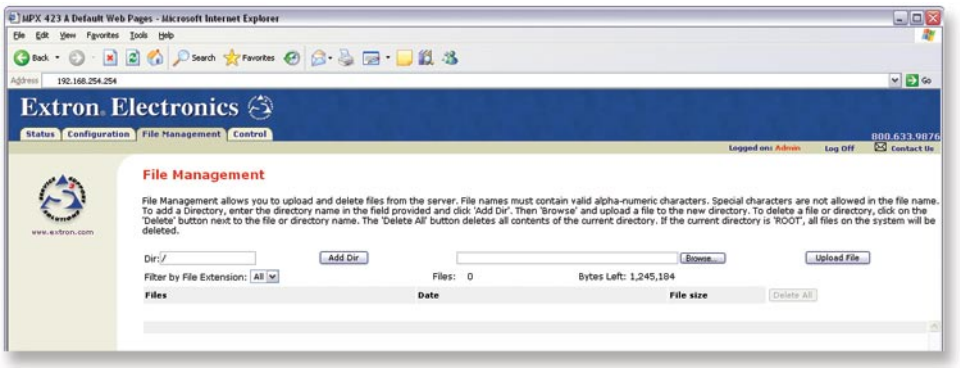


Figure 5-11 — Web server File Management screen

2. Click the **Browse** button to locate the file(s) you want to upload.

NOTE *If you want one of the pages that you create and upload to be the default start-up page, name that file "index.html".*

3. Click the **Upload File** button to upload the file. The file will be added to the list of files under the Files column. After ten files have been loaded, additional file management pages will appear in the page navigation area (on the right side of the screen).

To add a directory:

1. Enter the directory name in the Dir field.
2. Click the **Add Dir** button.
3. Click the **Browse** button, and locate your chosen directory.
4. Upload a file to the new directory.

To delete unwanted files:

1. Select the **File Management** tab and the File Management screen (figure 5-7) is displayed.
2. Find the file you wish to delete under the Files list.
3. Click the **Delete** button next to the file to be deleted. If you wish to delete additional files, wait for the screen to refresh before clicking the **Delete** button of the next file.

   If you wish to delete all files, click the **Delete All** button. The file count will revert to 0 and all pages will be deleted.

Control tab

The Control tab allows access to the Set and View Ties page (figure 5-12), and the Video and Audio Settings page for the MPX 423 A.

Set and View Ties page

Use the Set and View Ties page (figure 5-12) to quickly view and change input-to-output ties.

The Set and View Ties page shows a representation of the MPX 423 A front panel, where the computer (VGA) inputs, the video (composite) inputs, and the S-video inputs are shown in their 4x2 groupings. Output modes can be easily identified as Single or Separate.

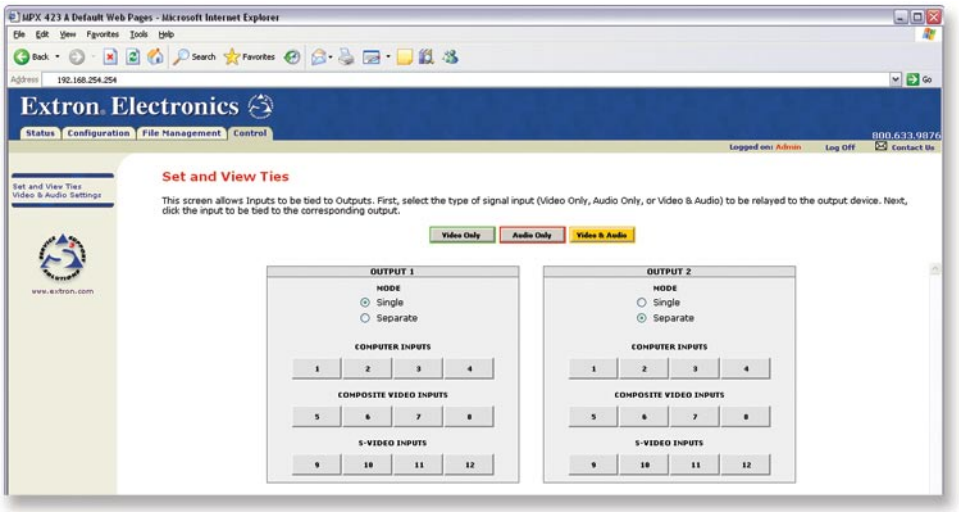


Figure 5-12 — Set and View Ties page

The status of each tie is visible through buttons of three different colors:

- An **amber** button indicates **video and audio ties**.
- A **green** button indicates **video only ties**.
- A **red** button indicates **audio only ties**.
- The **gray** buttons indicate **no ties**.

Creating a tie

Select and switch an input as follows:

1. Click the **Video Only, Audio Only,** or **Video & Audio** button to select video, audio, or both for switching (audio follow or audio breakaway). Each mouse click on a button toggles the other two buttons off.
2. Move the mouse over the input and output selection buttons. Click on a button to create a tie (if not tied) or untie (if tied) of the input and output associated with that button. The button color represents the signal type for the tie: **green** for video, **red** for audio and **amber** for audio and video.

Video & Audio Settings page

The Video & Audio Settings page (figure 5-13) provides a way to set the input audio gain and attenuation, set the output volume, mute and unmute all video and audio outputs, and set the video delay (switching interval).

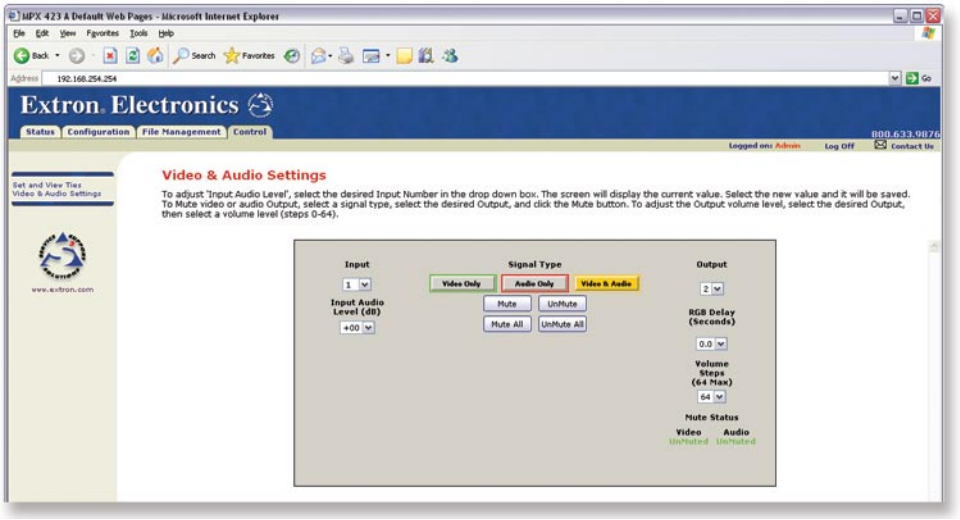


Figure 5-13 — Video and Audio Settings page

Change the input gain and attenuation

Users can set each input's level of audio gain or attenuation (-18 dB to +24 dB) from the Video & Audio Settings page. Audio levels can be adjusted so there are no noticeable volume differences between sources.

Change an input's audio level setting as follows:

1. Click the Input drop box. A drop down scroll box appears (figure 5-14).

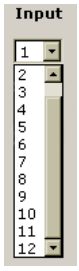


Figure 5-14 — Input selection drop-down box

2. Click and drag the slider or click the scroll up ( ) button or scroll down ( ) button until the desired input is visible.
3. Click the desired input.

4. Click the Input Audio Level (dB) drop box. A drop down scroll box appears.

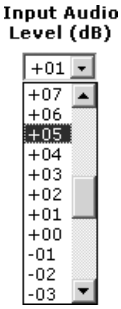


Figure 5-15 — Input Audio Level drop-down box

5. Click on the desired gain or attenuation value.

Mute and unmute one or all outputs

Mute one or all outputs as follows:

1. To select an individual output to mute or unmute, click on the Output drop box. A drop-down scroll box appears (figure 5-16).

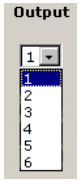


Figure 5-16 — Output selection drop-down box

2. Click the desired output.
3. Click the **Video Only, Audio Only,** or **Video & Audio** button to select video, audio, or both for muting. Each mouse click on a button toggles the other two buttons off.
4. Click the **Mute** or **UnMute** button to mute or unmute the selected output, or click the **Mute All** or **UnMute All** to mute or unmute all of the outputs. Observe the mute status indications on the page (figure 5-17). Unmuted is displayed in green and muted is displayed in red.

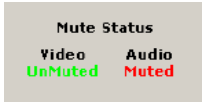


Figure 5-17 — Mute status indications

NOTE *If you choose an output number greater than 2, (i.e., outputs 3 or 4 for Video signals and 5 or 6 for S-video signals) the audio mute options are no longer accessible.*

Use RGB Delay

You can use the RGB Delay feature to insure smooth, glitch-free transitions between inputs of the Computer group only. With a range of half second increments, the maximum delay possible is 5 seconds.

To use the RGB Delay feature

1. Click on the RGB Delay drop box. A drop-down scroll box appears.

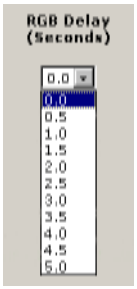


Figure 5-18— RGB Delay drop-down box

2. Click the desired time (in seconds) for the output delay.

NOTE *If you choose an output number greater than 2, (i.e., outputs 3 or 4 for Video signals and 5 or 6 for S-video signals) the RGB Delay options are no longer accessible.*

Change the output volume level

Users can set each output's volume level. The range is:

level 0 = minimum volume to

level 64 = maximum volume

NOTE *If you choose an output number greater than 2, (i.e., outputs 3 or 4 for Video signals and 5 or 6 for S-video) the volume level options are no longer accessible.*

NOTE *The default volume level for output 1 is at level 50. The default volume level for output 2 is at level 64.*

Change an output's audio level setting as follows:

1. Click on the output drop-down scroll box (figure 5-19).

2. Select the desired output (1 or 2).

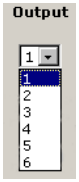


Figure 5-19— Output selection drop-down box

3. Click on the Volume Steps (64 max) drop box (figure 5-20).

4. Select the desired output level (00 to 64)

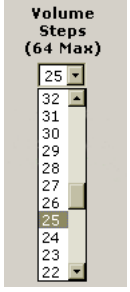


Figure 5-20— Volume steps drop-down box

The following table defines the value of each audio volume step.

X7 value	dB of attenuation	Output volume	X7 value	dB of attenuation	Output volume	X7 value	dB of attenuation	Output volume
00	98	0%						
01	63	5.5%	23	41	38.5%	45	19	71.5%
02	62	7%	24	40	40%	46	18	73%
03	61	8.5%	25	39	41.5%	47	17	74.5%
04	60	10%	26	38	43%	48	16	76%
05	59	11.5%	27	37	44.5%	49	15	77.5%
06	58	13%	28	36	46%	50	14	79%
07	57	14.5%	29	35	47.5%	51	13	80.5%
08	56	16%	30	34	49%	52	12	82%
09	55	17.5%	31	33	50.5%	53	11	83.5%
10	54	19%	32	32	52%	54	10	85%
11	53	20.5%	33	31	53.5%	55	9	86.5%
12	52	22%	34	30	55%	56	8	88%
13	51	23.5%	35	29	56.5%	57	7	89.5%
14	50	25%	36	28	58%	58	6	91%
15	49	26.5%	37	27	59.5%	59	5	92.5%
16	48	28%	38	26	61%	60	4	94%
17	47	29.5%	39	25	62.5%	61	3	95.5%
18	46	31%	40	24	64%	62	2	97%
19	45	32.5%	41	23	65.5%	63	1	98.5%
20	44	34%	42	22	67%	64	0	100%
21	43	35.5%	43	21	68.5%			
22	42	37%	44	20	70%			

X7 value = volume step level

Figure 5-21— Audio volume adjustment settings

Special Characters

The HTML language reserves certain characters for specific functions. The switcher will not accept these characters as part of the switcher's name, passwords, or locally created file names.

The switcher rejects the following characters:
{space} ~ @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Appendix A

Specifications, Part Numbers, Accessories

Specifications

Part Numbers and Accessories

Specifications, Part Numbers, Accessories

Specifications

Video

Routing	(3) 4 x 2 matrix switchers
Gain	Unity
Bandwidth	
RGB signals	350 MHz (-3 dB)
S-video or composite video signals	150 MHz (-3 dB)
Differential phase error	1.0º at 3.58 MHz and 4.43 MHz
Differential gain error	1.0% at 3.58 MHz and 4.43 MHz
Crosstalk (RGB signals)	<-50 dB @ 10 MHz, <-30 dB @ 100 MHz
Switching speed	
RGB signals' sync	<5 ms (max.)
RGB, S-video, composite video	100 ms

Video input

Number/signal type	
RGB/VGA inputs	4 VGA–UXGA RGBHV, RGBS, RGsB, RsGsBs
S-video inputs	4 S-video
Composite video inputs	4 composite video
Connectors	
RGB/VGA inputs	4 female 15-pin HD
S-video inputs	4 female 4-pin mini DIN
Composite video inputs	4 female BNC
Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB and R-Y and B-Y of component video 0.3 Vp-p for C of S-video
Minimum/maximum levels	
RGB/VGA inputs	Analog: 0.3 V to 1.5 Vp-p with no offset
S-video inputs	Analog: 0.5 V to 2.0 Vp-p with no offset
Composite video inputs	Analog: 0.5 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	
RGB/VGA inputs	<-40 dB @ 5 MHz
S-video inputs	<-30 dB @ 5 MHz
Composite video inputs	<-30 dB @ 5 MHz

Video output

Number/signal type	
RGB/VGA outputs	2 VGA–UXGA RGBHV, RGBS, RGsB, RsGsBs
S-video outputs	2 S-video
Composite video outputs	2 composite video
Connectors	
RGB/VGA outputs	2 female 15-pin HD
S-video outputs	2 female 4-pin mini DIN
Composite video outputs	2 female BNC

Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB, and R-Y and B-Y of component video 0.3 Vp-p for C of S-video
Minimum/maximum levels	
RGB/VGA outputs	0.3 V to 1.5 Vp-p
S-video outputs	0.4 V to 2.0 Vp-p
Composite video outputs	0.4 V to 2.0 Vp-p
Impedance	75 ohms
Return loss	-40 dB @ 5 MHz
RGB/VGA inputs	<-40 dB @ 5 MHz
S-video inputs	<-30 dB @ 5 MHz
Composite video inputs	<-30 dB @ 5 MHz
DC offset	
RGB/VGA outputs	±5 mV with input at 0 offset
S-video outputs	1.5 V with input at 0 offset
Composite video outputs	1.5 V with input at 0 offset
Switching type (S-video and/or composite video)	
	Vertical interval

Sync

Input type (RGB/VGA group)	RGBHV, RGBS, RGsB, RsGsBs
Output type (RGB/VGA group)	RGBHV, RGBS, RGsB, RsGsBs (follows input)
Standards	NTSC 3.58, NTSC 4.43, PAL, SECAM
Input level	1.9 V to 5.0 Vp-p
Output level	TTL: 5.0 Vp-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Max input voltage	5.0 Vp-p
Max. propagation delay	30 ns
Max. rise/fall time	4.2 ns
Polarity	Positive or negative (follows input)

Audio

Routing	12 x 2 stereo matrix switcher
Gain	Unbalanced output: -6 dB; balanced output 0 dB
Frequency response	20 Hz to 20 kHz, ±0.05 dB
THD + Noise	0.03% @ 1 kHz, 0.3% @ 20 kHz at nominal level
S/N	>90 dB, output 21 dBu, balanced, at maximum output (unweighted)
Crosstalk	<-90 dB @ 1 kHz, fully loaded
Stereo channel separation	>80 dB @ 1 kHz
CMRR	>75 dB @ 20 Hz to 20 kHz
Volume range	-98 dB to 0 dB (volume numbers 0 to 64 in 1.0 dB steps); Output 2 default = 64 (0 dB)

NOTE *Full attenuation is volume level 0, -98 dB. The default for output 1 is -15 dB, volume level 50.*

Audio input

Number/signal type	12 stereo, balanced/unbalanced
Connectors	(12) 3.5 mm captive screw connectors, 5 pole
Impedance	>12.5k ohms unbalanced, 25k ohms balanced, DC coupled
Nominal level	-10 dBV (316 mVrms)
Maximum level	+20 dBu, (balanced or unbalanced) at 1%THD+N
Input gain adjustment	–18 dB to +24 dB, adjustable per input; default = 0 dB

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

Audio output

Number/signal type	2 stereo, balanced/unbalanced
Connectors	(2) 3.5 mm captive screw connectors, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	>+20 dBu, balanced or unbalanced at 1% THD+N

Control/remote — switcher

Serial control port	RS-232, 9-pin female D connector
Baud rate and protocol	9600 baud (default), 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Ethernet control port	1 RJ-45 female connector
Ethernet data rate	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, DHCP, ICMP (ping), TCP/IP, Telnet, HTTP
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™) Microsoft® Internet Explorer, Netscape® Navigator®, Telnet

General

Power	100 VAC to 240 VAC, 50/60 Hz, 15 watts, internal
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 included brackets, part #70-077-03 Also furniture mountable with optional Under-Desk Mounting Kit, part #70-222-01
Enclosure type	Metal
Enclosure dimensions	1.75" H x 17.4" W x 8.5" D (1U high, full rack wide) 4.4 cm H x 44.2 cm W x 21.6 cm D (Depth excludes connectors and knob. Width excludes rack ears.)
Product weight	7.0 lbs (3.2 kg)
Shipping weight	10 lbs (5 kg)
DIM weight	
International	11 lbs (5 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 and Accessories

Included parts

These items are included in each order for a MPX 423 A Matrix Switcher:

Included parts	Replacement part number
MPX 423 A	60-683-01
Rack/desk mounting brackets	70-077-03
Tweeker (small screwdriver)	
IEC power cord	
MPX 423 IP User's Manual	
4 rubber feet (self-adhesive)	
3.5 mm captive screw audio connectors	

Optional accessories

These items can be ordered separately:

Accessories	Part number
RCAF-BNCM/10 (qty. 10)	100-229-01
RCAF-BNCM/50 (qty. 50)	100-229-03
RCAF-BNCM/100 (qty. 100)	100-229-04
SVHS-BNC adapter	26-353-01
SY VGA-RGBHVM cable	26-533-02
Under-desk mounting bracket	70-222-01
3.5mm 5-pole captive screw audio connectors (Qty 10)	100-457-01

Cables

When using signals with a scanning frequency of 15-125 kHz over 100 feet or more, use high resolution BNC cables to achieve maximum performance.

Cable Type	Part number
Super High Resolution Cable	
RG6/SHR-1 bulk, 500'	22-098-02
RG6/SHR-1 bulk, 1000'	22-098-03
RG6/SHR-4 bulk, 500'	22-099-02
RG6/SHR-5 bulk, 500'	22-100-02
SHR male crimp connectors, qty. 50	100-075-51
BNC-4 Mini HR Cable	
BNC-4 Mini HR bulk, 500'	22-032-02
BNC-4 Mini HR bulk, 1000'	22-032-03
BNC-5 Mini HR Cable	
BNC-5 Mini HR bulk, 500'	22-020-02

Cable Type	Part number
BNC-5 Mini HR bulk, 1000'	22-020-03
Plenum BNC-5 Mini HR Cable	
Plenum BNC-5 Mini HR bulk, 500'	22-103-02
Plenum BNC-5 Mini HR bulk, 1000'	22-103-03

Assorted connectors

BNC Connectors	Part number
BNC mini HR crimp connectors, qty. 50	100-074-51
SHR male crimp connectors, qty. 50	100-075-51
BNC bulkhead connectors, qty. 50 (for custom wall plates)	100-076-51

Pre-cut cables

BNC-4 Mini HR cable is used for RGBS cable runs. BNC-5 Mini HR cable is used for RGBHV cable runs. Either type can also be used for composite video, S-video, or RGsB. All Extron BNC cables have male connectors on both ends. A plenum version of the BNC-5 Mini HR cable is also available.

Cable Type	Part number
BNC-4 Mini HR Cable	
BNC-4-25 MHR, 25'	26-210-04
BNC-4-50 MHR, 50'	26-210-05
BNC-4-75 MHR, 75'	26-210-06
BNC-4-100 MHR, 100'	26-210-07
BNC-4-15 MHR, 150'	26-210-08
BNC-4-200 MHR, 200'	26-210-09
BNC-4-250 MHR, 250'	26-210-54
BNC-4-300 MHR, 300'	26-210-53
BNC-5 Mini HR Cable	
BNC-5-25 MHR, 25'	26-260-03
BNC-5-50 MHR, 50'	26-260-04
BNC-5-75 MHR, 75'	26-260-16
BNC-5-100 MHR, 100'	26-260-05
BNC-5-15 MHR, 150'	26-260-12
BNC-5-200 MHR, 200'	26-260-06
BNC-5-250 MHR, 250'	26-260-18
BNC-5-300 MHR, 300'	26-260-14

NOTE *Rolls of bulk cable in lengths up to 5000' (1524 meters) are available with or without connectors.*

Extron's Warranty

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

USA, Canada, South America, and Central America:

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

Europe, Africa, and the Middle East:

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

Asia:

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

Japan:

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

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

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (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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